

# TRAVEL WEEKLY

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## Experts: Tsunamis pose deadly threat to Caribbean

By Gay Nagle Myers

SAN JUAN — Tsunamis in the Caribbean? Who knew? Who even suspected?

Actually, tsunamis, massive tidal waves triggered by earthquakes or volcano eruptions, have been occurring in the region long enough to have earned the local nickname of "El Peligro Olvidado," Spanish for "The Forgotten Danger."

Since the middle of the 19th century, it turns out, they have caused more deaths in the Caribbean than hurricanes.

Though seismologists who track tsunami activity have known of the threat for decades, it was rarely discussed until December 2004.

The tsunami that pummeled Southeast Asia that month left 170,000 dead and missing in the Indonesian province of Aceh alone.

Tsunamis and the danger they pose were brought home in vivid detail at the recent Caribbean Sustainable Tourism Conference here. The discussion was part of an opening day session on disasters — how to plan for them, manage them and react to

them — led by the Caribbean Disaster Emergency Response Agency.

Most people in the audience assumed the focus would be hurricanes, given the past two devastating seasons. But in her opening remarks, Mariba Scott, the Caribbean Tourism Organization's sustainable-tourism product specialist, hinted that far more than tropical storms were on the agenda.

"Even though we tend to point to hurricanes, we see what's happening with the avian flu and floods, which affect the Caribbean every year," Scott said. "More and more, we see a significant amount of climate change, and we have to pay attention to that area."

Following up, Jeremy Collymore, the CDEA's coordinator and moderator of the session, said that "generating awareness of any potential disaster is the critical first step in managing hazard risks in the Caribbean."

"The Caribbean has had significant losses in the last 10 years that appear to be on the increase and have set back development," Collymore said.

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# Caribbean warned that tsunamis are a threat

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He was alluding to the increase in hurricanes that were Category 3 or higher in each decade since 1970, growing from 15 storms between 1970 and 1979 to 25 between 1990 and 1999. Since 2000, there have been 19 hurricanes that were Category 3 or higher.

"We will have more in the next two decades," Collymore said.

That was unsettling but not unexpected news. Far more surprising was the message

representatives, who grapple with complex issues affecting 37 different island countries. Now they had to add tsunamis to their disaster-preparedness equations.

Hillebrandt-Andrade has for years been the lone voice calling for the development of a Caribbean tsunami alert and preparation plan. She may have finally found an audience willing to listen.

She peppered her talk here with charts and graphs, including one slide that graphi-

tion with 1,865 deaths in 1946. Today, conditions are ripe for a tsunami because of climate and warm water, said Hillebrandt-Andrade.

Other unsettling statistics:

- Fourteen percent of all tsunamis occur in the Caribbean region.

- About 200,000 people in Puerto Rico live in a tsunami flood zone.

- On any given day in the Caribbean, more than 1 million vacationers are at a beach, according to an estimate by the National Weather Service.

"Where are the sirens?" Hillebrandt-Andrade asked. "Where are the signs? Where are the emergency plans? Do hotels know what to tell their guests regarding tsunamis? Do governments have plans?"

She added, however, that "the process is under way to make the region tsunami-ready." A Caribbean Tsunami Warning System is taking shape, thanks to a Unesco directive issued in June 2005 that called for the development of such a plan.

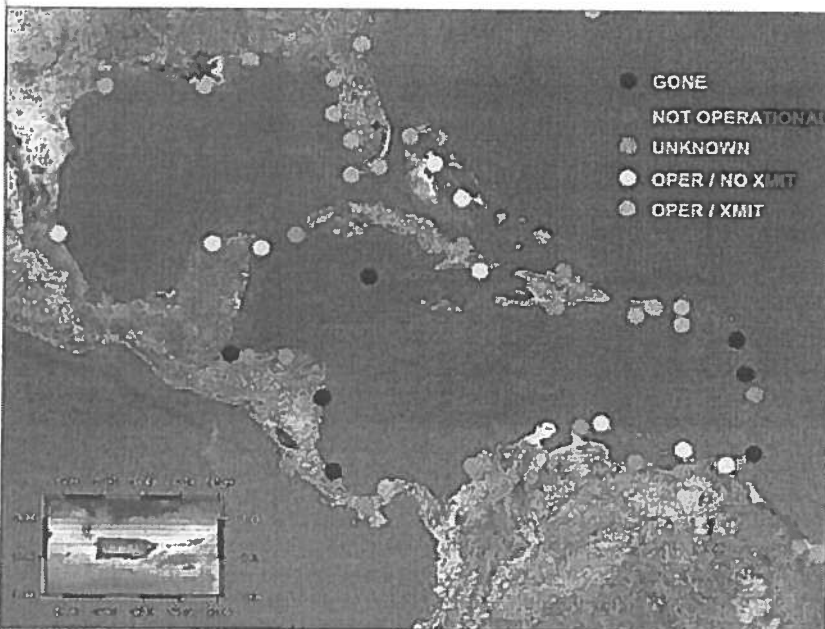
The first meeting was held in Barbados last January when four working groups were established to assess and research tsunami risks, develop monitoring and detection systems and create a network of seismic centers in the Caribbean to disperse warning information within two minutes of an earthquake.

Already, five deep-water ocean buoys have been sunk in critical areas in the Caribbean Sea and Atlantic Ocean to help in the quick detection of earthquakes.

Unesco directed that each Caribbean country have an information center in operation 24 hours a day, seven days a week that could receive and disseminate tsunami bulletins quickly. To date, only Suriname has set up such a facility, and Barbados has created an International Information Center on Tsunamis. Puerto Rico has erected 250 signs in English and Spanish that illustrate tsunami evacuation routes and areas of danger.

"The goal is to have the entire region tsunami-ready, like Hawaii is," she said.

Funding is crucial. Hillebrandt-Andrade estimated that the cost of such a plan is approximately \$41 million for the Caribbean region, with the bulk of it going to studies and research on coastal populations, evacuation routes, response and recovery plans and education and outreach programs.



The chart illustrates the location and status of instruments used to measure sea levels in the Caribbean. Several instruments have been destroyed by storms (black dots), others no longer operate (red dots), some operate but cannot transmit data (yellow dots) and some operate and can transmit data (green dots).

delivered by Christa von Hillebrandt-Andrade, director and assistant researcher of the Puerto Rico Seismic Network.

"The Caribbean is highly vulnerable to the threat of tsunamis," she said.

Referring to the tsunami that hit Southeast Asia in December 2004, Hillebrandt-Andrade said, "There wasn't an adequate warning system in place. No one was prepared. We have been working for years toward the development of a tsunami plan in the Caribbean. We can no longer ignore this potential danger."

That was not welcome news to Caribbean tourism officials and government rep-

resentatives, who grapple with complex issues affecting 37 different island countries. Now they had to add tsunamis to their disaster-preparedness equations.

Hillebrandt-Andrade has for years been the lone voice calling for the development of a Caribbean tsunami alert and preparation plan. She may have finally found an audience willing to listen.

She peppered her talk here with charts and graphs, including one slide that graphically illustrated the number of tsunamis that have struck in the Caribbean since 1846. "Earthquakes create tsunamis, but tsunamis are much less frequent than earthquakes," she explained. "Tsunamis are tidal waves usually caused by an underwater earthquake or volcanic eruption, but not all tidal waves — defined as an unusually high sea wave that sometimes follows an earthquake — become tsunamis."

The charts outlined a compelling story. From 1842 to 1946, more than 11,000 people in the Caribbean died as a result of tsunamis. The Dominican Republic suffered the single largest toll in the re-