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Tsunamis Generated by Submarine Landslides

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In this study, we investigated tsunamis generated by submarine landslides in the Marmara Sea. The area of Ganos, Küçükçekmece, Yenikapı and central portion in Central Basin (CNI) have been selected as a pilot landslide case area in the Marmara Sea and bathymetry data with 150 m resolution has been used. We have benefited from the General Directorate of Mineral Research and Exploration (MTA) landslide map and previous studies to determine possible landslide locations in Marmara Sea. We modelled the generation of the landslide generated tsunamis using TWO-LAYER model and the propagation and coastal amplification of the landslide generated waves are investigated using the tsunami simulation and visualization code NAMI-DANCE. Sediment thicknesses are set as 10 m-50 m for Ganos, whereas for Küçükçekmece and CN1, they are set as 5m, 10 m and 50 m. In Yenikapı case thicknesses are 5 m, 10 m, 30 m, 60 m and 120 m. We have assigned the velocity of the slide for the selected landslide points according to the sediment thickness to understand its effect. Our investigations indicated that velocity is reduced from the slide center to the boundary of the sliding (rupture) surface and the velocity increases while the thickness is increased. In addition, it is observed that there is a linear relation between the thickness and the velocity in Yenikapı case. The effects of the tsunami waves may change depending on the velocity of the slide, the thickness of the sediment. Tsunami generated by submarine landslides should be considered as hazardous for the Marmara Sea coasts.