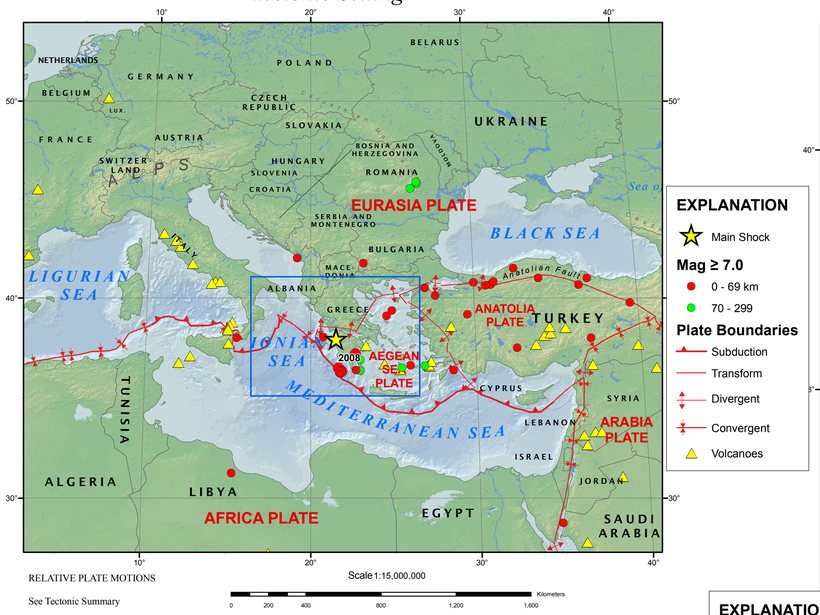
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

EARTHQUAKE SUMMARY MAP XXX

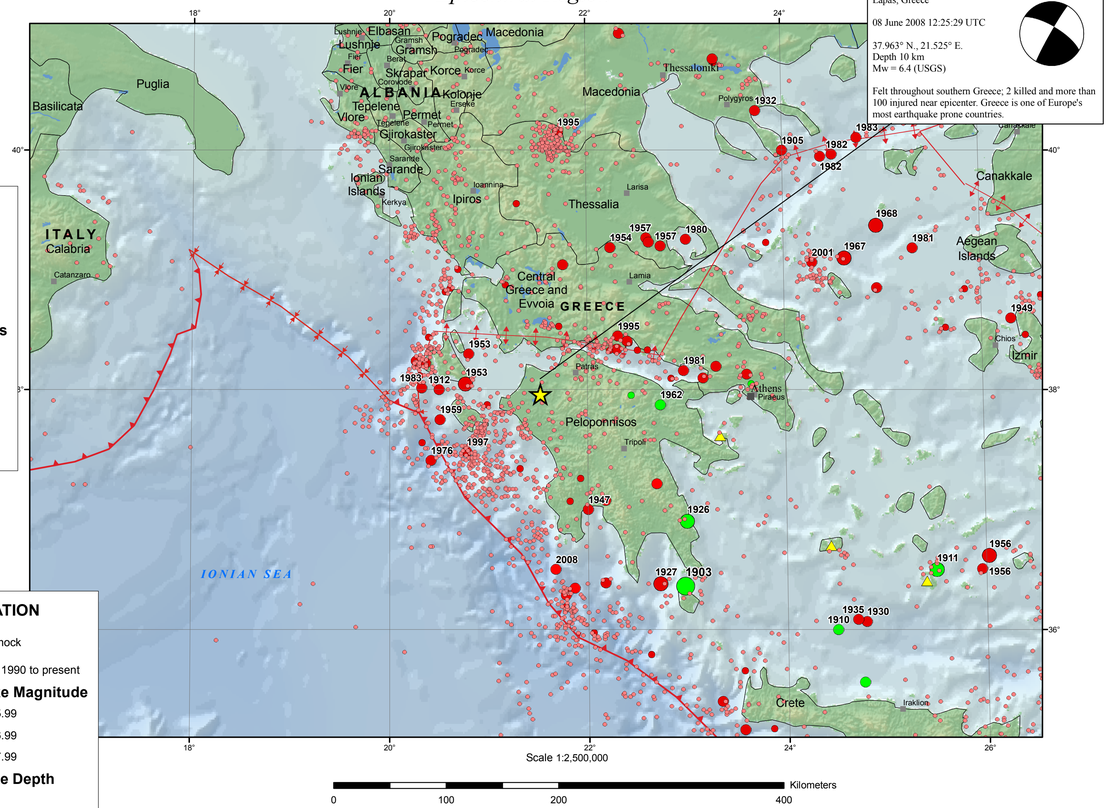
Prepared in cooperation with the Global Seismographic Network
GSN

