

Great Lakes Science Advisory Board-Research Coordination Committee (SAB-RCC) Monitoring Great Lakes Connecting Waters Report Webinar

Public Audience (October 8, 2021) Webinar video recording: <https://vimeo.com/631110539>

Summary of SAB-RCC panelist responses to webinar questions

On October 8, 2021, an open webinar was held to present report findings and answer participants' questions. Below is a list of questions posed by webinar audience members with the responses from the panelists (beginning below on page 1). The list also includes responses to questions that were not able to be answered during the available webinar time ([beginning on page 6](#)).

Webinar Panelists: Chris Winslow (SAB-RCC US co-chair and Ohio State University Sea Grant)
Jeff Ridal (Report co-author, St. Lawrence River Institute)
Rebecca Rooney (Report co-author, University of Waterloo)
Michael Twiss (Report co-author, Clarkson University)

QUESTIONS ANSWERED DURING THE WEBINAR

Question: Two related questions answered together:

1. Why would the Straits of Mackinac be associated with the Lake Michigan LAMP rather than the Lake Huron LAMP. Most connected channels are tied to the downstream lake in the GLWQA.

2. If Niagara River coordination is to be shared by Lake Erie and Lake Ontario LAMPs, why isn't the Straits coordination shared by Lake Michigan and Lake Huron LAMPs?

Response: [Michael Twiss] Yes, that's a good question. The Straits of Mackinac, or *Mackinaw*, however you wish to pronounce it, are an interesting situation because the water flows both ways through the Straits. It can flow east-west from the surface water, and west-east on the bottom waters, and any permutation of that. And since the entire Straits are in US waters, it makes sense to keep it with the Lake Michigan LAMP, in which Canadians don't get involved with the Lake Management Plan of Lake Michigan.

[Jeff Ridal] And also, part of the recommendation is to assign clear priority and clear responsibility for that connecting water, I think that's part of that recommendation. And it's interesting too in terms of this question, is also thinking about how it reflects the institutional culture of lakes. Should it be tied to the downstream because they are inputs into the lake, so that's how they're considered. But if you think of it the other way, as they flow, let's say in the case of the St. Lawrence River, it's affected primarily by what comes to it from Lake Ontario. So from an ecosystem point of view, obviously that's how it's set up but if you're looking at it as, how is that ecosystem affected by the lake, it's just a different point of view. So, I think instead of thinking of it as a source, necessarily, you think about it in the broader ecosystem context. It makes some sense to think about it connected to the upper lake. I think that there's the follow-on question about why not look at it from both angles, and I think really that's likely the best response, is you want to look at it from both sides of the CSMI cycle of both lakes, because they can influence the lake in both directions.

Question: How does the US EPA's National Coastal Condition Assessment, 5-year rotating sampling effort fill some of these gaps?

Response: [Michael Twiss] I just reviewed the last National Coastline Condition Assessment for 2017, for a contractor for the EPA, and one of my criticisms, as you can imagine, was that the connecting waters are not included. And so that's unfortunate, but hopefully the US EPA will take heed of that recommendation, and in future years they'll include it.

Question: I would think that a number of restoration/monitoring projects have been conducted in the target areas under smaller grant programs. Are this / have they been helpful to achieving the goal?

Response: [Rebecca Rooney] I think part of the issue of the connecting waters, and this reflects one of the cultural gaps that we identified, is that doing probabilistic, site-based monitoring in the connecting waters is helpful and yields important data, but it doesn't assess them as a river ecosystem. And to assess them as a river ecosystem requires a different ecological approach and set of monitoring design principles, rather than looking at the nearshore, or at the success of a remediation at a particular Area of Concern. All of these activities do yield important insights into the current condition of our connecting waters, but they don't treat them as an ecosystem, as a lotic, running water ecosystem.

[Jeff Ridal] Yes, and similar thinking there, as someone who is quite involved with the Remedial Action Plan program and Area of Concern monitoring, I think in its initial years there was some very broad-based monitoring programs that were put in place, but as we've seen, as we've become more focused on AOC restoration projects, the monitoring becomes more and more focused to answer specific questions around specific, place-based contamination or habitat or other issues. So exactly what Rebecca was saying, the ability to look at it from an ecosystem perspective is sort of lost through that. And there is definitely valuable information that's generated, but the perspective, the intention is different than what you would have in a larger-based monitoring program.

