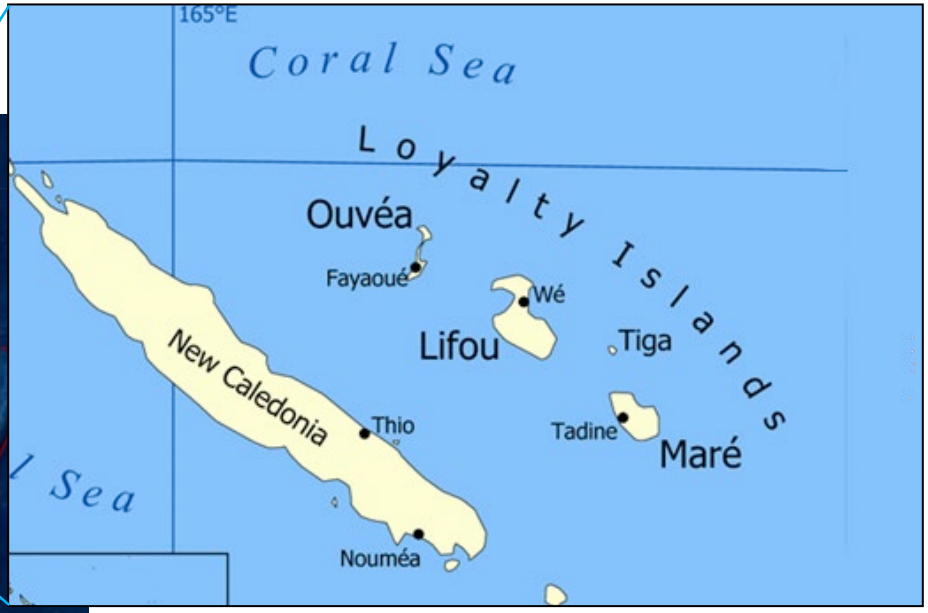
Magnitude 7.0 NEW CALEDONIA
Thursday, March 31, 2022, 05:44:01 UTC

A magnitude 7.0 earthquake has occurred 279 km (173 miles) ESE of Tadine, New Caledonia at a depth of 10 km (6.2 miles). A tsunami warning issued for the region has been lifted. There are no immediate reports of damage or injuries.



