

Magnitude 7.6 PAPUA NEW GUINEA

Saturday, September 10, 2022 at 23:46:57 UTC

A magnitude 7.6 earthquake occurred 67 km (41.6 miles) E of Kainantu, Papua New Guinea at a depth of 90 km (55.9 miles).

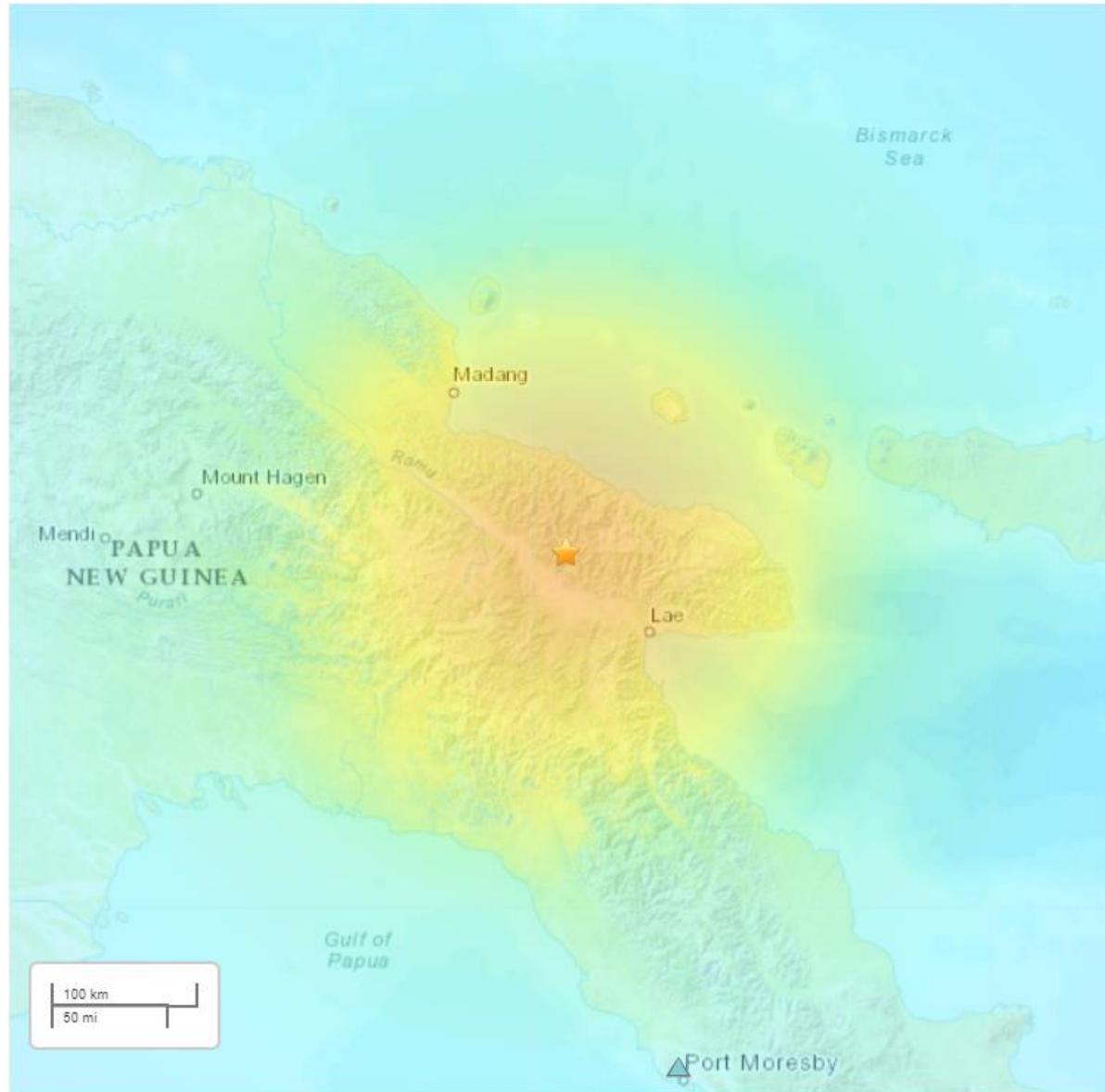
There are no immediate reports of casualties or significant damage.



