

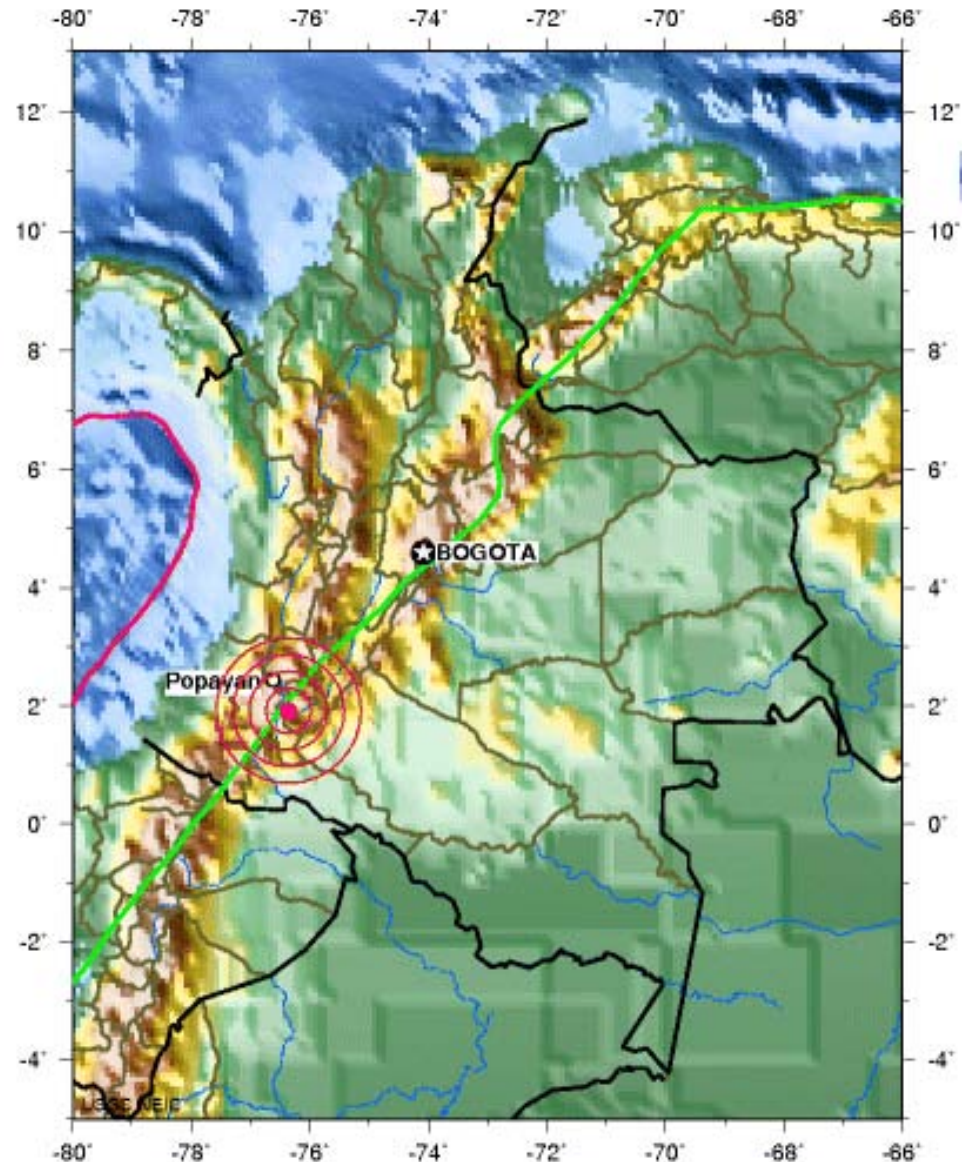
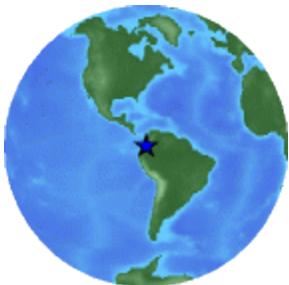
Magnitude 7.3 COLOMBIA

Sunday, September 30, 2012 at 16:31:35 UTC

A major 7.3 magnitude earthquake struck southwestern Colombia near the border with Ecuador on late Sunday morning local time. There were no immediate reports of damage or casualties. No tsunami warnings were issued.

