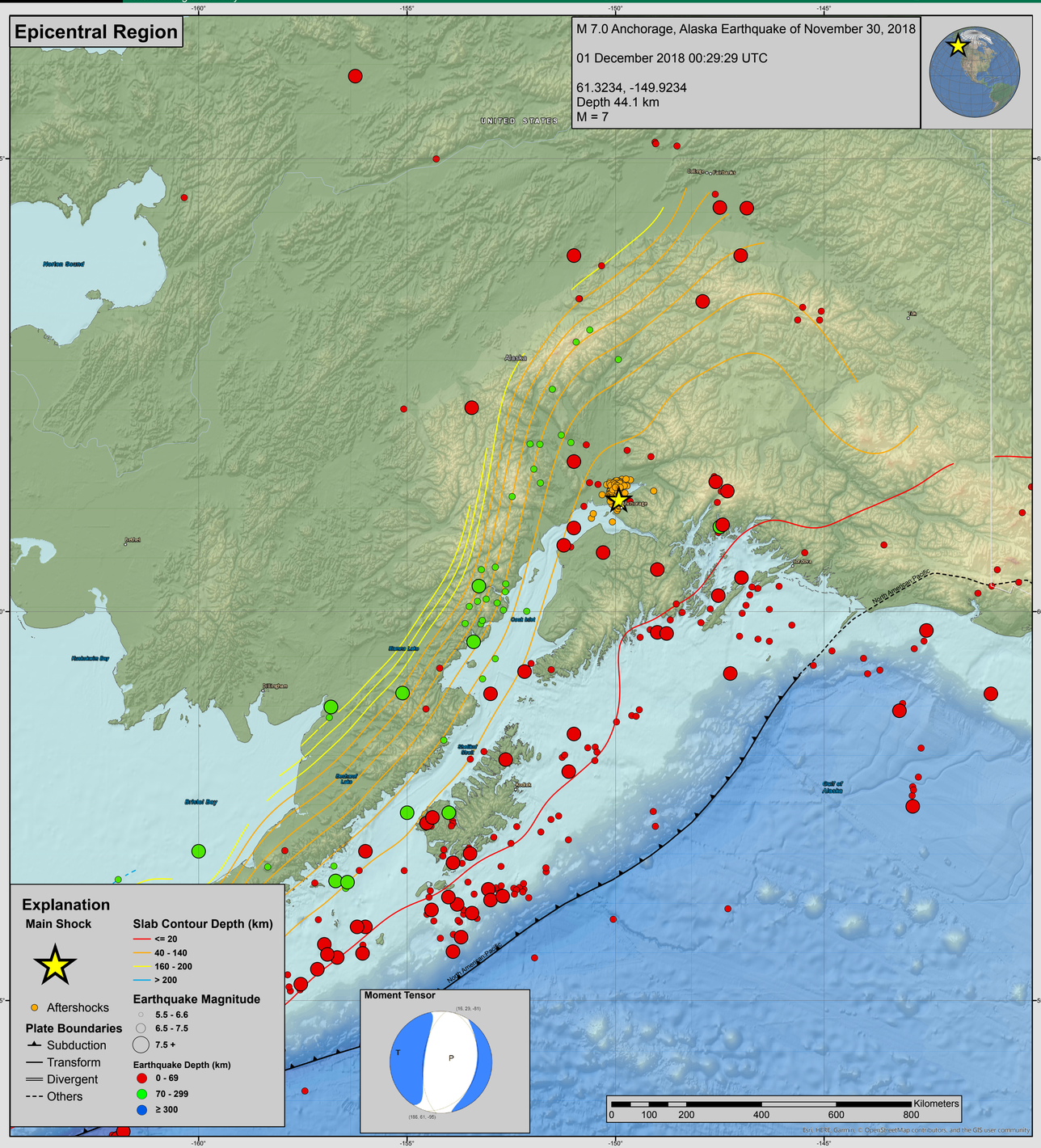
M 7.0 Anchorage, Alaska Earthquake of November 30, 2018

Earthquake Summary Map prepared in cooperation with the Global Seismographic Network

Epicentral Region

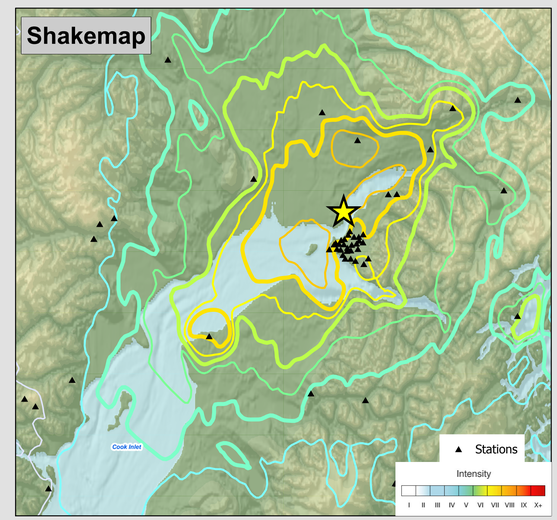


Tectonic Summary

The November 30, 2018, Mw 7.0 earthquake near Anchorage, Alaska, occurred as the result of normal faulting at a depth of about 40 km. Focal mechanism solutions for the event indicate slip occurred on a moderately dipping fault striking north-south (dipping either to the east at about 30 degrees, or the west at about 60 degrees). At the location of this earthquake, the Pacific plate is moving towards the northwest with respect to the North America plate at about 57 mm/yr, subducting beneath Alaska at the Alaska-Aleutians Trench, approximately 150 km south-southeast of this event. The location and mechanism of this earthquake indicate rupture occurred on an intraslab fault within the subducting Pacific slab, rather than on the shallower thrust-faulting interface between these two plates.

