APPENDICES TO WATER QUALITY MONITORING IN MASSACHUSETTS AND CAPE COD BAYS: APRIL AND MAY 1993

by
John R. Kelly
Carl S. Albro
John T. Hennessy

prepared by:
Battelle Ocean Sciences
397 Washington Street
Duxbury, MA 02332
(617) 934-0571

Jeff Turner
Dave Borkman
University of Massachusetts — Dartmouth

Peter Doering
Laura Reed
University of Rhode Island

prepared for:
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129
(617) 242-6000

an MWRA Miscellaneous Publication

ms-18

APPENDICES TO WATER QUALITY MONITORING IN MASSACHUSETTS AND CAPE COD BAYS: APRIL AND MAY 1993

by
John R. Kelly
Carl S. Albro
John T. Hennessy

prepared by:
Battelle Ocean Sciences
397 Washington Street
Duxbury, MA 02332
(617) 934-0571

Jeff Turner
Dave Borkman
University of Massachusetts — Dartmouth

Peter Doering
Laura Reed
University of Rhode Island

prepared for:
Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129
(617) 242-6000

an MWRA Miscellaneous Publication

ms-18

citation:

Kelly, J., C. Albro, J. Hennessy, J. Turner, D. Borkman, P. Doering, and L. Reed. 1994. **Appendices to Report No. 94-3 "Water quality monitoring in Massachusetts and Cape Cod Bays: April and May 1993."** MWRA Enviro. Quality Dept. Miscellaneous Report No. ms-18. Massachusetts Water Resources Authority, Boston, MA. 168 pp.

LIST OF APPENDICES

APPENDIX A

STATION DATA TABLES AND INSTRUMENT CALIBRATION DATA

Part 1

Physical and Chemical Parameters at Discrete Bottle Measurement Depths

Depth, Temperature (Temp), dissolved oxygen (DO), conductivity (Cond), sigma-T, fluorescence (Flu), salinity (Sal), and beam attenuation (Beam) were all obtained electronically from *in situ* readings made during the upcast of vertical profiling, during which water samples were taken by closing bottles. The table values represent a depth-averaged value bracketing the depth interval encompassed by the hydrocast bottle at closing. Dissolved oxygen and fluorescence data represent post-survey calibrated values based on wet chemistry determinations made on a subset of the bottles (Appendix A, Part 2). The other parameters rely on factory calibrations of sensors to calculate values. The dissolved inorganic nutrient data (Table A-1) and additional measurements made at a subset of stations (Table A-2) represent direct analyses of water samples from bottles.

Data from all surveys represented in this report are included in the tables. Table A-1 lists the combined farfield/nearfield survey followed by a chronological listing of the two other nearfield surveys. Table A-2 lists data for the combined survey, and the values for analytical replicates of a given bottle.

Note that % saturation for dissolved oxygen has been calculated using an algorithm given on the following page.

Saturation Values of Oxygen is Sea Water (mg/L) based on Weiss (1970)

Salinity PPT \ Temperature (°C)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0	14.60	14.20	13.81	13.45	13.09	12.76	12.44	12.13	11.83	11.55	11.28	11.02	10.77	10.53	10.29	10.07	9.86	9.65	9.45	9.26	9.08
1	14.50	14.10	13.72	13.36	13.01	12.67	12.35	12.05	11.76	11.47	11.21	10.95	10.70	10.46	10.23	10.01	9.80	9.59	9.40	9.21	9.02
2	14.40	14.01	13.63	13.27	12.92	12.59	12.27	11.97	11.68	11.40	11.13	10.88	10.63	10.40	10.17	9.95	9.74	9.54	9.34	9.15	8.97
3	14.31	13.91	13.54	13.18	12.84	12.51	12.19	11.89	11.61	11.33	11.06	10.81	10.57	10.33	10.11	9.89	9.68	9.48	9.28	9.10	8.92
4	14.21	13.82	13.45	13.09	12.75	12.43	12.11	11.82	11.53	11.26	10.99	10.74	10.50	10.27	10.04	9.83	9.62	9.42	9.23	9.04	8.86
5	14.11	13.72	13.36	13.00	12.67	12.34	12.04	11.74	11.46	11.18	10.92	10.67	10.43	10.20	9.98	9.77	9.56	9.36	9.17	8.99	8.81
6	14.02	13.63	13.27	12.92	12.58	12.26	11.96	11.66	11.38	11.11	10.86	10.61	10.37	10.14	9.92	9.71	9.50	9.31	9.12	8.94	8.76
7	13.92	13.54	13.18	12.83	12.50	12.18	11.88	11.59	11.31	11.04	10.79	10.54	10.30	10.08	9.86	9.65	9.45	9.25	9.06	8.88	8.71
8	13.82	13.45	13.09	12.75	12.42	12.10	11.80	11.51	11.24	10.97	10.72	10.47	10.24	10.01	9.80	9.59	9.39	9.20	9.01	8.83	8.66
9	13.73	13.36	13.00	12.66	12.33	12.02	11.72	11.44	11.16	10.90	10.65	10.41	10.18	9.95	9.74	9.53	9.33	9.14	8.96	8.78	8.61
10	13.64	13.27	12.91	12.58	12.25	11.94	11.65	11.36	11.09	10.83	10.58	10.34	10.11	9.89	9.68	9.47	9.28	9.09	8.90	8.73	8.56
11	13.54	13.18	12.83	12.49	12.17	11.87	11.57	11.29	11.02	10.76	10.52	10.28	10.05	9.83	9.62	9.42	9.22	9.03	8.85	8.67	8.51
12	13.45	13.09	12.74	12.41	12.09	11.79	11.50	11.22	10.95	10.70	10.45	10.21	9.99	9.77	9.56	9.36	9.16	8.98	8.80	8.62	8.46
13	13.36	13.00	12.66	12.33	12.01	11.71	11.42	11.15	10.88	10.63	10.38	10.15	9.92	9.71	9.50	9.30	9.11	8.92	8.74	8.57	8.41
14	13.27	12.91	12.57	12.24	11.93	11.63	11.35	11.07	10.81	10.56	10.32	10.09	9.86	9.65	9.44	9.24	9.05	8.87	8.69	8.52	8.36
15	13.18	12.82	12.49	12.16	11.85	11.56	11.27	11.00	10.74	10.49	10.25	10.02	9.80	9.59	9.38	9.19	9.00	8.82	8.64	8.47	8.31
16	13.09	12.74	12.40	12.08	11.77	11.48	11.20	10.93	10.67	10.42	10.19	9.96	9.74	9.53	9.33	9.13	8.94	8.76	8.59	8.42	8.26
17	13.00	12.65	12.32	12.00	11.70	11.41	11.13	10.86	10.60	10.36	10.12	9.90	9.68	9.47	9.27	9.08	8.89	8.71	8.54	8.37	8.21
18	12.91	12.57	12.24	11.92	11.62	11.33	11.05	10.79	10.54	10.29	10.06	9.83	9.62	9.41	9.21	9.02	8.84	8.66	8.49	8.32	8.16
19	12.82	12.48	12.15	11.84	11.54	11.26	10.98	10.72	10.47	10.23	9.99	9.77	9.56	9.35	9.16	8.97	8.78	8.61	8.44	8.27	8.11
20	12.74	12.40	12.07	11.76	11.47	11.18	10.91	10.65	10.40	10.16	9.93	9.71	9.50	9.30	9.10	8.91	8.73	8.55	8.39	8.22	8.07
21	12.65	12.31	11.99	11.68	11.39	11.11	10.84	10.58	10.33	10.10	9.87	9.65	9.44	9.24	9.04	8.86	8.68	8.50	8.33	8.17	8.02
22	12.56	12.23	11.91	11.61	11.32	11.04	10.77	10.51	10.27	10.03	9.81	9.59	9.38	9.18	8.99	8.80	8.62	8.45	8.29	8.13	7.97
23	12.48	12.15	11.83	11.53	11.24	10.96	10.70	10.45	10.20	9.97	9.74	9.53	9.32	9.12	8.93	8.75	8.57	8.40	8.24	8.08	7.92
24	12.39	12.07	11.75	11.45	11.17	10.89	10.63	10.38	10.14	9.90	9.68	9.47	9.26	9.07	8.88	8.69	8.52	8.35	8.19	8.03	7.88
25	12.31	11.98	11.67	11.38	11.09	10.82	10.56	10.31	10.07	9.84	9.62	9.41	9.21	9.01	8.82	8.64	8.47	8.30	8.14	7.98	7.83
26	12.23	11.90	11.59	11.30	11.02	10.75	10.49	10.24	10.01	9.78	9.56	9.35	9.15	8.96	8.77	8.59	8.42	8.25	8.09	7.93	7.78
27	12.14	11.82	11.52	11.23	10.95	10.68	10.42	10.18	9.94	9.72	9.50	9.29	9.09	8.90	8.71	8.54	8.37	8.20	8.04	7.89	7.74
28	12.06	11.74	11.44	11.15	10.87	10.61	10.35	10.11	9.88	9.65	9.44	9.23	9.04	8.84	8.66	8.48	8.31	8.15	7.99	7.84	7.69
29	11.98	11.66	11.36	11.08	10.80	10.54	10.29	10.05	9.81	9.59	9.38	9.18	8.98	8.79	8.61	8.43	8.26	8.10	7.94	7.79	7.65
30	11.90	11.58	11.29	11.00	10.73	10.47	10.22	9.98	9.75	9.53	9.32	9.12	8.92	8.74	8.55	8.38	8.21	8.05	7.90	7.75	7.60
31	11.81	11.51	11.21	10.93	10.66	10.40	10.15	9.92	9.69	9.47	9.26	9.06	8.87	8.68	8.50	8.33	8.16	8.00	7.85	7.70	7.56
32	11.73	11.43	11.14	10.86	10.59	10.33	10.09	9.85	9.63	9.41	9.20	9.00	8.81	8.63	8.45	8.28	8.11	7.96	7.80	7.66	7.51
33	11.65	11.35	11.06	10.78	10.52	10.26	10.02	9.79	9.56	9.35	9.14	8.95	8.76	8.57	8.40	8.23	8.07	7.91	7.76	7.61	7.47
34	11.58	11.27	10.99	10.71	10.45	10.20	9.96	9.73	9.50	9.29	9.09	8.89	8.70	8.52	8.35	8.18	8.02	7.86	7.71	7.57	7.43
35	11.50	11.20	10.91	10.64	10.38	10.13	9.89	9.66	9.44	9.23	9.03	8.83	8.65	8.47	8.29	8.13	7.97	7.81	7.66	7.52	7.38
36	11.42	11.12	10.84	10.57	10.31	10.06	9.83	9.60	9.38	9.17	8.97	8.78	8.59	8.42	8.24	8.08	7.92	7.77	7.62	7.48	7.34
37	11.34	11.05	10.77	10.50	10.24	10.00	9.76	9.54	9.32	9.11	8.92	8.72	8.54	8.36	8.19	8.03	7.87	7.72	7.57	7.43	7.29
38	11.26	10.97	10.70	10.43	10.18	9.93	9.70	9.48	9.26	9.06	8.86	8.67	8.49	8.31	8.14	7.98	7.82	7.67	7.53	7.39	7.25
39	11.19	10.90	10.62	10.36	10.11	9.87	9.64	9.41	9.20	9.00	8.80	8.61	8.43	8.26	8.09	7.93	7.78	7.63	7.48	7.34	7.21
40	11.11	10.82	10.55	10.29	10.04	9.80	9.57	9.35	9.14	8.94	8.75	8.56	8.38	8.21	8.04	7.88	7.73	7.58	7.44	7.30	7.17

OXsat=1.429*EXP(-173.4292 +249.6339*(100/(273.15+T)) +143.3483*LN((T+273.15)/100)
-21.8492*((T+273.15)/100) +Salinity*(-0.033096 +0.014259*((T+273.15)/100) -0.0017*((T+273.15)/100)^2))

% Saturation =100*DO/OXsat

Reference:

Weiss, R.F., 1970: The Solubility of Nitrogen, Oxygen, and Argon in Water and Seawater. Deep-Sea Res., 17, 721-735

