Magnitude 7.2 PAPUA NEW GUINEA
Monday, May 6, 2019 at 21:19:35 UTC

A magnitude 7.2 earthquake occurred 33km NW of Bulolo, Papua New Guinea at a depth of 126.9 km (78.8 miles).

There are no immediate reports of damage.

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

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 7.2 Earthquake

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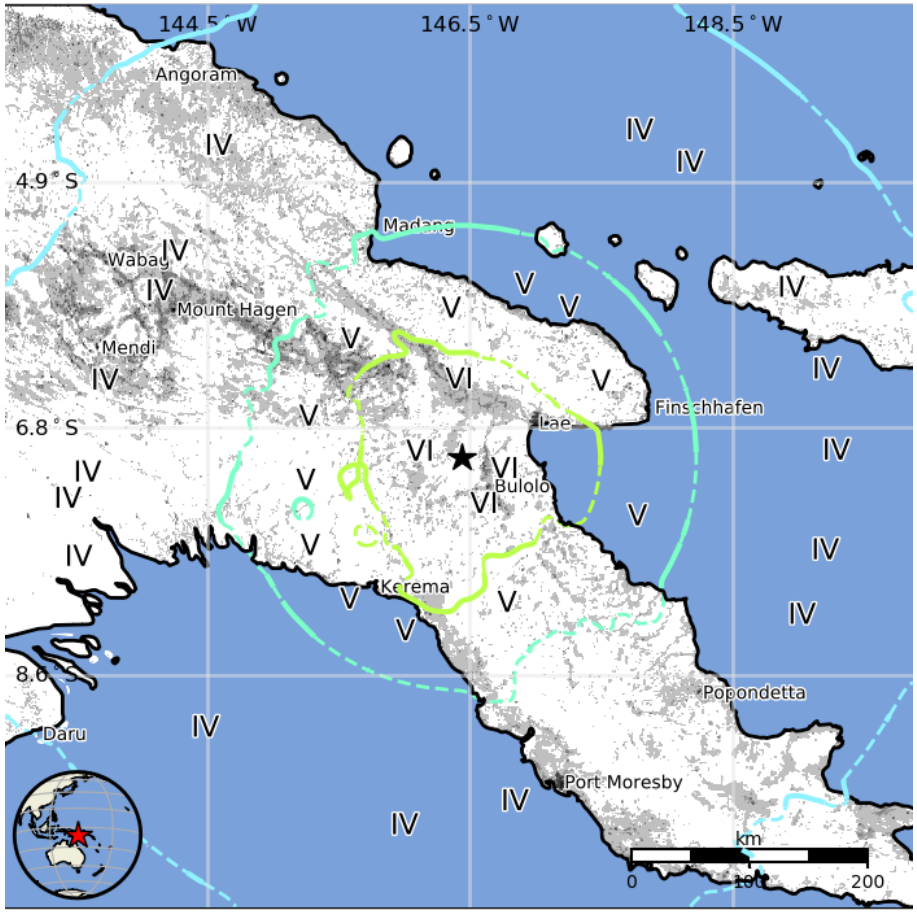
USGS PAGER
Population Exposed to Earthquake Shaking

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

761,000 people were exposed to strong shaking from this earthquake.