Question: Three related questions answered together:

1. I think this is similar to the first question re: Straits of Mackinac: What was the justification for recommending the Niagara River be shared between the LE and LO LAMPs, and are there specific components of the ecosystem (water quality, fisheries, habitat, etc.) that the recommendation suggests each LAMP would focus on? Or, would each LAMP share responsibility for all components? How does Niagara Falls factor into this, as there are unique ecosystems up and downstream of this?
2. Great presentation, thank you! What are the thoughts behind a recommendation to monitor the upper and lower Niagara River during different CSMI years? Won't this make it hard to compare results between these two sections of the River?
3. Need scientists in barrels to address Niagara (ha, ha)

Response: [Rebecca Rooney] I would just echo what Michael and Jeff were saying earlier, that there's a bit of a tension between the logistical challenges of trying to do this monitoring, and so crossing Niagara Falls is a logistic challenge with some of our equipment, and ecologically it presents a barrier in terms of connectivity for fish populations. So there are reasons to partition it, but I think our main concern is that these connecting waters be all clearly attributed to a lake in the CSMI so that they're not overlooked. So it's definitely something that requires at least that and we hope that the recommendation from our report will prompt that careful consideration and bring the connecting waters back up in terms of their priorities of the CSMI prioritization cycle.

I think as Jeff said, ideally the connecting waters should be part of monitoring of both lakes that they connect. But we want them to be at least an intentional component of one of them.

[Michael Twiss] Yes, I think the barrel reference is actually a good segue into the obvious reason that the upper Niagara, I believe, would be connected to the Lake Erie LAMP, and the lower [Niagara] to the Lake Ontario LAMP, because there is such a disconnect, biologically (and physically), between those areas. So the upper Niagara River is a spawning area, for fish for Lake Erie, not for Lake Ontario; and likewise the lower Niagara plays a role for spawning for fish in Lake Ontario, but obviously not Lake Erie.

[Jeff Ridal] And of course, the lower Niagara River is a unique source and very important, significant source of contaminants into Lake Ontario, and so those components by necessity have to be monitored for Lake Ontario as well. So there's different kinds of objectives that are being served here.

Question: **Is the early warning detection network not deployed anymore? This was created to protect drinking water suppliers intakes. The last I heard that WSU [Wayne State University] was taking it over.**

Response: **[Michael Twiss]** A lot of drinking water facilities now use ways to monitor the water quality coming in before they treat it, for example turbidity, and that type of thing because turbidity is often associated with resuspended sediments, either from high wind events or from tributary inflows following rainfall. There is no coordinated early warning system across the Great Lakes, unfortunately. And this is something that the [IJC Great Lakes] Science Advisory Board is currently working on; that project [Great Lakes Early Warning System, see Phase 1 at: <https://ijc.org/en/sab/towards-great-lakes-early-warning-system>] is in Phase 2 right now, so I hate to say wait and you'll find the answer to that question. But suffice it to say that it's currently being worked on at the level of the IJC and there will be recommendations that follow.

[A comment from the chat also addressed this question] There are 14 drinking water treatment facilities that are part of the drinking water monitoring network. Southeast MI Council of Governments helps the municipalities manage the system.

Question: **Two related questions answered together:**

1. Is there a reason you are working only with Tribes and First Nations but not the Métis in Canada. Métis are one of Canada's 3 Indigenous peoples, recognized in our Canadian constitution.

2. The Métis Nation of Ontario should also be included with the First Nations on all aspects of this agreement

Response: **[Michael Twiss]** For those in the United States who may not be familiar with the Métis, they are Indigenous people that are of mixed heritage, of French or Scottish and Indigenous communities across Canada. They are recognized with hunting and harvesting rights in the Province of Ontario, but they have no ceded territory. So when the contractors were looking for Indigenous communities, we're looking at the maps that were associated with the ceded territory associated with the connecting waters. And so, we had no way of knowing where the Métis communities are active. And so to that end, we do still need to pay more attention to that important community.

[A comment from the chat also addressed this question] Excerpt from contractor report: Métis Nation of Ontario (MNO) – SMR, SMC One of seven officially recognized historic MNO groups is the Sault Ste. Marie Historic Métis Community, which encompasses the

areas of Batchewana, Goulais Bay, Garden River, Bruce Mines, Desbarates, BarRiver, St. Joseph's Island, Sugar Island and parts of Northern Michigan. MNO signed a Framework Agreement on Métis Harvesting on May 3, 2018 with the Ontario Ministry of Natural Resources and Forestry (MNRF) that advances the recognition of Métis rights in the province and commits the MNO to sharing data collected about the Métis harvest with MNRF. This data sharing protocol is reportedly the 'first-of-its-kind' with an Indigenous community in Ontario.

