

Johnston, J. W., Thompson, T. A., Baedke, S. J., Argyilan, E. P., Forman, S. L., Wilcox, D. A., 2003, **The Separation of Lake Superior from Lake Michigan/Huron**, *Geological Society of America Annual Meeting & Exposition*, November 2-5, Seattle, Washington, Abstracts with Programs, v. 34, no. 7., p.294.

The upper Great Lakes (Superior, Michigan, and Huron) were confluent during most of the late Holocene and their elevation was controlled by the Port Huron/Sarnia outlet. Following rebound of the bedrock surface near Sault Ste. Marie, the Sault outlet controlled water levels in Lake Superior. Farrand (1962) reported that this outlet change occurred about 2,200 calendar years B.P. Further work by Larsen (1999) suggested a similar time period. Preliminary results from our sedimentological analysis of continuous records of beach ridges in Lake Superior suggest the outlet change occurred between about 1,200 and 1,400 calendar years B.P.

Five different strandplains in Lake Superior embayments were investigated with 30 to 100 beach ridges in each. Over 300 vibracores were collected from individual beach ridges to determine elevations of the lake during the late Holocene. Over 150 basal peat samples collected from swales between beach ridges were radiocarbon dated. Sand samples collected from inside beach ridges were dated using optically stimulated luminescence to determine a chronology of lake-level changes through time. Four of the five sites have a preserved record before and after the change in outlets. Subsurface elevations of basal foreshore deposits across each strandplain record a lowering of the long-term relative lake-level followed by a short-term rise or slower rate of fall. This aberration in the trend implies a change in the outlet from Port Huron/Sarnia to Sault Ste. Marie. Four of the study sites record water-level fluctuations after the outlet changed. All sites on the southern shore of Lake Superior have experienced a relative lake-level rise, or inundation of the shoreline, from just beyond 1,000 years ago up to the present, with the Sault as the controlling outlet. One site on the eastern shore of Lake Superior has been experiencing a relative lake-level fall where the land is rising faster than the Sault outlet during the last 1,000 years. Understanding the relationship of water-level changes relative to rebound and the active outlet for Lake Superior is critical for addressing several important climate-related and regulatory issues at the forefront today.