This earthquake was 64 kilometers (40 miles) SSE of Popayan, Colombia and 190 kilometers (118 miles) north of the border with Ecuador.

The earthquake was 168.3 kilometers (104.6 miles) deep.

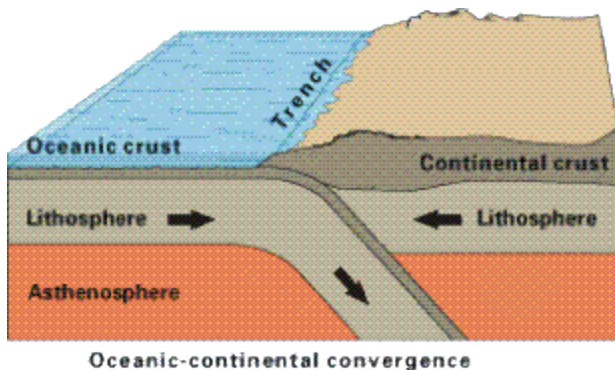


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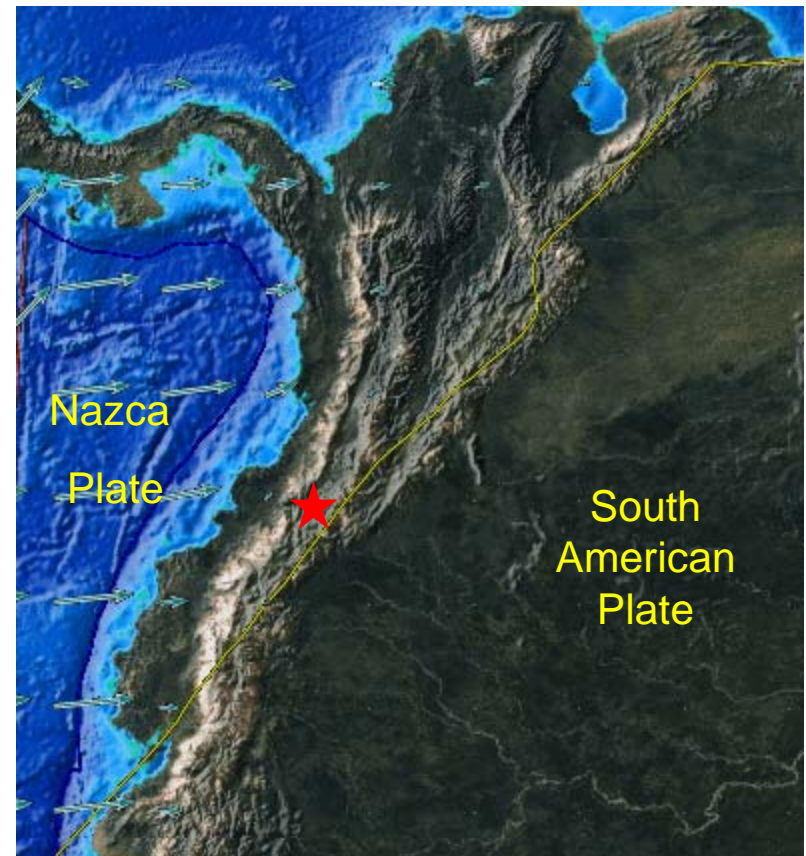
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Based on its depth and nature, this earthquake occurred within the subducting Nazca Plate. The Nazca plate, oceanic in origin, subducts beneath the South American plate along the South America trench.

At the location of this event, the Nazca plate moves east-northeast with respect to the South American plate at a rate of approximately 60 mm/yr.



