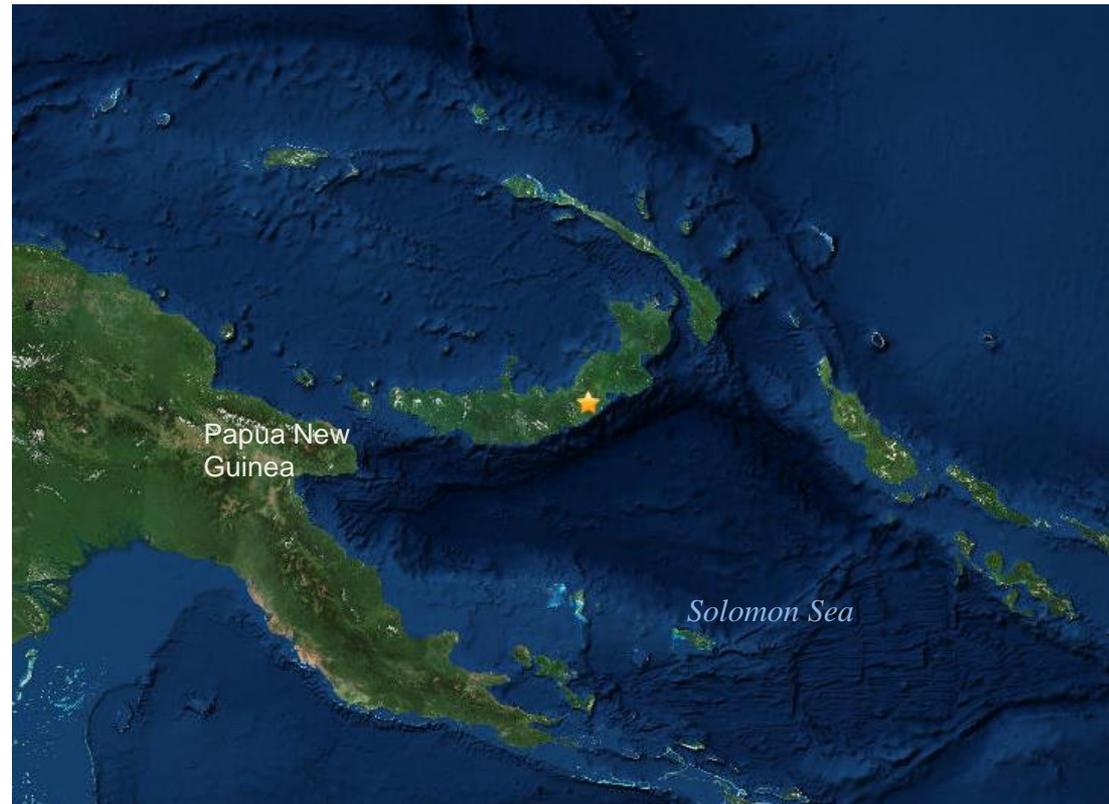


Magnitude 7.0 PAPUA NEW GUINEA

Wednesday, October 10, 2018 at 20:48:20 UTC

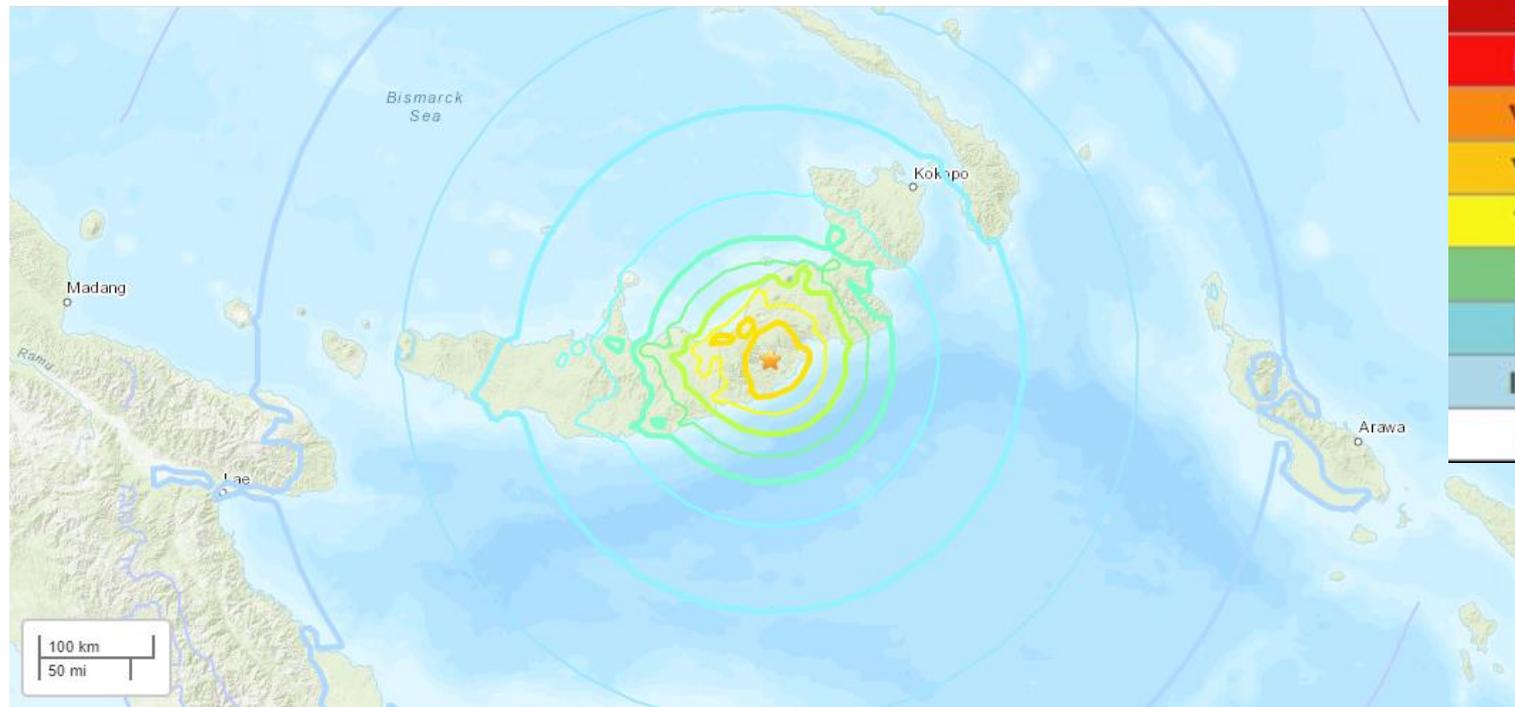
A magnitude 7.0 earthquake occurred 117km east of Kimbe, Papua New Guinea at a depth of 40.3 km (25 miles).

There are no immediate reports of damage.



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 very strong shaking from this earthquake.



