

Assessment of Surface Water Quality of Mayur River in Khulna City

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Abstract

River water quality is one of the foremost concerns now a days as it plays a significant role in human and aquatic life. Mayur River, located on the northwestern side of the Khulna city, is important from numerous points of view like freshwater reservoir, navigation, water source for irrigation, ground for fishing and the main wastewater route of Khulna city. However along with human interruption, the unplanned and untreated crude dumping of domestic, industrial and household waste into it, the natural flow of the river is totally retarded and the river water quality has been degraded on a large scale due to water pollution. This pollution has colossal negative impact on day to day life of the inhabitants living alongside of this river as they use this water for domestic and sometimes drinking purposes. That is where the significance of assessing the water quality of Mayur River has come from. The core objectives of this study is to assess the water quality of Mayur River and to develop a model using statistical analysis between water quality parameters (WQP) and water quality index (WQI) to interpret relationship among them. Water quality was assessed on the basis of WQI calculation using National Sanitary Foundation water quality index method. The temporal WQI value showed that the water quality in Mayur River got worse in dry season than that of wet season due to dilution. Much higher values were obtained in case of biochemical oxygen demand (BOD), turbidity, total solids (TS), chloride, phosphate, nitrate and fecal coliform (FC). Pearson correlation coefficient shows negative relationship among temporal average WQI with other parameters except pH. Regression analysis indicates that 99.7% proportion of variance of dependent variable (temporal average WQI) can be predicted from the independent variables (Dissolved Oxygen (% saturation), BOD, turbidity, TS, pH, temperature change, phosphate, nitrate and FC). Total nine prediction equations were formed using regression coefficients that may be helpful to predict the WQI on the basis of WQP in future.

Full Text

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Figures

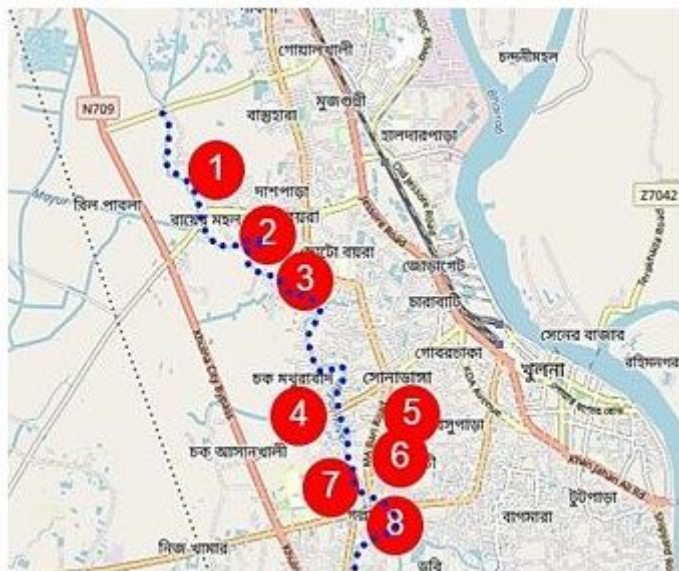


Figure 1

Study Area sample stations of Mayur River. Note: The designations employed and the presentation of the material on this map do not imply the expression of any opinion whatsoever on the part of Research Square concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. This map has been provided by the authors.

