

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](#).

Fish Lake Valley fault zone, Cucomongo section (Class A) No. 49d

Last Review Date: 1994-06-01

Compiled in cooperation with the California Geological Survey

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Synopsis

General: Major structure consisting of a long zone of right-oblique and normal faults and subsidiary left-lateral faults and thrust faults that extend mainly north from the Northern Death Valley fault zone [114] from California into western Nevada. Most of the fault has been mapped at 1:24,000 scale and trenching has been conducted on the Leidy Creek [49a] and Oasis [49c] sections of the fault zone, but not in the Wildhorse Creek [49b] and Cucomongo Canyon [49d] sections, which border Death Valley National Park. The entire fault zone has been active, repeatedly, in the latest Quaternary (<15 ka), with some sections

having evidence for late Holocene surface rupturing. Slip rates are typically 1–5 mm/yr, but exceed 5 mm/yr along the Oasis section. This fault zone is one of the most active in the western Basin and Range province.

Sections: This fault has 4 sections. The sections are modified from those defined by Brogan and others and by Sawyer who called them subzones, on the basis of distinct differences in fault strike and faulting style and possible differences in the timing of the most recent event along the fault zone. The Leidy Creek and Wildhorse Creek sections are the same as Brogan and others' Chiatovich Creek and Dyer sections and Sawyer's "northern" and "Dyer" subzones. The Oasis section includes the Oasis and Horsethief Canyon sections of Brogan and others, and combines the "eastern" and "western" subzones (parallel fault strands) of Sawyer into one section. The Cucomongo Canyon section is the same as that of Brogan and others.

**Name
comments**

General: Named by Sawyer (1990 #1633) and subsequently adopted in maps by Reheis and others (1993 #648; 1995 #3823). Previously referred to as the northern part of the Furnace Creek fault zone of the northern part of the Death Valley-Furnace Creek fault zone or fault system (*e.g.*, McKee, 1968 #1574; Stewart, 1988 #1654; Brogan and others, 1991 #298; Oldow, 1992 #3821). Extends from Chiatovich Creek in the north to about 12 km south of Last Chance Canyon in northern Death Valley (Machette, 2001 #4773). Joins Northern Death Valley fault zone [141] at Little Sand Springs within northern part of Death Valley National Park.

Section: Section extends from where the Eureka Valley Road enters into Willow Wash in the north to Last Chance Canyon and northernmost Death Valley in the south. This usage has the same lateral extent as the Cucomongo Canyon section of Brogan and others (1991 #298). Machette and others (2001 #4773) suggest that the Fish Lake Valley and Northern Death Valley fault zones adjoin one another at Little Sand Spring, about 12 km south of Last Chance Canyon. Section consists of a single main fault for most of its length; however, several inactive parallel strands to the north offset Pliocene deposits in Willow Wash and extend into quartz monzonite as strongly sheared zones east of Willow Wash. Strikes NW at both ends of segment, but curves into due E-W strike in the middle, where the fault has a strong reverse component (a compressional bend).

Fault ID: Refers to fault 211 of Jennings (1994 #2878) and faults

	DV-1a, -1b, and -1c of dePolo (1998 #2845).
County(s) and State(s)	INYO COUNTY, CALIFORNIA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. <i>Comments:</i> Location of most of the faults on 1:24,000-scale map (Reheis, 1992 #1605) were compiled at 1:100,000 scale by Reheis and Noller (1991 #1195) and subsequently at 1:250,000 scale by Piety (1995 #915).
Geologic setting	High-angle, right-oblique, down-to-east fault zone in Fish Lake Valley, bounding east side of White Mountains and the east side of the Horsethief Hills (informal name, Reheis, 1992 #1605) between Eureka and Fish Lake valleys.
Length (km)	This section is 33 km of a total fault length of 99 km.
Average strike	N38°W (for section) versus N15°W (for whole fault)
Sense of movement	Right lateral <i>Comments:</i> As shown on 1:24,000-scale map by Reheis (1992 #1605) and at 1:100,000 scale by Reheis and Noller (1991 #1195).
Dip	15–90° SE. <i>Comments:</i> Measured dips are abundant because fault is mostly exposed in bedrock. Dips are vertical (90°) to steeply SE at northern and southern ends of segment where fault strikes northwest, and gradually decrease to a minimum of 15° at the confluence of Willow Wash and Cucomongo Canyon, where fault strikes E-W; here, Jurassic quartz monzonite is thrust over Paleozoic sedimentary rocks (Reheis, 1992 #1605).
Paleoseismology studies	
Geomorphic expression	Fault is mostly expressed as strongly sheared zones in bedrock units. Where fault is within Quaternary deposits, shutter ridges,

