Nature and timing of deformation and heat flow related to Laramide shallow subduction beneath the Southern California margin

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Comparatively low heat flow is observed along convergent margins as a result of subduction refrigeration of the forearc while higher heat flow in the adjacent arc reflects magmatism. This normally sharp contrast in heat flow regimes is eliminated when oceanic crust is rapidly subducted at shallow depths beneath a continental margin. Subnormal geotherms are established within the arc as magmatism shifts into the continental interior. Such was the case during Late Cretaceous – Early Cenozoic (ca. 85-40 Ma) shallow subduction episode that occurred beneath southern California during the Laramide Orogeny and produced the Rocky Mountains in the continental interior. This talk focuses upon the imprint of the Laramide Orogeny at the leading edge of the margin in the southern Sierra Nevada and western Mojave desert region of southern California. There, field observations and thermochronology from upper plate arc crust and accreted trench sediment (Pelona-Orocopia-Rand schist) as well as from sediment shed from the arc provide a precise chronology into the timing of the onset of shallow subduction as well as insights into deformation related to this process.

Biography: Dr. Marty Grove is a native Southern Californian with a PhD in Geology from UCLA (1993) who has been a professor in the Geological Sciences department (School of Earth, Energy, and Environmental Sciences) at Stanford University since 2008. Grove meshes field studies, petrology, structure, tectonics, geochemistry, and geo/thermochronology to elucidate the nature and rates of lithospheric deformation processes.