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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.**

## Spanish Springs Valley fault (Class A) No. 1656

**Last Review Date: 1999-03-31**

***citation for this record:*** **Adams, K., and Sawyer, T.L., compilers, 1999, Fault number 1656, Spanish Springs Valley 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 02:35 PM.**

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| **Synopsis** | This primarily down-to-the-east fault zone extends from the north edge of the Truckee Meadows north to the north end of Hungry Ridge and consists of: (1) nearly continuous range-front and piedmont faults on the west side of Spanish Springs Valley extending the entire length of the valley; and (2) a subsidiary zone of intermontane and intra basin faults on the west side of Sun Valley that extend through a low pass on the north side of Sun Valley and apparently join the main range-front fault on the west side of central Spanish Springs Valley. Detailed surficial and bedrock geologic mapping, reconnaissance photogeologic mapping, and regional geologic mapping are the sources of data. Trench investigations and detailed studies of scarp morphology have not been conducted. |
| **Name comments** | Refers to faults mapped by Slemmons (1968, unpublished Reno 1:250,000-scale map), Bonham (1969 #2999), Bonham and |

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| | Bingler (1973 #3607), Bingler (1974 #2425), Bell (1984 #105), Bell and Bonham (1987 #3643), and Greene and others (1991 #3487) on the west sides of Spanish Springs Valley and of Sun Valley. dePolo (1998 #2845) referred to this zone as the Spanish Springs Valley fault.<br><br>**Fault ID:** Refers in part to fault R6 (Spanish Springs Valley fault) of dePolo (1998 #2845). |
| **County(s) and State(s)** | WASHOE COUNTY, NEVADA |
| **Physiographic province(s)** | BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Fault locations are primarily based on 1:24,000-scale map of Bonham and Bingler (1973 #3607) and Bell and Bonham (1987 #3643) and 1:250,000-scale map of Bell (1984 #105). Mapping by Bell (1984 #105) is from photogeologic analysis of 1:40,000-scale low sun-angle aerial photography, supplemented with 1:12,000-scale aerial photography of selected areas, several low-altitude aerial reconnaissance flights, and field reconnaissance of major structural and stratigraphic relationships. |
| **Geologic setting** | This primarily down-to-the-east fault zone extends from the north edge of the Truckee Meadows north to the north end of Hungry Ridge and consists of: (1) nearly continuous range-front and piedmont faults on the west side of Spanish Springs Valley extending the entire length of valley (Bell, 1984 #105; Bell and Bonham, 1987 #3643) and (2) a subsidiary zone of intermontane and intra basin faults on the west side of Sun Valley that extend through a low pass on the north side of Sun Valley and apparently join the main range-front fault on the west side of central Spanish Springs Valley (Bonham and Bingler, 1973 #3607; Bell, 1984 #105). |
| **Length (km)** | 23 km. |
| **Average strike** | N12°E |
| **Sense of movement** | Normal<br><br>*Comments:* (Bonham and Bingler, 1973 #3607; Bingler, 1974 |

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| | #2425; Bell and Bonham, 1987 #3643). |
| **Dip Direction** | E |
| **Paleoseismology studies** | |
| **Geomorphic expression** | Faults bounding the west side of Spanish Springs Valley near the south end of the zone are primarily expressed as east-facing piedmont and range-front scarps on Quaternary alluvium at the base of a prominent topographic escarpment. In places, these faults juxtapose Quaternary piedmont-slope deposits against bedrock along an abrupt range front (Bell and Bonham, 1987 #3643). The northern part of this zone, adjacent to Hungry Ridge, is less well expressed and has been mapped as a lineament apparently defined by an abrupt linear slope break that is coincident with the contact between Quaternary piedmont-slope deposits and bedrock (Bonham, 1969 #2999; Bell, 1984 #105; Greene and others, 1991 #3487). Intermontane faults in the Sun Valley area are expressed by topographic lineaments including minor topographic breaks, aligned saddles, and linear sections of stream drainages (Bonham and Bingler, 1973 #3607). Intrabasin faults in Sun Valley are expressed as east-facing scarps on Quaternary alluvium (Bell, 1984 #105). dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 110 m (90–130 m). |
| **Age of faulted surficial deposits** | Holocene; Pleistocene; Tertiary. Bonham and Bingler (1973 #3607) and Bell and Bonham (1987 #3643) mapped Holocene and Pleistocene deposits and Tertiary bedrock offset by faults in this zone. Bonham (1969 #2999) and Greene and others (1991 #3487) also mapped displaced Tertiary bedrock. |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | latest Quaternary (<15 ka)<br><br>*Comments:* Although timing of most recent event is not well constrained, a latest Quaternary time is depicted by Bell (1984 #105) and Bell and Bonham (1987 #3643). This timing is consistent with that reported by Dohrenwend and others (1996 #2846). |
| **Recurrence** | |

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| **interval** | |
| **Slip-rate category** | Less than 0.2 mm/yr<br><br>*Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical displacement rate of 0.214 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived displacement rate reflects a long-term average. The late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) and the fact that the slip rate assigned by dePolo represents a maximum indicates that the less than 0.2 mm/yr slip-rate category is appropriate for this fault. |
| **Date and Compiler(s)** | 1999<br>Kenneth Adams, Piedmont Geosciences, Inc.<br>Thomas L. Sawyer, Piedmont Geosciences, Inc. |
| **References** | #105 Bell, J.W., 1984, Quaternary fault map of Nevada—Reno sheet: Nevada Bureau of Mines and Geology Map 79, 1 sheet, scale 1:250,000.<br><br>#3643 Bell, J.W., and Bonham, H.F., 1987, Geologic map of the Vista quadrangle: Nevada Bureau of Mines and Geology Map 4Hg, scale 1:24,000.<br><br>#2425 Bingler, E.C., 1974, Earthquake hazards map, Reno Folio: Nevada Bureau of Mines and Geology Environmental Series, scale 1:24,000.<br><br>#2999 Bonham, H.F., 1969, Geology and mineral deposits of Washoe and Storey Counties, Nevada: Nevada Bureau of Mines and Geology Bulletin 70, 140 p., 1 pl., scale 1:250,000.<br><br>#3607 Bonham, H.F., and Bingler, E.C., 1973, Reno Folio, geologic map: Nevada Bureau of Mines and Geology Map 4Ag, scale 1:24,000.<br><br>#2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 p. |

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| | #2846 Dohrenwend, J.C., Schell, B.A., Menges, C.M., Moring, B.C., and McKittrick, M.A., 1996, Reconnaissance photogeologic map of young (Quaternary and late Tertiary) faults in Nevada, *in* Singer, D.A., ed., Analysis of Nevada's metal-bearing mineral resources: Nevada Bureau of Mines and Geology Open-File Report 96-2, 1 pl., scale 1:1,000,000.<br><br>#3487 Greene, R.C., Stewart, J.H., John, D.A., Hardyman, R.F., Silberling, N.J., and Sorensen, M.L., 1991, Geologic map of the Reno 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2154-A, scale 1:250,000. |