Magnitude 7.2 TAJIKISTAN
Monday, December 7, 2015 at 07:50:06 UTC

A 7.2-magnitude earthquake has occurred in Tajikistan in a sparsely populated area approximately 349km (217mi) E of the capital Dushanbe. This earthquake shook buildings in cities in Afghanistan, Pakistan and India.

No injuries or damage have been reported.

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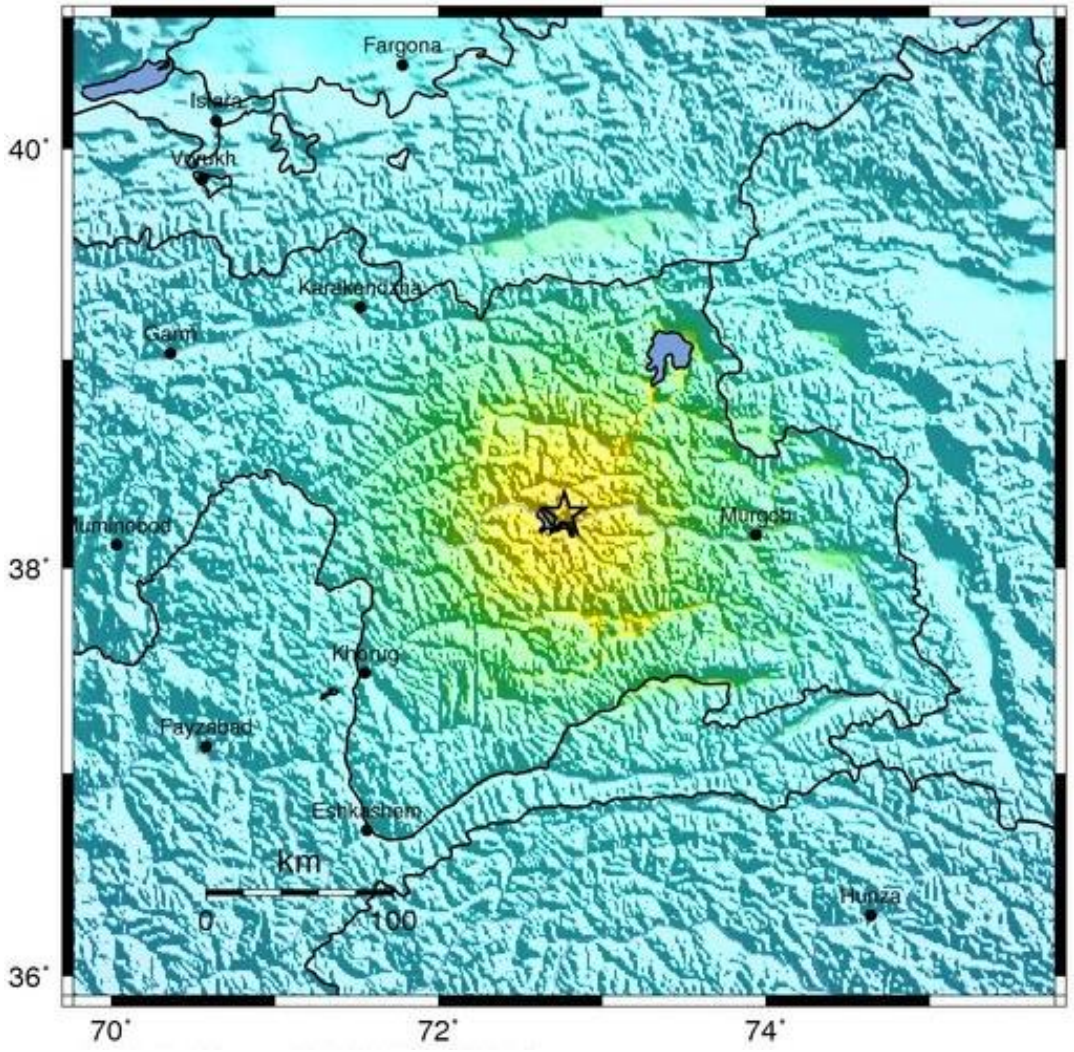
The Modified Mercalli Intensity (MMI) scale depicts shaking severity. Tajikistan experienced strong shaking in this earthquake.

