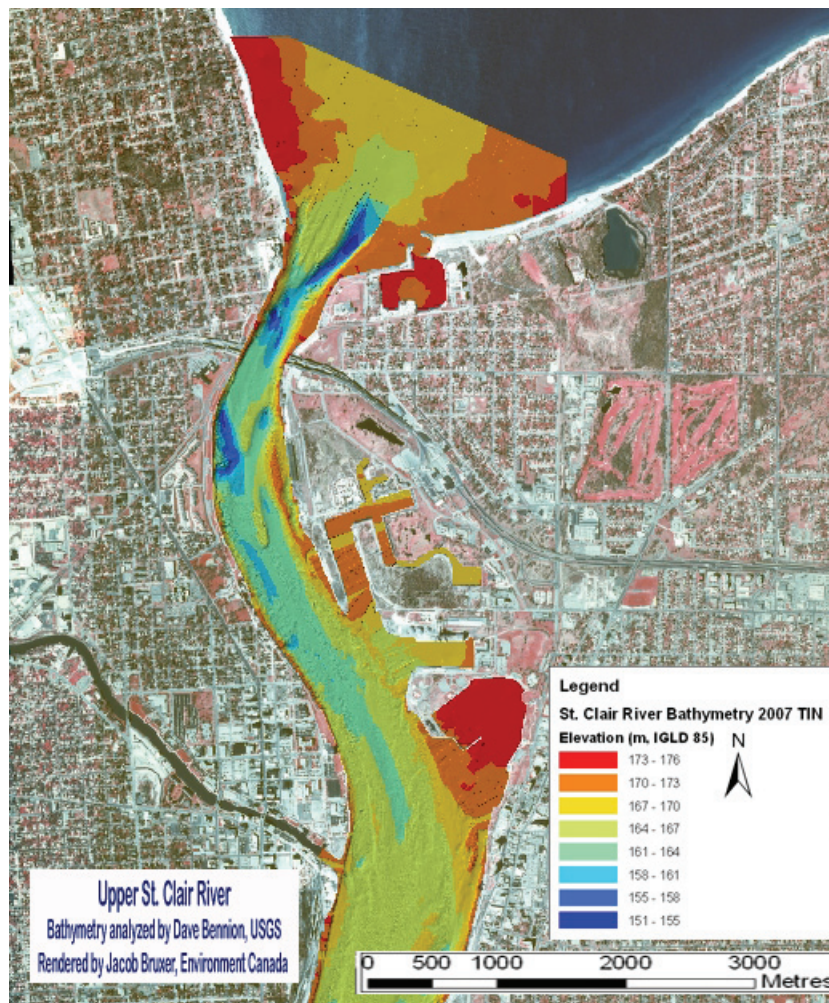


**3rd PROGRESS REPORT
to the
INTERNATIONAL JOINT COMMISSION
by the
INTERNATIONAL UPPER GREAT LAKES STUDY BOARD**



**Semi-annual Appearance
Washington D.C.
April 15-17, 2008**

INTERNATIONAL UPPER GREAT LAKES STUDY BOARD

Commissioners:

The International Upper Great Lakes Study Board submits herein its third Semi-annual Progress Report, covering activities from September 20, 2007 to March 28, 2008.

1. SUMMARY

During the reporting period, much progress has been made in our investigations into the causes of the declining levels of the upper Great Lakes. Although this has been the Study's primary focus, progress has also been made in establishing the framework for evaluating the management of outflows from Lake Superior.

The following are highlights, with more details provided under Section 2:

- A number of key projects were completed and several other are in the final stages of analysis and reporting. The early findings from these studies are being reviewed internally and will be provided to the Study Board followed by discussions with external peer reviewers and the public. The following summarizes key milestones:
 - The bathymetry collected in 2007 took longer to finalize due to quality control reasons and delayed several projects dependent on its delivery by a few months. Some of the lost time has been recovered and no further delays are anticipated. All bathymetry from 1971, 2001, 2002, 2005, 2006 and 2007 was processed and delivered.
 - Preliminary results from 2-D modelling of St. Clair River hydraulics using two different models were completed and a draft report received. The results will be used in 2-D sediment modelling.
 - A key project on comparing different computation techniques on the hydrologic components for water supplies into upper Great Lakes was completed and data delivered.
 - Table 1 summarizes the status of the projects with completed milestones.
- The St. Clair River Task Team organized its investigations around the following activities:
 - Collection of physical data including refined bathymetric data, determination of bed characteristics and velocity and flow measurements;
 - Refinement of existing and development of new conveyance models;
 - Determination of net basin supply components and assessment of their sensitivity along with a refinement of river rating curves.
 - Establishment of an ADVN gauge on the St. Clair River in Port Huron, Michigan.

