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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.

Hite fault system, Hite section (Class A) No. 845a

Last Review Date: 2003-10-03

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Synopsis	**General:** The Hite fault system is a complex zone of faulting that parallels the northeast-trending western flank of the Blue Mountains uplift in northeastern Ore and southeastern Washington; the fault system may overlie the suture zone betwe accreted terranes in the Blue Mountains and the stable craton. Sense of slip on structures included in this zone has been described as normal, left-lateral, and rig lateral strike slip, but recent work is most consistent with a left-lateral oblique (d to-the-west or northwest) sense of slip. Most structures in the Hite fault system a found exclusively in rocks of the Miocene Columbia River Basalt Group, so determination of Quaternary activity is difficult. **Sections:** This fault has 4 sections. The Hite fault system was originally divided i four sections in this compilation; from northeast to southwest, these were the Hit section, the Kooskooskie section, the Thorn Hollow section, and the Agency sect the Hite section and the Kooskooskie section were combined by DOGAMI in the ORActiveFaults compilation

	(http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS
Name comments	**General:** The Hite fault system is a complex zone of faulting that parallels the northeast-trending western flank of the Blue Mountains uplift. The Hite fault was named after U.S. Soil Conservation Service scientist Thomas Hite (Kuehn, 1995 #3478). Faults included in the system herein include the Hite, Thorn Hollow, and Kooskooskie faults (Kienle and others, 1979 #3728); most faults have been mapp Swanson and others (1981 #3496). **Section:** This section consists of the Hite fault, the primary structure in the Hite f system. **Fault ID:** Some of these structures are included in fault number 76 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	COLUMBIA COUNTY, WASHINGTON GARFIELD COUNTY, WASHINGTON UMATILLA COUNTY, OREGON WALLA WALLA COUNTY, WASHINGTON
Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault traces are from 1:100,000-scale compilation of Schuster (1993 a 1994 #4655) in Washington, and ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:100,000-scale mapping of Madin and Ge (2007 #7804) in Oregon.
Geologic setting	The Hite fault system is a complex zone of faulting that parallels the northeast-tre western flank of the Blue Mountains uplift in northeastern Oregon and southeaste Washington; the fault system may overlie the suture zone between accreted terran the Blue Mountains and the stable craton (Reidel and others, 1994 #3539). Sense on structures included in this zone has been described as normal, left-lateral, and lateral strike slip (Newcomb, 1970 #3761; Kienle and others, 1979 #3728; Tolan Reidel, 1989 #3765). Most structures in the Hite fault system are found exclusive rocks of the Miocene Columbia River Basalt Group (Walker, 1973 #3756; Swans others, 1981 #3496; Walker and MacLeod, 1991 #3646; Schuster and others, 199 #3760), so determination of Quaternary activity is difficult.
Length (km)	This section is 87 km of a total fault length of 140 km.
Average strike	N27°E (for section) versus N20°E (for whole fault)

Sense of movement	Left lateral, Normal *Comments:* Sense of slip on the Hite fault has been mapped or described as norm lateral, and right-lateral strike slip (Newcomb, 1970 #3761; Kienle and others, 19 #3728; Myers and others, 1979 #5175; Swanson and others, 1980 #3574; 1981 #3 Tolan and Reidel, 1989 #3765; Schuster, 1993 #4656; 1994 #4655; Schuster and 1997 #3760). However, recent detailed work on faults in the Hite section (Kuehn #3478) indicate left-lateral oblique (down-to-the-northwest) slip; this sense of slip probably characterizes the entire Hite fault system (Reidel and others, 1994 #353
Dip	70–90° NW *Comments:* Limited dip measurements, mostly on subsidiary structures in the Hit section, indicate steeply northwest-dipping attitudes (Kuehn, 1995 #3478). Geom Consultants, Inc. (1995 #3593) modeled the Hite fault as a steeply dipping strike- normal-oblique fault in their analyses of earthquake hazards associated with the H fault.
Paleoseismology studies	
Geomorphic expression	Structures in the Hite section form a complex, up to 1.5-km-wide zone of folding faulting in rocks of the Miocene Columbia River Basalt Group; in some places th zone is cemented with silica and stands in positive relief, and elsewhere forms topographic swales, saddles, and alignments of vegetation and drainages (Kienle others, 1979 #3728; Sandness and others, 1982 #3788; Piety and others, 1990 #3 Kuehn, 1995 #3478). Most geomorphic expression of these faults is related to differential erosion, rather than primary tectonic control on topography (Kienle a others, 1979 #3728). No fault scarps on Quaternary surficial deposits have been described, but Weldon and others (2002 #5648) observed lineaments across Quat deposits on 1:100,000-scale DEMs of the area.
Age of faulted surficial deposits	Structures in the Hite section offset Miocene Columbia River basalts, but no offse Quaternary surficial deposits have been described (Kienle and others, 1979 #3728 Rigby and Othberg, 1979 #3738; Piety and others, 1990 #3733; Geomatrix Consu Inc., 1995 #3593).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Piety and others (1990 #3733) suggest that the latest event on the Hit predates the late Quaternary, and thus occurred prior to 125 ka. Pezzopane (1993 #3544) and subsequent compilations (Geomatrix Consultants Inc., 1995 #3593; M

	and Mabey, 1996 #3575; Weldon and others, 2002 #5648) infer Quaternary (<1.6 Ma) displacement on this part of the Hite fault system.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed fault slip data have been documented, but maximum vert displacement across the fault zone in Miocene Columbia River basalts is 200–30((Kienle and others, 1979 #3728; Kuehn, 1995 #3478); such offsets yield low rate long-term slip. Geomatrix Consultants, Inc. (1995 #3593) use estimated slip rates 0.005-0.05 mm/yr in their analysis of earthquake hazards associated with faults ir Hite section.
Date and Compiler(s)	2003 Stephen F. Personius, U.S. Geological Survey David J. Lidke, U.S. Geological Survey
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