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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.

Black Point/Doney Mountain fault zone (Class A) No. 957

Last Review Date: 1997-01-03

Compiled in cooperation with the Arizona Geological Survey

citation for this record: **Pearthree, P.A., compiler, 1997, Fault number 957, Black Point/Doney Mountain 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 03:13 PM.**

Synopsis	This is a complex fault zone that deforms Paleozoic bedrock and late Pliocene and middle Pleistocene basalt flows. The southern part of the zone appears to be comprised of a normal fault having down-to-the-east displacement. The central part of the zone includes several minor, down-to-the-northeast normal faults; these faults are superimposed on a larger down-to-the-northeast monocline (Black Point) that probably formed during the late Cretaceous-early Tertiary Laramide orogeny. On the northern part of the zone, Pliocene-Quaternary displacement is down-to-the-southwest, which may represent normal reactivation of a

	Laramide reverse fault. The timing of youngest rupture is probably middle Pleistocene, because an upper Pleistocene basalt flow apparently is not faulted.
Name comments	Mapped and named the Black Point monocline and the Doney Mountain fault scarps by Menges and Pearthree (1983 #2073). The fault zone and monocline were grouped together by Pearthree and others (1996 #2153), and the name is simplified herein as the Black Point/Doney Mountain fault zone. The geology of this area was mapped by Moore and Wolfe (1987 #2152) and Ulrich and others (1984 #2157).
County(s) and State(s)	COCONINO COUNTY, ARIZONA
Physiographic province(s)	COLORADO PLATEAUS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Trace mapped at 1:50,000 scale, transferred to 1:250,000-scale topographic base map.
Geologic setting	The fault zone is located along the northeastern margin of the Pliocene-Quaternary San Francisco volcanic field, on the bedrock erosion surface that slopes from the Mogollon Rim northeast to the Little Colorado River. The Black Point / Doney mountain fault zone is the northeasternmost fault that cuts Quaternary basalt flows. Young displacement on the northern part of the fault zone may represent normal reactivation of an older reverse fault and monocline of Laramide age.
Length (km)	24 km.
Average strike	N1°W
Sense of movement	Normal *Comments:* Normal movement is inferred from regional geologic and topographic relations. However this fault zone has complicated geometry because the southern part is apparently an east-side-down normal fault, the central part is a northeast-side-down series of small faults and a monocline, and the northern part is a southwest-side-down monocline.

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Paleoseismology studies	
Geomorphic expression	The southernmost part of the fault forms a low, east-facing scarp on middle Pleistocene basalt. The remainder of the southern and central part of the fault is expressed as a moderately high (<50 m), east-facing escarpment formed on Paleozoic bedrock. A late Quaternary basalt flow (and its cinder cones) was erupted along and appears to bury the fault. The northern part of the fault is expressed as a gentle, several-meter-high, west-facing scarp on a late Pliocene basalt flow.
Age of faulted surficial deposits	Paleozoic, Pliocene, middle Pleistocene
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* A middle Pleistocene basalt flow is faulted, whereas an upper Pleistocene basalt flow and associated cinder cones apparently are not faulted.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* The lack of evidence suggesting faulting during the late Quaternary indicates the slip rate is low for this fault.
Date and Compiler(s)	1997 Philip A. Pearthree, Arizona Geological Survey
References	#2073 Menges, C.M., and Pearthree, P.A., 1983, Map of neotectonic (latest Pliocene-Quaternary) deformation in Arizona: Arizona Geological Survey Open-File Report 83-22, 48 p., scale 1:500,000. #2152 Moore, R.B., and Wolfe, E.W., 1987, Geologic map of the east part of the San Francisco Volcanic Field, north-central Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-1960, 2 sheets, scale 1:50,000.

	#2153 Pearthree, P.A., Vincent, K.R., Brazier, R., and Hendricks, D.M., 1996, Plio-Quaternary faulting and seismic hazard in the Flagstaff area, northern Arizona: Arizona Geological Survey Bulletin 200, 40 p., 2 pls. #2157 Ulrich, G.E., Billingsley, G.H., Hereford, R., Wolfe, E.W., Nealey, L.D., and Sutton, R.L., 1984, Maps showing geology, structure, and uranium deposits of the Flagstaff 1° by 2° quadrangle, Arizona: U.S. Geological Survey Miscellaneous Investigations Map I-1446, 2 sheets, scale 1:250,000.