

Magnitude 7.3 INDONESIA

Wednesday, December 29, 2021 at 18:25:51 UTC

A magnitude 7.3 earthquake occurred 121 km (75 miles) NNE of Lospalos, Timor-Leste, Indonesia at a depth of 166.9 km (103 miles) with no reports of damage or injuries.

Indonesia is the world's fourth most populous country with 277 million people distributed over more than 17,000 islands. Because of its location within the Sunda Subduction Zone region, Indonesia experiences frequent earthquakes and volcanic eruptions.



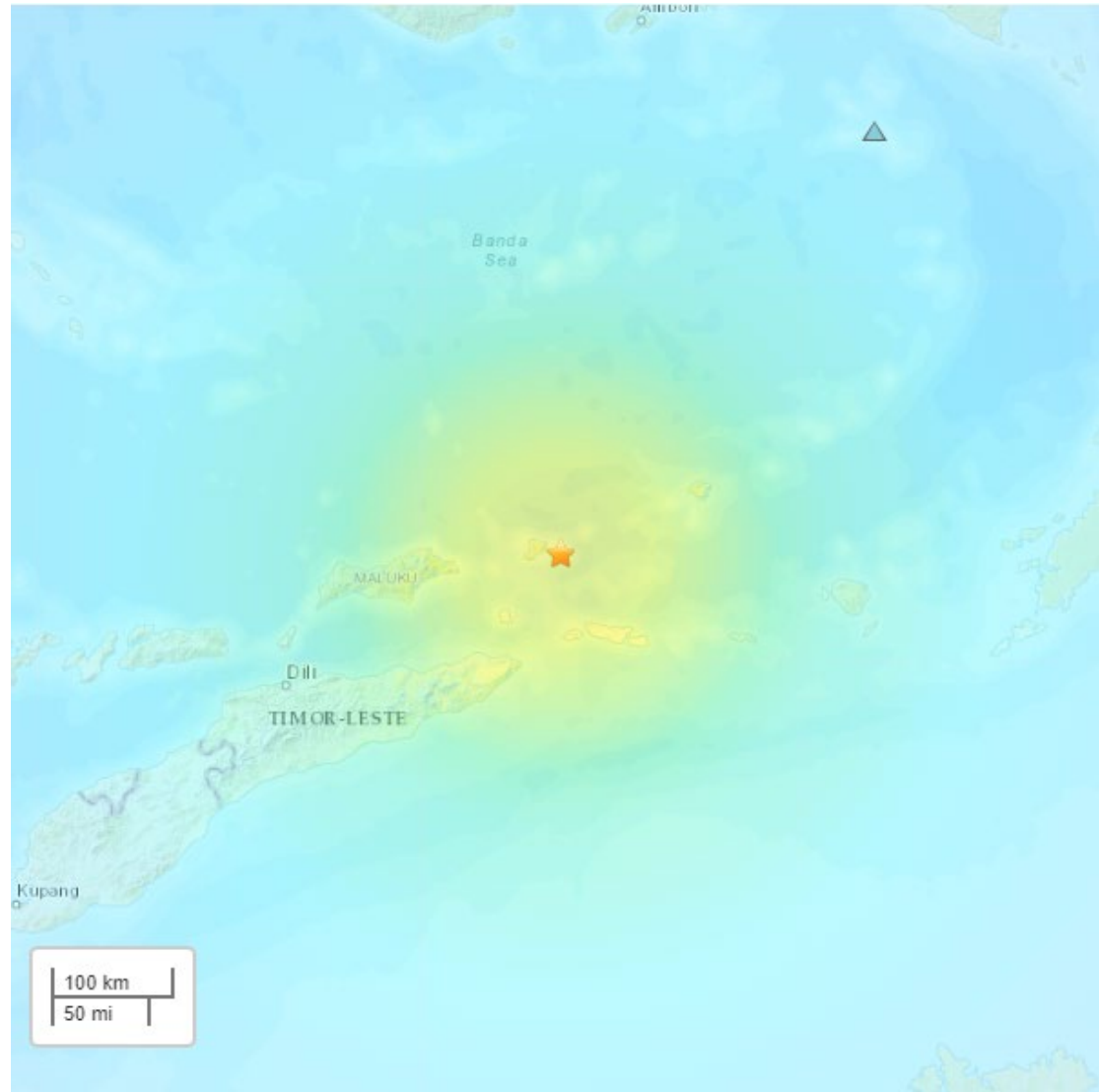
Dili is the capital city of Timor-Leste, or East Timor, on the country's north coast.



