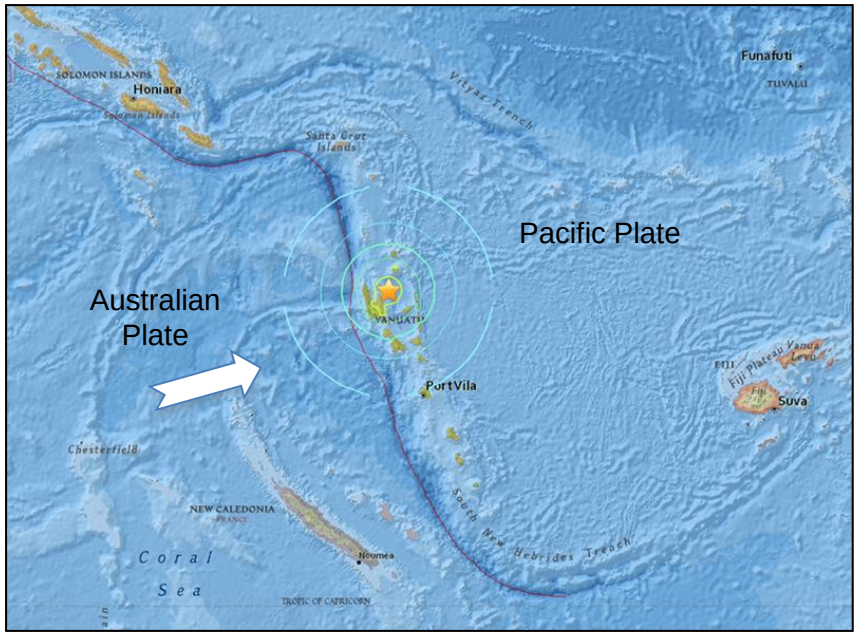
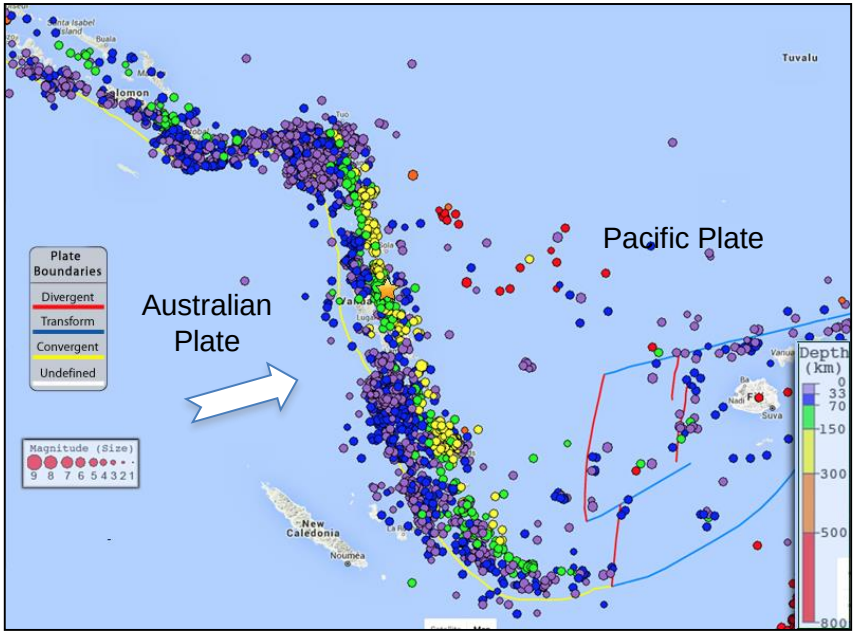
Magnitude 7.1 VANUATU
Tuesday, October 20, 2015, 21:52:02 UTC

A major earthquake struck near Vanuatu in the southwest Pacific Ocean early Friday morning (8:52 AM) local time 337 km (209 miles) west of Port-Vila, Efate, Vanuatu. In spite of the 127 km depth, there was moderate to strong shaking in Port-Olry.



The Vanuatu Islands sit above the subduction zone where the Australian plate dives beneath the Pacific Plate.

Image courtesy of the US Geological Survey



Earthquakes occur as the plates grind past each other. They are shallow on the west near the plate contact, and deeper to the east.

