

## **Not My Fault: Remembering Samoa ten years later**

Lori Dengler/For the Times-Standard  
Posted September 12, 2019

I'm not a big fan of disaster anniversaries and don't usually draw attention to them. But this earthquake was the first local tsunami to kill Americans since 1964. I was part of a survey team that visited both American Samoa and the country of Samoa about three weeks afterwards and it made a big impression on me. The lessons are worth repeating, particularly as we enter October and gear up for the Great ShakeOut.

The September 29th 2009 earthquake was centered at the northern end of the Tonga trench, one of the most seismically active areas of the planet and the deepest trench in the Southern Hemisphere. While many earthquakes occur in the region, most are too deep or too far from populated areas to cause damage and few have generated significant tsunamis.

The 2009 earthquake was complex and unique. Centered about 100 miles south of Samoa, it was a compound earthquake – the initial rupture on a normal fault where the Pacific plate bends before being pulled under the Australian plate, followed within seconds by slip on the subduction zone interface. This double whammy of an earthquake ended up as a magnitude 8.1 earthquake and produced a very large tsunami, that quickly arrived on Samoa, American Samoa, Tonga and the small country of Wallis and Futuna. The earthquake was felt throughout the region but caused little damage. It was the tsunami that arrived between 14 and 50 minutes later that caused the devastation and nearly 200 deaths.

I was part of a seven-person team focusing on tsunami impacts and human response. We were particularly interested in what triggered evacuation, if people recognized ground shaking or other natural signs of an impending tsunami, how coastal structures, planning and management affected exposure and response challenges. We arrived about three weeks after the earthquake and spent time in both American Samoa and Samoa surveying impacts and interviewing eyewitnesses.

Just a few observations to highlight here:

1) Educating officials makes a difference. Amenave is a village in American Samoa where almost all of the coastal buildings were destroyed. The mayor had attended a tsunami workshop only three weeks before the earthquake. He showed us the bullhorn he used to warn the people about a possible tsunami after he felt the earthquake. Many people ignored him on his first run through the village, so he ran through again as the water receded. That finally triggered people to move. This a recurring theme – relatively few people were willing to act on the ground shaking alone. But seeing the water recede definitely got them moving. Unfortunately not all tsunamis start with a water drawdown. We have to do a better job of getting people to recognize an earthquake that lasts a long time should be enough to get them moving.

2) Educating children makes a difference. 10-year old Abby Wutzler, from New Zealand, was vacationing in Samoa when she noticed the ocean was withdrawing. She had been taught about the natural warning signs of a tsunami in school and ran up and down the beach yelling that a tsunami was coming. "I remember looking under my arms and seeing all these trees just crushing and being crushed in the brown water, just swirling around and killing everything in sight," she recounted. Many other tourists credit Abby's warning with saving their lives. For her life-saving efforts, she was presented with a certificate of commendation by New Zealand's Ministry of Civil Defense.

3) Social pressure can lead people to do the wrong thing. We talked to a group of women in their late teens/early twenties. One of the women had gotten caught in the tsunami and her leg was stuck by debris. She was barely able to escape when the second wave came. The women were aware that tsunamis could follow earthquakes but admitted that they were embarrassed to evacuate right after the earthquake and they didn't want to appear foolish, especially because there was group of men nearby. It nearly cost them their lives.

4) The amount of debris produced by tsunamis is astounding. I spent a day with an Army Corps of Engineers debris specialist. Tsunami debris is very dirty, generally a mix of sand, vegetation, metal and building materials. Some of it is toxic, some can be re-used and a lot is in between. Sorting and moving debris is expensive and time consuming. All communities need to have debris management plans before disaster strikes. They tried to do primary sorting of metal/no metal/compostable on site so that the debris only needed to be handled once.

5) Barriers to evacuation routes can be deadly. The islands in the affected region are generally steep and high ground was nearby in most places. But fences, mangrove swamps and waterways often blocked easy access to high ground.

The line that remains imprinted on my brain is drill – drill – drill. Practicing evacuation beforehand not only saved lives but created peace of mind.

Note: You can find my blog posts from the post-tsunami survey study at <https://rctwg.humboldt.edu/news-blog> - scroll down to the bottom of the page for the seven Samoa entries.

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Lori Dengler is an emeritus professor of geology at Humboldt State University, an expert in tsunami and earthquake hazards. Questions or comments about this column, or want a free copy of the preparedness magazine "Living on Shaky Ground"? Leave a message at (707) 826-6019 or email [Kamome@humboldt.edu](mailto:Kamome@humboldt.edu)

<https://www.times-standard.com/2019/10/03/lori-dengler-four-lessons-from-the-deadly-2009-samoa-earthquake/>