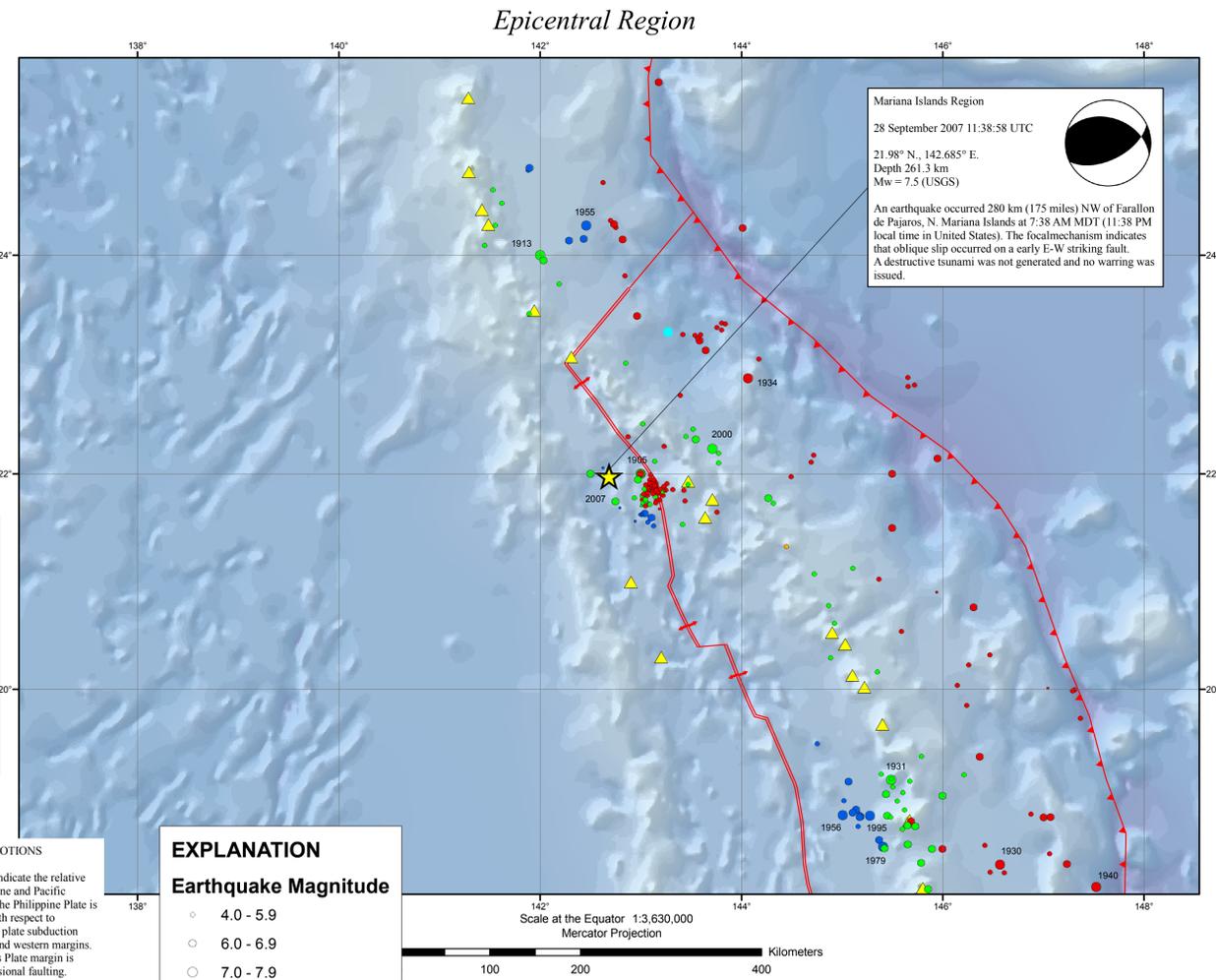
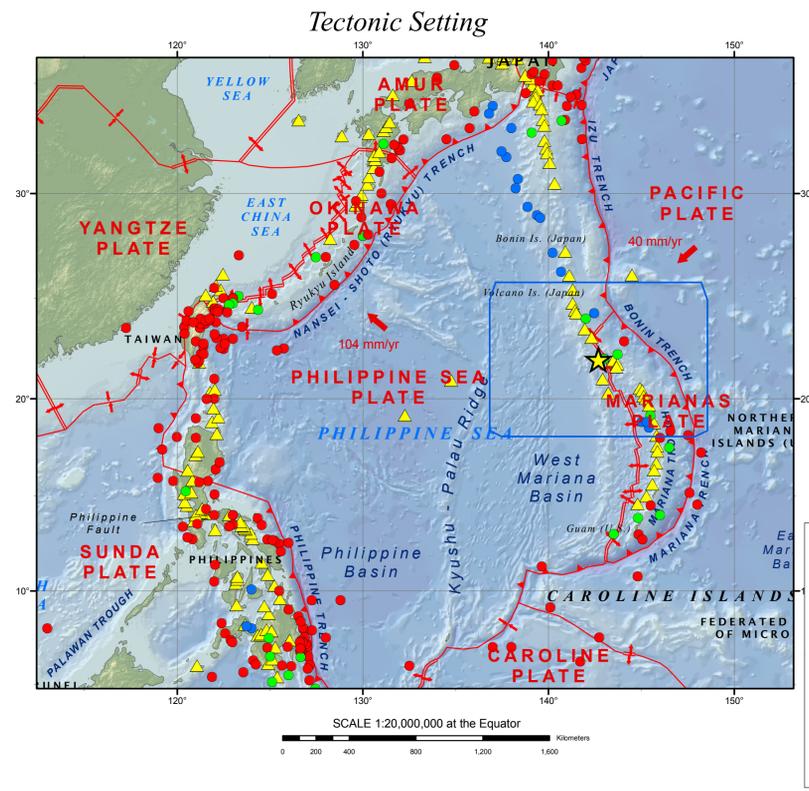




