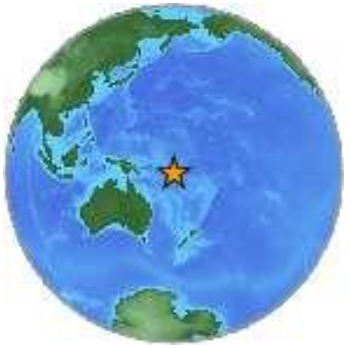
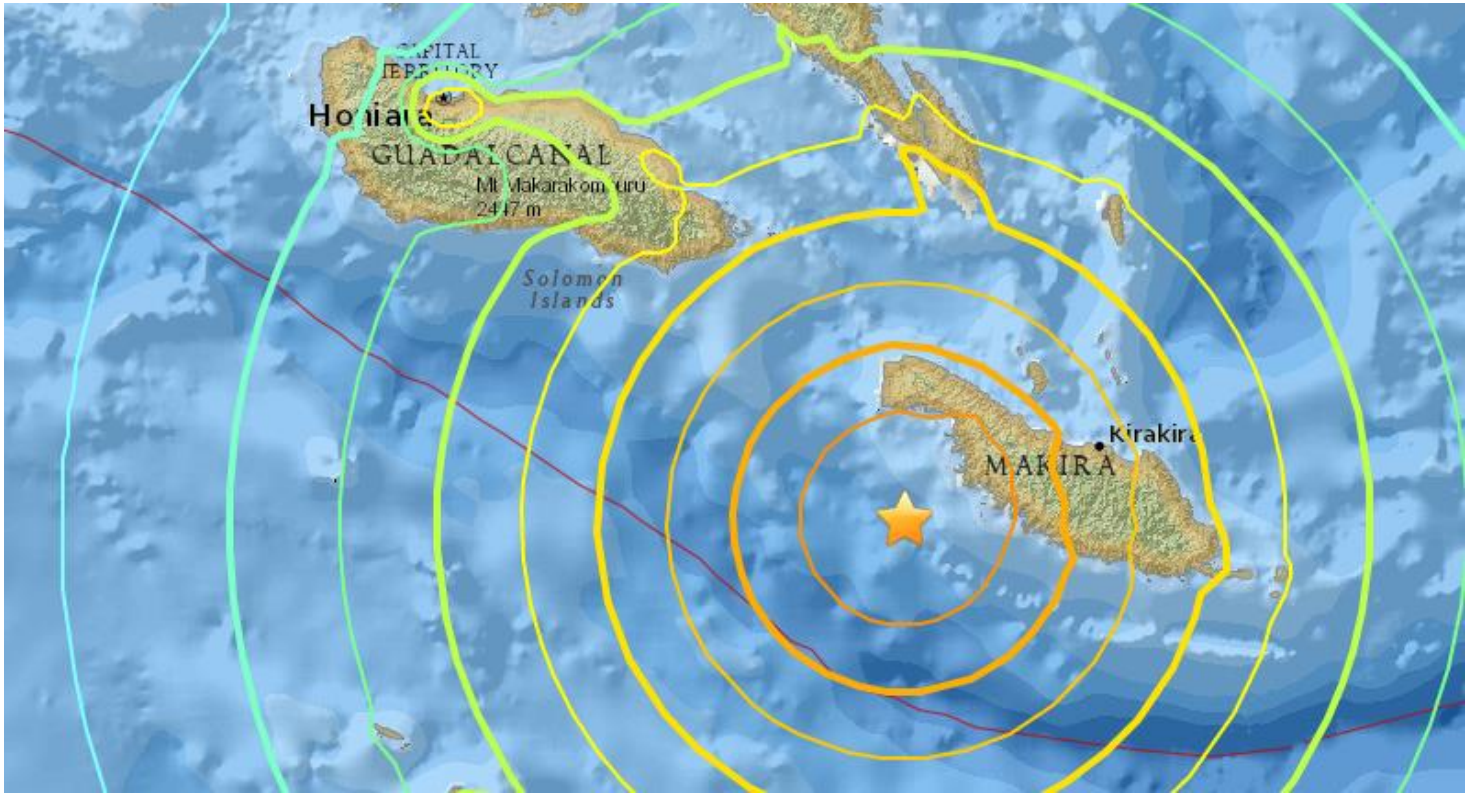
Magnitude 7.7 SOLOMON ISLANDS

Thursday, December 8, 2016 at 17:38:47 UTC



A 7.7 magnitude earthquake struck offshore in the Solomon Islands.

The earthquake occurred less than 30 kilometers off the island of Makira, at a depth of 48.7 km (30.3 miles), and 70 kilometers southwest of the island's city of Kirakira, about 4:38 a.m. local time Friday. There are no current Tsunami warnings in effect.



