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Quaternary Fault and Fold Database of the United States

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Montana Mountains/Desert Valley fault zone, southern section (Class A) No. 1501b

Last Review Date: 1998-07-19

citation for this record: **Sawyer, T.L., compiler, 1998, Fault number 1501b, Montana Mountains/Desert Valley fault zone, southern 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 02:50 PM.**

Synopsis	**General:** This long, nearly continuous fault zone consists primarily of range-bounding normal faults along the western front of The Granites, Montana Mountains, Double H Mountains (which collectively form an eastward-tilted fault block), Slumbering Hills, and along the eastern front of the Coyote Hills. Valleyward piedmont and bolson faults extend from the Double H Mountains through southern Kings River Valley and through northern Desert Valley. **Sections:** This fault has 2 sections. Although not studied in detail, the geometry and general movement history of the fault zone suggest two possible sections. The northern section [1501a] bounds The Granites, Montana Mountains and northern Double H Mountains and includes a few short piedmont faults, south of Moonlight Mine and north of Thacker Pass. The two

	intermontane faults, one extending up Horse Creek canyon and the other extends from North Fork of Flat Creek north to the Trout Creek Mountains, are included in this section. The southern section [1501b] is principally delineated by a zone of subparallel faults on the floor of Kings River Valley and Desert Valley and includes range-bounding faults along the west front of the Double H Mountains and Slumbering Hills and along the eastern front of the Coyote Hills. The boundary between the sections approximately coincides with a 2-km-wide left step in the front of the Double H Mountains and with the intersection of unnamed faults [1502] that bound an intermontane graben(?) separating these mountains from the Montana Mountains to the north.
Name comments	**General:** Refers to faults mapped by Willden (1964 #3002), Slemmons (1966, unpublished Vya 1! X 2! sheet), Dufurrena and Rigby (1988 #3005) and Dohrenwend and Moring (1991 #281). North of the Quinn River, dePolo (1998 #2845) named it the Montana Mountains fault zone and south of the river named it the Desert Valley fault zone; both names are used herein to describe the entire fault zone. The zone bounds the west fronts of The Granites, Montana Mountains, Double H Mountains and Slumbering Hills, and the eastern front of the Coyote Hills. The fault zone extends southward along the bolson-like Kings River Valley, parallel to the Kings River, and into the Desert Valley, parallel to the northern part of Battle Creek Slough, to as far south as Lee Windmill, northwest of Blue Mountain. The northernmost part of the zone extends to the east flank of the Trout Creek Mountains. **Section:** This section forms a nearly continuously zone of faults extending from the border of Township 43/44N southward roughly along the axis of Kings River Valley, parallel to the Kings River, and across the floor of Desert Valley, parallel to northern part of the Battle Creek Slough, to Lee Windmill northwest of Blue Mountain. The zone has faults along and near the front of the Double H Mountains, Slumbering Hills and Coyote Hills. South of the Quinn River, dePolo (1998 #2845) used the name Desert Valley fault zone. **Fault ID:** Refers to fault and V15B and V17 of dePolo (1998 #2845).
County(s) and State(s)	HUMBOLDT COUNTY, NEVADA
Physiographic	

Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault locations based on 1:250,000-scale map of Dohrenwend and Moring (1991 #281) and on 1:250,000- and 1:62,500-scale unpublished maps compiled for Slemmons (1966, unpublished Vya 1? X 2? sheet); mapping by Dohrenwend and Moring (1991 #281) was produced by analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic maps enlarged to scale of the photographs. Mapping by Slemmons (1966, unpublished Vya 1? X 2? sheet) is from analysis of 1:60,000-scale AMS photography transferred to mylar overlaid onto either a 1:250,000-scale or 1:62,500-scale topographic maps using proportional dividers. The location of one fault that bounds the low hills adjacent of the northwest side of Slumbering Hills near Franklin Well is based on 1:100,000-scale mapping of Dufurrena and Rigby (1988 #3005).
Geologic setting	This long, nearly continuous fault zone is comprised primarily of range-bounding normal faults along western fronts of The Granites, Montana Mountains and Double H Mountains (which collectively form an eastward-tilted fault block; Stewart, 1978 #2866), and along the east front of the Coyote Hills, and valleyward piedmont and bolson faults from the Double H Mountains through southern Kings River Valley through northern Desert Valley (Slemmons, 1966, unpublished Vya 1:250,000-scale map; Dufurrena and Rigby, 1988 #3005; Dohrenwend and Moring, 1991 #281). The fault zone includes two intermontane faults in the northern Montana Mountains and in The Granites (Willden, 1964 #3002; Slemmons, 1966, unpublished Vya 1:250,000-scale map); the fault in The Granites displaces Tertiary basalt and andesite approximately 500 m down to the west on the south side of Flat Creek and displaces these same rocks approximately 370 m down to the west on the south side of Granite Creek, about 6.4 kilometers to the north.
Length (km)	This section is 65 km of a total fault length of 101 km.
Average strike	N4°E (for section) versus N2°W (for whole fault)
Sense of movement	Normal *Comments:* Shown as normal or undesignated on maps

