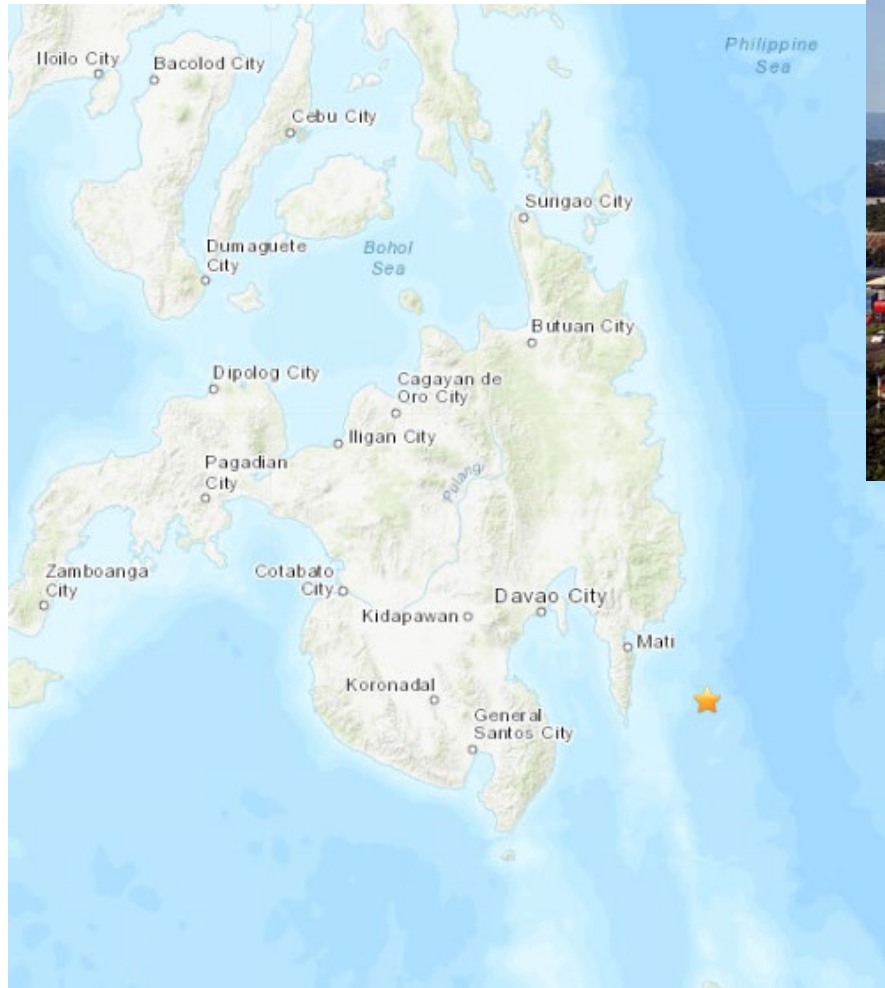


Magnitude 7.1 PHILIPPINES

Wednesday, August 11, 2021 at 17:46:14 UTC

Latitude 6.455° N
Longitude 126.742° E
Depth 65.6 km

A magnitude 7.1 earthquake shook parts of the southern Philippines 142.6 km (88.6 mi) east southeast of Davao, Philippines. There are no reports of damage or injuries. There are no tsunami warnings.



