Kerogen in the Miocene Monterey Formation in the Pismo syncline consists of amorphous material of algal orgin. Most of the rocks presently contain 1 to 5 wt. % total organic carbon. Thermal alteration index determinations and pyrolysis (thermal extract) data suggest that the organic material at the center of the fold is mature, whereas the organic material on the limbs of the fold is immature. The Monterey Formation in this region entered the liquid hydrocarbon window at a present day depth of approximately 1,700 m. The liquid window appears to be coincident with the opal-CT to quartz reaction (80 ± 10°C).

Hydrocarbons were expelled from the Monterey rocks deep in the center of the fold and began migrating as a result of microfracturing. The hydrocarbons migrated up into the southwest limb of the fold through macrofractures. This limb of the fold is characterized by brittle dolomitic and opal-CT rich rocks that were intensely fractured prior to hydrocarbon migration. The potential reservoirs on this limb of the fold are in fractured Monterey. In contrast, on the northeast limb of the fold, Monterey rocks consist of silty and sandy siliceous rocks that tend to be more resistant to fracturing; hydrocarbons migrate up into this limb of the fold through relatively low angle faults and spread into structural traps along the fault in the adjacent Pliocene Pismo Formation through conjugate shears. The potential reservoirs on this limb are in structural traps in the Pismo Formation. A third potential hydrocarbon target is the basal sand in the Pismo Formation; almost everywhere in the fold this unit is highly bituminous.

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Sedimentologic Framework of Green River Formation, Wyoming

During deposition of the Green River Formation, ancient Lake Gosiute began as a freshwater lake, evolved to a saline, alkaline lake, and ended as a freshwater lake. This evolution reflects the change from a closed-basin to an open-basin hydrologic regime; as a result, sedimentation in the Lake Gosiute system was strongly influenced by the relation between evaporation and inflow of water into the basin. In the Green River Formation, stratification sequences, sedimentary structures, and mineralogy of lithofacies provide important insights into the evolution of the system and the competing factors that determined the type of sediment accumualated in the lake and fringing environments. Carbonate sedimentation was strongly influenced by lacustrine transgressions and regressions across a low topographic gradient. Terrigenous rocks reflect progradation of beach and deltaic shorelines during wetter climatic intervals when detritus that was produced and stored in upland areas during preceding drier intervals was transported to the lake.

Hydrochemistry of lake Gosiute during the deposition of the Wilkins Peak member was controlled by ground water discharge; during the deposition of the Tipton and Laney Members it was controlled largely by surface water. Calcite precipitated as a result of mixing calcium-rich inflow and saline-alkaline lake waters. Dolomite formed as a result of periodic flooding and drying of the playa fringe (carbonate mud flat), where carbonate muds were saturated with saline-alkaline lake waters and underwent evaporitive pumping. Some surface waters were preconcentrated by dissolution of efflorescent crusts in alluvial plain and mud-flat sediments. Trona and halite precipitated from brine pools as the lake shrank during periods of intense aridity. During himid periods the lake expanded and oil shale was deposited.

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Wave-Dominated Deltaic Sedimentation in Devonian Bokkeveld Basin of South Africa

In the Devonian Bokkeveld basin on the southwestern periphery of Gondwanaland, over 3,000 m of mudstones and sandstones were deposited as a southerly prograding clastic wedge. Five thick regressive sequences record processes on arcuate deltas along a mixed wave and tidal energy coastline. Variations among the upward-coarsening sequences are the result of differential preservation and transgressive reworking caused by uneven rates of relative sea level rise.

The base of each sequence is represented by dark shelf-prodelta shales which grade upward through mudstones to graywackes and lithic arenites of river-mouth bar facies. This upward-coarsening deltaic package is topped by tidal flat, shallow subtidal, and interdistributary bay deposits of the delta plain. These delta plain deposits are extensively bioturbated and contain brackish invertebrate taxa of the Malvinocaffric province. Reworked sands are present largely as tidal channel and tidal inlet quartzarenites that unconformably overlie the distributary-mouth bar facies and in places the delta plain facies. Plane-bedded sheet sands locally occur below the quartzarenites and are attributed to storm washover processes.

It is suggested that deposition of the Bokkeveld Group occurred on arcuate deltas similar to the modern Brazos and Niger deltas. Rates of relative sea level rise were high and were punctuated by periods of near stillstand. The duration of these stable periods increased through time, culminating in stable shelf conditions in Witteberg time.

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Paleogeographic Setting and Depositional Environments of Santa Margarita Formation, Ventura County, California

The Santa Margarita Formation in Ventura County, California, represents a transgressive-regressive sequence of rock deposited in a late Miocene shallow marine and paralic environment. A relatively steady low rate of subsidence with an initially low rate of sedimentation produced the transgressive phase. Increased rate of sedimentation produced a seaward progradational sequence or regressive phase.

Rocks that represent the transgressive sequence are herein divided into two facies: (1) facies A, a basal conglomerate zone and thick beds of bioturbated, locally fossiliferous, fine-grained sandstone with some large-scale cross bedding; and (2) facies B, laminated mudstone, phosphatic mudstone, and pelletic phosphate. Rocks that represent the regressive sequence conformably overlie facies B and are herein divided into three facies: (1) facies C, medium to very coarse-grained fossiliferous sandstone characterized by small to large-scale cross bedding; (2) facies D, thin to thick beds of laminated, nodular, and honeycomb gypsum and intercalated claystone, and lenticular-bedded and interlaminated mudstone and very fine-grained sandstone; (3) facies E, medium to thick-bedded mudstone and medium to very coarse-grained sandstone characterized by cross bedding.

Facies A represents marine deposition in a high-wave-energy, shoreface environment. Facies B represents deposition in a low-wave-energy, embayed, inner-shelf environment. Facies C was deposited in a high-wave-energy, east-west-trending, shoreface environment consisting of barriers, bars,