WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 17-1

Improving Tsunami Public Education and Warning Procedures for Distant and Local Sources

Policy Recommendation 17-1

WSSPC recommends expanding the efforts by NOAA, the USGS, FEMA, and WSSPC members to enhance public education programs about potential impacts from local tsunamis and the need to evacuate threatened areas immediately after strong or sustained ground shaking; prioritizing those efforts, which have an immediate and direct impact on life-safety for locally-generated tsunamis, over deep-sea tsunami detection systems that have no benefit for local warnings. WSSPC also recommends robust, effective, and fully maintained implementation of the tsunami detection system by NOAA, as long as it is not at the expense of community-level tsunami preparedness, mitigation, and recovery planning.

Executive Summary

In the case of locally generated tsunamis, the time before impact is so brief that the most effective means for protecting the public is not through warning systems, but through sustained community outreach and education. The efforts of the U.S. Geological Survey (USGS) and National Oceanic and Atmospheric Administration (NOAA) to maintain the current array of the nation's seismic monitoring system, coastal tide gauges, and the deep-ocean tsunami detection system (DART) are vital to improve response and reduce loss of life from distant tsunamis. Buoys, sirens, and loudspeakers, etc., are meaningless if the general public does not know what to do in the critical few minutes following an earthquake that generates a deadly and damaging tsunami.

Effective community outreach and education requires sustained commitment by state and local governments partnering with the federal government through the National Tsunami Hazard Mitigation Program (NTHMP) to implement robust, long-term education programs reinforced by exercises and training, and subsequently measured and evaluated using social science surveys. The Tsunami Warning and Education Act (TWEA) provides the framework for the NTHMP collaboration and supports the full national effort to reduce loss of life from tsunamis. For this reason, continued support of the NTHMP by NOAA and/or reauthorization of TWEA is important.

Background

Tsunamis are among the most destructive and deadly hazard, not only to nearby coastal areas, but occasionally to regions thousands of miles from the source. According to the 2011 WSSPC paper titled: ***Tsunami Hazard Mitigation and Preparedness: A Perspective from State and Territory Tsunami Programs in the High Tsunami Risk Pacific Region***, eight significant tsunamis since 1946 have killed 392 people and caused over $1,600,000,000 in damages to WSSPC member states and territories. The 1946 and 1964 Alaskan earthquakes produced tsunamis that caused damage and/or loss of life in Hawaii, American Samoa and along the coasts of British Columbia, Washington, Oregon and California. The Pacific Tsunami Warning Center at Ford Island, Hawaii, and the National Tsunami Warning Center at Palmer, Alaska, were established as a result of these destructive tsunamis and because of the need to warn coastal populations of tsunamis from distant sources.

Pacific States, Provinces and Territories must also plan for locally generated near-shore tsunamis that provide little or no time to issue a general public warning of a destructive tsunami. Recent events in Japan (2011), Chile (2010), American Samoa (2009), and Sumatra (2004) validate findings that a well-educated and trained public is the most effective way to avoid catastrophic loss of life from a local tsunami. The 2013 Uniform California Earthquake Rupture Forecast (UCERF3) estimates a ten percent probability of a M 8.0 or greater earthquake somewhere along the Cascadia Subduction Zone (Cascadia Megathrust) in the next 30 years (Frankel and Petersen, 2013). During the past century, the Alaska-Aleutian Subduction Zone had a M 8.0 or greater earthquake on the average of every 16 years, four of which produced destructive tsunamis.

Therefore, it is vitally important to continually educate coastal residents, businesses, and visitors about the importance of immediate evacuation to high ground upon cessation of strong or sustained ground shaking. In areas where no high ground is nearby, vertical evacuation in approved engineered structures may be the only option to survive a tsunami impact. Members of coastal maritime communities exposed to tsunami hazards must also understand how to best protect life and property. Through the use of scientifically researched and developed tsunami inundation models, maps, and other products, community evacuation plans and guidance must be developed showing evacuation routing and safe zones both on land and at sea, and these plans should be exercised on a continual basis.

Currently, Congress only measures the TsunamiReady program and the Deep-ocean Assessment and Reporting of Tsunamis (DART) system. What should also be measured and acknowledged is community-level tsunami preparedness, mitigation, response, and recovery planning. These efforts are essential for making at-risk communities more resilient.

References

Frankel, Arthur D., and Petersen, Mark D., 2013, Appendix P – Models of Earthquake Recurrence and Down-Dip Edge of Rupture for the Cascadia Subduction Zone in: The Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3) – The Time-Independent Model: USGS Open-File Report 2013-1165, CGS Special Report 228, and Southern California Earthquake Center Publication 1792, 13 p.

Western States Seismic Policy Council, 2011, Tsunami Hazard Mitigation and Preparedness: A Perspective from State and Territory Tsunami Programs in the High Tsunami Risk Pacific Region: WSSPC Report 2011-01, 30 p.
http://www.wsspc.org/wp-content/uploads/2013/10/WSSPC_Tsunami_Report_2011-01.pdf