MMI	Shaking	Population
I	Not Felt	0 k*
II-III	Weak	372 k*
IV	Light	3,251 k
V	Moderate	913 k
VI	Strong	761 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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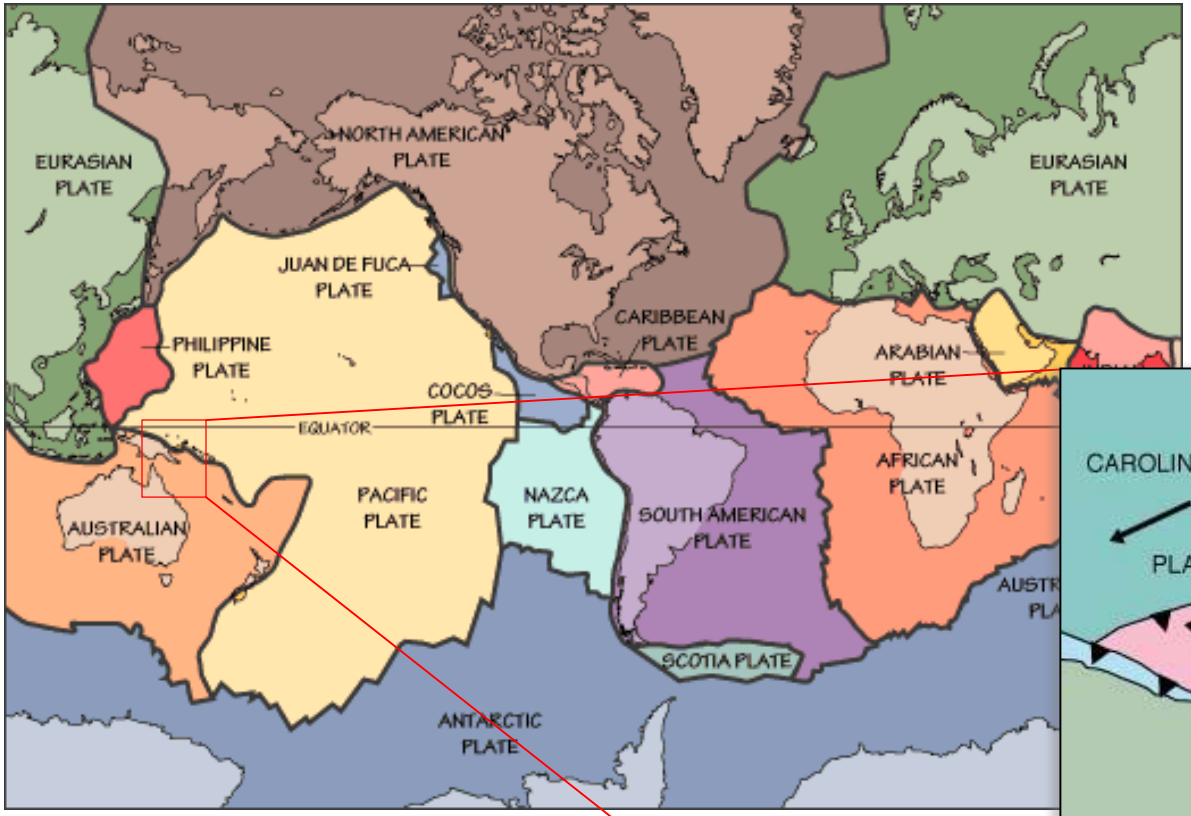
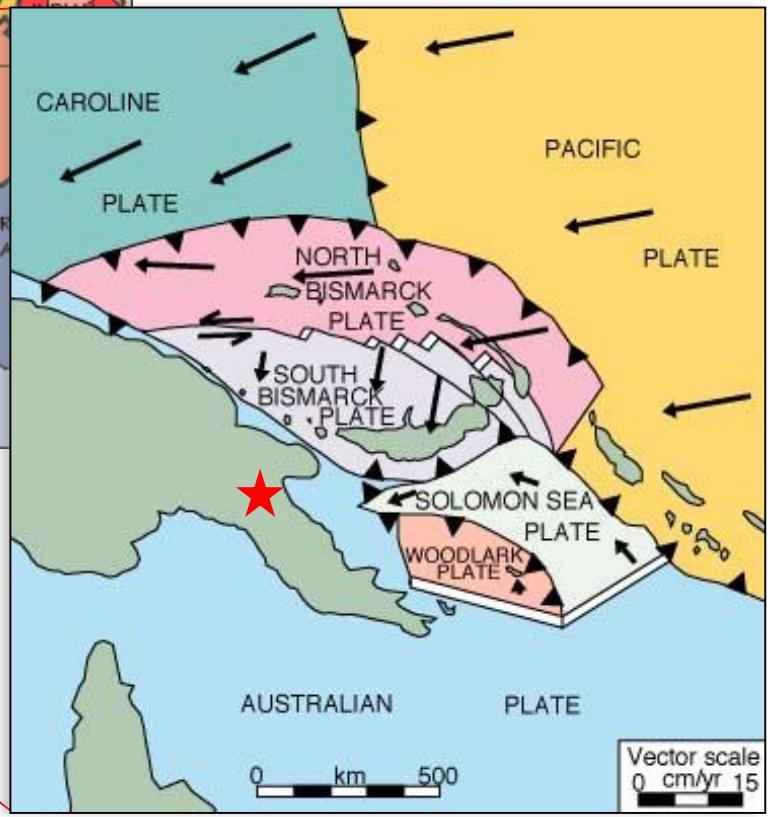
Across and east of Papua New Guinea, the Australian Plate is broken into microplates that accommodate its convergence with and subduction beneath the Pacific Plate. Arrows on the map below show motions relative to the Australian Plate. The red star shows the location of the May 6th earthquake.





