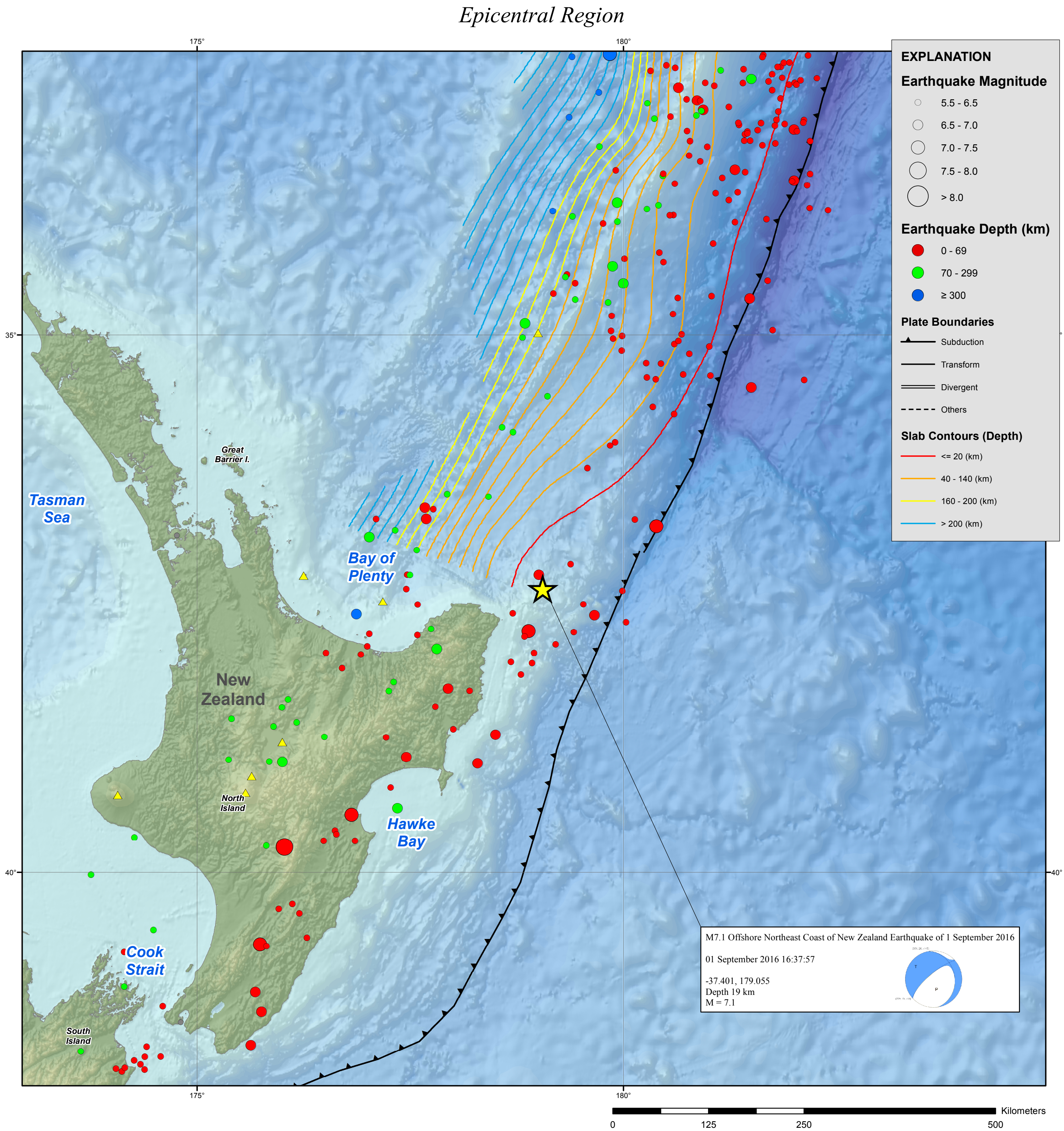