Question: **What are the benefits of incorporating the Traditional Ecological Knowledge into the monitoring data sets and information? Why is that important to contributing to our understanding of the connecting waters?**

Response: [Jeff Ridal] Great question and it's one that I think generally and overall is one of great discussion among many different agencies and groups working on the Great Lakes in terms of resolving a better understanding of Indigenous knowledge and the value that it can bring to these programs. And I think to start off with, of course, is that we recognize that the importance and critical role the Great Lakes play in Indigenous lives and the importance that Indigenous communities bring to the Great Lakes. So we're fortunate at the River Institute to work with the Mohawks of Akwesasne and work very closely with them. And it is so deep in terms of the understanding what is most relevant to their community, what are their questions, how do they get answers, and also, about the traditional knowledge in terms of understanding those particular issues, and also what areas should, for example in terms of designing a monitoring program by speaking with groups like the Mohawks of Akwesasne. At the River Institute we have learned a lot about how that river functions, what are the key points in the river that we should be looking at in more detail, and how that information should be passed on through the community. And it's a two-way street because we are learning. Some of the questions that were answered; we run a monitoring program that looks at small fish, and it was really because it came from questions that came from the elders that wanted to know to the small fish populations in the St. Lawrence River. So it's a dialogue that can happen, I think that's the starting point: ensure that there's a dialogue in which that traditional knowledge can be passed and some of the questions that the Indigenous communities want answered can be part of the monitoring program.

Question: **Two related questions answered together:**

1. What funding mechanisms need to be enhanced or improved to drive these programs?

2. Thank you for the excellent presentation summarizing the recommendations and advice to enhance monitoring within the connecting channels. My question pertains to enhancing monitoring capabilities among Indigenous communities around the Great Lakes. While monitoring capacity is a desire among many communities, I wonder about the funding that will be needed to purchase, maintain and train personnel so that monitoring results can be accurate and effectively used.

Response: [Michael Twiss] I think that's a question for the agencies to answer. We can only make the recommendation that there's a need.

[Rebecca Rooney] I think we can also mention that in terms of gaps, we identified that the sustainability of funding is really important, and that the funding needs to cover not just the collection of data, but the management of that data and the archiving of that

data. That also needs to have stable funding. So those were some of the gaps that we identified.

Question: Two related questions answered together:

1. What can I do as a citizen to help your efforts?

2. What types of data needs for the connecting waters might be reasonably met by citizen science initiatives?

Response: [Michael Twiss] I suppose participating in webinars like this helps. I know that the IJC is doing a great job these days with reaching out and making sure that the reports that we do are shared far and wide. I am captivated by a lot of these questions that people are asking and a lot of them show such passion for Great Lakes topics. It's welcoming to see. So I think the thing to do would be to make sure that you use this report and what you find useful in it, to help advance what you feel is important. I teach a course called Great Lakes Water Protection and I tell the students, 'if you're an engineer or you're in business, that's ok, you're going to learn about the Great Lakes and if anything it will make you a better voter'.

[Chris Winslow] What we recognize is that we're in a time now that there are so many different technological advances that the ability to monitor our lakes and connecting channels has increased, and I would argue that there's a want by the communities that live along these systems. And so finding a way to connect that want and the technology effectively and efficiently is incredibly important. And so community science is going to play a role in here But what we're trying to work on is finding out what is collected by these participants is of value. And so that value could be getting that information into fifth grade classrooms, that value could be providing information to academics, that value could be providing information to our state agencies to know the condition of these Great Lakes and the connecting waters. And so to follow up on that, I think the communities that live along the lakes [and connecting waters] have a chance to play an important role in how these lakes look and how they're addressed and some improvements that can be made.

[Jeff Ridal] To give some props, this report was a process and during that process in Canada and Ontario the Canada-Ontario Agreement, which is a funding arrangement between Canada and Ontario to work on the Great Lakes issues, and some areas some of the specifics in there are around creating strategies around different parts of the Great Lakes including the upper St. Lawrence River where I'm most familiar with. And written in there is the desire to create a St. Lawrence River strategy. And it's sort of an open book right now in terms of what it looks like, but I think any strategy going forward needs to consider the role of community and citizen science, in terms of not only learning from these monitoring programs, but then working on the ground to help improve the environment.

