

DEPOSITIONAL SYSTEMS IN THE WOODBINE FORMATION (UPPER CRETACEOUS), NORTHEAST TEXAS

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ABSTRACT

The Woodbine Formation is composed largely of terrigenous sediment eroded from Paleozoic sedimentary and weakly metamorphosed sedimentary rocks of the Ouachita Mountains in southern Oklahoma and Arkansas, and subsequently deposited in a complex of nearshore environments along the margins of a broadly subsiding basin (Northeast Texas Basin). Three principal depositional systems are recognized in Woodbine rocks — a fluvial system, a high-destructive delta system, and a shelf-strandplain system. Their recognition is based on a regional outcrop and subsurface investigation in which external geometry of framework sands was integrated with lithology, sedimentary structures, fossil distribution, and bounding relationships.

Two components of the fluvial system, a tributary channel sand facies and a meander belt sand facies, are developed in the Dexter Member (lower Woodbine) northeast of a line from Dallas to Tyler. To the south and southwest, a high-destructive delta system is persistent throughout the entire Woodbine section. The three component facies of the delta system are: progradational channel-mouth bar sands; coastal barrier sands, deposited along shore adjacent to channel mouths; and prodelta-shelf muds. The Lewisville (upper Woodbine) shelf-strandplain system, developed in the northern third of the basin marginal to principal deltaic facies, is composed of two facies: shelf muds; and strandplain sands, accumulated along shore.

Near the end of deposition of the Woodbine, but before transgression by Eagle Ford seas, emergence of the Sabine Uplift resulted in erosion of Woodbine sediments. These were subsequently redeposited along margins of the uplift as the Harris Sand.

GUM HOLLOW DELTA, NUECES BAY, TEXAS: A DEPOSITIONAL MODEL FOR FAN DELTAS ¹

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ABSTRACT

Modern terrigenous clastic deposits that are lobate in plan, wedge-shaped in cross-section, and which prograde into a body of marine water, or bay, from an adjacent area of high relief are termed fan deltas. Periods of construction are of short duration and sediment is dispersed across the subaerial fan by shallow braided streams. Both the subaerial segments and marine extensions of these features are relatively coarse grained. Because of the brief and sporadic progradational pulses, marine reworking of distal fan deposits is operative most of the time.

A study of depositional processes and resulting facies of a modern fan delta along the mainland shore of Nueces Bay has provided data for constructing a model with which ancient terrigenous clastic deposits may be compared. Recognizable facies of the modern fan delta are (1) the fan plain which extends from the apex downfan to a point where surficial features of braided streams are no longer identifiable, (2) the distal fan, a relatively featureless part of the subaerial fan, which lies in the realm of fluvial, wind and tidal processes, (3) the prodelta, the marine extension of the distal fan, bears a fluvial imprint but has been modified, and, (4), facies which include depositional features modified in the bay by physical and biological processes, and abandoned parts of the subaerial fan modified chiefly through fluvial processes.

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