

Magnitude 7.5 PAPUA NEW GUINEA

Saturday, April 19, 2014 at 13:27:59 UTC

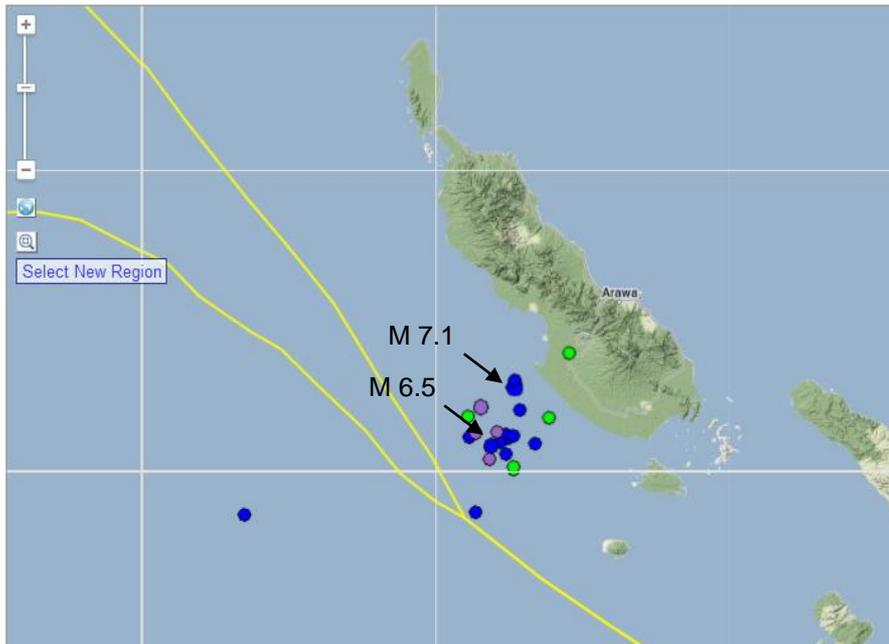


A magnitude 7.5 earthquake struck off the eastern coast of Papua New Guinea on Saturday, approximately 75 km (47 miles) southwest of Panguna, Bougainville Island. Although Bougainville Island is geographically part of the Solomon Islands archipelago, the state of Solomon Islands is not a part of Papua New Guinea.

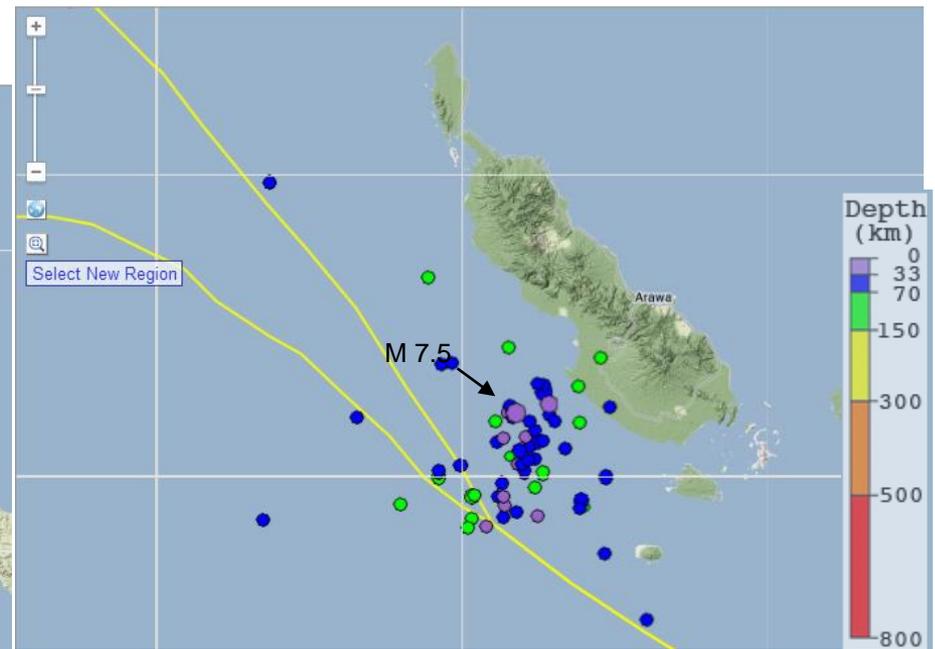
There were no immediate reports of damage or injuries from this earthquake.



