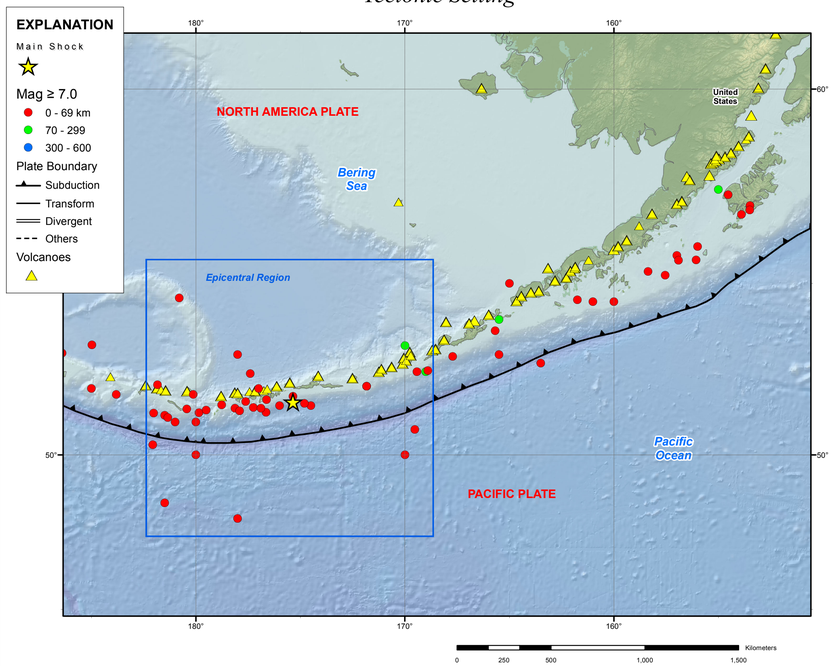
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