Yédjélé Beach, Maré, New Caledonia

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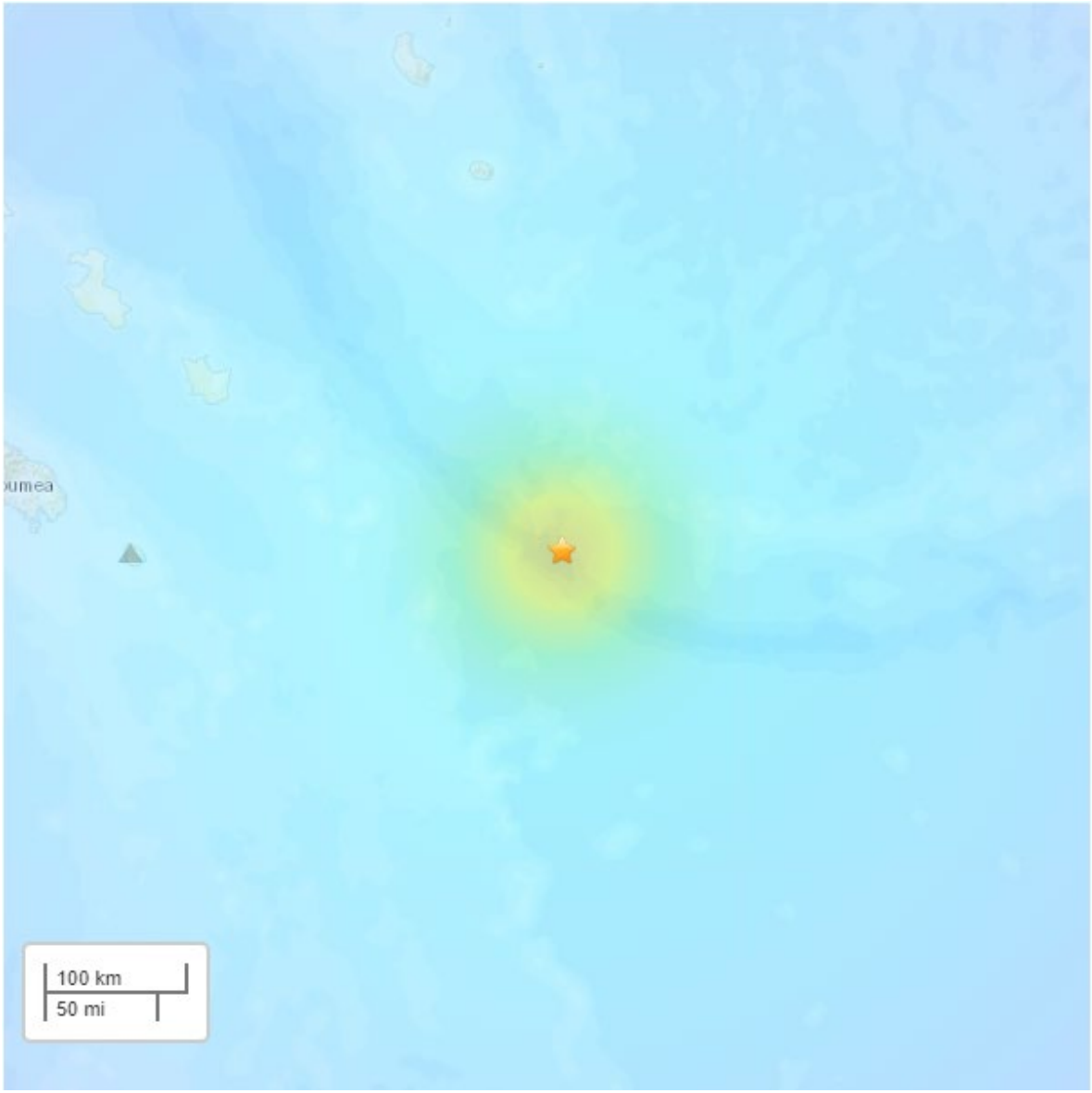
The Modified-Mercalli Intensity (MMI) scale is a ten-stage scale, from I to X, that indicates the severity of ground shaking. Intensity is based on observed effects and is variable over the area affected by an earthquake. Intensity is dependent on earthquake size, depth, distance, and local conditions.

