**Spatial and Temporal Variability in the Characteristics of Extreme Daily Rainfalls in Ghana**

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**Abstract**

There is considerable focus on the potential for increased frequency of extreme hydroclimatological events in the presence of climate change. In Ghana, with its reliance on rain-fed agriculture, the question of crop loss from flooding and soil erosion is further aggravated by concern whether the climate has recovered to conditions that prevailed prior to the regional drought of the 1970s and 80s. This study examines long-term (44-52 years), complete, daily rainfall records from 19 stations throughout Ghana to determine magnitude and frequency of daily rainfall totals exceeding levels equivalent to the historic 90th percentile of non-zero observations at each station. The results are sub-divided into three sub-populations corresponding to pre-drought, drought, and recovery periods and two basic research questions addressed; 1) Are there significant differences in any/all variables between periods at a station?, 2) Are there distinctive regional patterns in changes? The hypergeometric distribution is used to determine the statistical significance of the frequency with which observations exceed the long run median value of the variables and differences in the means during each period are mapped revealing heterogeneous effects of the drought and degrees of recovery. Locations along the coast have recovered in neither frequency nor magnitude, while mid-Ghana shows a fuller recovery. Outliers correspond to Axim in extreme southwestern Ghana and Navrongo in the north. KeteKrachi, located on Lake Volta, produces frequent anomalies, which may result from its local climatological setting.

Keywords: Extremes, Rainfall, Precipitation, Daily, Ghana, Variability