
Hurricane Rita Storm Surge Deposits in Southwest Louisiana: Preliminary Fieldwork Results

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ABSTRACT

When Hurricane Rita made landfall on September 24, 2005, it generated a 4-5 meter high storm surge along the southwest Louisiana coast. Water levels were probably highest in Cameron and Vermilion parishes, which were overridden by the northeast quadrant of the hurricane. These parishes contain extensive tracts of coastal woodlands and marshes extending inland from sandy beaches. The storm surge and accompanying waves, generated by 100+ mph winds, transported shallow marine and inter-tidal sand and mud into these environments. A field survey of the resulting storm surge deposits was conducted in November 2005, in the vicinity of Johnson's Bayou, Cameron Parish, Louisiana. The storm surge deposits form a wedge of sediment extending approximately 400 m inland. Directly behind the beach, the deposits are up to 50 cm thick and consist predominantly of sand. At the distal end of the wedge, the deposits are mainly mud and clay up to a few cm thick. Field observations suggest two phases of deposition: a layer of finer rippled sand, about 10 cm thick and extending about 300 m inland, probably deposited from suspension and reworked by waves, and overlying this, coarser sand transported as sub-aqueous dunes, about 30-40 cm thick. The dunes have an abrupt termination about 100 m inland, readily observable in the field. Internally, the dunes have well-developed foreset beds that, in places, form a distinct angular unconformity with the underlying rippled sand. The storm surge deposits have an abrupt sharp contact with underlying woodland and marsh soils.