Table 1 – Status of Key Projects and Milestones

No.	Project	Status	Key Output & Next Steps
1	Bathymetry of the St. Clair River from 1971 to 2007	The project was completed – delayed to ensure quality control	<ul style="list-style-type: none"> • Corrected data for input into hydraulic and sediment models. • Slices of cross-sections for visual interpretation • Temporal differences in volumetric changes
2	1-D basic hydraulic model of the St. Clair River	The calibrated and verified model is ready for hand over to other investigators	<ul style="list-style-type: none"> • A basic hydraulic model for checking changes in conveyance • The model will be used for developing Hydraulic Performance Graphs (HPG) • The model will be used for studying the impact of ice on flow and conveyance
3	2-D hydraulic modelling of the St. Clair River with RMA2	The draft final report was submitted	<ul style="list-style-type: none"> • Preliminary results on water levels under different time periods • A measure of conveyance issue addressed • Further work required for HPG
4	2-D hydraulic modelling of the St. Clair River with TELEMAC	The draft final report was submitted	<ul style="list-style-type: none"> • Preliminary results on water levels under different time periods • A measure of conveyance issue addressed • Further work required for HPG
5	Video Transects, sediment data collection	The project is progressing without delays. It achieved several milestones	<ul style="list-style-type: none"> • Movies and still shots from videography of river bottom • Sediment samples and interpretation • The experiments from 1967 and 1987 will be compared with 2007 data.
6	1-D sediment modelling with MOBED	The project is slightly behind due to capacity issues. The base model was set up and ready for calibration and validation	<ul style="list-style-type: none"> • This is the basic sediment model for evaluating conveyance, deposition and erosion • Further work required for HPG
7	Glacial Isostatic Adjustments Study	The study is complete and preliminary findings submitted in a draft report	<ul style="list-style-type: none"> • The lake-to-lake relationship was rationalized • There is a better understanding of the estimate for use in the study
8	Net Basin Supplies (NBS) Comparison and Water Balance Closure	The draft report of the analysis was submitted – awaiting the final version	<ul style="list-style-type: none"> • The analysis explains the uncertainties and errors in estimating NBS • Aid understanding residual values
9	Scoping papers on coastal zone processes, FEPS application and future required studies	The draft reports are ready.	<ul style="list-style-type: none"> • The scoping papers will guide future work of the TWG • Determine feasibility of using FEPS
10	Indicator Species scoping paper	The draft report was submitted – undergoing internal review	<ul style="list-style-type: none"> • The Ecosystem TWG will follow-up in setting performance indicators
11	Water Use Characterization Study	Phase I of the project is complete	<ul style="list-style-type: none"> • The collected water use database is being uploaded on the SharePoint

- The Lake Superior Task Team established all the Technical Work Groups (TWGs) and the Study Board approved year 1 work plans for the:
 - Coastal Processes TWG;
 - Water Uses TWG;
 - Commercial Navigation TWG; and,
 - Recreational Boating and Tourism TWG.
- The Hydroclimatic Group:
 - Sponsored a hydroclimatic workshop to gather opinions from experts on the causes of the declining upper Great Lakes
 - Initiated work leading to the development of net basin supply scenarios related to historic, stochastic and climate change for both Task Teams.
- The Plan Evaluation Group began the development of fencepost plans with input from the Lake Superior Task Team TWGs upon approval by the Study Board of its year 1 work plan.
- The Public Interest Advisory Group:
 - Sponsored public meetings in Michigan and Ontario;
 - Representatives met frequently with the media, government officials and agency representatives;
 - Drafted communication products including a newsletter; and,
 - Provided op-ed columns for area newspapers.
- The SharePoint system is now operable and will be used by Study participants to share and archive their reports and data.
- During the initial setup of the SharePoint system, the capacity for storing data files was found to be limited. Similarly, capacity for uploading information on the Study site was below standard. The Information Management Group planned and acquired necessary components to store large data files and the bandwidth is being upgraded.
- The Study Team refined its Strategic Framework Report and all Task Team work progressed in accordance with the information and financial limits outlined therein.
- The Study team developed a hydraulic and sediment modelling strategy as a lead up to the first independent methodology review.
- The Study Team worked with IJC staff to develop the review framework and costing model for the independent peer review.

2. STUDY TEAM AND BOARD ACTIVITIES

- 2.1 **St. Clair River Task Team**. The activities of the Task Team are addressed in the following sections in terms of the questions that it is attempting to answer regarding changes of “conveyance” and “altered morphology” since the 1962 dredging. The investigations are also summarized in Table 2. The projects are shown in terms of their key focus and also their ability to address other issues (secondary focus). Figure 1 shows the timelines and project linkages.

