MED POLL PHASE III

LONG TERM BIO MONITORING TREND MONITORING AND COMPLIANCE MONITORING PROGRAM IN COASTAL AND HOT-SPOT AREAS FROM NORTH-EASTERN MEDITERRANEAN

1998

FINAL REPORT

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ACKNOWLEDGEMENTS

This work is carried in the coastal areas of Turkey in the north-eastern Mediterranean and Aegean Sea during 1998 in relation to MED POLL Phase III Long Term bio monitoring, trend monitoring and compliance monitoring in coastal and hot spot areas which is related to Mediterranean Action Plan (MAP). We would like to thank Ministry of Environment - Republic of Turkey, who gave financial support to the present study.

We also thank academic and technical staff of the Institute of Marine Sciences-Middle East Technical University, the captain and the crew of R/V Bilim who helped on the board of the ship and in the laboratory during the field studies and laboratory studies carried in relation to present program.

CONTENTS

1. SUMMARY

The first oceanographic survey in relation to MED POLL Phase III Long Term bio monitoring, trend monitoring and compliance monitoring (Program of Mediterranean Action Plan) (MAP) in coastal and hot spot areas in the north-eastern Mediterranean and the Aegean Sea were carried out during 30 April-10 May 1998.

During the cruises sediment samples were collected with a grab sampler for analysis. Some other oceanographic parameters such as salinity, temperature etc... were measured in situ. Total suspended sediment samples (TSS) were also collected from every sampling station. Locations of the sampling stations for the oceanographic cruises in Mediterranean Sea and Aegean Sea are shown in Figure 1 and Figure 2 respectively.

The biological (fish) samples are collected during the cruise of RV/Lamas in the Mediterranean in November 1998. The fishes are taken by deep-trowling. The sampling areas for the fish samples are shown in Figure 3.

2. MATERIAL AND METHODS

In the present study a total of 11 sediment samples and 11 TSS samples were collected and three sub-samples were taken from each bulk of sediment samples. The sediment samples are taken with a grab sampler and are transferred in to the acid cleaned polyethylene bags and stored in a deep-freezer at about -30 ^{o}C until the analysis time.

In relation to the MED POL PHASE III project a total of 100 individual fish samples were collected by deep-trawling. The fish samples are collected from 5 different locations, which are shown in Figure 3. From each sampling area two different length

group were selected and sampled. From each length group 10 individuals are taken. The length and the weight of each individual were measured and washed with distilled deionised water. The samples were coded and placed in to acid cleaned polyethylene bags. After expelling the air the bags were isolated and placed to a deep-freezer and preserved at –30 ^{0}C.

3. ANALYSIS OF THE SAMPLES

The methods of sample preparation and the analysis were explained in details in the previous report (1998-progress report).

4. RESULTS AND DISCUSSION

Due to the re-construction and re-organization of our laboratories, the analysis of the sediment samples, TSS samples and fish samples cannot be performed yet. Sediment and TSS samples are digested and taken in to the preservation bottels and are kept in refrigerator for future analysis. For the determination of the laboratory performance and the quality assurence of our laboratory after the re-organization and re-construction, a series of fish, mussel and sediment referance materials and intercalibration samples were obtained at 19 December 1998 from the International Atomic Energy Agency (IAEA). These referance and intercalibration samples will be digested and analysed together and in the same way of the samples taken in reference to the MED POL PHASE III.

The results obtained from the measurement of standard oceanographic parameters are given in Table 1. This table represents the hydrographic data for the water column (eg. temperature, salinity, density). at standard depths.

The analysis of the sediment samples, TSS samples and fish samples will be performed after the re-construction and re-organization of our laboratories. The data

of these analysis and the evaluation of the data will be submitted as a separate report.

TABLE 1. Hydrographic parameters measured at the sampling stations.

