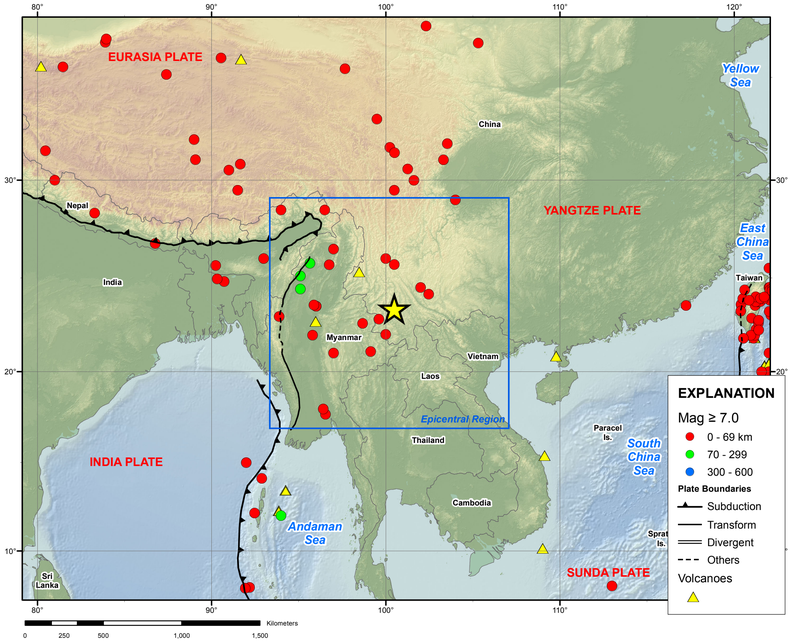
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

EARTHQUAKE SUMMARY MAP

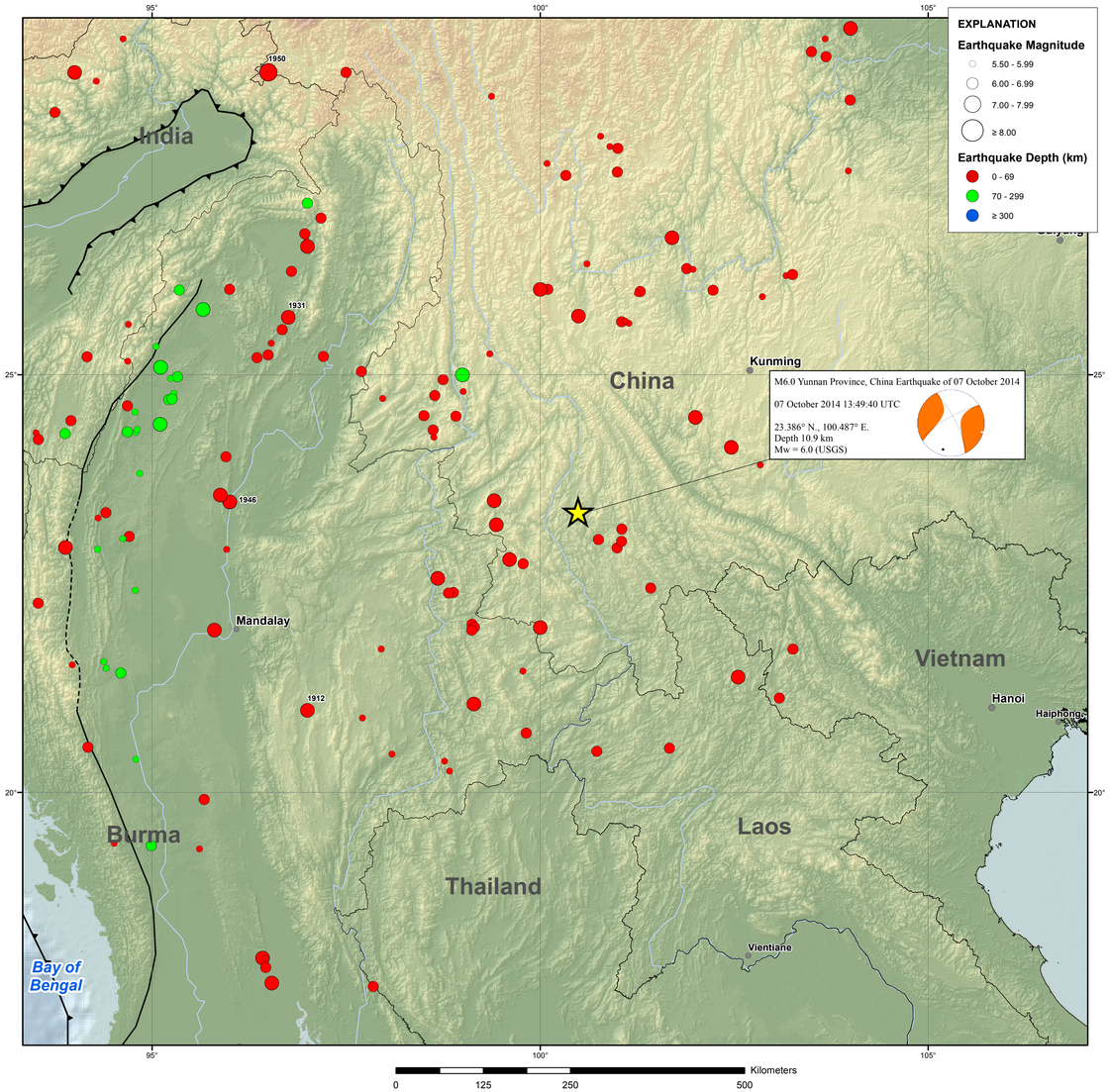
Prepared in cooperation with the Global Seismographic Network