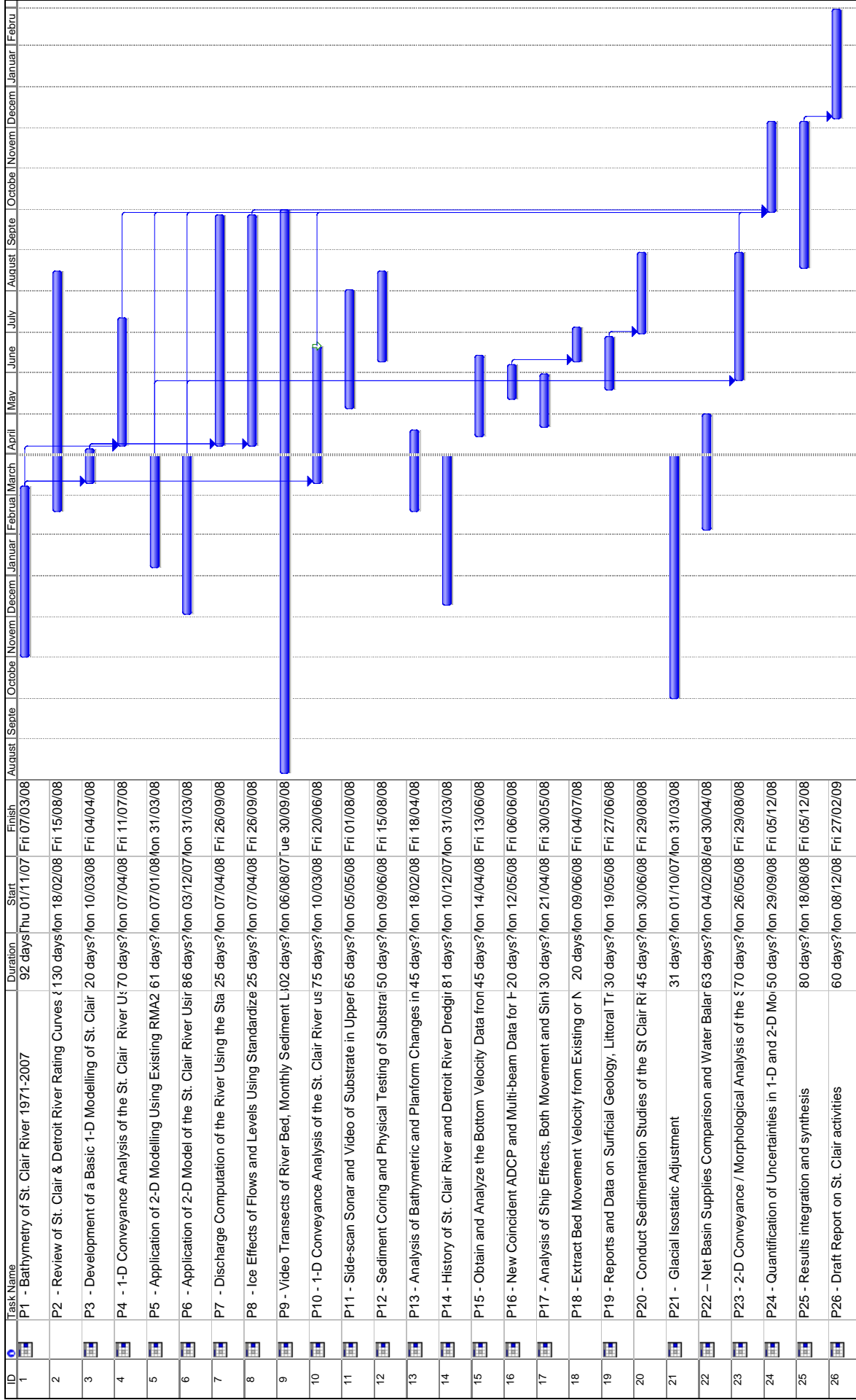
Table 2 - Result Integration - St. Clair River Tasks

		Science Questions Framework					
		Has the "Conveyance" of the St. Clair River changed since the 1962 dredging?			Has the "Morphology" of the St. Clair River been altered since the 1962 dredging?		
		SQ1	SQ2	SQ3	SQ4	SQ5	SQ6
No.	Tasks	What is causing the declining head difference between Lakes Michigan/Huron - Erie?	Has the St. Clair River flow regime (i.e. water level-discharge relationship) changed with time and if so, why?	Has the velocity patterns in the St. Clair River been modified and if so, what are the implications?	Is the St. Clair River bed stable or eroding?	If the bed of the St. Clair river is eroding, what initiated it, and when?	Has the sediment budget for the St. Clair River changed and if so, what are the implications?
P21	Net Basin Supplies Comparison and Water Balance Closure	□	◆				
P22	Glacial Isostatic Adjustment	□	◆				
P2	Review of St. Clair & Detroit River Rating Curves and Develop Hydraulic Performance Graphs	□	□		◆	◆	
P7	Discharge Computation of the River Using the Standardized HEC-RAS Model	□	□		◆	◆	
P3	Development of a Basic 1-D Modelling of St. Clair River Using HEC-RAS	◆	□	◆	◆		
P4	1-D Conveyance Analysis of the St. Clair River Using the Standardized HEC- RAS Model	◆	□	◆	◆		
P8	Ice Effects of Flows and Levels Using Standardized Geometry Model of HEC-RAS	◆	□	◆	◆		
P10	1-D Conveyance Analysis of the St. Clair River using the Mobile Bed MOBED Model	◆	□	◆	□	◆	◆
P23	2-D Conveyance / Morphological Analysis of the St. Clair River using SED2D or equivalent	◆	□	◆	□	◆	◆
P5	Application of 2-D Modelling Using Existing RMA2 Model of the St. Clair River with Different Bathymetric Data Sets	◆	□	□	□	□	
P6	Application of 2-D Model of the St. Clair River Using Telemac Modules with Different Bathymetric Data Sets	◆	□	□	□	□	
P24	Quantification of Uncertainties in 1-D and 2-D Modeling	◆	□	□	□	□	◆
P1	Bathymetry of St. Clair River 1971 - 2007		□		□	□	◆
P13	Analysis of Bathymetric and Planform Changes in the Past 130 years and Registration into Common GIS		□		□	□	◆
P15	Obtain and Analyze the Bottom Velocity Data from ADCP		◆	□	□	◆	
P16	New Coincident ADCP and Multi-beam Data for Hydraulic/sediment Model Verification		◆	□	□	◆	
P18	Extract Bed Movement Velocity from Existing or New ADCP Data		◆	□	□	◆	
P11	Side-scan Sonar and Video of Substrate in Upper St Clair River		◆		□	◆	
P12	Sediment Coring and Physical Testing of Substrate in the ST. Clair River		◆		□	◆	
P9	Video Transects of River Bed, Monthly Sediment Load Measurements, Cross-section Surveys, Grab samples of Bed Material - Samia-Pt Lambton		◆		□	□	□
P17	Analysis of Ship Effects, Both Movement and Sinking on Sediment and Erosion Regimes				◆	□	◆
P19	Reports and Data on Surficial Geology, Littoral Transport, St Clair River and Delta				◆	◆	□
P20	Conduct Sedimentation Studies of the St Clair River Delta		◆		◆		□
P14	History of St. Clair River and Detroit River Dredging and Compensation Works				◆	◆	◆

