Goldfinger, Chris (College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, OR), Gary J. Huftile (Queensland University of Technology Brisbane, Australia), Mark Legg (Legg Geophysical, Huntington Beach, CA), Bob Yeats (Department of Geology, Oregon State University, Corvallis, OR), Marc Kamerling (Venoco, Inc, Carpinteria, CA)

VERTICAL TECTONICS AT PENINSULAR RANGES-TRANSVERSE RANGES INTERSECTIONS: OFFSHORE INVESTIGATIONS OF PLEISTOCENE LOW-STAND SHORELINES

We have been using paleoshorelines found on the submarine slopes of the northern Channel Islands to investigate the intersection of the offshore Peninsular Range faults with the Transverse Range block. These paleoshorelines provide excellent strain markers, precisely recording vertical deformation over the last ~18,000 years. The paleoshorelines are recognized by distinct wave-cut platforms, paleo seacliffs, shallow water sedimentary facies, and intertidal fossils that can be dated with AMS ^{14}C techniques.

The Transverse Ranges have rotated clockwise 90° since the late Miocene, and movement northward of the WTR block is accommodated (driven?) by right-lateral strike-slip faults to the south in the Peninsular Ranges and offshore equivalents. What happens right at the boundary between the rapidly rotating block and the right-lateral strike-slip faults to the south? In some cases, right-lateral displacement appears to die into folds at the boundary, but new data offshore suggest that the borderland block is underthrusting the Transverse Range block to some degree. Each of the Northern Channel Islands lies west of one of these intersections, suggesting their uplift may be linked to the greater convergence west of fault intersections. Preliminary results show that the Channel Islands thrust front has been uplifted 10-15m relative to the Catalina Ridge since the ~ 18 Ka shoreline ceased incising, yielding an uplift rate of ~ 0.5-1.0 mm/yr. Rates and sign of vertical movement along the Catalina ridge suggest downbending of the ridge during the same time period.