Recent earthquakes in this area have caused secondary hazards such as landslides.

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 7.2 Earthquake

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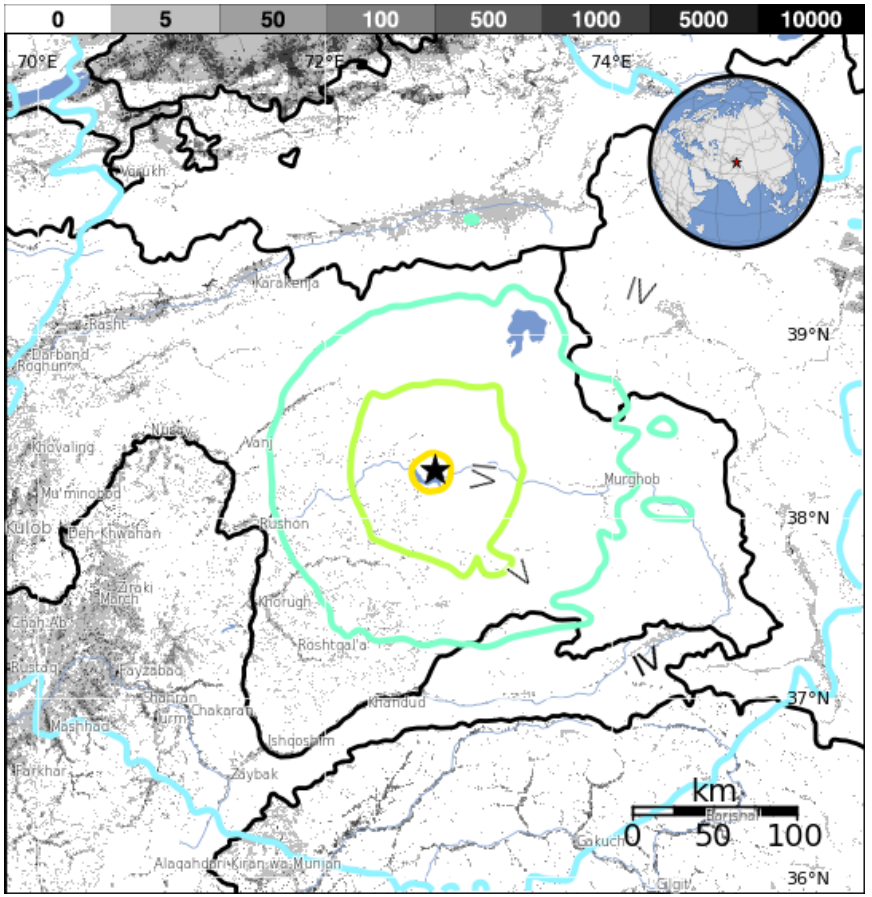
USGS PAGER
Population Exposed to Earthquake Shaking

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

5,000 people experienced strong ground shaking during this earthquake.

MMI	Shaking	Pop.
I	Not Felt	--*
II-III	Weak	591k*
IV	Light	7,614k*
V	Moderate	70k
VI	Strong	5k
VII	Very Strong	0k
VIII	Severe	0k