Legend:

Primary focus	□
Secondary focus	◆
Tasks not initiated - projected to start this Spring	□

Matrix version 1.5 - Study Team - March 18, 2008



Project: St. Clair Task Team.mpp
Date: Mon 31/03/08

Task Split

Progress Milestone

Summary Project Summary

External Tasks External Milestone

Deadline

Figure 1 / Page 6

2.1.1 What is causing the declining head difference between Lakes Michigan/Huron-Erie? Four projects are underway with a key focus on answering this question:

- a. “Net Basin Supplies Comparison and Water Balance Closure” by Dr. Frank Quinn. This investigation is looking at the hydrologic components responsible for differences in water levels between Lakes Michigan-Huron and Erie and their uncertainty. A draft report was completed and the final report with recommendations will be completed by the end of May.
- b. “Glacial Isostatic Rebound” by Dr. Frank Quinn and Chuck Southam. The work is nearing completion. This study will update the adjustments for use by other components of the investigations. The draft report with the basis for adjustments and rationalizing the lake-to-lake relationship was delivered. The final report work will be completed by the end of April.
- c. “Review of St. Clair & Detroit River Rating Curves and Development of Hydraulic Performance Graphs” by Dr. Art Schmidt of the University of Illinois at Urbana-Champaign. This investigation has just begun and is also key to answering the question posed in Section 2.1.2. The investigation will be complete by the end of August.
- d. “Discharge Computation of the River Using the Standardized HEC-RAS Model” by Dave Holtshlag of the USGS, Great Lakes Science Center. This project is also key to answering the question posed in Section 2.1.2. The investigation will be complete by the end of August.

2.1.2 Has the St. Clair River flow regime changed with time and if so, why? Eleven projects are underway or planned with a key focus on answering this question including the two investigations mentioned above in Section 2.1.1 (c & d):

- a. “Development of a Basic 1-D Modelling of St. Clair River Using HEC-RAS” by Dr. Jason Giovannettone of the Hydrologic Engineering Center. This is the base model which will be used in other investigations. The basic model was calibrated and validated using the bathymetry collected in 2007 and flow data representing different flow periods. The delivery is the end of April.
- b. “1-D Conveyance Analysis of the St. Clair River Using the Standard HEC-RAS Model” is being carried out by Dave Holtshlag. This work will be initiated in May with completion in September.
- c. “Ice Effects of Flows and Levels Using Standardized Geometry Model of HEC-RAS” has been approved and will be carried out by Dr. Steve Daly of

the Cold Regions Research and Engineering Lab. The target for completion is September.

- d. "1-D Conveyance Analysis of the St. Clair River using the Mobile Bed MOBED Model" by Dr. Bommanna Krishnappan. This work was initiated in January and is key to answering sediment budget and morphological questions. It is expected to be complete by August. This activity is also key to answering the question posed in Section 2.1.4.
- e. "2-D Conveyance / Morphological Analysis of the St. Clair River using SED2D or equivalent" has been approved. It has been suggested that Dr. Gary Parker of University of Illinois at Urbana-Champaign perform the investigation. This activity is also key to answering the question posed in Section 2.1.4.
- f. "Application of 2-D Modelling Using Existing RMA2 Model of the St. Clair River with Different Bathymetric Data Sets" by Jacob Bruxer of Environment Canada and is expected to be completed by the end of March. Preliminary results will be available at the April hearings in Washington, DC. This activity is also key to answering the questions posed in Section 2.1.3, 2.1.4 and 2.1.5.
- g. "Application of 2-D Model of the St. Clair River Using TELEMAC Modules with Different Bathymetric Data Sets" by Dr. Thierry Faure of the National Research Council, Canada and is expected to be completed by the end of March. Preliminary results will be available at the April hearings in Washington, DC.. This activity is also key to answering the questions posed in Section 2.1.3, 2.1.4 and 2.1.5.
- h. "Bathymetry of St. Clair River 1971-2007" by Dr. Dave Bennion of the USGS, Water Levels Center. This project will standardize all bathymetry from 1971-2007. The project was initiated in November 2007 and is now complete. The cover photo is a product of this project. All hydraulic and sediment modelling tasks will employ the products of this activity. This activity is also key to answering the questions posed in Sections 2.1.4 and 2.1.5.
- i. "Analysis of Bathymetric and Platform Changes in the Past 130 years and Registration into Common GIS". Utilizing the above activity, the data will be rendered into a GIS platform for visualization, interpretation and reporting. This activity is also key to answering the questions posed in Sections 2.1.4 and 2.1.5.

2.1.3 Have the velocity patterns in the St. Clair River been modified and if so, what are the implications? Five projects are underway or planned with a key focus on answering this question including the two investigations mentioned above in Section 2.1.2 (f & g):

- a. "Obtain and Analyze the Bottom Velocity Data from ADCP" proposed by Dr. James Best of University of Illinois, Urbana-Champaign. The objective

of the project is to establish zones of active erosion and deposition. This project will be initiated in July and completed in October.