M6.4 Lapas, Greece, Earthquake of 8 June 2008

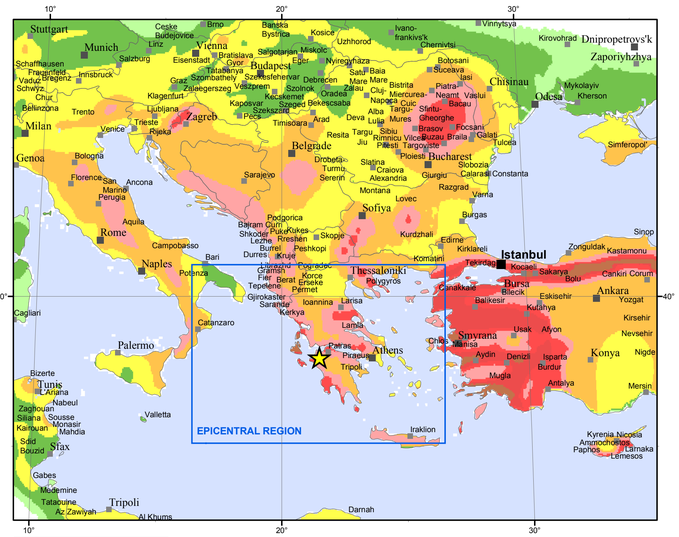
Tectonic Setting



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.

Significant Earthquakes Mag >= 6.5

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1903	08	11	0432	36.360	22.970	80	8.3
1905	11	08	2206	40.000	24.000	0	6.8
1910	02	18	0509	36.000	24.500	150	6.9
1911	04	04	1543	36.500	25.500	140	7.0
1912	01	24	1623	38.000	20.500	60	6.8
1926	08	30	1138	36.901	22.996	85.2	7.1
1927	07	01	0818	36.381	22.723	35	7.0
1930	02	14	1838	36.067	24.789	35	6.8
1932	09	26	1920	40.333	23.732	35	6.9
1935	02	25	0251	36.084	24.703	35	6.8
1947	10	06	1955	37.000	22.000	0	6.9
1949	07	23	1503	38.600	26.300	0	6.8
1953	08	11	0332	38.300	20.800	0	6.8
1953	08	12	0923	38.046	20.766	15	7.2
1954	04	30	1302	39.187	22.239	25	6.8
1956	07	09	0311	36.617	26.026	35	7.2
1956	07	09	0324	36.508	25.956	35	6.9
1957	03	08	1214	39.201	22.750	10	6.8
1957	03	08	1221	39.267	22.607	10	6.9
1959	11	15	1708	37.751	20.508	25	6.8
1962	08	28	1059	37.874	22.737	107	6.8
1967	03	04	1758	39.099	24.618	8.7	7.1
1968	02	19	2245	39.372	24.946	8.1	7.2
1975	03	27	0515	40.420	26.147	3.4	6.7
1976	05	11	1659	37.411	20.418	8.2	6.5
1980	07	09	0211	39.257	23.009	17.2	6.6
1981	02	24	2053	38.160	22.974	16.9	6.6
1981	12	19	1410	39.184	25.313	10	6.9
1982	01	18	1927	39.948	24.388	15	6.6
1982	01	18	1931	39.966	24.506	50	6.8
1983	01	17	1241	38.015	20.324	6	6.9
1983	08	06	1543	40.107	24.763	10	6.7
1995	05	13	0847	40.151	21.713	14	6.6
1995	06	15	0015	38.448	22.310	14	6.5
1997	11	18	1307	37.481	20.777	22.9	6.6
2001	07	26	0021	39.064	24.291	6.1	6.5
2006	01	08	1134	36.311	23.212	66	6.7
2008	02	14	1009	36.501	21.670	29	6.9

