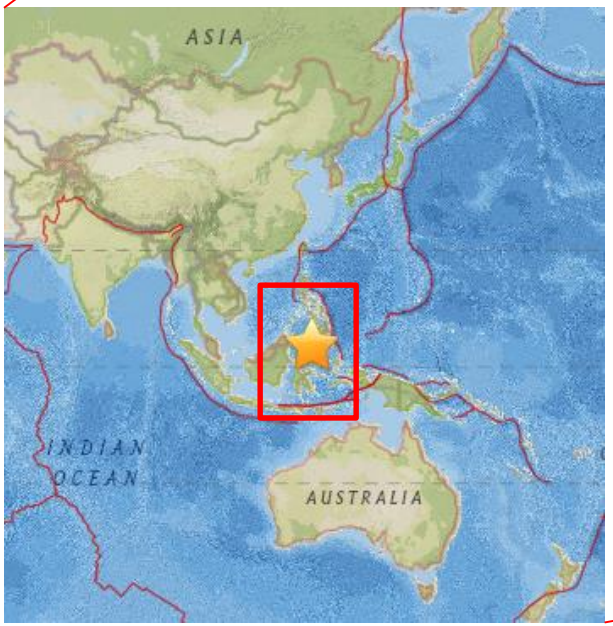
Magnitude 7.3 PHILIPPINES
Tuesday, January 10, 2017 at 06:13:47 UTC

A magnitude 7.3 earthquake occurred 188.8 km (117.3 mi) SSE of Tabiauan, Philippines at a depth of 612.7 km (380.7 miles) under the Celebes Sea.

There is no risk of a tsunami from an earthquake at this depth.



