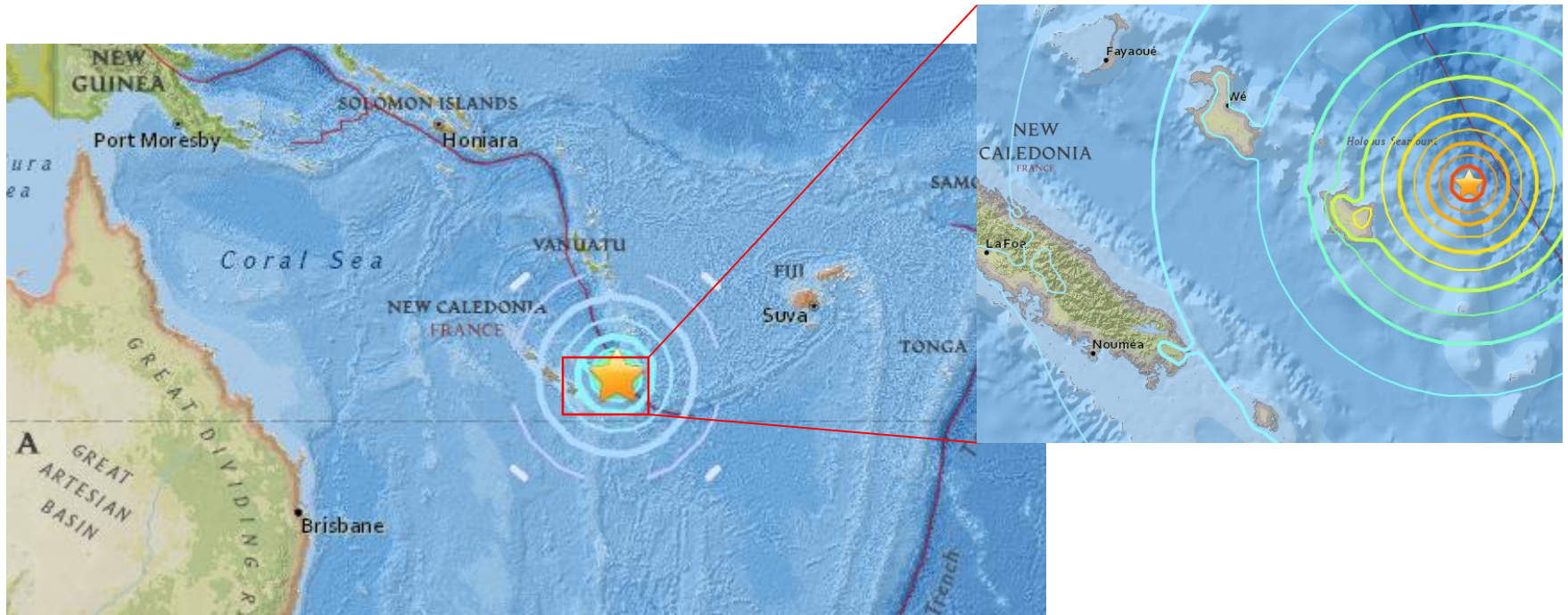


Magnitude 7.0 NEW CALEDONIA

Sunday, November 19, 2017, 22:43:29 UTC

A magnitude 7.0 earthquake has occurred 82km ENE of Maré Island, the second-largest of the Loyalty Islands in the archipelago of New Caledonia. The initial report of the magnitude and shallow 10km depth prompted a tsunami warning that 'Hazardous tsunami waves from this earthquake are possible within 300 km of the epicenter along the coasts of Vanuatu and New Caledonia'.

There are no immediate reports of damage or casualties.