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

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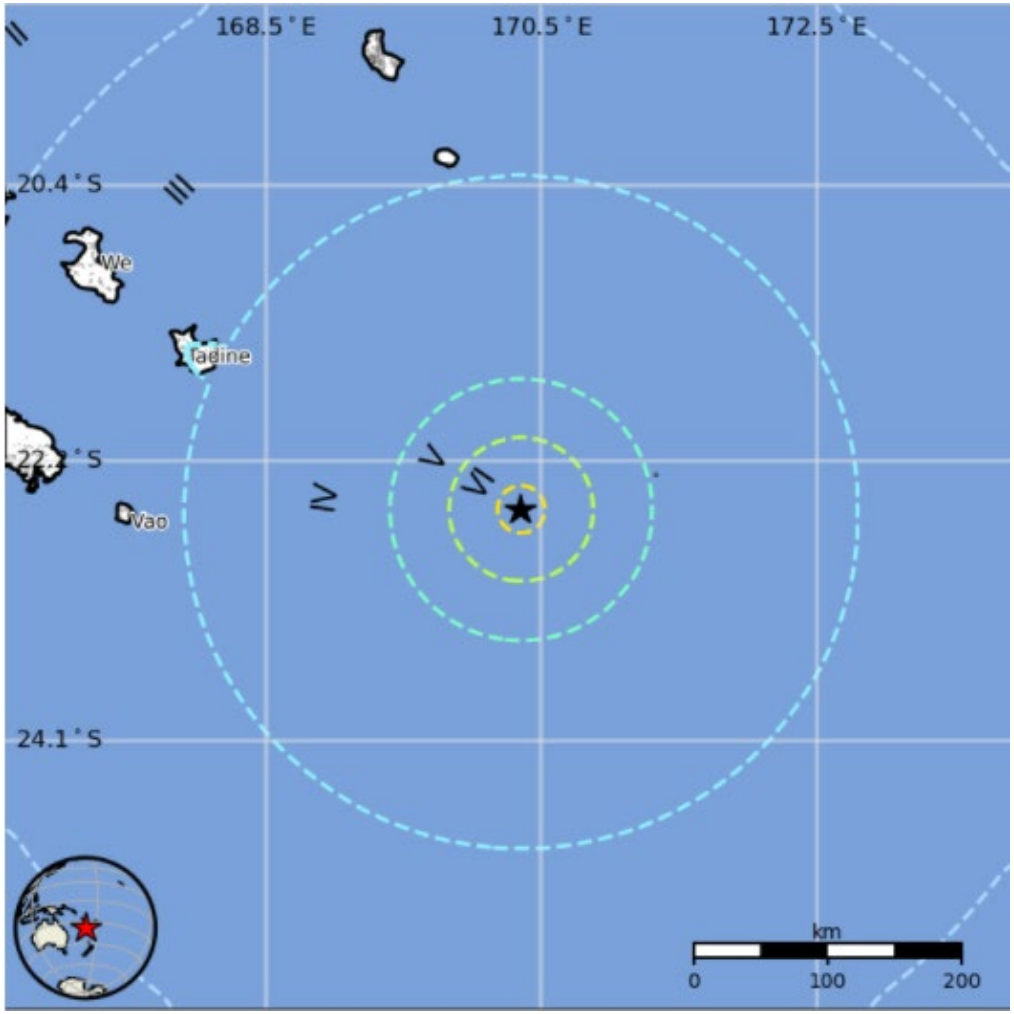
The USGS PAGER map shows the population exposed to different Modified Mercalli Intensity (MMI) levels.

The USGS estimates that over 3,000 people felt light shaking from this earthquake.