Prepared in cooperation with the Global Seismographic Network

M7.5 Mariana Islands Region Earthquake 28 September 2007

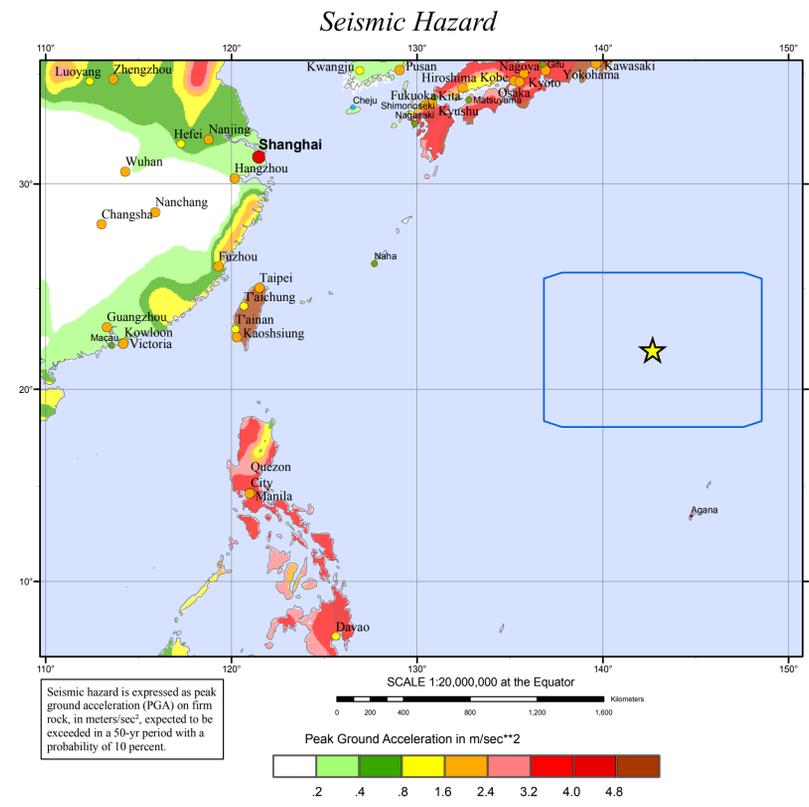


Mariana Islands Region
28 September 2007 11:38:58 UTC
21.98° N, 142.685° E
Depth 261.3 km
Mw = 7.5 (USGS)

An earthquake occurred 280 km (175 miles) NW of Farallon de Pajaros, N. Mariana Islands at 7:38 AM MDT (11:38 PM local time in United States). The focal mechanism indicates that oblique slip occurred on an early E-W striking fault. A destructive tsunami was not generated and no warning was issued.

FOCAL MECHANISM

The direction of slip and the orientation of the fault on which the earthquake occurred is represented by the focal mechanism diagram. Information from seismograms from recording stations is used in its calculation. Focal mechanisms are typically displayed as "beach ball" images which depict the stress-field orientation at the time of the earthquake. More information on focal mechanisms can be found at <http://quake.usgs.gov/recenteqs/beachball.html>.



RELATIVE PLATE MOTIONS

The large red vectors indicate the relative motions of the Philippine and Pacific Plates. The motion of the Philippine Plate is generally westward with respect to neighboring plates and plate subduction dominates its eastern and western margins. However, the Marianas Plate margin is characterized by extensional faulting.

EXPLANATION

- Earthquake Magnitude
 - 4.0 - 5.9 (Small circle)
 - 6.0 - 6.9 (Medium circle)
 - 7.0 - 7.9 (Large circle)
 - 8.0 - 8.9 (Very large circle)
 - 9.0 - 9.9 (Huge circle)
- Earthquake Depth
 - 0 - 69 km (Red circle)
 - 70 - 299 km (Green circle)
 - 300 - 700 km (Blue circle)

DISCUSSION

The Mariana Islands earthquake of September 28, 2007, occurred in the inclined seismic zone that marks the position of the subducted Pacific plate beneath the overriding Philippine Sea plate. The Pacific plate moves to the west with respect to the Philippine Sea plate with a velocity of about 40 mm/yr and thrusts under the Philippine Sea plate at the Mariana Trench. The earthquake represents the release of stress resulting from the distortion of the

Significant Earthquakes Mag ≥ 7.0

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1905	07	11	1537	22.000	143.000	450	7.2
1913	03	23	2047	24.000	142.000	80	7.1
1914	11	24	1153	22.000	143.000	110	7.9
1930	10	24	2015	18.351	146.570	35	7.0
1931	09	09	2038	19.152	145.489	171	7.1
1934	02	24	0623	22.878	144.067	35	7.2
1940	12	28	1637	18.140	147.527	35	7.3
1955	05	30	1231	24.269	142.458	563	7.1
1956	02	01	1341	18.819	145.006	380	7.0
1979	10	17	0543	18.521	145.409	583	7.0
1995	08	23	0706	18.814	145.279	598	7.1
2000	03	28	1100	22.232	143.711	105	7.6
2007	09	28	1338	21.980	142.685	2261	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)
HDF (unpublished earthquake catalog) (Engdahl, 2003)
Global Seismic Hazard Assessment Program

PLATE TECTONICS AND FAULT MODEL
PB2002 (Bird, 2003)
Finite Fault Model, Chen Ji, UC Santa Barbara (2007)

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 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 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.