A major earthquake struck in the southwest Pacific Ocean at a depth of 27 km beneath the island of Melampa in the Vanuatu island chain.

There are no reports of damage.
The Modified Mercalli Intensity (MMI) scale depicts shaking severity.

Very strong ground shaking was felt at the epicenter.
The USGS PAGER map shows the population exposed to different Modified Mercalli Intensity (MMI) levels.

Approximately 6,000 people experienced very strong ground shaking during this earthquake.

<table>
<thead>
<tr>
<th>MMI</th>
<th>Shaking</th>
<th>Pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Not Felt</td>
<td>~1</td>
</tr>
<tr>
<td>II-III</td>
<td>Weak</td>
<td>9 k</td>
</tr>
<tr>
<td>IV</td>
<td>Light</td>
<td>125 k</td>
</tr>
<tr>
<td>V</td>
<td>Moderate</td>
<td>76 k</td>
</tr>
<tr>
<td>VI</td>
<td>Strong</td>
<td>30 k</td>
</tr>
<tr>
<td>VII</td>
<td>Very Strong</td>
<td>6 k</td>
</tr>
<tr>
<td>VIII</td>
<td>Severe</td>
<td>0 k</td>
</tr>
<tr>
<td>IX</td>
<td>Violent</td>
<td>0 k</td>
</tr>
</tbody>
</table>

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*
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.
The Vanuatu Islands sit above the subduction zone where the Australian Plate dives beneath the Pacific Plate. Earthquakes occur as the plates grind past each other. They are shallow on the west near the surface contact between the plates, and deeper to the east.
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 this earthquake fits the general pattern of increasing depths of earthquakes from west to east across the subduction zone.

Hand-drawn lines on the 3-D cross-sectional view from the IEB reveal a steeply dipping plate.
According to the USGS, the preliminary location, depth and focal mechanism of the event indicate rupture occurred on an east-dipping thrust fault consistent with the location and orientation of the subduction zone interface at depth in this region.

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.
Following the earthquake, it took 12 minutes and 52 seconds for the compressional P waves to travel a curved path through the mantle to Portland, Oregon.

S waves are shear waves that follow the same path through the mantle as P waves. S waves took 23 minutes and 37 seconds to travel from the earthquake to Portland.

Surface waves traveled the 9777 km (6075 miles) along the perimeter of the Earth from the earthquake to the recording station.
Teachable Moments are a service of

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Please send feedback to tkb@iris.edu