

Crescent City PTHA Project

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Probabilistic Tsunami Hazard Assessment (PTHA) [1, 2, 3] is based on the methods of Probabilistic Seismic Hazard Assessment (PSHA) [4, 5]. A PTHA study of Crescent City, CA, is currently underway and builds on the previous study of Seaside, OR [3]. This presentation briefly highlights planned improvements to the PTHA methodology that will be applied to Crescent City. The Crescent City study will use a similar set of earthquake sources as the Seaside study, but will add earthquake sources off the coast of Japan and five additional sources, $M < 9$, in the Cascadia Subduction Zone (CSZ), based on the work of Goldfinger, et al. [6]. To account for slip uncertainty on the CSZ, stochastic slip distributions will be modeled using a von Karman autocorrelation function with correlation lengths that differ in the along-strike and along-dip directions [7]; the slip distribution will be represented as a Karhunen-Loeve expansion, to provide a precise representation of the CSZ geometry. The uncertainty in tidal stage will be estimated by conducting tsunami simulations with the GeoClaw tsunami model [8] at different tide levels to estimate the tidal stage required to produce inundation above each exceedance level of interest. These will be combined with probabilities, obtained by processing past tidal records for Crescent City, that the tide will be above a given stage during an appropriate time period Δt over which the largest waves for the given event are observed to occur.

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