

CRETACEOUS, PALEOCENE AND LOWER EOCENE GEOLOGIC HISTORY OF THE UPPER MISSISSIPPI EMBAYMENT

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ABSTRACT

Subsurface data show that the Upper Mississippi Embayment record of Cretaceous, Paleocene, and Lower Eocene position is a single complex sedimentary cycle.

The cycle began with Cretaceous deposition of nonmarine Tuscaloosa, restricted in areal extent. Marine advance depositional limits reached a maximum in the Paleocene with the Porters Creek clay, which once generally extended the Embayment limits. Deposition ended in the Early Eocene with nonmarine Wilcox beds, now restricted to the subsurface near the Embayment axis. An interval of uplift and erosion resulting in marked truncation followed to complete the cycle.

Overlying Middle Eocene Claiborne beds overlap all Lower Eocene Wilcox and part of the Paleocene Midway all the way to the upper end of the Embayment north of the Tennessee-Mississippi border.

Within the above major sedimentary cycle five advances and regressions of the sea are recorded. These are illustrated by stratigraphic cross sections and a series of paleogeographic maps. The pre-Claiborne truncation pattern is illustrated by a paleogeologic map.

The pattern of basal onlap with the sedimentation limit extending to a maximum in the Paleocene is the result of negative tectonic behavior of the Embayment depositional area. Above the Paleocene, limits of preservation of sea level are increasingly restricted toward the Embayment axis, but this situation is the result of uplift after deposition.

Transgressions and regressions of the sea result from interplay between rate of subsidence and rate of sedimentation and perhaps also from eustatic sea-level change, factors which are controlled by events that occurred beyond the Embayment limits.

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