

## Tsunami Vertical Evacuation Potential Analysis in the Shizuoka Metropolitan Area

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The City of Shizuoka directly faces the Nankai Trough which has given two M8.1 earthquakes in modern history (1944 and 1946), which were tsunamigenic. After the great Tohoku earthquake the Japanese government updated its worst case scenario for a tsunami from the Nankai trough, which is expected to have a maximum run-up of 34m. This study aims to use GIS in order to locate vertical evacuation sites in the City of Shizuoka within the existing urban structure, and to assess their potential in supporting the city's population for immediate evacuation under variable tsunami inundation scenarios (34m, 20m, 10m and 5m run up). A building population estimation model was applied to estimate the daytime and nighttime population of the buildings in the city in order to determine the affected people and potential empty structures for evacuation. For the 34m inundation scenario 599,367 people are estimated to be in buildings touched by water in the nighttime and 326,554 people in the daytime. For the weakest scenario of 5m run-up, 78,503 people are estimated to be in buildings affected by tsunami waters in the nighttime and 54,264 people in the daytime. Inundation ratio analysis was conducted for all four scenarios. The inundation ratio shows the percentage of a buildings height that is flooded in a certain scenario. Results show the largest amount of buildings to be flooded by 75% or more in the case of the 34, scenario with numbers dropping significantly with the scenario severity.

Keywords: Shizuoka City, Vertical Evacuation, Nankai Trough, Tsunami, Population Estimation