Spatial characterization of water quality using principal component analysis approach at Juru River Basin, Malaysia.

ABSTRACT

Juru River is named as one of polluted river in Malaysia by Department of Environment (DOE) Malaysia up till recent times. The pollution loadings of this river basin come from various point and non-point sources. This study reveals that the water quality of Juru River is very much affected by the industrial activities in this locality area. The principle component analysis (PCA) display that the Juru River mainly dominates with anthropogenic pollution sources which contributing to the river water quality deterioration. New sources were apportioned using this pattern recognition technique which demonstrates anthropogenic activities (industrial activities, wood industry and rubber industry), land activities and domestic waste. The major contribution from industrial activities associated at the monitoring station of 2JR03, 2JR06, 2JR08, 2JR04 and 2JR07 while for 2JR02 was highly impacted by land development considering housing and commercial development. Meanwhile station 2JR01 and 2JR05 were suspected having pollution loading from timber and wood industries considering the high correlation of DO and arsenic parameters. Overall, Juru River having combination pollution sources coming from various activities in the studied area and urgent actions are required to conserve and protect the health of the river.

Keyword: Juru River; Penang, Malaysia; Principle Component Analysis (PCA); Water quality; Spatial characterization; River pollution.