- b. “New Coincident ADCP and Multi-beam Data for Hydraulic/sediment Model Verification”, proposed project that will be required for further testing of hydraulic and sediment models.
- c. “Extract Bed Movement Velocity from Existing or New ADCP Data”, proposed project that will be required for sediment modelling to establish zones of active erosion/ deposition.

2.1.4 Is the St. Clair River bed stable or eroding? Twelve projects are underway or planned with a key focus on answering this question including nine investigations mentioned above in Sections 2.1.2 (d through i) and 2.1.3 (a through c):

- a. “Side-scan Sonar and Video of Substrate in Upper St Clair River”, proposed project to repeat USGS earlier efforts for mapping and identifying bed material. Any differences will be highlighted.
- b. “Sediment Coring and Physical Testing of Substrate in the St. Clair River”, proposed project which may be required if modelling results indicate the need for establishing the make-up of sub-surface material.
- c. “Video Transects of River Bed, Monthly Sediment Load Measurements, Cross-section Surveys, Grab samples of Bed Material - Sarnia-Pt. Lambton” by Dr. Bommanna Krishnappan of Environment Canada. This multi-objective study will video-graph the key sections of the river bottom, it will repeat the experiments carried out by David Duane in the 1960s, and Krishnappan & Lau in the 1980s to establish the changes in sediment regime and equilibrium conditions of the river. The project is expected to be complete by September. This work is also key to answering questions in Sections 2.1.5 and 2.1.6.

2.1.5 If the bed of the St. Clair is eroding, what initiated it and when? Six projects are underway or planned including five mentioned in previous Sections (2.1.2 f through i and 2.1.4 c):

- a. “Analysis of Ship Effects, Boat Movement and Sinking of Large Objects on Sediment and Erosion Regimes”, proposed project subject to findings from modelling and field observations.

2.1.6 Has the sediment budget for the St. Clair River changed and if so, what are the implications? Three projects are underway or planned including one mentioned above (2.1.4 c):

- a. “Reports and Data on Surficial Geology, Littoral Transport, St. Clair River and Delta”, proposed project to assemble and synthesize all existing data (cores, maps, logs, reports) on surficial make-up and geology in the vicinity of St Clair River. This project will ascertain the composition and

stratigraphy of materials, depth to bedrock, and Holocene history of St. Clair River outlet.

- b. “Conduct Sedimentation Studies of the St. Clair River Delta”, proposed project dependent on the results of modelling and sediment studies.

2.1.7 Additional Investigations to provide further context:

- a. “History of St. Clair River and Detroit River Dredging and Compensation Works” by the USACE Detroit District and Environment Canada. This study will document (from literature and archive review) the historic changes in both the St. Clair and Detroit Rivers that have significantly affected, or are suspected to influence conveyance, due to dredging, associated compensation and sand and gravel mining, to the extent that credible information exists.
- b. “Quantification of Uncertainties in 1-D and 2-D Modelling”. The purpose of this proposed project is to quantify the uncertainty of the modelling results. Uncertainty of data used in all of the 1-D and 2-D modeling applications will be determined, including the uncertainty of bathymetry soundings, water level data, and flow measurements. The results of this study will be used to understand the total uncertainty of the modeling results.

2.2 Lake Superior Regulation Task Team. All Technical Work Groups have been established for the Task Team.

2.2.1 Coastal Zone TWG. During the past six months, the Coastal Zone leads have initiated the formation of the TWG. There are currently three members from the U.S. and two from Canada with one Canadian vacancy that will be filled during Year 2. As well, the Coastal Zone TWG has undertaken two short-term projects that are to be completed by the end of Year 1 of the Study. The first project is a data/information gathering exercise pulling together available baseline information on the general socio-economic status of the coastal zone interest in the Upper Great Lakes, past coastal impacts (e.g. flooding and erosion), and observed adaptive behavior. The information will support the development of a draft contextual narrative document by the TWG and will be updated with new information as it becomes available.

The second project is the application of the Flood and Erosion Prediction System (FEPS) model for a few select coastal locations of Lake Michigan. FEPS is a detailed shoreline process and impact assessment model that was originally developed for use in the Lake Michigan Potential Damages Study. The TWG is interested in testing the model for a selection of new water level sequences to see the relative sensitivity of impacts. The TWG will utilize the project results as part of the planning process to determine an impact assessment strategy that is appropriate given the large geographic scope of the study area.

The TWG met by conference call on February 1st and in person in Windsor on March 11th and 12th to review progress to date and initiate discussion on work planning priorities for Year 2.

- 2.2.2 Water Uses TWG. The TWG has six members, three from the United States and three from Canada.

The TWG received Study Board approval for its Phase 1 study at the Board's meeting in Toronto at the end of October 2007. In February, the Phase 1 contract proposal was tendered through the IJC in Ottawa and was awarded to Environmental Consulting and Technology Inc. (ECT) of Ann Arbor, Michigan. ECT and its sub-contractors, Veritas Economic Consulting and the Great Lakes Commission will identify and characterize potential problems of municipal, industrial and domestic water uses associated with fluctuations in water levels and flow rates on the Upper Great Lakes. Specifically, they will identify and develop a data base for municipal and industrial water supply intakes and sewage outfalls, identify self supplied domestic users and develop an approach to identify potential problems of municipal and industrial water supplies and wastewater outfalls. The Phase 1 Study began in early March 2008 and is expected to be completed in 6 months.