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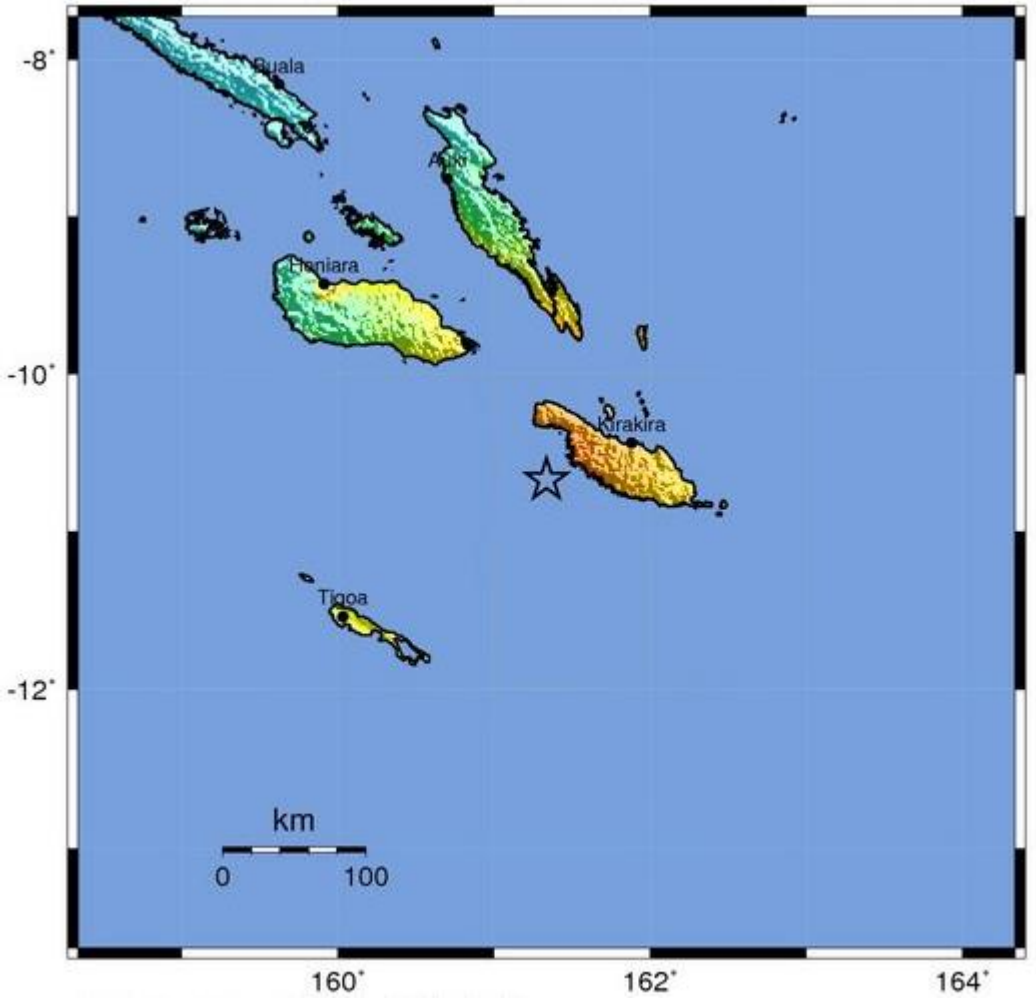
Very strong to severe shaking was reported on the island of Makira, which was the closest to the epicenter of the quake.

Strong shaking was reported near the capital of Honiara, north of the epicenter.

