

Combination of Artificial Neural Network Model and Geographic Information System for Prediction Water Quality

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Abstract : Water quality has initiated serious management efforts in many countries. Artificial Neural Network (ANN) models are developed as forecasting tools in predicting water quality trend based on historical data. This study endeavors to automatically classify water quality. The water quality classes are evaluated using 6 factor indices. These factors are pH value (pH), Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Nitrate Nitrogen (NO₃N), Ammonia Nitrogen (NH₃N) and Total Coliform (T-Coliform). The methodology involves applying data mining techniques using multilayer perceptron (MLP) neural network models. The data consisted of 11 sites of Saen Saep canal in Bangkok, Thailand. The data is obtained from the Department of Drainage and Sewerage Bangkok Metropolitan Administration during 2007-2011. The results of multilayer perceptron neural network exhibit a high accuracy multilayer perception rate at 94.23% in classifying the water quality of Saen Saep canal in Bangkok. Subsequently, this encouraging result could be combined with GIS data improves the classification accuracy significantly.

Keywords : artificial neural network, geographic information system, water quality, computer science

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