Davao, Philippines



Magnitude 7.1 PHILIPPINES

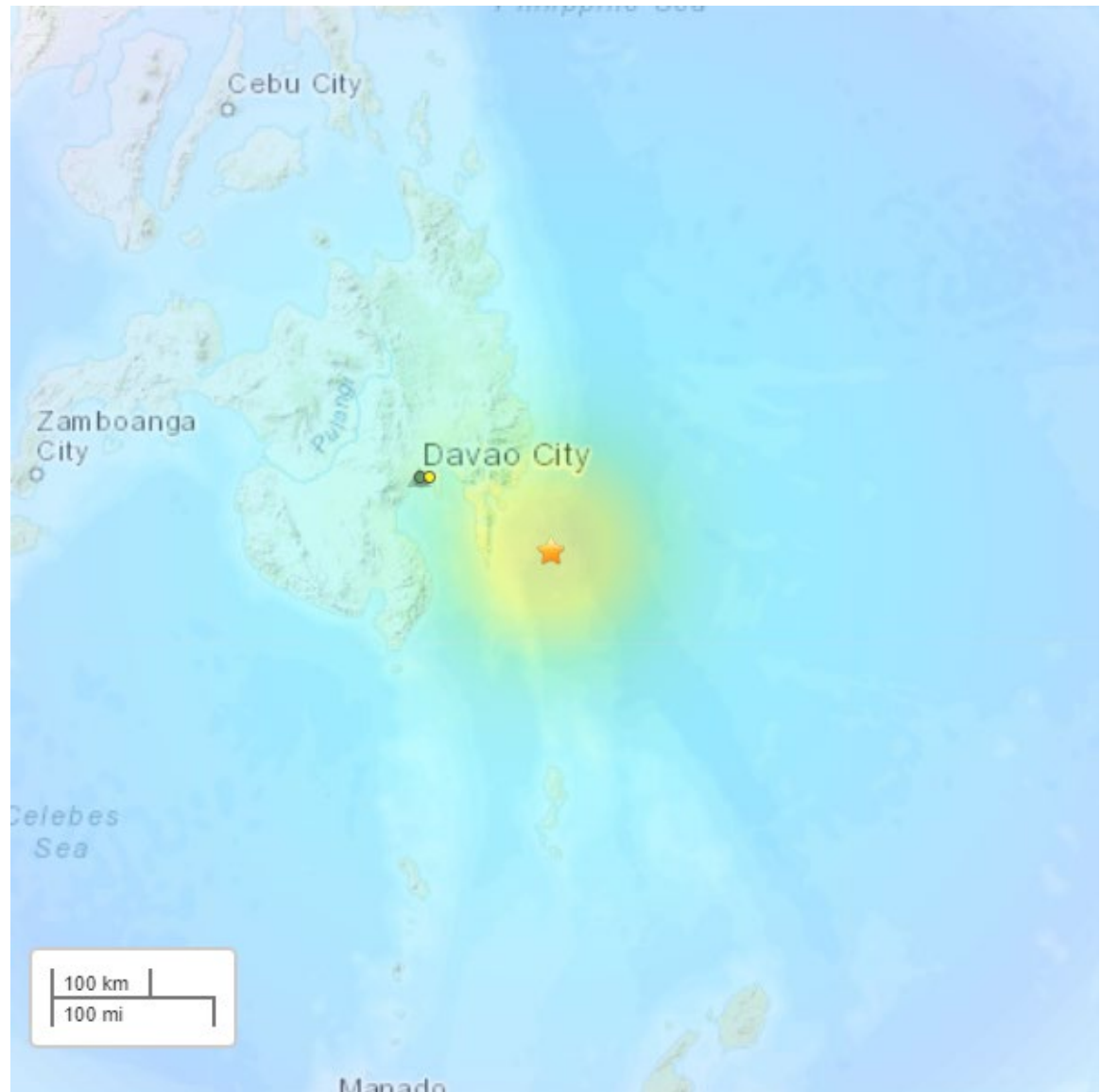
Wednesday, August 11, 2021 at 17:46:14 UTC

The Modified-Mercalli Intensity (MMI) scale is a ten-stage scale, from I to X, that indicates the severity of ground shaking. Intensity is dependent on the magnitude, depth, bedrock, and location.

Strong shaking was felt in the area closest to the earthquake.