STATION	: C0	DATE	: May 02 1998
LATITUDE	: 39 59 N	TIME	: 04:27:58
LONGITUDE	: 20 00 E	TOTAL DEPTH	: 95 m
S.D.D	: 9.6 m		

D (m)	T (°C)	S (‰)	SIG-T
5.0	12.2833	26.5543	19.9903
10.0	12.7162	30.9075	23.2776
15.0	13.9379	36.1305	27.0745
20.0	14.4556	38.7492	28.9888
25.0	14.4227	38.8603	29.0820
30.0	14.4021	38.9083	29.1237
35.0	14.3937	38.9270	29.1400
40.0	14.3527	38.9330	29.1537
45.0	14.3298	38.9364	29.1614
50.0	14.3177	38.9387	29.1659
55.0	14.3198	38.9423	29.1682
60.0	14.3267	38.9467	29.1701
65.0	14.3269	38.9479	29.1710
70.0	14.3178	38.9472	29.1724
75.0	14.3118	38.9483	29.1746
80.0	14.3047	38.9500	29.1774
85.0	14.3043	38.9503	29.1778
90.0	14.3047	38.9504	29.1778
95.0	14.3049	38.9510	29.1782

STATION	: Meriç	DATE	: May 02 1998
LATITUDE	: 40° 39' N	TIME	: 08:41:36
LONGITUDE	: 25° 28' 50" E	TOTAL DEPTH	: 41 m
S.D.D	:		

D (m)	T (°C)	S (‰)	SIG-T
5.0	15.3593	35.6628	26.4033
10.0	14.4576	35.9598	26.8319
15.0	14.4460	36.0603	26.9120
20.0	14.4100	36.2604	27.0744
25.0	13.6510	36.8274	27.6743
30.0	14.0317	38.0550	28.5439
35.0	14.3014	38.5916	28.9008
40.0	14.2065	38.7020	29.0071

Table 1 cont'ed

STATION	: Edremit	DATE	: May 02 1998
LATITUDE	: 39 30 N	TIME	: 13 14 55
LONGITUDE	: 26 52 E	TOTAL DEPTH	: 65 m
S.D.D	: 7.1 m		

D (m)	T (°C)	S (‰)	SIG-T
5.0	14.1483	32.1487	23.9552
10.0	14.7533	34.8839	25.9370
15.0	14.0436	36.2617	27.1541
20.0	14.4828	38.2848	28.6235
25.0	14.5665	38.7280	28.9477
30.0	14.6835	38.8510	29.0167
35.0	14.9179	38.9458	29.0373
40.0	14.9300	38.9593	29.0449
45.0	14.8795	38.9533	29.0518
50.0	14.7806	38.9384	29.0625
55.0	14.7639	38.9364	29.0648
60.0	14.6898	38.9243	29.0720
65.0	14.6777	38.9240	29.0745

STATION	: E3	DATE	: May 02 1998
LATITUDE	: 33 27 N	TIME	: 20:22:18
LONGITUDE	: 26 49 E	TOTAL DEPTH	: 42 m
S.D.D	:		

D (m)	T (°C)	S (‰)	SIG-T
5.0	17.5263	39.0013	28.4602
10.0	16.6597	39.0694	28.7252
15.0	16.3481	39.0706	28.8010
20.0	16.1228	39.0726	28.8562
25.0	16.0633	39.0708	28.8689
30.0	16.0043	39.0718	28.8836
35.0	15.9549	39.0719	28.8953
40.0	15.7918	39.0651	28.9283

Table 1 cont'ed

STATION	: İzmir	DATE	: May 03 1998
LATITUDE	: 38° 27' N	TIME	: 04:42:12
LONGITUDE	: 26° 49' E	TOTAL DEPTH	: 55 m
S.D.D	: 5.1 m		

D (m)	T (°C)	S (‰)	SIG-T
5.0	17.6941	38.8307	28.2873
10.0	17.2995	38.9337	28.4645
15.0	16.7535	38.9471	28.6083
20.0	16.2242	38.9690	28.7523
25.0	16.0276	38.9792	28.8067
30.0	15.9840	39.0101	28.8408
35.0	15.9039	39.0145	28.8630
40.0	15.7671	39.0092	28.8910
45.0	15.4836	39.0077	28.9557
50.0	15.0630	39.0102	29.0542

STATION	: B. Menderes	DATE	: May 03 1998
LATITUDE	: 37° 32' N	TIME	: 19:12:27
LONGITUDE	: 27° 08' E	TOTAL DEPTH	: 46 m
S.D.D	:		

D (m)	T (°C)	S (‰)	SIG-T
5.0	18.7653	39.1322	28.2456
10.0	18.1849	39.1538	28.4114
15.0	17.5974	39.1896	28.5873
20.0	17.3982	39.1862	28.6342
25.0	17.2740	39.1828	28.6624
30.0	17.0970	39.1754	28.7003
35.0	16.7406	39.1553	28.7717
40.0	16.5210	39.1586	28.8274
45.0	16.3900	39.1578	28.8582

