Tsunamis threaten world's coastlines

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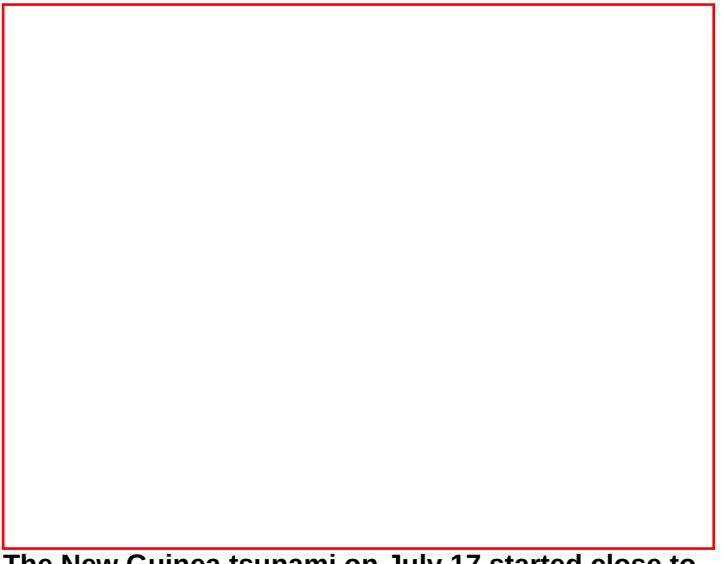
By Environmental News Network staff

(ENN) -- Tsunamis, or tidal waves, may threaten more coastline regions around the world, including the West Coast of the United States, than previously thought, according to scientific team reporting on last month's tsunami in Papua New Guinea.



The New Guinea tsunami on July 17 started close to shore and damaged a relatively small, though heavily populated, area.

The team just returned from the Sissano Lagoon in northwestern Papua New Guinea and determined that July's devastating tsunami occurred when a 7.0 magnitude earthquake triggered a massive underwater landslide. The landslide created a series of waves that swept across heavily populated shoreline strips at the lagoon's entrance.

"We used to think a magnitude 7.0 earthquake was too small to generate a tsunami," says Costas Synolakis, Ph.D., leader of the four-person team funded by the National Science Foundation to measure the tsunami's inundation heights and

inland penetration distances.

"Of the nine large tsunamis that have occurred in the past six years, only the New Guinea one resulted from an earthquake as small as magnitude 7.0," he said.

"We probably have 10 earthquakes of that magnitude a year worldwide," said team member Emile Okal, Ph.D. "You can have a very large danger concentrated in a very small area because of the instability of submarine structures that we do not have very well mapped."

The death toll from the Papua New Guinea disaster will likely exceed 3,000 and be recorded as the deadliest tsunami of the century.

The researchers lament the world's lack of knowledge about ocean-floor topography. "We have a better map of the surface of Venus than we do of our own ocean floor," said Synolakis.

Earthquakes of magnitude 7.5 and greater trigger tsunamis that traverse thousands of miles of ocean to affect thousands of miles of coastline, Synolakis said. In contrast, the New Guinea tsunami on July 17 started close to shore and damaged a relatively small, though heavily populated, area.

Many seismically active coastlines of the Pacific Rim are comparable to the New Guinea disaster site, where the ocean floor declines rapidly close to shore, falling away in precipitous chasms and steep canyons.

"The Cascadia Subduction Zone off the state of Washington threatens British Columbia, Washington, Oregon and the northern California coastlines," Synolakis said.

"Southern California, because of its population density and offshore topography, is also threatened. It would not take a large tsunami to cause a disaster here, where hundreds of thousands of people are often at the beach. If you're at the beach and feel an earthquake, you should move to higher ground as quickly as possible," he said.

The researchers believe that an underwater landslide was involved in the tsunami because there is evidence of them occurring in the area, including a fresh one on a cliff at the western end of the survey area that locals say occurred during he earthquake, said Okal.

"In terms of the accelerations and the intensity of motion, what took place under the water was probably the same as what took place next door above the water, and if the material had the same level of instability, one could imagine a submarine landslide," he said.

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