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# Quaternary Fault and Fold Database of the United States

**As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the interactive fault map.**

## Newport-Inglewood-Rose Canyon fault zone, north Los Angeles Basin section (Class A) No. 127a

**Last Review Date: 1999-06-01**

## Compiled in cooperation with the California Geological Survey

***citation for this record:*** **Treiman, J.A., and Lundberg, M., compilers, 1999, Fault number 127a, Newport-Inglewood-Rose Canyon fault zone, north Los Angeles Basin section, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 12/14/2020 02:16 PM.**

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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 |

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| | 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.<br><br>**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. |

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| | 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.<br><br>**Section:** Section name is assumed based on name given to section 127b (Fischer and Mills, 1991 #6468); includes Inglewood, Potrero and Avalon-Compton faults, as well as faulting inferred to have formed the West Beverly Hills lineament (Wright, 1991 #5950; Dolan and Sieh, 1992 #6462); section extends southeasterly from the southern margin of the Santa Monica Mountains to the Dominguez Hills.<br><br>**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)** | LOS ANGELES COUNTY, CALIFORNIA |
| **Physiographic province(s)** | PACIFIC BORDER |
| **Reliability of location** | Good<br>Compiled at 1:24,000 scale.<br><br>*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 1:24,000-scale map by Bryant (1985), 1:31,680-scale map by Poland and others (1959), and maps by Dolan and others (2000) and Olson (in prep) of unspecified scale. |

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| **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).<br><br>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.<br><br>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 28 km of a total fault length of 209 km. |
| **Average strike** | N27°W (for section) versus N29°W,N27°W,N31°W (for whole fault) |
| **Sense of movement** | Right lateral<br><br>*Comments:* Surface faults include numerous normal faults as a response to folding above the underlying dextral fault; Legg and Kennedy (1991 #6486) report pure dextral strike slip; supported by seismicity as reported by Hauksson (1990 #6879). |
| **Dip Direction** | V<br><br>*Comments:* Wright (1991 #5950) shows fault zone vertical in cross-sections; assumed vertical by Petersen and others (1996 #4860). |
| **Paleoseismology studies** | Numerous consulting studies (on file with the California Geological Survey, Alquist-Priolo Earthquake Fault Zoning project) have |

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| | addressed location and recency of faulting, but no studies have been published detailing Holocene event chronology or offsets. |
| **Geomorphic expression** | Large scale features include a line of hills underlain by en echelon anticlinal folds and faults; small to intermediate scale features include scarps, deflected drainages, linear drainages, closed depressions and troughs (Bryant, 1988 #6461). |
| **Age of faulted surficial deposits** | Holocene alluvial deposits and soils; late Pleistocene Inglewood Formation; Pleistocene Lakewood Formation (Bryant, 1988 #6461). |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | latest Quaternary (<15 ka)<br><br>*Comments:* Timing of most recent paleoevent is poorly constrained. Historic events (without surface rupture) include the 1920 M4.9 Inglewood earthquake; no details available on individual events or age of last event. |
| **Recurrence interval** | |
| **Slip-rate category** | Between 1.0 and 5.0 mm/yr<br><br>*Comments:* Wesnousky (1986 #5305) and Working Group on California Earthquake Probabilities (1995 #4945) assume 1.0 mm/yr; other investigators and compilers (such as Clark and others, 1984 #2876) have cited principally vertical components of slip on South Los Angeles Basin section [127b] which may not be representative of slip on the deeper seismogenic structure. |
| **Date and Compiler(s)** | 1999<br>Jerome A. Treiman, California Geological Survey<br>Matthew Lundberg, California Geological Survey |
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