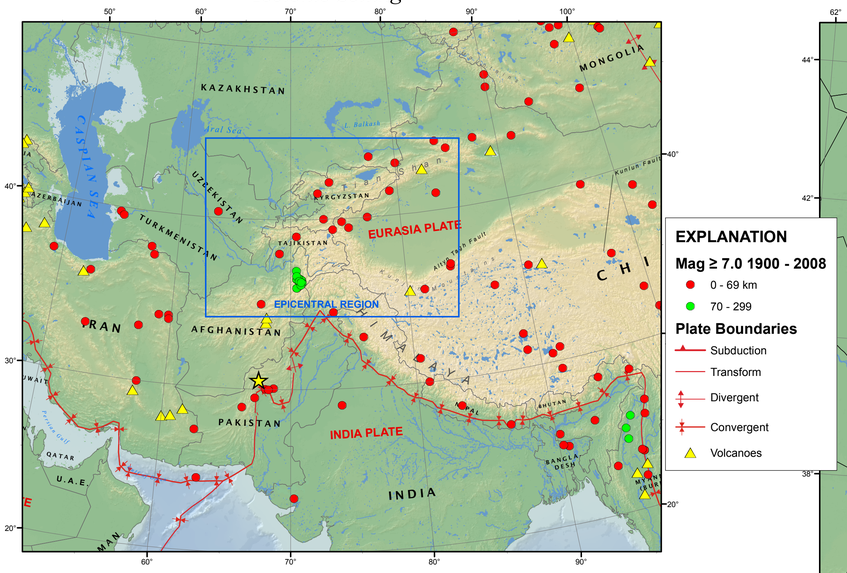
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the Global Seismographic Network
GSN

