PRINT: ISSN 0970-9274 ONLINE: ISSN 2456-6608

JOURNAL OF HUMAN ECOLOGY

International Interdisciplinary Journal of Man-Environment Relationship

PRINT: ISSN 0970-9274 ONLINE: 2456-6608
J Hum Ecol, 32(2): 127-133 (2010)
DOI: 10.31901/24566608.2010/32.02.09

Prediction of Northern Nigeria Rainfall Using Sea Surface Temperature

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KEYWORDS Savanna JAS Rainfall. SST Anomalies. Rainfall Prediction. Models Construction

ABSTRACT Large-scale vertical motion in the atmosphere in the tropics is tied to high sea surface temperatures (SST). Enhanced moisture content of the boundary layer over sea leads to enhanced moisture convergence because of the low pressure created over the high sea surface temperature regions. This leads to a feed-back mechanism that enhanced moisture convergence because vertical ascent of air through the release of latent heat in deep convection. All these phenomena are associated with high sea surface temperatures (SST) and are widely believed to induce large scale atmospheric circulation and heating anomalies. These anomalies in the tropical atmosphere can have consequences in locations far and remote from the direct sea surface temperatures (SST). In order to have data coverage sufficient and adequate for this study, the region was enlarged to include stations at the outskirts of northern Nigeria. All the stations lie approximately between latitudes 9°N and 15°N were used to analyse the data covering a period of 1901 to 2006. Sytat software was used to analyse rainfall and temperature data of cities of northern Nigeria and its outlying geographic areas for predicting rainfall. Correlation and regression was carried out on the data set to estimate the model. Using the results of the regression, models were constructed for April, May and June. Testing the models on the correlation between the forecast and the actual savanna July, August and September (JAS) rainfall shows that it can be predicted with 62.10% accuracy using April model, 74% accuracy using May and 64.5% accuracy using June model. The model showed a more robust prediction when more recent data (2000- 2006) are used. The result obtained for April was 70%, May was 90% and June was 80% when evaluated by common statistics, the model performed well as the magnitude of error was low.