Argyilan, E. P., Forman, S.L., Booth, R. K., Jackson, S., Johnston, J.W., 2003, **Optically stimulated luminescence dating of late Holocene raised strandline sequences adjacent to southern Lake Superior, Upper Peninsula, Michigan USA**, *Geological Society of America Annual Meeting & Exposition*, November 2-5, Seattle, Washington, Abstracts with Programs, v. 34, no. 7., p.259.

Raised strandplains commonly occur in embayments along the Great Lakes coastlines and are time transgressive, sedimentological records of decadal to century scale fluctuations in lake level. Chronologic control on the establishment of individual beach ridges is necessary to determine the rates and magnitudes of fluctuations in water levels and to reconstruct regional isostacy, sediment supply, and climatic variability during the late Holocene. Our research focused on dating strandplain sequences adjacent to Lake Superior and Lake Michigan to better understand late Holocene lake-level variability.

This study compares single aliquot regeneration (SAR) ages for littoral beach ridge sediments against conventional and AMS 14C ages obtained from inter-ridge peat deposits for strandplain sequences at Manistique, Grand Traverse, Tahquamenon, and Au Train Bays, Michigan, USA. Clustering of 14C ages within strandplains and excessive scatter in 14C ages from peat deposits in adjacent swales suggest that the timing of ridge deposition and peat deposition may have sometimes differed considerably. OSL-SAR technology allows for direct dating of beach ridge quartz grains within the waterlain foreshore facies, and should therefore be less influenced by local hydrology. SAR ages are generally consistent across each strandplain, increasing in age with distance from the modern shoreline. The SAR chronology at Grand Traverse Bay indicates that the strandplain deposition was initiated during high lake levels associated with Algoma Phase (2300-3400 yr B.P.). However, radiocarbon dates suggest that deposition began somewhat earlier (~ 4000 yr B.P.). At Tahquamenon Bay, SAR ages of 4000 ± 400 yr B.P. and 4100 ± 370 yr B.P. are chronologically consistent with an elevated platform of prograding beach ridges associated with the Nipissing II Phase. Our results suggest that OSL-SAR technology provides a credible alternative dating method when 14C dating is problematic or non-existent.