Geologic History of Mt. Diablo

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Mt. Diablo is a large, actively growing anticline that has formed between two major strike-slip faults of the San Andreas system. Uplift of Mt. Diablo anticline during the past 3-5 million years has produced unique 3-D exposures of normal faults that were active in a forearc basin during late Cretaceous-early Tertiary time, coeval with plate convergence and subduction beneath western California. Stepwise restoration of Mt. Diablo anticline and other late Cenozoic structures reveals that the Mesozoic-early Tertiary normal faults are related to low-angle structures that attenuate the ophiolitic basement and juxtapose deeply metamorphosed blueschist-facies rocks of the Franciscan complex with relatively unmetamorphosed marine sediments. Apatite fission-track analyses indicate that the Franciscan rocks were exhumed and cooled from depths of 20-30 km in the subduction zone while normal faulting and extension were occurring in the overlying forearc crust. The uniquely exposed structural relations at Mt. Diablo support models for exposure of Franciscan blueschists through sun-subduction extension and attenuation of the overlying forearc crust, rather than uplift and erosion of the accretionary prism.

Biography: **Dr. Jeffrey R. Unruh** is a Senior Principal Geologist and Vice President at William Lettis & Associates a consulting firm headquartered in Walnut Creek that specializes in geologic hazard analysis. He has been with WLA since 1991. Jeff received his B.S. (1985) and Ph.D. (1990) degrees at UC Davis. He also has a courtesy appointment as an Associated Research Geologist at U.C. Davis. At William Lettis he is actively involved in geologic research and resolving geologic problems with a neotectonic and structural geology focus, including subsurface analyses, surface geophysics, remote sensing, numerical modeling and field mapping. At UC Davis his research includes structural geology, neotectonics, and seismic hazard assessment. Primary research interests include the kinematics and dynamics of continental deformation, with applications to seismic source characterization. Current projects include: large-scale kinematics of the Sierra Nevada microplate; the role of buoyancy forces in localizing and driving deformation in southern California; and neotectonic evolution of the Coso geothermal field, eastern California. Additional research interests include the crustal structure and evolution of the northern California Coast Ranges; kinematic analysis of seismogenic deformation in southern California; and transpressional tectonics of the San Andreas system in northern California.