Science Advisory Board
Research Coordination Committee

Team and Virtual meeting

October 17, 2023
9:00-12:00 ET

Notes

Attendees:

RCC members: Chris Winslow, Carl Platz, Debbie Lee, Michael Twiss, Ram Yerubandi, Eric Boisvert (virtual), Rebecca Rooney (virtual), Sandra Eberts (virtual), Sergio Paulo (virtual), Val Klump (virtual).

Staff: Lizhu Wang, Mark Burrows, Lyne Sabourin

1. **Welcome, roll call, approval of agenda, and approval of last RCC meeting summary**.
   - Co-chairs welcomed attendees and had a roundtable introduction. The new Section liaisons were particularly welcomed.
   - Draft agenda was approved as presented.
   - September 2023 RCC Meeting Summary was approved.

2. **New project ideas for 2024 funding cycle**
   - *Great Lakes Early Warning System (GLEWS) Pilot project*

     RCC has completed the 1st phase of the project in 2020. The 2nd phase of the project is near completion. One of the recommendations of the 2nd phase of the project report is to carry out a pilot GLEWS study.

     The 1st and 2nd phases of the project provide a framework on how stressors and threats can be identified, screened, analyzed, and warned. The pilot study will use the developed framework pathway to examine examples of known, suspected, and unknown stressors and threats to test out if the framework can be used effectively.

     This project will be a joint effort between RCC and SPC. Michael Twiss from RCC and Lucinda Johnson from SPC will lead the effort, but it will need additional support from SAB members. The intent of this project is to submit a work plan for the 2024 funding cycle.

     Several potential candidates for known, suspected, and unknown stressors and threats were discussed, which included invasive species, emerging chemical concern, harmful algal bloom, and hypoxia.

   - *Expending mining database of the Rainy River and Lake of the Woods*

     The International Rainy River-Lake of the Woods Watershed Board (IRLWWB) and the Health Professionals Advisory Board (HPAB) conducted a project - Assessing vulnerability of waters to mining in the Rainy River and Lake of the Woods watersheds. The project will assemble and document various relevant datasets,

including geology, mining activities, commodities, mining potential, geochemistry (water, soil, rock), watershed, hydrology, and hydrogeology. The database needs to be harmonised spatially and semantically if possible.

During a recent project status report meeting, the possibility of expanding the work to other watersheds was discussed. The project already has a harmonised product that covers transboundary watersheds (surface water-groundwater model). The methodology, data model, and vocabulary work can be used for other watersheds (for example, data collected in Ontario also relevant to the Great Lakes). This could be linked to the Great Lakes Atlas work. This was brough up for information.

- *Impacts of population dynamic resulted from climate change for the Great Lakes basin*
  There is sufficient evidence that human populations have moved to climate refuges from areas experiencing serious impacts of climate change. Due to the rich water resource of Great Lakes, such population movement is suspected to shift population density and demographic composition. Such population changes are expected to have significant impact on land use, pollutant discharge, water use, wildfire, road salt application, and consequently impact Great Lakes water quality. This is a fruit of thought and could be a scoping project. The RCC does not have a firm idea regarding how the project will be shaped, and probably it will not be a work plan for the 2024 funding cycle.

- *Media communication products*
  It is very important to effectively communicate IJC message and SAB products to stakeholders, right holders, and government natural resource managers and policy makers. There is a need to consider how we modernize the way we communicate with young generations. Developing effective media communication products has been discussed during RCC's September meeting, and it has been also brought up by other Great Lakes Boards.

  Antimicrobial Resistance Monitoring System (AMRMS) was used as an example being applicable to the Great Lakes to address water issues, and to ask what we have done in terms of monitoring, what the microbial resistance looks like, how much we understand it in the Great Lakes. Those questions include whether we have enough information to answer if it is increasing, if it is transmissible to humans, and what the microbial resistant pathogens and mutations are. Short videos were suggested as examples of products.

  It was discussed that RCC does not have the expertise on this topic, and it should be just considered as an idea for IJC communication team to consider.

- *Potential risks of increased wildfire frequency and severity on the Great Lakes region*
  Freshwater systems are vulnerable to the recent massive wildfires across the world and in the North America. The extensive hydrogeomorphic effects from a wildfire can impair the ability of watersheds to provide safe drinking water and overall water resources. A map of wildfire water risks to humans and to natural ecosystems from a

2018 paper published in The Science for Total Environment was presented. The Great Lakes basin is an area of such an elevated risk even if it typically thinks that wildfires occur more often in the West and more arid regions.