I	Not Felt	0 k*
II-III	Weak	68 k*
IV	Light	3 k
V	Moderate	0 k
VI	Strong	0 k
VII	Very Strong	0 k
VIII	Severe	0 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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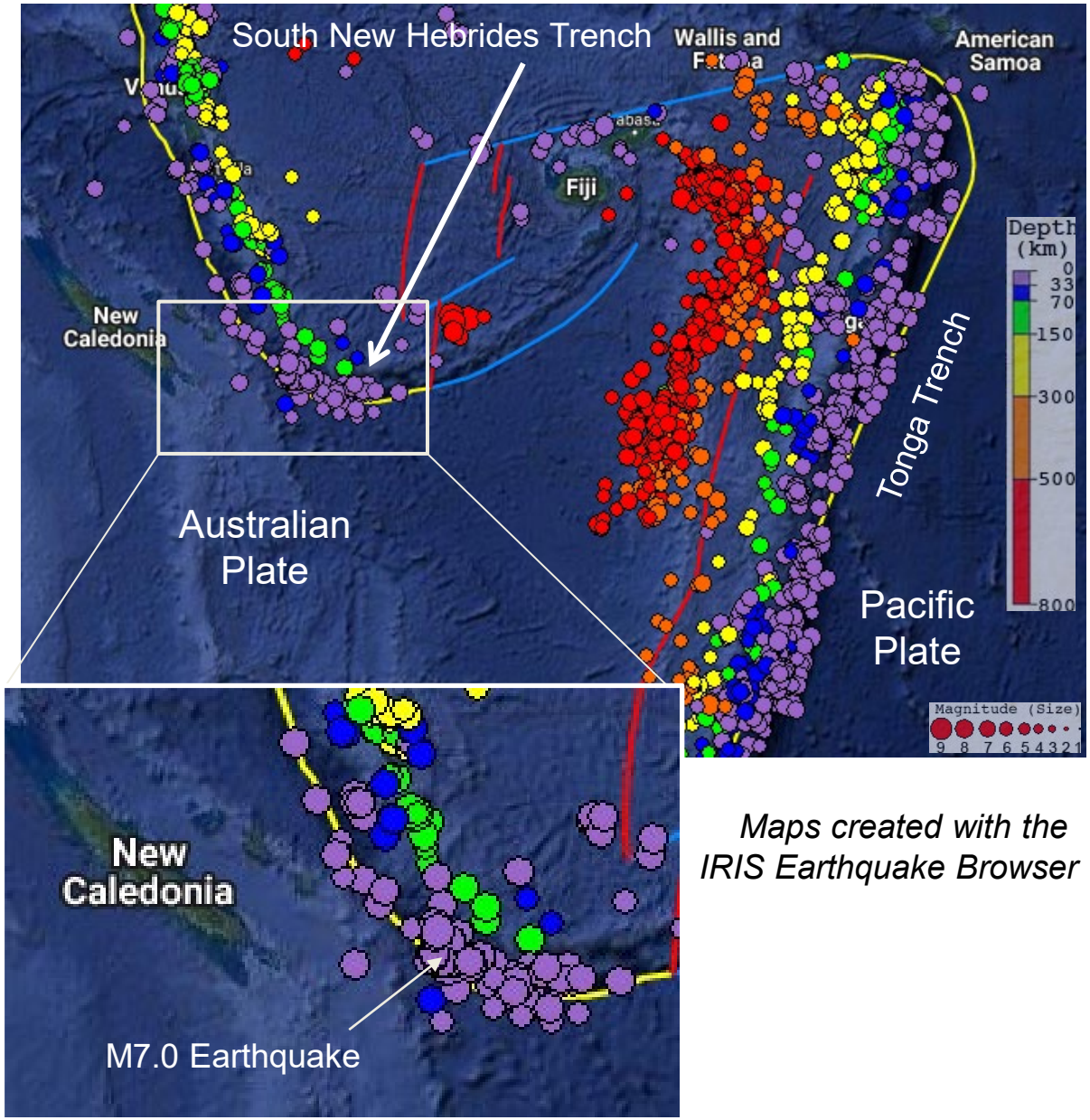
This seismicity map shows the most recent 2000 earthquakes in the region of the South New Hebrides and Tonga trenches. Earthquake depths increase from west to east across the South New Hebrides Trench, where the Australian Plate subducts beneath the Pacific Plate.

Across the Tonga Trench, earthquake depths increase from east to west where the Pacific Plate subducts beneath the Australian Plate.

The epicenter of this M7.0 earthquake is labeled on the inset map at right.