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 7.7 Earthquake

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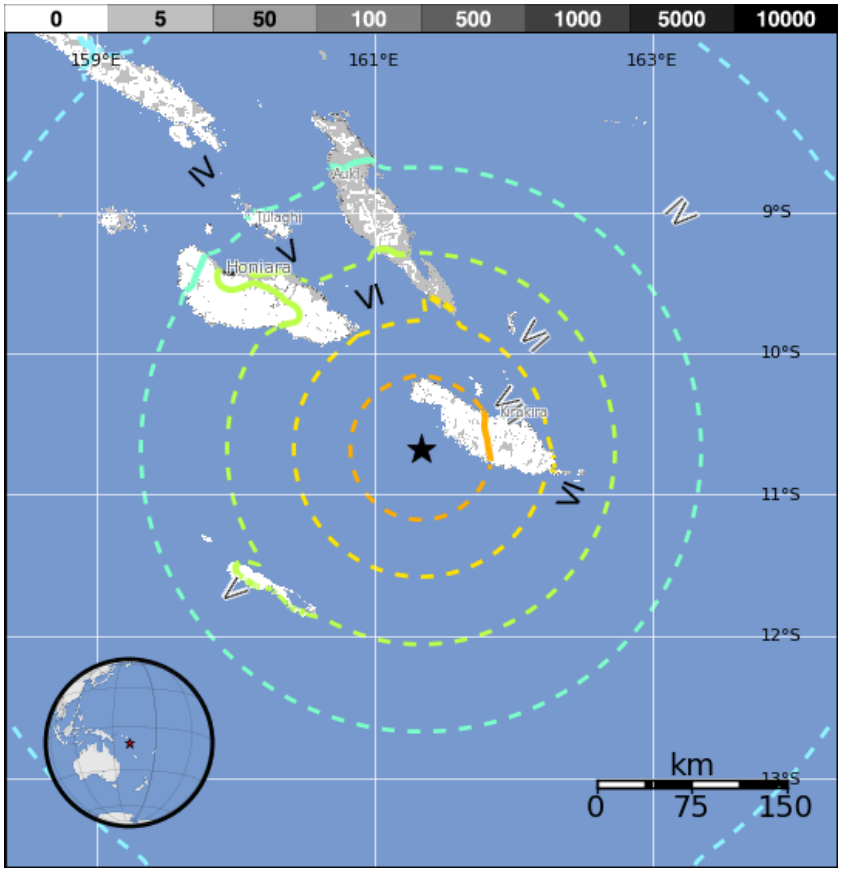
USGS PAGER
Population Exposed to Earthquake Shaking

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

The USGS approximates 20,000 people were exposed to severe shaking from this earthquake.



MMI	Shaking	Pop.
I	Not Felt	--*
II-III	Weak	2 k*
IV	Light	95 k
V	Moderate	133 k
VI	Strong	194 k
VII	Very Strong	31 k
VIII	Severe	20 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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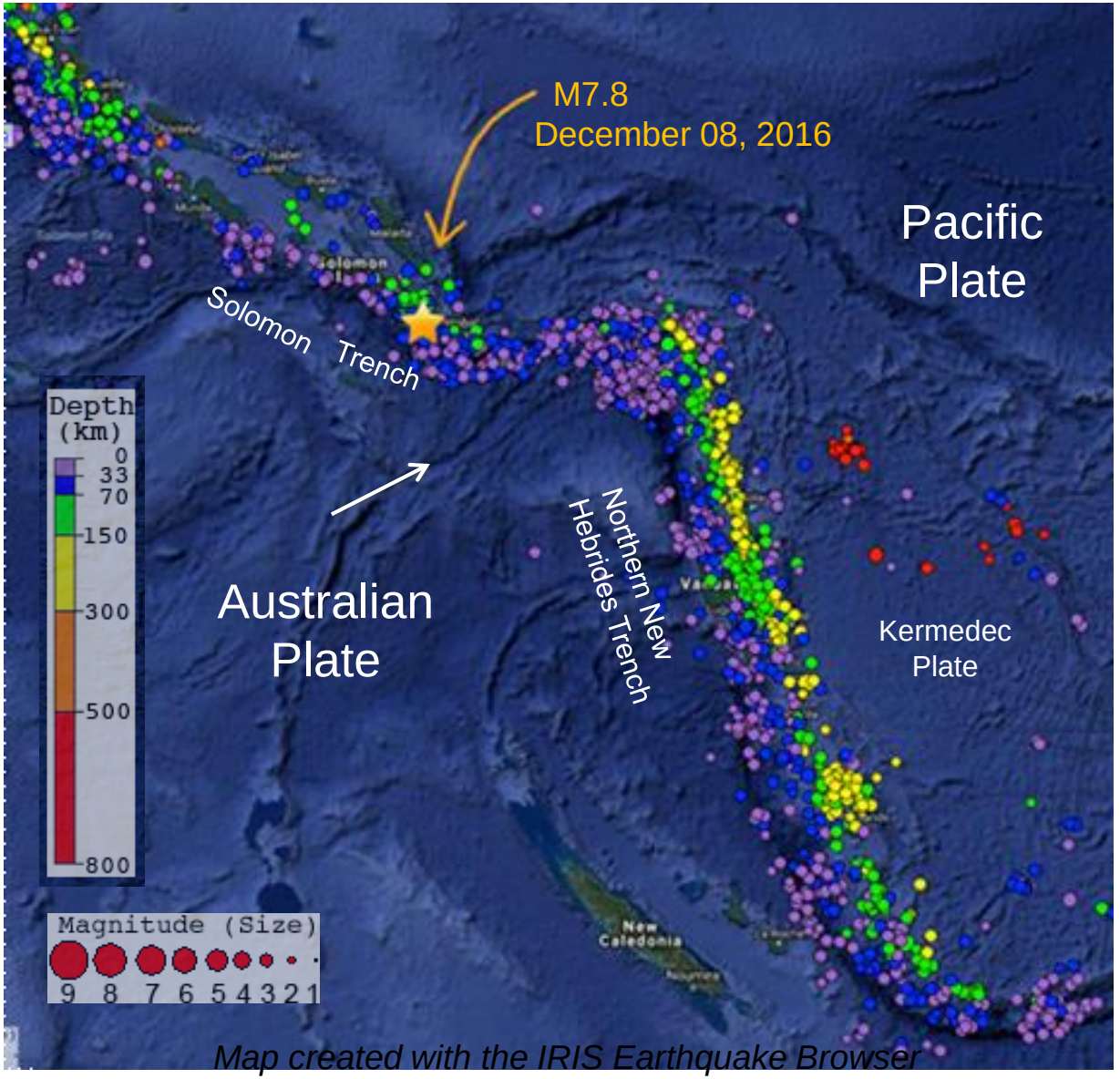
The epicenter of the December 8, 2016 earthquake is labeled on this seismicity map showing the most recent 3000 earthquakes in the surrounding region.