MMI Perceived Shaking

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



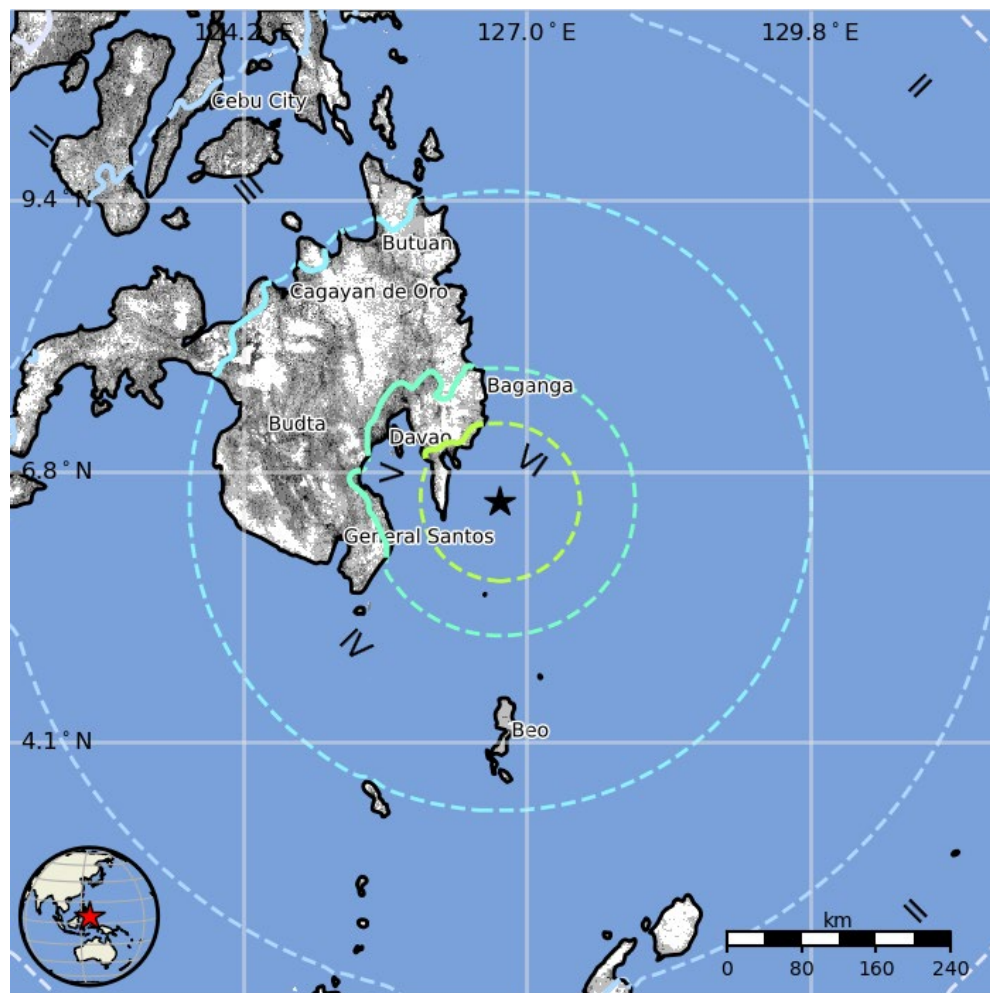
Magnitude 7.1 PHILIPPINES

Wednesday, August 11, 2021 at 17:46:14 UTC

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

The USGS estimates that 453,000 people felt strong shaking from this earthquake.

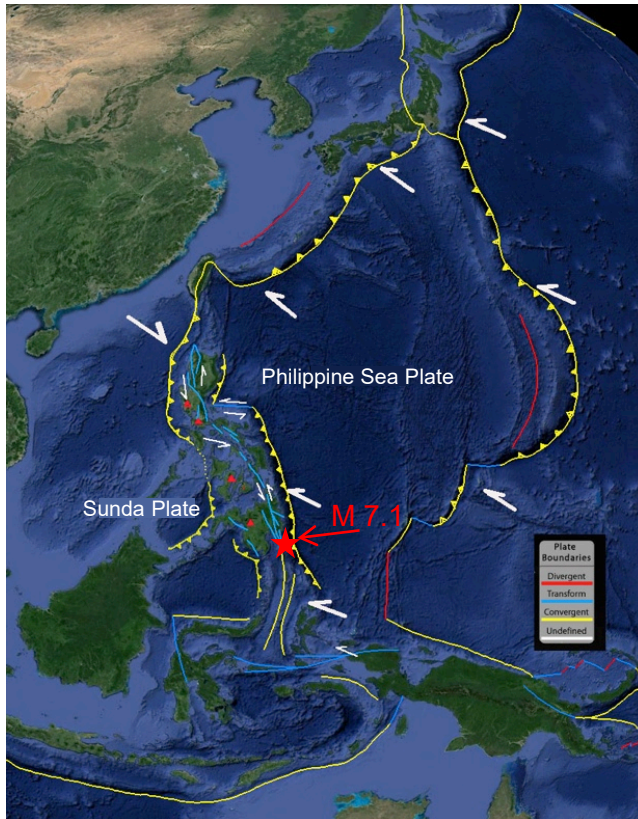
I	Not Felt	75 k*
II-III	Weak	23,058 k*
IV	Light	14,543 k
V	Moderate	3,707 k
VI	Strong	453 k
VII	Very Strong	0 k
VIII	Severe	0 k
IX	Violent	0 k
X	Extreme	0 k