M6.0 Yunnan Province, China Earthquake of 07 October 2014

Tectonic Setting



Epicentral Region



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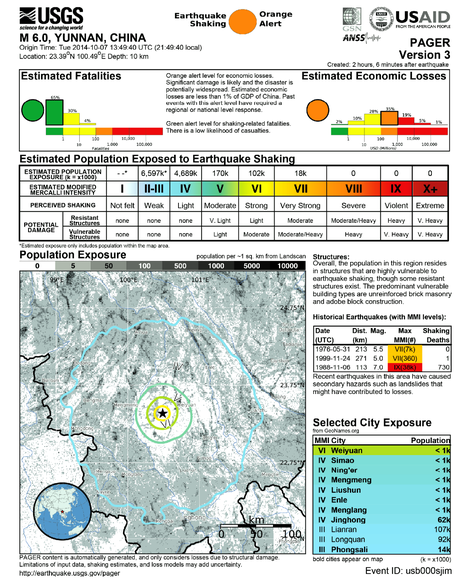
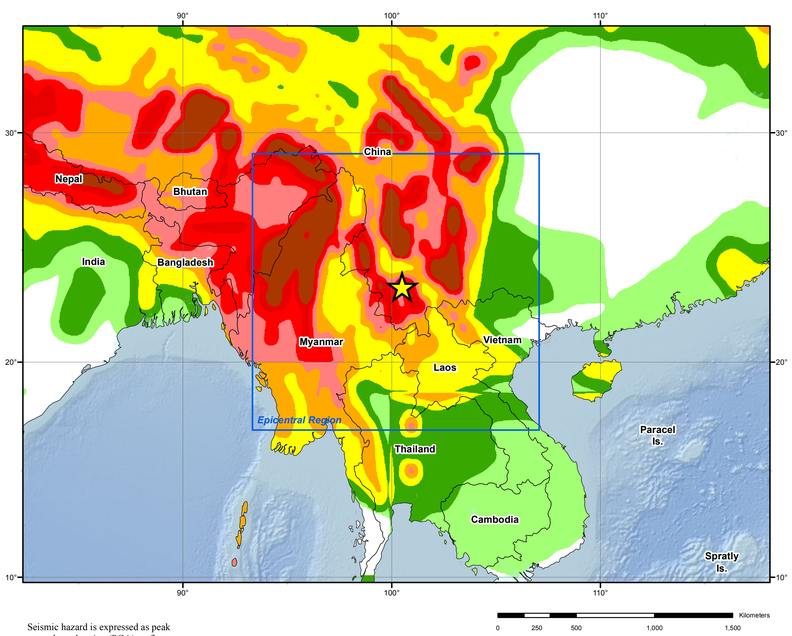


