

عنوان مقاله:

Comparison of temporal and spatial patterns of water quality parameters in Anzali Wetland (southwest of the Caspian Sea) using Support vector machine model

محل انتشار:

مجله علوم زیستی خاورمیانه، دوره 19، شماره 1 (سال: 1400)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

Urgent is growing to have reliable information from the country's water resources. In recent years, data mining models such as artificial neural network (ANN), gene expression programming, Bayesian network, machine algorithms, such as a support vector machine (SVM), and Random Forest have found widespread use in the field of simulation and prediction of components in aquatic ecosystems. Variables vary greatly on water quality parameters (due to nonlinear and complex relationships). Therefore, conventional methods are not eligible to solve water resource quality management problems. The aim of this study was to investigate the possibility of simulating the spatial and temporal alterations in water quality parameters during the period ۱۹۸۵-۲۰۱۴ in Anzali Wetland using a SVM model. Based on principal components analysis (PCA), the parameters EC, TDS, pH and BOD₅ were selected for analysis in this study. Spearman correlation was calculated to determine the inputs of the model and the correlation coefficient(CC) between the water quality parameters. According to the results of the correlation table analysis, ۸ types of structures including different inputs were used to predict the parameters with machine vector. In the next stage, ۷۰% of the data were used to train, while the rest were used for analyzing the models. Criteria for determination coefficient (R²) and root mean square error (RMSE) were used for evaluation and model performance. The results revealed that in verification stage among different used models, the pH had the highest accuracy (۰.۹۵), while the lowest RMSE (۰.۲۰). Trend of alterations for optimal model of each parameter on a time scale, indicated an adequate estimation at most points. In general, the results exhibited the appropriate accuracy and acceptable performance of the SVM model in simulating water parameters.

کلمات کلیدی:

Machine algorithms, PCA, RMSE, Simulation, Wetland

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