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9304	F01P	04-08-93	0907	2.40	W93040401	3.50	31.60	11.82	110	29.27	25.13	0.94	0.87	1.62	0.04	0.03	0.31	3.58
W9304	F01P	04-08-93	0906	6.30	W93040400	3.33	31.62	11.95	111	29.15	25.16	1.62	0.90	2.02	0.03	0.02	0.31	3.49
W9304	F01P	04-08-93	0905	12.20	W93040399	3.28	31.63	12.10	112	29.12	25.17	1.31	0.90	1.73	0.01	0.01	0.28	3.27
W9304	F01P	04-08-93	0904	17.20	W93040398	3.13	31.67	12.03	111	29.04	25.22	1.57	0.93	1.14	0.11	0.24	0.24	3.39
W9304	F01P	04-08-93	0901	22.50	W93040397	2.64	31.74	11.95	109	28.70	25.32	1.36	1.02	3.10	0.03	0.01	0.30	3.13
W9304	F02P	04-08-93	0741	2.10	W93040379	3.51	31.45	11.91	111	29.16	25.01	1.33	1.03	0.17	0.25	4.37	0.32	4.99
W9304	F02P	04-08-93	0741	9.10	W93040378	3.48	31.46	11.92	111	29.14	25.02	2.33	1.03	3.91	0.12	0.00	0.35	4.97
W9304	F02P	04-08-93	0740	14.00	W93040377	3.44	31.45	11.89	110	29.10	25.02	2.51	1.03	2.22	0.05	2.19	0.39	5.41
W9304	F02P	04-08-93	0738	17.70	W93040376	2.94	31.60	11.78	108	28.83	25.18	1.43	0.94	3.56	0.20	0.46	0.50	6.48
W9304	F02P	04-08-93	0737	26.70	W93040375	2.46	31.78	11.81	107	28.59	25.36	0.91	0.73	1.17	0.10	3.78	0.50	7.03
W9304	F03	04-08-93	1018	2.30	W93040417	3.64	30.57	12.18	113	28.52	24.30	0.71	0.98	1.74	0.02	0.03	0.20	3.17
W9304	F03	04-08-93	1017	4.90	W93040416	3.51	30.62	12.24	113	28.46	24.35	1.42	1.09	1.72	0.01	0.01	0.21	3.18
W9304	F03	04-08-93	1016	8.40	W93040415	3.62	30.61	12.12	112	28.54	24.33	2.18	1.19	1.90	0.02	0.02	0.23	3.26
W9304	F03	04-08-93	1015	11.10	W93040414	3.74	30.71	11.93	111	28.72	24.40	2.13	1.33	2.45	0.03	0.83	0.26	3.44
W9304	F03	04-08-93	1014	13.80	W93040413	3.73	30.72	11.85	110	28.72	24.41	2.09	1.34	2.54	0.02	0.04	0.31	3.45
W9304	F04	04-07-93	1556	2.10	W93040350	3.37	31.67	11.66	108	29.22	25.20	0.89	0.84	1.99	0.02	0.01	0.32	3.80
W9304	F04	04-07-93	1555	9.40	W93040349	2.63	31.78	11.52	105	28.72	25.35	1.44	0.79	4.08	0.04	0.04	0.41	5.08
W9304	F04	04-07-93	1553	19.80	W93040348	2.29	31.96	11.64	105	28.59	25.52	1.34	0.71	0.06	0.58	0.88	0.25	4.81
W9304	F04	04-07-93	1552	36.30	W93040347	2.18	32.00	11.64	105	28.54	25.56	1.03	0.79	3.81	0.02	0.02	0.44	5.45
W9304	F04	04-07-93	1549	56.80	W93040346	2.13	32.05	11.79	106	28.55	25.60	1.53	0.98	1.65	0.14	5.68	0.72	5.70
W9304	F05	04-07-93	1049	2.40	W93040278	3.90	30.01	11.73	109	28.25	23.83	1.24	1.36	3.09	0.22	0.68	0.31	5.33
W9304	F05	04-07-93	1048	4.70	W93040277	3.84	30.01	11.72	109	28.20	23.83	1.56	1.36	4.54	0.21	1.14	0.26	4.66
W9304	F05	04-07-93	1047	8.50	W93040276	3.70	30.04	11.75	109	28.12	23.87	2.10	1.37	2.78	0.19	0.55	0.27	4.73
W9304	F05	04-07-93	1046	14.90	W93040275	3.50	30.15	11.78	109	28.06	23.97	1.89	1.28	2.56	0.22	0.46	0.34	4.62
W9304	F05	04-07-93	1045	19.30	W93040274	3.05	30.61	11.60	106	28.09	24.38	1.81	1.41	0.86	0.03	4.03	0.32	4.55
W9304	F06	04-07-93	1134	2.40	W93040291	3.22	30.72	12.02	110	28.31	24.45	0.79	0.93	0.23	0.03	0.01	0.07	5.07
W9304	F06	04-07-93	1133	7.80	W93040290	2.50	30.97	11.60	105	27.95	24.71	1.31	0.99	2.41	0.03	0.00	0.30	4.32
W9304	F06	04-07-93	1132	15.60	W93040289	2.06	31.58	11.80	106	28.10	25.23	1.39	0.72	1.49	0.03	0.01	0.30	4.08
W9304	F06	04-07-93	1131	25.80	W93040288	2.01	31.96	11.73	105	28.37	25.54	1.12	0.71	2.98	0.03	0.00	0.44	4.39
W9304	F06	04-07-93	1130	34.30	W93040287	1.98	32.09	11.60	104	28.45	25.65	1.19	0.76	3.59	0.08	0.23	0.49	5.86
W9304	F07	04-07-93	1216	2.30	W93040304	3.42	31.03	12.09	112	28.73	24.68	1.17	0.88	0.42	0.01	0.03	0.17	3.02
W9304	F07	04-07-93	1215	7.50	W93040303	2.89	31.34	12.09	111	28.56	24.97	1.97	0.87	0.75	0.02	0.01	0.18	2.93
W9304	F07	04-07-93	1213	19.50	W93040302	2.07	31.94	11.96	108	28.39	25.52	1.76	0.69	0.49	0.02	0.00	0.34	2.01
W9304	F07	04-07-93	1212	27.60	W93040301	2.10	32.15	11.73	106	28.59	25.68	1.36	0.73	1.65	0.02	0.00	0.36	3.41
W9304	F07	04-07-93	1207	52.00	W93040300	1.99	32.37	11.18	101	28.69	25.87	1.07	1.05	4.38	0.19	0.93	0.62	10.91
W9304	F08	04-07-93	1312	2.60	W93040323	3.08	32.15	12.60	116	29.39	25.60	0.95	0.83	0.08	0.02	0.01	0.20	1.17
W9304	F08	04-07-93	1311	13.70	W93040322	2.32	32.17	12.11	110	28.78	25.68	2.35	0.75	1.43	0.01	0.01	0.30	2.16
W9304	F08	04-07-93	1309	30.00	W93040321	2.27	32.21	11.70	106	28.78	25.72	1.79	0.73	e	0.00	0.04	0.41	5.89
W9304	F08	04-07-93	1307	59.60	W93040320	2.06	32.39	10.96	99	28.77	25.88	0.93	1.01	3.17	0.17	1.49	0.64	10.77
W9304	F08	04-07-93	1306	80.60	W93040319	2.07	32.40	10.98	99	28.80	25.88	1.30	1.17	3.32	0.08	0.24	0.64	11.90
W9304	F09	04-08-93	1225	1.70	W93040432	4.15	29.98	12.53	117	28.41	23.78	1.20	1.10	1.76	0.02	0.00	0.12	3.45

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9304	F09	04-08-93	1225	3.40	W93040431	3.62	30.12	12.70	117	28.12	23.94	1.15	1.13	1.76	0.01	0.02	0.14	3.14
W9304	F09	04-08-93	1224	10.70	W93040430	3.21	30.46	12.69	116	28.09	24.25	4.40	1.06	0.87	0.01	0.01	0.07	2.31
W9304	F09	04-08-93	1223	13.70	W93040429	3.19	30.52	12.42	114	28.12	24.30	3.45	1.04	0.19	0.01	0.01	0.08	2.24
W9304	F09	04-08-93	1221	18.30	W93040428	2.77	30.89	12.01	109	28.10	24.62	2.07	0.92	0.61	0.01	0.02	0.12	2.94
W9304	F10	04-08-93	1259	2.30	W93040447	3.79	30.52	12.38	115	28.60	24.25	1.45	1.02	0.47	0.11	1.43	0.19	2.89
W9304	F10	04-08-93	1258	10.90	W93040446	1.99	31.66	11.69	105	28.10	25.30	1.32	0.70	2.86	0.03	0.02	0.38	3.95
W9304	F10	04-08-93	1257	19.20	W93040445	1.91	31.97	11.39	102	28.28	25.55	1.18	0.65	2.65	0.03	0.00	0.46	4.41
W9304	F10	04-08-93	1256	25.00	W93040444	1.86	32.06	11.40	102	28.32	25.62	1.01	0.65	0.23	1.21	1.47	0.30	4.19
W9304	F10	04-08-93	1255	33.30	W93040443	1.85	32.12	11.40	102	28.37	25.68	0.91	0.65	3.20	0.05	0.00	0.48	5.01
W9304	F11	04-08-93	1338	2.10	W93040465	2.97	32.09	12.46	115	29.25	25.57	0.79	0.79	0.14	0.03	-0.03	0.20	2.06
W9304	F11	04-08-93	1336	12.00	W93040463	2.42	32.21	12.30	112	28.89	25.70	3.80	0.85	1.23	0.03	-0.02	0.28	2.23
W9304	F11	04-08-93	1335	25.70	W93040462	2.04	32.23	11.55	104	28.61	25.75	1.49	0.81	3.04	0.08	0.02	0.37	4.23
W9304	F11	04-08-93	1334	38.10	W93040461	2.07	32.25	11.46	103	28.65	25.76	1.38	0.75	3.39	0.02	0.00	0.44	4.38
W9304	F11	04-08-93	1333	51.00	W93040460	2.05	32.30	11.32	102	28.68	25.80	1.06	1.04	1.03	0.14	2.77	0.45	7.86
W9304	F12	04-07-93	1353	2.50	W93040335	3.16	31.54	12.29	113	28.94	25.11	0.41	0.78	0.40	0.14	1.09	0.32	1.83
W9304	F12	04-07-93	1353	11.70	W93040334	2.47	31.91	12.06	110	28.69	25.46	2.09	0.85	1.15	0.07	-0.05	0.24	2.29
W9304	F12	04-07-93	1352	32.30	W93040333	2.45	32.12	11.73	107	28.86	25.63	1.78	0.78	1.54	0.05	-0.04	0.34	3.39
W9304	F12	04-07-93	1349	60.90	W93040332	2.19	32.32	11.42	103	28.82	25.81	1.69	0.81	3.65	0.06	-0.01	0.45	6.16
W9304	F12	04-07-93	1346	84.50	W93040330	2.08	32.39	11.03	100	28.79	25.88	1.10	1.12	0.41	1.12	1.30	0.52	10.94
W9304	F13P	04-07-93	0936	2.10	W93040256	3.63	29.72	11.61	107	27.80	23.62	1.35	1.37	1.57	0.06	4.81	0.29	6.23
W9304	F13P	04-07-93	0935	5.70	W93040255	3.53	29.76	11.71	108	27.75	23.66	1.34	1.31	2.80	0.27	0.19	0.26	6.32
W9304	F13P	04-07-93	0933	11.30	W93040254	2.93	31.05	12.60	115	28.36	24.74	2.86	1.01	0.14	0.05	0.02	0.10	2.22
W9304	F13P	04-07-93	0931	17.00	W93040253	2.14	31.26	11.78	106	27.90	24.96	1.25	0.85	2.03	0.05	0.02	0.40	4.49
W9304	F13P	04-07-93	0930	24.80	W93040252	2.05	31.56	11.69	105	28.07	25.21	1.14	1.09	2.45	0.05	0.01	0.39	4.56
W9304	F14	04-06-93	1020	2.00	W93040093	3.32	29.80	11.70	107	27.62	23.71	1.16	1.19	1.91	0.07	1.61	0.12	6.52
W9304	F14	04-06-93	1019	4.60	W93040092	3.05	29.90	11.73	107	27.49	23.81	1.44	1.24	2.06	0.15	2.46	0.22	6.51
W9304	F14	04-06-93	1018	7.30	W93040091	2.86	30.07	11.68	106	27.49	23.96	2.09	1.24	4.15	0.23	0.02	0.32	6.28
W9304	F14	04-06-93	1017	11.30	W93040090	2.60	30.57	11.61	105	27.70	24.39	2.12	1.35	3.27	0.24	-0.07	0.16	5.11
W9304	F14	04-06-93	1015	14.60	W93040088	2.32	30.83	11.79	106	27.69	24.61	1.86	1.27	3.03	0.19	1.96	0.15	4.69
W9304	F15	04-06-93	1106	2.30	W93040106	2.66	31.51	12.78	116	28.51	25.12	1.56	0.98	0.06	0.03	-0.03	0.14	5.24
W9304	F15	04-06-93	1105	8.70	W93040105	2.07	31.69	11.95	107	28.19	25.31	2.25	0.87	2.46	0.05	-0.04	0.29	3.33
W9304	F15	04-06-93	1104	14.80	W93040104	1.83	31.92	11.71	105	28.19	25.52	0.87	0.65	1.14	0.33	0.32	0.27	4.25
W9304	F15	04-06-93	1102	26.60	W93040103	1.76	32.11	11.53	103	28.28	25.67	1.01	0.69	2.41	0.06	-0.06	0.37	6.15
W9304	F15	04-06-93	1100	36.30	W93040102	1.79	32.19	11.24	101	28.37	25.73	1.13	0.87	1.62	0.06	-0.06	0.36	6.03
W9304	F16	04-06-93	1157	2.10	W93040119	2.52	32.02	12.14	110	28.82	25.55	0.97	0.74	0.70	0.00	0.01	0.28	3.02
W9304	F16	04-06-93	1156	7.50	W93040118	2.30	32.01	12.12	110	28.63	25.56	1.61	0.74	0.64	0.01	-0.01	0.27	3.09
W9304	F16	04-06-93	1155	17.00	W93040117	1.92	32.09	11.97	107	28.39	25.64	1.05	0.69	2.39	0.03	-0.03	0.42	3.28
W9304	F16	04-06-93	1153	32.90	W93040116	1.84	32.12	11.56	103	28.36	25.68	1.76	0.67	2.06	0.07	-0.02	0.39	3.91
W9304	F16	04-06-93	1150	53.30	W93040115	1.90	32.27	11.09	100	28.54	25.79	1.49	1.58	2.00	0.17	6.48	0.77	8.96
W9304	F17	04-06-93	1255	2.40	W93040133	3.09	30.10	12.21	111	27.69	23.97	0.99	1.04	e	e	e	e	e
W9304	F17	04-06-93	1254	13.30	W93040131	2.48	32.10	11.93	109	28.85	25.61	3.02	0.84	e	e	e	e	e

