

**NEURAL NETWORK PREDICTION OF MONTHLY PRECIPITATION:  
APPLICATION TO FLOOD OCCURRENCE IN CENTRAL EUROPE**

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Dramatic floods occurred in Central Europe in 1997 followed by similar catastrophes in easternmost Hungary and western Ukraine in 1998 and 2000. As it is the rain field that essentially controls the runoff process, and thus the river flow fluctuations, the conditions for the floods can be investigated through the precipitation time series. Artificial neural network (ANN) models may be a useful tool to forecast future precipitation from the existing data. Three-layer back propagation ANNs were trained with actual monthly precipitation data from six Czech and four Hungarian meteorological stations for the period 1961-1999. Predicted amounts are next-month-precipitation. The work is a continuation of the previous studies which focussed on training and testing the ANN models to predict the extreme precipitation. Present work includes numerous experiments with different input layer sets of various combinations of previous monthly precipitation amounts to find optimal configuration. Both training and testing ANN results provided a good fit with the actual data and showed a high feasibility in prediction of extreme precipitation. It was found that the ANN model makes significantly better predictions than the optimum autoregressive approach.