

EGU2020-13311

<https://doi.org/10.5194/egusphere-egu2020-13311>

EGU General Assembly 2020

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## Evaluation of the sensitivity of open source DEM vs. local high resolution DEM data in tsunami hazard assessment

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Tsunami simulations using high resolution datasets would always resemble the results that are closer to the reality. However, high resolution airborne or spaceborne local datasets have not yet been available for many regions and acquisition of this data is costly or might not even be possible for some locations. This hard-to-reach situation of high resolution datasets obliged researchers to work with open source datasets in their studies, which forces them to cope with the uncertainties of low spatial resolution.

Tsunami numerical models require both bathymetric and topographic data in order to calculate wave propagation in the water and inundation on the land. Leaving aside the availability of reliable bathymetric data, there are different open source global Digital Elevation Model (DEM) datasets, which are freely available. ASTER GDEM, SRTM and ALOS World 3D are present global open source DEMs that have highest spatial resolution of 30 meters. These three different sources of DEMs are generated using different technologies during data acquisition and different methodologies while processing. Even if they are the best available open source datasets, they all include variable sources of differences and errors.

This study aims evaluation of the sensitivity of open source DEM datasets against high resolution DEM datasets for tsunami hazard assessment and examination of accuracy of the simulations' results. A small area in Silivri district of Istanbul is selected as study area, where 1m resolution of topographic data is available. Tsunami simulations are performed using NAMI DANCE GPU with topography data of 1m resolution based on LiDAR measurements and topography data of 30m resolution based on ASTER GDEM, SRTM and ALOS World 3D datasets. The resulted inundation on land and flow depth distributions are plotted and discussed with comparisons.

Acknowledgement: MSc. Bora Yalciner and Assoc. Prof. Dr. Andrey Zaytsev are acknowledged for their contributions in developing tsunami numerical model NAMI DANCE GPU used in this study. The authors also thank Istanbul Metropolitan Municipality, Directorate of Earthquake and Ground Investigation for providing high quality data and close cooperation.

Keywords: tsunami, hazard assessment, numerical modeling, open source DEM, high-resolution DEM