Geophysical Research Abstracts
Vol. 18, EGU2016-10592, 2016
EGU General Assembly 2016

Projected Flood Risks in China based on CMIP5

Ying Xu
China Meteorological Administration, National Climate Centre, Beijing, China (xuying@cma.gov.cn)

Based on the simulations from 22 CMIP5 models and in combination with data on population, GDP, arable land, and terrain elevation, the spatial distributions of the flood risk levels are calculated and analyzed under RCP8.5 for the baseline period (1986-2005), the near term future period (2016-2035), the middle term future period (2046-2065), and the long term future period (2080-2099).
(1) Areas with higher flood hazard risk levels in the future are concentrated in southeastern China, and the areas with the risk level III continue to expand. The major changes in flood hazard risks will occur in the middle and long term future.
(2) In future, the areas of high vulnerability to flood hazards will be located in China's eastern region. In the middle and late 21st century, the extent of the high vulnerability area will expand eastward and its intensity will gradually increase. The highest vulnerability values are found in the provinces of Beijing, Tianjin, Hebei, Henan, Anhui, Shandong, Shanghai, Jiangsu, and in parts of the Pearl River Delta. Furthermore, the major cities in northeast China, as well as Wuhan, Changsha and Nanchang are highly vulnerable.
(3) The regions with high flood risk levels will be located in eastern China, in the middle and lower reaches of Yangtze River and stretching northward to Beijing and Tianjin. High-risk flood areas are also occurring in major cities in Northeast China, in some parts of Shaanxi and Shanxi, and in some coastal areas in Southeast China.
(4) Compared to the baseline period, the high flood risks will increase on a regional level towards the end of the 21st century, although the areas of flood hazards show little variation.
In this paper, the projected future flood risks for different periods were analyzed under the RCP8.5 emission scenarios. By comparing the results with the simulations under the RCP 2.6 and RCP 4.5 scenarios, both scenarios show no differences in the spatial distribution, but in the intensity of flood hazard risks, which are weaker than for the RCP8.5 scenarios.
By using the simulations from climate model ensembles to project future flood risks, uncertainty exists for various factors, such as the coarse resolution of global climate models, different approaches to flood assessments, the selection of the weighting coefficients, as well as the used greenhouse gas emission scheme, and the estimations of future population, GDP, and arable land. Therefore, further analysis is needed to reduce the uncertainties of future flood risks.