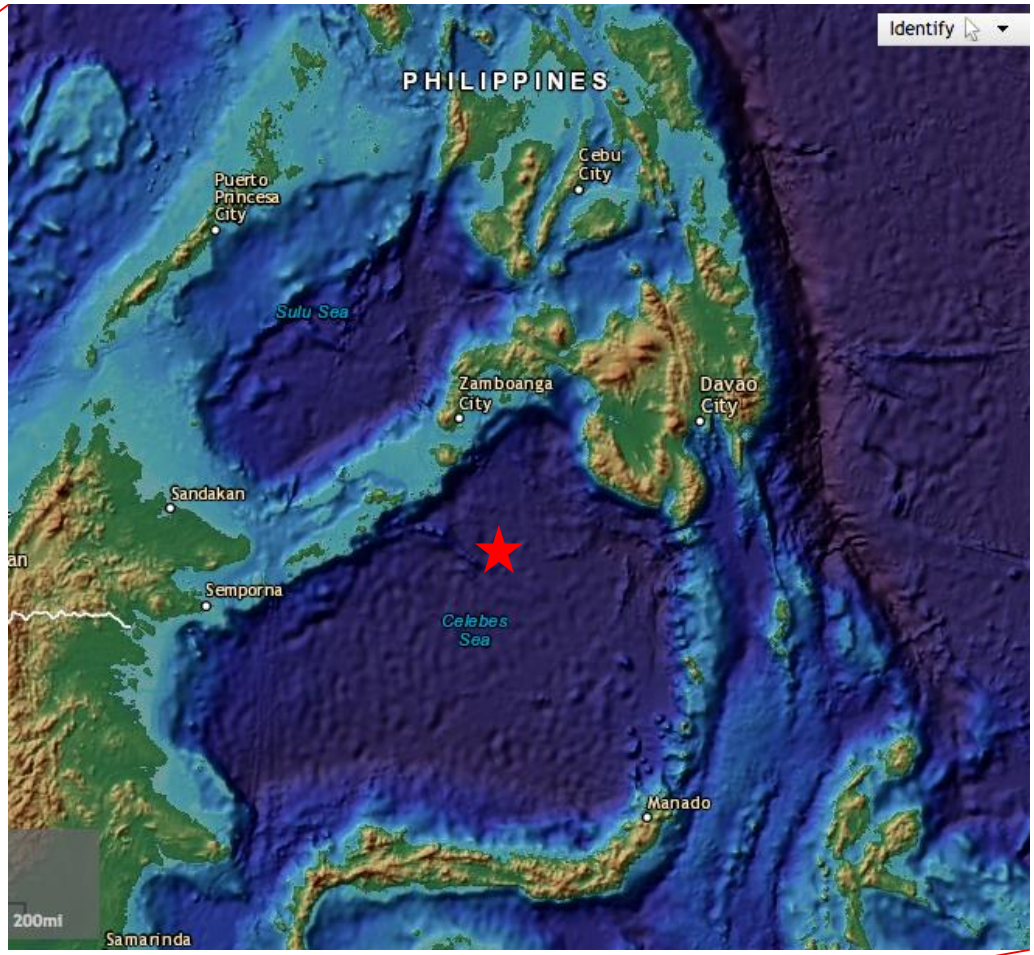


Image courtesy of NOAA

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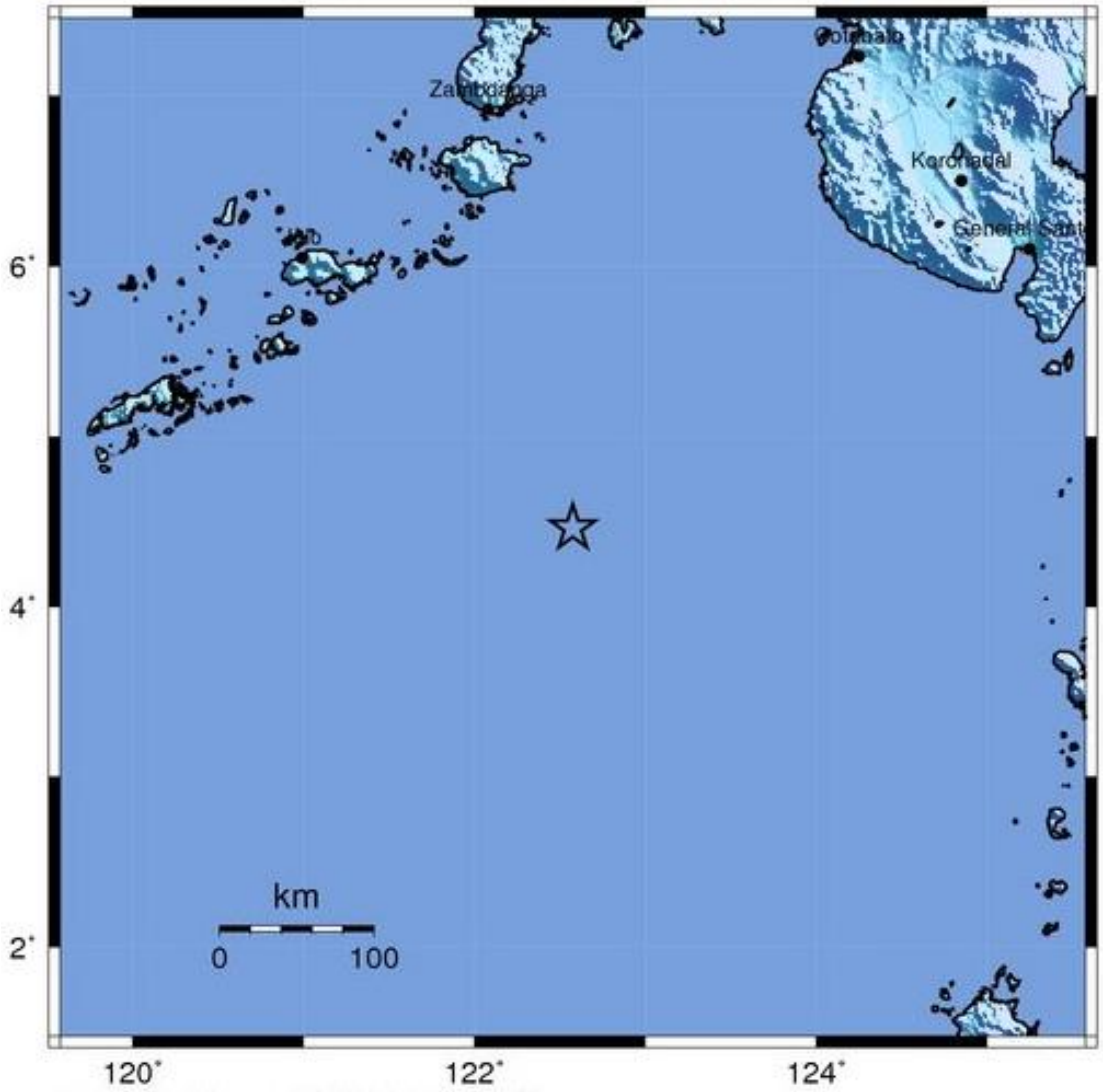
The Modified-Mercalli Intensity scale is a twelve-stage scale, from I to XII, that indicates the severity of ground shaking.

Due to the depth of 612.7 km (380.7 miles), the area nearest the earthquake experienced only weak shaking.

Modified Mercalli Intensity	Perceived Shaking
X	Extreme
IX	Violent
VIII	Severe
VII	Very Strong
VI	Strong
V	Moderate
IV	Light
II-III	Weak
I	Not Felt