The Modified-Mercalli Intensity (MMI) scale is a ten-stage scale, from I to X, that indicates the severity of ground shaking. Intensity is based on observed effects and is variable over the area affected by an earthquake. Intensity is dependent on earthquake size, depth, distance, and local conditions.

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 7.6 Earthquake

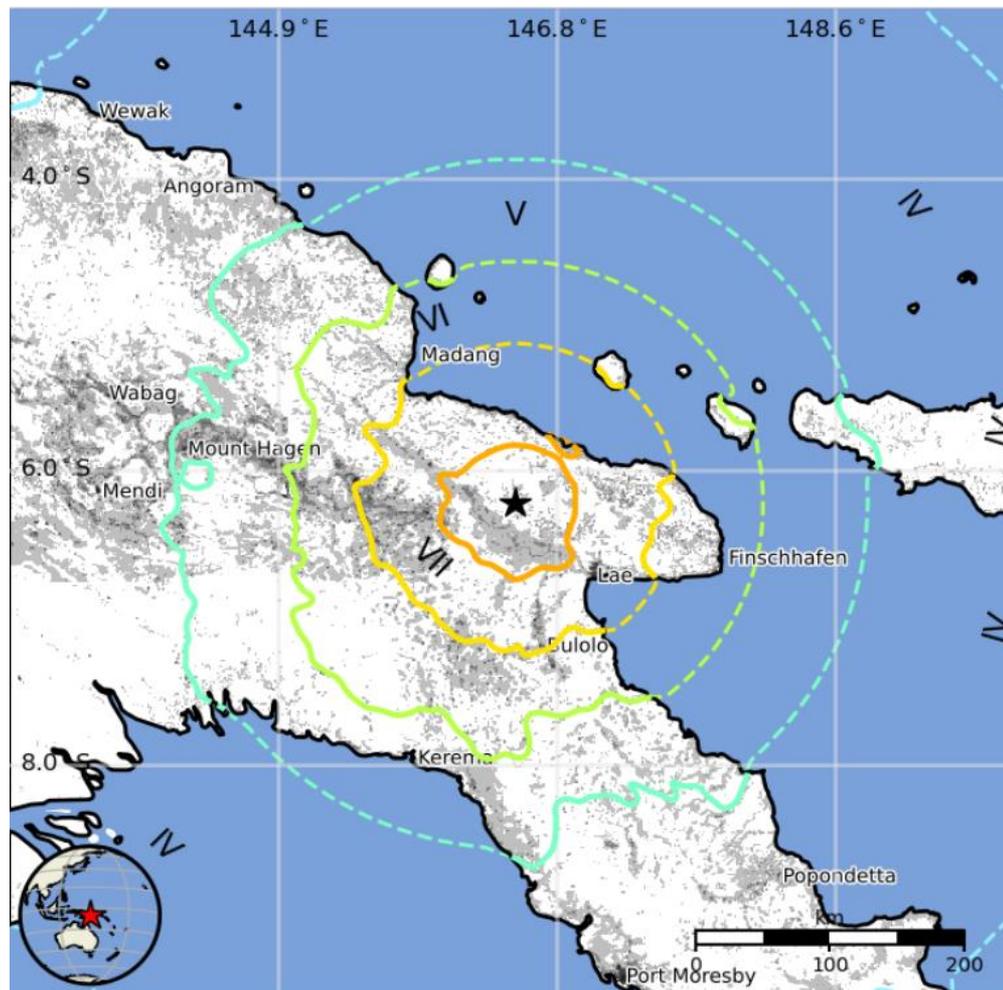
Magnitude 7.6 PAPUA NEW GUINEA

Saturday, September 10, 2022 at 23:46:57 UTC

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

The USGS estimates that 180,000 people felt severe shaking from this earthquake.

