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Sensitivity of worst-case strom surge considering influence of climate change

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There are two standpoints when assessing risk caused by climate change. One is how to prevent disaster. For this purpose, we get probabilistic information of meteorological elements, from enough number of ensemble simulations. Another one is to consider disaster mitigation. For this purpose, we have to use very high resolution sophisticated model to represent a worst case event in detail. If we could use enough computer resources to drive many ensemble runs with very high resolution model, we can handle these all themes in one time. However resources are unfortunately limited in most cases, and we have to select the resolution or the number of simulations if we design the experiment. Applying PGWD (Pseudo Global Warming Downscaling) method is one solution to analyze a worst case event in detail. Here we introduce an example to find climate change influence on the worst case storm-surge, by applying PGWD to a super typhoon Haiyan (Takayabu et al, 2015). 1 km grid WRF model could represent both the intensity and structure of a super typhoon. By adopting PGWD method, we can only estimate the influence of climate change on the development process of the Typhoon. Instead, the changes in genesis could not be estimated. Finally, we drove SU-WAT model (which includes shallow water equation model) to get the signal of storm surge height. The result indicates that the height of the storm surge increased up to 20% owing to these 150 years climate change.