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

The area near the epicenter experienced strong shaking from this 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 |

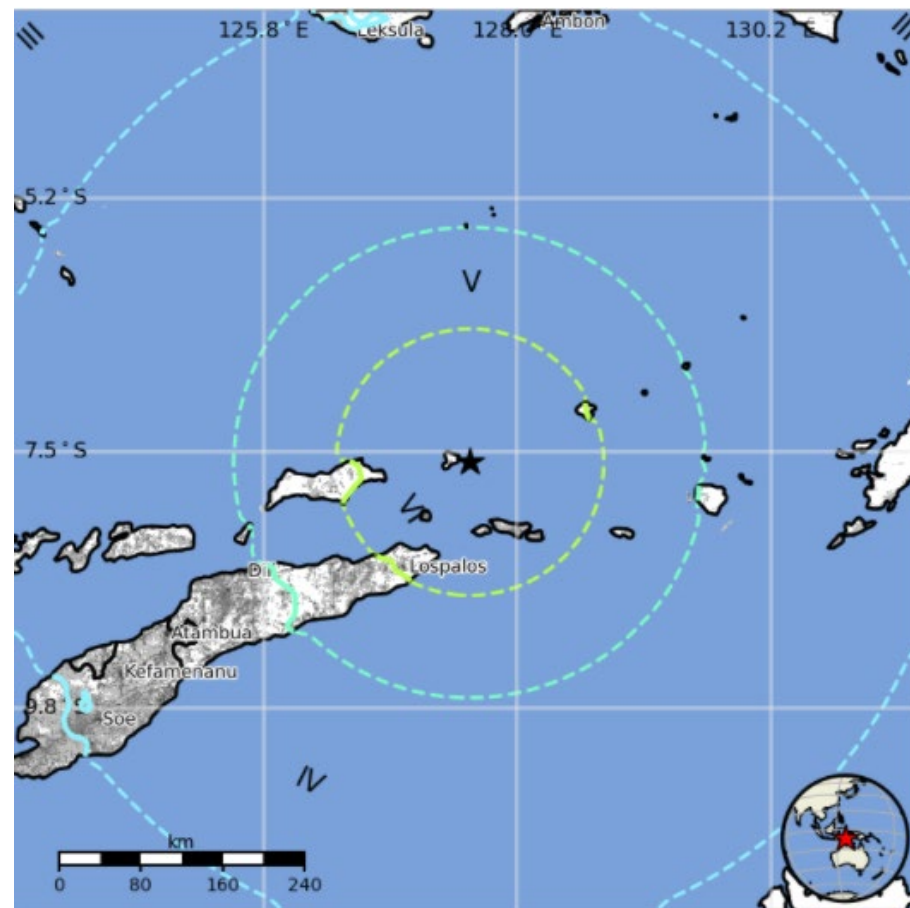


USGS Estimated shaking Intensity from M 7.3 Earthquake

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

140,000 people were exposed to strong shaking from this earthquake.

| | | |
|--------|-------------|---------|
| I | Not Felt | 0 k* |
| II-III | Weak | 661 k* |
| IV | Light | 3,084 k |
| V | Moderate | 365 k |
| VI | Strong | 140 k |
| VII | Very Strong | 0 k |
| VIII | Severe | 0 k |
| IX | Violent | 0 k |
| X | Extreme | 0 k |