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

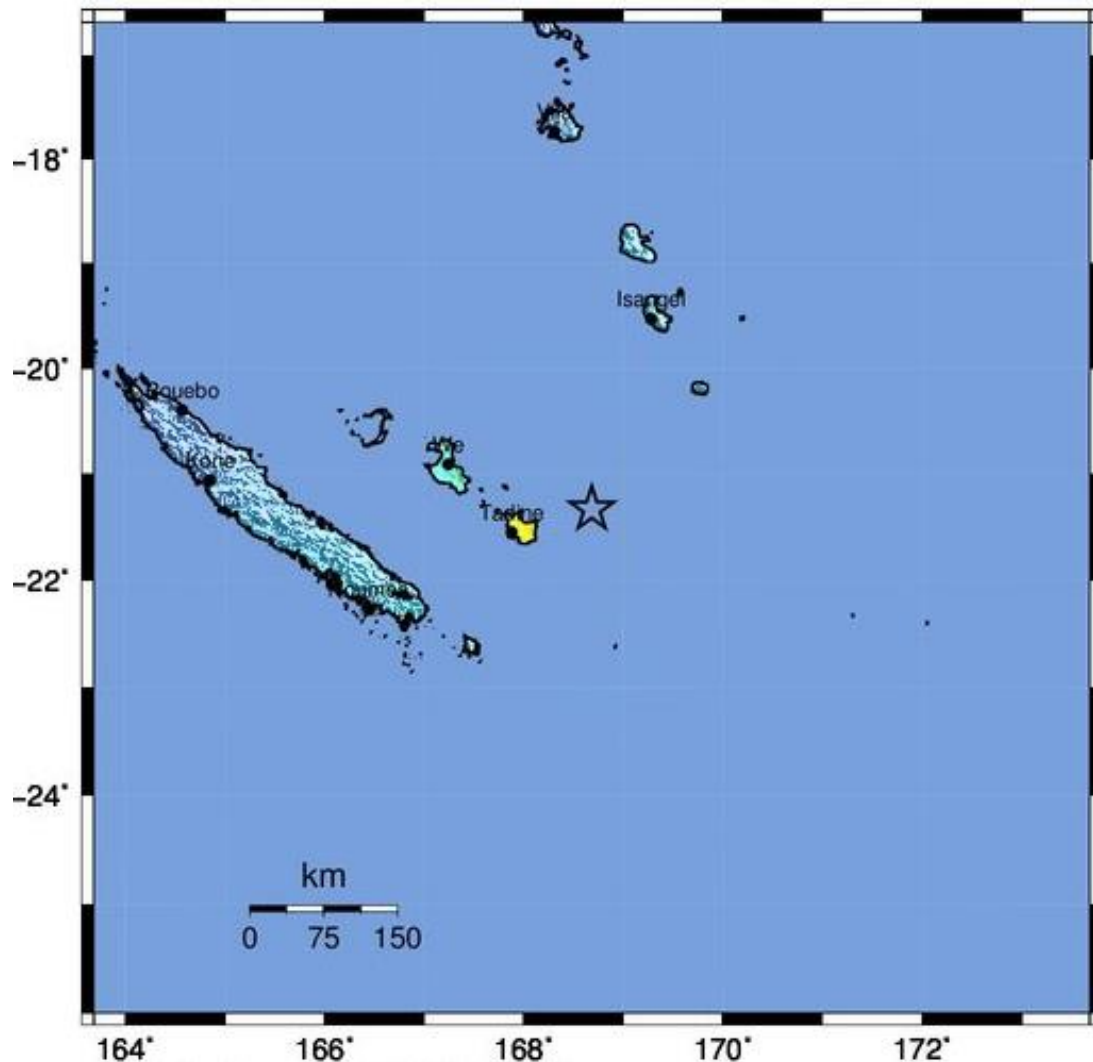
Maré Island with a population nearing 7,000 experienced strong shaking during the earthquake.