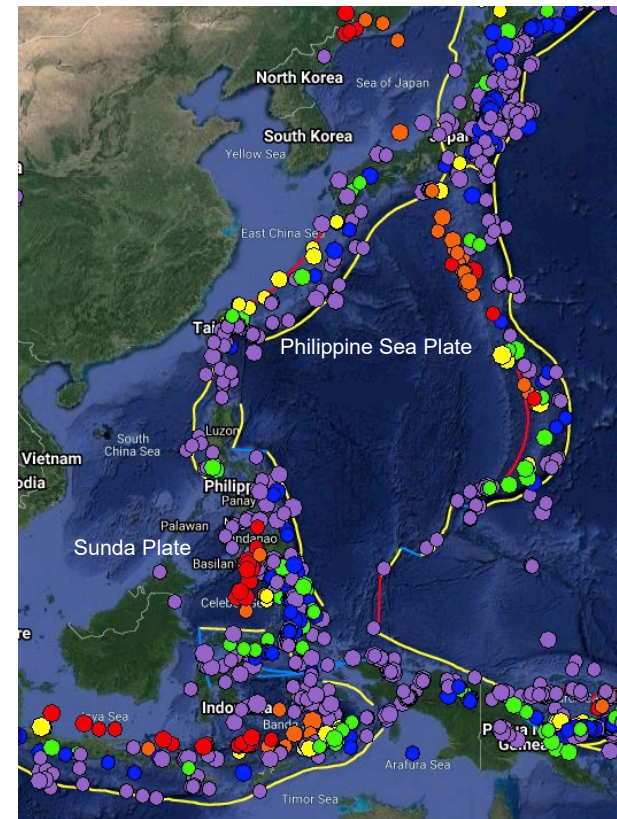
The color-coded contour lines outline regions of MMI intensity. The total population exposure to a given MMI value is obtained by summing the population between the contour lines. The estimated population exposure to each MMI Intensity is shown in the table.

Image courtesy of the US Geological Survey

Along its western margin, the Philippine Sea Plate converges with and subducts beneath the Sunda Plate. The Philippines Archipelago has oceanic plates subducting beneath both its east and west sides. These islands contain active volcanoes (red triangles), as well as high earthquake activity.



Simplified tectonic boundaries



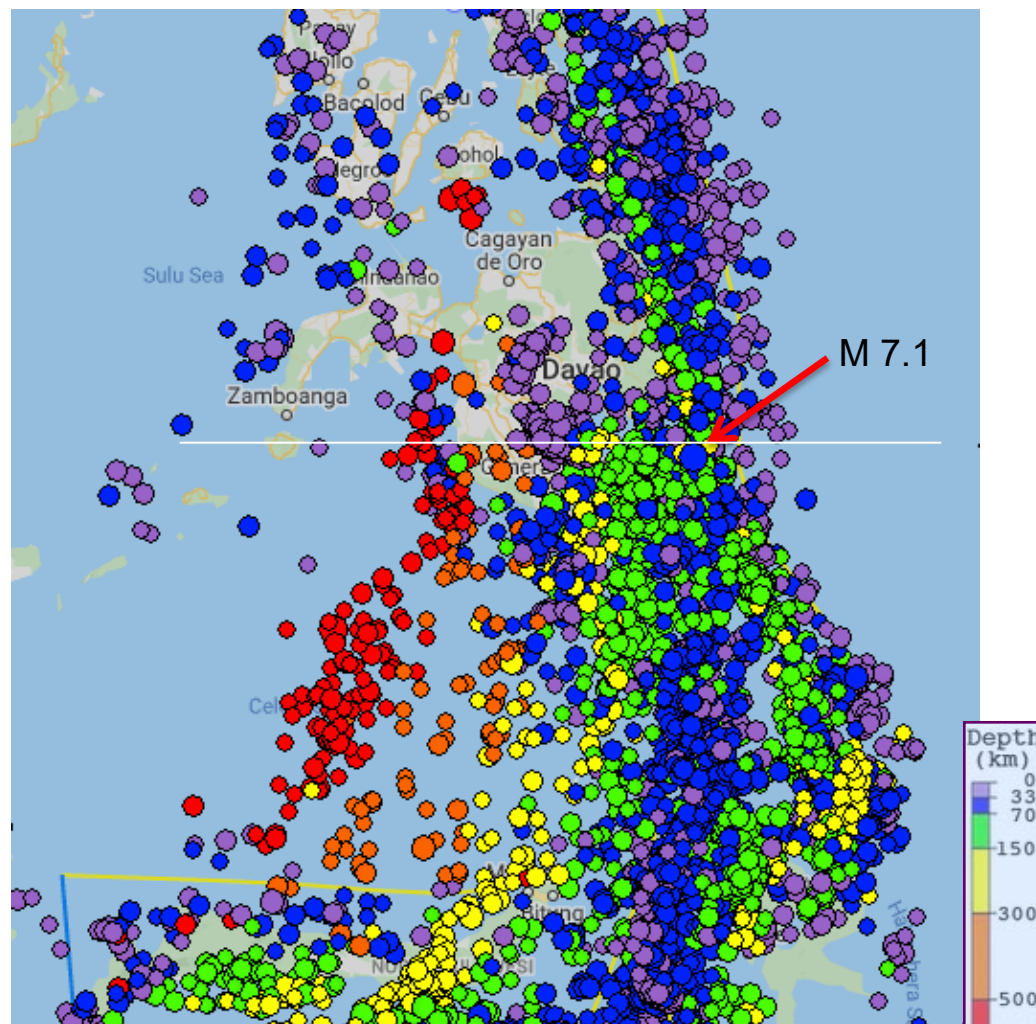
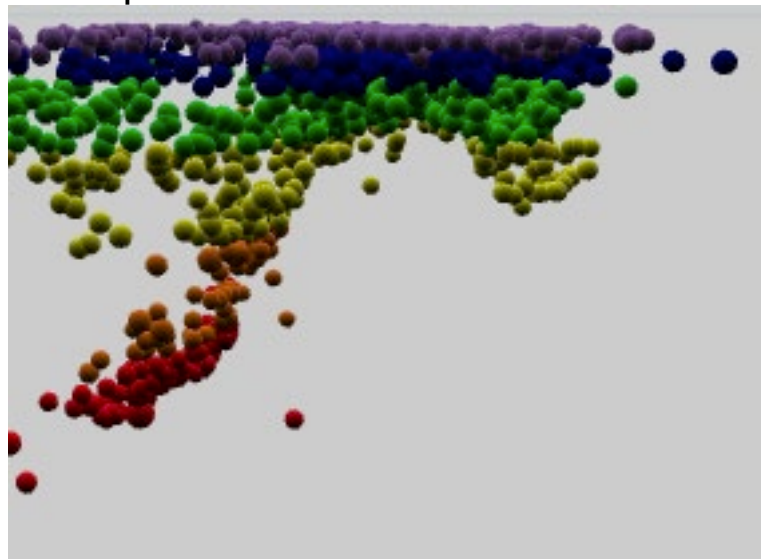
Magnitude 6-8 earthquakes 2000-2018