Generalized Subduction Zone

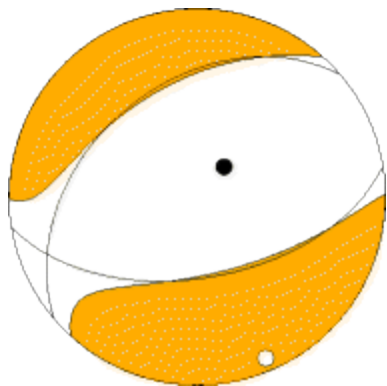


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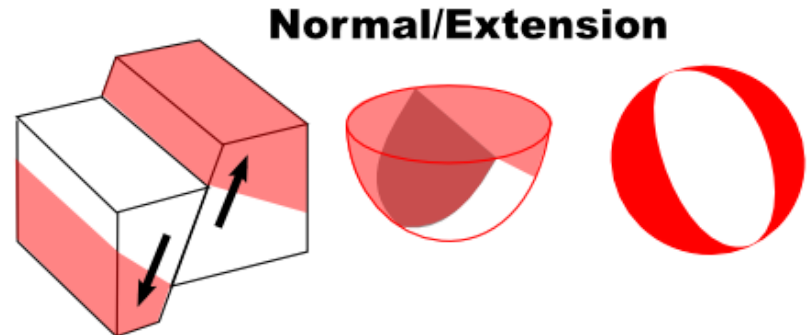
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The earthquake occurred as a result of normal faulting deep within the subducting Nazca slab that begins its decent into the mantle at the South America trench offshore of Colombia and Ecuador.

The event resulted from stresses generated by the slow distortion of the subducting plate as it descends through the mantle, rather than on the thrust interface that constitutes the boundary between the Nazca and overlying South American plates; the latter is active only near the Earth's surface, while the subducting Nazca plate generates intraplate earthquakes to depths of 200 km or more in this region. (USGS)



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 dots represent the axis of maximum compressional strain (in black, called the "P-axis") and the axis of maximum extensional strain (in white, called the "T-axis") resulting from the earthquake.



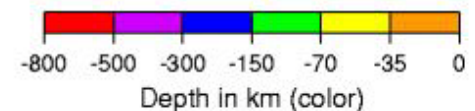
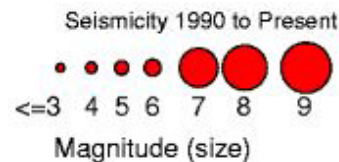
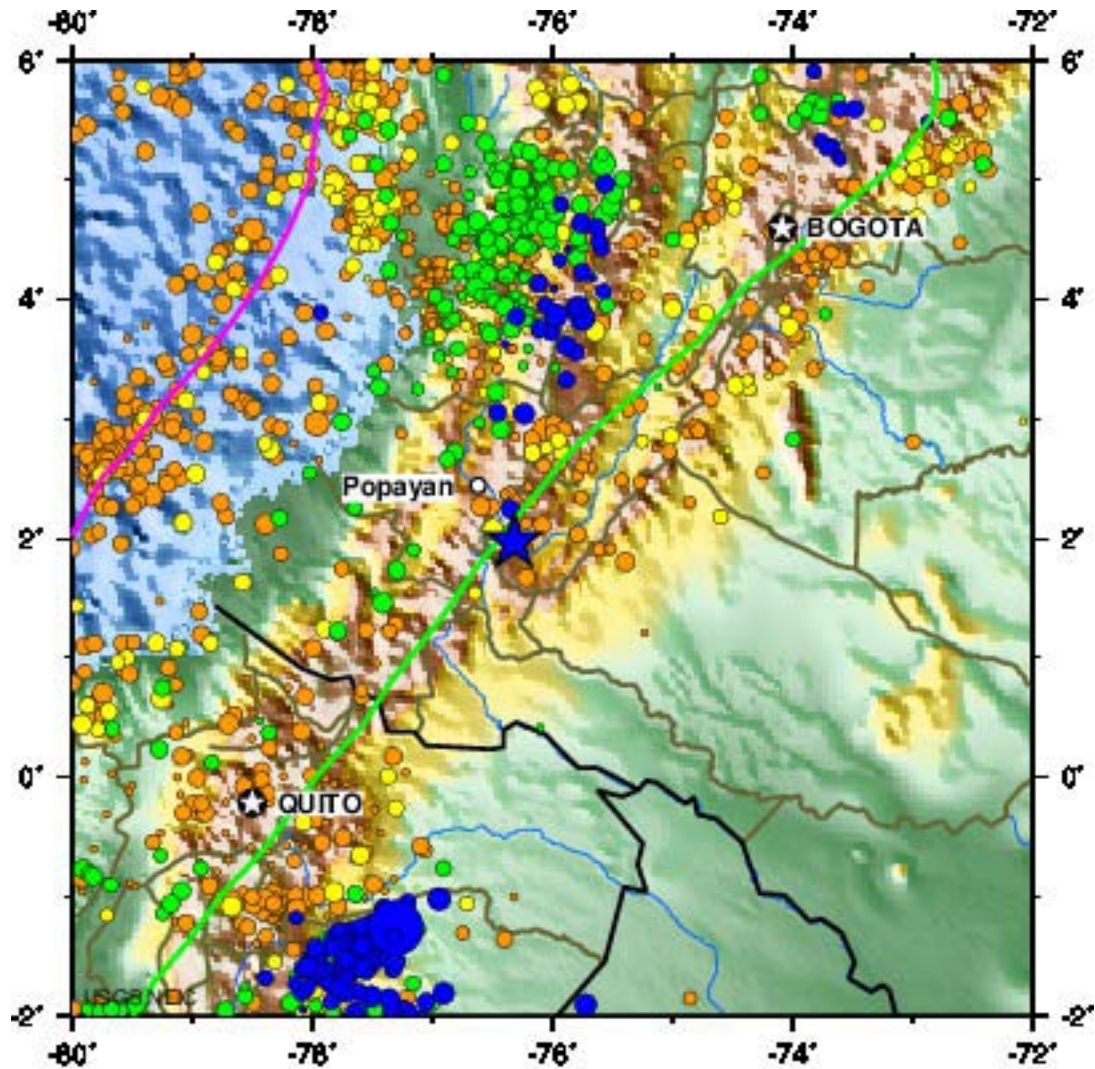
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The earthquake (blue star) is plotted with epicenters of earthquakes in the region since 1990. It occurred at a depth of 168.3 km (104.6 mi).

