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.

Abert Rim fault, Lake Abert section (Class A) No. 829a

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Synopsis	**General:** This north-northeast-trending normal fault forms the eastern margin of graben that confines the Lake Abert basin. The fault has produced escarpments u 0.8 km high in Pliocene and Miocene volcanic rocks. The Abert Rim fault is divi into two sections herein, primarily based on recency of movement. **Sections:** This fault has 2 sections. The Abert Rim fault is divided into sections h primarily based on recency of movement—the southern section, the Lake Abert section, most of which exhibits evidence of Holocene displacement, and the nort section, which exhibits no evidence of latest Pleistocene or Holocene displaceme Scarberry and others (2010 #7374) define three segments based on change in gen strike of the fault, cross cutting relations between the fault and NW-striking fault overall topographic relief; because their study does not address the nature of Quaternary faulting, we do not further subdivide the northern, older section of th [829b].

Name comments	**General:** The Abert Rim fault was originally mapped by Walker (1963 #3565), W and Repenning (1965 #3559), Greene and others (1972 #3560), and Madin and ot (1996 #3479); the fault was named by Pezzopane (1993 #3544) after the associat prominent topographic escarpment, the Abert Rim.
County(s) and State(s)	LAKE 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).
Geologic setting	This north-northeast-trending normal fault forms the eastern margin of a half grab that confines the Lake Abert basin in the Basin and Range province of southeaste Oregon. The fault has produced escarpments up to 0.8 km high (Trench and other 2012 #7373) in Pliocene to Miocene to Oligocene volcanic rocks (Walker, 1963 # Walker and Repenning, 1965 #3559; Greene and others, 1972 #3560; Walker and MacLeod, 1991 #3646).
Length (km)	This section is 42 km of a total fault length of 77 km.
Average strike	N14°E (for section) versus N15°E (for whole fault)
Sense of movement	Normal, Left lateral *Comments:* This section is mapped as a normal or high-angle fault by Walker (19 #3565) and Walker and MacLeod (1991 #3646). Pezzopane (1993 #3544) and Pezzopane and Weldon (1993 #149) note fault patterns that suggest a small comp of left-lateral displacement.
Dip Direction	NW *Comments:* No structural data on fault dip have been published, but Geomatrix Consultants, Inc. (1995 #3593) used an estimated dip of 70° in their modeling of earthquake potential of the Abert Rim fault. Similarly, Scarberry and others (201 #7374) assign a 70° dip based on measurements of dip on analogous faults in the region.
Paleoseismology	

studies	
Geomorphic expression	The range-bounding Abert Rim fault is coincident with a prominent 300- to 800-r high escarpment (Abert Rim) in Miocene bedrock along its length. The fault exhi nearly continuous fault scarps on late Pleistocene and Holocene deposits along m the section adjacent to Abert Lake, from the latitude of Valley Falls, northward to Highway Spring (Pezzopane and Weldon, 1993 #149; Pezzopane, 1993 #3544; Geomatrix Consultants Inc., 1995 #3593; Madin and others, 1996 #3479; Weldor others, 2002 #5648). Fault-scarp profiles along this section show scarps are 4- to high on Holocene debris flows and as much as 8 m high on latest Pleistocene dep maximum scarp-slope angles of approximately 30° are near the angle of repose, a places a scarp free face is preserved (Pezzopane and Weldon, 1993 #149; Pezzopa 1993 #3544).
Age of faulted surficial deposits	No radiometric ages have been obtained on deposits along the Abert Lake sectior relations with latest Pleistocene pluvial lake deposits in the region indicate that th fault offsets Holocene colluvium and alluvium, and latest Pleistocene (approxima 16 ka) pluvial lake sediments (Pezzopane and Weldon, 1993 #149; Pezzopane, 19 #3544); however, Licciardi (2001 #7376) suggests the faulted deposit may be a fe thousand years younger.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Fault scarps on post pluvial deposits, steep (30°) scarp-slope angles, a the presence of a scarp free face in places along the fault support a Holocene age most-recent movement on the Abert Lake section of the Abert Rim fault (Pezzopa and Weldon, 1993 #149; Pezzopane, 1993 #3544). Geomatrix Consultants, Inc. (1 #3593), Madin and Mabey (1996 #3575), Madin and others (1996 #3479), and W and others (2002 #5648) also infer Holocene displacement along most of the Abe Lake section.
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* Pezzopane (1993 #3544) and Pezzopane and Weldon (1993 #149) use estimated age of 16 ka and offset measurements of 8 m in latest Pleistocene pluvi deposits to calculate a vertical displacement rate of 0.5 mm/yr for the Abert Lake section of the Abert Rim fault; the rate they cite may be underestimated based on shoreline ages in Licciardi (2001 #7376). They also used a differential elevation o m of latest Pleistocene shorelines across the basin to calculate a deformation rate (mostly on fault) of 0.5–1 mm/yr. Scarsberry and others (2010 #7374) report post

	Ma rates of extension and conclude that the greatest rates of extension (0.4 mm/y based on 70°-dipping fault) occurred on the southern part of the fault and the exte rate to the north is an order of magnitude slower.
Date and Compiler(s)	2016 Stephen F. Personius, U.S. Geological Survey Kathleen M. Haller, U.S. Geological Survey
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