Jump to Navigation

Quaternary Fault and Fold Database of the United States

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Stonewall Mountain fault (Class A) No. 1088

Last Review Date: 1998-12-15

citation for this record: **Anderson, R.E., compiler, 1998, Fault number 1088, Stonewall Mountain 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 02:19 PM.**

Synopsis	The Stonewall Mountain fault consists mostly of several overlapping (en echelon) northeast-striking, slightly concave-northward main traces. The westernmost, northeast-striking trace separates bedrock from alluvium along the structural boundary between the main precipitous uplifted Stonewall Mountain block on the south and the basin beneath Stonewall Flat on the north. This western trace bends to the southeast and appears to connect with northwest-striking scarps in Quaternary deposits along the southwest flank of Stonewall Mountain. The easternmost part of the northeast-striking traces is moderately to weakly expressed as a cluster of lineaments or scarps on Quaternary deposits in the low-relief southeast part of Stonewall Flat. These eastern, northeast-striking features appear to connect with range-front faults and faults in Tertiary rocks near the range front that express the central part of the principally northeast-striking Stonewall Mountain fault. There are no stratigraphic subdivisions of

	surficial deposits or scarp-height data to constrain slip rate or recurrence; however, the height of basal fault facets, which are present along the northwest range front of Stonewall Mountain, were used to calculate estimates of slip rate along that part of the fault. Based on reconnaissance photogeologic studies, the youngest deposits cut by the fault are estimated to be late Pleistocene.
Name comments	Name given by Piety (1995 #915) to a set of overlapping northeast-striking faults and fault-related features at the southeast margin of Stonewall Flat. These features were mapped by Dohrenwend and others (1992 #289), Reheis and Noller (1991 #1195), and Reheis (1992 #1604). Reheis and Noller (1991 #1195) also show northwest-striking scarps and lineaments on Quaternary deposits or surfaces, which appear to connect with the southwest end of the more prominent northeast-striking features. de Polo (1998 #2845) included these northwest-striking features as the southwest end of the Stonewall Mountain fault and these northwest-striking features are also included herein as the southwestern end of the Stonewall Mountain fault. Piety (1995 #915) shows these northwest-striking features as an isolated northwestern end of the Sarcobatus fault, but these features do not align with that fault, are isolated from it, and appear to connect with and be related to the Stonewall Mountain fault. Furthermore, the main strands of the Sarcobatus fault do not show evidence of Quaternary activity (Reheis and Noller, 1991 #1195; Dohrenwend and others, 1992 #289) and consequently the Sarcobatus fault is not shown in this compilation. The Stonewall Mountain fault extends northwestward along the southwest flank of Stonewall Mountain, bends to the northeast, and extends northeastward along and past the northwest flank of Stonewall Mountain to about 2 km northeast of Civet Cat Canyon, in the eastern margin of Stonewall Flat. **Fault ID:** Fault referred to as SWM by Piety (1995 #915); de Polo (1998 #2845) portrayed the fault as two related parts, faults G10A and G10B.
County(s) and State(s)	NYE COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of	Good

location	Compiled at 1:100,000 scale. *Comments:* Traces taken from Reheis and Noller (1991 #1195), and Reheis (1992 #1604) who compiled them on 1:100,000 topographic maps from photogeologic mapping on aerial photos at scales ranging from 1:30,000 to 1:80,000.
Geologic setting	The faults strike principally northeast and are mostly down to the northwest. In the southwest they form the boundaries between the sharply uplifted Stonewall Mountain block and the basins beneath Stonewall Flat and Alkali Flat. In the northeast they cross and terminate in the low-relief area of southern Stonewall Flat. Piety (1995 #915) noted that the fault is one of several northeast-striking fault zones that bound the northwest sides of mountain blocks in the area west of Cactus Flat and east of Fish Lake Valley. Reheis and Noller (1989 #1610) speculated that the northeast-striking faults could be conjugate shears to the right-slip, northwest-striking Furnace Creek fault in the Death Valley area of California. Alternatively and consistent with the main dip slip of the Stonewall Mountain fault, the northeast-striking faults could be dip-slip faults oriented normal to the regional NW-SE extension direction. The western and central parts of the fault bound the northwest and southwest sides of the late Tertiary Stonewall Mountain volcanic center (Weiss and others, 1993 #1607).
Length (km)	24 km.
Average strike	N47°E
Sense of movement	Normal *Comments:* Most of the fault is normal and down to the northwest, but at the southwest end there are reported left slip and reverse slip components (Piety, 1995 #915), which may be related to the bend in the fault along this end.
Dip Direction	NW *Comments:* On the basis of bedrock escarpments that are decorated with displacement features such as crenulations and slickenlines (Reheis and Noller, 1989 #1610; Reheis, 1992 #1604), the main northeast-striking part of the fault dips steeply to the northwest beneath Stonewall Flat.