Seismic Hazard

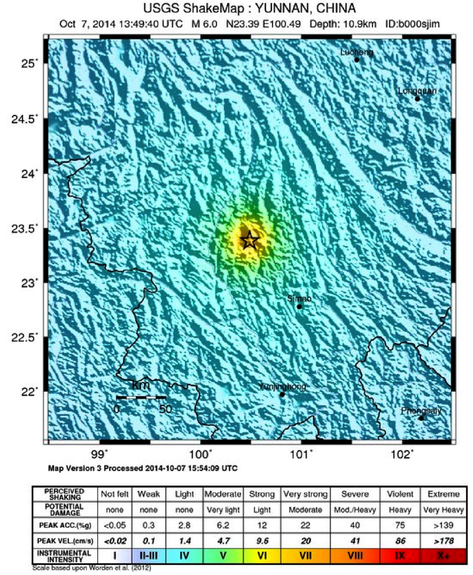


Seismic hazard is expressed as peak ground acceleration (PGA) on firm rock, in meters/sec², expected to be exceeded in a 50-yr period with a probability of 10 percent.

Peak Ground Acceleration in m/sec**2

.2 .4 .8 1.6 2.4 3.2 4.0 4.8

ShakeMap



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

TECTONIC SUMMARY

The October 7, 2014 M 6.0 earthquake southwest of Weiyuan, China, in the southwestern Yunnan Province, occurred as the result of shallow strike-slip faulting within the crust of the Eurasia plate, in the broad plate boundary region between the India and Eurasia plates. Tectonics here are controlled by the convergence of the India plate with Eurasia, which has driven the uplift of the Himalayas to the west of this earthquake, and has caused the formation of numerous intraplate continental transform structures in the surrounding region. The pattern of elastic-wave radiation from the earthquake is consistent with the shock occurring either as the result of right-lateral faulting on a northwest-trending fault or as the result of left-lateral faulting on a northeast trending fault. Faults of both types have been mapped in southwestern Yunnan, and it is unclear at this time which type of fault hosted this event. At the latitude of the October 7 earthquake, India moves northeastward with respect to Eurasia at a rate of approximately 51 mm/yr.

Strong earthquakes are reasonably common in the Yunnan province, and the bordering countries of Burma and Laos; the area within 500 km of the October 7 earthquake has hosted 44 other earthquakes of M 6 or above over the past century. Earthquakes here are also often damaging and deadly, as a result of the high vulnerability of most residential structures in this dominantly agricultural province. Nearby earthquakes in the M5-7 range in March 1979, November 1988, May 1989, January 1993, and June 2007, all caused fatalities – the largest, 110 km to the southwest in November 1988 (M 7.0) resulted in approximately 730 deaths. Within several hours of the 2014 earthquake, news reports indicate this M 6.0 event has caused limited fatalities, likely due to the sparse population nearby.

