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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.

Davis Dome fault (Class A) No. 1998

Last Review Date: 2016-06-20

citation for this record: **Jochems, A.P., and Witcher, J.C., compilers, 2016, Fault number 1998, Davis Dome 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 02:23 PM.**

Synopsis	The Davis Dome fault forms discontinuous scarps on the east side of the Hueco basin of southern New Mexico and western Texas. It disrupts fluvial strata of the Plio-Pleistocene Camp Rice Formation as well as stage IV calcic horizons capping the local geomorphic surface. The fault also acts as a barrier to westward groundwater flow derived from the Hueco Mountains to the east.
Name comments	The fault is named for Davis Dome, a small hill underlain by the Permian Hueco Formation on the east side of the broad Hueco basin in southern New Mexico.
County(s) and State(s)	OTERO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of	Good

location	Compiled at 1:24,000 scale. *Comments:* Fault trace from unpublished mapping by Witcher, approximately 1: 24,000-scale mapping shown in figure 2 of O'Donnell and others (2001 #7560), and photogrammetric interpretations made by the compilers.
Geologic setting	This down-to-the-east fault is located on the east side of the Hueco basin, which is the more northerly of two basins forming the Hueco bolson of southern New Mexico, western Texas, and northeastern Chihuahua, Mexico. Surfaces in the Hueco basin are largely flat and planar except where disrupted by geologically recent faulting (Seager, 1980 #843; Seager and others, 1987 #627). The Davis Dome fault is similar in orientation and morphology to faults of the Hueco fault zone [901] on the west side of the basin (Seager, 1980 #843; Collins and Raney, 1997 #7419). Few faults are observed on the east side of the Hueco basin, although the Alamogordo fault [2054] forms the eastern basin margin farther north. Seismic and well data indicate that the Davis Dome fault possibly impedes groundwater flow and influences connectivity between basin-fill and bedrock aquifers in the area (O'Donnell and others, 2001 #7560).
Length (km)	7 km.
Average strike	N36°W
Sense of movement	Normal
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	The Davis Dome fault forms a discontinuous, east-facing scarp that is buried in many places by windblown sediment. The scarp is subtle where exposed, with a maximum height of <10 m and more typical heights of 2–5 m. A minor amount of offset of stage IV calcic horizons formed atop the Camp Rice Formation is recognized locally.
Age of faulted surficial deposits	The Davis Dome fault cuts sediments of the upper Camp Rice Formation (Plio-Pleistocene). A pumice clast dated at ~2.2 Ma using argon geochronology was found within 10 m of the constructional surface of the Camp Rice Formation on the west

	side of the Hueco basin (Mack and others, 2006 #7447), indicating that the faults in the basin have ruptured in the Quaternary. Moreover, the Davis Dome faults locally cuts stage IV calcic horizons underlying a geomorphic surface that is congruent with and likely correlates to the lower La Mesa surface of the Mesilla basin to the west. Magnetostratigraphic constraints suggest that this surface stabilized 700–900 ka (Mack and others, 1993 #1020).
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Timing based on local disruption of geomorphic surface that is likely correlative to the 700–900 ka lower La Mesa surface (Mack and others, 1993 #1020).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip rate inferred based on burial by late Quaternary windblown sediment, disruption of a geomorphic surface that is likely early to middle Pleistocene in age, and similarity to regional faults.
Date and Compiler(s)	2016 Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources James C. Witcher, Witcher & Associates
References	#7419 Collins, E.W., and Raney, J.A., 1997, Quaternary faults within intermontane basins of northwest Trans-Pecos Texas and Chihuahua, Mexico: The University of Texas at Austin, [Texas] Bureau of Economic Geology Report of Investigations 245, 59 p. #1020 Mack, G.H., Salyards, S.L., and James, W.C., 1993, Magnetostratigraphy of the Plio-Pleistocene Camp Rice and Palomas formations in the Rio Grande rift of southern New Mexico: American Journal of Science, v. 293, p. 49–77. #7447 Mack, G.H., Seager, W.R., Leeder, M.R., Perez-Arlucea, M., and Salyards, S.L., 2006, Pliocene and Quaternary history of the Rio Grande, the axial river of the southern Rio Grande rift, New Mexico, USA: Earth-Science Reviews 79, p. 141–162.

	#7560 O'Donnell, T.M., Jr., Miller, K.C., and Witcher, J.C., 2001, A seismic and gravity study of the McGregor geothermal system, southern New Mexico: Geophysics, v. 66, no. 4, p. 1002–1014. #843 Seager, W.R., 1980, Quaternary fault system in the Tularosa and Hueco basins, southern New Mexico and West Texas, *in* Dickerson, P.W., and Hoffer, J.M., eds., Trans-Pecos region southeastern New Mexico and west Texas: New Mexico Geological Society, 31st Field Conference, November 6-8, 1980, Guidebook, p. 131-135. #627 Seager, W.R., Hawley, J.W., Kottlowski, F.E., and Kelley, S.A., 1987, Geology of east half of Las Cruces and northeast El Paso 1° x 2° sheets, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 57, 3 sheets, scale 1:125,000.