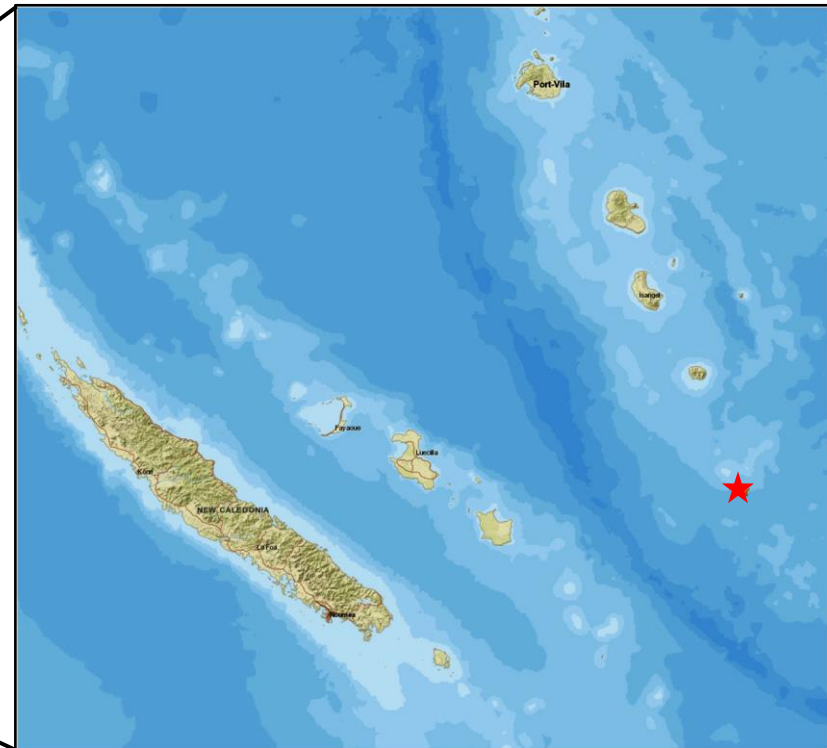
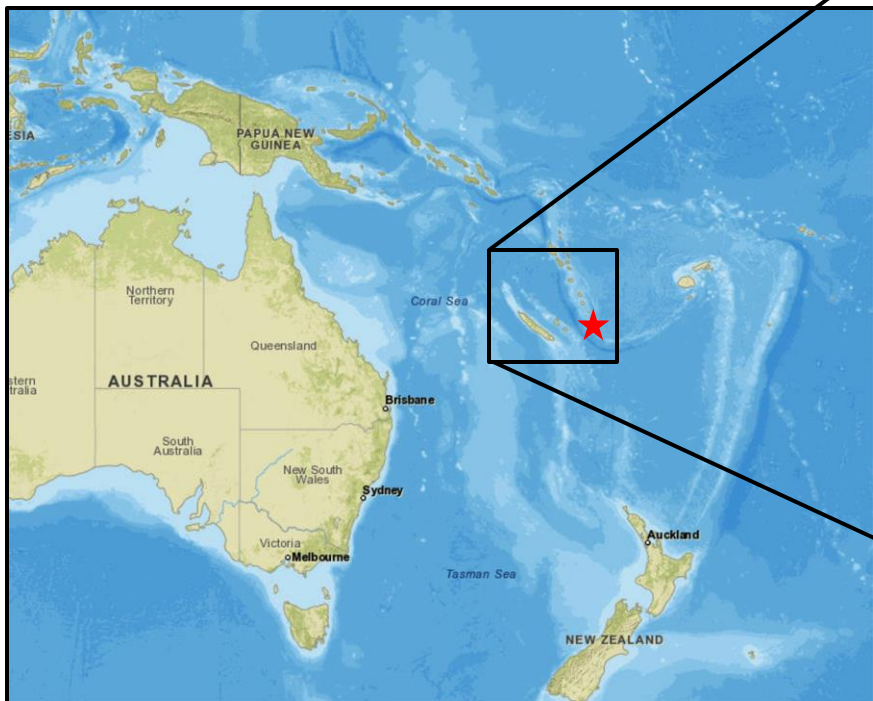


A magnitude 7.0 earthquake struck just after 9:00PM local time about 208 km (129 mi) south south east of Isangel, Vanuatu and 240 km (150 mi) east of Nouméa (population 182,000), the capital and largest city of New Caledonia.

