The California Geological Survey and the Governor's Office of Emergency Services are updating the State’s tsunami inundation areas using higher-resolution modeling for all low-lying, populated areas to assist local agencies in evacuation planning.

State's Update To the Existing Tsunami Inundation Maps

The second-generation State inundation maps were commissioned by CGS and Cal OES, completed by the University of Southern California, and covered all low-lying, populated areas of California’s coastline. These maps, published in 2009, were modeled at a resolution and quality are available. Over the past 10 years, significant development in modeling capability or data sources. The tsunami sources selected for inclusion in development of the new maps represent large, realistic events primarily from the Alaska and Cascadia subduction zones, equivalent to a baseline of the 975-year average return period (ARP).

The State is engaging communities to discuss the new evacuation maps and other products available in their tsunami response toolbox.

<table>
<thead>
<tr>
<th>TSUNAMI INUNDATION INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Poster</td>
</tr>
</tbody>
</table>

Source and magnitude disaggregation for San Francisco, 975-year ARP. The Alaska subduction zone dominates the hazard south of Cape Mendocino, California (Fig. 10, 2011).

The California Geological Survey (CGS) and the California Governor's Office of Emergency Services (Cal OES) are in the process of generating the third generation of statewide tsunami inundation maps for evacuation planning. National Tsunami Hazard Mitigation Program (NTHMP) guidelines recommend re-evaluating the tsunami hazard every 5-10 years or when significant development in modeling capability or data quality are available. Over the past 13 years, significant advances in tsunami source characterization and computer modeling have been made.

Third-Generation State Inundation Maps

The second-generation State inundation maps were commissioned by CGS and Cal OES, completed by the University of Southern California, and covered all low-lying, populated areas of California’s coastline. These maps, published in 2009, were modeled at a 30 to 90-m resolution for various local and distant tsunami sources. New modeling results, commissioned by CGS and completed by AECOM, use 10-m resolution data and are part of a probabilistic tsunami hazard analysis (PTHA). The tsunami sources selected for inclusion in development of the new maps represent large, realistic events primarily from the Alaska and Cascadia subduction zones, equivalent to a baseline of the 975-year average return period (ARP).

| Harbor hazard maps (current vs. damage) |
| Scenario-Based Evacuation Playbook: Local Agency Support Tool for Less Than “all-or-nothing” Scenario using real-time information | (Additional Tsunami Products Available to Local Agencies) |

Evacuation/Response Decision Support Tools

Local Agency Support Tool: National Tsunami Hazard Mitigation Program (NTHMP) guidelines recommend re-evaluating the tsunami hazard every 5-10 years or when significant development in modeling capability or data quality are available. Over the past 13 years, significant advances in tsunami source characterization and computer modeling have been made.

Steps To Update Local Agency Evacuation Plans

The State will meet with communities to discuss the new inundation maps, compare these maps to existing community evacuation maps, and make recommendations as to how communities should update their evacuation plans, if needed.

Regional and Local Lessons Learned

Regional Lesson from the Japan Tohoku Tsunamis of March 11, 2011

Japan's evacuation maps underestimated tsunami threat by 2-3m because they were based on historical events (past 100-300 years). However, there is geologic evidence for larger events occurring on 1000-year basis; the 2011 Japan tsunami was one of those 1000-year events.

Shaking for 1000 years or more...

Lessons Learned in California

· What can be done to improve tsunami resistance and redundancy in harbors?
· Inconsistent evacuation/response statewide.
· All or nothing for evacuation?
· What to do in a minor “Warning” level alert incorporating more than 3-4 hours to prepare?
· More time to prepare (tsunami travel time less than 3-4 hours)
· Less time to prepare (tsunami travel time greater than 3-4 hours)
· Scenario-Based Evacuation Playbook: Local Agency Support Tool for greater than “all-or-nothing” Scenario using real-time information

USGS Source: Northwestern Seismic Network. Using 10-meter resolution data. Sixty-three grids were modeled along the coastline (based on community input). Maps are FEMA RiskMAP products.

The updated inundation area is based on science (i.e., tsunami modeling), whereas the evacuation line is typically drawn further inland to an easily identifiable geographic feature, such as a road. However, each local agency ultimately determines where their evacuation line will be drawn based on their emergency response needs.