

## Magnitude 7.2 PERU

Thursday, May 26, 2022 at 12:02:20 UTC

A magnitude 7.2 earthquake occurred northwest of Lake Titicaca, near the town of Juliaca (population 276,110) that sits in the northern Altiplano, or Andean Plateau. At 3,825 meters (12,549 ft) above sea level, it is the most extensive high plateau on Earth outside Tibet.

Due to the 218 km (135 miles) depth of the earthquake there were no reports of damage or injuries.

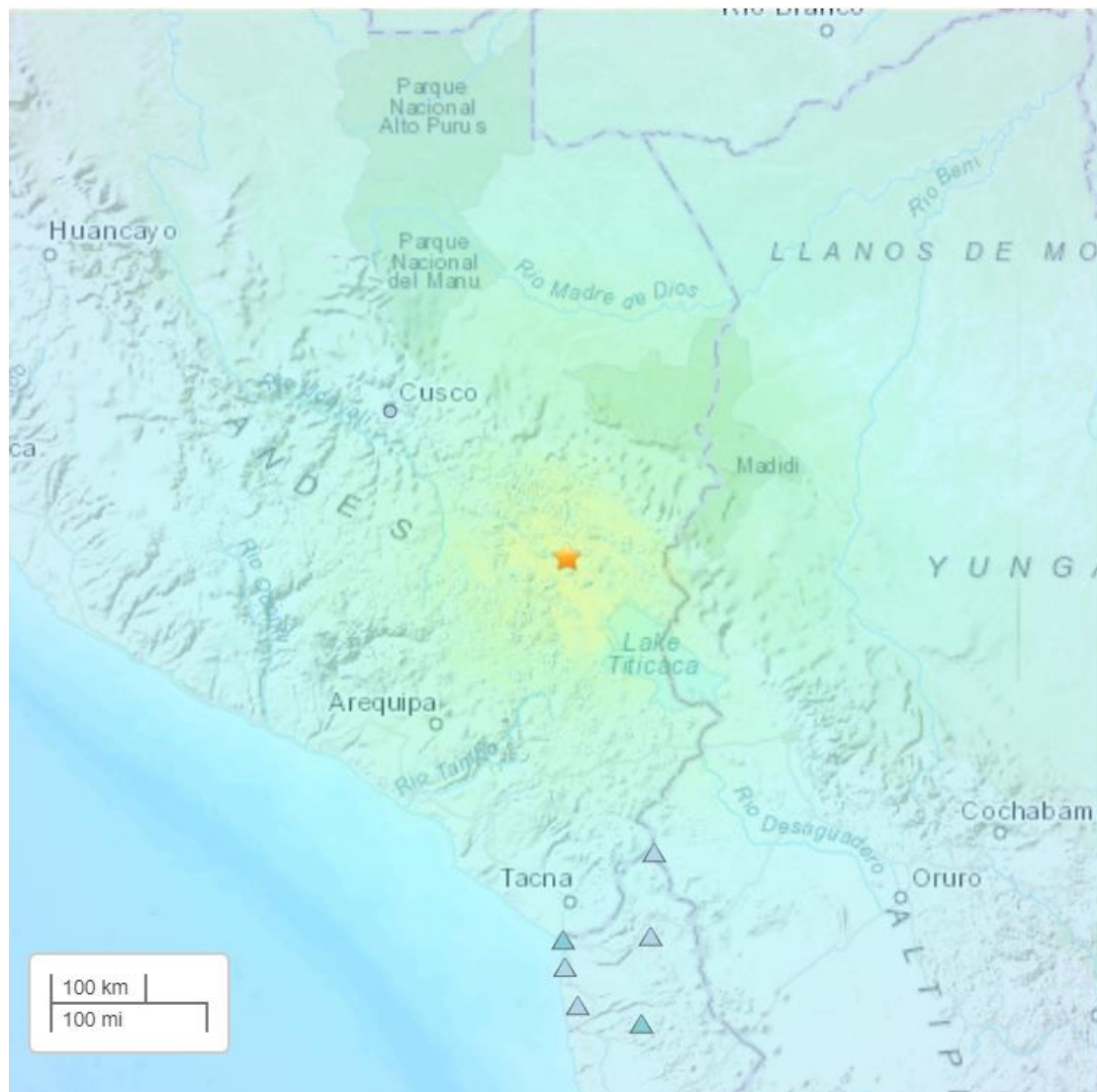


