

PRESENT

Earthquake in Loreto: The key is depth

Due to its particular characteristics, the earthquake in Loreto at dawn on Sunday was felt differently in a large part of the country. The deeper the place where an earthquake occurs, the destructive power is less



A general view shows a crack in the ground caused by an earthquake in Puerto Santa Gema, on the outskirts of Yurimaguas, Loreto. (Photo: AFP)

Bruno Ortiz Bisso
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Pisco, Peru. Wednesday, August 15, 2007, 6:40 pm An earthquake is recorded 40 kilometers west of Pisco. Its magnitude was 7.9 and its hypocenter was located 39 kilometers deep. More than half a thousand people died, more than 75,000 homes were destroyed and almost half a million people were affected.

Port au Prince, Haiti. Tuesday, January 12, 2010, 4:53 pm An earthquake is registered only 15 kilometers from the capital. With a magnitude of 7.3 and a depth of 13 kilometers, the dead and wounded were counted by hundreds of thousands. Countless buildings were destroyed.

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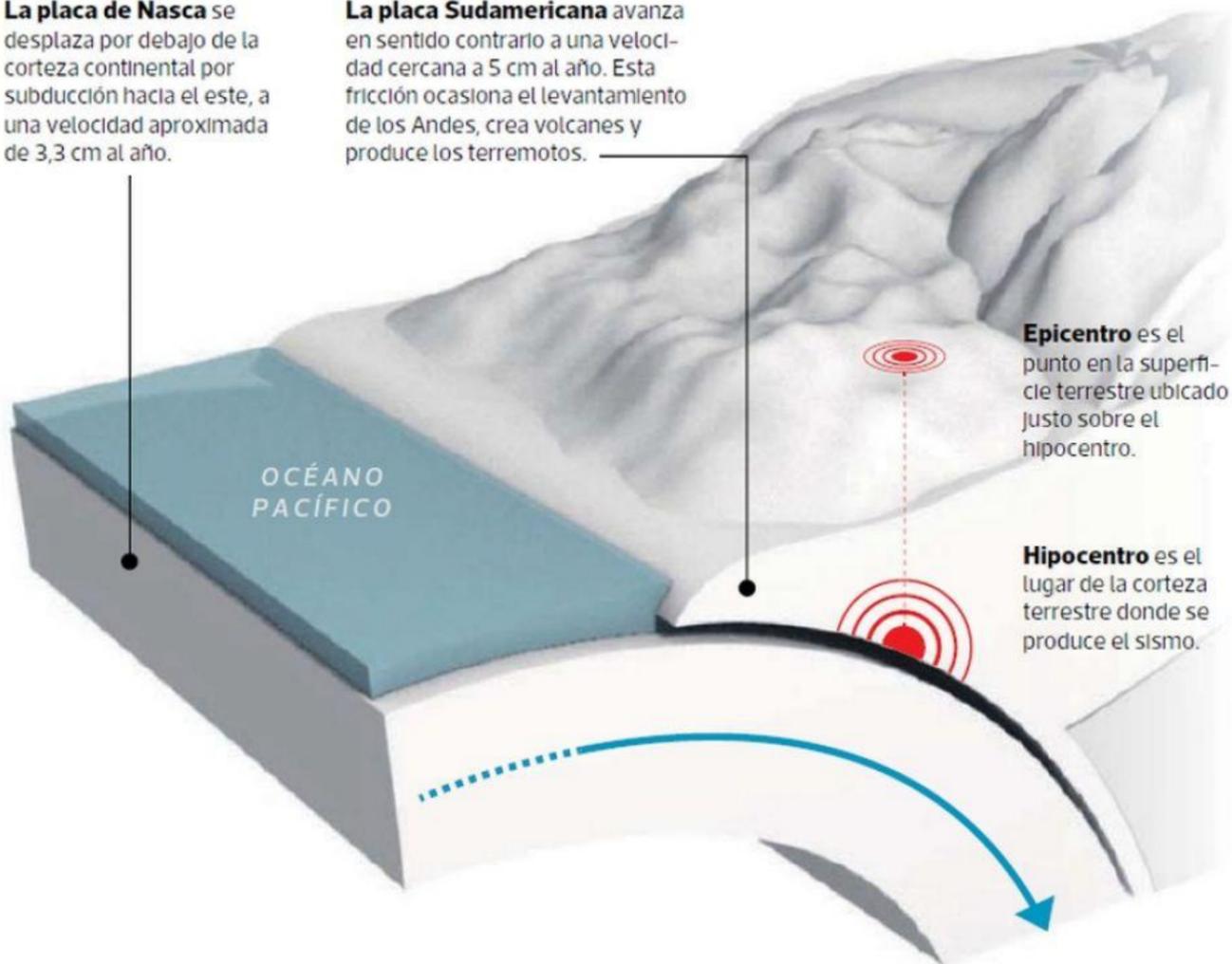
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Nuestra condición de país sísmico

