

Lake Michigan Potential Damage Study

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This project was completed in 1999

The Detroit District Corps of Engineers (COE) and key cooperators have initiated and are currently conducting a Lake Michigan potential Damage study (LMPDS) which will provide an extensive assessment of shoreline damages due to changes in water levels over the next 50 years. The study is expected to be completed by the year 2000 and ultimately satisfies several recommendations from the 1986-1993 IJC Great Lakes Reference Study.

The objective of the LMPDS is to create a modeling procedure for estimating economic effects of lake level changes and related social, environmental, and cultural impacts. The LMPDS is also intended to be a forum for concerted information system development between international, federal, state, county, township, and municipal governance about the resource base that is commonly shared.

The hydrologic and water level scenarios will strongly influence the level of effort and resources required to conduct associated impact studies. Presently the LMPDS has made a very preliminary recommendation of 16 different alternative hydrologic scenarios. In addition, a wide variety of interest groups exist in areas influenced by Lake Michigan water levels and their tributary rivers. These groups include riparian home owners, recreational facilities, industrial facilities, and public infrastructure. Similarly the inland extent to which storm water levels affect the backwater areas, as low-lying shoreline areas will have to be determined.

1999 Plans

GLERL's responsibility on this project will be to develop the hydrologic scenarios for the project and evaluate the geologic perspectives on water level fluctuations. One set of hydrologic scenarios will be extracted from five 10,000 year stochastic time series that GLERL and others developed for a funded Hydro Quebec study several years ago. These time series will be assessed, and 50 year high and low water supply/lake level events will be extracted, assessed, and provided for the impact analysis. In addition we will provide a geologic perspective to the water level scenarios, primarily through a literature review. This work will be partially funded by the Detroit District COE. In addition we will independently develop 1900-present lake level time series for Lakes Superior and Michigan-Huron based upon state-of-nature conditions and regulation scenarios to be used in evaluating proposed changes to the Lake Superior regulation Plan 77 which balances water levels between Lakes Superior and Michigan-Huron.

1999 Accomplishments

The hydrologic scenarios for the COE's Lake Michigan Potential Damage Study were developed and evaluated the geologic perspectives on water level fluctuations. Six sets of hydrologic scenarios were created from five 10,000 year stochastic time series that GLERL and others developed for a funded Hydro Quebec study several years ago. These time series were assessed and 50 year high and low water supply/lake level events were extracted, assessed,

and provided for the impact analysis. In addition we provided a geologic perspective to the water level scenarios, by convening a very successful Paleo-Levels workshop with experts from the U.S. and Canada. The proceedings of this workshop was published as a GLERL Tech Memo and was announced through GLIN. The proceedings recieved very good reviews from the COE. In addition we began work on dependently developing 1900-present lake level time series for Lakes Superior and Michigan-Huron based upon state-of-nature conditions and regulation scenarios to be used in evaluating proposed changes to the Lake Superior regulation Plan 77 which balances water levels between Lakes Superior and Michigan-Huron. This work was delayed to to the allocation of resources to support the IJC's Bulk Transfer of Water From the Great Lakes Reference.

Products

Sellinger C.E. and F.H. Quinn (Editors). *Proceedings of the Great Lakes paleo-levels workshop: the last 4000 years. NOAA Technical Memorandum ERL GLERL-113.* Great Lakes Environmental Research Laboratory, Ann Arbor, Michigan, 1999