Volume 2, April 2002

RIPPLE EFFECTS

International Lake Ontario-St. Lawrence River Study

The Study Completes Year 1

INSIDE

What is the Study All About?

Working together, the Study Board, the Public Interest Advisory Group, and the Technical Work Groups represent a binational team of experts from government, academia, native communities, and interest groups representing the geographical, scientific, economic and community concerns of the Lake Ontario-St. Lawrence River system. After completion of the 5-year study, the Board will, based upon the results of the study and consultations with the public, deliver recommendations to the International Joint Commission for possible amendments to the present Orders of Approval for the regulation of Lake Ontario and the St. Lawrence River, including the criteria and the recommended regulation plan to give effect to these criteria.

Users Share Their Concerns with the Public Interest Advisory Group

The Public Interest Advisory Group (PIAG) has been very active in Year 1 of the Study. The PIAG developed a presentation designed to explain the complexity of the Lake Ontario-St. Lawrence River system and the various user interests and needs that must be considered in reviewing the Order and in the development of a new regulation plan. The presentation was formally shown at 3 round-table sessions and public meetings in Clayton, NY, Rochester, NY and Burlington, ON between August and November of 2001. In addition, PIAG members have shown the presentation to close to 24 different user and interest groups, such as the International Water Levels Coalition, the Ontario Dune Coalition and the Renshaw Beach Association.

Public Interest Advisory Group Member workshop

The PIAG has also received a number of completed surveys from those concerned with water levels in Lake Ontario and the St. Lawrence River. A detailed summary of these concerns, as well as concerns raised during the PIAG's public meetings will be made available on the Study's website: **www.losl.org**. Copies of the survey and the PIAG's presentation are also available for download from the website. If you

do not have access to the internet, please contact **Arleen K. Kreusch** in the United States at: **(716) 879-4438** or **Amanda Morelli** in Canada at: **(613) 992-5727** to obtain a copy.

The PIAG committee is currently planning its 2002 public meeting schedule and finalizing their Year 2 workplan. Be sure to check the Study's website often for meeting notices, updates and other information.

Technical Working Groups Make Progress

by Ed Eryuzlu and Tony Eberhardt, Study Co-Managers

Last autumn in Montreal, Quebec, Co-Directors Dr. Eugene Stakhiv and Doug Cuthbert presented the International Joint Commission (IJC) with an update of the Study Team's recent activities. The Study Team has made great progress with the support of the Public Interest Advisory Group initiatives and has moved ahead with the following studies identified by the Technical Working Groups.

Coastal Zone TWG is paying particular attention to erosion and flood processes. They held a modelling strategies workshop in August 2001 where presentations were made by several consultants and researchers on the application of models to evaluate the impacts of water levels on the shores of Lake Ontario and the St. Lawrence River. The TWG has also identified the need for **digital orthoimagery** *(see glossary on page 6)* for their priority study areas, which will then be used to identify existing locations of the top edge and bottom of bluffs, identify building locations, identify and evaluate existing shore protection, and display future bluff locations.

Commercial Navigation TWG is collecting data related to commercial shipping operations on Lake Ontario and the St. Lawrence River. With the aid of a third party contractor, they are gathering and analyzing commercial traffic data in the St. Lawrence River from Montreal downstream. Scheduled for completion this summer, is a report documenting the state of the shipping industry. The report will be presented to the Study Board for consideration and then made available on the Study's website.

Orthophoto Example:
Shoreline from the City of Kingston

Common Data Needs TWG has made significant progress. They are co-ordinating aerial photography and other imagery requirements, as well as developing both a short and long-term **Geographic Information System** (GIS) strategy, to facilitate other study activities. The Group has collected **topographic** and **bathymetric** data for study priority areas. Maps detailing these study areas are now posted on the Study website at: **www.losl.org**. Other completed work includes the collection of **topographic laser radar (LIDAR)** data for parts of the U.S. Lake Ontario shoreline. Bathymetric LIDAR collection using the **Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS)** system was carried out for priority zones on both the U.S. and Canadian shores of Lake Ontario. The Canadian Hydrographic Service (CHS) joined in on this effort to test SHOALS data collection on the St. Lawrence River. Topographic LIDAR collection along the lower St. Lawrence River took place in the fall. In turn, all of this data will be used to develop **digital elevation models (DEMs)**, for modelling impacts of different water level scenarios. Lastly, the TWG is developing an information management strategy for issues related to the use, management and distribution of geo-spatial and other data collected throughout the study.

