Argyilan, Erin, Forman, Steven, and Johnston, John W., 2005, **A multi-proxy approach to dating coastal strandplains of the Great Lakes**, *Geological Society of America Annual Meeting & Exposition*, October 16-19, Salt lake City, Utah, Abstracts with Programs, v. 37, no. 7.

Beach ridge sequences that commonly occur in embayments of the Laurentian Great Lakes represent sedimentologic time series of lake level changes, sediment supply, and vertical ground movement during the Holocene. Dating of coastal strandplains has primarily relied on 14C dating of basal peats in swales that commonly form between individual beach ridges. Therefore, the potential to date coastal strandplains, and other sedimentary coastal landforms in the Great Lakes is often limited by a lack of organic material with a clearly identifiable provenance.

This contribution presents a detailed study of four strandplains adjacent to Au Train, Grand Traverse, and Tahquamenon Bays along the southern shore of Lake Superior and Batchawana Bay along the northeastern shore. Geomorphologic interpretations of ridges, wetlands, and river channels are combined with sedimentologic studies of foreshore deposits to identify (i) major lake phases including the Nipissing and Algoma and (ii) ridges that formed after the separation of Lake Superior from Lake Michigan-Huron when Sault Ste Marie replaced Port Huron/Sarnia as the primary outlet for Lake Superior.

14C and OSL dating methods were applied to strandplains to develop age models for ridge development and late Holocene lake level records. Ages generated by 14C dating of basal peats from inter-ridge swales are evaluated against optically stimulated luminescence (OSL) ages on foreshore sediments. Geomorphic and sedimentologic data are used to evaluate absolute ages obtained by 14C and OSL dating. Creation of reliable 14C age based models is confounded by (i) clustering of conventional and AMS 14C ages within portions of the strandplains, (ii) scatter of 10s to 100s of years in samples from the same or nearby swales, and (iii) a general lack of suitable organic matter. OSL ages from Au Train Bay cluster for the landward ~50 ridges, suggesting possible problems in sampling. This study illustrates the success of OSL as an alternative to 14C dating methods for dating Holocene strandplains. Further, OSL provides the potential to date sedimentary landforms that have heretofore been largely considered undatable.