**California Tsunami Program Accomplishments (FY12)**

The California Tsunami Preparedness and Hazard Mitigation Program is a state level tsunami hazard reduction project managed by the California Emergency Management Agency (Cal EMA) with assistance from the California Geological Survey (CGS) that, in cooperation with NOAA’s National Weather Service and other federal, state and local agencies, promotes tsunami planning, preparedness and hazard mitigation among California’s coastal communities. We provide the following abbreviated summary of our work in FY11-12 and FY12-13.

**Objectives 1 through 3: Assure conformity of California tsunami inundation maps with established methodologies and future NTHMP standards and guidelines. Produce maps and other products for evacuation planning, maritime planning, and land-use planning.**

**Summary of On-going Tsunami Mapping and Modeling Activities**

* **Maritime planning** - Initiated production of tsunami hazard mapping products for maritime communities, consisting of in harbor hazard maps and offshore safety zones for potential evacuation. First maps available by mid- to late-2013.
* **Land-use planning** – Created PTHA “Work Group” to review two products in Crescent City and guide production of PTHA maps for land-use planning and multiple other purposes. First maps available by late-2013.
* **Coastal evacuation planning** – Producing “playbook” maps identifying potential tsunami flooding from different size events (1m, 2m, 3m, and 4m), and from various local and regional sources. First maps available early-2013.
* **New modeling and mapping for evacuation planning** – Working with Univ. of Alaska to produce higher resolution (10m) modeling in select locations. Completed modeling and mapping of Catalina Island. Completed modeling using new Cascadia source information from Oregon, and maps may be updated in early-2013; this will help produce consistent inundation maps across state boundary. Completed initial modeling in northern Sonoma and southern Mendocino counties; new inundation maps will be completed by early-2013.
* **Tsunami response field team** – Developed statewide field team to respond before and after a tsunami. Thus far we have about 50 field team members signed up.
* **USGS SAFRR “The Next Wave” scenario** – Coordinated on inundation mapping efforts and effects, and tsunami deposit work at 20 sites statewide. Project roll-out in March 2013 (Port of LA/LB portion) and Fall 2013.
* **Lake Tahoe inundation maps** – Working with State of Nevada to produce first tsunami inundation maps for evacuation planning around Lake Tahoe. First maps available late-2013 to early-2014.
* **State tsunami deposit database** - Completion of comprehensive database for tsunami deposits north of Cape Mendocino (Cascadia). Will incorporate cores/data from SAFRR project in 2013 and 2014.

**Objective 1.3: Disseminate tsunami inundation mapping products for emergency management through a series of focused workshops.**

More than 90 workshops, presentations, meetings, and community forums occurred where tsunami modeling, hazards, and maps were discussed to assist constituent jurisdictions occurred during 2012 (a separate list is attached).

**Objective 3.2:  Develop derivative tsunami preparedness information for marine community owners and managers/operators.**

A well-received, popular, new brochure was completed “Tsunamis! What Boaters Should Know” and was presented at various venues during March 2012 Tsunami Preparedness Week/Month.

Progress has been made towards completion of work at six pilot project areas. CGS has worked with Humboldt State University (HSU) to complete the review of all available video recordings obtained from the 2010 and 2011 tsunamis. This information will help in the validation/calibration of the large database of existing numerical model data available to the state. Meetings with harbor masters at each of the pilot project areas have been conducted to provide background on the project and ideas on how the tsunami hazard information will be presented and how they can use it. The resulting products will include 1) current/velocity maps of harbors, 2) offshore safety maps, and 3) guidance for vessel evacuation protocol planning during tsunami notifications**.**

**Objective 4.2: Conduct tsunami exercises to test local tsunami response plans.**

Marin County conducted a countywide, HSEEP-graded, functional, tsunami scenario-based exercise on May 10, 2012. Multiple trainings and planning meetings occurred during the six month lead up to this large event. The County EOC and those of the City of Belvedere-Tiburon, City of Novato, Health Dept., and West Marin all participated as well as State and Federal agencies. The community of Pebble Beach (Monterey County) conducted a public evacuation drill on 3/27/12. The City of Tiburon (Marin County) conducted a public evacuation drill on 5/10/12 in conjunction with the above exercise. Both these events involved public outreach in the form of media, door to door, and community meetings. The Humboldt County community of King Salmon conducted a public evacuation drill on 1/14/12

**Objectives 5.2 and 5.3: Establish the last week of March of each year as California Tsunami Awareness and Preparedness Week and develop a statewide campaign to promote tsunami awareness and preparedness. Develop tsunami public education materials.**

