

INTERNATIONAL UPPER GREAT LAKES STUDY BOARD

ORGANIZATIONAL AND OPERATIONAL GUIDELINES FOR THE COASTAL ZONE TECHNICAL WORKING GROUP

GENERAL GUIDELINES AND INFORMATION

The Technical Working Groups (TWGs) are formed by the Board in consultation with the IJC. The TWGs are organized under specific tasks which fulfill the mandate of the IJC to undertake the studies required to provide the Commission with the information it needs to evaluate options for regulating levels and flows in the Upper Great Lakes system in order to benefit affected interests and the system as a whole in a manner that conforms to the requirements of the Treaty, and the Board shall be guided by this mandate in pursuing its studies. These studies include:

1. Examining physical processes and possible ongoing Lake Huron outflow and St. Clair River changes and their impacts on levels of Lake Michigan and Huron. Additionally, depending on the nature and extent of these changes and impacts, recommending and evaluating potential remedial options;
2. Reviewing the operation of structures controlling Lake Superior outflow in relation to impacts of such operations on water levels and flows, and consequently affected interests;
3. Assessing whether changes to the Order or regulation plan are warranted to meet contemporary and emerging needs, interests and preferences for managing the system in a sustainable manner; and
4. Evaluating any options identified to improve the operating rules and criteria governing the system.

Specific Tasks Teams (TTs) are the Lake Huron Outflow/ St. Clair River Task Team and Lake Superior Regulation Task Team (See attached “IUGLS Organization – Task Team Framework”). The following TWGs are established under the two Task Teams to provide the expert and technical support to deliver the Study:

I. Lake Huron Outflow/ St. Clair River Task Team:

1. Data Verification, Reconciliation, Collection and Monitoring;
2. Hydraulic Modeling; and
3. Sediment Studies.

II. Lake Superior Regulation Task Team:

1. Municipal, Domestic and Industrial Water Uses;
2. Commercial Navigation;
3. Eco-System;
4. Coastal Zone;
5. Hydropower; and
6. Recreational Boating and Tourism

III. Other TWGs which serve one or both TTs:

1. Basin Hydrology: to address net basin supply (NBS), net total supplies (NTS) and climate change issues for both Task Teams;
2. Plan Evaluation: directly linked to the Lake Superior Regulation Task Team, but could peripherally be connected to the Lake Huron Outflow/ St. Clair River Conveyance Task Team;
3. Mitigation Issues: directly linked to the Lake Huron Outflow/ St. Clair River Task Team, but could peripherally be connected to the Lake Superior Regulation Task Team.

The individuals appointed to the TWGs provide the Study Team and the International Joint Commission their expertise and support in their personal and professional capacity and not as representatives of their agencies or employers. The Board provides guidance to the TWGs directly and through the Study Co-Managers. Each TWG should, whenever possible, be composed of equal numbers of members from the U.S. and Canada, and there shall in all cases be at least one member from each country. Each TWG will have two co-Leads, one from each country. All reports of TWGs shall include any dissenting or different views within the group.

Study Board and PIAG members will be apprised of the activities of the TWG by the Task Team Co-Chairs and specifically by TWG co-Leads for those in which they have an expertise in the subject being evaluated by that TWG.

TWG members are committed to work with their specific group as a team in advising on the issues and delivering the work with which the group is tasked.

The co-Leads of each TWG, working in close liaison with the Study Managers and the TWG members are expected to provide leadership and guidance in planning and delivering the work of their TWG as defined by the Study Board Work Plan. The co-Leads will organize meetings and

conference calls; draft work plans; draft terms of reference and provide cost estimates for required work; identify suppliers and sources; draft documentation for contracts; prepare written reports on completed work; and coordinate with other TWGs.

Each TWG is expected to confirm its annual Work Plans and deliverables with the Board and Study Managers. Funding for the activities of each TWG, in accordance with its approved Work Plan, will be provided by the appropriate section of the Commission, in accordance with applicable government procedures and requirements.

Work that may be undertaken by other government agencies will be on the basis of well-identified products and deliverables, with timelines and itemized costs associated with the tasks. Such work may be according to a formal agreement, contract or memorandum of understanding as the case may justify. Such agreements will be concluded by the appropriate section of the Commission, in accordance with applicable government procedures and requirements.

Each TWG will submit a semi-annual activity report listing activities completed and products created during the reporting period in time to provide input to the Board's semi-annual Progress Report. The TWG will also submit a semi-annual report on expected deliverables that will be generated during the next period.

Each TWG should also keep abreast of the activities of the Board, TTs and other TWGs to ensure consistency in Board general procedures and guidelines, and to ensure best integration of the results of these groups towards the ultimate objectives of the Board and IJC.

SPECIFIC INFORMATION AND TASKS

The Study Team retained Chris Stewart Consultants to develop a scoping paper to investigate the availability of coastal information, applicability of techniques developed erstwhile for the Lake Ontario Study and the scope for surrogate techniques to minimize the efforts and maximize the information. This report will be provided to you under separate e-mail. This scoping report should be analyzed in light of the activities listed below.

