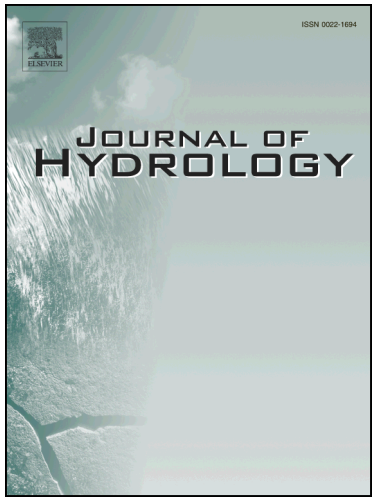

Research papers

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Harmonize Input Selection for Sediment Transport Prediction

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Abstract

In this paper, three modeling approaches using a Neural Network (NN), Response Surface Method (RSM) and response surface method basis Global Harmony Search (GHS) are applied to predict the daily time series suspended sediment load. Generally, the input variables for forecasting the suspended sediment load are manually selected based on the maximum correlations of input variables in the modeling approaches based on NN and RSM. The RSM is improved to select the input variables by using the errors terms of training data based on the GHS, namely as response surface method and global harmony search (RSM-GHS) modeling method. The second-order polynomial function with cross terms is applied to calibrate the time series suspended sediment load with three, four and five input variables in the proposed RSM-GHS. The linear, square and cross corrections of twenty input variables of antecedent values of suspended sediment load and water discharge are investigated to achieve the best predictions of the RSM based on the GHS method. The performances of the NN, RSM and proposed RSM-GHS including both accuracy and simplicity are compared through several comparative predicted and error statistics. The results illustrated that the proposed RSM-GHS is as