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Rainfall-runoff interactions of Göksu River Basin

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Abstract: The existence of any trend for the monthly and seasonal rainfall and runoff data between 2005-2015 acquired from the two runoff gauge station and one meteorological station at the Göksu River basin in Mersin province, were analyzed based on the Mann-Kendall Rank Correlation test. Prior to the trend analysis, initially, water yields were obtained dependent upon the basin sizes and flow rate data belonging to the runoff stations with the codes of E17A020 (Hamam) and E17A014 (Karahacılı). Then, flow coefficient percentages were determined for each station, based on the water yields and total rainfall ratios. The increase in the flow coefficient parameter that is an indicator of the water yield deficiency, implies the low total water deficiency within basin whereas the decrease emphasizes the much total water deficiency or the water is trapped as soil moisture or the natural flow is restricted by any structural means such as dams and etc. Considering the annual total flow and rainfall data, the runoff coefficient of the station with the code of E17A020 was 43.49% while it was 41.28% for the E17A014. In order to determine the rainfall-runoff interactions within the basin, the trend analyses for each 12 months revealed the inexistence of trend for the all months at the E17A020 station whereas revealed the increase for the July and September at the E17A014. On the other hand, no trend was determined for the other months. When the four seasons were separately evaluated, the increase in the summer season rainfall for long-term time series was observed only at the E17A014 station, yet it did not occur for the other seasons. According to the rainfall trend for the E17A020 station, it was concluded that the inexistence of any monthly and seasonal trend may be due to the artificial storage structures such as dams and etc.
Keywords: Rainfall, Runoff, Göksu, Water yield