M7.0 Aleutian Islands, Alaska Earthquake of 30 August 2013

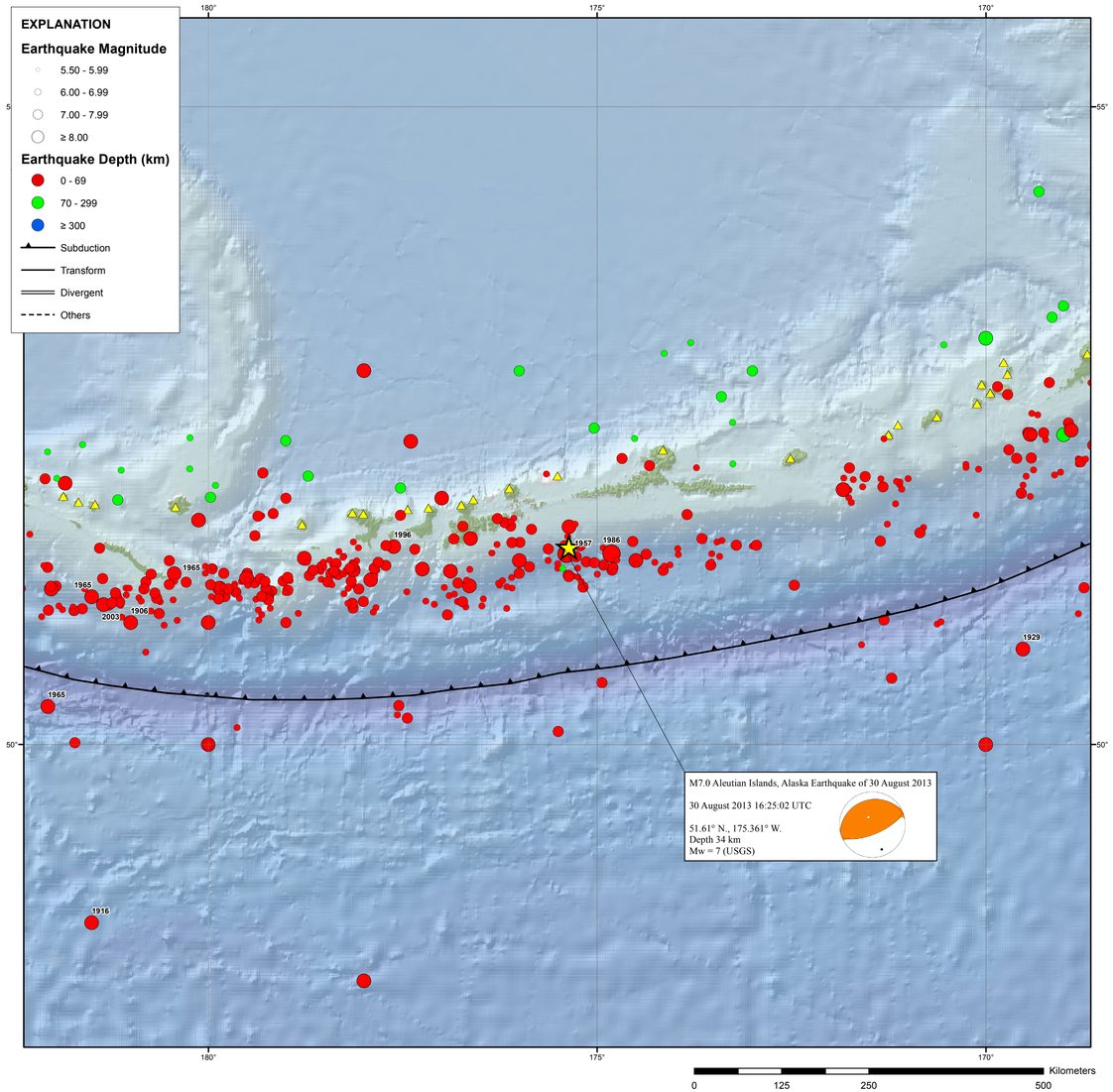
EARTHQUAKE SUMMARY MAP

Prepared in cooperation with the Global Seismographic Network

Tectonic Setting



Epicentral Region



PAGER

USGS science for a changing world

M 7.0, ANDREANOF ISLANDS, ALEUTIAN IS., ALASKA

Origin Time: Fri 2013-08-30 16:25:02 UTC (04:25:02 local)
Location: 51.61°N 175.36°W Depth: 33 km

Earthquake Shaking — Green Alert

USAID FROM THE AMERICAN PEOPLE

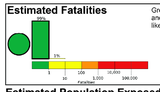
ANSS

PAGER Version 3

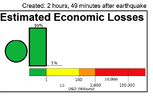
Created: 2 hours, 49 minutes after earthquake

Estimated Fatalities

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



Estimated Economic Losses



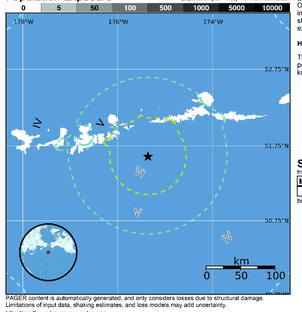
Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)		- -*	- -*	- -*	0	0	0	0	0	0
ESTIMATED MODIFIED MERCALLI INTENSITY		I	II-III	IV	V	VI	VII	VIII	IX	X+
PERCEIVED SHAKING		Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

*Estimated exposure only sums cities population within the map area

Population Exposure

population per ~1 sq. km from Landscan



Structures:
Overall, the population in this region resides in structures that are resistant to earthquake shaking, though some vulnerable structures exist.

Historical Earthquakes (with MMI levels):

There were no earthquakes with significant population exposure to shaking within a 400 km radius of this event.

Selected City Exposure

from GeoNames.org

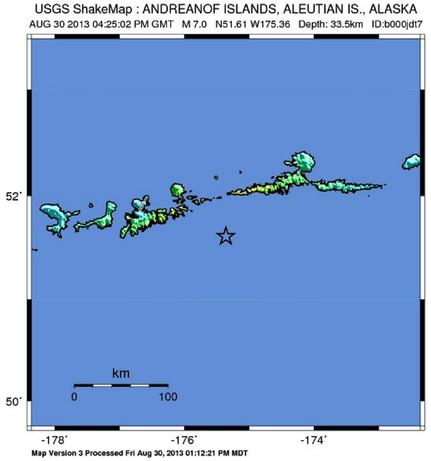
MMI	City	Population

bold cities appear on map (k = x1000)

*PAGER content is automatically generated, and only considers losses due to structural damage. Limitations of input data, shaking estimates, and loss models may add uncertainty.
http://earthquake.usgs.gov/pager