Table 1 cont'ed

STATION	: E6	DATE	: May 04 1998
LATITUDE	: 36° 33' N	TIME	: 06:45:14
LONGITUDE	: 28° 10' E	TOTAL DEPTH	: 390 m
S.D.D	: 16 m		

D (m)	T (°C)	S (‰)	SIG-T
5.0	18.2143	39.0510	28.3251
10.0	17.8988	39.0519	28.4058
15.0	17.5836	39.0793	28.5060
20.0	17.4270	39.0924	28.5550
25.0	17.3349	39.1053	28.5878
30.0	17.2147	39.1098	28.6208
35.0	17.1001	39.1074	28.6472
40.0	17.0867	39.1064	28.6497
45.0	17.0108	39.1078	28.6694
50.0	16.9087	39.1125	28.6980
55.0	16.8352	39.1138	28.7169
60.0	16.8029	39.1140	28.7249
65.0	16.7898	39.1145	28.7285
70.0	16.7834	39.1145	28.7300
75.0	16.7536	39.1145	28.7372
80.0	16.6194	39.1171	28.7717
85.0	16.5748	39.1185	28.7836
90.0	16.5657	39.1192	28.7863
95.0	16.5580	39.1203	28.7890
100.0	16.5521	39.1213	28.7912
105.0	16.5209	39.1231	28.8000
110.0	16.3826	39.1260	28.8355
115.0	16.3161	39.1249	28.8505
120.0	16.3110	39.1247	28.8516
125.0	16.2528	39.1218	28.8632
130.0	16.1891	39.1238	28.8800
135.0	16.1774	39.1241	28.8830
140.0	16.1673	39.1233	28.8847
145.0	16.1497	39.1207	28.8869
150.0	16.1297	39.1195	28.8907
155.0	16.1186	39.1192	28.8931
160.0	16.1168	39.1191	28.8935
165.0	16.1098	39.1188	28.8949
170.0	16.1030	39.1186	28.8964
175.0	16.0936	39.1185	28.8985
180.0	16.0923	39.1182	28.8985
185.0	16.0920	39.1180	28.8985
190.0	16.0870	39.1178	28.8995
195.0	16.0777	39.1179	28.9018

Table 1 cont'ed

Station E6 Cont'ed

200.0	16.0636	39.1177	28.9049
205	16.0497	39.1173	28.9080
210.0	16.0325	39.1164	28.9114
215.0	16.0212	39.1157	28.9135
220.0	16.0053	39.1149	28.9166
225.0	15.9931	39.1135	28.9184
230.0	15.9810	39.1128	28.9207
235.0	15.9646	39.1122	28.9241
240.0	15.9286	39.1085	28.9298
245.0	15.8817	39.1028	28.9364
250.0	15.8565	39.1006	28.9406
255.0	15.8403	39.0992	28.9433
260.0	15.8019	39.0966	28.9503
265.0	15.7871	39.0954	28.9528
270.0	15.7807	39.0948	28.9539
275.0	15.7787	39.0945	28.9541
280.0	15.7760	39.0941	28.9544
285.0	15.7715	39.0936	28.9551
290.0	15.7688	39.0933	28.9555
295.0	15.7669	39.0931	28.9557
300.0	15.7638	39.0927	28.9562

STATION	: G49K16	DATE	: May 04 1998
LATITUDE	:36° 49' N	TIME	: 09:12:02
LONGITUDE	:29° 16' E	TOTAL DEPTH	: 35 m
S.D.D	: 7.1 m		

D (m)	T (°C)	S (‰)	SIG-T
5.0	19.1599	38.8879	27.9556
10.0	18.6503	38.9281	28.1184
15.0	17.5883	39.0274	28.4648
20.0	17.2963	39.0526	28.5568
25.0	17.1840	39.0667	28.5953
30.0	17.1166	39.0711	28.6153
35.0	17.0205	39.0764	28.6429

Table 1 cont'ed

STATION	: G51.50M41	DATE	: May 05 1998
LATITUDE	:36° 51' 50" N	TIME	: 02:40:20
LONGITUDE	:30° 41' E	TOTAL DEPTH	: 51 m
S.D.D	:		