Paleoseismology studies	
Geomorphic expression	Reheis and Noller (1991 #1195) and Reheis (1992 #1604) mapped most of the fault as comprised of overlapping, slightly concave-northward traces that are present along and northwest of the southwest flanks of Stonewall Mountain. dePolo (1998 #2845) reported the presence of fault facets along the northeast-striking part of the fault. Dohrenwend and others (1992 #289) classified the geomorphic characteristics adjacent to the western traces as similar to those along major range-front faults; that is, as having a general absence of pediments, abrupt piedmont-hillslope transitions, steep bedrock slopes, faceted spurs, wineglass valleys, and narrow, steep-sided canyons perpendicular to range front. The central traces bound a lower and less steep part of the range front and include fault traces in Tertiary rocks southeast of the range front. The eastern traces cross irregular topography of the uplifted block and they extend to the northeast where they bound some low bedrock benches; farther northeast, these eastern traces cross low-relief terrain of southeastern Stonewall Flat and define a narrow (<1 km) graben that is about 2 km long (Reheis, 1992 #1604). The total length of the fault is greater than 30 km of which only about 6 km is interpreted to be on Quaternary surficial deposits, and, of that, half is weakly expressed and half moderately expressed as lineaments and low scarps (Reheis and Noller, 1991 #1195; Reheis, 1992 #1604). Most of the Quaternary lineaments or scarps are in the northeast part (Reheis, 1992 #1604), whereas the west part is mainly Quaternary alluvium against bedrock (Cornwall, 1972 #1482; Reheis and Noller, 1991 #1195).
Age of faulted surficial deposits	A short part of the fault is portrayed as abrupt and expressed by well-defined scarps on Quaternary depositional or erosional surfaces of late Pleistocene age (10 ka to 130 ka) (Dohrenwend and others, 1992 #289).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Estimate is based on reconnaissance photogeologic mapping by Dohrenwend and others (1992 #289).
Recurrence	

interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No information exists on the height of scarps or on stratigraphic subdivisions of faulted Quaternary surficial deposits. dePolo (1998 #2845) assigned a preferred reconnaissance vertical slip rate of 0.199 mm/yr for the northeast-striking part of the fault, based on a preferred basal facet height of 98 m; he estimated a much lower slip rate for the northwest striking part of the fault based on the absence of facets and presence of weakly expressed scarps on alluvium. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1998 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#1482 Cornwall, H.R., 1972, Geology and mineral deposits of southern Nye County, Nevada: Nevada Bureau of Mines and Geology Bulletin 77, 49 p., 1 pl., scale 1:250,000. #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. #289 Dohrenwend, J.C., Schell, B.A., McKittrick, M.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Goldfield 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2183, 1 sheet, scale 1:250,000. #915 Piety, L.A., 1995, Compilation of known and suspected Quaternary faults within 100 km of Yucca Mountain, Nevada and California: U.S. Geological Survey Open-File Report 94-112, 404 p., 2 pls., scale 1:250,000. #1604 Reheis, M.C., 1992, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the Cactus Flat and Pahute Mesa 1:100,000 quadrangles and the western parts of the Timpahute Range, Pahranagat Range, Indian Springs, and Las Vegas 1:100,000 quadrangles, Nevada: U.S. Geological Survey Open-File Report 92-193, 14 p., 3 pls., scale 1:100,000. #1610 Reheis, M.C., and Noller, J.S., 1989, New perspectives on Quaternary faulting in the southern Walker Lane, Nevada and

	California, *in* Ellis, M.A., ed., Late Cenozoic evolution of the southern Great Basin: Nevada Bureau of Mines and Geology Open-File Report 89-1, p. 57-61. #1195 Reheis, M.C., and Noller, J.S., 1991, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the eastern part of the Benton Range 1:100,000 quadrangle and the Goldfield, Last Chance Range, Beatty, and Death Valley Junction 1:100,000 quadrangles, Nevada and California: U.S. Geological Survey Open-File Report 90-41, 9 p., 4 sheets, scale 1:100,000. #1607 Weiss, S.I., Noble, D.C., Worthington, J.E., IV., and McKee, E.H., 1993, Neogene tectonism from the southwestern Nevada volcanic field to the White Mountains, California—Part I. Miocene volcanic stratigraphy, paleotopography, extensional faulting and uplift between northern Death Valley and Pahute Mesa, *in* Lahren, M.M., Trexler, J.H., Jr., and Spinosa, C., eds., Crustal evolution of the Great Basin and the Sierra Nevada: Reno, Mackay School of Mines, University of Nevada, Geological Society of America, Cordilleran/Rocky Mountain section meeting, Reno, Nevada, May 19-21, 1993, Guidebook, p. 353-369.