

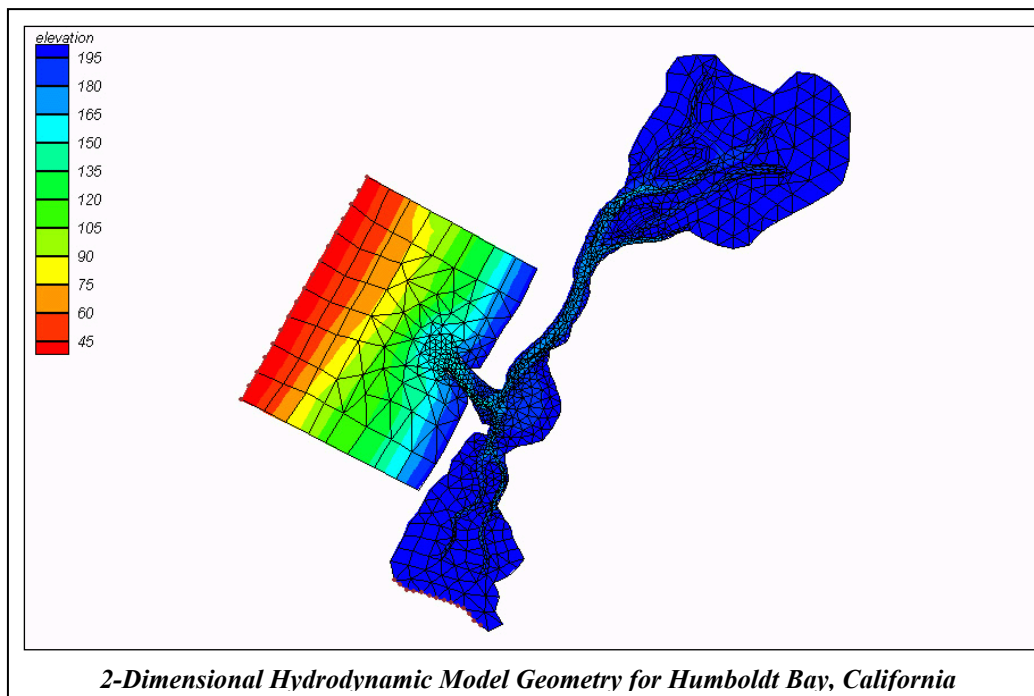


## Humboldt Bay Bridge Seismic Retrofit Scour Evaluation Study

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The California Department of Transportation (Caltrans) planned to seismically retrofit the highway bridge crossing Humboldt Bay near Eureka in Northern California. The bridge is approximately 8,000 feet long, and crosses the bay in three sections with two islands. The proposed retrofit would substantially increase the number of piles at each pier and the size of the pile caps.

A study using a 2-dimensional hydrodynamic model (RMA-2) and a 2-dimensional sediment transport model (SED2D) was conducted to: (1) determine if the larger bridge foundation might alter circulation patterns in the northern part of the bay, (2) evaluate scour at the modified individual bridge piers, and (3) determine if sediment transport processes in the bay might change sufficiently to cause increased sedimentation in sensitive areas, such as a nearby marina. The study included a detailed survey within 2,000 feet of the bridge, development of a detailed finite-element grid in the vicinity of the bridge, model calibration, and model application. A 14-day tide, including neap and spring cycles, was used to analyze the bay's circulation and sediment transport response to normal conditions. A 100-year storm surge was used to evaluate pier scour at the modified bridge.



*2-Dimensional Hydrodynamic Model Geometry for Humboldt Bay, California*

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