Modified Mercalli Intensity



Perceived Shaking

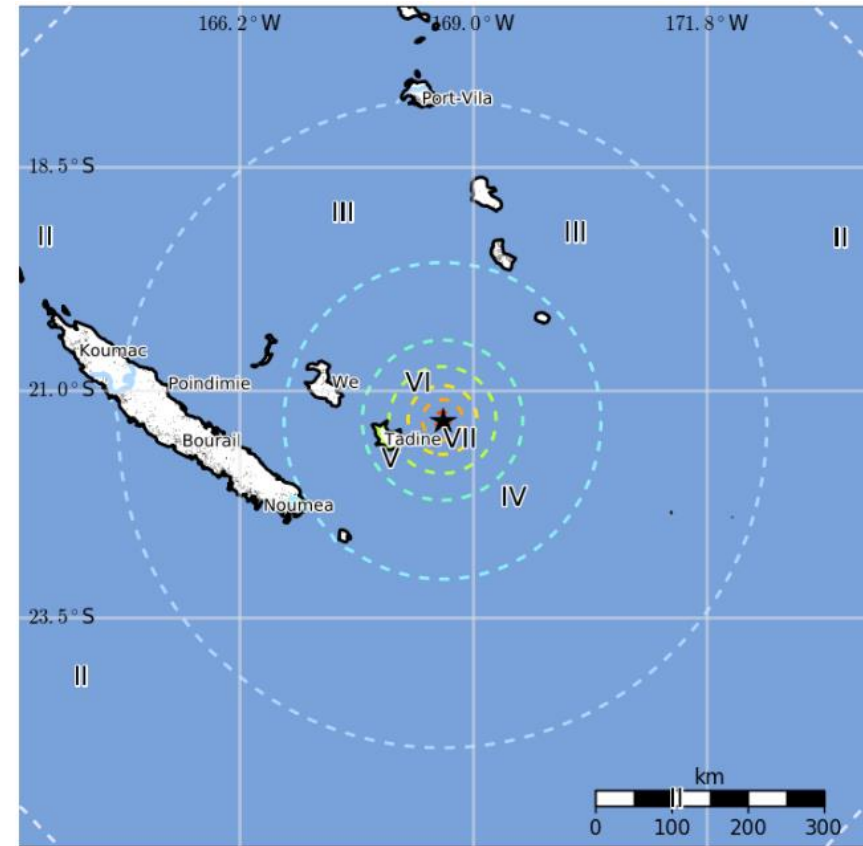
Extreme
Violent
Severe
Very Strong
Strong
 Moderate
 Light
 Weak
 Not Felt



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

The USGS estimates approximately 1000 people felt strong shaking from this earthquake.

MMI	Shaking	Pop.
I	Not Felt	--*
II-III	Weak	359 k*
IV	Light	30 k
V	Moderate	5 k
VI	Strong	1 k
VII	Very Strong	0 k
VIII	Severe	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