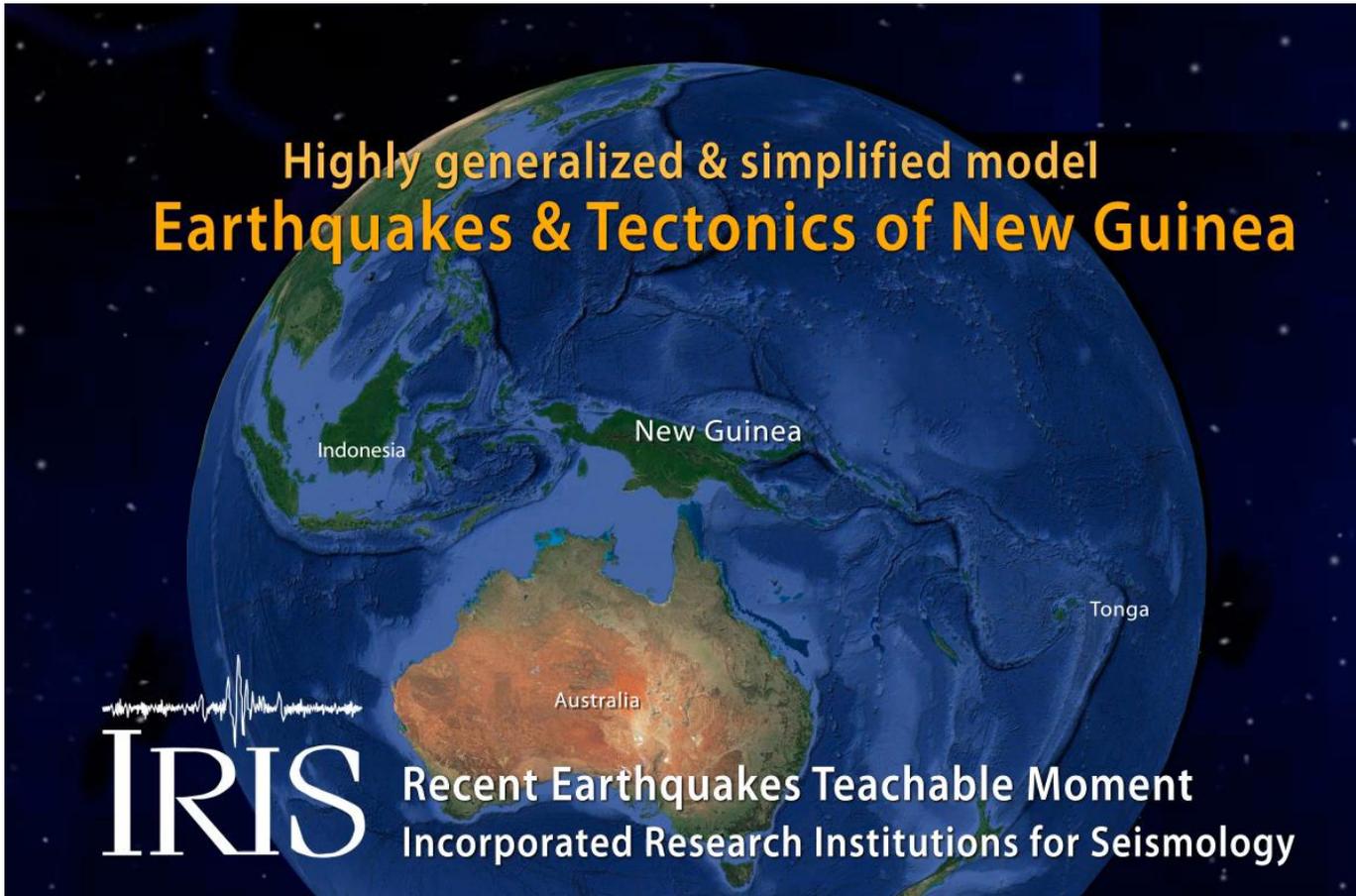
I	Not Felt	0 k*
II-III	Weak	5 k*
IV	Light	2,113 k*
V	Moderate	1,227 k
VI	Strong	824 k
VII	Very Strong	839 k
VIII	Severe	180 k
IX	Violent	0 k
X	Extreme	0 k



