عنوان مقاله:

Artificial Neural Network Approaches to the Prediction of Eutrophication and Algal Blooms in Aras Dam, Iran

محل انتشار:

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Abstract Background and purpose: Eutrophication is one of the major environmental problems in waterways causing substantial adverse impact on domestic, livestock and recreational use of water resources. Aras Dam, Iran which provides Arasful city with drinking water, has chronic algal blooms since ۱۹۹۰. Levels of up to ۹۰۰,۰۰۰ cells/mL of toxic cyanobacteria (mainly Anabaena and Microcystis) have been recorded in the dam. Materials and Methods: In this study, artificial neural network (ANN) model was investigated to predict the chlorophyll-a (Chl-a) concentration in water of dam reservoir. Water samples were collected from ۵ stations and analyzed for physical quality parameters including water temperature, total suspended solids, biochemical oxygen demands, orthophosphate, total phosphorous and nitrate concentrations using standard methods. Chl-a was also measured separately in order to investigate the accuracy of the predicted results by ANN. Results: The results showed that a network was highly accurate in predicting the Chl-a concentration. The mean squared error and coefficient of correlation (R۲) between experimental data and model outputs were calculated. A good agreement between actual data and the ANN outputs for training was observed, indicating the validation of testing data sets. The initial results of the research indicate that the dam is enriched with nutrients (phosphorus and nitrogen) and is on the verge of being eutrophic. Conclusion: The Chl-a concentration that was predicted by the model was beyond the standard levels indication the possibility of .eutrophication especially during fall season

کلمات کلیدی:

Aras Dam, Eutrophication, Artificial Neural Network, Water Quality, Algal Bloom