Maps created with the IRIS Earthquake Browser

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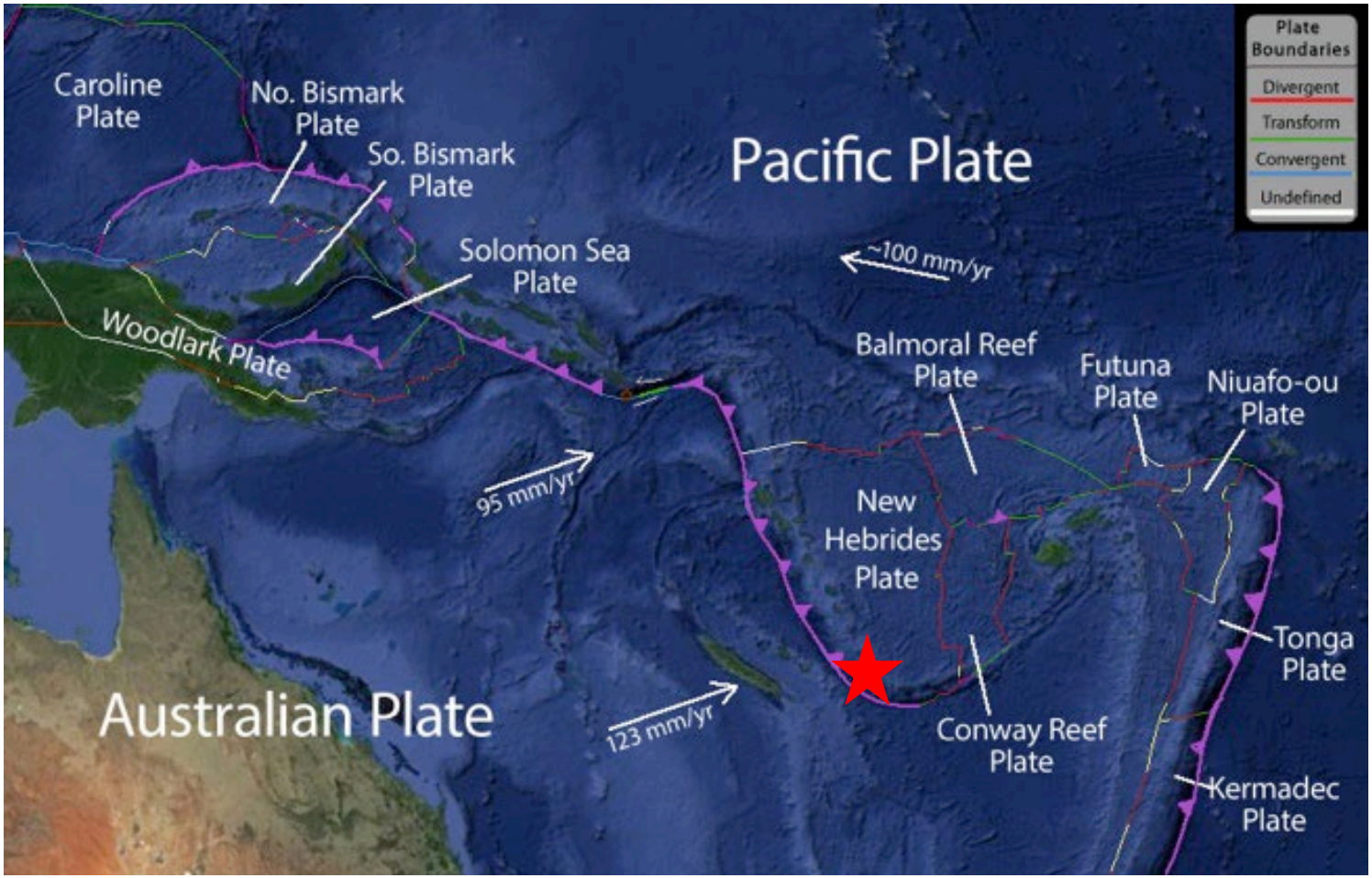
This regional map shows the complexity of major tectonic plates and microplates resulting from the convergence between the Australian and Pacific Plates. The red star indicates the epicenter of this earthquake. The location and focal mechanism indicate that this earthquake resulted from thrust faulting on or near the boundary between the subducting Australian Plate and the overriding Pacific Plate in the subduction zone at the South New Hebrides Trench.



