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HYDRO-SEDIMENTARY FLOW MODELLING
IN SOME CATCHMENTS CONSTANTINE HIGHLANDS,
CASE OF WADIS SOULTEZ AND REBOA (ALGERIA)

Abstract

Erosion is a major phenomenon that causes damage not only to soil and agriculture, but also to the quality of the water amounting to tonnes of matter annually transported on the earth's surface. This fact has attracted the interest of researchers to understand its mechanism and explain its causes and consequences. This work is a comparative study of water erosion in the two semi-arid catchments of Wadi Soultez and Wadi Reboa, located in the North-East of Algeria. The approach adopted for the quantification of sediment transport consists on researching the best regressive model to represent the statistical relation between the sediment yield and the measured water discharge at different scales: annual, seasonal and monthly. The available data cover 27 years from 1985–2012. The results show that the power model has given the best correlation coefficient. Results have indicated that Wadi Reboa transported an average of 14.66 hm³ of water and 0.25 million tonnes of sediments annually. While Wadi Soultez has transported 4.2 hm³ of water and 0.11 million tonnes of sediments annually. At a seasonal scale, sediment amounts have showed significant water erosion in autumn with around 44% and secondarily in the spring with 29% in Wadi Soultez. Unlike Wadi Reboa, sediment transport represents 32% and 46% in autumn and spring respectively. Based on the obtained sediment amounts; it is found that the physical factors: such as steep reliefs, vulnerable lithological nature of rocks and poor vegetal cover, have significantly contributed in accelerating soil erosion.

Key words: accelerating, regressive model, sediment transport, Wadi Reboa, Wadi Soultez, water discharge, water erosion