Image from IRIS' Internet Earthquake Browser (IEB)

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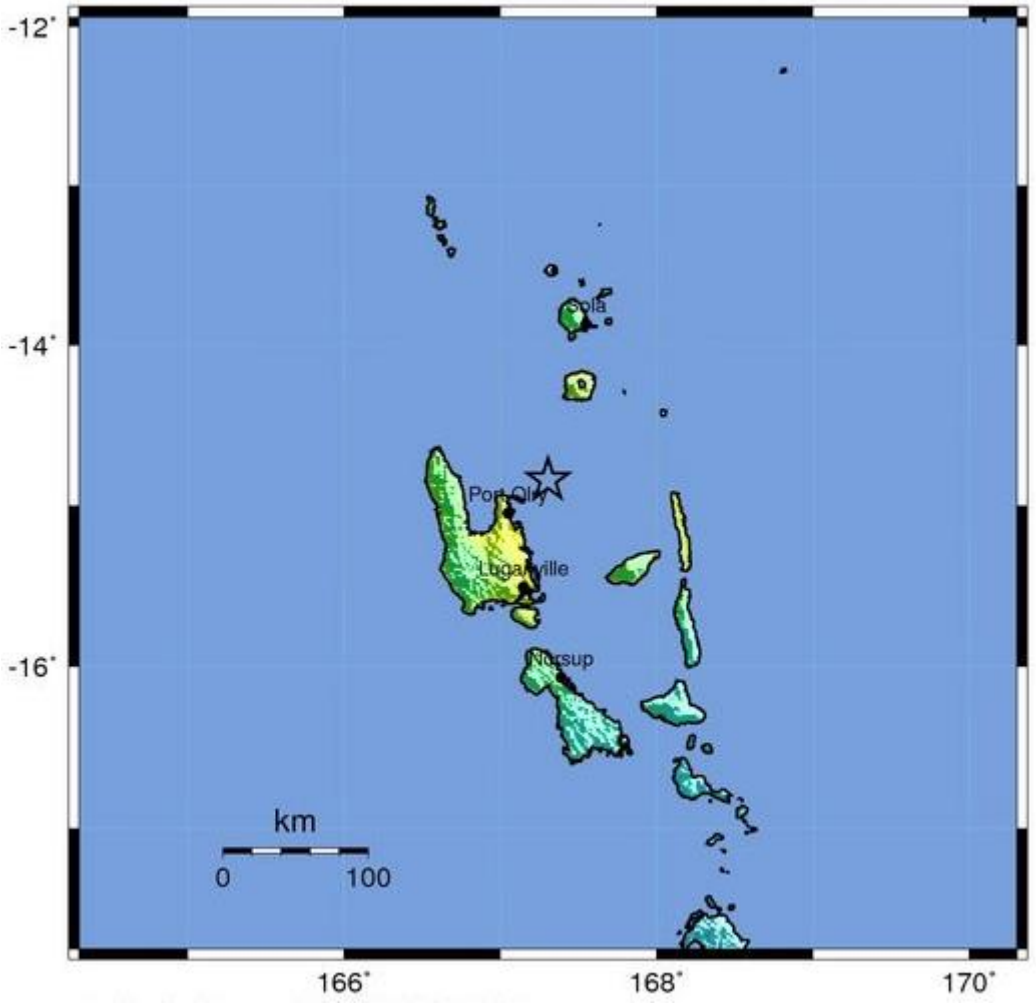
The Modified Mercalli Intensity (MMI) scale depicts shaking severity. The area nearest the earthquake experienced strong shaking.