Environmental TWG has participated in various seminars and workshops, and conducted an extensive planning process in Year 1. Their activities to the end of March 2002 will focus on the study and mapping of wetland vegetation, faunal studies to identify habitat in coastal waters that are significant to fish and bird communities and lastly, modelling and data integration. Each of these activities will provide a portion of information that is required to make recommendations about the regulation scenarios that best meet the ecological requirements of the system.

Hydroelectric Power Generation TWG expects to provide a description of the physical characteristics of power generation equipment and the operational constraints related to power production optimization, dam and riparian safety and the environment. They are also developing a report on the state of the industry, which will be completed for the summer of 2002.

Hydrologic and Hydraulic Modelling TWG is updating the hydrologic models that will be used by all TWGs to evaluate historic water level data and climate change conditions. To help coordinate activities with other TWGs and foster communication, the TWG has attended numerous meetings and is participating in the work of the Plan Formulation and Evaluation Technical Work Group.

Recreational Boating and Tourism TWG is performing an inventory of marinas on Lake Ontario and the St. Lawrence River, which will include physical data collection, for example of water depths. They are also developing a marina physical impact survey and evaluating preliminary data on the

Environment Technical Working Group collects data for wetland vegetation study

socio-economic valuation of the marina industry, in addition to developing a regional impact model.

Water Uses TWG has issued a contract to conduct a physical inventory and assessment of public and private water supply intakes along the Lake Ontario and St. Lawrence River shorelines.

Plan Formulation and Evaluation Group Moves Ahead

by Bill Werwick, U.S. Lead

A new technical working group was created in July 2001 at a Study Board meeting in Buffalo, New York. This new Group will work with the Study Team to develop the tools and procedures to provide information needed to determine whether to keep or change the current regulation plan for Lake Ontario outflows.

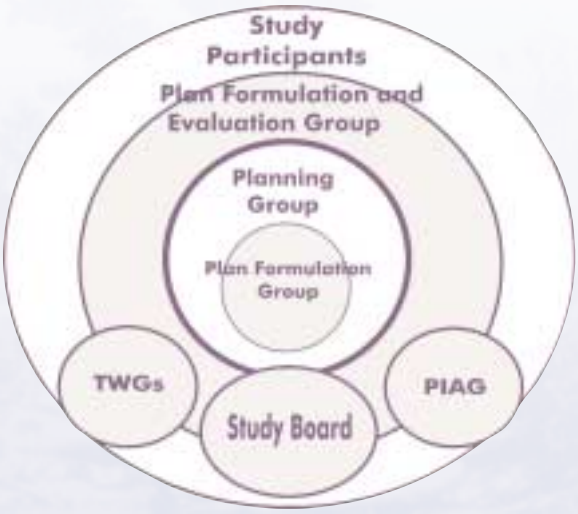
The Plan Formulation and Evaluation Group will integrate all work done in the Lake Ontario - St. Lawrence River Study. Considering the volume of data and interests that need to be organized and evaluated, the group has organized themselves into 3 additional sub-groups. At the center is the four-member Plan Formulation Group consisting of David Fay, Canadian Lead for the Hydrology and Hydraulic Modeling TWG, Tony Eberhardt, U.S. Study Co-Manager, André Carpentier, Study Board Member and Bill Werick, U.S. Lead for the Plan Formulation and Evaluation Group. This team will have to figure out how to convert broad policy goals such as whether or not to reduce or increase the variability of Lake Ontario levels into new water level regulation plan rules. They will also be charged with making the plan formulation process widely accessible so others can test different water level regulation scenarios.

