

Federal and State Efforts

- S.50
- Seismic Safety Commission
- Coastal Commission

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S.50 (Inouye)

The Tsunami Preparedness Act

- Establish regional tsunami detection and warning systems for Pacific, Atlantic, Caribbean, and Gulf of Mexico
- Develop tsunami hazard mitigation program
- Establish tsunami research program
- Tsunami system upgrade and modernization
- Provide assistance in establishing global tsunami warning and mitigation system
- Coastal Community Vulnerability and Adaptation Program

Appropriations

- \$35 M annually for FY 2006-2012
- \$5 M annually for Coastal Community Vulnerability and Adaptation Program
 - At least \$3M for 3 pilot projects

Amendment

- S.AMDT.1101 (Stevens)
- Marine Debris Research, Prevention, and Reduction Act

Status

- Passed unanimously in Senate (1 July 05)
- Referred to three House Committees (11 July):
 - Science
 - Resources
 - Transportation and Infrastructure
- Currently in Committee(s)

California Seismic Safety Commission

Developing a report for the Governor

- Recommendations for better safeguarding the people of California from future tsunamis
- Largely related to warning and emergency response
- Coastal Commission staff has developed a set of recommendations on land use planning for tsunamis, for the Commission's consideration

Land Use Recommendation

Consider tsunamis when making land use planning decisions in potential tsunami inundation zones.

These recommendations should be applied in coordination with existing requirements for flood zone mapping, wave run-up for storm events, design standards for flood and seismic loadings and special design requirements for select facilities; the most restrictive and conservative condition should be used for final planning and design purposes.

Recommendation 1

(Identification of potential hazard areas)

In addition to current mapping efforts for tsunami evacuation and response, identify and map potential tsunami inundation zones for land use planning. Maps should identify generalized tsunami inundation zones on a probabilistic basis (e.g., 100-year event).

Recommendation 2 (Mitigation of hazard by avoidance)

Recommendation 2 (Mitigation of hazard by avoidance): If new development is proposed within a potential tsunami inundation zone as identified by recommendation (1), require a site-specific hazard analysis for a 100-year tsunami event. Where feasible, site development outside of the area identified as a tsunami inundation zone in the site specific wave runup analysis.

Recommendation 3

Mitigation by design standards

- a) The State should continue to fund study for development of tsunami design standards to minimize impacts to residential and commercial development, and to critical facilities, such as fire and police stations, hospitals, and schools .

- b) If it is not feasible to site development outside of the tsunami inundation zone identified by a site-specific analysis (recommendation 2), locate and configure new development that occurs in tsunami inundation zones to minimize future tsunami losses by designing and constructing new buildings to minimize tsunami damage.

Recommendation 4

Critical facilities

Avoid where feasible siting new critical facilities, including fire and police stations and hospitals in tsunami inundation zones as identified in recommendation (2). If it is necessary to site such facilities in tsunami inundation zones to provide adequate population protection, locate and configure critical facilities that occurs in tsunami inundation zones to be functional immediately after a 100-year tsunami event by meeting building standards identified in recommendation (3a).

The Coastal Commission's approach to tsunami planning

- Evaluation of hazard
 - Coastal Development Permits
 - Local Coastal Plans
- Signage
- Education

Coastal Act Section 30253

New development shall:

- (1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.
- (2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

