

Long-term impact assessment of storm surges around the southeastern Korean Peninsula based on a large-ensemble of climate projection of d4PDF

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This study examine long-term impact assessment of storm surges due to typhoons around the southeastern area in Korean Peninsula considering climate change. The analysis is carried out by using outputs of large-ensemble experiments so-called d4PDF for a past and +4K future climate conditions over 5000 years by MRI-AGCM3.2H with 60 km spatial resolution to obtain probabilistic future changes in low-frequency of extreme storm surge events. The historical climate simulation from 1951 to 2010 was conducted with 100 ensemble members and the future climate simulation from 2051 to 2110 was conducted with 90 ensemble members considering warmer +4°C global mean temperature in d4PDF. The characteristics of tropical cyclones (typhoons) which may directly and indirectly have an effect on Korean Peninsula from d4PDF for past and future climate condition is extracted. The reproducibility of historical typhoon and storm surge is evaluated by comparing with the observed data. The typhoon properties extracted from d4PDF are employed as the driving force to simulate storm surges. The extreme storm surge heights with specific return periods are examined. It was found that the potential future changes of the extreme storm surges along the southeastern area in the Korean Peninsula have a strong regional dependency.

Keywords: storm surge, climate change, large-ensemble climate projection, d4PDF