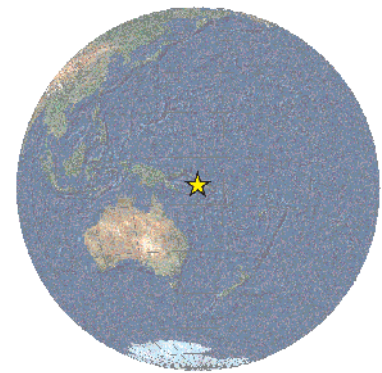


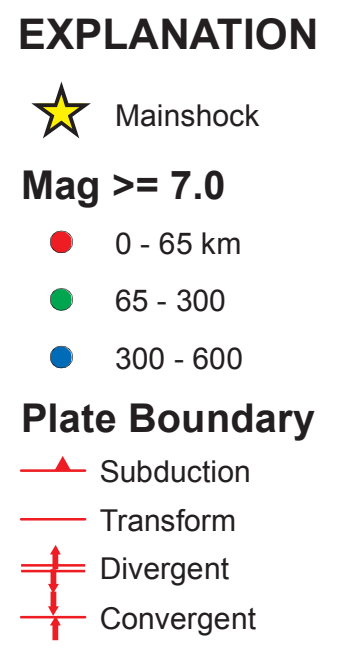
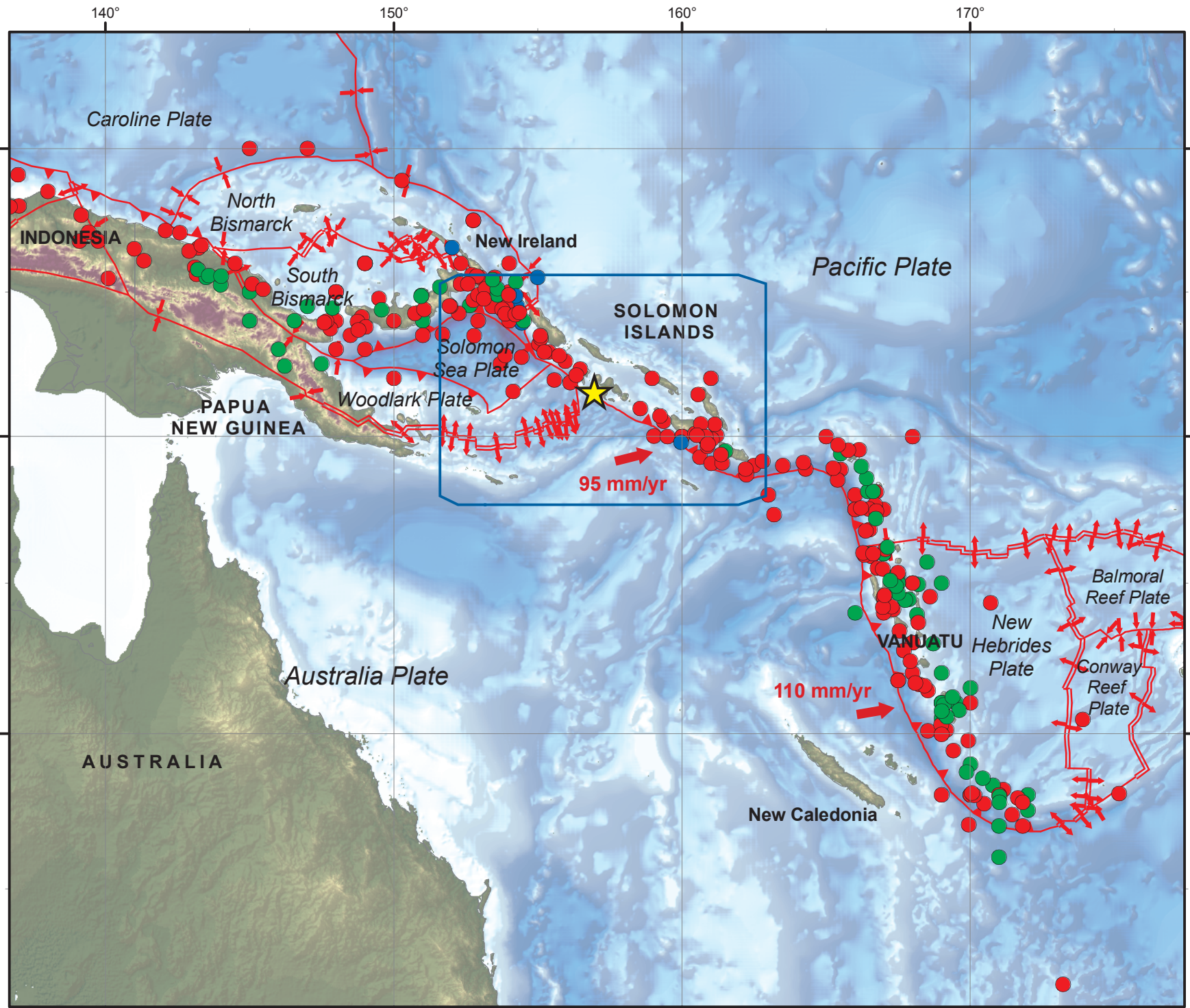


