

Geologic History of Mt. Diablo

Mt. Diablo is a large, actively growing anticline that has formed in a restraining stepover between two major dextral 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 the ancestral Great Valley forearc basin during late Cretaceous-early Tertiary time, coeval with plate convergence and subduction beneath western California. Stepwise restoration of Mt. Diablo anticline reveals that the Mesozoic-early Tertiary normal faults are related to low-angle structures that attenuate the ophiolitic basement and juxtapose metamorphosed blueschist-facies rocks of the Franciscan complex with relatively unmetamorphosed marine forearc sediments. Apatite fission-track analyses indicate that the Franciscan rocks were uplifted and cooled from depths of 20+ km in the subduction zone while normal faulting and extension were occurring in the overlying forearc crust. The unique stratigraphic and structural relations at Mt. Diablo support models for exhumation of Franciscan blueschists through syn-subduction extension and attenuation of the overlying forearc crust, rather than uplift and erosion of the accretionary prism.

Biography

Jeff Unruh is Senior Principal Geologist with Lettis Consultants International, Inc. (LCI), a consulting firm headquartered in Walnut Creek that specializes in geologic and seismic hazard analysis. Unruh got his B.S. (1985) and Ph.D. (1990) degrees at UC Davis, and has been with LCI since it was founded in 2011. Previously he worked with Fugro Consultants and William Lettis & Associates, Inc. Unruh's primary areas of expertise are structural geology, neotectonics and seismic hazard assessment. Recent projects include seismotectonic analysis of the southern San Joaquin Valley, and evolution of the Miocene Pismo Basin during late Cenozoic uplift of the central California Coast Ranges. Unruh held a courtesy appointment as a Research Geologist at UC Davis from 1994-2015, and is currently President of LCI.