

# *Geoscience Notes*

## RECENT SEDIMENTS OF THE LOUISIANA INNER CONTINENTAL SHELF

by Wesley Krawiec

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### ABSTRACT

A two dimensional study based on 331 surface samples of the inner continental shelf of Louisiana (from the beach to 15 fathom water depth and from the western side of the modern Birdfoot Delta to the Texas-Louisiana border) shows that there are deltaic sediments west of the Birdfoot Delta and south and west of March Island. Delta destructional sands and non-deltaic sediments occur in the central portion of the area and relict sediments (Pleistocene) are exposed in the western portion of the investigated area. The deltaic sediments are characterized by rapid accumulation and regression of the shoreline of silt- and clay-sized material. These sediments contain less than two per cent sand. In contrast the delta destructional sediments are clean, well-sorted terrigenous sands. These sands are derived from the erosion and winnowing of pre-modern channel sands, bar finger sands and natural levee deposits of pre-existing deltas. The sands are concentrated and form barrier islands at the seaward margin of former deltas. Erosion and subsidence of the older deposits result in marine transgression. Trinity and Ship Shoals are the drowned equivalents of the modern barrier islands which have subsided to their present position by crustal downwarping and internal sediment compaction. The non-deltaic sediments in the offshore area are a thin, brown, oxidized veneer which are not accumulating permanently. This veneer has a sharp contact with the underlying pre-modern sediments. Where there is permanent accumulation of the non-deltaic sediments, the greater amount of sand and the coarser laminations distinguish the non-deltaic from the deltaic sediments. The relict sediments are texturally and compositionally different than the modern sediments.

The beaches in the region are a thin discontinuous veneer of sand and/or shell overlying marsh deposits. Where the beaches are absent the marsh is exposed at the water line. The type of beach present is directly related to the nature of the sand-size material in the offshore area. Terrigenous sand beaches are found in the regions where abandoned deltaic sequences are being eroded and winnowed; shell beaches are found where pre-modern beach ridges are being eroded or where living organisms (principally oysters and *Mulinia*) supply the sand-size material. The beaches are in equilibrium with the normal physical conditions. Hurricane forces erode and transport beach material both landward and offshore.

The prevailing permanent and semi-permanent currents in the area are from east to west. The waves are from the south to southeast and produce longshore currents and drift to the west. The waves are closely related to the winds.