



National Coastal Baseline Survey Results: 1992-1993

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THE 1993 NATIONAL COASTAL BASELINE SURVEY RESULTS

Introduction

The NRA national coastal baseline surveys were carried out as a coordinated programme by the 4 survey vessels operated by Northumbrian & Yorkshire, Anglian, South Western and North West regions.

Samples were taken at 186 pre-identified sites between Berwick on Tweed and the Solway Firth. They were analysed mainly in laboratories within the 4 regions. Analysis was carried out for chlorophyll-A, nutrients, organic contaminants, suspended solids, dissolved and total metals.

In addition, the vessels continuously monitored water along their tracks for pH, temperature, dissolved oxygen, salinity, light transmittance, chlorophyll and depth.

All results and data were passed to the South Western Region Process Investigations Section at Bridgwater, Somerset where they were processed and combined into national baseline and continuous monitoring databases.

The Results Package

The package contains the results of the analysis of baseline samples and continuously monitored data from the 1993 surveys around the whole coast of England and Wales.

This not only simplifies the procedure involved in preparing the information for distribution but also enables regions to put the data from their own coastal waters into the national context.

The package comprises:-

i) This document, including 34 appendices:-

Nos. 1 - 3 showing the location of the baseline sampling points, the coast monitored by each of the 4 coastal survey vessels including the on-board monitoring systems and the lines flown by the aircraft carrying the remote sensing monitors.

Nos. 4 & 5 are excerpts from the Lotus 1-2-3 files referred to in ii) below.

Nos. 6 - 29 are various graphs of the results obtained from the laboratory analysis of the samples from each of the 186 baseline sites during 3 surveys in 1993.

Nos. 30 - 34 are examples of charts derived from the data on the Exabyte tape referred to in iii) below. These have been reduced here to A3 size for convenience but A0 size charts can be made available on request to regions which require them and do not have the facilities to produce them from the data on the Exabyte tape.



2.

- ii) 2 no. 3.5 " floppy discs with the results of the analysis of the samples in ASCII (Text) and Lotus 1-2-3 formats.

Disc 1 contains Lotus 1-2-3 files named as follows:-

1_93_1cc.wk3 - Jan/Feb 1993 nutrients & dissolved metals
1_93_2cc.wk3 - Jan/Feb 1993 total metals
2_93_1cc.wk3 - May/Jun 1993 nutrients & dissolved metals
2_93_2cc.wk3 - May/Jun 1993 total metals
3_93_1cc.wk3 - Aug/Sep 1993 nutrients & dissolved metals
3_93_2cc.wk3 - Aug/Sep 1993 total metals

Disc 2 contains delimited ASCII files named as follows:-

Jan93_1.txt - Jan/Feb 1993 nutrients & dissolved metals
Jan93_2.txt - Jan/Feb 1993 total metals
May93_1.txt - May/Jun 1993 nutrients & dissolved metals
May93_2.txt - May/Jun 1993 total metals
Aug93_1.txt - Aug/Sep 1993 nutrients & dissolved metals
Aug93_2.txt - Aug/Sep 1993 total metals

** NB. Results below the limit of detection are expressed as negative numbers.**

- iii) 1 no. Exabyte tape which contains a Unix tape archive (tar) file which can be restored under Unix to provide EasiCad charts of the parameters continuously monitored on board the coastal survey vessels.

These files can be restored under Unix using the command "tar-xvf/dev/rst0"

- iv) Super VHS video tapes copied from the infra-red video recorder carried in the remote sensing aircraft and showing thermal features along the coast.

Unlike i) - iii) above, regions will only receive videos of their own section of the coastline.

No other remotely sensed imagery has been included with these results but a "Picture book" disc is being prepared for distribution shortly. This will show examples of I.R. and compact aerial spectrographic imagery (CASI) demonstrating discharge and riverine mixing zones, distribution patterns and calibrated images of chlorophyll concentration.

In case of difficulty or for further information, please contact the following at the Bridgwater office:-

General information -

Nick Holden or Keith Taylor

Laboratory data & Exabyte tape - Emmanuel Wensink or Sue Webster

EasiCad Charts -

Nick Collier or Nick Holden

APPENDIX 1



APPENDIX 2



APPENDIX 3



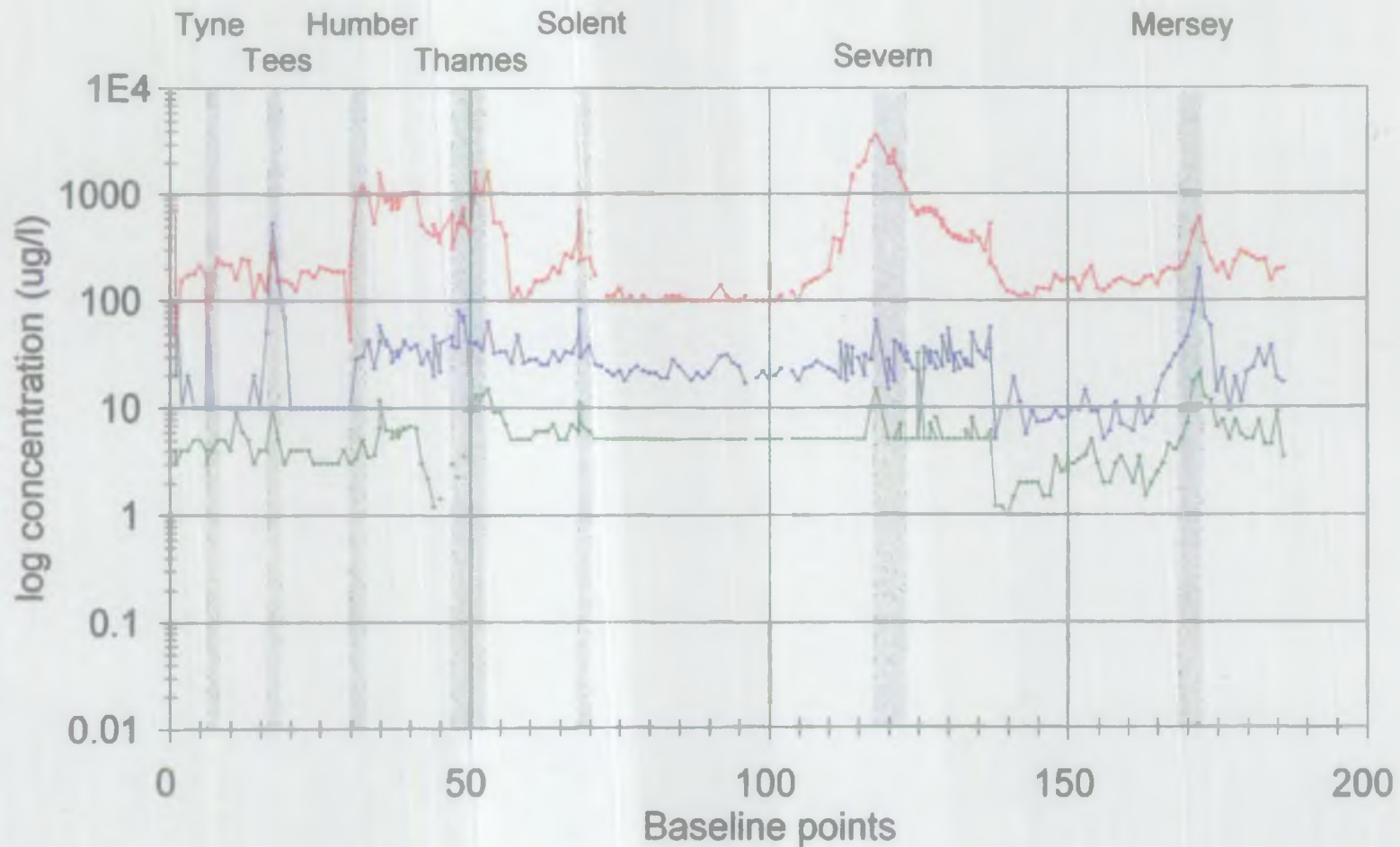
EXAMPLE OF THE LINES FLOWN BY THE
REMOTE SENSING AIRCRAFT

			Hg diss	Cd diss	SS @105	PO4	Chlorophyll	NH3	NO2	NO3	SiO3	Cu diss	Pb diss
		Base	ug/l	ug/l	mg/l	ug/l P	ug/l	ug/l N	ug/l N	mg/l N	mg/l SiO2	ug/l	ug/l
Date	Time	no	0103	0106	0135	0189	0729	3403	3404	3419	3420	7213	7230
22.5.93	14:04	138	-0.02	0.04	-2	10.7	0.7	33.1	3.3		0.107	0.34	-2.5
22.5.93	13:20	139	-0.02	-0.05	-2		0.3					0.38	-2.5
22.5.93	12:29	140	-0.02	0.08	19	10.9		13.5	3.3		0.144	0.34	1.5
22.5.93	11:31	141	-0.02	-0.05	6	13.4	0.3	14.2	4		0.152	0.35	-2.5
22.5.93	11:45	142	-0.02	0.04	3	10.1	0.2	8.7	5.3		0.251	0.41	-2.5
21.5.93	20:58	143	0.03		9	19.5	0.3	11.6	5.3		0.301	0.4	-2.5
22.5.93	10:15	143	0.03	0.26	8	13.1	0.2	7.7	10.9		0.635	0.6	1.6
21.5.93	20:15	144	-0.02	0.06	5	18.9		4.2	5.7		0.384	0.37	-2.5
21.5.93	19:25	145	0.02	-0.05	7	19.1	0.4	5	5.5		0.349	0.79	-2.5
21.5.93	18:23	146	-0.02	0.09	4	9.5	1.5	-2	2.7		0.222	0.46	-2.5
21.5.93	17:36	147	-0.02	-0.05	9	5.2	3.7	-2	0.3		0.164	0.66	-2.5
21.5.93	16:32	148	0.05	-0.05	3	13.4	0.2	12.3	0.9		0.085	0.42	-2.5
21.5.93	13:28	149	-0.02	-0.05	7	3.5	0.6	-2	0.3		0.157	0.51	-2.5
21.5.93	12:38	150	-0.02	0.03	-2	5.5	0.5	-2	-2		0.054		-2.5
21.5.93	12:05	151	-0.02	0.04	11	2.6	0.6	-2	0.4		0.184	3.25	-2.5
21.5.93	11:05	152	0.03	0.05	2	4.4	0.2	-2	0.2		0.076	11.4	-2.5
21.5.93	10:12	153	0.02	0.04	20	6.3	2	7.6	0.4		0.137	0.57	-2.5
20.5.93	15:42	154	-0.02	0.05	4	3.5	0.7	4.6	0.2		0.208	1.36	-2.5
21.5.93	08:37	154	0.05	-0.05	2	4	0.7	-2	0.8		0.624	0.82	-2.5
20.5.93	15:00	155	0.03	-0.05	-2	2	0.5	2.9	0.2		0.098	0.57	-2.5
20.5.93	13:48	156	0.02	0.08	-2	11.8	0.4	4.8	2.6		0.13	0.57	-2.5
20.5.93	13:12	157	-0.02	0.04	-2	9.2	0.5	9.6	3		0.174	-0.5	-2.5
20.5.93	12:26	158	0.02	0.05	-2	10		4.9	1.2		0.129	0.34	-2.5
20.5.93	11:26	159	0.02	0.03	12	5.3	1	11.1	1.6		0.095	0.96	-2.5
20.5.93	10:32	160	-0.02	0.08	5	2.6	1.1	7.3	-0.2		0.065	0.78	-2.5
20.5.93	09:20	161	0.03	-0.05	10		0.7					1.02	1.3
20.5.93	08:23	162	0.02	0.07	-2		0.3					3.45	-2.5
20.5.93	20:50	162	0.02	0.07	41	9.5	1.5	4	0.5		0.05	0.53	-2.5
19.5.93	19:10	163	-0.02	-0.05	-2	14.2	0.5	11.1	0.4		0.07	-0.5	-2.5
20.5.93	17:12	164	-0.02	0.05	-2	6.7		4.4	-0.2		0.362	-0.5	-2.5
19.5.93	15:51	165	-0.02		4	1.6		6.4	0.5		0.075	-0.5	-2.5
19.5.93	14:56	166	-0.02		49	6.4	4.5	13	0.5		0.074	0.27	-2.5
19.5.93	13:55	167	0.02	0.03	20	8.8	3.3	4.5	0.5		0.208	0.48	-2.5
19.5.93	13:15	168	-0.02		27	4.7	8.9	5.8	0.5		0.06	0.51	-2.5
19.5.93	10:58	169	0.02	0.13	5	3.4	4.5	8.7	0.5		0.063	2.3	1.6
19.5.93	10:40	170	0.02	0.03	4	20.1	3.37	47	3.4		0.046	1.4	-2.5

