
Berriasian-Cenomanian Carbonate Platform Successions of the Southwestern U.S. and Northern Mexico

Charles Kerans¹, Robert Loucks², Lowell Waite³, Ryan Phelps¹, and Laura Zahm²

¹Bureau of Economic Geology, The University of Texas at Austin,
University Station, Box X, Austin, Texas 78713-8924

²Jackson School of Geosciences, The University of Texas at Austin,
1 University Station C1100, Austin, Texas 78712-0254

³Jackson Pioneer Natural Resources Company, 5205 N. O'Connor Blvd., Ste. 200, Irving, Texas 75039

ABSTRACT

The Cretaceous carbonate platform of the southwestern U.S. and northern Mexico illustrates a spectrum of shelf-slope morphologies, facies architectures, and reservoir styles that reflect the changing structural underpinnings, subsidence patterns, and sediment supply variables in each region. Five 2nd-order sequences are tracked between the Bisbee Basin-Chihuahua Trough, western Comanche Shelf/Maverick Basin, and Llano Uplift to Stuart City Margin. The 2nd-order supersequences (SS) are (1) the Berriasian–Early Aptian Hosston/Sligo-Cupido, (2) the mid Aptian–Early Albian Pine Island/La Pena/Pearsall–Cow Creek/James/Lower Mural, (3) Early-Mid Albian Glen Rose/Mural, (4) Late Albian Edwards/Georgetown–Stuart City, and (5) Early-Mid Cenomanian Del Rio–Buda.

The Llano-Stuart City passive margin succession illustrates all five 2nd-order supersequences. SS1 (Sligo) establishes a continuous reef-rimmed platform margin, followed by Early Aptian eustatic rise and deposition of the Early Aptian Pearsall–La Pena supersequence 2. Sequence 3 Early-Mid Albian Glen Rose carbonates prograde dramatically, reclaiming the sequence 1 margin. Sequence 4 once again is dominated by aggradational stacking and development of a well-defined reefal rim/lagoon/shallow shelf with reservoirs developed in rim grainstones. Sequence 5 records the demise of the platform terminated by the mid-Cenomanian sea level fall. The western Comanche Shelf/Maverick Basin is best known for productive SS3 Glen Rose transgressive sequence set (TSS) buildups and highly progradational SS4 grainstones. The Mural shelf of the Bisbee Basin/Chihuahua Trough is dominated by siliciclastics. The Early Aptian SS2 eustatic rise initiates carbonate sedimentation in the Lower Mural. SS3 Upper Mural includes TSS patch reefs and platform-margin reefs. SS4 highstand sequence set (HSS) deposits are forced regressive intercalated highstand grainstones and lowstand siliciclastic wedges.