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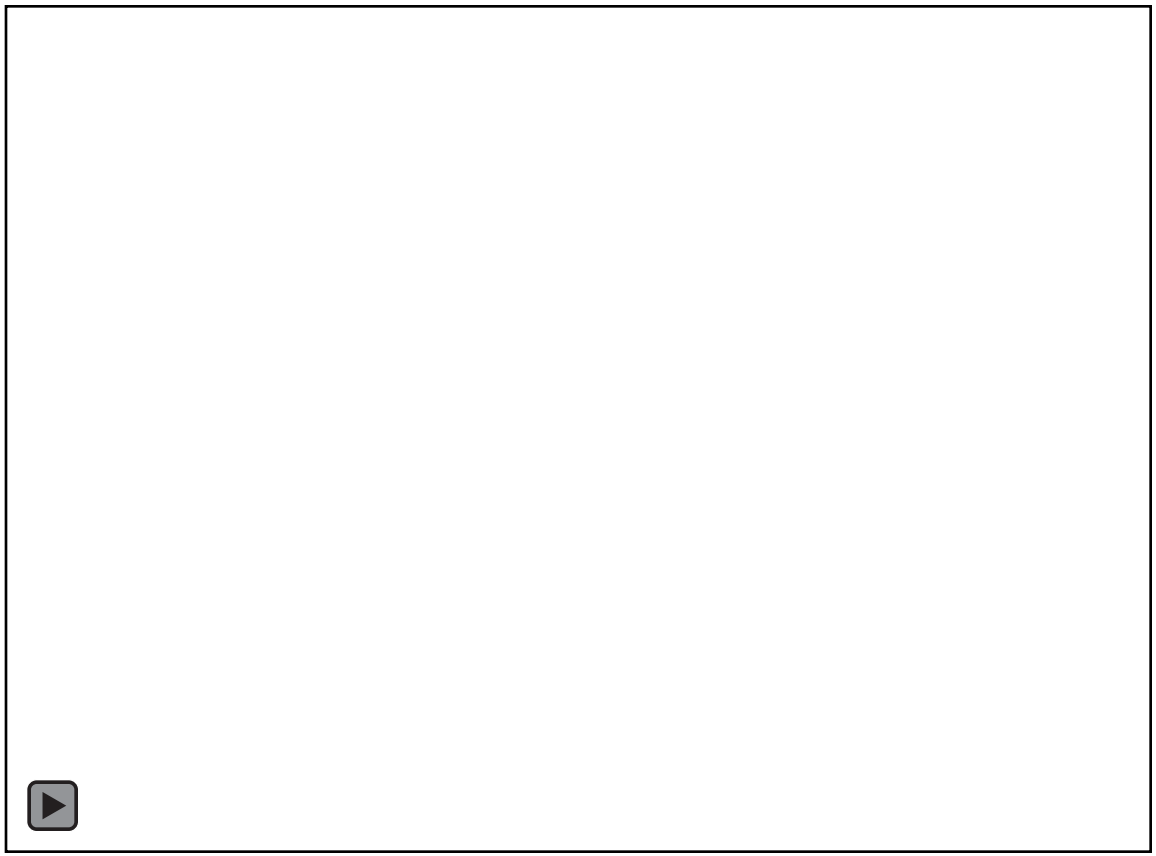
This short animation is part of a longer IRIS animation that looks at seismicity and tectonics of Australian – Pacific Plate interactions immediately to the northwest of this earthquake

The animation examines three cross sections from southeast to northwest that reveal a change from:

