



The impact of climate change on the storm surge over Irish sea

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Coastal floods caused by the combination of high tides and storm surges are a major natural hazard in many parts of the world. Over Ireland, serious coastal flooding has occurred over the past decades causing deaths and damage to property. It is particularly important, therefore, to investigate whether the frequency and intensity of storm surges (especially the extreme events) is changing due to anthropogenic climate change. In this study, the Regional Ocean Model System (ROMS) of Rutgers University is used for the surge simulation over the west European continental shelf area. The 8 km resolution ROMS model is driven by the winds and pressure from the Rossby Centre Regional Atmosphere model (RCA3), which is driven by ECHAM5/OM1 data for the past (1961-1990) and ECHAM5/OM1 A1B scenario data for the future (2031-2060). The results show that the high resolution ROMS model is capable of simulating the surge climatology very well for the present day, especially in the southern Irish sea. However, the magnitude of the simulated surge is underestimated comparing to the observed surge; this is very likely related to the quality of the driving atmospheric data. The results from the extreme value analysis are also investigated to determine the impact of climate change on the occurrence of extreme storm surges.