

Reservoir Inflow Prediction for Pump Station Using Upstream Sewer Depth Data

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Abstract : Artificial Neural Network (ANN) approach is commonly used in lots of fields for forecasting. In water resources engineering, forecast of water level or inflow of reservoir is useful for various kind of purposes. Due to advantages of ANN, many papers were written for inflow prediction in river networks, but in this study, ANN is used in urban sewer networks. The growth of severe rain storm in Korea has increased flood damage severely, and the precipitation distribution is getting more erratic. Therefore, effective pump operation in pump station is an essential task for the reduction in urban area. If real time inflow of pump station reservoir can be predicted, it is possible to operate pump effectively for reducing the flood damage. This study used ANN model for pump station reservoir inflow prediction using upstream sewer depth data. For this study, rainfall events, sewer depth, and inflow into Banpo pump station reservoir between years of 2013-2014 were considered. Feed - Forward Back Propagation (FFBF), Cascade - Forward Back Propagation (CFBP), Elman Back Propagation (EBP) and Nonlinear Autoregressive Exogenous (NARX) were used as ANN model for prediction. A comparison of results with ANN model suggests that ANN is a powerful tool for inflow prediction using the sewer depth data.

Keywords : artificial neural network, forecasting, reservoir inflow, sewer depth

Conference Title : ICSWRM 2017 : International Conference on Sustainable Water Resources Management

Conference Location : Sydney, Australia

Conference Dates : January 26-27, 2017