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Detrital Zircon Double-Dating and Characterization of Paleo-Colorado River Derived Turbidites in the Fish Creek-Vallecito Basin, southern California

Cloos, M. E.[1], Steel, R.[1], Stockli, D.[1]
Michael.cloos@utexas.edu
1. Jackson School of Geosciences, The University of Texas at Austin, Austin, TX

The stratigraphy exposed at Split Mountain Gorge in the Fish Creek-Vallecito Basin preserves a complete and relatively undeformed section of Miocene to Pleistocene sediments recording the opening and filling of the Gulf of California as slip along the San Andreas fault created a pull-apart basin. Previous studies have chronologically constrained the stratigraphic units and linked these units to tectonic activity. As basin lowering began, local terrestrial sediment accumulated followed by local marine sedimentation as the area became part of the Gulf of California. Capture of the Colorado River at the Miocene-Pliocene boundary resulted in progradation of a delta into the Gulf. The focus of this study will be examination of the Colorado River from a source to sink perspective. Detrital zircons from throughout the section will be dated for crystallization through U-Pb geochronologic methods and cooling age through (U-Th)/He thermochronometry. Inferences can be made for both provenance and basin history based on the results. The Miocene-Pliocene age Wind Caves member turbidites of the Latrania formation will be of primary sedimentological study as it represents the furthest extent of Colorado River-derived sediment into the Gulf of California. Characterization of the turbidites will be done through fieldwork consisting of creation and correlation of sections measured in the field with LIDAR and photographic data.

Keywords: Detrital zircon, double-dating, turbidites, geochronology, thermochronology, sedimentology, Colorado River