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Quaternary Fault and Fold Database of the United States

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Newport-Inglewood-Rose Canyon fault zone, Silver Strand section (Class A) No. 127g

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Synopsis	**General:** Data on this fault zone is variable. Fault locations onshore and in some limited offshore areas are generally well located. The large central portion of the fault zone is offshore and less well defined. Urbanization in the San Diego area has also somewhat limited the accurate location of some of the fault strands. The northern onshore portion is demonstrably Holocene based on numerous geotechnical studies as well as the historic Long Beach earthquake. The southern onshore portion, through San Diego, is also demonstrably active based on geotechnical and research studies. The intermediate offshore portion is presumed Holocene based on sparse evidence of displacement of presumed young Holocene sediments offshore as well as its continuity to the better-defined onshore sections. There are three detailed study sites along

	the fault zone. Grant and others (1997 #1366) reported evidence for 3–5 earthquakes in the past 11.7 ka, but stated that the recurrence interval varied from 1,200 yr to 3,000 yr. Slip rate is not fully constrained, but appears to be approximately 1.0±0.5 mm/yr in the north, increasing to 1.5±0.5 mm/yr in the south. **Sections:** This fault has 7 sections. Section designations after Fischer and Mills (1991 #6468) who designated three segments offshore, two segments onshore south of La Jolla and one southern segment within the Los Angeles basin (thereby implying a northern, 7th segment as well). Sections were distinguished based on asperities (bends), steps and seismicity. The division of the Los Angeles basin part of the fault zone into two segments is based on slight differences in geometry (discussed by several workers, including Wright (1991 #5950), seismicity differences (Hauksson, 1987 #6475), and the subsurface extent of the 1933 Long Beach earthquake rupture (Wesnousky, 1986 #5305; Hauksson and Gross, 1991 #6476). Fischer (1992 #6467) designates one additional segment offshore. Working Group on California Earthquake Probabilities (1995 #4945) and Petersen and others (1996 #4860) identify three sections: Newport-Inglewood, Newport-Inglewood offshore and Rose Canyon (the latter including offshore faults north to Oceanside).
Name comments	**General:** Entire fault zone referred to as Newport-Inglewood-Rose Canyon fault zone by Greene and others (1979 #6470). Newport-Inglewood fault: onshore structural zone first recognized as a zone of folding by Mendenhall (1905 #6488). Hamlin (1918 #6473) associated seismicity and faulting with the zone; first mapped and named by Taber (1920 #6491) as the Inglewood-Newport-San Onofre fault; called Newport-Inglewood fault by Hoots (1931 #5921). Eaton (1933 #6463) was first to suggest continuity to Rose Canyon fault in the San Diego area; offshore portion was called the South Coast Offshore fault by utility consultants (Southern California Edison Co. and San Diego Gas and Electric Co., 1972 #6490), and the South Coast Offshore Zone of Deformation by Woodward-Clyde Consultants (1979 #6496). Rose Canyon fault: Fairbanks (1893 #6466) suggested presence of fault and Ellis and Lee (1919 #6465) were the first to show part of the fault on a map. Hanna (1926 #6474) referred to the Soledad Mountain fault; Hertlein and Grant (1939 #6477) were the first to refer to the Rose Canyon fault; Kennedy (1975 #6478) and Kennedy and others (1975 #6480) mapped the fault in greater detail. See sections 127f and g for additional fault strands.

