

St. Clair River Task Team Investigations under the International Great Lakes Study

4th Binational Lake St. Clair Conference
March 19-20, 2008



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International Upper Great Lakes Study

IUGLS Objective

To examine whether the regulation of Lake Superior outflows can be improved to address the evolving needs of the upper Great Lakes

IUGLS—<http://www.iugls.org/>

Study area includes lakes Superior, Michigan, Huron and Erie, and their interconnecting channels (St. Mary's River, St. Clair River, Lake St. Clair, Detroit River and Niagara River)

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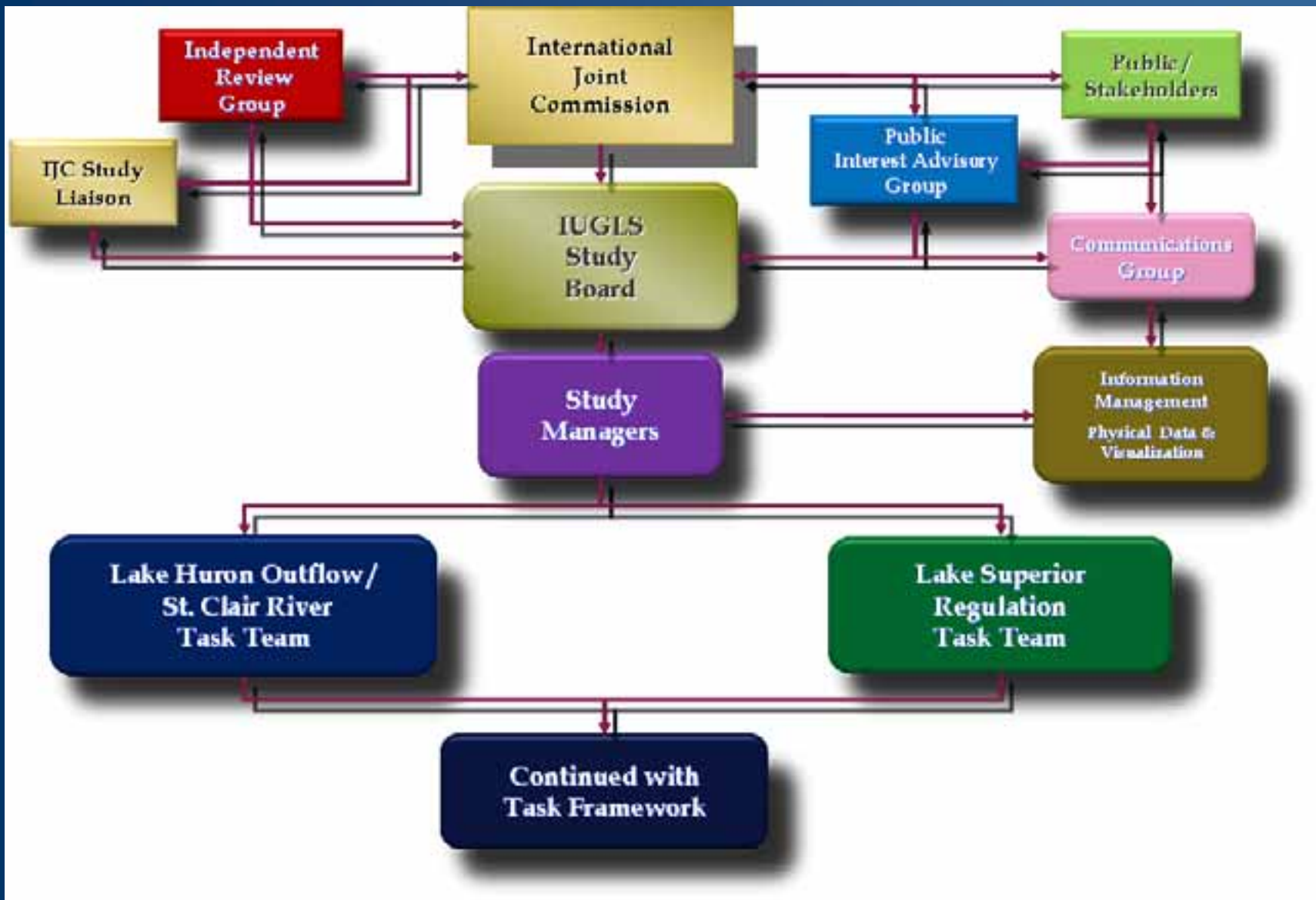
Major topics include:

- determining factors that affect water levels and flows
- developing and testing potential new regulation plans
- assessing the impacts of these potential plans on the ecosystem and human interests

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Physical changes in the St. Clair River will be investigated early in the study as one factor that may be affecting water levels and flows

Depending on the nature and extent of the physical changes, and their potential impact on water levels and flows, the study may also explore potential remediation options



St. Clair River Task Team

What is the magnitude of the decline in water-level difference between Lakes Michigan-Huron and Lake Erie?

