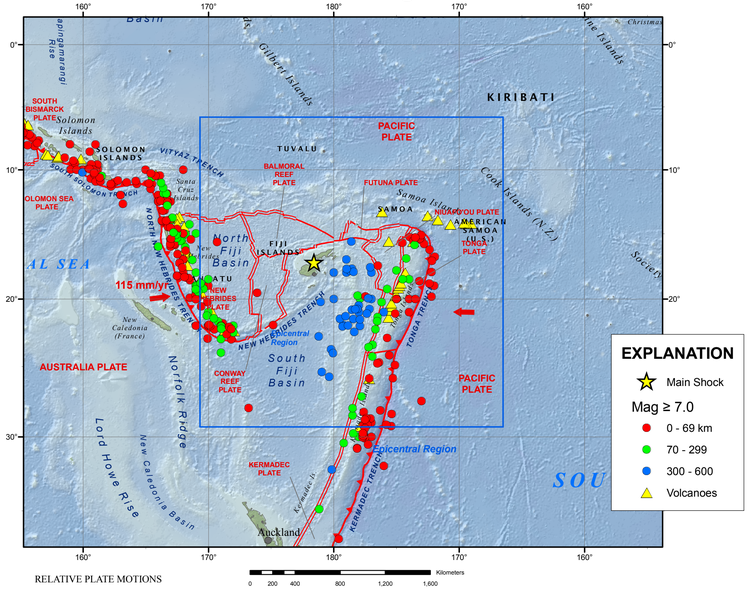
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

