

## Caribbean Vulnerable to Killer Tsunamis



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By *FRANK GRIFFITHS*, Associated Press Writer

SAN JUAN, Puerto Rico - Scientists predict killer tsunamis could strike the Caribbean, which lacks a warning system even though its seabed is gouged by some of the world's deepest trenches, where the giant waves can be generated by tectonic activity, and its low-lying islands are heavily populated along their coastlines.



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The last tsunami struck the Caribbean in 1946, before island populations skyrocketed, major construction dotted shorelines and the region developed into a prized tourist destination attracting 17 million visitors last year.

"The Caribbean is a very dangerous place for tsunamis," said Uri ten Brink, a U.S. Geological Survey ([news](#) - [web sites](#)) geologist in Woods Hole, Mass., and co-author of an article on the threat in the Journal of Geophysical Research. "The Caribbean needs a tsunami warning system."

The article was published two days before a Dec. 26 earthquake under the Indian Ocean generated a tsunami that killed at least 157,000 people in 11 nations. The quake occurred along the long north-south fault in the Earth's crust where the edge of the Indian tectonic plate dives below the Burma plate, forming the Sunda Trench.

That trench is about 25,000 feet deep.

The Puerto Rico Trench — one of the deepest in the world at 27,355 feet — is a 560-mile-long underwater canyon and fault line running parallel to this U.S. island territory and east of the Lesser Antilles islands.

Seismic tensions in the Puerto Rico, Hispaniola and Cayman trenches ringing the Caribbean force tectonic plates to sink under one another as they collide, producing earthquakes, underwater landslides or tsunamis.

A tsunami is a series of waves formed by a disturbance in sea level over a short period of time, such as an earthquake, underwater volcanic eruption or coastal landslide.

In the deep and open ocean, the waves can travel at up to 600 mph but be no more than 2 feet high, making them imperceptible to the human eye.

The last fatal tsunami here occurred in 1946 when an 8.1-magnitude earthquake in the Hispaniola Trench triggered waves that killed an estimated 1,700 people in the Dominican Republic and Haiti, ten Brink said.

Major earthquakes erupt about every 50 years in the Caribbean, a region where even minor natural disasters can kill thousands because of environmental degradation, shoddy construction and the many people who live in coastal areas or on low-lying islands.

The Caribbean has an effective hurricane warning system and a number of tidal gauges to measure sea height. But it lacks a centralized system to alert all islands to a tsunami.

The United States uses a system called Deep-ocean Assessment and Reporting of Tsunamis, or DART, with pressure recorders anchored to the sea floor detecting tsunamis of less than a half-inch in height. A link transmits data to a buoy that relays information to alert centers via satellite.

There are only six DART buoys in the world and they are all in the northeast Pacific Ocean, Brink said. Last week, the U.S. government announced a \$37.5 million plan to put 32 DART buoys in the Pacific and Atlantic oceans by mid-2007.

From 1900 to 2001, there were 796 tsunamis observed or recorded in the Pacific, according to the Pacific Tsunami Warning Center.

"There is a real risk from tsunamis in the Caribbean, but the risk is small when compared to other earthquake hazards over history such as buildings collapsing and fires," said Lloyd Lynch, a seismological engineer at the Seismic Research Unit in Trinidad. "But that could change. We're more vulnerable now because of recent coastal development."

One reason the Asian tsunami proved so deadly was that a 750-mile plate lifted as the pressure built, producing a magnitude 9.0 quake. Because the Caribbean trenches are shorter, they would be unlikely to produce such a strong eruption, ten Brink said.

Still, because of development and population growth, an 8.1-magnitude earthquake followed by a tsunami could be much deadlier than the 1946 wave, he said.

Members of the Caribbean Disaster Emergency Response Agency will meet in May with scientists and disaster coordinators to discuss the need for an early warning system, said Terry Ally, a spokesman for the Barbados-based agency.

"It's a matter of time before a tsunami happens in the Caribbean," said Christa von Hillebrandt, director of the Puerto Rico Seismic Network. "All the ingredients are there."

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