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Climate variability and its impact on water resources: case study of the Souk Ahras region, northeastern Algeria

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ABSTRACT

Climate variability has been identified as one of the major factors affecting water resources. The purpose of this study is to characterize climate variability in the region of Souk Ahras and to evaluate its impact on surface and groundwater resources. Various statistical methods, including Mann–Kendall test, Pettitt test, drought indices, and Fourier filter were used. Pettitt test revealed the occurrence of breaks over the period (1994–1996), showing significant increase in the annual rainfall and temperature data time series. The analysis of drought indices provided insights into the relationship between meteorological and hydrological droughts in the study area. This mainly revealed that rainfall deficit results in an immediate response to runoff regime and a delayed response to groundwater level. Moreover, it was found that both meteorological and hydrological drought conditions significantly decreased after the climatic shift in terms of frequency, intensity and duration. Such information is of great importance for managing water resources and preparing drought mitigation measures.

Keywords: Climate variability; Mann–Kendall test; Pettitt test; Drought indices; Algeria

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