Image courtesy of the US Geological Survey



USGS Estimated shaking Intensity from M 7.3 Earthquake

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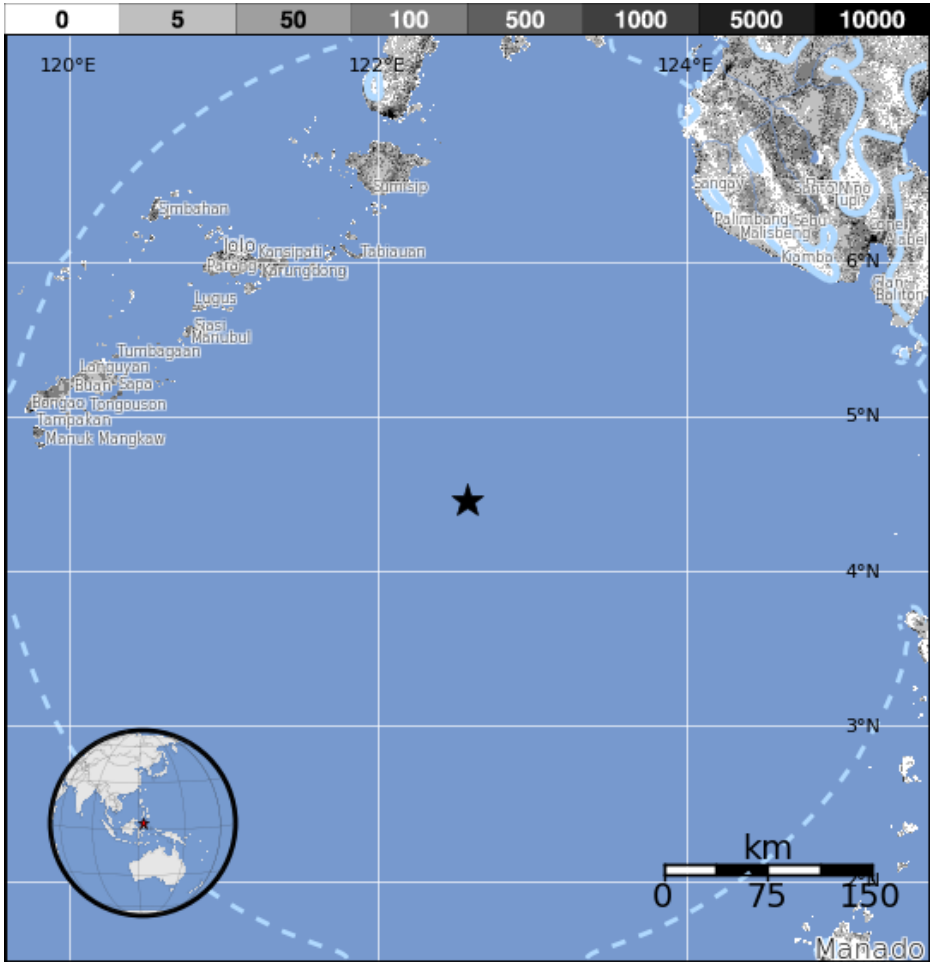
USGS PAGER
Population Exposed to Earthquake Shaking

The USGS PAGER map shows the population exposed to different Modified Mercalli Intensity (MMI) levels.

Over 10 million people were exposed to weak shaking from this earthquake.

MMI	Shaking	Pop.
I	Not Felt	--*
II-III	Weak	10,450 k*
IV	Light	0 k
V	Moderate	0 k
VI	Strong	0 k
VII	Very Strong	0 k
VIII	Severe	0 k
IX	Violent	0 k
X	Extreme	0 k



The color coded contour lines outline regions of MMI intensity. The total population exposure to a given MMI value is obtained by summing the population between the contour lines. The estimated population exposure to each MMI Intensity is shown in the table.