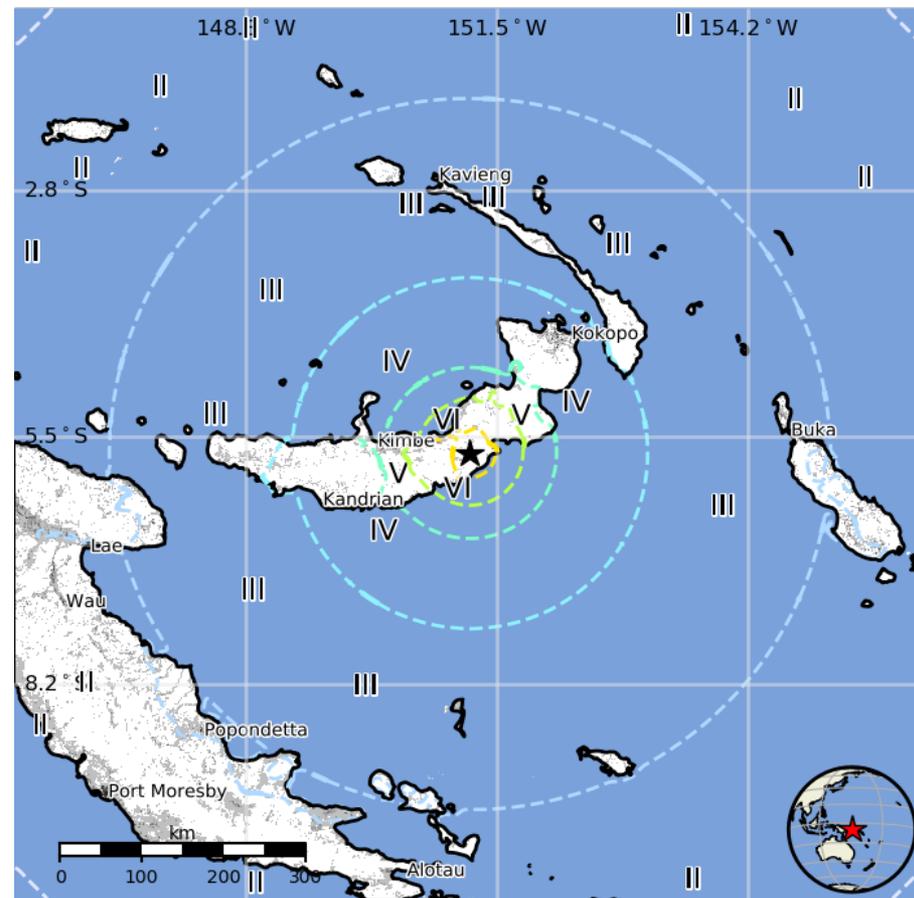
MMI	Perceived Shaking
X	Extreme
IX	Violent
VIII	Severe
VII	Very Strong
VI	Strong
V	Moderate
IV	Light
III-II	Weak
I	Not Felt

USGS Estimated shaking Intensity from M 7.0 Earthquake

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

14,000 people were exposed to very strong shaking from this earthquake.

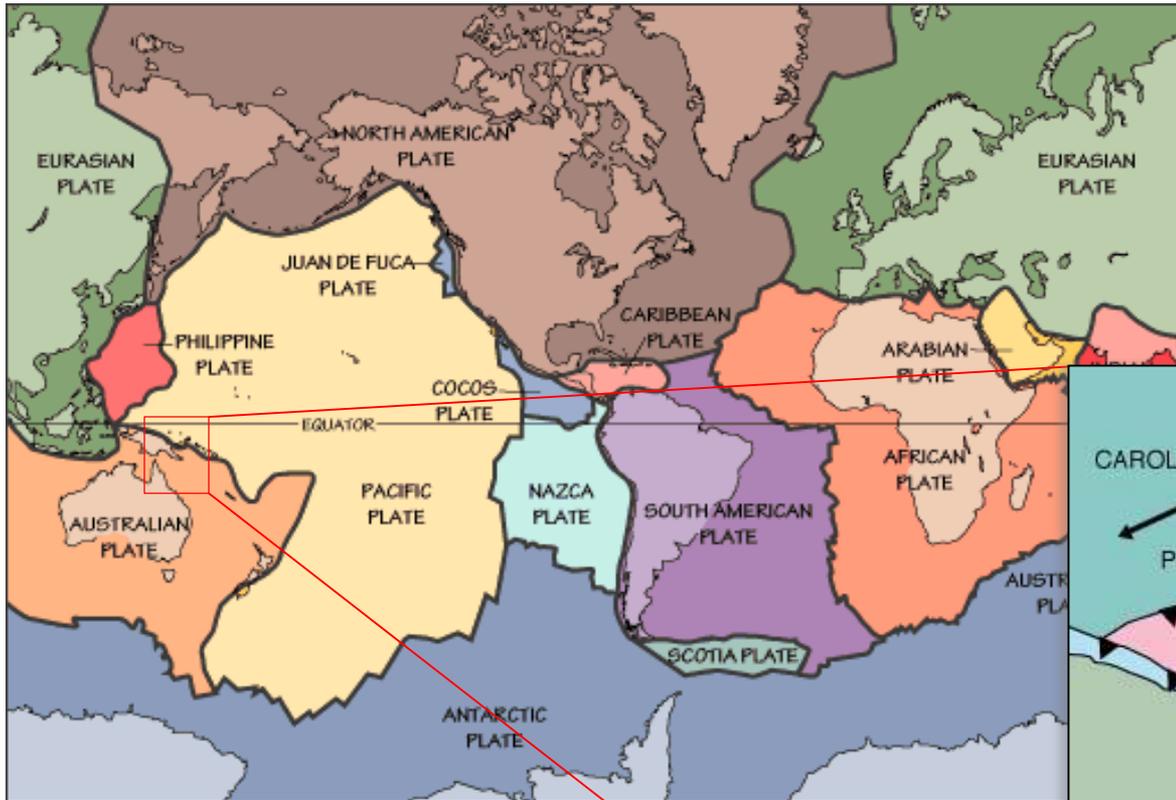
MMI	Shaking	Population
I	Not Felt	0 k*
II-III	Weak	2,084 k*
IV	Light	352 k
V	Moderate	73 k
VI	Strong	40 k
VII	Very Strong	14 k
VIII	Severe	0 k
IX	Violent	0 k
X	Extreme	0 k