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)		NO2 (uM)		NO3 (uM)		PO4 (uM)		SIO4 (uM)	
W9304	F17	04-06-93	1253	36.90	W93040130	2.21	32.25	11.60	105	28.77	25.76	1.95	0.79		e		e		e		e		e
W9304	F17	04-06-93	1250	56.30	W93040129	2.20	32.26	11.57	105	28.78	25.77	1.85	0.78		e		e		e		e		e
W9304	F17	04-06-93	1249	66.00	W93040128	1.96	32.30	11.24	101	28.61	25.81	1.51	0.87		e		e		e		e		e
W9304	F18	04-06-93	1635	2.00	W93040195	3.37	30.19	12.33	113	27.98	24.02	1.52	1.11	2.19		0.07		1.36		0.08		5.01	
W9304	F18	04-06-93	1634	6.90	W93040194	3.23	30.31	12.29	113	27.98	24.12	2.74	1.15	0.85		0.00		0.01		0.18		4.60	
W9304	F18	04-06-93	1632	10.30	W93040193	3.18	30.36	11.96	109	27.98	24.17	2.13	1.17	0.12		0.00		0.00		0.04		4.98	
W9304	F18	04-06-93	1631	15.40	W93040192	2.71	30.81	11.72	106	27.99	24.57	2.43	1.63	1.67		0.00		0.00		0.28		4.96	
W9304	F18	04-06-93	1630	18.60	W93040190	2.42	30.96	11.73	106	27.88	24.71	1.46	1.20	2.20		0.00		0.00		0.33		4.90	
W9304	F19	04-06-93	1342	3.90	W93040146	3.43	30.03	12.12	111	27.89	23.88	0.95	1.02		e		e		e		e		e
W9304	F19	04-06-93	1340	22.70	W93040145	2.30	31.92	12.38	112	28.57	25.48	2.96	0.94		e		e		e		e		e
W9304	F19	04-06-93	1338	41.40	W93040144	2.25	32.16	11.79	107	28.73	25.68	1.96	0.82		e		e		e		e		e
W9304	F19	04-06-93	1337	61.50	W93040143	2.04	32.22	11.60	104	28.61	25.74	1.22	0.75		e		e		e		e		e
W9304	F19	04-06-93	1336	74.60	W93040142	1.98	32.27	11.39	102	28.61	25.79	1.85	1.45		e		e		e		e		e
W9304	F20	04-06-93	1540	2.20	W93040181	3.83	30.12	12.39	115	28.28	23.92	1.13	1.09	0.13		0.00		0.00		0.05		8.49	
W9304	F20	04-06-93	1539	8.00	W93040180	3.24	30.19	12.29	113	27.88	24.03	2.17	1.11	1.54		0.00		0.00		0.15		4.80	
W9304	F20	04-06-93	1538	13.90	W93040179	2.90	30.23	12.15	110	27.66	24.09	2.25	1.09	0.45		0.00		0.00		0.08		4.92	
W9304	F20	04-06-93	1537	21.20	W93040178	1.99	31.54	11.75	105	28.01	25.20	1.29	0.75	1.91		0.09		1.58		0.41		5.22	
W9304	F20	04-06-93	1536	30.40	W93040177	1.93	31.83	11.85	106	28.19	25.44	1.00	0.73	1.45		0.10		4.18		0.61		4.96	
W9304	F21	04-06-93	1506	2.40	W93040170	3.54	29.97	12.23	113	27.93	23.82	1.14	1.14	1.71		0.00		0.01		0.18		5.32	
W9304	F21	04-06-93	1505	15.40	W93040169	2.55	30.56	12.42	112	27.65	24.37	2.13	1.10	0.94		0.00		0.01		0.20		3.95	
W9304	F21	04-06-93	1504	30.20	W93040168	2.03	31.97	11.81	106	28.39	25.54	1.46	0.79	2.17		0.00		0.02		0.39		3.20	
W9304	F21	04-06-93	1503	38.30	W93040167	1.83	32.03	11.76	105	28.29	25.61	0.87	0.73	3.28		0.00		0.02		0.46		4.99	
W9304	F21	04-06-93	1500	50.40	W93040166	1.81	32.11	11.74	105	28.34	25.67	0.99	0.86	1.77		0.13		4.88		0.66		5.74	
W9304	F22	04-06-93	1422	2.50	W93040159	3.59	29.72	12.17	112	27.76	23.62	0.89	0.99	1.70		0.01		-0.01		0.19		6.88	
W9304	F22	04-06-93	1421	13.20	W93040158	2.43	30.73	12.22	110	27.70	24.52	2.32	1.01	1.96		0.00		0.01		0.20		4.44	
W9304	F22	04-06-93	1420	41.00	W93040157	2.15	32.15	11.76	106	28.64	25.67	1.76	0.77		e		e		e		e		e
W9304	F22	04-06-93	1419	58.30	W93040156	2.02	32.18	11.69	105	28.56	25.71	1.63	0.75		e		e		e		e		e
W9304	F22	04-06-93	1418	75.00	W93040155	1.92	32.26	11.32	102	28.55	25.79	3.38	4.42	2.96		0.00		0.88		0.44		8.88	
W9304	F23P	04-06-93	0556	2.20	W93040022	3.56	27.99	11.34	103	26.27	22.25	2.52	2.11	4.14		0.35		4.98		0.40		12.73	
W9304	F23P	04-06-93	0556	4.20	W93040021	3.50	28.53	11.36	104	26.68	22.69	2.71	2.06	4.62		0.30		4.35		0.41		11.38	
W9304	F23P	04-06-93	0555	10.40	W93040020	3.28	29.29	11.43	104	27.16	23.31	2.53	1.91	3.29		0.31		3.96		0.38		8.51	
W9304	F23P	04-06-93	0553	14.80	W93040019	3.27	29.44	11.47	105	27.28	23.43	2.38	1.98	2.90		0.33		2.78		0.24		7.93	
W9304	F23P	04-06-93	0550	21.20	W93040018	3.15	29.91	11.56	105	27.59	23.81	2.71	1.91	3.10		0.27		2.23		0.32		7.27	
W9304	F24	04-06-93	0645	2.10	W93040036	3.22	29.31	11.53	105	27.13	23.33	2.06	1.68	5.70		0.23		1.12		0.41		8.53	
W9304	F24	04-06-93	0644	5.80	W93040035	2.96	30.01	11.71	106	27.52	23.91	2.17	1.48	7.18		0.23		0.89		0.37		6.63	
W9304	F24	04-06-93	0643	11.70	W93040034	2.59	30.31	12.12	109	27.48	24.18	2.20	1.26	2.60		0.00		0.01		0.23		5.33	
W9304	F24	04-06-93	0642	14.90	W93040033	2.44	30.52	12.09	109	27.54	24.36	2.18	1.15	2.11		0.01		-0.01		0.24		5.16	
W9304	F24	04-06-93	0641	16.80	W93040032	2.39	30.68	11.96	108	27.63	24.49	2.01	1.08	2.93		0.00		0.00		0.23		5.08	
W9304	F25	04-08-93	1539	2.40	W93040483	4.15	29.44	11.41	106	27.95	23.35	1.62	1.50	1.85		0.22		4.58		0.33		6.69	
W9304	F25	04-08-93	1538	5.00	W93040482	4.06	29.53	11.44	106	27.96	23.43	1.93	1.52	3.24		0.26		2.47		0.29		6.58	
W9304	F25	04-08-93	1537	7.80	W93040481	3.92	29.63	11.44	106	27.94	23.53	1.88	1.47	3.66		0.27		1.96		0.38		6.40	

00004

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9304	F25	04-08-93	1534	10.80	W93040479	3.61	29.88	11.58	107	27.91	23.75	1.87	1.36	2.41	0.21	3.18	0.35	5.92
W9304	F25	04-08-93	1533	14.20	W93040478	3.46	30.01	11.73	108	27.91	23.87	1.64	1.22	4.04	0.21	1.87	0.36	5.63
W9304	N01P	04-07-93	0624	2.40	W93040212	2.99	30.22	12.39	113	27.71	24.07	2.72	1.07	0.08	0.02	0.03	0.07	3.77
W9304	N01P	04-07-93	0623	5.80	W93040211	2.97	30.22	12.43	113	27.70	24.08	2.64	1.06	1.06	0.04	0.03	0.16	3.83
W9304	N01P	04-07-93	0620	10.30	W93040210	3.12	30.27	12.23	112	27.86	24.10	2.39	1.13	0.90	0.03	-0.02	0.16	8.35
W9304	N01P	04-07-93	0619	18.60	W93040209	2.43	30.78	12.01	108	27.74	24.56	1.96	0.96	1.96	0.03	-0.01	0.30	4.32
W9304	N01P	04-07-93	0617	25.90	W93040208	1.96	31.68	11.89	106	28.09	25.31	0.94	0.74	0.43	0.08	2.07	0.32	4.92
W9304	N01P	04-09-93	0745	2.30	W93040537	4.01	30.06	12.63	118	28.38	23.86	1.86	0.94	0.00	0.00	0.00	0.08	2.85
W9304	N01P	04-09-93	0744	5.50	W93040536	3.96	30.07	12.56	117	28.34	23.87	2.88	0.96	0.00	0.01	-0.01	0.09	2.80
W9304	N01P	04-09-93	0743	11.10	W93040535	3.30	30.44	12.18	112	28.14	24.22	3.05	1.03	0.03	0.01	-0.01	0.10	2.25
W9304	N01P	04-09-93	0742	18.60	W93040534	2.24	31.29	11.48	103	28.01	24.99	1.18	0.82	5.90 s	0.34 s	1.28 s	0.06 s	5.42 s
W9304	N01P	04-09-93	0741	26.30	W93040533	1.89	31.82	11.52	103	28.16	25.43	1.02	0.84	3.12	0.00	0.02	0.41	4.93
W9304	N02	04-09-93	0813	2.20	W93040548	3.72	30.39	12.22	113	28.42	24.14	1.31	0.78	0.39	0.02	-0.02	0.17	3.29
W9304	N02	04-09-93	0812	8.70	W93040547	3.22	30.76	12.13	111	28.35	24.49	1.64	0.79	0.28	0.01	-0.01	0.21	2.90
W9304	N02	04-09-93	0811	18.30	W93040546	2.91	31.10	12.18	111	28.38	24.78	1.91	0.79	0.70	0.02	-0.02	0.22	2.26
W9304	N02	04-09-93	0810	24.40	W93040545	2.22	31.62	12.11	109	28.25	25.25	2.45	0.80	0.47	0.00	0.00	0.21	1.20
W9304	N02	04-09-93	0809	34.70	W93040544	1.80	32.01	11.51	103	28.24	25.59	1.01	0.73	1.32	0.13	1.21	0.38	4.51
W9304	N03	04-09-93	0848	2.50	W93040559	3.57	30.21	12.27	113	28.16	24.02	1.15	0.79	0.29	0.00	0.00	0.20	3.49
W9304	N03	04-09-93	0847	10.60	W93040558	3.04	31.00	12.29	113	28.41	24.69	1.84	0.78	0.45	0.00	0.00	0.24	2.38
W9304	N03	04-09-93	0846	17.70	W93040557	2.85	31.39	12.25	112	28.58	25.02	2.20	0.80	0.41	0.00	0.00	0.24	1.90
W9304	N03	04-09-93	0844	26.40	W93040556	2.58	31.82	12.21	111	28.72	25.38	2.01	0.81	0.08	0.00	0.00	0.24	1.28
W9304	N03	04-09-93	0843	41.60	W93040555	1.88	32.07	11.84	106	28.35	25.63	1.00	0.75	2.36	0.01	-0.01	0.50	4.14
W9304	N04P	04-07-93	0727	2.70	W93040226	3.11	30.02	12.10	110	27.64	23.91	1.23	0.96	e	0.03	-0.01	0.12	4.91
W9304	N04P	04-07-93	0726	12.90	W93040225	2.48	31.08	12.42	112	28.03	24.80	2.87	0.99	0.76	0.01	0.03	0.19	2.52
W9304	N04P	04-07-93	0724	24.10	W93040224	2.52	31.42	12.69	115	28.34	25.07	3.28	1.01	0.02	0.00	0.02	0.10	1.49
W9304	N04P	04-07-93	0723	31.80	W93040223	1.79	32.00	11.83	106	28.22	25.58	0.98	0.64	1.78	0.01	0.00	0.41	3.67
W9304	N04P	04-07-93	0721	45.60	W93040222	1.76	32.07	11.90	106	28.25	25.64	0.82	0.62	2.39	0.02	0.03	0.45	4.43
W9304	N04P	04-09-93	0921	2.30	W93040570	3.90	28.99	12.26	113	27.37	23.02	1.23	0.84	0.07	0.00	0.00	0.07	5.53
W9304	N04P	04-09-93	0919	6.10	W93040569	3.14	30.40	12.55	115	27.98	24.20	1.76	0.82	0.65	0.01	0.00	0.17	2.90
W9304	N04P	04-09-93	0918	11.50	W93040568	3.36	31.13	12.44	115	28.77	24.77	1.61	0.75	0.03	0.00	0.00	0.09	2.14
W9304	N04P	04-09-93	0916	23.30	W93040567	2.58	31.71	12.03	109	28.62	25.29	1.99	0.81	0.52	0.00	0.00	0.21	1.48
W9304	N04P	04-09-93	0914	44.40	W93040566	1.88	32.09	11.47	103	28.38	25.65	1.04	0.72	2.56	0.00	0.00	0.47	3.99
W9304	N05	04-09-93	0957	2.20	W93040587	4.26	29.75	11.43	107	28.30	23.59	0.86	0.79	0.38	0.00	0.00	0.13	5.57
W9304	N05	04-09-93	0949	9.00	W93040580	3.07	31.05	12.31	113	28.46	24.73	1.92	0.79	0.03	0.00	0.02	0.19	2.50
W9304	N05	04-09-93	0948	15.10	W93040579	2.93	31.82	12.30	113	29.00	25.36	2.82	0.79	0.17	0.01	0.09	0.20	1.45
W9304	N05	04-09-93	0947	23.40	W93040578	2.40	32.07	11.75	107	28.77	25.60	2.70	0.78	0.83	0.00	0.01	0.35	1.91
W9304	N05	04-09-93	0945	46.40	W93040577	1.96	32.19	11.27	101	28.52	25.72	1.58	0.92	0.32	0.00	2.30	0.36	5.33
W9304	N06	04-09-93	1028	2.20	W93040602	3.38	31.58	12.73	118	29.15	25.12	1.47	0.74	0.12	0.02	0.05	0.21	1.85
W9304	N06	04-09-93	1027	6.30	W93040601	2.96	31.78	13.04	120	28.98	25.32	2.87	0.86	0.16	0.01	0.01	0.21	1.32
W9304	N06	04-09-93	1025	22.40	W93040600	1.96	32.12	11.87	107	28.45	25.67	1.84	0.67	2.75	0.02	0.05	0.35	2.38
W9304	N06	04-09-93	1024	38.60	W93040599	1.89	32.20	11.42	102	28.46	25.74	1.31	0.78	3.92	0.03	0.01	0.57	5.46

