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# CLIMATE EXTREMES OF PRECIPITATION AND TEMPERATURE OVER BRAZIL DURING 1980-2016

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## Abstract

The devastating effects of intense climate extreme events in the last decades will undoubtedly impact food costs and average citizens' average quality of life. This research evaluated climate extremes indices for monitoring and detecting climate change proposed by the Expert Team on Detection and Climate Change Indices during 1980–2016 over Brazil. These indices are calculated using daily data from precipitation and air temperature series. We used three different databases (e.g., Observations, Reanalysis, and merging products) used to characterize weather climate is available on a national grid of precipitation, maximum and minimum temperature with a daily temporal and high spatial resolution of 0.25° (28km x 28 km) for the present climate. For this purpose, 16 extreme climate indices of precipitation and temperature were estimated at an annual scale. In order to identify annual trends, statistical methods of the Mann-Kendall and Sen Slope estimator were used. The majority of precipitation-related indexes present positive trends, especially in the extreme precipitation indexes (PRCPTOT, RX1day, Rx5day, and R30mm) over the southern and negative trends over Northeast Brazil. On the other hand, the different datasets show a reduction in consecutive wet days (CWD) and an increase in consecutive dry days (CDD) since the 1980s in almost all study domains. The extreme temperature indices show statistically significant warming patterns for both warm over most areas in Brazil. These findings provide decision-making criteria for water resource planners and benefit future studies of climate resilience studies over Brazil.

**Keywords:** Climate extremes, ETCCDI indices, Trends, ERA5, GMFD, MSWEP

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