Magnitude 7.1 PHILIPPINES

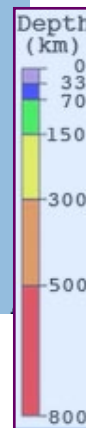
Wednesday, August 11, 2021 at 17:46:14 UTC

Historical seismicity in the region of the August 11, 2021 earthquake is shown on the right. Earthquakes are color-coded by depth as shown by the legend in the lower right corner. Depths of earthquakes increase from east to west across the subduction zone boundary between the Philippine Sea and Sunda plates.

A cross section through the M7.1 earthquake is shown below.



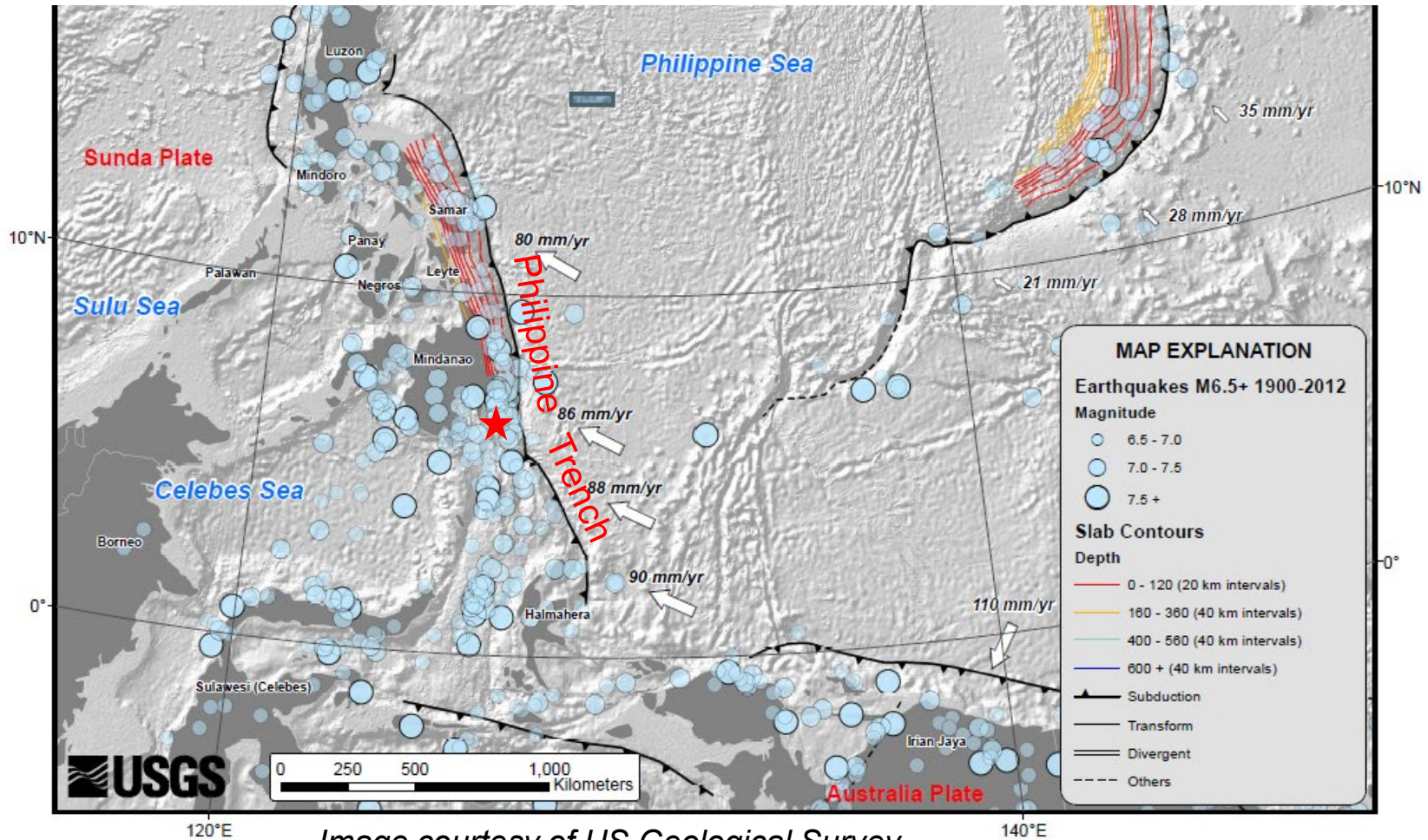