Prepared in cooperation with the Global Seismographic Network

M8.1 Solomon Islands Earthquake of 1 April 2007



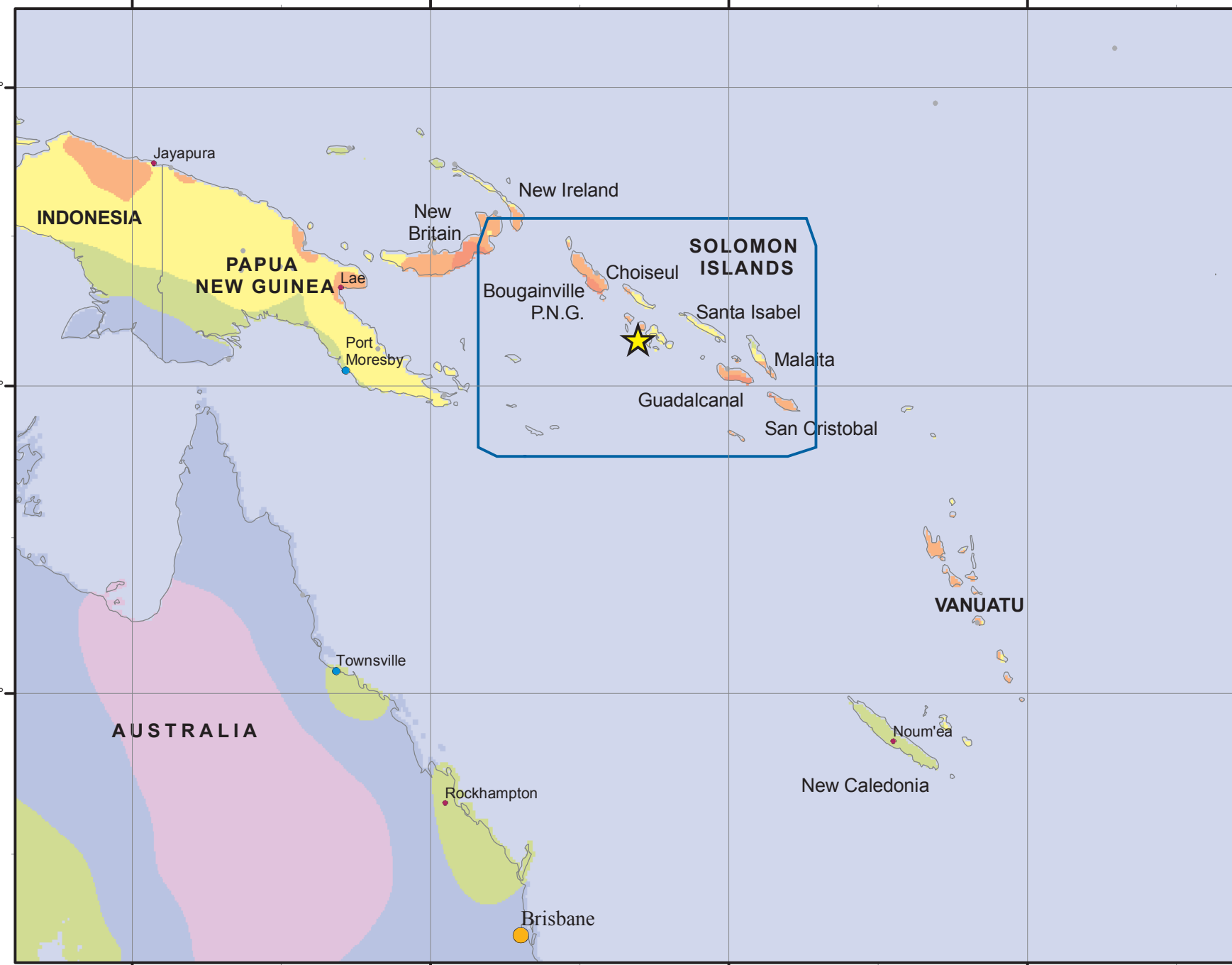
Tectonic Setting



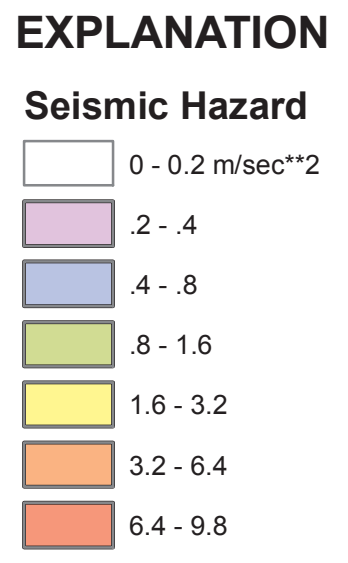
RELATIVE PLATE MOTIONS

The broad red vectors represent the motion of the Australia Plate relative to the other plates in the region. The motion of the Australia Plate is generally northward with respect to the Pacific Plate, and many micro-plates are caught between them.