The Pacific Plate converges rapidly with the Australian Plate. Earthquakes in this region are generally associated with the large-scale convergence of these two major plates and with complex interactions of the associated microplates. From its location and the depth of 126.9 km (78.8 miles), this intermediate depth earthquake likely occurred within the Australian Plate as it subducts beneath the Pacific Plate.

Image courtesy OSU; simplified from Hamilton (1979)

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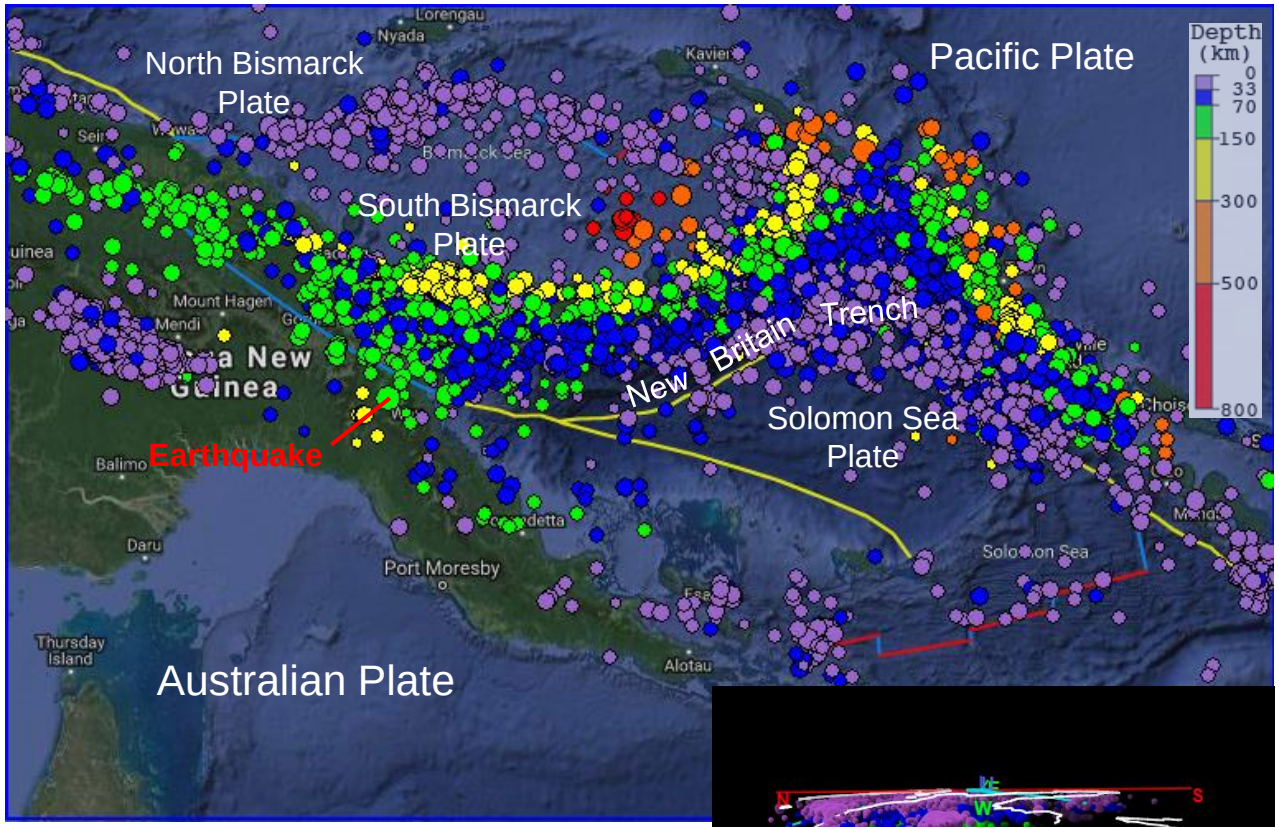
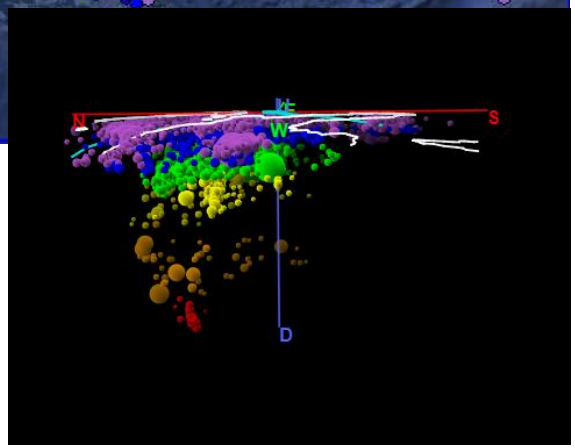
This seismicity map covers the same region as the microplate tectonic map of the previous slide. Locations of the 5000 most recent earthquakes are shown.