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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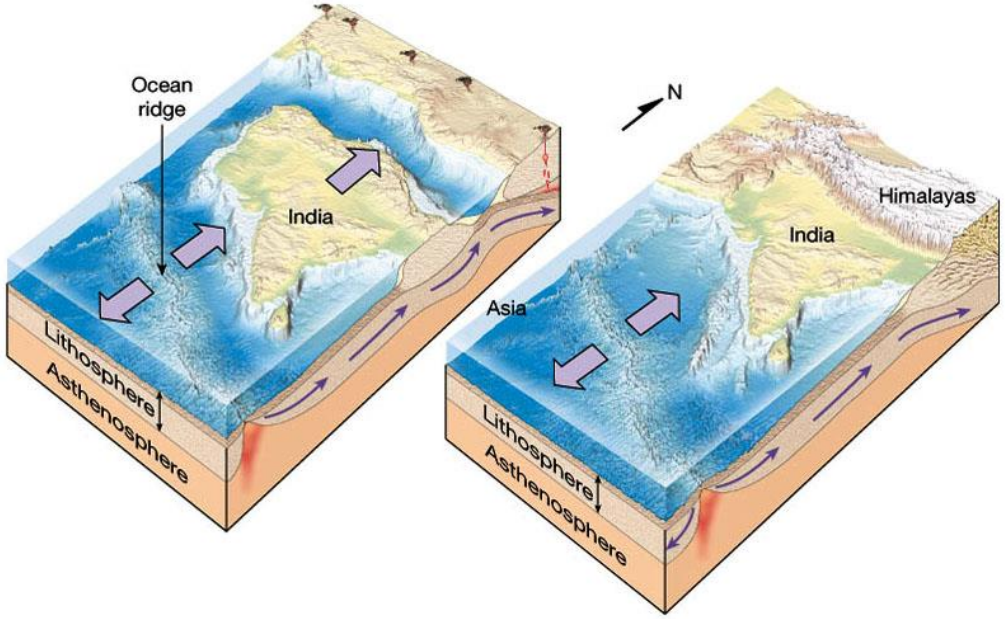
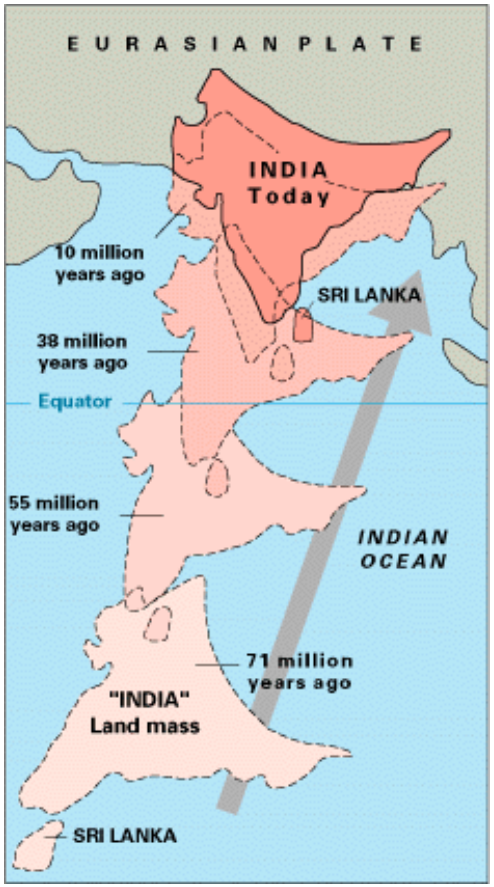
When Pangaea broke apart about 200 million years ago, India began to move northward. The Indian-Eurasian Plate boundary was an ocean-continent collision, subducting the more dense Tethyan oceanic plate beneath the more buoyant Eurasian continental plate. When India reached Asia about 40 to 50 million years ago, and essentially crashed into Asia, its northward advance slowed by about half. The collision and associated decrease in the rate of plate movement marked the beginning of the rapid uplift of the Himalayas.





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The conversion to a continental-continental boundary led to thrust faulting. The Himalayas and the Tibetan Plateau to the north have risen very rapidly due to this faulting, which accounts for their high elevation.

