Times-Standard
Times-Standard / Humboldt Beacon

Not My Fault: Learning from earthquakes and tsunamis requires boots on the ground

Lori Dengler/For the Times-Standard
Posted May 9, 2021
https://www.times-standard.com/2021/05/09/lori-dengler-learning-from-quakes-tsunamis-requires-boots-on-the-ground/

Every day this week, Facebook has reminded me of a trip to Japan ten years ago. I was part of a reconnaissance study of the Tohoku-oki (Great East Japan) earthquake and tsunami. I spent ten days in some of the hardest hit areas of Miyagi and Iwate Prefectures identifying factors that reduced or exacerbated impacts.

The purpose of post-event studies is to document what happened. In the case of tsunamis, much data is ephemeral and disappears quickly as weather and debris cleanup removes their trace. Some groups focus on measurements of tsunami water heights and the extent of the inundation zone. These measurements are used to calibrate tsunami models so that we can be confidant that hazard models are credible.

Other groups measure tsunami deposits. I spent two weeks in 2005 with a team documenting sediment thicknesses and characteristics in areas flooded by the 2004 Indian Ocean tsunami. Paleotsunami deposits from events hundreds to thousands of years ago are one of the main ways to look at tsunami risk in areas that haven't experienced a tsunami in historic times and studying modern deposits yield clues to deciphering ancient ones.

I've worked with engineering groups examining structural damage and ones that studyied ecological impacts. Our group in Samoa (2009) looked at response issues like debris removal and storage. By 2011, I realized it was important to get as broad a picture as possible of impacts and my skill was to query and listen to as many different people as I could.

I had met Megumi Sugimoto three months before the Japan tsunami at the fall meeting of the American Geophysical Union. Meg was a social scientist at Tokyo University's Earthquake Research Institute and gave a talk on Indonesia tsunami recovery and preparedness. We hit it off immediately and talked afterwards about her coming to Humboldt to help our preparedness efforts.

The 2011 Japan tsunami upended those plans. We decided I would join her in Japan as soon as international scientists were allowed entry. The immediate post-disaster period is always a tricky time and the US State Department prohibited Americans from traveling to Japan until late April. I left on April 29th, as soon as the travel ban was lifted.

I met Meg at a hotel in Sendai and we planned out our strategy for the next ten days. Most of my post-tsunami field excursions have involved groups of five or more people. There were 13 of us in Peru (2001) and 17 involved with the Indian Ocean reconnaissance (2005). There are advantages and disadvantages to a large team. It is helpful when you want to collect much data in a short period. But logistics can be difficult. Meg and I wanted to understand the human impacts and decided we could work best as just the two of us. As long as I wore sunglasses and the hood up on my black coat, the two of us could pass for local residents and move freely in the most heavily hit areas. In nine days of field work, we were denied entry only once, a problem quickly resolved by taking another street.

We rented a car and Meg found us a former mountain resort to stay in just west of Iwanuma that had only recently been re-opened to provide access to hot springs for tsunami evacuees. From there we could head out for day trips to sites in Miyagi and Iwate Prefectures. The management were kind enough to let me use the hotel computer to post daily blogs and keep in contact with other teams.

We focused on three areas: tsunami awareness, evacuation (what people did and what hindered evacuation efforts), and relief efforts post event. Starting in Natori and ending up in Rikuzentakata, we visited schools used as evacuation sites, the Sendai Airport that served as a refuge for hundreds of people, shelter locations and temporary housing and talked to officials and survivors.

I don't have the space to recap all of what we learned, but a few things stand out. More than 95% of the people who lived and worked in the area flooded by the tsunami survived. The level of tsunami awareness and participation in evacuation drills was high. Unfortunately, the tsunami was larger than what had been expected. Sea walls and hazard maps were based on an earthquake of about magnitude 8, not a 9.

I've said this before, but it bears repeating. Vertical evacuation structures should only be used as a last resort;

it is always better to get to higher ground outside of the inundation area. Any site designated as a shelter or evacuation site must be equipped with supplies to provide basic needs for at least a week. Seconds count – the more quickly you respond to natural or official warnings, the more likely you are to survive. And at least as much effort needs to be placed on relief and recovery planning as on issuing alerts and evacuation.

Our last field day was May 8, 2011. It began with a 5.7 aftershock. We felt one or two aftershocks nearly every day, a constant reminder that an earthquake was the cause of what we were studying. We spent the morning investigating the temporary housing situation and talking to several people who had been housed at a public apartment building that had been converted into a shelter. They were lucky. We had seen many families who were still housed in public spaces, their small area separated by flimsy cardboard partitions.

On the drive back to Sendai, we paused to visit Chuson-ji, a famous Buddhist temple founded in the early 12th century by the Fujiwara lord to foster peace and reconciliation after vicious civil wars that had claimed the lives of many in his clan. It was the perfect end note to our field work, serene, beautiful and proof that balance can return after tragedy. And a reminder of how much I appreciate being in Japan.

Note: blog posts and report are posted at https://kamome.humboldt.edu/taxonomy/term/11.

Lori Dengler is an emeritus professor of geology at Humboldt State University, an expert in tsunami and earthquake hazards. The opinions expressed are hers and not the Times-Standard's. All Not My Fault columns are archived online at https://kamome.humboldt.edu/resources and may be reused for educational purposes. Leave a message at (707) 826-6019 or email rctwg@humboldt.edu for questions and comments about this column, or to request a free copy of the North Coast preparedness magazine "Living on Shaky Ground."