Grammatical Evolution for Total Phosphorus in Reservoir Prediction

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Abstract

The objective of this study is to establish a monthly water quality predicting model using a Grammatical Evolution (GE) programming system for Feitsui Reservoir in Northern Taiwan. GE has an ability to find out significant input variables and combine them to form mathematical equations automatically. In this study, GE model was fed with fifteen input variables to determine a reasonable nonlinear mathematical equation for predicting the Total Phosphorous (TP) concentration in reservoir.Four significant input variables were chosen through GE process. GE predictive performance was compared with those of traditional Multi-Linear Regression (MLR) in a case study. The results show that GE can obtain a more accurate mathematical equation which outperforms the traditional MLR with lower estimation errors.

Keyword：Grammatical Evolution (GE), water quality predicting model, Total Phosphorous (TP)