

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](#).

Duchesne-Pleasant Valley fault system (Class B) No. 2414

Last Review Date: 1999-10-01

Compiled in cooperation with the Utah Geological Survey

citation for this record: Black, B.D., and Hecker, S., compilers, 1999, Fault number 2414, Duchesne-Pleasant Valley fault system, 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 02:55 PM.

Synopsis	Poorly understood suspected Quaternary faults (Class B) in Duchesne and Pleasant Valleys in the Uinta Basin. Photogeologic mapping indicates that no scarps are present on late Quaternary (>250 ka?) deposits. However, the geomorphic position of the faults suggests the possibility of late Quaternary faulting, perhaps less than a thousand years ago judging from scarp morphology. No detailed paleoseismic investigations have been conducted to confirm Quaternary movement on this fault system.
Name	

Name comments	Fault ID: Refers to fault number 12-1 of Hecker (1993 #642).
County(s) and State(s)	DUCHESNE COUNTY, UTAH
Physiographic province(s)	COLORADO PLATEAUS
Reliability of location	Good Compiled at 1:250,000 scale. <i>Comments:</i> Mapped or discussed by Stokes and Madsen (1961 #5010), Osborne (1973 #5004), Martin and others (1985 #4998), and Sullivan (1988). Mapping from Stokes and Madsen (1961#5010).
Geologic setting	East-west trending normal faults in Duchesne and Pleasant Valleys in the southern Uinta Basin. Slopes in the southern part of the basin are mainly dip slopes on harder layers of the Eocene Green River and Uinta Formations. The structural axis of the basin trends east-west and is about 16 km north of the topographic low (followed by the Duchesne River).
Length (km)	46 km.
Average strike	N89°W
Sense of movement	Normal
Dip Direction	N; S
Paleoseismology studies	
Geomorphic expression	The faults are expressed as prominent lineaments and escarpments in bedrock. Photogeologic mapping indicates that no scarps are present on late Quaternary (>250 ka?) deposits. This evidence, together with a fault orientation that appears to be at odds with the contemporary tectonic stress regime, indicated to Sullivan (1988 #5012) that the fault system should not be considered a potential source for large-magnitude earthquakes. A relation between variations in escarpment height and drainage incision led Sullivan (1988 #5012) to conclude that the escarpments are fault-line features, resulting from base-level lowering and erosion rather than Quaternary faulting. However, the geomorphic position of the faults suggested to Martin and

	others (1985 #4998) the possibility of late Quaternary faulting, and judging from scarp morphology, Osborn (1973 #5004) thought that faulting may have occurred less than a thousand years ago.
Age of faulted surficial deposits	Tertiary.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i> Based on escarpment morphology and the presence of lineaments. However, No detailed paleoseismic investigations have been conducted to confirm Quaternary movement on this fault system.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr
Date and Compiler(s)	1999 Bill D. Black, Utah Geological Survey Suzanne Hecker, U.S. Geological Survey
References	#642 Hecker, S., 1993, Quaternary tectonics of Utah with emphasis on earthquake-hazard characterization: Utah Geological Survey Bulletin 127, 157 p., 6 pls., scale 1:500,000. #4998 Martin, R.A., Jr., Nelson, A.R., Weisser, R.R., and Sullivan, J.T., 1985, Seismotectonic study for Taskeech Dam and Reservoir site, Upalco Unit and Upper Stillwater Dam and Reservoir site, Bonneville Unit, Central Utah Project, Utah: U.S. Bureau of Reclamation Seismotectonic Report 85-2, 95 p. #5004 Osborn, G.D., 1973, Quaternary geology and geomorphology of the Uinta basin and the south flank of the Uinta Mountains: Berkeley, University of California, unpublished Ph.D. dissertation, 266 p. #5010 Stokes, W.L., and Madsen, J.H., Jr., compilers, 1961, Geologic map of Utah, northeast quarter: Utah State Land Board,

1 sheet, scale 1:250,000.

#5012 Sullivan, J.T., 1988, Seismotectonic study for Starvation Dam, Bonneville Unit, Central Utah Project, Utah: U.S. Bureau of Reclamation Seismotectonic Report 88-7, 14 p.

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