Image courtesy of the US Geological Survey

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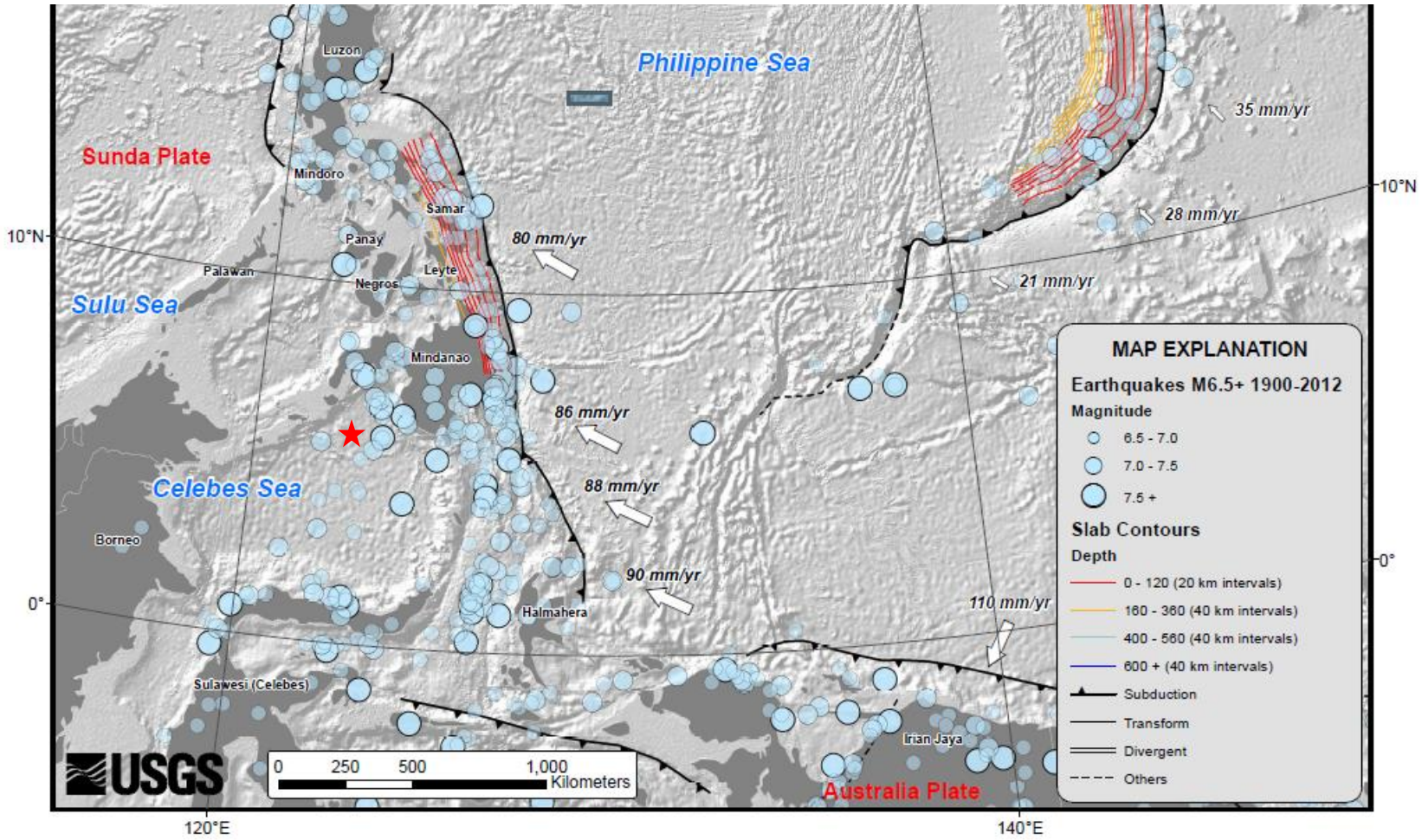
At the latitude of this earthquake, the Philippine Sea Plate moves towards the west-northwest with respect to the Sunda Plate at a rate of approximately 9 cm/yr. The Philippine Sea Plate subducts beneath the Philippine Islands at the Philippine Trench several hundred kilometers to the east of this earthquake.