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9304	N06	04-09-93	1023	47.90	W93040598	1.91	32.23	11.32	102	28.51	25.76	1.38	1.01	3.10	0.01	0.01	0.50	6.98
W9304	N07P	04-07-93	0832	2.30	W93040242	2.48	31.92	12.29	112	28.71	25.47	0.93	0.91	0.48	0.02	0.00	0.13	2.48
W9304	N07P	04-07-93	0831	11.10	W93040241	2.35	31.99	12.11	110	28.65	25.53	1.78	0.74	1.98	0.01	0.03	0.32	2.75
W9304	N07P	04-07-93	0830	20.40	W93040240	1.81	32.10	11.75	105	28.32	25.67	1.01	0.64	0.05	0.04	0.09	0.25	4.10
W9304	N07P	04-07-93	0828	32.90	W93040239	1.85	32.17	11.73	105	28.40	25.71	1.10	0.79	3.03	0.10	0.01	0.48	5.17
W9304	N07P	04-07-93	0827	45.30	W93040238	1.85	32.17	11.69	105	28.41	25.71	1.13	0.81	3.16	0.09	-0.01	0.41	5.38
W9304	N07P	04-09-93	1057	2.70	W93040619	3.56	31.88	12.51	117	29.56	25.35	0.99	0.67	0.23	0.00	0.12	0.26	1.66
W9304	N07P	04-09-93	1056	15.60	W93040618	2.57	32.02	12.37	113	28.86	25.54	3.55	0.81	0.13	0.00	0.02	0.25	1.59
W9304	N07P	04-09-93	1055	23.30	W93040617	1.95	32.10	11.70	105	28.43	25.65	1.34	0.64	1.60	0.14	3.53	0.61	2.93
W9304	N07P	04-09-93	1053	39.10	W93040616	1.90	32.18	11.31	101	28.45	25.72	1.42	0.81	3.44	0.10	0.03	0.55	5.39
W9304	N07P	04-09-93	1051	45.90	W93040615	1.89	32.18	11.56	104	28.45	25.72	1.34	0.82	3.61	0.02	0.04	0.47	5.38
W9304	N08	04-09-93	1149	2.10	W93040634	3.25	31.25	12.82	118	28.78	24.87	1.34	0.84	0.06	0.00	0.00	0.15	1.61
W9304	N08	04-09-93	1148	7.30	W93040633	2.72	31.60	12.77	116	28.63	25.19	3.39	0.91	0.77	0.04	0.32	0.35	0.97
W9304	N08	04-09-93	1147	9.60	W93040632	2.53	31.66	12.45	113	28.54	25.26	3.20	0.88	0.99	0.05	1.09	0.37	1.38
W9304	N08	04-09-93	1147	17.20	W93040631	2.01	31.93	11.65	105	28.34	25.51	1.58	0.72	2.60	0.00	0.01	0.40	3.51
W9304	N08	04-09-93	1145	25.30	W93040630	1.83	32.08	11.44	102	28.32	25.65	1.10	0.76	0.09	0.10	0.57	0.27	5.96
W9304	N09	04-09-93	1221	2.20	W93040647	4.24	30.07	12.34	116	28.57	23.85	0.95	0.84	0.59	0.00	0.08	0.07	2.96
W9304	N09	04-09-93	1220	6.20	W93040646	3.04	30.55	12.75	116	28.03	24.33	3.37	0.99	0.13	0.00	0.00	0.08	1.82
W9304	N09	04-09-93	1219	9.60	W93040645	2.63	31.16	12.39	112	28.21	24.85	3.36	0.88	0.69	0.00	0.01	0.16	1.49
W9304	N09	04-09-93	1218	19.60	W93040644	2.14	31.61	11.60	104	28.19	25.25	1.48	0.76	1.46	0.00	0.01	0.40	3.65
W9304	N09	04-09-93	1216	30.80	W93040643	1.91	31.89	11.49	103	28.23	25.49	1.24	0.81	2.82	0.00	0.01	0.44	4.81
W9304	N10P	04-06-93	0933	2.40	W93040077	2.78	30.16	12.15	110	27.49	24.04	1.26	1.13	0.58	0.03	0.11	0.11	5.06
W9304	N10P	04-06-93	0932	6.30	W93040076	2.47	30.68	12.07	109	27.69	24.48	2.30	1.11	1.69	0.12	1.74	0.33	3.78
W9304	N10P	04-06-93	0931	10.50	W93040075	2.15	31.05	11.78	106	27.74	24.80	1.58	0.94	2.68	0.01	0.01	0.31	4.59
W9304	N10P	04-06-93	0928	19.10	W93040074	2.02	31.43	11.71	105	27.95	25.11	1.61	1.13	3.14	0.02	0.01	0.35	5.20
W9304	N10P	04-06-93	0927	21.50	W93040073	2.01	31.45	11.80	106	27.96	25.13	1.53	1.11	0.05	0.02	-0.02	0.27	8.38
W9304	N10P	04-09-93	0618	2.30	W93040502	3.97	29.57	11.95	111	27.93	23.47	2.15	1.54	3.57	0.24	2.41	0.34	6.54
W9304	N10P	04-09-93	0617	8.20	W93040501	3.86	29.72	11.91	110	27.97	23.60	2.28	1.56	3.41	0.06	2.57	0.36	5.96
W9304	N10P	04-09-93	0616	12.40	W93040500	3.64	29.95	12.15	112	28.00	23.81	2.20	1.36	4.10	0.14	0.04	0.25	5.23
W9304	N10P	04-09-93	0614	16.80	W93040499	3.37	30.33	12.35	114	28.11	24.13	2.46	1.21	2.88	0.00	0.03	0.28	4.38
W9304	N10P	04-09-93	0613	20.00	W93040498	3.25	30.49	12.49	115	28.15	24.27	2.52	1.18	1.75	0.00	0.02	0.13	3.20
W9304	N11	04-09-93	0646	2.40	W93040513	3.83	29.65	11.77	109	27.89	23.55	2.20	1.29	3.17	0.16	2.37	0.17	5.64
W9304	N11	04-09-93	0645	5.10	W93040512	3.68	29.83	11.77	109	27.93	23.71	2.15	1.30	4.00	0.05	0.00	0.31	5.44
W9304	N11	04-09-93	0644	10.10	W93040511	3.46	30.13	11.83	109	28.02	23.97	2.09	1.17	2.78	0.00	0.00	0.24	4.67
W9304	N11	04-09-93	0642	16.80	W93040510	2.38	31.25	11.57	104	28.08	24.94	1.58	0.91	1.81	0.00	0.00	0.39	4.09
W9304	N11	04-09-93	0641	25.20	W93040509	2.07	31.62	11.66	105	28.14	25.26	1.48	0.97	2.56	0.01	0.00	0.34	4.52
W9304	N12	04-09-93	0716	2.20	W93040526	3.95	29.67	12.28	114	28.00	23.56	2.93	1.31	1.72	0.13	1.61	0.11	3.78
W9304	N12	04-09-93	0715	4.00	W93040525	3.94	30.02	12.53	117	28.29	23.83	2.68	1.11	0.15	0.01	-0.01	0.04	3.05
W9304	N12	04-09-93	0715	8.40	W93040524	3.61	30.29	12.61	117	28.26	24.07	3.32	1.06	0.09	0.00	0.00	0.09	2.47
W9304	N12	04-09-93	0713	15.50	W93040523	3.14	30.58	12.64	116	28.13	24.34	2.71	1.00	0.10	0.00	0.00	0.10	2.31
W9304	N12	04-09-93	0709	18.40	W93040520	2.18	31.40	11.86	107	28.05	25.08	1.55	0.89	1.89	0.00	0.00	0.29	3.79

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9304	N13	04-09-93	1350	2.40	W93040689	4.06	31.04	12.48	117	29.26	24.63	0.75	0.75	0.20	0.08	0.70	0.21	2.32
W9304	N13	04-09-93	1349	4.70	W93040688	3.49	31.27	12.55	116	28.99	24.87	1.23	0.79	0.65	0.01	-0.01	0.12	1.83
W9304	N13	04-09-93	1348	13.70	W93040687	2.80	31.81	12.53	115	28.88	25.35	2.79	0.83	0.21	0.02	-0.02	0.13	1.30
W9304	N13	04-09-93	1347	20.10	W93040686	2.28	31.96	11.77	106	28.58	25.51	2.29	0.76	2.32	0.07	-0.02	0.28	2.69
W9304	N13	04-09-93	1345	30.80	W93040685	1.99	32.03	11.66	105	28.40	25.59	1.18	0.71	1.46	0.15	-0.12	0.33	3.34
W9304	N14	04-09-93	1414	2.40	W93040702	4.14	31.37	12.62	119	29.60	24.89	1.13	0.73	0.20	0.00	0.01	0.18	1.72
W9304	N14	04-09-93	1413	5.60	W93040701	3.43	31.56	12.84	119	29.18	25.10	2.43	0.82	0.19	0.00	0.03	0.12	1.61
W9304	N14	04-09-93	1412	9.90	W93040700	2.93	31.80	12.59	116	28.97	25.34	3.25	0.84	0.20	0.00	0.02	0.19	1.19
W9304	N14	04-09-93	1411	16.00	W93040699	2.28	32.07	11.95	108	28.67	25.60	2.68	0.77	0.22	0.00	0.02	0.25	1.71
W9304	N14	04-09-93	1410	30.30	W93040698	1.91	32.14	11.59	104	28.44	25.69	1.24	0.72	0.64	0.38	0.69	0.31	4.05
W9304	N15	04-09-93	1438	2.20	W93040721	3.50	31.24	12.70	118	28.97	24.84	1.48	0.77	0.26	0.00	0.03	0.19	2.00
W9304	N15	04-09-93	1437	4.40	W93040720	3.45	31.47	12.86	119	29.12	25.03	1.72	0.79	0.75	0.00	0.04	0.16	1.49
W9304	N15	04-09-93	1436	13.20	W93040719	2.88	31.83	12.47	114	28.96	25.36	2.50	0.81	0.22	0.00	0.02	0.18	1.17
W9304	N15	04-09-93	1435	20.80	W93040718	2.48	32.05	11.85	108	28.82	25.57	2.38	0.81	1.20	0.00	0.03	0.31	1.58
W9304	N15	04-09-93	1433	40.70	W93040717	1.94	32.13	11.57	104	28.45	25.67	1.17	0.70	2.13	0.00	0.04	0.37	3.36
W9304	N16P	04-06-93	0831	2.40	W93040063	2.74	31.21	12.48	114	28.34	24.88	1.33	0.96	0.02	0.02	-0.01	0.11	2.33
W9304	N16P	04-06-93	0830	7.60	W93040062	2.16	31.47	12.07	108	28.08	25.14	2.68	0.97	0.79	0.02	0.00	0.24	2.81
W9304	N16P	04-06-93	0828	17.30	W93040061	1.78	31.96	11.71	105	28.17	25.55	0.96	0.63	4.09	0.03	0.04	0.40	4.12
W9304	N16P	04-06-93	0826	33.00	W93040060	1.81	32.13	11.52	103	28.34	25.69	1.29	0.76	2.81	0.02	0.01	0.50	5.19
W9304	N16P	04-06-93	0824	39.90	W93040059	1.82	32.14	11.59	104	28.36	25.70	0.90	0.79	3.21	0.05	0.01	0.44	5.50
W9304	N16P	04-09-93	1503	2.30	W93040734	4.47	31.27	12.52	119	29.79	24.77	1.16	0.70	0.13	0.01	0.01	0.15	1.41
W9304	N16P	04-09-93	1502	7.80	W93040733	3.20	31.63	13.19	122	29.05	25.18	2.66	0.84	0.14	0.01	0.02	0.16	0.96
W9304	N16P	04-09-93	1501	17.70	W93040732	2.61	31.87	12.64	115	28.77	25.42	3.16	0.90	1.30	0.01	0.05	0.25	2.31
W9304	N16P	04-09-93	1459	27.30	W93040731	1.92	32.15	11.34	102	28.44	25.69	1.11	0.74	2.74	0.01	0.03	0.42	4.27
W9304	N16P	04-09-93	1458	39.40	W93040730	1.86	32.16	11.48	103	28.41	25.71	1.05	0.77	0.09	0.01	3.03	0.24	4.61
W9304	N17	04-09-93	1528	2.00	W93040747	3.57	31.34	12.81	119	29.11	24.91	1.04	0.78	0.22	0.00	0.01	0.09	1.43
W9304	N17	04-09-93	1527	9.10	W93040746	2.69	31.78	12.85	117	28.77	25.34	3.54	0.88	0.20	0.00	0.03	0.15	0.75
W9304	N17	04-09-93	1526	16.70	W93040745	1.96	32.09	11.60	104	28.42	25.64	1.37	0.69	2.40	0.00	0.03	0.38	3.41
W9304	N17	04-09-93	1525	27.90	W93040744	1.87	32.17	11.23	101	28.42	25.72	0.90	0.71	3.72	0.03	0.01	0.56	5.07
W9304	N17	04-09-93	1523	38.70	W93040743	1.90	32.19	11.24	101	28.46	25.73	1.00	0.76	3.89	0.14	0.01	0.52	5.28
W9304	N18	04-09-93	1552	2.10	W93040760	3.80	31.27	12.68	119	29.24	24.84	1.36	0.78	0.20	0.00	0.14	0.13	1.69
W9304	N18	04-09-93	1551	5.70	W93040759	3.09	31.45	12.58	116	28.82	25.05	2.38	0.83	0.25	0.00	0.00	0.19	1.45
W9304	N18	04-09-93	1550	8.60	W93040758	2.35	31.69	12.08	109	28.41	25.29	2.86	0.88	0.65	0.00	0.03	0.19	1.52
W9304	N18	04-09-93	1548	18.50	W93040757	1.88	32.02	11.33	101	28.31	25.60	0.98	0.68	2.66	0.15	1.50	0.50	4.21
W9304	N18	04-09-93	1547	22.90	W93040756	1.87	32.06	11.30	101	28.33	25.62	1.02	0.73	3.05	0.00	0.03	0.45	4.30
W9304	N19	04-09-93	1247	2.40	W93040660	3.74	30.36	12.34	115	28.42	24.12	0.96	0.84	0.30	0.00	0.04	0.15	3.64
W9304	N19	04-09-93	1246	8.20	W93040659	3.02	31.14	12.56	115	28.50	24.81	2.41	0.81	0.11	0.00	0.02	0.17	2.00
W9304	N19	04-09-93	1244	12.80	W93040658	2.86	31.60	12.37	113	28.76	25.18	2.49	0.81	0.10	0.00	0.04	0.16	1.27
W9304	N19	04-09-93	1243	15.60	W93040657	2.25	31.68	11.74	106	28.33	25.30	2.69	0.80	2.23	0.00	0.03	0.32	3.17
W9304	N19	04-09-93	1242	22.20	W93040656	1.95	31.88	11.65	104	28.25	25.47	1.21	0.77	1.59	0.11	3.88	0.58	3.73
W9304	N20P	04-06-93	0731	2.10	W93040047	2.28	30.52	12.47	112	27.40	24.37	1.42	1.07	0.13	0.02	-0.02	0.10	3.70

