Time marching forward testing of two neural network rainfall-runoff models

R.J. Abrahart (1) and C.W. Dawson (2)

(1) School of Geography, University of Nottingham, UK; (2) Department of Computer Science, Loughborough University, UK (Email: bob.abrahart@nottingham.ac.uk)

Two neural network discharge forecasting models were evaluated with regard to the detrimental effect of incorporating model output predictions as inputs in a repeated manner through the use of feedback loops i.e. 'time marching forward'. Model 1 was for the Upper River Wye in Central Wales (UK); Model 2 was for the River Ouse in Northern England (UK). The two one-step-ahead models were developed using standard procedures and thereafter run over extended periods in 'feedback mode'. The outputs were tested on a continuous basis for CE and RMSE. Marked similarities in the manner and pattern of output degradation will be described and used to provide important insights into the process of model development. The point at which rapid degradation ceased and a levelling out of errors occurred is of particular interest.