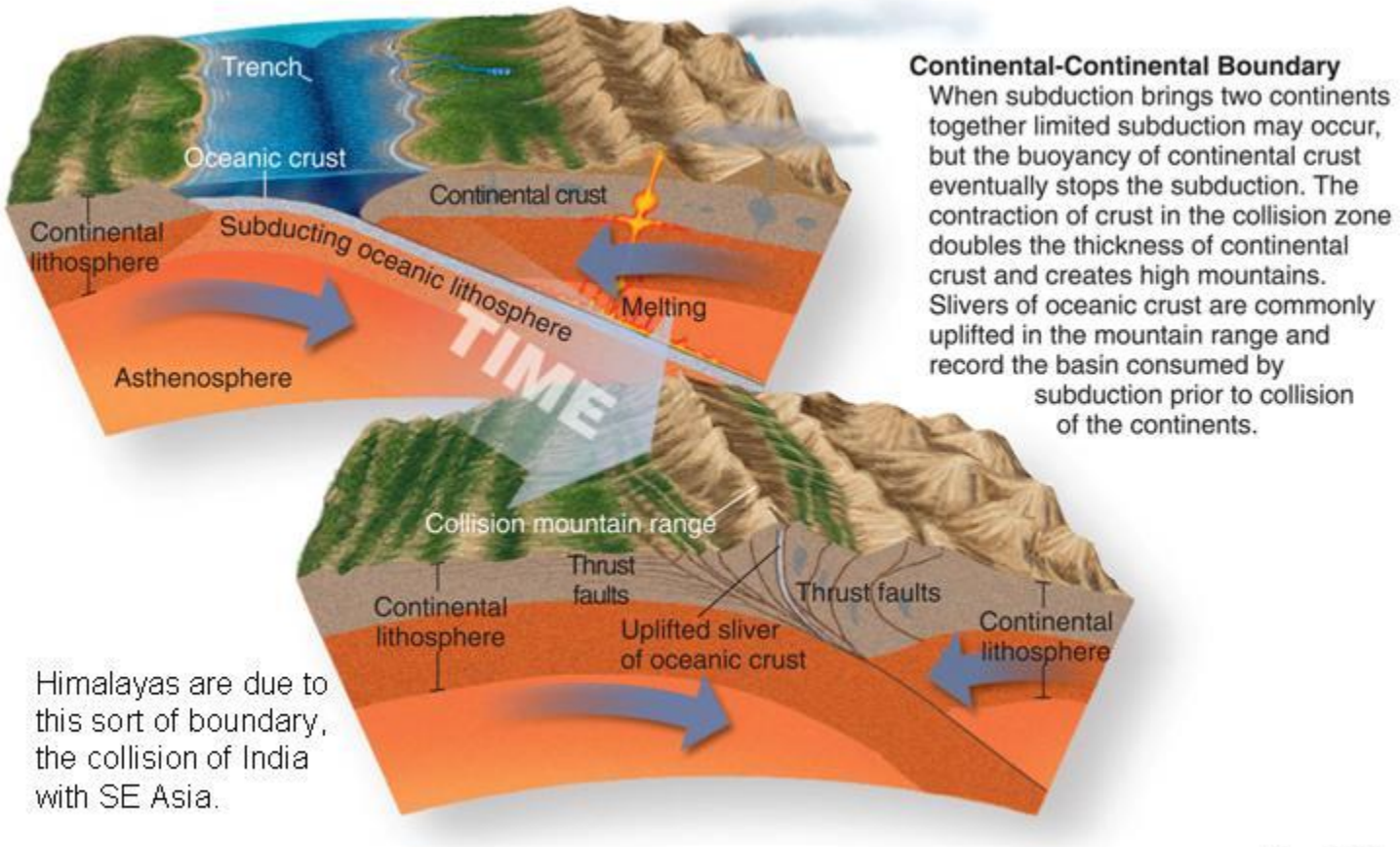

Fig 12.26

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The earthquake was located several hundred kilometers north of the Indian - Eurasian Plate boundary, in the Pamir Mountains.