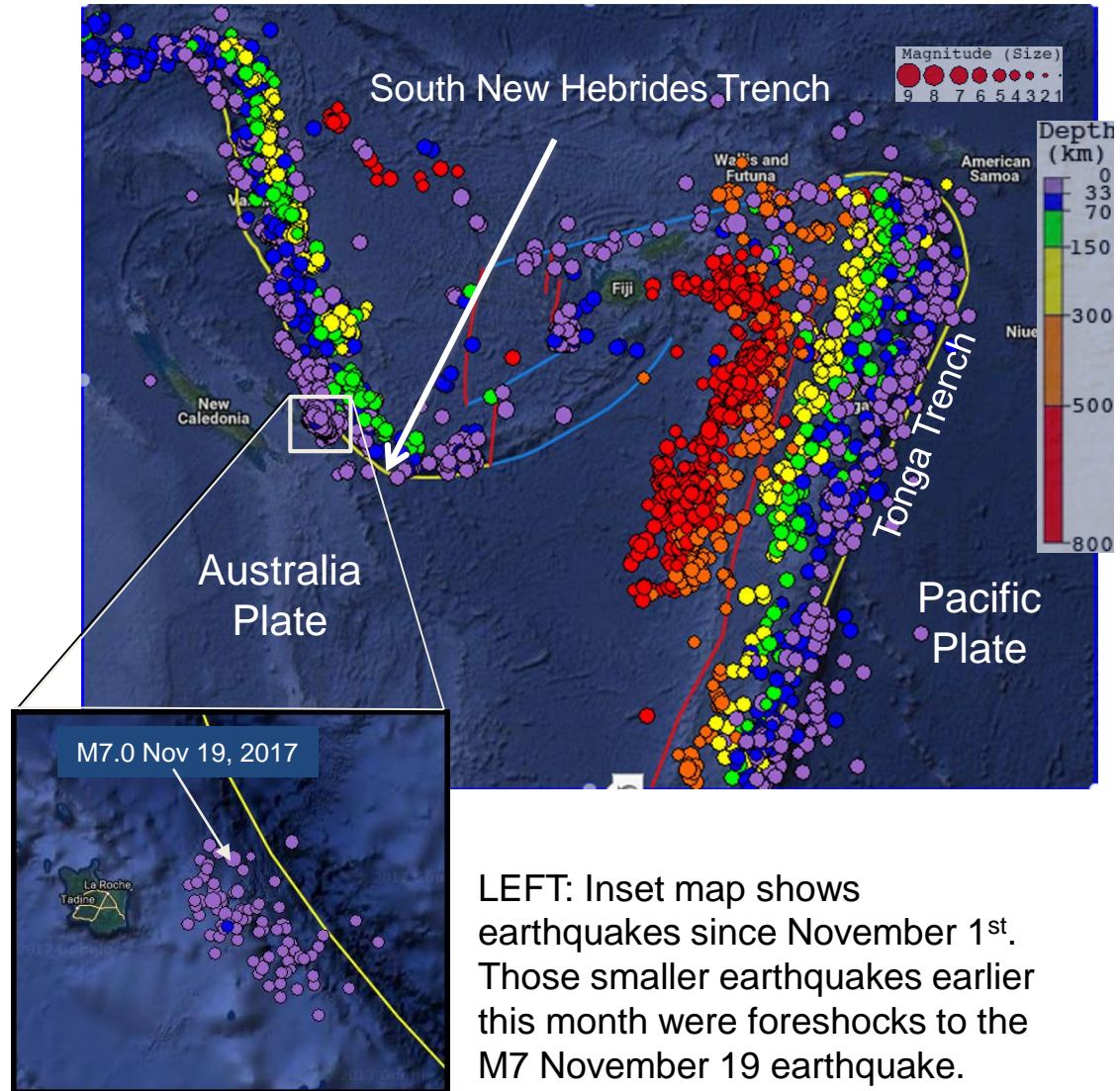
Magnitude 7.0 NEW CALEDONIA

Sunday, November 19, 2017, 22:43:29 UTC

The epicenter of this earthquake is labeled on this seismicity map showing the most recent 3000 regional earthquakes.

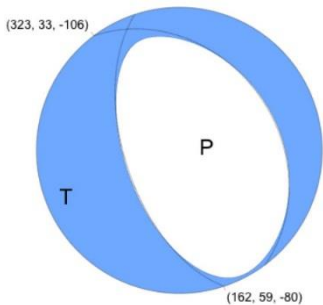
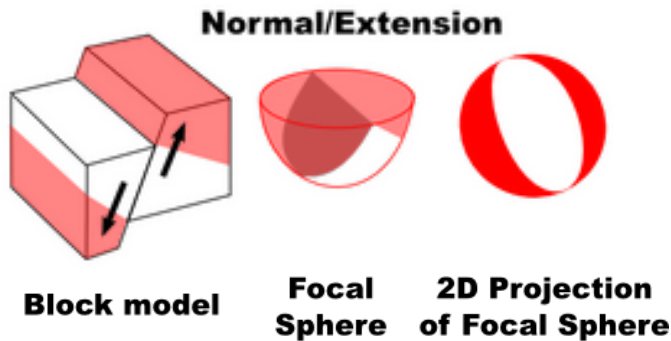
Earthquake depths increase from east to west across the Tonga Trench where the Pacific Plate subducts beneath the Australian Plate. Across the South New Hebrides Trench, earthquake depths increase from west to east where the Australia Plate subducts beneath the Pacific Plate.

This earthquake was caused by normal (extensional) faulting where the Australia Plate bends to dive beneath the Pacific Plate.