Group 2 determinands for Jan/Feb '93 baseline survey											
						Base	Hg tot	Cd tot	Cu tot	Pb tot	Zn tot
						no	ug/l	ug/l	ug/l	ug/l	ug/l
Lab no	Site name	X coordinate	Y coordinate	Date	Time		0105	0108	7215	7229	7245
49272	BERWICK	401443	652107	30.1.93	17:00	1	0.04				
49273	BERWICK	401443	652107	30.1.93	17:15	1	0.043				
49271	CASTLEHEAD ROCKS	413450	644616	30.1.93	16:30	2	0.067				
49270	SHORESTON OUTCARS	421779	633985	30.1.93	15:20	3	0.024	-0.05	2.3	-1	29
49267	CRASTER	426513	620379	30.1.93	13:00	4	0.039				
49266	WARKWORTH	427260	606770	30.1.93	12:45	5	0.035				
49265	BRIG HEAD	430730	594089	30.1.93	11:30	6	0.035	0.18	3.3	1.15	26
49274	BRIG HEAD	430730	594089	30.1.93	11:30	6		-0.05	-1	-1	7.3
49264	BLYTH	434352	579260	30.1.93	10:30	7	0.145				
49263	TYNE (NORTH)	438464	568444	30.1.93	09:30	8	0.082				
49262	TYNE (MIDDLE)	438895	569078	30.1.93	09:00	9	0.039	-0.05	4.7	2.95	26
49260	TYNE (SOUTH)	439306	569694	30.1.93	08:30	10	0.078				
49259	MARSDEN	440937	566073	30.1.93	07:30	11	0.074				
49257	WEAR (NORTH)	442341	559707	1.2.93	12:00	12	0.044	-0.05	2.85	1.4	29
49256	WEAR (MIDDLE)	442402	558854	1.2.93	11:45	13	0.028				
49254	WEAR (SOUTH)	442433	557927	1.2.93	11:30	14	0.06				
49252	PINCUSHION ROCK	443338	551556	1.2.93	11:00	15	0.17	-0.05	5.55	5.95	29
49269	BLACKHALL	449679	538324	29.1.93	10:30	16	0.061				
49268	TEES (MIDDLE)	455462	530528	29.1.93	10:00	17	0.056				
49261	TEES (MIDDLE)	456231	529147	29.1.93	09:45	18	0.027	0.05	3.5	1.8	22
49258	TEES (SOUTH)	459667	527892	29.1.93	19:30	19	0.063				
49255	SKINNINGROVE	472910	521798	29.1.93	08:30	20	0.058				
49253	SANDSEND	486288	515059	29.1.93	08:00	21	0.17	-0.05	4.8	2.45	54.5
49251	ROBIN HOODS BAY	497341	505265	28.1.93	19:40	22	0.066				
49250	SCARBOROUGH OUTFAL	504454	492103	28.1.93	18:30	23	0.056				
49249	FILEY BRIGG	514516	481769	28.1.93	17:30	24	0.081	-0.05	2.6	1.55	36
49248	FLANBOROUGH (NORTH)	524552	472901	28.2.93	16:30	25	0.081				
49247	BRIDLINGTON	519087	466394	28.1.93	15:30	26	0.088				
49279	HORNSEA	520801	451653	28.1.93	14:30	27	0.076	0.11	220	180	365
49278	BEACON HILL	528006	438358	28.1.93	13:30	28	0.19				
49277	WITHERNSEA	536920	426310	28.1.93	12:00	29	0.055				
49275	SPURN	546422	414537	28.1.93	10:40	30	0.061	-0.05	1	-1	2.45
49276	SPURN	546422	414537	28.1.93	11:00	30	0.091	0.065	6.3	3.2	205

Marine Baseline Jan/Feb 1993

Available Nitrogen at 1m depth

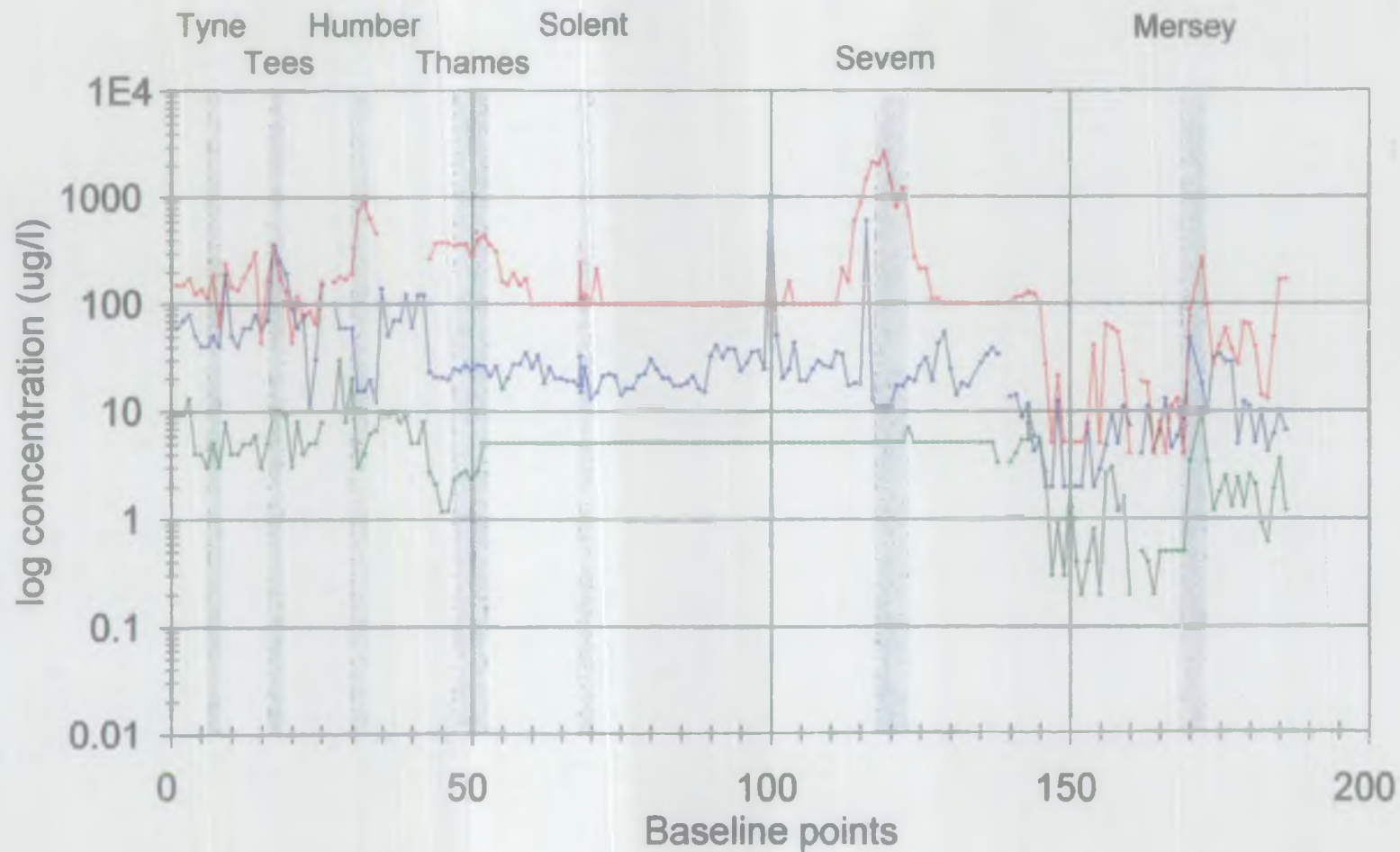


Ref: 1-93-1C

— NH3 — NO2 — T.O.N

Marine Baseline May/June 1993

Nitrogens at 1m depth

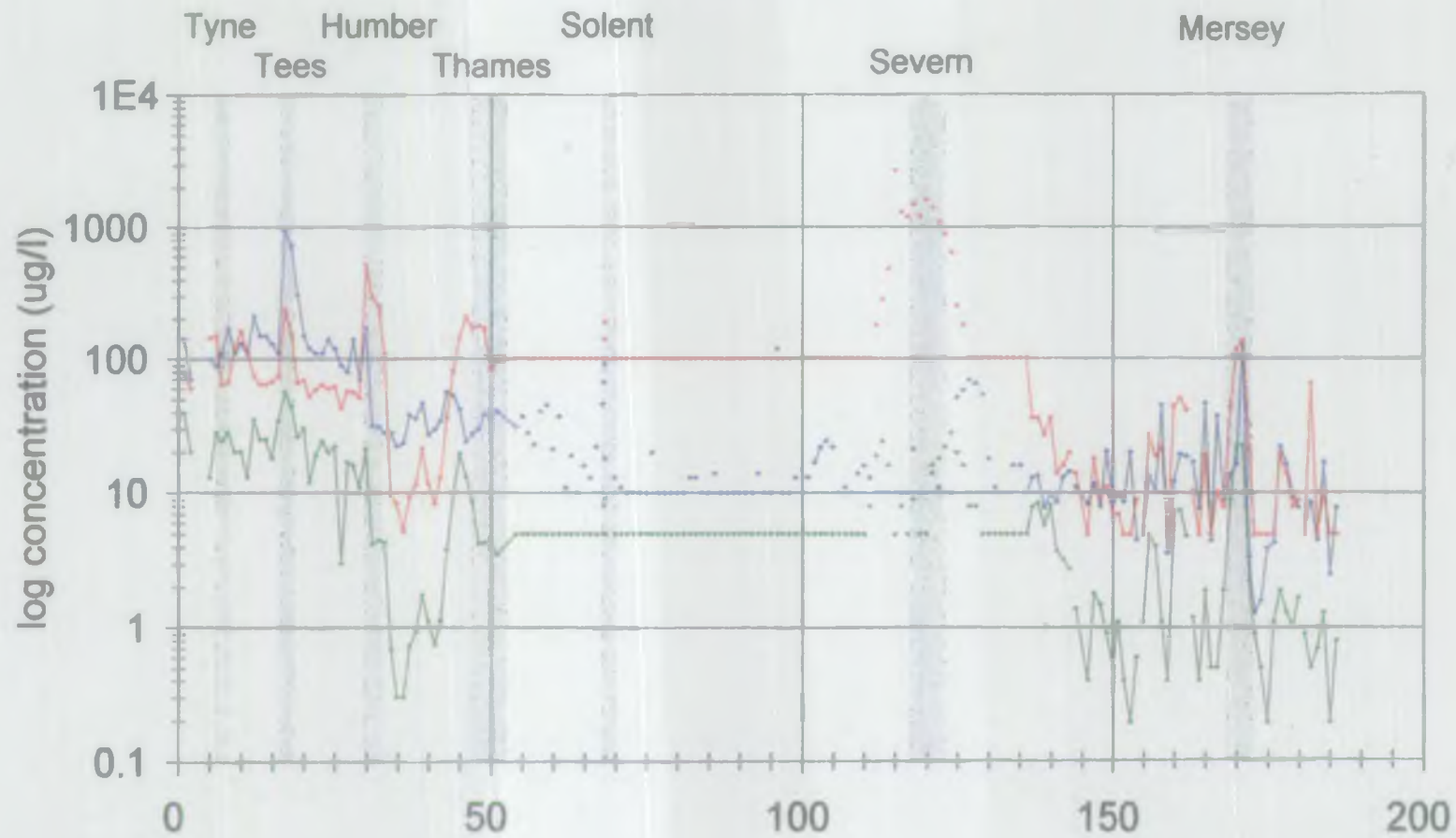


Ref: 2-93-1C

— NH3 — NO2 — TON

Marine Baseline August 1993

Available Nitrogen at 1m depth

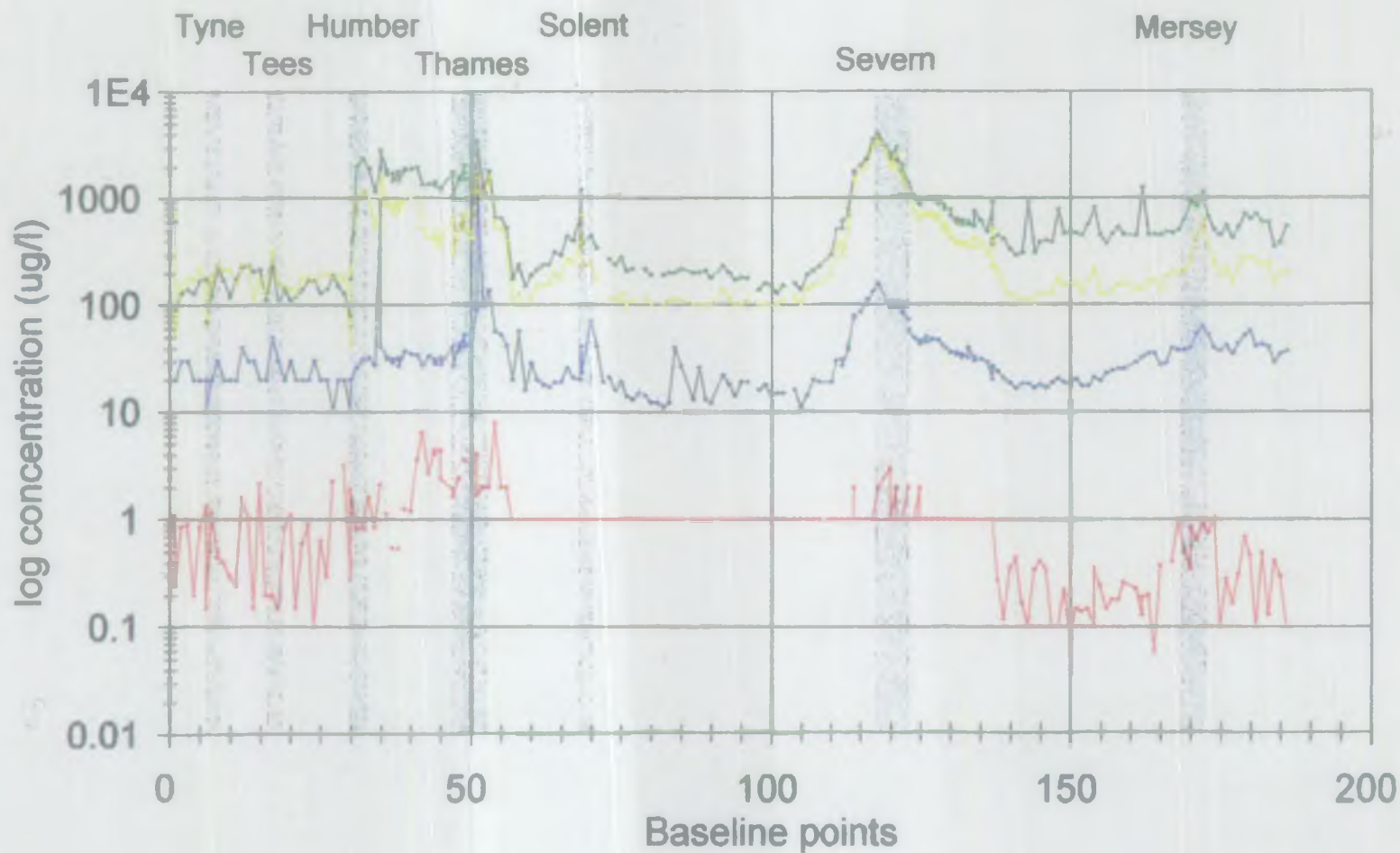


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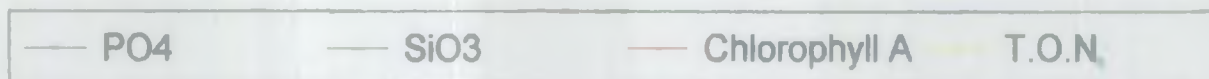
— NH3 — NO2 — T.O.N

