M 7.2 Earthquake of Papua New Guinea on May 6, 2019

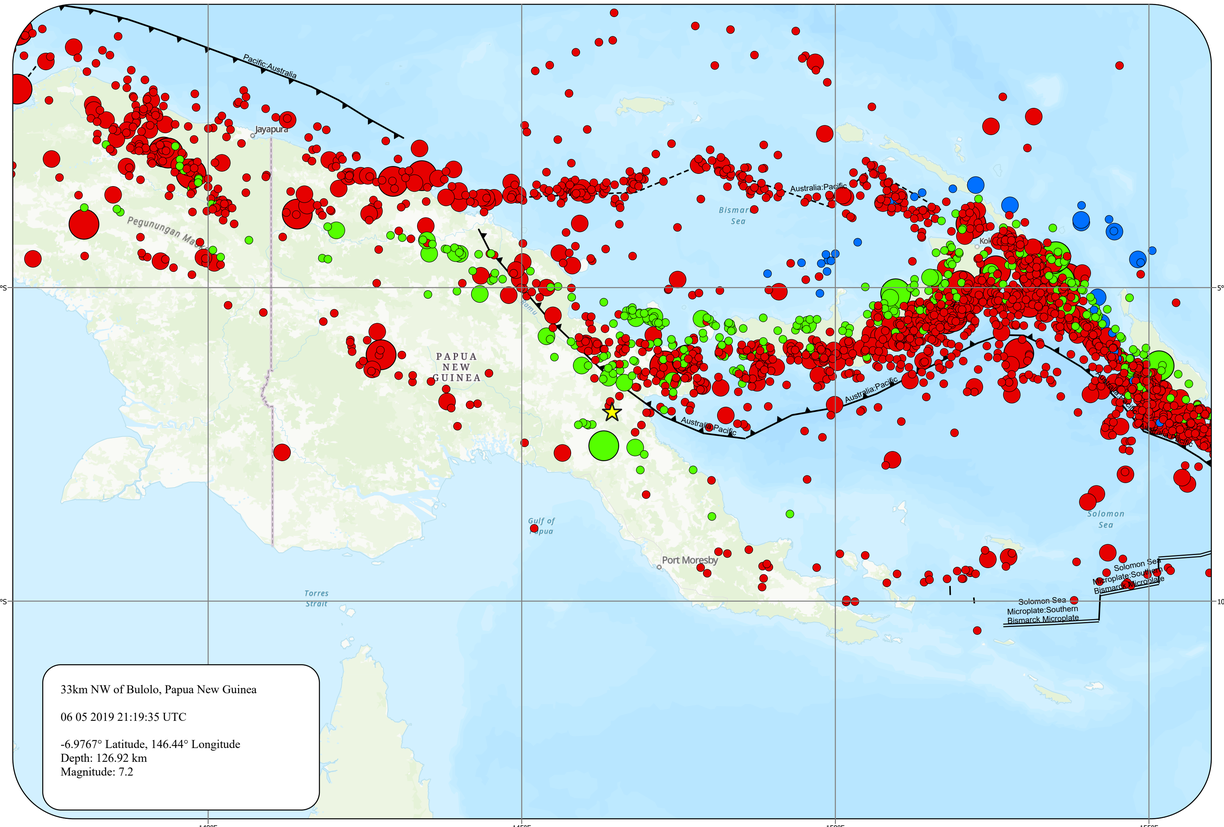
U.S. Department of the Interior
U.S. Geological Survey

Earthquake Summary Map
prepared in cooperation with
the Global Seismographic Network

The May 6, 2019, M 7.2 Papua New Guinea earthquake occurred as a result of normal faulting at an intermediate depth, approximately 127 km beneath eastern Papua New Guinea, near the northern edge of the Australia plate. Focal mechanism solutions indicate that rupture occurred on an east-southeast striking steeply dipping fault or a west-northwest shallowly dipping fault. At the location of the earthquake, the Australia plate moves towards the east-northeast relative to the Pacific plate at a velocity of about 100 mm/yr. Earthquakes in this geographical region are generally associated with the large-scale convergence of these two major plates and with the complex interactions of several associated microplates, most notably the South Bismarck plate, the Solomon Sea microplate, and the Woodlark plate.

Papua New Guinea experiences a high rate of seismic activity, with almost 61 events of M 6+ occurring within 250 km of the May 6 event since 1973. Nearby (within 100 km), five large earthquakes have occurred at depths greater than 100 km.

Earthquakes like the May 6 event, with focal depths between 70 and 300 km are commonly termed "intermediate-depth" earthquakes. Intermediate-depth earthquakes represent deformation within subducted slabs rather than at the shallow plate interface between subducting and overriding tectonic plates. They typically cause less damage on the ground surface above their foci than is the case with similar-magnitude shallow-focus earthquakes, but large intermediate-depth earthquakes may be felt at great distances from their epicenters. "Deep-focus" earthquakes, those with focal depths greater than 300 km, also occur in beneath Papua New Guinea and the Bismarck Sea to the northeast.



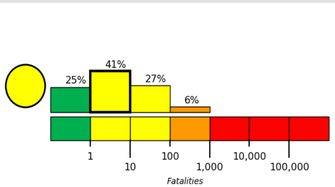
PAGER Information

Green alert for shaking-related fatalities and economic losses. There is a low likelihood of casualties and damage.

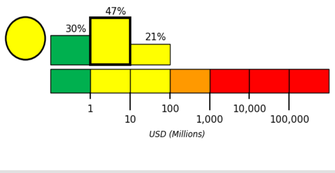
Recent earthquakes in this area have caused secondary hazards such as tsunamis, landslides and liquefaction that might have contributed to losses.

