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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.**

## Rodgers Creek fault (Class A) No. 32

**Last Review Date: 1998-09-10**

## Compiled in cooperation with the California Geological Survey

***citation for this record:*** **Hart, E.W., compiler, 1998, Fault number 32, Rodgers Creek fault, 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 02:51 PM.**

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| **Synopsis** | Holocene dextral fault. Important branch of the larger San Andreas fault system connecting, by means of right steps, the Hayward fault [55] to the south and the Maacama fault [30] to the north. Detailed geologic and geomorphic mapping by Brown (1970 #1320; 1971 #5273), Fox and others (1973 #5253), Sims and others (1973 #5263), Blake and others (1971 #4797; 1974 #5272), Huffman and Armstrong (1980 #4862), Hart (1982 #5267; 1992 #5268), Bryant (1982 #5251), and Jennings (1988 #5266) identified recently active traces of the fault. Based on surface traces, the fault was zoned under the Alquist-Priolo Earthquake Fault Zoning Act from Windsor Creek on the north almost to San Pablo Bay (California Division of Mines and Geology, 1983 #5275; 1993 #5298). Two paleoseismic |

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| | investigations may have identified the last three earthquakes and determined a slip rate of 6.4–10.4 mm/yr for the south part of the fault (Schwartz and others, 1992 #5264) and several site investigations under the Alquist-Priolo Act have located or verified Holocene-active fault traces (Hart, 1982 #5267; 1992 #5268). High-precision theodolite surveys conducted since 1980 have not indicated any fault creep (Galehouse, 1995 #5500). |
| **Name comments** | Wood (1916 #5929) showed a northwest-striking structure that he referred to as the "Eureka-Ukiah-San Pablo line", the southern part of which generally corresponds to the location of the Rodgers Creek fault. The Rogers Creek fault was first mapped and described by Dickerson (1922 #5271) as the northwest extension of the "Hayward Rift." Also shown on the small-scale map of Willis and Wood (1922 #5256) as an active or probable active fault extending from Santa Rosa to San Pablo Bay. Southern parts of the fault were mapped in greater detail and named the Rodgers Creek fault by Weaver (1949 #5262) based on "topographic peculiarities" along Rodgers Creek. The northern part of the fault (north of Santa Rosa) was first mapped in detail and designated the Healdsburg fault [31] by Gealey (1951 #4854), who recognized recent dextral slip near Windsor, but extended the fault as a structural feature for 17 km northwest of Healdsburg. The active part of the Healdsburg fault [31] was extended southward to Santa Rosa by Brown (1970 #1320) and Huffman and Armstrong (1980 #4862), as well as others. Recognizing the apparent continuity between the Rodgers Creek fault and the southern Healdsburg fault [31] across a 1-km-wide right step at Santa Rosa, Herd and Helley (1976 #510), Herd (1978 #5269), Hart (1982 #5267; 1992 #5268), Jennings (1994 #2878) and the Working Group on Northern California Earthquake Potential (1996 #1216) applied the name "Rodgers Creek" to both faults. The central and northern parts of the Healdsburg fault [31] do not exhibit geomorphic evidence of Holocene offset and, thus, are not considered part of the Rodgers Creek fault.<br><br>**Fault ID:** Refers to number 149 (Rodgers Creek fault) of Jennings (1994 #2878) and number H3 (Rodgers Creek fault) of the Working Group on Northern California Earthquake Potential (1996 #1216). |
| **County(s) and State(s)** | SONOMA COUNTY, CALIFORNIA |
| **Physiographic** | |

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| **Physiographic province(s)** | PACIFIC BORDER |
| **Reliability of location** | Good<br>Compiled at 1:24,000 scale.<br><br>*Comments:* Locations based on digital revisions to Jennings (1994 #2878) using original mapping by Brown (1971 #5273), Herd and others (1977 #4858), Herd (1978 #5270), and California Division of Mines and Geology (1983 #5275; 1993 #5298) at 1:24,000. |
| **Geologic setting** | Dextral faulting offsets upper Cenozoic volcanic and sedimentary rock units along the southwestern flanks of Sonoma Mountains and unnamed hills to the north (Huffman and Armstrong, 1980 #4862). Dextral offset is estimated to be 28±3 km in the past 6 m.y. (Sarna-Wojcicki, 1992 #5265). The southern end of the fault connects with the Hayward fault [55] via a 6-km-wide right stepover under San Pablo Bay (Wright and Smith, 1992 #5258). The northern end apparently connects with the Maacama fault [30] via a complex right stepover of about 6 km. Historical dextral slip is indicated by first-motion studies for the 1969 Santa Rosa earthquakes (M5.6 and 5.7) by Wong and Bott (1995 #5260), who also documented a complex but continuous zone of seismicity for the northern half of the Rodgers Creek fault and its stepover to the Maacama fault. |
| **Length (km)** | 56 km. |
| **Average strike** | N34°W |
| **Sense of movement** | Right lateral<br><br>*Comments:* Nearly pure dextral slip based on geology (Sarna-Wojcicki, 1992 #5265) and geomorphic features (Bryant, 1982 #5251; Hart, 1982 #5267; 1992 #5268). Possible down to the southwest displacement component at southern end (Wright and Smith, 1992 #5258). |
| **Dip** | 90°<br><br>*Comments:* Fault is assumed to be vertical based on geomorphic features, but locally may dip steeply to the northeast (e.g., Wright and Smith, 1992 #5258); trenches at several sites support vertical to near vertical dips. |

