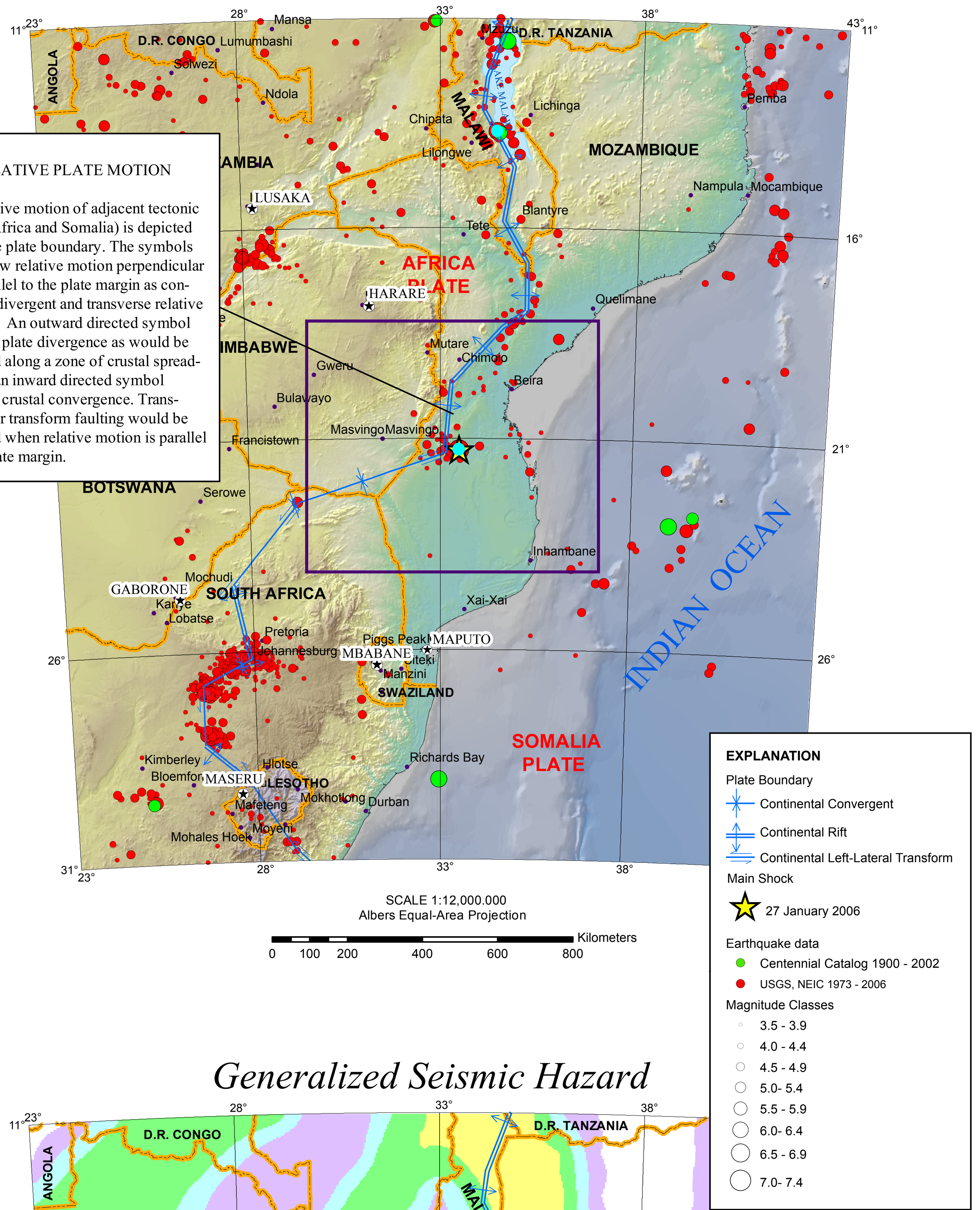
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