Question: What are findings or recommendations from the report that might be useful to individuals or organizations with questions or concerns about specific issues in the Great Lakes connecting waters (i.e., pipelines, dredging)

Response: [Michael Twiss] I think we need to make our attention come back to these connecting waters. They're intersections of biota and people and they have traditionally been that way. And I think in the past, like back in the 1970s when all this industrialized activity was happening, and still is in our region, we tended to turn our backs on rivers. We've used them as channels. They used to use that word, "channel," connecting channels, and

we still do, but we want to give it a more respectful term, which is connecting water. So I think that's the beginning of an education that will help develop a new culture and get people focusing more on the rivers themselves and the straits, rather than just the blue, open ocean-like environment of the Great Lakes. So hopefully people recognize the importance of these waters.

[IJC Public Affairs Specialist (contractor) Allison Voglesong Zejnati, webinar facilitator] I might also add that the report just identifies an overarching, glaring need that, in order to make science-based, informed decision about whether they're new projects, or changes to projects, there needs to be an adequate basis of research and monitoring to inform those decisions. I think the report can be helpful in communicating to constituents or decision-makers that there's a real need to increase the research and monitoring around these areas, whether it's through independent assessments, or CSMI modifications, that more attention needs to go to these connecting waters in order to make science-based decisions that benefit the improvement of their water quality and the protection of these ecologically important and vulnerable areas.

QUESTIONS ANSWERED AFTER THE WEBINAR

Question: Could you elaborate on the problems associated with monitoring such large connecting channel volumes of water? I think this may actually be more complicated in practice than in concept.

Response:

In the SAB-RCC report, we provide a quote attributed to (D.P Dodge (1989) who stated: "We know very little about large rivers...defined as those which are large enough to intimidate researchers." The connecting waters are not wadeable rivers and traditional methods for assessment using benthic invertebrate indices are not applicable in these high-energy environments. The rivers and strait that drain the Great Lakes also differ from usual rivers in that they begin as large rivers, rather than as small headwater streams. Using the usual monitoring platforms (ships) is not an option in much of the high-energy environments and shallow reaches in some of the connecting waters. Applying new remote sensing technology offers the best options for connecting water monitoring and surveillance. New techniques and development of protocols as well as highly qualified personnel for deployment and interpretation of observations is needed.

Question: Wouldn't it be beneficial to regionalize all this analyses that come from monitoring on the Great Lakes Connecting Channel for trends, highs, and lows of different water quality parameters.

Response: Monitoring objectives can be divided into effects-based monitoring and trend-based monitoring, with trends being spatial and temporal. When we are monitoring the AOCs and the effectiveness of remediation and restoration efforts, we are carrying out effects-based monitoring, and this requires a certain design to rigorously detect changes and attribute cause. For trend-based monitoring, to give us a kind of report-card status on the condition and trajectory of our connecting waters, we require a different monitoring program design at a more regional spatial scale. This type of monitoring is really missing, but it would be the format where we would be interested in trends through time,

maximum and minimum values, overall ecological condition, and that might include water quality.

Question: **Re: Recommendation II: Further, changes made to GLWQA Annex 2.C. Please describe how this revision process is initiated by the Parties.**

Response: In Article 11 of the 2012 Great Lakes Water Quality Agreement, “This Agreement and its Annexes may be amended by written agreement of the Parties.” This may occur at any time. However, the governments have the opportunity to review the agreement under Article 5.5 of the Agreement, “Following every third triennial Assessment of Progress Report of the Commission, the Parties shall review the operation and effectiveness of this Agreement.” Therefore, the review of the Agreement may provide an opportunity to demonstrate the compelling need for an amendment to the Agreement. See: https://www.ijc.org/sites/default/files/2018-07/GLWQA_2012.pdf. In summary, it can be a simple exchange of letters between the two nations that they agree to a change in the text of the Agreement.

Question: **The following two questions are related and a single response is provided for both:**
1. If the Niagara River will be partitioned between the two lakes, how will the Welland Canal be included?
2. Is there any plans or thoughts to incorporate the Chicago River as a connecting waterway in the future? While it doesn't connect the Great Lakes to one another, it does connect the Great Lakes to the Mississippi watershed and seems to have a large ecological importance (RE: invasive species movement).

