Johnston, J.W., Baedke, S.J., Thompson, T.A., Argyilan, E.P., Wilcox, D.A., 2008, **How do ancient shorelines help in regulation efforts of the upper Great Lakes?,** *International Association for Great Lakes Research*, May 19-23, Peterborough, ON.

For 17 years our research group has conducted fieldwork in remote coastal areas to build the most complete and accurate geologic framework of natural lake-level variability in the upper Great Lakes. Our work has concentrated on embayments filled with beach ridges and intervening wetlands (strandplains) because they provide a unique lateral chronosequence. Elevations and ages are used to interpret glacial isostatic adjustment (GIA) specific to each site and a common lake-level signal within each basin through time. A five-millennial record with multi-decadal resolution is constructed for the Lake Michigan basin and is imminent for lakes Superior and Huron. Current major findings exceed previous studies by defining natural patterns and trends within a record that extends beyond instrumental records and can place historical events into context and help predict future possible scenarios. Three superimposed lake-level fluctuations (multi-decadal, centennial and millennial) occurred during the past five millennia that are coupled to natural climatic variability. Higher calculated rates of GIA from strandplains relative to instrumental gauge records raise concerns over possible biases created by not properly accounting for natural water-level variability. In addition, redefining the modern phase of the UGL's has numerous implications.