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9304	N20P	04-06-93	0729	7.10	W93040046	2.32	30.77	12.61	113	27.64	24.56	2.84	1.17	0.33	0.02	0.01	0.17	2.81
W9304	N20P	04-06-93	0728	12.10	W93040045	2.41	30.93	12.55	113	27.85	24.69	3.01	1.11	0.03	0.01	-0.01	0.12	4.21
W9304	N20P	04-06-93	0725	21.40	W93040044	2.21	31.15	11.96	107	27.87	24.87	1.74	0.94	0.26	0.02	0.02	0.23	7.17
W9304	N20P	04-06-93	0723	28.10	W93040043	1.90	31.71	11.76	105	28.07	25.34	0.97	0.73	3.01	0.02	1.78	0.36	4.60
W9304	N20P	04-09-93	1324	2.00	W93040676	4.08	30.94	12.38	116	29.19	24.55	0.66	0.75	0.25	0.00	0.01	0.13	2.32
W9304	N20P	04-09-93	1323	6.60	W93040675	3.43	31.39	12.72	118	29.04	24.97	1.77	0.80	0.19	0.00	0.03	0.15	1.61
W9304	N20P	04-09-93	1322	9.30	W93040674	2.91	31.67	12.70	116	28.85	25.24	2.38	0.85	0.31	0.00	0.04	0.13	1.36
W9304	N20P	04-09-93	1321	13.90	W93040673	2.36	31.97	12.06	109	28.65	25.52	2.83	0.80	1.11	0.00	0.03	0.28	1.72
W9304	N20P	04-09-93	1320	28.70	W93040672	1.90	31.96	11.55	103	28.28	25.55	1.28	0.80	2.18	0.00	0.09	0.40	4.18
W9304	N21	04-09-93	1616	2.20	W93040775	4.23	31.42	12.68	120	29.72	24.92	1.85	0.74	0.21	0.00	0.01	0.13	1.62
W9304	N21	04-09-93	1615	9.10	W93040774	2.98	31.77	13.03	120	28.99	25.31	3.61	0.86	0.20	0.00	0.04	0.18	1.09
W9304	N21	04-09-93	1614	16.80	W93040773	2.03	31.99	11.57	104	28.39	25.56	1.70	0.71	1.82	0.00	0.04	0.37	3.41
W9304	N21	04-09-93	1613	21.60	W93040772	1.92	32.13	11.39	102	28.43	25.68	1.33	0.69	3.08	0.01	0.01	0.39	3.38
W9304	N21	04-09-93	1612	31.20	W93040771	1.90	32.16	11.49	103	28.44	25.71	1.21	0.72	2.15	0.17	0.02	0.38	4.06
W9305	N01P	05-01-93	0904	2.07	W93050221	5.63	29.86	11.09	107	29.48	23.54	1.39	0.68	0.50	0.11	1.16	0.31	7.54
W9305	N01P	05-01-93	0903	4.27	W93050220	5.58	29.88	11.09	107	29.46	23.56	1.76	0.70	0.10	0.00	0.07	0.15	4.23
W9305	N01P	05-01-93	0902	9.27	W93050219	5.51	29.99	11.09	107	29.50	23.65	4.00	0.87	0.99	0.09	1.34	0.34	9.90
W9305	N01P	05-01-93	0901	17.44	W93050218	5.48	30.05	11.00	106	29.54	23.70	1.86	0.72	0.55	0.09	1.49	0.34	4.23
W9305	N01P	05-01-93	0900	30.17	W93050217	5.53	30.52	10.43	101	30.00	24.07	2.17	1.42	1.19	0.00	0.11	0.13	7.51
W9305	N02	05-01-93	0944	2.37	W93050232	5.83	29.60	11.11	108	29.41	23.31	0.91	0.69	0.91	0.09	1.38	0.32	4.36
W9305	N02	05-01-93	0943	9.83	W93050231	5.59	29.88	11.03	107	29.47	23.55	2.09	0.74	0.60	0.07	1.37	0.35	4.26
W9305	N02	05-01-93	0942	19.57	W93050230	5.49	30.13	10.98	106	29.62	23.77	1.00	0.68	1.05	0.08	1.50	0.38	3.93
W9305	N02	05-01-93	0941	28.52	W93050229	5.72	30.45	10.52	103	30.09	23.99	0.90	0.85	1.63	0.11	2.42	0.48	4.77
W9305	N02	05-01-93	0940	39.01	W93050228	3.32	31.82	10.72	99	29.33	25.32	1.56	1.46	3.05	0.10	3.36	0.70	5.65
W9305	N03	05-01-93	1015	2.53	W93050243	5.91	29.50	11.02	107	29.37	23.22	0.71	0.63	0.72	0.09	1.57	0.34	5.76
W9305	N03	05-01-93	1014	8.18	W93050242	5.49	29.83	10.96	106	29.34	23.52	1.70	0.74	0.79	0.07	1.86	0.42	5.49
W9305	N03	05-01-93	1014	19.49	W93050241	5.45	30.12	10.82	105	29.57	23.76	2.03	0.64	0.83	0.07	1.70	0.38	4.28
W9305	N03	05-01-93	1013	30.91	W93050240	5.26	30.62	10.59	102	29.87	24.18	1.39	0.83	0.72	0.00	0.06	0.15	7.72
W9305	N03	05-01-93	1011	43.78	W93050239	3.03	31.98	10.80	100	29.22	25.47	1.19	0.98	2.85	0.09	3.33	0.73	6.24
W9305	N04P	05-01-93	1049	2.68	W93050254	5.85	29.50	11.02	107	29.33	23.23	0.80	0.65	0.80	0.07	1.70	0.36	5.89
W9305	N04P	05-01-93	1049	8.40	W93050253	5.54	29.69	10.95	106	29.26	23.41	1.59	0.71	0.82	0.06	1.80	0.42	5.49
W9305	N04P	05-01-93	1048	18.43	W93050252	5.32	30.18	10.91	105	29.52	23.82	1.44	0.66	0.73	0.05	1.51	0.37	3.83
W9305	N04P	05-01-93	1047	32.06	W93050251	4.86	30.73	10.48	100	29.65	24.31	1.21	0.91	2.09	0.09	2.86	0.57	9.73
W9305	N04P	05-01-93	1046	45.27	W93050250	3.01	32.06	10.88	100	29.27	25.54	0.99	0.81	2.86	0.08	3.30	0.69	5.00
W9305	N05	05-01-93	1136	2.53	W93050267	6.10	29.56	10.98	107	29.59	23.25	0.78	0.63	1.23	0.11	1.80	0.38	5.95
W9305	N05	05-01-93	1134	9.77	W93050266	5.23	30.16	10.98	106	29.43	23.81	1.95	0.75	0.87	0.06	1.02	0.37	3.31
W9305	N05	05-01-93	1134	19.11	W93050265	5.26	30.27	10.97	106	29.55	23.90	1.32	0.69	1.00	0.08	1.27	0.34	3.48
W9305	N05	05-01-93	1133	35.10	W93050264	4.97	30.94	10.75	103	29.92	24.47	0.88	0.68	1.28	0.09	2.06	0.52	4.28
W9305	N05	05-01-93	1131	51.89	W93050263	3.11	32.10	10.95	101	29.39	25.56	1.11	0.84	2.42	0.12	3.50	0.72	4.63
W9305	N06	05-01-93	1205	2.24	W93050278	6.31	29.22	10.97	108	29.43	22.95	1.04	0.69	0.61	0.12	1.41	0.37	5.61
W9305	N06	05-01-93	1204	10.19	W93050277	5.49	30.27	11.02	107	29.74	23.87	2.13	0.76	0.53	0.06	0.70	0.33	2.46

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9305	N06	05-01-93	1203	17.03	W93050276	5.19	30.50	10.92	105	29.70	24.09	1.65	0.65	0.96	0.08	1.46	0.37	3.03
W9305	N06	05-01-93	1202	30.90	W93050275	5.03	30.95	10.85	104	29.98	24.46	1.41	0.66	1.22	0.08	1.56	0.44	2.77
W9305	N06	05-01-93	1201	46.47	W93050274	3.78	31.85	10.88	102	29.73	25.30	1.16	0.63	1.51	0.09	2.21	0.52	2.71
W9305	N07P	05-01-93	1239	2.75	W93050289	6.32	29.47	11.00	108	29.67	23.15	0.66	0.62	0.91	0.08	1.10	0.31	9.38
W9305	N07P	05-01-93	1238	8.30	W93050288	5.44	30.26	11.09	107	29.69	23.88	1.84	0.80	1.01	0.07	1.19	0.39	3.26
W9305	N07P	05-01-93	1238	17.27	W93050287	5.18	30.97	10.96	106	30.10	24.46	1.73	0.66	0.75	0.08	1.08	0.40	2.59
W9305	N07P	05-01-93	1236	29.35	W93050286	5.05	31.31	10.82	104	30.31	24.75	1.24	0.59	1.26	0.08	1.33	0.41	1.87
W9305	N07P	05-01-93	1234	39.37	W93050285	4.64	31.59	10.75	103	30.21	25.01	0.88	0.58	1.76	0.09	1.96	0.50	3.05
W9305	N08	05-01-93	1328	2.17	W93050302	6.18	29.65	11.05	108	29.73	23.31	0.67	0.64	1.06	0.12	1.20	0.61	4.56
W9305	N08	05-01-93	1327	5.44	W93050301	5.80	29.96	11.04	107	29.70	23.59	1.36	0.65	1.22	0.08	1.15	0.39	3.71
W9305	N08	05-01-93	1326	11.92	W93050300	5.26	30.39	11.05	106	29.67	24.00	2.32	0.70	1.48	0.09	1.35	0.34	4.18
W9305	N08	05-01-93	1325	20.41	W93050299	5.15	30.49	10.98	106	29.66	24.08	1.92	0.69	0.88	0.09	1.46	0.42	3.39
W9305	N08	05-01-93	1324	27.77	W93050298	5.04	30.79	10.78	104	29.85	24.34	1.01	0.63	1.45	0.12	2.19	0.54	4.00
W9305	N09	05-01-93	1354	2.50	W93050311	5.89	30.22	11.03	108	30.01	23.79	0.98	0.63	0.88	0.09	1.50	0.51	4.00
W9305	N09	05-01-93	1353	7.38	W93050310	5.44	30.29	11.05	107	29.72	23.90	1.90	0.70	0.64	0.09	1.51	0.45	3.83
W9305	N09	05-01-93	1352	14.05	W93050309	5.43	30.36	11.03	107	29.76	23.95	2.09	0.68	0.64	0.08	1.54	0.42	3.70
W9305	N09	05-01-93	1351	21.38	W93050308	5.37	30.45	10.92	106	29.81	24.03	1.62	0.62	0.94	0.09	1.72	0.43	3.72
W9305	N09	05-01-93	1351	30.76	W93050307	5.25	30.71	10.87	105	29.94	24.25	1.45	0.72	1.33	0.11	2.14	0.52	3.92
W9305	N10P	05-01-93	0708	2.59	W93050188	5.67	30.41	10.89	106	30.00	23.96	1.72	0.84	e	e	e	e	e
W9305	N10P	05-01-93	0707	6.71	W93050187	5.54	30.40	10.87	105	29.89	23.97	1.98	0.80	2.05	0.12	1.95	0.71	4.04
W9305	N10P	05-01-93	0706	12.40	W93050186	5.60	30.42	10.71	104	29.96	23.99	1.54	0.84	1.43	0.00	0.07	0.31	4.13
W9305	N10P	05-01-93	0705	20.11	W93050185	5.23	30.67	10.88	105	29.88	24.22	1.53	0.67	1.50	0.11	1.94	0.66	3.61
W9305	N10P	05-01-93	0703	24.57	W93050184	5.19	30.73	10.81	104	29.91	24.27	1.55	0.71	2.04	0.11	2.26	3.37	4.56
W9305	N11	05-01-93	0756	2.37	W93050199	5.85	30.13	10.94	107	29.90	23.73	1.94	0.76	0.23	0.00	0.07	0.13	4.74
W9305	N11	05-01-93	0755	6.96	W93050198	5.81	30.25	10.88	106	29.97	23.82	2.89	0.86	1.10	0.11	1.94	0.44	4.74
W9305	N11	05-01-93	0754	13.13	W93050197	5.76	30.40	10.86	106	30.07	23.95	1.76	0.74	1.18	0.11	2.02	0.66	4.91
W9305	N11	05-01-93	0753	20.24	W93050196	5.55	30.45	10.84	105	29.95	24.01	1.27	0.71	0.26	0.04	0.92	0.21	4.18
W9305	N11	05-01-93	0752	25.63	W93050195	5.41	30.55	10.78	104	29.93	24.10	1.70	0.77	0.65	0.00	0.07	0.17	4.21
W9305	N12	05-01-93	0832	2.40	W93050210	5.92	30.06	10.93	107	29.89	23.66	1.16	0.78	0.85	0.13	1.80	0.43	8.00
W9305	N12	05-01-93	0831	5.26	W93050209	5.86	30.14	10.86	106	29.91	23.73	2.67	0.89	0.96	0.10	2.00	0.46	4.83
W9305	N12	05-01-93	0831	11.42	W93050208	5.51	30.19	11.00	107	29.68	23.81	2.48	0.70	0.76	0.10	1.60	0.42	4.25
W9305	N12	05-01-93	0830	18.25	W93050207	5.67	30.30	10.71	104	29.91	23.88	2.05	0.77	0.18	0.00	0.05	0.14	4.53
W9305	N12	05-01-93	0829	26.33	W93050206	5.47	30.57	10.45	101	30.00	24.12	1.79	1.29	2.72	0.15	2.60	0.62	5.14
W9305	N13	05-01-93	1513	2.37	W93050338	6.32	29.64	11.12	109	29.83	23.29	0.91	0.65	0.66	0.10	1.19	0.33	9.56
W9305	N13	05-01-93	1512	5.84	W93050337	6.08	29.77	11.09	109	29.76	23.42	0.97	0.67	0.90	0.08	1.18	0.34	4.19
W9305	N13	05-01-93	1511	12.35	W93050336	5.90	29.99	11.02	108	29.82	23.61	2.31	0.73	0.73	0.10	1.49	0.41	4.25
W9305	N13	05-01-93	1510	20.04	W93050335	5.82	30.41	10.65	104	30.13	23.95	1.75	0.82	1.73	0.13	2.28	0.52	4.85
W9305	N13	05-01-93	1509	27.60	W93050334	5.46	30.54	10.75	104	29.96	24.09	1.24	0.75	1.46	0.11	2.14	0.48	4.43
W9305	N14	05-01-93	1542	2.63	W93050349	6.57	29.31	11.09	109	29.73	23.00	1.06	0.66	0.65	0.10	1.38	0.34	5.66
W9305	N14	05-01-93	1542	3.76	W93050348	6.10	29.57	11.21	110	29.59	23.26	1.85	0.67	0.65	0.09	1.28	0.35	5.44
W9305	N14	05-01-93	1541	9.19	W93050347	5.56	29.99	11.22	109	29.55	23.65	2.65	0.76	0.69	0.10	1.10	0.36	3.82