Marine Baseline Jan/Feb 1993

Nutrients at 1m depth



Ref: 1-93-1C



Marine Baseline May/June 1993

Nutrients at 1m depth

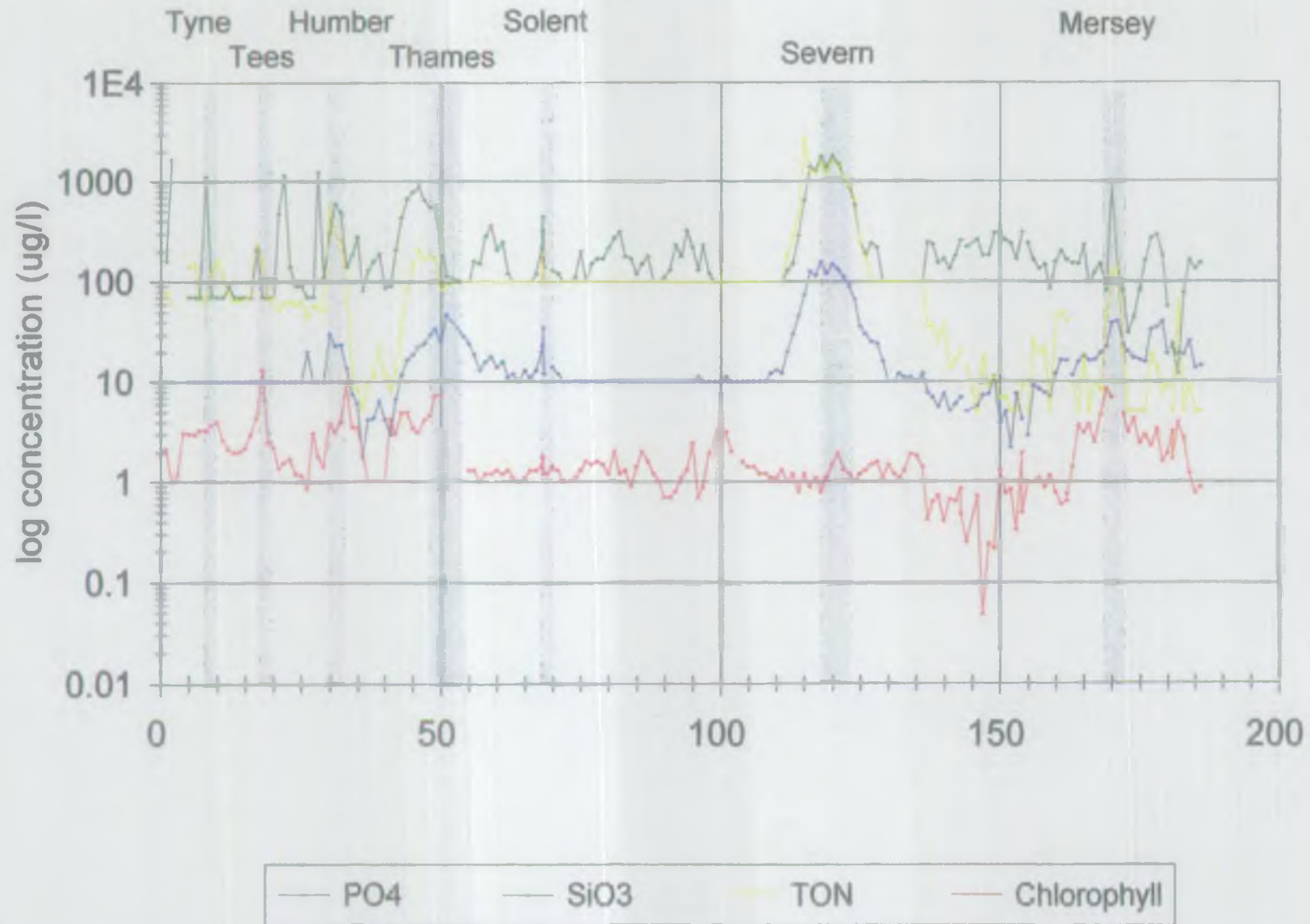


Ref 2-93-1C

— PO4 — SiO3 — Chlorophyll — T.O.N

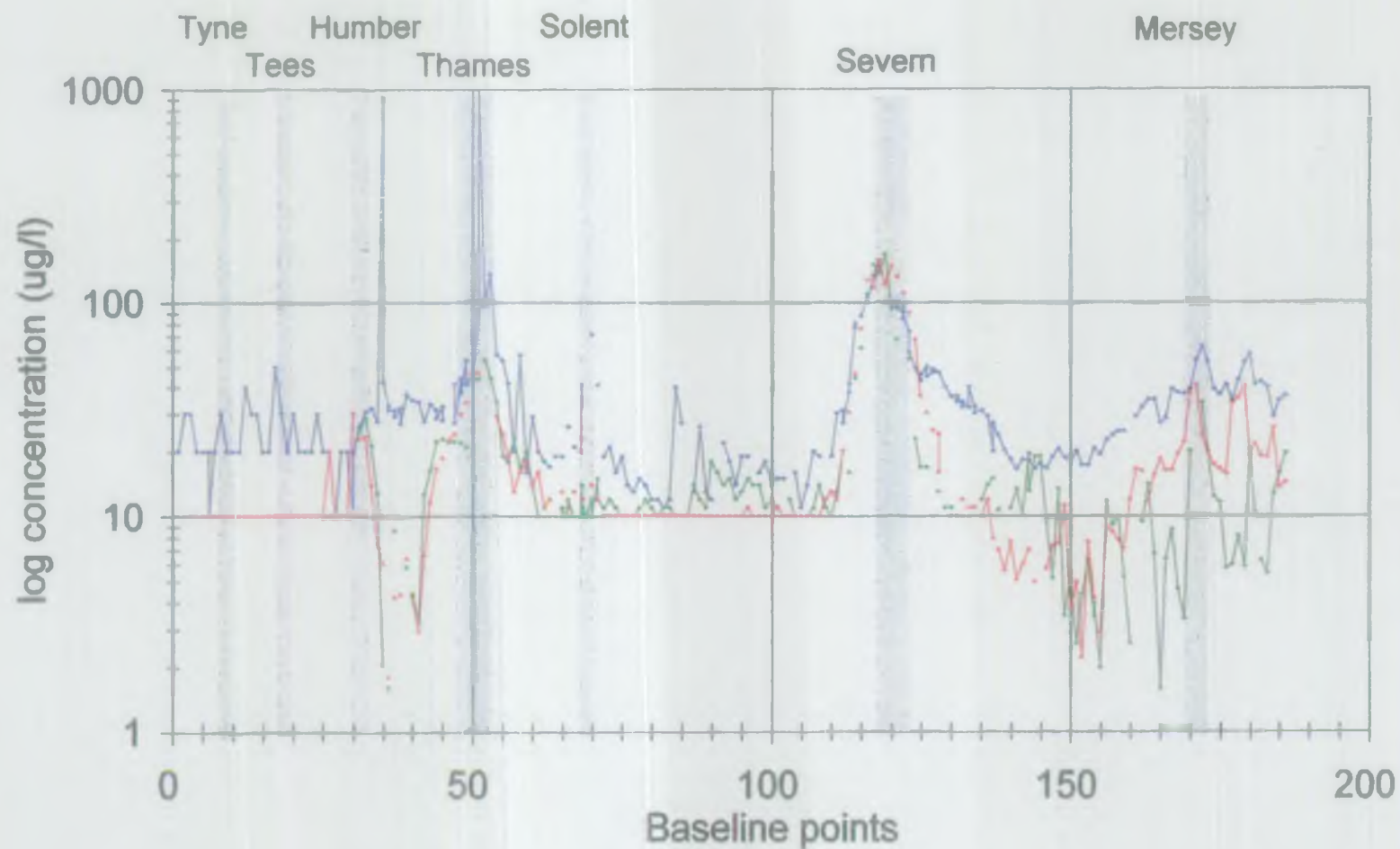
Marine Baseline August 1993

Nutrients at 1m depth



Marine Baseline 1993

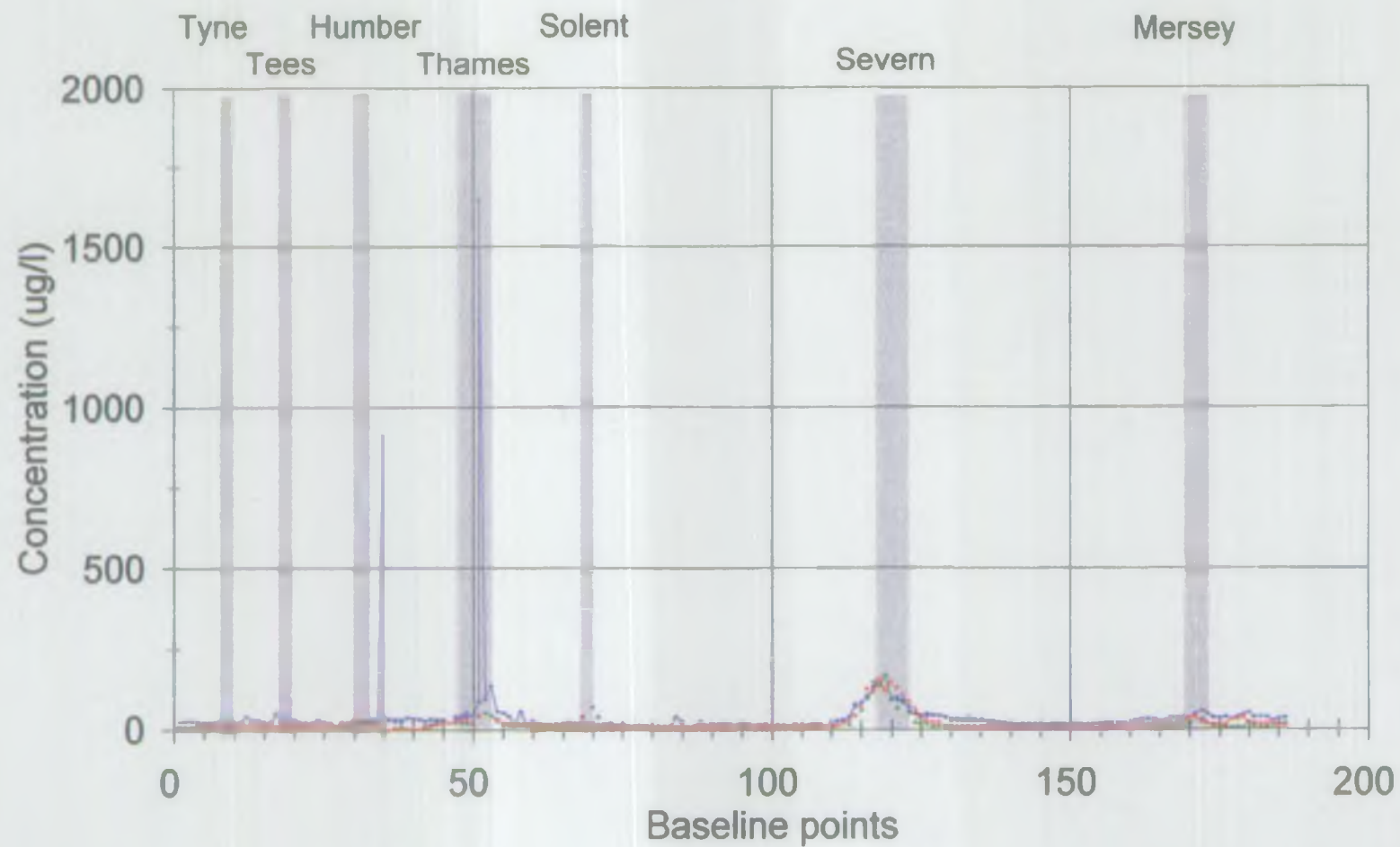
Phosphate



— Jan '93 — May '93 — Aug '93

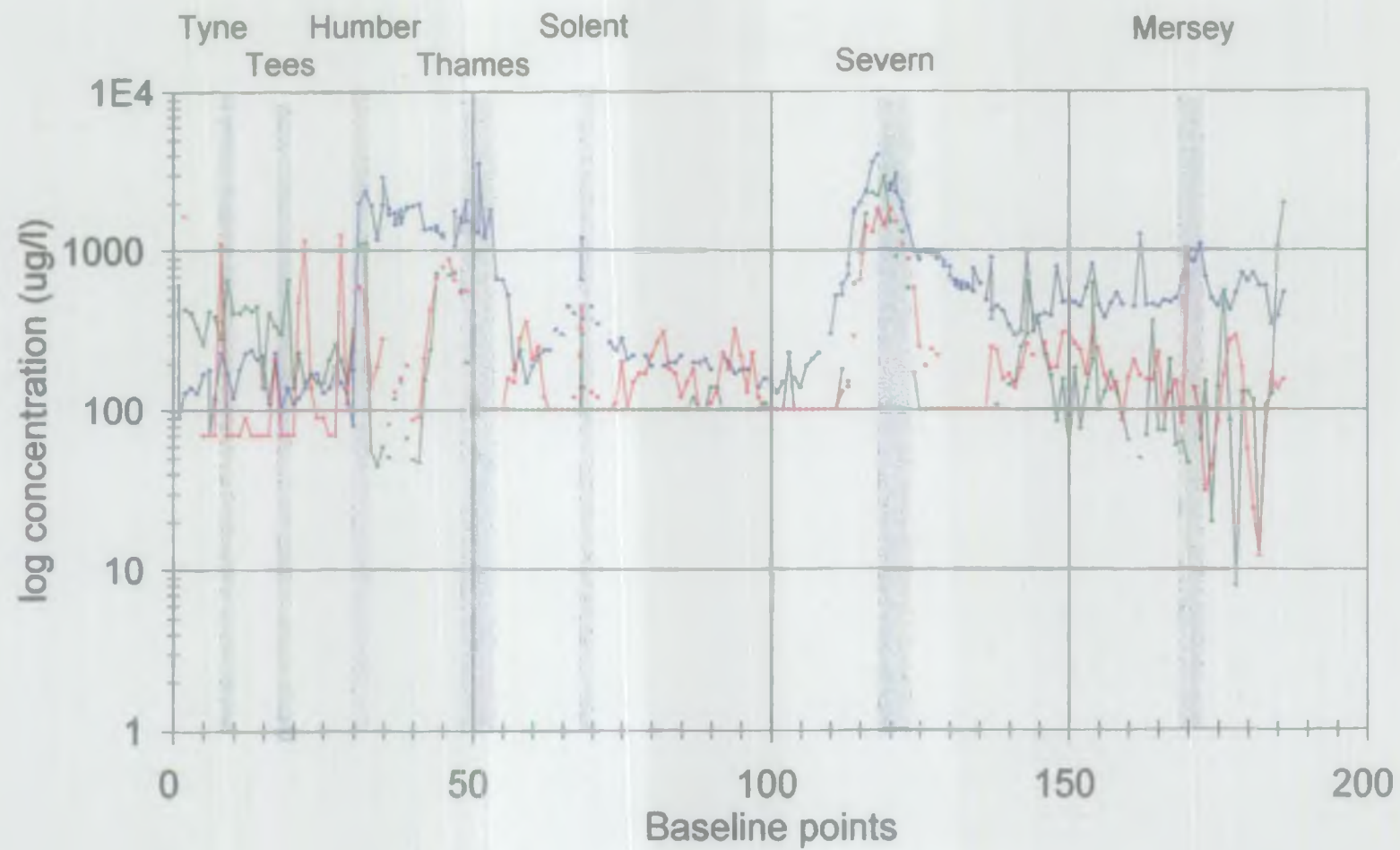
Marine Baseline 1993

Phosphate



Marine Baseline 1993