Over what time period have they occurred?

To what can a decline in water-level difference be attributed?

- **Geologic/Geodesic**
- **Climate/Water Budget**
- **Hydraulic**
- **Geomorphic**

What is the role of GIA?

Glacial Isostatic Adjustment is the movement of the land surface in response to removal of glaciers

Causes changes in absolute and relative elevations of several inches per century

Can cause part of a lake basin to move upward relative to lake outlet

What is the role of climate variability?

Is increasing evaporation from Lake Superior causing decreasing water levels in Lakes Michigan-Huron?

Are changes in precipitation patterns causing increasing water levels in Lake Erie relative to upstream lakes?

Are there trends in streamflow to the lakes?

Are hydroclimatic changes natural, caused by human activities or both?

What physical changes have occurred in the St. Clair River?

Did the conveyance of the St. Clair River change after 1960's dredging?

Is there an ongoing change in conveyance?

Is any ongoing change in conveyance related to any ongoing change in channel morphology?

Conveyance

Conveyance is a measure of the carrying capacity of a river channel

Conveyance is related to channel shape and roughness

A change in conveyance will affect the relation between water level and the amount of flow

St. Clair River Task Team

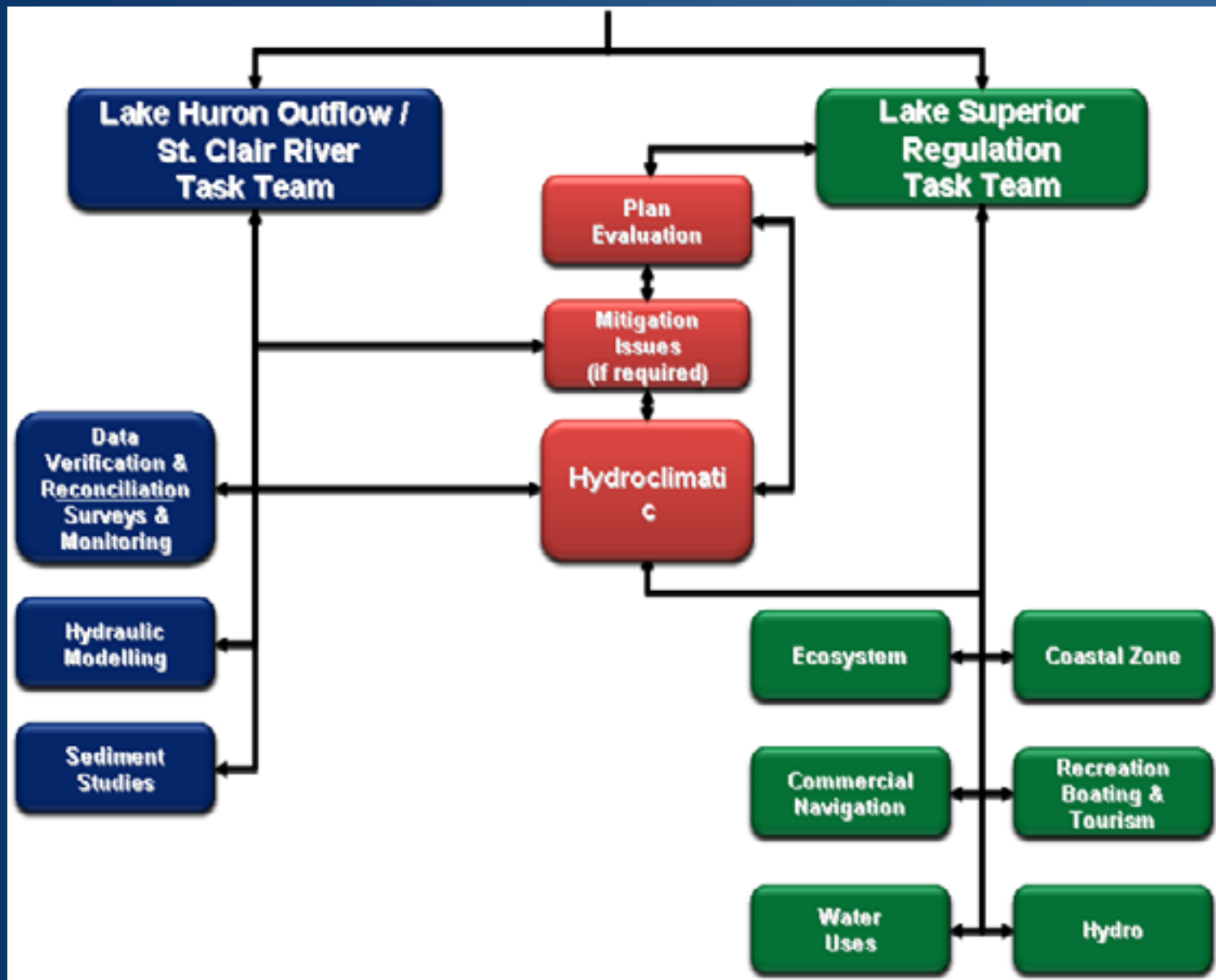
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Answers require a suite of approaches, resulting in multiple lines of evidence.