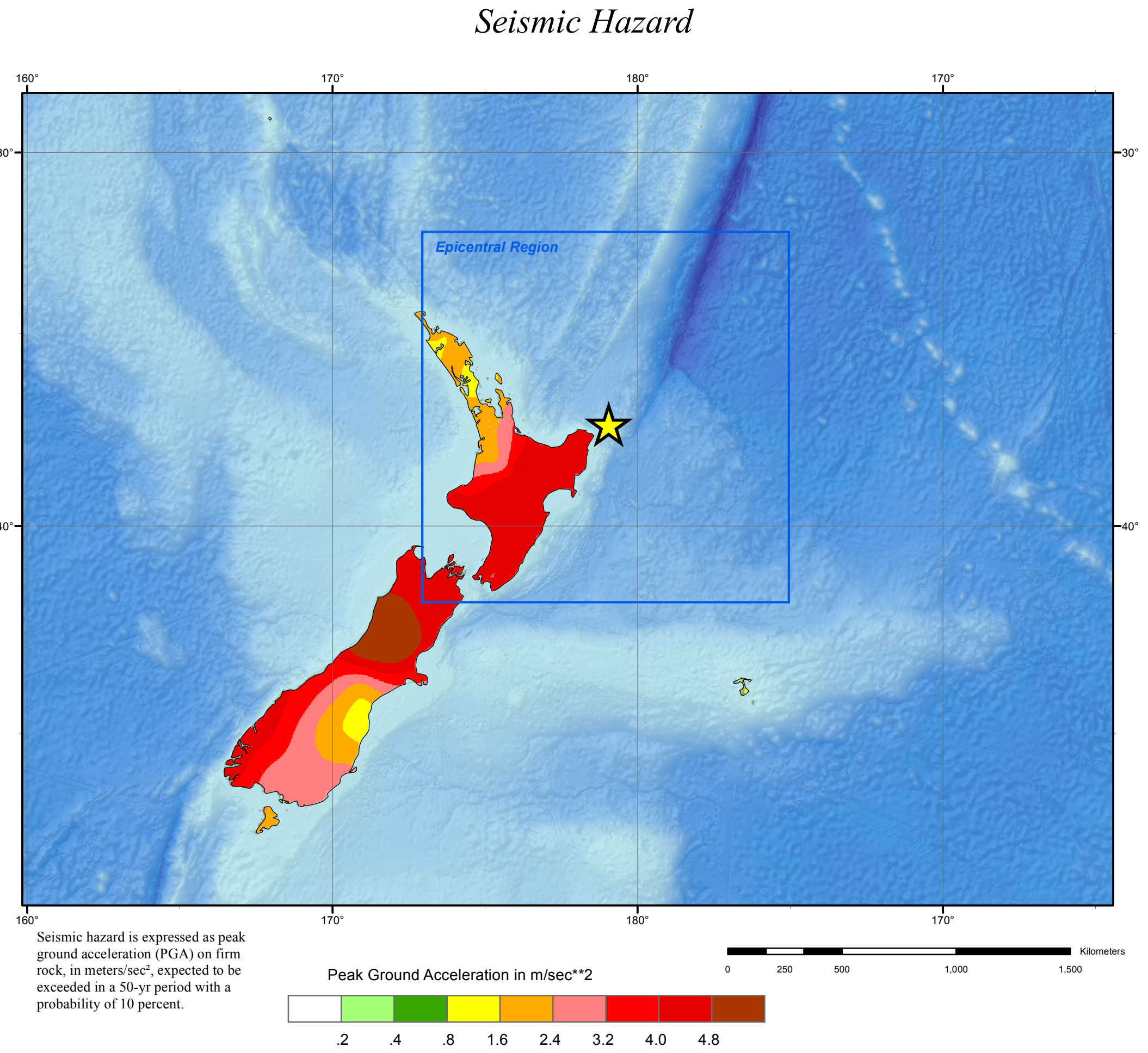