Lake Titicaca is the largest freshwater lake in South America. Titicaca is one of less than twenty ancient lakes on earth and is thought to be three million years old. Lake Titicaca sits 3 810 m above sea level and is situated between Peru to the west and Bolivia to the east.

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
III	Weak
I	Not Felt

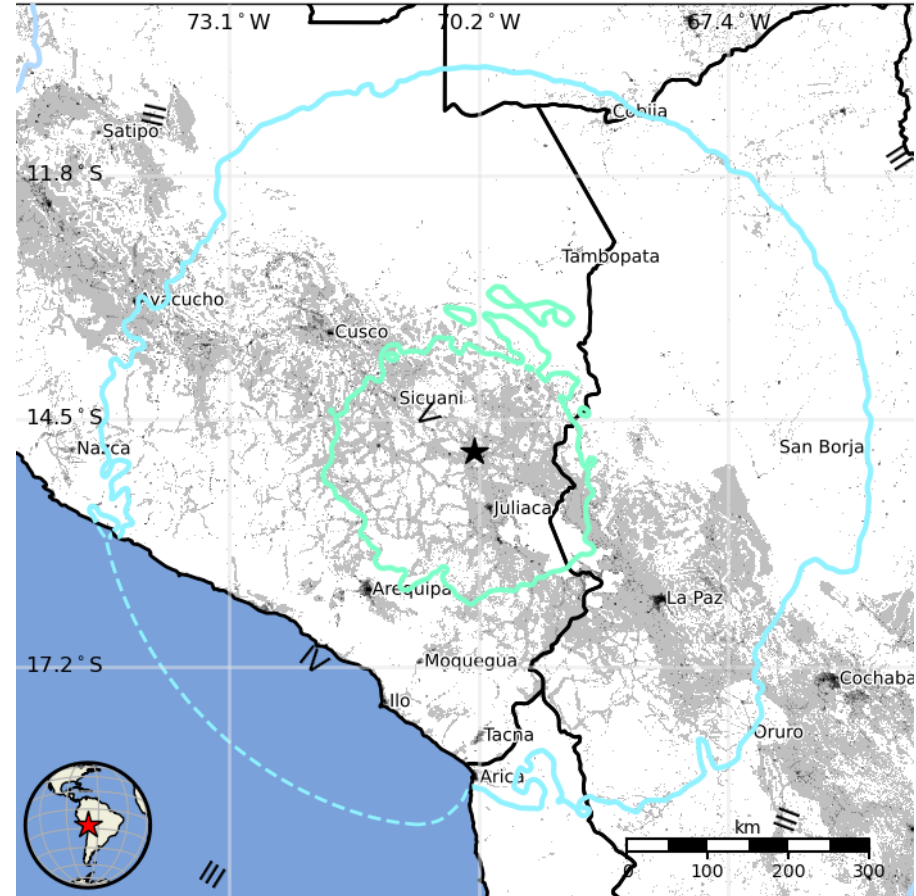


USGS Estimated shaking Intensity from M 7.2 Earthquake

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

24,000 people were exposed to strong shaking from this earthquake.

