

International Joint Commission  
Canada and United States



Commission mixte internationale  
Canada et États-Unis

April 21, 2020

Mr. Sylvain Fabi, Director  
U.S. Transboundary Affairs Division  
Global Affairs Canada  
125 Sussex Drive  
Ottawa, Ontario K1A 0G2

Ms. Laura Lochman, Director  
Office of Canadian Affairs  
U.S. Department of State  
2201 C Street, NW  
Washington, D.C. 20520

Dear Ms. Lochman and Mr. Fabi:

The International Joint Commission (IJC) is pleased to transmit to you its final report on the Lake Champlain Missisquoi Bay and Lake Memphremagog Reference letter of October 19, 2017, comprising the Commission's synthesis and recommendations, and the two basin reports. In this Reference, the governments of the United States and Canada, in accordance with Article IX of the Boundary Waters Treaty, requested Commission assistance in addressing the proliferation of harmful algal blooms (HABs) that adversely affect recreation, human health and ecosystems on both sides of the border.

The IJC produced the report with the assistance of the following basin organizations, The Lake Champlain Basin Program, and the Organisme de bassin versant de la bay Missisquoi, for the Champlain Missisquoi Bay sub watershed; and the Memphremagog Watershed Association and the Memphremagog Conservation Inc. for Lake Memphremagog. The IJC appointed two Study Advisory Groups (SAGs) in each basin made up of binational science policy experts. Each SAG directed work in its basin. The IJC's report presents the results of work activities identified in the October 19, 2017 Reference which requested IJC assistance in developing a summary and analysis of work done to date by governments and others along with recommendations to address HABs in those basins.

The Commission endorses the recommendations put forward in the SAGs' reports. Both groups recommend strengthened governance that would lead to the development and implementation of basin specific binational nutrient reduction action plans. The SAGs recommended that nutrient loading reduction goals be agreed upon at the watershed level as the initial action of these plans. General reduction of nutrient loading on agricultural land is also recommended using appropriate cropping systems, agricultural and environmental best management practices (BMPs), market-based incentives and financial incentives. Reduction on other developed lands is also recommended through, for example, support for land-use planning for stormwater discharge, updating of regulations for infrastructure development, and targeted enforcement to ensure

**[www.ijc.org](http://www.ijc.org)**

234 Laurier Avenue W., 22<sup>nd</sup> Floor  
Ottawa, ON K1P 6K6  
Phone: (613) 995-2984 Fax: (613) 993-5583  
[commission@ottawa.ijc.org](mailto:commission@ottawa.ijc.org)

100 Ouellette Avenue, 8<sup>th</sup> Floor  
Windsor, ON N9A 6T3  
Phone: (519) 257-6700 Fax: (519) 257-6740  
[commission@windsor.ijc.org](mailto:commission@windsor.ijc.org)

1717 H St. NW, Suite 835  
Washington, DC 20006  
Phone: (202) 736-9000 Fax: (202) 632-2006  
[commission@washington.ijc.org](mailto:commission@washington.ijc.org)

compliance. Both SAGs see a need for improved binational harmonization of science and monitoring efforts in order to better understand nutrient inputs and outputs in each basin and work towards nutrient reduction goals.

The cyanobacteria, and associated HABs problem is pervasive throughout the world. It is restricting the development of society and the economy. In 2010 the United States Environmental Protection Agency (USEPA) estimated the cost of HAB related impacts to be nearly 5 billion dollars per year. The IJC conducted a global scan of how jurisdictions are addressing the problem; this served to inform our recommendations to governments. Missisquoi Bay has felt the impacts of nutrient inputs due to human activities for over 400 years and is now a eutrophic system. The approach governments should be adopting for that system will need to differ from the Memphremagog system which is relatively pristine; Lake Champlain Missisquoi Bay necessitates intense remediation, while the Lake Memphremagog system requires protection.

In addition to the recommendations in the SAGs' reports, the IJC proposes the following additional recommendations which are grouped in a management approach to facilitate governments' actions:

- 1. Strengthen current government efforts (estimated 10 years to complete):** Federal Governments should accelerate the pace of recovery and protection working with provincial, state and local and indigenous governments to strengthen current efforts to systematically implement the recommendations in the SAGs' reports.
- 2. Improve existing governance mechanisms (estimated 2 years to complete):** Federal Governments should provide resources to support existing provincial, state, and local governance mechanisms that coordinate binational oversight of the basins to more effectively sustain long-term management of joint efforts and actions.
- 3. Understand nutrient inputs and outputs (estimated 3 years to complete):** Federal Governments should assist in providing an improved understanding of nutrient input/outputs in each of the two basins by supporting more harmonization of provincial, state, and local science efforts to create a comprehensive binational mass balance model that enables jurisdictions to efficiently and effectively evaluate and manage measures to mitigate nutrient loading.
- 4. Develop and initiate implementation of basin-specific action plans (estimated 7 years to initiate):** Using the mass balance model, Federal Governments should work with provincial, state and local and indigenous governments to develop and implement basin specific binational sustained action plans (approximately 20-30 years) to address nutrient loading in both basins. These action plans should set out the following, with accompanying timelines and should occur in consultation with the public, stakeholders, and local and indigenous communities:

- a. Set societal sustainability goals and objectives;
- b. Ensure an understanding of nutrient inputs and outputs (i.e., mass balance);
- c. Set nutrient specific objectives that target critical source areas and are enforced by the relevant government;
- d. Implement targeted adaptive management plans that include BMPs, market-based mechanisms and financial incentives to meet nutrient specific objectives;
- e. Develop a sustained communication strategy for the duration of action plans; and,
- f. Create an ongoing adaptive oversight and evaluation plan with systematic review of management plans.

Basin-specific action plans should systematically review the goals and nutrient specific objectives to adapt to anticipated effects of climate change. Climate change is expected to exacerbate the impacts of HABs and current efforts by governments may not be enough to remedy the situation.

Innovation and investments in new and emerging BMP technologies such as *in situ* nutrient soil injection applications will be needed. Other changes in the basins that will have an impact on the nutrient mass balance will need to be monitored and plans adjusted accordingly. For example, there are current government efforts to regain hydrologic connectivity within Lake Champlain and return it to a more natural state while restoring ecosystem services. This will enhance water quality through functioning and connected wetlands.

This binational study would not have been possible without the management and guidance provided by the Champlain and Memphremagog Study Advisory Groups (SAGs) and the basin organizations. The International Joint Commission expresses its sincere thanks and appreciation to SAG members for contributing their time and expertise and to basin organisations for the planning, research, analysis, and writing of their individual basin reports.

The IJC also thanks and recognizes the efforts and contributions of participating federal, provincial, state, Indigenous governments and municipal agencies, academic institutions, and other entities in the region. The cooperative spirit of these groups ensured the successful completion of this valuable and high-quality report.

The report also greatly benefited from public participation and input provided at public meetings, workshops, and public consultations. The IJC thanks all members of the public who participated in these meetings and contributed their experiences and knowledge in order to improve our understanding of the nutrient impact on the two basins.

The SAGs, IJC, and other report contributors appreciate the study extension provided by the Canadian and United States governments, which allowed adequate time to finalize the report.

Sincerely,



Pierre Béland  
Chair, Canadian Section



Jane Corwin  
Chair, U.S. Section



Merrell-Ann Phare  
Commissioner, Canadian Section



Rob Sisson  
Commissioner, US Section



Henry Lickers  
Commissioner, Canadian Section



Lance Yohe  
Commissioner, US Section