The Study Board also requested that the TWG revise its Water Uses Demand Study Proposal and present it to the Board for approval at the Board's next meeting in early May 2008.

- 2.2.3 Recreational Boating & Tourism TWG. Three committee members from the United States and three from Ontario were selected to participate in this TWG.

A two-day TWG committee meeting was held in Port Huron, Michigan in March of 2008 in an attempt to develop a preliminary Contextual Narrative and formulate a Work Plan for Year 2. Much discussion took place as to what needed to be studied/researched and how to go about implementing the required research. The Work Plan will be finalized by mid April for presentation and approval by the Study Board. Also, a preliminary Contextual Narrative will be developed and made available to the Study Board.

- 2.2.4 Commercial Navigation TWG. The year 1 work plan for the TWG was approved at the January 29-31 Board meeting. The group held its first meeting in Burlington, Ontario on March 27-28. During year 1, they will develop conceptual narratives and compile data and reports leading to the development of tools to assess the impact of fluctuating levels and flows on the interest.

- 2.2.5 Ecosystems TWG. The group has conducted conference calls with members to determine what data are currently available for sentinel/ indicator species that can be used as a starting point to evaluate responses to changes levels and flows. A report by Dr. Dennis Albert of the University of Michigan on key and endangered species is being reviewed by the group.

- 2.2.6 Hydropower TWG. The TWG leads have been selected, however, the TWG has not yet proposed members or submitted a work plan to the Board. At its January 29-31, 2008 meeting, the Study Board approved the appointments of

Steven Rose and Paul King-Fisher as the United States and Canadian co-leads, respectively, of the working group. Confirming the rest of the members of the TWG has been their first order of business. Representatives of the other dam owners at Sault Ste. Marie – Brookfield Power and Edison Sault Electric have accepted the co-leads' invitations to join the working group. As the Study will also be modeling and testing the effect of climate change and stochastically-generated water supplies on hydropower generation across the study area, the co-leads have also approached Ontario Power Generation, New York Power Authority, St. Lawrence Seaway Management Corporation and St. Catharines Hydro Generation, about having representatives become involved at the appropriate juncture in the study. A work plan for Year 2 was drafted, and the first meeting of the TWG is planned to occur in Sault Ste. Marie in April, 2008.

2.3 Synthesis Groups.

2.3.1 Plan Evaluation Group.

The Plan Evaluation Group developed an evaluation model using “benefit-transfer” methods to estimate impacts to shipping and boating. They used a set of four fencepost plans developed by Environment Canada and the Corps of Engineers to explore the possible bounds of Lake Superior outflow regulation to achieve single objectives. These plans are not considered to be viable plans because they ignore other objectives, but have been developed to illustrate what might be possible with the existing regulation structures at Sault Ste. Marie with several different hydrologic sequences.

The four fencepost plans include:

- Pre-project plan: This plan tries to replicate the conditions of the flow prior to regulation when Lake Superior outflows were limited only by the hydraulic capacity of the St. Marys River channel. This is considered the natural flow plan.
- “Superior for Michigan-Huron”. This plan attempts to reduce the range of fluctuation of Lakes Michigan-Huron by using Lake Superior as a reservoir and allowing more variation in the month-to-month flow from Lake Superior and more variation in the Lake Superior level.
- “Superior for Superior”. This plan attempts to keep Lake Superior’s level as close as possible to its monthly long-term average levels (1900-2002), regardless of the consequences for the downstream lakes, hydropower, or the environment.
- “Dependable flow plan”. This plan is designed to release a constant flow of 2030 m³/s plus a ½ gate open setting in the Compensating Works, unless the level of Lake Superior is more than set amounts above or below its seasonal average level. A near constant release provides a dependable flow for hydropower, and under the historical supplies series, maintains a

relatively high level of Lake Superior that results in more hydropower production.

Each of the four fencepost plans as well as the baseline plan 1977A were run through four water supply sequences that included the historical time series, two 100 year stochastic time series developed under the Lake Ontario-St. Lawrence River (LOSLR) study as well as a warm/dry climate change sequence also developed under the LOSLR study. The fencepost plans were incorporated into a mock evaluation model along with some preliminary impact assessments using readily available models and data. Impact functions were developed for recreational boating and commercial navigation using benefit transfer methods from the LOSLR study to estimate benefit changes for these two interest categories.

The preliminary evaluation model with results from the fencepost plans has been posted to the SharePoint server. The Plan Evaluation Group will continue to examine these fencepost plans with the different TWGs and explore the impacts and the influence of regulation.

In addition to the preliminary evaluation, the Plan Evaluation Group developed a 25 question survey and interviewed the Board and PIAG members; developed a draft proposal for evaluating economic benefits over the next 30 years; and, is working with the PIAG to initiate a series of “circle of influence” workshops over this year.

2.3.2 Hydroclimatic Group.

The work of this Group supports both Task Teams. Initially, the work will focus on the hydroclimatic issues related to the St. Clair Task Team. The Group sponsored a workshop in Toronto on Nov. 1st and 2nd with invited experts regarding their opinions regarding short-term variability or the beginnings of long-term climate change. A second workshop is planned for the summer of 2008 to continue the discussion. The Group also held a meeting in Windsor on January 22nd with scientific investigators to review proposals for improving the collection and estimation of net basin supply components and the development of historic, stochastic and climate change scenarios and forecasts.