<b>I</b>	Not Felt	0 k*
<b>II-III</b>	Weak	6,172 k*
<b>IV</b>	Light	8,089 k
<b>V</b>	Moderate	1,537 k
<b>VI</b>	Strong	24 k
<b>VII</b>	Very Strong	0 k
<b>VIII</b>	Severe	0 k
<b>IX</b>	Violent	0 k
<b>X</b>	Extreme	0 k

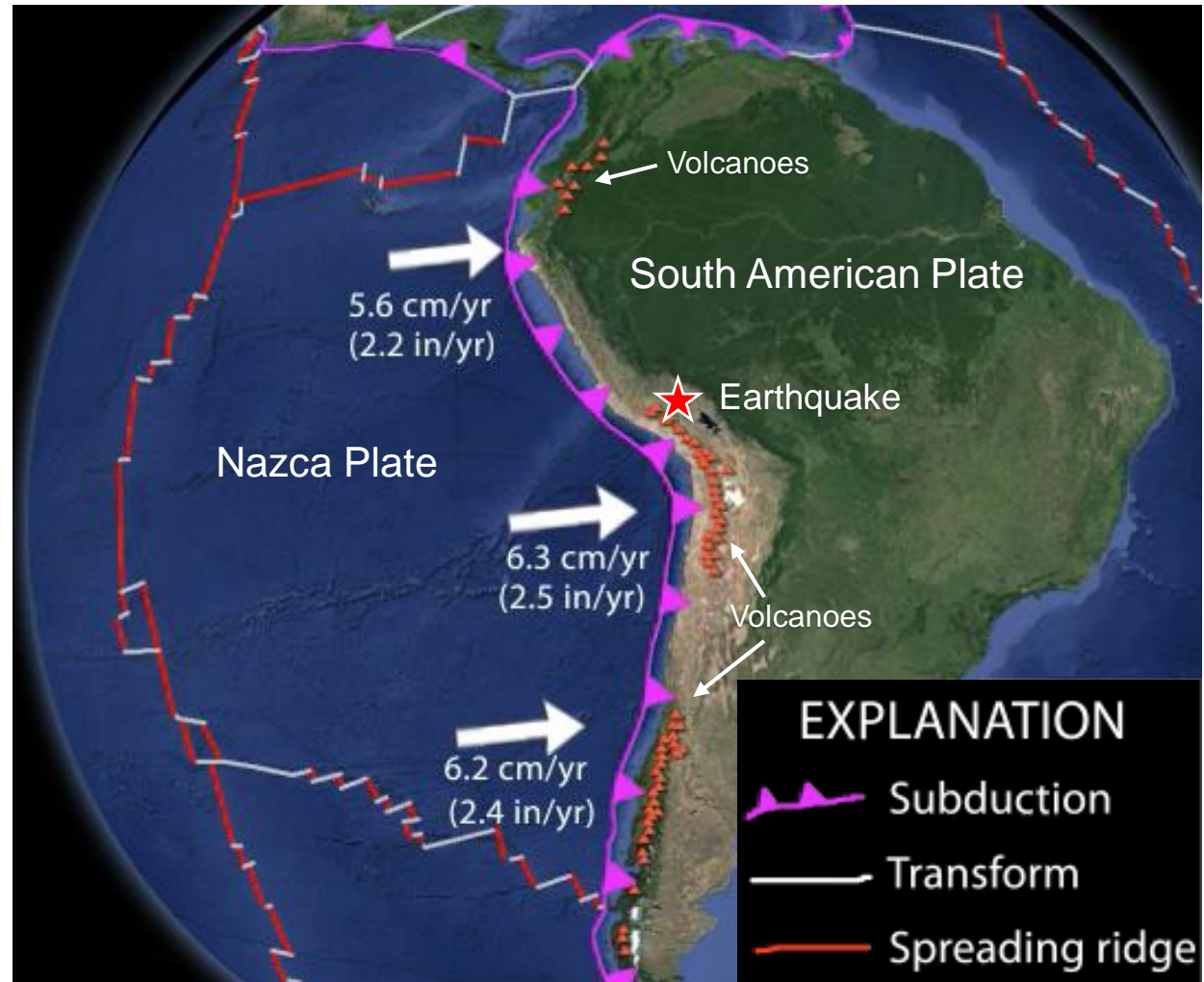


The color coded contour lines outline regions of MMI intensity. The total population exposure to a given MMI value is obtained by summing the population between the contour lines. The estimated population exposure to each MMI Intensity is shown in the table.

