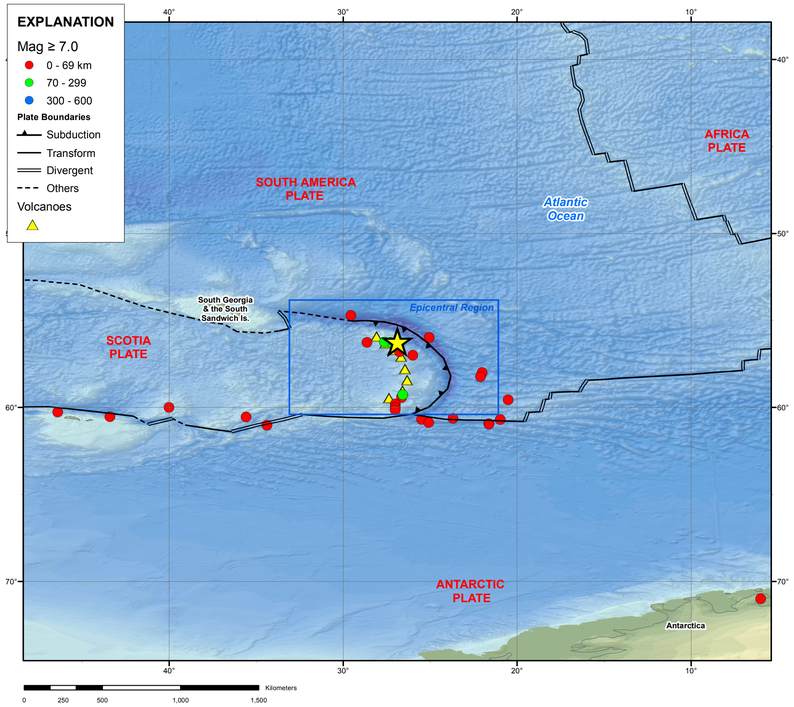
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

EARTHQUAKE SUMMARY MAP

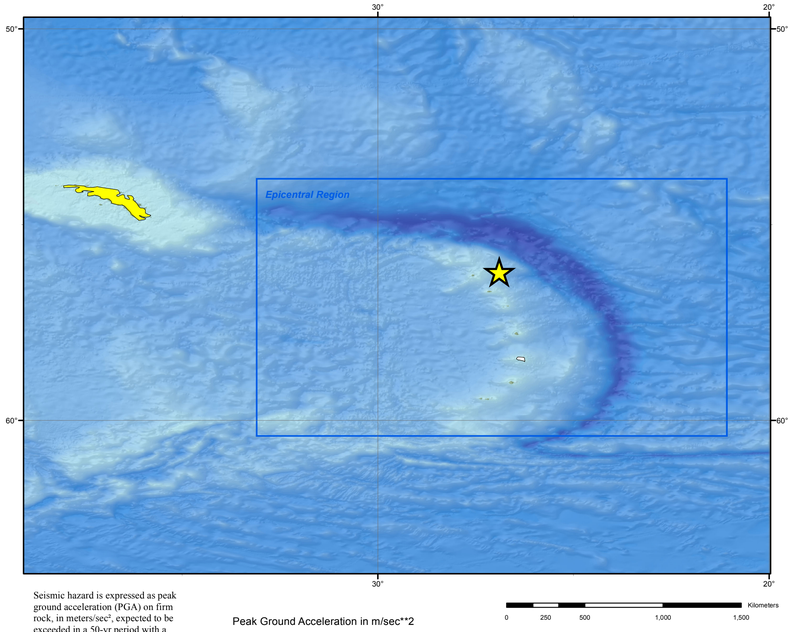
Prepared in cooperation with the Global Seismographic Network