Data Verification TWG

All Basic Data checked and distributed by this team:

- Elevation datums (including GIA effects)
- Flows
- Water levels
- Bathymetry
- Basin Supplies—runoff, precipitation, evaporation

Surveys and Monitoring TWG

- New flow and bathymetric data

Hydraulic Modeling TWG

Develop analytical and numerical models to address the questions regarding changes in conveyance

- **Stage-discharge relationships**
- **New 1-D flow models using bathymetry, stage, and discharge from various time periods**
- **Existing 2-D flow model using bathymetry, stage, and discharge from various time periods**

Sediment Studies TWG

Investigate physical nature of and changes in St. Clair River Channel

- Historical and current bathymetry
- Identification of cross-sectional changes
- Direct and indirect identification of substrate character
- Understanding sediment movement
- Developing a sediment budget

Hydroclimatic TWG

Cross-cutting between St. Clair River Task Team and Lake Superior Regulation Task Team

Quantify historical changes in water balances

Predict future water balances

Work and findings closely intertwined with St Clair River Task Team

Study interconnections...

Data Verification TWG determines a set of water levels at a location needs to be corrected

Changes Stage-Discharge relationship developed by Hydraulic Modeling TWG

Results in new discharges, affecting 1-D modeling

Changes computation of historical net basin supplies by Basin Hydrology TWG

Changes future scenarios for regulation of Lake Superior outflows

St. Clair River Task Team Reporting Schedule

**Planned and implemented as a 3-year study:
April 1, 2007 to March 30, 2010**

Changed in late 2007 to a 2-year study

April 2008—Interim Progress Report

October 2008—Interim Progress Report

**February 2009—Draft Final Report distributed
for comment**

June 2009—Final Report submitted to the IJC



Independent Review Group

IRG is a technical group, not policy

- Review strategy/approach of various scientists working on study
- Review products from various efforts
- Review draft final report

Currently IRG contracts are being finalized

IRG will report to IJC on scientific quality of work being done under the Study Board

Public Interest Advisory Group

Provides input at TWG, Task Team, and Study Board levels of IUGLS

- Review strategy/approach of various scientists working on study
- Review products from various efforts
- Review draft final report

Advises Study Board on outreach and communication

Represents a broad range of interests in the Great Lakes



Public Interest Advisory Group

James Bruce Co-Chair
James Anderson Ducks Unlimited
Doug Cuddy Lake Superior
Conservancy and Watershed
Council
Dick Hibma Conservation Ontario
Kenneth Higgs Property Owner
William Hryb Lakehead Shipping
Company Ltd.
John Jackson Great Lakes United
Don Marles Lake Superior
Advisory Committee
Mary Muter Georgian Bay
Association

Kay Felt Co-Chair
David Powers Save our
Shoreline
Roger Smithe International
Great Lakes Coalition
Dan Tadgerson Sault Ste. Marie
Tribe, Chippewa Indians
Alan Steinman Annis WRI
Samuel Speck Ohio DNR
Jim Weakley Lake Carriers'
Assn.
Jeff Vito Cities Initiative
Dan Thomas Great Lakes Sport
Fishing Council
David Irish Boat shop owner



Questions?

<http://www.iugls.org/>