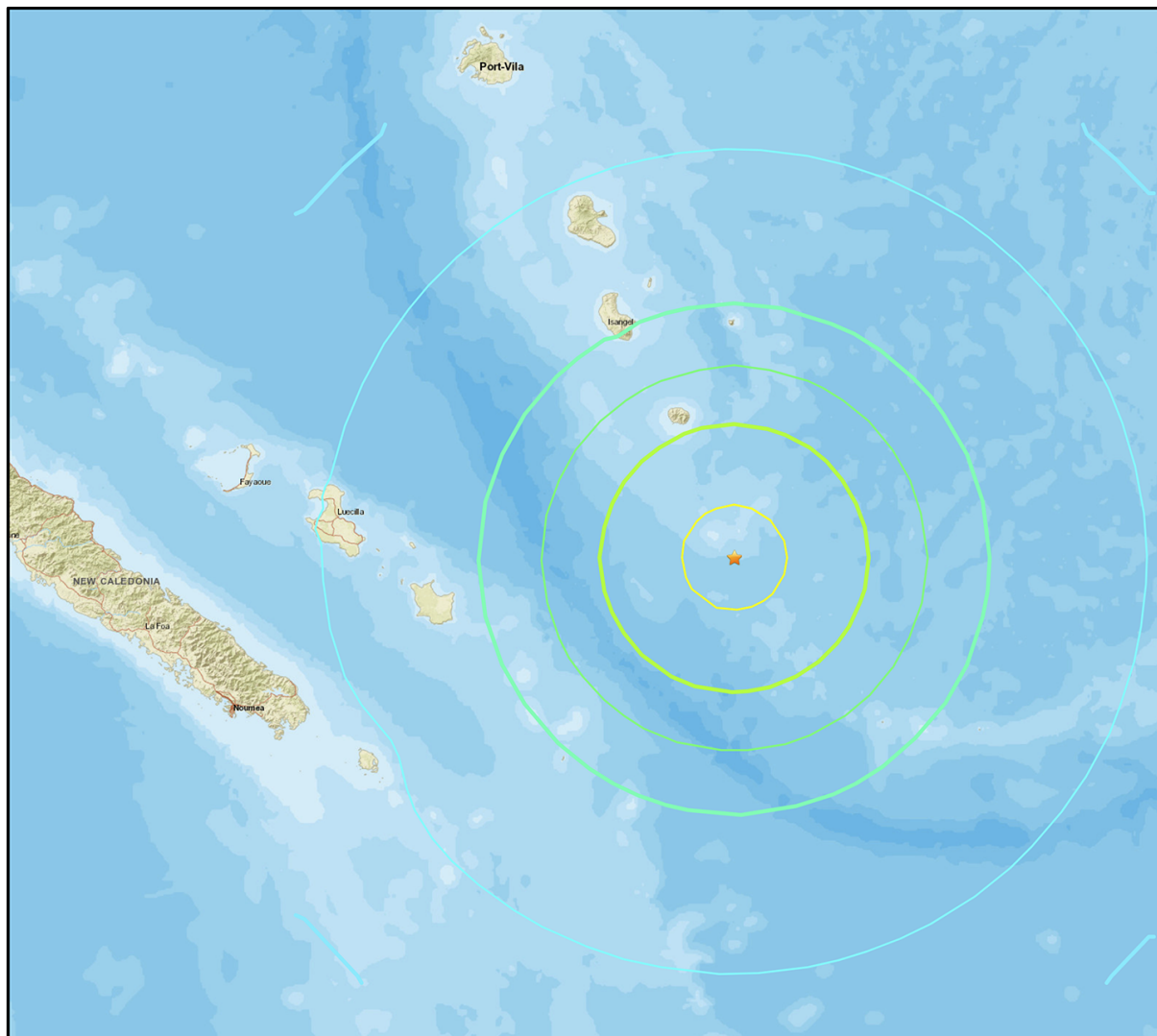
There are no reports of damage or injuries, and no risk of a tsunami.



