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Upper Cretaceous Shoreface/Tidal Couplets in the San Juan Basin: Significant High Frequency Events Resolved from the Gallup Clastic Wedge

High-frequency stratigraphic events, which we denominated "Shoreface/Tidal Couplets", were recognized in the Western San Juan basin, New Mexico. This was possible by conducting a high-resolution genetic stratigraphic study in a 1000 km² area. We used 2000 m of measured section calibrated with 1200 m of outcrop gamma ray from 25 sections and 85 plugs. This study helped to establish the 3-D stratigraphic architecture and facies distribution of the Turonian-Coniacian Gallup Sandstone, Crevasse Canyon Formation and Mancos Shale. Shoreface/tidal couplets in the Gallup Clastic Wedge are restricted to the lower part of the wedge and are included in a long-term base level fall. They are genetically associated to symmetric intermediate-scale base level cycle. In a couplet, the shoreface component is associated to an intermediate-term base level-fall hemicycle while its tidal component is associated to an intermediate-term base level rise hemicycle. In general, the seaward depositional limit of the tidal component of the couplet is displaced landward of the genetically associated shoreface and its seaward depositional limit. The landward depositional limit of the tidal component is frequently displaced less than 5 km landward of the shoreface and its landward depositional limit. The tidal component overlies shoreface and bay-margin/intertidal flat strata and is usually capped by heterolithic margin/intertidal flat and coastal plain strata. The tidal components are coarser than shorefaces (uf to lm), 4 to 12m thick and 20 to 30 wide. The Shoreface/Tidal couplet is a very important chronostratigraphic motif and constitutes an important potential stratigraphic trap that has been overlooked in the past.