San Joaquin Geological Society

Date: **Tuesday, June 12, 2012**

Time: **6:00 PM Social Hour**
7:00 PM Dinner
8:00 PM Lecture

Place: **American Legion**
2020 H St. Bakersfield, CA 93301

PSAAPG Members & Mesozoic's
$25 w/reservation
$30 without reservation

Non PSAAPG Members
$30 w/reservation

Full-time Students with ID:
Free, Courtesy of Chevron & Occidental

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FROM SUBMARINE CANYON TO BASIN FLOOR: AN OUTCROP STUDY OF A STRUCTURALLY CONFINED TURBIDITE SYSTEM, UPPER MODELO FORMATION, EAST VENTURA BASIN, CALIFORNIA

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Outcrops of the Late Miocene Modelo Formation in the Eastern Ventura basin (EVB), southern California, represent a longitudinal transect through a deepwater clastic depositional system, from proximal submarine canyon to more distal distributary lobe deposits. The Modelo Formation was deposited in a transtensional deepwater sub-basin, the EVB, west of the San Gabriel fault and south of the Ridge basin. Previous isopach mapping indicates that the Modelo Formation is thickest in the axis of the sub-basin, and thins toward syndepositionally active normal faults that form the basin margins. The EVB is presently undergoing inversion, and hence, the Modelo Formation is exposed in very young surface anticlines and synclines. Ancient turbidite systems, such as the upper Modelo system, which were originally deposited in structurally complex, confined basin settings are often prolific hydrocarbon reservoirs today. High-resolution outcrop studies provide an improved understanding of the diversity and spatial distribution of sandbody architectures and facies within these depositional systems.

Proximal upper Modelo exposures, nearest to the San Gabriel fault, are in abrupt erosional contact with underlying strata (lower Tertiary) and are interpreted as the infill of a submarine canyon. Strata at this proximal location include shallow-water breccias, coarse-grained fan-delta-front gravity-flow deposits, heterolithic slumps and slides, mudstones, and linked debrite-and-turbidite-sandstone packages. The coarse-grained facies are prevalent northeast of the Devil Canyon fault. Southwest of the Devil Canyon fault, sandstone-filled turbidite channels are encased in thick packages of mudstone within the inferred submarine canyon; this low net-to-gross succession reflects a high degree of sediment bypass. South of the Agua Blanca fault zone in the vicinity of north Lake Piru, there is a thick (> 400m) vertical succession of sandstones; this succession is interpreted to be a sand-rich fairway comprised of channel elements and amalgamated lobes deposited on the most proximal region of the basin floor. The basin floor itself may have been controlled by the NW-SE-trending Agua Blanca fault. Farther to the southwest, lobe elements thin and pinch out near Modelo and Hopper Canyons. Strata in these localities are more abundant in thin beds, "dirty" sandstones and hybrid gravity-flow deposits, and soft-sediment deformation.

Overall, the thickest succession of reservoir-quality sandstones occurs immediately basinward of the submarine canyon, on the proximal basin floor. Amalgamation and vertical connectivity of sandstones generally decrease, and the abundance of thin-bedded, "dirty" sandstones (poor reservoir quality) increases, toward the distal fringes of this submarine fan. Isopach mapping suggests that the distal fringes of the fan were onlapping a structural high located near the current town of Fillmore.

Greg Gordon –BIO

Greg Gordon is currently a Ph.D. candidate and research assistant at the Chevron Center of Research Excellence, Colorado School of Mines Department of Geology and Geological Engineering. He earned a B.S. in Geoscience from the University of Texas at Dallas, and a M.S. in Geology from California State University Bakersfield. Greg has worked on projects in petrophysics, development geology, and exploration in areas such as the San Joaquin basin, the Eel River basin (northern California), the Texas Gulf Coast, and deepwater basins of the Eastern Niger Delta, Nigeria. His current research interests are in deepwater stratigraphy of Spain and Southern California, turbidite sedimentology, reservoir characterization, and sedimentary basin evolution. In 2013, Greg will join Aera as a geologist.