

Analysis of extreme sea level change around the East China Seas including Korea

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This study analyzed the long-term linear trends of the sea surface height around the East China Seas including Korea for the period of 1993~2016 by using quantile regression and the change of tidal characteristics with the coastal topographic changes around the East China Seas including Korea using MOHID (MOdelo HIDrodinâmico) ocean circulation model. From the quantile regression analysis, we found that each area shows different trend for each quantile (lower (1%), median (50%) and upper (99%)). we also confirmed that these tendencies can be eliminated by removing major tidal components from the harmonic analysis. It is assumed that the regional characteristics are related to the long term change of tide amplitude. Based on the previous study simulating changes in sea level amplitude due to tidal flat reclamation effects (Song et al., 2013), we sequentially changed the coastal topography of Gyeonggi-bay of Korea and Jiangsu coast of China and we analyzed changes in tidal amplitude. As the coastline and topography change, the amplitude of M2 constituent reacted differently in each region. The amplitude of M2 constituent increased significantly with the tidal flat disappearance in the yellow sea and it decreased in the South sea of Korea. These results indicate that the change of coastal topographic in specific area can cause sea level change in the surrounding area through tidal energy redistribution process.

Keywords: Quantile Regression, Tidal Characteristic Change, Coastal Topographic Change, MOHID