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

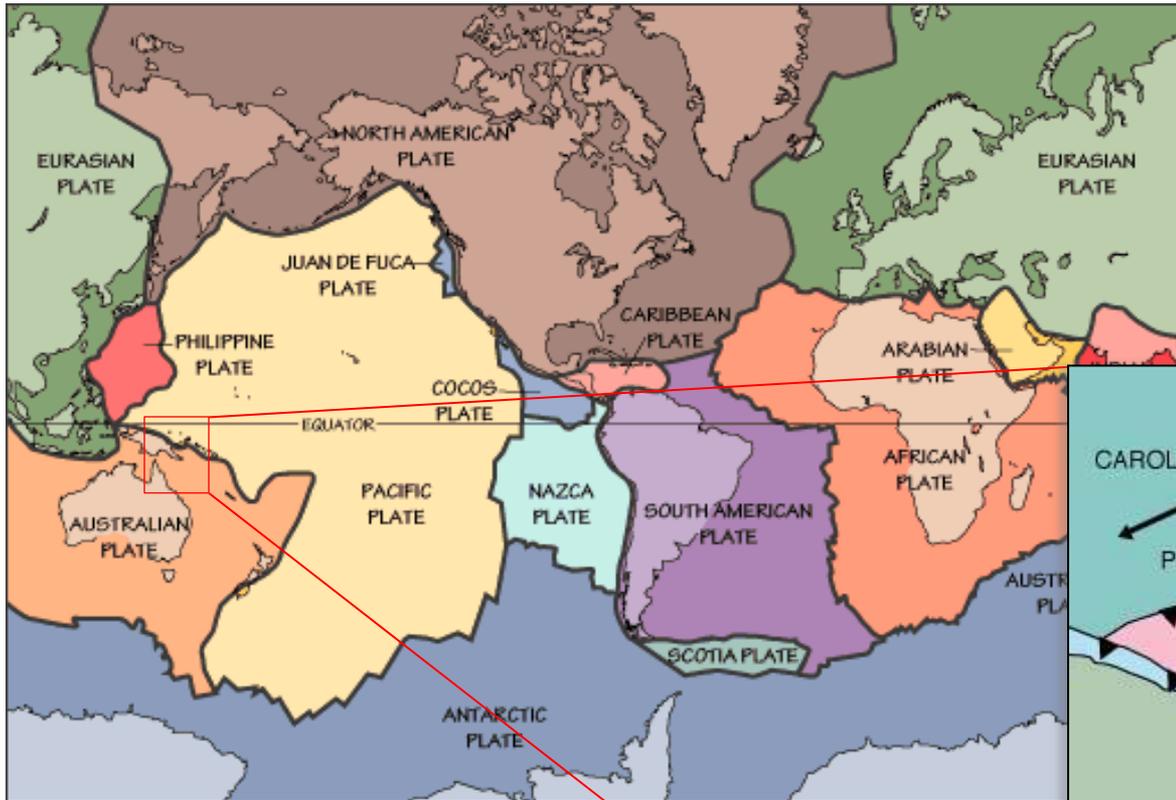
The New Guinea region marks the boundary between the major, rapidly converging Australian and Pacific Plates. It is one of the most complicated tectonic settings, due to the oblique convergence of the Australian Plate as it dives beneath the Pacific Plate.



Animation exploring plate tectonics and earthquakes of the Australian – Pacific Plate boundary region.