Event ID: usb000jdt7

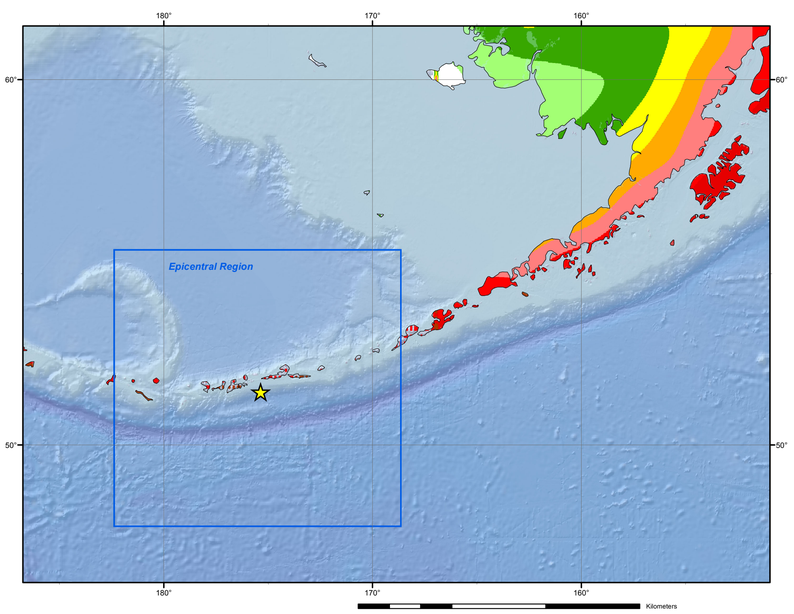
ShakeMap



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2011)

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

TECTONIC SUMMARY

The August 30, 2013 M 7.0 earthquake southeast of Adak, Alaska, occurred as the result of thrust faulting on or near the subduction zone interface between the Pacific and North America plates. At the location of this event, the Pacific plate moves towards the northwest with respect to North America at a rate of approximately 73 mm/yr, beginning its descent into the mantle at the Aleutian trench approximately 130 km south of the August 30 earthquake. The depth and mechanism of this earthquake are consistent with it occurring along the megathrust interface between these two plates.

The Aleutians Arc is familiar with large earthquakes –two-dozen events of M 6.5 or larger have occurred over the last century within 250 km of the August 30 earthquake. The largest of these was an Mw 8.6 earthquake in March of 1957, whose hypocenter was located just 15 km south of the August 30 earthquake. Aftershocks associated with the 1957 event extended for more than 1000 km along the arc, roughly from the International Dateline in the west to Unimak Island in the east. The 1957 earthquake also resulted in a large tsunami that was observed throughout the Pacific Basin, and caused damage locally along the Aleutian Arc and in Hawaii. Other large nearby events include the May 1986 Mw 8.0 earthquake 40 km to the southeast, and the June 1996 Mw 7.9 earthquake 150 km to the west. Neither of these more recent events are known to have caused fatalities or significant damage.

Significant Earthquakes Mag >= 7.5

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1900	01	31	1922	48.000	146.000	450	7.5
1904	06	25	1445	52.000	159.000	0	7.5
1904	06	25	2100	52.000	159.000	0	7.6
1905	07	09	0940	49.000	99.000	0	8.4
1905	07	23	0246	49.000	98.000	0	8.4
1906	08	17	0010	51.000	179.000	0	7.8
1913	08	01	1710	47.500	155.500	0	7.7
1915	05	01	0500	47.500	154.500	35	7.9
1915	07	31	0131	54.000	162.000	0	7.5
1916	02	06	2151	48.500	178.500	0	7.7
1917	05	31	0847	54.500	-160.000	0	7.5
1923	02	03	1601	53.853	160.761	35	8.5
1929	03	07	0134	50.786	-169.524	25	7.8
1929	12	17	1058	53.783	171.512	35	7.7
1938	11	10	2018	55.328	-158.370	35	8.2
1946	06	23	1713	49.750	-124.500	0	7.6
1949	08	22	0401	53.750	-133.250	0	8.1
1952	11	04	1658	52.755	160.057	22.2	9.0
1957	03	09	1422	51.556	-175.392	30	8.6
1959	05	04	0715	53.351	159.645	35	8.0
1965	02	04	0501	51.209	178.499	30.1	7.5
1965	02	04	0840	51.397	179.560	8.2	7.8
1965	03	30	0227	50.314	177.935	20	7.7
1986	05	07	2247	51.557	-174.813	28.2	8.0
1993	06	08	1303	51.203	157.736	71	7.5
1996	06	10	0403	51.613	-177.615	28	7.9
1997	12	05	1126	54.799	162.003	36.1	7.8
2003	11	17	0643	51.146	178.650	33	7.8
2008	07	05	0212	53.882	152.886	632	7.7
2012	08	14	1102	49.800	145.064	583	7.7
2013	01	05	0858	55.394	-134.650	10	7.5

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

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 August 2013
http://earthquake.usgs.gov/
Map not approved for release by Director USGS