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 7.1 Earthquake

Image courtesy of the US Geological Survey

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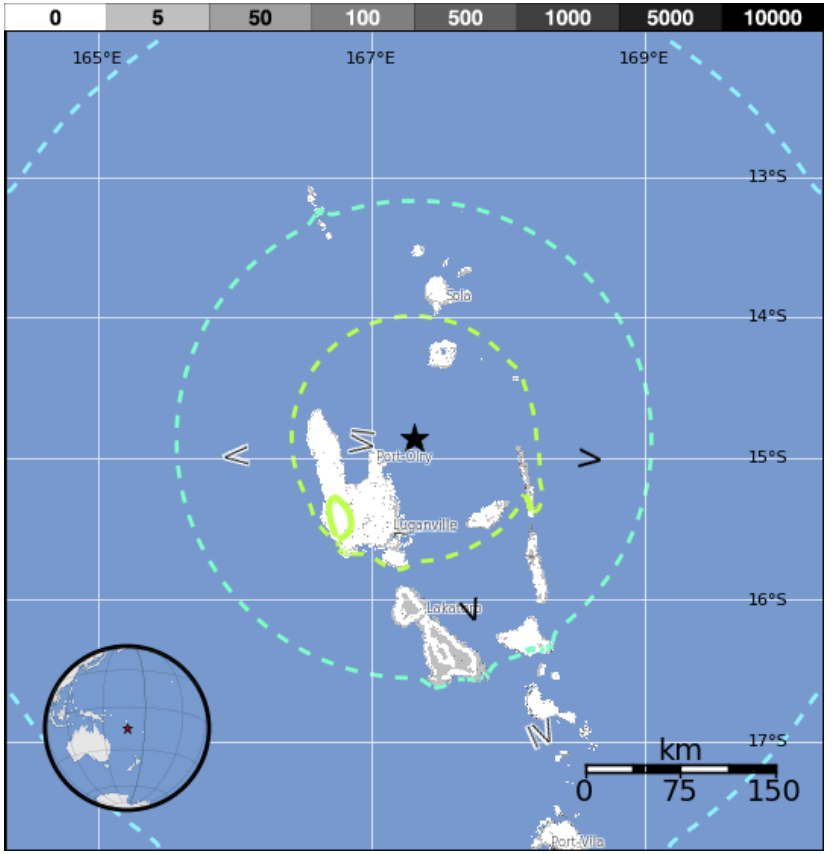
USGS PAGER
Population Exposed to Earthquake Shaking



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

Approximately 32,000 people experienced strong ground shaking during this earthquake.

MMI	Shaking	Pop.
I	Not Felt	--*
II-III	Weak	6k*
IV	Light	97k
V	Moderate	72k
VI	Strong	32k
VII	Very Strong	0k

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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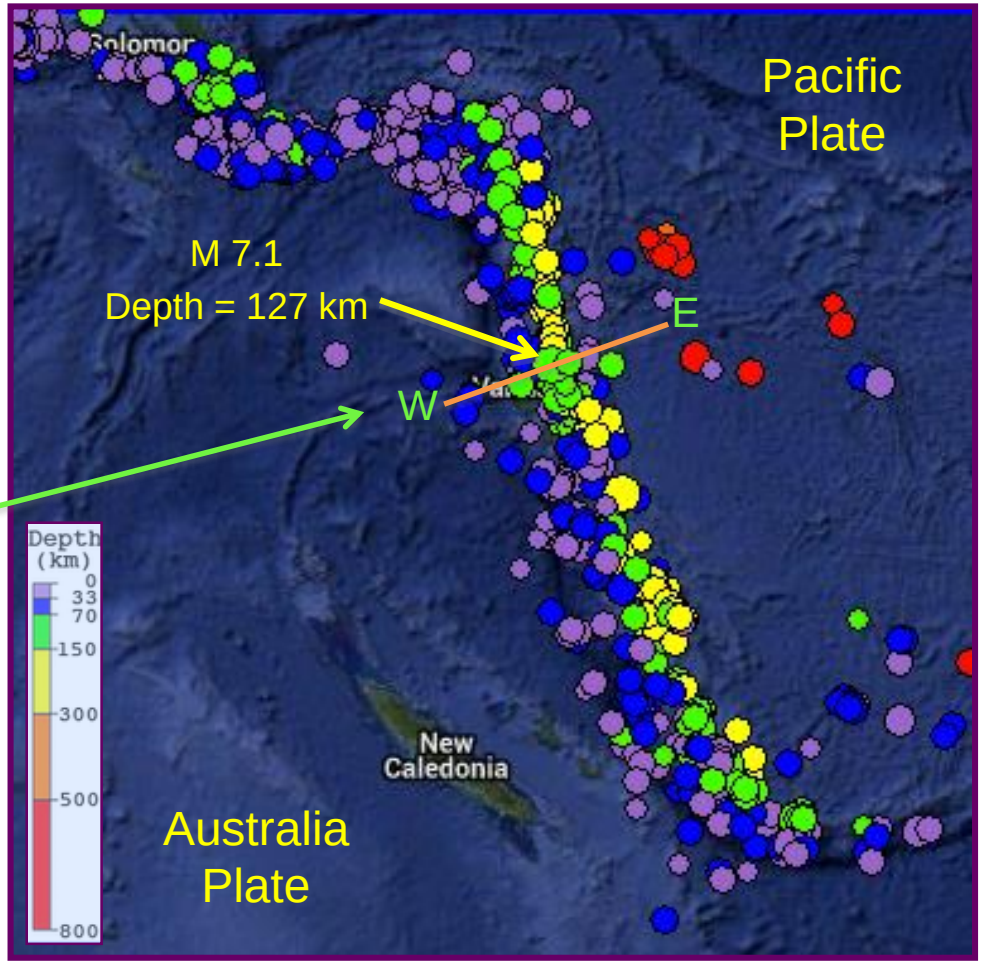
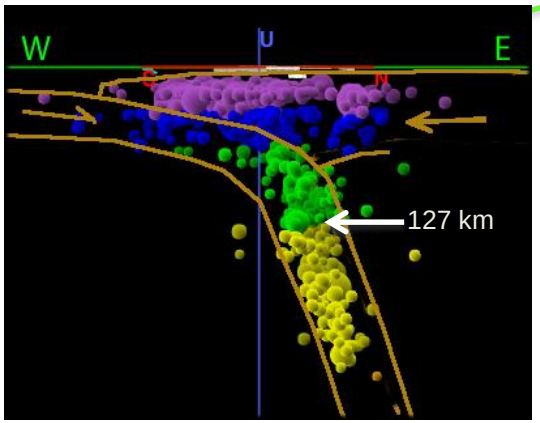
This map shows locations of the 1000 most recent earthquakes along the New Hebrides Trench where the Australian Plate subducts beneath the North Fiji Basin part of the Pacific Plate. The hypocenter of the October 20, 2015 earthquake fits the general pattern of increasing depths of earthquakes from west to east across the subduction zone.

