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Stratigraphic Architecture of Upper Cretaceous Coastal Plain and Shallow Marine Strata: Gallup Sandstone, Crevasse Canyon Formation, San Juan Basin, New Mexico

A 3-D stratigraphic architecture and facies distribution of coastal plain and shallow marine strata was established in the Western San Juan basin, New Mexico. Strata are represented by the Turonian-Coniacian Gallup Sandstone and the Crevasse Canyon Formation. This high-resolution genetic stratigraphic study in a 1000 km² area, used 2000 m of measured section calibrated with 1200 m of outcrop gamma ray from 25 sections and 85 plugs.

We characterized twenty short-term cycles that account for the internal distribution of facies within facies tracts and reveal a large degree of compartmentalization. Seven intermediate-term cycles compose a long-term cycle. The basal four account for deposition of seaward-stepping shoreface/tidal couplets and the coeval bay margin to intertidal flat strata during the long-term base level fall. These cycles are fully asymmetrical to symmetrical. Three landward-stepping cycles containing tidal influenced open bay, tidal dominated inner shelf and bay-margin/intertidal flat strata occur in the long-term base-level rise. These cycles are rise asymmetrical. Coarse tidal facies are good reservoirs and the shoreface/tidal couplet stratigraphic motif constitutes a potential future reservoir target. The Gallup Sandstone consists of seaward-stepping shoreface/tidal couplets. The landward-stepping Tocito Member of the Mancos Shale overlies the Gallup and no major stratigraphic dislocation is observed at the contact between them. Those changes are expressions of sediment volume partitioning and facies differentiation accompanying changes in accommodation and sediment supply (A/S).