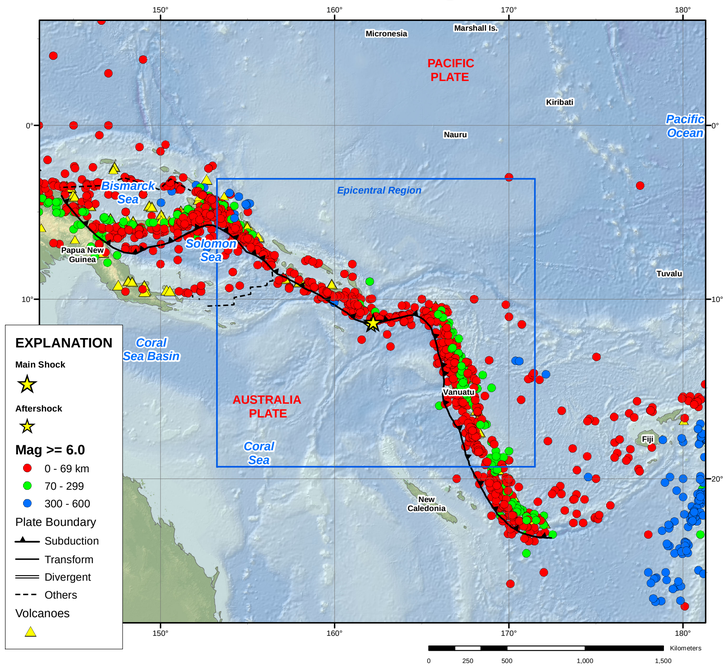
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

EARTHQUAKE SUMMARY MAP

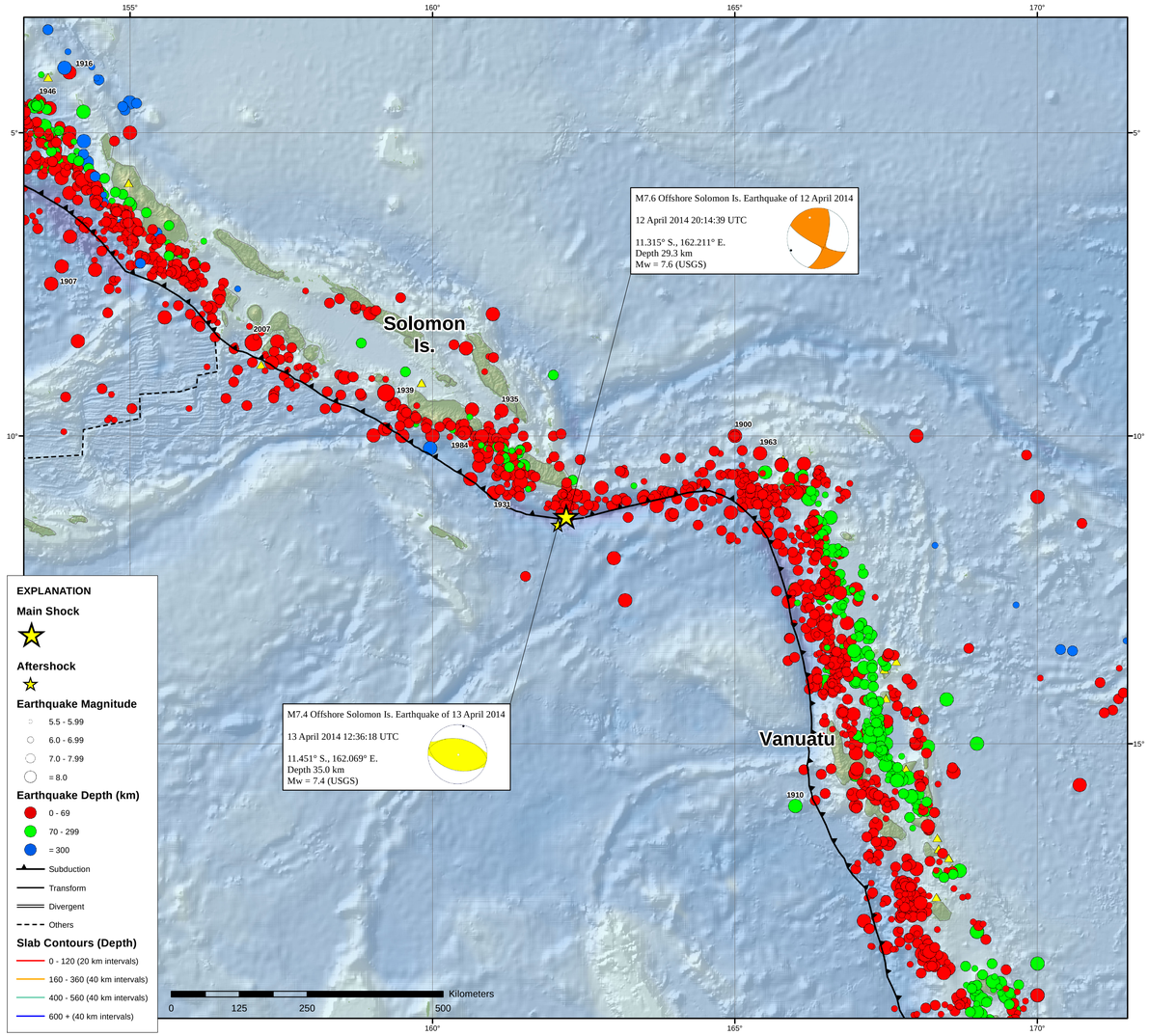
Prepared in cooperation with the Global Seismographic Network