Created using the IRIS Earthquake Browser (IEB)



Magnitude 7.1 PHILIPPINES

Wednesday, August 11, 2021 at 17:46:14 UTC

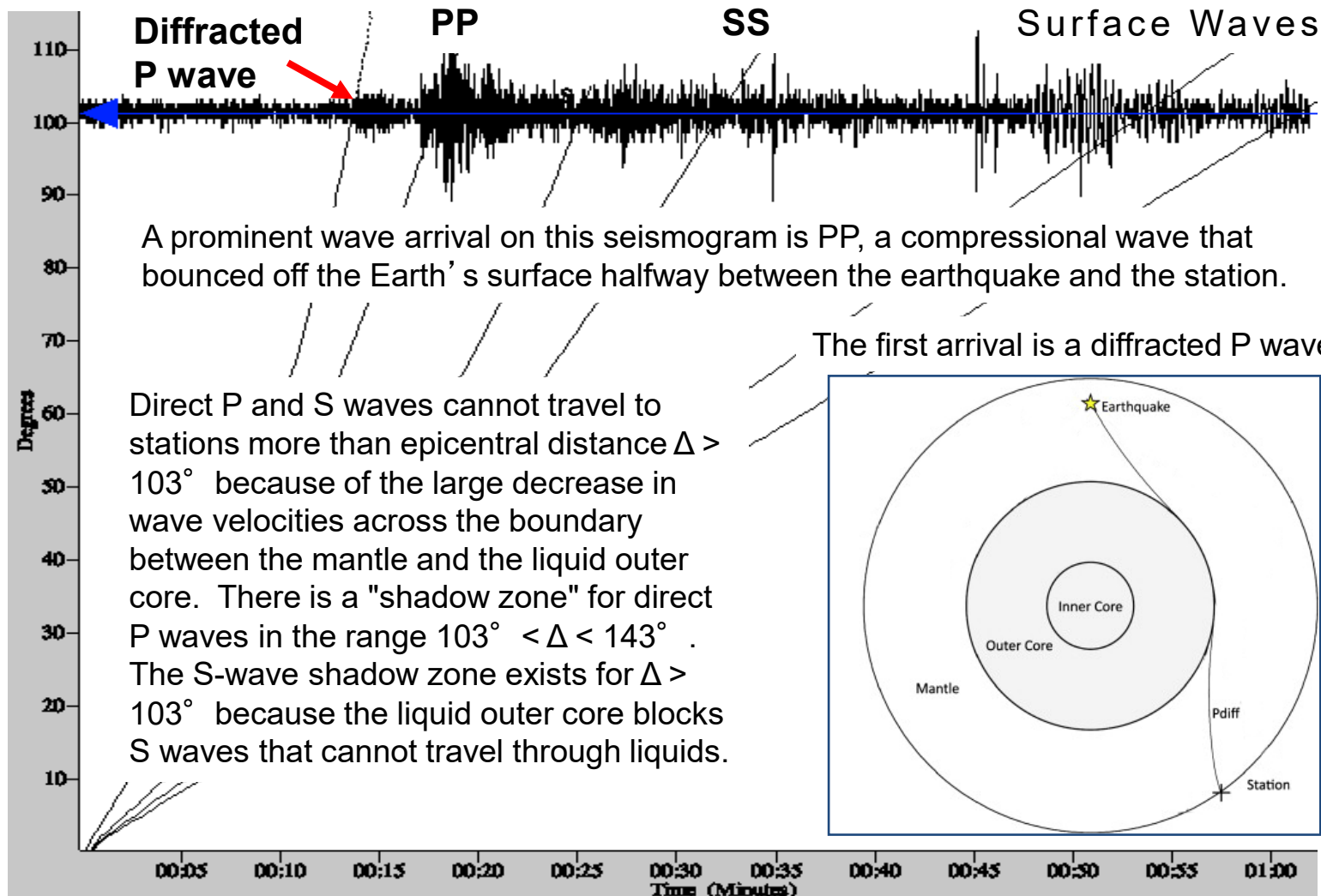
The August 11, 2021 earthquake is shown by the red star on the map below. In the region of this earthquake, the Philippine Sea Plate moves west-northwest with respect to the Sunda Plate at a rate of 8.6 cm/yr. At the Philippine Trench, the Philippine Sea Plate subducts beneath the Philippine Islands that are located on the eastern side of the Sunda Plate.



