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.

Faults near Owyhee Dam (Class B) No. 808

Last Review Date: 2002-12-03

citation for this record: **Personius, S.F., compiler, 2002, Fault number 808, Faults near Owyhee Dam, 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 01:59 PM.**

Synopsis	Faults near Owyhee Dam are located in a structurally complex region between th Blue Mountains to the north, the Basin and Range to the south, and the Snake Riv Plain to the east. Structural features in this area are dominated by generally north- trending normal faults that form narrow basins and ranges superposed on plateau topography. Bedrock in the region is predominantly Miocene sedimentary and vo rocks. The most prominent of the faults near Owyhee Dam, the Oxbow Basin and Hollow faults, are expressed as scarps, vegetation lineaments, and aligned springs Miocene bedrock, but neither exhibit good geomorphic evidence of Quaternary o Scarps are best preserved in resistant Tertiary volcanic bedrock, but are very subd in Tertiary sedimentary rocks. Evidence of Quaternary displacement is restricted single location about 3 km north of Owyhee Reservoir, where the Oxbow Basin f crosses a minor unnamed drainage. At this location, a 1-m-high scarp is present o bouldery debris-flow alluvium of unknown age. This scarp may be fault related, b could also be a depositional feature formed in the debris-flow deposit. Given the or corroborative evidence anywhere else along any of these faults, we herein clas these structures as Class B until further studies are conducted.

Name comments	This group of faults near Owyhee Dam include the informally named Oxbow Bas Sand Hollow, and Owyhee Ridge faults of Hawkins and others (1989 #3551). Sev other unnamed faults in this area are included in recent fault compilations (Pezzo 1993 #3544; Knudsen and others, 1994 #3594; Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, 1996 #3575; Weldon and others, 2002 #5648).
County(s) and State(s)	MALHEUR COUNTY, OREGON
Physiographic province(s)	COLUMBIA PLATEAU
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 Ferns and others (1993 #3582).
Geologic setting	Faults near Owyhee Dam are located in a structurally complex region between th Blue Mountains to the north, the Basin and Range to the south, and the Snake Riv Plain to the east. Structural features in this area are dominated by generally north-trending normal faults that form narrow basins and ranges superposed on plateau topography (Knudsen and others, 1994 #3594). Bedrock in the region is predomi Tertiary sedimentary and volcanic rocks (Walker and MacLeod, 1991 #3646; Fer Cummings, 1992 #5164; Ferns and others, 1993 #3582).
Length (km)	37 km.
Average strike	N13°W
Sense of movement	Normal *Comments:* Not reported.
Dip Direction	E; W *Comments:* Knudsen and others (1994 #3594) used an estimated dip of 70° and W and others (1999 #5654) used an estimated dip of 60° in their analyses of paleo-earthquake magnitudes on the Oxbow Basin and Sand Hollow faults.
Paleoseismology studies	
Geomorphic	The most prominent of these faults, the Oxbow Basin and Sand Hollow faults, ar

expression	expressed as scarps, vegetation lineaments, and aligned springs on Miocene bedr but neither exhibit good geomorphic evidence of Quaternary offset (Hawkins and others, 1989 #3551). Scarps are best preserved in resistant Tertiary volcanic bedr but are very subdued in Tertiary sedimentary rock (Hawkins and others, 1989 #3 Evidence of Quaternary displacement is restricted to a single location about 3 km of Owyhee Reservoir, where the Oxbow Basin fault crosses a minor unnamed drainage. At this location, a 1-m-high scarp is present in bouldery debris-flow all of unknown age in the channel. Hawkins and others (1989 #3551) concluded that scarp was fault related, but acknowledged that the scarp could also be a depositio feature formed in the debris-flow deposit. Given the lack or corroborative eviden anywhere else along the fault, we herein classify the Oxbow Basin fault as a Clas structure until further studies are conducted.
Age of faulted surficial deposits	A possible fault scarp along the Oxbow Basin fault was identified in bouldery all that Hawkins and others (1989 #3551) assumed was late Quaternary in age. Detai mapping in the region (Ferns and Cummings, 1992 #5164; Ferns and others, 199 #3582) map these faults entirely in Miocene bedrock.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Knudsen and others (1994 #3594) and Geomatrix Consultants, Inc. (1 #3593) inferred that the Oxbow Basin and Sand Hollow faults had undergone mi and late Quaternary displacement, based on the possible fault scarp described by Hawkins and others (1989 #3551). These investigations suggested that the other f in this area, including middle and late Quaternary faults mapped by Pezzopane (1 #3544) to the north and west, had undergone Tertiary or Quaternary, but probably late Quaternary displacement. Wong and others (1999 #5654) considered these fa to be possibly active, with assigned probabilities of 0.5 based on equivocal evide for Quaternary displacement. Weldon and others (2002 #5648) map the Oxbow B fault as active in the Holocene or latest Quaternary, but do not describe the evide for this age assignment. Given the poor documentation of Quaternary displaceme single location along the Oxbow Basin fault, these faults are herein classified as C B structures until further studies are conducted.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No offset Quaternary deposits have been recognized, so Quaternary r are unknown. Slip measurements in bedrock yield generally low, albeit widely divergent, slip rates. Lillie and Crouch (1979 #3778) used Bouguer gravity data t

