

12-1999

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Publication Info

Published in *Legacy*, Volume 4, Issue 1-3, 1999, pages 31-31.

<http://www.cas.sc.edu/sciaa/>

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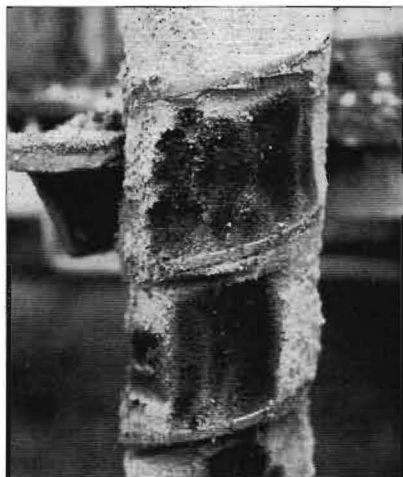
Savannah River Archaeological Research

Big Bay, Sumter County, South Carolina

By Mark J. Brooks and Barbara E. Taylor

Mark J. Brooks (UC, SCIAA-SRARP), Barbara E. Taylor (University of Georgia, Savannah River Ecology Laboratory), Peter A. Stone (SC Department of Health and Environmental Control, Groundwater Division), and Leonard R. Gardner (University of South Carolina, Department of Geological Sciences) continue investigations at Big Bay on the Poinsett Electronic Combat Range, Sumter County, SC. Big Bay is a Carolina bay on the Middle-Upper Coastal Plain. An eolian sand sheet, which emanates from the floodplain sand source area at the confluence of the Congaree and Wateree Rivers 10 km to the west-southwest of Big Bay, encroaches into the west side of the bay.

Some age constraints for the coevolution of the sand sheet and Big Bay have been obtained from a 10.61-meter drill hole through the toe (leading edge) of the sand sheet, where it has encroached into the bay. Marine sediments of the Duplin Formation form the basal confining layer beneath the bay. Thus, the bay can be no older than the early late



Drill hole sample from Big Bay. (SCIAA photo)

Pliocene. At the other end of the temporal continuum, radiocarbon dates from the organically enriched, bay basin fill sequence, above the basal confining layer and below the sand sheet, indicate that bay formation and encroachment of the sand sheet into the bay must have occurred before 48,000 radiocarbon years BP. The archaeological record in the upper one-meter of the sand sheet indicates that the sand sheet encroached into Big Bay sometime prior to 10,000 years BP and that it was periodically reactivated until ca. 4000-3000 years BP.

At the Congaree-Wateree sand source area, deposits of the sand sheet overlay the Duplin Formation. The formation, which is exposed on the bluff immediately west of the floodplain, was incised by tributary streams of the Wateree River prior to sand sheet emplacement. Therefore, initiation of the sand sheet must post-date the early late Pliocene-aged, Duplin Formation.

The apparent coevolution of stream-associated eolian deposits (e.g., the sand sheet) and Carolina bays on the South Atlantic Coastal Plain is thought to be linked to fluctuating water levels, an abundant sediment supply, and strong directional winds. High water levels and strong directional winds from the southwest are necessary for the NW/SE orientation of bays observed for South Carolina. Low water levels exposing high energy, water-lain floodplain, and bay shoreface sand sources are necessary for the characteristic eolian deposition on the northeast side of southeasterly flowing streams and on the east side of Carolina bays (i.e., sand rims) by



Mark Brooks (center) examining sample from drill rig. (SCIAA photo)

strong directional winds. Thus, strong directional winds, and both wet and dry conditions, are essential. Moreover, widely fluctuating water levels are essential for inhibiting emergent vegetation, thereby facilitating the high energy conditions necessary for maintaining an abundant sediment supply. Larger-than-present, late Pleistocene and early Holocene paleochannel and Terrace I meanders do in fact indicate greater magnitude of flood discharge and sedimentation. It seems then that any reconstruction of the presumably late Pleistocene climate must accommodate not only strong directional winds, but also both wet and dry conditions manifested as frequent and widely fluctuating water levels. Greater seasonal contrasts and extremes in temperature, precipitation and wind may have existed, including elements of both cool, pluvial and cooler, drier conditions, each of which has been variously suggested for the late Pleistocene in this unglaciated area.