SAN ANDREAS FAULT

The San Andreas Fault is a continental transform fault that runs a length of roughly 810 miles (1,300 km) through California in the United States. The fault's motion is right-lateral strike-slip (horizontal motion). It forms the tectonic boundary between the Pacific Plate and the North American Plate.

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All land west of the fault on the Pacific Plate is moving slowly to the northwest while all land east of the fault is moving southwest (relatively southeast as measured at the fault) under the influence of plate tectonics. The rate of slippage averages approximately 33 to 37 millimetres (1.3 to 1.5 in) annually across California.

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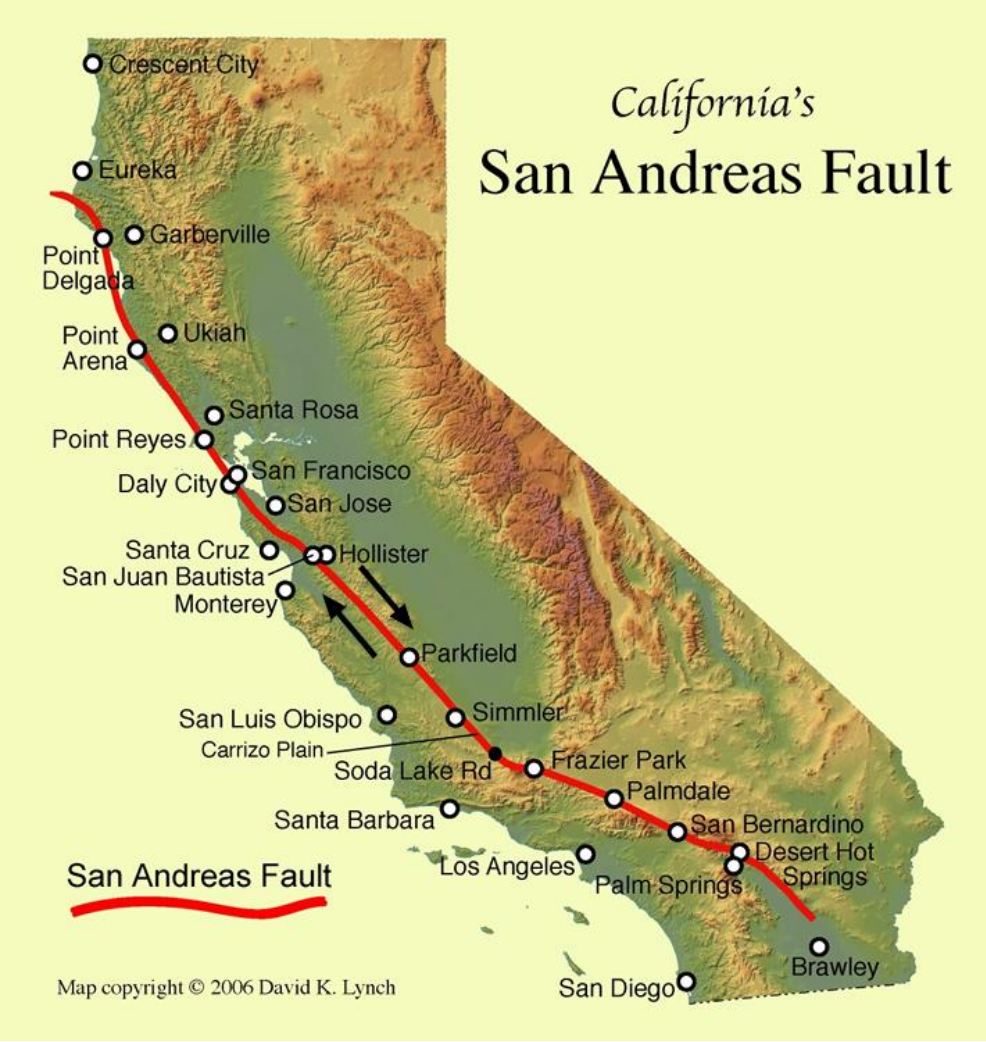
The SAF was born when the Pacific Plate first touched the North American Plate. Before this time the Farallon Plate was subducting under North America, and most of it is now scraping along the bottom of the NA plate, ultimately to descend into the mantle, melt and be recycled. Pieces of the Farallon Plate are still around as the Juan de Fuca, Cocos and Rivera plates. The boundary between the Pacific and Farallon plates is called the East Pacific Rise (EPR). The EPR still exists as a series of transform faults and spreading centers that run the length of the Sea of Cortez; indeed, it was the EPR the split Baja from mainland Mexico.



The San Francisco earthquake of 1906 was a major earthquake that struck San Francisco and the coast of Northern California at 5:12 a.m. on Wednesday, April 18, 1906. Devastating fires broke out in the city and lasted for several days. As a result of the quake and fires, about 3,000 people died and over 80% of San Francisco was destroyed.

As damaging as the earthquake and its aftershocks were, the fires that burned out of control afterward were even more destructive. It has been estimated that up to 90% of the total destruction was the result of the subsequent fires. Over 30 fires, caused by ruptured gas mains, destroyed approximately 25,000 buildings on 490 city blocks.

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"The transportation system, the water pipelines crossing the faults, [and] the bridges have been retrofitted, except for the Bay Bridge, not quite finished yet, " said Schwartz.

The collapse of part of the Bay Bridge in the1989 quake made it a symbol of the state's vulnerable infrastructure. The replacement bridge scheduled for completion in 2013 includes innovations designed to let it bend and swing and rock in a major earthquake.

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The San Andreas Fault received its name from Andrew Lawson after the 1906 earthquake. He named it for San Andreas Lake, a (now) man-modified sag pond in San Mateo county through which the fault passes.

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California's largest recorded earthquakes:

7.9	Jan. 9, 1857	Fort Tejon	2 killed, 220-mile surface scar
7.9	April 18, 1906	San Francisco	3,000 killed, $524 million in property damage, including fire damage
7.8	March 26, 1872	Owens Valley	27 killed, 3 aftershocks of 6.25+
7.5	July 21, 1952	Kern County	12 killed, 3 aftershocks of 6+

Engineers would like to make every building earthquake-proof, but can't because it's too expensive. Instead, they recommend making dams and public buildings earthquake-proof. All other buildings should be earthquake resistant to avoid deaths. The cost of repair is a fraction of the cost of earthquake-proofing these buildings. The Transamerica Pyramid Building in San Francisco is earthquake-proof. It swayed more than one foot in the 1989 earthquake but wasn't damaged.

On maps, aerial photographs, or satellite images, at almost any scale, the San Andreas fault zone appears as a linear scar across the landscape. At scales small enough to display the entire fault length, valleys, bays, chains of lakes and ponds, linear flanks of mountain ranges, and elongate ridges bounding one side or the other of the fault are the principal features that reveal its location.

Erosion of the softer broken and sheared rocks in the several-hundred-meters- to 1-km-wide fault zone accounts for much of the valley-like expression of the fault, but differential vertical displacements also play a major role. The ratio of local horizontal to vertical displacement may be about 10 or 20 to 1. Differential erosion of the various rock types juxtaposed by faulting also influences the geomorphic expression of the fault.

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