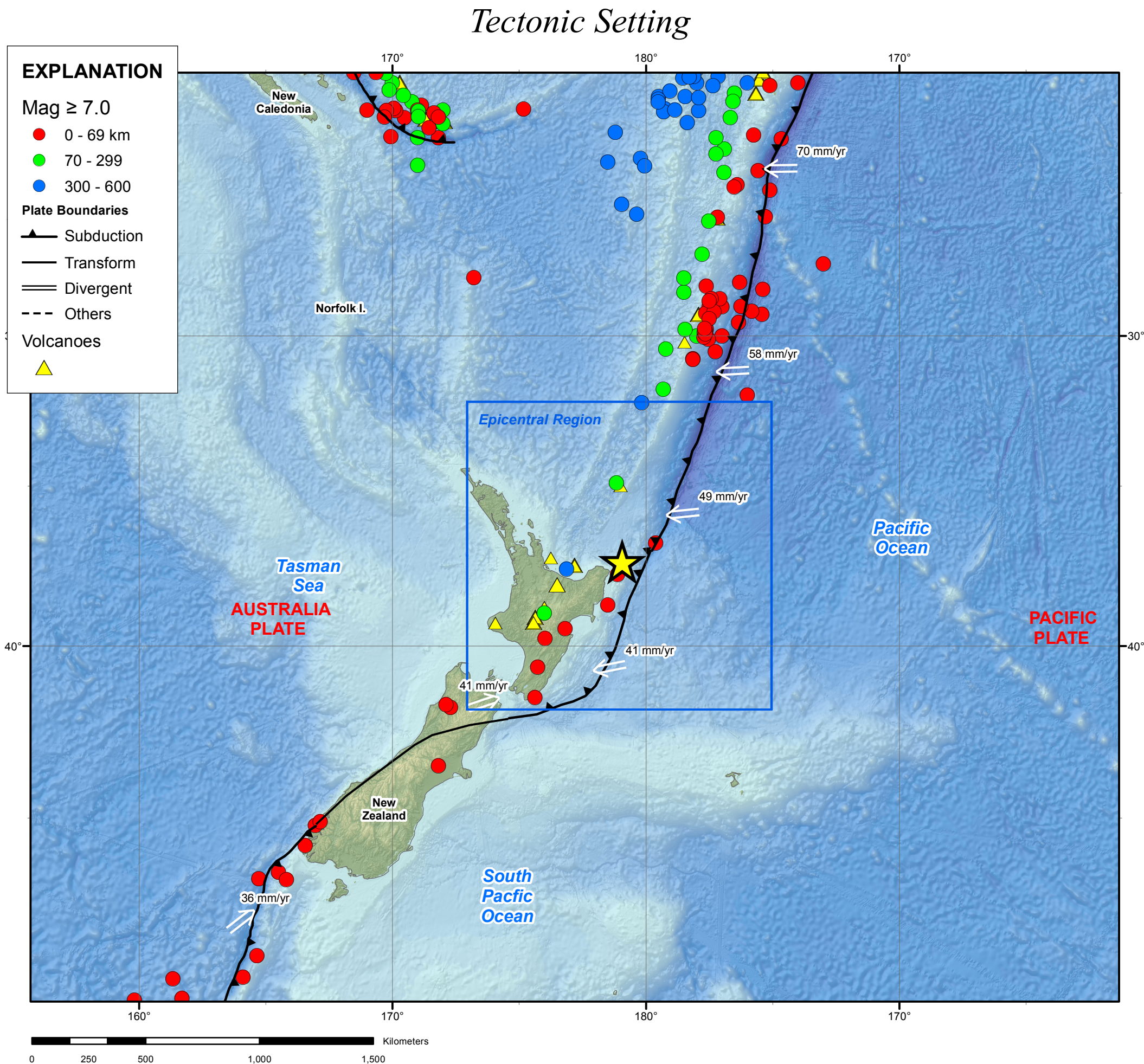


