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### Abstract

Changes over the last 50 years in low flow, high flow, low flow index, total flow, runoff coefficient and rainfall was analyzed for 12 rivers in the Blue Nile Basin of Ethiopia. The aim of the study is to characterize the changes happening in the hydrological regime of the Basin with special reference to low flows. Monthly meteorological and hydrological data were used for the analysis. Trend analysis was done using Spearman's rho correlation coefficient and Wilcoxon signed-rank was used to test for step-changes. The study period was also divided into three periods (1960-1975, 1976-1990, and 1991-2004) to test for changes in the hydrological regime, including linear fits of the flow duration curves. There were significant changes in the hydrological parameters in 10 of the 12 rivers. But what changed, and in which direction were different for different rivers. The number of rivers which have an inverse relationship between runoff coefficient and low flow index has increased by 50% from the earliest to the most recent period. But even this relationship (which was hypothesized to indicate soil degradation) is not statistically significant. Our conclusion is that hydrological changes in the Blue Nile Basin over this period cannot be generalized, despite strong pressures with respect to land use and soil degradation across the entire basin. Thus water management in the region needs to be designed with due attention to the specific characteristics of each catchment.

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