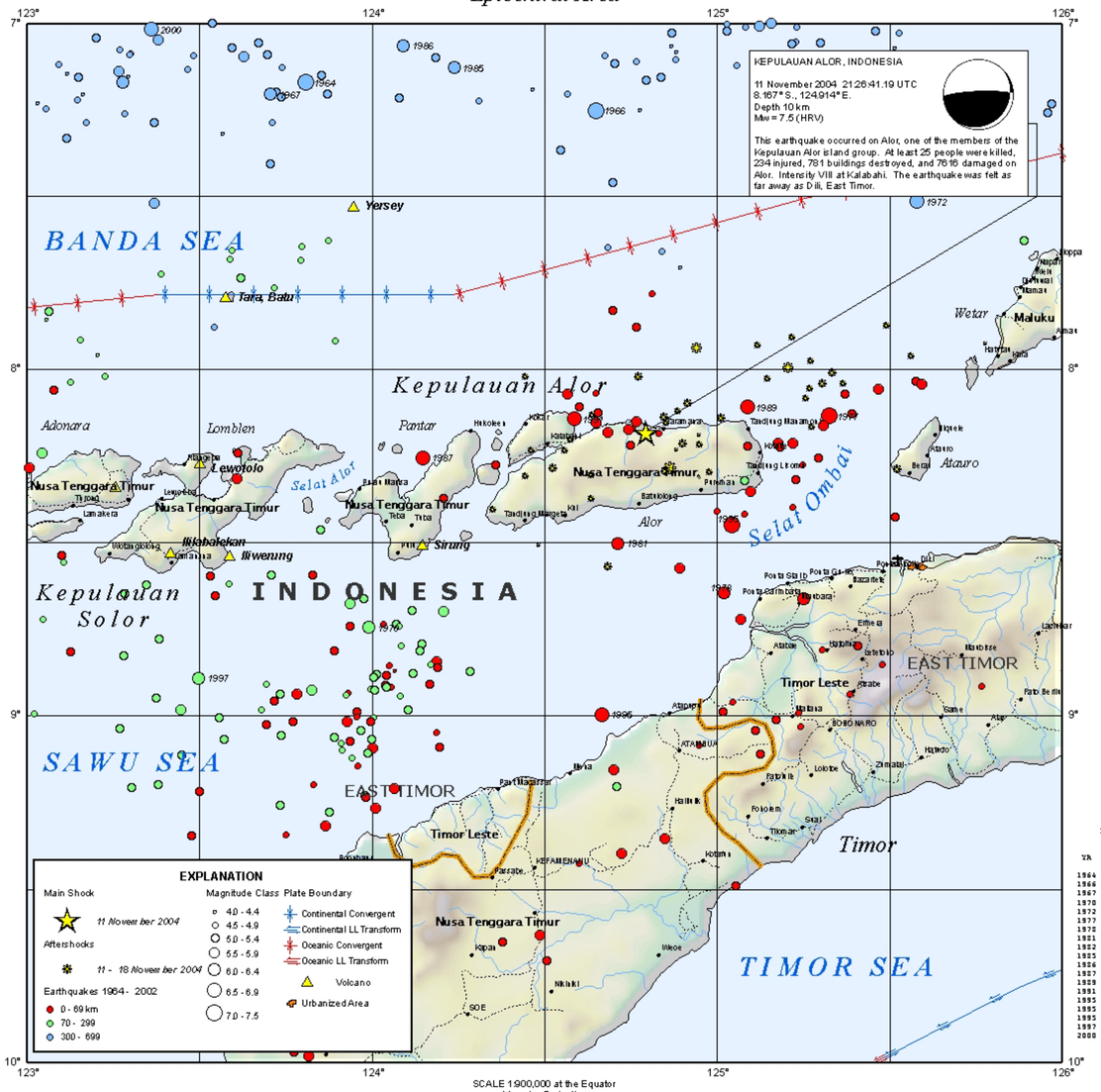
M7.5 Alor, Indonesia Earthquake of 11 November 2004

