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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.

Mickey Basin faults (Class A) No. 857

Last Review Date: 2016-05-06

citation for this record: **Personius, S.F., compiler, 2002, Fault number 857, Mickey Basin faults, 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 03:16 PM.**

Synopsis	Most faults in this area define a northeast-striking graben that forms Mickey Basi northeastern arm of the Alvord Desert. Fault scarps in late Pleistocene and Holoc alluvial and lacustrine deposits are present along northwest and southeast range fi margins of the basin; a north-trending intra-basin fault may control the location o Mickey (hot) Springs in the southern part of the area. Scarp-profile analysis sugg latest movement on the down-to-the-southeast fault along Mickey Butte occurred 2 ka.
Name comments	The Mickey Basin faults are included in the Alvord Desert graben faults of Pezzo (1993 #3544) and the East Alvord graben fault of Geomatrix Consultants, Inc. (1 #3593). These faults consist of a prominent fault along the southeastern base of Mickey Butte, previously termed the Mickey Butte (Geomatrix Consultants Inc., #3593), Mickey (Narwold, 1999 #4045), or Mickey Springs (Lindberg, 1999 #40 fault, unnamed faults on the southeastern margin of Mickey Basin, and an unnam fault that lies between the basin margin faults near Mickey (hot) Springs (Lindbe 1999 #4037; Narwold, 1999 #4045).

	Fault ID: Some of these structures are included in fault number 49 of Pezzopane (1993 #3544), and fault number 62c of Geomatrix Consultants, Inc. (1995 #3593)
County(s) and State(s)	HARNEY COUNTY, OREGON
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to Madin and others (1996 #3479), further ref by Madin in 2009, and supplemented by 1:100,000-scale mapping of Weldon and others (2002 #5648), based on 1:500,000-scale mapping of Pezzopane (1993 #35 and 1:24,000-scale mapping of Narwold and others (1999 #4045).
Geologic setting	These faults define a graben that forms Mickey Basin, which forms the northeaste arm of the Alvord Desert. The topography of the region is dominated by extensiv Basin and Range faulting along the Steens fault zone [856], which controls the w margin of the Alvord Desert. The region is underlain by Miocene volcanic rocks, primarily the Steens Basalt (Walker and Repenning, 1965 #3559; Brown and Pete 1980 #3585; Sherrod and others, 1989 #3745; Walker and MacLeod, 1991 #3646
Length (km)	8 km.
Average strike	N33°E
Sense of movement	Normal *Comments:* Faults in this zone are mapped as normal or high-angle faults by Wall and Repenning (1965 #3559), Brown and Peterson (1980 #3585), Walker and MacLeod (1991 #3646), Pezzopane (1993 #3544), Geomatrix Consultants, Inc. (#3593), Narwold and others (1999 #4045), and Weldon and others (2002 #5648). Lindberg (1989 #3980) found no field evidence of oblique or strike-slip displacer on the fault near Mickey Butte.
Dip Direction	SE; NW
Paleoseismology studies	
Geomorphic expression	The Mickey Basin faults define a northeast-trending graben that forms the margir Mickey Basin, the northeastern arm of the Alvord Desert. Fault scarps in Quatern

	alluvial and lacustrine deposits are present along northwest and southeast range fr margins of the basin; a north-trending intra-basin fault may control the location o Mickey (hot) Springs in the southern part of the area. Geomatrix Consultants, Inc (1995 #3593) mention possible Quaternary fault scarps along small basins north c Mickey Basin, but presented no evidence to support this possibility.
Age of faulted surficial deposits	Faults in the Mickey Basin offset late Pleistocene and Holocene alluvium and lacustrine deposits associated with pluvial lakes in the Alvord Desert basin (Lindl 1989 #3980; 1999 #4037; Narwold, 1999 #4045).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Lindberg (1989 #3980; 1999 #4037) and Narwold and others, (1999 #4045) used scarp-profile modeling to determine an age of about 2 ka for the you event on the fault that forms the range front along Mickey Butte. Lindberg (1989 #3980; 1999 #4037) described a possible correlation between the youngest event the fault near Mickey Butte and the youngest event on the Alvord section of the S fault zone [856c] to the south, and suggested that the youngest displacements in t Alvord Desert region have stepped eastward from the Steens fault zone to the Mi Basin faults. These same authors used offsets of late Pleistocene and Holocene alluvium and lacustrine deposits to infer late Pleistocene or Holocene displaceme several other faults in the Mickey Basin. Pezzopane (1993 #3544), Geomatrix Consultants, Inc. (1995 #3593), and Weldon and others (2002 #5648) inferred Holocene or latest Pleistocene movement on faults in the Mickey Basin; Madin a others (1996 #3479) mapped some faults in the Mickey Basin as active in the Quaternary.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Offsets of about 2 m across late Pleistocene and Holocene alluvial an lacustrine deposits have been described on several faults in the basin (Lindberg, 1 #3980; 1999 #4037; Narwold, 1999 #4045), and Brown and Peterson (1980 #358 estimated offsets of 80–900 m in Miocene volcanic rocks across faults in the basi such data suggest low rates of slip. Geomatrix Consultants, Inc. (1995 #3593) estimated slip rates of 0.05–0.2 mm/yr and a preferred rate of 0.1 mm/yr for fault included in their Eastern Alvord graben fault, which includes faults in the Mickey Basin.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey

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