San Joaquin Geological Society

Date: Tuesday, March 8, 2011

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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"Unraveling the Structural Knot in the Southern San Andreas Fault"

Victoria E. Langenheim
U.S. Geological Survey MS 989

BIOs

Vicki Langenheim

Vicki Langenheim is a research geophysicist with the U.S. Geological Survey in Menlo Park, Calif., specializing in the application of gravity and magnetic methods to assessment of seismic hazards and groundwater resources throughout the western U.S., particularly focused on investigations of the San Andreas Fault system and extensional basins in the Basin and Range. She has also delineated buried structures and faults in the Mississippi Embayment and Antarctica. She received a bachelor of science degree in geophysics from Stanford University and a master's degree from University of California, Berkeley.

ABSTRACT

Gravity and magnetic data illustrate the complexity of deformation when a strike-slip fault changes its orientation in San Gorgonio Pass, a relatively narrow restraining bend at the eastern end of the Big Bend of the San Andreas fault. Geologic studies have shown that the active trace of the San Andreas fault has migrated in time and space during the past 5 million years in this area and that the neotectonic strands of the San Andreas fault do not appear to be continuous. Furthermore, seismicity studies disagree on the continuity of the San Andreas Fault in this area.

Gravity and magnetic data define intertonguing thrust wedges that form the upper crust in San Gorgonio Pass region. Interpretation of gravity data indicates that sedimentary rocks have been thrust at least 5 km in the central part of San Gorgonio Pass beneath basement rocks of the southeast San Bernardino Mountains. Subtle, long-wavelength magnetic anomalies indicate that magnetic rocks extend in the subsurface across the San Gorgonio Pass region, south under Peninsular Ranges basement. These deep magnetic rocks are composed either of upper-plate rocks of San Gabriel Mountains basement or rocks of San Bernardino Mountains or both. These rocks are out of place; a likely scenario to place these rocks beneath San Gorgonio Pass posits that transpression caused by space problems within the restraining bend in San Gorgonio Pass drove a wedge of Peninsular Ranges basement and its overlying sedimentary cover northward into the San Bernardino Mountains during the Neogene. This interpretation suggests that faults mapped at the surface evolved not only in map but also cross sectional view. Given this multi-layered nature of deformation, it is unlikely that the San Andreas Fault will rupture cleanly through the complex structures in San Gorgonio Pass.