

## Small islands may amplify tsunamis

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A woman sits with her daughter in her collapsed house on October 31, 2010 in Tumalei village, Metawai islands, Indonesia, six days after an earthquake-triggered tsunami hit the area

Small islands, long thought to be natural tsunami barriers for coast-dwellers, may in fact amplify the waves they are supposed to break, researchers warned Wednesday.

The findings are of concern, for many coastal communities have settled

in areas traditionally believed to be shielded from waves by offshore islands.

But simulations of [wave motion](#) found that some of these communities may be at higher risk from tsunamis of the kind that devastated villages in the Indian Ocean in 2004 and in northeastern Japan in 2011.

The study is published in a British journal, *Proceedings of the Royal Society A*.

In 200 computer simulations, not one concluded that the presence of an island defended the [coastal area](#) behind it, they found.

Instead, the tsunami's energy was amplified "by as much as 70 percent," co-author Frederic Dias of France's Center for Mathematical Studies and their Applications (CMLA) told AFP.

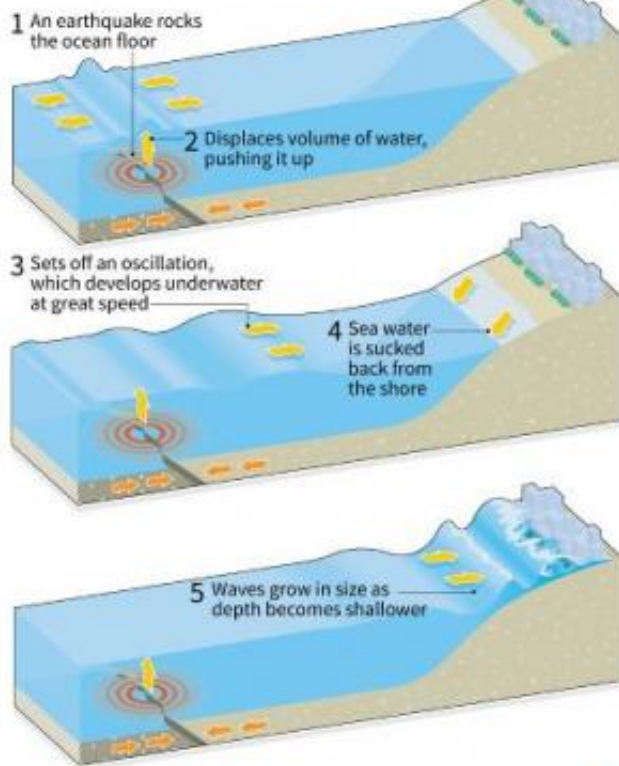
An island "often acted as a lens, focusing the wave's [destructive power](#)," he said.

The simulations varied the island and beach slope, the water depth, the distance between the island and the beach, and tsunami wavelength.

Dias said [coastal communities](#) in countries like Greece and Indonesia were particularly at risk from the phenomenon uncovered by the study.

"The findings might stir some inhabitants of apparently shielded coastlines, and the authorities responsible for their safety, to rethink the risks they face," he said.

### How a tsunami occurs



Sources: Nature/USGS

AFP

Graphic on how a tsunami works

The research was inspired by scientists observing that Indonesia's Sumatra was particularly badly hit by the 2004 Indian Ocean tsunami, even though it is dotted with offshore islands.

Similarly, a tsunami that hit the Mentawai islands off Sumatra in 2010 caused the most severe flooding in areas where it was least expected—on the coastline behind [offshore islands](#).

**More information:** Can small islands protect nearby coasts from tsunamis? An active experimental design approach, *Proceedings of the Royal Society A*, [rspa.royalsocietypublishing.org ... .1098/rspa.2014.0575](https://royalsocietypublishing.org/doi/10.1098/rspa.2014.0575)

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