	offset drainages, and linear notches are common (Brogan and others, 1991 #298; Reheis, 1992 #1605).
Age of faulted surficial deposits	Holocene (5 percent); late Pleistocene (15 percent); middle and early Pleistocene (5 percent); Pliocene (10 percent); Miocene (5 percent); Mesozoic and Paleozoic (60 percent).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) <i>Comments:</i> Fault offsets deposits of middle to late Holocene age.
Recurrence interval	
Slip-rate category	Between 1.0 and 5.0 mm/yr <i>Comments:</i> Early Holocene deposits are apparently offset about 25 m in one locality, yielding a slip rate of 2.5-5 mm/yr; however, little work has been done on this section
Date and Compiler(s)	1994 Marith C. Reheis, U.S. Geological Survey, Emeritus
References	#298 Brogan, G.E., Kellogg, K.S., Slemmons, D.B., and Terhune, C.L., 1991, Late Quaternary faulting along the Death Valley-Furnace Creek fault system, California and Nevada: U.S. Geological Survey Bulletin 1991, 23 p., 4 pls., scale 1:62,500. #2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 p. #2878 Jennings, C.W., 1994, Fault activity map of California and adjacent areas, with locations of recent volcanic eruptions: California Division of Mines and Geology Geologic Data Map 6, 92 p., 2 pls., scale 1:750,000. #4773 Machette, M.N., Klinger, R.E., Knott, J.R., Wills, C.J., Bryant, W.A., and Reheis, M.C., 2001, A proposed nomenclature for the Death Valley fault system, <i>in</i> Machette, M.N., Johnson, M.L., and Slate, J.L., eds., eds., Quaternary and late Pliocene geology of the Death Valley region—Recent observations on

tectonics, stratigraphy, and lake cycles (Guidebook for the 2001 Pacific Cell, Friends of the Pleistocene Fieldtrip): U.S. Geological Survey Open-File Report 01-51, p. J173-J183.

#1574 McKee, E.H., 1968, Age and rate of movement of the northern part of the Death Valley-Furnace Creek fault zone, California: Geological Society of America Bulletin, v. 79, p. 509-512.

#3821 Oldow, J.S., 1992, Late Cenozoic displacement partitioning in the northwestern Great Basin, *in* Craig, S.D., ed., Structure, tectonics, and mineralization of the Walker Lane: Geological Society of Nevada, Proceedings of the Walker Lane symposium, p. 17-52.

#915 Piety, L.A., 1995, Compilation of known and suspected Quaternary faults within 100 km of Yucca Mountain, Nevada and California: U.S. Geological Survey Open-File Report 94-112, 404 p., 2 pls., scale 1:250,000.

#1605 Reheis, M.C., 1992, Geologic map of late Cenozoic deposits and faults in parts of the Soldier Pass and Magruder Mountain 15' quadrangles, Inyo and Mono Counties, California, and Esmeralda County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2268, 1 sheet, scale 1:24,000.

#1195 Reheis, M.C., and Noller, J.S., 1991, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the eastern part of the Benton Range 1:100,000 quadrangle and the Goldfield, Last Chance Range, Beatty, and Death Valley Junction 1:100,000 quadrangles, Nevada and California: U.S. Geological Survey Open-File Report 90-41, 9 p., 4 sheets, scale 1:100,000.

#648 Reheis, M.C., Sawyer, T.L., Slate, J.L., and Gillespie, A.R., 1993, Geologic map of late Cenozoic deposits and faults in the southern part of the Davis Mountain 15' quadrangle, Esmeralda County, Nevada: U.S. Geological Survey Miscellaneous Investigations Map I-2342, 1 sheet, scale 1:24,000.

#3823 Reheis, M.C., Slate, J.L., and Sawyer, T.L., 1995, Geologic map of late Cenozoic deposits and faults in parts of the Mt. Barcroft, Piper Peak, and Soldier Pass 15' quadrangles, Esmeralda County, Nevada, and Mono County, California: U.S. Geological

Survey Miscellaneous Investigations Map I-2464, 2 sheets.

#1633 Sawyer, T.L., 1990, Quaternary geology and neotectonic activity along the Fish Lake Valley fault zone, Nevada and California: Reno, University of Nevada, unpublished M.S. thesis, 379 p., 6 pls.

#2384 Sawyer, T.L., 1991, Quaternary faulting and Holocene paleoseismicity of the northern Fish Lake Valley fault zone, Nevada and California, *in* Field trip to Fish Lake Valley, California-Nevada:, Friends of the Pleistocene, Pacific Cell, May 31-June 2, 1991, Guidebook, p. 114-138.

#1654 Stewart, J.H., 1988, Tectonics of the Walker Lane belt, western Great Basin— Mesozoic and Cenozoic deformation in a zone of shear, *in* Ernst, W.G., ed., Metamorphism and crustal evolution of the western United States, Ruby Volume VII: Englewood Cliffs, New Jersey, Prentice Hall, p. 683-713.

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