Times-Standard
Times-Standard / Humboldt Beacon

Not My Fault: Resiliency requires government support

Lori Dengler/For the Times-Standard
Posted: Jun. 7, 2017

Resilient communities take efforts to reduce risk and will recover more quickly. When it comes to earthquakes and tsunamis, this means being aware of faults, shaking hazards and the tsunami threat, understanding the physical interactions of the hazard and the built environment, developing strategies to reduce impacts, and improving response and recovery planning. A resilient community means fewer deaths and injuries and a quicker return to a new normal and requires a partnership between the scientific and engineering research communities, government agencies, the business sector, emergency management professionals and the general public so that all of us understand what to do in case of emergency and why it is important to support resiliency efforts.

Becoming resilient is a never-ending task. We can't say voila — we have arrived. There is no single technology that will magically keep us safe and reduce our vulnerabilities. It is an evolving process — incorporating new research and lessons learned from past experience. It took the 1933 Long Beach earthquake and the collapse of over 230 brick school buildings to enact California's first seismic building codes. The 1946 April Fool's Day tsunami from Alaska struck the completely unaware Hawaiian Islands, causing America's worst tsunami disaster and leading to the establishment of the first tsunami warning center. The 1985 Mexico earthquake devastated tall buildings in Mexico City and led to both more stringent building codes for skyscrapers and the world's first earthquake early warning system.

Personal and community awareness and preparedness efforts are important but we need the support and financial resources of government. The federal support for this partnership may be changing if the president's proposed 2018 budget becomes law. There are many places in this budget that could make us more vulnerable. Here I will pick out two where eliminating funding could have a profound effect on North Coast earthquake and tsunami safety.

First, eliminating the U.S. National Tsunami Hazard Mitigation Program. This program began in 1996, largely in response to West Coast tsunami concerns following the 1992 Cape Mendocino earthquake and the recognition that we were unprepared for a Cascadia tsunami. In the proposed NOAA 2018 budget, "NOAA requests a decrease of $11,000,000 to reduce or eliminate components of its Tsunami Research and Operational Warning program. This reduction will affect monitoring, reporting, modeling research, and support to partners. Support for preparedness education, outreach, and innovation research will cease. This program change request is consistent with the elimination of the DART network."

To get a feel for how these cuts could impact us, let's turn back the clock to the evening of March 10, 2011. NOAA's warning centers sent notice of a potential tsunami following a major earthquake in Japan a little before 10 p.m. Bulletins were issued every half hour over the next 12 hours with updated information. By midnight, the tsunami had crossed over two deep ocean DART sensors, instruments on the ocean floor that allowed the warning centers to estimate likely water heights with confidence. At 1:30 a.m., a warning was issued for the West Coast and emergency managers began deploying emergency personnel and establishing road closures. Boat owners in Crescent City harbor were notified and all but five commercial fishing boats were able to exit the harbor in an orderly fashion. Sirens and door-to door notification began at 4:30 a.m. The DART system, improvements in warning notification, and the emergency response coordination was all supported by NOAA's National Tsunami Hazard Mitigation Program.

The DART network is to tsunamis what seismographs are to earthquakes. They provide the data in the deep ocean that allows an understanding of both the propagation of tsunamis in the deep ocean and, for tsunami sources far away, provide the critical information to forecast the likely water height in coastal areas hours before the first wave strikes. The DART-aided water height forecast for Crescent City was 2.5 meters. The actual measured water height was 2.47 meters. What would have happened without this forecast? A lot of uncertainty about how important it was to evacuate. I was part of the conversation with emergency managers that long night of March 10 into March 11. Being able to share the modeled water heights and compare it with what happened in 1964 was the clincher. There was no hesitation in moving forward with a full-scale evacuation. Crescent City still lost their harbor in the tsunami, but almost all of the fishing fleet survived, and their owners were able to work out of other ports and continue to provide for their families.

Another program slated for elimination is implementing Earthquake Early Warning on the U.S. West Coast. We can't predict earthquakes weeks or months beforehand, but we can detect an earthquake very soon after it starts and four countries have operational systems. Japan's is the most advanced — based on a dense network of seismographs, so that multiple instruments can record seismic waves only a few seconds after an earthquake begins anywhere in the country. Automated algorithms immediately estimate magnitude and forecast when the stronger shaking will arrive at areas further away. There's not a lot of warning time — only seconds to tens of seconds — but time to slow and stop trains, open fire house doors, safely shut down power stations, stop delicate operations and start emergency generators in hospitals and give you a few important seconds to prepare yourself and Drop, Cover and Hold On. The ShakeAlert U.S. West Coast system was intended to be operational in California by 2018. So what is the down side of eliminating a program that doesn't exist yet? The real hazards we could reduce and the psychological benefits of not being surprised when the shaking comes are huge — and instead of being right around the corner, may require many more years to come to fruition.

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