Overall, the population in this region resides in structures that are a mix of vulnerable and earthquake resistant construction. The predominant vulnerable building types are unreinforced brick masonry and informal (metal, timber, GI etc.) construction.

Estimated Economic Losses



Estimated Fatalities



Landslides

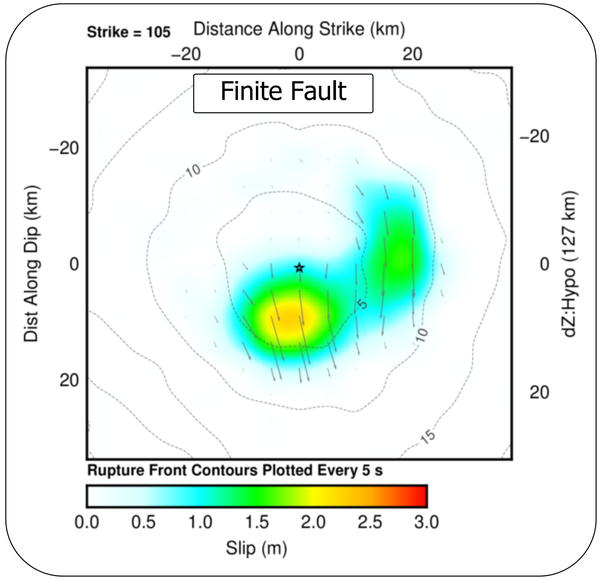
Limited area affected

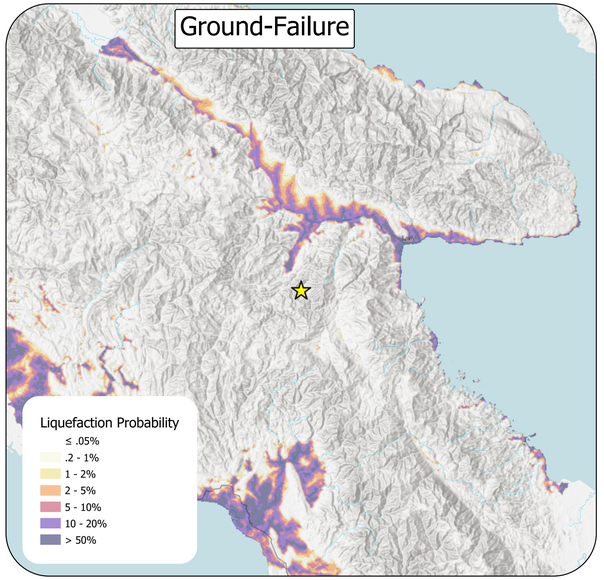
Little or no population exposed

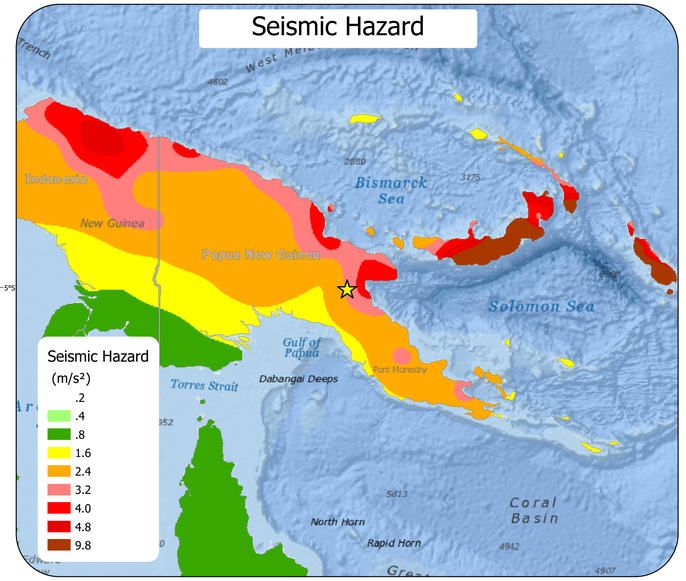
Liquefaction

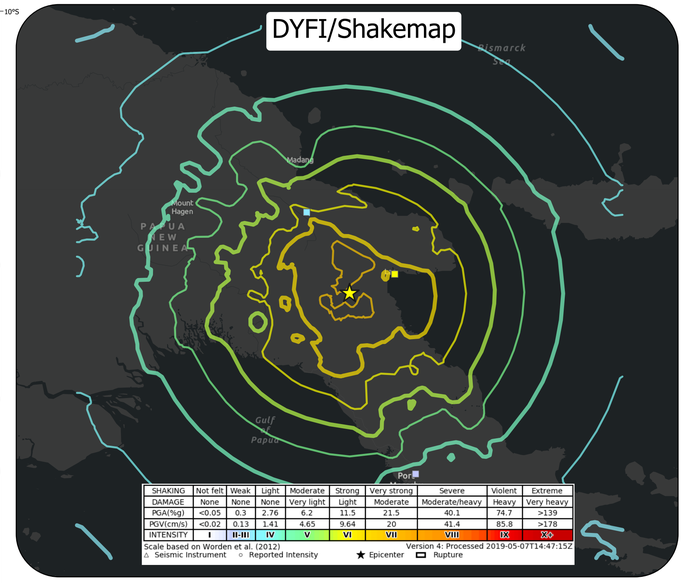
Extensive area affected

Significant population exposed









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. Helmberger, 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 ESRI, 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 Villasenor, 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
06 May 2019
https://earthquake.usgs.gov/
Map not approved for release by Director USGS