
Oral Presentation Abstracts

Patch-reef and ramp interior facies architecture of the Early Albian Mural Limestone, Southeastern Arizona

¹Rachel Aisner, and ²Charles Kerans,
1. Occidental Petroleum
2. Jackson School of Geosciences, The
University of Texas, Austin, Texas
Rachel_Aisner@oxy.com

The Mural Limestone, located in the Mule Mountains to the northeast and southeast of Bisbee, Arizona provides an exceptional outcrop analog for time-equivalent productive reservoirs such as the Albian Glen Rose patch-reef play of the Maverick Basin of Texas. The Mural Limestone is exposed in a number of folds and east-dipping fault blocks in the Grassy Hill and Paul Spur localities in the Mule Mountains and represents a remnant of a south-facing distally-steepened carbonate ramp that prograded into the Chihuahua Trough in Albian time. This study documents the detailed facies architecture and sequence stratigraphic setting of a multicyclic patch-reef and its associated ramp interior facies at the Paul Spur and Grassy Hill localities, respectively.

Small mud-dominated coral-algal buildups (~5 m thick) and tabular biostromes (up to 1.5 m thick) consisting of rudist floatstones are common in the bedded ramp interior carbonates at the Grassy Hill locality in the Mule Mountains 10 km landward of the Paul Spur reef. Buildups in this area are flanked by weakly-cyclic and well-bedded skeletal mud- and grain-dominated packstones. At the Paul Spur locality, Mural facies consist of a 10-35 m thick patch-reef with four distinct reef communities: microbial-*Microsolena* framestone, algal-*Actinastrea* boundstone, branching coral-skeletal framestone and caprinid-requienid floatstone. Measured reef dimensions from ground-based lidar show a distinct windward-leeward margin with reef frame facies extending ~70 m from the margin and extensive lee-

ward rudstone debris and grainstone shoal facies extending a distance of 870 m. Reef and backreef shoal facies exhibit low preserved porosity but petrographic analysis of backreef grainstones shows that primary porosity and permeability was present. These extensive reservoir-prone shoals may be a suitable reservoir target similar to flank rudstones and grainstones of the Maverick Basin reefs.

Three aggradational to retrogradational cycles of reef growth are evident at the Paul Spur locality. Retrogradational stacking is consistent with that of time-equivalent Lower Glen Rose patch-reefs, which suggests a eustatic driver for stratigraphic architecture along the Bisbee/Comanche shelf. Backstepping of reef frame facies in Cycle 3 is interpreted to be time-equivalent to patch-reef development at the Grassy Hill locality.