Wildfire affects water quantity and quality by increasing surface runoff and bringing materials, such as sediment, nutrients, toxicants, and others in the runoff to the water systems including rivers, inland lakes, and the Great Lakes. The recent increase in wildfire occurrence and spatial scale exemplified the need to understand the impact of wildfire on aquatic system. This is related to climate change and increased human activities on the landscape.

There are potentially a lot of risks of wildfire, and it would be valuable to do a horizon scan to see what the concerns are and how serious it is. Although there is a lot of academic research on the impact of wildfire, the widespread of fire in Canada this year indicates we really need to start thinking about this in the Great Lakes U.S. States and in Ontario. This work may emphasize the connectivity between fire and water, and anything that affects wildfire risk within the basin is absolutely going to affect water, water quality, drinking water, human health, and ecosystem. Since the project is related to human health, RCC may want to work with HPAB jointly.

- *Challenge in nutrient reduction to control HABs and nutrient deficiency of fish productivity*

  It was mentioned that charter captains started to worry about fish productivity if 40% P reduction is achieved. They have seen enough evidence that when the lake is green, the fishing is good. This is an unintended consequence of addressing harmful algal bloom issue that impacts fisheries. It was pointed out that although fish productivity is related to green water, harmful algal bloom is not the kind of water we are looking for because such type of bloom cannot be used by fish or fish prey very efficiently and cyanobacteria are typically a dead end for the food web. When we set up new nutrient reduction targets, the impacts on fishery need to be considered in the discussion since there could be negative consequences to fisheries.

  Since Jason who brought up this topic is not attending the meeting, this topic will be discussed further in future RCC meeting.

- *USGS National Integrated Water Availability Assessment*

  The USGS Integrated Water Availability Assessment program has been investigating salinity trends across the United States. Earlier work showed there are increases in salinity in urban areas. This work has been going on for more than a year with a report that has chapters on water supply and demand that include water quality, quality, and use. There is a regional synopsis in the report which could be inclusive of the Great Lakes region.

  This was brought up for awareness and could be a topic to be presented at the future RCC meeting.

- *Salinization of the Great Lakes watershed and its waters*
  IJC may want to consider salinization of the Great Lakes because many agencies measure it routinely, but it is not being considered from the point of view as an emerging threat. This was introduced as a potential topic for the SPC/QWB to consider. It relates to ongoing SAB projects (GLEWS, Winter Science). It relates most directly to annexes 9 (climate change impacts) and 10 (science) with connections to annexes 4 (nutrients) and 6 (aquatic invasive species).

  Salinization of the Great Lakes has been ongoing with industrialization of the watershed, and it exemplifies a poorly defined yet emerging concern. Abundant mineral deposits underlying the Great Lakes, combined with inexpensive ship transport, and increasing use of road salt in winter road management are threats to water quality. Salinization occurs primarily from industrial and municipal wastewater treatment plant effluents and road salt use. Following the 1972 GLWQA, salinization - as indicated by chloride concentration – decreased markedly (due to industrial controls) but beginning in 1990, salinization is now increasing at a greater rate than prior to 1972. Chloride is a conservative ion and although its concentration is regularly monitored by responsible agencies, information on watershed loading is not readily available to constrain mass-balance models. Salinization is not a particularly sexy issue, but the potential widespread impact makes it a pressing concern. For example, the potential impacts include: an influence on invasive species (including pathogens) more adapted to higher salinity levels; effects on nutrient mobilization (through ion exchange processes) in watersheds, that enhance eutrophication. Climate change is a multiple stressor of salinization. Warming climate brings more potential invasive species and stresses on native species and populations in the Great Lakes. Decreased ice cover due to warmer climate means more lake effect snow and thus, more road salt use. The SPC may consider this topic to form a work group to better describe the potential threat it causes across the Great Lakes Basin.

It was summarized at the end of the new project ideas discussion that the RCC will focus on the following:

- GLEWS pilot project – Michael Twiss and Lucinda Johnson will develop a work plan.
- Other project ideas are under consideration:
  - Horizon Scan related to climate induced migration to Great Lakes region and movement within the basin. Debbie Lee is interested in exploring more and leading this effort.
  - In discussion with SPC, and soon with WQB and HPAB to consider:
    - ✓ Fire and its impact on water quality
    - ✓ Microbial resistance - monitoring and impact
    - ✓ Salt impacts on the Great Lakes - monitoring and impact

3. **Questions/comments on on-going projects**
   - *Great Lakes Early Warning System*

The project is near completion. A work group report will be circulated to the Great Lakes Boards for red-flag review next week, and plan to submit it to the Commissioners for approval within the next couple of months. One of the recommendations of the report is to develop a pilot project to test and improve the warning system.

