



The impact of climate change on the frequency of droughty and wet weather patterns in the Volta basin of West Africa

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In this paper, the frequencies of droughty and wet weather patterns are investigated. For this reason, a multi objective fuzzy rule - based classification method has been applied. This classification conditions daily rainfall time series to large-scale atmospheric weather patterns.

First, weather patterns within the sector $40^{\circ}\text{W}10^{\circ}\text{S}$ to $30^{\circ}\text{E}60^{\circ}\text{N}$, which are significantly linked to past (1961-1990) droughty and wet weather situation of 5 different regions within the Volta basin, are identified. Therefore, several meteorological predictor variables of the NCEP/NCAR reanalysis data set have been tested towards usability. The occurrence frequencies of the extreme weather patterns are analyzed at inter-annual and decadal time scale using the best performing predictor variable for each region.

Second, frequency distribution of extreme weather patterns of the 1961-1990 period is compared to the 2011-2040 period. The analysis of the future time slice has been conducted using the A1B driven ECHAM5 data set.

The impact of climate change on the frequency change of droughty and wet circulation patterns is presented and discussed.

Keywords A1B scenario, Droughty and Wet Weather Patterns, ECHAM5, NCEP/NCAR reanalysis, Weather Pattern Analysis