At the latitude of this earthquake, the Indian Plate is moving northwards with respect to the Eurasian Plate at a rate of approximately 38 mm/yr.

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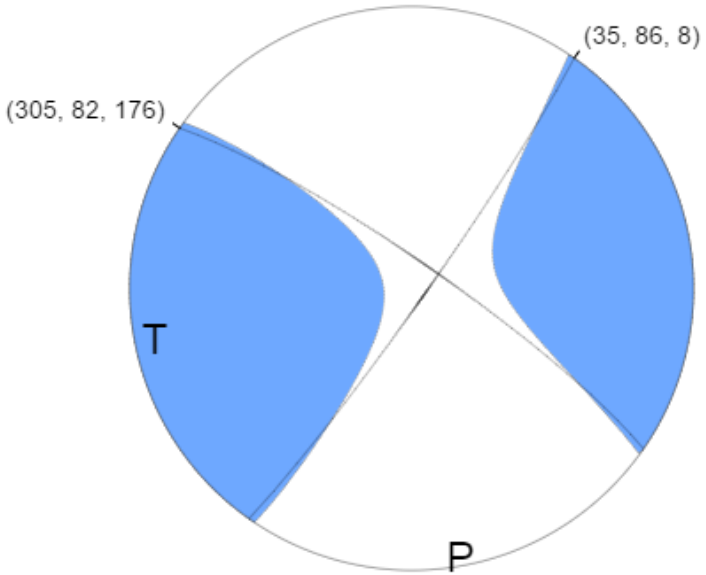
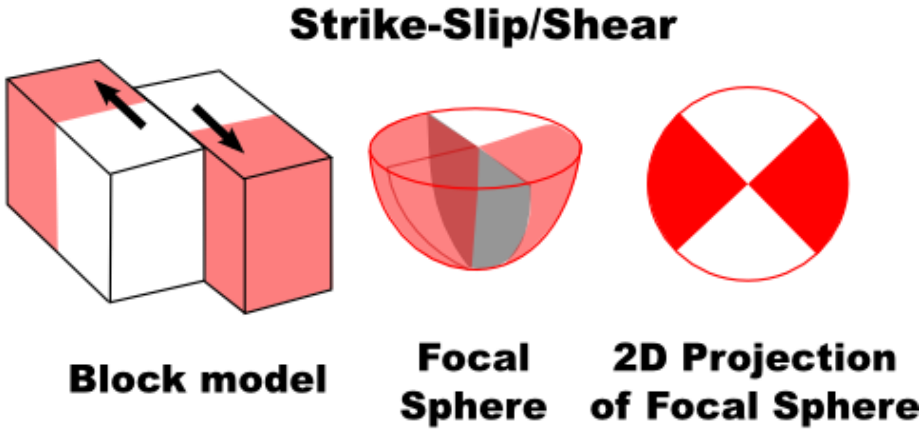
This earthquake occurred as the result of strike-slip faulting within the crust of the Eurasian Plate. Focal mechanisms indicate rupture occurred on either a northwest-southeast striking right-lateral fault, or on a southwest-northeast striking left-lateral fault.





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.