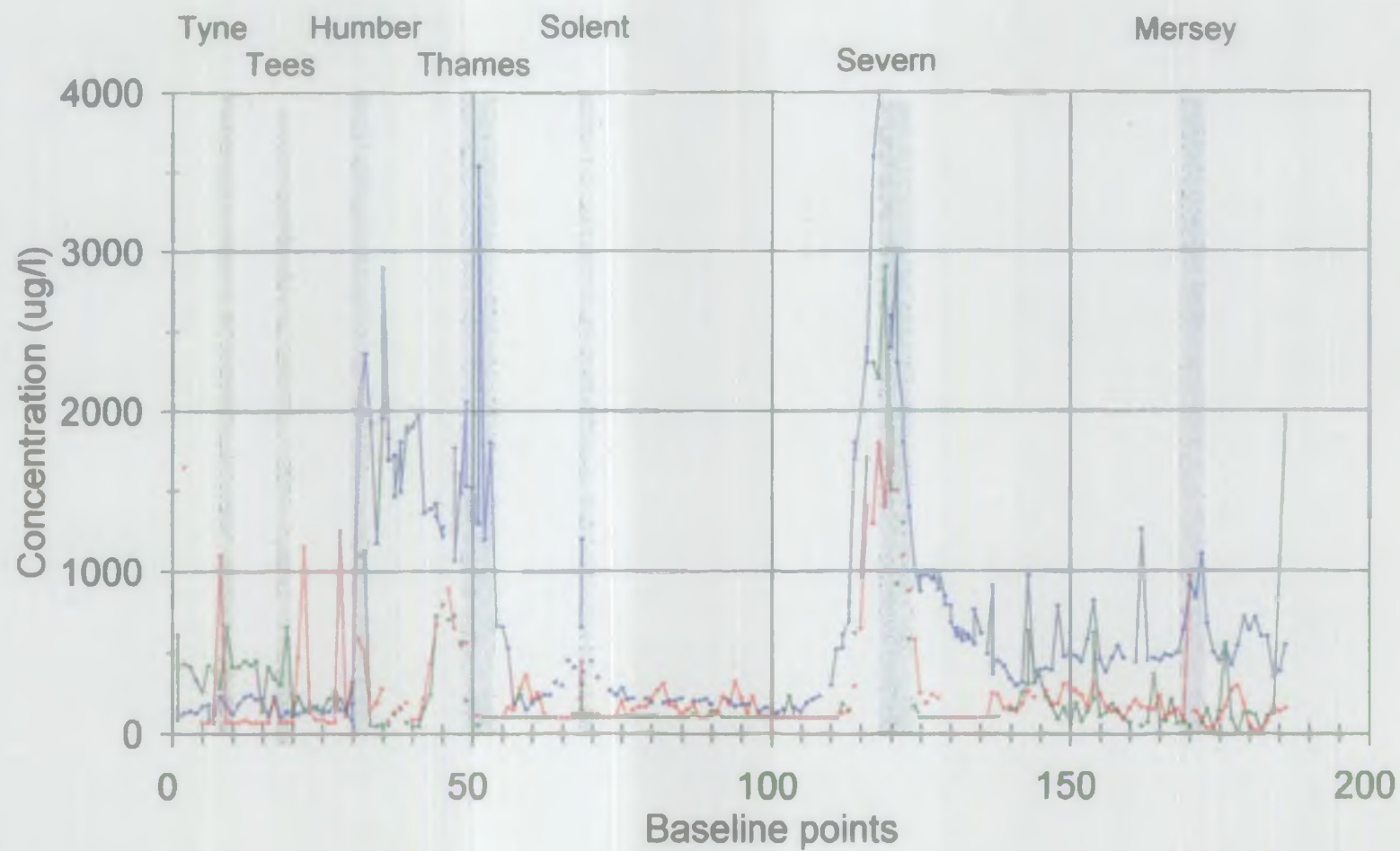
Silicate



— Jan '93 — May '93 — Aug '93

Marine Baseline 1993

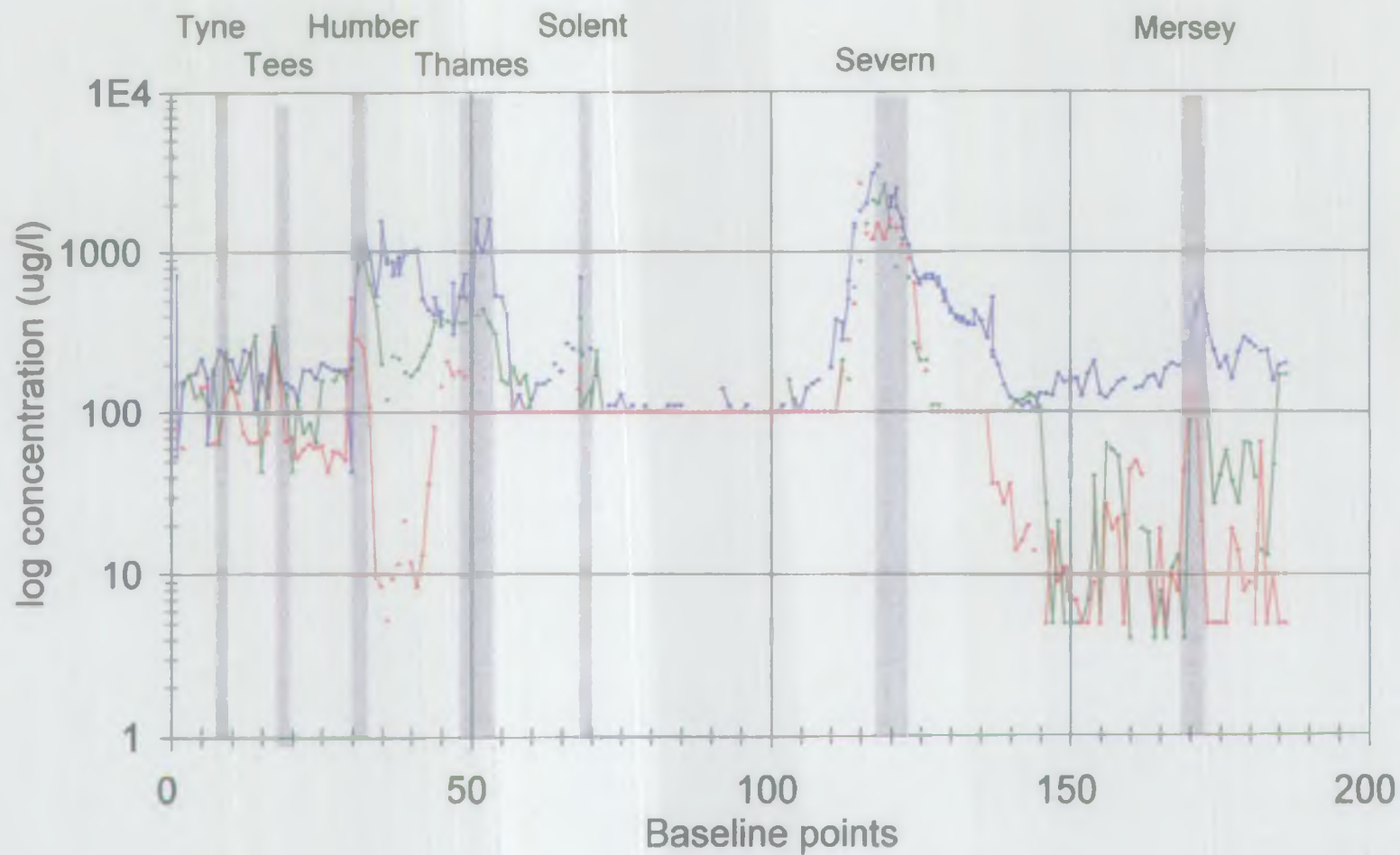
Silicate



— Jan '93 — May '93 — Aug '93

Marine Baseline 1993

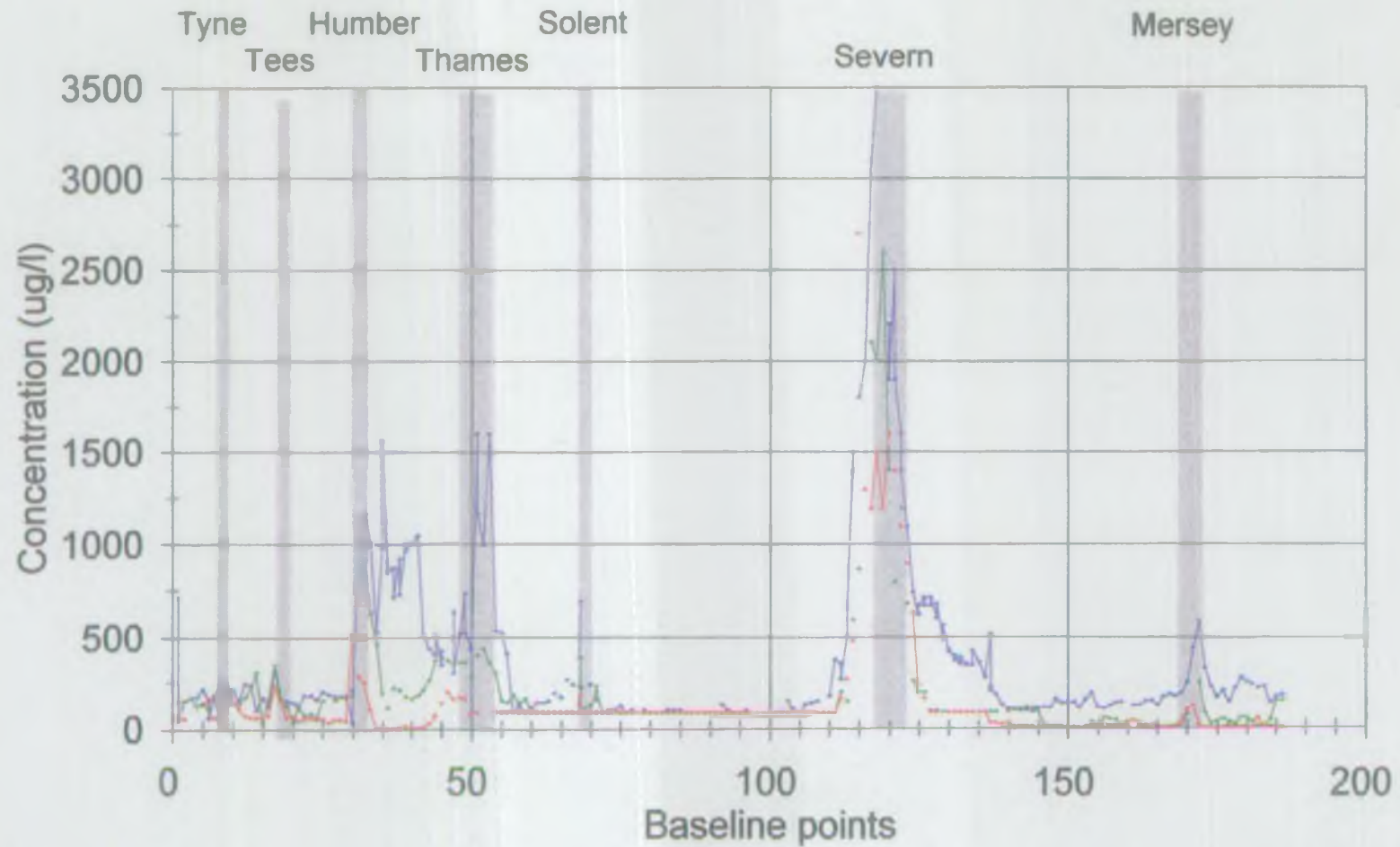
Total Oxidised Nitrogen



— Jan '93 — May '93 — Aug '93

Marine Baseline 1993

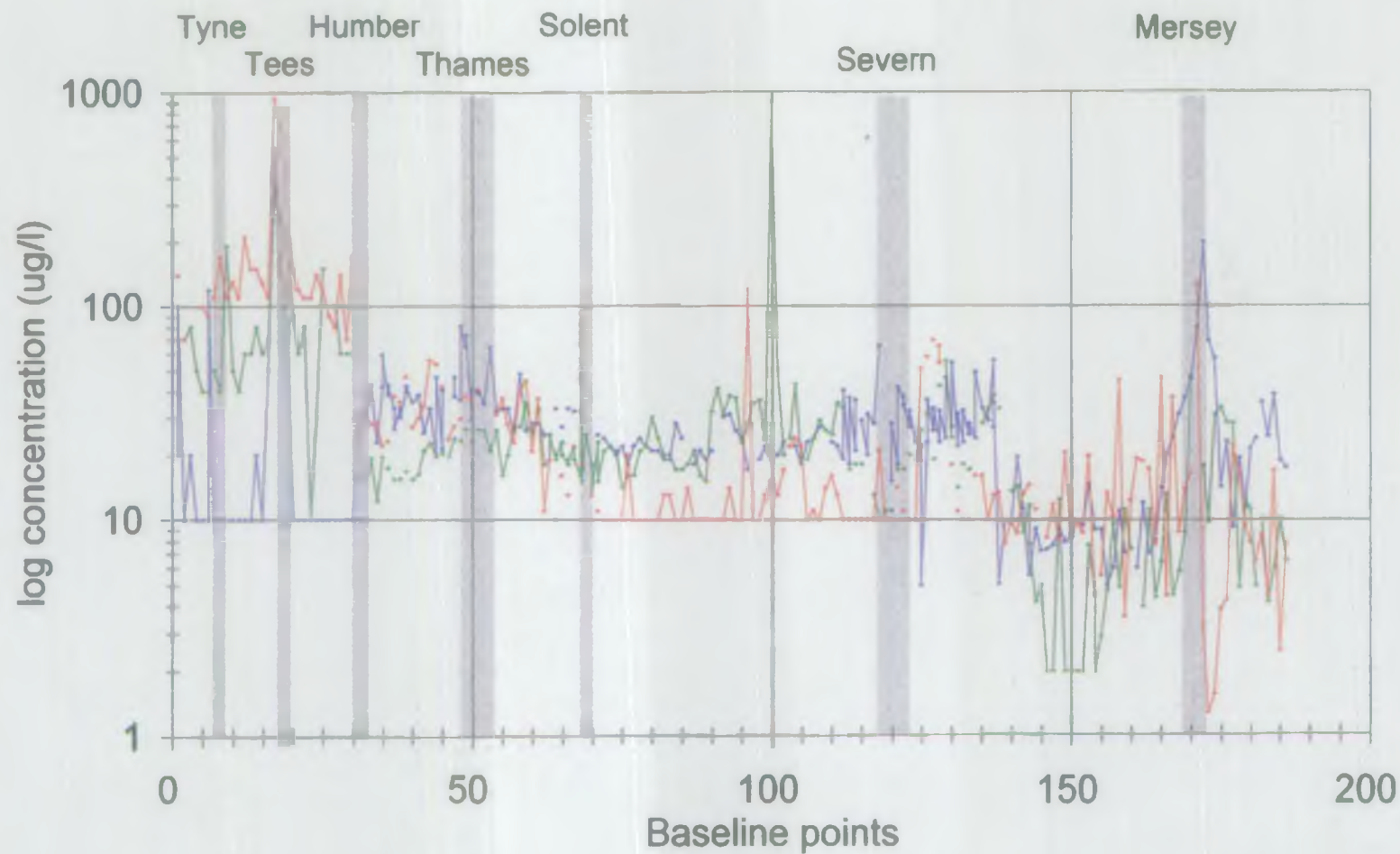
Total Oxidised Nitrogen



— Jan '93 — May '93 — Aug '93

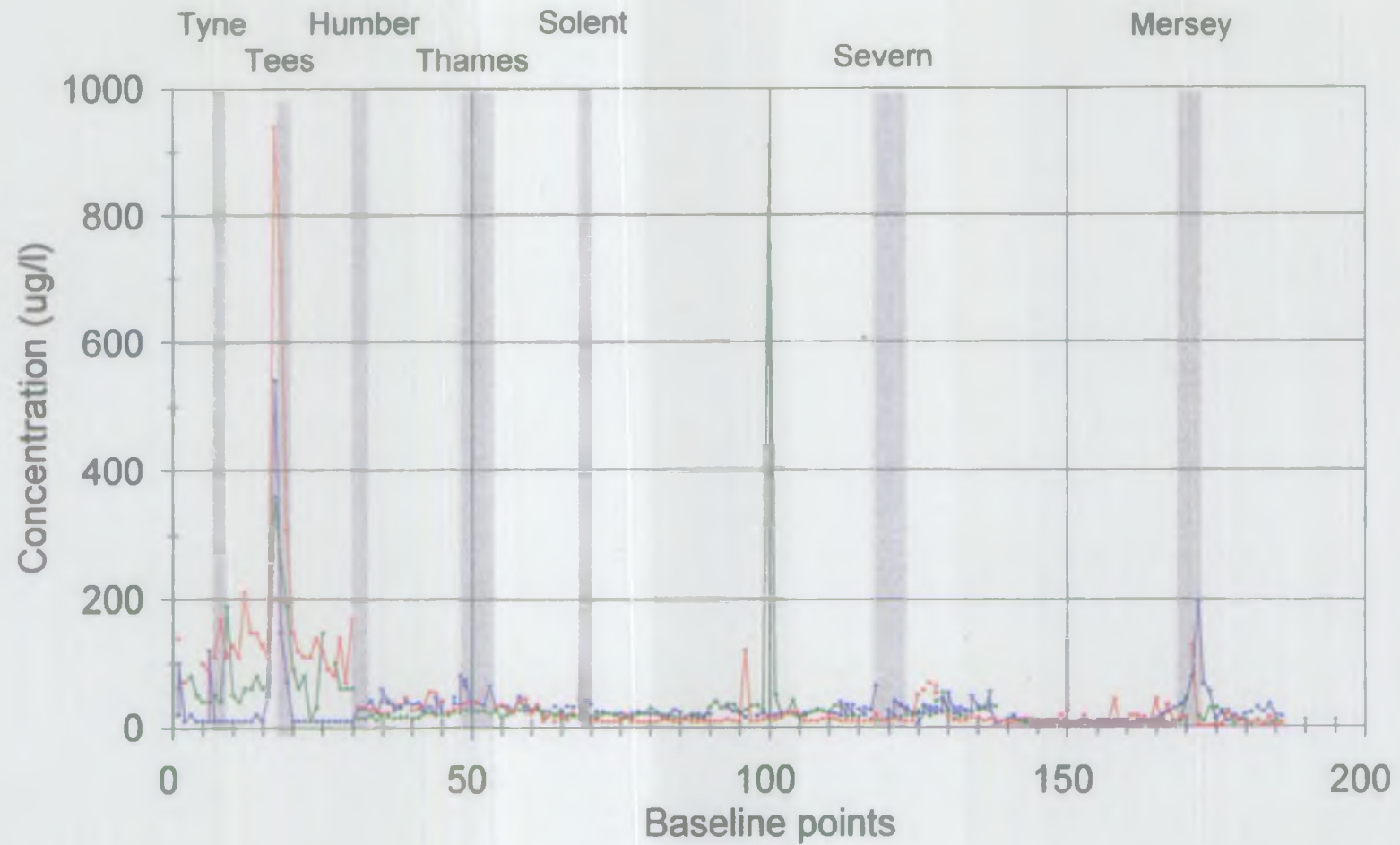
Marine Baseline 1993

Ammonia



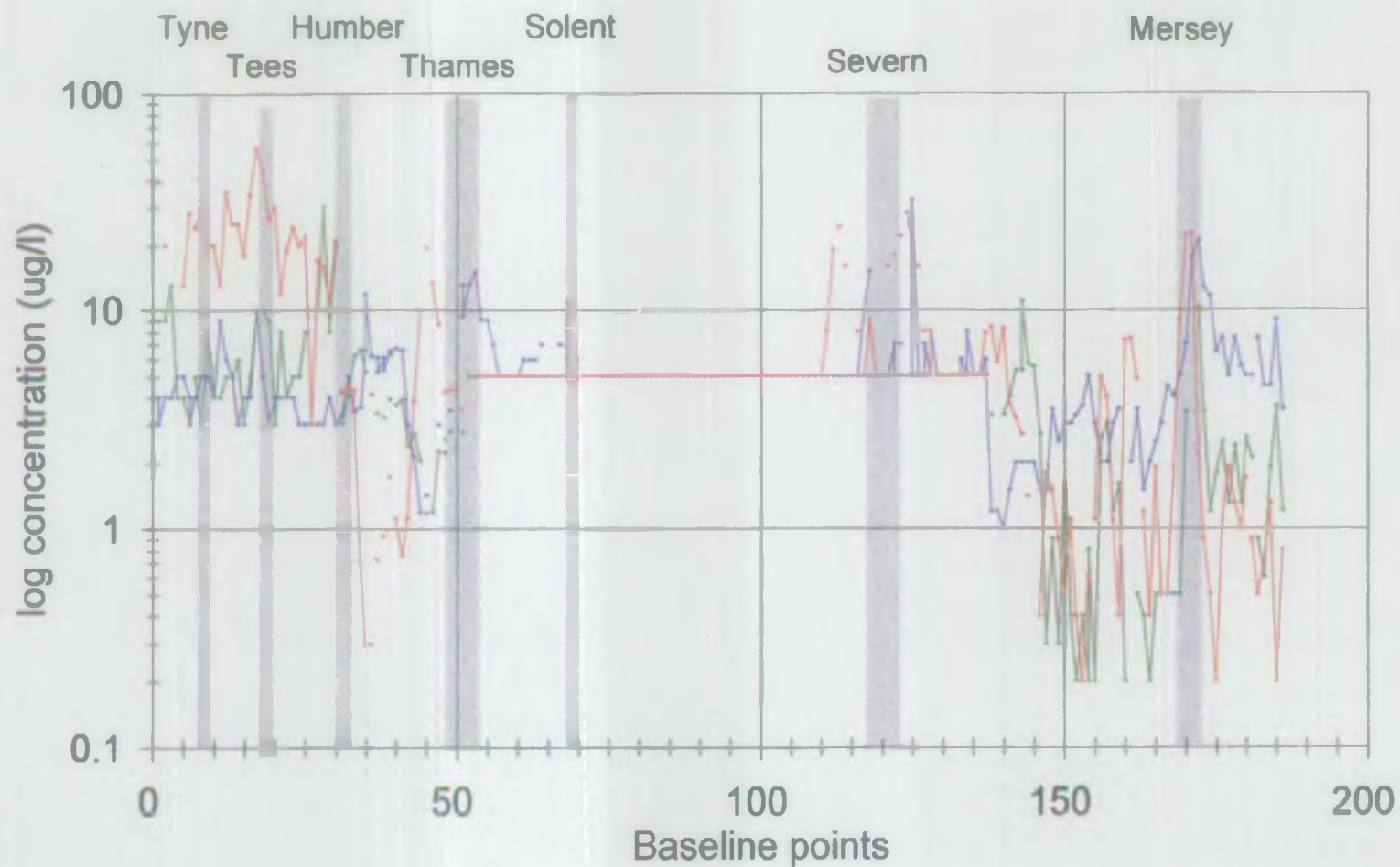