The Solomon Sea (micro)Plate subducts beneath the Pacific Plate at the New Britain Trench. That subduction zone continues onto and beneath the Papuan Peninsula where the May 6, 2019 earthquake occurred at a depth of 126.9 km (78.8 miles). Given the normal-faulting mechanism shown in the next slide, it is likely this earthquake resulted from bending of the Australian Plate as it descends beneath the Pacific Plate.





Above: Map created with the IRIS Earthquake Browser

Right: a 3D view from the west, looking East along the New Britain Trench.

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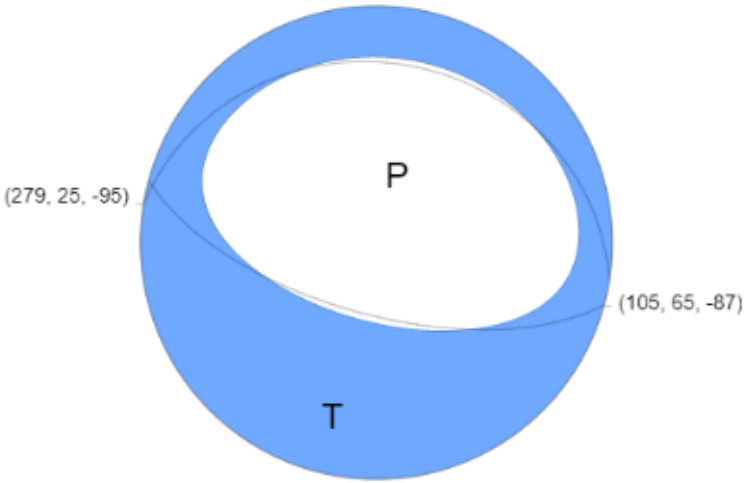
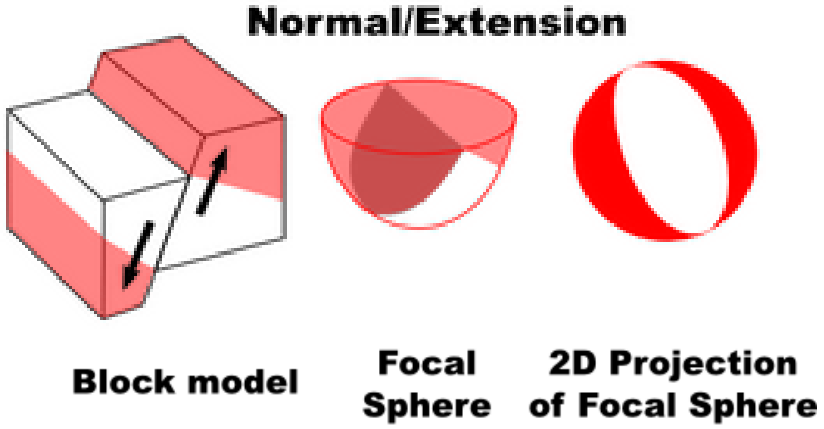
The focal mechanism is how seismologists plot the 3-D stress orientations of an earthquake. Because an earthquake occurs as slip on a fault, it generates primary waves in quadrants where the first pulse is compressional (shaded) and quadrants where the first pulse is extensional (white). The orientation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

This earthquake occurred as a result of normal faulting at an intermediate depth, approximately 127 km beneath eastern Papua New Guinea, near the northern edge of the Australian Plate.



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.