M6.7 Kyrgyzstan Earthquake of 5 October 2008

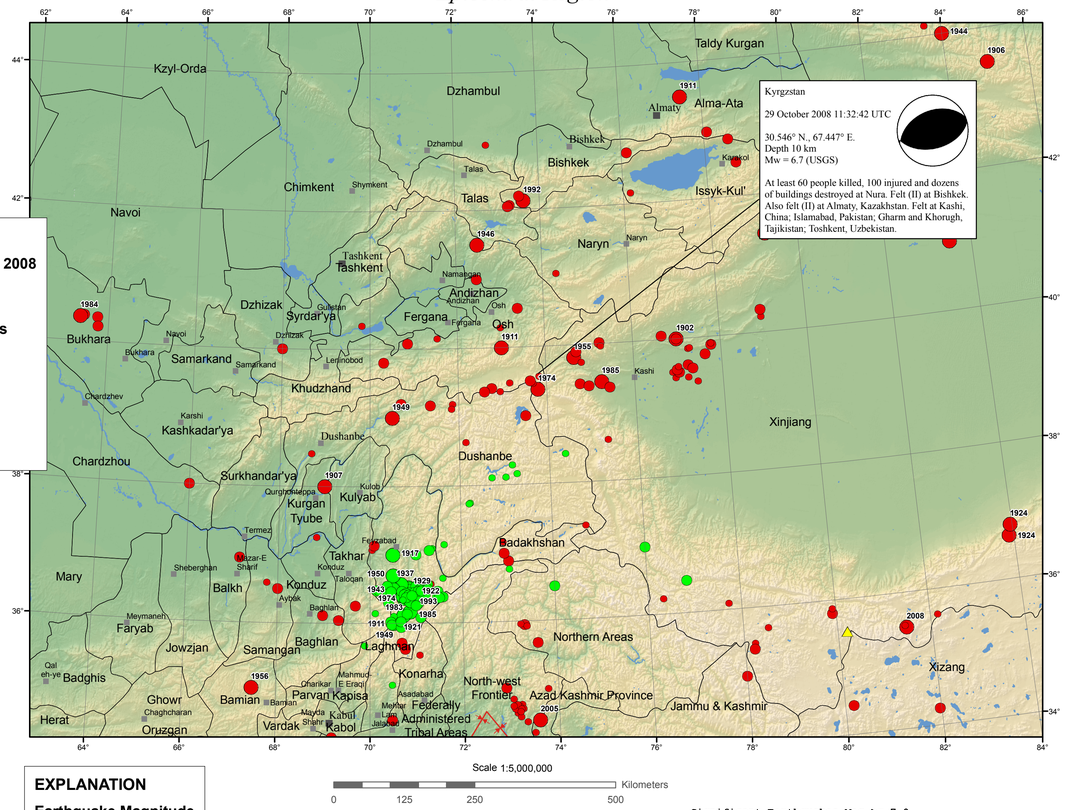
Tectonic Setting



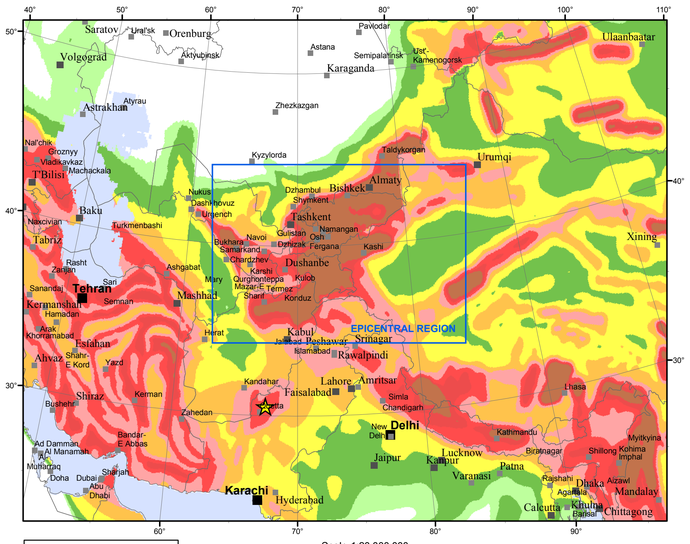
RELATIVE PLATE MOTIONS

The red vectors represent the motion of the India Plate relative to the Eurasia Plate in the region. The motion of the Inda Plate is generally 40 - 50 mm/yr northward with respect to the Eurasia Plate.

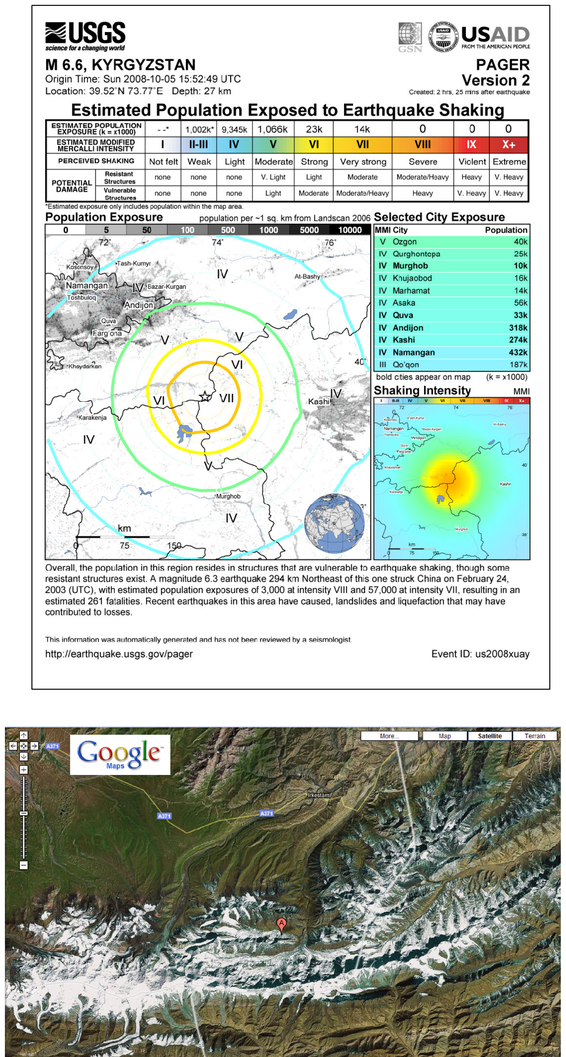
Epicentral Region



Seismic Hazard



Seismic hazard is expressed as peak ground acceleration (PGA) on firm rock, in meters/sec^2, expected to be exceeded in a 50-yr period with a probability of 10 percent.



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M 6.6, KYRGYZSTAN
Origin Time: Sun 2008-10-05 15:52:49 UTC
Location: 39.52°N 73.77°E Depth: 27 km

PAGER
Version 2
Created: 2 hrs, 25 mins after earthquake

Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)		- -*	1,002k*	9,345k	1,066k	23k	14k	0	0	0
ESTIMATED MODIFIED MERCALLI INTENSITY		I	II-III	IV	V	VI	VII	VIII	IX	X+
PERCEIVED SHAKING		Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

*Estimated exposure only includes population within the map area.

Population Exposure population per ~1 sq. km from Landscan 2006

Selected City Exposure

MMI	City	Population
V	Ozgon	40k
IV	Qurghontepa	25k
IV	Murghob	10k
IV	Khujaobod	16k
IV	Marhamat	14k
IV	Asaka	56k
IV	Quva	33k
IV	Andijon	318k
IV	Kashi	274k
IV	Namangan	432k
III	Qo'qon	187k

bold cities appear on map (k = x1000)

Shaking Intensity MMI

Overall, the population in this region resides in structures that are vulnerable to earthquake shaking, though some resistant structures exist. A magnitude 6.3 earthquake 294 km Northeast of this one struck China on February 24, 2003 (UTC), with estimated population exposures of 3,000 at intensity VIII and 57,000 at intensity VII, resulting in an estimated 261 fatalities. Recent earthquakes in this area have caused, landslides and liquefaction that may have contributed to losses.

