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FLUVIAL TERRACES OF THE LITTLE RIVER VALLEY, ATLANTIC COASTAL PLAIN, NORTH CAROLINA

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ABSTRACT

An optically-stimulated luminescence (OSL) and radiocarbon chronology is presented for fluvial terraces of the Little River, a tributary to the Cape Fear River that drains 880 km² of the Sandhills Province of the upper Coastal Plain of North Carolina. This study differs from previous work in the southeastern Atlantic Coastal Plain in that numerical age estimates are provided for all terraces in the valley of mappable extent by direct dating of fluvial sediments. The Little River valley contains a floodplain and five fluvial terraces with average heights above modern river bed level that range from 3.0 m (T1) to 29.0 m (T5b). Dating indicates the floodplain has a late Holocene (1.3 ± 0.3 ka) to historical age while terraces range in age from 9.9 ± 2.0 ka (T1) to 94.0 ± 15.9 ka (T5b). Age separation of the six fluvial surfaces is corroborated by distinct differences in soil morphology and chemistry. Terrace heights above modern river level and terrace ages indicate a long-term net incision rate of 0.29 mm/yr during the last 100 ka. This rate is nearly an order of magnitude higher than late Pleistocene uplift rates reported for the Cape Fear River valley in the 1980s, based on age estimates for the Wando Formation. However, the 0.29 mm/yr rate is consistent with OSL and radiocarbon dates reported from terraces in the adjacent Pee Dee River valley. Together, these data refine the ages assigned to fluvial facies of the Wando terrace and suggest it is composed of multiple fluvial deposits with a wide range of late Pleistocene ages. The long-term net incision rate of the Little River is consistent with the range of neotectonic uplift rates reported for this region. Scrutiny of the inter-terrace ages indicates that Little River terraces may reflect short-term aggradation in response to periodic climate-mediated increases in sediment supply that is compensated by long-term incision in response to neotectonic uplift.