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Hydrol. Earth Syst. Sci., 6, 619-626, 2002

www.hydrol-earth-syst-sci.net/6/619/2002/

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## Evaluation of artificial neural network techniques for flow forecasting in the River Yangtze, China

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**Abstract.** While engineers have been quantifying rainfall-runoff processes since the mid-19th century, it is only in the last decade that artificial neural network models have been applied to the same task. This paper evaluates two neural networks in this context: the popular multilayer perceptron (MLP), and the radial basis function network (RBF). Using six-hourly rainfall-runoff data for the River Yangtze at Yichang (upstream of the Three Gorges Dam) for the period 1991 to 1993, it is shown that both neural network types can simulate river flows beyond the range of the training set. In addition, an evaluation of alternative RBF transfer functions demonstrates that the popular Gaussian function, often used in RBF networks, is not necessarily the 'best' function to use for river flow forecasting. Comparisons are also made between these neural networks and conventional statistical techniques; stepwise multiple linear regression, auto regressive moving average models and a zero order forecasting approach.

**Keywords:** Artificial neural network, multilayer perception, radial basis function, flood forecasting

[Final Revised Paper](#) (PDF, 628 KB)

Citation: Dawson, C. W., Harpham, C., Wilby, R. L., and Chen, Y.: Evaluation of artificial neural network techniques for flow forecasting in the River Yangtze, China, Hydrol. Earth Syst. Sci., 6, 619-626, 2002. [Bibtex](#) [EndNote](#) [Reference Manager](#)

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