Levels Reference Study Board
International Joint Commission
Issue 7

UPDATE

Study Board Seeks Your Views On Its Draft Recommendations

Public Forums Will Present The Details

The Levels Reference Study Board has drafted more than 30 recommendations that deal with the issues of lake level regulation, land use and management, guiding principles for governments, communications initiatives, changes in the institutions that manage water levels issues, and potential improvements to existing information bases.

This **UPDATE** summarizes these recommendations for your review. A complete draft of the Final Report will be available for mailing the second week of February from either of the offices listed on the back page. Please request your copy as soon as possible. Copies will be mailed as soon as they are available. Please note that, due to the need to condense the recommendations for **UPDATE**, the wording of the recommendations in the draft report may differ somewhat from that presented here.

A review of the draft recommendations will be held during four public forums, scheduled for February 22 to February 25. See the map on page 2 for the location nearest you. Details about times and locations are given below.

"These recommendations are the result of careful consideration of the views expressed by hundreds of citizens throughout the Great Lakes-St. Lawrence River Basin over the course of the Study, and of our numerous scientific and technical studies," explains Tony Wagner, Canadian Co-chair of the Study Board.

U.S. Co-chair John D'Aniello adds, "We hope citizens will continue to participate in the Study right through to its completion."

Following the public forums, the draft report will be finalized and presented to the International Joint Commission on March 31.

The Study Board was pleased with the response to the first set of public forums, held from November 30 to December 3. Citizens at Thunder Bay, Ontario; Milwaukee, Wisconsin; Sarnia, Ontario, and Watertown, New York contributed to useful discussion about how the technical studies were conducted, and they were able to express their views on how particular actions might affect them.

Study members heard from approximately 230 riparians, recreational boaters, environmentalists, shipping interests, farmers and other interested people.

The upcoming public forums will be the last major opportunity for citizens to contribute to the Study's final report before it is sent to the International Joint Commission, which will then make its own report to the Governments of Canada and the United States, as requested in the Reference of 1986. ❐

BE SURE TO ATTEND THE PUBLIC FORUMS

Sault Ste. Marie, Ontario
Monday, February 22
Holiday Inn,
208 St. Mary's River Drive
Tel. (705) 949-0611
Registration 6:30 p.m.

Buffalo, New York
Wednesday,February 24
Buffalo Hilton
120 Church Street
Tel. (716) 845-5100
Registration 6:30 p.m.

Chicago, Illinois
Tuesday, February 23
Chicago Hilton and Towers
Lake Erie Room - 8th Floor
720 S, Michigan, Downtown
Tel. (312) 922-4400
Registration 6:30 p.m.

Dorval, Quebec
Thursday, February 25
Sarto Desnoyers Community Centre
1335 Lakeshore Road
Registration 6:30 p.m.

Guiding Principles Can Assist In Making Foresighted Decisions

With almost 20% of the world's supply of fresh surface water, a drainage basin that embraces the industrial heartland of the North American continent, and a surrounding population of more than 40 million people, the significance of Great Lakes and St. Lawrence River is considerable.