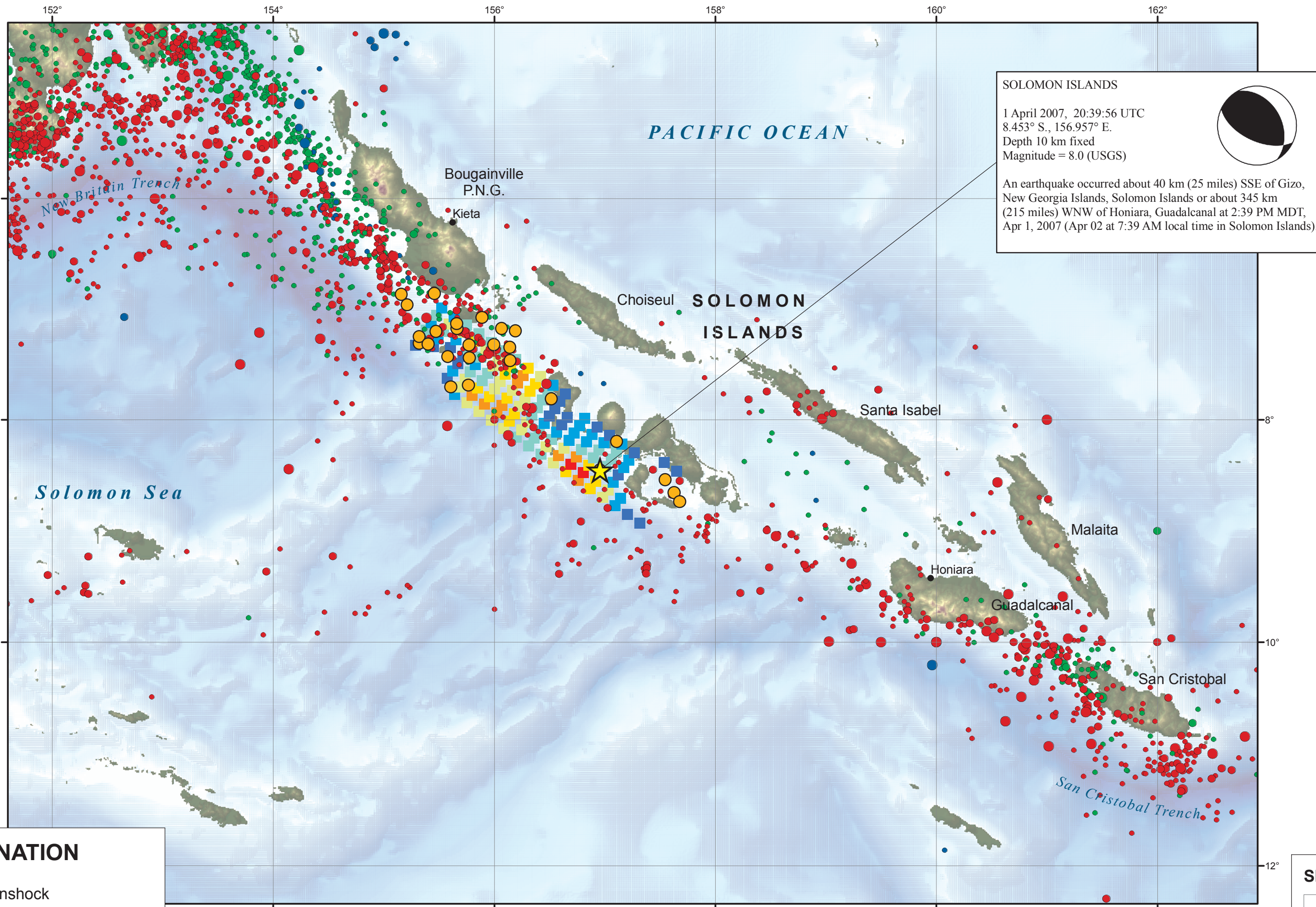
Seismic Hazard



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.



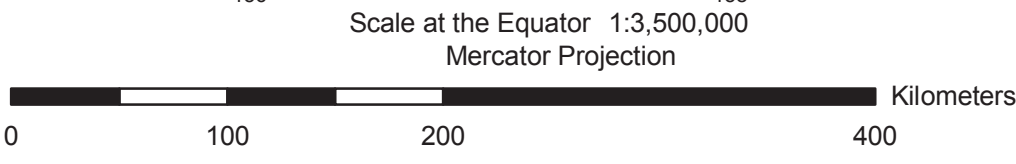
Epicentral Region



SOLOMON ISLANDS

1 April 2007, 20:39:56 UTC
8.453° S, 156.957° E
Depth 10 km fixed
Magnitude = 8.0 (USGS)

An earthquake occurred about 40 km (25 miles) SSE of Gizo, New Georgia Islands, Solomon Islands or about 345 km (215 miles) WNW of Honiara, Guadalcanal at 2:39 PM MDT, Apr 1, 2007 (Apr 02 at 7:39 AM local time in Solomon Islands).



DISCUSSION

The Solomon Islands earthquake of April 1, 2007, occurred along the boundary of the Pacific plate with, respectively, the Australia, Woodlark, and Solomon Sea plates. The latter three plates converge to the east-northeast or northeast against the Pacific plate with velocities of 90-105 mm/y. Along much of the plate boundary between the Pacific plate and the Australia/Woodlark/Solomon Sea plates, relative