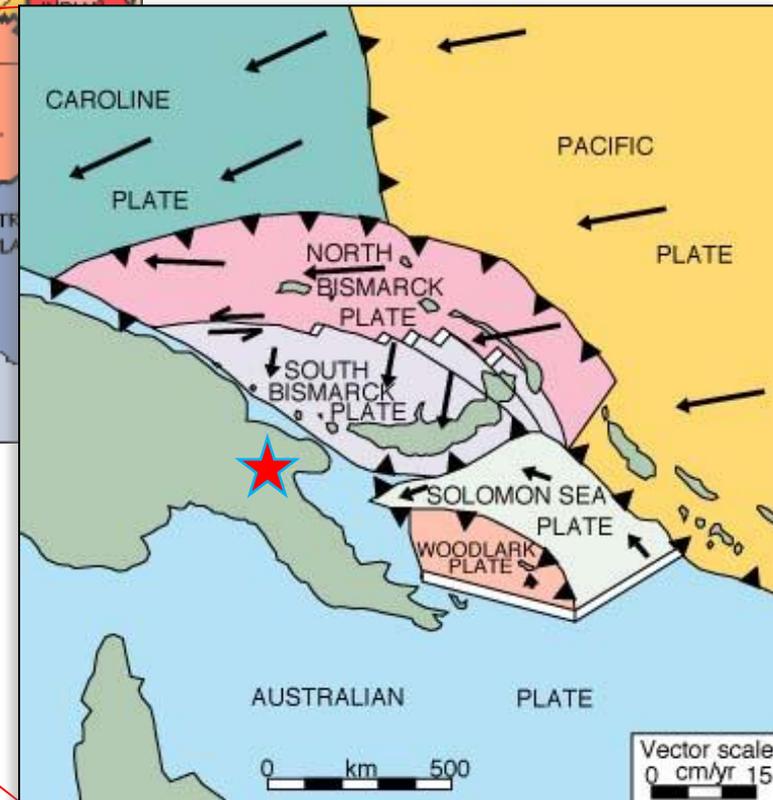
Magnitude 7.6 PAPUA NEW GUINEA

Saturday, September 10, 2022 at 23:46:57 UTC



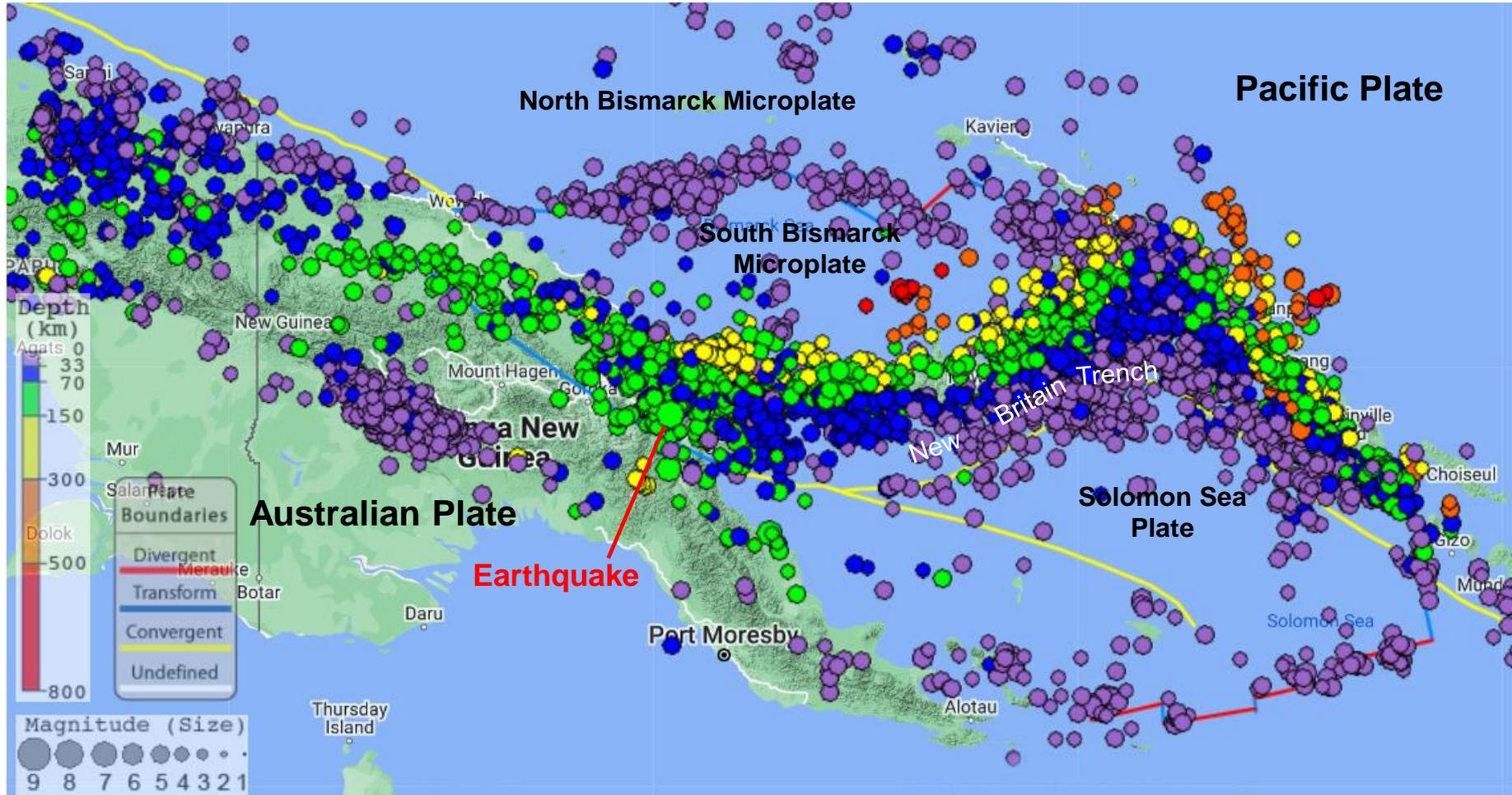
Arrows on map below show motions relative to the Australian Plate. The red star shows the location of the September 10th earthquake. This earthquake occurred on the NE side of the Papuan Peninsula where the Australian Plate subducts beneath the South Bismarck microplate.

