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Abstract title
PRECIPITATION VARIABILITY FOR ANNUAL, WET AND DRY PERIODS IN TURKEY

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Topic
Regional climate, sea level rise and storm surges and their effects on coastal flooding

Keywords
Mann-Kendall test, REOF, teleconnections, wavelet transform

Precipitation variability has a great impact on agriculture, economic and social characteristics of the regions. In the present study, annual, winter and summer precipitation records for the period 1961–2008 from 271 stations in Turkey were analyzed using the rotated empirical orthogonal function (REOF), the Mann–Kendall trend test and the continuous wavelet transform (WT) method. Additionally, relationships between time variability of the significant spatial patterns and NAO (North Atlantic Oscillation), AO (Arctic Oscillation), NSCP (North–Sea Caspian Pattern, and ME (Multivariate El Niño Southern Oscillation Index) are examined.

The REOF method was used to analyze the annual and dry and wet period variability of precipitation patterns over Turkey, the Mann–Kendall method was used to detect the temporal trend of the rotated principal components time series, and the continuous wavelet method was used to explore the periodicity of precipitation changes. Continuous wavelet transform results indicate that the significant 3–4 year, 6-10 year and 12–16 year bands are the major period components. Precipitation in Turkey is uneven in space and time, and its complex temporal structure and spatial variations are different in each dry and wet period. The Mann–Kendall test results show that, in throughout the Anatolia including west, and southwest sections are dominated by decreasing annual precipitation. Decreasing wet/dry period precipitation in throughout the country except northeast coasts and eastern parts of Turkey will have strongly impact on the life upon, agricultural production, drinking water and hydroelectricity production.