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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.**

## Bull Run thrust (Class B) No. 868

**Last Review Date: 2016-05-09**

***citation for this record:*** **Personius, S.F., compiler, 2002, Fault number 868, Bull Run thrust, 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 03:14 PM.**

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| **Synopsis** | This northeast-striking thrust fault is located in the Bull Run watershed of northe Oregon, in Miocene volcanic rocks of the Columbia River Basalt Group and Plio- Pleistocene volcanic rocks of the High Cascades Province. Thrust displacement a association with the Bull Run anticline indicate that this structure is part of the Ya fold belt of south-central Washington and northern Oregon. No detailed informati Quaternary offset is available, but limited airphoto analysis suggests possible Quaternary displacement. Given the lack of documented geomorphic expression i Quaternary deposits, herein the fault is classified as Class B until further studies a conducted. |
| **Name comments** | The Bull Run thrust is named after its location in the Bull Run watershed of north Oregon and its association with the Bull run anticline, which lies just southeast of mapped fault trace (Vogt, 1981 #3949; Beeson and others, 1989 #4023). |
| **County(s) and State(s)** | MULTNOMAH COUNTY, OREGON<br>CLACKAMAS COUNTY, OREGON |
| **Physiographic** | CASCADE SIERRA MOUNTAINS |

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| **province(s)** | CASCADE-SIERRA MOUNTAINS |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:100,000-scale mapping of Sherrod and S (1995 #3495). |
| **Geologic setting** | This northeast-striking, southeast-dipping thrust fault is located in the Bull Run watershed in northern Oregon, in Miocene volcanic rocks of the Columbia River Basalt Group and Plio-Pleistocene volcanic rocks of the High Cascades (Swanson others, 1981 #3496; Vogt, 1981 #3949; Bela, 1982 #3584; Beeson and others, 198 #4022; Sherrod and Smith, 1989 #3498; Tolan and Reidel, 1989 #3765; Beeson a others, 1989 #4023; Beeson and Tolan, 1990 #3999; Sherrod and Scott, 1995 #34 Walker, 1991 #3646). Thrust displacement and association with the Bull Run anti (Vogt, 1981 #3949; Beeson and others, 1985 #4022; Tolan and Reidel, 1989 #376 Beeson and others, 1989 #4023; Beeson and Tolan, 1990 #3999) indicate that this structure is part of the Yakima fold belt of central Washington and northern Orego |
| **Length (km)** | 9 km. |
| **Average strike** | N4°E |
| **Sense of movement** | Thrust<br><br>*Comments:* The Bull Run thrust is mapped as a southeast-dipping thrust fault (Swanson and others, 1981 #3496; Vogt, 1981 #3949; Bela, 1982 #3584; Beeson others, 1985 #4022; Sherrod and Smith, 1989 #3498; Tolan and Reidel, 1989 #37 Beeson and others, 1989 #4023; Beeson and Tolan, 1990 #3999; Walker and Mac 1991 #3646; Pezzopane, 1993 #3544; Sherrod and Scott, 1995 #3495; Geomatrix Consultants Inc., 1995 #3593). |
| **Dip** | 12° SE.<br><br>*Comments:* Dip measurement from Vogt (1981 #3949) and Beeson and others (19 #4023). |
| **Paleoseismology studies** | |
| **Geomorphic expression** | |
| **Age of faulted** | The fault is mapped in Miocene volcanic rocks of the Columbia River Basalt Gro |

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| **surficial deposits** | and Plio-Pleistocene volcanic rocks of the High Cascades Province (Swanson and others, 1981 #3496; Vogt, 1981 #3949; Bela, 1982 #3584; Beeson and others, 198 #4022; Sherrod and Smith, 1989 #3498; Tolan and Reidel, 1989 #3765; Beeson a others, 1989 #4023; Beeson and Tolan, 1990 #3999; Sherrod and Scott, 1995 #34 Walker, 1991 #3646). No fault scarps on Quaternary surficial deposits have been described. |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | undifferentiated Quaternary (<1.6 Ma)<br><br>*Comments:* Pezzopane (1993 #3544) used airphoto analysis to infer Quaternary (- Ma) displacement, and subsequent compilations (Geomatrix Consultants Inc., 19 #3593; Madin and Mabey, 1996 #3575) also show the fault as active in the Quate (<1.6–1.8 Ma). Weldon and others (2002 #5648) classify this fault as possibly act the Quaternary in their compilation. The fault was judged not active by Geomatri Consultants, Inc. (1990 #3550), and Wong and others (1999 #4073; 2000 #5137) not include this fault in their recent analysis of earthquake hazards in the Portlanc Given the lack of documented geomorphic expression in Quaternary deposits, her we classify the fault as Class B until further studies are conducted. |
| **Recurrence interval** | |
| **Slip-rate category** | Less than 0.2 mm/yr<br><br>*Comments:* Vogt (1981 #3949) measured more than 180 m of vertical offset and a least 900 m of dip slip of Miocene Columbia River Basalt Group rocks across the Such data yield low rates of long-term slip. |
| **Date and Compiler(s)** | 2002<br>Stephen F. Personius, U.S. Geological Survey |
| **References** | #3999 Beeson, M.H., and Tolan, T.L., 1990, The Columbia River basalt group in Cascade Range—A middle Miocene reference datum for structural analysis: Jour Geophysical Research, v. 95, no. B12, p. 19,547-19,559.<br><br>#4022 Beeson, M.H., Fecht, K.R., Reidel, S.P., and Tolan, T.L., 1985, Regional correlations within the Frenchman Springs member of the Columbia River Basalt Group—New insights into the middle Miocene tectonics of northwestern Oregon Oregon Geology, v. 47, no. 8, p. 87-96.<br><br>#4023 Beeson, M.H., Tolan, T.L., and Anderson, J.L., 1989, The Columbia River Basalt Group in western Oregon-Geologic structures and other factors that contro flow emplacement patterns, *in* Reidel, S.P., and Hooper, P.R., eds., Volcanism and tectonism in the Columbia River Flood-Basalt Province: Geological Society of |