Response: The project scope of the literature review, monitoring and surveillance inventory, and expert interviews conducted by the contractor and summarized in Appendix 1 of the report did not include other channels such as the engineered Welland or Erie Canals, or the narrow passages in the northern Lake Huron/Georgian Bay region, though they are recognized as sharing some features of the connecting waters. The contractors report notes that “engineered navigation channels or canals such as the Chicago Area Waterway System, Welland Canal, Trent-Severn Waterway, and Erie Canal can serve as direct or indirect... conduits for invasive species... that can affect natural connecting channels from downstream or upstream direction.” These areas are presently included to some extent in the LAMPs; for example, the [Lake Ontario 2018-2022 LAMP](#) has a Programmatic Focus Area to Reduce the Impact of Aquatic Invasive Species and given an example action as exploring feasibility of developing a basinwide rapid response framework for early detection of AIS for high-risk areas such as these canals. Monitoring or investigations of specific canals are tied to other Agreement objectives, such as sediment sampling in the Black Rock Canal as part of the priority LAMP actions to support the binational Niagara River Area of Concern remedial action plan. Similarly, the [draft Lake Erie 2019-2023 LAMP](#) identifies a priority to prevent Asian Carp establishment via canals through the Asian Carp Regional Coordinating Committee.

Question: **The NRTMP [Niagara River Toxics Management Plan] does monitor the Niagara river ...but what specific questions need answering - I think that has to shape what monitoring goes on In the connecting channels.**

Response: This is a great example of a monitoring program designed to address a precise monitoring objective. In certain areas of historic contamination, like our AOCs, we can

have targeted monitoring to examine the effects of particular contaminants or the effects of remediation actions (e.g., is the RAP successful?). These types of monitoring program address a specific question and should absolutely be driven by narrowly defined objectives. But, more generally, we need whole-river or whole-strait monitoring of the condition of these ecosystems to give us baseline information, for example if there were an accidental spill. It would also take stock of how their condition is changing through time, which should inform how we manage them to preserve their ecological integrity and protect water quality.

Question: **A lot of the monitoring of sediment and water in the St. Marys River is related to the RAP. What additional monitoring would the SAB recommend?**

Response: The St. Marys River Area of Concern and Remedial Action Plan is somewhat unique because the scope is inclusive of the entire river system, which is not always the case for other Areas of Concern in connecting waters. However, the AOC program only identifies 14 specific beneficial use impairments (BUIs) related to legacy pollution impacting water quality, and the St. Marys River has 10 of those 14 possible BUIs. Furthermore, while the entire river is considered an area of concern, projects and monitoring focus on site-specific restoration objectives. What the SAB-RCC recommends for this river and all connecting waters is that regular monitoring occurs throughout the ecosystem and the responsible agencies collect data on factors that are not just limited to indicators of ecological health related to BUIs, but also examine trends and changes in chemical, physical and biological properties of the waters independent of impairment status.

Question: **The following two questions are related and a single response is provided for both:**
1. Wonder what the panel thoughts are on dredging activities and impacts on connecting channel ecology, especially in the St. Clair and Detroit Rivers.
2. Only the St. Clair River is unstable and has been found by the IJC's Upper Lakes Study to have eroded and that resulted in increased conveyance. Last winter there was a massive ice jam in the St. Clair River that very likely caused erosion of the riverbed. Would this initiative result in the development of a mathematical model of the river to determine conveyance change and how it could be stabilized by replacing with rock rubble that was removed during navigation dredging?

Response: The IJC Great Lakes Science Advisory Board-Research Coordination Committee report provides ideas about how the Canadian and US government agencies might best advance a plan for incorporating connecting waters monitoring into their existing Lakewide Action and Management Plan (LAMP) and Cooperative Science and Monitoring Initiative (CSMI) programs under the Great Lakes Water Quality Agreement. Initiatives for modelling specific portions of Great Lakes connecting waters riverbeds or bathymetry as they relate to understanding water levels and flows are not part of the scope of this committee report.

