

EVALUATION OF HEAVY METALS IN IZMIR BAY

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Abstract

The level of marine pollution in Izmir Bay was investigated using heavy metal values obtained from surface sediments. These values were transferred to GIS database for 1997 and 2005 for the analysis and the study was carried out on sediment samples taken from 10 sampling stations located in inner, middle and outer Izmir Bay. The data used in this study were collected within the frame of a project namely "Izmir Bay Pollution Monitoring Project" supported by Izmir Metropolitan Municipality. Hg, Cd, Pb, Cr, Zn and Cu parameters were analyzed in this period.

Keywords : Coastal Waters, Gis, Trace Elements.

Introduction

The most important vital problem of seaside countries is the pollution of the sea and the coastal areas. In this region, this pollution spoils the ecological balance spoils, threatens the public health and ceases the fishery activities. Izmir Bay is one of the greatest natural bays of the Mediterranean. The main urban center around the bay is Izmir Metropolitan Municipality, which is an important industrial, commercial center and a cultural focal point. The Gediz River, which flows to the outer bay, is the biggest river in Izmir Bay.

Parameters (Hg, Cd, Cr, Zn, Cu and Pb) were evaluated in 10 stations located in Izmir Bay for the year of 1997 and 2005. The data was transferred to GIS database and thematic maps were done to observe the changes more simply. For this study, July 1997 [2] and September 2005 [3] values were used. The analysis was carried out according to background levels of Mediterranean Sea.

Results and Discussion

As a result of the evaluation, between 1997 and 2005, a little improvement was observed in sediment in the heavy metal concentrations. The reason for this little improvement could be explained as the accumulation of heavy metals in sediment district since 1960.

Throughout Izmir Bay; in the outer-I bay, the effects of drainage waters coming from irrigation in Gediz River Basin were seen. In the outer-III bay, pollution carried by Gediz River had a far reaching influence. Heavy metal enrichments are also reported from shallow water sediments off the Gediz River. The effect of mineral deposits in Karaburun, high heavy metal concentrations were seen in the outer-III bay. In outer-I bay, wastewaters discharge effect of Urla that flows to the bay was seen. In outer-II bay, effects of wastewaters discharged from industries especially leather industry was seen. Also moderate levels of heavy metal contamination observed around the Uzunada and outer-II bay, was probably caused by the continuous dumping sediments excavated from the most polluted inner-most inner Izmir Bay [4]. Despite the improvement from 1997 to 2005 in inner bay, anyway, it can still be counted as the one in worst condition.

References

- 1 - Kucukseşgin F., Kontas A., Altay O., Uluturhan E., and Darılmaz E, 2005. Assessment of marine pollution in Izmir Bay: Nutrient, heavy metal, and total hydrocarbon concentrations, D.E.U. IMST, Izmir.
- 2 - D.E.U. CIESM in the name of Izmir Metropolitan Municipality, Izmir, 1999. Assessment of marine pollution in Izmir Bay: Nutrient, heavy metal, and total hydrocarbon concentrations.
- 3 - D.E.U. CIESM in the name of Izmir Metropolitan Municipality, Izmir, 2006. Izmir Bay pollution Research Project 2005 Final Report.
- 4 - Aksu, A.E., Yasar, D., Uslu, O., 1997. Assessment of marine pollution in Izmir Bay: Heavy metal and organic compound concentrations in surficial sediments, 14p.

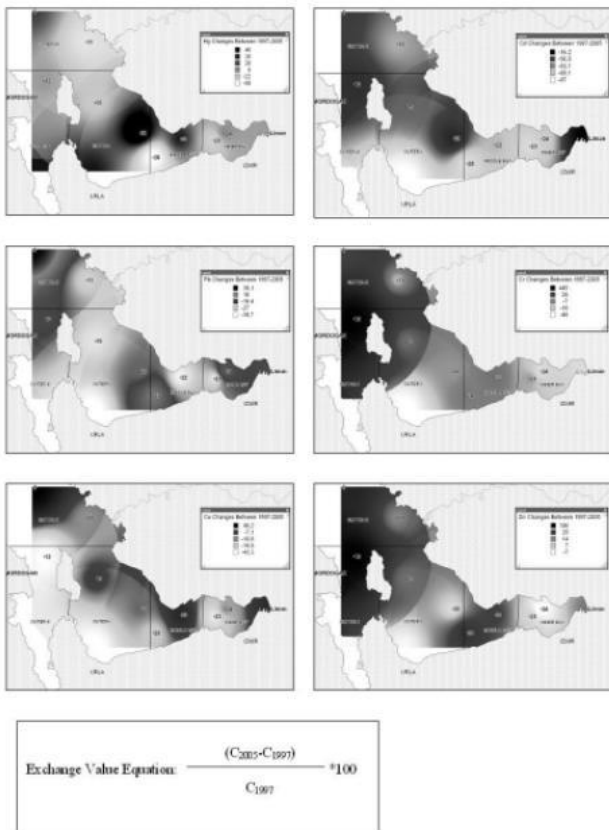


Fig. 1. Exchange values of heavy metal parameters between 1997 and 2005.

The inner bay is heavily polluted by nutrients, organic material and heavy metals, before urban wastewater treatment plant, which became operative in 2000. The streams and hundreds of domestic and industrial discharge outlets flow to the bay before 2000. The main industries in the region include food processing, beverage manufacturing, tanneries, oil, soap, paint production, chemical industries, paper and pulp factories, textile industries, metal processing, etc[1]. Eutrophication of inner bay was a serious problem throughout the year. In this study, the changes of heavy metal pa-