

CHARACTERIZATION OF THE ABDAL RIVER CATCHMENT WATER AND SEDIMENT QUALITY AT THE BLACK SEA COAST OF TURKEY

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In this study, the characteristics of river catchment water and sediments quality at different cross sections along the Abdal River catchment were investigated. The water samples were analyzed for physical and chemical characteristics. Selected physicochemical parameters (temperature, dissolved oxygen, pH) were measured at six sampling sites throughout the water column. Chemical parameters determined were inorganic compounds such as total phosphate (PO₄-P) and nitrates (NO₃). The measured variables for the sediments included pH, Eh, particle-size distribution, water content and, % organic substances. The study site Abdal catchment is located at the Mid-Black Sea coast and between 41° 44' 40" 05' latitude and 37° 05' 35" 30' longitude degrees. The catchment area is 502 km². Abdal catchment is an important area because of Çakmak dam which provides drinking and irrigation water in Samsun city constructed above the catchment area. For this reason; all of the results were examined and evaluated for according to Turkish Environmental Regulations from the point of drinking and irrigation water on Abdul catchment area. Finally, according to Environment Law Water Pollution Control Legislation Land- Based Water Quality, in Turkey, it was determined that total phosphate – phosphorus, nitrogen derivatives results satisfied the criteria. This information would be a useful tool for the effective management and control of the natural area with respect to the input of chemicals and their bioavailability.

This paper also presents the results of tests for total organic carbon (TOC) in water and sediments of the Abdal catchment, collected in 2008. TOC contents were determined with an Apollo 9000 TOC analyzer (Tekmar Dohrmann Co., USA), each sample was measured twice. TOC analyzer offers an alternative that includes more accurate measurement of TOC in samples containing particulates without sample filtration or pretreatment. It also allows for the analysis of up to 0.8 mm diameter particulates and ensures homogeneity of the sampling. The results show there was an increase in TOC concentration in spring/summer period in comparison to autumn/winter months. According to spring and autumn results, maximum mean TOC values were characteristic for spring period, while the minimum ones for the autumn. TOC concentrations in water samples were in the range of 2.7 mg/l and 1.58 mg/l, whereas TOC contents of these sediments along the Abdal River varied from mean 6.5 g TOC/kg at autumn season to mean 13.3 g TOC/kg at spring season. Dependent upon the acquired results, the temperature influence the content of organic carbon in water and sediment samples was observed. It is possible to say that seasonal changes have certain effects upon the characteristics of river. Furthermore, sediments at the main cross sections along the Abdal River have varied characteristics in organic carbon content and particle size distribution.

References

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