1. Steeply-dipping subduction along the New Hebrides trench to

2. Strike-slip motion along the Solomon Islands to

3. Shallow-dipping subduction farther to the west.



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

Or download: https://www.iris.edu/hq/inclass/animation/237

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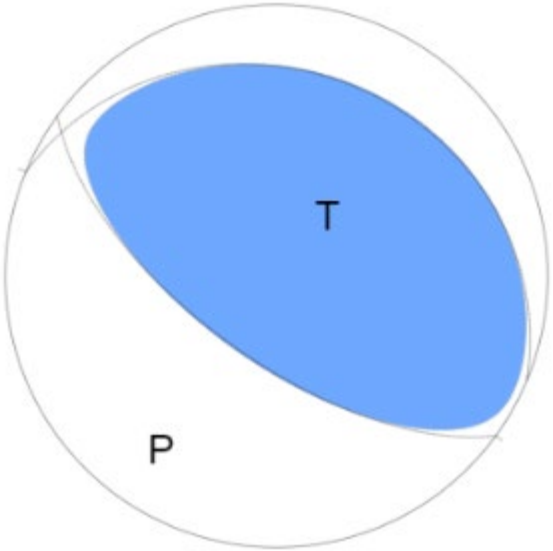
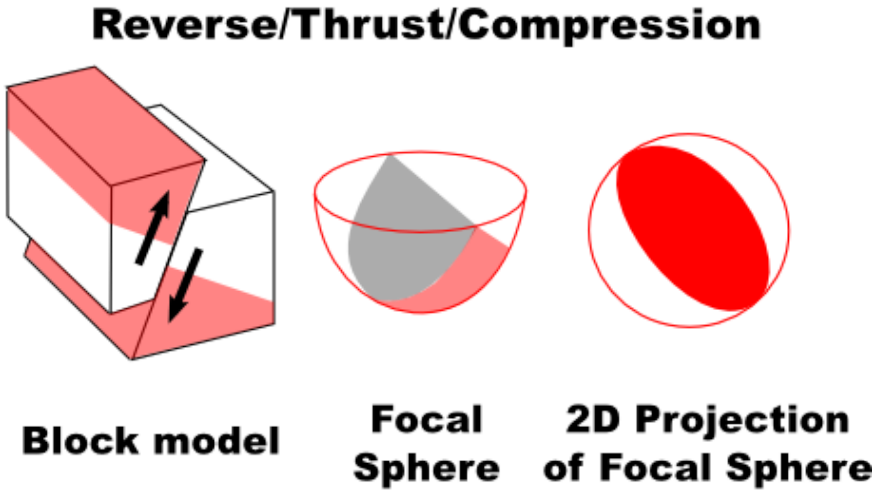
The focal mechanism is how seismologists plot the 3-D stress orientations of an earthquake. Because an earthquake occurs as slip on a fault, it generates primary (P) waves in quadrants where the first pulse is compressional (shaded) and quadrants where the first pulse is extensional (white). The orientation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

The earthquake occurred as the result of reverse faulting on or near the plate boundary interface between the Australian Plate and the Pacific Plate.





USGS WPhase Centroid Moment Tensor Solution

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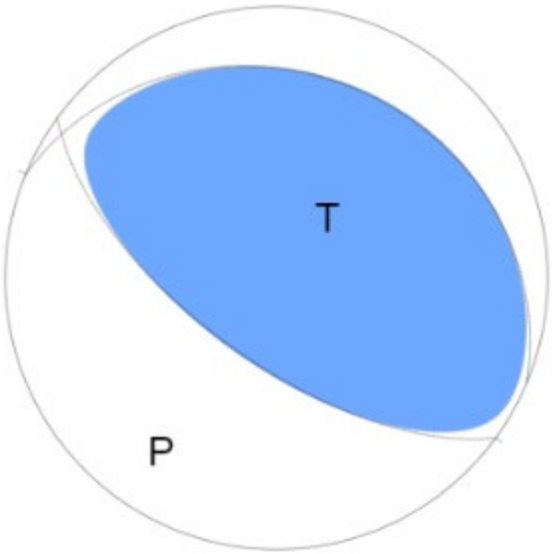
This animation explores the motion of a reverse fault, and how reverse faults are represented in a focal mechanism.



USGS W-phase Moment Tensor Solution

Remember, this was the focal mechanism solution for this earthquake. It was estimated by analysis of the pattern of "first motions", that is, whether the first-arriving P waves push up or pull down.