Created using the IRIS Earthquake Browser (IEB).





Hand-drawn lines on the 3-D cross-sectional view from the IEB reveal a steeply dipping plate.

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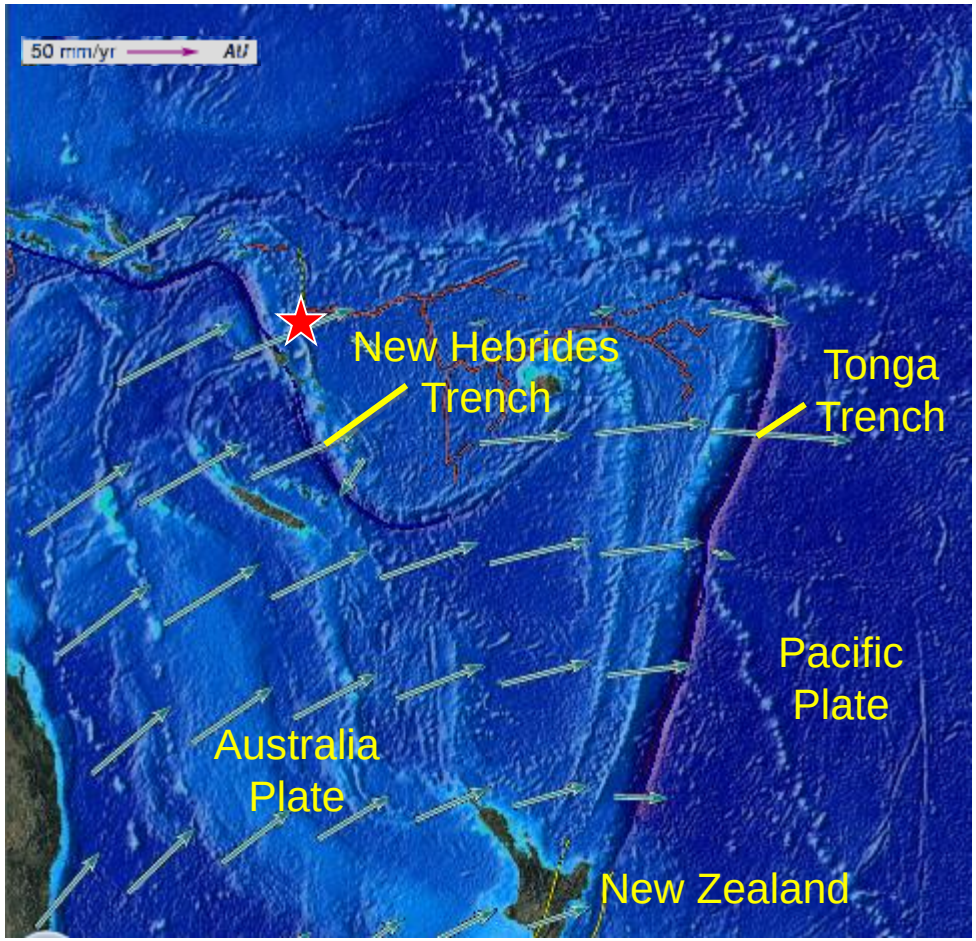

Arrows show net plate motion relative to the Pacific Plate.