Maps from US Geological Survey

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.

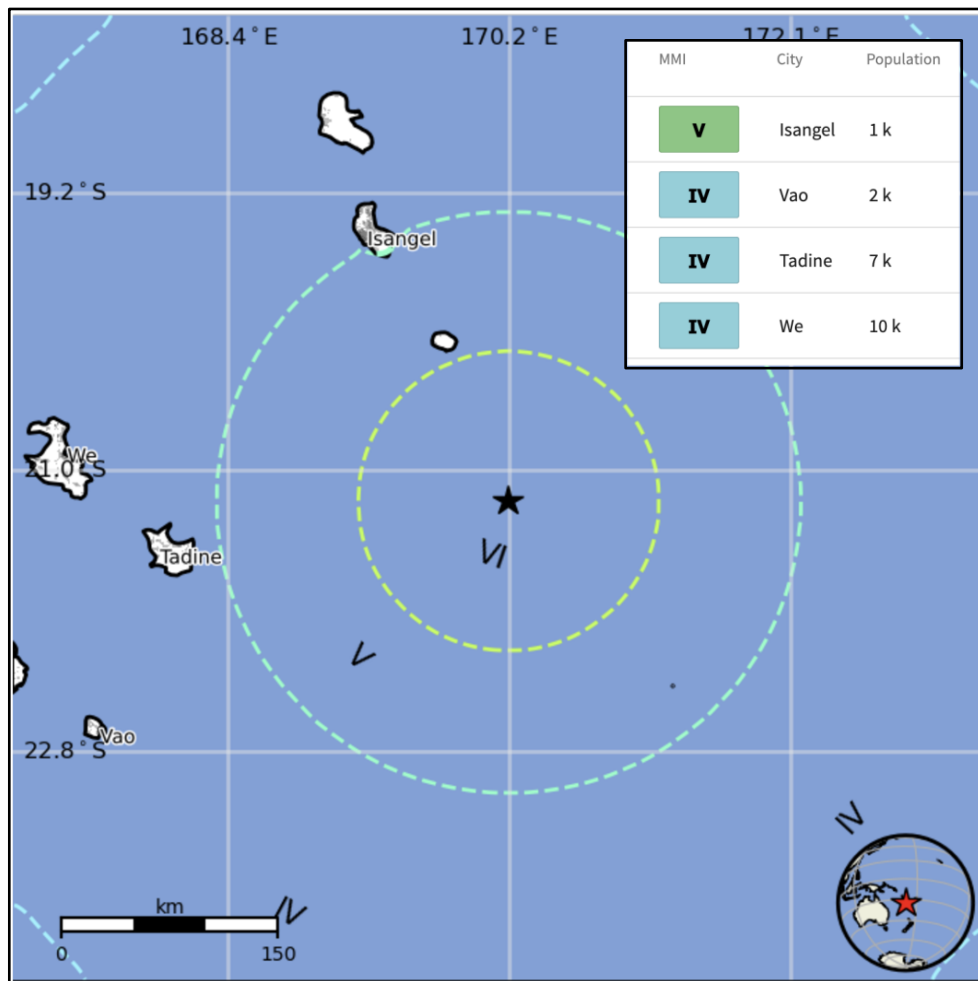
MMI	Perceived Shaking
X	Extreme
IX	Violent
VIII	Severe
VII	Very Strong
VI	Strong
V	Moderate
IV	Light
II-III	Weak
I	Not Felt



*USGS estimated shaking intensity from M 7.0 Earthquake*

The USGS PAGER map shows the population exposed to different Modified Mercalli Intensity (MMI) levels. The USGS estimates that 64,000 people felt light to moderate shaking from this earthquake. Inset shows populations and MMI levels for the islands in this image.

