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Comparison of prediction model using spatial discriminant analysis for marine water quality index in mangrove estuarine zones

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Abstract

The prediction models of MWQI in mangrove and estuarine zones were constructed. The 2011-2015 data employed in this study entailed 13 parameters from six monitoring stations in West Malaysia. Spatial discriminant analysis (SDA) had recommended seven significant parameters to develop the MWQI which were DO, TSS, O&G, PO4, Cd, Cr and Zn. These selected parameters were then used to develop prediction models for the MWQI using artificial neural network (ANN) and multiple linear regressions (MLR). The SDA-ANN model had higher R-2 value for training (0.9044) and validation (0.7113) results than SDA-MLR model and was chosen as the best model in mangrove estuarine zone. The SDA-ANN model had also demonstrated lower RMSE (5.224) than the SDA-MLR (12.7755). In summary, this work suggested that ANN was an effective tool to compute the MWQI in mangrove estuarine zone and a powerful alternative prediction model as compared to the other modelling methods.

Keywords

Author Keywords: Marine water quality; Discriminant analysis; Artificial neural networks; Multiple linear regression; Mangrove estuarine zone

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