[Jump to Navigation]

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.

Belted Range fault (Class A) No. 1084

Last Review Date: 1998-12-08

citation for this record: Anderson, R.E., compiler, 1998, Fault number 1084, Belted Range 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 Belted Range fault lies along the west flank of the Belted Range on the east side of Kawich Valley. Scarps and lineaments on Quaternary deposits and faults that displace bedrock of the range against Quaternary piedmont deposits are shown on photogeologic maps. More recent field studies have identified discontinuous scarps on surficial materials, which form a northeast-striking zone about 21 km long that can be divided into three parts of contrasting strike separated by short scarp-free sections. The sense of slip is normal and down to the west. The most recent movement is probably early Holocene to latest Pleistocene and produced a maximum surface offset of about 1 m. Total surface offset in surficial materials ranges from 0.6 m on the youngest faulted alluvium to 11.3 m on older alluvium. Quantitative estimates of recurrence are not possible, but slip rate estimates have been reported that range from 0.01 to 0.09 mm/yr. In general, scarps are best developed along the part of the range

	that shows the greatest topographic and structural relief, suggesting that the Quaternary deformation reflects, in a general way, the long-term pattern of deformation of the range.
Name comments	Name taken from Piety (1995 #915). dePolo (1998 #2845) referred to the fault as the Western Belted Range fault. Refers to a northeast-striking zone of faults and scarps along the west side of the Belted Range that has been mapped by Dohrenwend and others (1992 #289), Reheis (1992 #1604), and Anderson and others (1995 #897). Piety (1995 #915) shows the Belted Range fault on her compilation of Quaternary faults. The Belted Range fault extends discontinuously from Kawich Canyon northeastward to the north end of the Belted Range. **Fault ID:** Shown as BLR by Piety (1995 #915) and portrayed as G16 by dePolo (1998 #2845).
County(s) and State(s)	NYE COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location is from field reconnaissance and mapping on 1:30,000 scale aerial photos compiled on 1:24,000 scale topographic maps (Anderson and others, 1995 #897).
Geologic setting	The Belted Range fault is a range-front structure separating the basin beneath Kawich Valley on the west from the uplifted Belted Range on the east, forming a typical northerly trending basin and range structural pair. These features, together with the Kawich Range and Gold Flat basin to the west, form a typical Basin and Range structural and geomorphic pattern (Cornwall, 1972 #1482) that contrasts with the broad highlands to the south and southwest that express the southern Nevada volcanic field.
Length (km)	25 km.
Average strike	N14°E
Sense of movement	Normal *Comments:* Anderson and others (1995 #897) found no evidence

	for displacement other than dip slip.
Dip Direction	W *Comments:* A conspicuous gravity gradient, especially along the southern part of the Belted Range fault (Ekren and others, 1971 #1505) suggests that the fault is a range-front fault that has a moderate to steep west dip.
Paleoseismology studies	
Geomorphic expression	The range front along the west flank of the Belted Range varies along strike from areas where the range front shows abrupt piedmont-hillslope transitions to areas where the range front is strongly modified and embayed by erosion and has retreated. The trace of the Belted Range fault generally lies a few hundred meters valleyward of the bedrock-alluvium contact and is marked by three diversely oriented scarps separated by short scarp-free gaps (Anderson and others, 1995 #897): a 10-km-long northern part strikes N3?W, a 7-km-long central part strikes N28?E, and a 1-km-long southern part strikes N6?E (Anderson and others, 1995 #897). The range of surface offset based on 21 scarp profiles is 0.6-11.3 m, although some of the larger offsets may be exaggerated by graben formation in the hanging wall of the fault (Anderson and others, 1995 #897). Field studies by Anderson and others (1995 #897) also indicate that single-event and multiple-event scarps are present, and indicate that the average surface offset for the youngest event is about 1 m. In general, they found that scarps are best developed along areas of the Belted Range that show the greatest topographic and structural relief; structural relief is based on gravity contours (Ekren and others, 1971 #1505). This apparent correlation of topographic and structural relief with prominent scarp expression, suggests that the Quaternary deformation reflects, in a general way, the long-term pattern of deformation of the range (Anderson and others, 1995 #897).
Age of faulted surficial deposits	The age of the youngest surficial deposits cut by the Belted Range fault is poorly constrained. Dohrenwend and others (1992 #289) show part of the trace on depositional or erosional surfaces estimated, on the basis of a general geomorphic classification, to be of late Pleistocene age (10-130 ka). Anderson and others (1995 #897) reported that scarps are developed on surfaces that

	probably are as young as latest Pleistocene to early Holocene in age (<30 ka).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* On the basis of limited scarp-profile data and comparisons to the geomorphic characteristics of reference scarps, Anderson and others (1995 #897) estimated that the most recent event is latest Pleistocene or early Holocene in age.
Recurrence interval	*Comments:* Multiple-event scarps are common along the Belted Range fault (Anderson and others, 1995 #897), but lacking better age constraints on offset deposits and surfaces, no reliable estimates of recurrence can be made.
Slip-rate category	Less than 0.2 mm/yr *Comments:* On the basis of scarp morphology and poorly constrained age estimates of faulted surfaces, Anderson and others (1995 #897) calculated slip rates that range from 0.09 to 0.1 mm/yr. The maximum slip rate of 0.1 mm/yr, is based on the assumption that the highest scarp is no older than 100 ka. They also reported a longer term, maximum slip rate of 0.05 mm/yr., based on offset of late Tertiary volcanic strata. dePolo (1998 #2845) reported similar rates; he estimated a preferred reconnaissance vertical slip rate of 0.01 mm/yr for the fault based on the presence of scarps on alluvium and the absence of basal facets. No other slip rate estimates are known to have been reported for the Belted Range fault, and based on the rates reported the lowest slip-rate category (<0.2 mm/yr) was assigned to this fault.
Date and Compiler(s)	1998 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#897 Anderson, R.E., Bucknam, R.C., Crone, A.J., Haller, K.M., Machette, M.N., Personius, S.F., Barnhard, T.P., Cecil, M.J., and Dart, R.L., 1995, Characterization of Quaternary and suspected Quaternary faults, regional studies, Nevada and California: U.S. Geological Survey Open-File Report 95-599, 70 p., 2 sheets. #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.

#1505 Ekren, E.B., Anderson, R.E., Rogers, C.L., and Noble, D.C., 1971, Geology of the northern Nellis Air Force Base Bombing and Gunnery Range, Nye County, Nevada: U.S. Geological Survey Professional Paper 651, 91 p., 1 pl., scale 1:125,000.

#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.