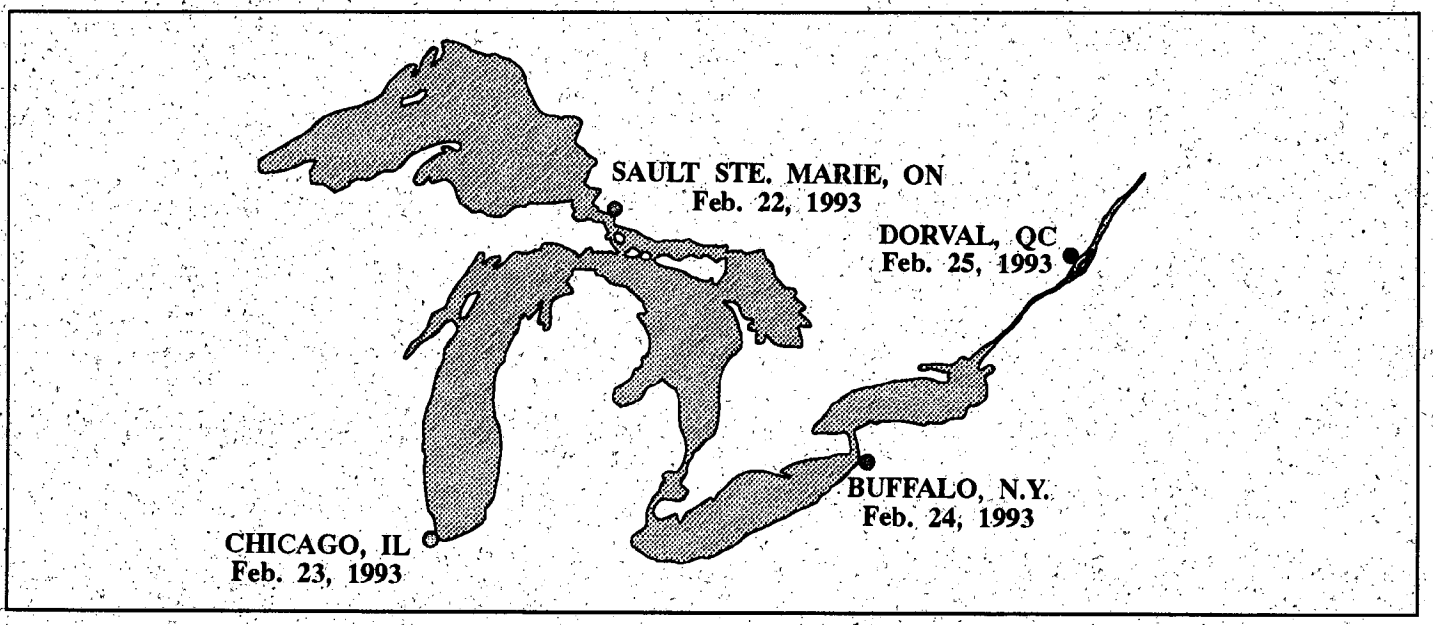
Many people benefit in many ways from this vast water resource, which has a value that extends well beyond the boundaries of its drainage basin. Millions rely on the lakes for their drinking water, for transportation of goods, community sanitation, their industrial jobs, electricity in their homes and at work, and for their leisure time enjoyment. The traditional ways of life in many Native North American communities are tied to the Great Lakes and St. Lawrence River. Hundreds of plant and animal species rely on the lake system as well, from common backyard species to the Carolinian forests and the bald eagle which are examples of the many rare, threatened and endangered life forms that depend on this resource.

The region's relative prosperity can be expected to continue well into the foreseeable future, but it cannot continue without due consideration for the complex ecosystem that supports the diversity of economic and social development that has burgeoned here almost since the first European settlers arrived.

The replenishable supply to the Great Lakes and St. Lawrence River comes primarily from precipitation and runoff from the drainage basin. This often overlooked fact underlines the need for wise planning today of a finite water resource that must serve the generations to come at least as well as it has served to the present day.

The following principles are broad guidelines and enhance coordinated, system-wide management in future water levels and flows issues. These principles are recommended for dealing with issues related the water levels and flows of the Great Lakes-St. Lawrence River System.

- Existing and future beneficial uses will be considered and the fundamental character of the Great Lakes-St. Lawrence River System will not be adversely affected.
- Actions approved or taken will be environmentally sustainable and respect the integrity of the Great Lakes-St. Lawrence River System ecosystem.
- Actions approved or taken will be beneficial to the Great Lakes-St. Lawrence River System and not result in undue hardship to any particular group.
- Coordinated management of the System needs to respect and accommodate the dynamic nature of the entire Great Lakes-St. Lawrence River Basin. Reduction of damages to existing development from fluctuating water levels in the Great Lakes- St. Lawrence River System will be based on a combination of non-structural and structural measures.
- Prevention of damages to future development from fluctuating water levels in the Great Lakes- St. Lawrence River System will include the implementation of land use measures that will discourage construction in areas subject to damage from fluctuating water levels and storms.
- Management of the Great Lakes-St. Lawrence River System will be done in full awareness of the potential for reduced water supply as a result of climate change.
- Decision-making with respect to management of the Great Lakes-St. Lawrence River System will be open, respecting the full range of interests affected by any decisions, and facilitating their participation in the policy process.



- Management of the Great Lakes-St. Lawrence River System will be based on coordination of actions relating to levels and flows.

- Management of the Great Lakes-St. Lawrence River System will be based on continued improvement in the collection of data and the understanding of the processes and impacts of fluctuating water levels and flows.

- Management of the Great Lakes-St. Lawrence River System requires ongoing communications and public awareness. ❐

Recommendation

That the federal, state and provincial governments adopt the guiding principles listed above, and that these principles be used as guidelines for the management of issues related to water levels and flows within the Great Lakes-St. Lawrence River System.