EARTHQUAKE SUMMARY MAP

Prepared in cooperation with the Global Seismographic Network

M7.2 Fiji, Earthquake of 9 November, 2009

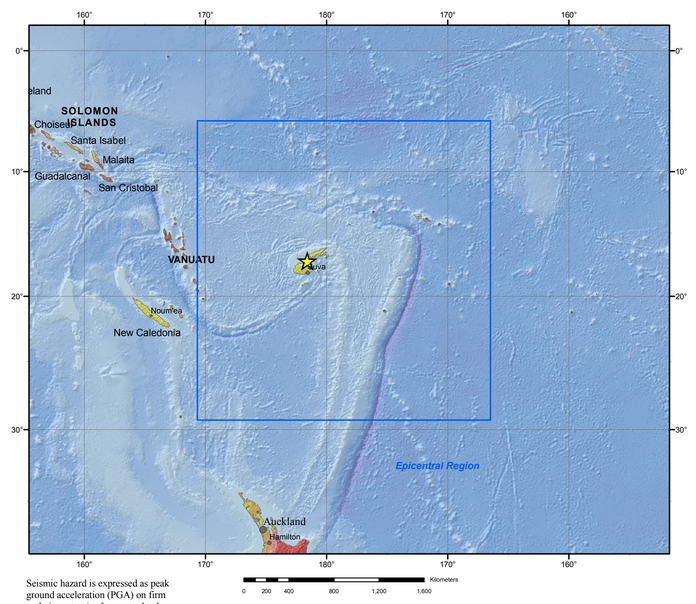
Tectonic Setting



RELATIVE PLATE MOTIONS

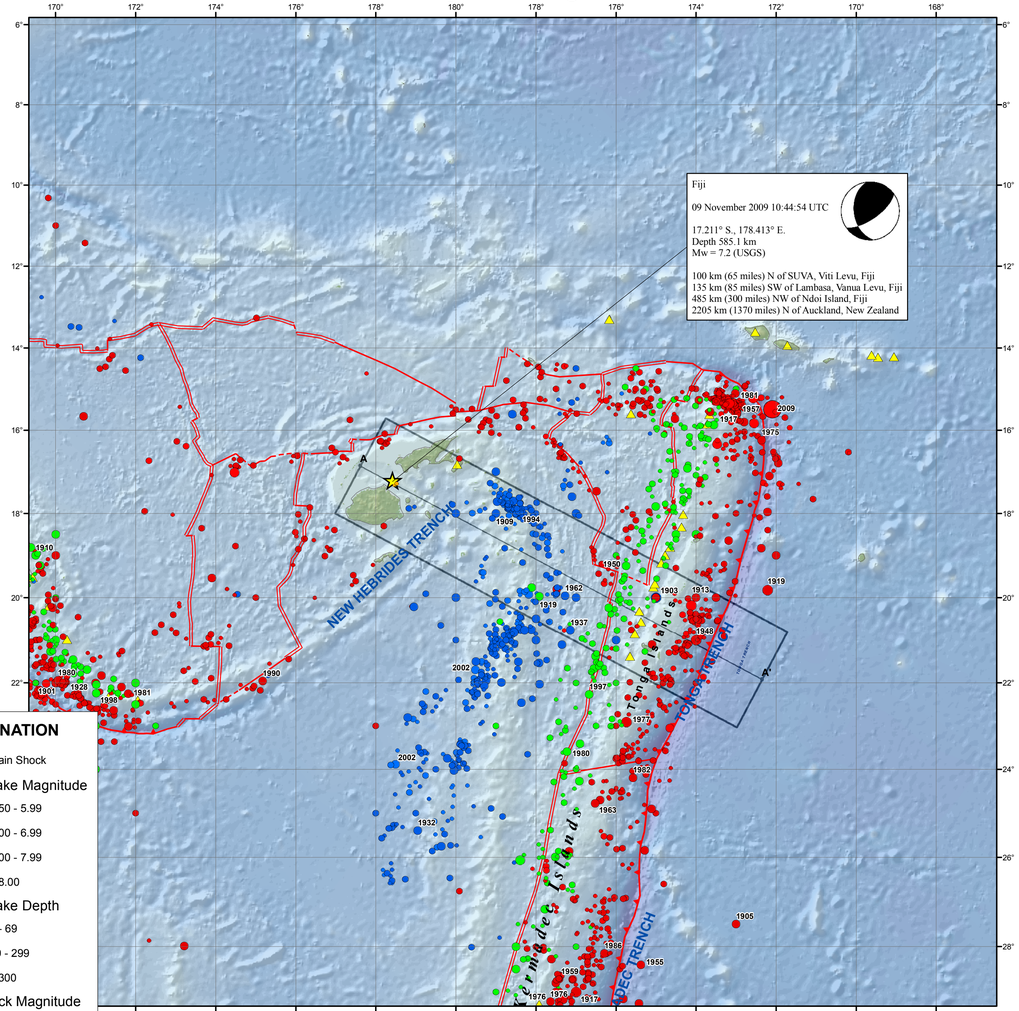
The broad red arrow represents the motion of Pacific plates relative to the Australia plate. In the region of this earthquake, the Australia Plate and Pacific Plate are converging at about 86 mm/yr. Many microplates are caught in this convergence.

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.

Epicentral Region



DISCUSSION

The Fiji earthquake of 9 November 2009 occurred at the northern end of the inclined seismic zone that dips to the west beneath Tonga and Fiji. The broad-scale tectonics of the earthquake region are dominated by the relative convergence of the Pacific and Australia plates. The inclined seismic zone lies within the Pacific plate, which subducts westward beneath the Australia plate at the Tonga trench. At the latitude of the earthquake, the Pacific plate moves westward with respect to the interior of the Australia plate at a velocity of about 86 mm/y.

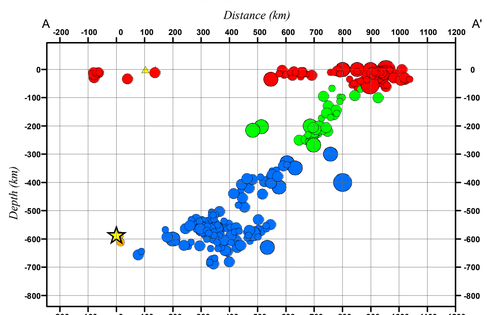
The earthquake occurred in response to stresses generated by slow distortion of the Pacific plate, rather than on the thrust fault that constitutes the interface between the Australia and Pacific plates and which is seismically active near the earth's surface. The Pacific plate is active to depths of about 700 km in the region of the earthquake.

Earthquakes that have focal depths greater than 300 km are commonly termed "deep-focus" earthquakes. Deep-focus earthquakes cause less damage on the ground surface above their foci than is the case with similar magnitude shallow-focus earthquakes, but large deep-focus earthquakes may be felt at great distance from their epicenters. The largest recorded deep-focus earthquake had a magnitude of 8.2.

DATA SOURCES and REFERENCES

EARTHQUAKES AND SEISMIC HAZARD
USGS, National Earthquake Information Center
NOAA, National Geophysical Data Center
IASPEI, Centennial Catalog (1900 - 1999) and extensions Engdahl, E.R. and Villaseñor, 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 Academeic Press, 932 p.
HDF (unpublished earthquake catalog) (Engdahl, 2003)
Global Seismic Hazard Assessment Program
http://www.seismo.ethz.ch/GSHAP/

Cross Section A-A'



USGS science for a changing world
USAID
PAGER
Version 2
Created: 51 minutes, 25 seconds after earthquake

M 7.2, FIJI
Origin Time: Mon 2009-11-09 10:44:54 UTC
Location: 17.21°S 178.41°E Depth: 585 km

Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)	- -*	911k	0	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
POTENTIAL DAMAGE: Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

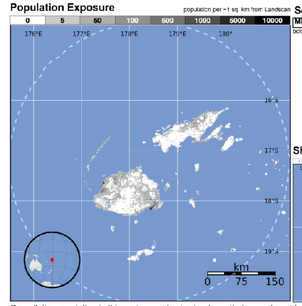
*Estimated exposure only includes population within the map area.

