

PAPER (3)

A Novel Approach for the Joint Use of Rainfall Monthly and Daily Ground Station Data with TRMM Data to Generate IDF Estimates in a Poorly Gauged Arid Region

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ABSTRACT

In poorly gauged regions, rainfall data are often short or even absent, hindering the possibility of estimating Intensity- Duration-Frequency (IDF) relations with operationally acceptable accuracy. In this research, a novel idea is presented for the use of three separate rainfall datasets: maximum annual daily data, monthly data and Tropical Rainfall Measuring Mission (TRMM) satellite data to develop robust IDF in Namibe, south of Angola. TRMM data is used to derive relations between maximum monthly and maximum daily rainfall and between sub-daily and daily rainfall depths. Frequency analysis is undertaken on the mixed daily record using several distributions and the best fitting is selected based on discriminant plots of the distribution tails and the moment ratio diagram as well as Bayesian criteria. The IDF curves are derived based on the estimates of daily rainfall at various return periods, with the derived sub-daily rainfall duration ratios. Robust IDFs are thus developed for a scarce data region in Africa.