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Analyzing spatio-temporal precipitation variability and trends over Ethiopia

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The spatial-temporal variation of precipitation significantly affects the hydrological processes and the proper management of surface water resources. This study analyzed the spatio-temporal variability and trends of precipitation over Ethiopia by using a non-parametric Mann-Kendall test from 1980 to 2016. The results show that the annual precipitation was 758.504 mm. Monthly precipitation revealed an upward trend in summer season (June to August) and a downward trend in winter season (December to February). The results also showed an increasing trend in the eastern and southwestern parts of Ethiopia and decreasing trend in the northeastern part. The spatial variability of annual precipitation was observed with a CV averaged of 3.03%. The trend analysis of the annual precipitations showed a dramatic decreasing trend in 1984. However, no statistically significant trend was observed in the annual precipitation but increasing and decreasing seasonal trends were observed. The increase in precipitation during rainy season along with the decrease in number of rainy days leads to an increase of extreme rainfall events over the country during 1980-2016. The consistency in precipitation trends over the country confirms the robustness of the change in trends. Studying the precipitation trends serves as a basis for understanding the changes in climate.

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