Question: **How much impact on the connecting waters do the varying lake levels have, and how much influence does the IJC have on the lake levels?**

Response: As the contractor report indicates, record low water levels results in lower flows through connecting waters. Record high water levels result in high levels of flow in connecting

waters, that can result in shoreline flooding and erosion in the connecting waters. Sustained winds can also affect flow in some parts of the connecting waters. Flow is regulated at only two points in the Great Lakes: at control structures in the St. Marys River and in the St. Lawrence River. Flow is diverted at Niagara Falls to drive turbines. Flow control structures, and the IJC control boards that help Canadian and US governments collaborate on science-based decisions for regulating flow, have relatively little impact on overall lake levels. Environmental and climate conditions are the main determinants of trends and changes to lake levels. The IJC control boards are separate from the Great Lakes Science Advisory Board-Research Coordination Committee and the Commission's work under the Great Lakes Water Quality Agreement. For more information please visit the websites of the control boards:

International Niagara Board of Control: <https://ijc.org/en/nbc>

International Lake Superior Board of Control: <https://ijc.org/en/lisbc>

International Lake Ontario-St. Lawrence River Board of Control: <https://ijc.org/en/loslrb>

Question: **The Vertical Control - Water levels subcommittee, Coordinating Committee of Great Lakes Hydraulic and Hydrologic Data are looking at updating (likely lowering) the Low Water Datum for the Great Lakes. When asked how climate change modelling was informing this process the answer was basically "it isn't". So another use of the work products you are describing that would be timely as 12" lowering of the datum might require a foot of dredging in the St. Clair to meet the authorized 27 foot channel depth requirements.**

Response: [To answer this question, the Science Advisory Board-Research Coordination Committee conferred with the Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data to provide an answer directly from that Committee.]

At this time, climate change modeling is not included in the calculations of Low Water Datum. As for dredging, depending on the new value chosen for Low Water Datum there is a potential that dredging might be required, but that decision will lie with the agencies that maintain the channel depths, some of whom are members of the Great Lakes Coordinating Committee. There is an outreach effort being planned to meet with stakeholders and gather feedback on implications. [For more information, see: <http://www.greatlakescc.org/>]

Question: **Please provide some details of the application of improved monitoring and measurement technologies to enhance our understanding of the dynamics through the connecting channels, particularly with regard to water levels. Many thanks.**

Response: [The Science Advisory Board-Research Coordination Committee mandate under the Great Lakes Water Quality Agreement focuses on water quality, and the report focuses on improving monitoring to enhance our understanding of chemical, biological and physical properties specific to water quality objectives. To provide an answer to this question about water levels, the Committee conferred with the US Army Corps of Engineers to provide an answer specific to water levels.]

There are several water level gauge stations in the Great Lakes connecting waters. NOAA water level gauges record data every six minutes, Canadian Hydrographic Service gauges record data every three minutes. Preliminary data are released with minimal quality control and latency. Survey boats equipped with acoustic instruments are able to measure velocities and conduct a high-resolution discharge survey in less than an hour at

most Great Lakes connecting channel locations. High resolution discharge measurements coupled with water level gauges and velocity meters permanently installed on the shorelines of rivers allows for the creation of relationships that continuously estimate discharge. In the past, this was achieved with discharge measurement, and water level gauges only. Continuously measuring velocity, along with water levels allows for a better understanding of discharge when the channel is affected by ice, wind, or excessive aquatic vegetation.

These high-resolution datasets have been applied to statistical water balance models that examine all the components of the water budget across each of the Great Lakes. The uncertainty of the water balance decreases when these high-resolution data sets are introduced into the model.

In addition to monitoring water levels and velocities and applying these datasets to water balance type modeling, monitoring channel morphology has significantly improved since the start of the 21st century, especially on the St. Clair River. High resolution surveys of the entire channel have been collected in 2007, 2012, 2018 and 2021. Prior to these surveys, the rivers were mapped with single beam survey and the depths in the channel were only known and discrete transects across the river. This made it difficult to monitor morphology and channel capacity in response to changes in water levels or large ice jams. Rivers are always evolving, but if they change enough and the channel capacity increases then a water level regime change on the lakes would be possible.

Question: The following two questions are related and a single response is provided for both:
1. Can you speak to your role and the risks posed by the Enbridge pipelines (3+5)?
2. Enbridge energy is currently proposing to construct an oil pipeline tunnel beneath the Straits of Mackinac. Can the SAB recommend to Canada and the U.S. that a major study of baseline conditions in the Straits be conducted before any construction commences?

Response: It is the policy of the International Joint Commission, and its volunteer expert advisory boards, not to comment on domestic projects or proposals undertaken by either country or its states or provinces, unless both federal governments direct the IJC to study the issue.