MMI	Shaking	Population
<b>I</b>	Not Felt	0 k*
<b>II-III</b>	Weak	0 k*
<b>IV</b>	Light	39 k*
<b>V</b>	Moderate	25 k
<b>VI</b>	Strong	0 k
<b>VII</b>	Very Strong	0 k
<b>VIII</b>	Severe	0 k
<b>IX</b>	Violent	0 k
<b>X</b>	Extreme	0 k



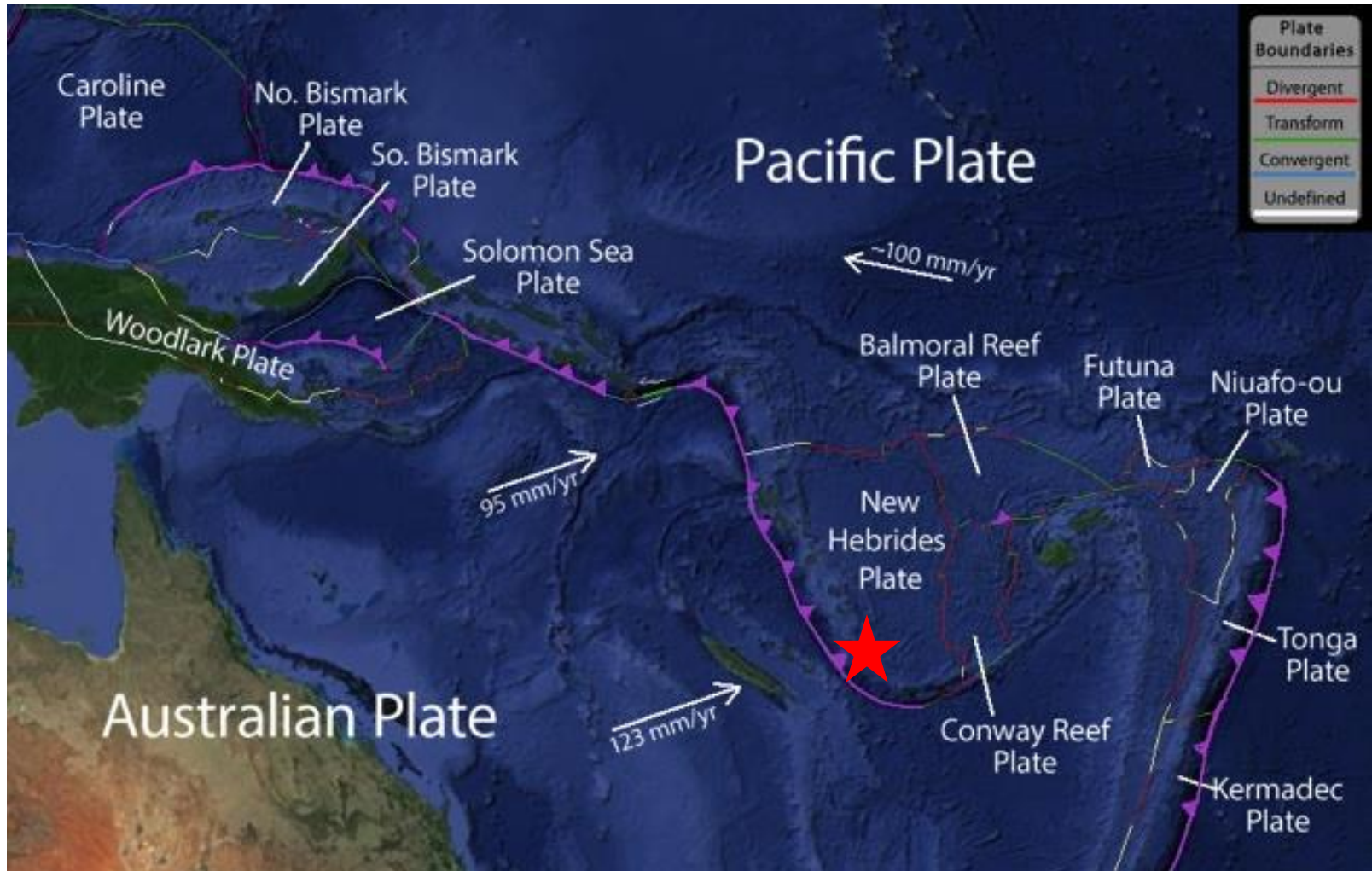
The color-coded contour lines outline regions of MMI intensity. The total population exposure to a given MMI value is obtained by summing the population between the contour lines. The estimated population exposure to each MMI Intensity is shown in the table.