Marine Baseline 1993

Ammonia



Marine Baseline 1993

Nitrite



Marine Baseline 1993

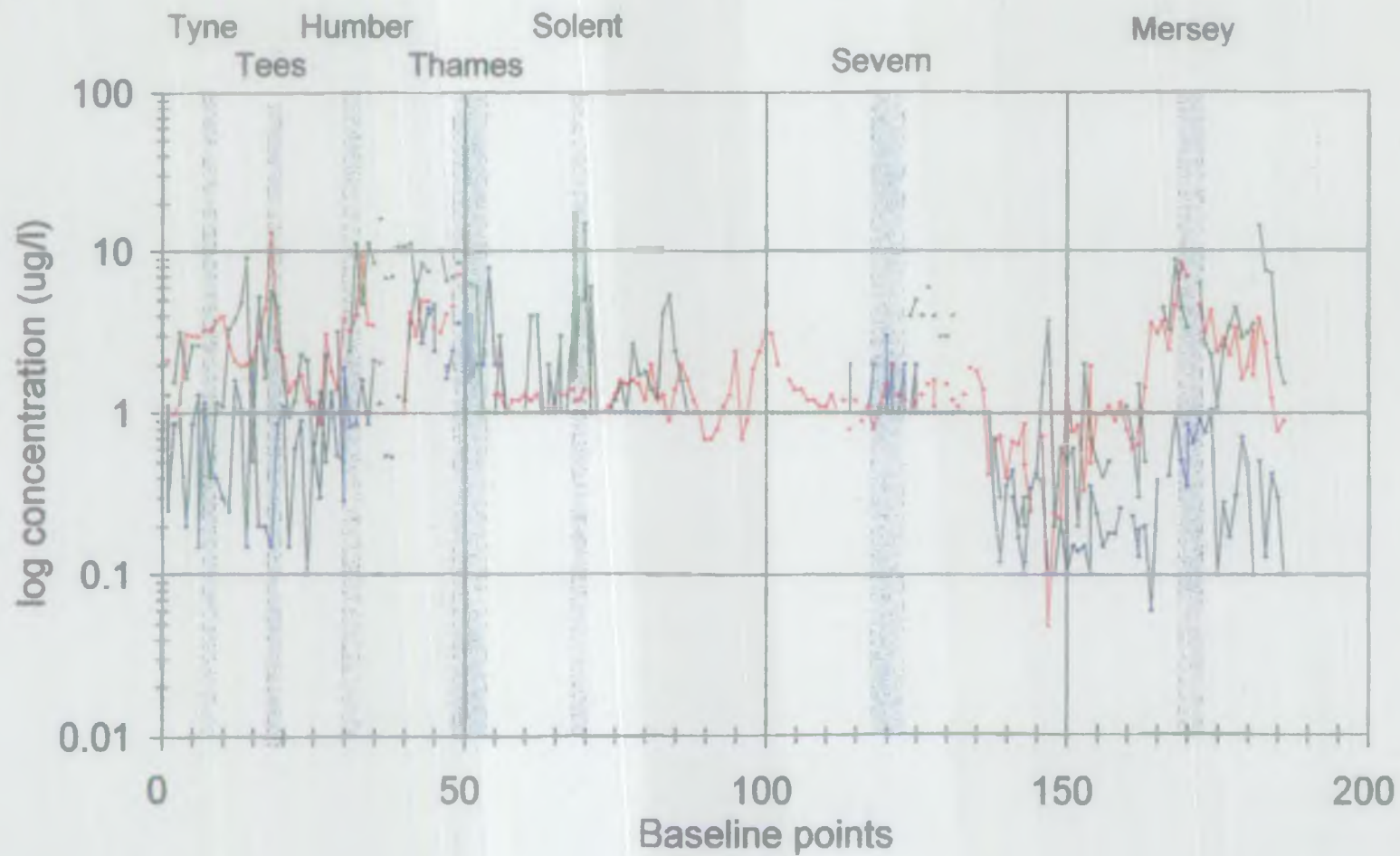
Nitrite



— Jan '93 — May '93 — Aug '93

Marine Baseline 1993

Chlorophyll

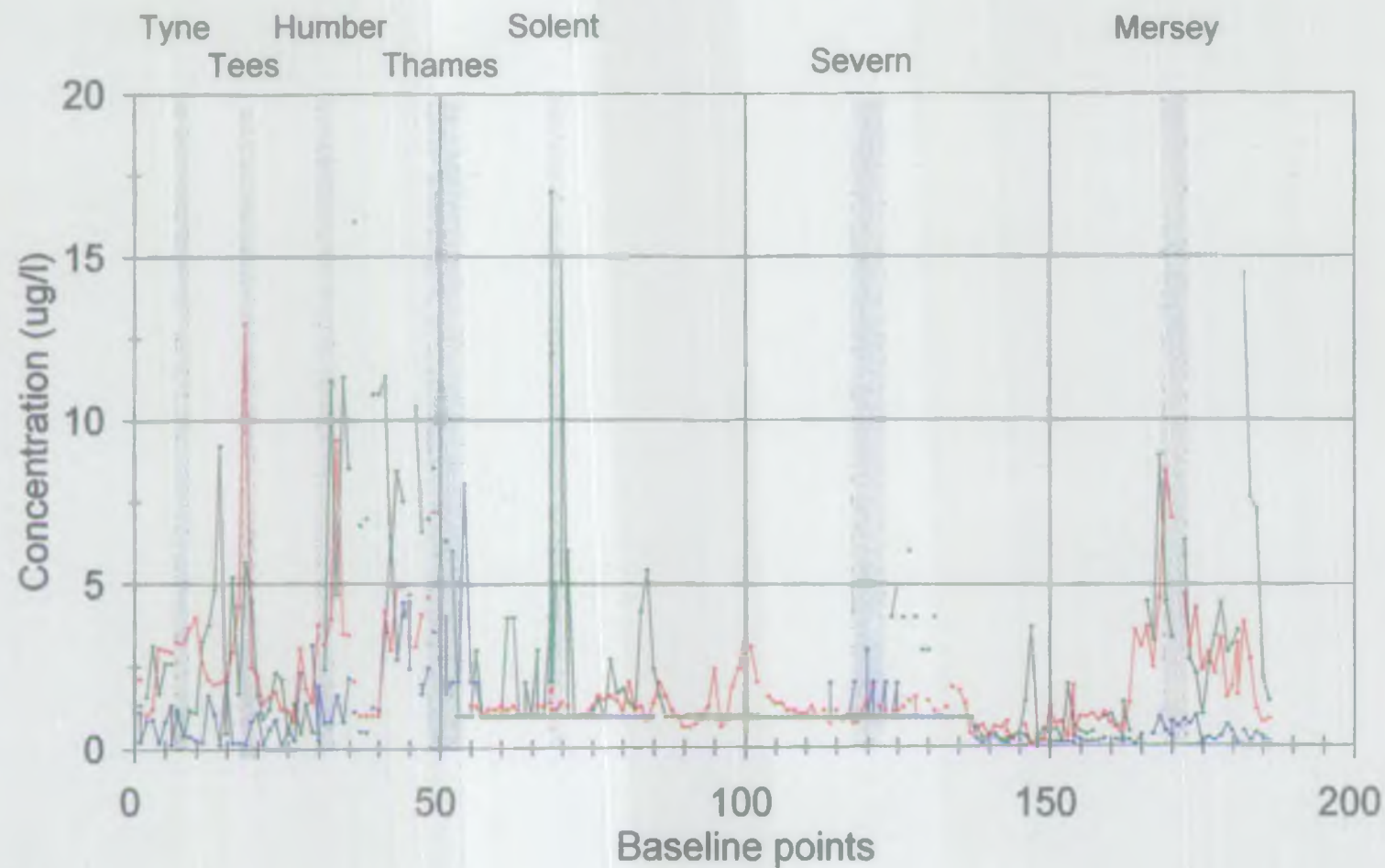


Ref: 2-93-1C

— Jan '93 — May '93 — Aug '93

Marine Baseline 1993

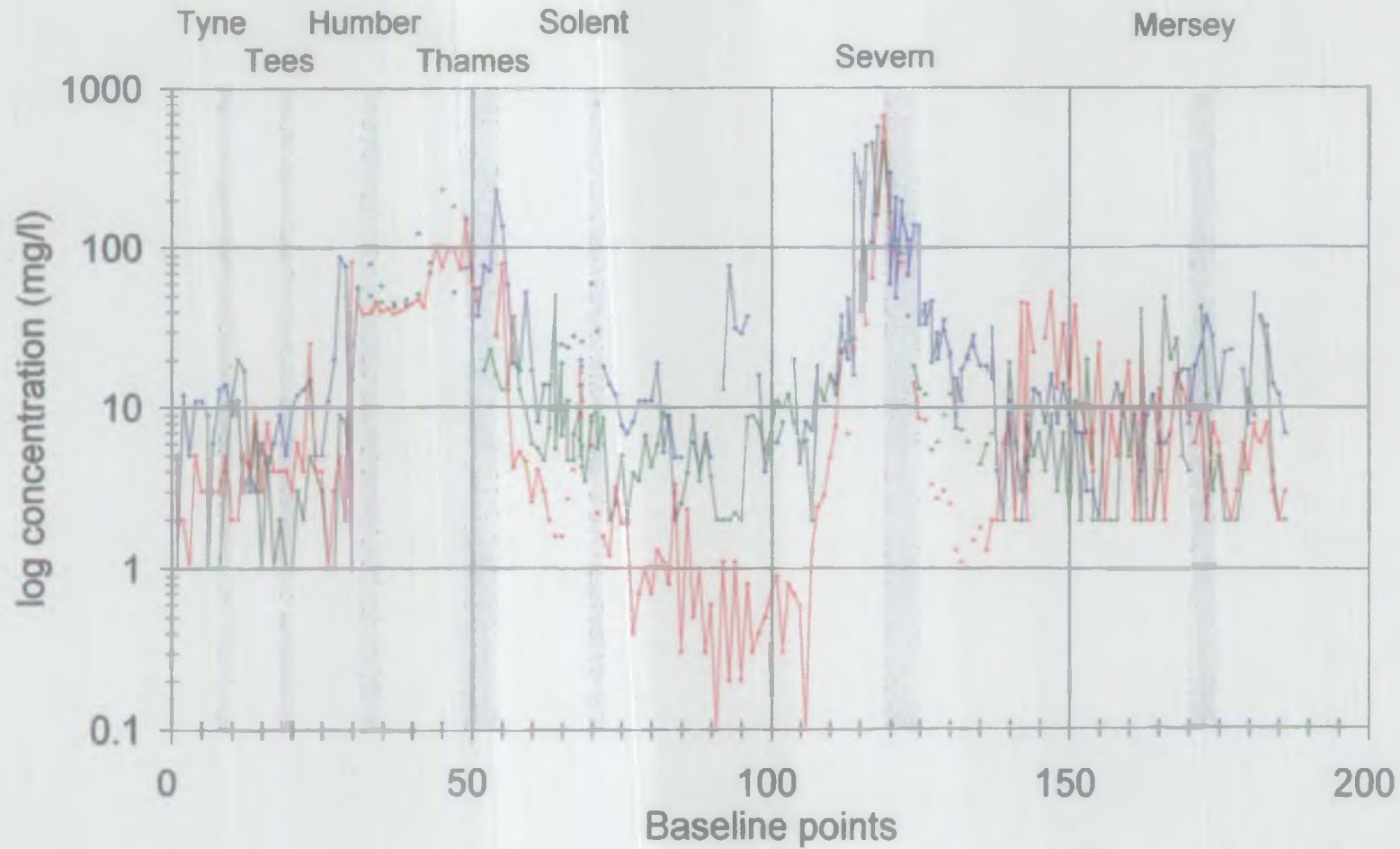
Chlorophyll



— Jan '93 — May '93 — Aug '93

Marine Baseline 1993

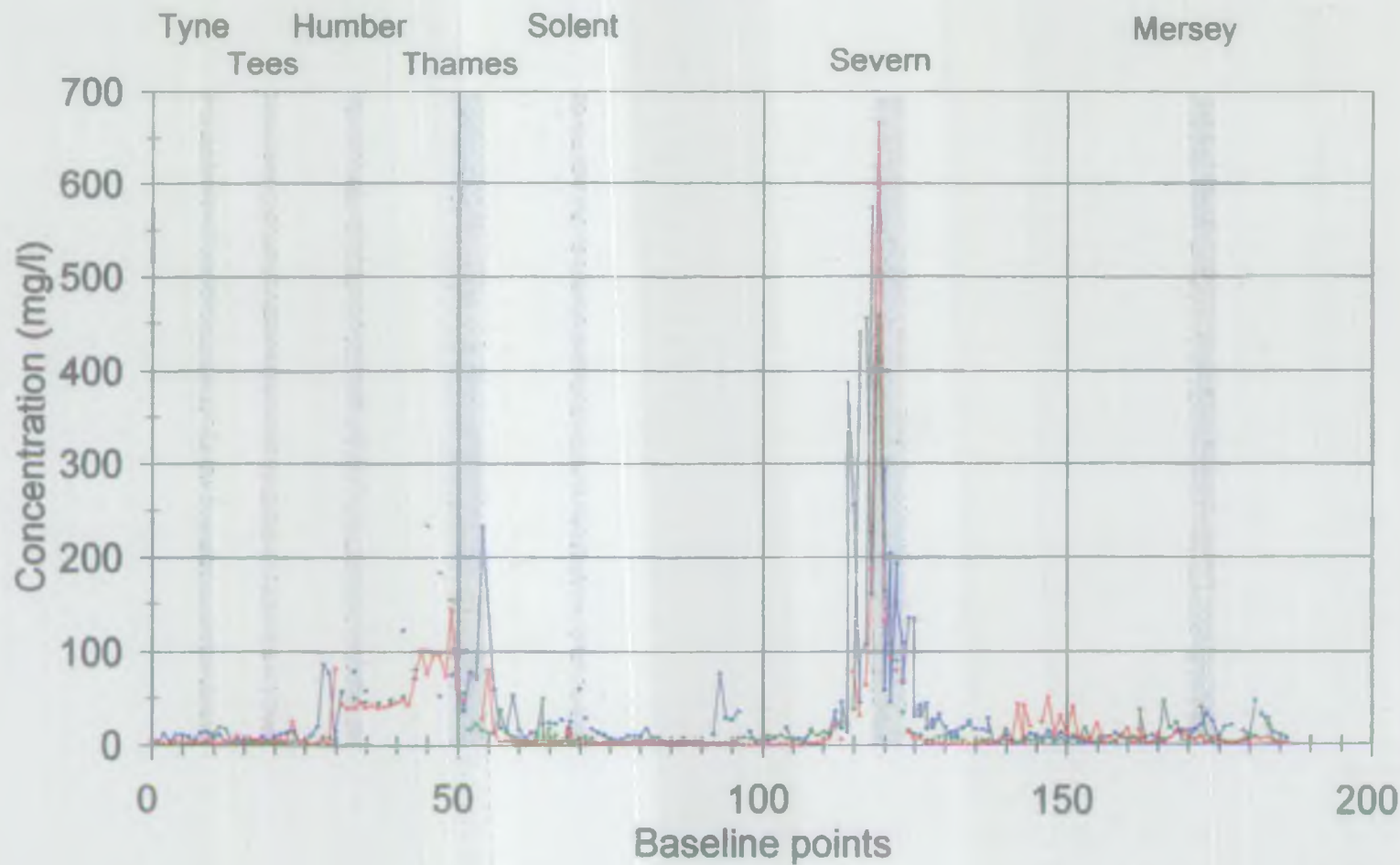
Suspended Solids



— Jan '93 — May '93 — Aug '93

