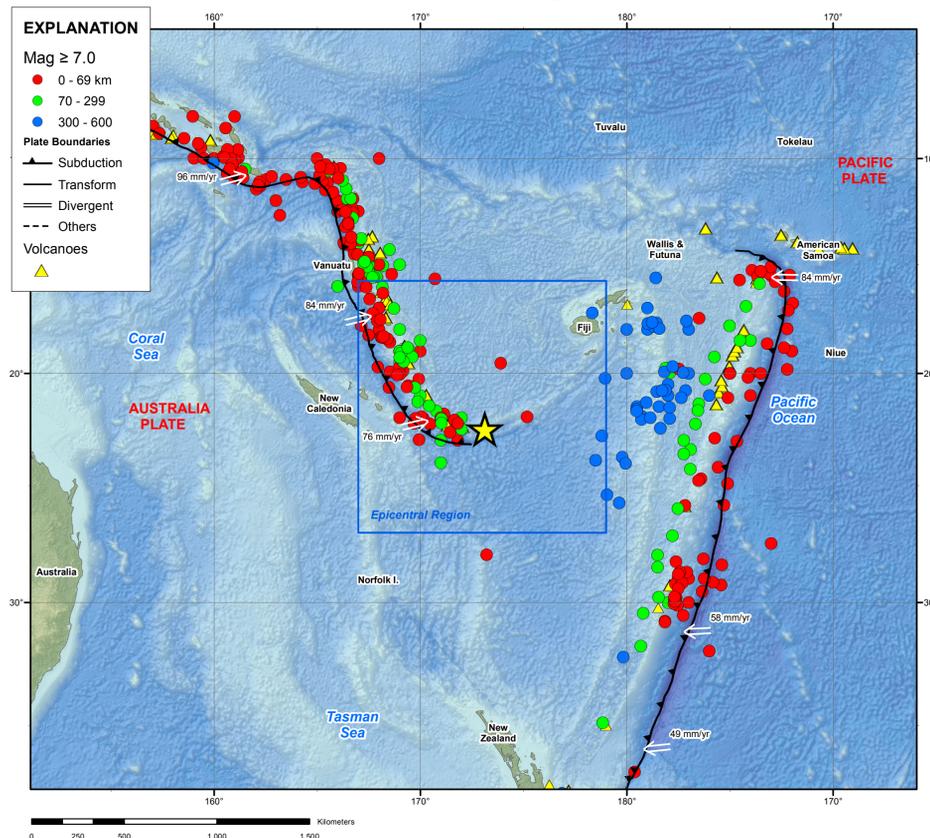


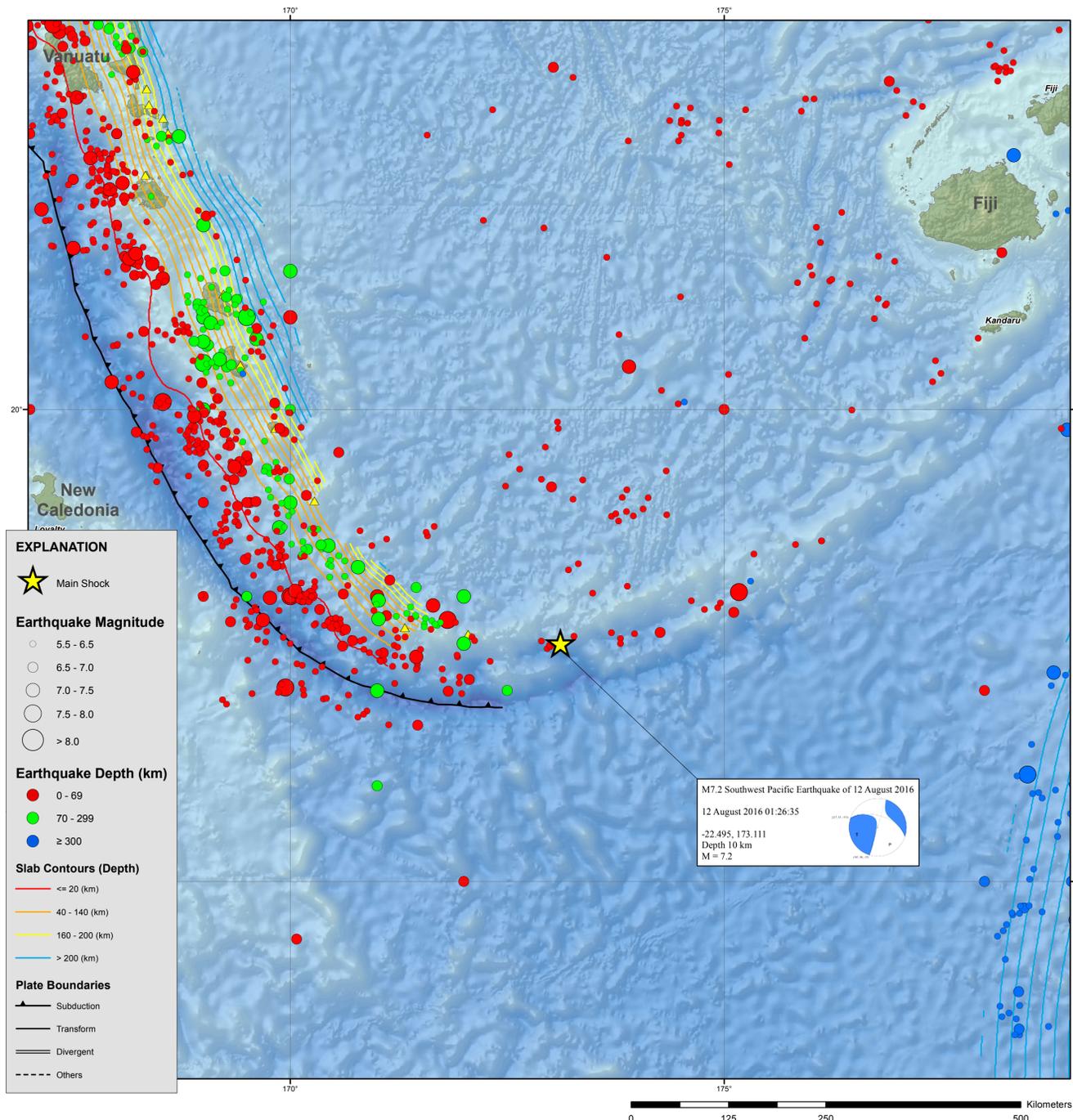
M7.2 Southwest Pacific Earthquake of 12 August 2016



