

TRANSPORT OF HEAVY METALS WITHIN A TWO LAYERED SYSTEM:
THE MARMARA-MEDITERRANEAN-BLACK SEAS SYSTEM

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ABSTRACT

The Marmara Sea is a passage between the Mediterranean and Black Sea. The hydrography of the Marmara Sea is dominated by the Mediterranean and Black Sea water. The great difference between the salinity of the two water masses results in a well stratified water column with a marked halocline separating a superficial layer salinity 22-25‰ from underlying saline 38.5‰ water mass. It is connected to Aegean Sea and Mediterranean Sea via Dardanelles Strait and to Black Sea via Bosphorus Strait. Within the strait system two major currents are prevailing. The under current is generated by the Mediterranean water flowing in to the Marmara Sea through the Dardanelles Strait and out to the Black Sea through the Bosphorus Strait. The surface current is generated by Black Sea waters flowing in to the Marmara Sea through the Bosphorus Strait and out to the Aegean Sea through the Dardanelles Strait.

The concentration of some heavy metals (Zn, Cu, Ni, Cr, Cd, and Hg) in the water column was determined along the Dardanelles Strait and Bosphorus Strait and in the Marmara Sea. The metal concentrations are ranging between 13.26-144.9 µg/L for Zn, 0.23-0.77 µg/L for Cu, 0.41-5.42 µg/L for Ni, 0.26-2.56 µg/L for Cr, 0.67-12.67 ng/L for Cd and 2.0-5.3 ng/L for Hg.

By utilising the average metal concentrations within the straits and annual average water fluxes between Aegean Sea-Marmara Sea-Black Sea, the metal fluxes in the region were determined.