The SAB-RCC report establishes that connecting waters are important and vulnerable ecosystems that are not sufficiently monitored. The report demonstrates that there is insufficient data from current research and monitoring efforts to establish baseline conditions for connecting waters. Additional monitoring of connecting waters is a benefit to all connecting waters related to understanding the relative risks and benefits of any infrastructure developments.

It is worth mentioning that in 2018 the SAB issued a report entitled “Potential Ecological Impacts of Crude Oil Transport in the Great Lakes Basin” that contained 12 recommendations on data gaps. One of these recommendations relates to the second question about studying the condition of habitat before any pipeline construction occurs. Another recommendation was to appropriately site future oil transportation developments/infrastructure. Further, for species conservation purposes, agency program managers should encourage, and researchers should pursue, assessments with regards to exposure, sensitivity and adaptive capacity (hence vulnerability) that includes

a focus on species of particular cultural and/or conservation concern in the Great Lakes (i.e., walleye, lake trout, lake sturgeon), particularly those species that may be present in vulnerable areas. The report is available at: https://ijc.org/en/sab/SAB-SPC_CrudeOil_Transport_GreatLakes_Report.

Question: Can you comment on wind and wave monitoring on Huron and Georgian Bay

Response: Unfortunately no, this report focused on the connecting waters of the Great Lakes and did not include Lake Huron or Georgian Bay. The project scope of the literature review, monitoring and surveillance inventory, and expert interviews conducted by the contractor and summarized in Appendix 1 of the report did not include other channels such as the engineered Welland or Erie Canals, or the narrow passages in the northern Lake Huron/Georgian Bay region (the North Channel), though they are recognized as sharing some features of the connecting waters.

Question: Between 1992 and 2017, chlorpyrifos was one of the most heavily used pesticides in the US with some 450 million pounds sprayed on crops. Does your organizations measure for its presence in the connecting water ways and if present what measures are you taking to remove chlorpyrifos from the water ways?

SOURCE : Chlorpyrifos Question: <https://theintercept.com/2021/06/30/epa-pesticides-exposure-opp/>

Chlorpyrifos are a serious issue and should be addressed; the class to which chlorpyrifos belongs, caused children born in the U.S. in a single year — 2010 — to collectively lose 1.8 million IQ points, costing the country \$44.7 billion in productivity, education, and health costs.

Response: This question is not specifically relevant to the scope of this SAB-RCC report. The International Joint Commission does not conduct monitoring activities or undertake activities for remediation; Canadian and US government undertake water quality monitoring and remediation through domestic actions undertaken by a variety of federal, state, regional and local agencies. The extent to which Chlorpyrifos is or is not monitoring in the Great Lakes or their connecting channels is a function of the policies established by each jurisdiction.

At the binational level, the 2012 Great Lakes Water Quality Agreement establishes “Chemicals of Mutual Concern” under Annex 3 that sets forth coordination plans for Canada and the US governments to address specific contaminants. More information about how governments designate Chemicals of Mutual Concern, and the process for nominating and screening criteria, are available at: <https://binational.net/annexes/a3-2/>

Question: When will radionuclides be added to Chemicals for Mutual Concern, and as well included in baseline studies plus monitoring, given the increasing threats in the Great Lakes Basin?

Response: This question is not specifically relevant to the scope of the SAB-RCC report. Updates about the Canadian and US governments’ decisions and processes for considering and establishing Chemicals of Mutual Concern under the 2012 Great Lakes Water Quality Agreement Annex 3 is available at: <https://binational.net/annexes/a3-2/>

Question: Is there legislation to stop corporations from poisoning YOUR drinking waters?

Response: This question is not specifically relevant to the scope of this SAB-RCC report.

Question: Proposed Hydro Electric Dam – pumping 23 million cubic meters in and out of Georgian Bay every 11 hours from a 375 acre dammed reservoir: According to the Navigant report Jan 2020, TCE claims that the proposed open loop pump station (using Lake Huron/Georgian Bay as the lower reservoir) on the Department of Defence in Meaford will save 490,000 tons of CO2 gases per year. This proposed project is modelled after Ludington in Michigan state. Mr. Jester a principal at 5 Lakes Energy states that "1.37 tons of carbon dioxide per MWh is produced", therefore "it is not carbon free" (Ludington). The facility operates at a 72% efficiency and produces more CO2 emissions than are avoided.

