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Cyclicality in Paralic Deposits, Mid-Cretaceous, United States Western Interior

Cretaceous tectono-eustatic cycles in the U.S. Western Interior range from second- and third-order transgressive-regressive cycles of 4 to 8 m.y. duration to fourth- and fifth-order climatic cycles expressed as offshore marine, chalk-marl couplets. However, short-term cycles in paralic siliciclastic facies are poorly understood.

Shale-sandstone, coarsening-up, meter-scale cycles in the Dakota Group in New Mexico, Oklahoma, Colorado, and Kansas comprise transgressive systems tracts of two alloformations. The Cucharas Canyon Alloformation consists of the Upper Albian Mesa Rica and Dry Creek Canyon formations and is bounded below by sequence boundary SB3 that overlies the lower Upper Albian Kiowa-Skull Creek Cycle. The Huerfano Canyon Alloformation bounded by SB 4 consists of the Romeroville Formation.

Thirteen meter-scale, coarsening-up and fining-up cycles in the Cucharas Canyon Alloformation in Kansas become progressively non-marine as indicated by the upward decrease in trace fossils and dinoflagellates. By graphic correlation analysis average cycle duration is estimated to be 169,000 yrs. In southeastern Colorado and New Mexico this alloformation consists of fluvial sandstone deposited in active-fill channels and bars.

Meter-scale coarsening up mudstone-sandstone cycles comprise the upper part of the Huerfano Canyon Alloformation in New Mexico, Oklahoma, and Colorado. The cycles become progressively marine up section by the inclusion of trace fossils, the *Ammobaculites*-dominated agglutinated foraminiferal biofacies, and nearshore marine dinoflagellates. These cycles are overlain by dark gray, restricted marine Graneros Shale. By graphic correlation analysis the estimated average cycle duration was 98,000 years so these cycles could represent allocyclic climatic processes, although variation in sediment input cannot be discounted.