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9305	N14	05-01-93	1539	22.14	W93050346	5.55	30.39	10.82	105	29.90	23.96	1.42	0.63	1.16	0.11	2.08	0.47	4.44
W9305	N14	05-01-93	1538	31.20	W93050345	5.27	30.61	10.80	104	29.87	24.16	1.71	0.66	1.52	0.11	2.36	0.51	4.61
W9305	N15	05-01-93	1613	2.36	W93050356	6.53	29.16	11.05	109	29.55	22.88	1.16	0.67	0.69	0.11	1.51	0.34	5.95
W9305	N15	05-01-93	1612	10.45	W93050355	5.48	30.07	11.25	109	29.55	23.71	2.50	0.75	0.57	0.06	0.94	0.34	3.38
W9305	N15	05-01-93	1611	19.40	W93050354	5.23	30.16	10.98	106	29.43	23.82	2.04	0.69	0.69	0.09	1.58	0.39	4.93
W9305	N15	05-01-93	1610	32.89	W93050353	4.91	30.88	10.83	104	29.82	24.42	0.55	0.66	1.51	0.10	2.27	0.51	4.19
W9305	N15	05-01-93	1609	41.57	W93050352	3.50	31.86	11.00	103	29.51	25.34	0.88	0.71	2.30	0.11	2.86	0.67	4.04
W9305	N16P	05-01-93	1646	2.33	W93050365	6.38	29.32	11.13	109	29.58	23.02	1.19	0.67	0.64	0.10	1.36	0.33	5.54
W9305	N16P	05-01-93	1645	6.54	W93050364	5.76	29.58	11.18	108	29.33	23.30	1.96	0.69	0.80	0.10	1.59	0.41	6.15
W9305	N16P	05-01-93	1644	16.02	W93050363	5.25	30.32	11.05	106	29.59	23.94	2.05	0.68	0.70	0.07	1.37	0.37	3.37
W9305	N16P	05-01-93	1643	27.11	W93050362	5.13	30.63	10.78	104	29.78	24.20	1.58	0.73	1.54	0.10	2.10	0.47	4.28
W9305	N16P	05-01-93	1642	37.42	W93050361	4.02	31.63	11.07	104	29.74	25.10	1.44	0.65	1.67	0.10	2.10	0.51	3.80
W9305	N17	05-01-93	1729	2.43	W93050374	6.19	29.53	11.15	109	29.63	23.21	1.61	0.64	0.54	0.13	1.30	0.38	4.84
W9305	N17	05-01-93	1729	9.78	W93050373	5.46	30.28	11.22	109	29.72	23.89	2.47	0.75	0.39	0.06	0.73	0.36	2.49
W9305	N17	05-01-93	1728	16.36	W93050372	4.98	30.44	11.00	105	29.47	24.06	1.90	0.67	0.66	0.09	1.77	0.46	3.28
W9305	N17	05-01-93	1727	26.18	W93050371	4.69	31.11	11.06	106	29.84	24.63	2.36	0.61	0.94	0.08	1.63	0.46	1.96
W9305	N17	05-01-93	1726	35.50	W93050370	4.93	31.49	10.99	106	30.36	24.90	1.15	0.54	1.20	0.08	1.61	0.49	1.98
W9305	N18	05-01-93	1752	2.47	W93050383	6.12	29.61	11.14	109	29.64	23.28	1.60	0.64	0.67	0.10	1.39	0.41	4.81
W9305	N18	05-01-93	1751	5.89	W93050382	5.94	29.68	11.22	109	29.56	23.36	1.97	0.66	0.58	0.09	1.33	0.41	4.65
W9305	N18	05-01-93	1751	11.17	W93050381	5.73	29.92	11.20	109	29.62	23.57	2.11	0.71	0.55	0.08	1.06	0.39	3.77
W9305	N18	05-01-93	1750	15.99	W93050380	5.29	30.38	11.04	106	29.68	23.99	2.21	0.75	0.63	0.09	1.21	0.42	3.72
W9305	N18	05-01-93	1749	22.32	W93050379	5.25	30.50	10.92	105	29.75	24.08	1.67	0.65	0.73	0.08	1.36	0.41	3.49
W9305	N19	05-01-93	1420	2.62	W93050320	6.42	29.80	11.00	109	30.05	23.39	0.52	0.61	1.38	0.08	1.20	0.42	4.05
W9305	N19	05-01-93	1419	5.36	W93050319	6.24	29.92	11.00	108	30.02	23.51	0.79	0.61	0.71	0.08	1.22	0.39	3.79
W9305	N19	05-01-93	1418	10.47	W93050318	5.47	30.27	11.18	108	29.72	23.88	2.18	0.73	0.91	0.10	1.48	0.46	3.81
W9305	N19	05-01-93	1417	15.80	W93050317	5.49	30.35	11.02	107	29.81	23.94	1.92	0.69	0.63	0.10	1.59	0.45	3.96
W9305	N19	05-01-93	1416	21.27	W93050316	5.53	30.44	10.94	106	29.93	24.01	1.77	0.69	0.88	0.11	1.89	0.47	3.96
W9305	N20P	05-01-93	1443	2.36	W93050329	6.25	29.67	11.05	109	29.80	23.32	1.08	0.67	0.06	0.08	0.02	0.15	6.87
W9305	N20P	05-01-93	1442	5.68	W93050328	6.01	29.86	11.11	109	29.78	23.49	1.48	0.65	0.82	0.08	1.20	0.34	3.99
W9305	N20P	05-01-93	1441	11.38	W93050327	5.69	30.10	11.11	108	29.74	23.72	1.79	0.69	0.12	0.01	0.01	0.15	3.61
W9305	N20P	05-01-93	1440	20.33	W93050326	5.70	30.32	10.89	106	29.95	23.89	1.97	0.70	0.08	0.02	0.01	0.14	16.52
W9305	N20P	05-01-93	1440	27.36	W93050325	5.39	30.60	10.76	104	29.96	24.15	1.35	0.76	0.59	0.00	0.04	0.13	9.83
W9305	N21	05-01-93	1817	2.61	W93050392	6.22	29.42	11.22	110	29.55	23.12	1.71	0.66	0.70	0.11	1.41	0.37	9.83
W9305	N21	05-01-93	1815	6.26	W93050391	5.88	29.62	11.19	109	29.46	23.32	2.19	0.69	0.59	0.09	1.37	0.39	5.71
W9305	N21	05-01-93	1815	13.57	W93050390	5.38	30.21	11.05	107	29.60	23.84	2.21	0.74	0.52	0.09	1.30	0.40	3.18
W9305	N21	05-01-93	1814	23.81	W93050389	5.20	30.37	11.02	106	29.61	23.99	1.92	0.67	0.74	0.09	1.58	0.42	3.42
W9305	N21	05-01-93	1810	34.14	W93050388	5.19	30.69	10.68	103	29.88	24.24	1.38	0.66	1.37	0.11	2.42	0.54	4.15
W9306	N01P	05-21-93	0827	1.60	W93060290	11.62	29.25	9.76	108	33.72	22.19	1.22	0.75	1.01	0.00	0.07	0.14	0.78
W9306	N01P	05-21-93	0826	4.50	W93060289	11.54	29.26	9.78	108	33.67	22.22	1.26	0.77	0.65	0.00	0.06	0.12	0.74
W9306	N01P	05-21-93	0825	8.31	W93060288	11.56	29.32	9.53	105	33.74	22.26	1.66	0.79	2.08	0.00	0.21	0.18	0.98
W9306	N01P	05-21-93	0823	18.91	W93060287	5.21	30.77	10.68	103	29.96	24.30	1.01	0.64	1.40	0.05	2.46	0.52	2.93

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9306	N01P	05-21-93	0822	27.41	W93060286	4.50	31.47	9.93	95	29.99	24.93	0.94	0.71	2.38	0.10	2.47	0.65	4.09
W9306	N02	05-21-93	0900	1.86	W93060303	11.34	29.20	9.91	109	33.45	22.21	0.87	1.33	0.54	0.04	0.03	0.14	1.13
W9306	N02	05-21-93	0858	7.52	W93060302	11.17	29.24	9.85	108	33.35	22.26	1.58	0.76	0.03	0.00	0.00	0.02	1.02
W9306	N02	05-21-93	0857	15.22	W93060301	7.01	30.44	10.01	101	31.13	23.83	1.22	0.68	0.02	0.00	0.02	0.20	1.58
W9306	N02	05-21-93	0856	23.56	W93060300	4.97	31.24	10.49	101	30.17	24.70	1.09	0.60	0.13	0.00	0.84	0.23	2.35
W9306	N02	05-21-93	0854	35.81	W93060299	4.35	31.63	10.04	95	30.01	25.07	0.84	0.94	0.25	0.00	0.95	0.33	4.56
W9306	N03	05-21-93	0928	2.56	W93060318	11.39	29.25	10.00	110	33.53	22.24	0.82	0.81	1.04	0.03	0.09	0.14	1.30
W9306	N03	05-21-93	0926	10.04	W93060317	11.22	29.31	9.82	108	33.46	22.31	1.65	0.78	0.01	0.04	-0.04	0.03	1.06
W9306	N03	05-21-93	0925	14.46	W93060316	6.22	30.58	10.73	106	30.61	24.04	0.66	0.62	1.79	0.09	1.29	0.39	2.13
W9306	N03	05-21-93	0924	26.46	W93060315	4.53	31.46	10.83	103	30.01	24.92	0.55	0.55	0.10	0.06	-0.03	0.04	2.89
W9306	N03	05-21-93	0922	40.15	W93060314	4.06	31.76	10.32	97	29.88	25.20	0.57	0.63	2.42	0.17	3.01	0.69	4.47
W9306	N04P	05-21-93	0953	2.00	W93060335	11.80	29.38	9.92	110	34.01	22.27	0.80	0.77	0.97	0.04	0.24	0.18	1.37
W9306	N04P	05-21-93	0952	4.84	W93060334	11.52	29.32	9.88	109	33.72	22.27	2.59	1.13	0.91	0.04	0.22	0.20	1.52
W9306	N04P	05-21-93	0951	13.88	W93060333	7.63	30.04	10.65	108	31.25	23.44	0.85	0.63	0.11	0.01	0.00	0.03	1.71
W9306	N04P	05-21-93	0949	29.40	W93060332	4.61	31.67	10.74	103	30.25	25.07	0.87	0.53	0.16	0.02	-0.02	0.11	2.25
W9306	N04P	05-21-93	0948	46.41	W93060331	3.85	31.90	10.29	97	29.83	25.33	0.95	0.77	0.00	0.00	0.00	0.03	5.09
W9306	N05	05-21-93	1019	1.90	W93060348	11.16	29.17	10.01	110	33.27	22.21	0.54	0.61	0.03	0.09	-0.09	0.00	0.50
W9306	N05	05-21-93	1018	8.47	W93060347	10.68	29.14	10.11	110	32.85	22.27	1.52	0.75	0.04	0.10	-0.09	0.00	0.42
W9306	N05	05-21-93	1017	15.71	W93060346	10.12	29.50	10.08	108	32.76	22.64	1.30	0.68	1.75	0.14	0.59	0.28	4.82
W9306	N05	05-21-93	1015	35.67	W93060345	4.27	31.79	10.75	102	30.08	25.21	1.00	0.52	1.96	0.17	2.54	0.56	2.75
W9306	N05	05-21-93	1014	51.11	W93060344	3.75	31.94	10.47	98	29.79	25.37	0.84	0.90	0.67	0.14	1.34	0.39	5.83
W9306	N06	05-21-93	1048	1.82	W93060361	11.37	29.15	9.99	110	33.42	22.16	0.96	0.73	0.44	0.07	-0.05	0.06	0.40
W9306	N06	05-21-93	1047	6.94	W93060360	10.97	29.17	10.00	109	33.11	22.24	1.70	0.78	0.46	0.07	-0.04	0.08	0.44
W9306	N06	05-21-93	1046	16.28	W93060359	7.97	29.90	10.53	108	31.40	23.28	0.68	0.60	0.89	0.09	0.37	0.26	0.97
W9306	N06	05-21-93	1045	25.66	W93060358	4.56	31.41	10.85	103	29.98	24.87	0.96	0.54	1.49	0.15	2.15	0.46	2.69
W9306	N07P	05-21-93	1117	1.90	W93060374	11.43	29.25	9.90	109	33.57	22.23	0.33	0.63	0.08	0.03	-0.03	0.03	0.72
W9306	N07P	05-21-93	1116	8.04	W93060373	10.88	29.22	9.80	107	33.10	22.30	1.37	0.75	1.66	0.06	0.00	0.11	0.76
W9306	N07P	05-21-93	1115	16.14	W93060372	8.83	30.00	9.96	104	32.20	23.24	1.21	0.79	2.72	0.17	2.34	0.63	3.67
W9306	N07P	05-21-93	1114	27.58	W93060371	4.80	31.40	9.91	95	30.17	24.84	0.74	0.64	2.73	0.17	2.40	0.63	3.65
W9306	N07P	05-21-93	1140	47.16	W93060381	3.99	31.83	10.17	96	29.89	25.27	0.91	0.73	2.63	0.18	3.30	0.71	5.81
W9306	N08	05-21-93	1216	2.04	W93060395	11.25	29.39	9.83	108	33.57	22.37	0.98	0.80	0.48	0.01	0.05	0.16	1.14
W9306	N08	05-21-93	1215	7.74	W93060394	11.10	29.38	9.76	107	33.43	22.39	1.45	0.79	0.41	0.01	-0.01	0.03	1.13
W9306	N08	05-21-93	1214	14.59	W93060393	7.53	30.29	9.84	100	31.41	23.64	1.20	0.73	0.76	0.10	1.00	0.30	2.33
W9306	N08	05-21-93	1213	21.90	W93060392	5.26	31.19	9.86	96	30.37	24.63	0.99	0.66	2.48	0.13	2.03	0.62	3.57
W9306	N08	05-21-93	1212	30.45	W93060391	4.58	31.56	10.12	97	30.14	25.00	1.06	0.66	2.63	0.14	2.54	0.64	4.30
W9306	N09	05-21-93	1239	1.89	W93060408	12.42	29.13	9.70	109	34.26	21.96	0.40	0.60	0.80	0.02	0.05	0.16	1.05
W9306	N09	05-21-93	1238	8.96	W93060407	11.10	29.42	9.63	105	33.48	22.42	1.44	0.73	1.11	0.03	0.12	0.22	1.28
W9306	N09	05-21-93	1237	14.60	W93060406	10.01	29.65	9.71	104	32.82	22.78	0.70	0.65	2.11	0.09	1.32	0.51	2.76
W9306	N09	05-21-93	1236	21.34	W93060405	5.05	31.30	9.66	93	30.29	24.74	0.79	0.75	2.85	0.12	2.31	0.70	4.04
W9306	N09	05-21-93	1235	33.58	W93060404	4.83	31.42	9.81	94	30.22	24.86	0.81	0.77	2.90	0.12	2.40	0.69	4.30
W9306	N10P	05-21-93	0640	1.89	W93060249	11.40	29.32	8.39	92	33.61	22.29	2.96	1.60	6.13	0.26	1.55	1.05	3.97