Recommended Measures Will Be Preventive and Remedial

Focus on Coordinated Planning of Land Use and Shoreline Management

A large portion of this Study's effort was directed toward developing practical measures (or actions) that Governments could take to alleviate the problems associated with fluctuating water levels. Three possible approaches could be used: Preventive, remedial, or combinations of preventive and remedial.

Lake Level Regulation. The question of whether to further regulate the levels and flows of the Great Lakes and St. Lawrence River System is central to this Study. These types of measures are classified as remedial because they would reduce or eliminate future damages to property and structures that already exist.

Currently Lakes Superior and Ontario are the only two of the five Great Lakes that have structures at their outlets to regulate their outflows. A large portion of this Study's effort was devoted to determining whether similar structures could achieve beneficial water level ranges for some or all of the other lakes in the System. Among measures examined were possible regulation of all five Great Lakes, possible regulation of three of the lakes (Superior, Erie and Ontario), and possible modification of existing regulation to make it more closely coordinated and more responsive to interests' requirements.

Land Use and Shoreline Management. Measures such as shoreline zoning restrictions and real estate disclosure are considered preventive, because they keep development from occurring in areas that are vulnerable to flooding or erosion. However, some land use and shoreline management measures -- such as land acquisition or hazard insurance -- could be considered either preventive or remedial, depending upon whether they keep future development from occurring, or whether they help correct for damage that has already occurred.

This Study has found that no one measure will be the answer to all water level-related problems; nor can measures be applied to specific instances without regard for measures taken in other areas, or without regard for the varied interests affected. This Study has also concluded that, regardless of whether additional lake regulation measures are instituted, flooding and erosion caused by wind, wave and storm action will continue to occur along the shorelines of the Great Lakes and St. Lawrence River.

Many land use and shoreline management measures were found to be feasible, partly due to their ability to be tailored to specific areas, local budgets, the interests of local citizens and environmental requirements.

This Study found that, although it would be engineeringly feasible to regulate all five of the Great lakes, such an undertaking would be neither economically efficient nor environmentally acceptable. It was also found that existing lake level regulation has adversely affected the health of wetlands of Lake Ontario.

A number of possible plans for regulating three of the Great Lakes (Superior, Erie and Ontario) were examined. One of these plans was strongly supported by riparians of the middle lakes. Through dredging and installation of a structure in the Niagara River, this plan would have provided benefits to riparians on Lakes Michigan, Huron and Erie by reducing the range and frequency of water level fluctuations. Water level and flow ranges on Lakes Superior and Ontario and in the St. Lawrence River would increase. Mitigation works in the St. Lawrence River would be required. This plan would adversely affect the wetlands of the middle three lakes by reducing the range of water level fluctuations.

This plan had the highest economic efficiency of any plan that significantly reduced flooding and erosion damages on the middle three lakes, with reductions in annual property damages estimated at approximately $12.5 million. Damages would increase on Lake Ontario and the St. Lawrence River. If the avoided costs of installing and maintaining shore protection by implementing this plan are used as an indication of economic benefits for the middle three lakes, this plan would reduce average annual flood and erosion damages by approximately $42.5 million.

It would cost approximately $50 million annually to dredge, construct, operate and maintain the control works on the Niagara River that are called for in this plan. This amount would increase by as much as $327 million annually, as a result of works in the St. Lawrence River to mitigate the impacts of increased outflows from Lakes Erie and Ontario. Futher costs of approximately $3 million annually to the U.S. commercial shipping industry, and $13 million annually to hydropower production would be incurred as a result of this plan. The Study Board concluded that, although this plan is engineeringly feasible and could reduce flooding and erosion damage on the middle three lakes, the potential economic and environmental costs are too high to justify such a project. ❐

Recommendations

- That no further consideration be given to five-lake regulation.

- That no additional consideration be given to three-lake regulation.

- That Lake Superior regulation be reviewed for responsiveness to its current users, that the Lake Superior Board of Control be authorized to use its discretion in regulating outflows, similar to St. Lawrence River Board of Control; and that Lake Ontario regulation be revised to better reflect the needs of current users. In particular, this plan should be modified to minimize the occurence of low water levels on Lake Ontario and St. Lawrence River downstream to Trois Rivieres during the recreational boating season, and to take into account the environmental interest on Lake Ontario and St. Lawrence River downstream to Trois Rivieres. The modifications to the regulation plans should be based on potential modifications developed in this study.