This earthquake is the latest in an ongoing sequence of seismicity in the same region over the past week, which began with M 7.1 and 6.5 earthquakes on April 11, just to the northeast and southeast of this earthquake, respectively. Over the intervening eight days, 45 earthquakes of M 4.5 or greater have occurred nearby.



Regional Seismicity April 11, 2014

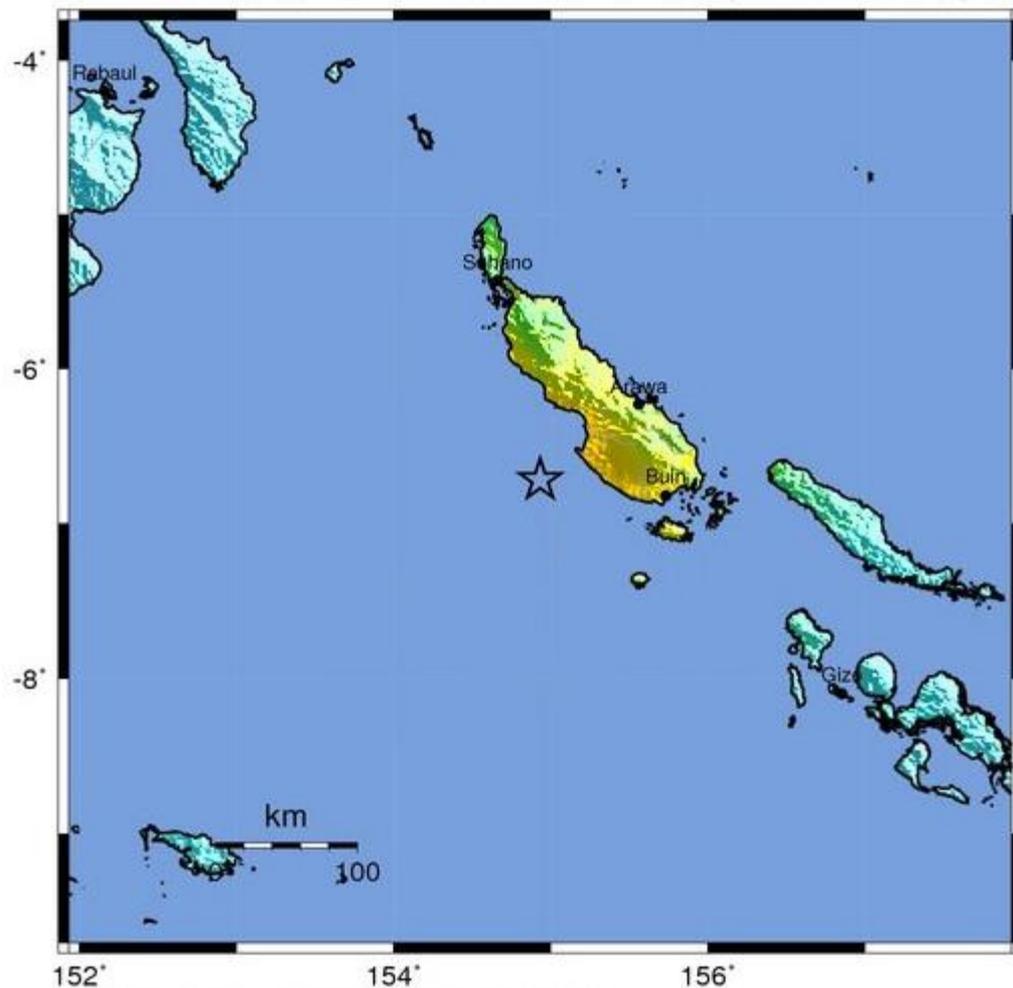


Regional Seismicity April 11–20, 2014

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

The entirety of Bougainville Island, with a population of 175,000 was shaken by this earthquake.