plate-motion is accomplished principally by subduction of the Australia/Woodlark/Solomon Sea plates beneath the Pacific plate. The April 1 earthquake's location and focal mechanism are consistent with the earthquake having occurred as underthrusting of the Australia/Woodlark/Solomon Sea plate beneath the Pacific plate, as part of the broader northeast-directed subduction process.

The Solomon Islands are as a whole experiences a very high level of earthquake activity, and many shocks of magnitude 7 and larger have been recorded since the early decades of the twentieth century. The April 1 earthquake, however, nucleated in a 250-long segment of the arc that had produced no shocks of magnitude 7 or larger since the early 20th century.

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

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.

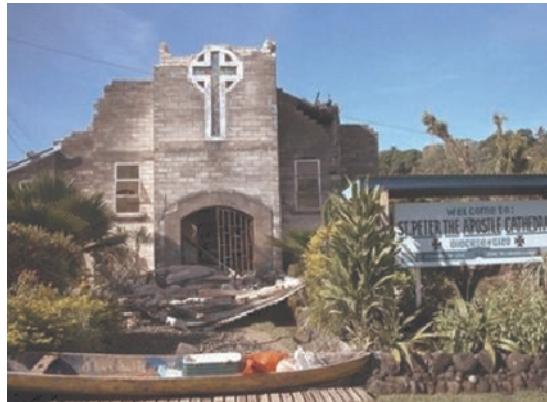
Solomon Islands earthquake and tsunami damage photos