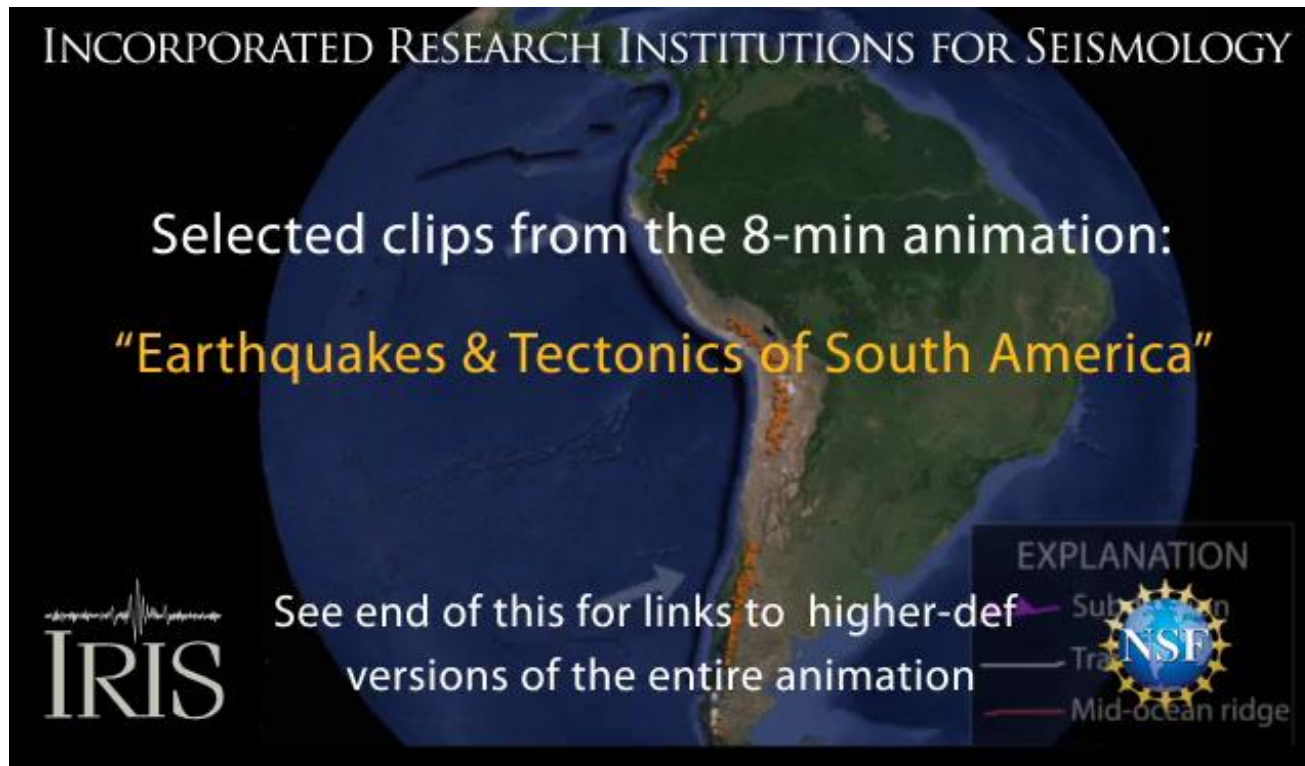


This illustration shows the rate and direction of motion of the Nazca Plate with respect to the South American Plate. Locations of active Andean volcanoes are shown by the orange triangles.

The May 26 earthquake is shown by the red star. At the location of this earthquake, the Nazca Plate subducts beneath the South America Plate at a velocity of about 6 cm/yr.