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.

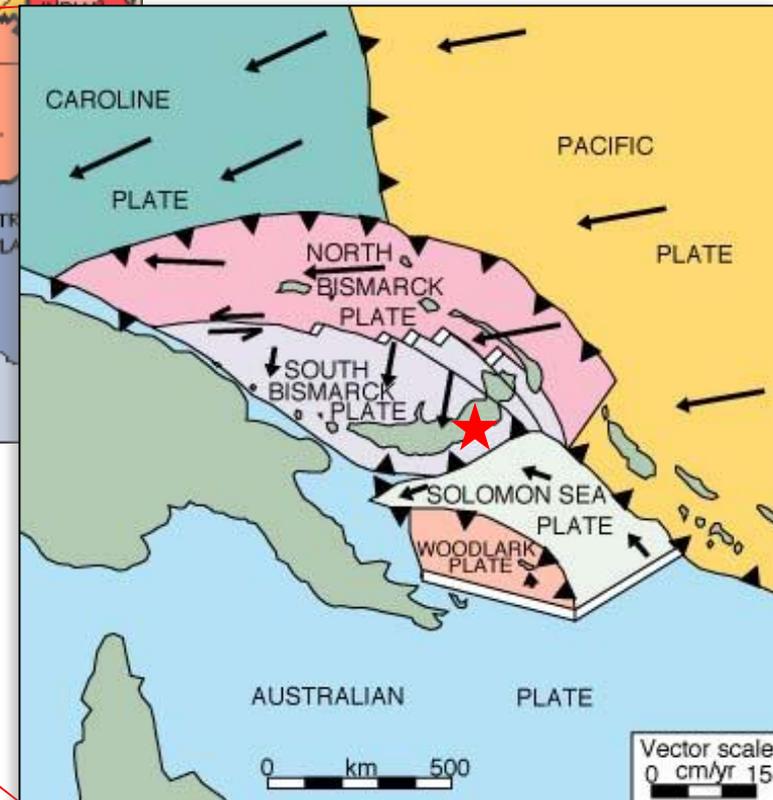
Magnitude 7.0 PAPUA NEW GUINEA

Wednesday, October 10, 2018 at 20:48:20 UTC



The NE part of the Australian Plate is broken into microplates that accommodate its convergence with the Pacific Plate. Arrows on the map below show motions relative to the Australian Plate. The red star shows the location of the October 10 earthquake.

