Do El Niño events modulate the statistical characteristics of Turkish streamflow?

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Abstract. The objective of this study is to investigate whether or not the basic statistical characteristics of a streamflow time series that is assumed to be affected by the warm phases of the Southern Oscillation (El Niño events). In order to achieve this intended goal, we considered a hypothetical series, so-called generated series, which can be obtained from the historical series at hand by first assuming non-occurrence of El Niño events in the past. The historical monthly precipitation data during the El Niño years were simulated by the Radial Based Artificial Neural Network (RBANN) method. The differences in the basic statistical characteristics between the generated and original historical series were tested by various statistical hypothesis testing methods for four different cases. Consequently if significant differences were determined between the two series in terms of variance, mean and autocorrelation parameters, then it can be inferred that the El Niño events modulate the major statistical characteristics of streamflow series. This type of result (related to a question of "how") may be conceived as the subsequent phase of the previously documented results concerning the determination of El Nino signal (related to a question of "is there"). The outcomes of this study were in agreement with the previous studies and may be taken into consideration by the hydrologist for the long-term irrigation, hydropower and environmental planning.

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