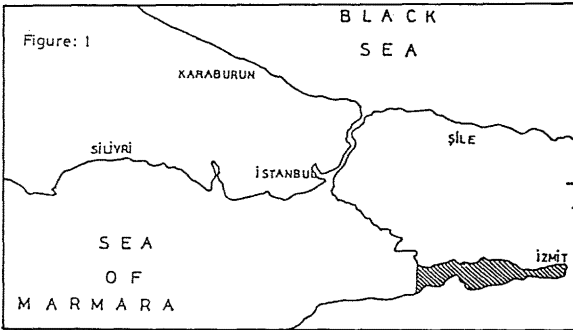


## Heavy Metal Distribution in Surface Sediments from Izmit Bay, Eastern Marmara Sea (Turkey)

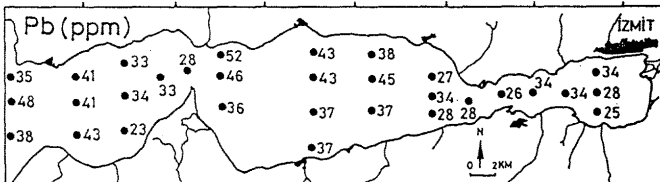
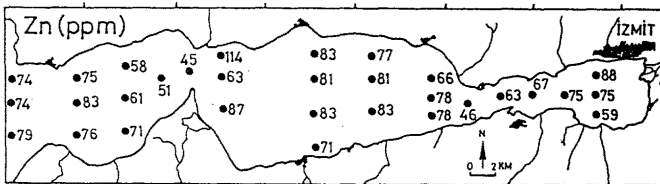
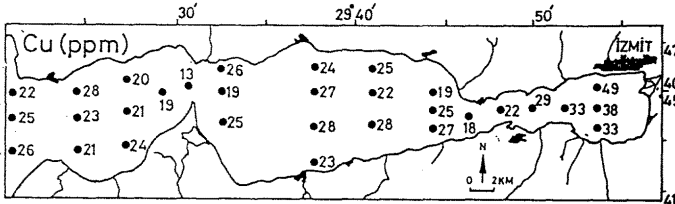
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A total of thirty-one surficial sediment samples were collected from the floor of Izmit Bay (Fig. 1) with a grab onboard the R/V Bilim in 1987 and analyzed for their heavy metal (Fe, Mn, Cr, Co, Cu, Zn, Pb and Ni) concentrations and associations.



Low-calcareous-terrigenous mud (2-45 % CaCO<sub>3</sub>; 0.35-1.62 % Org.C; ERGİN and YÖRÜK, 1990) with relatively high silt percentages are principal sediment types found on the floor of Izmit Bay. After removal of the pore waters, the HNO<sub>3</sub>-extractable heavy metal concentrations of bulk sediments ranged from 1.40 to 3.97 % for Fe; 112-678 ppm for Mn; 13-49 ppm for Cu; 43-105 ppm for Co; 45-114 ppm for Zn; 23-52 ppm for Pb; 6-81 ppm for Cr; and 34-98 ppm for Ni (Fig. 2; YÖRÜK, 1988).



A comparison of the heavy metal data of this study with those from relatively unpolluted sediments and sedimentary rocks elsewhere suggests that Fe, Mn, Zn, Cr and Ni in the Izmit Bay sediments occur largely at natural background levels. And, also, use of a geoaccumulation index reveals relatively unpolluted sediments on the floor of Izmit Bay, although this region is densely urbanized and industrialized.

However, the presence of coal and slag particles in some sediment samples and the high, positive correlation coefficients between Pb-Zn and Zn-Cu concentrations suggest metal influxes from anthropogenic sources. Part of the Cu probably originates from the waste discharges of electrolytic industries located around the eastern section of the bay.

As inferred from the correlation coefficient matrix data, the studied heavy metals in the sediments were predominantly associated with organic and iron phases.

### REFERENCES.

ERGİN, M. and YÖRÜK, R. 1990. Distribution and texture of the bottom sediments in a semi-enclosed coastal inlet, the Izmit Bay from the eastern Sea of Marmara (Turkey). Submitted to Est. Coast. Shelf Sci. 18 p.

YÖRÜK, R. 1988. A partial geochemical study of bottom sediments from the Izmit Bay. Thesis, Institute of Marine Sciences, METU, İçel, Turkey, 90 p.