In the region of Papua New Guinea, the Pacific Plate converges with the Australian Plate at a rate of 9.5 cm/yr. The Australian Plate is broken into microplates that accommodate its convergence with and subduction beneath the Pacific 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.



Magnitude 7.6 PAPUA NEW GUINEA

Saturday, September 10, 2022 at 23:46:57 UTC

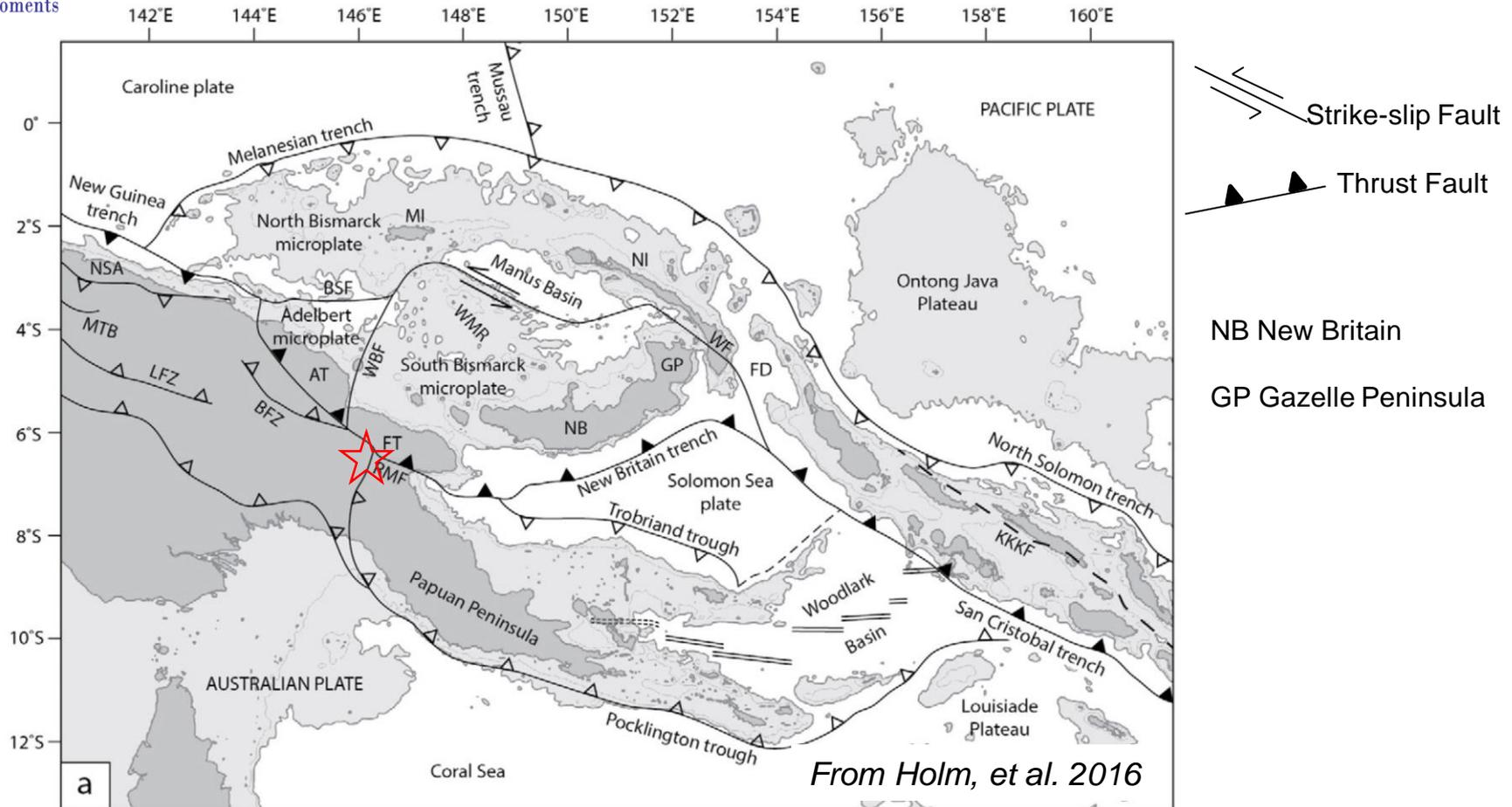


Map created with the IRIS Earthquake Browser

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.