Five major studies were approved and initiated in this reporting period:

a. Basin Hydrology NBS/Climate Change

The purpose of this investigation is to specify all uncertainties that go into the computation of net basin supplies (NBS) and to perform sensitivity analyses to understand the effects of these uncertainties on estimates of NBS. Investigative methods to be used include literature review, data analysis, and sensitivity analysis through computational experiments.

b. Direct Observations of Lake Superior Evaporation

In view of the importance of making accurate measurements of lake evaporation, and the inherent uncertainties in the traditional methods, attempts will be made to measure evaporation directly using the eddy covariance method. This project is led by Drs. Chris Spence of Environment Canada and Peter Blanken of the University of Colorado.

c. Comparative Analysis of Net Basin Supply Components and Climate Change Impact on the Upper Great Lakes

The objective of this project is to compare the net basin supply estimates by the traditional residual method with the process based computations by NOAA's Great Lakes Environmental Research Laboratories (GLERL). It will consider historic and stochastically-generated supplies and also those resulting from climate change scenarios. This project will be led by Drs. Brent Lofgren of GLERL and Carlos DeMarchi of the University of Michigan.

d. Closing the Water Balance of the Upper Laurentian Great Lakes: A Coupled Land, Lake, and Atmosphere Modelling Approach

This study develops a fully coupled land, lake and atmosphere modelling system which will be used to simulate as well as forecast individual terms of the water budget of the Laurentian Great Lakes basin. The modelling system will be used to provide estimates and forecasts of the individual terms of the water budget (precipitation, evaporation and runoff), assess the impact of natural climate variability in lake level fluctuations, and downscale climate change scenarios generated by a Global Climate Model, in order to provide projections of future water level regimes. The work will be led by Drs. Vincent Fortin and Murray MacKay of Environment Canada.

e. Analysis of Changes in Net Basin Supply Components

The study will analyze changes in net basin supply components and explanatory variables (evaporation, runoff, inflow, temperature, precipitations, etc.) by analyzing historical NBS time series. Time series of NBS will be analyzed to assess shift and trends using statistical approaches. Efforts will be made to explore positive factors for detecting anomalies: such as atmospheric tele-connections. This study was approved and initiated in February with a target of September for the results with work being led by Drs. Taha Ouarda and Ousmane Seidou of the University of Quebec/INRS.

2.4 Public Interest Advisory Group (PIAG)

The PIAG met in Toronto on November 3rd to discuss the activities required to conduct a successful outreach program with the public. Two tele-conferences were also conducted during the reporting period. PIAG also reached consensus on the role of PIAG liaisons to Technical Work Groups and made assignments to each TWG. The next PIAG meeting is scheduled for April 30th in Port Huron, Michigan.

More than 200 people attended public meetings that were held in Sault Ste Marie (Dec 12th), Grosse Pointe Farms (Feb. 18th), Detroit (Feb. 19th) and Point Edward (Feb. 21st). The next public meetings will be in Bay City (April 28th), Port Huron (April 29th) and Muskegon (May 3rd). Additional public meetings are tentatively set around the Great Lakes throughout the year.

A logo (see cover), unique to the Study, was professionally designed and will be shown on all correspondence and Study products, including the website.

A first Study newsletter is complete which includes information regarding issues that were raised at public meetings, such as Great Lakes diversions, the latest water level information and on Study progress. A media database and contact list of interested public is being developed and will soon be enhanced with the acquisition of a commercial media database.

Several media events are planned including participation in the Great Waters Institute in which Study scientists will brief a group of journalists who will be touring the St. Clair River to learn about the various research projects underway and to see the videography live. In addition, various PIAG members are now serving as surrogate speakers for the Study at events around the basin.

PIAG and Study work have been covered by many media outlets, and all articles referencing the Study have been archived on website. Work has also begun in the process of updating and redesigning the website to make it more user-friendly.

2.5 Study Management

2.5.1 Meetings. The various groups associated with the Study have met throughout the last reporting period. Table 3 shows the groups, activities, dates and locations of the meetings.

2.5.2 Modelling Framework. The Study Team developed a modelling framework for the work associated with hydraulic and sediment studies related to St. Clair River conveyance issues. The framework outlines the inter-connection of activities and the timelines required to meet the expedited June 2009 deadline. It is noted, that there is redundancy of activities performed to substantiate or refute study findings. A separate document has been developed and provided to the Commission. This document was the first provided to the Independent Peer Review Group.

2.5.3 Project Management/ SharePoint: Study activities will be tracked using a Gantt chart. Figure 1 shows the chart developed to track activities associated with accomplishing Phase I by June 2009. The figure also shows those projects which are proposed and necessary to address the questions posed in Section 2.2.

The SharePoint system is now operable for managing all Study activities and for loading all Study reports and data. Study participants have been assigned

a password which allows entries of information which can be viewed and shared by all Study participants. This system also provides an automatic archiving of Study products. The overall management of the system is through the Canadian section of the IJC.

