



Validation of satellite rainfall products over complex terrain in Africa

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A dense station network over the Ethiopian highlands is used to perform an extensive validation and inter-comparisons eleven satellite rainfall products. These include Global Precipitation Climatology (GPCP), National Oceanographic and Atmospheric Administration-Climate Prediction Centre (NOAA-CPC) Merged Analysis (CMAP), the Tropical Rainfall Measuring Mission (TRMM) combined 'TRMM and Other Sources' (3B43), NOAA-CPC African Rainfall Estimation Algorithm (RFE), NOAA-CPC African Rainfall Climatology (ARC), GPCP one-degree daily (1DD), the 'TRMM and Other Satellites' product (3B42), Tropical Applications of Meteorology using Satellite and other data (TAMSAT) product, the CPC morphing technique (CMORPH), Precipitation Estimation from Remotely Sensed Information using Artificial Neural Network, (PERSIANN), and the Naval Research Laboratory's blended product(NRL). These products are evaluated in three groups. The first group has low spatial (2.5°) and temporal (monthly) resolutions, and includes, GPCP, CMAP and 3B43. The second category (RFE, ARC, 1DD, 3B42, TAMSAT and CMORPH) are validates at 10-daily accumulations and spatial resolutions of 1° . The third group (RFE, 3B42, CMORPH, PERSIANN and NRL) are evaluated at daily accumulation and 0.25° spatial resolution. The first and second group of products exhibited reasonably good performance. The results are not so good for comparisons at daily accumulations. Though the products performed reasonably well in detecting the occurrence of rainfall, they performed poorly in estimating the amount of rainfall in each pixel