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Robert H Goldstein<sup>1</sup>, Evan K. Franseen<sup>2</sup> (1) The University of Kansas, Lawrence, KS (2) University of Kansas, Lawrence, KS

## **Point-Sourced Fill-and-Fan Sediment Gravity-Flow Deposits Along a Low-Relief Basin Margin, Miocene Carbonates, Agua Amarga Basin, SE Spain**

Upper Miocene carbonates of the Agua Amarga basin contain a laterally restricted wedge of sediment gravity-flow deposits that contrast with the semi-continuous line-sourced aprons of many carbonate basin margins. The basin, formed on earlier Miocene volcanic rocks, has approximately 200 meters of relief. Before deposition of Miocene carbonates, subaerial erosion and possible faulting produced a steep, west- and north-facing escarpment. A paleovalley-like feature was formed along its base and sloped generally eastward before it curved northeastward out into the basin. Early phases of marine inundation, during cooler climate, resulted in deposition of sandy heterozoan carbonates, but a later phase of warmer climate resulted in formation of a 4 km-long reef rim atop the escarpment. Enhanced productivity led to long-term shedding of carbonate debris to the basin, which may have been encouraged by several relative falls in sea level. The sediment gravity flows were funneled along pre-existing paleovalley morphology and erosionally enhanced it to produce a laterally restricted wedge of coarse-grained deposits traceable for several kilometers out into the basin. Proximal deposits near the toe of the escarpment are approximately 50-meters thick and consist of at least 40 coarse, sediment gravity-flow events (debris flows and turbidites). Distally, thickness and coarseness decrease as low-density sediment gravity flows became dominant. Most of the coarsest deposits onlap topography on the paleovalley margin and some spill out into the adjacent basin to produce a "fill-and-fan" point-sourced accumulation of coarse, resedimented material. These carbonates are analogs for point-sourced basinal reservoir facies predictable from substrate paleotopography.