

## **RMS-SEPM talk March 2010**

### **Stratigraphy of a Mass-Transport Dominated Deepwater Carbonate Interval, Permian Cutoff Formation, West Texas**

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Outcrop analysis of mass-transport deposits (MTDs), stratal geometries, and sedimentary facies and architecture in a deepwater carbonate interval (Permian Cutoff Formation), in addition to analysis of data from overlying deepwater siliciclastic strata (Permian Brushy Canyon Formation) along an inherited and drowned shelf-to-basin floor depositional profile (Western Escarpment, Guadalupe Mountains, west Texas), suggests that inherited paleobathymetry significantly controlled the vertical and lateral distribution of facies, sedimentary architecture, and MTDs in third- and fourth-order sequences and in the transgression and early highstand of a second-order supersequence within the latest Cisuralian and earliest Guadalupian fill of the Delaware Basin.

Units within the Cutoff Formation (Shumard, El Centro, and Williams Ranch Members and their informal subdivisions) exposed in the southern Guadalupe Mountains and northern–central Delaware Mountains are correlated to previously described strata in outcrop and subsurface studies in the Delaware Basin region. These units are interpreted in the context of previously modeled second-, third-, and fourth-order cyclicity in equivalent strata (San Andres Formation) exposed in the Guadalupe Mountains.

Results of this study show that, within the Cutoff Formation from the drowned shelf margin to the basin floor, lithologic units are added beneath a post-Cutoff unconformity, MTD thickness and deformation complexity and intensity increase. Over the same distance, Brushy Canyon Formation MTDs increase in number and the degree of channel amalgamation decreases. Brushy Canyon Formation channels are most numerous both on the drowned shelf margin, where the Cutoff Formation is missing and erosional processes, including mass-transport evacuation were dominant and on the basin floor, where the Cutoff Formation is thickest and mass-transport-related shortening is most intense.

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