Title of talk or presentation

Dr. Donald A. Medwedeff, Ph.D.
Independent Research Geologist, Danville, California

It has long been recognized that many of the geologic features exposed in the eastern Coast Ranges of the San Francisco Bay Area are due to a component of Pacific-plate-boundary contraction. This study uses regional cross sections, constrained by surface geology, petroleum wells, and map analysis, to infer the geometry and kinematics of the contractional and strike-slip fault systems responsible for the observed topographic and structural geometry. Insights from this research are: Uplift of the Mount Diablo anticline is generated by slip transfer from the here-defined Subsurface Greenville fault to the Franklin Canyon fault via Unruh et al.'s (2007) Mount Diablo blind thrust. Exposure of the Franciscan Complex and Coast Range Ophiolite at Mount Diablo anticline is due to the north-dipping, southwest-verging, Diablo Thrust (Dibble, 2005) that largely lies above the anticline and links the Concord fault and the Greenville fault system.

- The anomalous topographic height of Mt Diablo results from the superposition of structures and the exposure of resistant basement rocks at the surface.

- Slip from the regional wedge thrust that generates the boundary of the Eastern Coast Ranges daylights along the Concord and Franklin Canyon faults and their lateral equivalents.

- The Calaveras fault terminates northward by slip transfer to thrusts to the west, thus generating the anomalous structural relief in the East Bay Hills which culminates with exposure of the Coast Range Ophiolite, known locally as the San Leandro Gabbro.

- Geologic and active seismic fault are aligned in some locations and disparate in others.

- Development of a retro-deformable, three-dimensional geological model is required to evaluate the magnitude and timing of strike-slip versus dip-slip motion on East Bay faults.

Biography: Dr. Donald A. Medwedeff received his Ph.D., M.Sc., and B.S. in geological science from Princeton University (1988), Queen's University in (1983), and The University of Michigan (1981), respectively. As part of his studies, Don analyzed compressional structures in the Southern Appalachians, Canadian Rockies, and the California Coast Ranges. After university, Don held technology positions for 30 years at ARCO and Chevron. There he both developed structural analysis and kinematic restoration tools and applied them to interpret structural geology and kinematics in California, Alaska, Oklahoma Texas, Louisiana, Indonesia, Australia, Romania, the North Sea, the Alps, New Zealand, Nigeria, Angola, Brazil, China, Thailand. Don has authored or coauthored 14 journal articles and 30 conference presentations. An AAPG member since 1985 and a NCGS member since 2017, Don is now a Chevron Fellow emeritus and an independent research geologist living above vertically dipping Pliocene sediments on the southwest limb of Mt. Diablo. He seeks to contribute to the Northern California seismic hazard community by refining geologic models of the East Bay.