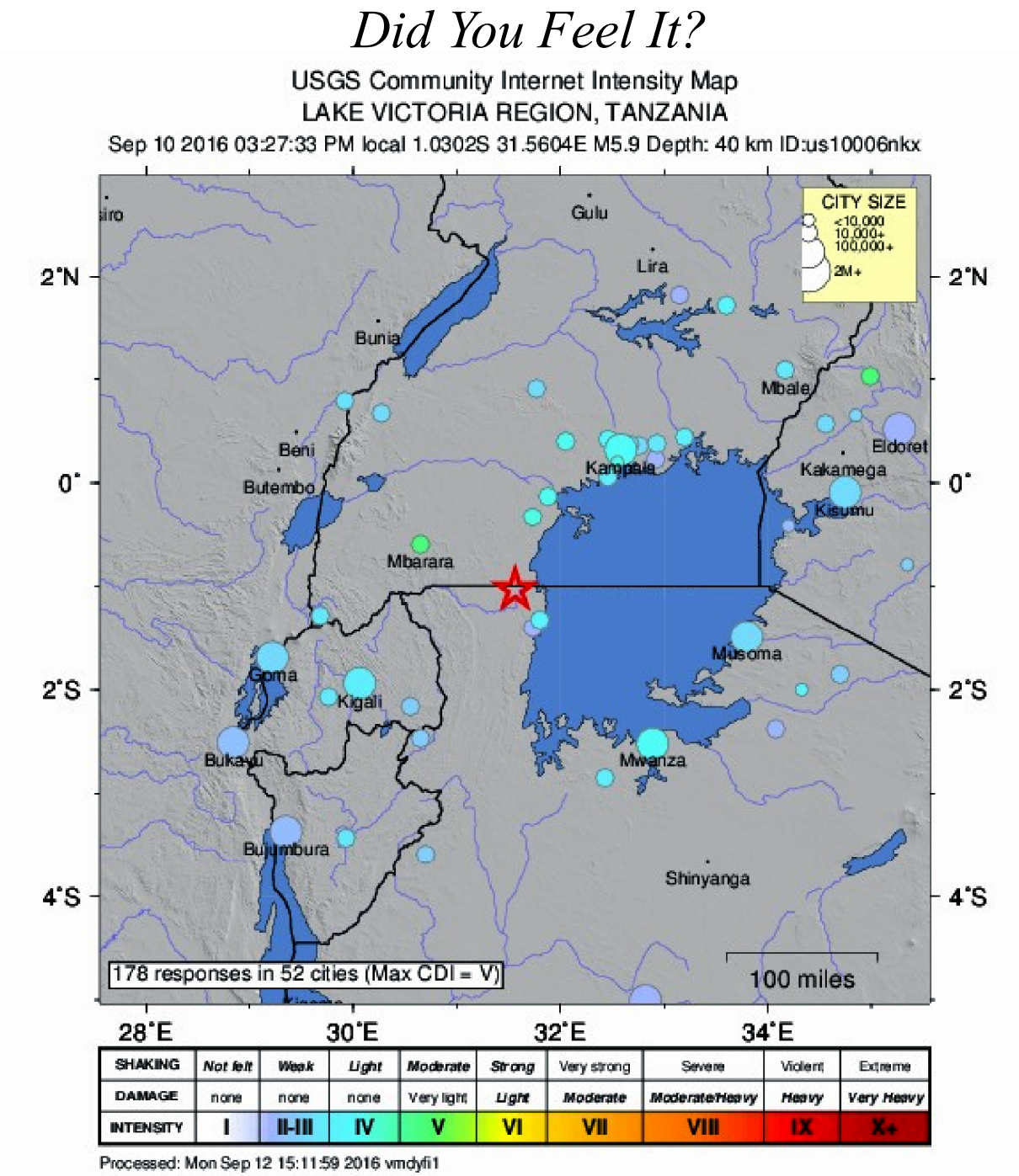
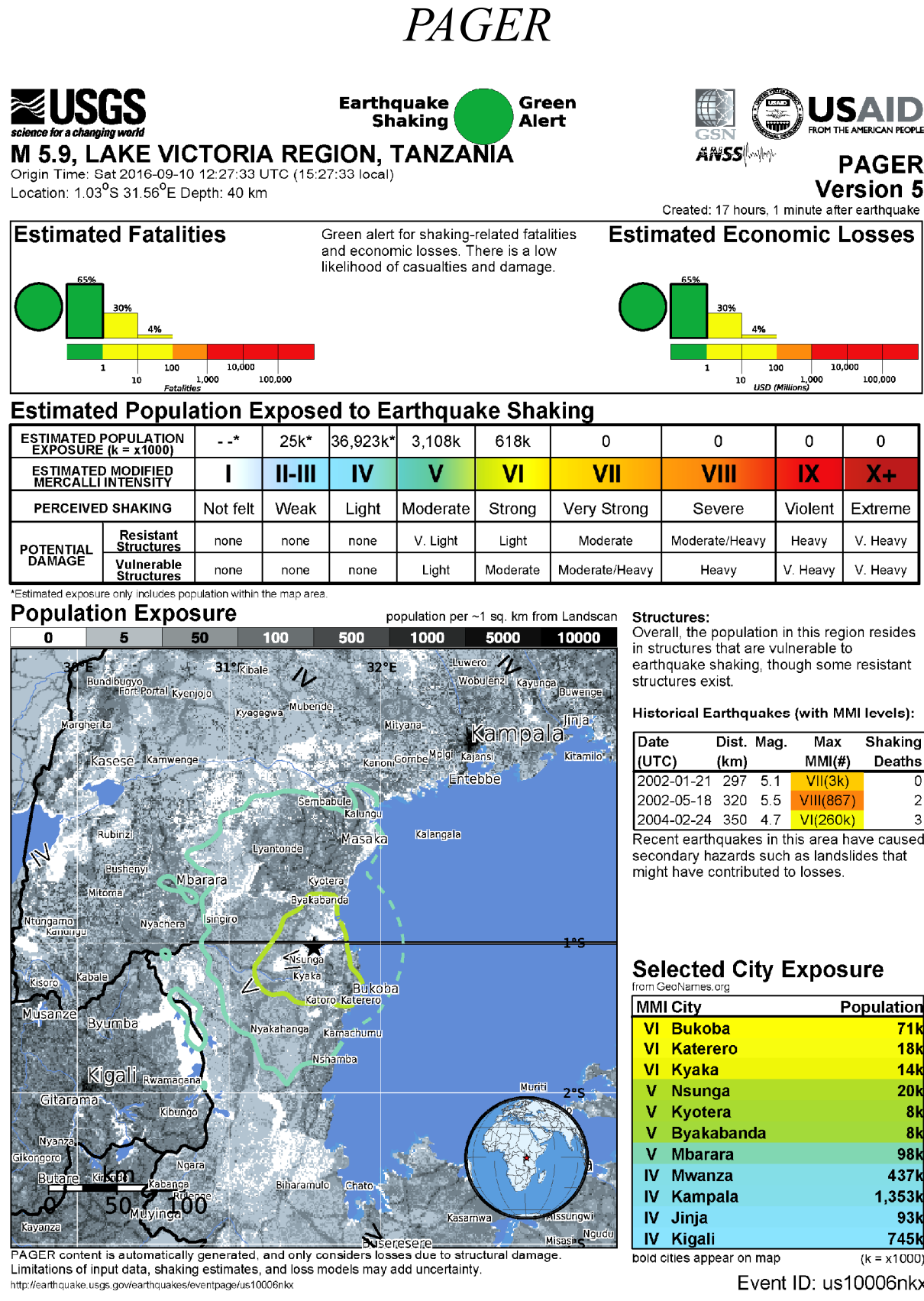
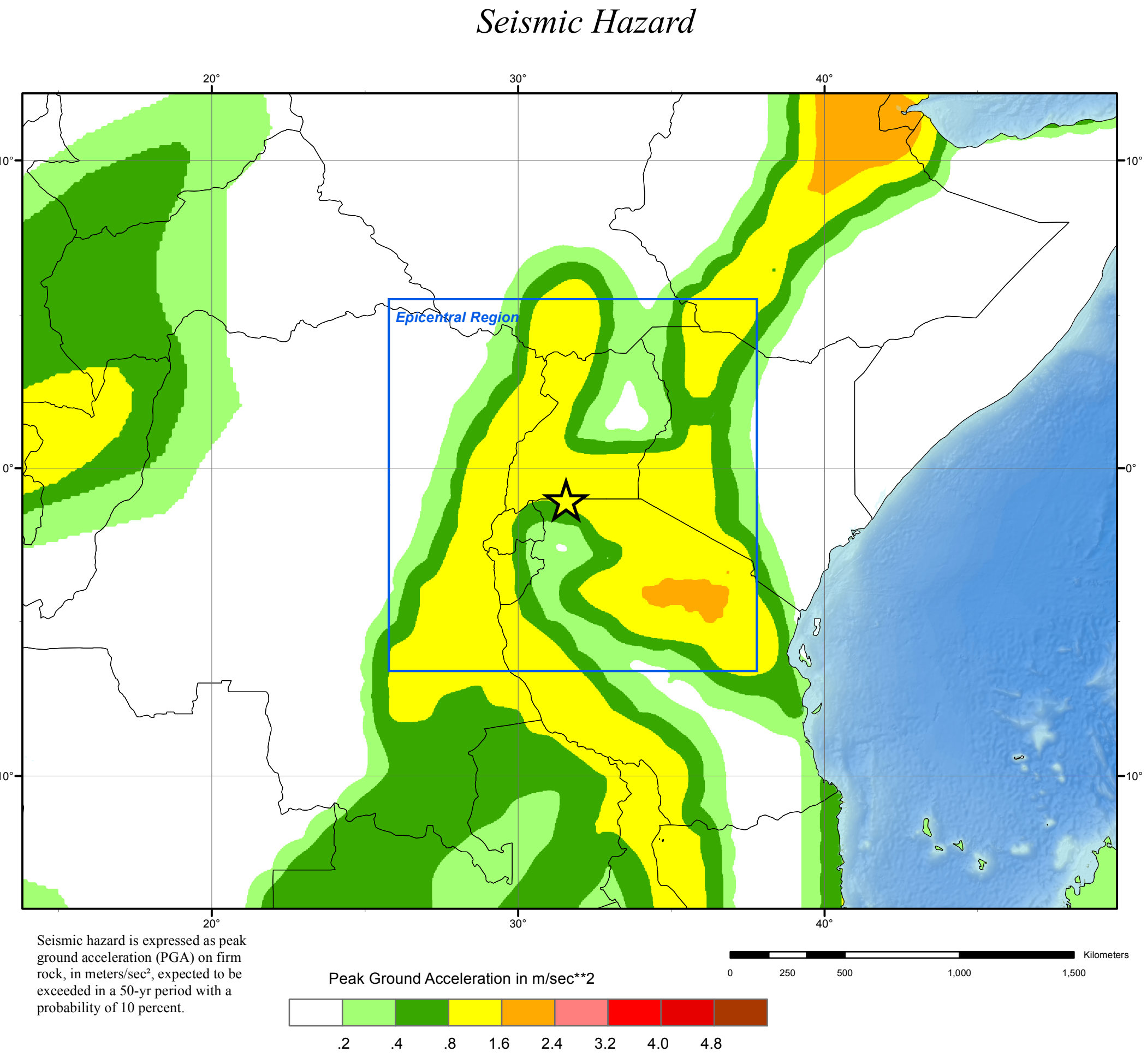
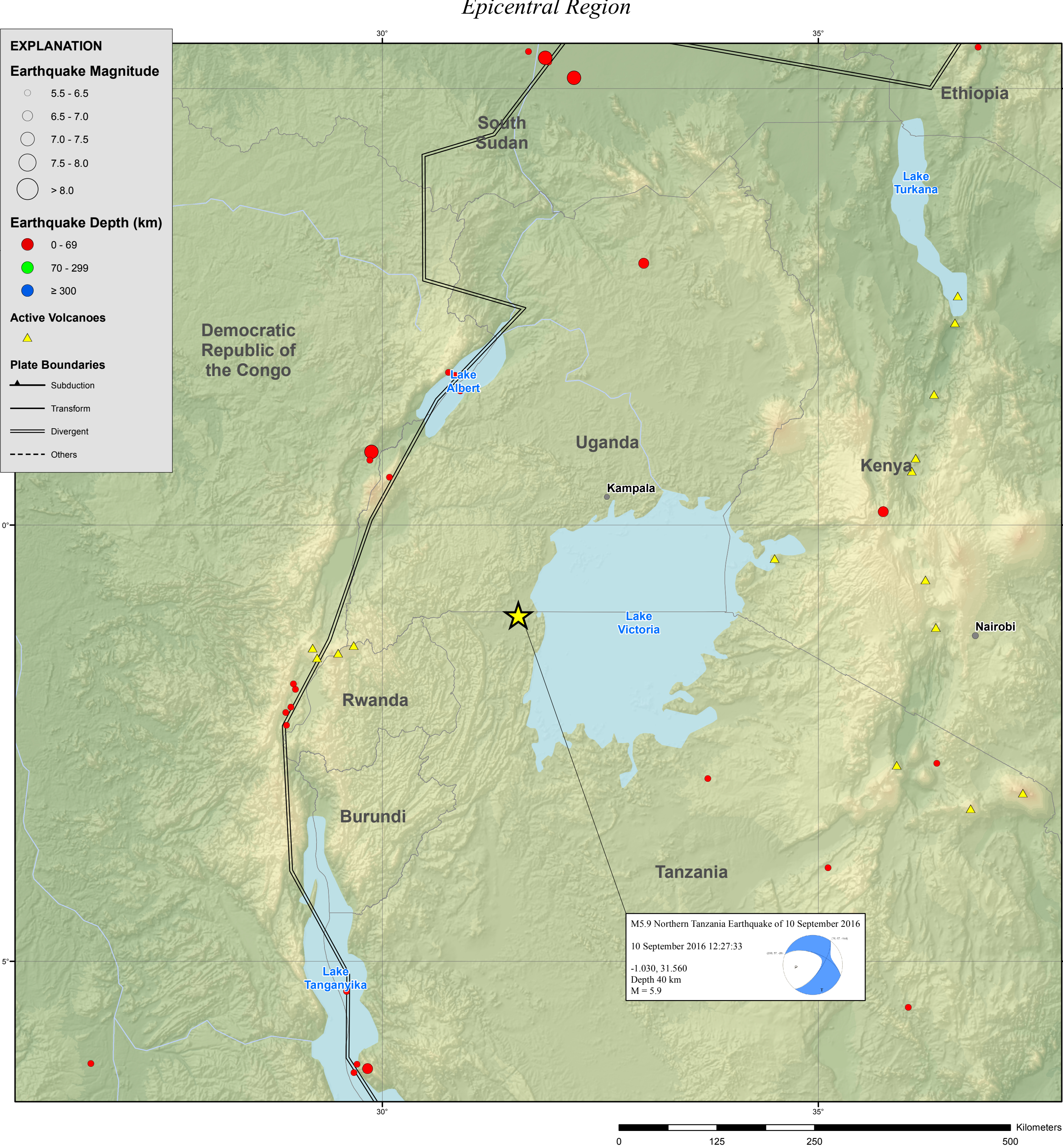
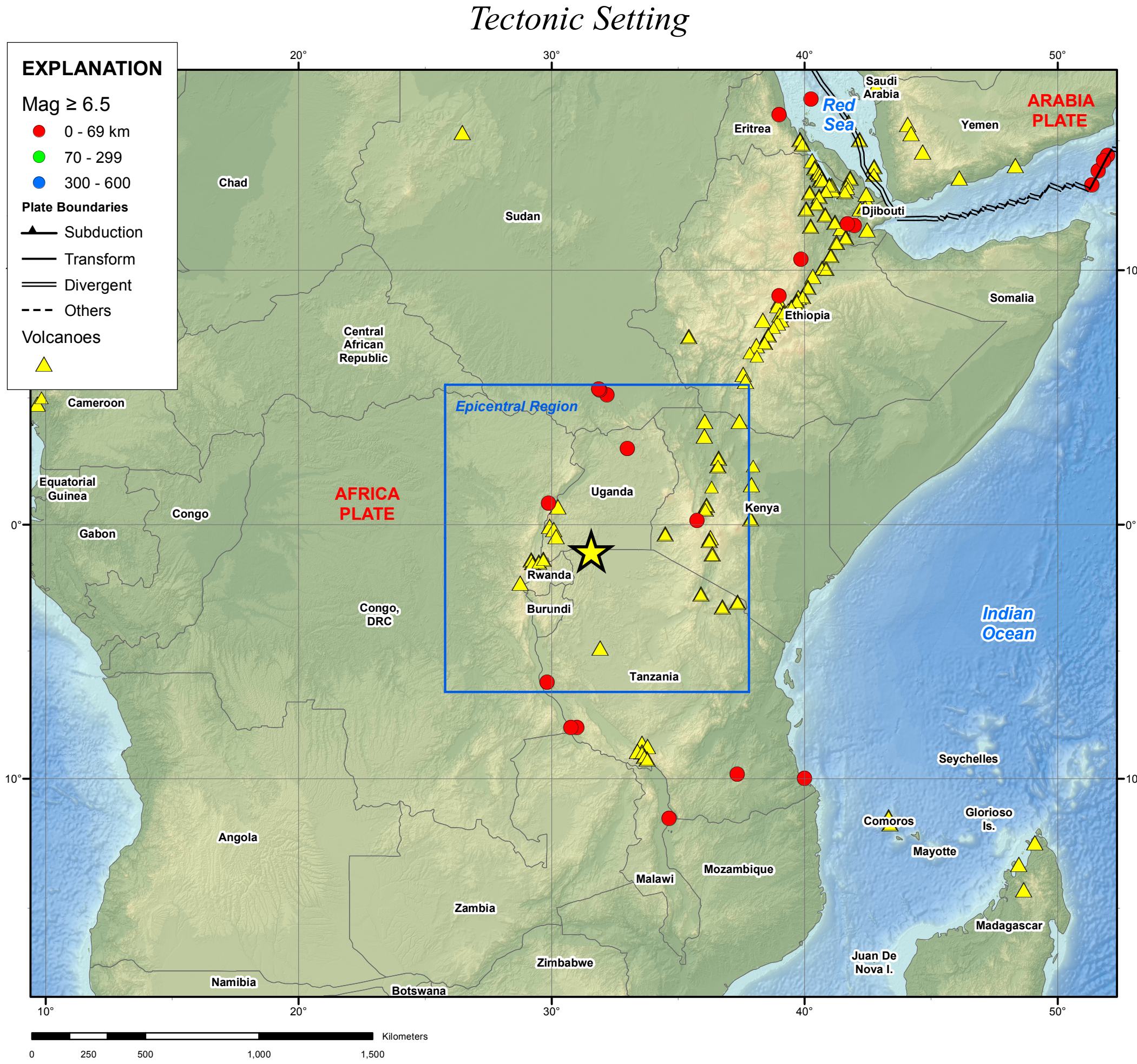
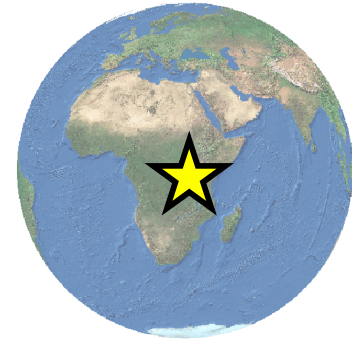


M5.9 Northern Tanzania Earthquake of 10 September 2016



TECTONIC SUMMARY

The September 10, 2016 M 5.9 earthquake near the west shore of Lake Victoria in northern Tanzania occurred as the result of shallow oblique faulting within the lithosphere of the Nubia (Africa) plate. The focal mechanism solution for the earthquake indicates rupture occurred on a moderately dipping fault striking either northeast-southwest (right-lateral slip) or east-west (left-lateral slip).

