ABSTACT

Wavelet Analysis on the Variability and the Teleconnectivity of the Rainfall of the Congo Basin for 1940 – 1999.

by

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It is known that the spatial and temporal variability’s of rainfall in the Congo Basin are complex because of its size, diversity of climates, topography, seasonal migration of the intertropical convergence zone (ITCZ), and the influence of oceans SST variations.

This basin is characterized by low density of meteorological stations associated with a high percentage of missing data which is a high source of uncertainty for the results.

However gridded database of rainfall (CRU, IRD,…) are available and can be used for various needs such as regional studies and modeling.

We propose to quantify this variability using a wavelet analysis.

Wavelet analysis of the Congo basin rainfall shows some energy bands:

Annual fluctuations are the most representative and the most structured signal, explaining more than 30 % of the total rainfall variability;

Multi-year fluctuations have a lower contribution (less than 10 %) during this period. It is clear that rainfall is highly structured by the annual cycle so that a transformation of rainfall data is required

and allows to evidence the eventual connection of 2 to 8 and 8 to 16 years bands.

We can observe three major shifts (around 1960, 1970 and 1983) in the signal (instationarities) of the rainfall in the Congo, Kasai and Oubangui basin’s, which affected the 2-4 years, 4-8 and the 8-16 bands.

The wavelets coherence confirms a weak relationship between the rainfalls of the Congo basin and the Pacific and tropical Atlantic long term SST forcing.