
Pliocene Sub-Willis Unconformity in Southeastern Texas: Forebulge to the Pliocene Mississippi Delta

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ABSTRACT

A major unconformity is mappable within the updip Neogene strata of southeastern Texas. Regional correlations for hydrologic framework refinement show that the upper Miocene (Goliad) units present in the subsurface are truncated before they reach outcrop and are overlain by sand-rich Willis rocks of late Pliocene or early Pleistocene age. This is consistent with surface mapping, which shows Goliad overlapped east of Columbus, and a band of Fleming (lower Miocene) rocks to the east that are highly overlaid by Willis sands eastward from Huntsville to the Sabine River. Mapping the subcrop lines of the Miocene rocks shows that the unconformity forms the margin of a gentle uplift or ‘bulge’ that was centered in Polk, San Jacinto, and Montgomery counties; effects of the unconformity extend southward nearly to Tomball and Liberty. Erosion on this axis may have begun during the late Miocene (regional correlations are too imprecise to be sure) but probably peaked in the Pliocene.

This gentle uplift probably formed by isostatic adjustment to the deposition of the thick Pliocene delta systems in and south of southern Louisiana. As such, it is a version of the Angelina-Caldwell Flexure (probably Oligocene-Miocene) that is displaced southward in Pliocene time because of the marked difference in thickness and loading between Texas and Louisiana shelf margins.