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9306	N10P	05-21-93	0639	7.30	W93060248	11.10	29.42	8.58	94	33.48	22.42	2.69	1.41	3.72	0.21	1.39	0.55	3.20
W9306	N10P	05-21-93	0638	12.66	W93060247	10.36	29.66	8.70	94	33.11	22.73	2.16	1.26	2.64	0.04	-0.03	0.39	3.17
W9306	N10P	05-21-93	0637	16.82	W93060246	8.31	30.38	9.44	98	32.13	23.60	1.49	1.01	1.94	0.03	1.53	0.38	3.35
W9306	N11	05-21-93	0723	1.96	W93060262	11.09	29.40	9.53	104	33.44	22.40	1.66	0.92	0.18	0.04	0.22	0.02	1.61
W9306	N11	05-21-93	0722	5.94	W93060261	11.09	29.40	9.50	104	33.44	22.40	2.06	0.92	2.40	0.09	0.46	0.33	1.71
W9306	N11	05-21-93	0721	11.34	W93060260	11.04	29.47	9.22	101	33.48	22.47	1.28	0.87	0.12	0.03	-0.03	0.04	1.87
W9306	N11	05-21-93	0720	16.89	W93060259	6.26	30.79	9.58	95	30.83	24.20	1.20	0.79	2.89	0.14	2.06	0.70	3.62
W9306	N11	05-21-93	0719	25.43	W93060258	5.04	31.27	9.52	92	30.26	24.72	1.10	1.07	2.98	0.16	2.50	0.69	4.65
W9306	N12	05-21-93	0751	2.55	W93060276	11.03	29.33	9.74	106	33.33	22.36	1.71	0.86	0.09	0.04	-0.02	0.05	1.33
W9306	N12	05-21-93	0752	6.70	W93060277	11.09	29.41	9.63	105	33.46	22.41	1.78	0.83	0.07	0.04	-0.03	0.03	1.52
W9306	N12	05-21-93	0749	9.73	W93060275	11.12	29.43	9.41	103	33.50	22.42	1.34	0.79	0.87	0.08	0.55	0.22	1.60
W9306	N12	05-21-93	0748	15.35	W93060274	7.46	30.60	9.36	95	31.64	23.89	1.38	0.89	2.96	0.13	2.00	0.66	3.62
W9306	N12	05-21-93	0748	18.40	W93060273	4.98	31.27	9.75	94	30.21	24.72	1.29	1.07	0.03	0.03	-0.03	0.12	3.47
W9306	N13	05-21-93	1358	1.86	W93060445	11.64	29.25	9.88	109	33.74	22.19	1.09	0.93	0.90	0.00	0.23	0.19	1.21
W9306	N13	05-21-93	1357	7.76	W93060444	10.99	29.26	9.82	107	33.22	22.31	1.46	0.75	1.10	0.01	0.23	0.22	1.20
W9306	N13	05-21-93	1357	13.27	W93060443	8.59	29.97	10.60	110	31.97	23.25	1.46	0.73	1.31	0.03	1.03	0.39	1.70
W9306	N13	05-21-93	1356	19.67	W93060442	5.04	30.91	10.70	103	29.95	24.43	1.26	0.61	0.17	0.09	2.27	0.36	2.95
W9306	N13	05-21-93	1355	27.45	W93060441	4.54	31.50	10.26	98	30.05	24.95	1.22	0.66	2.30	0.09	2.38	0.62	3.50
W9306	N14	05-21-93	1421	1.80	W93060456	12.91	29.14	9.72	110	34.66	21.87	0.69	0.65	0.44	0.00	0.03	0.13	0.93
W9306	N14	05-21-93	1420	8.76	W93060455	10.97	29.15	9.93	108	33.09	22.23	1.83	0.76	0.74	0.00	0.06	0.13	0.97
W9306	N14	05-21-93	1419	14.38	W93060454	10.03	29.49	10.36	111	32.68	22.65	1.09	0.73	0.15	0.00	0.03	0.11	1.17
W9306	N14	05-21-93	1418	19.12	W93060453	5.29	30.70	10.75	104	29.96	24.24	1.05	0.61	0.86	0.04	0.05	0.21	3.01
W9306	N14	05-21-93	1417	27.09	W93060452	4.59	31.43	10.25	98	30.03	24.89	0.98	0.57	2.22	0.06	2.36	0.63	3.46
W9306	N15	05-21-93	1458	1.61	W93060469	12.69	29.20	9.47	107	34.55	21.96	1.03	0.73	0.60	0.00	0.02	0.13	0.82
W9306	N15	05-21-93	1449	6.71	W93060466	11.07	29.12	10.04	110	33.14	22.19	1.72	0.76	0.11	0.00	0.00	0.04	0.61
W9306	N15	05-21-93	1444	14.28	W93060465	7.86	30.02	10.72	110	31.41	23.38	0.95	0.64	0.79	0.00	0.00	0.26	2.46
W9306	N15	05-21-93	1443	26.67	W93060464	4.37	31.52	10.54	100	29.92	24.98	0.78	0.53	1.94	0.08	2.64	0.62	3.46
W9306	N15	05-21-93	1442	37.27	W93060463	4.20	31.72	10.24	97	29.96	25.16	0.83	0.71	0.38	0.01	0.01	0.24	4.52
W9306	N16P	05-21-93	1600	1.85	W93060497	11.69	29.18	10.06	111	33.71	22.13	1.51	0.72	0.61	0.01	-0.01	0.14	0.67
W9306	N16P	05-21-93	1559	10.48	W93060496	11.01	29.36	9.63	105	33.35	22.39	1.41	0.65	1.05	0.02	0.07	0.23	1.10
W9306	N16P	05-21-93	1558	15.93	W93060495	5.01	30.94	10.74	103	29.95	24.46	1.03	0.58	1.42	0.08	2.08	0.53	2.88
W9306	N16P	05-21-93	1557	24.79	W93060494	4.65	31.45	10.22	98	30.10	24.90	0.94	0.60	2.33	0.11	2.34	0.65	3.40
W9306	N16P	05-21-93	1556	36.91	W93060493	4.24	31.69	10.10	96	29.97	25.13	0.90	0.65	2.68	0.12	2.98	0.74	4.96
W9306	N17	05-21-93	1630	1.76	W93060511	12.57	29.37	9.78	111	34.64	22.12	1.94	0.81	0.51	0.00	0.08	0.17	1.09
W9306	N17	05-21-93	1629	11.26	W93060510	9.31	29.86	10.12	107	32.45	23.05	1.20	0.64	1.50	0.01	0.27	0.38	1.45
W9306	N17	05-21-93	1627	15.31	W93060509	5.88	30.84	9.99	98	30.57	24.29	1.09	0.67	2.14	0.06	1.38	0.56	2.75
W9306	N17	05-21-93	1627	25.80	W93060508	4.59	31.50	10.04	96	30.09	24.94	0.76	0.63	2.73	0.10	2.68	0.69	4.18
W9306	N17	05-21-93	1625	36.25	W93060507	4.19	31.74	10.18	96	29.97	25.17	0.98	0.66	2.64	0.11	3.09	0.73	4.82
W9306	N19	05-21-93	1307	1.79	W93060421	11.94	29.06	9.73	108	33.79	21.99	0.61	0.64	0.77	0.02	0.19	0.13	0.78
W9306	N19	05-21-93	1306	6.98	W93060420	11.12	29.12	9.78	107	33.18	22.18	1.03	0.72	1.45	0.01	0.07	0.16	0.75
W9306	N19	05-21-93	1306	10.97	W93060419	10.64	29.31	9.55	103	32.99	22.41	1.36	0.70	0.25	0.06	0.55	0.18	1.68

Table A1. Physical and Chemical Parameters at Discrete Bottle Measurement Depths.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Temp (C)	Sal (PSU)	DO (mg/L)	Oxy Sat (%)	Cond (mmhos/cm)	Sigma t	Flu (ug/L)	Beam (1/M)	NH4 (uM)	NO2 (uM)	NO3 (uM)	PO4 (uM)	SIO4 (uM)
W9306	N19	05-21-93	1305	17.52	W93060418	5.65	31.00	9.56	93	30.52	24.43	1.02	0.83	2.90	0.12	2.28	0.69	3.70
W9306	N19	05-21-93	1304	22.57	W93060417	5.01	31.27	9.58	92	30.24	24.72	1.23	0.92	1.22	0.07	2.21	0.36	4.06
W9306	N20P	05-21-93	1333	1.69	W93060434	11.79	28.94	9.89	110	33.53	21.92	0.64	0.70	0.57	0.01	0.06	0.15	0.81
W9306	N20P	05-21-93	1332	7.20	W93060433	11.06	29.14	9.80	107	33.16	22.21	1.39	0.77	0.94	0.02	0.07	0.16	0.94
W9306	N20P	05-21-93	1331	13.77	W93060432	7.91	29.98	10.38	106	31.43	23.35	1.19	0.69	1.85	0.08	1.12	0.48	1.94
W9306	N20P	05-21-93	1330	20.43	W93060431	4.97	31.28	10.03	97	30.21	24.73	0.78	0.68	2.74	0.11	2.41	0.65	3.60
W9306	N20P	05-21-93	1329	27.98	W93060430	4.53	31.49	9.98	95	30.04	24.95	0.98	0.69	2.64	0.11	2.60	0.69	4.01
W9306	N21	05-21-93	1805	2.31	W93060530	13.28	29.17	9.58	110	35.00	21.83	2.46	0.74	0.07	0.01	-0.01	0.00	0.62
W9306	N21	05-21-93	1804	11.08	W93060529	11.06	29.19	9.59	105	33.21	22.25	1.49	0.63	1.08	0.01	0.04	0.14	1.05
W9306	N21	05-21-93	1803	18.65	W93060528	8.02	30.02	10.21	105	31.55	23.36	1.46	0.67	1.51	0.04	0.43	0.35	1.02
W9306	N21	05-21-93	1802	24.34	W93060527	5.15	31.11	10.32	100	30.21	24.58	1.04	0.55	1.71	0.08	1.67	0.54	2.25
W9306	N21	05-21-93	1801	30.80	W93060526	4.73	31.35	10.77	103	30.08	24.82	1.13	0.53	2.22	0.09	1.80	0.48	2.34

