

Paleotopographic and Sea-Level Controls on Sequence Stratigraphy of Heterozoan Carbonate Facies: Pliocene Carboneras Basin, Southeast Spain

By

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Most carbonate sequence stratigraphic models have been formulated for tropical settings. Improvement of models for temperate and subtropical settings is still necessary. The Carboneras basin of southeast Spain (~3 by 4 km) exposes up to 80 m of Pliocene heterozoan (subtropical-temperate) limestone facies. A relative rise in sea level took place at the beginning of the Pliocene in southeast Spain, allowing for deposition on a surface with greater than 100 m of relief. High frequency glacio-eustatic sea-level fluctuations also occurred during the Pliocene. Given the history of relative rises and falls in sea level, I will investigate how lowstand, transgressive, highstand, and forced regressive systems tracts are preserved. Control of sea-level change, and substrate topography will be evaluated relative to outcrop geometry and facies. Methods of evaluating geometries of facies in three dimensions will include detailed geologic mapping, measuring stratigraphic sections, sketching outcrops and constructing photomosaics. Evaluation of thin-sections will aid in accurate facies description, as well as identification of key paleodepth and paleoenvironmental indicators. These techniques combined will enable me to evaluate the effect of paleotopography and sea-level change on the distribution of heterozoan facies to aid in formulating conceptual models for controls on sequence stratigraphy of heterozoan carbonates.