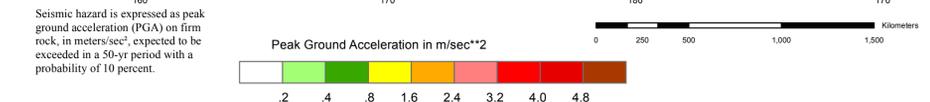
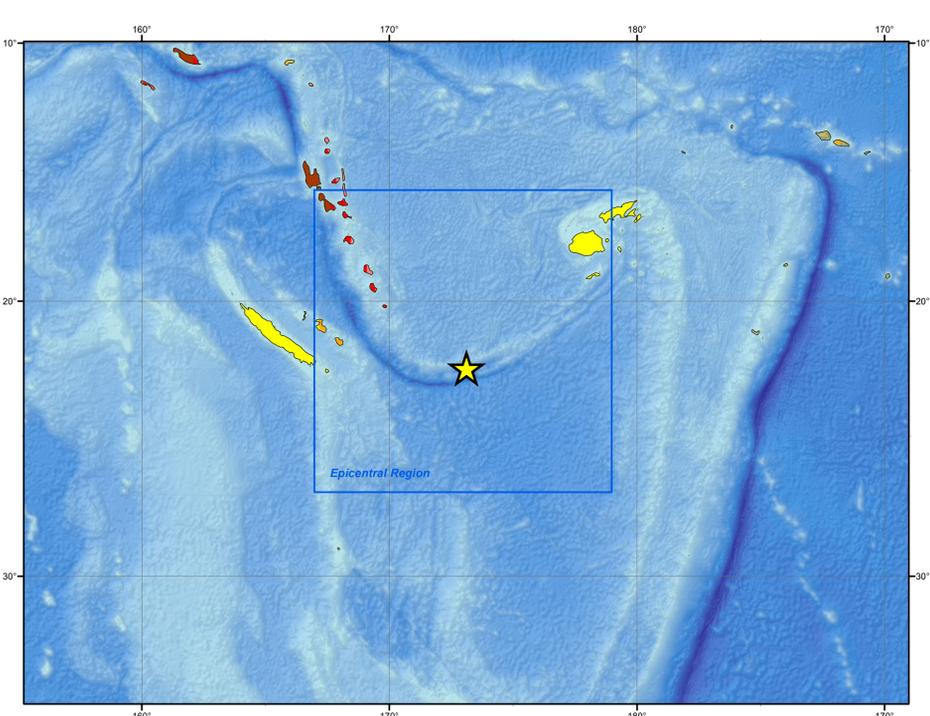
Tectonic Setting