The earthquake epicenter is located just 100 km east of the New Hebrides Trench, the bathymetric expression of the boundary between the Australia and Pacific plates, where lithosphere of the Australia plate subducts into the mantle beneath the North Fiji Basin.

At the location of this earthquake, the Australia plate moves east-northeast with respect to the Pacific Plate at a velocity of approximately 84 mm/yr.

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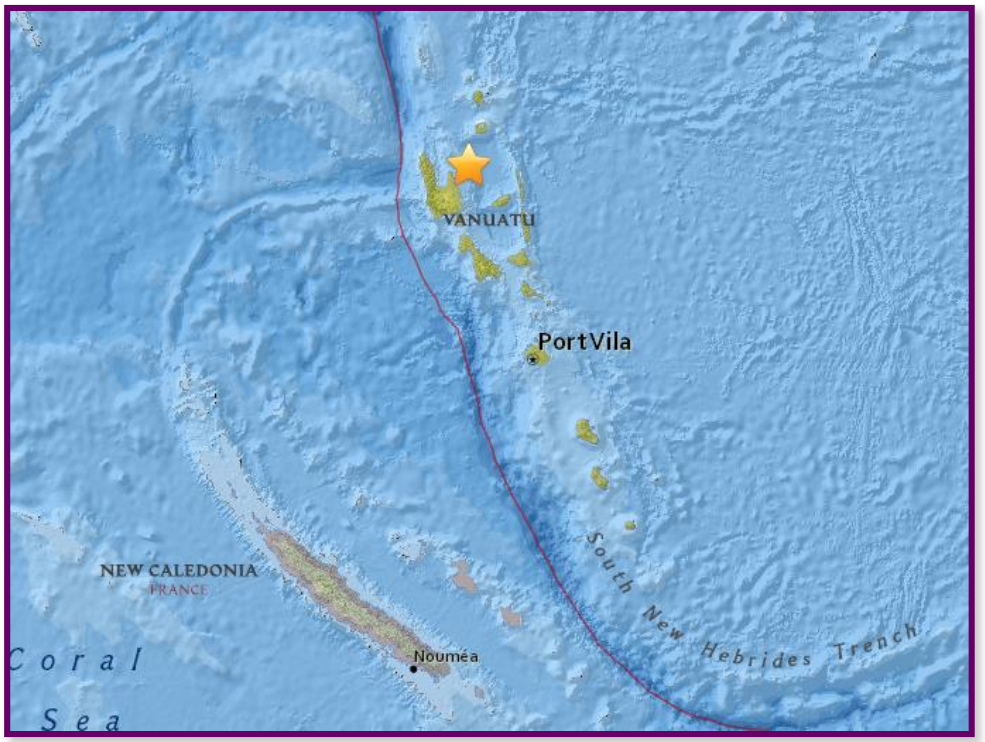
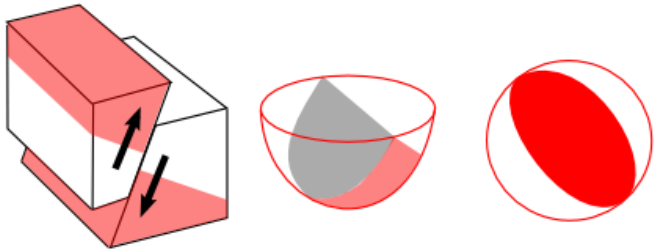
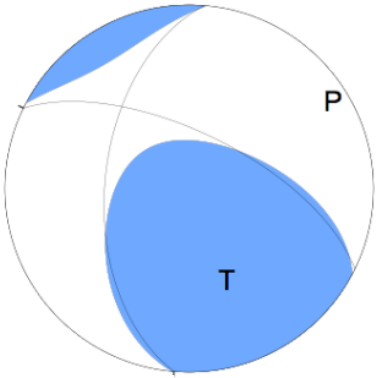
This earthquake occurred as a result of oblique-thrust faulting. At the 127 km depth of this earthquake, it is not clear whether the this thrust faulting was between the Australian and Pacific Plates or within the subducting Australian Plate.



Reverse/Thrust/Compression





Shaded areas show quadrants of the focal sphere in which the P-wave first-motions are away from the source, and unshaded areas show quadrants in which the P-wave first-motions are toward the source. The letters represent the axis of maximum compressional strain (P) and the axis of maximum extensional strain (T) resulting from the earthquake.

USGS WPhase Centroid Moment Tensor Solution

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