

**Edward T. Teixeira**  
**Vice Director of Civil Defense**  
**Hawaii State Department of Defense**

**TESTIMONY**  
**BEFORE THE**  
**SUBCOMMITTEE ON NATIONAL SECURITY, HOMELAND DEFENSE AND**  
**FOREIGN OPERATIONS**  
**COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM**  
**THE UNITED STATES HOUSE OF REPRESENTATIVES**  
**ON**  
**TSUNAMI WARNING, PREPAREDNESS, AND INTERAGENCY COOPERATION:**  
**LESSONS LEARNED**

**APRIL 14, 2011**

Chairman Chaffetz, Ranking Member Tierney, and distinguished members of the Subcommittee:

Thank you for providing the opportunity to present written testimony regarding our experience during the Honshu (Tohoku) Earthquake and Tsunami of March 10-11, 2011, in terms of our Tsunami Warning System, Interagency Cooperation, and lessons we have learned thus far. The potential threat of a tsunami to the State of Hawaii from a strong earthquake along the Pacific Rim or from an area in Hawaii is a real concern for State and county civil defense agencies. We, therefore, need to be vigilant and ready to evacuate our coastal areas 24/7, 365 days a year.

**Tsunami Warning System**

The Tsunami Warning System in Hawaii worked during the evening of March 10 through first wave arrival on March 11. The Tsunami Warning System is based on the Emergency Alert System and supported by the State's outdoor siren warning system that include a variety of mass notification programs at the county level including social media resources. From a federal perspective, the Emergency Alert System (EAS) worked flawlessly. The State's outdoor siren warning system comprised of 367 siren systems, however, performed at about an 88 percent operational rate. (The majority of sirens not sounding are older models to be replaced with solar-powered systems with State funds).

In addition to the EAS, outdoor siren systems, mass notification systems, the Civil Air Patrol, Hawaii Wing, was mobilized by the State Emergency Operating Center (EOC) to fly pre-planned routes providing tsunami warning instructions by air in remote areas and along coastlines. County emergency response agencies implemented their plans to alert and evacuate coastal communities and

neighborhoods. Local police in all counties provided traffic control points at pre-designated intersections to prevent residents and visitors from entering tsunami evacuation zones. And finally, the news media including three radio stations that broadcasted in Japanese, Korean, and in other languages carried public information messages until the Tsunami Advisory was cancelled.

The support the Hawaii State EOC and county EOC received from the Pacific Tsunami Warning Center located in Ewa Beach, Hawaii, was nothing short of excellent. We were notified by the Pacific Tsunami Warning Center (PTWC) within minutes of the Honshu (Tohoku) Earthquake and placed in a Tsunami Watch by 7:56 p.m. (HST), March 10. The State of Hawaii was subsequently placed in a Tsunami Warning at about 9:31 p.m. (HST), March 10. Earliest wave arrival to the State of Hawaii was estimated at 2:59 a.m. (HST), March 11.

Through the leadership and efforts of Dr. Charles McCreery, Director, PTWC, and his staff, emergency managers, government officials including Governor Neil Abercrombie and our county mayors, were kept apprised hourly of deep ocean buoy and tide gauge station readings via a telephone and video teleconference system provided through the State EOC. Dr. McCreery and his staff were available to address questions from emergency managers and key government officials through first wave arrival. More importantly, Dr. McCreery did not downgrade the Tsunami Warning until he and his staff received appropriate measurements from tide gauges within State waters that wave oscillation in and around our harbors was below a half meter. When that occurred, the PTWC issued a Tsunami Advisory for the State of Hawaii at about 7:31 a.m., March 11, enabling our county government response agencies to survey coastal areas and subsequently provide All Clear instructions where appropriate. That single decision by Dr. McCreery, after enduring nine and half hours in a Tsunami Warning condition, saved lives and prevented damage to marine vessels that were waiting out at sea.

### Interagency Cooperation

Interagency cooperation at all levels of government including the support from the private sector was excellent. Hourly conference calls as mentioned above provided an opportunity to address and to resolve issues requiring agency coordination and clearance. Federal agency representatives present in the State EOC to provide assistance and coordination included: U. S. Coast Guard Sector Commander, Captain Jo Anna Nunan and staff; Federal Emergency Management Agency, Pacific Area Office Deputy Director, Marilyn Shigetani and staff; U. S. Department of Homeland Security Protective Services Advisor, Richard Mitchem; liaison teams from U. S. Army Pacific, Joint Task Force Homeland Defense (Executive Agent for U. S. Pacific Command for Defense Support to Civilian Authorities); and senior commanders from the Hawaii Army and Air National Guard. The National Weather Service, Honolulu Forecast Office provided support throughout the period through EAS messaging and weather products. There were also representatives from non-government organizations i.e. University of Hawaii, American Red Cross, Hawaiian Electric Company etc. At two hours before first wave arrival, Governor Abercrombie received a briefing from State and federal agency representatives on the state of

preparedness by 15 Emergency Support Functions. The briefing clearly showed that agencies at all levels of government including the private sector were taking appropriate measures to evacuate our coastal areas, to protect lives and property, and to safeguard our visitors.