Earthquake depths increase from southwest to northeast across the Solomon Trench where the Australian Plate subducts beneath the Pacific Plate. Across the Northern New Hebrides Trench, earthquake depths increase from west to east where the Australia Plate subducts beneath the Pacific Plate.

The December 8th earthquake occurred along the Solomon Trench.



Map created with the IRIS Earthquake Browser

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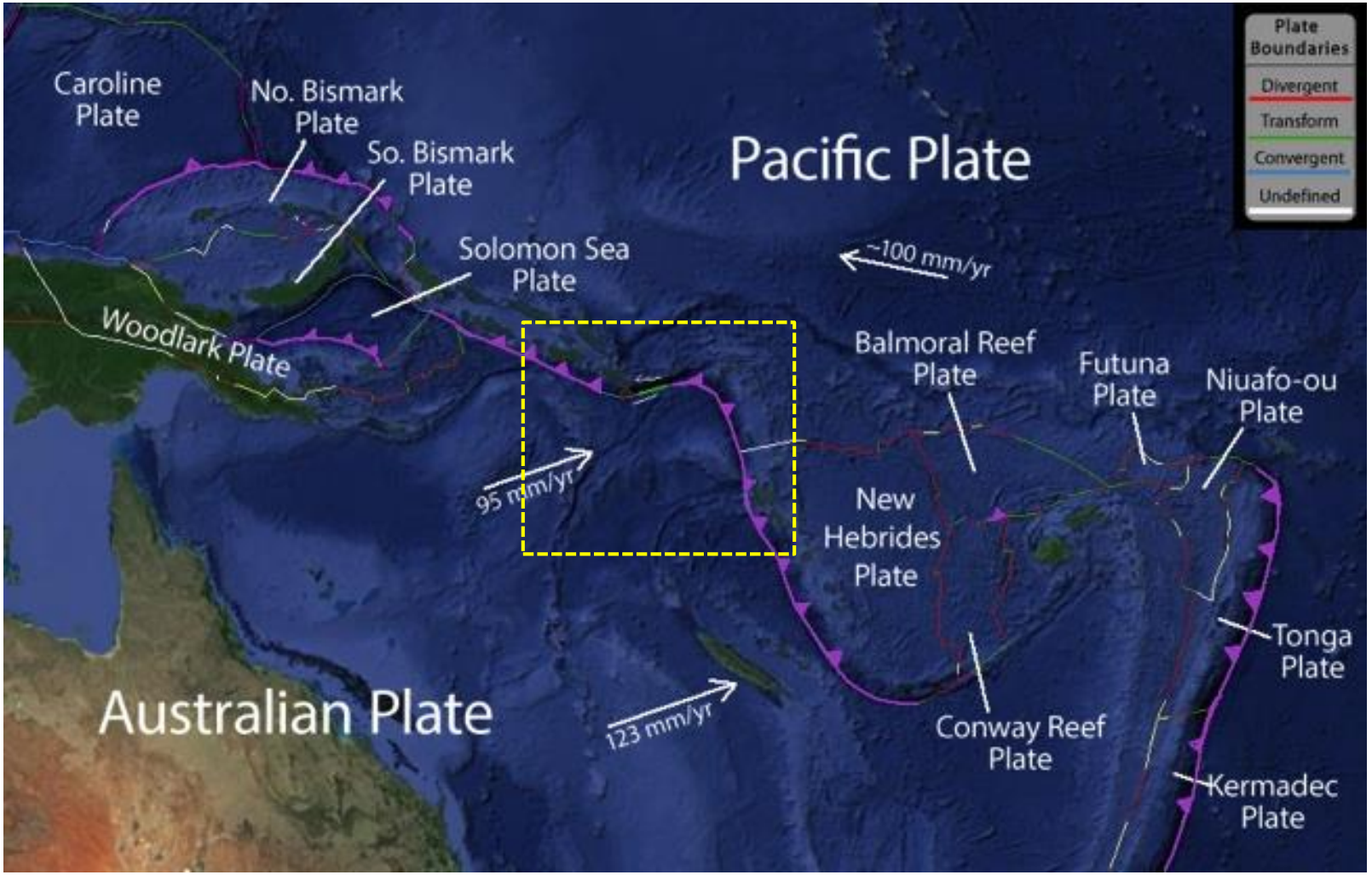
This regional map shows the complexity of major tectonic plates and microplates due to the convergence between the Australian and Pacific Plates. The rectangle outlines the map area on the next slide.



