

# Study of Water Quality in the Coastal Waters of Hormozgan Province Using Multivariate Statistical Methods

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## Abstract

This study was conducted to investigate Multivariate Statistical Methods, i.e., Principal Component Analysis (PCA), Cluster analysis (CA) and Discriminant analysis (DA), to assess temporal and spatial variations in the water quality in coastal waters of the Hormozgan province. Thirteen physico-chemical parameters (including Temperature, pH, Salinity, Dissolved oxygen, Electrical conductivity, Turbidity, TSS, Nitrate, Nitrite, Total ammonia, Phosphate, Silicate, DIN and Chlorophyll a) were selected to evaluate the quality of coastal waters. Surface water sampling layers (0-1m) were collected from at 14 stations during 12 months in 2013-2014. Results showed that Cluster analysis grouped Water quality in the fourteen stations and twelve months into three and two clusters of similar water quality features respectively. The principle component analysis identified five parameters (Temperature, Electrical conductivity, Nitrate, Total ammonia, DIN and Chlorophyll a) for temporal analysis and seven parameters (Temperature, Electrical conductivity, TSS, Nitrate, Phosphate, DIN and Chlorophyll a) for spatial analysis. Finally, according PCA analysis three possible latent pollution sources for groups 1, 2 and 3 (organic/eutrophication, Nutrient pollution and natural pollution) were identified. It seems that the coastal waters can be classified into three groups, i.e. low, moderate and high pollution.

Keywords: *Water quality, Multivariate analysis, Coastal waters, Hormozgan Province.*

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