

ABSTRACT

Geophysical surveys, sedimentology, and optically-stimulated luminescence age analyses were used to assess the geologic development of a coastal system near Swansboro, NC. This area is a significant Woodland Period Native American habitation and is designated the “Broad Reach” archaeological site. 2-d and 3-d subsurface geophysical surveys were performed using a ground penetrating radar system to define the stratigraphic framework and depositional facies. Sediment samples were collected and analyzed for grain-size to determine depositional environments. Samples were acquired and analyzed using optically stimulated luminescence techniques to derive the depositional age of the various features. The data support a low eolian to shallow subtidal coastal depositional setting for this area. LiDAR data reveal ridge and swale topography, most likely related to beach ridges, and eolian features including low-relief, low-angle transverse and parabolic dunes, blow-outs, and a low-relief eolian sand sheet. Geophysical data reveal dominantly seaward dipping units, and low-angle mounded features. Sedimentological data reveal mostly moderately-well to well-sorted fine-grained symmetrical to coarse skewed sands, suggesting initial aqueous transport and deposition, followed by eolian reworking and bioturbation. OSL data indicate initial coastal deposition prior to ca. 45,000 yBP, followed by eolian reworking and low dune stabilization at ca. 13,000 to 11,500 yBP, and again at ca. 10,000 yBP (during, and slightly after the Younger Dryas chronozone).