



The encroachment of dry and hot zones into north-east Zimbabwe

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Decadal temperature fields over NE-Zimbabwe have been produced to illustrate climate dynamics over the period of 1965-1998. Our study shows that the climate in this region is progressively getting drier and hotter. The rainfall pattern over the region is shown as a well organized process displaying a decreasing gradient on either sides of a central ridge of a high rainfall belt. Spatial fluctuations of precipitation and temperature were quantified revealing a tendency towards drier conditions for >1970. The encroachment of the drier zones towards the high precipitation belt was quantified; it indicates an increase in the total area of the low rainfall region. Precipitation time-series (from regional meteorological stations' data) show a tendency of annual decrease. Since 1960, the general linear trend (entire region's average) indicates a decrease of 0.45 mm a^{-1} . During 1989-1998, the coefficient of rainfall variability increased strongly (max. 30%). This indicates that the NE-Zimbabwe rainfall regime is slowly progressing towards the desert-like climate where the coefficient of rainfall variability is $\geq 40\%$. Comprehensive analysis of the temperature regime provides convincing evidence for a strong tendency towards hotter environments. Quantification of corresponding areas indicates an increase in the fields of maximum temperature, which are sending a maximum temperature wave south-eastwards. This phenomenon is coupled with the night-time cooling wave shifting in north-easterly directions, at an angle of about 90° to the maximum temperature wave front. The observed change in rainfall and surface temperatures trends may be not entirely natural in origin, but also partly be induced and reinforced by human activities, especially by changing of the landscape.