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Extreme Precipitation in the Kulfo River Watershed, Ethiopia: Wavelet and Trajectory Analysis Assistant Professor at Ethiopian Defence University, College of Engineering

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Analysis of precipitation time series is a fundamental undertaking in meteorology and hydrology. The extreme precipitation scenario of the Kulfo River watershed is studied using wavelet analysis and atmospheric transport, a lagrangian trajectory model. Daily rainfall data for the 1991-2020 study periods are collected from the office of the Ethiopian Meteorology Institute. [Meteorological fields](#) on a three-dimensional grid at 0.5o x 0.5o spatial resolution and daily temporal resolution are also obtained from the Global Data Assimilation System ([GDAS](#)). Wavelet analysis of the daily precipitation processed with the lag-1 coefficient reveals some high power recurred once every 38 to 60 days with greater than 95% confidence for red noise. The analysis also identified inter-annual periodicity in the periods 2002 - 2005 and 2017 - 2019. Back trajectory analysis for 3-day periods up to May 19/2011 indicates the Indian Ocean source; trajectories crossed the eastern African escarpment to arrive at the Kulfo watershed. Atmospheric flows associated with the [Western Indian monsoon](#) redirected by the low-level Somali winds and Arabian ridge are responsible for the moisture supply. The time-localization of the wavelet power spectrum yields valuable hydrological information and the back trajectory approaches provide useful characterization of air mass source.

Biography

Dr Tesfay Mekonnen is a leading Assistant professor in the faculty of Meteorology and Hydrology. He has been actively participating in advising post graduate theses and writing researches. He has published extensively as author and co-author different articles in highly regarded, peer-reviewed journals. His research article entitled Analysis of Rainfall Trends and Its Relationship with SST Signals in the Lake Tana Basin, Ethiopia, which relates the effect of the large-scale dynamics on local climate for example had acquired a greater number of views, downloads, and citations. He frequently speaks at international conferences and was awarded many prestigious certificates.

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