Dissolved Oxygen and Nutrients in the Northeastern Ionian Sea

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Nutrient and dissolved oxygen data collected at several stations in the northeastern Ionian Sea (Figure 1) during the September - October 1987 cruise of R/V AEGAIO, were used to demonstrate the distribution of the chemical characteristics along a section parallel to the coastline. The oxygen and nutrient pattern was affected by the presence of mesoscale cyclonic and anticyclonic gyres in the area.

In the vicinity of the Otranto Strait (northernmost part of the oxygen and nitrate sections), the interface of interaction between well oxygenated and relatively poor in nutrient Adriatic Water (Ad) made a front with the richer in nutrient and poorer in oxygen water of Levantine origin (Figure 2 and 3). This front appeared also on the salinity and temperature profiles. Similar patterns have been found recently in winter (Georgopoulos et al. 1986, Theodorou et al. 1988).

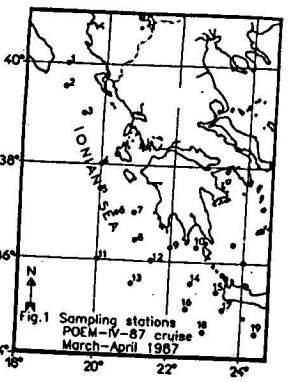

Fig.1 Sampling stations POEM-IV-87 cruise March-April 1987

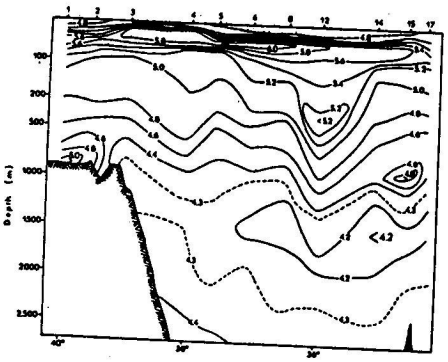

Fig.2 Distribution of oxygen (ml/l) along a transect in the Ionian Sea

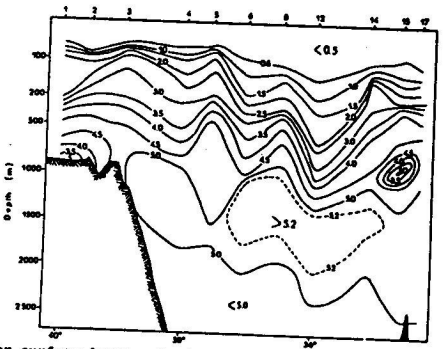

Fig.3 Distribution of nitrates (µgat/l) along a transect in the Ionian Sea

The nutrient poor surface layer extended down to 60 m in the north, while, in the south, it was brought down to 150 meters by a meandering anticyclone near 36°00 N latitude. This layer presents high concentrations of oxygen and very strong gradients between 50 and 100m. Note that, between these depths there was less saline and warmer water of Atlantic origin (NAW).

In the intermediate layer, the depth of isoconcentrations of 4.8 ml/l O_2 and 3.5 µgat/l NO_3 followed that of 38.80 psu isohaline, deemed to represent the boundary delineating the spatial extent of the Levantine Intermediate Water (LIW), (Artegiani et al. 1988, Theodorou et al. 1988).

The thermocline, isohaline, oxygen (Figure 2) and nutrient (Figure 3) isoconcentration lines at station 12 (36°00 N, 21° 30'E) were about 400 m below those in the adjacent areas.

The Deep Water (DW) had an oxygen content lower than 4.4 ml/l and nitrate greater than 5.0 µgat/l. The concentration of oxygen diminuted and that of nitrate augmented at the south of the section, where a core with oxygen less than 4.2 ml/l and nitrate greater than 5.2 µgat/l was found.

At station 15, to the west of Crete, there was a water mass with low nutrient also and high oxygen content at a depth of 900 m. This water mass also presented high salinity and temperature ; it probably originated from the Cretan Sea.

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

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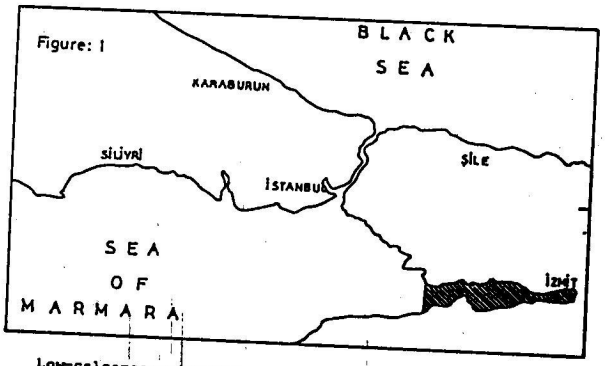
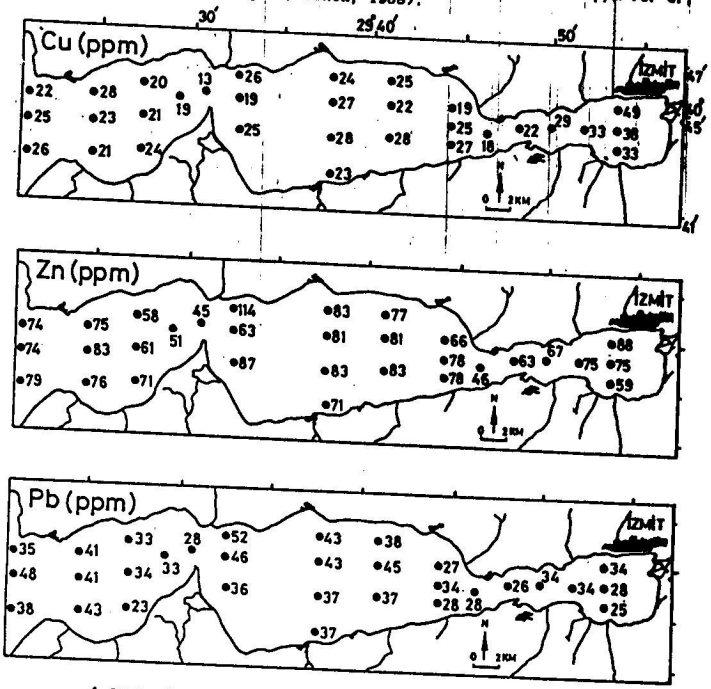
A total of thirty-one surficial sediment samples were collected from the floor of İzmit Bay (Fig. 1) with a grab onboard the R/V Bilim in 1987 and analyzed for their heavy metal (Fe, Mn, Cr, Co, Cu, Zn, Pb and Ni) concentrations and associations.



Low-calcareous-terrigenous mud (2-48 % $CaCO_3$; 0.35-1.82 % Org.C; ERGİN and YÖRÜK, 1990) with relatively high silt percentages are principal sediment types found on the floor of İzmit Bay. After removal of the pore waters, the HNO_3-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; 23-82 ppm for Pb; 6-81 ppm for Cr and 34-96 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 İzmit Bay sediments occur largely at natural background levels. And, also, use of a geoaccumulation index reveals relatively unpolluted sediments on the floor of İzmit 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.

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