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In this study, neural network model was developed to Forecast monthly release water for Haditha Dam. Seven different combinations of input variables were trained for release model. The principal inputs which used to compute monthly release (t) are: monthly Inflow, rainfall, evaporation, reservoir storage, monthly total demand and released water at previous time. The statistics parameters "coefficient of correlation (r)", "root of mean square error (RMSE)" and "mean absolute error (MAE)" were used to get best model inside each of seven combinations for release models. The statistic parameter, coefficient of determination (R²), was used to get best model among the seven models' combination.

The model which gave the highest coefficient of determination (R²) (RM) was selected to make released formula. It was found that ANNs have the ability to predict the release with accepted accuracy.

The sensitivity analysis for the (RM) model indicated that the reservoir storage(t) has the most significant effect on the predicted release water (t) followed by release water(t-1). The results also indicate that rainfall(t), monthly total demand (t) have moderate impact, while evaporation(t) and inflow (t) have the smallest impact.

The ANN model could be translated into simple and practical formula from which release water can be calculated.