

Abstract

Facies and sequence stratigraphic analysis of the Lower Cretaceous Dakota Sandstone was completed in southwestern Colorado. Delta-front sandstone, channel-fill sandstone, and deltaplain and/or floodplain siltstone are the dominant lithofacies. Delta-front sandstones are upward-coarsening intervals, with abundant planar-to-current-rippled beds indicating river dominance. Individual deltas can be traced for up to 10 km and show facies changes from distributary channel to proximal delta to distal delta-front settings. The facies belts are usually over 3 km in width. *Arenicolites*, found throughout the deltaic intervals, is interpreted to indicate stressed, possibly brackish-water condition.

Eight parasequences are present. Parasequence boundaries correspond to a sudden increase of accommodation seen by the vertical stacking of the various depositional facies. In places, a thin (cm-thick) coal horizon (traced up to 5Km) defines the parasequence boundary. Parasequences at the base of the studied interval usually contain floodplain/deltaplain or fluvial deposits. Parasequence toward the top of the studied interval contain deltaic deposits and record the sudden input of coarser material to the study area. Progressively greater wave influence is observed in the deltas that are stratigraphically higher in the section, seen through the presence of thick HCS and (10 to 15 cm) wave-ripple beds towards the top of the formation. The vertical stacking of parasequences, along with greater wave influence up section, is interpreted to reflect a gradual landward movement of the shoreline across the study area throughout the Dakota deposition. Based on this, an overall retrogradational pattern is inferred.

Regional Context

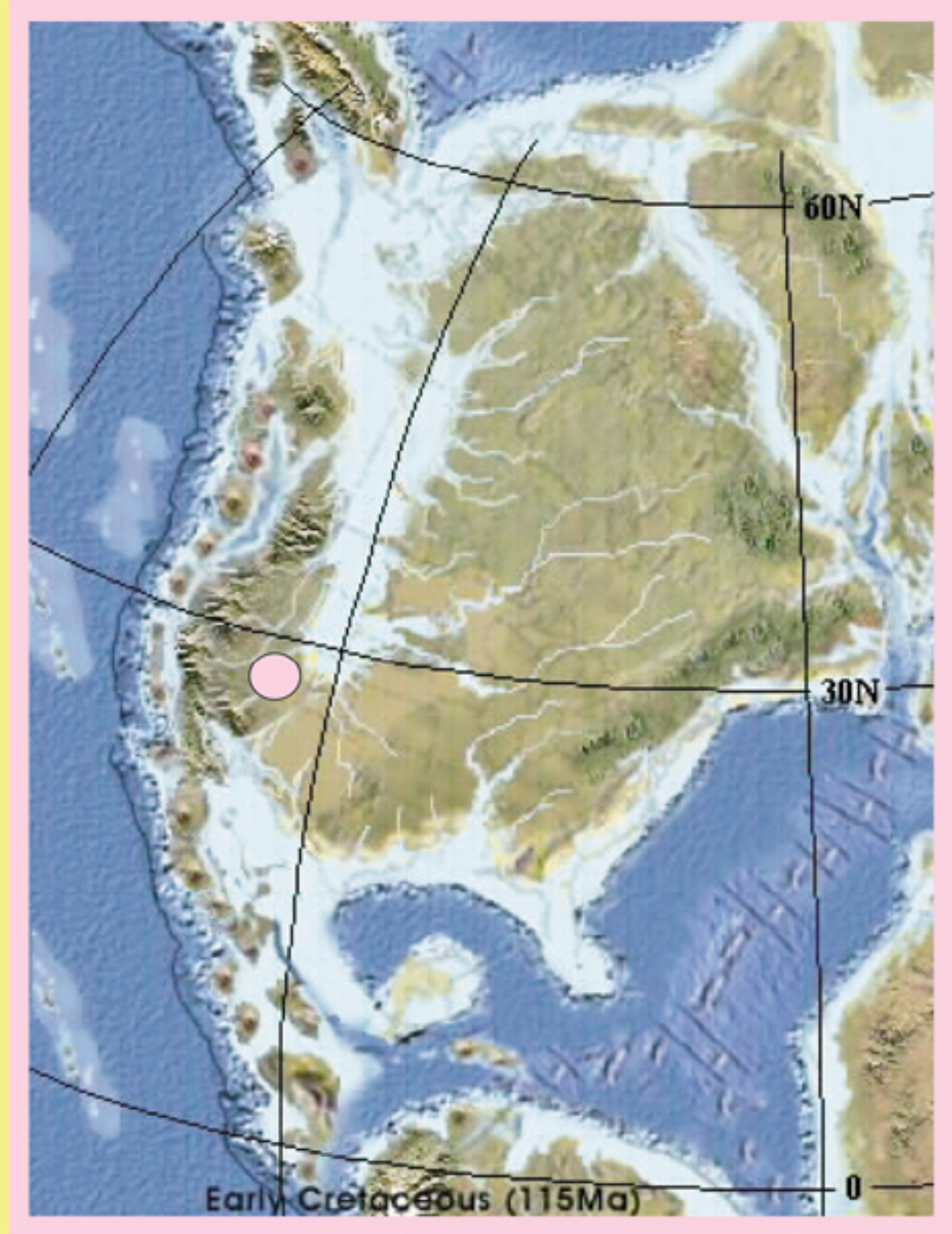
The Dakota Sandstone records the transition from continental environments represented by the Jurassic Morrison and Burro Canyon formations to a fully marine environment represented by the Cretaceous Mancos Shale. It was deposited during the transgression of the Western Interior Seaway across the area, and is interpreted to represent a transgressive system in western Colorado. The Dakota Sandstone is described as Early Cretaceous (Aptian and Albian) in the eastern part of Colorado, but as Early to Late Cretaceous (Aptian, Albian and Cenomanian) in the western part of Colorado (Young, 1960). It records the western shoreline of the Cretaceous Western Interior Seaway during this time interval. A facies and sequence stratigraphic study provides a better understanding of its depositional environments.



Stratigraphy of the area (Billy Creek, Ridgway)

Paleogeography of Southwestern Colorado during the Lower Cretaceous

During the late Mesozoic, convergence between the North American and Farallon plates created a Cordilleran orogenic belt. This orogenic belt extended north-south along the western North American craton (Dickinson and Snyder, 1978). The continuous growth of the Cordilleran orogenic belt induced the formation of the Western Interior Foreland Basin (Jordan, 1981). This foreland basin occupied the western limit of the Cretaceous Western Interior (KWI) Seaway. The flooding of the KWI Seaway across North America occurred from the Arctic and the Tethys simultaneously. During the mid-Cretaceous (~100 Ma), the two seas joined in SE Colorado and progressively spread west from there (Raynolds, 2002). The study area is located near the western margin of the Western Interior Foreland Basin (Ulicny, 1999).



Paleogeography of North America during Early Cretaceous (115Ma)
(Blakey, 2006.<http://jan.ucc.nau.edu/~rcb7/>)



Paleogeography of North America during Late Cretaceous (90Ma)
(Blakey, 2006.<http://jan.ucc.nau.edu/~rcb7/>)