	estimate offset of as much as 1980 m of the 17 Ma Sucker Creek Formation alon fault that may be the Oxbow Basin fault. In contrast, Hawkins and others (1989 # described 102–5 m high fault scarps on 13–16 Ma Owyhee basalt, and a 1-m-hig scarp on alluvium with an assumed late Quaternary age. Wong and others (1999 #5654) used this slip data to assign preferred slip rates of 0.001 mm/yr on the Ox Basin and Sand Hollow faults for seismic hazard analysis.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#5164 Ferns, M.L., and Cummings, M.L., 1992, Geology and mineral resources o of the Elbow quadrangle, Malheur County, Oregon: State of Oregon, Department Geology and Mineral Industries Geologic Map Series GMS-62, 2 sheets, scale 1:24,000. #3582 Ferns, M.L., Brooks, H.C., Evans, J.G., and Cummings, M.L., 1993, Geol map of the Vale 30 X 60 minute quadrangle, Malheur County, Oregon, and Owyh County, Idaho: State of Oregon, Department of Geology and Mineral Industries Geologic Map Series GMS-77, 12 p. pamphlet, 1 sheet, scale 1:100,000. #3593 Geomatrix Consultants, Inc., 1995, Seismic design mapping, State of Oreg Technical report to Oregon Department of Transportation, Salem, Oregon, under Contract 11688, January 1995, unpaginated, 5 pls., scale 1:1,250,000. #3551 Hawkins, F.F., Gilbert, J.D., and LaForge, R.C., 1989, Seismotectonic stud Warm Springs Dam-Vale Project and Owyhee Dam-Owyhee Project, Oregon: U.S Bureau of Reclamation Seismotectonic Report 89-6, 35 p., 2 pls. #3594 Knudsen, K.L., Wong, I.G., Bott, J.D.J., Weber, G.E., Silva, W.J., and Lett W.R., 1994, Seismotectonic evaluation, Agency Valley and Bully Creek Dams, V Project, east-central Oregon: Draft Report prepared for U.S. Department of the In Bureau of Reclamation, 171 p., 4 pls. #3778 Lillie, R.J., and Couch, R.W., 1979, Geophysical evidence of fault termina of the Basin and Range Province in the vicinity of the Vale, Oregon, geothermal a *in* Newman, G.W., and Goode, H.D., eds., Basin and Range symposium and Grea Basin field conference: Rocky Mountain Association of Geologists, p. 175-184. #3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: of Oregon, Department of Geology and Mineral Industries Geological Map Serie GMS-100, 1 sheet. #3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Or Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.

	#3646 Walker, G.W., and MacLeod, N.S., 1991, Geologic map of Oregon: U.S. Geological Survey, Special Geologic Map, 2 sheets, scale 1:500,000. #5648 Weldon, R.J., Fletcher, D.K., Weldon, E.M., Scharer, K.M., and McCrory, 2002, An update of Quaternary faults of central and eastern Oregon: U.S. Geolog Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000. #5654 Wong, I., Dober, M., Hemphill-Haley, M., Naugler, W., Silva, W.J., and Li 1999, Probabilistic seismic hazard analysis and safety evaluation earthquake grou motions—Bully Creek Dam, Vale Project, eastern Oregon: U.S. Department of th Interior, Bureau of Reclamation Technical Memorandum D8330-99-28.