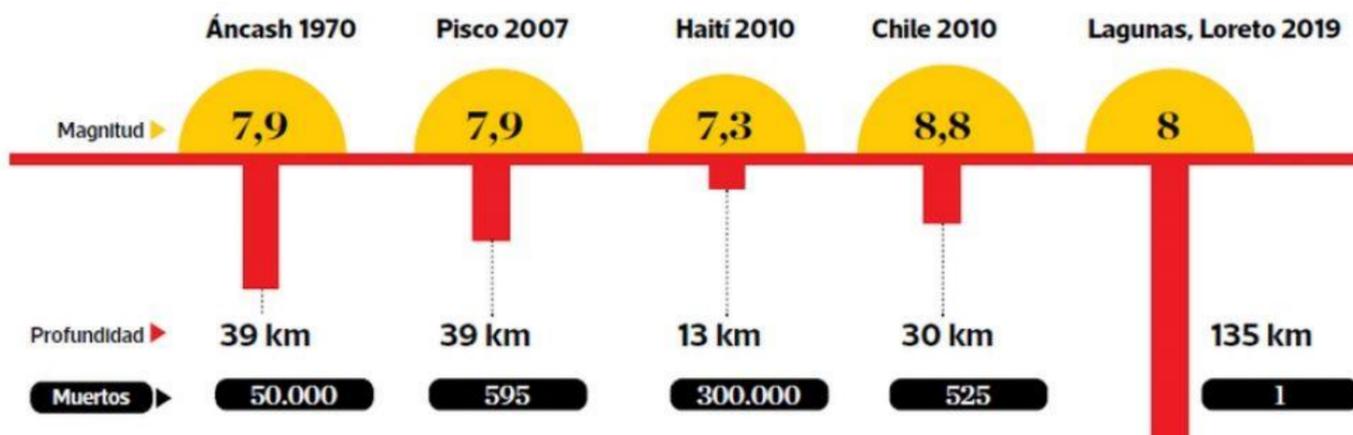
LA CAUSA DE LOS TERREMOTOS

La placa de Nazca se desliza por debajo de la corteza continental por subducción hacia el este, a una velocidad aproximada de 3,3 cm al año.

La placa Sudamericana avanza en sentido contrario a una velocidad cercana a 5 cm al año. Esta fricción ocasiona el levantamiento de los Andes, crea volcanes y produce los terremotos.



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In an earthquake, depth is the key to determine if there will be destruction of cities. (Illustration: Raúl Rodríguez / El Comercio)

Why these two previous earthquakes, that even registered smaller magnitude than the one that happened the dawn of Sunday in [Loreto](#) were more destructive and harmful? Here the key is depth.

"It is undeniable that everything close to the epicenter (point on the surface of the vertical of the hypocenter or place where an earthquake occurs) will be exposed to peculiarities [of the Loreto earthquake](#) is that its hypocentre has been very deep surface. This explains why it has not caused as much damage as other tremors of why it seems to have felt much more," Peruvian seismologist **Jean Paul Ampuero** for Development Research (IRD), told El Comercio. and of the University of Nice (I

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The Peruvian Jean Paul Ampuero also works with the University of the French Riviera (France) and is a professor at the California Institute of Technology (Caltech). (Photo: Cote d'Azur University)

According to the expert, the depth of the earthquake causes seismic waves to propagate through the rock, and although the amplitude of these waves is attenuated, it can be felt in more places.

"The most superficial layer of the Earth is made of a rock that is already very fractured, very damaged. It ends up being like a sponge for seismic waves. If an earthquake is deep enough to avoid that surface layer, there is much more chance that we will feel it very strong, as has happened in several parts of the country," Ampuero adds.

According to the researcher, the comparison with the Pisco earthquake helps to understand more these mechanisms, because they were of similar magnitudes. "The one in Pisco lasted almost two minutes. It is important to separate the duration of the earthquake from the duration of the shake. If we were 100 km deep in the fault, we would have seen how it moved for a minute. The waves propagate, bounce. And if we are on soft ground they will reverberate as if it were a bell. In summary: it feels more in areas with low quality floors and buildings that are not well made. In those areas you could feel for more than a minute. "

- ADJUSTED CHAIRS -

He called the attention of social network users the issue of the final magnitude of the earthquake. In its first alert, the Geophysical Institute of Peru (IGP) indicated that the magnitude was 7.2, while the institutes of Ecuador, Colombia and the United States. they placed it in 8 or greater figures. Several hours later, the IGP adjusted to 8.

"National agencies, such as the IGP, use the data from their seismometers in the country to estimate the magnitude. Ecuador or Colombia do the same. The difference with the US Geological Survey (USGS) and other international agencies is that the estimate is made with data from all seismometers around the world," he says.

For Ampuero, it is better to rely on data from more stations in the world, because it allows analyzing the earthquake from different angles. "If only the data collected from Peru is used, only one side of what the earthquake was will be seen."

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