### Lessons Learned

As a State, we continue to identify areas for improvement and have yet to convene an interagency After Action Review. As you are aware, President Obama recently approved Governor Abercrombie's request for federal disaster assistance. That said the State Civil Defense Division and other State and county agencies are implementing disaster management responsibilities to address the needs of residents and businesses affected by the tsunami. At Governor Abercrombie's request, the Small Business Administration approved an Administrative Disaster Declaration for Hawaii County on March 29, 2011. As well, Governor Abercrombie requested an SBA Administrative Disaster Declaration for Maui County on April 8, 2011. That request is pending approval at the time of this writing.

Thus far, we have learned is that the best technology available to the Pacific Tsunami Warning Center can neither predict nor measure the power of a tsunami on exposed shorelines. Safety and security managers have indicated that most of the damage to hotel properties in West Hawaii, and to businesses in Kailua-Kona, and residential properties in the South Kona District, Hawaii County, occurred between 5:30 a.m. (HST), and 7:30 a.m. (HST), or 2-4 hours after first wave arrival time to the county. We estimate that the tsunami wave height at Kealakekua Bay, South Kona, may have been between 11-15 feet causing major damage to about ten residential units and a church.

The estimated height of the tsunami wave was brought to our attention by a researcher and Tsunami Advisor to the City and County of Honolulu, Dr. Dan Walker, who built and installed a water pressure recorder on a utility pole at Kealakekua Bay. The water pressure recorder at Kealakekua Bay sounded an alarm at 7 a.m., March 11.

Over the years, Dr. Walker installed several water pressure recorders which use a cell phone to transmit if the recorder is inundated by the ocean. This simple invention was created to record the effects of a local earthquake along selected points of the shoreline in that seismically active region at a very low cost. The March 11 Tsunami has proved that we need additional water pressure recorders installed in that region and elsewhere in the State. Dr. Walker has patiently waited for more funding from the State or from a federal grant to install more recorders.

Initial funding for Dr. Walker's project was provided from our annual allocation of National Tsunami Hazard Mitigation Program (NTHMP) Grant funds. A change of program policy prevented the use of these funds for "research" work. As grantee for the NTHMP grant funds, we were not able to continue with Dr. Walker's project. (NTHMP grant fund information is provided at the enclosed Truth-in-Testimony Form). We recommend that Congress look into NTHMP grant guidance to ensure State and

local governments are provided the opportunity and discretion to maximize these funds to best accommodate their tsunami preparedness and mitigation needs.

The other important lesson we have learned is that the nominal investment we have made over the past seven years in tsunami inundation map modeling has paid off in the development of new tsunami evacuation maps for the City and County of Honolulu. New tsunami evacuation maps for Hawaii County are in development. (Tsunami inundation map modeling is in progress for Maui County. Tsunami inundation map modeling for Kauai County is projected for early 2012). Accelerated by State funding in 2006-2007, the tsunami inundation map modeling project conducted by Dr. Kwok Fai Cheung, University of Hawaii, is probably the best example of science and technology at work in providing the tools Hawaii's civil defense agencies and emergency responders need in evacuating our coastlines. As well, the tsunami inundation map modeling has produced new tsunami evacuation maps for the City and County of Honolulu that are available in local phone directories and on-line sources through the National Oceanic Atmospheric Administration (NOAA) web server. The tsunami evacuation mapping on-line tool is available at our website [www.scd.hawaii.gov](http://www.scd.hawaii.gov).

The tsunami inundation map modeling project is also funded by our allocation of annual NTHMP grant funds. We recommend that Congress continue to fund NOAA and specifically the NTHMP Grant so that this State and other states can continue to develop tsunami inundation maps as data and technological improvements become available.

Finally, I recommend that your Subcommittee consider another fact-finding by the Government Accountability Office (GAO). Previous GAO fact-finding sessions on tsunami preparedness provided sound recommendations.

Thank you, again, for giving me the opportunity to provide written testimony on this important matter.

Aloha!

**Committee on Oversight and Government Reform**  
**Witness Disclosure Requirement – “Truth in Testimony”**  
**Required by House Rule XI, Clause 2(g)(5)**

Name: Edward T. Teixeira, Vice Director, Civil Defense Division, Hawaii State Department of Defense

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1. Please list any federal grants or contracts (including subgrants or subcontracts) you have received since October 1, 2008. Include the source and amount of each grant or contract.

Source: NOAA/U.S. Department of Commerce  
Award Period: 8/1/2008 to 7/31/2009 (rev. to 7/31/2010)  
Award #: NA08NWS4670033 (NA4)  
Award Amount: \$282,910.00

Source: NOAA/U.S. Department of Commerce  
Award Period: 8/1/2009 to 7/31/2010 (rev. to 7/31/2013)  
Award #: NA09NWS4670016  
(NA5) FY09-FY10  
Award Amount: \$466,000.00  
(NA6) FY10-FY11  
Award Amount: \$259,000.00  
(NA7) FY11-FY12  
Award Amount: \$453,000.00  
(NA8) FY12-FY13  
Award Amount: \$678,000.00

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2. Please list any entity you are testifying on behalf of and briefly describe your relationship with these entities.

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3. Please list any federal grants or contracts (including subgrants or subcontracts) received since October 1, 2001, by the entity(ies) you listed above. Include the source and amount of each grant or contract.

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*I certify that the above information is true and correct.*

Signature:

*Edward T. Teixeira*

Date:

*April 11, 2011*

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