Population Exposure
population per ~1 sq. km from Landscan
0 1k 10k 100k 500k 1000k 5000k 10000k

Selected City Exposure

MMI	City	Population (k = x1000)

bold cities appear on map



Overall, the population in this region resides in structures that are vulnerable to earthquake shaking, though some resistant structures exist. A magnitude 6.0 earthquake 205 km Southwest of this one struck Fiji on February 02, 1990 (UTC), with estimated population exposures of 109,000 at intensity V and 229,000 at intensity IV, with no reported fatalities. On February 02, 1990 (UTC), a magnitude 6.0 earthquake 205 km Southwest of this one struck Fiji, with estimated population exposures of 106,000 at intensity V and 229,000 at intensity IV, with no reported fatalities.

This information was automatically generated and has not been reviewed by a seismologist

http://earthquake.usgs.gov/pager Event ID: us2009nuam

Significant Earthquakes Mag >= 7.5

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1901	08	09	1301	-22.000	170.000	0	7.9
1903	01	04	0507	-20.000	-175.000	400	8.0
1905	03	18	0058	-27.500	-173.000	60	7.5
1909	02	22	0921	-18.000	-179.000	550	7.6
1910	06	16	0630	-19.000	169.500	100	7.9
1913	06	26	0457	-20.000	-174.000	0	7.7
1917	05	01	1826	-29.000	-177.000	0	8.0
1917	06	26	0549	-15.500	-173.000	0	8.5
1919	01	01	0300	-19.971	-177.914	202	7.7
1919	04	30	0717	-19.823	-172.215	35	8.2
1928	03	16	0501	-22.281	170.476	35	7.5
1932	05	26	1609	-25.399	179.049	568	7.5
1937	04	16	0301	-20.768	-177.144	348	7.5
1948	09	08	1509	-21.000	-174.000	0	8.0
1950	12	14	0152	-19.250	-175.750	200	7.5
1955	02	27	2043	-28.406	-175.379	17.9	7.8
1957	04	14	1918	-15.403	-173.129	35	7.5
1959	09	14	1409	-28.722	-177.079	35	7.8
1962	04	26	0726	-17.873	-178.683	551	7.5
1962	05	21	2115	-19.962	-177.272	416	7.5
1963	12	18	0030	-24.776	-176.520	35	7.7
1975	12	26	1556	-16.241	-172.364	15	7.7
1976	01	14	1556	-29.213	-177.638	43.7	7.8
1976	01	14	1647	-29.172	-177.316	31.7	7.9
1977	06	22	1208	-22.912	-175.744	65.5	8.1
1980	04	13	1804	-23.593	-177.225	148	7.6
1980	10	25	1100	-21.941	170.056	39	7.5
1981	07	06	0308	-22.251	171.814	30	7.6
1981	09	01	0929	-15.112	-173.019	14.2	7.5
1982	12	19	1743	-24.193	-175.575	31.6	7.5
1986	10	20	0646	-28.150	-176.291	26.7	7.7
1990	03	03	1216	-21.956	175.171	35.5	7.6
1994	03	09	2328	-17.950	-178.417	563	7.6
1995	05	16	2012	-22.968	169.945	23.6	7.7
1997	10	14	0953	-22.271	-176.672	169	7.7
1998	01	04	0611	-22.239	171.017	97.1	7.5
2002	08	19	1101	-21.696	-179.513	580	7.7
2002	08	19	1108	-23.884	178.495	675	7.7
2006	05	03	1526	-20.187	-174.123	55	8.0
2007	12	09	0728	-25.996	-177.514	152	7.8
2009	03	19	1817	-23.046	-174.659	34	7.6
2009	09	29	1748	-15.489	-172.095	18	8.1

PLATE TECTONICS
Bird, P., 2003, An updated digital model of plate boundaries: Geochem. Geophys. Geosyst., v. 4, no. 3, pp. 1027- 80.

BASE MAP
NIMA and ESRI, Digital Chart of the World
USGS, EROS Data Center
NOAA GEBCO and GLOBE Elevation Models

Map prepared by U.S. Geological Survey
National Earthquake Information Center
09 November 2009
http://earthquake.usgs.gov/