

Stochastic modeling of Karasu River (Turkey) using the methods of Artificial Neural Networks

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Abstract: Engineering project design, environmental impact analysis and water resources problems, particularly hydrological simulation and forecasting often require the estimation of streamflow. Simulation and forecasting techniques of streamflow time series have been applied widely for determining the dimensions of hydraulic works for risk assessment in urban water supply systems and irrigation, optimal operation of reservoir systems, optimization hydroelectric production, and so on. The present study uses two different artificial neural network (ANN) approaches for the stochastic modeling of the monthly mean streamflow of Karasu River located in the Upper Euphrates River Basin in the Eastern Anatolia part of Turkey. The ANN approaches used in this study are well known one-hidden layer feed forward back propagation (FFBP) architecture trained with the error back propagation and a variant of radial basis networks called Generalized Regression Neural Networks (GRNN). The study shows that the GRNN performs very well in the prediction of the hydrological time series. The performance of the GRNN is also found to be comparable with that of FFBP.

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