



World Today News

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## NTU's study of ancient coral in Indonesia revealed the slowest earthquake ever recorded

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**Picture:** NTU's Asian School Environment Committee (LR) behind the study of ancient coral in Indonesia includes: Associate Professor Emma Hill, PhD student Rishav Mallik

and Assistant Professor Aaron... see Furthermore

*Credit: NTU Singapore*

*The 32-year 'slow motion' quake – the slowest ever recorded – ultimately led to the Sumatra earthquake of 1861, found researchers at the Nanyang Technological University in Singapore (NTU Singapore).*

*The NTU research team says their study highlights missing factors or erroneous changes in estimates of global earthquake risk.*

*A 'slow motion' earthquake or 'slow landslide event' refers to a type of long drawn pressure release event in which the earth's tectonic plates do not shift with each other and cause a major earthquake or natural disaster. They usually involve movements of several cm / year to cm / day.*

*The NTU team made a surprising discovery while studying the history of sea level using ancient coral reefs called 'microdolls' on the island of Simiulu off the coast of Sumatra. Disc-shaped coral microdolls that grow sideways and upward are a natural record of changes in sea level and land elevation through visible growth patterns.*

*Using data from microdolls and combining it with simulations of the movement of Earth's tectonic plates, the NTU team found that the southeastern island of Simiulu sank faster than expected at sea, from 1829 to the 1861 earthquake in Sumatra.*

*The NTU team reports that this slow avalanche event gradually reduces pressure in the shallow area where two tectonic plates meet. However, this depression shifted to the surrounding area deep, culminating in an earthquake and tsunami measuring 8.5 on the Richter scale in 1861, causing major damage and casualties.*

*The NTU team said the discovery marks the slowest slip event ever recorded, and will change global perspectives on the timing and mechanism of these events. Scientists previously believed that slow avalanche events could only last for hours or months, but NTU research shows that they can continue for decades without triggering the devastating earthquakes and tsunamis found in historical records.*

*The study's lead author, Rishav Mallik, a PhD student at NTU Asian School of Environment, said, "It's interesting to see how much we can find from just a few coral reefs. Our research approach will be useful for future studies of other sub-regions – areas prone to earthquakes, tsunamis and volcanic eruptions, so that our studies will contribute to better risk assessment in the future. "*

Aaron Meltzner, assistant professor at the Earth Laboratory in Singapore at NTU, said: "When we first discovered these corals a decade ago, we knew from their developmental pattern that something strange must have been happening as they were growing. Needs an explanation. "

The findings were published in the journal *Peer Review Natural Earth Sciences* In May, the authors suggested that current seismic risk assessments may ignore observed slow ace events that occur under observation, and therefore do not properly consider the potential for slow ace events to trigger future earthquakes and tsunamis.

### **Possible 'slow motion' earthquake somewhere on the island**

Located one kilometer under water and away from the ground level, the shallow part of the sub-zone is generally 'calm' and does not cause many earthquakes. Its remote location makes it difficult for ground-based scientific instruments to find a function and for scientists to understand what is going on.

Therefore, many scientists tend to describe 'calm' in the shallow part of the subcontinent, which means that the tectonic plates beneath it slide smoothly and are harmless.

While this may be true in some cases, the NTU study found that this slip was unstable as predicted and can occur in the case of slow slip.

Describing their findings, Rishaw said, "Since such slow ace events are so slow, we didn't see them because current instrument records usually last up to ten years."

He added, "If similar behavior causes earthquakes elsewhere, this process can eventually be recognized as a precursor to earthquakes."

Making use of their research method, the NTU team reported a slow event about 100 km (60 miles) from Sumatra on an island in Indonesia.

Assistant Professor Meltzner said, "If our findings are correct, it means that people living near the Indonesian island may be at greater risk of tsunamis and earthquakes than previously thought. This suggests that risk models and mitigation strategies need to be updated. "

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