SUSPENDED SEDIMENT PREDICTION USING WAVELET WITH RBF-ANN AND SVM

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Abstract

In this study wavelet radial basis function artificial neural network (WRBF-ANN) and wavelet support vector machine (WSVM) model is proposed for daily suspended sediment (SS) prediction in river. These models are achieved by combining discrete wavelet analysis with support vector machine (SVM) and radial basis function artificial neural network (RBF-ANN). Daily discharge (Q) and SS data from Yadkin River in the USA are used. The root mean square error (RMSE), correlation coefficient (R) and coefficient of efficiency (R^2) are used to evaluate the models. Results demonstrated that WRBF-ANN with RMSE =2167.98 ton/day and R^2 =0.91 were more desired than the other model with RMSE =3294.61 ton/day and R^2=0.838. Comparisons of these models revealed that, RMSE and error standard deviation for WRBF-ANN model were about 0.34% less than WSVM model in test period.

Keywords

Discrete wavelet analysis; RBF-artificial neural network; Daily discharge; Suspended sediment; Support vector machine