

## Orange County FEMA Study

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A study was conducted for the Federal Emergency Management Agency (FEMA) under the National Flood Insurance Program (NFIP) to evaluate the 100-year flood hazard for approximately 12 miles of flood control channels on the Talbert Valley Channel system. The study area is located in the Cities of Huntington Beach and Fountain Valley in Orange County, California, underlying the Santa Ana River floodplain. The leveed channels convey stormwater runoff from the highly urbanized low-lying interior areas to the Pacific Ocean.

The Corps of Engineers one-dimensional unsteady flow HEC-UNET computer program was used to model the channel network by simulating the overbanks as a series of interconnected storage areas. The elevation-volume relationship for the storage areas was defined based on detailed 1-foot contour interval topography. Lateral inflow hydrographs were routed and combined in UNET.



Failure of levees not meeting FEMA criteria was conducted using lateral simple spillway connections between the channels and the storage areas in the overbanks. Various combinations of levee lengths were failed in order to determine the worst-case flooding depth in each overbank storage cell as required by FEMA. For each levee failure case, the program was allowed to fill the overbank storage cells with the volume of water leaving the channel. The 100-year riverine

floodplain was delineated on the topographic workmap by connecting the computed maximum water surface elevations in each storage cell. More accurate volumetric accounting provided a better indication of depth and extent of flooding in the overbank areas compared to steady flow models such as HEC-2 and HEC-RAS. The 100-year coastal floodplain was also delineated for the inland areas connected to the Pacific Ocean via channels, by plotting the wave-setup elevation.

**Project Owner:**

*Federal Emergency Management Agency  
Region IX, Mitigation Division  
Presidio of San Francisco, Building 105  
San Francisco, CA 94129  
Contact: Raymond Lenaburg  
(415) 923-7181*

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