Next, a 10-member Planning Group was formed and includes the four formulation group members plus Study Co-Directors, Gene Stakhiv and Doug Cuthbert, along with Pete Loucks, and Steve Renzetti, Study Board Members and Ed Eryuzlu, Canadian Study Co-manager and Wendy Leger, Canadian Lead of the Common Data Needs TWG. This group will develop a plan evaluation, rating and ranking method and integrate that with the plan formulation work. Lastly, the Plan Formulation and Evaluation Group consists of the ten members of the planning group, the entire Study Board, a representative from each of the TWGs, and the Public Interest Advisory Group. This group will integrate individual studies together and ensure they support the goals outlined in the Plan of Study for Criteria Review in the Orders of Approval for Regulation of Lake Ontario-St. Lawrence River Levels and Flows.

Pete Loucks of Cornell University designed the architecture that was used by Bill Werwick to develop a shared vision planning model, to help illustrate possible relationships between goals, objectives, and plan evaluation. Guidelines were sent to each of the TWGs to help them develop the linkages between their work and the planner's work. They were asked to list the problems and the opportunities associated with regulation of Lake Ontario outflows, develop specific geographic planning objectives for regulation, suggest metrics to gauge the performance of regulation plans in meeting those objectives, and then describe how their work will develop the data required to measure the performance of different regulation regimes.

Metrics that will be evaluated by the Plan Formulation and Evaluation Group include **performance indicators** and **hydrologic attributes**. Performance indicators are direct measures of progress towards an objective, for example, economic benefits. Hydrologic attributes are statistics on lake levels and stream flows, such as the percentage of time Lake Ontario is above a certain elevation. By the end of March 2002, the Plan Formulation and Evaluation Group will attempt to construct the mathematical linkage between the hydrologic attributes and the Performance Indicators.

Even with the best plan evaluation metrics, the group must complete one more step to fulfill the goal of the regulation study. They must explain the reasons why they will ultimately prefer one plan over another. What happens when results are mixed? What are the most important criteria? Considering the complexity of the Lake Ontario-St. Lawrence River System and the requirements of it's users, these questions will not be easily answered. The group will develop a draft set of Decision Factors in time for their first presentation workshop in the spring of 2002. The workshop will be the first meeting where all information will be put together to see where the Study is, how much is left to do and most importantly, recognize the limitations of what can realistically be done.



Plan Formulation and Evaluation Team Structure

Study's 2001 Public Meeting Identifies Concerns

The Study Team's public meeting was held on October 18, 2001 in Montreal, Quebec, in association with the International Joint Commission's Biennial Public Forum on Water Quality. The meeting drew an attendance of just over 100 people, including Study Team members, IJC commissioners and staff, conference attendees and local residents.

Representatives of organizations such as the Stratégies Saint-Laurent, Amis de la vallée du Saint-Laurent, Fédération québécoise pour le saumon atlantique STOP (Montreal) and the City of Montreal, each took an opportunity to identify for the panel, an area of concern regarding water levels in the St. Lawrence River. One representative wanted to know how this Study would measure environmental concerns, especially when other areas of interest like hydroelectric power, can be measured using a cost benefit approach. This is a type of measurement that the Plan Formulation and Evaluation Technical Work Group will be responsible for identifying. Another concern raised was whether the Study is considering the migration of non-native fish into the St. Lawrence River, and eventually into the tributaries of Quebec. Currently, the Environmental TWG is developing a list of **priority species**, to identify the types of fish and birds most affected by water level and flow fluctuations in Lake Ontario and the St. Lawrence River.

Many questions were asked, issues identified and ideas shared during the two-hour meeting. The presentation and a complete transcript of the meeting are available in the ***Reports*** section on the Study website.

The Study Team is in the process of scheduling the next Annual Public Meeting, likely to be held in the United States. Be sure to visit the Study's website regularly for public meeting announcements.

