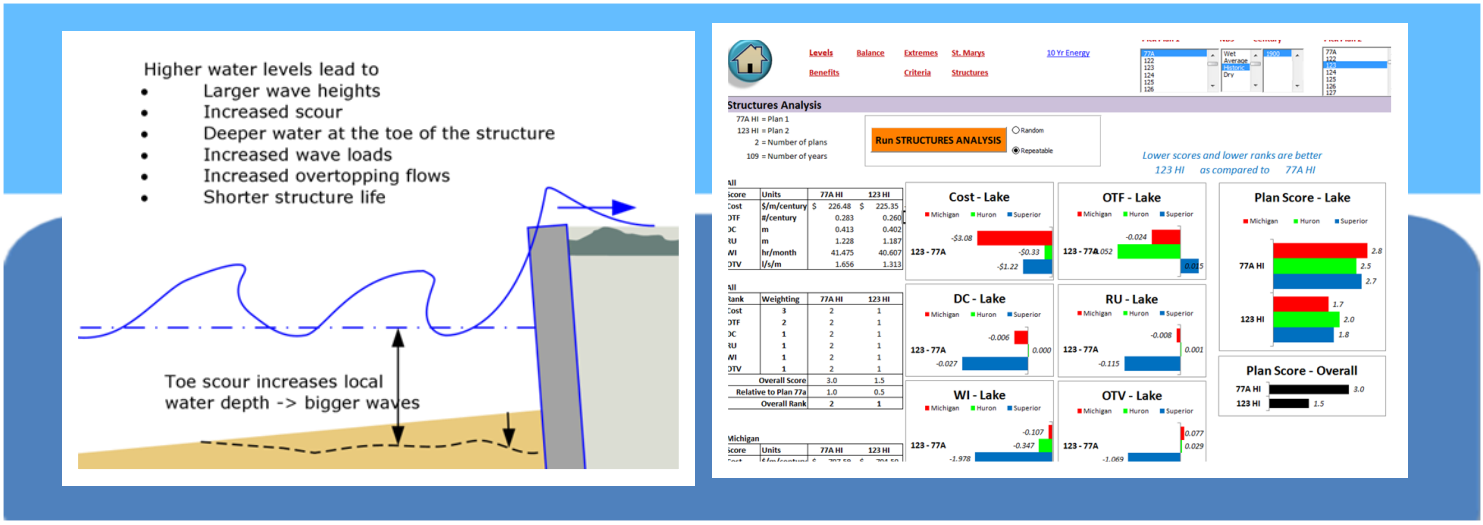
PROJECT Upper Great Lakes Shore Protection Study



PROJECT DESCRIPTION

Coldwater Consulting Ltd. was contracted by the International Joint Commission (IJC) to assimilate, document and map shore protection data for the Upper Great Lakes and to use this data to determine the influence of water level regulation on damage to shore protection. This damage included the effects of overtopping, structural degradation and downcutting at the toe.

DESIGN APPROACH

The first task in the project was to collect and organize a number of GIS-based shore protection databases, including shoreline classification datasets, climatic data, digital elevation model data and aerial imagery. These datasets served as input to the system-wide, statistically-derived UGLSP model, which was applied using an indicator-site approach to study the shores of Lakes Superior, Michigan and Huron.

The UGLSP model computes wave overtopping, runup and scour, both in physical and economic terms. Overtopping and runup are based on published engineering predictors, while scour is computed using parametric predictors specifically developed for this project. These predictors were based on the analysis of the results of thousands Coldwater's CPE model simulations, which model scour under random, reflective waves and currents. The UGLSP model's results were analyzed in order to evaluate the effects of regulation plans on coastal infrastructure. In order to support the larger study, the UGLSP model was also reformulated into a stand-alone Windows DLL. This DLL was then installed in the IJC's Excel-based Shared Vision Model (SVM) and used by Study Board members to assist in lake level regulation plan selection.

CLIENT

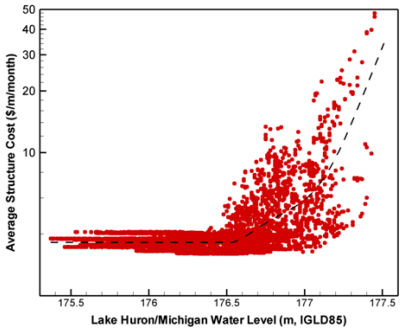
International Joint Commission
Ottawa, ON

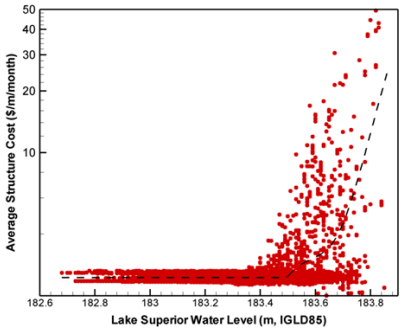
LOCATION

Lakes Superior, Huron-Michigan

DATE

2010-2011





Influence of water level on the cost of ownership for structures on Lake Huron-Michigan and Lake Superior.

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