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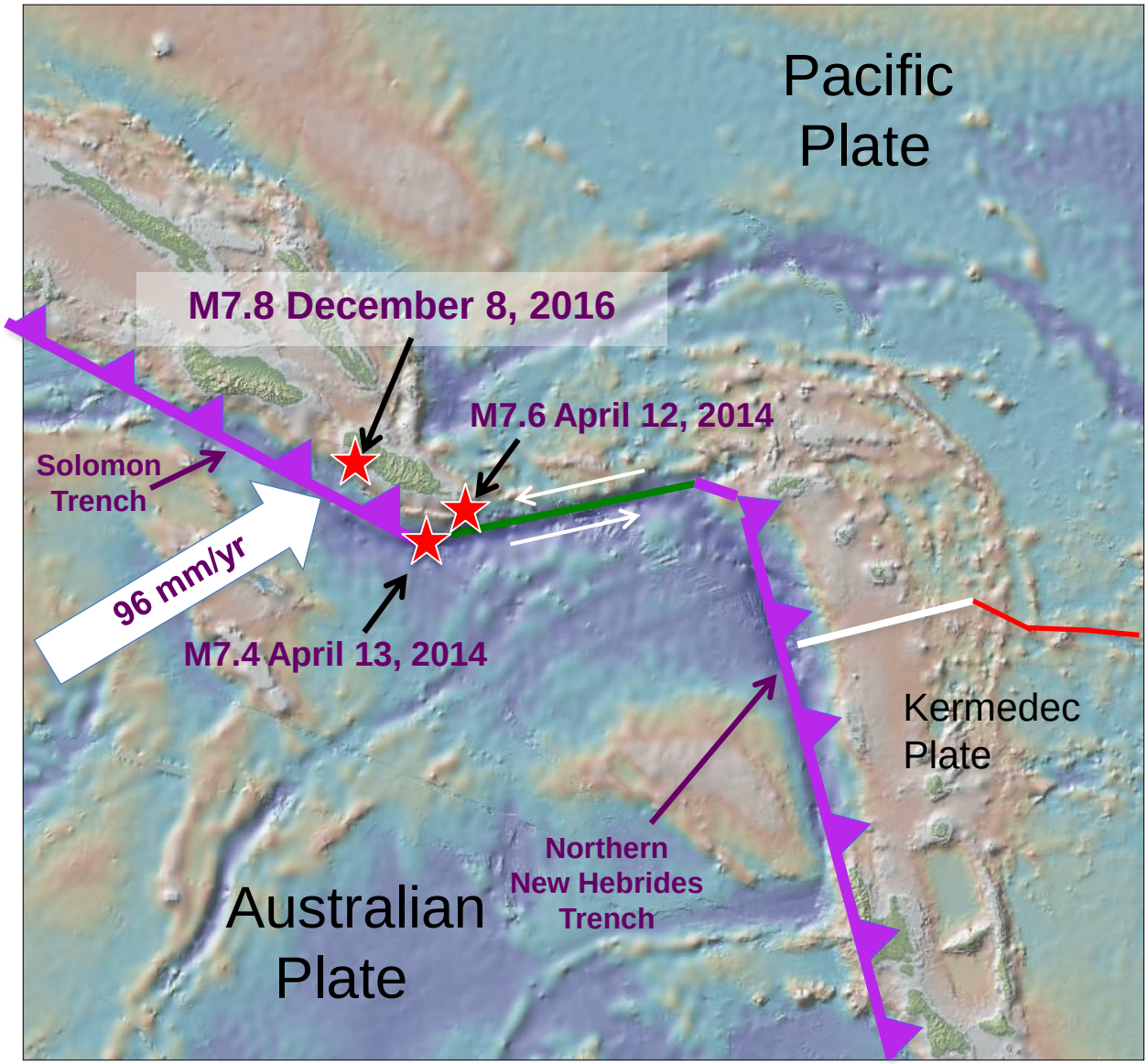

This earthquake occurred along a portion of the Australian–Pacific Plate boundary. The Australian Plate subducts beneath the Pacific Plate at the Solomon and Northern New Hebrides trenches. Along with its location and depth, the thrust faulting mechanism of the M7.8 December 8, 2016 earthquake indicates that it occurred on the Solomon Trench subduction zone boundary.