- *Microplastic Monitoring and Risk Assessment*
  The workgroup has been meeting bimonthly. The contractor has completed a literature review report and workgroup has convened an in-person workshop in September to develop a framework for monitoring plastic pollution in the Great Lakes that would support its use as a sub-indicator for the State of the Great Lakes report under GLWQA. A 2nd in-person workshop has been planned in February 2024. The project is expected to conclude in mid-2024.

- *Great Lakes Winter Science*
  A literature review report and summary of winter science database have been completed. Two virtual workshops were carried out in May and September in 2023 to explore winter science gaps, needs, and priorities, and identify training, infrastructure and coordination to meet the needs of those science priorities. The project is expected to conclude in December 2024.

- *Governance of Nutrient Adaptive Management*
  The final workgroup report has been approved by the Commissioners and transmitted to the Parties in July 2023. Since this project is complementary to the SAB-SPC's Nutrient Synthesis project, an outreach and engagement webinar was held on September 25 to release and promote the two reports together publicly. This webinar had 109 attendees, many of which expressed significant interest in the subject matter presented. The GLRO responded to several post webinar inquiries as a result of the information shared. Although there will be more engagement with the Annex 4 and others, this project is considered as completion.

4. **Newly approved projects update and identify workgroup members**
   - *Great Lakes Science Plan*
     The goal of this project is to support the Commission in advancing the Great Lakes Science Strategy through the development of a detailed Great Lakes Science Plan. It involves establishing a partnership Collaborative, consolidating input from interested parties, and developing a detailed Science Plan report based on six workshops. More than 30 Great Lakes agencies, academia, and NGO representatives have been invited to join the Collaborative through which the Science Plan will be developed.

     RCC members serving on the collaborative include Debbie Lee, Eric Boisvert, Val Klump, Carl Platz, Jason Borwick, Rebecca Rooney.

     A contractor team has been secured and will have Collaborative call soon.

   - *Community Science Handbook*

This project is transitioning to a 2nd phase to develop a handbook for community science. The handbook will include program design that align monitoring purpose, data use, data users, and anticipated project impacts; technical design on what, when, where, and how to sample, equipment needs, accessibility, and lab analysis; informational design on data repository and its synthesis into information; and guidelines for coordinated community science efforts.

The project will also identify an outline plan for IJC (and/or sister commission) to serve as facilitator of transboundary information exchange between distributed community science programs and identify lead agency or agencies for resource curation, training, data-information management, and dissemination of findings.

Chris Winslow and Ram Yerubandi are the workgroup leads. A contractor team has been secured in September 2023.

- *Great Lakes Environmental Atlas I - A Scoping Exercise*
  The project will scope the content and characteristics of a modern and interactive Atlas that could maximize its utility to users. A Statement of Work has been prepared and contractor RFP will be sent to potential bidders soon.

  Ram Yerubandi and Eric Boisvert are interested in joining the workgroup.

5. **Participation in other board projects**
   - GL Horizons II: Broadening Engagement - WQB
     Debbie Lee and Carl Platz (tentatively) are interested in joining the workgroup.
   - Social Dimensions of GL Restoration and Revitalization – WQB
     Michael Twiss is interested in joining the workgroup.
   - Implementing the Great Lakes Microbial Source Water Quality Assessment – HPAB
     Sandy Eberts is interested in joining the workgroup.
   - Building a Framework Toward Bridging TEK and Western Science-II - SPC
     Ram Yerubandi and Rebecca Rooney are interested in joining the workgroup.

6. **Preparation for SAB meeting**
   A broad discussion was focused on the new project ideas regarding RCC's collaboration with SPC, as well as with WQB and HPAB. It has been recognized that the RCC members are too busy and may not be able to take on more projects, other than GLEWS Pilot project, in the 2024 funding cycle.

7. **Preparation of RCC board appearance**
   A draft set of slides were presented and discussed. Individual slides have been assigned to RCC Co-chairs and projects' work group leads who are responsible to review the slides and make changes as needed.

8. **Other topics**

Next RCC call will be in December. Co-chairs will identify several time slots for secretary to send a Doodle Poll.

9. Adjourned at 12:00 pm