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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.

Channel Islands thrust fault (Class A) No. 139

Last Review Date: 2006-07-18

citation for this record: **Fisher, M.A., compiler, 2006, Fault number 139, Channel Islands thrust fault, 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 02:14 PM.**

Synopsis	The Channel Islands thrust fault is hypothesized from structural modeling to be a blind fault that dips north, verges south and underlies the Santa Barbara Channel at depths between 8 and 16 km. This thrust fault is part of the province boundary separating the Western Transverse Ranges Province, on the north, from the California continental borderland, on the south.
Name comments	
County(s) and State(s)	VENTURA COUNTY, CALIFORNIA (offshore)
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Poor Compiled at 1: scale.

	Comments: Location of fault from Qt_flt_ver_3-0_Final_WGS84_polyline.shp (Bryant, W.A., written communication to K.Haller, August 15, 2017) based on geometric representation of the thrust ramp is from Plesch and others (2007).
Geologic setting	The Channel Islands thrust fault is hypothesized to exist mainly because axial-surface modeling of structures in the Santa Barbara Basin (Shaw and Suppe, 1994) seems to demand a deep thrust fault having ramp-flat structure to account for the development of overlying basin features. This thrust fault began to form in the late Miocene to early Pliocene, following a period of extensional faulting in the basin. The island platform below Anacapa to Santa Cruz Islands is thought to be uplifted by complicated thrust faulting near the tip of the thrust fault. This fault may not extend west of Santa Cruz Island, and according to Shaw and Suppe (1994), to the east, between Anacapa Island and the California mainland, the fault strikes northeastward into the Ventura Basin, following the course of the submarine Hueneme Canyon.
Length (km)	km.
Average strike	
Sense of movement	Thrust
Dip Direction	N *Comments:* The fault is thought to have variable dips; 30˚ in the south and 0˚ beneath the axis of the Santa Barbara Basin (Shaw and Suppe, 1994). The Community Fault Model (CFM) (Plesch and others, 2007) depicts the Channel Islands thrust fault with a 21° N. dip panel that extends from 7.4 to 14.7 km below sea level.
Paleoseismology studies	
Geomorphic expression	The fault's tip follows the base of the slope south of the northern Channel Islands.
Age of faulted surficial deposits	Shaw and Suppe (1994) indicate that Quaternary sediment is flexed to dip south above the tip of this thrust fault.

Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:*
Recurrence interval	
Slip-rate category	Between 1.0 and 5.0 mm/yr *Comments:* Shaw and Suppe (1994)
Date and Compiler(s)	2006 Michael A. Fisher, U.S. Geological Survey
References	#8407 Plesch, A., Shaw, J.H., Benson, C., Bryant, W.A., Carena, S., Cooke, M., Dolan, J., Fuis, G., Gath, E., Grant, L., Hauksson, E., Jordan, T., Kamerling, M., Legg, M., Lindvall, S., Magistrale, H., Nicholson, C., Niemi, N., Oskin, M., Perry, S., Planansky, G., Rockwell, T., Shearer, P., Sorlien, C., Süss, M.P., Suppe, J., Treiman, J., and Yeats, R., 2007, Community Fault Model (CFM) for southern California: Bulletin of the Seismological Society of America, v. 97, p. 1793–1802. #8475 Shaw, J.H., and Suppe, J., 1994, Active faulting and growth folding in the eastern Santa Barbara Channel: Geological Society America Bulletin, v. 106, p. 607–626. #8477 Shaw, J. Plesch, A., and Planansky, G., 2004, Community Fault Model, updated 1/4/04: Harvard College Geology Department, http://structure.harvard.edu/cfm, site accessed 5/06.