

Statistical Modeling and by Artificial Neural Networks of Suspended Sediment Mina River Watershed at Wadi El-Abtal Gauging Station (Northern Algeria)

Authors : Redhouane Ghernaout, Amira Fredj, Boualem Remini

Abstract : Suspended sediment transport is a serious problem worldwide, but it is much more worrying in certain regions of the world, as is the case in the Maghreb and more particularly in Algeria. It continues to take disturbing proportions in Northern Algeria due to the variability of rains in time and in space and constant deterioration of vegetation. Its prediction is essential in order to identify its intensity and define the necessary actions for its reduction. The purpose of this study is to analyze the concentration data of suspended sediment measured at Wadi El-Abtal Hydrometric Station. It also aims to find and highlight regressive power relationships, which can explain the suspended solid flow by the measured liquid flow. The study strives to find models of artificial neural networks linking the flow, month and precipitation parameters with solid flow. The obtained results show that the power function of the solid transport rating curve and the models of artificial neural networks are appropriate methods for analysing and estimating suspended sediment transport in Wadi Mina at Wadi El-Abtal Hydrometric Station. They made it possible to identify in a fairly conclusive manner the model of neural networks with four input parameters: the liquid flow Q , the month and the daily precipitation measured at the representative stations (Frenda 013002 and Ain El-Hadid 013004) of the watershed. The model thus obtained makes it possible to estimate the daily solid flows (interpolate and extrapolate) even beyond the period of observation of solid flows (1985/86 to 1999/00), given the availability of the average daily liquid flows and daily precipitation since 1953/1954.

Keywords : suspended sediment, concentration, regression, liquid flow, solid flow, artificial neural network, modeling, mina, algeria

Conference Title : ICWSFSWM 2024 : International Conference on Water, Sanitation, Food Security and Waste Management

Conference Location : Montreal, Canada

Conference Dates : May 23-24, 2024