



Sources of Data

We are grateful to the staffs of the following networks for providing their 1980-1994 earthquake data:

U.S. Geological Survey and California Institute of Technology, Southern California Seismograph Network, Pasadena, CA

U.S. Geological Survey, Northern California Seismograph Network, Menlo Park, CA

U.S. Geological Survey, Southern Great Basin Seismograph Network, Golden, CO

University of Nevada, Reno Seismological Laboratory

The locations of M_s 5.5 earthquakes and the table of "Known M_s 5.5 Earthquakes Since 1836" are primarily from the following sources:

Dever, D.L., 1990, Forebushes and aftershocks of large (M_s 5.5) earthquakes within the western cordillera of the United States: *Seismological Society of America Bulletin*, v. 80, p. 119-128.

Ellsworth, W.L., 1990, Earthquake history, 1769-1989, in Wallace, R.E., ed., *The San Andreas Fault System, California*: U.S. Geological Survey Professional Paper 1515, p. 153-187.

Hutton, L.K. and Jones, L.M., 1993, Local magnitudes and apparent variations in seismicity rates in southern California: *Seismological Society of America Bulletin*, v. 83, p. 313-329.

Rail, C., Toppenstedt, T.R., and Park, D.L., 1978, Earthquake catalog of California, January 1, 1800 - December 31, 1974: California Division of Mines and Geology Special Publication 52.

Toppenstedt, T.R., Rail, C., and Park, D.L., 1981, Preparation of isostatic maps and summaries of reported effects for pre-1900 California earthquakes: California Division of Mines and Geology Open-File Report 81-1.

References for most of the rupture areas can also be found in Ellsworth (1990).

Magnitude			Earthquakes
<5.5	5.5-6.4	≥6.5	Date
	○	○	1 January 1836 — 31 January 1994
•			1 January 1980 — 31 January 1994

Rupture Zones

Vertical, strike/slip faults

Dipping faults

Note: rupture zone patterns are applied so that areas of overlap can be perceived clearly. The pattern angles do not denote any characteristic.

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EARTHQUAKES IN CALIFORNIA AND NEVADA

by Susan K. Guter⁽¹⁾, David H. Oppenheimer⁽¹⁾, and James J. Mori⁽¹⁾, Martha K. Savage⁽²⁾, and Robert P. Masse⁽¹⁾

(1) U.S. Geological Survey
(2) University of Nevada, Reno

1994

Each year seismic networks record more than 30,000 earthquakes with magnitudes (M) as small as 1.0 in California and Nevada. Historic accounts indicate more than 260 earthquakes of M_s 5.5 have occurred in this region between 1836 and 1994. This map depicts the recent and historic seismicity in three ways. The small red dots represent epicenters of earthquakes between 1 January 1980 and 31 January 1994. The black circles depict all known epicenters of M_s 5.5 earthquakes since 1836. A number adjacent to an epicentral location refers to an entry in the table "Known M_s 5.5 Earthquakes Since 1836". The hatched regions indicate the surface projection of fault rupture for significant earthquakes as inferred from geologic observations of surface deformation and estimates of subsurface faulting from geophysical methods. Tightly spaced hachures represent vertical, strike-slip faults, and wider spaced hachures designate dipping faults.

Although great earthquakes on well-known faults like the San Andreas accommodate most of the relative plate motion between the Pacific and North American plates, this map shows that deformation of the brittle crust occurs over a much broader region. Many faults that are capable of producing large earthquakes are quiescent for long periods between the occurrence of large earthquakes. Particularly noteworthy

examples of such faults are the 1857 and 1906 rupture zones of the San Andreas Fault and most faults in Nevada that ruptured in M_s 6 earthquakes this century. Consequently, the faults illuminated by the seismicity on this map are not representative of all faults in this region which have seismicogenic potential.