- That any comprehensive approach to management of the adverse impacts of fluctuating water levels and flows should be multi-objective in focus and coordinated in application.

- That consideration be given to establishing a multi-level government funding of $10 to $20 million per year for planning and implementing land use and shoreline management measures. It is suggested that areas requiring land use and shoreline management measures be prioritized through a comprehensive shoreline management program in developed and undeveloped areas.

- That consideration be given by federal, state, provincial and local governments to implementing the following remedial measures, as appropriate to local conditions: Relocation of dwellings; flood proofing of existing structures; non-structural shore protection, and structural shore protection. Decisions on implementation should be made in a regional multi-objective planning process, and decisions on implementation should be consistent with federal, state and provincial guidelines, taking into account local concerns.

- That the following preventive measures be implemented and applied consistently and uniformly:

Erosion Setback Requirements, which include minimum 30-year erosion zones for movable structures and 60 to 100 year erosion zone for permanent structures, plus adequate distance to assure a stable slope. Variances should be allowed in areas where the slope has been stabilized by a well-engineered structure.

Flood Protection Requirements, which include requirements for setbacks and elevations for flooding, with minimum requirements of a one percent risk line, plus an allowance for wave uprush and freeboard.

Shoreline Alteration Requirements in the context of a comprehensive plan that considers the environmental and hydraulic impacts, as well as those updrift and downdrift of the alterations.

Real Estate Disclosure Requirements that require the seller to disclose to prospective buyers when the property is in a known or mapped flood or erosion hazard area, and require the buyer to acknowledge being informed of the risk.

- That the following combination remedial and preventive measures be considered:

Acquisition of undeveloped land, developed land and habitat areas is recommended as a priority measure, as it has high potential for preventing future shoreline damage. Local governments and other agencies should embark on long-term, or phased-in, acquisition programs, with the support and cooperation of regional and other levels of government.

Hazard Insurance, either existing or newly instituted, should include the following elements: use of historic shoreline change methods coupled with recession rate studies to identify long term erosion hazards on Flood Insurance Rate Maps; encouragement of community-based erosion management through setback requirements for new construction; denial of subsidized flood insurance for new or substantially improved construction in the hazard zone, denial of subsidized insurance for repeat claimants, and reconstruction of storm damaged structures landward of the hazard zone; eligibility for mitigation assistance when damage claims exceed 50% of fair market value of the insured property, and mitigation assistance for structures imminently threatened by erosion with an emphasis on relocation rather than demolition.

Planning Will Be The Key To Emergency Preparedness

A variety of short-term actions that could be quickly taken to lessen the effects of high or low water crises, and quickly reversed once the crises were over, were reviewed for possible incorporation into an Emergency Operations Plan.

These actions included hydraulic measures, which would alter the levels and flows of the lakes and St. Lawrence River, and land-side measures, which would provide protection from extreme levels.

A set of hydraulic measures was selected that, when grouped together, represents the maximum possible effect on

water levels that could be achieved in a crisis situation. These measures include adjusting flows from Lakes Superior and Ontario; manipulation of the Long Lac-Ogoki, Chicago and Welland Canal diversions; placement of an ice boom at the head of the St. Clair River; and, increasing Niagara River flows through the Black Rock Lock.

Land-side measures include emergency preparedness plans at the state, provincial and local levels; storm and water level forecasting and warning networks; emergency sandbagging; shore protection alternatives; temporary land and water use restrictions, and others.

This Study finds that preparation and implementation of an Emergency Operations Plan before the next water level crisis is essential. However, manipulation of the Long Lac-Ogoki and Chicago Diversions, are controversial and would have impacts outside the Basin. In addition, the potential side effects of hydraulic measures would have to be considered. Preparation of such a plan would require cooperation by the two federal governments, the provincial, state and local governments, in consultation with other affected parties. ❐

Recommendation

- That the two federal governments, in cooperation with the provincial and state governments, begin as soon as possible preparation of a joint and cooperative Emergency Operations Plan for the Great Lakes and St. Lawrence River. Some of the elements that could be quickly implemented include provisions for adjustments to the following in crisis situations: Existing lake level regulation plans, flow through the Black Rock and Welland Canal, and addition of an ice boom in the St. Clair River. This plan should also include post-crisis evaluation of its effectiveness.

