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Quaternary Fault and Fold Database of the United States

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Red Mountain fault zone (Class A) No. 90

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Synopsis	The Red Mountain fault zone is a north-dipping reverse fault within the western Transverse Ranges. At least three sub-parallel surface traces (Woodward-Clyde Consultants, Inc., 1979; Jackson and Yeats, 1982; Grigsby, 1988) show Quaterna late Quaternary displacement (Smith, 1977; Lajoie and others 1982; Sarna-Wojci and others, 1987) with some indication of Holocene surface rupture (Smith, 1977 Anderson and O'Connell, 1998). Activity is also suggested by historic seismicity and others, 1979; Yerkes and Lee, 1979; Yeats and others, 1987). The surface trac swings northward at its eastern end and disappears within the contact between the Tertiary Sisquoc and Pico formations (Yeats and others, 1987; Dibblee, 1988). Sl is poorly constrained at 1–3 mm/yr based on offset of the 45 ka Punta Gorda terra (Clark and others, 1984) but may be as high as 5.9 mm/yr at seismogenic depths (Huftile and others, 1997).
Name comments	First mapped and named (onshore) by Putnam (1942) and offshore extension dep by Ziony and others (1974).

	Fault ID: Refers to number 331 (Red Mountain fault) of Jennings (1994) and nu 52 (Red Mountain fault) and 53 (fault Y) of Ziony and Yerkes (1985).
County(s) and State(s)	VENTURA COUNTY, CALIFORNIA
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:1:24,000 scale. *Comments:* Location of fault from Qt_flt_ver_3-0_Final_WGS84_polyline.shp (Bryant, W.A., written communication to K.Haller, August 15, 2017). Offshore tr are poorly located and generally are based on unpublished industry seismic data a well interpretation (Jackson and Yeats, 1982; Kamerling, 2000). Onshore fault tra are better located but are largely obscured by widespread slope movement (Smith 1977; Tan and others, 2003a, 2003b). They are locally well constrained by mappa scarps (Smith, 1977), borings (Woodward-Clyde Consultants, Inc., 1979), trenche (Huftile and others, 1997) and limited exposures (Smith, 1977; Woodward-Clyde Consultants, Inc., 1979); other traces from Sarna-Wojcicki and others (1987), Dib (1988), Tan and others (2003a, 2003b) and Weber and others (1976), locally mod to match geomorphic observations of Smith (1977).
Geologic setting	The north-dipping Red Mountain fault lies within the western Transverse Ranges is one of several reverse and thrust faults accommodating late-Quaternary north-s contraction of the western Ventura basin and its offshore extension (Jackson and 1982; Huftile and Yeats, 1995). Maximum stratigraphic separation (top of Oligoc is in excess of 5500 m (Yeats and others, 1987). Horizontal shortening of 0.2–2.9 estimated for the late Quaternary (500–975 ka)(Huftile and Yeats, 1995).
Length (km)	73 km.
Average strike	
Sense of movement	Reverse *Comments:* Reverse sense of movement based on stratigraphic separation (Jacksc Yeats, 1982; Yeats and others, 1987); dominant reverse motion with possible sma sinistral component suggested by earthquake focal mechanisms (Yerkes and Lee, Yeats and others, 1987).
Dip	~60º (onshore); 40–80º (offshore) *Comments:* Onshore dip at seismogenic depths from hypocenters (57º from Yerke Lee, 1987), focal mechanisms (63º from Yerkes and Lee, 1979) and well control (

	from Huftile and Yeats, 1995); shallower dips near surface (Huftile and Yeats, 19 offshore dip of 40–50º for south branch (Kamerling and others, 2003) and about 8 north branch (Jackson and Yeats, 1982)
Paleoseismology studies	Site 90-1 Punta Gorda terrace by Huftile and others (1997) and Anderson and O'Connell (1998). One fault-normal trench exposed faulted Pleistocene terrace. E marine sand on the 45 ka Punta Gorda terrace has 34 m vertical separation. Proba Holocene fan deposits are deformed and overridden by Pleistocene terrace deposi possible colluvial wedge within the Holocene deposits appears associated with fa that show a minimum of 1.7 m cumulative thrust displacement within the Pleisto deposits. Near surface dip of the fault is 20–26º, which is averaged with dip at de develop a slip rate. Trench exposures showed significant folding of the late-Quate terrace deposits and Holocene fan; also evidence of multiple events. Age of indiv events was not controlled.
Geomorphic expression	saddles in some steeper terrain; scarps (varying freshness) visible on late Quatern terrace surfaces; gross expression in the uplift of Red and Rincon mountains; larg obscured by landslides
Age of faulted surficial deposits	deposits probable Holocene fan (Anderson and O'Connell, 1998); possible Holoc (but undated) offset topsoil (cited by Smith, 1977; Ziony and others, 1974); 40–6 Punta Gorda marine terrace platform and associated marine and non-marine cove offset (Lajoie and others, 1982; Huftile and others, 1997)
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Presumed Holocene fan deposits (possibly <2 ka) are deformed and overlain by older Pleistocene terrace deposits (Anderson and O'Connell, 1998). A inferred by authors based on weak soil development. Seismicity associated with t eastern part of the fault zone is suggestive of activity (Yeats and others, 1987). Hi strain across the fault zone was also suggested by leveling surveys (Buchanan-Ba and others, 1975), but according to Yeats (p.c., 2006) they did not consider the contribution of subsidence due to groundwater withdrawal which could account f reported relative uplift of Red Mountain.
Recurrence interval	
Slip-rate category	Between 1.0 and 5.0 mm/yr *Comments:* Slip rate of 1.5 mm/yr is based on vertical separation of the ~45 ka Pu Gorda marine abrasion platform and an assumed average dip of 30º, but this may

	minimum if there are other active strands (Huftile and others, 1997). 1–2 mm/yr i estimated by Anderson and O'Connell (1998) based on offset of the 45 ka Punta terrace. Further discussion by Huftile and others (1997) suggests total uplift of th Punta Gorda terrace may reflect a slip rate as high as 5.9 mm/yr on the Red Mour fault at seismogenic depths. Clark and others (1984) cited rates on several strands cumulatively range from 1 to 3 mm/yr (also based on displaced late Quaternary n terraces), and was the basis for the PSHA rate (Petersen and others, 1996).
Date and Compiler(s)	2006 Jerome A. Treiman, California Geological Survey
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