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Time Series Modeling of River Flow Using Wavelet Neural Networks

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ABSTRACT

A new hybrid model which combines wavelets and Artificial Neural Network (ANN) called wavelet neural network (WNN) model was proposed in the current study and applied for time series modeling of river flow. The time series of daily river flow of the Malaprabha River basin (Karnataka state, India) were analyzed by the WNN model. The observed time series are decomposed into sub-series using discrete wavelet transform and then appropriate sub-series is used as inputs to the neural network for forecasting hydrological variables. The hybrid model (WNN) was compared with the standard ANN and AR models. The WNN model was able to provide a good fit with the observed data, especially the peak values during the testing period. The benchmark results from WNN model applications showed that the hybrid model produced better results in estimating the hydrograph properties than the latter models (ANN and AR).

KEYWORDS

Time Series, River Flow, Wavelets, Neural Networks

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