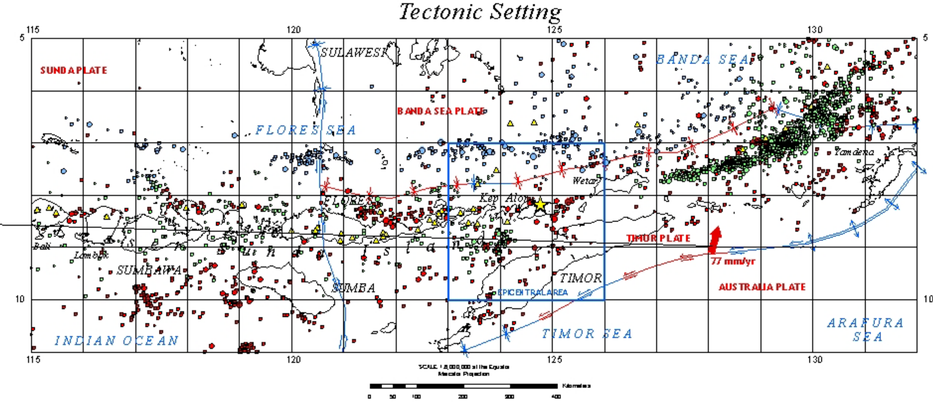
Epicentral Area



SCALE 1:900,000 at the Equator
Mercator Projection

0 20 40 80 120 160 Kilometers

Tectonic Setting

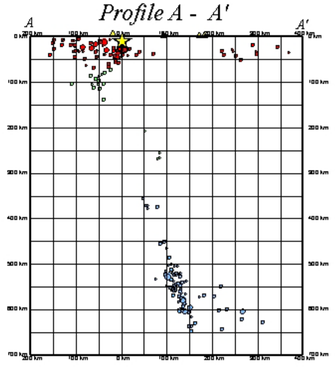


RELATIVE PLATE MOTIONS

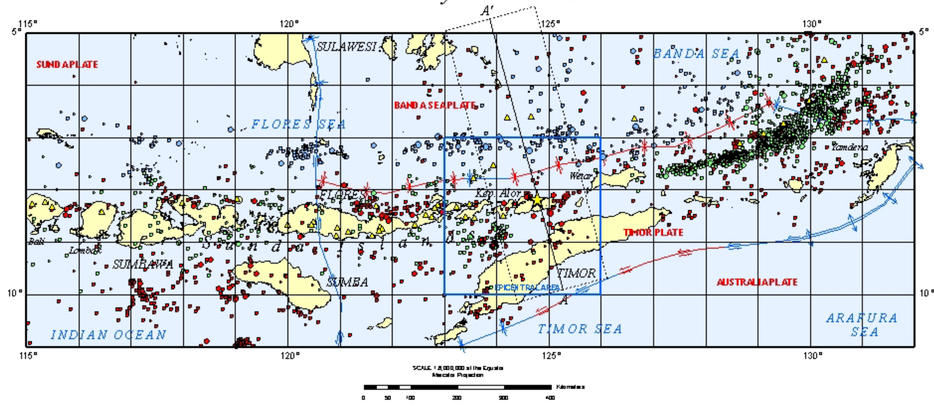
The relative motion of adjacent tectonic plates is depicted on the map by short vectors located at selected points on the plate boundary. In this presentation, one plate (the reference plate) is assumed to be fixed. The vector therefore represents the direction of the moving plate relative to the reference plate. The rate of relative motion is labelled next to the vector.

The components of the vector perpendicular and parallel to the plate margin approximate convergent/divergent and transverse direction of motion between the plates, respectively. As viewed from the fixed plate, an inward directed component suggests convergence at and near the plate boundary that may be expressed as crustal folding, uplift, thrust faulting, or plate subduction. Similarly, an outward directed component suggests plate divergence such as would be expected at a zone of crustal spreading. Transcurrent or transform faulting would be expected when the predominant vector component is parallel to the plate margin.