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



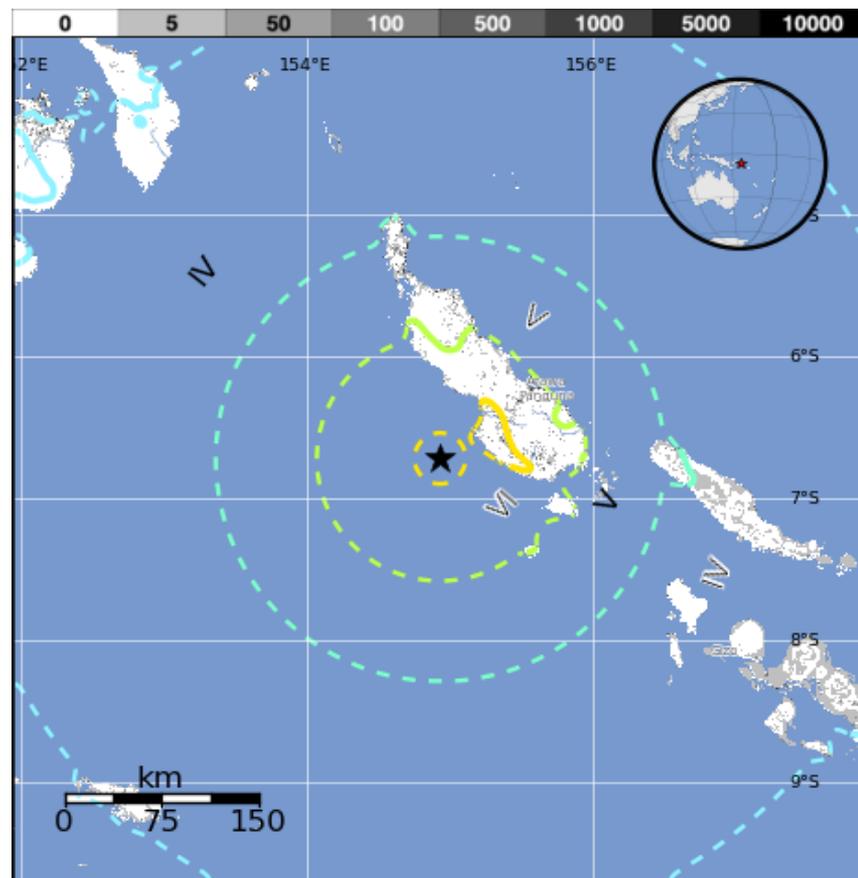
USGS Estimated shaking Intensity from M 7.5 Earthquake

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

17,000 people were exposed to very strong shaking, with an additional 97,000 people experiencing strong shaking from this earthquake.

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 below.

Image courtesy of the US Geological Survey



Estimated Modified Mercalli Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X
Est. Population Exposure	--*	67k*	291k	102k	97k	17k	0k	0k	0k
Perceived Shaking	Not Felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme

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This earthquake is shown by the blue star on the map at the right. It is a seismically active area with frequent large earthquakes.

The Australian Plate subducts at a steep angle towards the north beneath the Pacific Plate at the New Britain Trench shown below in a N-S cross section.