Two major earthquakes occurred in April 2014 on or near the left-lateral transform fault that connects convergent plate boundaries at the Solomon and Northern New Hebrides trenches.

Large arrow shows relative motion of Australian Plate with respect to Pacific Plate.

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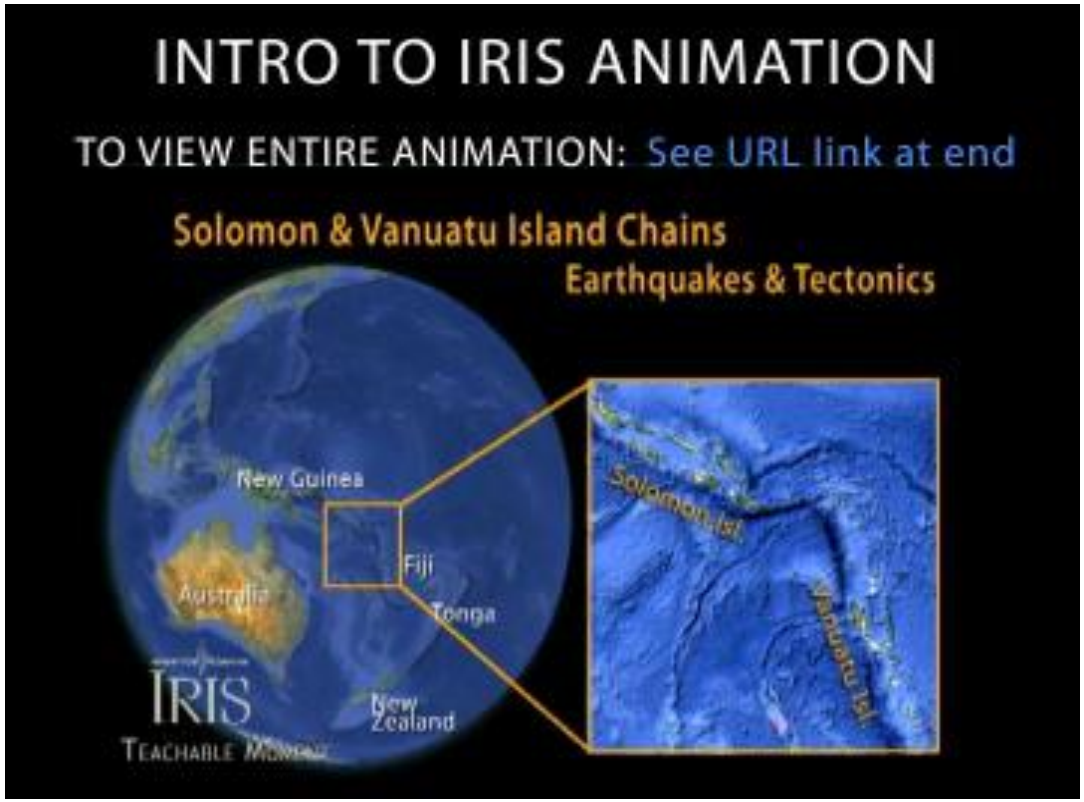
This short animation is part of a longer IRIS animation that looks at seismicity and tectonics of this region.



The full animation (URL below) looks at three areas in cross section to reveal a change from:

1) Steeply dipping subduction along the New Hebrides trench
2) Strike slip motion along the Solomon Islands
3) Shallow subduction zone to the west.

http://www.iris.edu/hq/inclass/animation/solomon__vanuatu_islands_earthquakes__tectonics