Magnitude 7.6 PAPUA NEW GUINEA

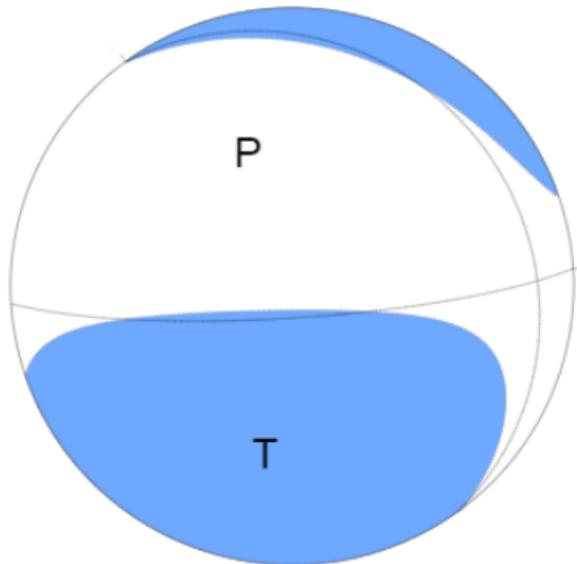
Saturday, September 10, 2022 at 23:46:57 UTC



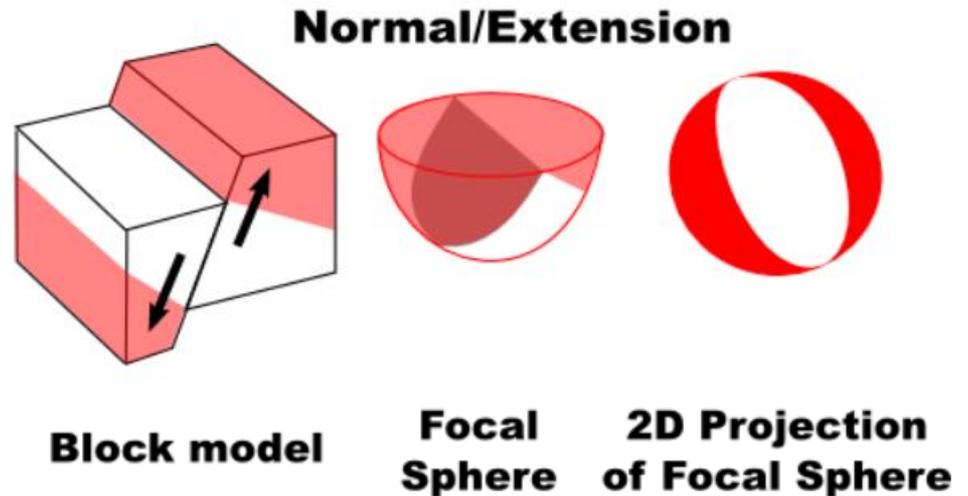
The map above shows microplates and structures in the Papua New Guinea - Solomon Sea region with the location of the September 10th earthquake indicated by the red star. At the New Britain trench and Ramu-Markham fault (RMF), the Australian and Solomon Sea plates subduct beneath the South Bismarck microplate. Although the normal-faulting focal mechanism and 90 km depth challenge simple interpretations, the September 10th earthquake was produced by convergence of the northern fringe of the Australian Plate with the South Bismarck microplate.

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.