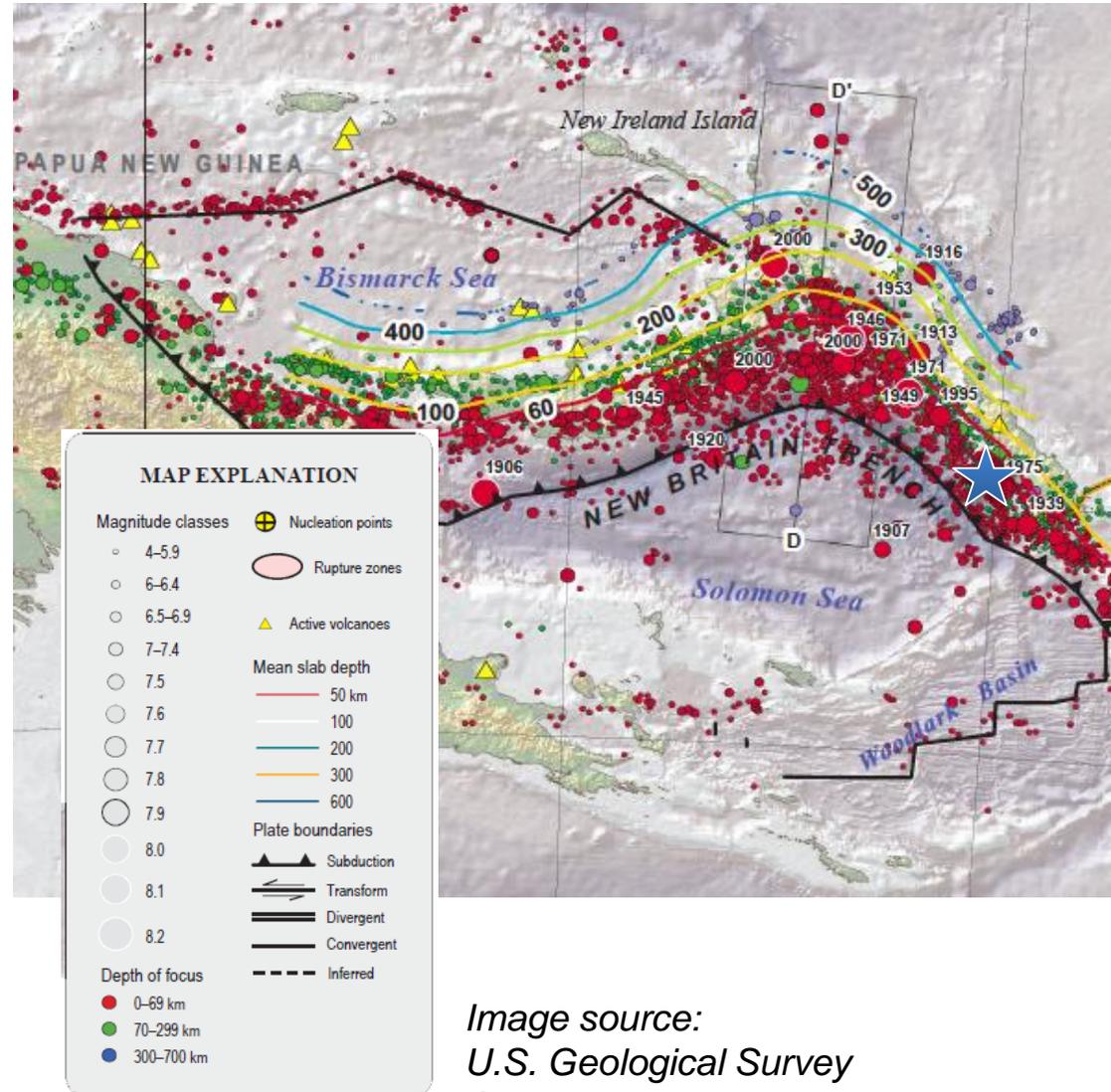
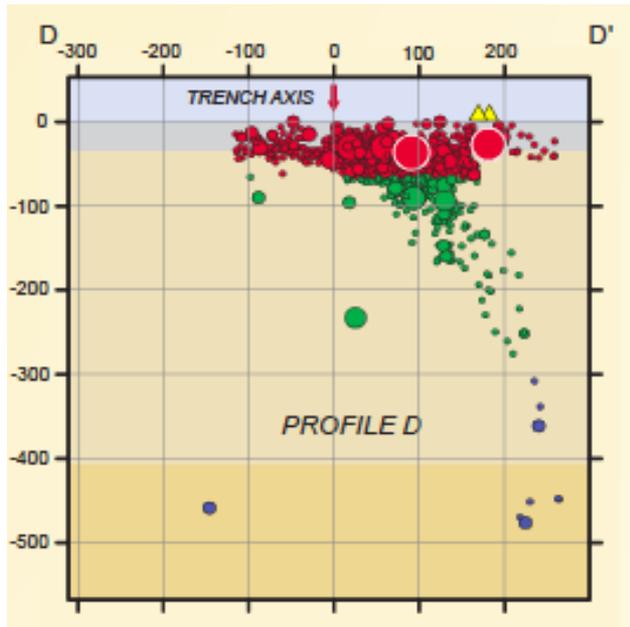