# Magnitude 7.0 VANUATU

Wednesday, September 14, 2022 at 11:04:07 UTC

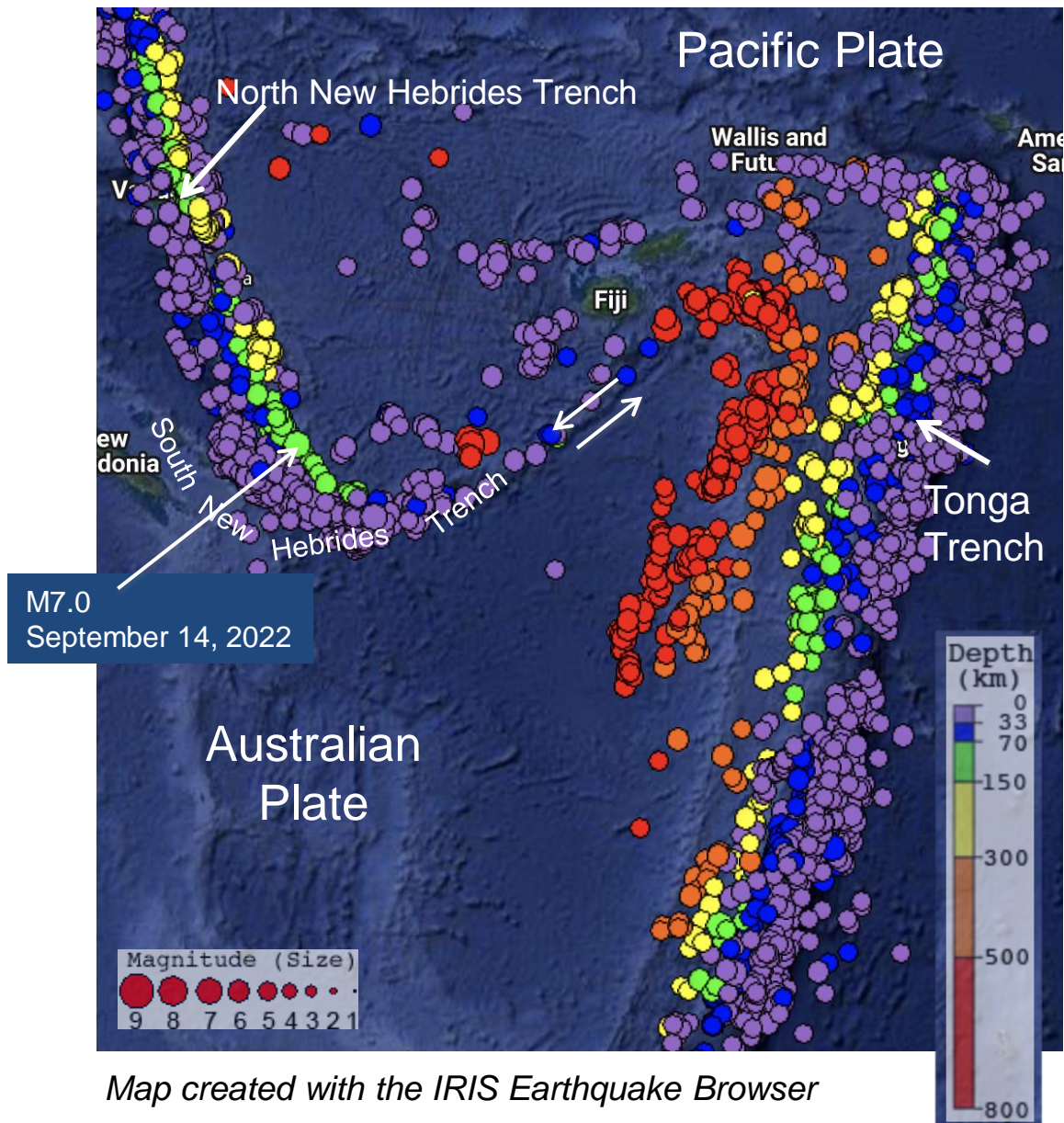
This regional map shows the complexity of plate boundaries and microplates resulting from the convergence between the Australian and Pacific Plates. The red star locates the epicenter of this magnitude 7.0 earthquake.