Earthquakes on the subduction zone boundary are shallow near the trench and become deeper toward the east-northeast as the Nazca Plate descends beneath Ecuador and Colombia.

According to the USGS, deep earthquakes in this region of the Nazca plate are not uncommon; there have been 13 similar events deeper than 100 km over the past 40 years, within 500 km of this earthquake.



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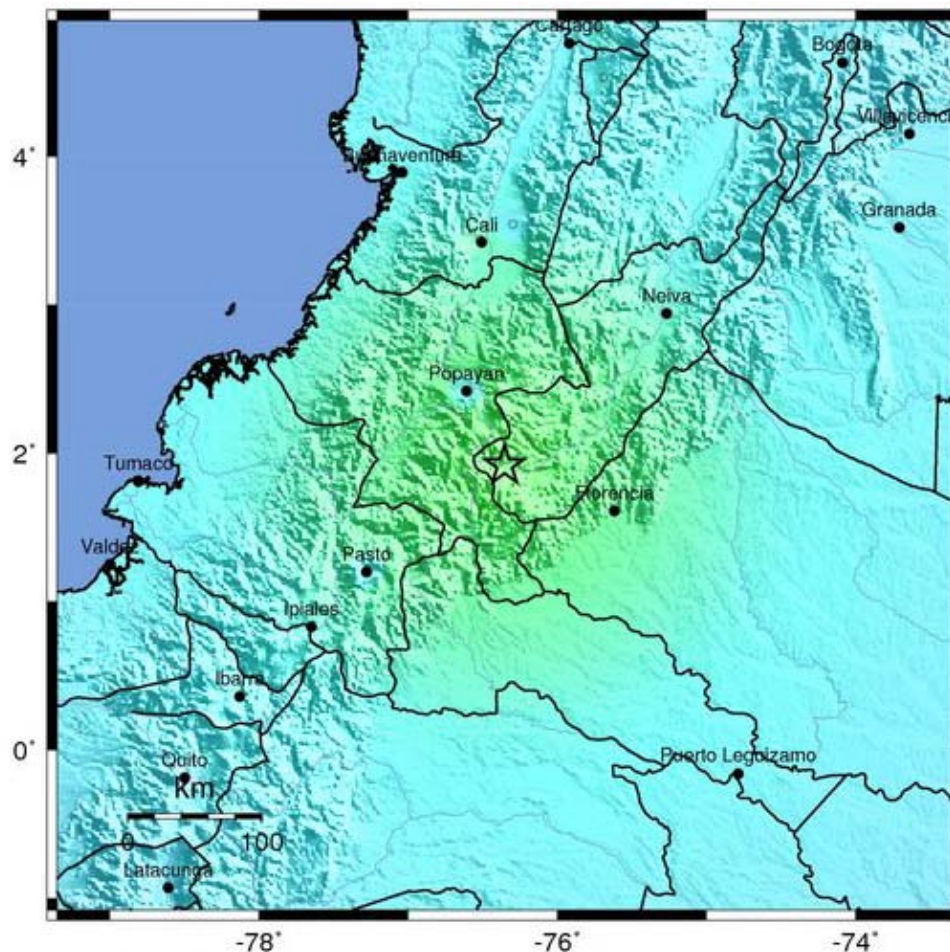
Shaking intensity scales were developed to standardize the measurements and ease comparison of different earthquakes. The Modified-Mercalli Intensity scale is a twelve-stage scale, numbered from I to XII. The lower numbers represent imperceptible shaking levels, XII represents total destruction. A value of IV indicates a level of shaking that is felt by most people.

