Statistical Modelling of Storm Surge on Lake Erie

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Abstract

The Great Lakes-St. Lawrence River system is an integral part of inland shipping in North America. At its midpoint is Lake Erie, the shallowest of the Great Lakes. Lake Erie is susceptible to significant variations in water level due to surge and seiche. These rapid water level changes can, at times, be a hazard to navigation.

An investigation was carried out to develop a statistical tool that would permit forecasting of water level variation due to wind forcing. Multiple regression analyses were completed to examine the correlations between wind speed and direction, and surge-induced water levels. It was determined that the primary peak or trough of a surge event could be predicted with reasonable accuracy.