M7.1 Offshore Northeast Coast of New Zealand Earthquake of 1 September 2016

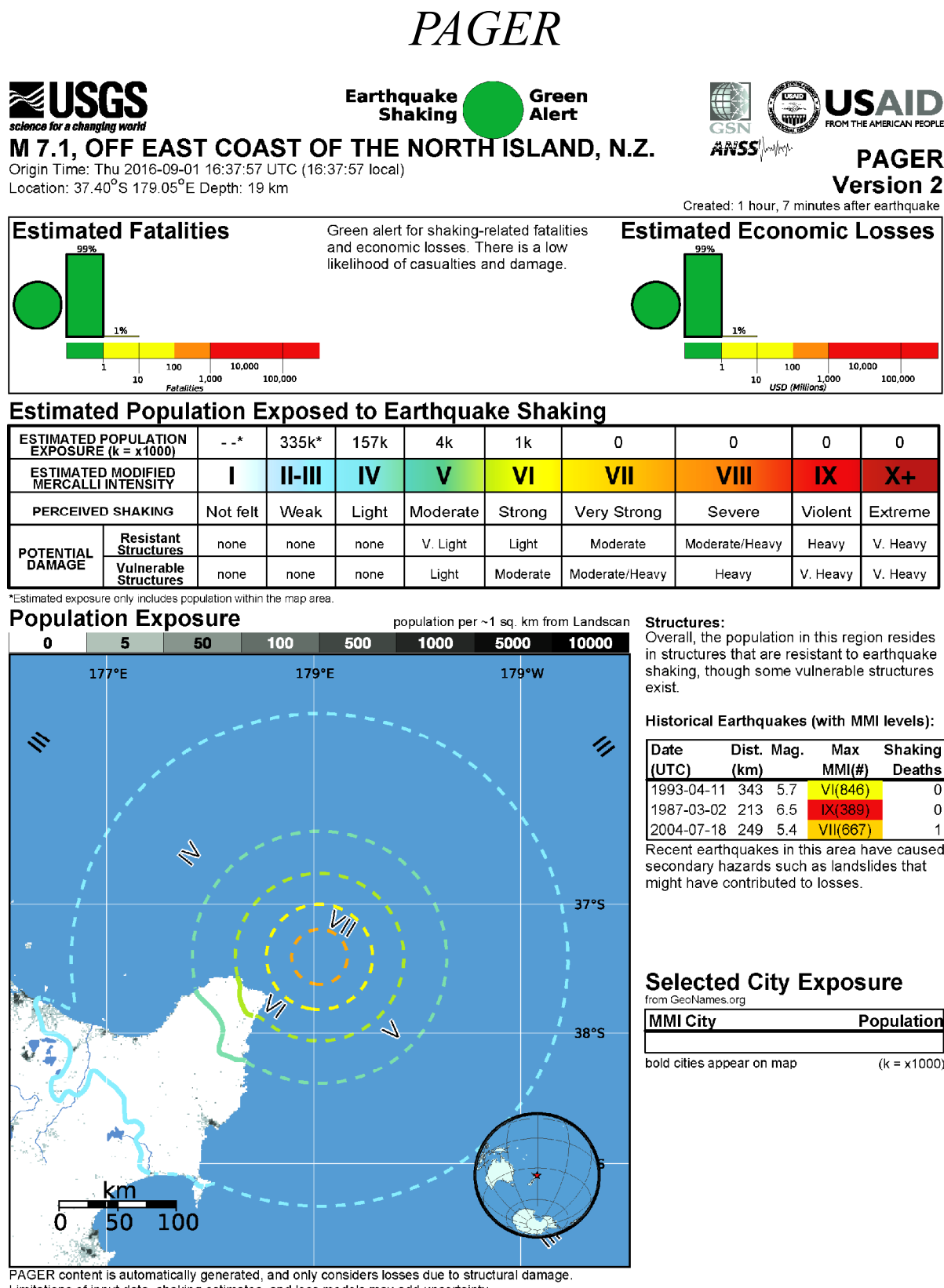


TECTONIC SUMMARY

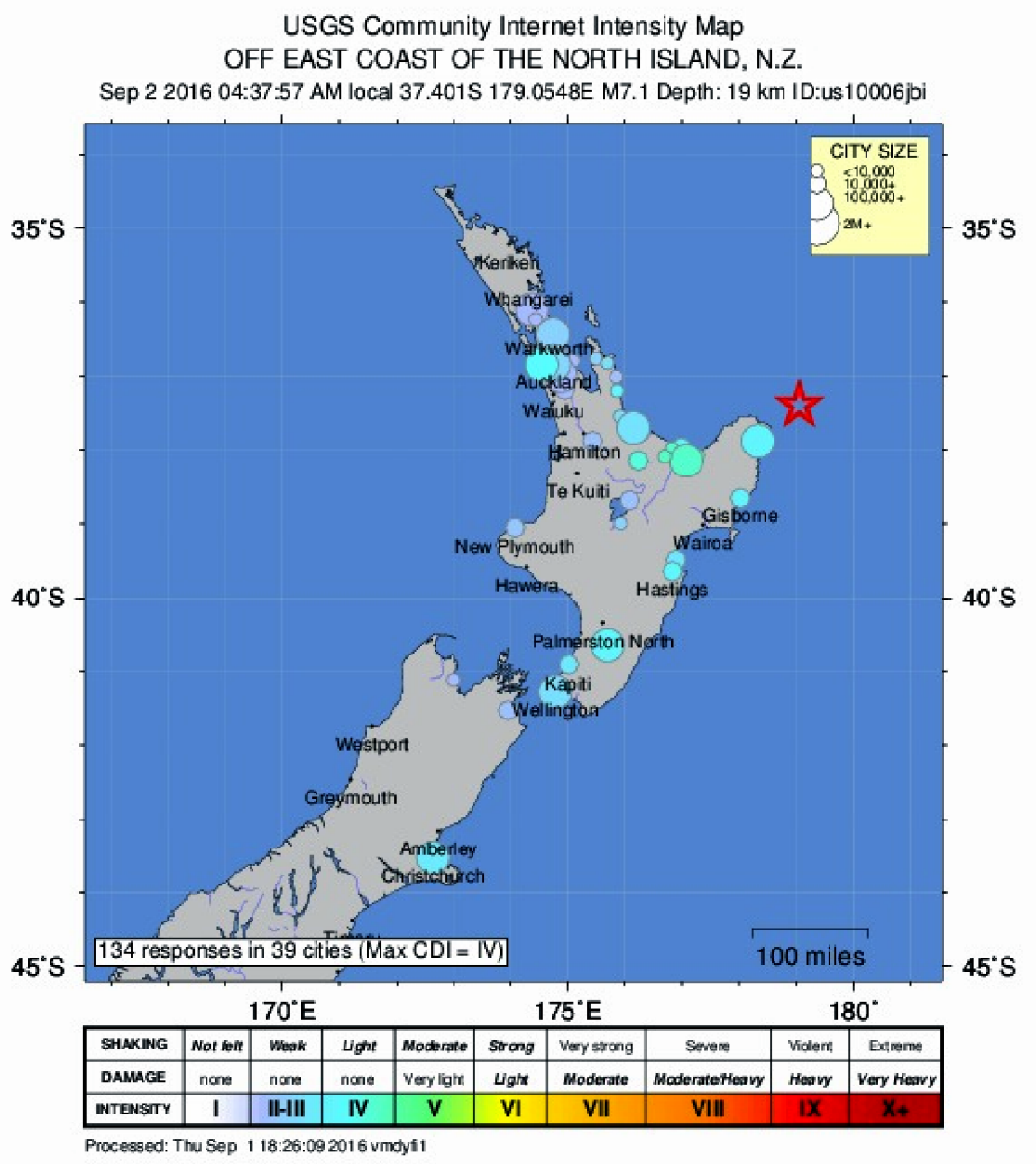
The September 1, 2016 M 7.1 earthquake northeast of Gisborne, New Zealand occurred as the result of shallow oblique-normal faulting near the plate boundary between the Pacific and Australia plates. Preliminary focal mechanism solutions indicate oblique rupture occurred on either a steep dipping, southwest striking normal fault, or on a shallow dipping, north-northeast striking fault. The Pacific plate begins its westward subduction beneath the Australia plate at the Kermadec and Hikurangi trenches, 65 km to the east of this event, with a velocity of about 47 mm/yr. The depth, location and focal mechanism of the earthquake all indicate this is most likely an intraplate event within the subducting Pacific slab, rather than being an interplate thrust earthquake on the overlying subduction zone interface.

The Australia-Pacific plate boundary region east of the North Island of New Zealand has a history of large earthquakes both along the plate boundary proper, within the subducting Pacific Plate, and in the overlying Australia plate. Seismic activity is especially high in the Kermadec Islands region to the north. Within 250 km of the September 1, 2016 event, 28 other M 6 and larger earthquakes have occurred over the preceding century. The largest was a M 7.1 event in February 1995, about 45 