CBS online



CBS online



Justin Anderson/Reuters



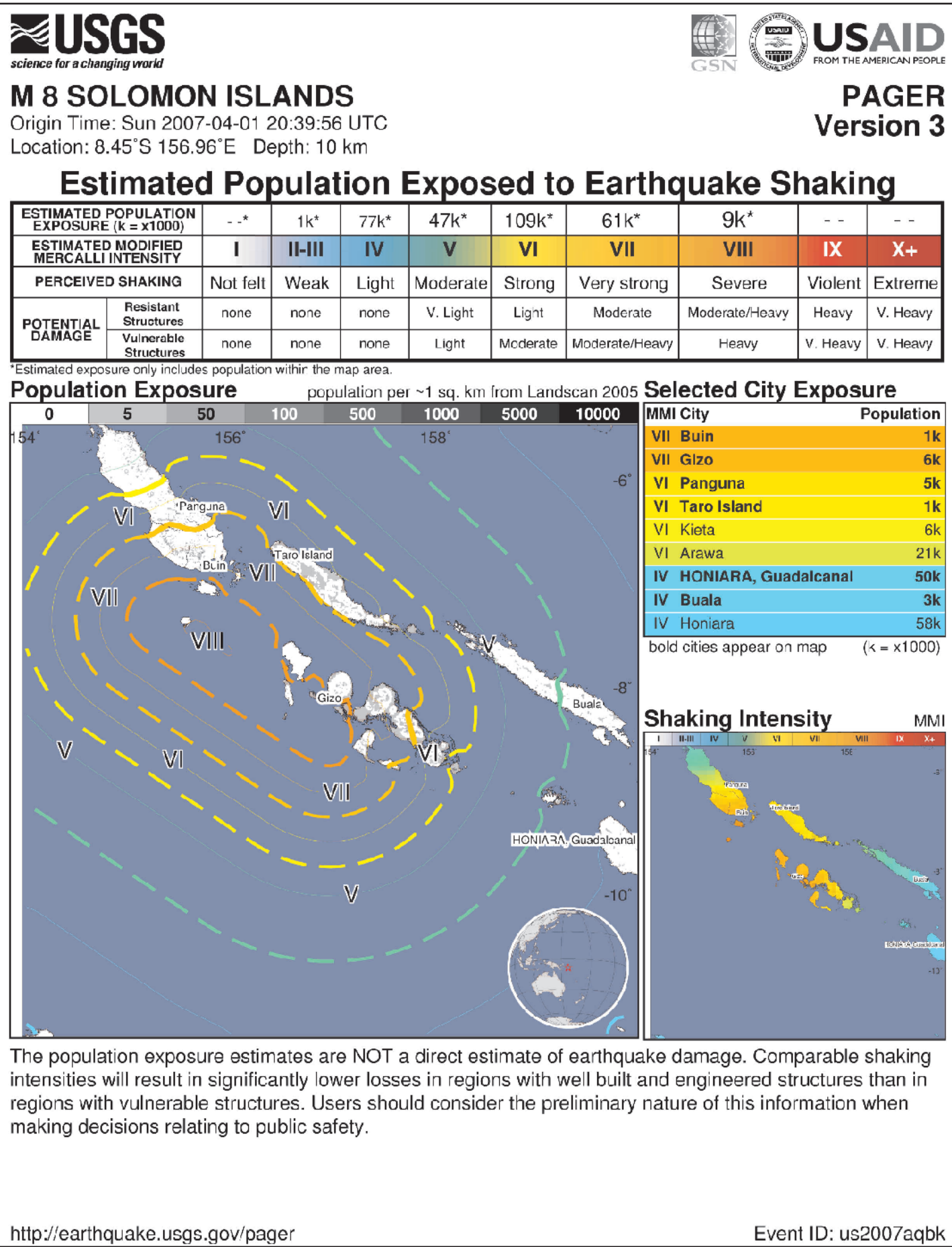
CBS online

REFERENCES

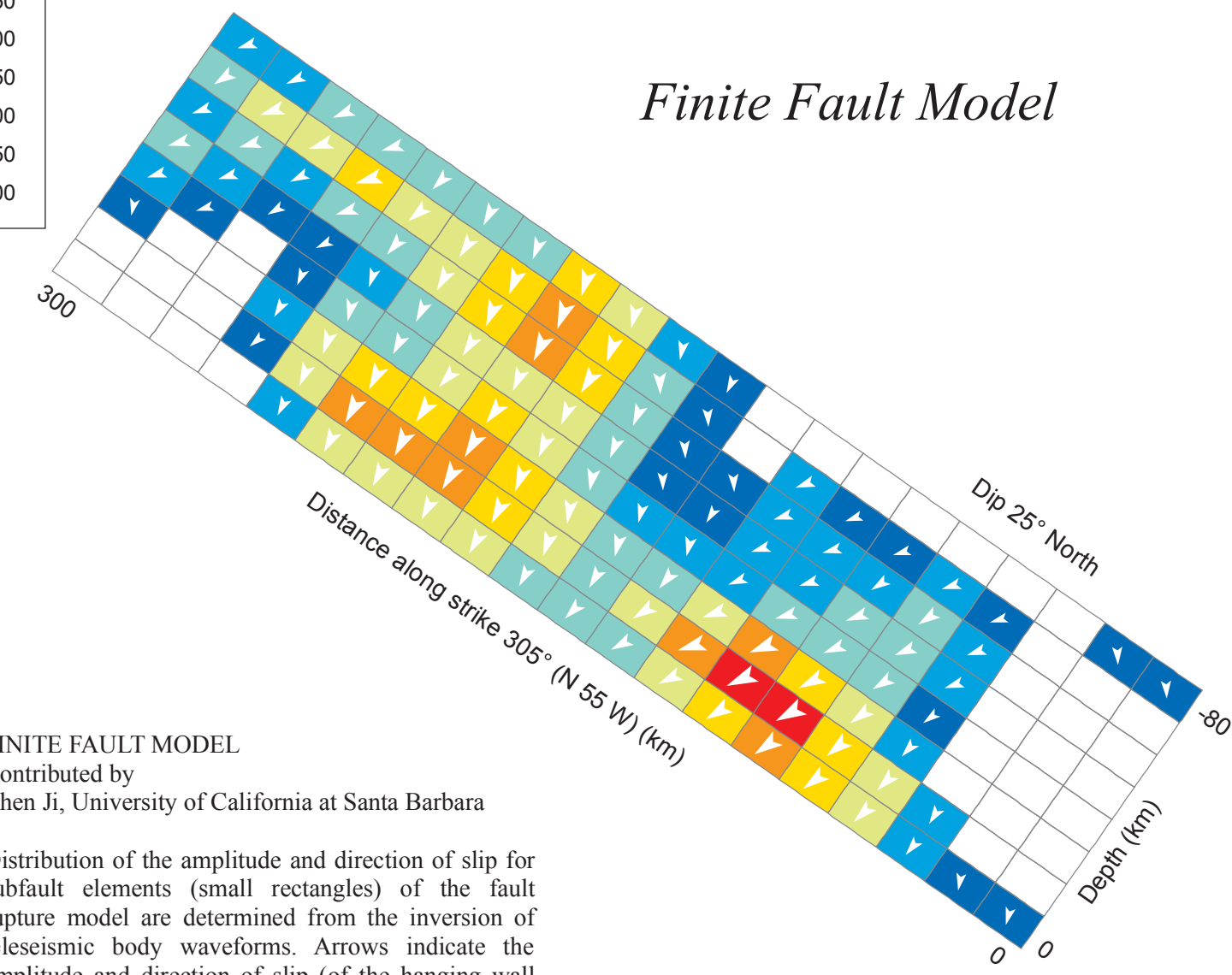
Bird, P., 2003. An updated digital model of plate boundaries: *Geochem. Geophys. Geosyst.*, v. 4, no. 3, pp. 1027-80.

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 procedures for depth determination. *Bull. Seism. Soc. Amer.*, v. 88, p. 722-743.



Finite Fault Model



FINITE FAULT MODEL
Contributed by
Chen Ji, University of California at Santa Barbara

Distribution of the amplitude and direction of slip for subfault elements (small rectangles) of the fault rupture model are determined from the inversion of teleseismic body waveforms. Arrows indicate the amplitude and direction of slip (of the hanging wall with respect to the foot wall); the slip amount is also color-coded as shown. The view of the rupture plane is from above.

The strike of the fault rupture plane is N55W and the dip is 25 NE. The dimensions of the subfault elements are 15 km in the strike direction and 10 km in the dip direction.