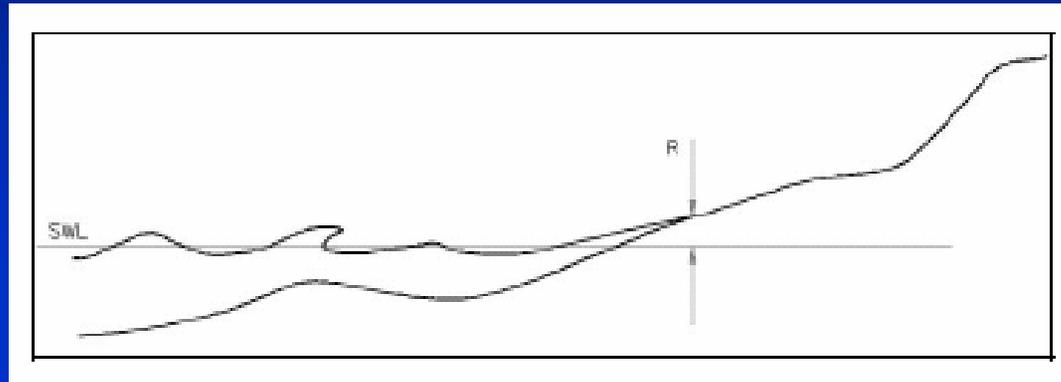


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Wave uprush analysis

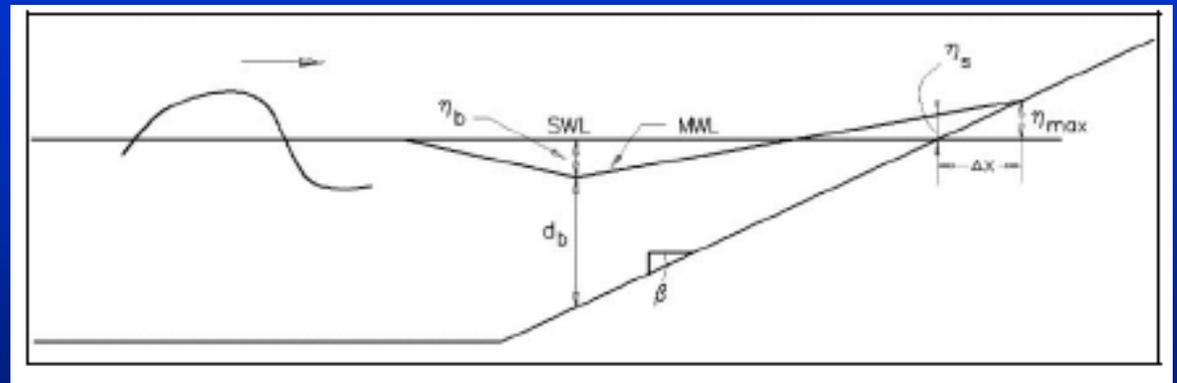


$$\frac{R_{max}}{H_o} = 2.32 \xi_o^{0.77}$$

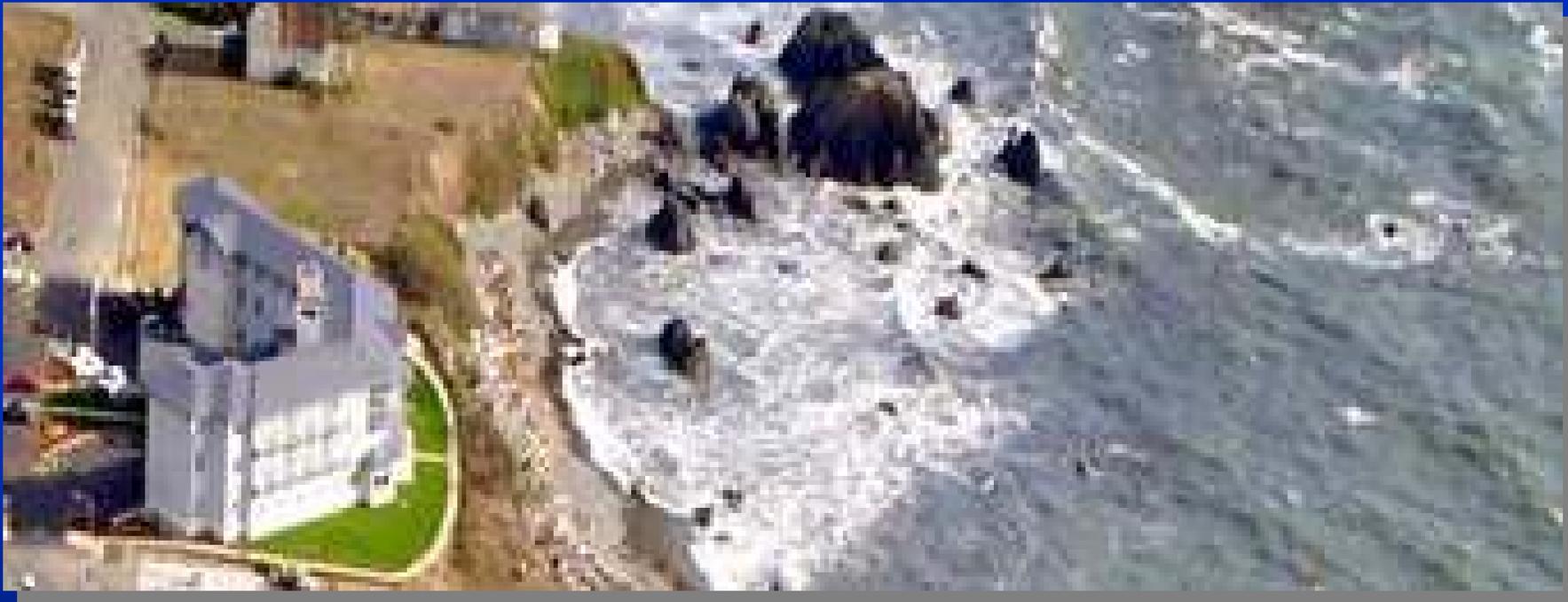
$$\frac{R_{2\%}}{H_o} = 1.86 \xi_o^{0.71}$$