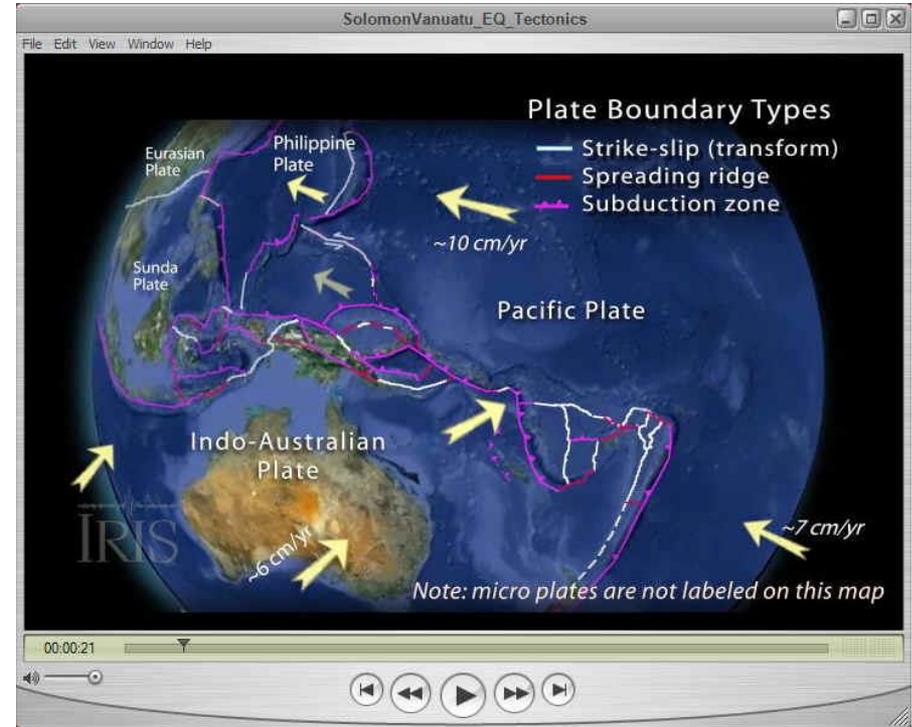