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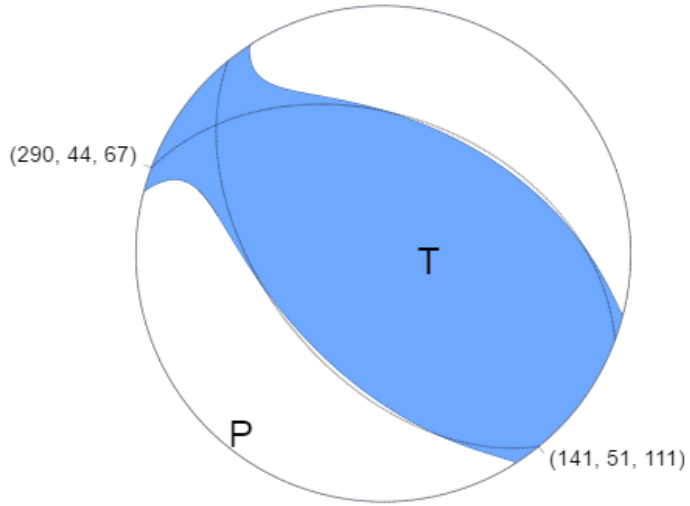
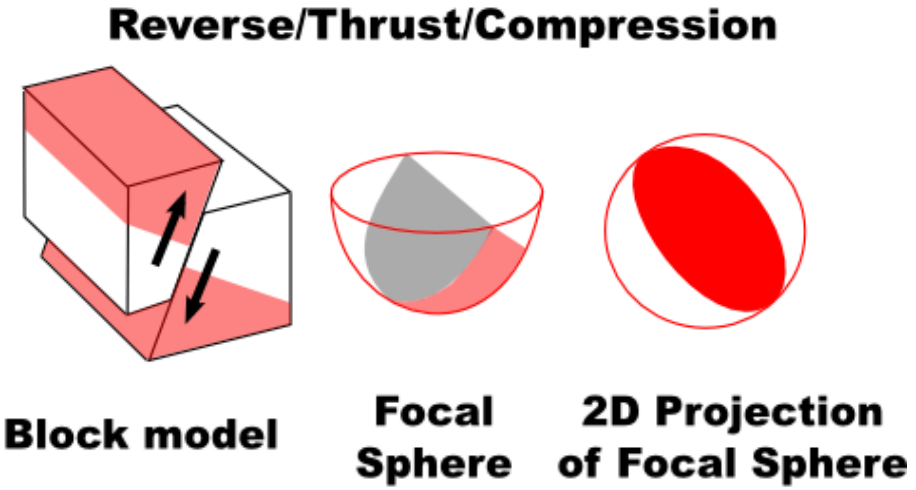
This earthquake occurred as the result of thrust faulting on or near the boundary between the Pacific and Australian Plates.





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

USGS W-phase Moment Tensor Solution

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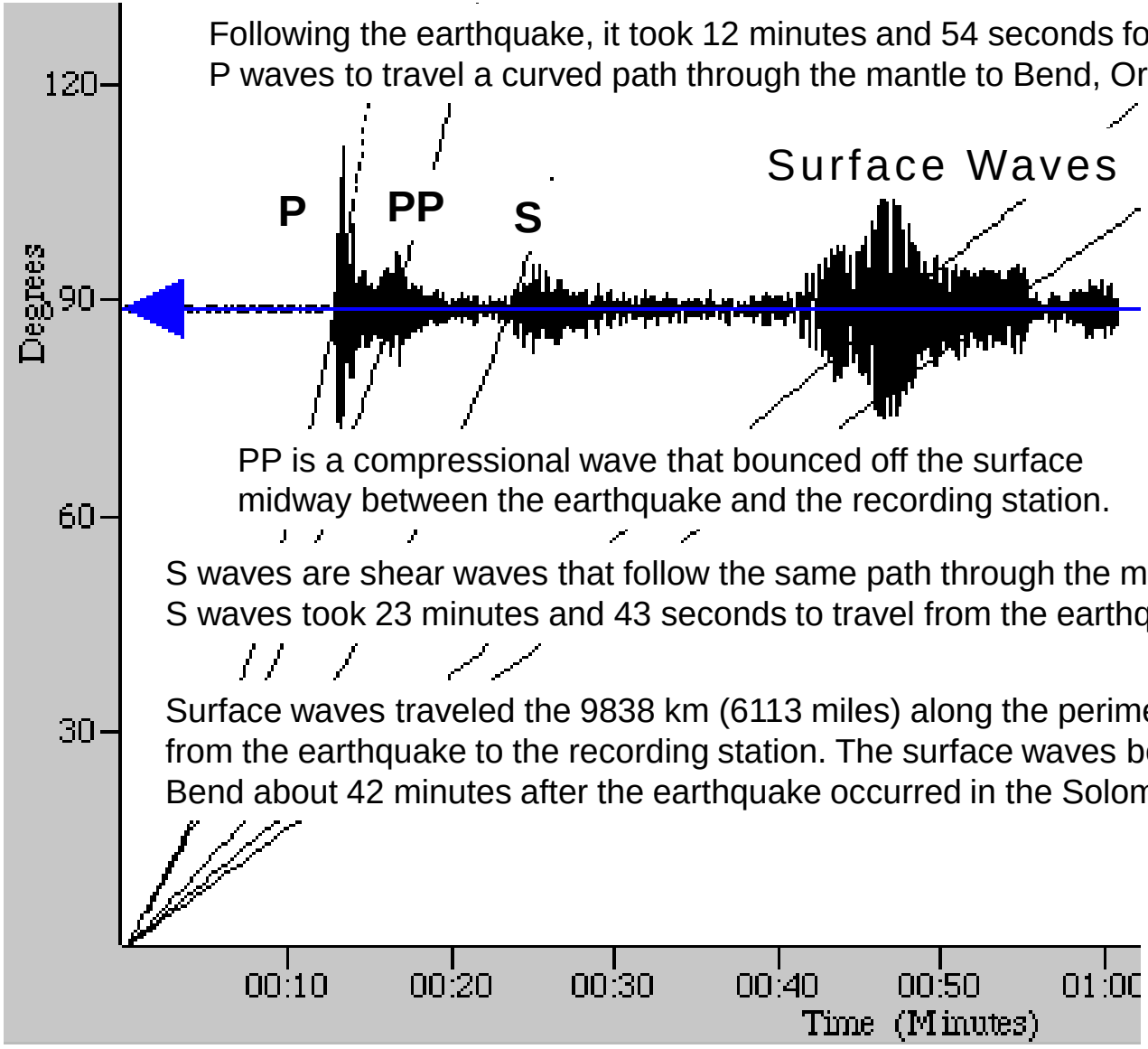
The record of the earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 9838 km (6113 miles, 88.63˚) from the location of this earthquake.