D (m)	T (°C)	S (‰)	SIG-T
5.0	19.0094	38.3176	27.5581
10.0	18.5044	38.9149	28.1465
15.0	18.2809	38.9984	28.2678
20.0	18.0995	39.0223	28.3323
25.0	17.8341	39.0247	28.4012
30.0	17.5638	39.0225	28.4672
35.0	17.5150	39.0263	28.4823
40.0	17.4478	39.0358	28.5063
45.0	17.2832	39.0777	28.5793
50.0	17.0885	39.0810	28.6298

STATION	: G16Q53	DATE	: May 05 1998
LATITUDE	:36° 16' N	TIME	: 21:09:40
LONGITUDE	:33° 53' E	TOTAL DEPTH	: 33 m
S.D.D	:		

D (m)	T (°C)	S (‰)	SIG-T
5.0	20.2148	37.7752	26.8234
10.0	19.2755	38.3893	27.5433
15.0	18.7962	38.6139	27.8404
20.0	18.2746	38.7326	28.0655
25.0	18.1676	38.8782	28.2045
30.0	18.0689	38.9427	28.2790
35.0	17.8015	38.9598	28.3598

5. APPENDIX 1. ABBREVIATION, SYMBOLS AND UNITS

Parameter		Symbol	Unit
Depth		D	m
Salinity		S	‰
Temperature		T	°C
Conductivity		C	S/m
Sigma-theta		SIG-T	unitless
Secchi-disk depth		S.S.D	m
Dissolved oxygen		DO_W	µM
Total Suspended Sediment		TSS	mg/L
Total Mercury	Susp. sediment	$T\text{-}Hg_{TSS}$	ng/L
	Sediment	$T\text{-}Hg_{TSS}$	ng/g
	Organism	$T\text{-}Hg_{ORG}$	ng/g
Cadmium	Susp. sediment	Cd_{TSS}	ng/L
	Sediment	Cd_{SED}	ng/g
	Organism	$T\text{-}Cd_{ORG}$	ng/g
Lead	Sediment	Pb_{SED}	µg/g
	Organism	Pb_{ORG}	µg/g
Chromium	Sediment	Cr_{SED}	µg/g
	Organism	Cr_{ORG}	µg/g
Petroleum	Sediment	PAH_{SED}	µg/g
Hydrocarbons	Organism	PAH_{ORG}	µg/g
	Susp. sediment	PHC_{TSS}	µg/L
	Sediment	PHC_{SED}	µg/g
Halogenated	Susp. sediment	HH_{TSS}	µg/L
Hydrocarbons	Sediment	HH_{SED}	µg/g
	Organism	HH_{ORG}	µg/g

