

Northern Alameda County, California San Francisco Bay Area Coastal Study

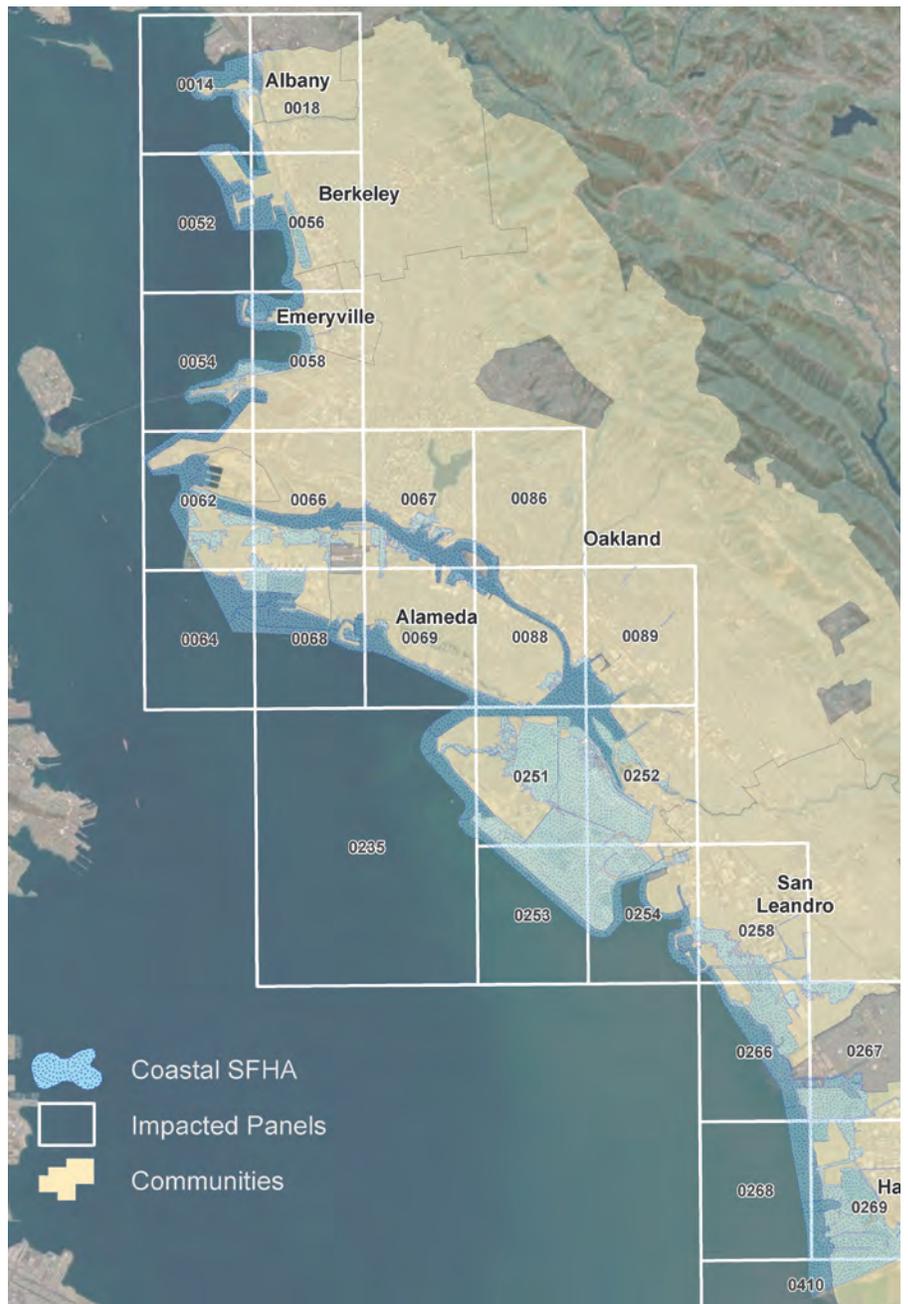


March 2014

The Northern Alameda County shoreline is part of the San Francisco Bay Area Coastal Study conducted under the Federal Emergency Management Agency's (FEMA) California Coastal Analysis and Mapping Program (CCAMP). This study will revise and update flood and wave data included in the National Flood Insurance Program (NFIP), Flood Insurance Study (FIS) reports, and Flood Insurance Rate Map (FIRM) panels.

Coastal flooding along the bay shoreline is a product of local still water levels (SWELs) and waves. SWELs include the effects of tides, storm surge, and riverine discharges, and exclude local variations due to waves and wave set-up. The waves within the bay originate from two sources, wind-driven waves that are generated locally during strong wind events, and ocean swells that enter the bay through the Golden Gate. The interrelationship of SWEL and waves, and their combined flood hazard effect, vary along the Northern Alameda County shoreline.