IJC Commissioners listen to public concerns at Study Board Public Meeting in Montreal, QC

Study Team Participates in 2001 Lake Ontario Basin Forum

by Frank Sciremammano, Board Member

This past October, Study Board Member Frank Sciremammano, and Environment Technical Working Group U.S. Lead, Mark Bain presented an overview of the Study at the ***10th Annual Sustainable Watersheds Conference*** in Auburn, NY. The 2001 Lake Ontario Basin Forum was hosted by the Finger Lakes - Lake Ontario Watershed Protection Alliance (FLLOWPA), a consortium of 25 New York State counties in the Lake Ontario Basin. The conference was organized to share information on the status of Lake Ontario's ecosystem, related efforts to address water quality issues, priorities and approaches for making local programs count more toward regional watershed sustainability, and complement broader Great Lakes initiatives.

As part of the forum, Drs. Sciremammano and Bain organized a session entitled ***Managing Lake Ontario Water Levels: User Needs, Future Withdrawals, Ecological Impacts and Considerations for the Basin***. Dr. Sciremammano's presentation provided an overview of the current Lake Ontario water level management as well as the organization and progress of the Criteria Review Study. His talk included background on Great Lakes hydrology and water level fluctuations, the role of the International Joint Commission and the St. Lawrence River Board of Control in managing the system and a description of the various interests affected by the water levels and flows. This was followed by an introduction to the history, need and creation of the International Lake Ontario-St. Lawrence River Study.

Dr. Bain followed with a more detailed look at the wide range of environmental effects attributed to water level and flow variations currently being considered by the Environmental Technical Working Group. He described the numerous habitats present in the system, the environmental objectives established by the group, the evaluation methodology being utilized in the study, and some of the environmental performance indicators under consideration. Dr. Bain then outlined their Year 1 Work Plan and specific studies underway.

The Study Team thanks the alliance for the invitation to participate in the conference. For more information visit **http://www.fllowpa.org** or contact Betsy Landre at **(315) 536-7488**.

Study Announcements

U.S. Study Funding is Approved

The study has received $3 million of U.S. funding for fiscal year 2002. The funds are part of the IJC's U.S. Section budget under the Commerce, Justice State Department Appropriation (PL 107-77), which was signed by President Bush on November 28, 2001.

Study Board Annual Public Meeting

The Study team has proposed to hold their annual public meeting on **September 19, 2002**. The meeting location and time will be made available on the Study's website: **www.losl.org.**

Study Departures

After serving as US Environmental Technical Work Group Lead for most of

2001, **Mark Bain** of the New York Cooperative Fish and Wildlife Research Unit at Cornell University resigned his position with the Study. The Study Team thanks Dr. Bain for his contributions to the study and wishes him well with his Lake Ontario study on ecosystem structure of bays and wetlands under different hydrologic regimes.

Study Arrivals

The study welcomes **Dr. Joseph F. Atkinson**, the new U.S. Lead for the Environmental Technical Working Group and Director of the Great Lakes Program at the State University of New York at Buffalo. You can reach Dr. Atkinson for more information about the Environmental TWG studies taking place in the U.S., by e-mailing him at: **atkinson@eng.buffalo.edu**.

Arleen K. Kreusch is now serving as the Public Affairs Specialist for the U.S. section of the Study Team. Working out the U.S. Secretariat Study office in Buffalo, New York. Contact Arleen at: **arleen.k.kreusch@usace.army.mil**.

Activities of Interest

If you know of any upcoming activities related to water levels in Lake Ontario or the St. Lawrence River, that we can highlight in future issues of Ripple Effects, let us know.

Great Lakes Navigation System Review

by Wayne Schloop,
U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers - Detroit District is nearing completion of a two-year study to review the feasibility of improving commercial navigation on the Great Lakes-St. Lawrence Seaway navigation system by making capital improvements.

The study, scheduled for completion in the summer of 2002, will identify factors and trends that affect the character of the existing Great Lakes/St. Lawrence Seaway system, and project future trends and commodity flows. The study will also report on characteristics of the GLSS fleet, as well as existing infrastructure (locks, channels and harbors) and what investments may be required to sustain it into the future.