Marine Baseline 1993

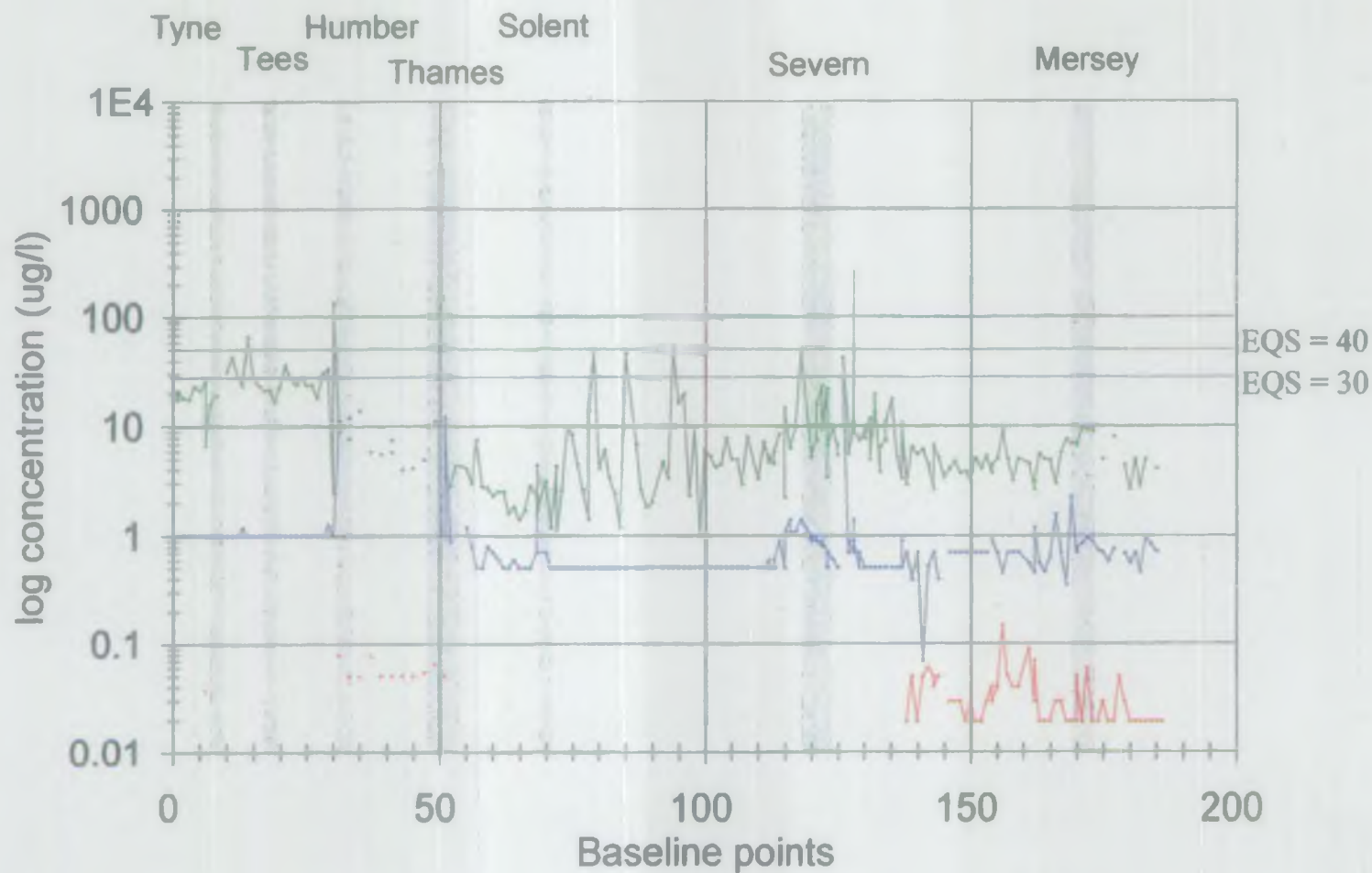
Suspended Solids



— Jan '93 — May '93 — Aug '93

Marine Baseline Jan/Feb 1993

Dissolved Metals at 1m depth



Ref: I-93-1C

— Ni $\mu\text{g/l}$ Ni — Zn $\mu\text{g/l}$ Zn — Hg $\mu\text{g/l}$ Hg

Marine Baseline Jan/Feb 1993

Dissolved Metals at 1m depth



Ref: I-93-1C

Marine Baseline May/June 1993

Dissolved Metals at 1m depth

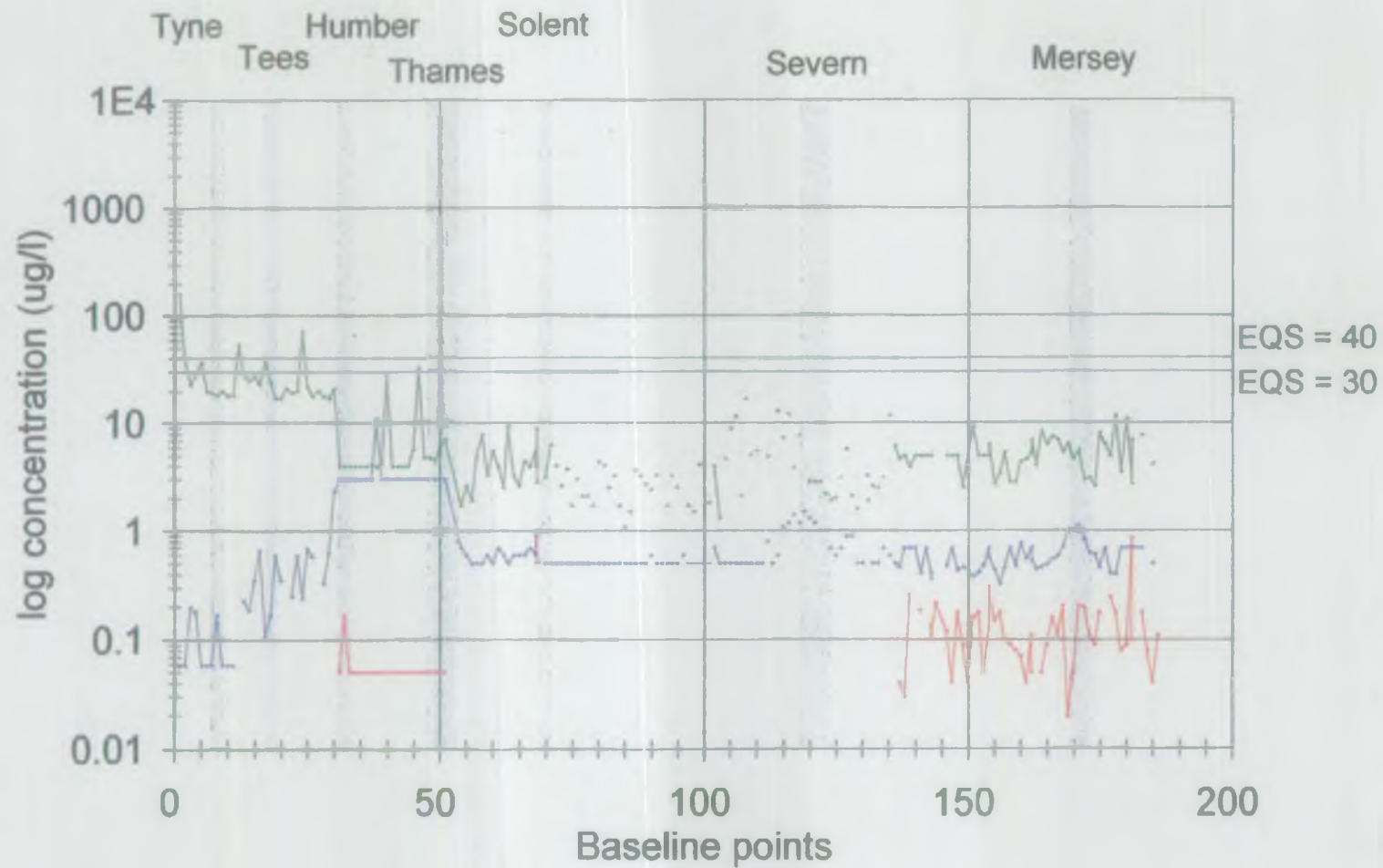


Ref:2-93-1C

— Ni $\mu\text{g/l}$ Ni — Zn $\mu\text{g/l}$ Zn — Hg $\mu\text{g/l}$ Hg