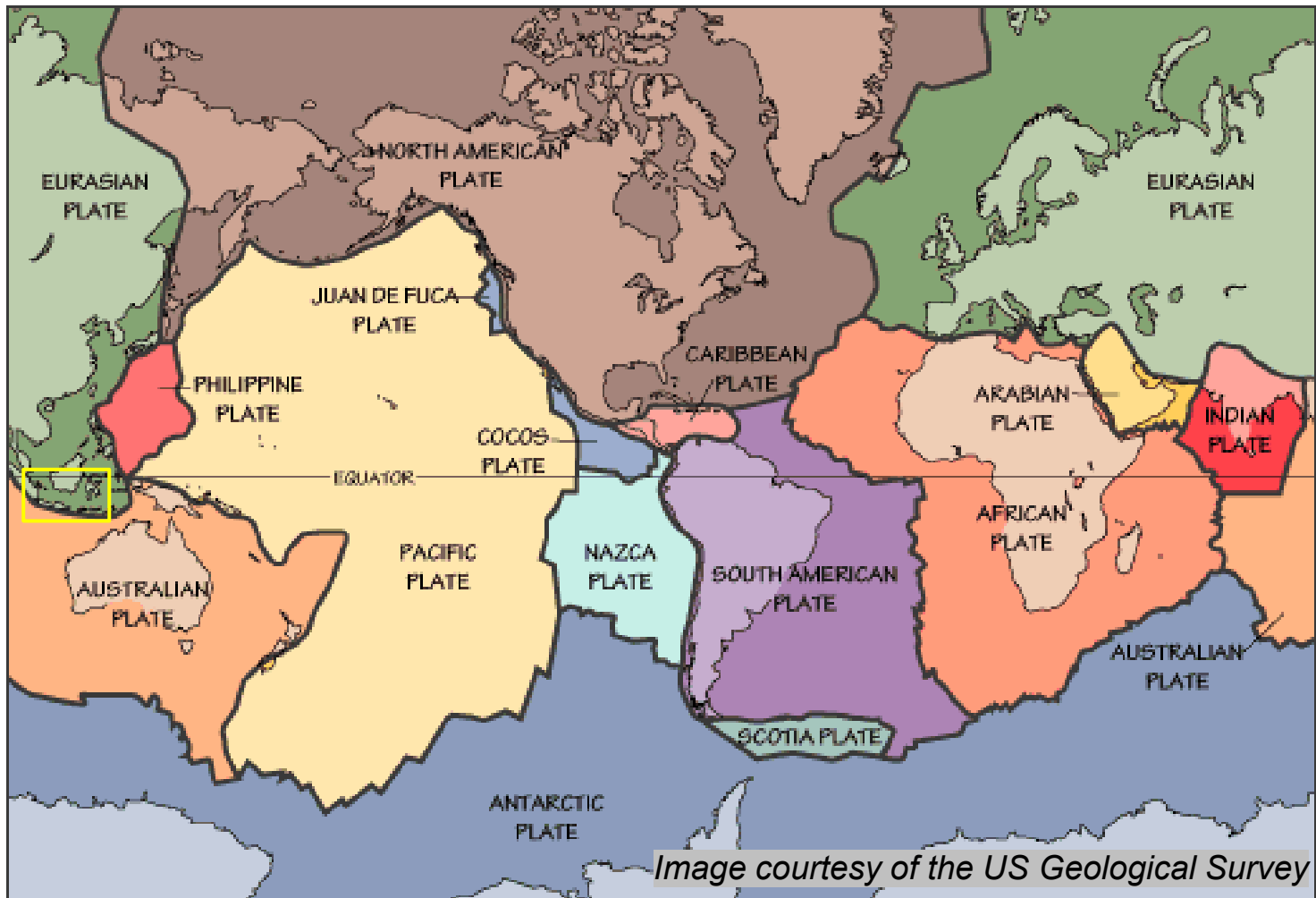


The color coded contour lines outline regions of MMI intensity. The total population exposure to a given MMI value is obtained by summing the population between the contour lines. The estimated population exposure to each MMI Intensity is shown in the table.