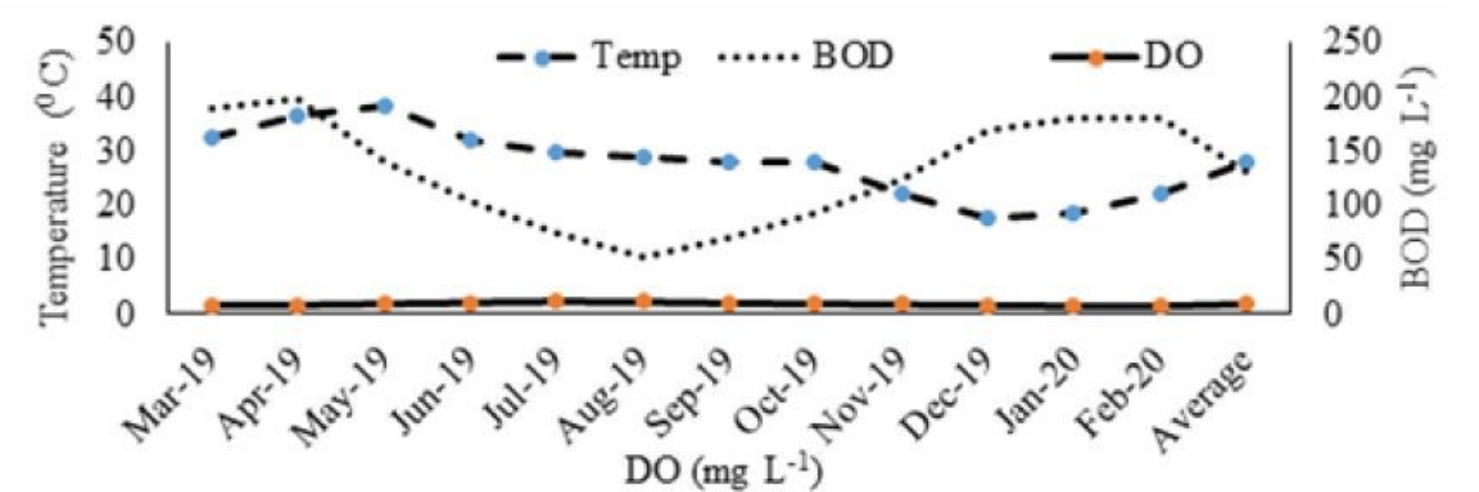


Figure 2

Interrelationship among Temperature, DO and BOD in Mayur River

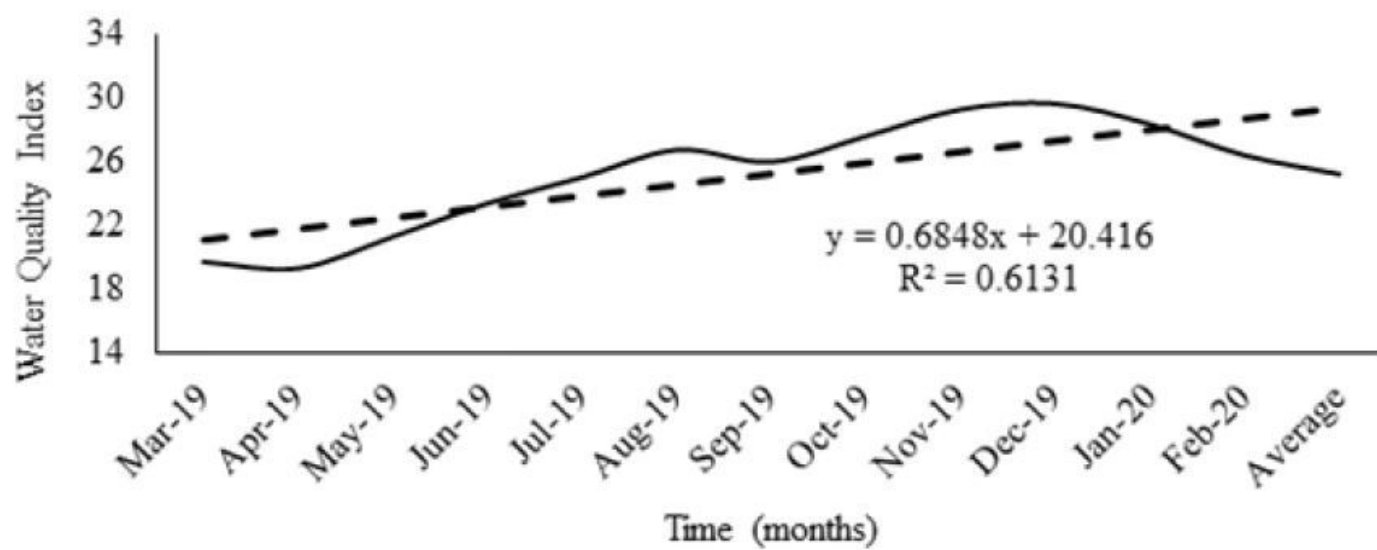


Figure 3

Temporal Variation of Water Quality Index of Mayur River