

Lithostratigraphic and Paleogeographic Comparisons of the Jurassic Section in the Gulf Coastal Plain to the Jurassic Ellis Group in Southern Montana and Northern Wyoming

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Abstract

Integrated outcrop and subsurface data indicate that the Jurassic strata in the Gulf Coastal Plain and the Jurassic Ellis Group of southern Montana/northern Wyoming share similar lithostratigraphic architecture. Lessons learned from the subsurface Gulf Coast Jurassic over the past century provide depositional models for the Ellis Group. Data from this study also suggest that the well-exposed Ellis Group provides an outcrop analogue for the Gulf Coast Jurassic.

The Ellis Group is divided into the Gypsum Spring Formation (evaporites and shale), the Piper and Sawtooth Formations (mixed carbonates-siliciclastics), the Rierdon and Lower Sundance Formations (carbonates), and the Swift and Upper Sundance Formations (mixed carbonates-siliciclastics). This lithostratigraphy is similar in sequence to the Gulf Coast Jurassic. The Ellis Group was deposited in a shallow epeiric sea where depositional conditions ranged from restricted to normal marine. The Ellis Group strata record an increasing water depth from the base through the Rierdon and Lower Sundance Formations to final basinal infilling and shallowing water depth recorded in the Swift and Upper Sundance Formations. The Ellis Group lithofacies maintain characteristic ramp geometries throughout, but facies distributions are complicated in updip areas by underlying topographic relief similar to the Jurassic in the updip eastern Gulf Coast.

Because of their similar facies geometries, the application of current depositional models of the Gulf Coast Jurassic greatly facilitates the design of new depositional models for the Ellis Group. Likewise, the well-exposed Ellis Group provides outcrop analogues to further characterize and refine the current knowledge of Gulf Coast Jurassic deposition.