The location of the September 10, 2016 earthquake broadly places it in the East African Rift System, a 3,000-km-long Cenozoic age continental rift extending from the Afar triple junction (between the horn of Africa and the Middle East), to western Mozambique. In this context, today's earthquake is some 200 km or more to the east of the West Branch of the Rift System, which runs along the border between the Democratic Republic of the Congo and both Uganda (in the north) and Tanzania (to the south). The East Branch of the Rift System runs north-to-south through Kenya and central Tanzania, several hundred kilometers to the east of the September 10 earthquake. The Victoria microplate lies between these two branches of the rift, and helps to accommodate the dominantly divergent (extensional) tectonics of the Rift System, where rift segments are connected by dominantly strike-slip transform faults. The September 10, 2016 earthquake is consistent with this mixed divergent and strike slip setting, and occurred somewhat centrally within that microplate, in an area with little to no recorded earthquakes over the past century.

Historically, seismicity in the East African Rift is mainly concentrated along the branches of the rift system (i.e., at the edges of the Victoria microplate, and along the main rift running through Ethiopia in the north, and Malawi and Mozambique in the south). Over the preceding century, only one other earthquake has been recorded within 100 km of the September 10, 2016 earthquake – a M 4.3 event in Lake Victoria in December 2013. Further afield, 22 M6+ events have occurred within 500 km of the September 10, 2016 earthquake over the preceding century, most on the Western Branch of the Rift System to the west of today's earthquake. These include a M 6.6 earthquake in March 1966 near Lake Edward on the Uganda-DRC border. Tanzania's largest historic earthquake over this time period was a M 7.2 event in July 1919, near Lake Tanganyika in the west of the country. A M 6.8 earthquake near the center of Lake Tanganyika in December 2005 resulted in half a dozen or more fatalities. At the time of writing (10 hours after the earthquake), the September 10, 2016 earthquake has been reported to have caused over a dozen fatalities, and 200 or more injuries.

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)
EBH 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. Helwegger. 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: Geochim. Geophys. Geost., v. 4, no. 3, pp. 1027-88.

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
13 September 2016
http://earthquake.usgs.gov/
Map not approved for release by Director USGS