

Advances in Tsunami Inundation Mapping in California

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Since the International Tsunami Symposium held in Seattle, Washington in August 2001, significant progress has been made in tsunami inundation mapping for the state of California. While the mapping effort continues to focus on creating a "worst case scenario" for use by emergency management in evacuation planning and guidance, the modeling technologies being developed will be instrumental in creating a future generation of tsunami hazard assessments that include probabilities of occurrence. Significant progress over the last two years has been achieved with the completion of a uniform, 3 arc-second combined bathymetry and topography data set that extends from San Diego County to north of San Francisco Bay. This data set also includes a 1 arc-second resolution grid over the San Francisco Bay region. Over the last two years, the inundation mapping program has continued to focus on near-shore tsunami sources. These include submarine mass movements, offshore thrust faulting and complex ruptures on near-shore strike slip faults. Sources recently modeled include the Palos Verdes debris avalanche, the Catalina Island restraining bend, the Lasuen Knoll uplift structure and the San Mateo Thrust Fault. The latter three sources in particular highlight the possibility for a local tsunami warning system - something previously assumed to be of little use due to the proximity of the tsunami sources to the coast. Numerical modeling shows that first wave arrival in to the Ports of Los Angeles and Long Beach is delayed by up to 20 minutes after tsunami generation due to the shallow offshore bathymetry of the San Pedro Shelf. Thus far the inundation mapping program has completed inundation maps for Los Angeles, Santa Barbara, San Diego, Ventura, Orange and San Luis Obispo counties. The remainder of the state is to be mapped in the coming year. Other projects being undertaken in this effort include examining sources within San Francisco Bay to investigate the tsunami hazard for marine oil transfer terminals located inside the Bay.