

## **Modelling West African total precipitation depth: a statistical approach**

**Sovoe, S.\***

**\*Environmental Protection Agency, Ho, Volta Region, Ghana; [sovo35@yahoo.com](mailto:sovo35@yahoo.com); +233 246099870 (cell); +233 362026529 (office); +233 362025277 (home)**

**Sponsor(s): International Foundation for Science, Grant No. W/4330-1**

### **Abstract**

Even though several reports over the past few decades indicate an increasing aridity over West Africa, attempts to establish the controlling factor(s) have not been successful. The traditional belief of the position of the Inter-tropical Convergence Zone (ITCZ) as the predominant factor over the region has been refuted by recent findings. Changes in major atmospheric circulations such as African Easterly Jet (AEJ) and Tropical Easterly Jet (TEJ) are being cited as major precipitation driving forces over the region. Thus, any attempt to predict long term precipitation events over the region using Global Circulation or Local Circulation Models could be flawed as the controlling factors are not fully elucidated yet. Successful prediction effort will require models which depend on past events as their inputs as in the case of time series models such as Autoregressive Integrated Moving Average (ARIMA) model. In this study, the researcher used historical precipitation data to build appropriate Seasonal Multiplicative Autoregressive Integrated Moving Average model,  $ARIMA(p,d,q)*(P,D,Q)$  in an *R* programming language. The model was then used to predict long term precipitation events over the Ghanaian segment of the Volta Basin which could be used in planning and implementation of development policies.

**KEYWORDS: Modelling; West Africa; Total Precipitation Depth; Statistical Approach**