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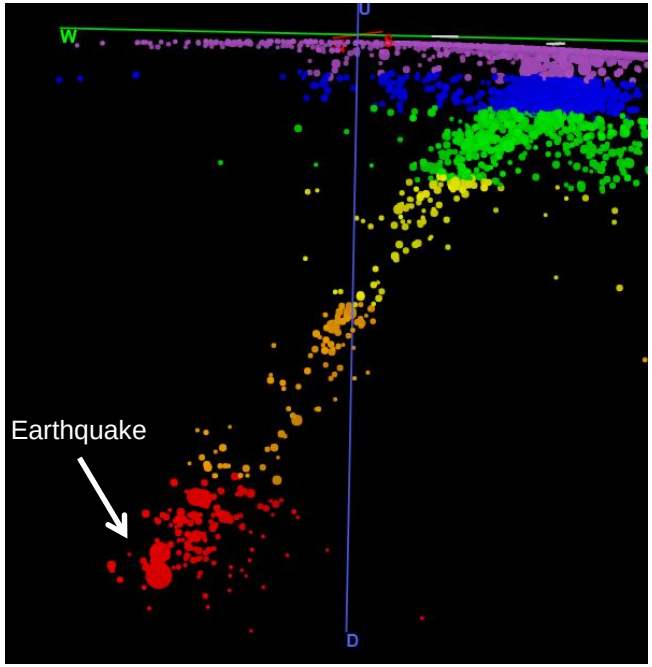
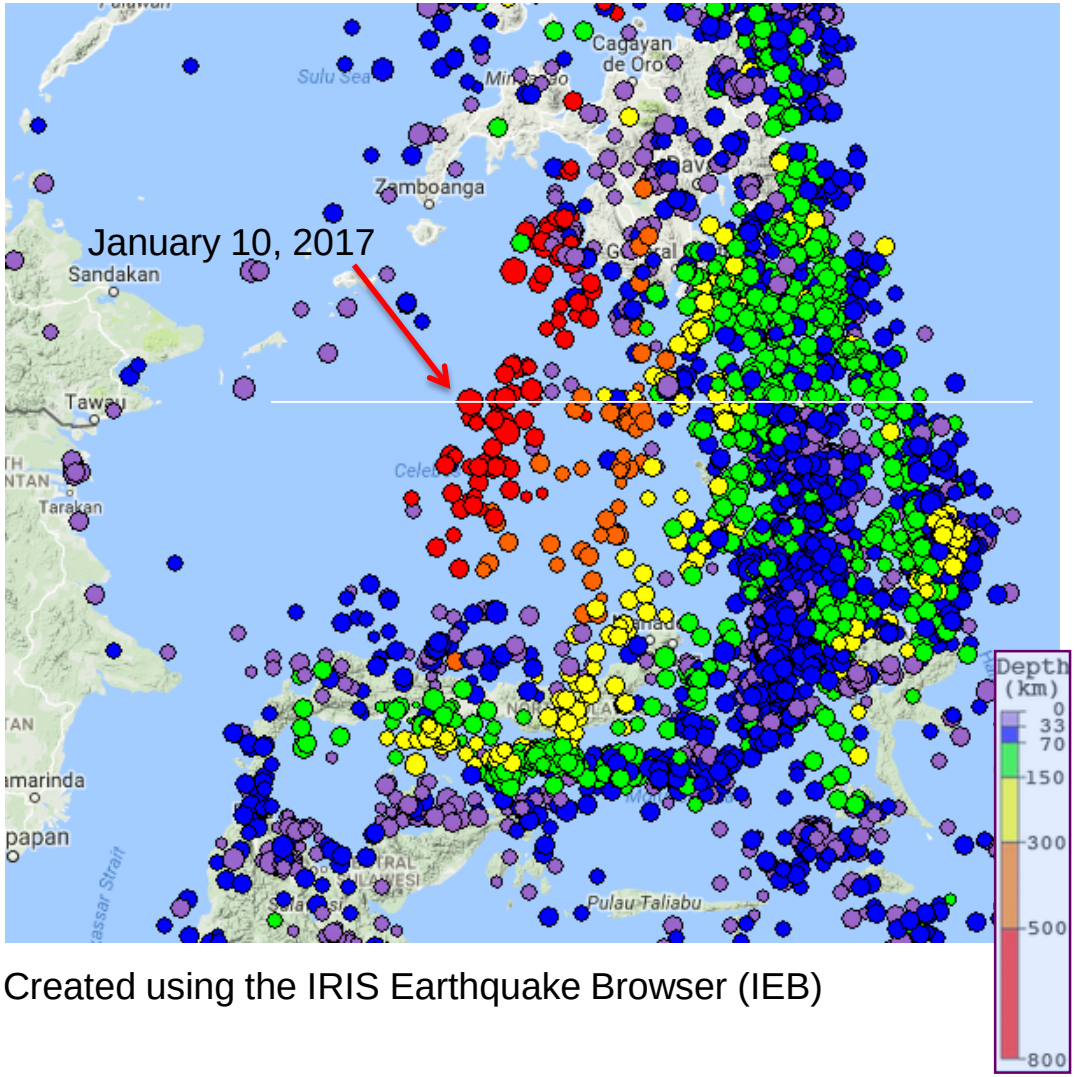
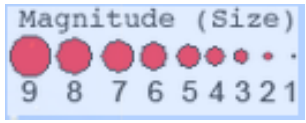
This map shows historical seismicity in this region. Earthquakes are color-coded by depth as shown in the legend in the lower right corner. Depths of earthquakes increase from east to west across the subduction zone boundary. A 3D cross section through the earthquake (white line) is shown below.





Created using the IRIS Earthquake Browser (IEB)



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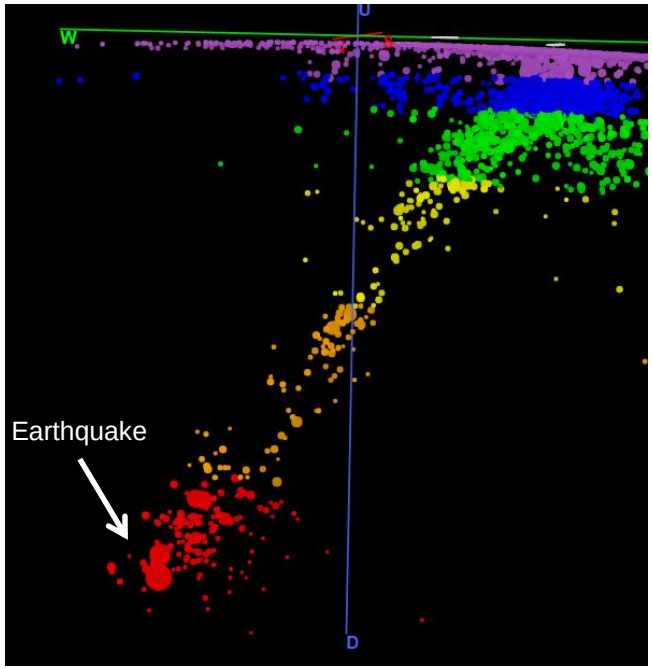
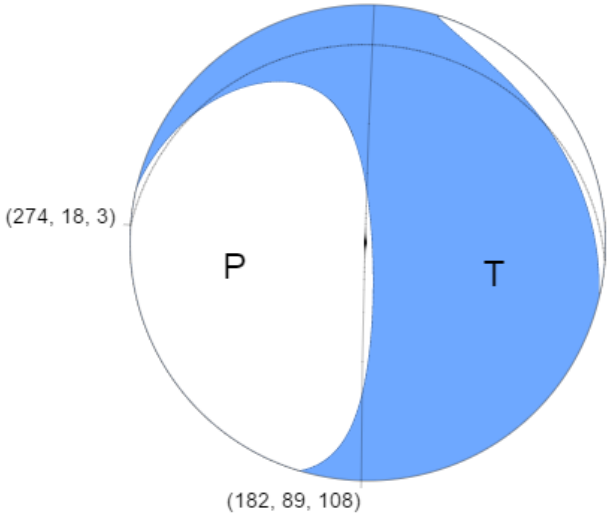
A deep-focus earthquake has a hypocenter depth exceeding 300 km. Deep earthquakes occur exclusively within subducting oceanic lithosphere, especially within old oceanic lithosphere that is subducting rapidly.