Marine Baseline Aug' 1993

Dissolved Metals at 1m depth



Marine Baseline May/June 1993

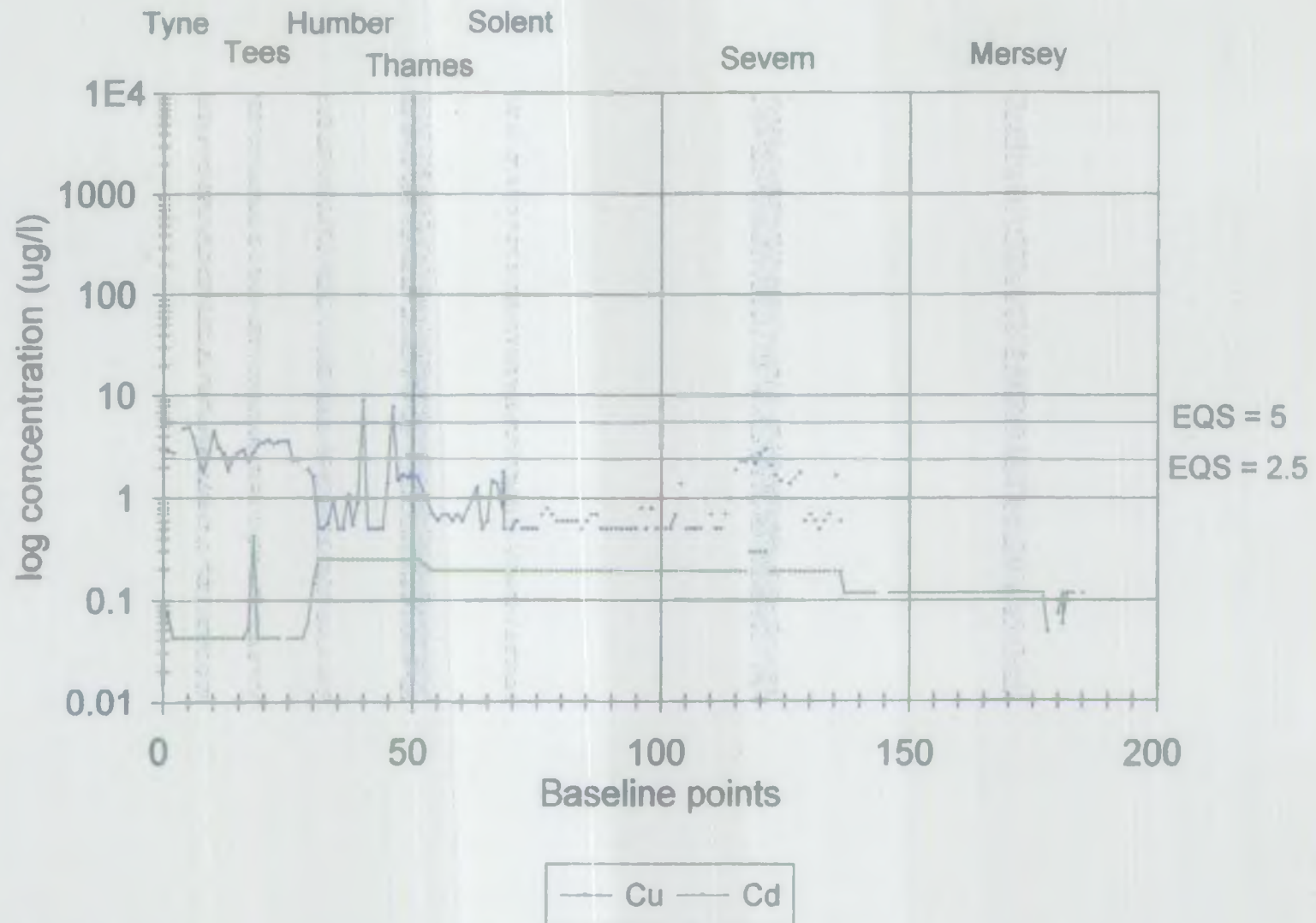
Dissolved Metals at 1m depth



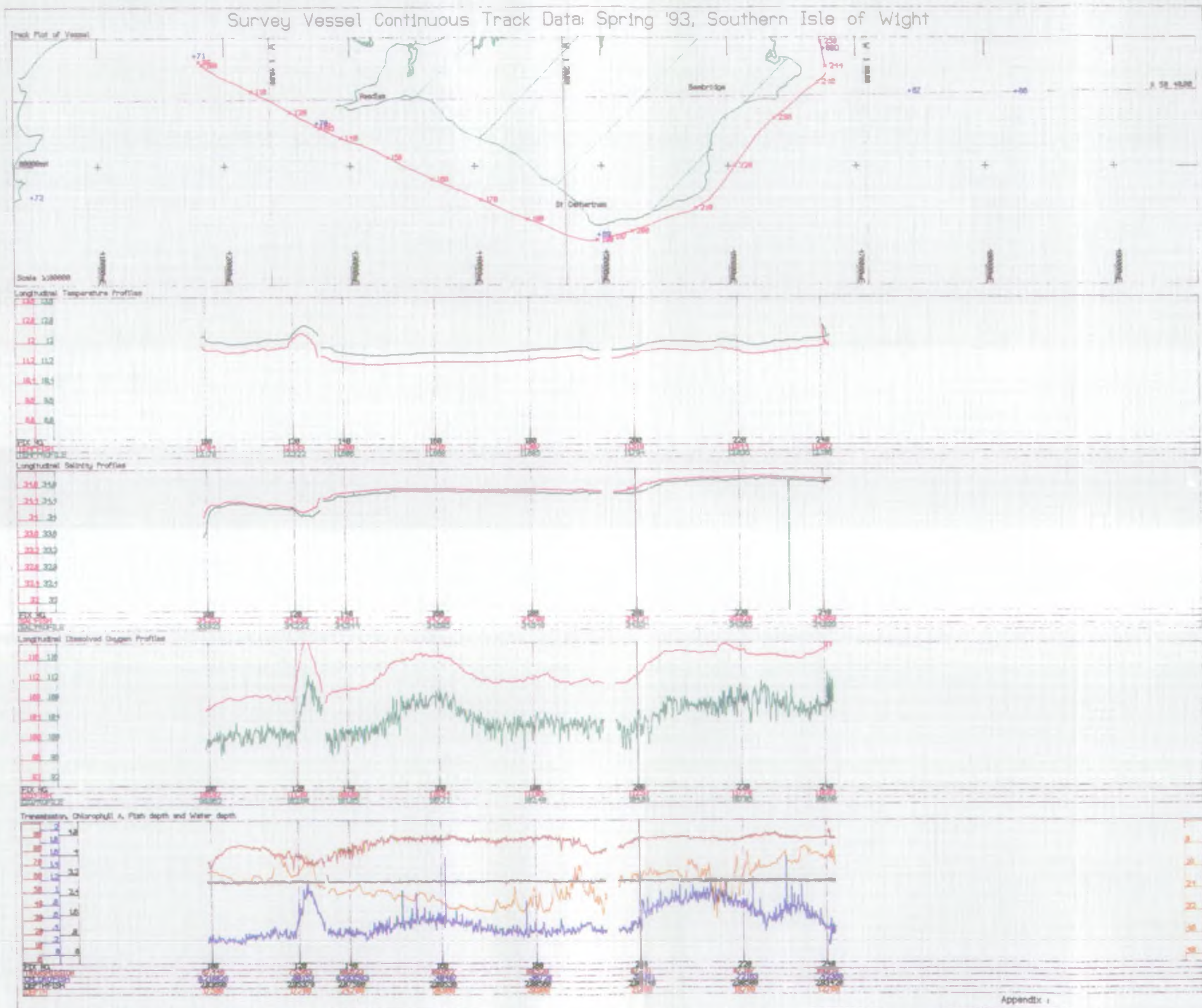
Ref2-93-1C

Marine Baseline Aug' 1993

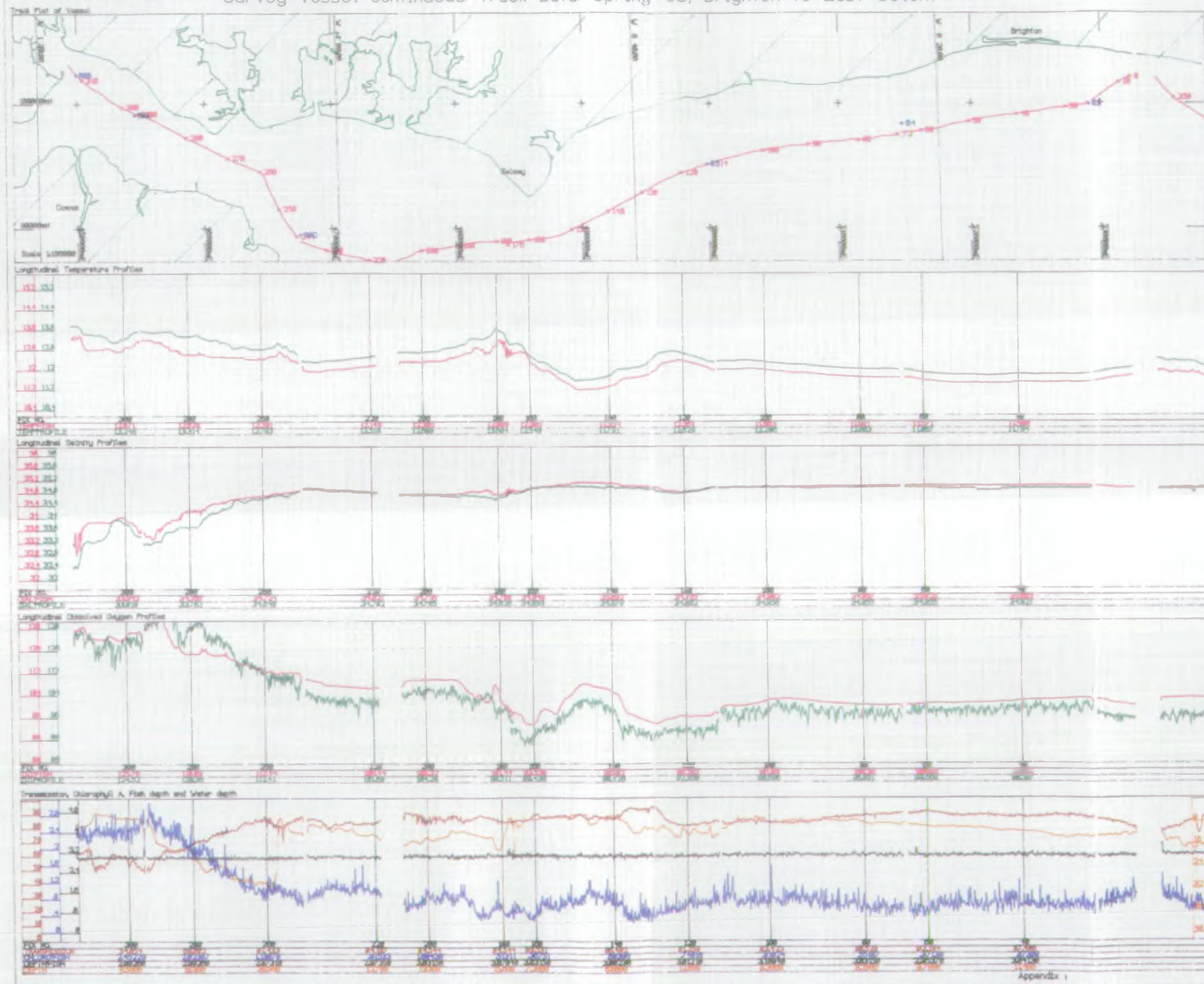
Dissolved Metals at 1m depth



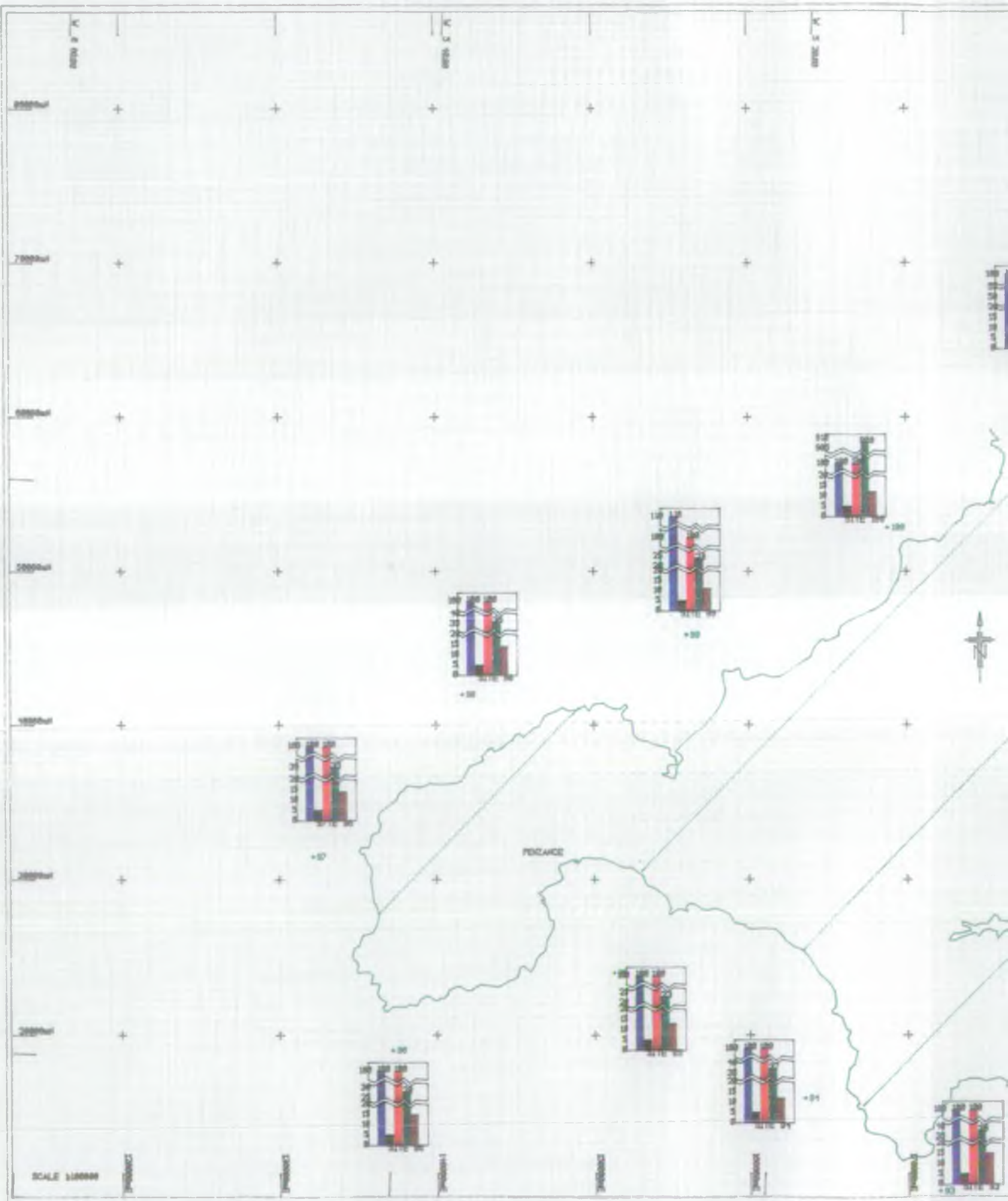
Survey Vessel Continuous Track Data: Spring '93, Southern Isle of Wight

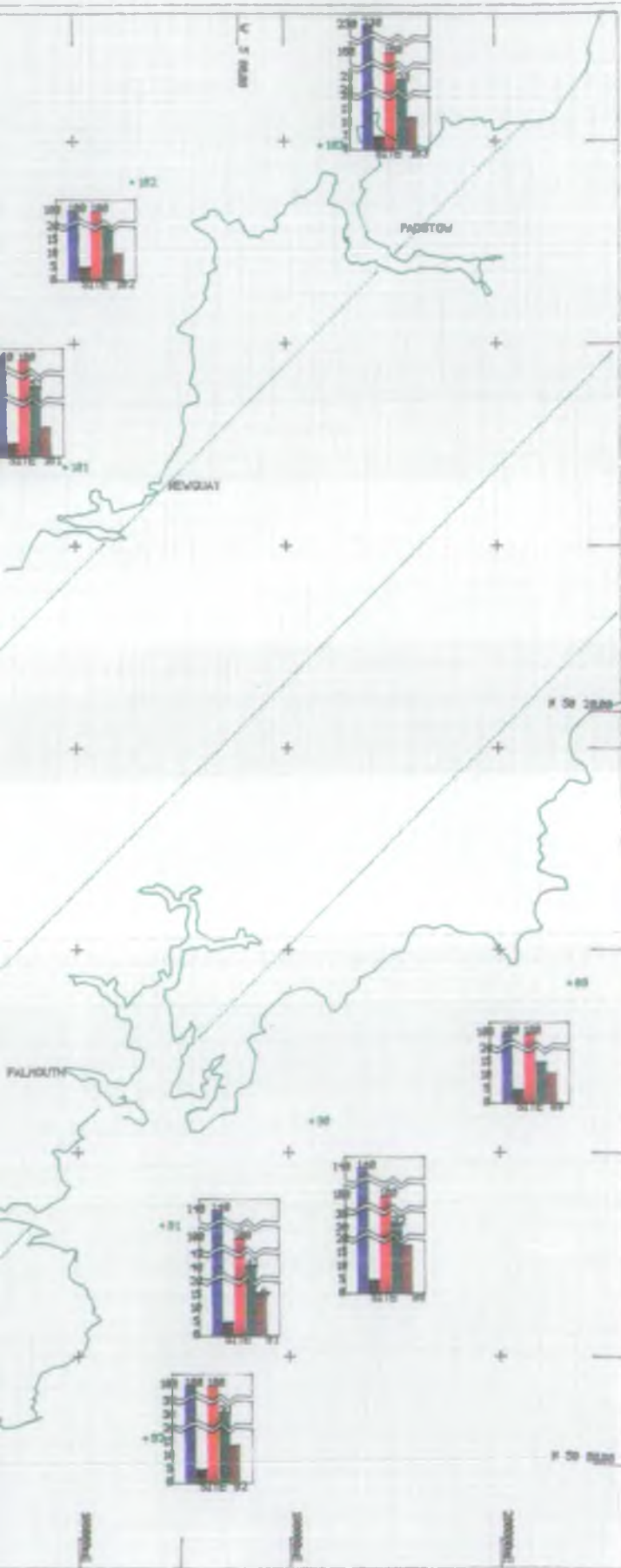


Survey Vessel Continuous Track Data: Spring '93, Brighton to East Solent



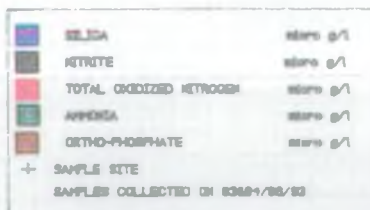
APPENDIX 32





NRA

CHEMICAL ANALYSIS
OF
SEA WATER SAMPLES
(NUTRIENTS)



SCALE 1:100000



CHEMICAL ANALYSIS OF SEA WATER SAMPLES (METALS)



	LEAD DISSOLVED	store g/
	MERCURY	store g/
	CADMIUM DISSOLVED	store g/
	COPPER DISSOLVED	store g/
	ZINC DISSOLVED	store g/
	ARSENIC DISSOLVED	store g/
	CHROMIUM DISSOLVED	store g/
	NICKEL DISSOLVED	store g/

+ Sample 1075
 Sample 1075 collected on 06-08-07, 5:17-04-08-07



SCALE 1:100000