

Title: Reconstruction of radioactivity levels and sediment quality assessment in a deep basin at Lemnos, North Aegean Sea, Greece

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Abstract

The marine environment has undergone substantial changes in recent decades, due to by-products that cause pollution and end up to the marine environment mainly from the coastal zone and the drainage basins of the marine area. Sea bottom sediments are the final recipient of the largest portion of discharged pollutants. In this work a sediment core is studied from Lemnos basin at North Aegean Sea collected at a depth of 1550 m. The sediment core was sampled with a box corer and it was analysed to determine the rate of sedimentation of the basin, to measure and assess the levels of radioactivity of ¹³⁷Cs due to the Chernobyl accident, to study the temporal variation of anthropogenic microparticles in the sediment and finally to investigate and assess the influence of the rivers flows discharging into the North Aegean on the concentrations of pollutants. The activity concentrations of the radionuclides were measured in Marine Environmental Laboratory of HCMR by the high resolution gamma spectroscopy method while the sedimentation rate was determined by both the ²¹⁰Pb and the ¹³⁷Cs methods. The anthropogenic microparticles were isolated from the sediment and the analysis was performed by a stereoscope. The results exhibited that the increased water supply of the rivers flowing into the North Aegean the last decades as well as the production of dense water masses, was related with the increase of the concentrations of the pollutants.