both hiatuses and preserved sediments are approximately 1-2 m.y. The inferred Miocene glacial epochs are of the same duration as the glacial epochs of the Pliocene-Pleistocene. Oligocene hiatuses are found in all of the world's oceans, indicating cold bottom-following waters. Evidence (e.g., hiatuses or ice-raftered material) demonstrates the occurrence of Eocene continental glaciers in Antarctica. Interaction between the three planetary orbital parameters of eccentricity, tilt, and precession apparently control much of long-term climate change, with the dominance of eccentricity dictating glacial cycles. Continuity of climate pattern for the Tertiary is indicated, given constancy of planetary motion. Miocene, Pliocene, and Quaternary assemblages, which gradually become more abundant, more diverse, and better preserved but less equally distributed, reflect offshore but somewhat stressful conditions with intense naticid predation. Recent Upper Jurassic Norphlet oil discoveries associated with the West Bend fault system in Clarke County, Alabama, and the Foshee fault system in Escambia County, Alabama, have renewed interest in exploring for hydrocarbons along the regional peripheral fault trend in Mississippi, Alabama, and the Florida Panhandle. The recently discovered Chavers Creek and Sizemore Creek oil fields and the Strickland 10-4-2 oil discovery in Escambia County, Alabama, are upthrown to the West Bend fault system. The trapping mechanism at Chavers Creek field is a faulted salt anticline, and the petroleum trap at Sizemore Creek field is an elongate salt anticline. The 1985 Womack Hill Field Unit 14-5 oil discovery in Clarke County, Alabama, is upthrown to the West Bend fault system. The petroleum reservoirs at Chavers Creek and Sizemore Creek oil fields include dolomite and wadi sandstones of the Norphlet Formation. Porosity is estimated to be 11-22%, and permeability is estimated to be 14-47 md. Oil gravity in Chavers Creek field is 42.7° API, and that in Sizemore Creek field is 59.9° API.

The Norphlet oil discoveries in Clarke and Escambia Counties, Alabama, and the existence of established productive Norphlet hydrocarbon fields in Mississippi, Alabama, and the Florida Panhandle demonstrate the petroleum potential along the regional peripheral fault trend in central and eastern Mississippi, southwestern Alabama, and the Florida Panhandle. The key to successful prospecting for hydrocarbons along this fault trend is to delineate faulted salt anticlines or other salt anomalies and identify reservoir-grade dolomite, wadi, and marine sandstones of the Norphlet Formation.

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Sources of Pleistocene and Holocene Sand for Northeast Gulf of Mexico Shelf and Mississippi Fan

Grain shape, surface texture, and mineralogic analyses were conducted on the Pleistocene and Holocene sands of the northeast Gulf of Mexico shelf and the Mississippi fan to determine their sources. Two distinct petroleum provinces of sand are present in this area: the Mississippi province, characterized by spherical quartz grains derived from older strata in the drainage basin of the Mississippi River, and the eastern Gulf province, characterized by a mixture of spherical and elongate quartz grains. The former is derived from Cretaceous and Tertiary coastal plain strata; the latter is derived from sedimentary and crystalline rocks of the southern Appalachian Mountains.

Sand distribution patterns of these two provinces on the northeast shelf are distinct; Mississippi province sands are found in the western part of the shelf near the Mississippi delta, while Eastern Gulf province sands are found throughout the remaining parts of the shelf. However, sands of the Mississippi fan are a mixture of Mississippi and Eastern Gulf province sand. Glacial sand is uncommon in both the Holocene and Pleistocene deposits of the Mississippi province.

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Fluid-Flow Patterns in Central Tuscaloosa Trend, Louisiana

Contoured hydraulic-head cross sections constructed from well logs in the central Tuscaloosa gas trend of Louisiana provide information about fluid flow near the hydropressure-gasoline interface. Extensive head inversions correspond to long, dip-oriented convolutions of the interface. The inversions occur where permeable, hydropressured, massive sandstone facies in the lower Tuscaloosa underlie gaspressured Eagle Ford Shale updip of fault zones that preserve geopresses downdip. Thus, regional fluid pressure regimes in the Tuscaloosa and Eagle Ford are predominantly structurally controlled, with some lithofacies control updip. Hydraulic-head trends indicate an overall pattern of regional upward flow from depth, with highest hydraulic gradients corresponding to the top of the Austin Chalk in most places. This pattern is complicated by inversions—which are nearly horizontal and tend to show high hydraulic gradients—and by a sharp, upward-protruding head peak that becomes nearly vertical along a trend above the Lower Cretaceous limestone shelf edge. This peak represents the escape of highly pressurized fluids from depth along a preferred path, which may be fault controlled. Highest hydraulic gradients occur locally and regionally where fluids flow from geopressured shale toward permeable, hydropressured sandstone. Salinities are also reported to show a regional increase toward