Following the earthquake, it took 12 minutes and 54 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 23 minutes and 43 seconds to travel from the earthquake to Bend.

Surface waves traveled the 9838 km (6113 miles) along the perimeter of the Earth from the earthquake to the recording station. The surface waves began to arrive in Bend about 42 minutes after the earthquake occurred in the Solomon Islands.

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Aftershock sequences follow predictable patterns as a group, although the individual earthquakes are themselves not predictable. The graph shows how the number of aftershocks and the magnitude of aftershocks decay with increasing time since the main shock. The number of aftershocks also decreases with distance from the main shock.

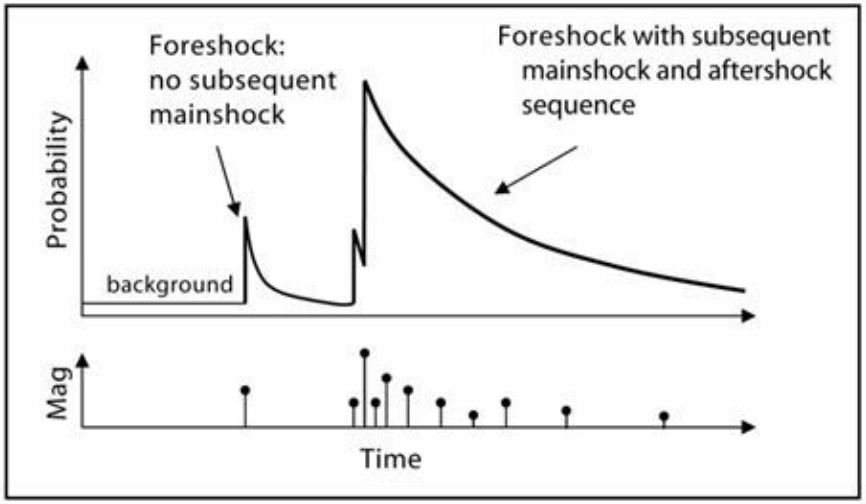
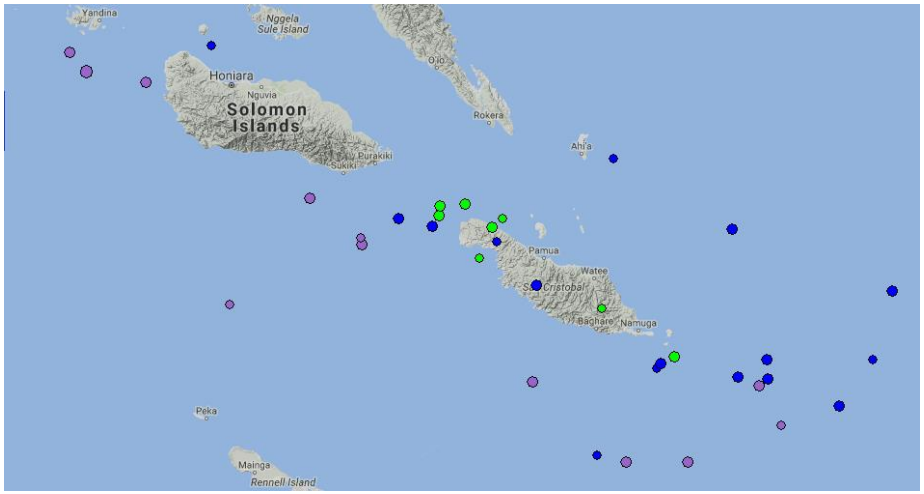


Image and text courtesy of the US Geological Survey



Regional Seismicity Dec 07, 2015 – Dec 07, 2016

Regional Seismicity Dec 08, 2016

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