Image courtesy of the US Geological Survey

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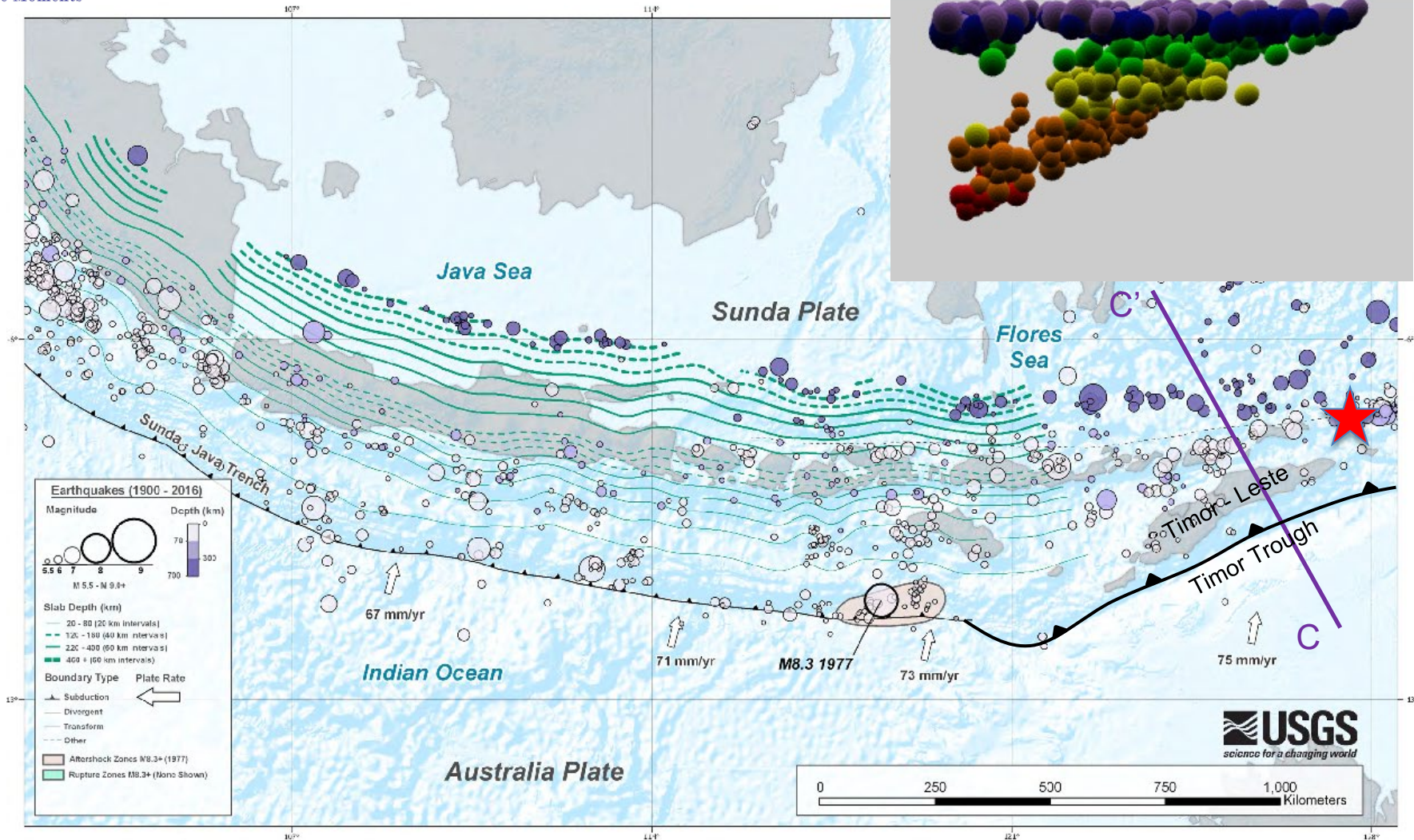
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The Sunda – Java Trench and Timor Trough are the convergent plate boundary where the Australia Plate subducts beneath the southeastern promontory on the Eurasian Plate. The tectonics and seismicity of the area within the yellow rectangle are shown on the next slide.