The physical mechanism of rupture of deep focus earthquakes is different than earthquakes that occur at a shallow depth. This earthquake occurred within the subducting Philippine Sea Plate.





USGS Centroid Moment Tensor Solution

Shaded areas show quadrants of the focal sphere in which the P-wave first-motions are away from the source, and unshaded areas show quadrants in which the P-wave first-motions are toward the source. The letters represent the axis of maximum compressional strain (P) and the axis of maximum extensional strain (T) resulting from the earthquake.

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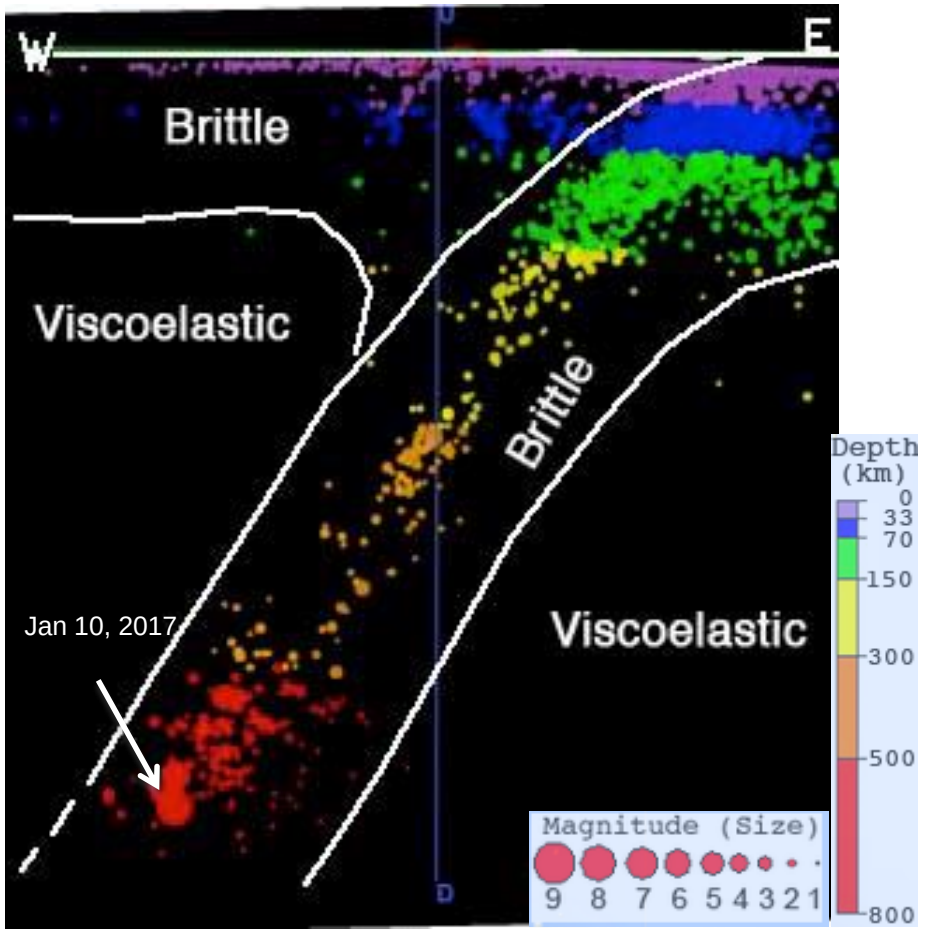
To produce earthquakes, rocks must be brittle. Brittle rock accumulates elastic energy as they bend then rapidly releases that energy during earthquake rupture.

With the exception of subducting oceanic plates, rock in Earth's mantle below about 100 km depth is viscoelastic and cannot rupture to produce earthquakes. Rocks are brittle at low temperatures but become viscoelastic when they reach temperatures of about 600° C.