Information generated by the Great Lakes Navigation System Review will be used by the International Lake Ontario-St. Lawrence River Study's **Commercial Navigation TWG**. Background data provided on the Great Lakes system will be used in the TWG's evaluation process. Useful data includes information on the systems connecting channels (their maintained depths at **Low Water Datum**), port and dock information (maintained depths at docks, loading rates, unloading rates), vessel operating characteristics (maximum vessel carrying capacity, vessel draft at maximum carrying capacity, tons per inch immersion factors, etc.), as well as representative vessel operating costs.

For further information on the Great Lakes Navigation System Review, contact Wayne Schloop by telephone at: **(313) 226-5013** or visit their website: **www.lre.usace.army.mil/glnav/index.htm**

New York's North Coast Conference

by John Terninko,
Center for Environmental Information

On May 3, 2002, the **Center for Environmental Information** will be hosting "*New York's North Coast - A Troubled Coastline*" Conference, at the Burgundy Basin in Pittsford, NY. The north coast of New York State stretches for 300 miles through seven counties on Lake Ontario's south shore, from the Niagara River in the west to the St. Lawrence River in the east. Despite significant water quality improvement in the open waters of Lake Ontario over the last decade, few coastal waters and embayments have shown measurable recovery. The conference is intended to bring together local, state, tribal, and federal stakeholders to begin an on-going dialogue and an action framework for resolving the coastal region's water quality problems. Through development of an action framework, members are striving to create a unified and coordinated regional approach to restoration and remediation of the coastal ecosystem.

The conference program will alert the public to the problems affecting the coastal waters and embayments; define the social, ecological and economic importance of the Lake Ontario shoreline and associated embayments and watersheds; identify work in progress and opportunities for constructive remedies; and create a regional action framework for restoration of coastal waters and embayments.

For more information about the conference contact the **Center for Environmental Information** by mail: 55 St Paul Street, Rochester, NY 14604-1314; by telephone: (585) 262-2870; by email: ceiroch@frontiernet.net or on the internet: **www.rochesterenvironment.org**.

Managing Shared Waters International Conference

The Managing Shared Waters Conference - *Towards Sustainable Transboundary Coastal Ecosystems* will convene from the 24th to the 28th of June 2002 in Hamilton, ON. The main objectives are to evaluate international capacity, equip coastal communities, examine real-life applications of transboundary coastal ocean management through examples, and produce an outcome report with recommendations and strategies to improve capacity to manage sustainable transboundary coastal ecosystems. For more information contact: Managing Shared Waters by telephone: **(416) 926-1907**, or e-mail: managing.shared.waters@pollutionprobe.org. Visit their website at: **www.pollutionprobe.org/managing.shared.waters/.**

Glossary of Terms

BATHYMETRY *- The measurement of water depth at various places in a body of water.*

DIGITAL ELEVATION MODEL (DEM) *- A digital map of elevation data.*

DIGITAL ORTHOIMAGERY *- A representation of surface features in their true geometric map position. Inaccuracies due to distortion, tilt, and ground relief are eliminated, resulting in an image with a high degree of positional accuracy.*

DIGITAL ORTHOPHOTO *- A computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts have been removed. It combines the image characteristics of a photograph with the geometric qualities of a map.*

GEOGRAPHIC INFORMATION SYSTEM (GIS) *- A system that links spatial data to maps.*

LIDAR *- A device that is similar in operation to radar but emits pulsed laser light instead of microwaves.*

LOW WATER DATUM *- The zero line that all harbors are dredged from.*

PRIORITY SPECIES *- A species that is protected by federal, state, or provincial laws.*

SCANNING HYDROGRAPHIC OPERATIONAL AIRBORNE LIDAR SURVEY (SHOALS) *- A system that profiles under water terrain and coastline topography.*

TOPOGRAPHY *- Natural land and man-made features of a place or a region that are detailed on maps or charts showing their relative positions and elevations.*

Contacting Us

If you are interested in sharing your concerns about water levels in Lake Ontario and the St. Lawrence River, would like to get more information about the study, or would like to participate in one of our meetings, please contact the public affairs person in your country.

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We would like to thank all those who contributed to the second edition of Ripple Effects.

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