NEW GEOLOGIC MAP AND STRUCTURAL CROSS-SECTIONS OF SANTA ROSA ISLAND, CALIFORNIA

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For the first time ever, a detailed, full-color geologic map of Santa Rosa Island is published that combines the four separate U.S.Geological Survey 7.5-minute topographic base maps of the island into one sheet. The map is based primarily on the geologic field work of Thomas W. Dibblee, Jr., completed in 1997. The color scheme is coordinated with published geologic maps of the southern California mainland.

Three south-to-north structural cross-sections through the western, central and eastern part of the island are based on subsurface data from 12 exploratory wells drilled there. The history of geologic mapping and oil exploration of the island from the 1920s to the 1970s is detailed on the back side of the map. Publication of this map was sponsored by the Santa Cruz Island Foundation, Santa Barbara.

Santa Rosa Island consists of roughly 220 km^2 of hilly terrain, deeply dissected by narrow canyons eroded into Tertiary sedimentary bedrock. Much of the island is fringed by one or more levels of Quaternary marine terraces, covered by a veneer of alluvium, Pleistocene dunes and drift sand.

The mostly marine sedimentary bedrock sequence consists of the following eight formations, in ascending order: Eocene South Point Sandstone and Cozy Dell Shale; Oligocene?-lower Miocene Sespe Formation (terrestrial redbeds); lower Miocene Vaqueros Sandstone and Rincon Claystone; middle Miocene Monterey Shale, including the Santa Rosa Island Volcanics (newly named) and associated basaltic intrusive rocks; and middle Miocene Beechers Bay Formation. The exposed sequence aggregates roughly 2000 m; an additional 3400 m of late Cretaceous to Eocene marine clastic rocks are knows from deep test wells.

Santa Rosa Island is bisected by the east-striking, left-slip Santa Rosa Island fault. Up to 11 km of left-slip is indicated by displaced rock units; a south-side up component is suggested by the generally higher, more rugged terrain south of the fault. Miocene formations north of the Santa Rosa fault are gently uparched parallel to it and weakly downfolded farther north, with minor parallel faults. South of the fault, the Miocene formations are compressed into northwest- to west-trending folds with adjacent subparallel faults. Complexly faulted and folded Eocene formations are best exposed along the island's southwest and south coast.

New geologic maps of San Miguel, Anacapa, and Santa Barbara Islands by Thomas W. Dibblee are also now published and will be shown.