The area nearest the epicenter of this earthquake experienced light to moderate ground shaking.

Modified Mercalli Intensity

X
IX
VIII
VII
VI
V
IV
II-III
I

Perceived Shaking
Extreme
Violent
Severe
Very Strong
Strong
 Moderate
 Light
 Weak
 Not Felt



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The depth of an earthquake has a very strong effect on the intensity of ground shaking that occurs and the amount of damage that results.

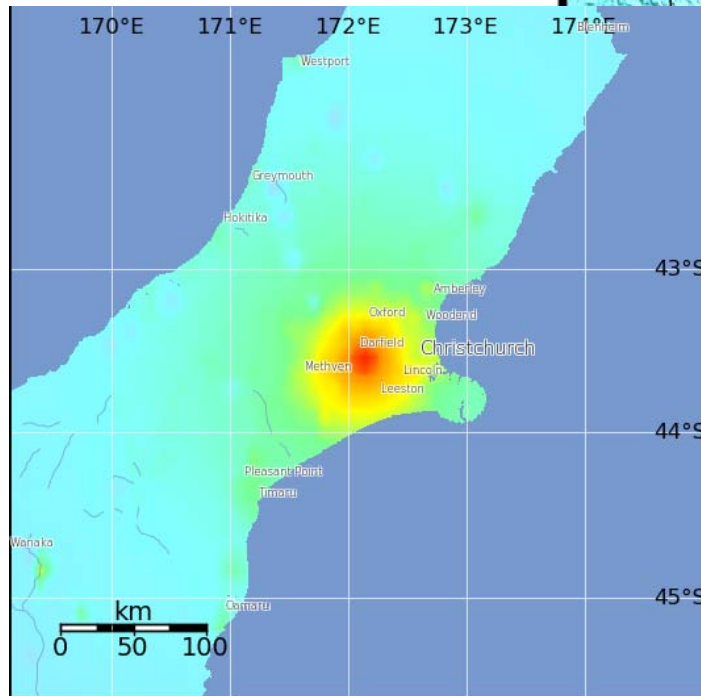
The images compare the estimated shaking intensity between the 2010 M 7.0 New Zealand earthquake and this Colombian earthquake.

Modified Mercalli Intensity

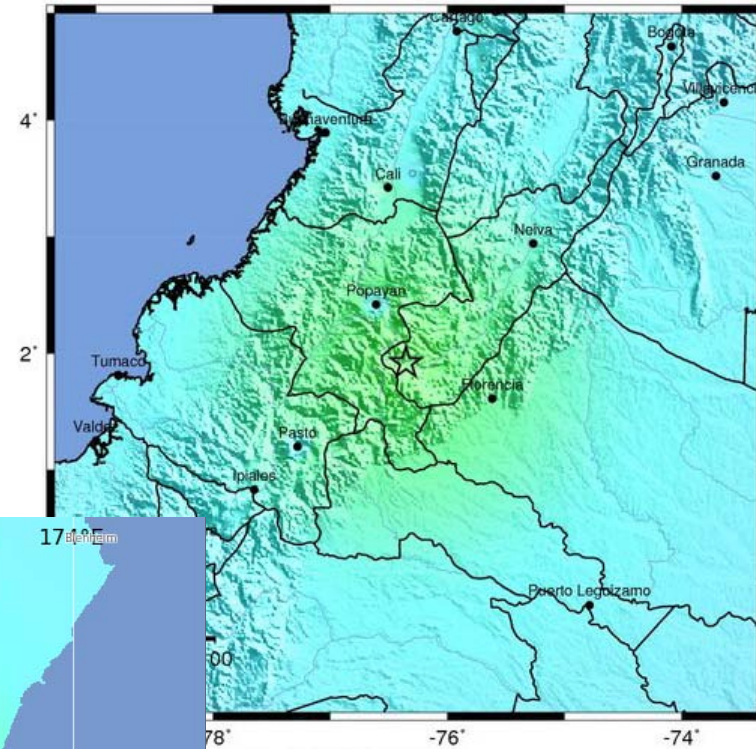
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Perceived Shaking