TECTONIC SUMMARY

The earth's crust and lithosphere in the eastern Mediterranean constitute a broad boundary region between three major tectonic plates, the Eurasia, Africa, and Arabia plates. The motions of these major plates drive smaller microplates, and it is the shapes and motions of these smaller plates that determine the locations and focal mechanisms of most intraplate earthquakes in the region.

The earthquake of June 8, 2008, was generated by stresses resulting from the motion of the small Aegean Sea plate southwest with respect to the Eurasia plate with a velocity of about 30 mm/y. The boundary between the Aegean plate and the Eurasia plate in central Greece is diffuse. Seismicity is concentrated in east trending and northeast trending zones of deformation. The east trending zones are characterized by predominantly normal faulting. The northeast trending zones are characterized by predominately strike slip faulting earthquakes. The focal mechanism of the earthquake of June 8 is consistent with the shock having been caused by strike slip faulting similar to that occurring within the northeast trending zones. Since the beginning of the twentieth century, the largest crustal earthquakes of central Greece have had magnitudes of about 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)

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.

USGS science for a changing world — USAID FROM THE AMERICAN PEOPLE

M 6.1, GREECE
Origin Time: Sun 2008-06-08 12:25:29 UTC
Location: 38.03°N 21.46°E Depth: 10 km

PAGER
Version 1
Created: 20 mins, 27 secs after earthquake

Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)	--*	--*	6,293k	615k	279k	53k	21k	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	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 populations within the map area.

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

Selected City Exposure

MMI	City	Population
VIII	Lapas	1k
VIII	Nea Manolas	2k
VIII	Varda	3k
VIII	Manolas	1k
VI	Koto Achaia	5k
VI	Kato Mazarakion	1k
VI	Patrai	163k
IV	Larisa	128k
IV	Piraeus	172k
IV	Peristerion	137k
IV	Athens	729k

bold cities appear on map (k = x1000)

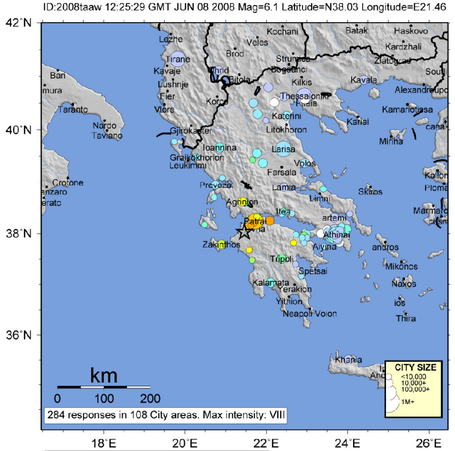
Shaking Intensity

Overall, the population in this region resides in structures that are a mix of vulnerable and earthquake resistant construction. A magnitude 6.0 earthquake 187 km Northeast of this one struck Greece on September 07, 1999 (UTC), with estimated population exposures of 19,000 at intensity IX or greater and 276,000 at intensity VIII, resulting in an estimated 143 fatalities. Recent earthquakes in this area have caused landslides 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: us2008taaw

USGS Community Internet Intensity Map (20 miles SW of Patras, Greece)
ID:2008taaw 12:25:29 GMT JUN 08 2008 Mag=6.1 Latitude=N38.03 Longitude=E21.46



Map last updated on Mon Jun 9 09:12:48 2008

INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy

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.

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