

AEG San Francisco Section Field Trip

Geology along the Rodgers Creek and Tolay faults: late Cenozoic stratigraphy and tectonics, Franciscan mélange and high-grade metamorphism, and Quaternary landslide complexes

Saturday, August 8th, 2009

Leaders:

James Allen, CSU East Bay, Earth and Environmental Sciences

John Wakabayashi, CSU Fresno, Earth and Environmental Sciences

Ron Rubin, AMEC Geomatrix

Peter Holland, Vector Engineering

To sign-up, please FAX a completed Field Trip Registration Form along with a signed, completed Liability Waiver Form to Sachiko Tanikawa (866-400-4068). The registration deadline is July 31st. One participant per form, please. The maximum number of participants is 30. You will receive a confirming email that includes instructions regarding payment. The cost is \$50 for AEG San Francisco Section members or \$55 for non-members.

Participants will be transported in vans. Parking at the stops is limited, so personal vehicles should remain at the meeting place during the field trip.

Abstract

Sonoma Mountain in Sonoma County is largely composed of the late Miocene to Pliocene Sonoma Volcanics and interbedded sedimentary units of the Petaluma and Wilson Grove Formations. The Franciscan Complex crops out west of the Tolay fault within the southern Sonoma Mountains. The Sonoma Volcanics are the largest of several Neogene volcanic fields in the San Francisco Bay Area, which young in age to north. These volcanic fields include the Quien Sabe Volcanics, Berkeley Hills Volcanics, the Tolay Volcanics, Sonoma Volcanics, Burdell Mountain Volcanics, and the Clear Lake Volcanics, and they are interpreted to be the product of asthenospheric upwelling in a slab window that trailed behind the northward-migrating Mendocino Triple Junction. Within Franciscan Complex out crops along the Tolay fault, at least one locality includes mélange blocks of eclogite, amphibolite, metachert, and serpentinite in a sheared shale matrix. The mélange blocks themselves may be embedded in a subunit of sheared

serpentinite matrix, and their history and field relations bear on the initiation of Franciscan subduction and subsequent material flow patterns within the subduction complex.

In an ongoing effort to map the geology of Sonoma Mountain to the level of desired detail, several challenges arise: Numerous faults slice the mountain including the active Rodgers Creek fault, considerable geologic complexity is seen along the Tolay fault, lateral facies changes within sedimentary units, and landslide complexes often complicate mapping. Continuing radiometric age dating, paleontology, and accurate landslide identification greatly aid in bedrock mapping and understanding of Sonoma Mountain geology.

We will visit locations within the Sonoma Volcanics, Petaluma Formation, and Franciscan Complex in the Sonoma Mountain area, which characterize the framework geology of the mountain. We will discuss lithology, stratigraphy, landslide complexes, regional offset along strike-slip faults including the Tolay and Rodgers Creek fault, Mendocino Triple Junction migration, and some aspects of Franciscan subduction complex development.

Meeting Place:

9:00 A.M., Saturday, August 8, 2009

Park n' Ride Lot, Lakeville Highway exit, Petaluma, CA
(located west of US Highway 101)