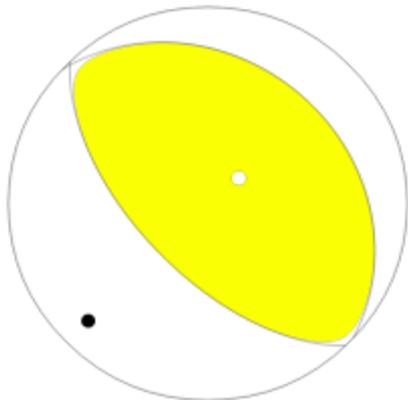
Image source:
U.S. Geological Survey
Open-File Report 2010-1083-H

This earthquake occurred on or close to the subduction zone megathrust boundary between the Australian and Pacific Plates.

At the location of the earthquake, the Australian Plate moves towards the east-northeast at a velocity of 102 mm/yr with respect to the Pacific Plate, and subducts beneath Bougainville Island at the New Britain Trench.



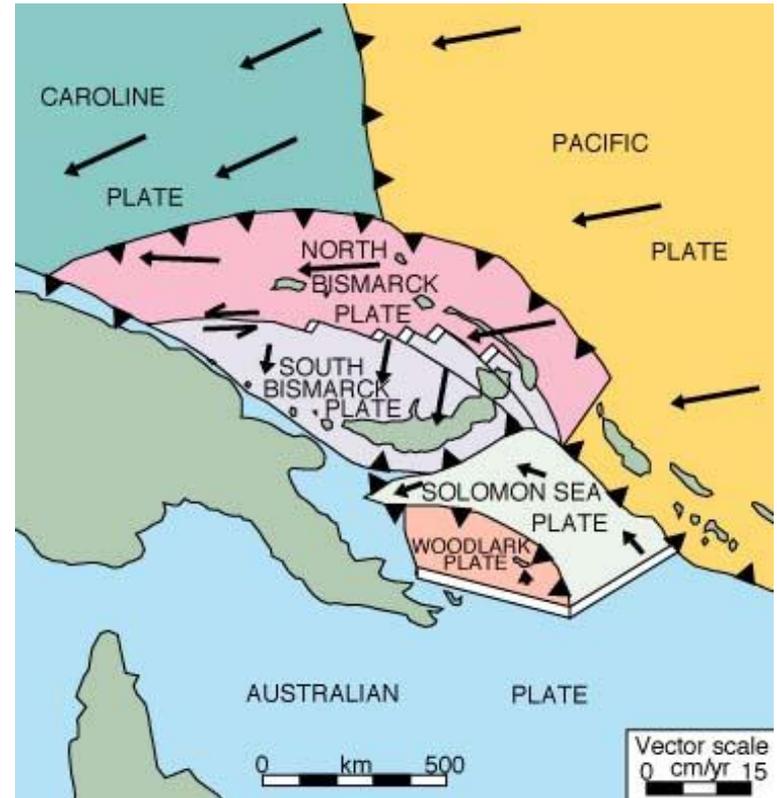
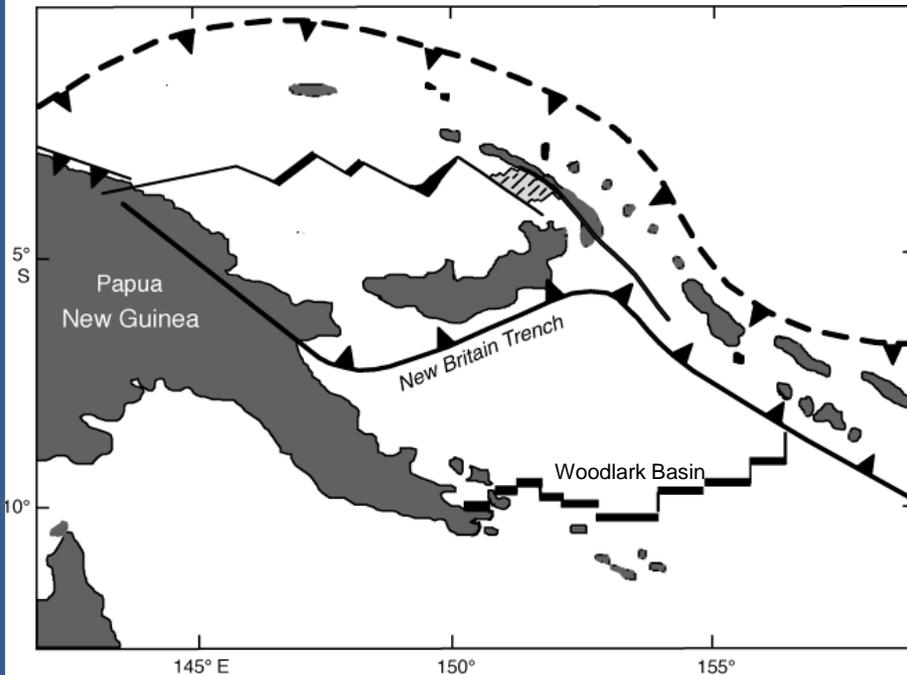
Regional tectonic complexities involving the convergence of the Australian and Pacific Plates.



The tension axis (white dot) reflects the minimum compressive stress direction. The pressure axis (black dot) reflects the maximum compressive stress direction.

USGS Centroid Moment Tensor Solution

The Solomon Islands are in the center of a region of tectonic microplates that accommodate convergence between the larger Australia and the Pacific Plates. The Solomon Sea Plate moves slightly faster and more northeasterly with respect to the Pacific Plate than does the Australia Plate due to sea-floor spreading in the Woodlark Basin.