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| **Paleoseismology studies** | A small drainage channel opposite Shiloh Road (site 32-1) was noted to be sharply offset about 1 m in a right-lateral sense with about 10 m of offset in the adjacent young (undated) terrace deposit. The small (1-m) offset may represent the last rupture event in late Holocene time (E.W. Hart and F.H. Swan, 1998, unpub. field observations). Trenches at the Triangle G site (site 32-2) along Rodgers Creek exposed evidence of three events in the past 1,000 yr (Schwartz and others, 1992 #5264). Trenches at another site 0.5 km to the southeast at Beebe Ranch (site 32-3) exposed dextrally offset channels in late Holocene alluvial deposits that allowed researchers to determine a slip rate of 6.4–10.4 mm/yr in the past 775 yr (Budding and others, 1991 #5274; Schwartz and others, 1992 #5264). Surface displacement of 2 m (+0.3, -0.2 m) was measured for the most recent event at the Beebe Ranch site (32-3) (Schwartz and others, 1992 #5264). |
| **Geomorphic expression** | Well-defined linear troughs and scarps, sag ponds, shutter ridges, sidehill benches, and dextrally deflected and beheaded drainages indicate a relatively high Holocene dextral slip rate (Bryant, 1982 #5251; Hart, 1982 #5267; Schwartz and others, 1992 #5264; 1992 #5268). Locally, the fault is obscured by large landslides. The southern end is concealed under late Holocene bay mud (Wagner and Bortugno, 1982 #4870) and the Santa Rosa stepover is concealed by young alluvium. |
| **Age of faulted surficial deposits** | Faulted alluvium and soil are exposed in trenches at several sites both north and south of Santa Rosa (unpublished consultants' reports, partly summarized by Hart, 1982 #5267; 1992 #5268). Soils and alluvium at two paleoseismic trench sites (32-2 and 32-3) have been identified as latest Holocene (Schwartz and others, 1992 #5264). |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | latest Quaternary (<15 ka)<br><br>*Comments:* Historical records and charcoal radiocarbon dates from the top of the faulted section at the Shiloh Road site (32-1) place the most recent event between 1670 A.D. and about 1800 A.D. (S. Hecker, written commun., Oct. 2001). |
| **Recurrence interval** | 230 yr (late Holocene) |

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| | *Comments:* Schwartz and others (1992 #5264) determined a recurrence interval of 131–370 yr (best estimate of 230 yr) at the Beebe Ranch site (32-3). The three events recorded at the nearby Triangle G Ranch site (32-2) are consistent with this estimate. |
| **Slip-rate category** | Greater than 5.0 mm/yr<br><br>*Comments:* 6.4–10.4 mm/yr at Beebe Ranch site (32-3) (Schwartz and others, 1992 #5264). Slip rate based on measured offset of 5.1–7.2 m of alluvium-filled channels and radiocarbon dating by Schwartz and others (1992 #5264) (specifics not given) who modified the results of Budding and others (1991 #5274) and Lienkaemper and Borchardt (1996 #5297). |
| **Date and Compiler(s)** | 1998<br>Earl W. Hart, California Geological Survey |
| **References** | #5272 Blake, M.C., Bartow, J.A., Frizzell, V.A., Jr., Schlocker, J., Sorg, D., Wentworth, C.M., and Wright, R.H., 1974, Preliminary geologic map of Marin and San Francisco Counties and parts of Alameda, Contra Costa and Sonoma Counties, California, San Francisco Bay Region Environment and Resources Planning Study: U.S. Geological Survey Miscellaneous Field Studies Map MF-574 (Basic Data Contribution 64), scale 1:62,500.<br><br>#4797 Blake, M.C., Jr., Smith, J.T., Wentworth, C.M., and Wright, R.H., 1971, Preliminary geologic map of western Sonoma County and northernmost Marin County, California: U.S. Geological Survey Basic Data Contribution 12, 1 pl., scale 1:62,500.<br><br>#1320 Brown, R.D., Jr., 1970, Faults that are historically active or that show evidence of geologically young surface displacement, San Francisco Bay region, a progress report—Oct. 1970: U.S. Geological Survey Open-File Map (U.S. Department of the Interior and U.S. Department of Housing and Urban Development Basic Data Contribution 7), 2 sheets, scale 1:250,000.<br><br>#5273 Brown, R.D., Jr., 1971, Recently active traces of the Rodgers Creek fault, Santa Rosa, Cotati, Glen Ellen, Petaluma River, and Sears Point quadrangles, California: Unpublished annotated maps of U.S. Geological Survey, scale 1:24,000.<br><br>#5251 Bryant, W.A., 1982, Chianti, Healdsburg, Alexander, Maacama and related faults, Sonoma County: California Division of Mines and Geology Fault Evaluation Report 135 microfiche |

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