$$\frac{R_{1/10}}{H_o} = 1.70 \xi_o^{0.71}$$

$$\frac{R_{1/3}}{H_o} = 1.38 \xi_o^{0.70}$$



Redwood Oceanfront Resort Hotel; Crescent City



Ultramar - Valero Wilmington Refinery Alkylation Improvement Project



Humboldt Bay Power Plant ISFSI



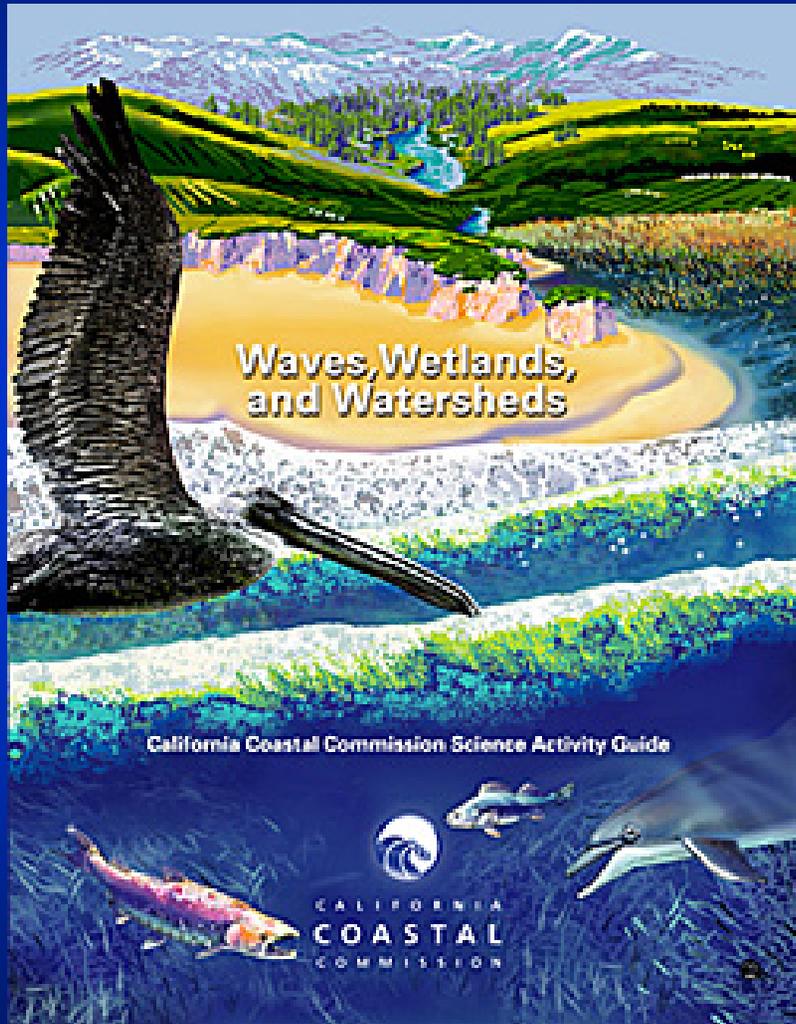
Malibu LCP

Where feasible, development shall be sited outside of potential tsunami inundation zones. *Tsunami inundation zones shall be defined as those areas identified as such on maps released by the California Office of Emergency Services, as they become available. If no such map is available, a Registered Civil Engineer with coastal experience shall make a determination, through wave run-up analysis, whether the site may reasonably be expected to be subject to inundation during a tsunami.* **If it is not feasible to site development outside of a tsunami inundation zone, new development shall be in conformance with all of the provisions set forth in this chapter with regard to Special Flood Hazard Zones.** *In addition, development shall be constructed to resist lateral movement due to the effect of water loading from the maximum expected tsunami, to the greatest extent feasible.*

Tsunami Signage



Education



California Content Standards Alignment

4 th GRADE	Activity 4.1: Moving Mountains to the Sea	Activity 4.2: No Ordinary Sandy Beach	Activity 4.3: Beach in a Pan
Science Content Standards			
4. Earth Sciences The properties of rocks and minerals reflect the processes that formed them. As a basis for understanding this concept:			
4.a. Students know how to differentiate among igneous, sedimentary, and metamorphic rocks by referring to their properties and method of formation (the rock cycle).		X	
4.b. Students know to identify common rock-forming minerals and ore minerals by using a table of diagnostic properties.		X	
Science Content Standards			
5. Earth Sciences Waves, wind, water and ice shape and reshape Earth's land surface. As a basis for understanding this concept:			
5.a. Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.	X	X	X
5.c. Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).	X	X	X
Mathematics Content Standards			
Measurement and Geometry			
3.5. Know the definitions of a right angle, an acute angle, and an			X