	Section: Section name from Fischer and Mills (1991 #6468); main faults are the offshore Silver Strand, Spanish Bight, and Coronado faults, but also includes several unnamed offshore faults as well as the (onshore) San Diego fault, and a zone of active unnamed faults in eastern downtown area (informally referred to as the "downtown graben" (Treiman, 2002 #6495); offshore faults named by Kennedy and others (1977 #6481); offshore faults were shown, unnamed, by Moore and Kennedy (1975 #6489); faults probably extend south of the international border; San Diego fault was named by Elder-Mills (1982 #6464); "downtown graben" identified by Treiman (1991 #6493). Section extends from downtown San Diego to the International border (offshore). **Fault ID:** Refers to numbers 434 (Potrero, Inglewood and Avalon-Compton faults), 439 (South Branch, Newport-Inglewood fault zone), 440 (North Branch, Newport-Inglewood fault zone), 441 (Cherry-Hill, Reservoir Hill and Seal Beach faults), 465 (Newport Inglewood-Rose Canyon fault zone, offshore), 487 (Mission Bay fault), 490 (Coronado fault, offshore), 490A (Spanish Bight fault, offshore), 491 (Rose Canyon fault zone), 492 (Old Town fault), and 493A (Silver Strand fault, offshore) of Jennings (1994 #2878). Also refers to numbers 30 (Newport-Inglewood, north section) and 31 (Newport-Inglewood, south section) of Hecker and others (1998 #6118), and to numbers 25 (Inglewood fault), 26 (Potrero fault), 27 (Avalon-Compton fault), 28 (Cherry-Hill fault), 29 (Reservoir Hill fault), 30 (Newport-Inglewood North Branch), 31 (Newport-Inglewood, South Branch), and 32 (Faults offshore of San Clemente) of Ziony and Yerkes (1985 #5931).
County(s) and State(s)	SAN DIEGO COUNTY, CALIFORNIA
Physiographic province(s)	LOWER CALIFORNIAN
Reliability of location	Good Compiled at 1:250,000 and unspecified 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) attributed to Clarke and others. (1987), Kennedy and Clarke (1999), Kleinfelder West, Inc. (2013), and Treiman (2002).
Geologic setting	This fault zone is a major structural element within the Peninsular

	Ranges. Both onshore, to the north, and in the offshore region the fault zone separates contrasting Mesozoic basement terrane-Catalina Schist on the west and metasediments, intrusives and volcanics to the east (Yerkes and others, 1965 #5930). The onshore Los Angeles basin reach of the fault zone is marked by a northwesterly trending line of generally en echelon anticlinal folds and faults that extends 40 miles from Newport Mesa to the Cheviot Hills along the western side of the Los Angeles Basin (Barrows, 1974 #6460); the zone is tentatively extended northward to the Santa Monica [101] and Hollywood [102] faults by Wright (1991 #5950). The onshore structural zone is an important petroleum-producing region. The offshore reach of the fault zone continues southeastward until offshore of Oceanside where it bends and steps and continues on a more south-southeast trend, paralleling the coastline. The Rose Canyon fault [127e, 127f] comes onshore at La Jolla and is characterized by zones of compression and extension associated with restraining and releasing bends in the faults. The fault zone is locally more than 1 km wide and is composed of both dip-slip and strike-slip en echelon faults that together extend from La Jolla Cove 50 km to San Diego Bay and beyond on the south (Treiman, 1993 #6494).
Length (km)	This section is 23 km of a total fault length of 209 km.
Average strike	N2°W (for section) versus N29°W,N27°W,N31°W (for whole fault)
Sense of movement	Right lateral, Normal *Comments:* Normal component is associated with broader trans-tensional graben centered on San Diego Bay; dextral movement is assumed based on style of faulting to the north [127f].
Dip	50° E. to vertical *Comments:* Spanish Bight and Coronado faults dip 73–90° E.; Silver Strand fault dips as shallow as 50–55° E.; other unnamed faults dip east or west at 65–90°.
Paleoseismology studies	Site 127-3, Coronado Bridge: More than three-hundred lines of high-resolution seismic reflection data provided good definition to the location of submarine faults and how high faulting occurred in the young stratigraphic section (Kennedy and Clarke, 1999 #6482).

	Holocene faulting was documented based on dating faulted sediments utilizing 14C, aminostratigrapic and paleontologic analyses (Kennedy and Clarke, 1999 #6483).
Geomorphic expression	Large-scale features include depression of San Diego Bay; intermediate- to small-scale features include the Spanish Bight and eroded scarps (Treiman, 1993 #6494; Treiman, 2002 #6495).
Age of faulted surficial deposits	Youngest dated faulted deposits (offshore) are 4,435±115 yr, but faults extend higher up-section ; youngest onshore faulting is younger than 3,230±40 yr and perhaps within past 300–500 yr (summarized in Treiman, 2002 #6495).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Onshore (summarized in Treiman, 2002 #6495) and offshore (Kennedy and Clarke, 1999 #6482) (Kennedy and Clarke, 1999 #6483) evidence indicate last event was within past 5,000 yr, possibly within past 500 yr.
Recurrence interval	
Slip-rate category	Between 1.0 and 5.0 mm/yr *Comments:* Assigned slip-rate category based on minimum onshore slip rate for section 127f; slip at surface may be distributed among several faults that probably merge at depth.
Date and Compiler(s)	1999 Jerome A. Treiman, California Geological Survey Matthew Lundberg, California Geological Survey
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