M7.6 and 7.4 Offshore Solomon Islands Earthquakes of April 2014

Tectonic Setting



Epicentral Region



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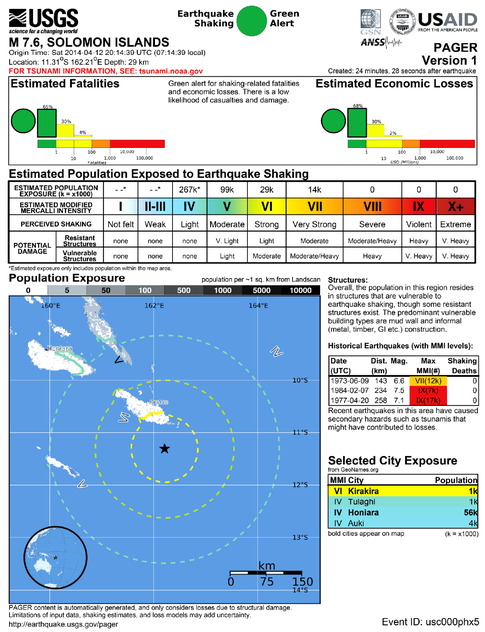


ESTIMATED POPULATION EXPOSURE (k = x1000)	- -*	- -*	267k*	99k	29k	14k	0	0	0
ESTIMATED MODIFIED MERCALLI INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
POTENTIAL DAMAGE: Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
POTENTIAL DAMAGE: Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

*Estimated exposure only includes population within the map area.

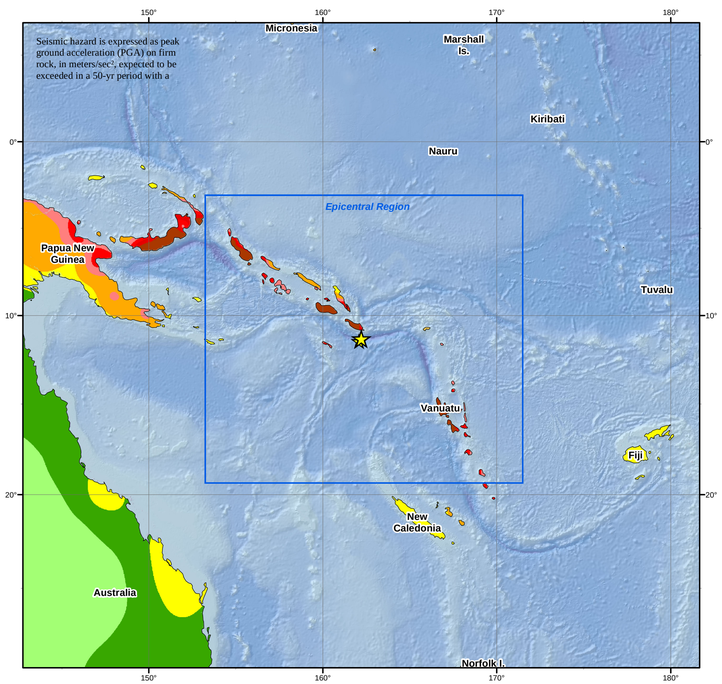
population per ~1 sq. km from Landscan

0	5	50	100	500	1000	5000	10000

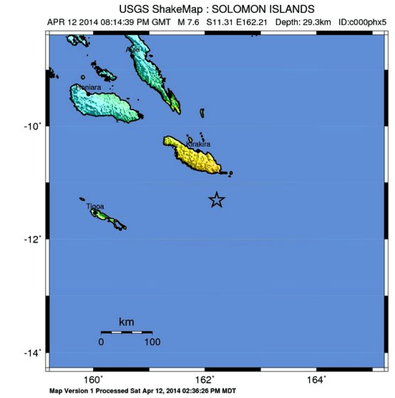
Date (UTC)	Dist. (km)	Mag.	Max MMI(#)	Shaking Deaths
1973-06-09	143	6.6	VIII(12k)	0
1984-02-07	234	7.5	IX(7k)	0
1977-04-20	258	7.1	IX(17k)	0

