

## A study on widespread extreme precipitation events over South Asia

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A study on the spatial extent of extreme precipitation events can be important to analyze changes in precipitation characteristics in the current global warming scenario. Also, it could give insights into variations in the underlying atmospheric phenomena. This study quantifies the spatial size of extreme daily precipitation using a 25 km gridded Aphrodite dataset during 1951-2007 in South Asia. We find a considerable variation in the spatial extent of extreme precipitation which varies regionally and sub-regionally. In tropics, widespread EREs occur in central India, western Ghats, east Indo-china Peninsula, western Myanmar, central-east China, and northwest Philippine regions. However, in the high-altitude area like the Himalayan belt, western Ghats, and west Myanmar regions, the frequency of massive EREs are less in 57 years. While in low altitude area in tropics like central India and east Indo-china Peninsula, the widespread EREs occurs more frequently. Furthermore, the rainfall distribution inside the widespread EREs is also changing. The probability distribution with di-decadal variation shows that recently the grids with peak intensity ( $>90 \text{ mm day}^{-1}$ ) inside the widespread EREs are increasing while the grids with rainfall ( $<85 \text{ mm day}^{-1}$ ) are decreasing. The widespread EREs mostly correspond to synoptic-scale phenomena like tropical depressions or tropical cyclone activities. These synoptic-scale activities might have got changed and intensified in recent decades.

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