M7.0 Mozambique Earthquake of 22 February 2006

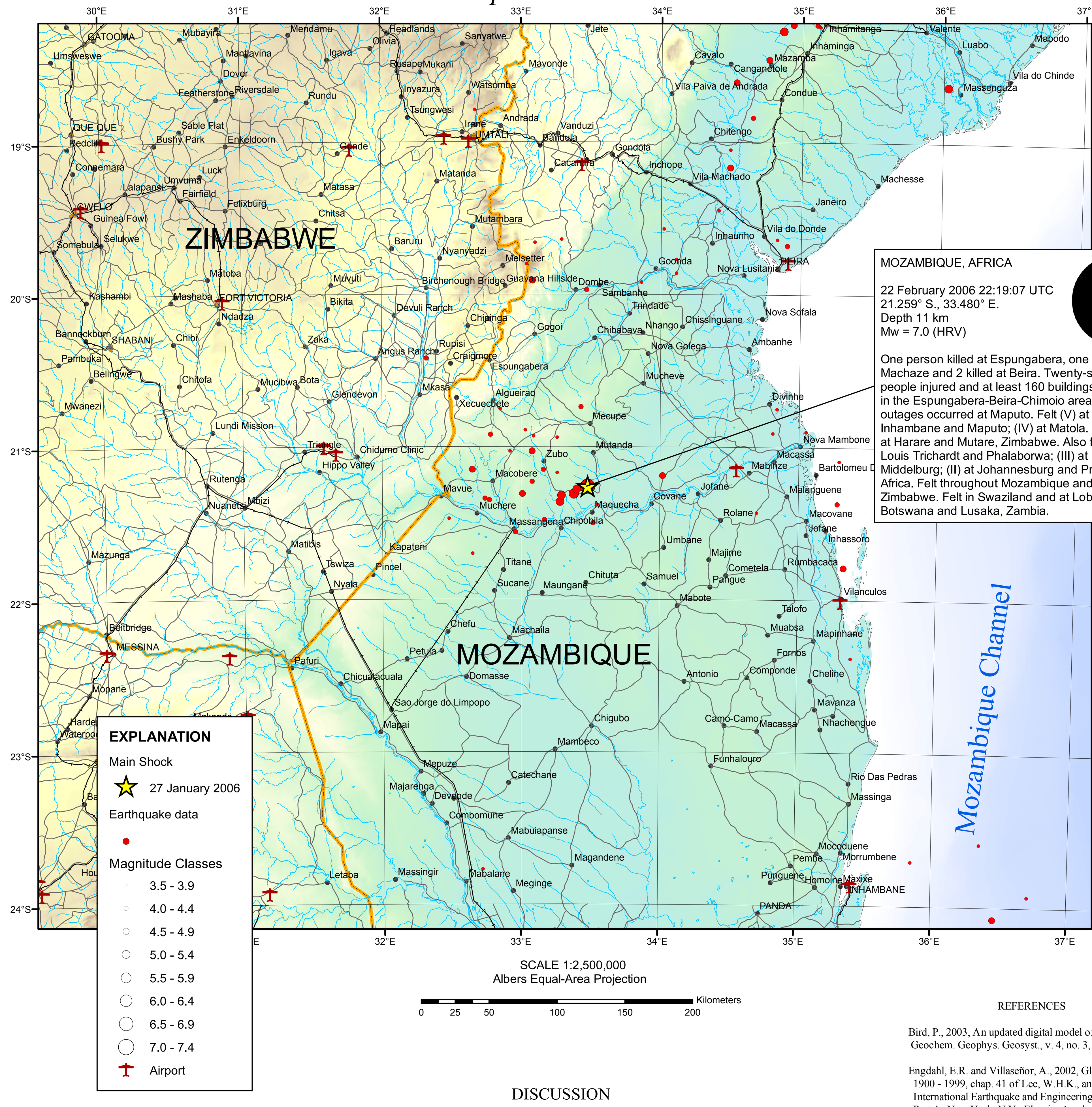
Tectonic Setting



RELATIVE PLATE MOTION

The relative motion of adjacent tectonic plates (Africa and Somalia) is depicted along the plate boundary. The symbols used show relative motion perpendicular and parallel to the plate margin as convergent/divergent and transverse relative motions. An outward directed symbol suggests plate divergence as would be expected along a zone of crustal spreading and an inward directed symbol suggests crustal convergence. Transcurrent or transform faulting would be expected when relative motion is parallel to the plate margin.

