

# Sedimentology, Ichnology and Depositional Environment of the Woodbine Sandstone (Cretaceous) Exposed along the Shores of Lake Grapevine, Tarrant County, Texas

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## Abstract

Outcrops of shallow marine strata of the Upper Cretaceous (Cenomanian) Woodbine Sandstone extend over three miles along the north and southeast shores of Lake Grapevine, Tarrant County, Texas. The outcrops rise from 30 to 50 feet above the level of the lake. Sixteen measured sections taken along the shoreline record the grain size, composition, and gamma ray response of the strata; and also, the occurrence and distribution of current-produced sedimentary structures and trace fossils. Two of the sections were sampled for palynomorphs. Sediments of a Cretaceous barrier-island complex trend NNE-SSW across the area. Sandy facies of the barrier-island complex include tidal-channel, shoreface, and flood-tidal delta deposits. The tidal channels and the flood-tidal delta deposits trend NW-SE. Lagoonal mudstones and lignites are present among the heterolithic facies found landward of the main barrier-island sand.

Current-produced sedimentary structures and trace fossils are abundant and well preserved in the sediments. Small-scale structures include both wave and current ripples. The wave ripples exhibit conspicuous interference patterns, including well-developed ladderback ripples, at several localities. Large-scale structures include trough cross-beds, and hummocky cross-stratification. Bidirectional cross-beds are common at several sites. Trace fossils include *Conichnus*, *Rusophycus*, *Ophiomorpha*, *Rhizocorallium*, *Thalassinoides*, *Planolites*, *Roselia* and a *Glossifungites* firmground. These traces represent the domichnia, cubichnia and fodinichnia of anemones, crustaceans and annelids—all fully marine invertebrates. An extensive deposit of rounded, agglutinated sand pellets and *Ophiomorpha*-like burrows found overlying the fringe of the main flood-tidal delta sand was probably produced by a colony of fiddler crabs living in the lagoon behind the barrier island.