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## **STRUCTURE AND KINEMATICS BENEATH SANTA MONICA BAY, CALIFORNIA**

West-striking seafloor faults and underlying blind thrust faults separate the Santa Monica Mountains (north) from northwest-striking right-lateral faults beneath Santa Monica Bay to the south. The moderately north-dipping Santa Monica-Dume fault (SMDF) is continuous for 75 km and links to the Malibu Coast fault. We model 4 to 7 km of post-~4 Ma left-lateral slip on the SMDF. An east-west-elongate basin extends 75 km offshore south of the SMDF. Assuming an unconformity beneath lower Pliocene strata formed near sea level, it has since subsided between 1.5 and 4 km. This foreland subsidence is synchronous with folding and basin inversion north of the SMDF. A blind fault dips north beneath this basin and the SMDF, and is interpreted as a Miocene detachment. This structure, which we call the Shelf Projection blind fault, has been mapped along 50 km of its strike using seismic reflection data. A thrust-reactivated segment of this fault located offshore of Manhattan Beach is overlain by the 20 by 20 km Shelf Projection anticlinorium. Folding is post-Miocene, and the south limb of this anticlinorium deforms the youngest strata. This contraction is due to a left restraining step between the NW-striking right-lateral Palos Verdes and San Pedro basin faults. Assuming a local 40-50° north-northeast dip beneath its imaged uppermost part, the Shelf Projection blind fault projects into nodal planes of the 1979 and 1989 M5 reverse-slip earthquakes. It continues southeast beneath a broad southwest-dipping fold limb along the San Pedro escarpment.