A 'Slow Motion' Earthquake Lasted 32 Years in the 19th Century

The slowest earthquake ever recorded led to catastrophe and could teach us about future quakes.

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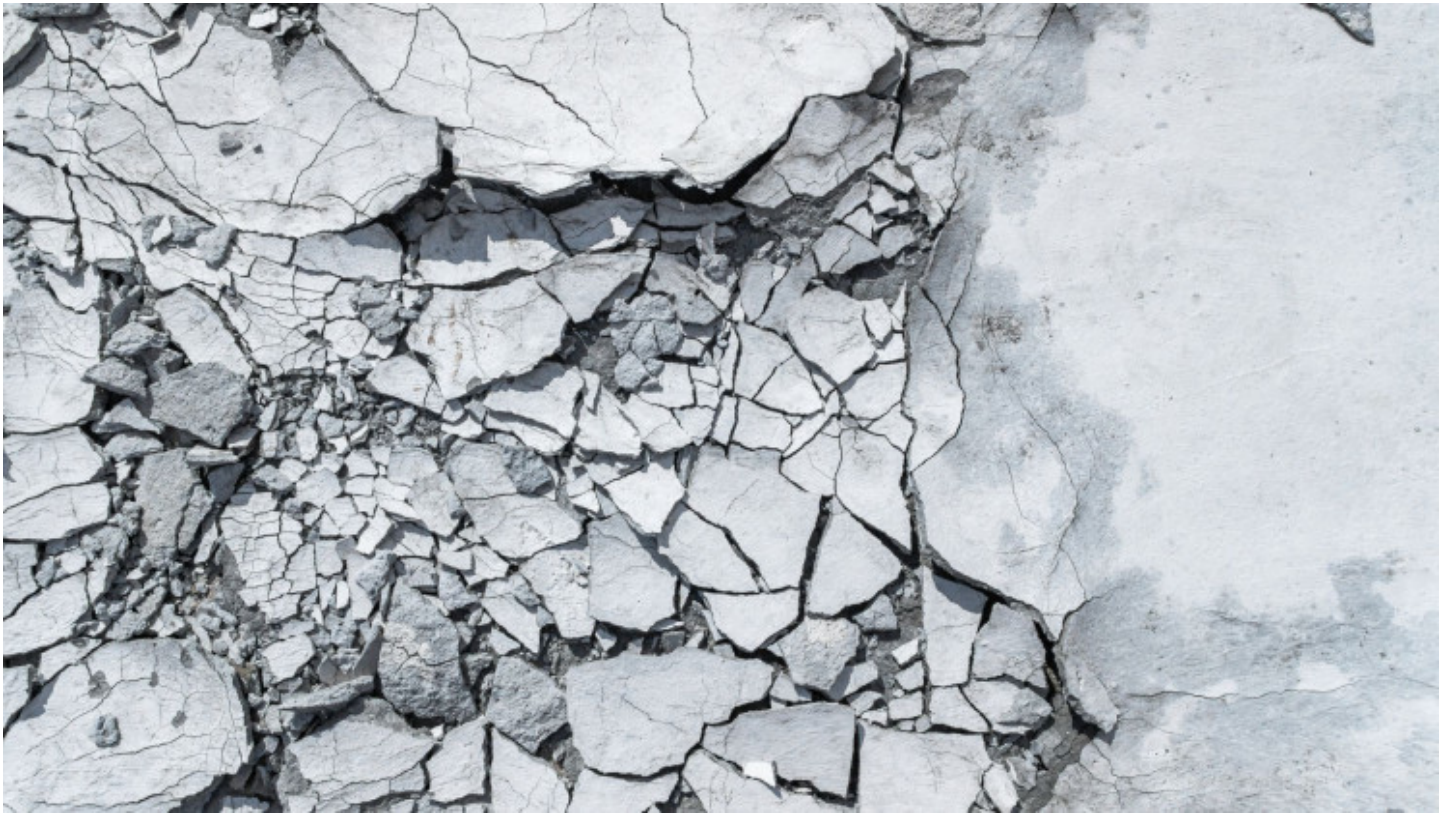

Researchers from the Nanyang Technological University of Singapore (NTU) discovered that a 'slow motion' earthquake lasted 32 years in the 1800s and eventually led to the catastrophic Sumatra earthquake of 1862. Their findings are published in the scientific journal Nature Geoscience.

'Slow motion earthquakes', also known as 'slow slip events', occur when the Earth's tectonic plates slide against each other at a slow rate without causing major ground tremors.

The NTU team behind the discovery were actually studying historic sea levels by investigating ancient corals at Simeulue Island off the coast of Sumatra. The corals naturally record changes in seal levels and land elevation via visible growth patterns.

The researchers combined data from the corals with simulations of the motion of the Earth's tectonic plates and found that from 1829 to 1861, when the Sumatra earthquake took place, the south-eastern side of Simeulue Island was sinking faster than expected into the sea, indicating a slow motion earthquake.

Earthquake models might need updating

In their paper, the researchers explained that the slow motion earthquake relieved stress on the shallow section where the two tectonic plates met. However, this was transferred to a deeper segment nearby, culminating in the massive Sumatra earthquake in 1861.

The 1861 Sumatra earthquake was an 8.5 magnitude quake that also caused a tsunami. Both events led to enormous damage as well several thousand fatalities.

The scientific community had previously believed that slow earthquakes occurred over a timespan of months at most, not decades. The NTU researchers said their study can help to contribute to better earthquake risk assessment in the future.

The new information — namely, that slow motion earthquakes are more likely to trigger massive quakes than previously thought — could be incorporated into existing models, such as the one used to forecast tsunamis using Japan's Fugaku supercomputer.

The researchers also stated that there might be a slow motion earthquake ongoing at Enganno Island. Using a new methodology based on their findings, they stated that there is a "potential ongoing drawn-out slow slip event at Enggano Island, Indonesia, located at about 100 km (60 miles) southwest of Sumatra," the researchers stated in a press release.

If this finding is correct, Assistant Professor Aron Meltzner co-author of the study, states that "communities living nearby this Indonesian island are potentially facing higher risk of tsunami and earthquake than what was previously thought. This suggests that models of risk and mitigation strategies need updating."