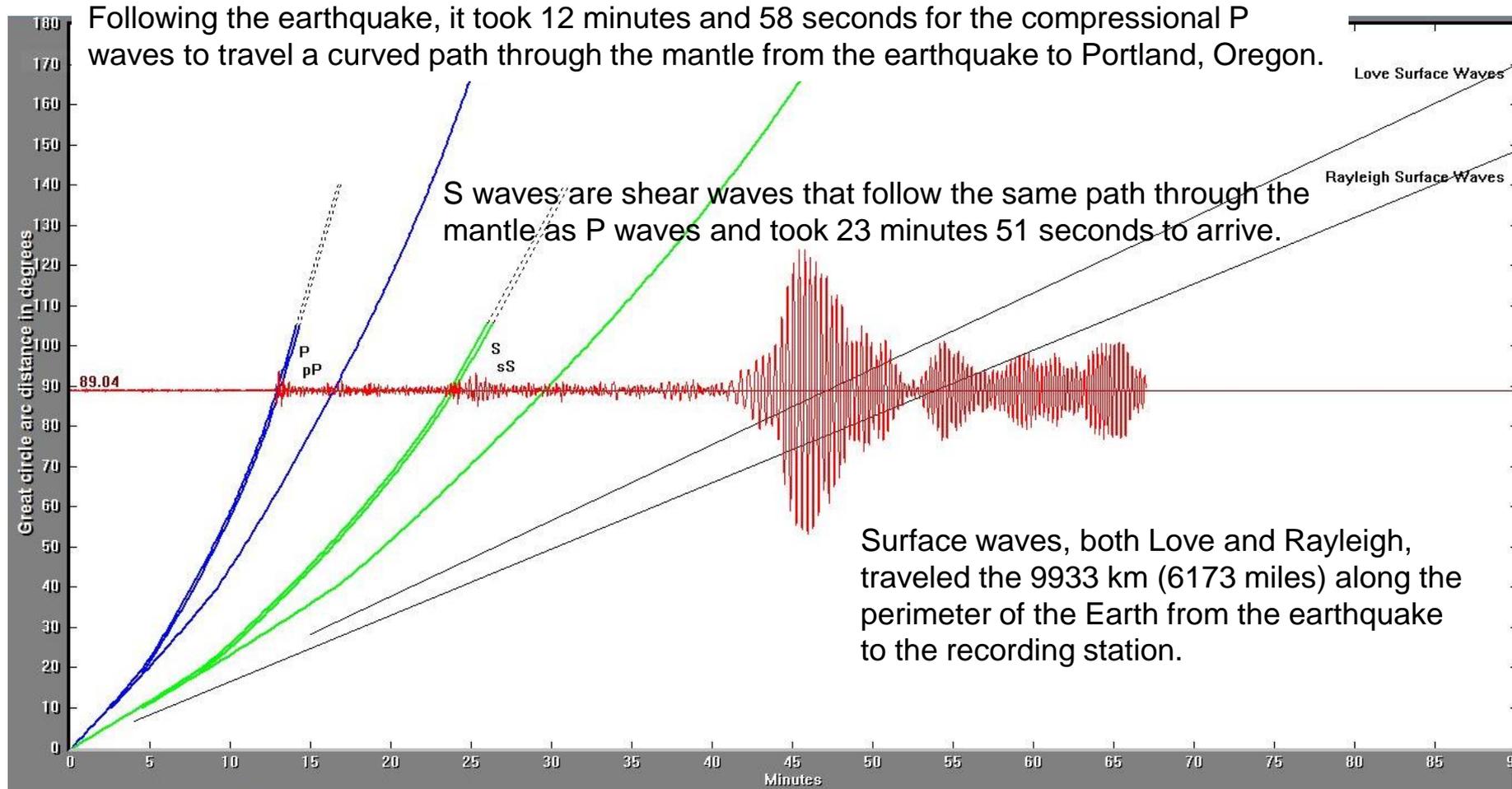
Regional tectonic microplates. Arrows show net plate motion relative to the Australian Plate.

Image credit: OSU; simplified from Hamilton (1979)

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The record of the earthquake on the University of Portland seismometer (UPOR) is illustrated below. Portland is 9933 km (6173 miles, 89.49°) from the location of this earthquake.



Teachable Moments are a service of

IRIS Education & Public Outreach
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