W-phase Moment Tensor Solution

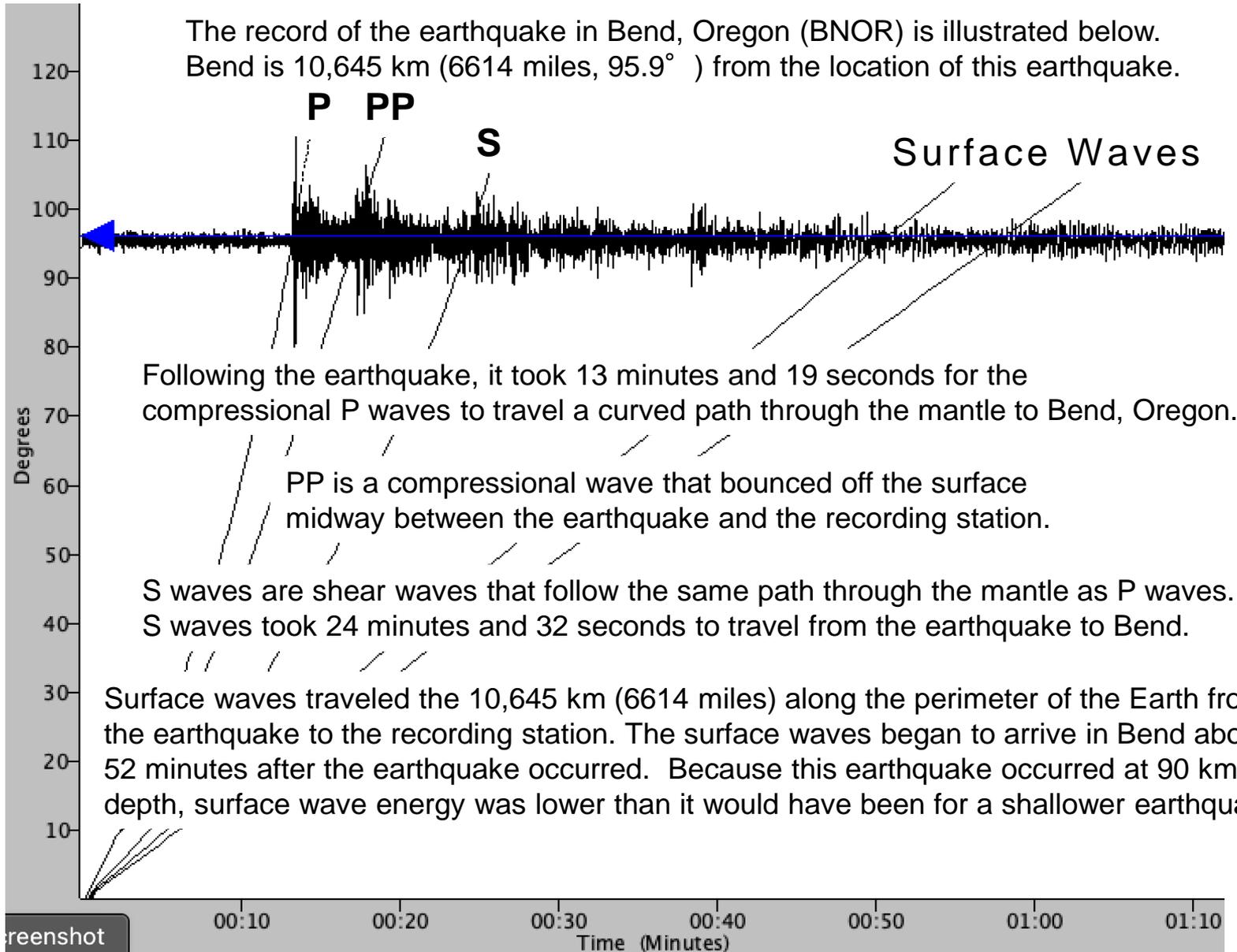


The tension axis (T) reflects the minimum compressive stress direction. The pressure axis (P) reflects the maximum compressive stress direction.

Magnitude 7.6 PAPUA NEW GUINEA

Saturday, September 10, 2022 at 23:46:57 UTC

The record of the earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 10,645 km (6614 miles, 95.9°) from the location of this earthquake.

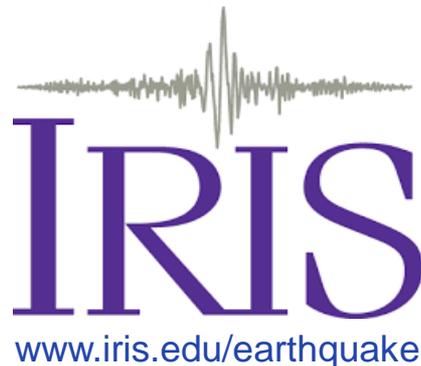


Teachable Moments are a service of

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



These resources have been developed as part of the SAGE facility operated by IRIS via support from the National Science Foundation.