M7.2 South Sandwich Islands Earthquake of 28 May 2016

Tectonic Setting



Seismic Hazard

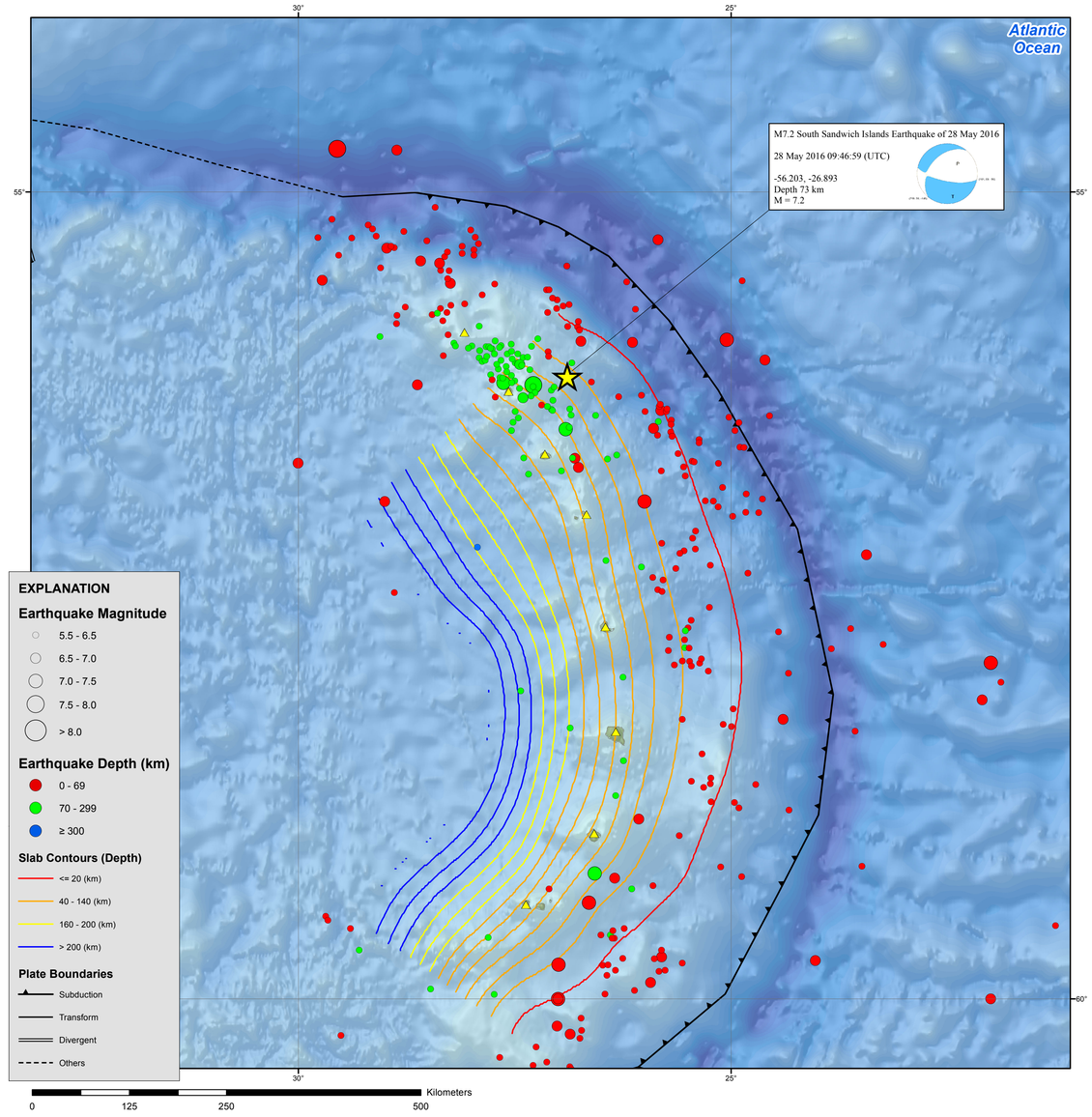


Seismic hazard is expressed as peak ground acceleration (PGA) on firm rock, in meters/sec², expected to be exceeded in a 50-yr period with a probability of 10 percent.

Peak Ground Acceleration in m/sec**2

.2 .4 .8 1.6 2.4 3.2 4.0 4.8

Epicentral Region



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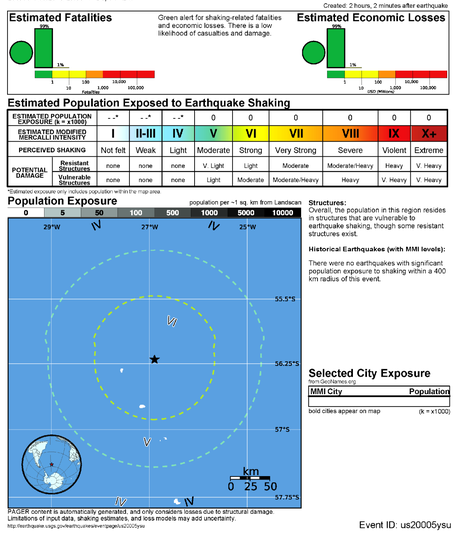
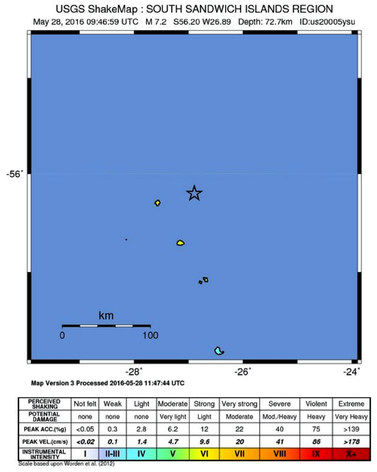


ShakeMap



TECTONIC SUMMARY

The May 28, 2016 M 7.2 earthquake near the South Sandwich Islands of the South Atlantic Ocean occurred at an intermediate depth within the lithosphere of the subducted South America plate. Focal mechanisms indicate that the earthquake resulted from oblique-normal faulting on either an east-striking, steeply-dipping fault, or on a southwest-striking, moderately-dipping fault. Slip on a fault of either orientation would accommodate the down-dip extension of the South America slab that is implied by the normal-component of the faulting solution.

At the location of this earthquake, the South America plate converges with and subducts beneath the Sandwich and Scotia Sea plates in a westerly direction at a rate of approximately 67 mm/yr. The South America plate begins its decent into the mantle at the South Sandwich Trench, approximately 80 km east-northeast of the May 28 earthquake, and is seismically active to depths of approximately 320 km in this region.

Earthquakes like this 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 interfaces 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 distance from their epicenters.

The South Sandwich Islands region is active seismically, frequently hosting moderate-sized earthquakes. Over the past century, 25 other M 6.5 events have occurred within 300 km of the May 28, 2016 earthquake. Five of these were at intermediate depths, including the largest – a M 7.8 event on May 26, 1964, 50 km west of the May 28, 2016 earthquake, and at a depth of 125 km. Because of their remote location, none of these events are known to have caused damage or fatalities.

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 signifiance.

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