Epicentral Area

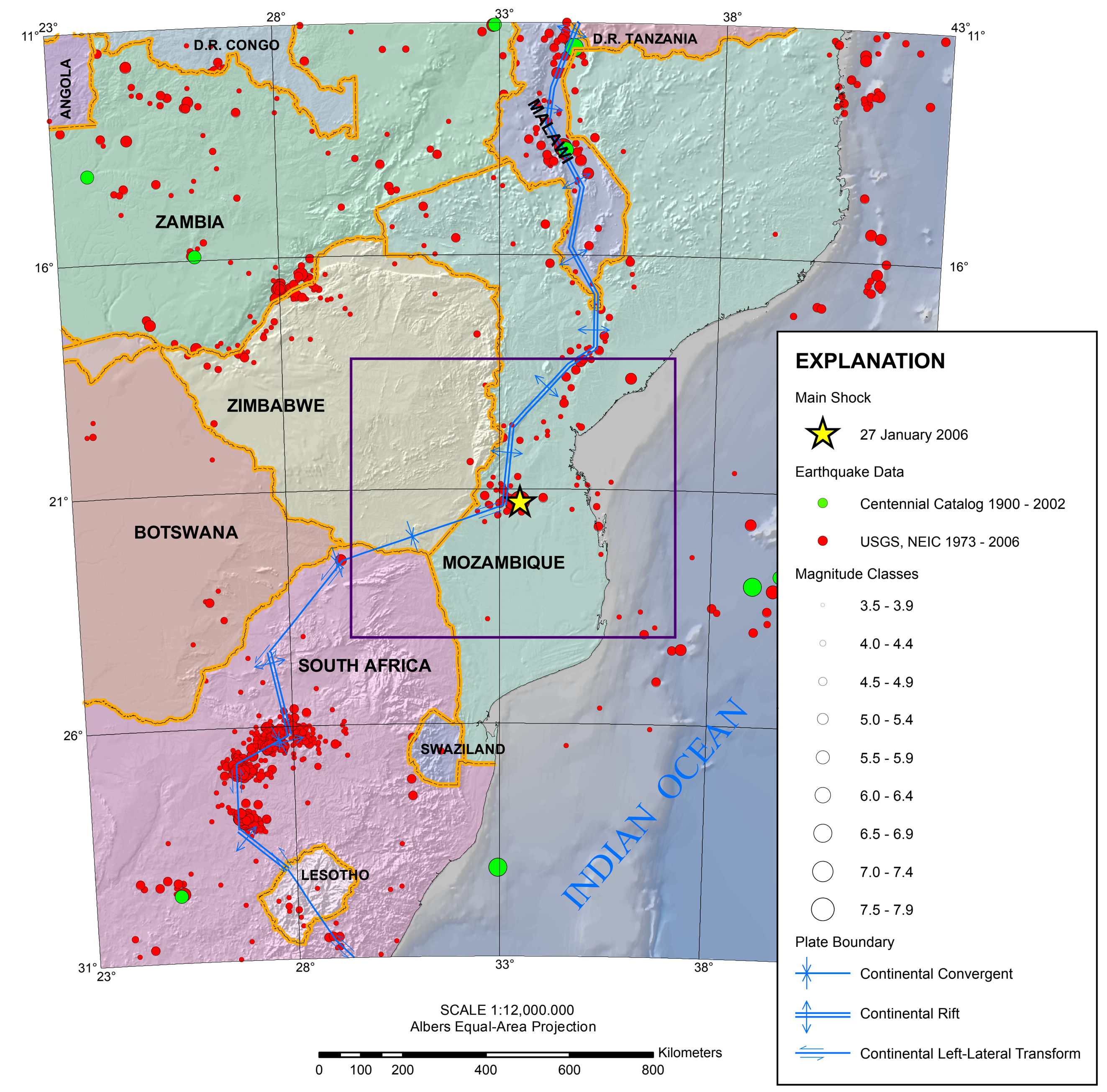


MOZAMBIQUE, AFRICA

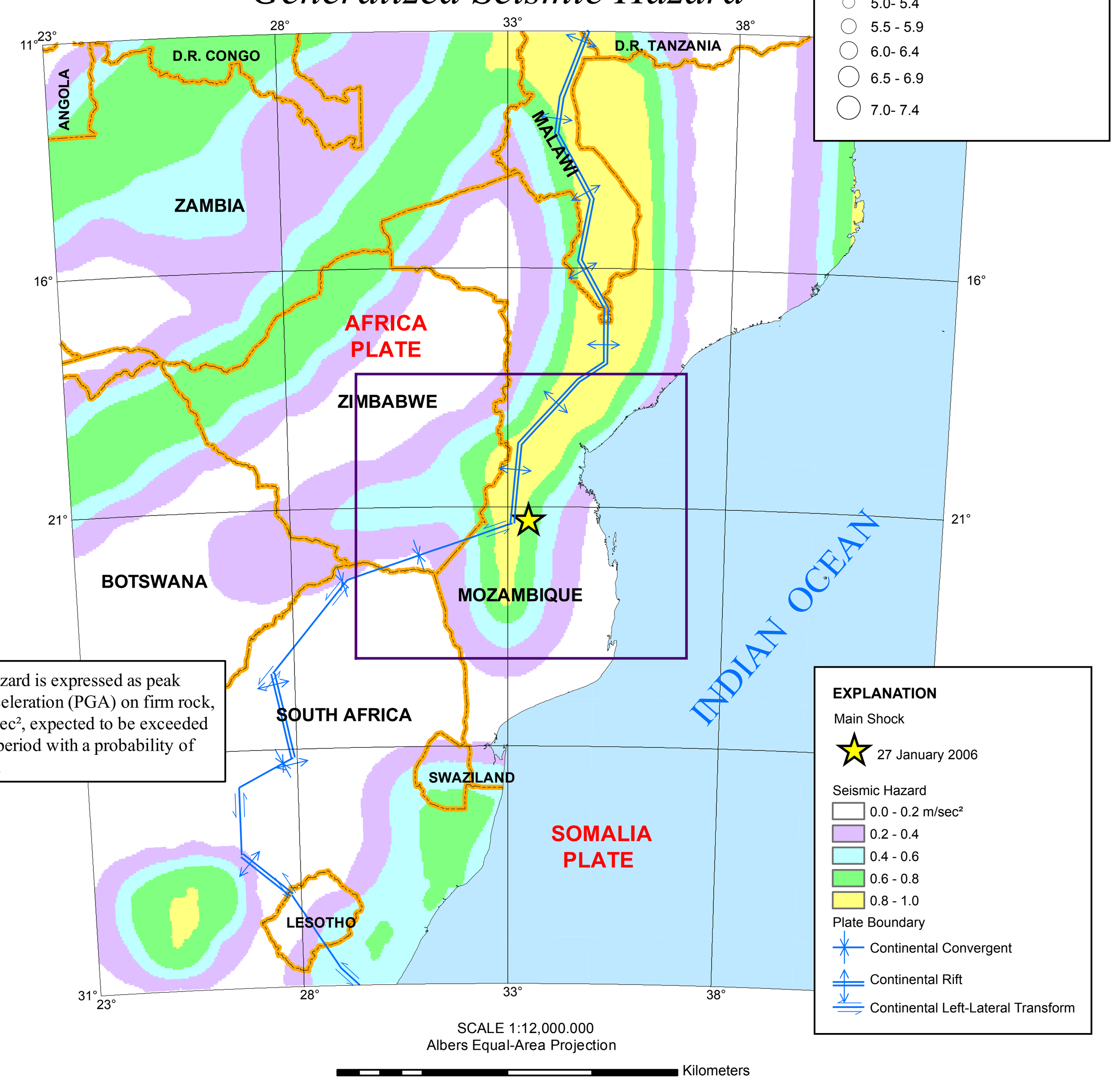
22 February 2006 22:19:07 UTC
21.259° S., 33.480° E.
Depth 11 km
Mw = 7.0 (HRV)

One person killed at Espungabera, one killed at Machaze and 2 killed at Beira. Twenty-seven people injured and at least 160 buildings damaged in the Espungabera-Beira-Chimoio area. Power outages occurred at Maputo. Felt (V) at Beira, Inhambane and Maputo; (IV) at Matola. Felt (IV) at Harare and Mutare, Zimbabwe. Also felt (IV) at Louis Trichardt and Phalaborwa; (III) at Durban and Middelburg; (II) at Johannesburg and Pretoria, South Africa. Felt throughout Mozambique and eastern Zimbabwe. Felt in Swaziland and at Lobatse, Botswana and Lusaka, Zambia.

Regional Seismicity



Generalized Seismic Hazard



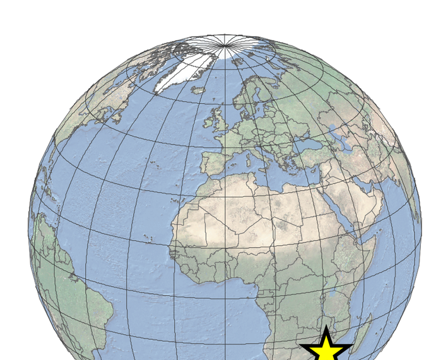
Seismic hazard is expressed as peak ground acceleration (PGA) on firm rock, in meters/sec², expected to be exceeded in a 50-yr period with a probability of 10 percent.

