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Spectral Characteristics of the Annual Mean Rainfall Series in Ghana

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Abstract

Time series of standardised (normalised) deviations of annual mean rainfall in Ghana for the period 1961-1998 was plotted using data for 30 stations. The plot revealed widespread floods in 1962, 1963 and 1996, and widespread droughts in 1977, 1983, 1992 and 1998. To check for periodicities, the time series was subjected to a power spectrum analysis using the Maximum Entropy Spectral Analysis (MESA) technique. A number of periodicities were detected. A periodicity of 5.6 years was found to be highly significant. That of 2.7 years was of borderline significance. The rest of the periodicities were insignificant. The most recent floods or excess rains (positive deviation) within the 1961–1998 period occurred in 1996. The next possible floods were, therefore, predicted to occur during the year 2001 or 2002. The widespread floods in Ghana during the period have proved this prediction right. The next major floods in Ghana are likely to occur in year 2006 or 2007.