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Determination and Evaluation of Some Physicochemical Parameters in the Saros Bay (North Aegean Sea, Turkey) Using Multiple Probe System and Geographic Information System

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Abstract

The present study has been carried out in order to determine the sources of fresh waters by some physicochemical parameters using Multiple Probe System (MPS) and to evaluate the physicochemical properties of water by Geographic Information System (GIS) in the Saros Gulf (North Aegean Sea). The average depth of the Gulf is 100 m; the deepest part reaches more than 650 m. Environmental parameters such as temperature, salinity, pH, dissolved oxygen (DO) and total dissolved solids (TDS) were measured as a temporal and vertical profile at nine different stations of the Gulf. Sampling period was between March 2002 and April 2003 (March 2002, May 2002, September 2002 and April 2003). All the data was measured by YSI 6600 Model Multiple Probe System. Also, Geographic Information System was used to create a tabular and spatial database, with the aim of integrating the physicochemical properties in the Gulf. The spatial and temporal maps of the temperature, pH, DO, TDS and salinity with depth of 0.5, 5, 10, 25, 50 and 75 m were produced. The value of pH does not seem to be affected by the depth. However, the salinity values show a positive correlation with depth. On the other hand, DO values show a negative trend by depth especially in March 2002 and April 2003. TDS values show a uniform distribution initially then increase from 25 m to downwards. The results of this study show that discharge of fresh water is seen in one location on the south of the Saros Gulf. MPS and GIS were proved to be successful tools when determining and evaluating physicochemical properties of the Gulf.

Keywords: Saros Bay, Multiple Probe System, Geographic Information System, freshwater discharge, physicochemical parameters