Earthquakes are common in this region. Over the past century, 14 other M 6+ earthquakes have occurred within 150 km of the November 30, 2018 event. Two of these – a M 6.6 earthquake in July 1983 and a M 6.4 event in September 1983 – were at a similarly shallow depth and caused damage in the region of Valdez. The M 9.2 great Alaska earthquake of March 1964, was an interface thrust faulting earthquake that ruptured over several hundred kilometers between Anchorage and the Alaska-Aleutians trench, and to the southwest.

Shakemap



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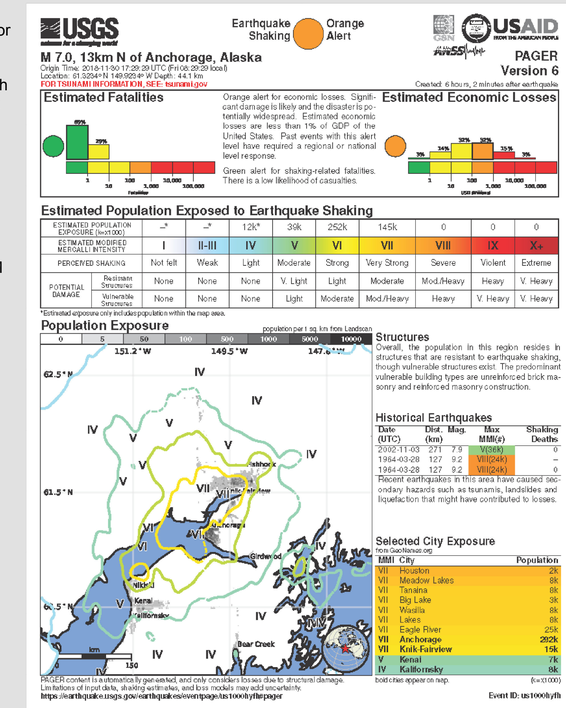
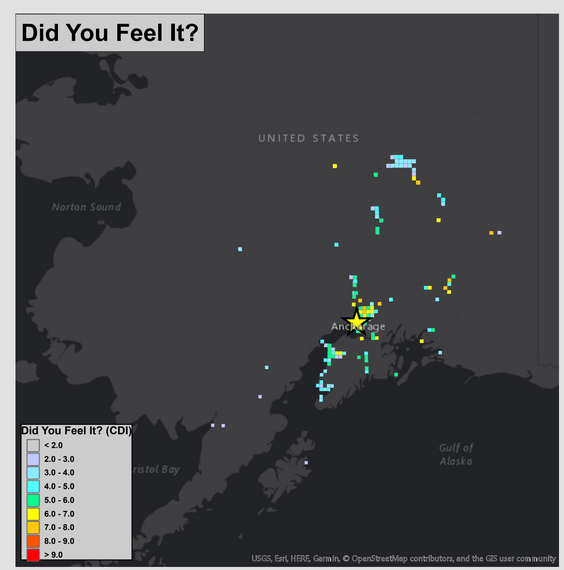
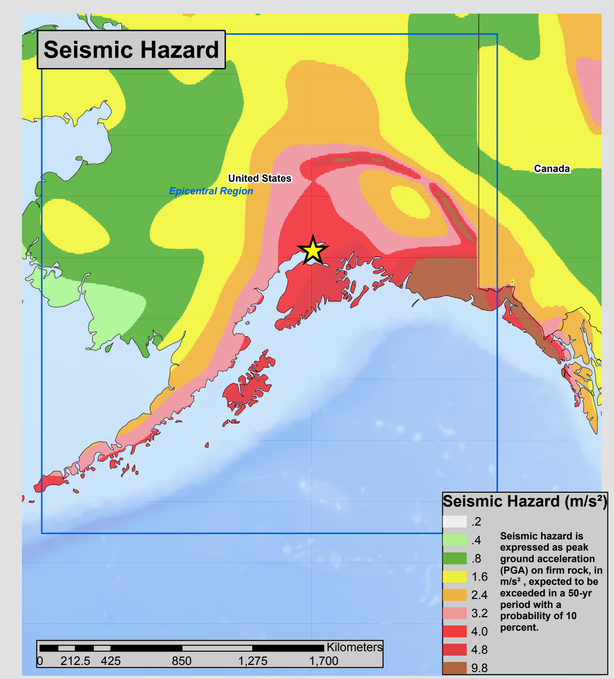


Did You Feel It?



Seismic Hazard



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
30 November 2018
http://earthquake.usgs.gov/
Map not approved for release by Director USGS