The coastal study is guided by FEMA's 2005 Guidelines for Coastal Flood Hazard Analysis and Mapping for the Pacific Coast of the United States. The analyses rely on a combination of regional-scale hydrodynamic models and localized one-dimensional (1-D) wave models to calculate elevated SWELs, wave heights, and overland wave propagation. These analyses, along with the local topographic data, are used to evaluate the location and extent of revised coastal Special Flood Hazard Areas (SFHA) as well as the Base Flood Elevations (BFEs).

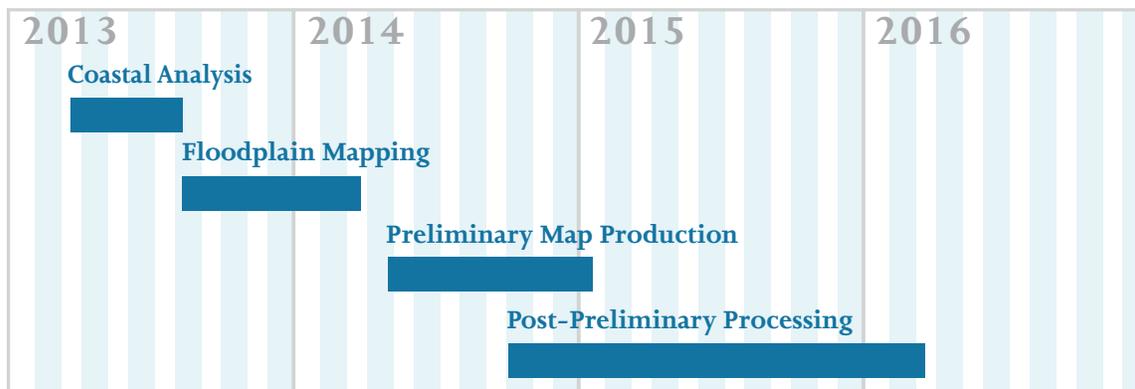


FEMA

California Coastal Analysis
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Northern Alameda County Study and Mapping Timeline



Coastal Flood Zones

Within the coastal SFHA, there are two primary zones: Zone VE and Zone AE. Zone VE, also known as the Coastal High Hazard Area, has a wave component that is greater than three feet in height. Coastal Zone AE has a wave component of 0-3 feet in height.

BFEs will vary in each zone. Changes in flood zone and BFEs can have a significant impact on building requirements and flood insurance costs. Because waves can diminish in size in a short distance, particularly where the ground is steep, BFEs can differ dramatically in adjacent areas of coastal zones.

Community Rating System

The National Flood Insurance Program Community Rating System (CRS) provides credits for communities requiring VE zone construction standards in areas defined by the Limit of Moderate Wave Action or areas subject to waves between 1.5 and 3 feet. More information on the CRS can be found at www.fema.gov/business/nfip/crs.shtm.

Southern Alameda County

In a partner study, the flood hazards south of the San Mateo Bridge (Highway 92) are being analyzed by the Alameda County Flood Protection Agency

Regional-scale storm surge and wave models of San Francisco Bay were used to produce time-series output of water levels, open ocean swells, and wind-driven waves at over eight thousand points along the complex San Francisco Bay shoreline. The Northern Alameda County shoreline was separated into representative reaches that account for variations in topography, nearshore bathymetry, shoreline type, development density, land use, and incident wave conditions. 1-D transect-based models oriented perpendicular to the shoreline were developed for each shoreline reach.

Using the regional-scale model output as the boundary conditions, the 1-D models are used to calculate the location and height of waves as the coastal floodwaters move inland over normally dry land and vegetated marshes. Depending on the shoreline characteristics, the 1-D models will include an analysis of wave runup, wave overtopping, and overland wave propagation. The result is the identification of coastal flood hazards associated with a flood event having a 1-percent annual exceedance probability that combines both elevated coastal water levels and waves.



The resulting coastal flood hazard elevations determine updated 1-percent annual chance flood zones which will be used to produce updated FIRM panels in the form of a Physical Map Revision and an updated FIS report for Alameda County.

Next Steps, Stay Informed and Engaged!

After FEMA's onshore coastal flood hazard analysis, a Flood Risk Review meeting was conducted with Northern Alameda County community officials to inform them of proposed SFHA and BFE changes before the revised FIRM panels are developed. The goal of the Flood Risk Review meeting was to enhance the communities' understanding of the available flood datasets, to discuss study methods and results, and to provide information on increasing risk awareness and stimulation mitigation actions that can reduce risk.



To stay up to date with the San Francisco Bay Area Coastal Study, and the companion Open Pacific Coast Study, sign up for the quarterly e-bulletin, *Coastal Beat*, that will include schedule updates, technical articles and facts of interest, and relevant information as the study progresses. Visit www.r9coastal.org for additional coastal study information.