

LIGHVAN CHAY RIVER SUSPENDED SEDIMENT LOAD FORECASTING: APPLICATION OF WAVELET AND RBF-ANN

*Maedeh Sadeghpour Haji¹
Saeed Ghanbarzadeh Darzi²
Ghasem Najafpur³*

¹Islamic Azad University

²Fan Avaran Ab Saze Iranian Consulting Engineering Company

*³Noshirvani University of Technology
Iran*

Abstract

Prediction of river suspended sediment load is an important point for operation of a water resources, environmental engineering and hydrologic events. In this study, wavelet radial basis function artificial neural network (WRBF-ANN) model is proposed for daily suspended sediment (SS) prediction in river. This model is achieved by combination of discrete wavelet analysis with radial basis function artificial neural network (RBF-ANN). Suspended sediment (SS) and daily stream flow (Q) data from Lighvan Chay River in IRAN were used for training and testing the model. The root mean square error (RMSE), correlation coefficient (R) and coefficient of efficiency (R^2) are used to evaluate the model. Results demonstrated that WRBF-ANN with RMSE = 1.85 tons/day and $R^2 = 0.92$ could logically approximate the suspended sediment load.

Keywords

Discrete wavelet analysis; RBF-artificial neural network; Daily stream flow; Suspended sediment; Lighvan Chay River