- Extreme**
- Violent**
- Severe**
- Very Strong**
- Strong**
- Moderate
- Light
- Weak
- Not Felt



USGS Estimated shaking Intensity from M7.0 Earthquake New Zealand Sept 3, 2010, **Depth: 12 km**



USGS Estimated shaking Intensity from M7.3 Earthquake Colombia Sept 30, 2012, **Depth: 168.3 km**

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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. MMI describes the severity of an earthquake in terms of its effect on humans and structures and is a rough measure of the amount of shaking at a given location.

Overall, the population in this region resides in structures that are vulnerable to earthquake shaking, though some resistant structures exist.

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 below.

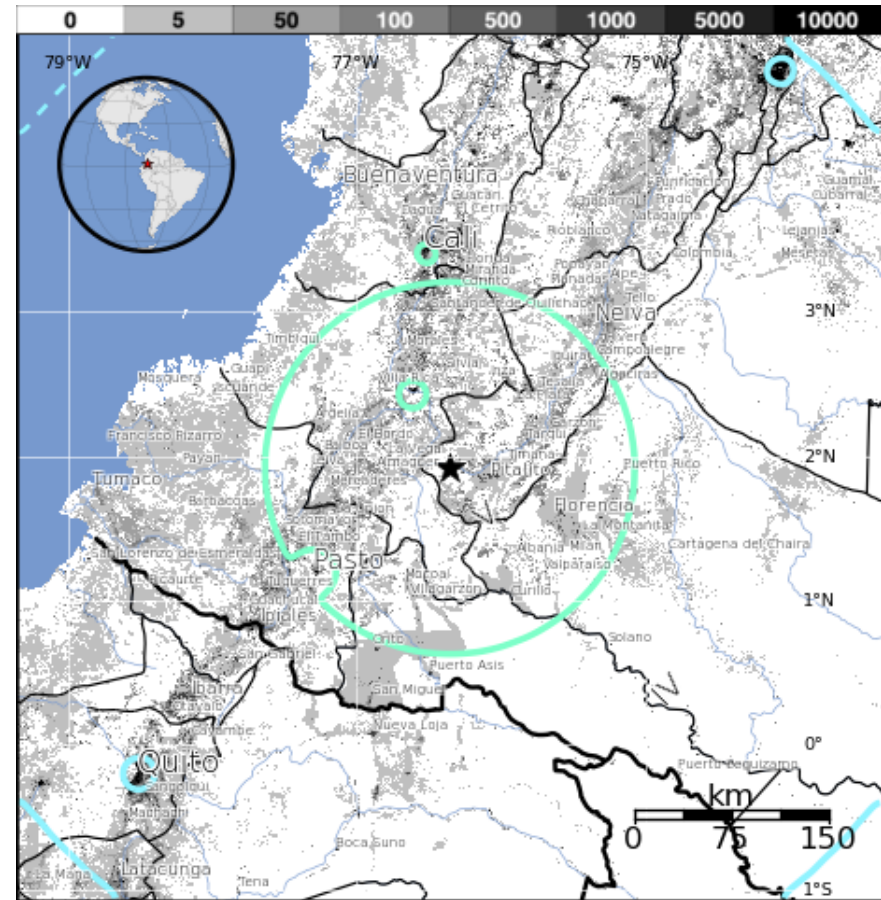


Image courtesy of the US Geological Survey

Estimated Modified Mercalli Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X
Est. Population Exposure	--*	6,478k*	15,087k*	4,368k	0	0	0	0	0
Perceived Shaking	Not Felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme

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The record of the earthquake on the University of Portland seismometer (UPOR) is illustrated below. Portland is about 6600 km (4101 miles, 59.45°) from the location of this earthquake.