LARGEST EARTHQUAKES M = 5.5
EPICENTRAL REGION

YR	MO	DY	LAT	LON	MAG	DEPTH
1915	05	08	-23.00	39.00	6.8	0
1932	12	31	-29.084	32.957	6.8	15
1942	10	09	-11.538	34.646	6.8	37
1968	5	15	-15.92	26.1	5.7	25.3
1968	12	2	-14.1	23.781	5.9	12.5
1974	05	14	-26.27	27.53	5.7	22
1974	08	01	-16.65	28.00	5.5	14
1976	07	01	-29.52	25.18	5.9	33
1976	09	19	-11.06	32.86	5.7	27
1977	04	07	-26.93	26.66	5.5	11
1981	02	17	-23.09	39.48	5.7	33
1986	07	18	-16.36	28.50	5.5	17
1989	01	25	-27.99	26.73	5.5	5
1989	03	09	-13.71	34.38	5.8	29
1989	03	10	-13.70	34.42	6.6	30
1994	10	30	-28.03	26.74	5.6	5
1999	04	22	-27.95	26.64	5.7	5
2006	02	22	-21.25	33.50	7.0	11
2006	02	23	-21.42	33.27	5.8	10
2006	02	23	-21.37	33.37	5.3	10
2006	02	23	-21.29	33.47	5.0	10

DISCUSSION

The earthquake occurred near the southern end of the East African rift system. The East African rift system is a diffuse zone of crustal extension that passes through eastern Africa from Djibouti and Eritrea on the north to Malawi and Mozambique on the south and that constitutes the boundary between the Africa plate on the west and the Somalia plate on the east. At the earthquake's latitude, the Africa and Somalia plates are spreading apart at a rate of several millimeters per year. The largest earthquake to have occurred in the rift system since 1900 had a magnitude of about 7.6. Most earthquakes within the East African rift system occur as the result of either normal faulting or strike-slip faulting.



DISCLAIMER

REFERENCES

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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.

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GLOBE Task Team and others, 1999, The Global Land One-Kilometer Base Elevation (GLOBE) Digital Elevation Model, Version 1.0: National Oceanic and Atmospheric Administration, Boulder, Colo., USA.

IOC, IHO, and BODC, 2003, Centenary Edition of the GEBCO Digital Atlas: CD-ROM(2), British Oceanographic Data Centre, Liverpool, UK.