The epicenter of this M 7.0 earthquake is labeled on this seismicity map showing 5000 > M5 between 2012–2022.

Earthquake depths increase from east to west across the Tonga Trench where the Pacific Plate subducts beneath the Australian Plate. Across the North New Hebrides Trench, earthquake depths increase from west to east where the Australia Plate subducts beneath the Pacific Plate.

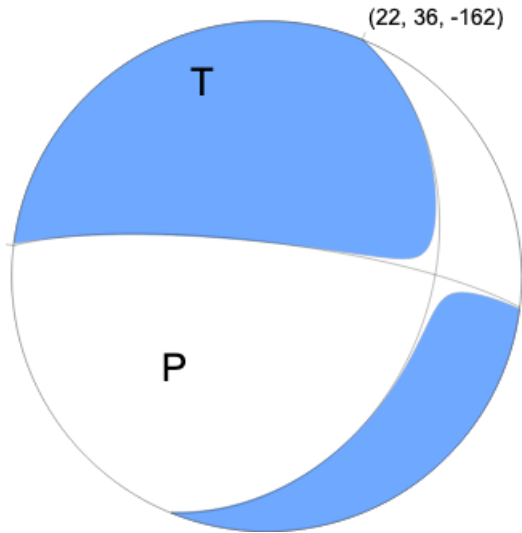
This earthquake occurred along the South New Hebrides Trench, where the plate boundary transitions from subduction to left-lateral strike-slip faulting along a transform fault that connects the two subduction zones.



Map created with the IRIS Earthquake Browser



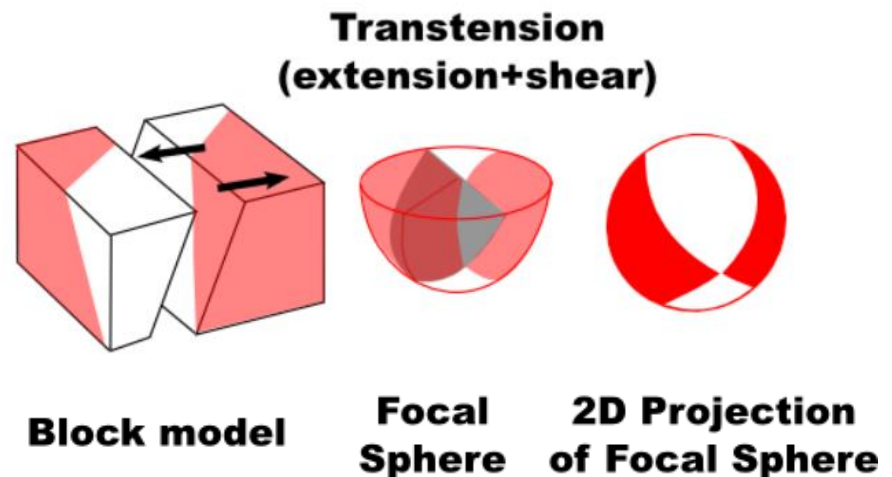
The focal mechanism is how seismologists plot the 3-D stress orientations of an earthquake. Because an earthquake occurs as slip on a fault, it generates primary (P) waves in quadrants where the first pulse is compressional (shaded) and quadrants where the first pulse is extensional (white). The orientation of these quadrants calculated from recorded seismic waves determines the type of fault that produced the earthquake.



