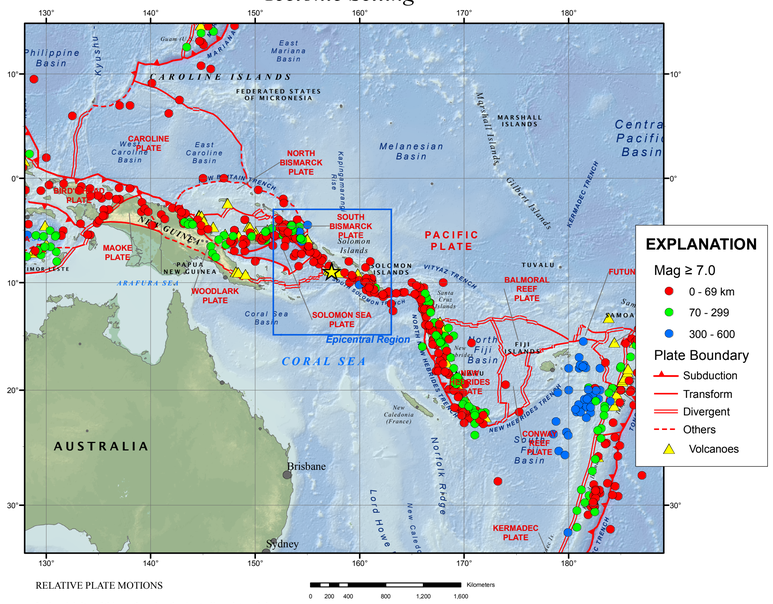
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

