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UH News

New tsunami forecasting model developed

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HONOLULU - Tsunamis pose a severe threat to coastal communities and often give very little warning prior to arrival. Real-time analysis of seismic records does not always give clear a indication of the tsunami hazards, so Dr. Kwok Fai Cheung, a University of Hawai'i Sea Grant College Program funded researcher, has been looking into ways to forecast tsunami impacts during the early stage of the event.

Using data from tide gauges and deep-ocean pressure sensors, Dr. Cheung and his graduate students developed a computer algorithm to reconstruct the earthquake rupture and estimate possible tsunami hazards across the Pacific Ocean. They have validated the formula with data from the 1964 Prince William Sound and 1996 Andreanov earthquakes in Alaska, the 1944 Tonakai and 1994 Kuril earthquakes near Japan, and the 1995 Antofagasta earthquake in Chile.

"This method has taken the guesswork out of the tsunami warning procedures," Cheung said. "Instead of looking at water-level data near the tsunami source and trying to figure out what might happen several thousand miles away, we can actually use the water-level data to calculate the tsunami waveforms anywhere in the Pacific basin."

The research is having far-reaching impacts. The National Oceanic and Atmospheric Administration's Pacific Marine Environmental Laboratory, its center for tsunami research, has adapted this mathematical formula into a tsunami forecasting tool. The Chilean Navy is now implementing this tsunami forecasting method and, starting this month, has an oceanographer at the University of Hawai'i working directly with Dr. Cheung.

The threats from tsunamis are far-reaching and have the potential to cause devastating loss of life and property. This research has provided emergency managers with an effective tsunami forecasting system, and a tool to reliably estimate tsunami waveforms in advance.

ABOUT THE SEA GRANT COLLEGE PROGRAM

The University of Hawai'i Sea Grant College Program supports an innovative program of research, education and extension services directed to the improved understanding and stewardship of coastal and marine resources of the state, region and nation. Science serving Hawai'i and the Pacific for 40 years.

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