The animation below illustrates subduction of the oceanic Nazca Plate into the Peru-Chile Trench and beneath the South American Plate. The May 26 earthquake occurred at 217.8 km depth where earthquakes occur within the subducting plate rather than on the shallower interface between the subducting and overriding plates.



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Selected clips from the 8-min animation:  
"Earthquakes & Tectonics of South America"

See end of this for links to higher-def versions of the entire animation

EXPLANATION

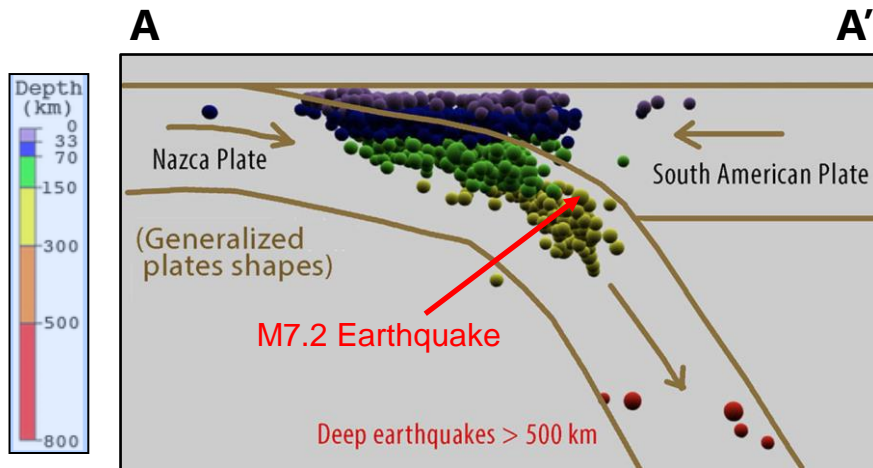
- Subduction
- Trench
- Mid-ocean ridge

IRIS

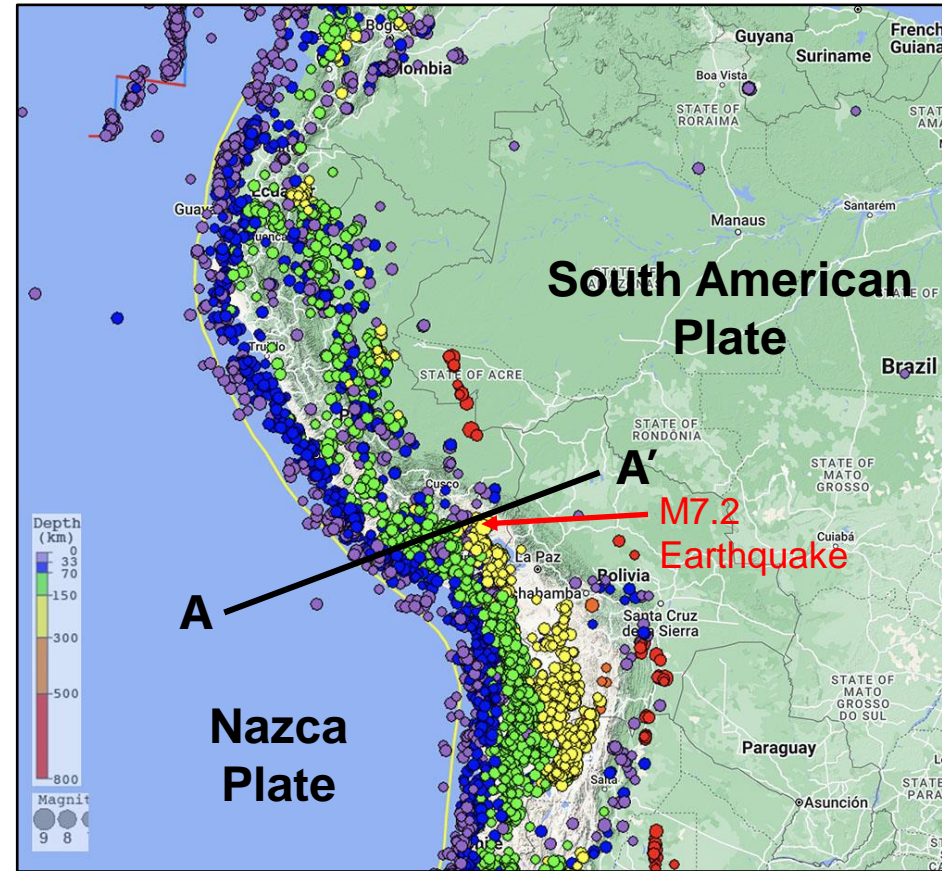
Animation exploring plate tectonics and earthquakes of the Nazca – South America plate boundary region.

