island developed by the marine reworking of the seaward edge of the Lafourche delta, the last major deltaic deposit laid down by the Mississippi River prior to the development of its present delta. Marine reworking of the deltaic front provides sediment which is moved northeasterly and northwesterly away from the deltaic front by longshore currents to form barrier spits and chains of barrier islands, such as Isles Dernieres on the west and Grand Isle-Grand Terre Islands.

Grand Isle became a subaerial deposit about 700 years ago and began to lengthen and grow southeasterly by ridge accretion. Its shape and location are controlled primarily by interaction of the longshore currents in the surf zone and the tidal-pass currents that interrupt them. Changes in the tidal channels, such as position or depth, drastically affect the action of the longshore currents. This has been dramatically shown at Grand Isle during 1970. High winds in the summer of 1970 and Hurricane Camille in 1969 deepened and changed the location of the tidal channels northeast and southwest of the island. As a result, accelerated erosion at the island's southwest end has removed several acres of a state park, moved the Gulf shoreline inland 300 ft, and caused the loss or removal of several beachfront homes. The causeway to the island and a large marina are threatened. Government money has been made available for jetty construction and for eventual sand-pumping operations to reduce erosion and restore the beach.

Destruction of the Lafourche delta and construction of the ephemeral and migrating barrier islands on its flanks provided sites attractive for development by man. The desire for permanency of the developed sites is in conflict with the natural dynamic shoreline processes.

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MAESTRICHTIAN (UPPER CRETACEOUS) BIOSTRATIGRAPHY, MAVERICK COUNTY, TEXAS, AND NORTHERN COAHUILA, MEXICO

Finely textured, calcitic, terrigenous clastic rocks of the type Escondido Formation (Río Grande section) afford perhaps the most complete sphenodiscid ammonite succession in North America. Documented superposition in the type section cannot be reconciled with the established Maestrichtian ammonite zonation for South Texas and northern Mexico. A new zonation is proposed that should provide a clearer basis for biostratigraphic correlation with sphenodiscid-bearing sections elsewhere.

Terrigenous clastic rocks previously referred to the Escondido Formation crop out in the eastern part of the Sabinas coal basin in northern Coahuila. In terms of facies and depositional style, these rocks bear more similarity to the Parras Shale-Difunta transition on the south than to the type Escondido. The lower part of the proposed zonal scheme can be recognized in the eastern Sabinas coal basin; the upper part is not expressed there because of facies change and missing section. If the ammonite zones have chronostratigraphic value then, during the Maestrichtian, the Sabinas coal basin was the site of far greater subsidence and sediment accumulation than the upper Río Grande embayment.

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CLAIBORNE GROUP OF CENTRAL TEXAS: RECORD OF MIDDLE EOCENE MARINE AND COASTAL PLAIN DEPOSITION

Sediments of the Claiborne Group in central Texas were deposited in a variety of nearshore-marine and coastal-plain environments. Fluctuations of the shoreline during middle Eocene time resulted in vertical stacking of 2,600 ft of sediments from contrasting depositional environments. Shoreline fluctuations probably did not result from simultaneous eustatic changes of sea level. They were caused by migrations of large fluvial, fluvio-deltaic, and interdeltaic complexes on the margins of a gently and perhaps uniformly subsiding basin. As a result of migrations of major sediment depocenters, the Claiborne rock record is characterized by high lateral and vertical variability.

Each formation of the Claiborne Group commonly is considered to be the product of a single depositional environment which extended laterally for hundreds of miles. For example, the basal formation of the Claiborne, the Carrizo Sandstone, is generally accepted as having been deposited under fluvial conditions close to the shoreline. This assumption is not borne out by detailed field work. An examination of the Carrizo Formation from Bastrop to Freestone Counties reveals that Carrizo sediments were deposited in fluvial, deltaic, and marine environments. In a single outcrop the Carrizo Sandstone may be shown as having been deposited in both barrier bars and delta distributary channels. Such variability also holds true for sediments from each formation comprising the Claiborne Group.

Petrographic analysis indicates that the sediment source remained constant during deposition of the Claiborne Group. The presence of phyllite and schist fragments together with the heavy minerals kyanite, staurolite, garnet, and zircon indicates that the source terrane was dominantly metamorphic. Evidence for volcanic activity is particularly strong in the Carrizo Formation and the uppermost Claiborne Yegua Formation. Volcanic minerals in these formations include bipyramidal quartz, euhedral apatite, and bentonite, indicating that the Claiborne coastline periodically was subjected to wind-transported detritus.

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DISTRIBUTARY-FRONT DEPOSITS INTERPRETED FROM DIPMETER PATTERNS

Continuing studies of high resolution dipmeter data suggest correlation between 3 types of dipmeter patterns and 3 different clastic depositional environments. The first environment lies between the beach and seaward edge of the continental shelf. The second environment lies between the seaward edge of the continental shelf and abyssal zone. The third environment is near active deltas where distributary-front sands tend to be deposited in one of three general shapes: elongate, crescent, or fan.

Distributary-front deposits in an active delta environment exhibit mainly "current patterns" on a high resolution dipmeter plot rather than structural dips. These "current patterns" result from the dip of foreset beds and make a characteristic dip pattern that can be identified readily. The direction of dip of these "current patterns" defines the direction of transport, and the magnitude of the dip patterns indicates the probable shape of the sand body.