This information was automatically generated and has not been reviewed by a seismologist

http://earthquake.usgs.gov/pager Event ID: us2008xuay

Google Maps image with epicenter indicated by red 'A'.

EXPLANATION

Earthquake Magnitude

- 5.50 - 5.99
- 6.00 - 6.99
- 7.00 - 7.99
- 8.00 - 8.99
- 9.00 - 9.99

Earthquake Depth

- 0 - 69
- 70 - 299
- 300 - 700

TECTONIC SUMMARY

The earthquake of October 5, 2008, occurred as a result of reverse faulting in the region of the Tien Shan and Pamir Mountains, near the intersection of the borders of Kyrgyzstan, Tajikstan, and China. The thrust nature of faulting is inferred from the characteristics of seismic waves radiated by the earthquake source. The faulting that caused the earthquake is a consequence of north-northwest, south-southeast, oriented compressive stress that ultimately arises from the motion of the India plate northwards with respect to the Eurasia plate at a rate of over 40 mm/yr. At the longitude of the earthquake epicenter, the principal boundary between these plates is situated in northern India and Pakistan, approximately 600 km south of the epicenter, but the zone of tectonic deformation associated with their convergence extends to the north of the principal boundary for more than 1000 km.

The tectonics of the epicentral region are complex, and both strike-slip and reverse faulting earthquakes have occurred in the vicinity of the October 5 shock. A magnitude 7.1 earthquake occurred on August 11, 1974, within several tens of kilometers of the 2008 shock; its aftershock sequence included earthquakes generated by both strike-slip and reverse faulting.

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 significance.

Significant Earthquakes Mag >= 7.0

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1902	08	22	0300	40.000	77.000	0	7.7
1902	10	06	0915	36.500	70.500	200	7.2
1906	03	02	0615	43.000	80.000	60	7.3
1906	12	22	1821	43.500	85.000	0	7.2
1907	10	21	0423	38.000	69.000	0	7.2
1908	10	24	2116	36.500	70.500	220	7.0
1909	07	07	2137	36.500	70.500	230	7.6
1911	01	03	2325	43.500	77.500	0	7.8
1911	02	18	1841	40.000	73.000	0	7.2
1911	07	04	1333	36.000	70.500	190	7.4
1917	04	21	0049	37.000	70.500	220	7.1
1921	11	15	2036	36.116	70.724	152	7.6
1922	12	06	1355	36.445	70.939	239	7.3
1924	07	03	0440	36.632	83.903	35	7.1
1924	07	11	1944	36.791	83.958	35	7.1
1924	10	13	1617	36.522	70.831	179	7.2
1929	02	01	1714	36.459	70.931	207	7.0
1937	11	14	1058	36.569	70.670	199	7.1
1943	02	28	1254	36.500	70.500	210	7.1
1944	03	09	2212	44.000	84.000	0	7.1
1946	11	02	1828	41.500	72.500	0	7.3
1949	02	23	1608	41.000	83.500	0	7.3
1949	03	04	1019	36.000	70.500	230	7.4
1949	07	10	0353	39.000	70.500	0	7.6
1950	07	09	1610	36.700	70.500	223	7.5
1951	06	12	2240	36.300	71.000	223	7.5
1955	04	15	0340	39.816	74.640	35	7.1
1956	06	09	2313	35.042	67.479	35	7.6
1965	03	14	1553	36.400	70.716	209	7.5
1969	02	11	2208	41.426	79.239	13.1	7.1
1974	07	30	0512	36.368	70.732	213	7.1
1974	08	11	0113	39.377	73.799	2.5	7.1
1983	12	30	2352	36.401	70.713	213	7.4
1984	03	19	2028	40.356	63.344	9	7.0
1985	07	29	0754	36.164	70.864	99.8	7.4
1985	08	23	1241	39.445	75.248	20	7.0
1992	08	19	0204	42.122	73.621	27	7.2
1993	08	09	1242	36.329	70.884	215	7.0
2005	10	08	0350	34.539	73.588	26	7.6
2008	03	20	2232	35.490	81.467	10	7.2

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)
HDF (unpublished earthquake catalog) (Engdahl, 2003)
Global Seismic Hazard Assessment Program

PLATE TECTONICS AND FAULT MODEL
PB2002 (Bird, 2003)
Finite Fault Model, Chen Ji, UC Santa Barbara (2007)

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 Villaseñor, 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 Academeic 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.

Map prepared by U.S. Geological Survey
National Earthquake Information Center
5 October 2008
Map not approved for release by Director USGS