

STATE OF POLLUTION ALONG THE MEDITERRANEAN COAST OF TURKEY

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Abstract

After the development of regional seas programme to protect the Mediterranean sea against pollution (UNEP, 1982; UNEP, 1985) the member countries begin to regulate and take measures against discharging and dumping the pollutants in the Sea. This work comprises the determination of pollutant levels at hotspots, in effluents, river water, biota and sediment from the Turkish coasts of the Mediterranean Sea. The work mainly includes results from the monitoring of some pollutants loads.

Keywords : Fishes, Sediments, Metals.

Introduction

This work is carried out as a part of the MED POL. The aim of this manuscript is to give a summary of the work carried out so far between 1998-2006 in the Northern Levantine Basin. The paper is based on the compilation of the data obtained from the work done:

a) in the North-Eastern Mediterranean from the so called coastal stations, b) at land-based sources (rivers, industrial effluents, and sewage) along the southern coast of Turkey,

Material and Methods

Determination of the temporal variability of the river fluxes is very difficult, for this reason the flux calculations was done by using average yearly flux values. A simple relationship is used to calculate the material and pollutant fluxes (Yemenicioglu et al. 1996). The sampling periods follows seasonal frequency including both low water stage and flood periods. The collection and analysis of the fish and the sediment samples is achieved according to "UNEP/FAO/ IOC/IAEA: Ref. Method No. 7, No: 26, No: 27, No: 29 and No: 39". The mercury in the water samples were analyzed as soon as possible by using cold vapor method (Hatch and Ott, 1968, Yemenicioglu and Salihoglu 1994). The other parameters (BOD, COD, DO, TSS) were determined by the procedure given by Grasshoff, (1999). Nutrients were measured by using Bran Lueppe AA.

Tab. 1. Fluxes of relevant water parameters (A, B) and contaminants (B) at stations in the Northern Levantine Basin.

A				
Station	Water Flux m ³ /y	TP t/y	TIN t/y	Si t/y
Ceyhan River	6.4062E+09	693.69	7498.26	31101.55
Seyhan River	5.2701E+09	1849.42	5407.27	12562.07
Berdan River	3.9763E+08	14.62	275.25	754.16
Lamas River	1.7514E+08	1.71	195.37	607.87
Goksu River	3.6291E+09	229.54	2924.37	13387.08
Mersin Dis.	1.8900E+07	136.32	467.33	136.78
Antalya Dis.	1.4300E+07	55.55	105.64	106.29
Marmaris Dis.	5.1000E+06	20.01	25.79	77.84
Iskenderun Dis.	8.3300E+06	44.35	41.03	121.89
Total	1.5925E+10	3045.21	16940.31	58855.52
River	1.5878E+10	2788.98	16300.52	58412.72
Discharge	4.6630E+07	256.23	639.79	442.80

B					
Station	BOD ₅ t/y	TSS t/y	COD t/y	Hg kg/y	COD/BOD
Ceyhan River	8696.41	203572.79	137733.15	24.53	15.84
Seyhan River	19934.23	149038.97	163373.70	25.65	8.20
Berdan River	1413.56	3725.75	11531.15	1.54	8.16
Lamas River	152.81	371.74	1138.44	0.49	7.45
Goksu River	6414.48	226965.41	89820.82	8.35	14.00
Mersin Dis.	3204.97	4827.53	8453.03	0.07	2.64
Antalya Dis.	297.44	93.74	597.03	0.06	2.01
Marmaris Dis.	374.34	28.28	198.90	0.02	0.53
Iskenderun Dis.	93.71	68.31	333.20	0.03	3.56
Total	40581.94	588692.53	413179.40	60.74	62.38
River	36611.48	583674.68	403597.25	60.56	53.64
Discharge	3970.46	5017.85	9582.15	0.18	8.73

Results

The heavy metal concentrations (Hg, Zn, Cd, Cr, Cu) are measured in fish (*M. barbatus*) and sediment samples. The Hg concentration in fish is ranging between 28.63-969 ng/g; Zn 1.54-89.55 µg/g; Cu 0.87-208 µg/g; Cr 3.6-6045 µg/g and Cd 15-851 ng/g on dry weight bases. In sediment

samples the Cd concentration varies between 52-485 ng/g, Cr 45-690 µg/g, Cu 12.5-467 µg/g, Hg 15.21-174.5 ng/g and Zn 27-287 µg/g on dry weight bases.

The biochemical parameter's (TSS, COD, BOD₅, Hg, DO, nutrients) concentrations in river and sewage water samples were also measured. The results are summarized in Table 1. The rivers feeding Mediterranean were generally poor in phosphate ions (0.1-1.0 µM). But these rivers were always rich in nitrate ions (40-85 µM). That is, the main source of the nitrate were the rivers and the domestic waste waters were the main source of phosphorous.

References

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