EARTHQUAKE SUMMARY MAP

Prepared in cooperation with the Global Seismographic Network

M7.2 Solomon Islands Region Earthquake of 3 January 2010

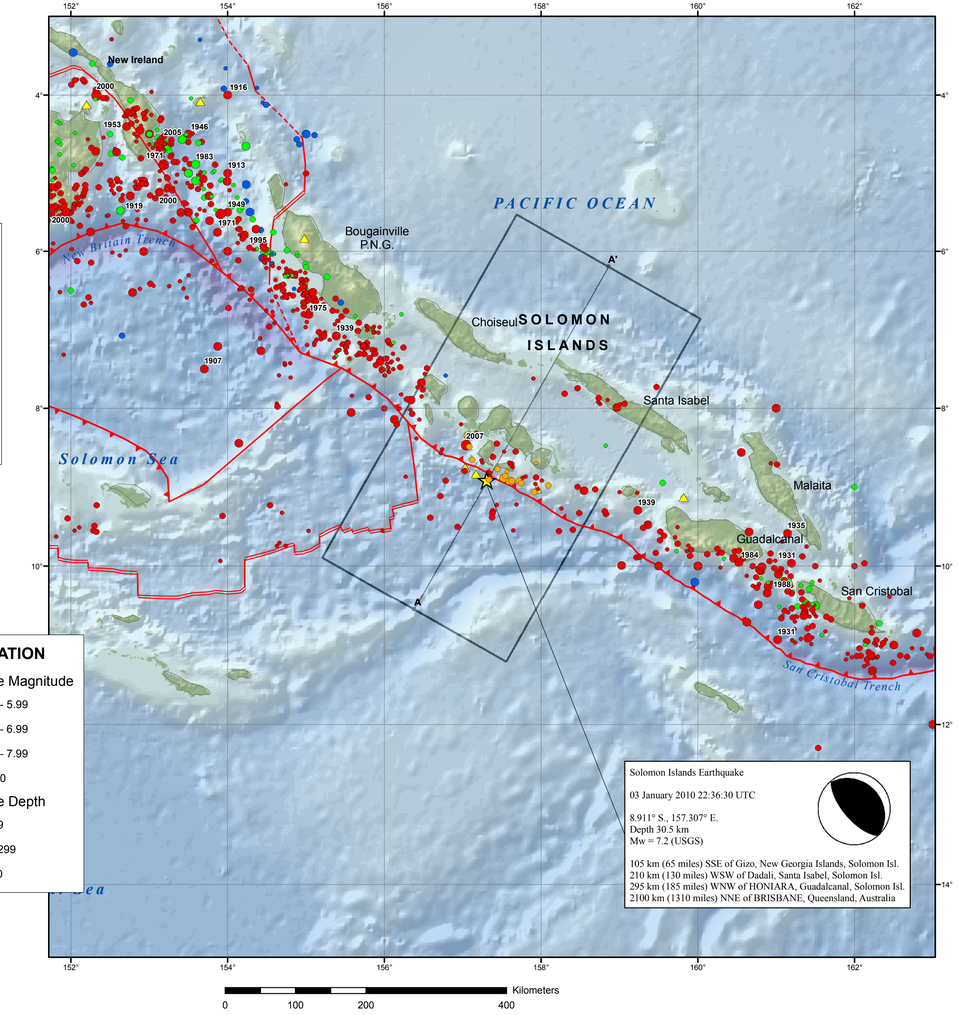
Tectonic Setting



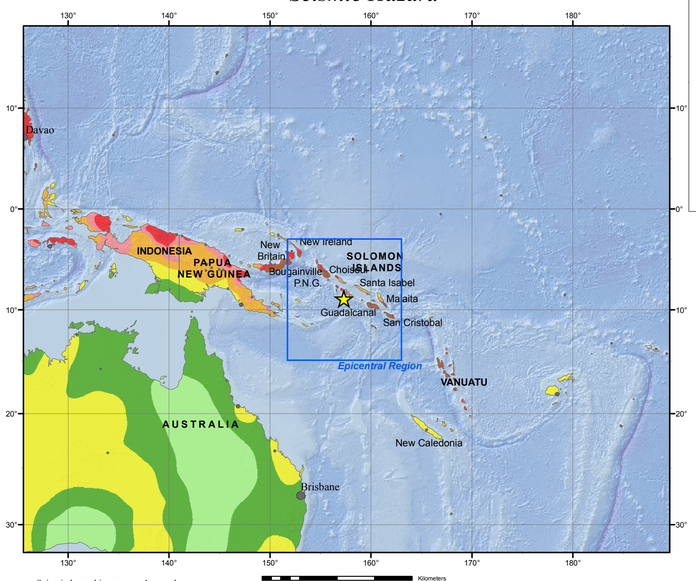
RELATIVE PLATE MOTIONS

In the vicinity of this earthquake, the Australian plate subducts beneath the Pacific plate at about 95 mm/yr.

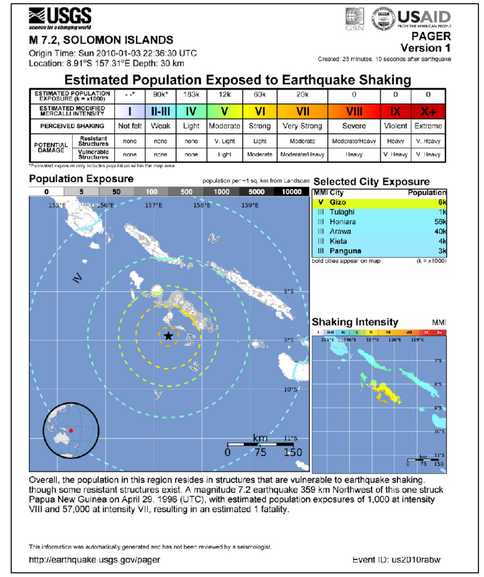
Epicentral Region

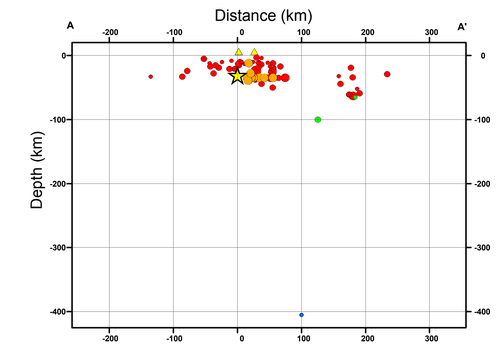


Seismic Hazard



Seismic hazard is expressed as peak ground acceleration (PGA) on firm rock, in meters/sec^2, expected to be exceeded in a 50-yr period with a probability of 10 percent.





DISCUSSION

The Solomon Islands earthquake of January 3, 2010, likely occurred at the boundary between the Pacific and Australian plates, where the Australian plate subducts beneath the Pacific towards the northeast at a rate of approximately 95 mm/yr. The mechanism of the January 3rd earthquake is consistent with its occurrence in relation to underthrusting of the Australia plate beneath the Pacific plate, as part of this subduction process.

The Solomon Islands arc as a whole experiences a very high level of earthquake activity, and many shocks of magnitude 7 and larger have been recorded since the early decades of the twentieth century. The January 3rd, 2010 earthquake nucleated approximately 50 km to the southeast of a M8.1 earthquake in April 2007, which with an associated tsunami caused at least 50 fatalities and destroyed several coastal villages on nearby islands. An M6.5 foreshock occurred less than one hour before this main shock, in approximately the same location.

Significant Earthquakes Mag >= 7.5

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1907	05	04	0651	-7.500	153.700	60	7.7
1913	05	30	1146	-5.000	154.000	0	7.7
1916	01	01	1320	-4.000	154.000	0	7.7
1919	05	06	1940	-5.477	152.629	232	7.6
1931	10	03	1913	-10.932	161.016	35	7.8
1931	10	10	0020	-9.968	161.194	50.2	7.7
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	04	23	1624	-4.402	152.708	35	7.6
1971	07	14	0611	-5.519	153.906	44.5	8.0
1971	07	26	0123	-4.889	153.183	37.1	8.1
1975	07	20	1437	-6.612	155.097	59.7	7.7
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
2000	11	16	0454	-4.001	152.327	16.8	8.0
2000	11	16	0742	-5.243	153.127	32.6	7.8
2000	11	17	2101	-5.491	151.936	25.7	7.8
2005	09	09	0726	-4.539	153.474	90	7.6
2007	04	01	2039	-8.466	157.043	24	8.1

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.
EHB catalog (Engdahl et al., 1998)
HDF (unpublished earthquake catalog) (Engdahl, 2003)
Global Seismic Hazard Assessment Program http://www.seismo.ethz.ch/GSHAP/
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
4 January 2010
http://earthquake.usgs.gov/
Map not approved for release by Director USGS