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Variability and trends in daily precipitation extremes on the northern and southern slopes of the central Himalaya

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This study focuses on the precipitation extremes recorded on the northern and southern slopes of the central Himalaya, especially those documented at higher altitudes. Daily precipitation data recorded over a 35-year period at nine meteorological stations in the region were studied. We used the precipitation extreme indices delineated by the Expert Team on Climate Change Detection and Indices (ETCCDI). The spatial and temporal variations in these precipitation extremes were calculated. When regional patterns were investigated to detect any anomalies, only 1 of the 10 precipitation extreme indices from the southern slopes of the central Himalaya showed a statistically significant trend; none from the northern slopes of the central Himalaya highlighted a statistically significant trend. On the southern slopes, all indices increased, apart from the maximum 1-day precipitation (RX1) and simple daily precipitation intensity (SDII) indices. Indices such as the consecutive dry days (CDDs) and RX1 indices exhibited similar increases on both the northern and southern slopes of the central Himalaya. These results suggest that increases in precipitation have been accompanied by an increasing frequency of extremes over the southern central Himalaya. Nonetheless, no relation could be established between the precipitation extreme indices and circulation indices for higher altitudes.