The coastal zone includes the shore zone and lands adjacent to the water that are either under private or public ownership. Fluctuating water levels affect the coastal zone in all of the lakes under consideration in this study. Coastal impacts include erosion and flooding along the coast and impacts due to low water levels. Near shore littoral sand movement can also be impacted by fluctuating water levels. These impacts affect shore property values and thus result in economic gains or losses. The occurrence of long-term maximum and minimum water levels, when combined with short-term seiche or surge/drawdown impacts, can cause substantial damage to coastal resources.

Fluctuating water levels affect most coastal zone interests either directly or indirectly. High water levels can combine with storm waves or ship wakes to cause serious flood and erosion damage. Low levels increase the shore area, but can also affect water intakes,

ramp and docking facilities, and water quality, and can lead to the undercutting of shore protective works.

Due to its geological setting and the relatively sparse urban development, flood and erosion damage on the Canadian shores of Lake Superior is relatively minor compared to that on the U.S shores or on the other Great Lakes. On the Canadian shores, the major urban centres affected by both high and low water levels are Thunder Bay and Sault Ste. Marie, Ontario. Numerous campsites, marinas and boat docks, cottages (some year-round) are located along the shores of Lake Superior, Lake Huron including Georgian Bay, and the St. Clair – Detroit River system. The Canadian shores of Lake Erie consist of mainly low-lying farmland in the western portion, and a combination of farms, cottages and small urban and industrial centres further to the east. Studies during the Levels Reference Study found that, in Canada, the highest incidence of erosion has occurred on Lake Erie.

The eastern coast of Georgian Bay is unique in its features. By size alone, it could be considered a lake in itself. However, unlike other bays on the Great Lakes, it is geologically, hydrologically, geomorphologically, and limnologically unique. Because of the shallow waters around the 30,000 islands, Georgian Bay is greatly affected by changes in water levels. There are extensive wetlands among the shallow waters in the steep granite shoreline island areas. When water levels change, these wetlands have difficulty migrating due to the steep near-shore environment.

The U.S. side of the upper Great Lakes differs from the Canadian coastal zone in several key areas. Population on the U.S. side is much greater than on the Canadian side. The potential for coastal damages is much higher. The U.S. portion of the upper Great Lakes coastal zone also contains more shoreline area and more areas that are subject to active erosion and flooding. Coastal erosion and flooding are a particular concern in the high bluff environment of Lake Michigan, the far western shores of Lake Superior, and select areas on Lake Erie. Previous studies have identified shore type and recession rates along all the Great Lakes.

Investigations on Lake Michigan should take advantage of the detailed analyses conducted during the Lake Michigan Potential Damages Study (LMPDS). The coastal processes model established for five coastal counties on Lake Michigan under the LMPDS could be used for this study. The models were developed using detailed bathymetric and topographic data, historical bluff line analysis, and coastal feature collection. The coastal processes model for these five counties could be run with water level scenarios from alternative regulation plans to assess the relative effects of the alternative plans on coastal erosion in these representative regions on Lake Michigan. If there is little relative difference in coastal erosion predicted under various alternative regulation plans for these five counties, or if the predicted differences in erosion rates is within the margin of error of the models, further intensive data collection to support detailed coastal modeling would not be recommended.

Coastal zone analyses must include investigations into the potential impacts of future basin land use changes. Demographic and land use changes and shifts will likely continue to occur in the basin. Demographic changes may result in increased shoreline development that may affect the near-shore environment. When shoreline protection is constructed, natural sediment transport processes are altered, and erosion of barrier beaches and coastal wetlands increases. A review should be made of the existing land use management practices, including zoning, designed to minimize flood and erosion damage. What can not be “managed” through water level regulation, may be able to be mitigated by appropriate land use management practices. An inventory of current practices may help to educate the users of the system as to what can be done to make developments along the coasts more sustainable.

The Coastal Zone TWG should address the issues of climate change/variability and how the coastal zone may need to adapt in the future to respond to more extreme conditions than have been experienced in the past.

Tasks would include, but are not limited to the following:

- Conduct a literature review of past flood and erosion concerns, as well as riparian risk land use trends.
- Conduct site-specific visits to gather additional information.
- Gather master plans and zoning ordinances of upper Great Lakes waterfront communities, including existing land use maps, air photos, and other sources of information on land use.
- Consult riparian representatives, experts, and land-use planners on desirable ranges of water levels.
- Assess the impacts on coastal zone of the lower St. Marys River due to flow variations at Sault Ste. Marie; provide input to developing guidelines governing hydropower operations.
- Develop water level – impact relationships or other alternatives such as stage damage curves, erosion sensitivity versus water level or flooded buildings versus water level curves to compare regulation plans.
- Review and assess effectiveness of existing land use regulations at protecting coastal zone interests from water level related damages, now and into the future.
- Conduct pilot studies for detailed assessment of impacts of water levels (note: pilot study could consist of using the detailed modeling results developed on Lakes Michigan and Ontario and develop a strategy to apply the results to similar shore environments, thus maximizing use of previous work and reducing amount of detailed modeling necessary; consider modeling five Lake Michigan counties under alternative regulations plans).
- Develop new stage-damage curves and other evaluation techniques.
- Identify any changes to regulation plans that could minimize coastal resource impacts.