	(Slemmons, 1966, unpublished Vya 1? X 2? sheet; Dufurrena and Rigby, 1988 #3005).
Dip Direction	W; E
Paleoseismology studies	
Geomorphic expression	This section is primarily expressed by a nearly continuous zone of lineaments and scarps extending from border of Township 43/44N southward, approximately along the axis of Kings River Valley, and across the floor of Desert Valley, to Lee Windmill northwest of Blue Mountain. The zone has piedmont faults on the western side of the Slumbering Hills and range-bounding faults along the western front of Double H Mountains and Slumbering Hills, and along the eastern front of the Coyote Hills. The section includes a range-bounding fault along western front of the Double H Mountains. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 158 m (134-183 m).
Age of faulted surficial deposits	Holocene; latest Pleistocene. Dohrenwend and Moring (1991 #281) and Slemmons (1966, unpublished Vya 1? X 2? sheet) mapped faults on the floor of Kings River Valley and Desert Valley that displace Holocene deposits; these faults lie below the approximately 13 ka highstand shoreline of pluvial Lake Lahontan based on mapping by Adams (1997 #3003) and Adams and others (1999 #3006). Dufurrena and Rigby (1988 #3005) mapped a fault bounding low hills adjacent of the northwest side of Slumbering Hills near Franklin Well that appears to juxtapose latest Pleistocene and Holocene (post-Sehoo lake) alluvial-fan deposits against Tertiary volcanic rock.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Although timing of most recent event is not well constrained, Dohrenwend and Moring (1991 #281) and Dohrenwend and others (1996 #2846) reported a latest Quaternary time based on reconnaissance photogeologic mapping, which is consistent with mapping by Dufurrena and Rigby (1988 #3005).
Recurrence	

interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) reported a reconnaissance vertical slip rate of 0.288 mm/yr for the part of the section that bounds the Double H Mountains 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. In addition, dePolo (1998 #2845) reported a reconnaissance vertical slip rate of 0.01 mm/yr for the southern part of the section based on the presence of scarps on alluvium and the absence of basal facets. 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 low. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1998 Thomas L. Sawyer, Piedmont Geosciences, Inc.
References	#3003 Adams, K.D., 1997, Late Quaternary pluvial history, isostatic rebound, and active faulting in the Lake Lahontan basin, Nevada and California: Reno, University of Nevada, unpublished Ph.D. dissertation, 169 p. #3006 Adams, K.D., Wesnousky, S.G., and Bills, B.G., 1999, Isostatic rebound, active faulting, and potential geomorphic effects in the Lake Lahontan basin, Nevada and California: Geological Society of America Bulletin, v. 111, p. 1739-1756. #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. #281 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Vya 1° by 2° quadrangle, Nevada, Oregon, and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2174, 1 sheet, scale 1:250,000. #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. #3005 Dufurrena, C.K., and Rigby, J.G., 1988, Reconnaissance geologic map of the Slumbering Hills and surrounding area, Humboldt County, Nevada: Nevada Bureau of Mines and Geology Open File Report 88-6, 3 p., scale 1:100,000. #2866 Stewart, J.H., 1978, Basin-range structure in western North America—A review, *in* Smith, R.B., and Eaton, G.P., eds., Cenozoic tectonics and regional geophysics of the western cordillera: Geological Society of America Memoir 152, p. 1-31, scale 1:2,500,000. #3002 Willden, R., 1964, Geology and mineral deposits of Humboldt County, Nevada: Nevada Bureau of Mines and Geology Bulletin 59, 154 p., scale 1:250,000.