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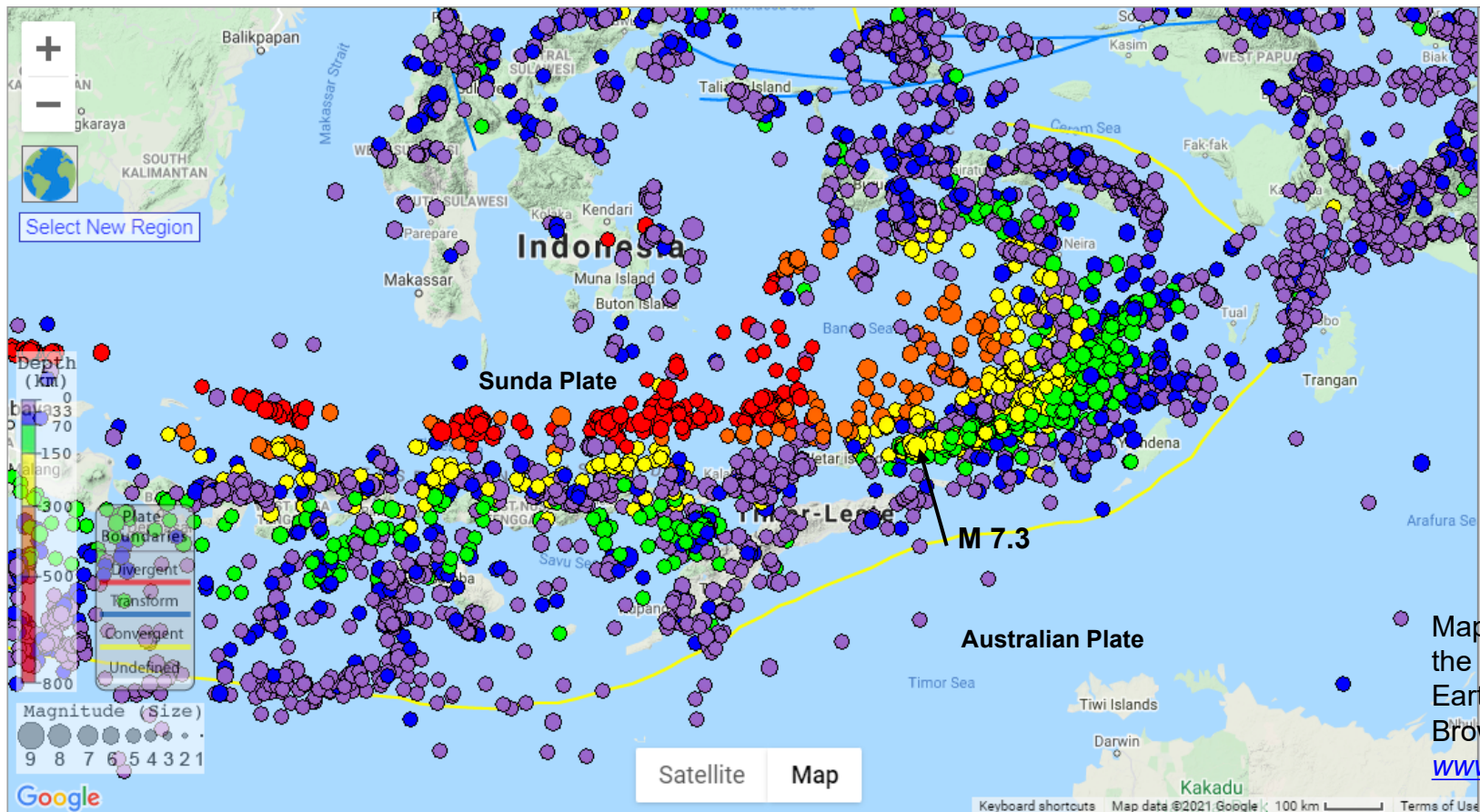


The earthquake history from 1900 to 2016 and rates of subduction of the Australia Plate beneath the Sunda Plate are shown on the map above. Red star indicates the epicenter of the December 29, 2021 earthquake. The Sunda – Java Trench connects with the Timor Trough that is located south of Timor – Leste. A south-to-north cross section of the subduction zone from C to C' is shown in the upper right. Earthquakes deeper than 50 km are within the subducting Australia Plate. With a depth of 167 km, the December 29 earthquake occurred within the subducting Australia Plate.