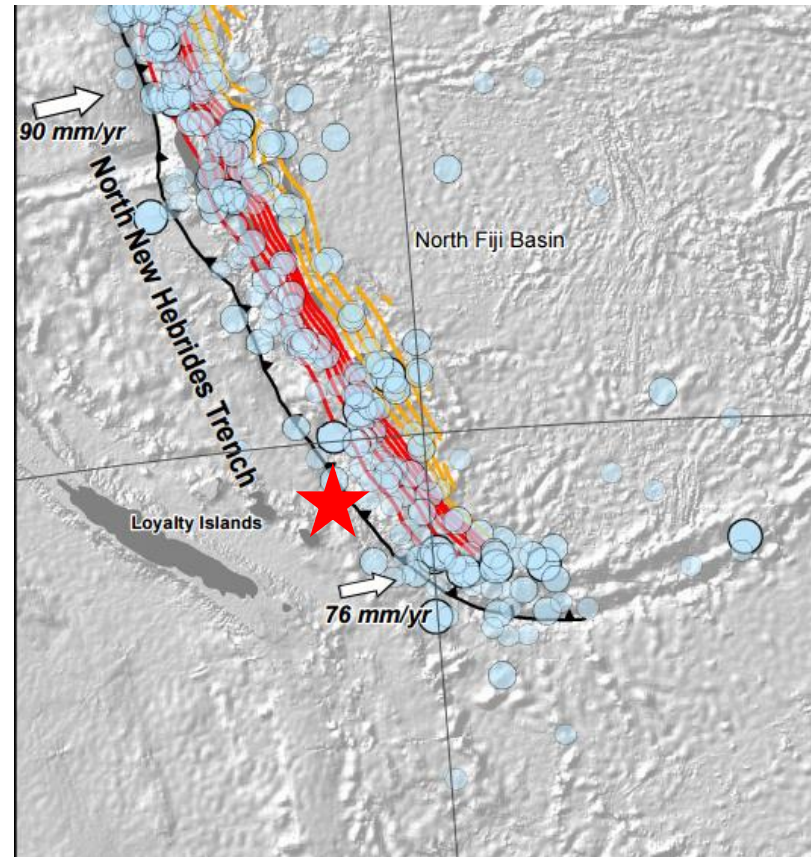


LEFT: Inset map shows earthquakes since November 1st. Those smaller earthquakes earlier this month were foreshocks to the M7 November 19 earthquake.

The focal mechanism solution indicates motion on a normal fault. As oceanic plates descend into subduction zones from the seafloor, they must increase their curvature. This results in extensional forces and normal-faulting earthquakes within the upper portion of the subducting plate.



USGS WPhase Centroid Moment Tensor Solution

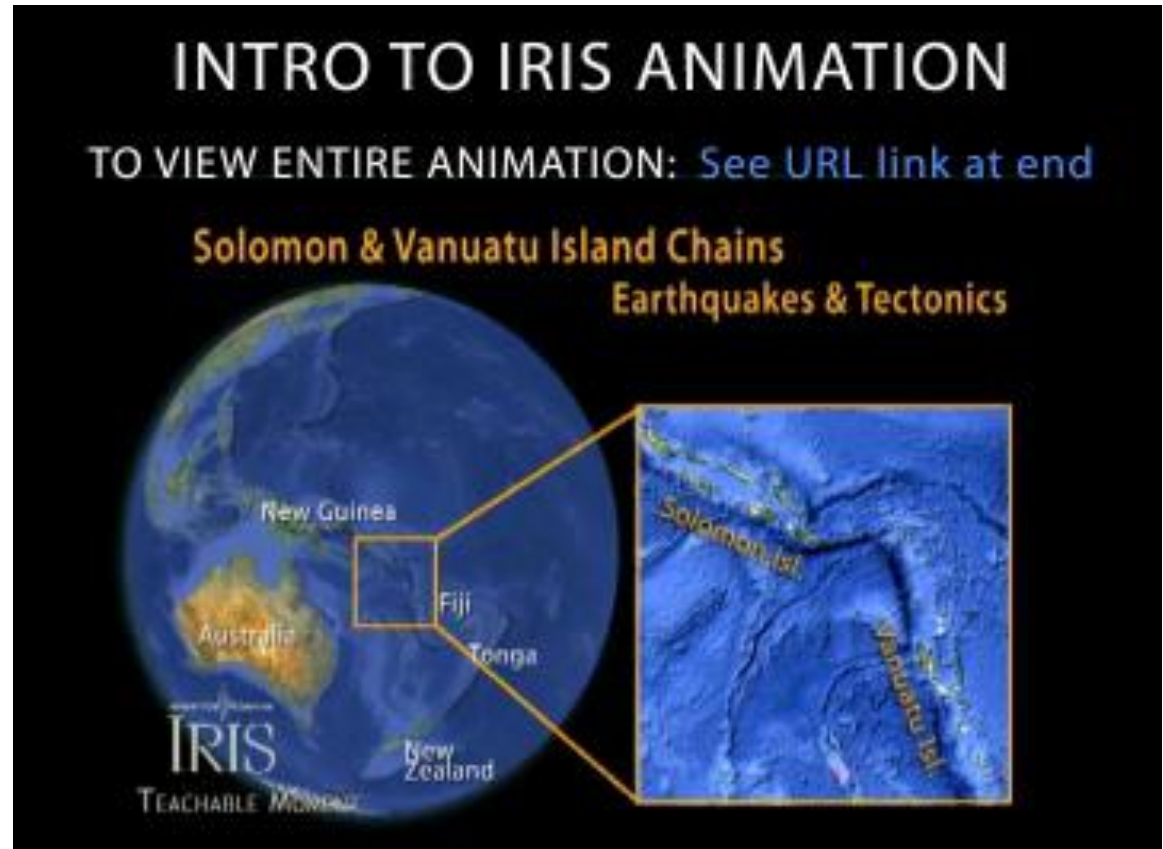


Shaded areas show quadrants of the focal sphere in which the P-wave first-motions are away from the source, and unshaded areas show quadrants in which the P-wave first-motions are toward the source. The letters represent the axis of maximum compressional strain (P) and the axis of maximum extensional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

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

The full animation 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.