The 1980-1994 earthquakes portrayed in this map were selected on the basis of location accuracy. Of the 300,000 earthquakes plotted, 5% have epicentral uncertainties less than 2.5 km. The selection criteria were relaxed for earthquakes occurring offshore, in parts of the Sierra Nevada, and in Nevada where fewer seismic stations exist. In these latter regions M_s 2.5 earthquakes are not reliably detected. Because of this non-uniform earthquake detection capability and the short time interval depicted, apparent variations in the rates of seismicity in different regions may not accurately reflect long-term rates. The accuracy of the M_s 5.5 epicenters depends on the date and location. For earthquakes occurring before 1910, the location uncertainty is controlled by the distribution of felt reports. Unless fixed by surface rupture, the uncertainty is at least 25 km but can approach 100 km. Between 1910 and 1960, the uncertainty ranges from several to tens of kilometers. The rupture zones depicted by the hachure patterns are only approximations.

Earthquake	Magnitude	Earthquake	Magnitude	Earthquake	Magnitude
1 Oakland, CA - June 10, 1836	6.9	19 Mendocino, CA - April 15, 1898	6.5	36 Fairview Peak, NV - December 16, 1954	7.1
2 San Francisco Peninsula, CA - June, 1838	7	20 1906 Earthquake, CA - April 18, 1906	8.4	37 Dixie Valley, NV - December 16, 1954	6.8
3 Volcano Lake, B.C. - November 29, 1852	6.9	21 Morgan Hill, CA - July 1, 1911	6.5	38 East of Arcata, CA - December 21, 1954	6.6
4 Ft. Tejon, CA - January 9, 1857	8.0	22 Pleasant Valley, NV - October 3, 1915	7.3	39 Borrego Mountain, CA - April 9, 1968	6.5
5 Carson City, NV - March 15, 1860	6.9	23 San Jacinto, CA - April 21, 1918	6.9	40 San Fernando, CA - February 9, 1971	6.6
6 S. Santa Cruz Mtns., CA - October 8, 1865	6.9	24 Eureka, CA - July 15, 1918	6.5	41 Eureka, CA - November 8, 1980	7.2
7 Hayward, CA - October 21, 1868	7	25 Eureka, CA - January 31, 1922	7.3	42 Coalinga, CA - May 2, 1983	6.5
8 Olinghouse Fault, NV - December 27, 1869	6.7	26 Cape Mendocino, CA - January 22, 1923	7.2	43 Superstition Hills, CA - November 24, 1987	6.6
9 Owens Valley, CA - March 26, 1872	7.6	27 Lompoc, CA - November 4, 1927	7.3	44 Loma Prieta, CA - October 18, 1989	7.1
10 Owens Valley, CA - March 26, 1872	6.6	28 Cedar Mountain, NV - December 21, 1932	7.2	45 Petrolia, CA - April 25, 1992	7.1
11 Owens Valley, CA - April 11, 1872	6.9	29 Imperial Valley, CA - May 19, 1940	6.9	46 Cape Mendocino, CA - April 26, 1992	6.6
12 Crescent City, CA - November 23, 1873	6.9	30 Cape Mendocino, CA - February 9, 1941	6.6	47 Cape Mendocino, CA - April 26, 1992	6.6
13 Carson City, NV - June 3, 1887	6.9	31 Fish Creek Mountains, CA - October 21, 1942	6.6	48 Landers, CA - June 28, 1992	7.3
14 San Jacinto or Elsinore Fault, CA - Feb. 9, 1890	6.9	32 Manix, CA - April 10, 1947	6.5	49 Northridge, CA - January 17, 1994	6.7
15 Laguna Salada, B.C. - February 24, 1872	7	33 Kern County, CA - July 21, 1952	7.5		
16 Vacaville, CA - April 19, 1892	6.9	34 Rainbow Mountain, NV - July 6, 1954	6.6		
17 San Jacinto or Elsinore Fault, CA - May 28, 1892	6.9	35 Stillwater, NV - August 24, 1954	6.8		
18 Mare Island, CA - March 31, 1898	6.9				

Known Magnitude ≥6.5 Earthquakes Since 1836

The above earthquakes are identified on the map by a bold circle labeled with the reference number. Dates are given in Greenwich Mean Time.

3 1818 00213325 2