Images courtesy of the U.S. Geological Survey

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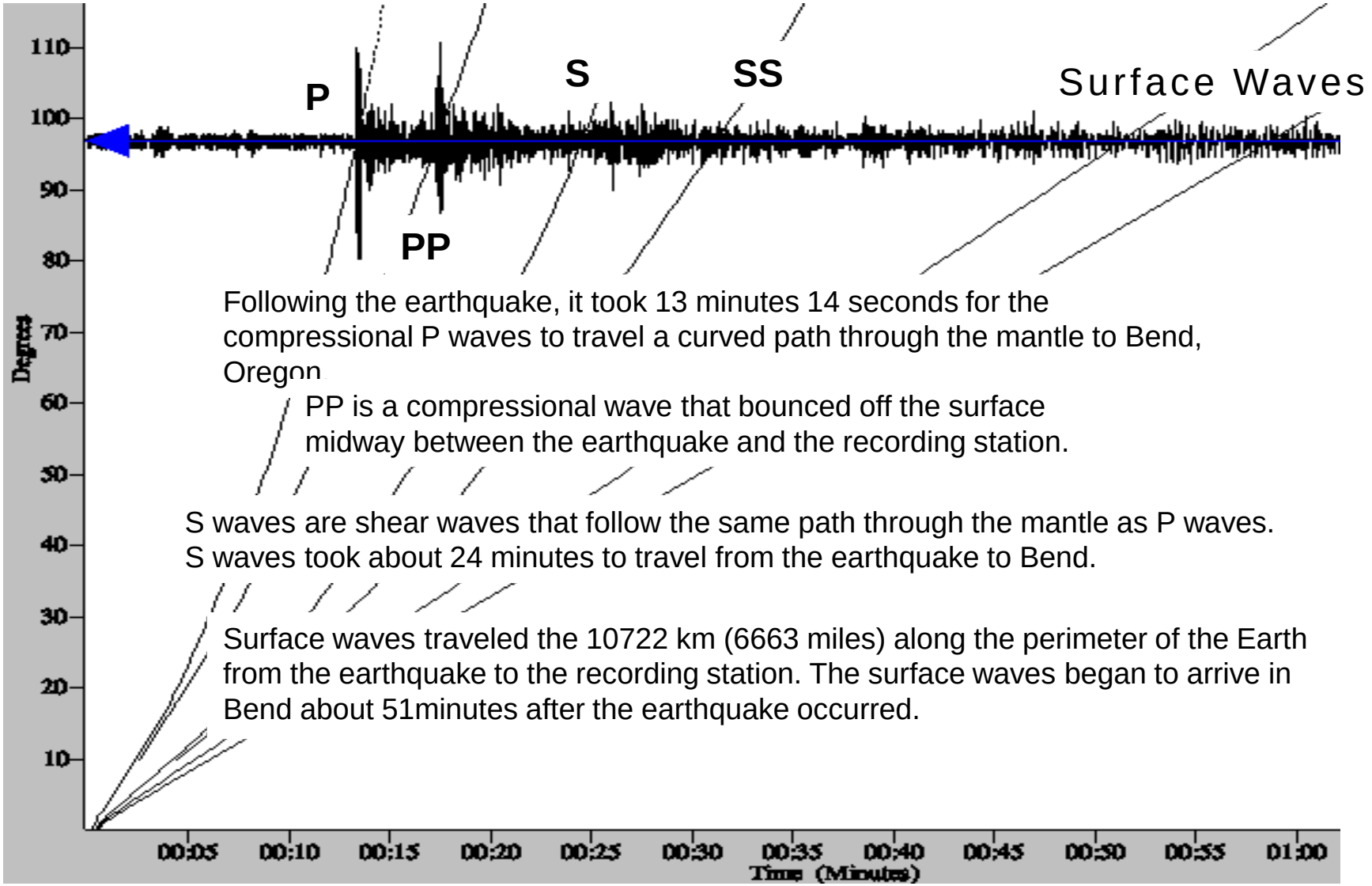
The record of the earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 10722 km (6663 miles, 96.6˚) from the location of this earthquake.



Following the earthquake, it took 13 minutes 14 seconds for the compressional P waves to travel a curved path through the mantle to Bend, Oregon.

PP is a compressional wave that bounced off the surface midway between the earthquake and the recording station.

S waves are shear waves that follow the same path through the mantle as P waves. S waves took about 24 minutes to travel from the earthquake to Bend.

Surface waves traveled the 10722 km (6663 miles) along the perimeter of the Earth from the earthquake to the recording station. The surface waves began to arrive in Bend about 51minutes after the earthquake occurred.

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