Magnitude 7.1 PHILIPPINES

Wednesday, August 11, 2021 at 17:46:14 UTC

The record of the earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 11,216 km (6970 miles, 101.0°) from the location of this earthquake. At this distance, it is challenging to identify some wave arrivals on a seismogram of a magnitude 7.1 earthquake.



Animation explaining the seismic shadow zone.

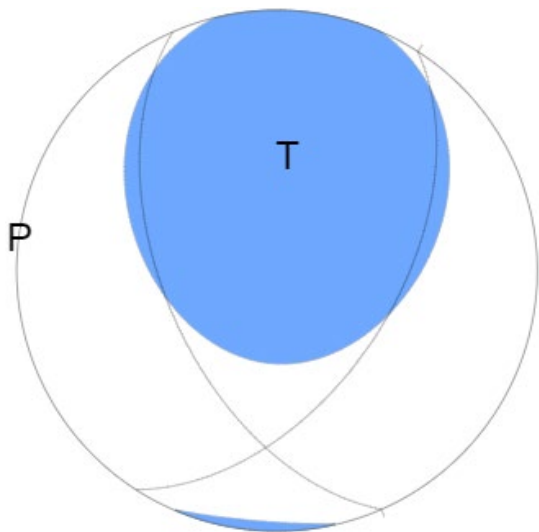
Epicentral distance is the angle formed by the intersection of the line from the earthquake to Earth's center with the line from the observing point to the Earth's center.

S waves are observed up to a distance of 104° from an earthquake, but direct S waves are not recorded beyond this distance.

P waves also have a shadow zone between 104° and 143° .



The focal mechanism is how seismologists plot the 3-D stress orientations of an earthquake. Because an earthquake occurs as slip on a fault, it generates primary (P) waves in quadrants where the first pulse is compressional (shaded) and quadrants where the first pulse is extensional (white). The orientation of these quadrants determined from recorded seismic waves determines the type of fault that produced the earthquake.

