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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.**

## Jersey Valley fault zone (Class A) No. 1144

**Last Review Date: 2000-07-17**

***citation for this record:*** **Anderson, R.E., compiler, 2000, Fault number 1144, Jersey Valley fault zone, 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 02:18 PM.**

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| **Synopsis** | The Jersey Valley fault zone consists of northeast- to north-striking, down-to-the-west faults with diverse geologic settings. It includes two major, slightly overlapping, range-front faults, one at the west base of the east-tilted western part of the Fish Creek Mountains and one of probable smaller total displacement at the western base of the east-tilted Augusta Mountains. The fault zone also includes basin-interior faults in both Jersey Valley and Dixie Valley, an east-side-down fault along the western margin of Jersey Valley, and range-bounding faults in the northwestern part of Antelope Valley. The structural relationship between these diverse faults is not known, and there are discrepancies in their mapped portrayal, which probably reflects a lack of field study and, for the mid-valley faults, weak geomorphic expression. In general, the last surface-faulting event appears to have been in the late Pleistocene (10–130 ka). |

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| **Name comments** | The name Jersey Valley fault zone is from dePolo (1998 #2845) who divided the zone into two parts. Wallace (1979 #203) referred to faults in the Jersey Valley to northern Dixie Valley area as the Jersey Valley scarps. The fault zone extends from Jersey Summit at the northern end of Jersey Valley southwest to a group of springs in northeastern Dixie Valley, directly west of the Augusta Mountains. The northern part of the fault is primarily at the western base of the Fish Creek Mountains and marks the east margin of Jersey Valley. The southern part of the fault is at the western base of the Augusta Mountains. We also include several faults at the eastern base of the Augusta Mountains and on the piedmont and foothills of the northwest part of Antelope Valley. The faults extend from Home Station Wash in the northeastern part of the Augusta Mountains south to about 40° N. latitude (the south limit of the Winnemucca sheet) in the Antelope Valley as mapped by Dohrenwend and Moring (1991 #282). The structural relation between these southern traces and the main traces along the Fish Creek Mountains is unknown.<br><br>**Fault ID:** Referred to as fault WI9A and WI9B by dePolo (1998 #2845). |
| **County(s) and State(s)** | LANDER COUNTY, NEVADA<br>PERSHING COUNTY, NEVADA |
| **Physiographic province(s)** | BASIN AND RANGE |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Most of the fault traces are taken from the 1:125,000-scale map of young fault scarps by Wallace (1979 #203). That map was compiled mostly from a combination of photogeologic and field mapping on 1:60,000-scale aerial photographs. Additional faults are compiled from the 1:250,000-scale map by Dohrenwend and Moring (1991 #282), which was produced by analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs. Ferguson and others (1951 #4355) mapped most of this fault as Quaternary. |
| **Geologic setting** | The Jersey Valley fault zone consists of northeast- to north-striking, down-to-the-west faults with diverse geologic settings. It includes two major, slightly overlapping, range-front faults, one at |

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| | the west base of the east-tilted western part of the Fish Creek Mountains and one of probable smaller total displacement at the west base of the east-tilted Augusta Mountains. The fault zone also includes basin-interior faults in both Jersey Valley and an east-side-down fault along the western margin of Jersey Valley. The structural relationship between these diverse faults is not known. Of the two range-front faults, the total displacement across the northern part of the fault (along the Fish Creek Mountains) probably greatly exceeds that along the southern part of the fault (along the Augusta Mountains), which has pre-Tertiary bedrock exposed on both sides of much of its trace (Stewart and Carlson, 1978 #3413). |
| **Length (km)** | 33 km. |
| **Average strike** | N14°E |
| **Sense of movement** | Normal |
| **Dip Direction** | W |
| **Paleoseismology studies** | |
| **Geomorphic expression** | The fault along the Fish Creek Mountains is marked by discontinuous scarps on Pleistocene (0.01–1.5 Ma) surficial deposits or erosion surfaces in the northern part and juxtaposes Quaternary alluvium against bedrock in the southern part (Dohrenwend and Moring, 1991 #282). The fault along the western margin of the Augusta Mountains was mapped photogeologically by Dohrenwend and Moring (1991 #282) as a major range-bounding structure along which Quaternary alluvium is juxtaposed against bedrock and locally marked by scarps on Quaternary surficial deposits or erosion surfaces. In contrast, Wallace (1979 #203) mapped young scarps throughout the fault's length. The discrepancy may be the weak geomorphic expression of the scarps. dePolo (1998 #2845) reported a maximum preferred basal facet height of 171 m (146–195 m) for the range-front escarpment along the Fish Creek Mountains and 146 m (122–171 m) for the range-front escarpment along the Augusta Mountains. |
| **Age of faulted surficial deposits** | On the basis of reconnaissance photogeologic mapping, Dohrenwend and Moring (1991 #282) show a short part (<1 km) of the fault as developed on deposits or erosion surfaces of late Pleistocene (10–130 ka) age. The faults to the west in Dixie |

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| | Valley are short (<4 km) and discontinuous and are shown as formed on deposits or surfaces of late Pleistocene (10–130 ka) or Holocene (0–10 ka) age. |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | late Quaternary (<130 ka)<br><br>*Comments:* Timing determined from photogeologic reconnaissance by Dohrenwend and Moring (1991 #282), which shows that late Pleistocene deposits are cut by faults along the eastern side of Jersey Valley. Also, Wallace (1979 #203) estimated that the scarps are >12 ka. On the basis of scarp morphology, Pearthree (1990 #148) suggested an age of 17–45 ka although poor preservation of scarps makes the estimate questionable. However, the mid-valley scarps in Dixie Valley may have formed in the Holocene. Timing based photogeologic reconnaissance by Dohrenwend and Moring (1991 #282) that indicate late Pleistocene (10–130 ka) deposits are cut. |
| **Recurrence 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 slip rate of 0.312 mm/yr for the northern part of the fault and 0.267 mm/yr for the southern part based on an empirical relationship between his preferred maximum basal facet height and vertical slip 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 slip rate reflects a long-term average. However, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) suggest the slip rate during this period is of a lesser magnitude. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault. |
| **Date and Compiler(s)** | 2000<br>R. Ernest Anderson, U.S. Geological Survey, Emeritus |
| **References** | #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. |

#282 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Winnemucca 1° by 2° quadrangle, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-2175, 1 sheet, scale 1:250,000.

#4355 Ferguson, H.G., Muller, S.W., and Roberts, R.J., 1951, Geology of the Mount Moses quadrangle, Nevada: U.S. Geological Survey Geologic quadrangle Map GQ-0012, 1 sheet, scale 1:125,000.

#148 Pearthree, P.A., 1990, Geomorphic analysis of young faulting and fault behavior in central Nevada: Tucson, University of Arizona, unpublished Ph.D. dissertation, 212 p.

#3413 Stewart, J.H., and Carlson, J.E., 1978, Geologic map of Nevada: U.S. Geological Survey, Special Geologic Map, 1, scale 1:500,000.

#203 Wallace, R.E., 1979, Map of young fault scarps related to earthquakes in north-central Nevada: U.S. Geological Survey Open-File Report 79-1554, 2 sheet, scale 1:125,000.