



San Joaquin Geological Society

Date: Tuesday, June 8th, 2010

Time: 6 pm Social Hour
7 pm Dinner
8 pm Lecture

Place: American Legion Hall

Cost: PSAAPG Members & Mesozoics
\$20 w/reservation
\$25 without reservation

Non PSAAPG Members
\$25 w/reservation
\$30 without reservation

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

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<http://www.sjgs.com/>

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The Goldstein Peak unit (western Sierra Nevada batholith): Exploring possible ties between California's first (?) nonmarine sediments and the Great Valley Sequence

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The newly recognized Goldstein Peak (GP) unit is possibly the oldest non-marine sedimentary rock sequences in California. Preserved within the metamorphic framework of the west-central Sierra Nevada batholith, the steeply dipping GP is in depositional contact with the Jura-Triassic marine Kings Sequence to the east and structurally inboard of the Kings-Kaweah ophiolite outcrops to the west.

The ≈3-km-thick Goldstein Peak unit is composed of fluvial, alluvial fan, and lacustrine (?) clastic sediments, interrupted by a lens of subaqueous to subaerial, basaltic to dacitic pyroclastic rocks. Regional considerations suggest that the fluvial deposits transported continentally derived sediments westward either from within the arc, or from areas east of the arc in the North American interior. Hornblende-hornfels facies recrystallization of mud-rich protoliths was complete, producing sillimanite-quartz-biotite schists at ≈115 Ma. The original mineralogy and depositional structures in the quartz-rich sedimentary and basaltic volcanic horizons, however, are well preserved.

The GP's depositional age is constrained by a single concordant U-Pb zircon date of 139±1 Ma from a granite dike that displays contact relations indicative of wet-sediment intrusion. Preliminary detrital zircon data from 3 meta-sandstones supports this Early Cretaceous (Valanginian) *minimum* age estimate, providing *maximum* date estimates of 152, 148 and 139 Ma that decrease upwards through the stratigraphic section. If correct, these data suggest that the non-marine Goldstein Peak unit may span the Jurassic-Cretaceous boundary, reaching back into the Tithonian.

The earliest Cretaceous period in central California is characterized by the marine sedimentation of the Great Valley Group (Surplless et al., 2006). These authors interpret the pre-Mesozoic detrital zircon record as indicating an original sedimentological tie between the Great Valley forearc and North America. Our preliminary data support this conclusion, identifying detrital zircon populations originating in the Superior craton (>2 Ga), the Yavapai-Mazatzal orogen (1.5-1.8 Ga), and the Grenville orogen (950-1300 Ma). The largest peak in all samples occurs at the Nevadan orogen (140-150 Ma), represented locally by metavolcanic rocks of nearby Owens Mountain.

The current study suggests that the GP conglomerates represent less mature nonmarine sediments correlative to the Early Cretaceous Great Valley marine sediments. Temporal variations in provenance, from distant to local, reflect changes in fluvial systems on the Late Jurassic to Early Cretaceous transtensional-transpression margin. On-going analysis of detrital zircon populations from (1) Goldstein Peak fluvial samples, (2) the Jura-Triassic Kings Sequence, underlying the GP, and (3) work by colleagues in the Great Valley sequence should clarify any possible relation between the Goldstein Peak unit and the Great Valley forearc sequence.

*** RSVP ***

By Friday, June 4th, 2010

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