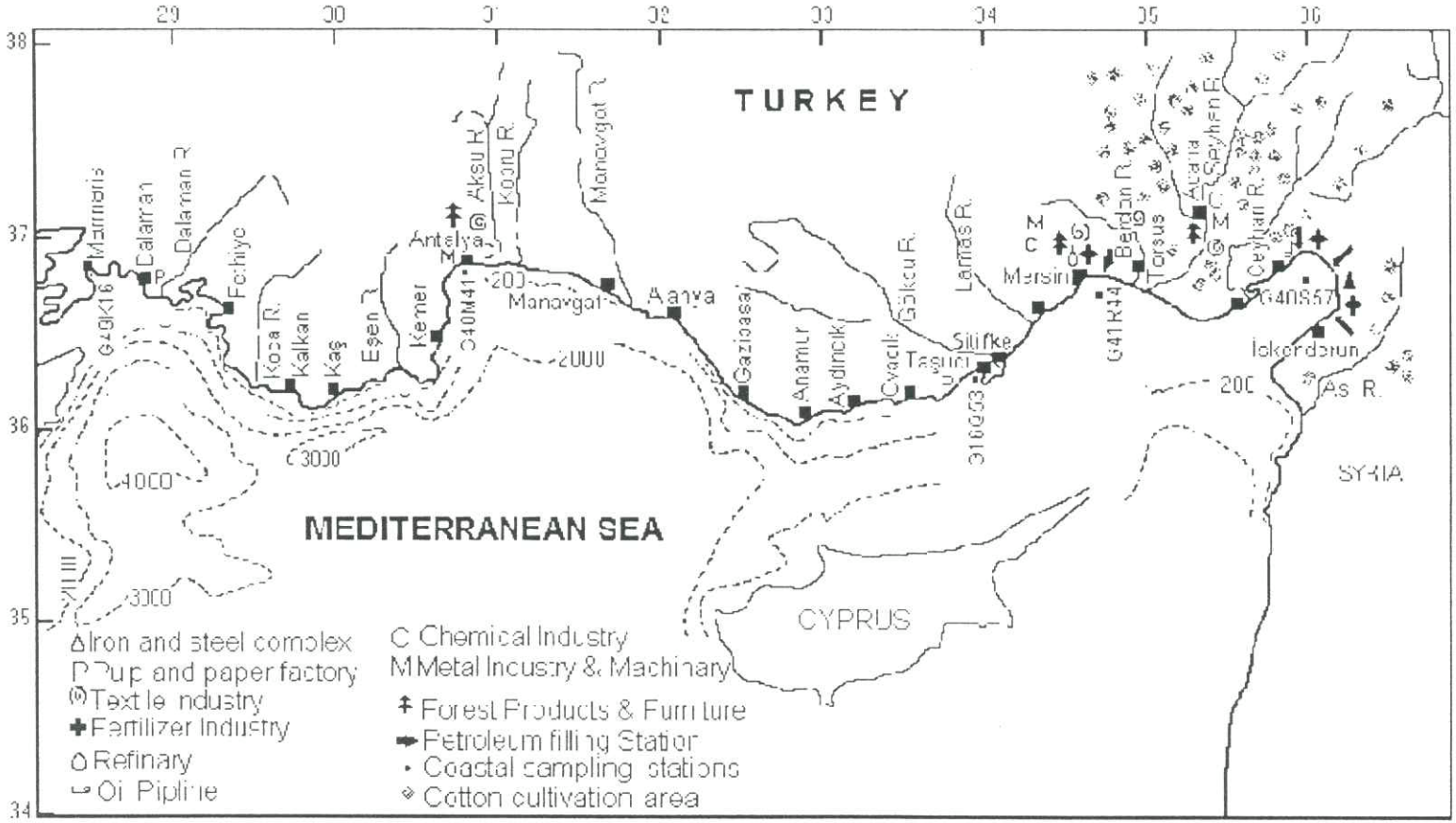

Figure 1 . MED-POL Phase III sampling locations (1993)

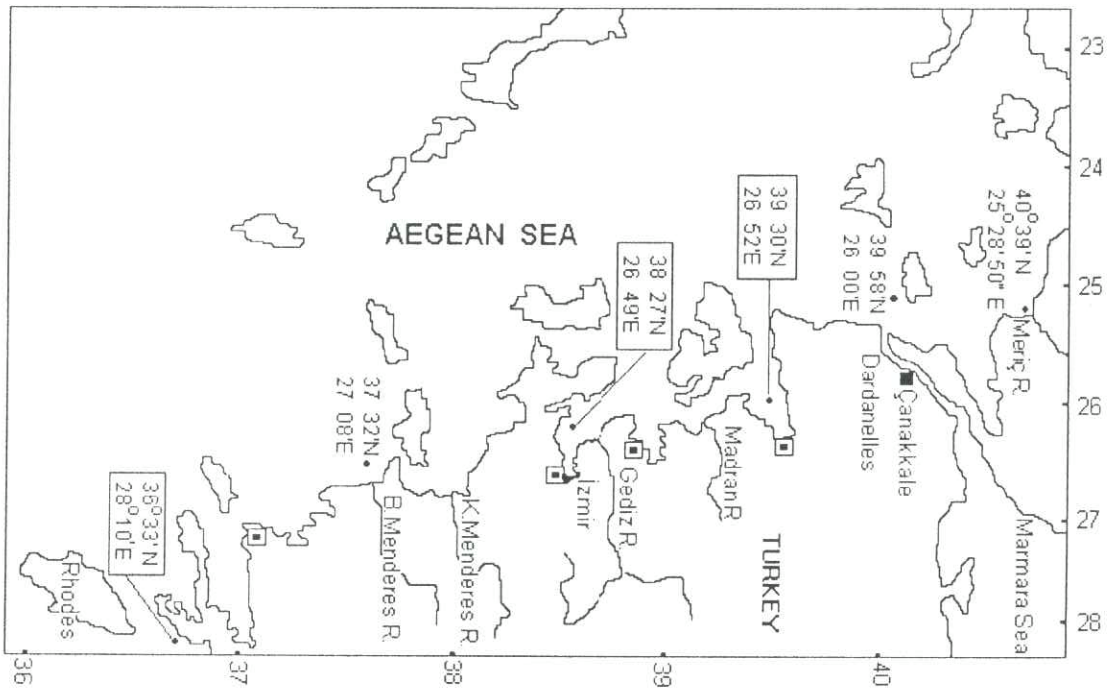

Figure 2. MED POL PHASE III sampling locations along Aegean Sea coasts.