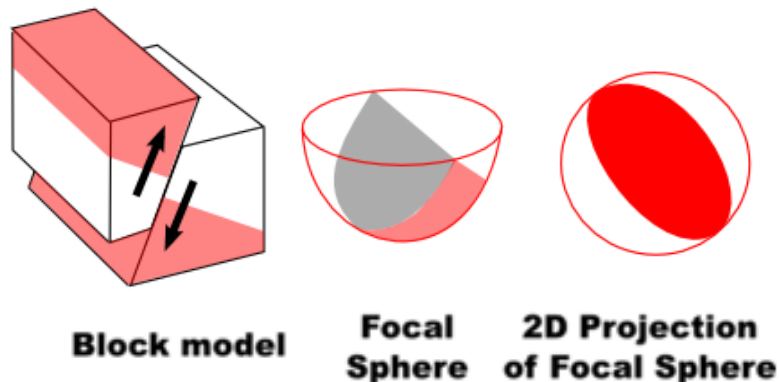


USGS W-phase Moment Tensor Solution

The tension axis (T) reflects the minimum compressive stress direction. The pressure axis (P) reflects the maximum compressive stress direction.

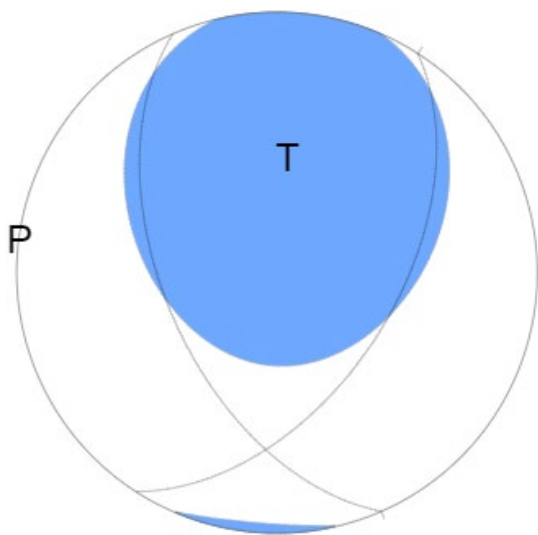
In this case, the focal mechanism indicates this earthquake occurred as the result of thrust faulting likely within the subducted oceanic lithosphere of the Philippine Sea Plate.

Reverse/Thrust/Compression

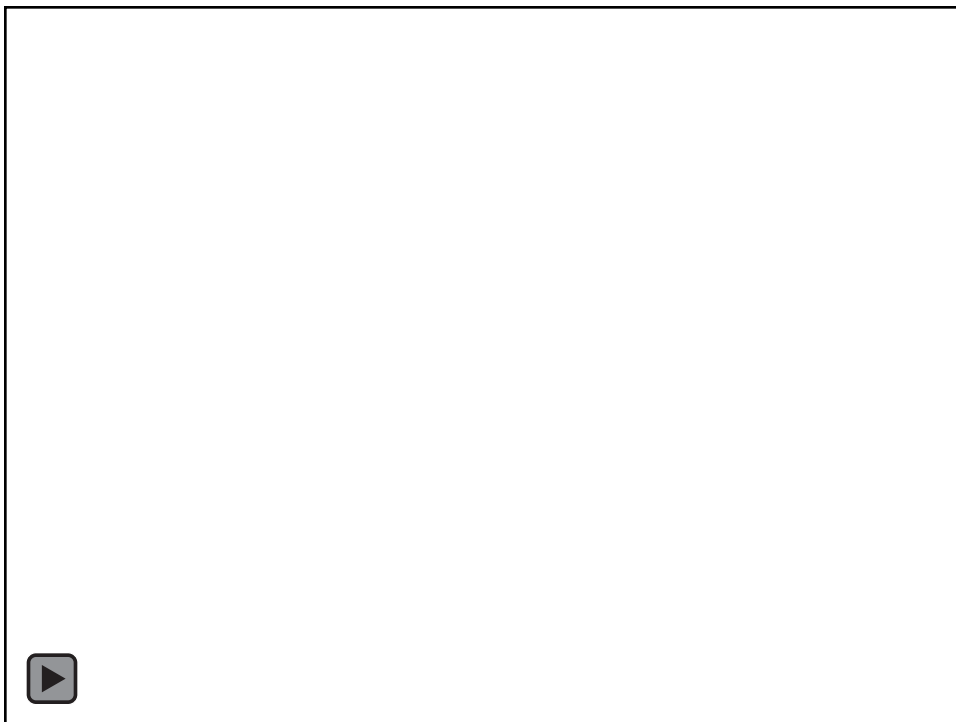


This animation explores the motion of a reverse fault, and how reverse faults are represented in a focal mechanism.

Remember, this was the focal mechanism solution for this earthquake. It was estimated by an analysis of observed seismic waveforms, recorded after the earthquake, observing the pattern of "first motions", that is, whether the first arriving P waves push up or down.



USGS W-phase Moment Tensor Solution



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