



Changes in Temperature and Precipitation Extremes in East Africa

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East Africa is one of the most vulnerable regions of Africa to extreme weather and climate events. Regional and local information on climate extremes is critical for monitoring and managing the impacts and developing sustainable adaptation measures. However, this type of information is not readily available at the necessary spatial resolution. Therefore, here we test trend and variability of temperature (1979-2010) and precipitation (1981-2016) extremes in East Africa using the indices defined by the Expert Team on Climate Change Detection and Indices (ETCCDI). We used daily temperature and precipitation data from the national weather service of Ethiopia, the global summary of the day available at the National Climate Data Centre, and quality controlled gridded datasets with high accuracy and resolution. Trends of 17 indices are computed by fitting a linear model and using the non-parametric Mann-Kendall test and the magnitude of change is computed using the Sen's slope method. Monthly maximum and minimum values of daily maximum and minimum temperature showed an increasing trend in this region. This is accompanied by significant increasing trends in warm nights (TN90p), warm days (TX90p), warm spell duration index (WSDI), and summer days index (SU). In addition, cold days (TX10p) and cold nights (TN10p) showed a significant decreasing trend. The magnitude of change in warm indices is higher than in cold indices in Ethiopia, Kenya, and Tanzania. Precipitation indices, on the other hand, showed increasing and decreasing trends in Ethiopia, Kenya and Tanzania, but few are statistically significant. Observed average annual temperature after 2000 is warmer than the reference period (1981-2010). In general, the results show an increasing tendency in temperatures extremes, which is in line with rising global mean temperature. In addition, observed temperature extremes after 2000 are warmer than the reference period (1981-2010).