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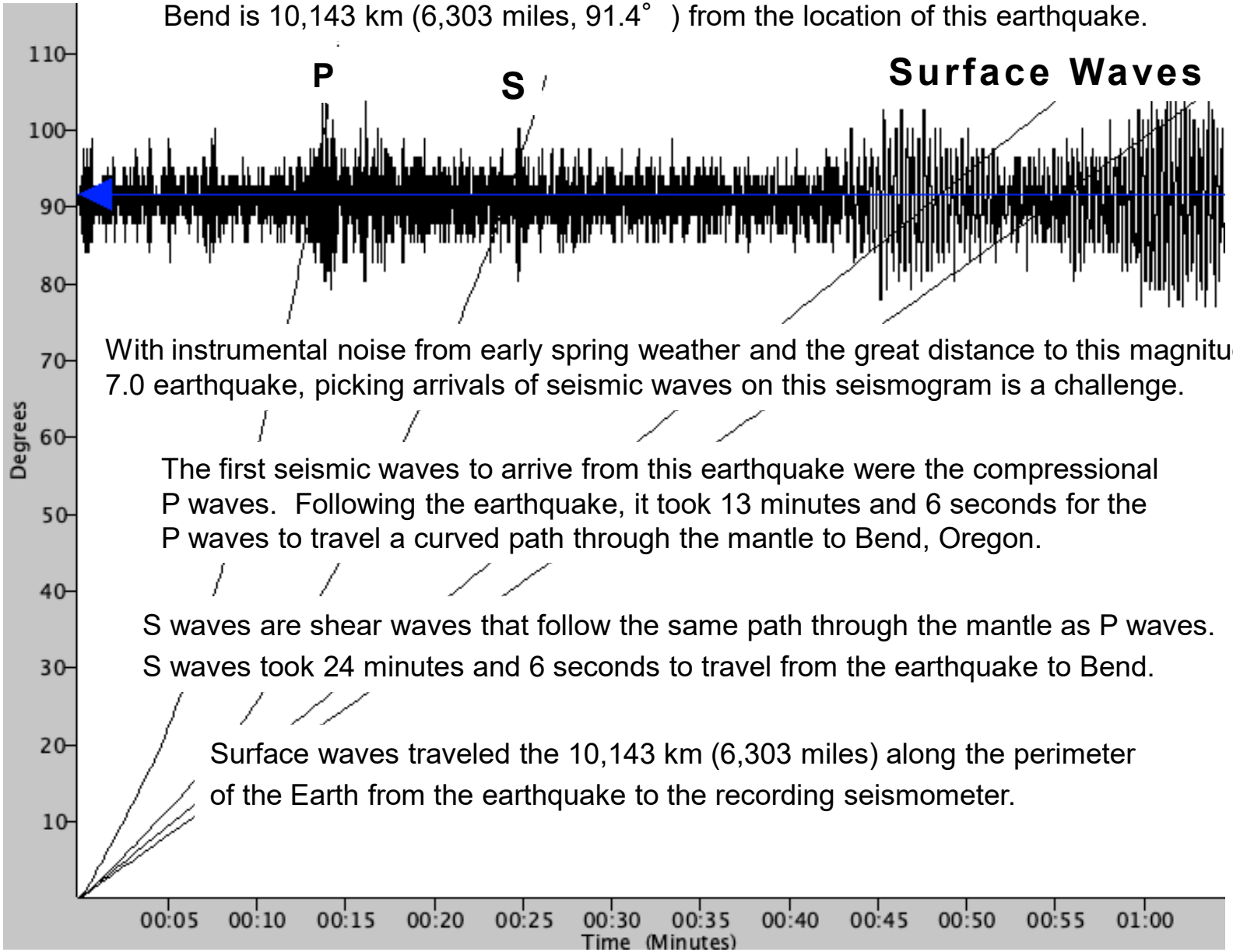
The record of the earthquake in Bend, Oregon (BNOR) is illustrated below.
Bend is 10,143 km (6,303 miles, 91.4˚) from the location of this earthquake.



With instrumental noise from early spring weather and the great distance to this magnitude 7.0 earthquake, picking arrivals of seismic waves on this seismogram is a challenge.

The first seismic waves to arrive from this earthquake were the compressional P waves. Following the earthquake, it took 13 minutes and 6 seconds for the P waves to travel a curved path through the mantle to Bend, Oregon.

S waves are shear waves that follow the same path through the mantle as P waves. S waves took 24 minutes and 6 seconds to travel from the earthquake to Bend.

Surface waves traveled the 10,143 km (6,303 miles) along the perimeter of the Earth from the earthquake to the recording seismometer.

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