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Mesozoic Thrombolitic Reef Play, Northeastern Gulf of Mexico

Thrombolitic reefs are known from Upper Jurassic and Lower Cretaceous carbonate strata of the northeastern Gulf of Mexico. These microbial buildups are Upper Jurassic petroleum reservoirs in the eastern Gulf Coastal Plain area. These thrombolites developed on Paleozoic rocks on the inner part of a carbonate ramp as part of early highstand systems tract deposits. They attain thicknesses of 150 ft and areal extents of 1 to 2 square miles. These microbial reefs include microbes, cyanobacteria and other bacteria that are chemosynthetic, and encrusting organisms, *Tubiphytes*, foraminifera and metazoans. Upper Jurassic microbial buildups have been interpreted from seismic data from the continental shelf of the northeastern Gulf of Mexico. Lower Cretaceous microbial reefs have been observed from core slabs from a well in Louisiana. These thrombolites developed seaward of the Lower Cretaceous shelf margin on a continental slope. Buildups of 22 ft have been observed. The presence of thrombolites in deeper water is consistent with the occurrence of Upper Jurassic microbial buildups observed in outer carbonate ramp settings from Upper Jurassic outcrops in Portugal. The development of microbial reefs in Upper Jurassic strata in the northeastern Gulf of Mexico and in Lower Cretaceous continental slope paleoenvironments extends the thrombolitic reef play from inner ramp, shallow water paleoenvironments of the eastern Gulf Coastal Plain to Upper Jurassic and Lower Cretaceous deeper water paleoenvironments in the northeastern Gulf of Mexico. The key factors for microbial buildups are hard substrates for colonization, low background sedimentation rate and sea-level rise for continued growth and abnormal marine conditions (shallow water with low salinities or water depths below the euphotic zone) to reduce organism competition for niche space and to reduce predation. Detection of these microbial buildups involves seismic reflection interpretation and geologic modeling of reef development and lateral and vertical variabilities