

Rainfall Observations over sub-Saharan Africa: Challenges and Prospects

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Abstract

Rainfall is the major component of the hydrological process. Thus, rainfall data is a critical input into any hydrologic model. The traditional source of rainfall data has been raingauge measurements. However, the number of raingauge stations over most of sub Saharan Africa is very small, and it has been deteriorating. Besides, the available stations are distributed unevenly with most of the stations located in cities along the major roads. The other problem is that most of the available data is not accessible out side the individual countries. Two data sources are used widely to overcome these problems. The first is the gridded rainfall products from sources such as the Global Precipitation Climate Project and the Climate Research Unit at University of East Angelia. The second source of rainfall data is satellite rainfall estimates. The satellite products have different spatial and temporal resolutions. Both gridded and satellite data sources have some series limitations. The major problem with a gridded product is that it is only as good as the number and quality of stations used in the interpolation; and there are not many from most parts of sub Saharan Africa. The other problem is that the monthly aggregation used in these products is very coarse for many hydrological applications. The major problem for the satellite products is accuracy. The satellite estimates are particularly bad over monotonous, coastal, and drier regions. Other problems include short time series and inhomogeneities of the relatively longer time series. There are possibilities to improve the rainfall time series over sub Saharan Africa with optimal use of available observations and satellite rainfall estimates. Satellite data from geostationary environmental satellites such as Meteosat now goes back thirty years. Thus, 30-year time series of rainfall could be produced using available stations for calibration and blending with the satellite estimates. This presentation will describe the available gridded and satellite products over Africa and the quality of theses products. It will also make some recommendations on how to improve the availability of better rainfall data over sub Saharan Africa.