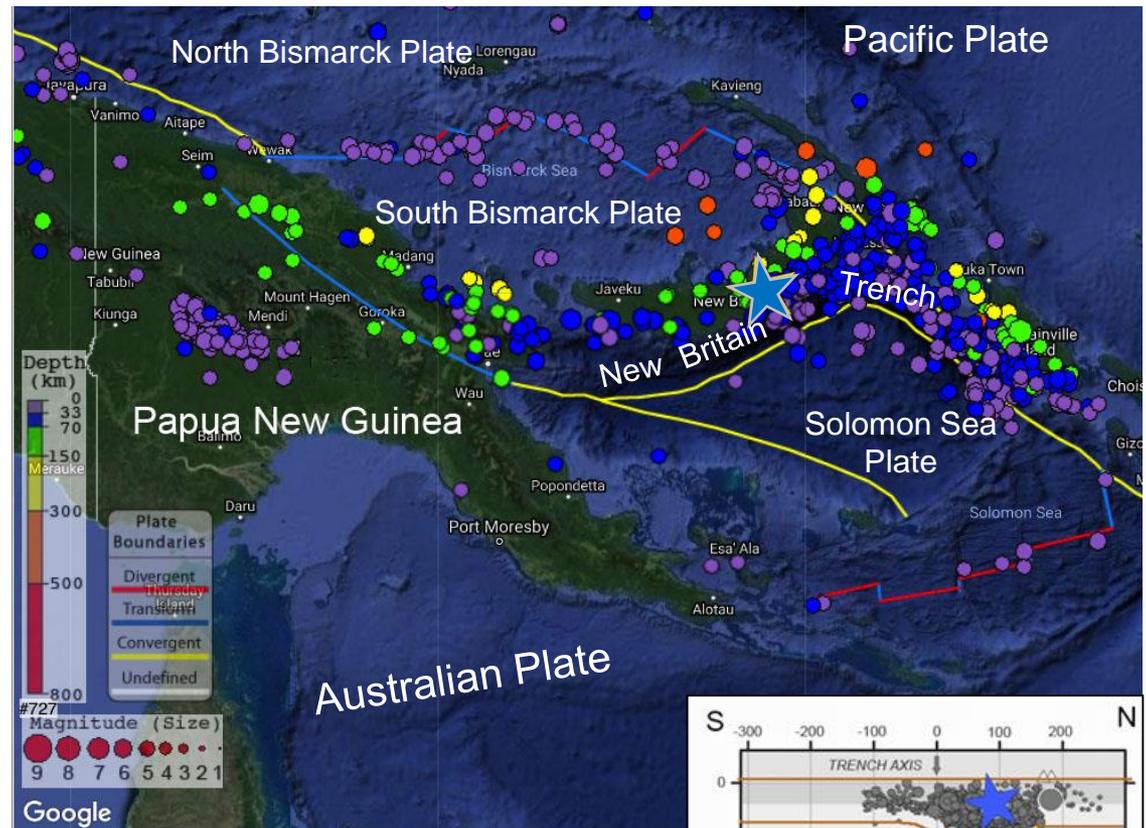
The Pacific Plate converges rapidly with the Australian Plate. Earthquakes in this region are generally associated with the large-scale convergence of these two major plates and with complex interactions of the associated microplates. From its location and the depth of 40 km (25 miles), this earthquake likely occurred in the subduction zone between the South Bismarck and Solomon Sea Plates that meet in the New Britain Trench.



This seismicity map covers the same region as the microplate tectonic map of the previous slide.

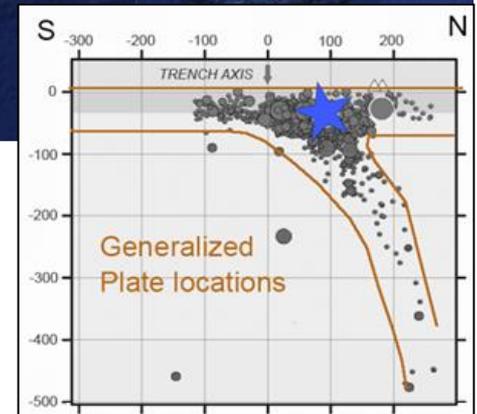
Locations of 1000 earthquakes of magnitude (M) ≥ 5 for the past 5 years are shown.

