The Carolina Sandhills: Quaternary eolian sand sheets and dunes along the updip margin of the Atlantic Coastal Plain province, southeastern United States

Chris Swezey, USGS, Reston, VA

Abstract

The Carolina Sandhills is a physiographic region of the Atlantic Coastal Plain province in the southeastern United States. In Chesterfield County (South Carolina), the surficial sand of this region is the Pinehurst Formation, which is interpreted as eolian sand derived from the underlying Cretaceous Middendorf Formation. This sand has yielded three clusters of optically stimulated luminescence ages: (1) 75 to 37 thousand years ago (ka), coincident with growth of the Laurentide Ice Sheet; (2) 28 to 18 ka, coincident with the last glacial maximum (LGM); and (3) 12 to 6 ka, mostly coincident with the Younger Dryas through final collapse of the Laurentide Ice Sheet. Relict dune morphologies are consistent with winds from the west or northwest, coincident with modern and inferred LGM January wind directions. Sand sheets are more common than dunes because of effects of coarse grain size (mean range: 0.35–0.59 mm) and vegetation. The coarse grain size would have required LGM wind velocities of at least 4–6 m/sec, accounting for effects of colder air temperatures on eolian sand transport. The eolian interpretation of the Carolina Sandhills is consistent with other evidence for eolian activity in the southeastern United States during the last glaciation.