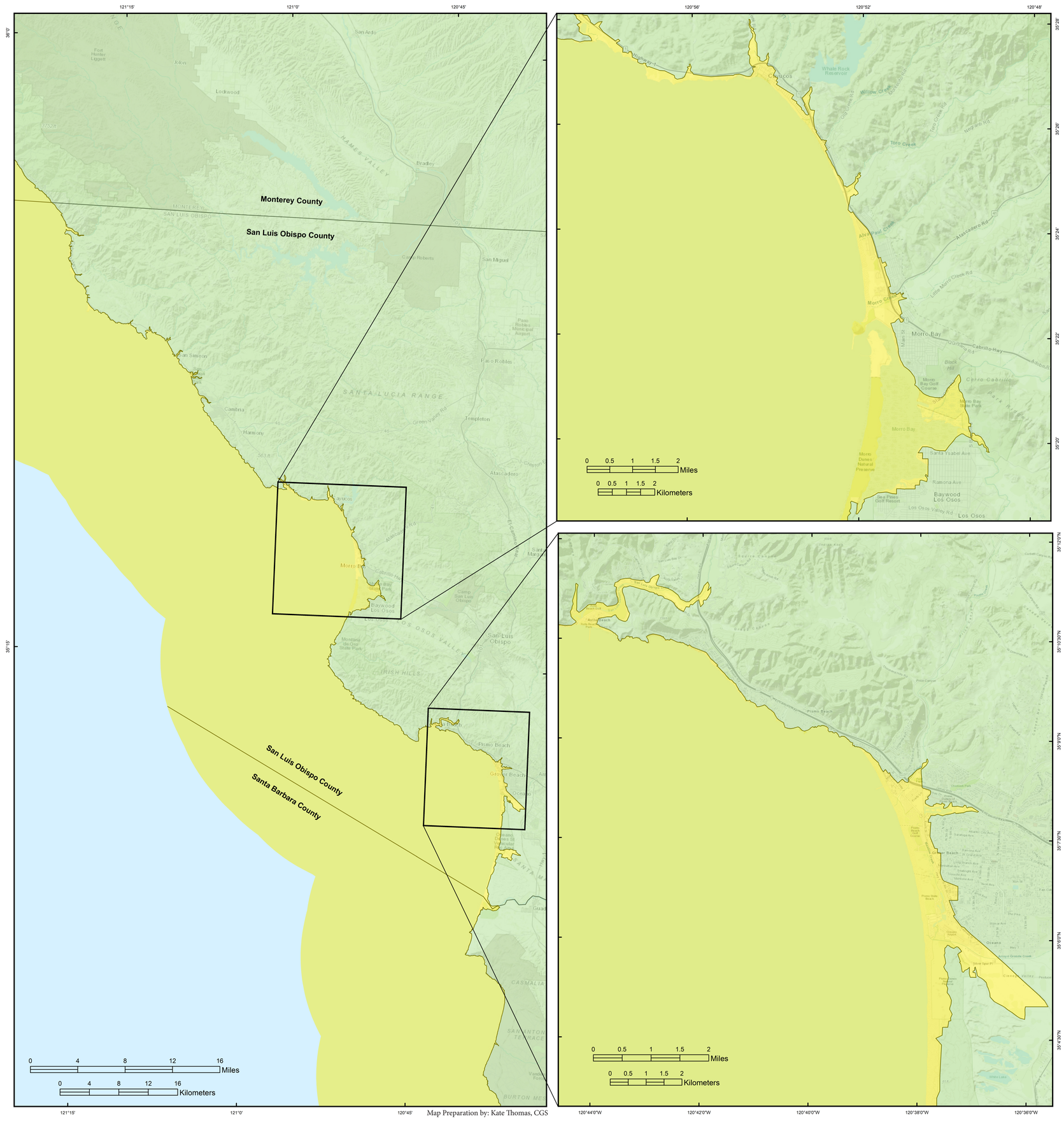


Map Preparation by: Kate Thomas, CGS

California Geological Survey

Tsunami Hazard Area Map

County of San Luis Obispo

July 8, 2021

PURPOSE OF THIS MAP

This Tsunami Hazard Area Map was prepared to assist cities and counties in identifying their tsunami hazard for tsunami response planning. It is intended for local jurisdictional coastal tsunami hazard planning uses only. This map, and the information presented herein, is not a legal document and does not meet disclosure requirements for real estate transactions nor for any other regulatory purpose.