Earthquake depths increase from the southwest to northeast across the New Britain Trench where the Solomon Sea microplate subducts steeply to 500 km depth beneath the much larger Pacific Plate.



Above: Map created with the IRIS Earthquake Browser

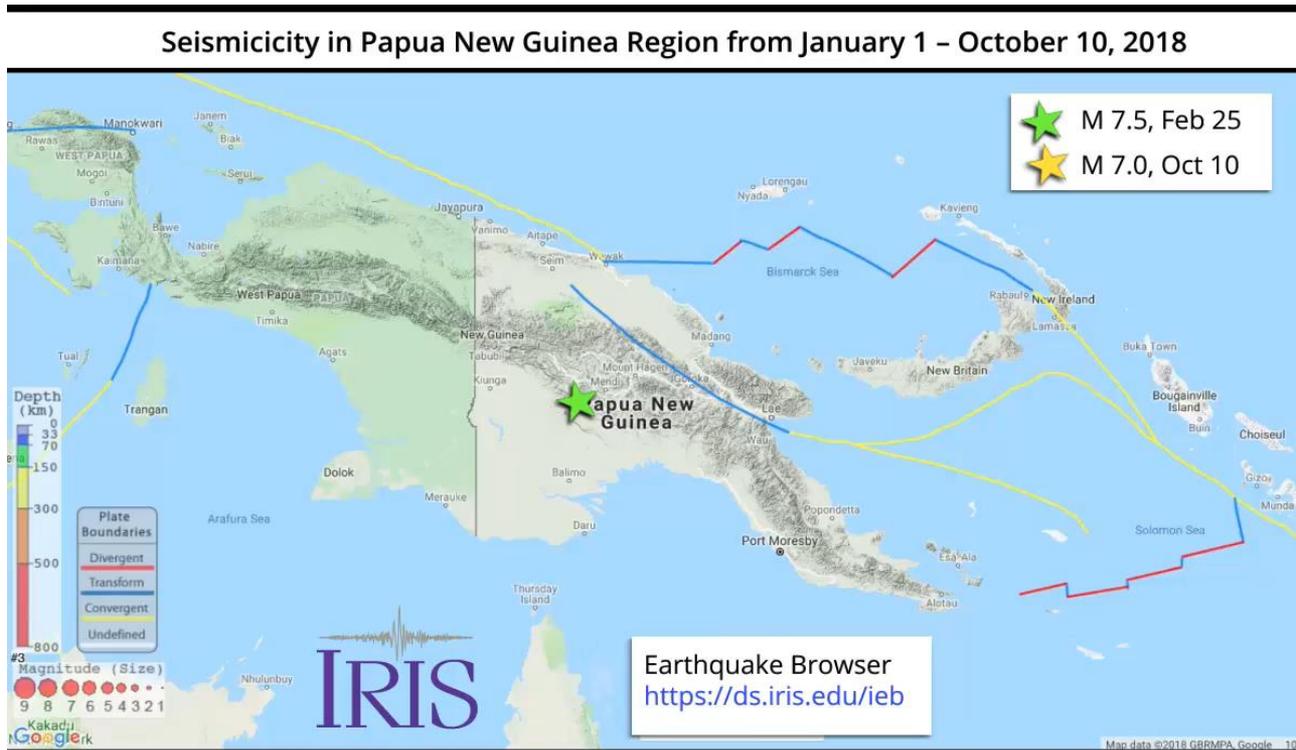
Right: a NNE trending cross section across the New Britain Trench.