America Special Paper 239, p. 223-246.

#3584 Bela, J.L., 1982, Geologic and neotectonic evaluation of north-central Ore
The Dallas 1 x 2 quadrangle: State of Oregon, Department of Geology and Miner
Industries Geologic Map Series GMS-27, 2 sheets, scale 1:250,000.

#3550 Geomatrix Consultants, Inc., 1990, Seismotectonic evaluation of Wasco D
site: Technical report to U.S. Department of Interior, Bureau of Reclamation, Der
under Contract 6-CS-81-07310, 115 p., 2 pls., scale 1:250,000.

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Technical report to Oregon Department of Transportation, Salem, Oregon, under
Contract 11688, January 1995, unpaginated, 5 pls., scale 1:1,250,000.

#3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon:
of Oregon, Department of Geology and Mineral Industries Geological Map Series
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.

#3495 Sherrod, D.R., and Scott, W.E., 1995, Preliminary geologic map of the Mo
Hood 30 by 60 minute quadrangle, northern Cascade Range, Oregon: U.S. Geolo
Survey Open-File Report 95-219, 28 p., 1 pl., scale 1:100,000.

#3498 Sherrod, D.R., and Smith, J.G., 1989, Preliminary map of upper Eocene to
Holocene volcanic and related rocks of the Cascade Range, Oregon: U.S. Geolog
Survey Open-File Report 89-14, 20 p., 1 pl., scale 1:500,000.

#3496 Swanson, D.A., Anderson, J.L., Camp, V.E., Hooper, P.R., Taubeneck, W.H
and Wright, T.L., 1981, Reconnaissance geologic map of the Columbia River Bas
Group, northern Oregon and western Idaho: U.S. Geological Survey Open-File R
81-797, 35 p., 5 pls., scale 1:250,000.

#3765 Tolan, T.L., and Reidel, S.P., 1989, Structure map of a portion of the Colu
River flood-basalt Province, *in* Reidel, S.P., and Hooper, P.R., eds., Volcanism an
tectonism in the Columbia River Flood-Basalt Province: Geological Society of
America Special Paper 239, 1 sheet, scale 1:500,000.

#3949 Vogt, B.F., 1981, The stratigraphy and structure of the Columbia River bas
group in the Bull Run Watershed, Multnomah and Clackamas Counties, Oregon:
Portland State University, unpublished M.S. thesis, 145 p., 2 pls.

#3646 Walker, G.W., and MacLeod, N.S., 1991, Geologic map of Oregon: U.S.

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| | Geological Survey, Special Geologic Map, 2 sheets, scale 1:500,000.<br><br>#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.<br><br>#4073 Wong, I., Silva, W., Bott, J., Wright, D., Thomas, P., Gregor, N., Li, S., Ma M., Sojourner, A., and Wang, Y., 1999, Earthquake scenario and probabilistic gro shaking maps for the Portland, Oregon metropolitan area: Technical report to U.S Geological Survey, under Contract 1434-HQ-96-GR-02727, 16 p., 12 pls.<br><br>#5137 Wong, I., Silva, W., Bott, J., Wright, D., Thomas, P., Gregor, N., Li, S., Ma M., Sojourner, A., and Wang, Y., 2000, Earthquake scenario and probabilistic gro shaking maps for the Portland, Oregon, metropolitan area: State of Oregon, Department of Geology and Mineral Industries Interpretive Map Series IMS-16, pamphlet, scale 1:62,500. |