The Tsunami Hazard Area Map was compiled with the best currently available scientific information and represents an area that could be exposed to tsunami hazards during a tsunami event. It is primarily based on inundation limits corresponding to a 975-year average return period tsunami event model. These limits have been extended to reflect potential local tsunami sources not considered in probabilistic analysis and are also modified to reflect the practical need to define limits that coincide with geographic features or city streets.

MAP EXPLANATION

Tsunami Hazard Area

Outside Hazard Area

METHOD OF PREPARATION

Tsunami modeling was performed by AECOM Technical Services and the University of Southern California funded through the California Governor's Office of Emergency Services by the National Tsunami Hazard Mitigation Program and through FEMA. Recent tsunami modeling used probabilistic tsunami hazard analysis to compute tsunami waves from sources from around the Pacific Ocean resulting in inundation models that are associated with different probabilities of exceedance over time. The tsunami modeling process allows for wave evolution over a variable bathymetry and topography used for inundation mapping. The California Geological Survey (CGS), Seismic Hazards Program, Tsunami Unit used the 975-year average return period tsunami model, with a 5% probability of exceedance in 50 years, as a basis for the minimum hazard level; this minimum hazard level along with a suite of credible local scenario events not included in the probabilistic analysis helped define the extent for inundation mapping.

For the probabilistic modeling the bathymetric/topographic data that were used in the tsunami models consist of a series of nested elevation grids. Deep ocean modeling was prepared using SRTM30+ bathymetric data (30 arc-second resolution). National Centers for Environmental Information coastal digital elevation models with a 1/3 arc-second (~10-meters) resolution and a "Mean High Water" vertical datum was used as the near-shore grids since these data represent a more conservative sea level for the intended use of the tsunami modeling and mapping.

In order to enhance the 10-meter resolution inundation data, we used higher resolution digital topographic data (e.g., 1-meter resolution LiDAR digital elevation models) to refine the location of the maximum inundation area. The location of the inundation area was refined by using digital imagery (e.g. recent National Agriculture Imagery Program imagery) and digital terrain data on a GIS platform with consideration given to historic inundation information. This information was verified, where possible, with workshops and fieldwork coordinated with local county personnel.

Data from the CGS Tsunami Inundation Maps for Emergency Planning (2009) and the enhanced high-resolution mapping of the 975-year return period probabilistic tsunami inundation model results were initially used as a minimum spatial constraint for the placement of the tsunami hazard area. Guidance from local stakeholders, including emergency managers, first responders, and subject matter experts was used to help advise CGS on the placement of the final hazard area in places that would help the public and government safely evacuate during a tsunami event.

The accuracy of the hazard area shown on these maps and in these data is subject to limitations in the accuracy and completeness of the mapping conducted by the CGS. While an attempt was made to define a maximum tsunami hazard extent at any location along the coastline, it remains possible that the actual tsunami hazard area may be greater as required by the local agencies.

ADDITIONAL INFORMATION

Please refer to the following websites for additional information on the construction and/or intended use of the Tsunami Hazard Area Maps:

State of California Geological Survey Tsunami Information:
www.conservation.ca.gov/cgs/tsunami

California Governor's Office of Emergency Services, Earthquake, Tsunami, and Volcano Program:
https://www.caloes.ca.gov/cal-oes-divisions/earthquake-tsunami-volcano-programs

