

Executive Summary

About This Document

This document describes the studies that are needed to investigate improvements to Lake Superior outflow regulation and to further our understanding of how changes in the St. Clair River affect regulation, as well as levels and flows in the upper Great Lakes.

Study Objectives and Scope

Lake Superior's outflows are regulated by structures on the St. Marys River. As the needs of the interests in the upper Great Lakes system continue to evolve and our concern with global climate change grows, questions arise as to whether the current methods to regulate the system could be improved to better meet the needs of the interests. Resources in this document are the people who live and work in the Great Lakes basin, the ecosystem which includes wetlands and other coincident uses.

The St. Clair River, Lake St. Clair and Detroit River connect Lake Huron with Lake Erie. The natural regime of this river system has been disturbed by human activities affecting the flow characteristics of the river. There is concern that further change may be ongoing in the relationship between the water levels of Lakes Michigan-Huron and Lake Erie. A change in the natural regime of the St. Clair River would affect the water levels of Lakes Michigan-Huron and would, in turn, impact Lake Superior outflow regulation.

The study tasks described in this document have been designed to examine these issues. The study area would include the upper Great Lakes system from Lake Superior downstream through Lake Erie including Lake Michigan and Lake Huron, their interconnecting channels and the Niagara River. These studies will be carried out in the context of Articles III and VIII of the 1909 Boundary Waters Treaty and the International Joint Commission's alerting responsibilities in the same manner as conducted for the IJC's Plan of Study for Criteria Review in the Orders of Approval for Regulation of Lake Ontario – St. Lawrence River Levels and Flows.

Study Approach

Investigating and evaluating water management options requires a good understanding of how water level changes affect the resources including the ecosystem. Also needed is knowledge of the hydrological and hydraulic processes of the Great Lakes system under the current climate regime and climate change. Computer models would be required to generate water levels and flows for various water management options, and methods would be developed to evaluate the effects that these options would have on resource groups including the ecosystem. The study and decision making processes would provide opportunity for public participation in all aspects of the study. The study will employ the most current science, and will engage relevant experts from governments, industries, academic community, First Nations/Native Americans and the public to conduct the study in an effective manner. Efforts will be made to ensure coordination and compatibility with related Great Lakes initiatives currently ongoing.

Public Participation

Public participation is a critical element in reviewing Lake Superior outflow regulation and examining the physical processes of the St. Clair – Detroit River system. The formation of a Public Interest Advisory Group is recommended. Periodic public meetings, issuing of newsletters and operation of an internet site would be part of the public participation process.

Understanding the St. Clair - Detroit River System

During the early part of the study, the factors affecting upper Great Lakes water levels and flows, including physical changes in the St. Clair River, would be investigated to provide a better insight into the cause of the recent and current water level changes. They include:

- Basin Water Supplies (which includes factors such as precipitation, evaporation and tributary flows)
- Diversions and Consumptive Uses
- Glacial Rebounding and Subsidence
- Flow Conveyance Capacity of the St. Clair – Detroit River System

Depending on the nature and extent of physical changes of the St. Clair River and their potential impacts on water levels and flows investigated during the course of the study, the study would explore potential remediation options.

Improving Lake Superior Outflow Regulation

The study to improve Lake Superior outflow regulation includes:

- Review of how Lake Superior outflow regulation and the operation of the control structures affect water levels and flows in the upper Great Lakes system
- Identification of potential updates and improvements to the criteria, requirements, operating rules and outflow limits as well as incorporating operating experience into the regulation plan
- Reviewing current institutional arrangements governing Lake Superior outflow regulation
- Testing of regulation plan performance under climate variability and climate change scenarios.

The Affected Resources

To determine whether the water management options to be explored in this study meet contemporary and emerging needs, and will manage the system in a sustainable manner, evaluations of their impacts on the various resources of the system are required. The evaluation of water management options would focus on the following resources:

- Ecosystem
- Recreational Boating and Tourism
- Hydropower
- Commercial Navigation
- Municipal, Industrial, and Domestic Water Use
- Coastal Zone

Study Organization

Given the multi-disciplinary nature of the study, it is proposed that a Study Board be set up to direct and manage the study. Within the Study Board, Study Directors are proposed to lead the study, with assistance from managers on financial, administrative matters and the day-to-day operations of the study. In addition, the Board would establish technical groups to generate water level and outflow information under the various water management options, and resource groups to evaluate the impacts of these options on the system's resources. A Public Interest Advisory Group is also proposed to advise the Study Board on issues and concerns as they relate to the resources.

Study Schedule and Cost

The tasks defined in this Plan of Study are designed to meet the study objectives and address the issues raised in the IJC Directive in one study. Consideration has been given to proper sequencing of tasks, currently available science and tools, and lessons learned from the International Lake Ontario – St. Lawrence River Study to ensure the study is conducted in an effective manner. The study is expected to take 5 years to complete at a cost of \$14.6 million (U.S.) dollars, which is equivalent to \$17.5 million (CDN) dollars assuming an exchange rate of 1.2. It is assumed that the cost would be split equally between the two Governments.

The Upper Lakes Plan of Study Revision Team is grateful for the considerable advice and many comments collected from members of the public, the study participants in the International Lake Ontario – St. Lawrence River Study, and other government and academic experts on the subject of Great Lakes water levels. Their input has helped toward making this document possible.

Respectfully submitted by the Upper Lakes Plan of Study Revision Team,

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