
Regional Depositional Episodes of the Cenomanian-Turonian Eagle Ford and Woodbine Groups of Texas and their Relationship to Oceanic Anoxic Event 2 (OAE2)

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ABSTRACT

A chronostratigraphic framework was developed for the subsurface Eagle Ford of South Texas in conjunction with a log-based regional study that was extended into East Texas using biostratigraphic and geochemical data to constrain log correlations of 12 horizons from 1729 wells. Seven regional depositional episodes were identified by the study. The clay-rich Maness Shale was deposited during the Early Cenomanian in East and northern South Texas. After a relative fall in sea level, East Texas was dominated by the Woodbine siliciclastics, whereas in South Texas deposition of organic-rich marls began during the subsequent Lewisville transgression. A shift in depositional style to the Eagle Ford limestones and organic-rich shales occurred in East Texas during the Middle Cenomanian produced by the continued rise in sea level. During the Middle to Late Cenomanian anoxic to euxinic bottom-water conditions prevailed throughout the Texas shelf. Erosion along the Sabine Uplift shifted East Texas deposition southward to the Harris delta and deposited the “clay wedge” of northern South Texas. The introduction of an oxygenated bottom-water mass produced the reduction in total organic carbon (TOC) preservation that marks the Lower/Upper Eagle Ford contact. This event coincided with the onset of Oceanic Anoxic Event 2 (OAE2) and the Cenomanian-Turonian Boundary sea-level high, which starved much of the Texas shelf of sediment. Deposition recommenced during the Late Turonian with the Sub-Clarksville delta of East Texas and the Langtry of South and West Texas. Bottom-waters became oxygenated at approximately 90 Ma, initiating the transition from the Eagle Ford to the Austin Chalk.

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