

Main factor selection in Harmful Algal Bloom prediction with a case study for Western Xiamen Bay, China

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Abstract Harmful Algal Blooms (HABs) involve physical, chemical and biological processes, which lead to difficulties in selecting the vital factors for HAB prediction. In this study, some statistical methods, e.g. correlation analysis and principle component analysis, are used for data analysis and high dimensional data reduction. Artificial neural networks are constructed for selecting HAB inducing factors with eight scenarios. A case study has been carried out in Western Xiamen Bay, China. As a result, a simple ANN model was derived using the following input variables for making one-week-ahead chlorophyll-a prediction: water temperature, rainfall and chlorophyll-a concentration. The fact that selecting rainfall data as one of the input variables helps to improve the prediction accuracy indicates the importance of coupling the hydrological processes and the algal growth process in HAB prediction.

Keywords harmful algal bloom prediction; artificial neural networks; statistical methods; Western Xiamen Bay
