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Evaluation of four satellite precipitation products over Tanzania

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This study comprehensively evaluates four precipitation products over Tanzania. Three of them are satellite-based including the Tropical Rainfall Measuring Mission (TRMM) Real-Time Multisatellite Precipitation Analysis (TMPA) 3B42RT V.7.0, Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS) V.2.0, Tropical Applications of Meteorology using SATellite (TAMSAT) V.3.0and the last one is the WATCH Forcing Data methodology applied to ERA-Interim reanalysis data (WFDEI).

The evaluation is performed on a point-to-pixel basis at multiple temporal scales (daily, 10-days and monthly).The ground reference is gauge data from Tanzania Meteorological Agency (TMA) stations. Sources of errors for each precipitation product are analyzed based on spatial categorization in relationship with topography and climatology, and temporal classification of wet seasons and dry seasons. Validation also includes the ability to capture heavy rainfall events (in terms of timing and amount) and the ability to detect drought events (in terms of the duration of consecutive dry days).Results show that TAMSAT outperforms others on estimating the tendency of rainfall and TRMM can better capture the variability of rainfall.