Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

APPLICATION OF MULTIVARIATE STATISTICAL TECHNIQUES IN THE ASSESSMENT OF THE WATER QUALITY OF DANUBE RIVER, ROMANIA

Alhassan H. Ismail*, Diana Robescu

Faculty of Power Engineering, Department of Hydraulics and Environmental Engineering, University POLITEHNICA of Bucharest

Abstract

Multivariate statistical methods such as factor analysis (FA) and cluster analysis (CA) were applied to identify the main factors and pollution sources affecting on the water quality of Danube River and to evaluate spatial and temporal similarities or dissimilarities among the sampling sites and monitoring periods. Water quality of 14 parameters has been considered in four sampling stations during 1 year period. The results of factor analysis specified three factors representing 64.369% of the total variance in water quality. The main differences are related to domestic wastewater, industrial discharge, and agriculture activities from agricultural area. Hierarchical spatial CA revealed two different groups of similarities between the sampling sites, reflecting different pollution levels in the river water quality. Hierarchical temporal CA showed that the temporal variations in the river water are not relying on the local climate.

Key words: cluster analysis, Danube River, Drobeta-Turnu Severin, factor analysis, river water

Received: January, 2016; Revised final: July, 2016; Accepted: August, 2016

*Author to whom all correspondence should be addressed: e-mail: hassan19851988@yahoo.com ; Phone: +40 732059715