

Abstracts of Papers

An erosional surface at the base of the Turner developed during a mid-Turonian sea level lowstand with progressive westward truncation of the Pool Creek and upper Greenhorn. Northeast-trending valleys, cut into the deeper water marine deposits during the lowstand, were subsequently filled on a sea level rise, first with fine- to coarse-grained brackish to marine water sandstones and shales, followed by typical shelf oxygenated sandstones.

The erosional surface at the base of the Niobrara is believed related to submarine scour in a basin environment. Maximum scour and fill (150 to 200 ft) occurs along a northwest-trending feature 10 to 15 miles wide and 70+ miles long in southern Campbell and western Converse Counties.

Both regional and local tectonics influenced the geographic distribution and magnitude of the maximum scour and fill features associated with the unconformities.

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Depositional Patterns and Unconformities, Upper Cretaceous, Eastern Powder River Basin, Wyoming

A study of the Upper Cretaceous marine interval (1200 ft thick) in the eastern Powder River Basin from the base of the Belle Fourche Formation to the top of the Niobrara Formation reveals that varying sedimentation rates, tectonics, and unconformities play important roles in the thickness, lithology, and geographic distribution of seven formations or members. Log cross sections and isopach maps were constructed for the Belle Fourche, Greenhorn, Carlile (including the Pool Creek, Turner, and Sage Breaks members) and the Niobrara formations (listed in ascending stratigraphic order).

During deposition of this interval, the area of the present eastern Powder River Basin was occupied by outer shelf, slope and basin topography of the Cretaceous marine basin. The limestone (chalk) and organic-rich shales of the Greenhorn and Niobrara are deep-water basin deposits that thicken westward into slope shales and siltstones. Slope and shelf shales are represented by the Pool Creek and Sage Breaks Members of the Carlile Formation. The thickness and distribution of these members are modified by regional unconformities at the base of the middle member, the Turner, a shallow water regressive sandstone, and at the base of the Niobrara.