MMI	City	Population
VI	Kirakira	1k
IV	Tulagi	1k
IV	Honiara	56k
IV	Auki	4k

Seismic Hazard



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)

TECTONIC SUMMARY

The April 12, 2014 M 7.6 Solomon Islands earthquake occurred as the result of nearly pure transform faulting, likely on a NW-SE oriented left-lateral fault, on or near the plate boundary between the Australia and Pacific plates. At the location of the earthquake, the Australia Plate converges with and slips past the Pacific plate at a rate of 95 mm/yr. The April 12 earthquake occurred along a portion of this plate boundary that transitions from thrust to transform tectonics between the New Britain Trench to the northwest and the New Hebrides Trench farther east. The earthquake occurred about 100 km SSE of Kirakira, Solomon Islands. The region of the April 12 earthquake is very seismically active, with 27 earthquakes of M6+ occurring within 100 km and 62 events of M7+ within 500 km since 1900. The majority of these earthquakes are grouped to the northwest around the Solomon Islands and to the east near Vanuatu and the Santa Cruz Islands. Notable earthquake within 100 km include a doublet of M7.0 events in November 1978, events of M7.1 in 1931 and 1937, and an M7.2 in 1910. The most recent local event prior to the April 12 earthquake was an M6.0 on April 4, 2014 94 km to the NW. The April 12 earthquake also occurred about 950 km to the SE of an earthquake sequence south of Bougainville Island, Papua New Guinea that began with an M6.1 on April 11, 2014. On February 6, 2013, an M8.0 struck offshore of the Santa Cruz Islands about 340 km east of the April 12 event. The 2013 earthquake triggered a regional tsunami of about 1.5 m and was followed by aftershocks of M7.0 and two of M7.1.

Significant Earthquakes Mag >= 7.5

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1900	07	29	0659	-10.000	165.000	0	7.6
1907	05	04	0651	-7.500	153.700	60	7.7
1910	06	16	0630	-19.000	169.500	100	7.9
1910	11	09	0602	-16.000	166.000	70	7.5
1913	05	30	1146	-5.000	154.000	0	7.7
1916	01	01	1320	-4.000	154.000	0	7.7
1931	10	03	1913	-10.932	161.016	35	7.8
1931	10	10	0020	-9.968	161.194	50.2	7.7
1934	07	18	1940	-11.907	166.731	35	7.8
1935	12	15	0707	-9.590	161.145	35	7.5
1939	01	30	0218	-7.080	155.386	35	7.7
1939	04	30	0255	-9.295	159.234	35	7.9
1946	09	29	0301	-4.500	153.500	0	7.6
1949	10	19	2100	-5.500	154.000	60	7.5
1953	11	04	0349	-13.189	166.516	35	7.5
1963	09	15	0046	-10.472	165.770	35	7.5
1963	09	17	1920	-10.286	165.413	27.6	7.5
1965	05	20	0040	-14.642	167.504	9.7	7.6
1965	08	11	2231	-15.797	167.268	45.8	7.6
1970	08	11	1022	-14.095	166.570	39.1	7.5
1971	07	14	0611	-5.519	153.906	44.5	8.0
1975	07	20	1437	-6.612	155.097	59.7	7.7
1980	07	08	2319	-12.487	166.482	56	7.5
1980	07	17	1942	-12.504	166.011	31.6	7.8
1983	03	18	0905	-4.887	153.589	88.7	7.7
1984	02	07	2133	-9.957	160.522	17	7.6
1988	08	10	0438	-10.258	160.896	36.1	7.6
1995	08	16	1027	-5.788	154.213	30	7.7
1997	04	21	1202	-12.560	166.738	29.8	7.7
2005	09	09	0726	-4.539	153.474	90	7.6
2007	04	01	2039	-8.466	157.043	24	8.1
2009	10	07	2203	-13.006	166.510	45	7.7
2009	10	07	2218	-12.517	166.382	35	7.8
2013	02	06	0112	-10.738	165.138	28.7	8.0
2014	04	12	2014	-11.315	162.211	29.3	7.6

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)
Hayes, G. P., Wald, D. J., and Johnson R. L., 2012, A three-dimensional model of global subduction zone geometries: Journal of Geophysical Research, v. 117, B01302, doi:10.1029/2011JB008524.
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
14 April 2014
http://earthquake.usgs.gov/
Map not approved for release by Director USGS