Magnitude 7.0 PAPUA NEW GUINEA

Wednesday, October 10, 2018 at 20:48:20 UTC

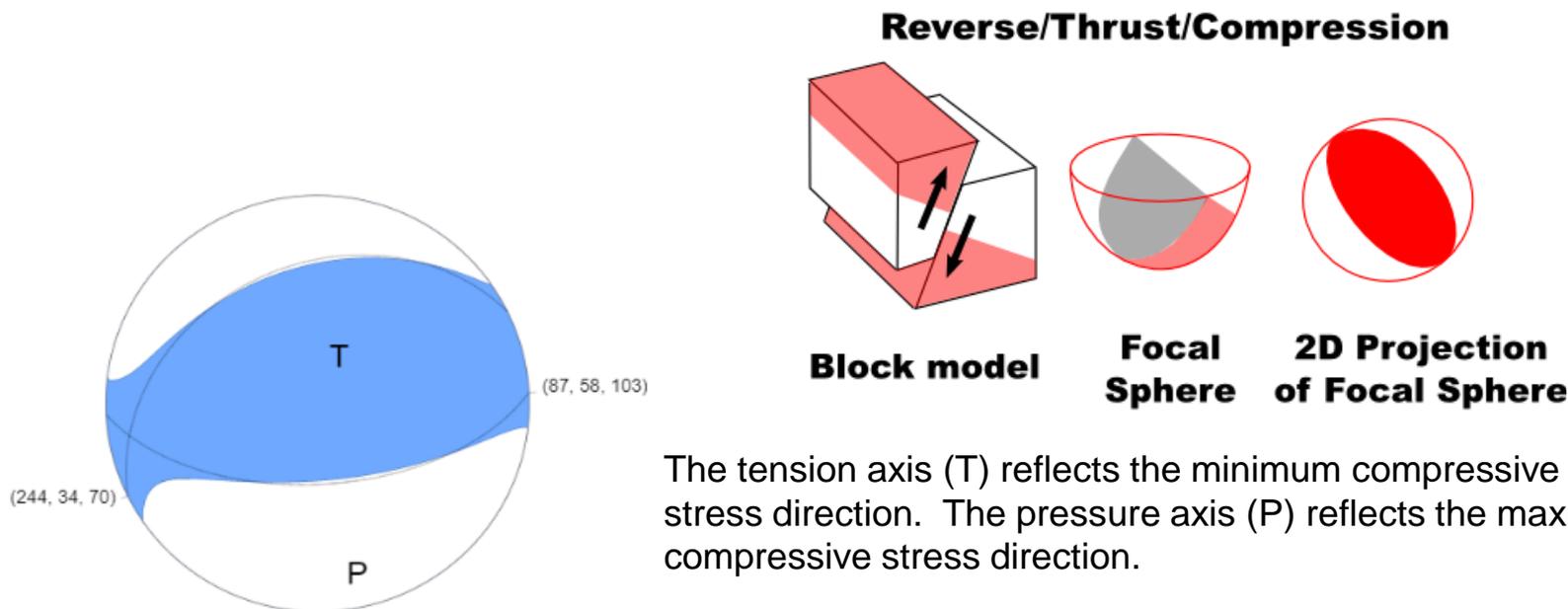
This animation of regional seismicity over last 10 months includes both a M7.5 that occurred in February 2018 and the October 2018 M7.0.



Animation created with the IRIS Earthquake Browser

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 likely occurred in the subduction zone between the South Bismarck and Solomon Sea Plates that meet in the New Britain Trench.



