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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.

Sumpter Valley faults (Class A) No. 711

Last Review Date: 2016-05-02

citation for this record: **Personius, S.F., compiler, 2002, Fault number 711, Sumpter Valley 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 02:03 PM.**

Synopsis	These normal faults appear to offset Quaternary alluvium on the north flank of Sumpter Valley, which is formed in Mesozoic and Paleozoic metamorphic rocks and Tertiary volcanic and volcaniclastic rocks in northeastern Oregon. The faults form an en echelon series of scarps with as much as 25 m of relief on inferred Tertiary or Quaternary gravels north of the Powder River. The age of most-recent faulting on the Sumpter Valley faults is poorly known. Possible Holocene displacement has been inferred on the westernmost of the Sumpter Valley faults, based on airphoto analysis of possible faulted deposits now covered by Phillips Lake. Other studies infer middle and late Quaternary (<700–780 ka) displacement.
Name comments	These faults are named after Sumpter Valley, a small northwest-trending valley in north-central Oregon (Geomatrix Consultants Inc., 1989 #1310).

County(s) and State(s)	BAKER COUNTY, OREGON
Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault traces are from 1:100,000-scale mapping of Weldon and others (2002 #5648), based in part on 1:250,000-scale mapping of Geomatrix Consultants Inc. (1989 #1310).
Geologic setting	These faults appear to offset Quaternary alluvium on the north flank of Sumpter Valley (Geomatrix Consultants Inc., 1989 #1310), which is formed in Mesozoic and Paleozoic metamorphic rocks and Tertiary volcanic and volcaniclastic rocks (Brown and Thayer, 1966 #3577; Walker and MacLeod, 1991 #3646).
Length (km)	12 km.
Average strike	N44°W
Sense of movement	Normal *Comments:* These faults are shown as high-angle, presumably normal faults on maps of the region (Brown and Thayer, 1966 #3577; Geomatrix Consultants Inc., 1989 #1310; Walker and MacLeod, 1991 #3646; Pezzopane, 1993 #3544; Knudsen and others, 1994 #3594).
Dip Direction	SW
Paleoseismology studies	
Geomorphic expression	The faults form an en echelon series of scarps with as much as 25 m of relief on inferred Tertiary or Quaternary gravels north of the Powder River (Geomatrix Consultants Inc., 1989 #1310). Weldon and others (2002 #5648) observed lineaments across Quaternary units on 1:100,000-scale DEMs of the area.
Age of faulted surficial deposits	Geomatrix Consultants Inc. (1989 #1310) conducted airphoto and limited field reconnaissance of the Sumpter Valley faults. The faults offset an extensive inferred Tertiary or Quaternary gravel deposit characterized by significant soil reddening and extensive

	secondary clay accumulation. The prominent westernmost scarp may also offset latest Pleistocene and Holocene sediments in Deer Creek Valley, which flows southeasterly into the Powder River; this offset was observed on airphotos flown before this part of Sumpter Valley was covered by the filling of Phillips Lake.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* The age of most-recent faulting on the Sumpter Valley faults is poorly known. Geomatrix Consultants Inc. (1989 #1310) inferred possible Holocene displacement on the westernmost of the Sumpter Valley faults, based on airphoto analysis of possible faulted deposits now covered by Phillips Lake. Pezzopane (1993 #3544) used airphoto analysis and Weldon and others (2002 #5648) used analysis of airphotos and 1:100,000-scale DEMs to infer middle and late Quaternary (<700–780 ka) displacement on the two prominent Sumpter Valley faults.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No Quaternary slip rate data are available for the Sumpter Valley faults, but offsets of 25 m in inferred Tertiary or Quaternary gravel suggest low rates of long-term slip.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#3577 Brown, E.C., and Thayer, T.P., 1966, Geologic map of the Canyon City quadrangle northeastern Oregon: U.S. Geological Survey Miscellaneous Geologic Investigations I-447, 1 sheet, scale 1:250,000. #1310 Geomatrix Consultants, Inc., 1989, Final report seismotectonic evaluation for Mann Creek Dam site and Mason Dam site: Technical report to U.S. Department of Interior, Bureau of Reclamation, Denver, Colorado, under Contract 6-CS-81-07310, October 1989, 118 p., 2 pls. #3594 Knudsen, K.L., Wong, I.G., Bott, J.D.J., Weber, G.E., Silva, W.J., and Lettis, W.R., 1994, Seismotectonic evaluation,

	Agency Valley and Bully Creek Dams, Vale Project, east-central Oregon: Draft Report prepared for U.S. Department of the Interior, Bureau of Reclamation, 171 p., 4 pls. #3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Oregon: 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, P.A., 2002, An update of Quaternary faults of central and eastern Oregon: U.S. Geological Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000.