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Comparative Study on Daily Discharge Estimation of Soolegan River

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Abstract : Hydrological modeling in arid and semi-arid regions is very important. Iran has many regions with these climate conditions such as Chaharmahal and Bakhtiari province that needs lots of attention with an appropriate management. Forecasting of hydrological parameters and estimation of hydrological events of catchments, provide important information that used for design, management and operation of water resources such as river systems, and dams, widely. Discharge in rivers is one of these parameters. This study presents the application and comparison of some estimation methods such as Feed-Forward Back Propagation Neural Network (FFBPNN), Multi Linear Regression (MLR), Gene Expression Programming (GEP) and Bayesian Network (BN) to predict the daily flow discharge of the Soolegan River, located at Chaharmahal and Bakhtiari province, in Iran. In this study, Soolegan, station was considered. This Station is located in Soolegan River at 51° 14´ Latitude 31° 38´ longitude at North Karoon basin. The Soolegan station is 2086 meters higher than sea level. The data used in this study are daily discharge and daily precipitation of Soolegan station. Feed Forward Back Propagation Neural Network(FFBPNN), Multi Linear Regression (MLR), Gene Expression Programming (GEP) and Bayesian Network (BN) models were developed using the same input parameters for Soolegan's daily discharge estimation. The results of estimation models were compared with observed discharge values to evaluate performance of the developed models. Results of all methods were compared and shown in tables and charts.

Keywords : ANN, multi linear regression, Bayesian network, forecasting, discharge, gene expression programming
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