



# San Joaquin Geological Society

**Date:** Tuesday, April 10, 2018

**Time:** 6:00 PM Social Hour / Poster Session \*\*  
7:00 PM Dinner  
8:00 PM Lecture

**Place:** Eagles Lodge  
1718 17<sup>th</sup> Street, Bakersfield, CA 93302

**PSAAPG Members**  
\$25 with reservation  
\$30 without reservation

**Non PSAAPG Members**  
\$30 with reservation

**Full-time Students with ID:**  
\$10 - Courtesy of  
California Resources Corporation

**\*\* STUDENT NIGHT \*\***

**Student Research Poster Session from 6:00 – 7:00**

**\* RSVP \***

**By: noon Monday,  
April 9, 2018**

Register online:  
<http://www.SanJoaquinGeologicalSociety.org/>

Pay online or at the door

## **SJGS WEBSITE**

<http://www.SanJoaquinGeologicalSociety.org/>

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## **Facies architecture and provenance of a boulder-conglomerate submarine channel system, Panoche Formation, Great Valley Group: A forearc basin response to middle Cretaceous tectonism in the California convergent margin**

Presented by: Dr. Todd Greene, CSU Chico

**Abstract:** Tectonic reorganization induced by a rapid increase in plate motion obliquity and rate beginning at ca. 100 Ma affected California's Andean-style convergent margin, with concomitant changes in the accretionary prism of the Franciscan Complex, the Great Valley forearc basin, and the Sierran continental arc. Using facies analysis and a combined provenance approach, we suggest that this ca. 100 Ma tectonic signal is preserved in a Cenomanian (Upper Cretaceous) boulder-conglomerate outcrop along the San Luis Reservoir (SLR) in the southern Great Valley, which represents the thickest and coarsest deep-water deposit ever described in the Great Valley Group (GVG). We document a 1.8-km-thick by 4-km-long depositional-dip profile of an interpreted SE-directed (axial) submarine channel system that is part of a conglomeratic package that stretches 20 km along the east-central Diablo Range. Our facies analysis of the SLR area documents five facies associations within four aggradational channel complex sets, followed by regional abandonment.

Sandstone petrography and mudrock geochemical data suggest a dissected continental Sierra Nevada arc source. Conglomerate clast counts show abundant ophiolitic-type clasts that may be derived from the Coast Range Ophiolite and/or the Western Sierra Nevada Metamorphic Belt. Detrital-zircon geochronology data also indicate western and central Sierra Nevada sources; however, we interpret an anomalous (relative to other Cenomanian localities) 105–95 Ma zircon population to indicate the initial erosional products from the volcanic carapace associated with the Late Cretaceous magmatic flare-up within the eastern Sierran arc. This flare-up has been linked to an increase in arc-parallel plate motion that induced deformation along shear zones in the eastern Sierra Nevada, allowing for widespread plutonism. Our provenance interpretation makes the SLR area the earliest Upper Cretaceous GVG locality to receive significant detritus from the flare-up, effectively linking tectonic plate motion changes and coarse-grained, deep-water forearc sedimentation.

**Biography:** Dr. Greene is a professor at California State University, Chico, in the Department of Geological and Environmental Sciences. Before coming to Chico in 2007, he received his B.S. at UC Santa Cruz (1994), Ph.D. at Stanford University (2000), and then worked six years in Houston with Anadarko Petroleum Corporation. His broad areas of research interests include tectonics and sedimentation, sequence stratigraphy and depositional systems. His main focus is on basin scale questions using a variety of technologies to address paleogeographic and tectonic histories of basins. He works with core, outcrop, shallow 3-D seismic data, and modern analogs to piece together depositional facies models for volcanic-derived deposits (eg. the Tuscan Formation, the main aquifer for the town of Chico), shallow marine clastic sequences, as well as deep-water sediment gravity flows and related bioturbation (eg. Eel River basin and the Great Valley Group of Northern California).

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