

Analysis of Extreme Precipitation Indices Over Urban Region: A Case Study

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ABSTRACT

The increase in greenhouse gas (GHG) emissions is accelerating climate change which results in altering the precipitation patterns. The precipitation extremes have increased in the past decade which causes the high floods in the urban areas. Due to this reason, researchers are focusing on assessing the climate extremes in urban scenarios. In this study the climate extremes, especially the precipitation extreme indices such as RX1day, RX5day, and R100 mm are analysed for Hyderabad city, Telangana State, India. These extreme indices are very important in urban flood scenarios. These indices are analysed for an observed baseline period (1985 to 2020) and two future periods such as Near Future (NF: 2015-2057) and Far Future (FF: 2058-2100) using a nine selected Coupled Model Intercomparison Project 6 (CMIP6) Global Climate Models (GCMs) under two scenarios such as SSP1-2.6, and SSP5-8.5. The results reveal that compared to the baseline observed period, the considered extreme indices are significantly increasing in the future under all the GCMs. The maximum RX1day and RX5day are projected in the range of 45 to 277 mm and 135 to 498 mm in the NF, 69 to 298 mm and 162 to 736 mm in the FF respectively for SSP5-8.5 scenario under different GCMs. Similarly, the count of occurrences of R100 mm is projected to increase up to 6 times in the future periods. The chance of flooding in Hyderabad city is higher in FF compared to NF. This information is very useful to policy makers to mitigate the floods in Hyderabad city in the future periods.

Keywords: Climate Change; Precipitation Extremes; Hyderabad City

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