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A five-member scientific team that visited the site of the July 17 tsunamis on the Papua New Guinea coast now theorizes that the deadly sea waves were probably the result of an undersea landslide caused by an earthquake centered inland.

This is a different scenario than the one initially reported from the site of the South Pacific disaster, which said the tsunamis were set off by a magnitude 7.0 earthquake centered 12 miles out to sea. The death toll exceeds 3,000, including hundreds of people whose bodies have not been recovered, making them probably the most deadly tsunamis of the 20th century.

The scientific team, whose trip was funded by the National Science Foundation, was headed by University of Southern California civil-engineering professor Costas Synolakis.

"We used to think a magnitude 7.0 earthquake was too small to generate a tsunami," Synolakis said in a written report. "Of the nine large tsunamis that have occurred in the past six years, only the New Guinea one resulted from an earthquake as small."

But Synolakis and associate Emile Okal, a geophysics professor from Northwestern University, are confident that a landslide caused the displacement of water resulting in the tsunamis, giving three reasons. "One, we can't explain the size of the tsunami otherwise," Okal said. "Two, we know sub-marine landslides have occurred in other areas, since they're conspicuous on the ocean floor in other subduction zones (similar to this one).

"And, three, we found a landslide above sea level while we were there. A cliff at the western end of our land-survey area showed a big landslide that was extremely fresh. People told us it went down during the earthquake."

Okal conceded, "It's a big jump to the conclusion that the same thing happened below the sea. But certainly, 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 sub-marine landslide."

The scientists said their examination of the New Guinea tsunami area and interviews with local residents indicated that three separate waves, initially no more than 10 feet high, gained height as they raced toward the coast.

"On touching land, the largest waves were 32 to 46 feet high at the center," Synolakis said, "and about 12 miles long." The water surged over the affected peninsula at an estimated speed of 22 to 44 mph.