Control limit detection for source apportionment in Perlis River Basin, Malaysia

ABSTRACT

This study presents the application of selected environmetric in the Perlis River Basin. The results show PCA extracted nine principal components (PCs) with eigenvalues greater than one, which equates to about 77.15% of the total variance in the water-quality data set. The absolute principal component scores (APCS)-MLR model discovered BOD and COD as the main parameters, which indicates the measure of the agricultural pollution in the Perlis River Basin, the hierarchical agglomerative cluster analysis (HACA) shows 11 monitoring stations assembled into two clusters in accordance with similarities in the concentration of BOD and COD, which are grouped in P4. The X ‹control chart shows that the mean concentration of BOD and COD in P4 is in the control process. The capability ratio (Cp) was applied to measure the risk of the concentration in terms of the river pollution in a subsequent period of time using the limit NWQS.

Keyword: Environmetric; Water quality; Principal component analysis; APCS-MLR; Cluster analysis; Statistical process control