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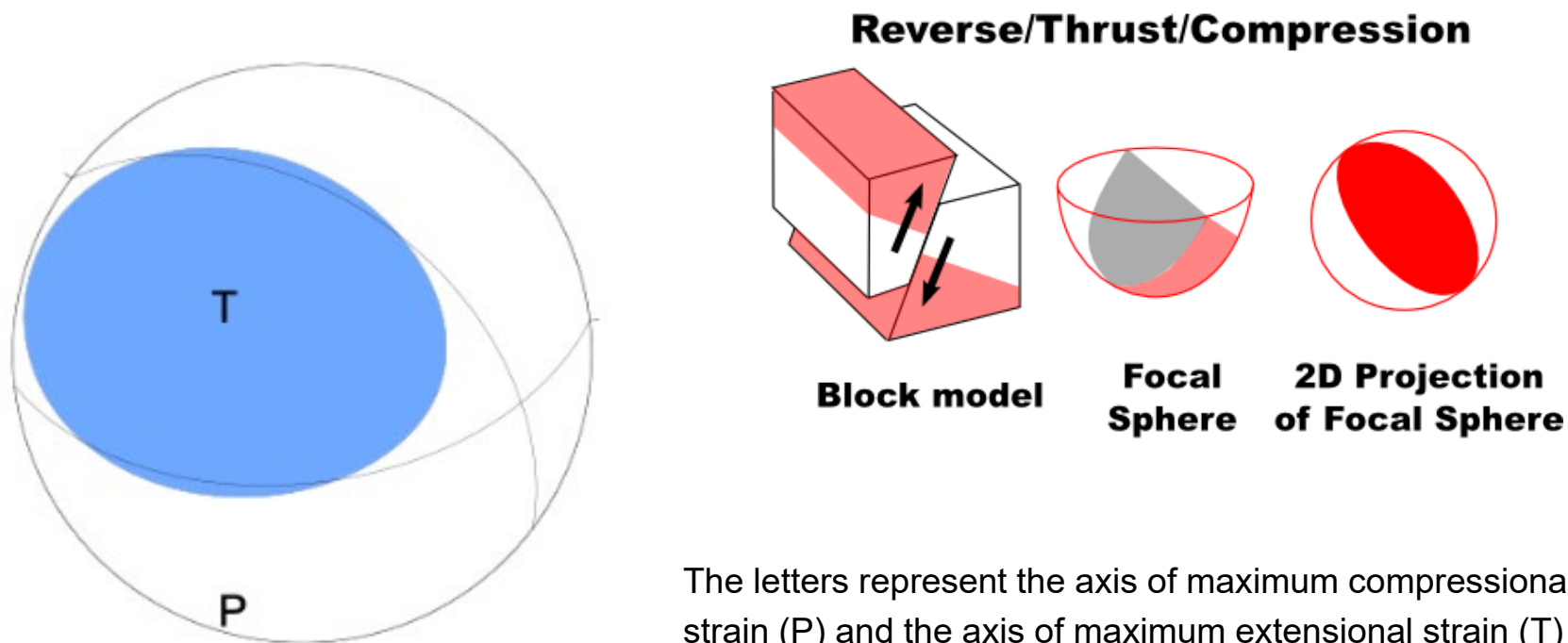
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Regional seismicity is shown on the map with earthquakes color coded by depth. Plotted are the most recent 4000 earthquakes magnitude 4 or larger. Notice that earthquakes are shallow on the south edge of the map area. As the oceanic portion of the Australian Plate subducts towards the north beneath the Sunda Plate, earthquakes within the Australia Plate increase in depth from south to north.



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

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 identifies the type of fault that produced the earthquake. In the case of the December 29, 2021 earthquake, the focal mechanism indicates thrust faulting as the primary mechanism.