USGS W-phase Moment Tensor Solution

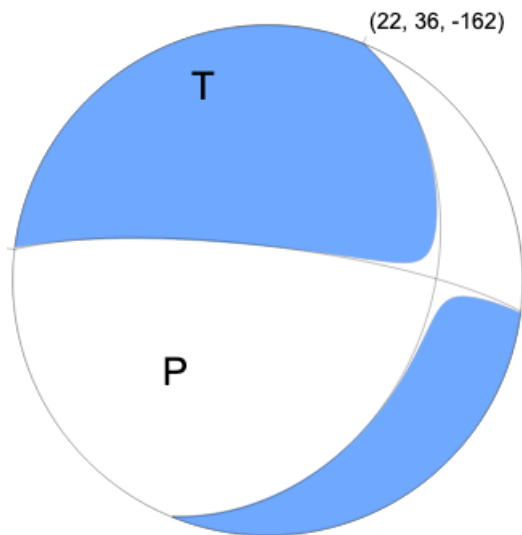
The tension axis (T) reflects the minimum compressive stress direction. The pressure axis (P) reflects the maximum compressive stress direction.

In this case, the earthquake occurred as the result of oblique normal faulting at an intermediate depth, approximately 145 km beneath the Loyalty Islands within the lithosphere of the subducted Australian Plate.

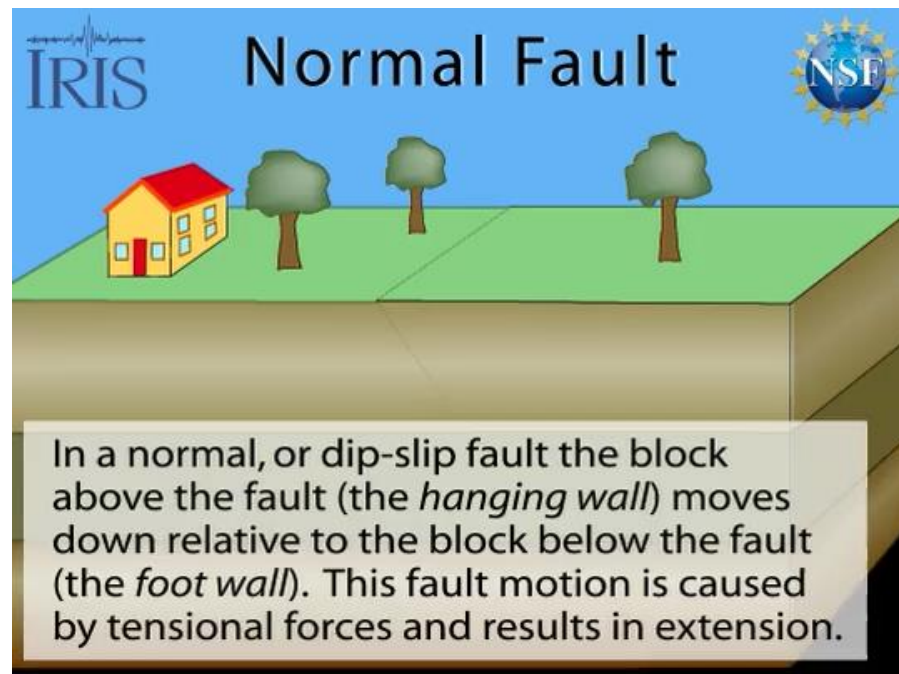


This animation explores the motion of a normal fault, and how normal faults are represented in a focal mechanism.

Remember, this was the focal mechanism solution for this earthquake. It was estimated by an analysis of observed seismic waveforms, recorded after the earthquake, observing the pattern of "first motions", that is, whether the first arriving P waves push up or down.