Rapidly subducting cool oceanic plates, however, can remain brittle up to about 700 km in the hot mantle. The deepest earthquakes are thought to be due to phase changes of minerals in the high pressure and temperature conditions at those depths.



Exploring a three-dimensional view from the IRIS Earthquake Browser.

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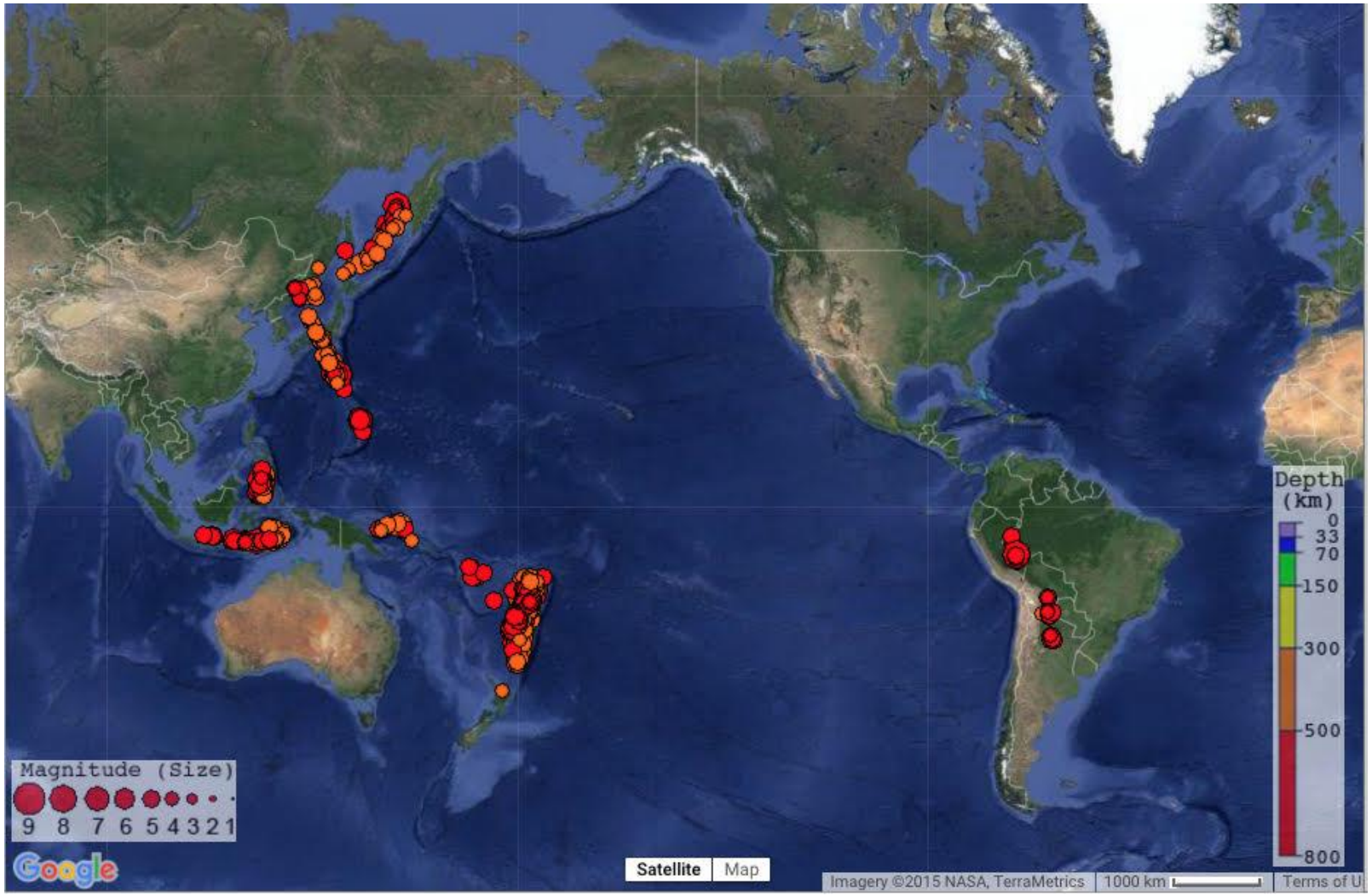
Locations where these deep large earthquake occur.



