

Visualization of tsunami and circumstances during initial evacuation and its effectiveness for disaster education

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Public interests in forthcoming large-scale tsunami have been increasing since the notification of the large-scale projected tsunami scenario along Nankai Trough. It is important for people to keep their high consciousness of tsunami hazards by means of continuous and effective tsunami-disaster prevention education. With regard to safe evacuation from tsunamis, people must evacuate as early as possible, and they should prepare an appropriate plan and method for evacuation, which is corroborated by understandings on tsunami behavior and situations of the initial stage of tsunami evacuation. In this study, we will present visualizations of tsunami behavior and circumstances during initial evacuation activity. We will further investigate effectiveness of the visualization for disaster prevention education.

Coastal areas of the Pacific coast of Tohoku have been photographed before and after the Great East Japan Earthquake. These photographs have been taken as both orthographical and diagonal (oblique) aerial imageries. The diagonal photographs are useful for people to figure out the elevations of features, such as buildings and topography three-dimensional and clearly. The oblique photographs and inundation map computed from the numerical simulation of 2011 Tohoku-oki tsunami are synthesized, to derive a realistic visualization of the tsunami flooding. This visualization will be useful for people to understand tsunami behavior, which is influenced by land use and local topography.

Visualization of circumstances during initial evacuation activity will be useful information for people to understand imminency and available time for tsunami evacuation. Airborne orthographical photographs and satellite imageries are superimposed by concentric circles centered by selected representative points that is familiar with local people, as well as main roads and evacuation facilities, because they are crucial for evacuation plan. It is unlikely that people may stay in their own houses and offices at the time of the earthquake and tsunami. The visualization proposed by this study will lead people to understand plausible circumstances and will provide useful information for various alternative measures for initial evacuation activity, as well as existences of insusceptible areas for evacuation.

Keywords: tsunami behavior, tsunami evacuation, visualization, disaster prevention education