

Presentation 4: Paul V. Heinrich

Stratigraphy and Geoarchaeology of the Late Pleistocene - Holocene Transgression, Past and Future

During the last interglacial, MIS 5, relative sea level in the northern Gulf of Mexico was 6 to 7 m higher than present and the shoreline was several kilometers inland of present. Following MIS 5, alternating lowstands and highstands created entrenched valleys, fluvial terraces, and shelf-phase deltas on the Louisiana continental shelf. During MIS 2, the growth of continental ice sheets lowered global, eustatic sea levels on the order of 120 m below present level. Because of isostatic adjustment, regional relative sea level was only about 90 m below present sea level within the Louisiana continental shelf. This created a regional unconformity, the Holocene-Pleistocene surface, that formed a subaerial coastal plain bordering the Gulf of Mexico and open to prehistoric occupation. As sea level rose during the Holocene, the shorelines of bays, sounds, and lagoons and later the Gulf of Mexico transgressed northward over this coastal plain. This transgression modified the former coastal plain and other paleosurfaces. In some cases, fluvial, estuarine, and eventually marine deposits buried and preserved subaerial paleosurfaces and associated cultural deposits within paleovalley fills and other geomorphic features. The nature and distribution of these surfaces can be used to define unconformity-bounded units; reconstruct paleogeography; infer where to search for submerged and intact prehistoric cultural deposits and paleoenvironmental archives; and infer where to locate sand resources lying beneath the Gulf of Mexico. The geoarchaeology of the offshore shelf can be used to infer the eventual fate of onshore cultural resources during the ongoing Holocene transgression.