



## **Effects of Land-Use and Climate Change on design flood in Huaihe River Basin**

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Design flood is the most crucial reference for the water conservancy projects construction and the corresponding operation standards setting. In practical application, whether the established projects meet the requirements of the design floods is an issue worthy of studying. In some areas with abundant and complicated distributed water conservancy projects, the runoff process of each section is the result of the land-use conditions and the hydro-projects, which leads to the inaccuracy of the design floods calculation. Huaihe River Basin is such an area with a dramatic change of cultivation style and consequently significant land-use alteration, along with the climate change during the past several decades. In this study, a sub-basin with only one reservoir in the Huaihe River Basin was selected to analyze the effect of land-use and climate change on the design floods. The maximum peak flow and multi-hour maximum flood volume from 1964 to 2014, based on 1980s and 2010s land-use patterns respectively, are calculated by using the Soil and Water Assessment Tool (SWAT) model to draw the P-3 curves. According to these curves, the design floods of different recurrence intervals under these two scenarios are compared and analyzed to explore the joint and the respective impacts of land-use and climate change. The results show that the design flood volumes and the peak flow under 1980s scenario are generally larger than those under 2010s scenario; with the return period length increasing, the maximum design flood volume within the same duration decreases in both 1980s and 2010s scenarios; additionally, the alteration range of the design flood volume in different intervals showed a monotonic decreasing trend.