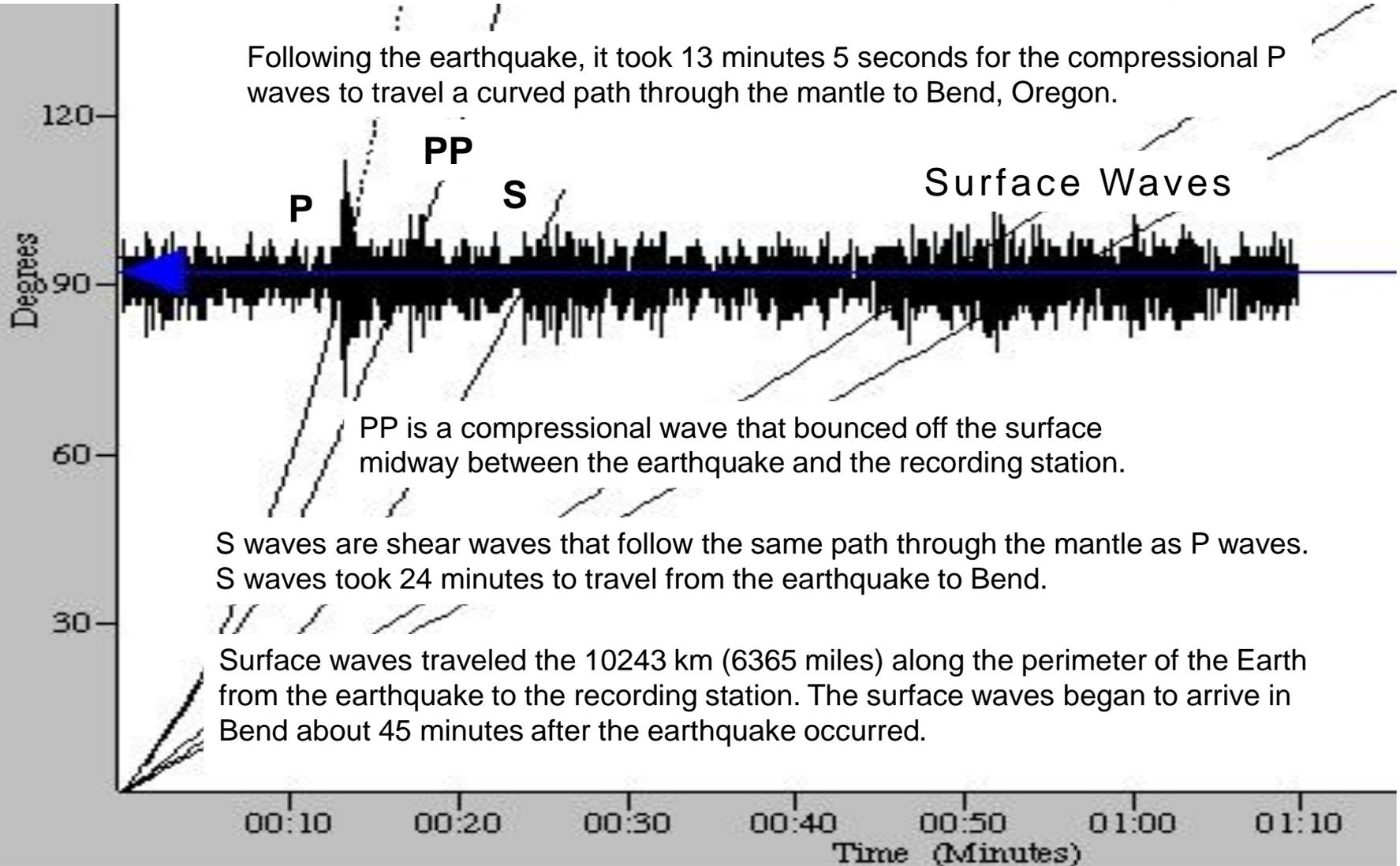
W-phase Moment Tensor Solution

Magnitude 7.0 PAPUA NEW GUINEA

Wednesday, October 10, 2018 at 20:48:20 UTC

The record of the earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 10243 km (6365 miles, 92.3°) from the location of this earthquake.

Following the earthquake, it took 13 minutes 5 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 24 minutes to travel from the earthquake to Bend.

Surface waves traveled the 10243 km (6365 miles) along the perimeter of the Earth from the earthquake to the recording station. The surface waves began to arrive in Bend about 45 minutes after the earthquake occurred.

Teachable Moments are a service of

The Incorporated Research Institutions for Seismology
Education & Public Outreach
and
The University of Portland

Please send feedback to tkb@iris.edu

To receive automatic notifications of new Teachable Moments
subscribe at www.iris.edu/hq/retm



www.iris.edu/earthquake