Map created using the IRIS Earthquake Browser: *www.iris.edu/ieb*

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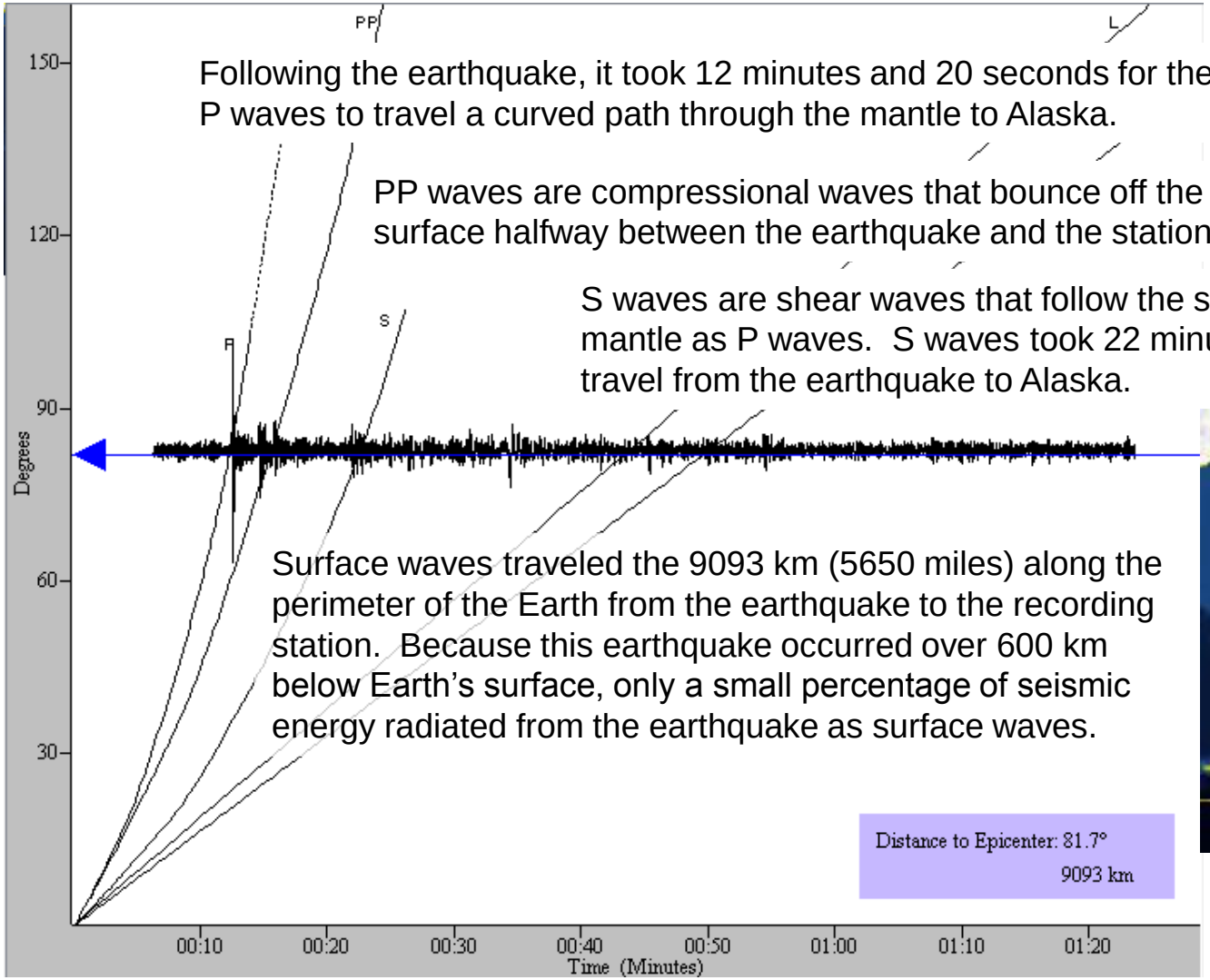
The record of the earthquake on the Chirikof Island seismometer (CHI) is illustrated below. Chirikof Island is 9093 km (5650 miles, 81.71˚) from the location of this earthquake.

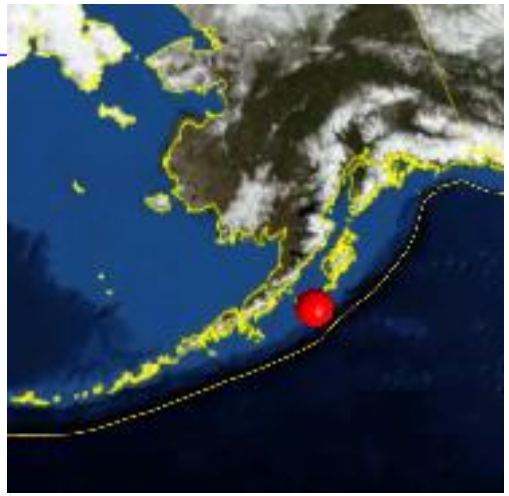


Following the earthquake, it took 12 minutes and 20 seconds for the compressional P waves to travel a curved path through the mantle to Alaska.

PP waves are compressional waves that bounce off the Earth's surface halfway between the earthquake and the station.

S waves are shear waves that follow the same path through the mantle as P waves. S waves took 22 minutes and 34 seconds to travel from the earthquake to Alaska.

Surface waves traveled the 9093 km (5650 miles) along the perimeter of the Earth from the earthquake to the recording station. Because this earthquake occurred over 600 km below Earth's surface, only a small percentage of seismic energy radiated from the earthquake as surface waves.



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