Changes Are Recommended For Basin Institutions

This Study reviewed the range of jurisdictions involved in activities related to water levels and flows, and it examined the ways in which the institutions involved fulfill their responsibilities. These investigations have led to a proposal for changes to the institutional structure that would improve coordination and effectiveness of the decision-making process. ❐

Recommendation

- That a Great Lakes-St. Lawrence River System Advisory Board be established with a membership as follows: Representatives from the Lake Superior, Niagara River and St. Lawrence River Control Boards, officials from the states and provinces, and interest groups. This board should oversee, and advise the Commission on, Great Lakes-St. Lawrence River water level issues, including lake level regulation and land use and shoreline management activities. It should also review and monitor the activities of a proposed Water Level Communication Clearinghouse.
- That membership of the Lake Superior Board of Control be expanded to include representation from the states and provinces and citizen members.

Communications Clearinghouse Would Improve Information Flow

Regardless of the measures implemented as a result of this Study, the foundation for their success will be laid only through an effective process of two-way communication between Governments and the users of the Great Lakes-St. Lawrence River System.

This Study considered several options for establishing a Communications Clearinghouse that would act as the central coordinating point for all government information efforts regarding Great Lakes-St. Lawrence water levels. ❐

Recommendation

- That a Communications Clearinghouse be established as a binational effort by Environment Canada and the United States Army Corps of Engineers, that it have direct access to the expertise that rests with these agencies, and that it establish a communications network.

Management And Operational Improvements

In the course of the Levels Reference Study, a number of areas were identified in which improvements could be made to improve knowledge of the Great Lakes-St. Lawrence River System, and to improve communication of water level and flow information. ❐

Recommendations

- That action be taken to update hydrologic and hydraulic models, improve data collection, improve forecasting and statistical methodologies and improve communication of specific water level and flow information
- That identification and mapping of all flood and erosion hazards in the Great Lakes-St. Lawrence River Basin continue, that mapping methods be standardized, and that maps be made available for general use.
- That long-term monitoring of shoreline erosion be undertaken and that future erosion damage assessments consider, or be based upon, information gathered in this Study.
- That a potential damage survey be undertaken in the future to improve flood damage estimates.
- That an inventory of Great Lakes-St. Lawrence River wetlands be completed, and that long-term assessments

be continued of the effects on wetlands of variations in levels and flows.

- That Global Climate Models be continually refined to improve their predictive capabilities. It is further recommended that a committee be established to develop a bi-national assessment of the potential impacts of climate change on the Great Lakes-St. Lawrence River Basin, and to coordinate responses to expected changes in climate.

- That data gathered in this Study and others be housed in a Geographic Information System (GIS) database to provide optimal use of the data. It is further recommended that the United States and Canada continue to share data and coordinate data gathering efforts .

Full Draft Of Report Available For Review

If you would like to read the complete draft of the Final Report, please request it as soon as possible from the offices listed below. If you would like to comment on the contents of the report, or on the recommendations summarized in **UPDATE**, please feel free to send your comments no later than February 25 to either of the contact points below. ❐

Practical Recommendations Are The Study's Goal

Grouped into six categories

A major goal of this Study is to present recommendations for practical steps that Governments in the U.S. and Canada can take to alleviate problems associated with fluctuating water levels - - in other words, to make recommendations that will be acted upon. "We want to make sure that our report doesn't end up gathering dust on someone's bookshelf," says John D'Aniello, the United States Co-chair of the Study Board. "We are designing our recommendations so that they can be readily put into effect by the responsible agencies."

"Our entire process for evaluating the actions that we will be recommending was oriented toward making sure, not only that they are technically possible, but that they make economic, environmental and social sense," adds Tony Wagner, the Canadian Co-chair.

The Study Board's report will present recommendations for action in six areas:

1. Guiding Principles that the Governments of the United States and Canada can use for management of water levels and flows;

2. Measures (specific projects or programs) to alleviate the adverse consequences of fluctuating Great Lakes-St. Lawrence River water levels;

3. Emergency Preparedness Planning for high or low water level crises;

4. Institutional arrangements to assist in implementing other recommendations;

5. Improvements in communications with the general public on water level issues; and,

6. Management and operational improvements to deal with future water levels issues. ❐

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Levels Reference Study Board **UPDATE** is published periodically by the Public Participation and Information Working Committee (Working Committee 1) of the Levels Reference Study.

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