



Compound storm surge and coastal precipitation in a regional climate model ensemble simulations for the Netherlands

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Hydrological extremes in coastal areas in the Netherlands result from a combination of extreme conditions: storm surges preventing the ability to discharge water to the open sea, and local precipitation generating excessive water levels in the inland area. An analysis of a near-flooding event in 2012 using an ensemble of regional climate model simulations demonstrates that the combined occurrence of these events is physically related by the governing synoptic patterns, and thus can not be treated as independent stochastics. Model data covering more than 400 years representative for current climate conditions were used to calculate the probability of combined occurrence of high sea level and high precipitation amounts. The correlation varies with the associated inland water level, where high water levels are stronger affected by the correlation than lower water levels. The case study also illustrated the importance of coupling a realistic impact model (expressing the inland water level) for deriving useful statistics from the model simulations.