Thompson, T.A., Baedke, S.J., Johnston, J.W., 2006, **Late Holocene lake level in the upper Great Lakes: What lake level do you want it to be?** *Geological Society of America, North-Central Section–40th Annual Meeting (20–21 April),* Abstracts with Programs, v. 38, no. 4, p. 7.

Many proxies exist for reconstructing past lake levels in the Great Lakes. Of particular importance are relict coastal features, containing deposits that provide information on the elevation of the lake through time. Lake-level hydrographs produced from these deposits are "relative" to the site from which they were obtained because all areas of the Great Lakes are influenced by glacial isostatic adjustments (GIA). To obtain an accurate hydrograph for any lake, GIA must be removed from relative hydrographs and the resultant hydrograph displayed at a reference elevation. Preferably this reference elevation is that of a modern outlet or an outlet used by the lake in the past.

Two approaches for removing GIA from relative hydrographs are: (1) adopting a rebound model and correcting lake-level data to the model, or (2) iteratively adjusting multiple relative hydrographs to yield a similar pattern of lake-level change. The former presupposes that the adjustment model is correct and the latter requires multiple relative hydrographs that overlap in time. In both approaches, residuals to the GIA rate are combined to produce the resultant hydrograph, and rates of adjustment that are too large or too small strongly influence older parts of the resultant hydrograph. An unknown factor in this removal of GIA is the effect of outlet erosion that reflects itself in higher GIA rates.

A nontrivial factor influencing the younger parts of the resultant hydrograph, however, is the outlet elevation in which the GIA rate is projected. For shallow-bedrock-controlled outlets, such as the Sault Ste. Marie outlet for Lake Superior, only small reference elevation assumptions can be considered that impart little change in the resultant hydrograph. Deeper outlets, such as the Port Huron outlet for lakes Michigan and Huron, permit a wider range of potential reference elevations. For lakes Michigan and Huron, the most recent part of the hydrograph can be modified as much as 1.8 m, strongly influencing interpreted lake levels during the past 1,000 years.