The title (العنوان):

Analysis of the hydrological behavior of watersheds in the context of climate change (Northwestern Algeria)

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Abstract : The aim of this work is to study the temporal evolution of the rainfall-runoff relations of four basins in northwestern Algeria: the Tafna Maritime, Isser Sikkak, downstream Mouilah and Upper Tafna basins. The adopted approach consists of analyzing hydroclimatic variables using statistical methods and testing the nonstationarity of the rainfall-runoff relation by the cross-simulation method using the GR2M model. The results of the different statistical methods applied to the series of rainfall and hydrometric variables show a decrease due to a break in stationarity detected since the mid-1970s and the beginning of the 1980s. The annual rainfall deficits reached average values of 34.6% during the period of 1941–2006 and 29.1% during the period of 1970–2010. The average annual wadi flows showed average deficits of 61.1% between 1912 and 2000 and 53.1% between 1973 and 2009. The GR2M conceptual model simulated the observed hydrographs in an acceptable manner by providing calculated runoff values in the calibration and validation periods greater or less than the observed runoff values. The application of the cross-simulation method highlighted the nonstationarity of the rainfall-runoff relations in three of the four studied basins, indicating downward trends of monthly runoff.

KEYWORDS : Precipitation ; Runoff ; Breakpoint ; Nonstationarity ; Drought ; GR2M model

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