In non-emergency times, a plan is in place to establish the fourth week of March each year as Tsunami Preparedness Week. Some jurisdictions have extended observations and activities to encompass Tsunami Preparedness Month, which the state program supports with staff and in principal. The campaign associated with this week/month consists of:

1. An information campaign involving the NWS, CalEMA, CGS, and Counties
2. Proclamations at the local, state and national levels
3. Tsunami Warning Communications Test (EAS)
4. PACIFEX table-top exercise
5. Printing and distribution of tsunami public information materials
6. Evacuation drills and reverse 911 calling, and
7. Workshops and other special events across the state

Planning for these event began in November 2011, with planning conference calls conducted among CalEMA (various divisions), CGS, NOAA (various levels), and emergency managers from the 20 coastal counties in CA. Calls continued on 2/1/12, 2/24/12, and 3/16/12, in final lead-up planning for support of locally conducted events.

Statewide brochures were translated to Spanish and Chinese. New custom brochures with local evacuation maps were developed for a variety of coastal communities. A new brochure titled “Tsunamis What Boaters Should Know” incorporated research and lessons learned from recent tsunamis affecting California. This was developed and vetted with assistance from the Redwood Coast Tsunami Work Group and various counties and ports in California and first distributed during Tsunami Preparedness Week 2012. To date it has been well received and much requested as the first product of its kind. Plans are to produce this in greater quantity for even wider distribution during Tsunami Week 2013. State program has worked with Redwood Coast Tsunami Work Group to develop and distribute tsunami strategy/education materials for the maritime community. This plan has been included in the report developed for Objective 3.2. Outreach efforts have focused on working with and informing port authorities and the public through presentations and planning meetings.

**Objective 11.1: Work with the National Weather Service Forecast Offices in California to assist local jurisdictions in activities that qualify them for TsunamiReady designation.**

During this period of performance Monterey County, Santa Cruz County, the Pebble Beach Fire District, the Los Angeles Unified School District, and the community of King Salmon completed all requirements to be recognized TsunamiReady. In addition, the following communities received renewals of their existing TsunamiReady status: Half Moon Bay, Orange County Sanitation District, City of Dana Point, and the San Onofre Nuclear Power Station (supporter). Progress was made during this period in preparing Marin County, Sonoma County, the Golden Gate National Recreation Area, San Francisco International Airport, Carmel Highlands, Cypress Grove, Orange Coast State Park, City of Santa Monica, City of Santa Barbara, City of Malibu, City of Goleta and North Island Naval Base and Seaworld for TsunamiReady designation.

**Objective 11.3: Assist local government in the purchase and deployment of tsunami signage on state highways.**

Sign Placement Guidance documents and plan proposals were developed for Malibu, Sonoma County, Marin County, and Monterey County. During this fiscal year, 1,255 tsunami hazard signs were purchased for 8 jurisdictions. In total more than 4,500 signs have been purchased by the program for jurisdictions in 14 counties. The state has worked to develop and has purchased replica tsunami sign decals for jurisdictions to place on beach trash cans, life guard towers, etc.; communities have responded well to these stickers because they are inexpensive to install and can be easily replaced. Three hundred decals were ordered by CalEMA for distribution. With recent receipt of the previous order, a new order (of at least 1,329 signs) will be submitted during the next performance period, including the first set of multi-hazard (tsunami warning inclusive) signs for use in coastal state parks. This will bring the total statewide to more than 5,800 tsunami warning signs.

**ANTICIPATED OUTCOMES**

The anticipated outcomes of the FY 11-12 California Tsunami Preparedness and Hazard Mitigation Program are:

1. Having completed and validated tsunami inundation modeling and mapping for emergency response purposes and dissemination of all products (including the modeling/mapping for Catalina Island, Gualala and Sea Ranch) to California’s fifteen exterior coastal counties and five interior Bay Area counties, continue to promote an understanding of how these maps may be used in planning and hazard mitigation and continue work initiated during this period of performance to establish a basis for tsunami land-use planning maps;
2. Continuing work on a project to model and map a maritime safe zone for the commercial and recreational boating communities as well as develop associated planning guidance and educational materials;
3. Promoting local, regional and state level tsunami planning through workshops, plan review and exercises;
4. Conducting an annual “Live Code” Tsunami Communications Test that includes progressively more California coastal counties in FY 2011-12;
5. Continuing to produce innovative and effective public education materials targeting all vulnerable populations with the broader objective of developing programs of public education to increase awareness of, and preparedness for, damaging tsunamis;
6. Conducting research to assess progress in achieving program goals;
7. Maintaining an organization that facilitates cooperation and coordination with federal, state, and local partners; and,
8. Continuing to promote the TsunamiReady program in California.

We feel that significant progress was made during this period of performance on all of these objectives.