Table 3 – Meetings Related to the Study

	Oct. 07	Nov. 07	Dec. 08	Jan. 08	Feb. 08	Mar. 08	Apr. 08
Study Board	Toronto (30-31)			Springfield, VA (29-31)			
Task Teams		SCTT – Sarnia (26-27)		LSTT – Burlington (14-15)	SCTT – Port Huron (19-21)		LSTT – Port Huron (7-8) SCTT – London, Ont. (23-24)
TWGs		Climatic Variability Workshop – Toronto (1-2)		Hydroclimatic Meeting- Windsor (23)		Rec. Btg.– Port Huron (5-6) Coastal- Windsor (11-12) C. Nav.– Burlington (27-28)	
PIAG		Toronto (3)					Port Huron (30)
Public Mtgs.		Meeting with US Reps. Of Congress – Wash, DC (8-9) Meeting with Parliament – Ottawa (20)	Sault Ste Marie, Ont. (12)		Grosse Pointe Farms (18) Detroit (19) Point Edward (21)		Bay City (28) Port Huron (29)
Other		Press Conference (1)		Meeting with GLOS – Windsor (22)			Study Team assistance with IPR Group/ IJC Mtg. (8)

2.5.4 Budget/ Expenditures

Tables 4 and 5 below show approved, committed and spent amounts in the U.S. and Canada up to March 2008. Canadian values reflect the entire FY07/08.

Table 4 - U.S. Funding (in \$1000US)

Activity	Budget ¹	Committed ²	Spent ³	Difference ⁴
Lake Huron Outflow/ St. Clair Task Team	585	414	405	180
Lake Superior Task Team	558	32	28	530
Information Technology Group	0	0	0	0
Plan Evaluation Group	250	65	45	205
Public Interest Advisory Group	175	15	0	175
Study Board and Management	250	250	80	170
Peer Review Group	12	0	0	12
Grand Total Budget	1830	776	558	1272
Notes:				
1. Study Board budget				
2. Funds allocated for Principal Investigator or Agency				
3. Funds spent to date				
4. Difference between the budget and spent to date				

Table 5 - Canadian Funding (in \$1000Cdn)

Activity	Budget ¹	Committed ²	Spent ³	Difference ⁴
Lake Huron Outflow/ St. Clair Task Team	578	0	267	311
Lake Superior Task Team	200	0	130	70
Information Technology Group	60	0	109	-49
Plan Evaluation Group	50	0	35	15
Public Interest Advisory Group	50	0	25	25
Study Board and Management	295	0	387	-92
Peer Review	30	0	0	30
Grand Total Budget	1263	0	953	310⁵
Notes:				
1. Study Board budget				
2. Funds allocated for Principal Investigator or Agency				
3. Funds spent to date				
4. Difference between the budget and spent to date				
5. A request has been made to Treasury Board (TB) to carry forward these unspent funds. This request is being considered by TB, but the IJC will not know if they have been successful until later this year.				

- 2.5.5 Strategic Framework Report. The report was presented to the Commission on October 17th, and completed and refined by the Study Team on October 25th.
- 2.5.6 Independent Peer Review. The Study Team assisted staff of the Commission with drafting documents related to hiring the team which will conduct the review of Study documents. The IPR Group will be managed by the American Society of Civil Engineers – Environment & Water Resources Institute (ASCE-EWRI) and American and Canadian Water Resources Association (AWRA & CWRA). April 8th has been tentatively set as the first meeting of the Group.

3. IJC ADVICE, CONSULTATION AND INFORMATION

- 3.1 Study issues. The Study Team would like clarification/ updates from the Commission on the following topics and issues:
- 3.1.1 Replacement of Study Board (Richard Bishop) and selection of PIAG (Canadian First Nation) members.
- 3.1.2 Modelling issues between GLOS & IUGLS: A meeting was held between the two on January 22nd in Windsor. It was agreed that both GLOS and the Study Team would cooperate and share data and modelling results as necessary. The debate persists regarding the need for 3-D modelling, limited efforts of which are being undertaken by the USGS under the auspices of the Great Lakes Commission.
- 3.1.3 There have been outside efforts to engage the Detroit District in mitigation studies. The Great Lakes Commission has drafted testimony for congressional approval for funding to conduct studies to review methods of mitigation in the St. Clair River for pre-1962 dredging. Though the Board feels that these studies may be, at best, funded and initiated after the completion of the St. Clair portion of the IUGLS, undertaking these two activities in parallel may create a capacity issue.
- 3.1.4 Need a mechanism for transferring funds between countries for activities such as Independent Peer Review and optimizing funds for projects.
- 3.1.5 Legal question for lawyers: What is the period of record that should be used in IUGLS for analyses of regulation changes and other plans? In the Lake Ontario Study, the question of using the pre-project rather than the historic period of record (1900-2001) was raised since the Orders of Approval were based on the pre-project record. The “proper” record from a legal standpoint should be determined prior to detailed plan development and evaluation.
- 3.2 Critical issues regarding governments. The Study Team would like updates from the Commission on the following:
- 3.2.1 Reply from Governments on IUGLS charge with regards mitigation.

3.2.2 International Gauging Stations – response to request for international designation and long-term funding support.

Respectfully submitted,



GENE STAKHIV
U.S. Co-Chair



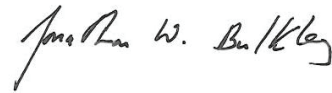
TED YUZYK
Canadian Co-Chair



KAY FELT



JIM BRUCE



JONATHAN BULKLEY



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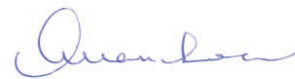


JAMES BREDIN



JON GEE

VACANT



ALLAN CHOW



TONY EBERHARDT
U.S. Study Manager



SYED MOIN
Canadian Study Manager