shales constitute less than half of the thickest part of the basin fill. Thus, compactional fluids were possibly less significant diagenetically than in the Gulf Coast basin. These factors may have contributed to the development of a regional flow system in which large volumes of meteoric water moved basinward through the marine sandstones.

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Depositional Systems of Continental Margin of Eastern Gulf of Mexico West of Peninsular Florida: A Possible Modern Analog to Some Depositional Models for Permian Delaware Basin

Facies relations and the Jacka and Thompson (1979) interpretation of the response of the Permian Delaware basin margin to glacially induced sea-level fluctuations provide a scaled-down model which is useful in coming to understand their Pleistocene-Recent analogs on the massive west Florida continental margin. Both have a high sea-level stand system which consists of a nearshore band of clastics grading into a skeletal carbonate facies and a reefal barrier on the outer aspect of the shelf. Beyond the reef lies a band of reef talus, a carbonate slope, and base-of-slope deposits which include mass wasting debris and carbonate turbidites. The low sea-level model of the Delaware basin margin, along with reconnaissance seismic and surficial sediment data from the west Florida margin, provides a basis for a hypothesis for low sea-level stands of the latter in which drainage would be rejuvenated across the shelf. The clastic bank would be extended perhaps resulting in channelized delivery of clastics to the otherwise dominantly carbonate slope and base of slope deposits.

Parallels between the two systems are, of course, not exact and care must be taken not to go too far with the analogy. However, as we learn more about the sedimentology of the west Florida margin, we may be able to take the comparison further and perhaps to reverse the flow, providing some insight into the interpretive problems remaining to be solved in the Delaware basin margin.

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Macrofossil Assemblages of Moodys Branch Formation (Upper Eocene), Louisiana and Mississippi

The Moodys Branch Formation (upper Eocene, Jackson Group) is a thin, fossiliferous, glauconitic sand which represents the destructive shelf phase of a transgressive sea. Computer cluster analysis of fossils taken from closely spaced samples reveals six distinct macrofossil assemblages: (A) open bay, (B) nearshore, (C) inner shelf, (D) western inner middle shelf, (E) eastern inner middle shelf, and (F) outer middle shelf. Quantitative trends are similar to Holocene trends for dead shell assemblages in that species dominance and numbers of individuals increase nearshore and diversity, as measured by the Shannon-Weiner index, increases offshore and in bays. However, there are conspicuous differences in the environmental preferences of some Eocene species and their closest living analogs. This suggests that care should be taken when making ecologic analogies between modern organisms and fossil remains.

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Shale Mineralogy and Burial Diagenesis of Frio and Vicksburg Formations in Two Geopressured Wells, McAllen Ranch Area, Hidalgo County, TX

Thirty-six shale samples ranging in depth from 1,454 to 13,430 ft (443 to 4,093 m) from Shell Oil Co. No. 1 Dixie Mortgage Loan well and 33 shale samples ranging in depth from 2,183 to 13,632 ft (665 to 4,155 m) from Shell Oil/Delhi-Taylor Oil Corp. No. 3 A. A. McAllen well were examined by X-ray techniques to determine the mineralogic parameters of the geopressured zone in the Vicksburg Fairway. Both wells have the same weight-percent trends with depth for the mineralogy: quartz, calcite, total clay, and potassium feldspar are constant; plagioclase feldspar gradually increases; kaolinite increases; discrete illite decreases; total mixed-layer illite-smectite (I/S) decreases; illite in mixed-layer I/S increases; and smectite in mixed-layer I/S decreases. Chlorite is found only in the geopressured zone of each well.

Significant diagenetic changes begin at calculated equilibrium temperatures of 58 to 69°C. The most important change is the transformation of smectite to illite within the mixed-layer I/S phase which occurs according to the reaction suggested by Boles and Franks (1979) with Al^{3+} acting as an immobile component. The source of K^+ for this reaction is discrete illite. The breakdown of discrete illite results in two other changes with depth: the formation of kaolinite; and the increase of plagioclase feldspar which is due to reaction with Na^+ and Ca^{2+} provided by the smectite to illite transformation.

The Boles and Franks model is compatible with a steady supply of original mixed-layer I/S during the depositional history of the McAllen Ranch area. The constant content with depth of calcite, quartz, and potassium feldspar indicates that limited material, if any, is supplied by the shales to surrounding sands. The ions generated by changes within the clay minerals are involved in further clay mineral reactions as outlined above. In addition, magnesium and iron are involved in forming chlorite within the shales.

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Land Loss in Mississippi River Deltaic Plain

Systematic measurements and comparisons of maps, black-and-white aerial photographs, and color infrared imagery taken at five periods within the interval from 1890 to 1978 have been used to document land loss and habitat change within the Mississippi River deltaic plain. The studies show that the long-term trend of net progradation, which persisted through most of the past 5,000 years, was reversed during the late 19th century, and that during the 20th century land loss rates have accelerated geometrically. Within the 11,500 mi^2 (29,900 km^2) study area, land loss rates have progressed from approximately 6.7 mi^2/year in 1913 to a projected 39.4 mi^2/year in 1980. The greatest loss has occurred in the wetlands, but barrier islands and natural levee ridges are also disappearing at a very high rate.

The data can be used not only to document past change, but also to project future conditions. The findings have great significance to fish and wildlife resources, flood-protection planning, and land ownership.

Apparent causes of the high rates of land loss include the harnessing of the Mississippi River by levees and control structures which reduce tendencies toward natural diversion and funnel valuable sediments to deep, offshore waters. Additional factors include canal dredging and accelerated sub-