

Simulation of Reservoir Sediment Deposition in Low-head Dams using Artificial Neural Networks

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Abstract

In this study, the simulation of sediment deposition at Sangju weir reservoir, South Korea, was carried out using artificial neural networks. The ANNs have typically been used in water resources engineering problems for their robustness and high degree of accuracy. Three basic variables namely turbid water inflow, outflow, and water stage have been used as input variables. It was found that ANNs were able to establish valid relationship between input variables and target variable of sedimentation. The R value was 0.9806, 0.9091, and 0.8758 for training, validation, and testing phase respectively. Comparative analysis was also performed to find optimum structure of ANN for sediment deposition prediction. 3-14-1 network architecture using BR algorithm outperformed all other combinations. It was concluded that ANN possess mapping capabilities for complex, non-linear phenomenon of reservoir sedimentation.

Keywords: Artificial Neural Networks; Low-head dam; Reservoir Sedimentation; Turbid Inflow

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