Significant Earthquakes Mag >= 6.5

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1901	02	15	0000	26.000	100.100	0	6.5
1905	02	17	1142	26.000	96.000	0	6.8
1906	08	31	1457	27.000	97.000	100	6.7
1908	02	09	1813	26.000	100.000	60	7.3
1908	12	12	1254	26.500	97.000	0	7.0
1911	07	00	0000	28.500	97.500	0	6.5
1912	05	23	0224	21.000	97.000	0	7.7
1913	12	21	1537	24.500	102.000	0	7.2
1914	03	28	1044	25.000	99.000	100	6.9
1917	07	30	2354	29.000	104.000	0	7.3
1923	06	22	0644	22.589	98.681	25	7.2
1925	03	16	1442	25.688	100.494	25	7.0
1925	12	22	0505	20.538	101.667	15	6.8
1930	05	05	1345	17.665	96.543	35	7.2
1930	12	03	1851	17.972	96.422	35	7.3
1931	01	27	2009	25.675	96.755	35	7.6
1932	08	14	0439	25.765	95.655	143	7.0
1935	11	01	1622	21.148	103.082	15	6.8
1936	04	26	2359	28.733	103.497	25	6.8
1936	05	16	0705	28.675	103.684	25	6.8
1938	04	14	0116	23.372	94.407	35	6.8
1938	08	16	0427	22.957	93.884	35	7.1
1939	05	27	0345	24.461	93.955	46.9	6.8
1941	05	16	0714	23.514	99.408	25	6.9
1941	12	26	1448	21.076	99.145	25	7.0
1946	09	12	1517	23.500	96.000	0	7.3
1946	09	12	1520	23.500	96.000	0	7.7
1947	07	29	1343	28.500	94.000	0	7.3
1950	02	02	2333	22.000	100.000	0	7.1
1950	08	15	1409	28.500	96.500	0	8.6
1954	03	21	2342	24.420	95.104	186	7.4
1955	09	23	1506	26.600	101.700	0	6.9
1956	07	16	1507	21.969	95.802	32.1	7.1
1957	07	01	1930	24.308	93.880	78	6.8
1970	01	04	1700	24.147	102.462	14	7.2
1974	05	10	1925	28.184	103.995	9	6.8
1976	05	29	1223	24.514	98.915	6	6.7
1976	05	29	1400	24.520	98.504	8.2	6.7
1983	06	24	0907	21.402	102.551	15	6.9
1988	08	06	0036	25.090	95.108	90.5	7.3
1988	11	06	1303	22.814	99.605	18	7.0
1988	11	06	1315	23.228	99.436	9.5	6.9
1991	01	05	1457	23.582	95.878	17.7	7.0
1994	05	29	1411	20.550	94.175	62.6	6.5
1995	07	11	2146	21.965	99.122	9.4	6.8
1996	02	03	1114	27.317	100.333	11	6.6
2003	09	21	1816	19.917	95.672	10	6.6
2011	03	24	1355	20.723	99.822	8	6.8

DATA SOURCES

EARTHQUAKES AND SEISMIC HAZARD
USGS, National Earthquake Information Center
NOAA, National Geophysical Data Center
IASPEI, Centennial Catalog (1900 - 1999) and extensions (Engdahl and Villaseñor, 2002)
EHB catalog (Engdahl et al., 1998)
HDF (unpublished earthquake catalog, Engdahl, 2003)
Global Seismic Hazard Assessment Program

PLATE TECTONICS AND FAULT MODEL
PB2002 (Bird, 2003)
Ji, C., D.J. Wald, and D.V. Helmberger, Source description of the 1999 Hector Mine, California earthquake; Part I: Wavelet domain inversion theory and resolution analysis, Bull. Seism. Soc. Am., Vol 92, No. 4. pp. 1192-1207, 2002.
DeMets, C., Gordon, R.G., Argus, D.F., 2010. Geologically current plate motions, Geophys. J. Int. 181, 1-80.

BASE MAP
NIMA and ESRI, Digital Chart of the World
USGS, EROS Data Center
NOAA GEBCO and GLOBE Elevation Models

REFERENCES

Bird, P., 2003, An updated digital model of plate boundaries: Geochem. Geophys. Geosyst., v. 4, no. 3, pp. 1027-80.

Engdahl, E.R., and Villasenor, A., 2002, Global Seismicity: 1900-1999, chap. 41 of Lee, W.H.K., and others, eds., International Earthquake and Engineering Seismology, Part A: New York, N.Y., Elsevier Academic Press, 932 p.

Engdahl, E.R., Van der Hilst, R.D., and Buland, R.P., 1998, Global teleseismic earthquake relocation with improved travel times and procedures for depth determination;Bull. Seism. Soc. Amer., v. 88, p. 722-743.

DISCLAIMER

Base map data, such as place names and political boundaries, are the best available but may not be current or may contain inaccuracies and therefore should not be regarded as having official signifiance.

Map updated by U.S. Geological Survey National Earthquake Information Center
07 October 2014
http://earthquake.usgs.gov/
Map not approved for release by Director USGS