



## **Flash Flood Hazard Hotspots Shifted by Sediment Transport: A Case Study of Suburban Mountain Area of Beijing**

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The suburban mountain area of Beijing in the southwest is a flash flood prone region, characterized by frequently heavy rainstorms, steep terrain, massive loose deposits, and dense population. Two severe flash flood events hit this region and caused great loss of human life and serious damage of infrastructures, respectively, in 2012 and 2017. Subsequent field survey shows massive deposition of gravels in downstream channels and implies intense interactions between the sediment and flood. We implemented a 1D numerical simulation of flash flood over heterogeneous erodible beds. The Saint Venant equations of unsteady flow were coupled with the Exner equation for the dynamics of channel bed. The simulated bed profiles and water stages agreed well with the field data. It was shown that the bed load transport augments the flood level through the deposition and increased flow resistance. The location of hazard hotspots, which are prone to inundation or destructive impact loading, changed with the bed load supply from the catchment. We then mapped the hotspots under scenarios of flash floods with different occurrence. The shifting configuration of hotspots may contribute to the efforts of disaster preparation and relief.