km to the southwest of the September 1, 2016 earthquake. The 1995 event also occurred as a result of shallow oblique-normal faulting, and is not known to have caused any fatalities or damage. The 1995 M 7.1 earthquake was followed by a M 6.5 aftershock five days later.

The September 1, 2016 event was preceded by a M 5.8 foreshock, approximately 18 hours earlier and 30 km to the north, at a similar depth and with the same faulting mechanism as the subsequent M 7.1 earthquake.



Did You Feel It?



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)
EHB catalog (Engdahl et al., 1998)
HDF (unpublished earthquake catalog, Engdahl, 2003)
Global Seismic Hazard Assessment Program
Volcanoes of the World (Siebert and Simkin, 2002)

PLATE TECTONICS AND FAULT MODEL
PB2002 (Bird, 2003)
Ji, C., D.J. Wald, and D.V. Helmenberger. Source description of the 1999 Hector Mine, California earthquake. Part I: Wavelet domain inversion theory and resolution analysis. Bull. Seism. Soc. Am., Vol 92, No. 4, pp. 1192-1207, 2002.
DeMets, C., Gordon, R.G., Argus, D.F., 2010. Geologically current plate motions. Geophys. J. Int. 181, 1-80.

BASE MAP
NIMA and ESKI, 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 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.

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 updated by U.S. Geological Survey National Earthquake Information Center
01 September 2016
<http://earthquake.usgs.gov/>
Map not approved for release by Director USGS