New relative importance of water quality variables in Langat River

ABSTRACT

The relative importance of s ix water quality variables was considered in a Water Quality Index (WQI) calculation by the Malaysian Department of Environment (DOE). This comprised: Dissolved Oxygen (DO), Biochemical Ox ygen Demand (BOD), Chemical Oxygen Demand (COD), Suspended Solid (SS), potential of Hydrogen (pH) and Ammonia (AN). The relative importance established in the formula was based on expert opinions, very subjective in nature , and do not consider the interrel ationships among the variables. The relationships of the variables are important due to the nature of multidimensionality and complex characteristics found in river water. In the study, water quality indices were clustered into three natural groupings iden tified by high-pollution sources (HPS), moderate-pollution sources and low-pollution sources. The prior information of natural groupings based on cluster analysis, CA , was then used in discriminant analysis, DA . This obtained the related linear combinations of the six main variables in WQI formula, i.e. discriminant functions that best separate the three identified groups. Apart from that, the summary index based on the interrelationships among the variables from DA indicates the difference in ranking of the relative impor tance for each variable compared to the classical approaches used in WQI-DOE. We firmly believe that the results obtained can be used as a guide to investigate other influential available variables in the water quality of Langat River.

Keyword: Relative importance; Water quality; Cluster analysis; Discriminant analysis; Langat River