Having understood these facts, is this advisory committee aware of this project? This proposed project is not green, it will destroy the environment, land habitats, fish habitats (endangered species), and the overall alter the ecosystem in Georgian Bay and connecting tributaries/water sheds etc. Can you comment on this proposal, and its impacts on the surrounding area?

Response: This question is not specifically relevant to the scope of this SAB-RCC report. It is the policy of the International Joint Commission, and its volunteer expert advisory boards, not to comment on domestic projects or proposals undertaken by either country or its states/provinces, unless both federal governments direct the IJC to study the issue. this report focused on the connecting waters of the Great Lakes and did not include Lake Huron writ large or Georgian Bay. The project scope of the literature review, monitoring and surveillance inventory, and expert interviews conducted by the contractor and summarized in Appendix 1 of the report did not include other channels such as the engineered Welland or Erie Canals, or the narrow passages in the northern Lake Huron/Georgian Bay region, though they are recognized as sharing some features of the connecting channels.

LIST OF ORGANIZATIONS THAT WERE PRESENT ON THE WEBINAR

A total of 187 participants from a variety of sectors attended the webinar.

Agriculture and Agri-Food Canada	Gordon Foundation
Anishinabek Nation	Great Lakes Fishery Commission
AquaTox Testing and Consulting, Inc.	Great Lakes Observing System
Bay Area Restoration Council	Grain Farmers of Ontario
Bell Media/AM800 CKLW Radio	Great Lakes Community Conservation Corps
Black Spruce Forest LCC	Great Lakes St. Lawrence Governors and Premiers
Blue Mountain Watershed Trust	Green Venture
Brandon Koltz Water and Environmental Consulting LLC	ICF International, Inc.
Bureau of Indian Affairs	Illinois Department of Natural Resources
Canadian House of Commons	Indiana Department of Natural Resources
Carleton University	Izaak Walton League of America
Central Michigan University	Keweenaw Bay Indian Community
Chiefs of Ontario	Lake Superior State University
Chippewa Ottawa Resource Authority	Laurentian University
City of Erie	Legacy Land Conservancy
City of St. Catharines	LimnoTech
Clarkson University	Lucas County Soil and Water Conservation District
Cleveland Water Alliance	Maitland Trail Association
DataStream	Métis Nation of Ontario
Detroit River Canadian Cleanup	Michigan Department of Environment, Great Lakes and Energy
Department of Fisheries and Oceans Canada	Michigan Sea Grant
Dillon Consulting Limited	Michigan State University
Eco SEEDS	Milwaukee Riverkeeper
Embassy of Canada	Ministère des Affaires municipales et de l'Habitation du Québec
Environment and Climate Change Canada	Minnesota Department of Health
Erie County Department of Planning and Community Development	Minnesota Sea Grant
Essex Free Press	New York Sea Grant
Euclid Chamber of Commerce	New York Department of Environmental Conservation
Farm and Food Care Ontario	Nokiiwin Tribal Council
Fond du Lac Band of Lake Superior Chippewa	Northwest Indiana Forum
For Love of Water	Oak Ridges Moraine Groundwater Program
Friends of Portage Lake	Ocean Conservancy
General Dynamics Information Technology	Ohio Department of Natural Resources Coastal Management Program
Georgian Bay Association	Ohio Pork Council
Georgian Bay Forever	Ontario Federation of Agriculture
Georgian Bay Great Lakes Foundation	Ontario Ministry of Agriculture, Food and Rural Affairs

Ontario Ministry of Northern Development, Mines,
Natural Resources and Forestry

Ontario Ministry of the Environment, Conservation and
Parks

Ontario Public Service

Park Point Community Club

Parks Canada

Pollution Probe

Public Health Ontario

Queen City Yacht Club

RISE Coalition

Ruekert-Mielke, Inc.

Sault Naturalists

Save Georgian Bay

Smithsonian Institutions

Spectrum News Buffalo

St. Lawrence River Institute

Tennessee Department of Environmental Conservation

Temagami First Nation

The Ohio State University

Town of the Blue Mountains

Trent University

University of Illinois-Chicago Health

University of Peradeniya

University of Minnesota-Duluth Natural Resources
Research Institute

University of Toledo

University of Washington

University of Waterloo

US Environmental Protection Agency Great Lakes
National Program Office

US Environmental Protection Agency Region 5

US Army Corps of Engineers

US Geological Survey

WaterWayze

Wisconsin Department of Natural Resources

West Ipperwash Property Owners Association
