

Effect of uncertainty in offshore tsunami heights on the probability inundation hazard assessment

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Application of the Probabilistic Tsunami Hazard Assessment (PTHA) to a tsunami inundation, which assumed occurrence of several types of earthquake, was discussed (Saito et al., 2014, JpGU). Estimations of tsunami inundation in PTHA is generally given by numerical simulations. The simulation results include uncertainties caused by tsunami source characteristics, propagation path characteristics or site characteristics. Therefore, there is variability in residual errors of tsunami heights at offshore. If one tsunami simulation results does not over a coastal levee, continental areas may not be inundated, but there is the potential that the tsunami clear a coastal levee due to an increase in offshore tsunami height by uncertainties.

We propose an approach of assessing inundation hazards considering the potential of overflow using a practical example of tsunami inundation hazard in Rikuzen Takata City, Iwate. First, we examine the correlation distribution of offshore tsunami heights and inundation height, and calculate an approximate straight line. We assume the approximation line as a model for predicting tsunami inundations from offshore tsunami heights. Using the tsunami hazard curve calculated at the offshore site and the approximation line, we can estimate the tsunami inundation hazard curve for the potential of overflow. Comparing with the tsunami inundation hazard curve for the results which over coastal levee, we discuss the effect of uncertainty in offshore tsunami heights.

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Keywords: tsunami, inundation, hazard assessment, probability