

# Cause of tsunami wave heights is studied

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Irish-led scientists have found tsunami wave height is independent of earthquake magnitude and is instead linked to a rupture's vertical displacement.

The massive 9.2-magnitude Sumatra-Andaman earthquake of 2004 generated a tsunami that propagated across the Indian Ocean, killing more than 250,000 people. By contrast, the nearby 8.7-magnitude 2005 Simeulue-Nias earthquake generated only a small tsunami that caused few casualties.

Although both occurred in similar tectonic settings, scientists said their tsunami were markedly different, highlighting the need for reliably determining tsunami hazards from earthquake geometry.

Using geodetic and stress accumulation studies, John McCloskey and colleagues at the University of Ulster-- in collaboration with Italian and U.S. scientists -- found that for locations close to an earthquake source, the timing of tsunami inundation is independent of the earthquake magnitude and slip distribution. However, they found maximum tsunami wave height is directly proportional to the vertical displacement of the rupture.

Because stress field studies indicate the Sumatra-Andaman region is overdue for another great earthquake, the scientists said a single estimate of vertical displacement during an earthquake might provide a reliable short-term forecast of tsunami wave height.

The research appears in the journal *Geophysical Research Letters*.

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