

THE SIGNIFICANCE OF CHANGES IN SHORELINE FEATURES ALONG THE TEXAS GULF COAST

J. H. McGowen¹ and L. E. Garner¹, and B. H. Wilkinson²
Austin, Texas

ABSTRACT

The open Texas coast is characterized by three distinct types of shoreline: (1) Barrier islands consisting of sand beaches, fore-island dunes and a vegetated or barren back-island area. (2) Peninsulas having beaches dominated by shell; shell ramps with or without incipient dunes form the crest of the peninsula, and storm channels and washover deposits dominate the back-island area. (3) Strand plain a few to several hundred feet across; shell material and rock fragments are dominant over terrigenous sand. Physiographic features of strand plains are a steep forebeach and a wide shell ramp that terminates as a steep avalanche face. Only the barrier islands and peninsulas are associated with bays and lagoons.

When viewed separately, these shoreline features appear to have a random distribution. However, when their occurrence is considered in the context of Pleistocene and Holocene depositional history of the Texas Coastal Zone, there is order in their distribution. Barrier islands develop in the same areas as do sand-rich Pleistocene deltas with broad strand plains. Peninsulas are positioned along Pleistocene interdeltaic areas. Strand plains are situated along the distal parts of mud-rich Pleistocene and Holocene deltas.

Distribution of these three shoreline types along the Texas coast cannot be explained adequately by a sand source from Modern rivers being transported by longshore drift. Occurrence of the three shoreline types can best be explained by local Pleistocene and Early Holocene sediment sources. Broad, sand-rich barrier islands are presently moving toward an equilibrium state where sediment input is about equalled by intensity of physical processes. Narrow, shell-rich peninsulas are moving toward the mainland at rates of 2 to 14 feet per year. Narrow, shell-rich strand plains are in a state of rapid erosion – up to 30 feet per year.

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¹ Bureau of Economic Geology, The University of Texas at Austin

² Department of Geological Sciences, The University of Texas at Austin