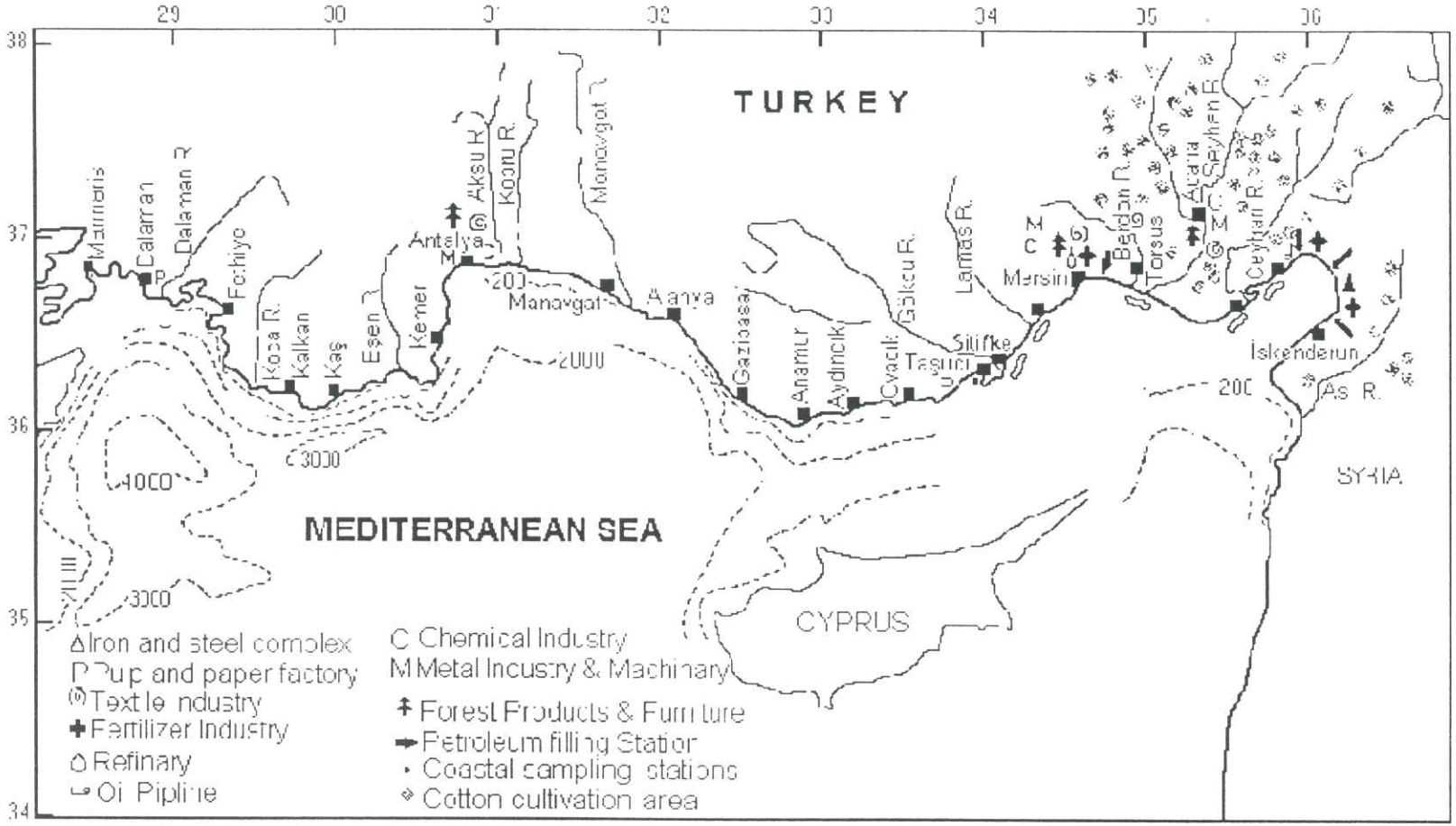

Figure 3. MED-POL Phase III fish sampling locations (1993)