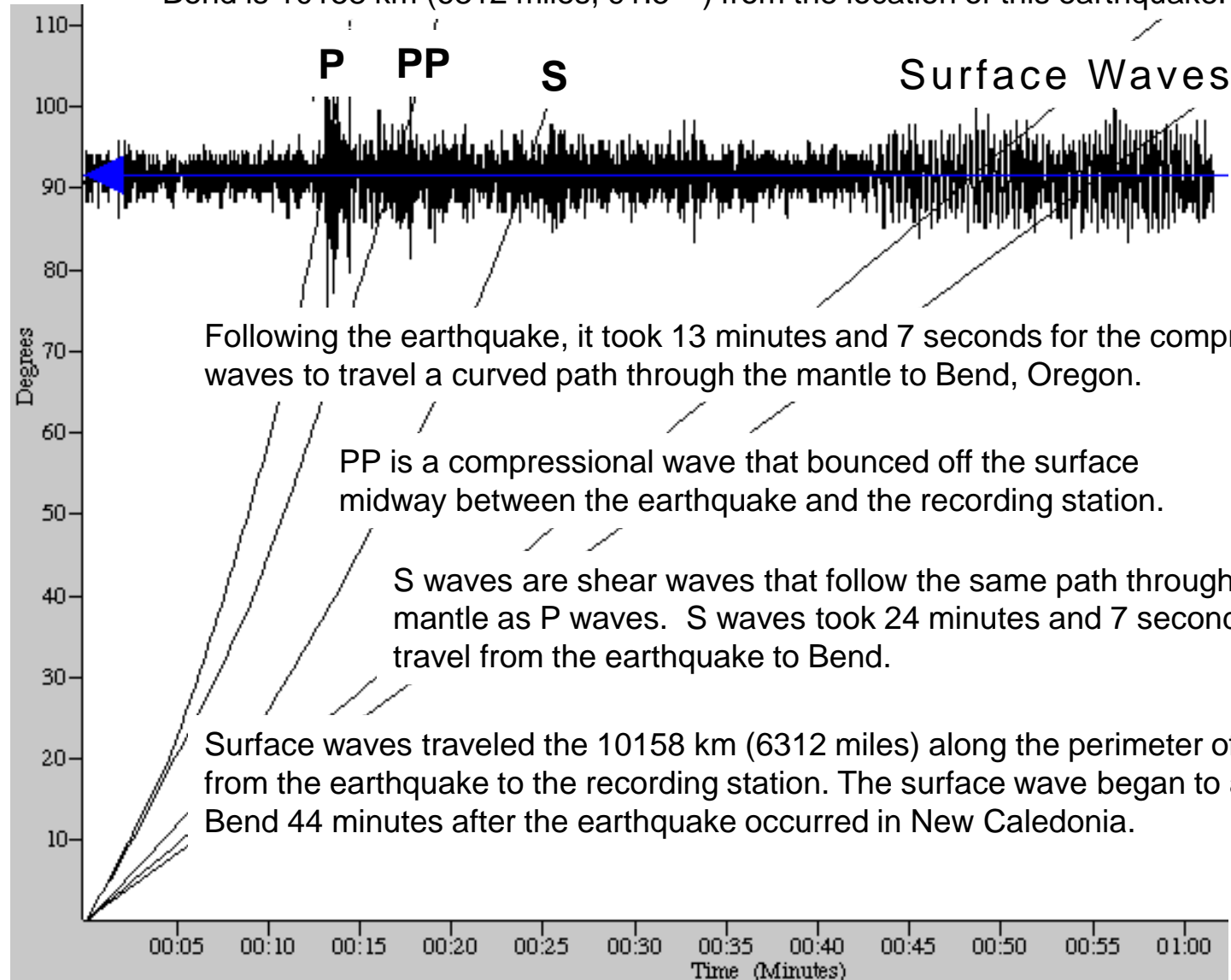
Full animation: <https://youtu.be/GUIPv1vUvlc>

Or download: www.iris.edu/hq/inclass/search#type=1

Magnitude 7.0 NEW CALEDONIA

Sunday, November 19, 2017, 22:43:29 UTC

The record of the earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 10158 km (6312 miles, 91.5°) from the location of this earthquake.



Teachable Moments are a service of

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Education & Public Outreach
and
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