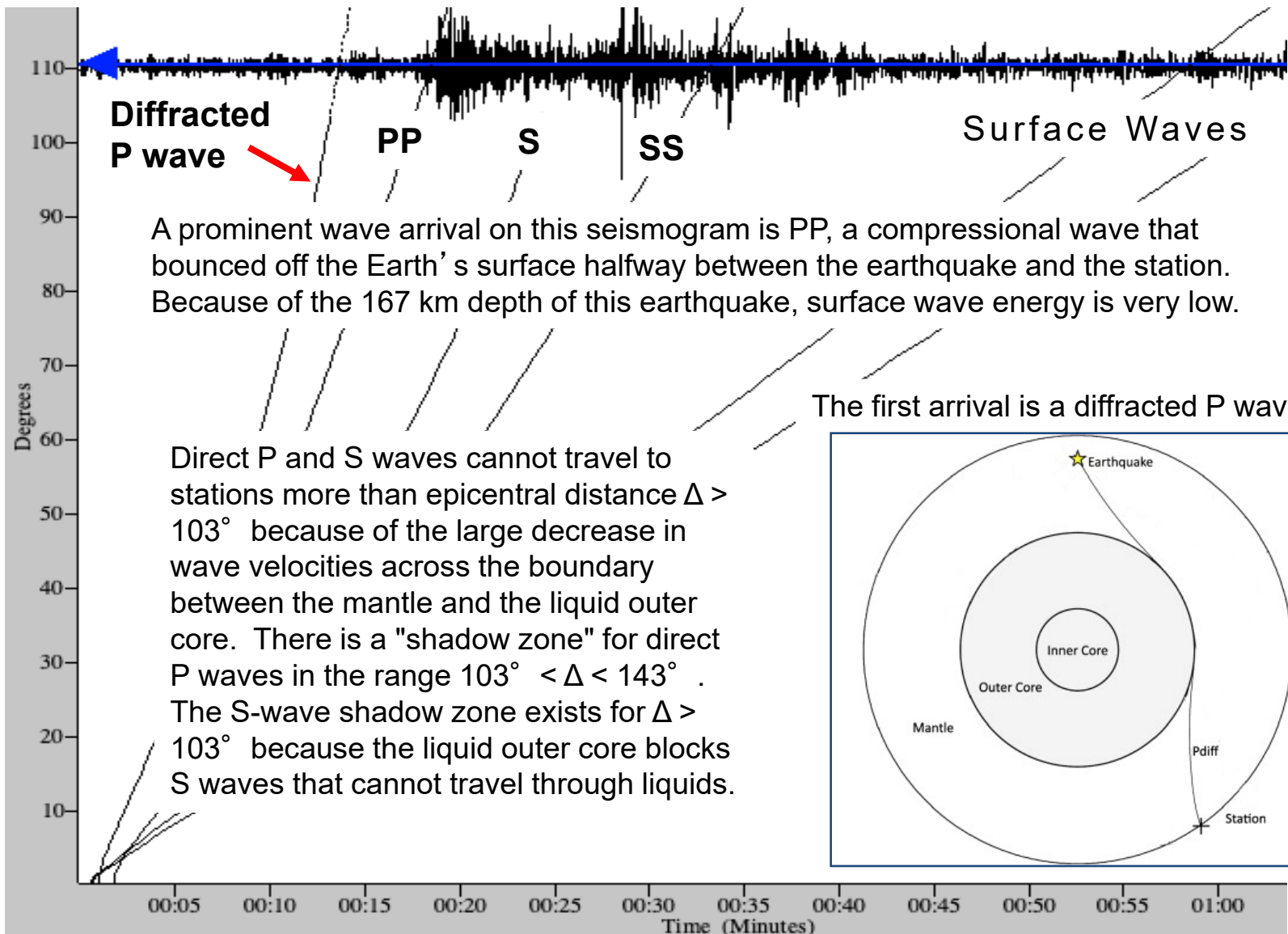


The letters represent the axis of maximum compressional strain (P) and the axis of maximum extensional strain (T) resulting from the earthquake.

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The record of the December 29, 2021 earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 12,273 km (7626 miles, 110.6°) from the location of this earthquake.



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