Epicenters are shown on a map of historic seismicity on the right. Earthquakes between the Nazca and South American Plates and within the Nazca Plate increase in depth from west to east.

A 3D view along the cross section (A-A') is shown below. This earthquake occurred within the top of the Nazca Plate as it bends to dive more steeply beneath the South American Plate.

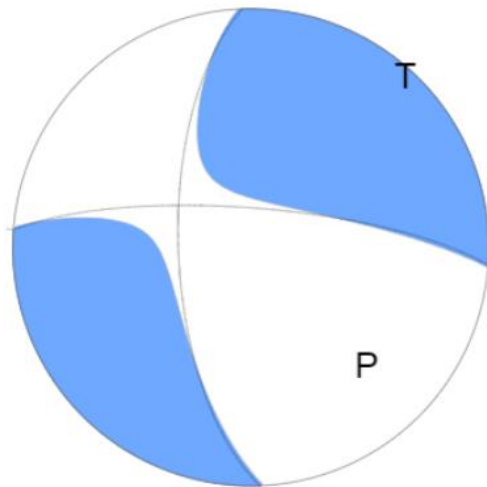


25 years of earthquakes > M4  
1997–2022



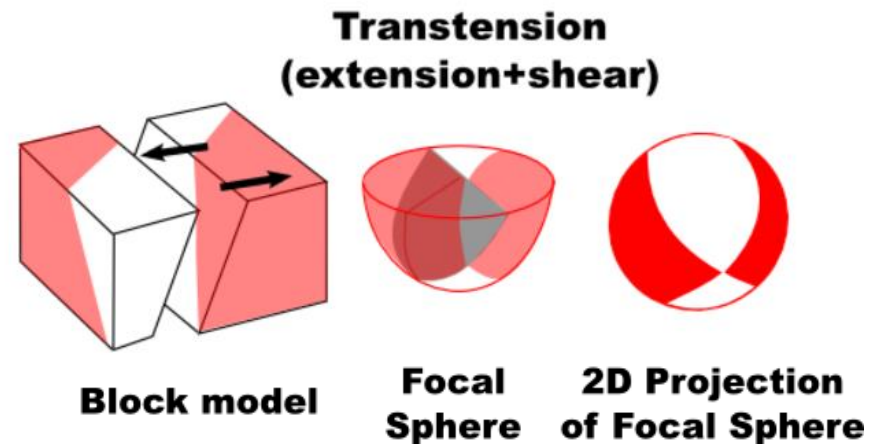


The focal mechanism is how seismologists plot the 3-D stress orientations of an earthquake. Because an earthquake occurs as slip on a fault, it generates primary (P) waves in quadrants where the first pulse is compressional (shaded) and quadrants where the first pulse is extensional (white). The orientation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

