

Variations in Heat and Cold Waves over Southern India

Authors : Amit G. Dhorde

Abstract : It is now well established that the global surface air temperatures have increased significantly during the period that followed the industrial revolution. One of the main predictions of climate change is that the occurrences of extreme weather events will increase in future. In many regions of the world, high-temperature extremes have already started occurring with rising frequency. The main objective of the present study is to understand spatial and temporal changes in days with heat and cold wave conditions over southern India. The study area includes the region of India that lies to the south of Tropic of Cancer. To fulfill the objective, daily maximum and minimum temperature data for 80 stations were collected for the period 1969-2006 from National Data Center of India Meteorological Department. After assessing the homogeneity of data, 62 stations were finally selected for the study. Heat and cold waves were classified as slight, moderate and severe based on the criteria given by India's meteorological department. For every year, numbers of days experiencing heat and cold wave conditions were computed. This data was analyzed with linear regression to find any existing trend. Further, the time period was divided into four decades to investigate the decadal frequency of the occurrence of heat and cold waves. The results revealed that the average annual temperature over southern India shows an increasing trend, which signifies warming over this area. Further, slight cold waves during winter season have been decreasing at the majority of the stations. The moderate cold waves also show a similar pattern at the majority of the stations. This is an indication of warming winters over the region. Besides this analysis, other extreme indices were also analyzed such as extremely hot days, hot days, very cold nights, cold nights, etc. This analysis revealed that nights are becoming warmer and days are getting warmer over some regions too.

Keywords : heat wave, cold wave, southern India, decadal frequency

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