

Slope and Toe-of-Slope Deposits Shed from a Late Wolfcampian Tectonically-Active Carbonate Ramp Margin

By

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Outcrops in the Victorio Flexure area of the Sierra Diablo Mountains, West Texas, provide evidence that suggests Ouachita-related tectonism remained active throughout latest Wolfcampian time and carbonate debris aprons can be composed of channel architectural elements as well as sheet architectural elements. The Victorio Flexure is a structural feature that was reactivated during late Paleozoic deformation. In Early Permian, uplifted pre-Permian strata along the Victorio Flexure were the source for terrestrial clastic systems (Powwow Formation). Marine transgression followed and flooded the landscape; clastic influx waned; and carbonate production ensued. Outer ramp carbonates were initially deposited, followed by the accumulation of platform carbonates (lower to middle Hueco 'C' Formation). The progradational extent of the platform was controlled by subtle topography associated with the Victorio Flexure. This carbonate depositional profile can be characterized as a structurally modified ramp.

In latest Wolfcampian, tectonic movement along the Victorio Flexure increased slope height and gradient. This structural modification triggered the mobilization of large volumes of carbonate material basinward. The allochthonous debris formed a slope-centered apron comprised of slide mass, debrite, hemipelagite, and sediment gravity flow packages (upper Hueco 'C' Formation). Platform-derived slide masses and periplatform hemipelagic drapes dominate proximal settings. Debrite-filled channel complexes and high- to low-concentration sediment gravity flow packages occupy more distal environments. The internal stacking patterns of the debrite complexes imply focusing of flows from updip point sources and display proximal-to-distal changes in internal architecture. The upper Hueco 'C' debris apron marks the final phase of deposition in the Wolfcampian.