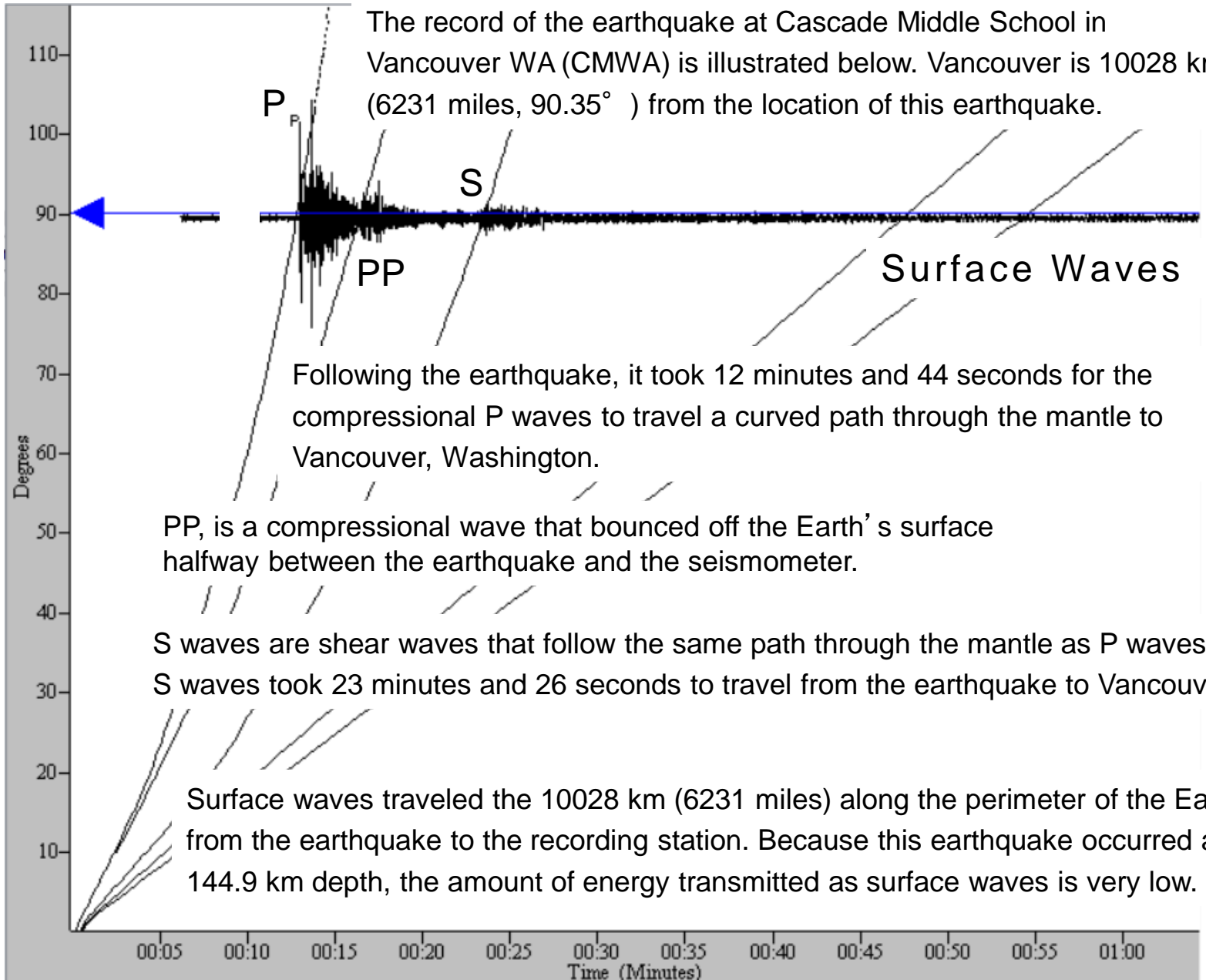


USGS W-phase Moment Tensor Solution



# Magnitude 7.0 VANUATU

Wednesday, September 14, 2022 at 11:04:07 UTC





## 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](mailto:tkb@iris.edu)

To receive automatic notifications of new Teachable Moments  
subscribe at [www.iris.edu/hq/retm](http://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.