REFERENCES

Becker, J.J., Sandwell, D.T., Smith, W.H.F., Braud, J., Binder, B., Depner, J., Fabre, D., Factor, J., Ingalls, S., Kim, S.-H., Ladner, R., Marks, K., Nelson, S., Pharaoh, A., Trimmer, R., Rosenberg, Von, J., Wallace, G., and Weatherall, P., 2009. Global Bathymetry and Elevation Data at 30 Arc Seconds Resolution: SRTM30_PLUS in Marine Geodesy, v. 32, no. 4, p. 355–371

Dewberry, 2013. Coastal California Data Merge Project, Report Produced for the National Oceanic and Atmospheric Administration (NOAA), NOAA Contract: EA133C-11-CQ-0007 Task Order Number: 11 Report Date: 10/31/2013, 57 p.

Eakins, B.W., and L.A. Taylor, 2010. Seamlessly integrating bathymetric and topographic data to support tsunami modeling and forecasting efforts, in Ocean Globe, ed. by J. Breman, ESRI Press, Redlands, p. 37-56

Lander, J.F., Lockridge, P.A., and Kozuch, M.J., 1993. Tsunamis Affecting the West Coast of the United States 1806-1992: National Geophysical Data Center Key to Geophysical Record Documentation No. 29, NOAA, NESDIS, NGDC, 242 p.

Thio, H.K., Somerville, P., and Polet, J., 2010. Probabilistic Tsunami Hazard in California, PEER Report 2010/108, Pacific Earthquake Engineering Research Center, College of Engineering, University of California, Berkeley, October 2010, 331 p.

Thio, H.K., 2019. Probabilistic Tsunami Hazard Maps for the State of California (Phase 2), report prepared for the California Geological Survey by AECOM Technical Services, 172 p.

Titov, V.V., and Synolakis, C.E., 1998. Numerical modeling of tidal wave runup in Journal of Waterways, Port, Coastal and Ocean Engineering, ASCE, v. 124, no. 4, p. 157-171

State of California, 2009. Tsunami Inundation Map for Emergency Planning, (map name*) Quadrangle, San Luis Obispo County; produced by California Emergency Management Agency, California Geological Survey, and University of Southern California – Tsunami Research Center; Dated June 1, 2009.

* 2009 San Luis Obispo County Maps

Cambria	Morro Bay North and South	Pismo Beach
Cayucos	Morro Bay South/Port San Luis	Point Sal
Cayucos West	Oceano	Port San Luis
		San Simeon/Pico Creek

CITATION FOR THIS MAP

State of California, 2021. Tsunami Hazard Area Map, San Luis Obispo County; produced by the California Geological Survey and the California Governor's Office of Emergency Services; dated 2021, displayed at multiple scales.

NOTE

The tsunami hazard areas are based on the State of California 2009 Tsunami Inundation Maps for Emergency Planning and the enhanced high-resolution, 975-year return period probabilistic tsunami inundation model results. The boundary of the tsunami hazard area is defined by the California Geological Survey, local stakeholders, including emergency managers, first responders, and subject matter experts, are consulted on the placement of the final hazard area in places that would help the public and government safely evacuate during a tsunami event.

ESRI Basemap: The map provides coverage for the world down to a scale of ~1:72k. Coverage is provided down to ~1:4k for the continental United States. Tsunami Hazard Area boundaries may reflect updated digital orthophotographic and topographic data that can differ significantly from contours shown on the base map.

N

California Department of Conservation
California Geological Survey
Geologic Information and Publications
801 K Street, MS 14-34
Sacramento, CA 95814-3532
www.conservation.ca.gov/cgs

Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

DISCLAIMERS

The California Governor's Office of Emergency Services (Cal OES), the University of Southern California (USC), AECOM Technical Services, and the California Geological Survey (CGS) make no representation or warranties regarding the accuracy of this Tsunami Hazard Area Map nor the data from which the map is derived. The State of California shall not be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

Web Accessibility Statement. We could not make this map fully accessible with assistive technology. To request alternative means of access, please visit our Accessibility web page at https://www.conservation.ca.gov. To help us respond to your concern, please include in your request: the title of the map, the web address where you obtained it, and your contact information.