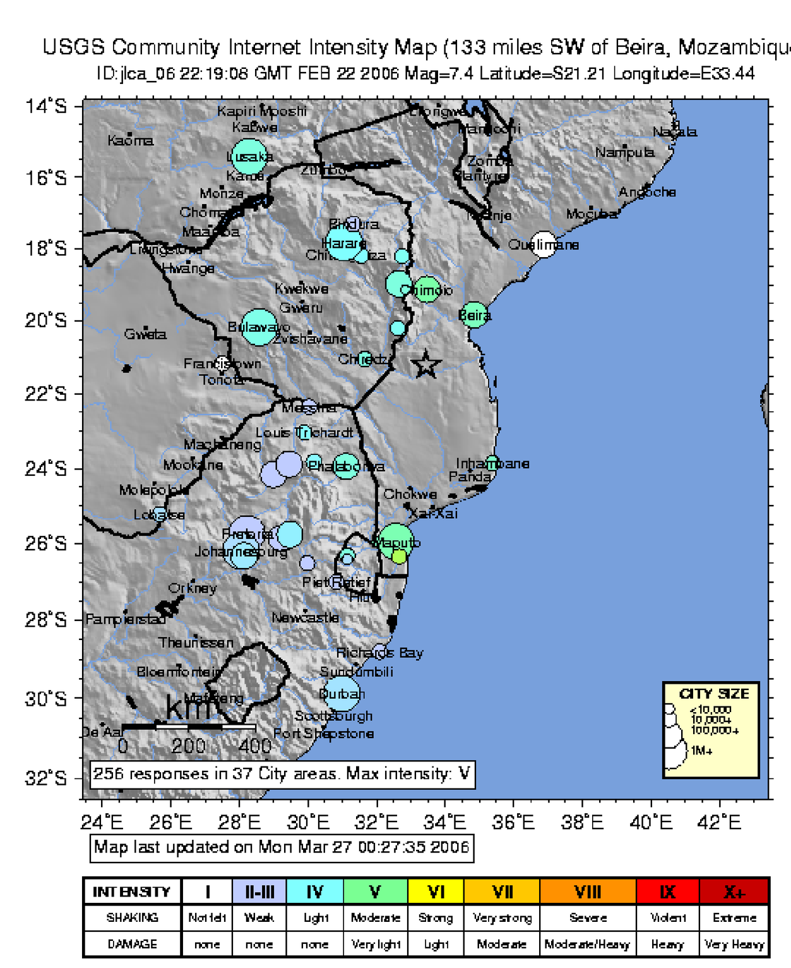
DATA SOURCES

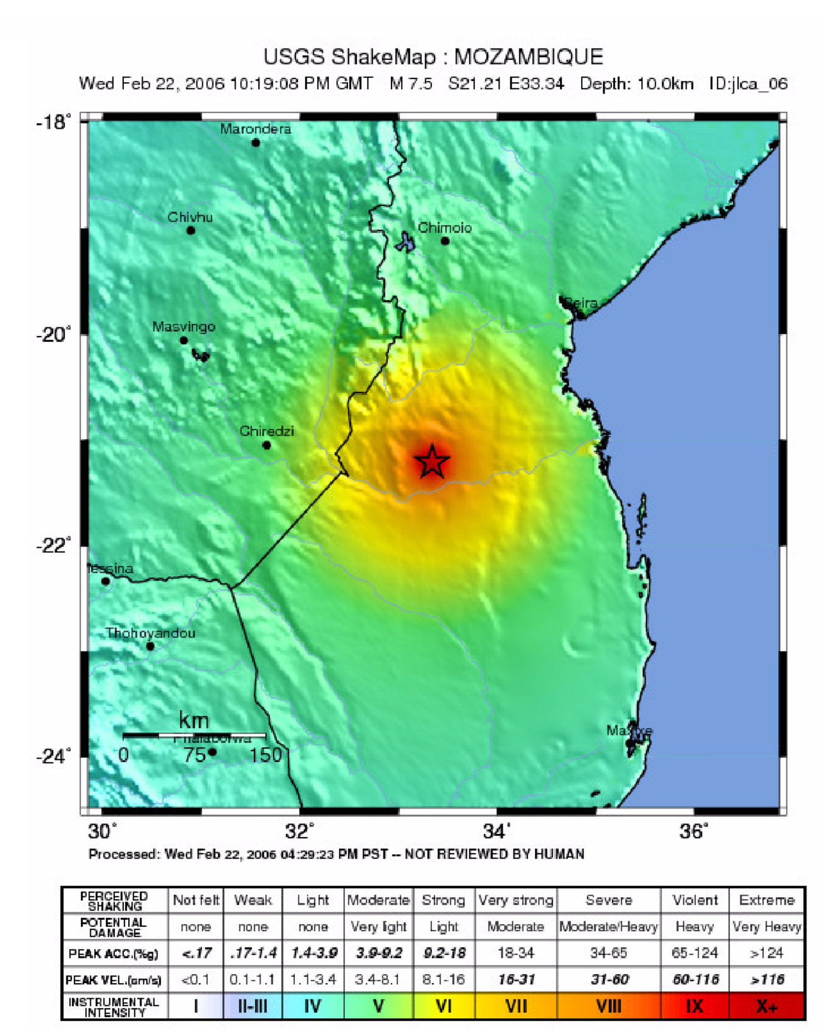
EARTHQUAKES AND SEISMIC HAZARD
USGS, National Earthquake Information Center
IASPEI, Centennial Catalog (1900 - 1999) and extensions (Engdahl and Villaseñor, 2002)
HDF (unpublished earthquake catalog) (Engdahl, 2003)
Global Seismic Hazard Assessment Program

BASE MAP
NIMA and ESRI (1992), Digital Chart of the World
GLOBE (1999)
IOC, IHO, and BODC (2003)
USGS, EROS Data Center

PLATE TECTONICS
PB2002 (Bird, 2003)

Liquefaction features at Chissalagi, Mozambique (left) and main fault scarp (right). Photos courtsey of Dr. Clark Fenton, Department of Civil and Environmental Engineering, Imperial College, London.





Map prepared by U.S. Geological Survey
National Earthquake Information Center
29 March 2006 @ 1530 MDT
Map not approved for release by Director USGS