Epicentral Region



Seismic Hazard



PAGER

USGS Earthquake Shaking Green Alert

M 7.2, SOUTHWEST OF THE LOYALTY ISLANDS
Location: 22.50°S 173.11°E Depth: 9 km
FOR TSUNAMI INFORMATION, SEE: tsunami.gov

Estimated Fatalities: 0
Estimated Economic Losses: 0

Estimated Population Exposed to Earthquake Shaking

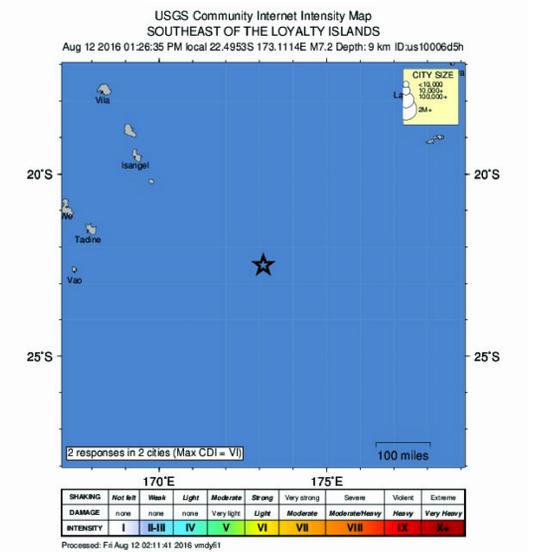
ESTIMATED POPULATION EXPOSURE (R = 1000)	I	II-III	IV	V	VI	VII	VIII	IX	X+
ESTIMATED MODIFIED MERCALLI INTENSITY	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
PERCEIVED SHAKING	None	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	None	None	None	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy	Very Heavy

Population Exposure: 0, 50, 100, 500, 1000, 5000, 10000

Selected City Exposure: 2 responses in 2 cities (Max CDI = VI)

Event ID: us10006d5h

DYFI?



TECTONIC SUMMARY

The August 12, 2016 M 7.2 earthquake east of New Caledonia in the southwest Pacific, and the North Fiji Basin, occurred as the result of shallow strike-slip faulting on or near the complex plate boundary between the Australia and Pacific plates. At the location of this earthquake the regional plate boundary is transitional, evolving from east-northeastward-oriented subduction of Australia beneath Pacific at the New Hebrides Trench to the north and west, to southwest-northeast oriented left-lateral transform faulting between the two plates just south of this earthquake. The location of the August 12 event also lies just south and west of the Central Spreading Ridge, a zone of back-arc spreading accommodating some of the divergence between the New Hebrides and Tonga subduction zones. The focal mechanism solution of the August 12 event implies faulting occurred as the result of either right-lateral slip on a fault oriented east-southeast, or left-lateral slip oriented south-southwest. Such a mechanism is inconsistent with the expected motions between the Australia and Pacific plates, and may instead indicate association with the development of a STEP (Subduction-Transform-Edge-Propagator) fault, a style of faulting that develops at many subduction terminations globally. Similar strike-slip events, also apparently inconsistent with local plate-motion, have occurred recently (2015) along this plate margin to the northwest at the transition from the Solomon Island subduction zone into the San Cristobal Trough (transform) plate boundary.

At the location of this earthquake, the Australia plate moves towards the east-northeast with respect to the Pacific at a rate of approximately 75 mm/yr. Spreading rates along the Central Spreading Ridge are also around 75-80 mm/yr.

While commonly plotted as points on maps, earthquakes of this size are more appropriately described as slip over a larger fault area. Strike-slip events of the size of the August 12, 2016 earthquake are typically about 80x15 km in size (length x width).

The New Hebrides (Vanuatu) Arc and the North Fiji Basin are very active seismically. Over the preceding century, the region within 250 km has hosted seven other M 7 or larger events, and two-dozen or more earthquakes of M 6.5 or larger. The largest of these was a M 7.6 left-lateral strike slip event on the Australia-Pacific plate boundary in March 1990, 215 km to the east of the August 12 earthquake. A M 7.5 event 230 km to the west in January 1998 also occurred as the result of left-lateral strike-slip faulting. Over the two hours following the August 12, 2016 earthquake, 6 aftershocks of M 4.5-5.4 had occurred, roughly aligned in a west-northwest – south-southeast orientation; similar to the right-lateral plane of the focal mechanism solution.

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 Villasenor, 2002)
EHB catalog (Engdahl et al., 1998)
IHF (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 ESRRI, 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. 1027-80.

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., 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
12 August 2016
<http://earthquake.usgs.gov/>
Map not approved for release by Director USGS