Centroid Moment Tensor Solution

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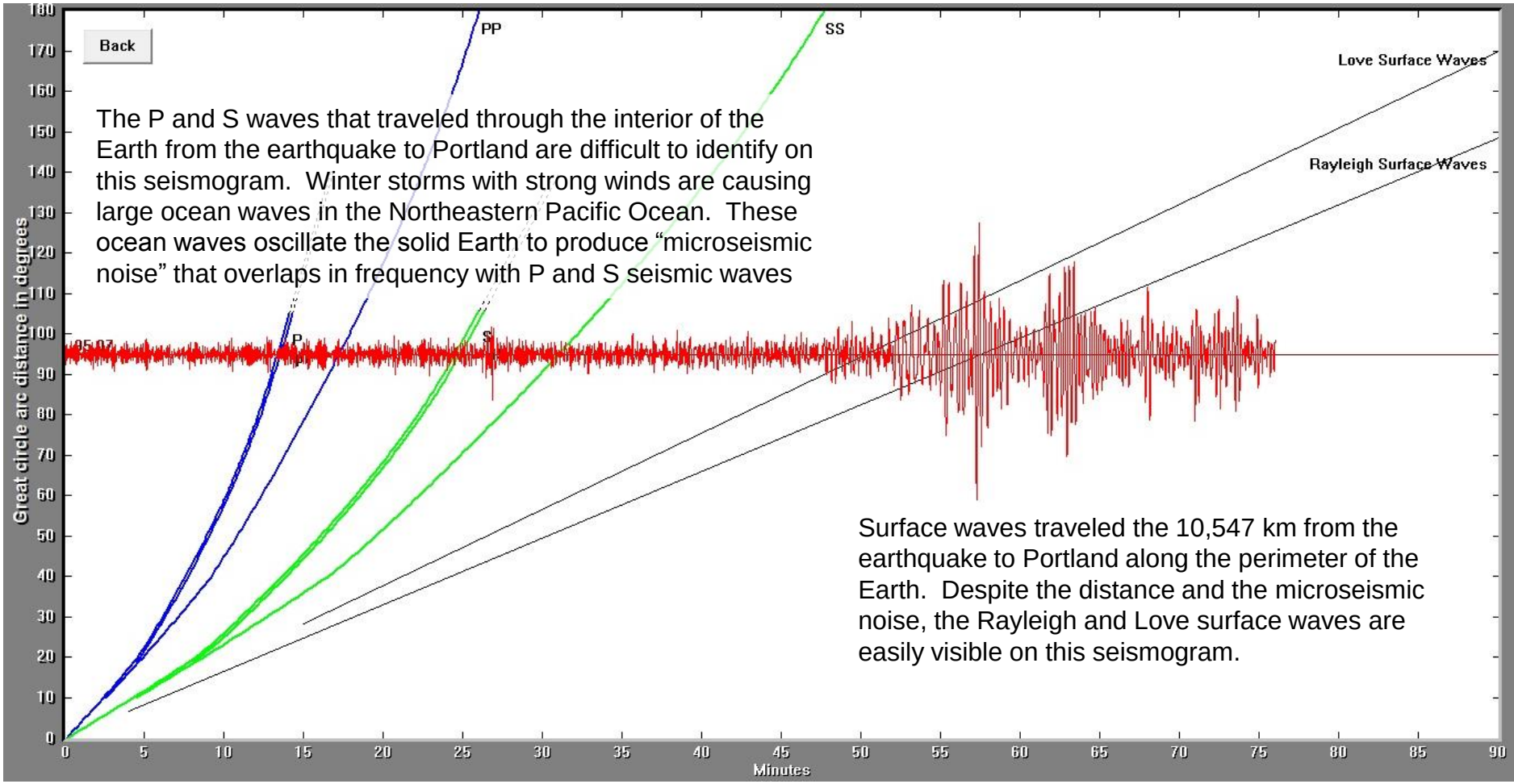
The record of the earthquake on the University of Portland seismometer (UPOR) is illustrated below. Portland is 10,547 km (6,553 miles, 95.0˚) from the location of this earthquake.



The P and S waves that traveled through the interior of the Earth from the earthquake to Portland are difficult to identify on this seismogram. Winter storms with strong winds are causing large ocean waves in the Northeastern Pacific Ocean. These ocean waves oscillate the solid Earth to produce “microseismic noise” that overlaps in frequency with P and S seismic waves

Surface waves traveled the 10,547 km from the earthquake to Portland along the perimeter of the Earth. Despite the distance and the microseismic noise, the Rayleigh and Love surface waves are easily visible on this seismogram.

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