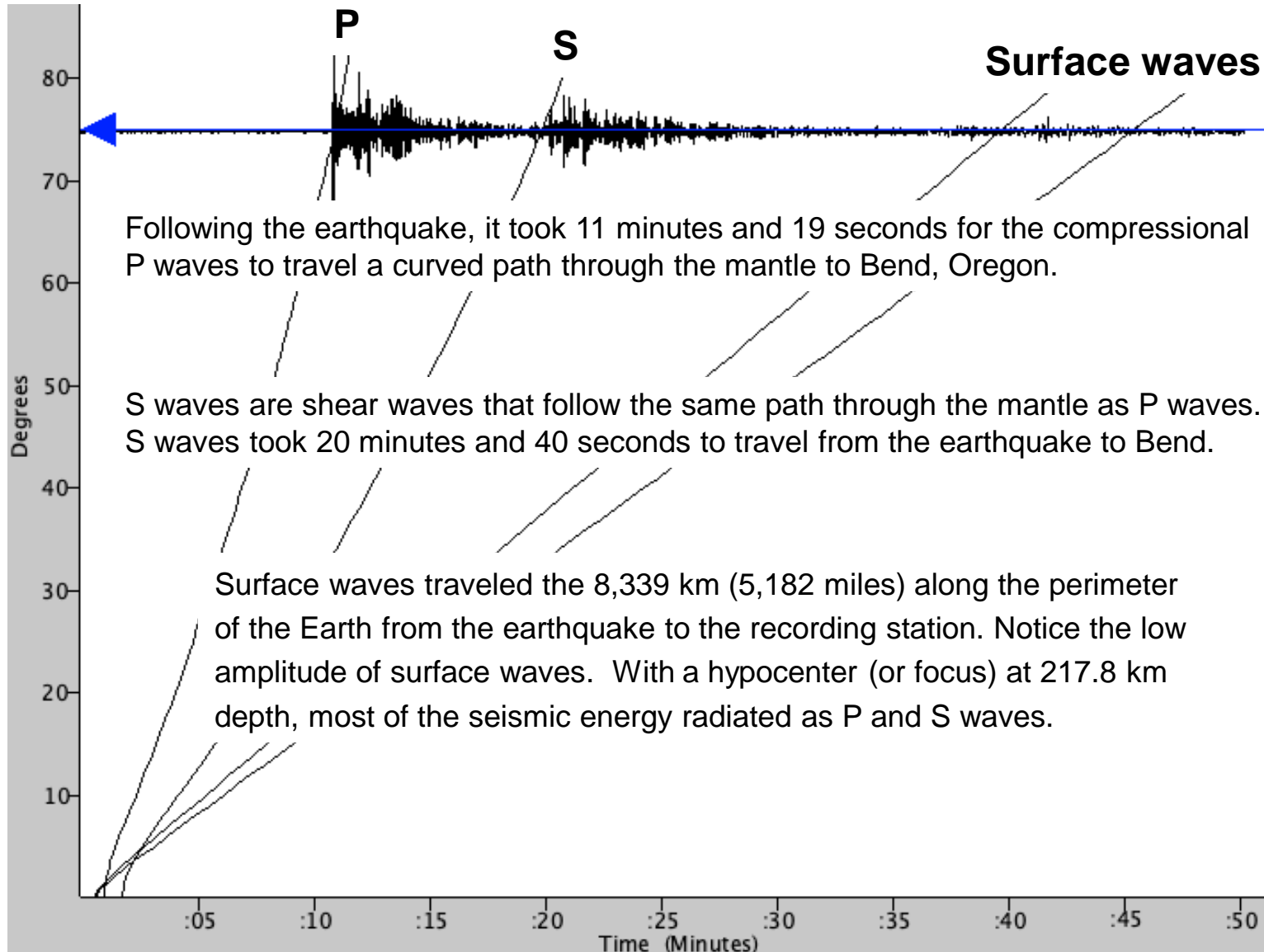


In this case, the earthquake occurred as the result of oblique faulting at an intermediate depth, approximately 220 km beneath southeastern Peru within the lithosphere of the subducted Nazca plate.

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The record of the earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 8,339 km (5,182 miles,  $75.1^\circ$ ) from the location of this earthquake.





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