Profile A - A'



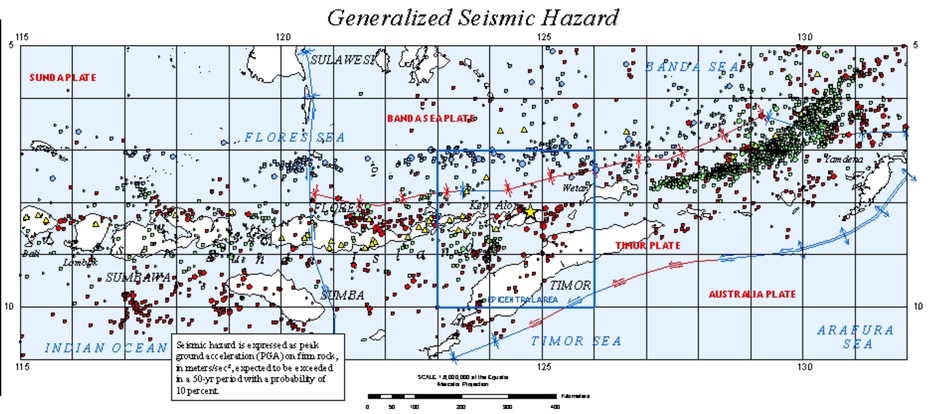
Seismicity 1964 - 2002



LARGEST EARTHQUAKES (1964 - 2002)
EPICENTRAL AREA

YR	MO	DY	LAT	LON	DEPTH	MAG
1964	10	12	-7.172	123.508	577.9	7.0
1966	6	22	-7.256	124.650	527.2	7.0
1967	11	8	-7.206	123.707	580.1	6.2
1970	6	28	-8.748	122.982	77.5	6.2
1972	4	4	-7.517	125.521	286.0	6.8
1977	8	27	-8.127	125.326	44.0	7.1
1978	3	27	-8.648	125.022	15.0	6.1
1921	1	19	-8.585	124.714	29.3	6.1
1922	10	7	-7.185	125.777	582.3	6.7
1925	10	25	-7.138	124.248	601.5	6.8
1926	5	27	-7.066	124.883	605.6	6.8
1927	11	26	-8.258	124.158	26.4	6.6
1928	7	14	-8.112	125.888	10.0	6.7
1951	7	4	-8.146	124.527	28.0	6.7
1955	5	14	-8.451	125.045	11.0	6.8
1955	5	14	-8.666	125.253	24.0	6.3
1955	12	5	-8.999	124.668	22.0	6.4
1997	1	17	-8.296	123.488	185.0	6.2
2000	8	7	-7.818	123.563	648.0	6.5

Generalized Seismic Hazard



EXPLANATION
Main Shock
11 November 2004
Depth Classes
0 - 69 km
70 - 299
300 - 700
Plate Boundary
Continental Convergent
Continental Rift
Continental LL Transform
Oceanic Convergent
Oceanic LL Transform
Volcano
Seismic Hazard
0.0 - 0.2 m/sec²
0.2 - 0.4
0.4 - 0.8
0.8 - 1.6
1.6 - 3.2
> 3.2 m/sec²

SCALE 1:8,000,000 at the Equator
Mercator Projection

0 50 100 200 300 400 Kilometers

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
PB2003 (Bird, 2003)

VOLCANOES
Smithsonian Institution, Global Volcano Program

BASE MAP
NIMA and ESRI, Digital Chart of the World
USGS, EROS Data Center

NEWS SOURCES
Associated Press
Herald and Weekly Times

DISCUSSION

The location and focal mechanism of the earthquake are consistent with it having occurred on the thrust-interface between the Banda Sea micro-plate to the north and the Timor micro-plate to the south. The Banda Sea micro-plate moves south toward, and thrusts beneath, the Timor micro-plate with a velocity of about 30 mm/year. The two micro-plates are sandwiched along with other micro-plates between the larger Sunda, Philippine Sea, Australia, and Pacific plates.

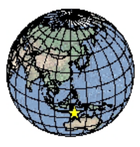
In July 1991, a magnitude 6.9 earthquake struck 20 km to the west and killed 23 people and injured 181.

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 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 procedure 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 significance.

Map prepared by U.S. Geological Survey
National Earthquake Information Center
30 November 2004
Map not approved for release by Director USGS