e = Data not reported
s = Suspect data

Table A2. Chemical and Biological Parameters at Two Depths of Bioproductivity Stations and Special Station F25.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Rep	Chl A (ug/L)	DOC (uM)	PHA (ug/L)	POC (uM)	PON (uM)	TDN (uM)	TDP (uM)	TSS (mg/L)
W9304	F01P	04-08-93	0907	2.40	W93040401	1	0.89	98.73	0.35	8.67	2.86	12.99	0.38	0.94
W9304	F01P	04-08-93	0907	2.40	W93040401	2	0.93	95.18	0.34	6.50	1.57	16.84	0.49	1.32
W9304	F01P	04-08-93	0905	12.20	W93040399	1	1.40	79.06	1.13	15.17	e	10.09	0.33	1.53
W9304	F01P	04-08-93	0905	12.20	W93040399	2	1.12	124.00	0.44	5.50	1.64	10.11	0.36	1.05
W9304	F02P	04-08-93	0741	2.10	W93040379	1	1.46	75.52	0.76	13.67	3.71	16.26	0.40	1.92
W9304	F02P	04-08-93	0741	2.10	W93040379	2	1.32	79.84	0.74	18.92	e	16.59	0.47	1.26
W9304	F02P	04-08-93	0741	9.10	W93040378	1	2.72	64.94	0.75	25.33 s	6.07 s	15.53	0.43	1.06
W9304	F02P	04-08-93	0741	9.10	W93040378	2	1.77	67.68	0.83	e	e	14.30	0.45	1.89
W9304	F13P	04-07-93	0936	2.10	W93040256	1	0.19	110.56	0.34	11.75	3.21	17.07	0.44	1.39
W9304	F13P	04-07-93	0936	2.10	W93040256	2	0.42	94.00	0.37	7.17	1.50	17.50	0.44	1.44
W9304	F13P	04-07-93	0933	11.30	W93040254	1	1.31	101.49	0.45	20.25	4.71	8.30	0.26	1.66
W9304	F13P	04-07-93	0933	11.30	W93040254	2	0.84	94.39	0.49	17.50	4.29	11.04	0.31	7.89
W9304	F23P	04-06-93	0556	2.20	W93040022	1	0.34	146.21	0.77	25.08	4.86	22.31	0.57	3.05
W9304	F23P	04-06-93	0556	2.20	W93040022	2	0.20	192.50	0.78	27.25	4.93	23.40	0.54	3.31
W9304	F23P	04-06-93	0556	4.20	W93040021	1	1.09	129.94	0.97	27.25	5.21	22.04	0.61	4.17
W9304	F23P	04-06-93	0556	4.20	W93040021	2	0.37	264.66	0.88	24.42	4.71	21.07	0.56	3.70
W9304	F25	04-08-93	1539	2.40	W93040483	1	0.20	107.01	0.55	10.83	3.00	18.56	0.55	2.67
W9304	F25	04-08-93	1539	2.40	W93040483	2	0.68	106.22	0.64	7.67 s	1.57 s	19.10	0.64	2.20
W9304	F25	04-08-93	1538	5.00	W93040482	1	1.07	105.82	0.76	11.67	3.00	18.50	0.63	3.00
W9304	F25	04-08-93	1538	5.00	W93040482	2	0.20	114.51	0.49	10.00	2.71	19.31	0.70	3.10
W9304	N01P	04-07-93	0624	2.40	W93040212	1	1.93	99.91	0.82	14.75	3.57	10.47	0.31	1.94
W9304	N01P	04-07-93	0624	2.40	W93040212	2	1.87	104.25	0.68	18.50	4.43	10.52	0.32	1.70
W9304	N01P	04-07-93	0620	10.30	W93040210	1	1.81	74.35	0.61	13.67	3.36	10.71	0.34	2.05
W9304	N01P	04-07-93	0620	10.30	W93040210	2	1.70	103.46	0.64	15.33	3.57	13.23	0.35	2.25
W9304	N04P	04-07-93	0727	2.70	W93040226	1	0.48	94.00	0.46	5.83	1.07	10.78	0.37	3.05
W9304	N04P	04-07-93	0727	2.70	W93040226	2	0.50	93.21	0.40	11.25	2.93	10.65	0.40	1.21
W9304	N04P	04-07-93	0724	24.10	W93040224	1	3.59	70.82	0.96	29.58	6.07	9.02	0.45	1.83
W9304	N04P	04-07-93	0724	24.10	W93040224	2	4.95	70.82	0.82	28.00	5.43	12.16	0.64	4.35
W9304	N07P	04-07-93	0832	2.30	W93040242	1	0.99	100.70	0.36	16.17	3.79	8.28	0.45	2.68
W9304	N07P	04-07-93	0832	2.30	W93040242	2	1.26	107.40	0.71	10.17	3.14	8.93	0.48	0.45
W9304	N07P	04-07-93	0831	11.10	W93040241	1	1.17	70.82	0.43	10.42	2.79	9.90	0.53	1.06
W9304	N07P	04-07-93	0831	11.10	W93040241	2	0.12	76.31	0.74	10.17	2.79	10.09	0.58	0.97
W9304	N10P	04-06-93	0933	2.40	W93040077	1	0.91	88.49	0.83	24.50	3.14	10.57	0.40	2.39
W9304	N10P	04-06-93	0933	2.40	W93040077	2	1.28	80.63	0.50	25.92	4.57	9.84	0.36	1.66
W9304	N10P	04-06-93	0932	6.30	W93040076	1	1.46	127.96	0.59	27.00	5.50	9.78	0.38	1.86
W9304	N10P	04-06-93	0932	6.30	W93040076	2	2.60	118.07	0.73	19.42	3.07	9.59	0.38	2.53
W9304	N16P	04-06-93	0831	2.40	W93040063	1	3.57	129.55	0.73	24.08	5.29	7.76	0.31	1.52
W9304	N16P	04-06-93	0831	2.40	W93040063	2	1.53	119.65	0.73	20.58	4.93	6.41	0.31	1.08

Table A2. Chemical and Biological Parameters at Two Depths of Bioproductivity Stations and Special Station F25.

Event	Station	Date	Time (EST)	Depth (M)	Sample id	Rep	Chl A (ug/L)	DOC (uM)	PHA (ug/L)	POC (uM)	PON (uM)	TDN (uM)	TDP (uM)	TSS (mg/L)
W9304	N16P	04-06-93	0830	7.60	W93040062	1	1.70	99.51	0.84	15.42	4.07	11.92	0.56	1.49
W9304	N16P	04-06-93	0830	7.60	W93040062	2	1.86	88.49	0.87	19.58	4.86	9.06	0.46	1.63
W9304	N20P	04-06-93	0731	2.10	W93040047	1	1.05	97.15	0.41	10.67	3.07	8.17	0.38	1.22
W9304	N20P	04-06-93	0731	2.10	W93040047	2	2.11	103.06	0.53	11.67	3.43	8.23	0.35	0.46
W9304	N20P	04-06-93	0728	12.10	W93040045	1	4.02	94.39	0.63	18.00	4.36	7.21	0.30	1.68
W9304	N20P	04-06-93	0728	12.10	W93040045	2	2.54	84.56	0.72	11.58	2.57	7.05	0.31	1.83

e = Data not reported
s = Suspect value

APPENDIX A

STATION DATA TABLES AND INSTRUMENT CALIBRATION DATA

Part 2

Instrument Calibration Data for Fluorescence and Dissolved Oxygen

The average value of individual analytical replicates from chlorophyll (n=2) and dissolved oxygen determinations (n=2) was used to post-calibrate *in situ* sensor readings, where the CTD value is regarded as dependent on the bottle value. All regressions were forced through zero (top regression of statistics block and ANOVA table accompanying each survey and parameter). Tests of intercept significance (regression statistics and ANOVA table) suggest whether the intercept model had intercepts not significantly different from zero. Note that, as described on the next page, setting the intercept to zero can produce negative r^2 values, but instrument blank readings are near zero and the established practice of forcing through zero was followed for all surveys.

For the survey series, to allow easy comparison of trends in calibration over time, all survey chlorophyll calibrations are given, followed by all survey dissolved oxygen calibrations. The sequence of surveys, coded as follows, is:

W9304 = Early April 1993 combined survey
W9305 = Late April/Early May 1993 nearfield survey
W9306 = Late May 1993 nearfield survey.

DOCUMENT:Q89472 23-JUN-1993 [W_EXCEL]
TITLE :Excel: LINEST() Returns Negative r^2 Value
PRODUCT :Microsoft Windows Excel
PROD/VER:4.00 | 4.00
OPER/SYS:WINDOWS | MACINTOSH
KEYWORDS:

The information in this article applies to:

- Microsoft Excel for Windows, version 4.0
- Microsoft Excel for the Macintosh, version 4.0

Summary:

In Microsoft Excel, setting the CONST argument in the LINEST() function to FALSE can result in a negative value for r^2 (coefficient of determination).

Setting CONST to FALSE in LINEST() forces the best-fit line through the origin which may result in a much greater margin of error. Using TRUE for the CONST argument results in a best-fit line computed solely on your data.

More Information:

The LINEST() function uses the "least squares" method to calculate a straight line that best fits your data. LINEST() also returns additional regression statistics including a coefficient of determination which indicates how useful the equation is in predicting y-values. The coefficient of determination (r^2) should be a value between 0 and 1 where 0 indicates the equation is not helpful and 1 indicates a perfect correlation between the estimated and actual y-values.

If the CONST argument to LINEST() is FALSE then Excel assumes a value of zero for b in the equation y=mx+b, that is, the line is forced through the origin. Forcing the line through the origin causes the predictions Excel generates to be arbitrarily worse than average which can result in r^2 becoming negative.

The coefficient of determination (r^2) is given by the formula:

$$r^2 = 1 - SSE/SST$$

Where:

SSE = The error sum of squares. = $\sum (Y_i - \text{slope} * X_i)^2$

SST = The total sum of squares. = $\sum (Y_i - \bar{Y})^2$

Forcing the best-fit line through the origin causes the estimates used in computing SSE to become arbitrarily large. As a result, the value SSE/SST may be greater than 1 causing the formula, 1 - SSE/SST, to become negative.

In general, forcing a best-fit line through the origin will likely result in a greater margin of error and, hence, less useful statistics.

Reference(s):

"Microsoft Excel Function Reference," version 4.0, pages 254-258

Additional reference words: 4.0 4.00

Survey W9304 Chlorophyll a Calibration

MARKER	STATION	DEPTH	BOTTLE_CHLA	CTD_CHLA	PREDICT_CH	RESIDUAL
21	F23P(3)	3.18	0.73	4.10	2.71	-1.98
22	F23P(2)	2.21	0.27	3.81	2.51	-2.24
45	N20P(11)	11.10	3.28	4.56	3.01	0.27
47	N20P(2)	2.20	1.58	2.15	1.42	0.16
62	N16P(7)	6.72	1.78	4.06	2.68	-0.90
63	N16P(3)	2.52	2.55	2.01	1.33	1.22
76	N10P(6)	5.84	2.03	3.48	2.30	-0.27
77	N10P(3)	2.59	1.10	1.90	1.25	-0.16
210	N01P(10)	10.14	1.76	3.62	2.39	-0.64
212	N01P(3)	2.58	1.90	4.12	2.72	-0.82
224	N04P(24)	24.06	4.27	4.96	3.27	1.00
226	N04P(3)	2.73	0.49	1.86	1.23	-0.74
241	N07P(11)	10.79	0.65	2.69	1.78	-1.13
242	N07P(2)	2.30	1.13	1.42	0.94	0.19
254	F13P(11)	11.11	1.08	4.33	2.86	-1.79
256	F13P(1)	1.37	0.31	2.25	1.49	-1.18
378	F02P(8)	8.15	2.25	3.52	2.33	-0.08
379	F02P(1)	1.10	1.39	1.99	1.32	0.07
399	F01P(11)	11.30	1.26	1.98	1.31	-0.05
401	F01P(2)	1.49	0.91	1.44	0.95	-0.04
482	F25(4)	4.20	0.64	2.91	1.92	-1.29
483	F25(2)	2.23	0.44	2.45	1.62	-1.18
498	N10P(19)	19.18	2.30	3.82	2.52	-0.22
500	N10P(12)	11.56	1.00	3.32	2.20	-1.20
502	N10P(2)	2.24	0.71	3.24	2.14	-1.43
533	N01P(25)	25.35	0.22	1.54	1.01	-0.79
535	N01P(11)	10.82	4.78	4.61	3.04	1.74
537	N01P(1)	1.16	1.42	3.07	2.03	-0.61
566	N04P(44)	43.54	0.42	1.57	1.04	-0.62
568	N04P(11)	10.50	0.82	2.43	1.61	-0.79
570	N04P(1)	1.37	0.38	1.84	1.21	-0.84
615	N07P(46)	45.46	0.52	2.02	1.34	-0.82
618	N07P(15)	14.57	3.63	5.37	3.55	0.08
619	N07P(3)	2.67	1.04	1.49	0.99	0.05
				0	0	

Regression Statistics

Multiple R	#NUM!
R Square	-0.744183887
Adjusted R Square	-0.774486917
Standard Error	1.513371346
Observations	34

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	-32.2472694	-32.2472694	-14.07997657	#NUM!
Residual	33	75.57966342	2.290292831		
Total	34	43.33239402			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A
x1	1.513305619	0.141667552	10.68209053	2.09636E-12	1.225080588	1.80153065

Standard Deviation of Residual: 0.86

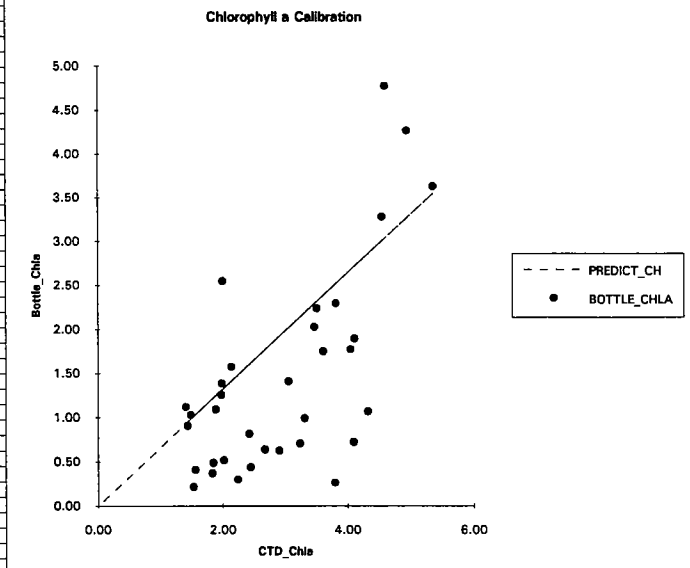
Regression Statistics

Multiple R	0.662321959
R Square	0.438670378
Adjusted R Square	0.421128827
Standard Error	0.871847112
Observations	34

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	19.00863765	19.00863765	25.00750276	1.98284E-05
Residual	32	24.32375637	0.760117387		
Total	33	43.33239402			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1.987074831	0.241981739	8.21167265	1.75644E-09	1.494174575	2.47997509
x1	0.660514109	0.132083004	5.00075022	1.84063E-05	0.391470063	0.92955816



Survey W9305 Chlorophyll a Calibration

MARKER	STATION	DEPTH	BOTTLE_CHLA	CTD_CHLA	PREDICT_CH	RESIDUAL
184	N10P(24)	24.49	0.17	1.73	1.55	-1.39
186	N10P(11)	11.49	0.39	1.71	1.54	-1.15
188	N10P(3)	2.52	0.44	1.91	1.72	-1.28
217	N01P(29)	29.38	0.26	2.41	2.17	-1.91
219	N01P(8)	8.16	4.80	4.44	4.00	0.80
221	N01P(3)	2.60	0.98	1.55	1.39	-0.42
250	N04P(44)	44.30	0.09	1.10	0.99	-0.91
252	N04P(18)	18.17	0.82	1.60	1.44	-0.62
254	N04P(2)	2.40	0.49	0.89	0.80	-0.31
285	N07P(39)	39.14	0.23	0.98	0.88	-0.65
287	N07P(16)	16.32	1.06	1.93	1.73	-0.67
289	N07P(3)	2.51	0.37	0.73	0.66	-0.29
				0	0	

Regression Statistics

Multiple R	#NUM!
R Square	-0.358544717
Adjusted R Square	-0.449453808
Standard Error	1.144594652
Observations	12

Standard Deviation of Residual: 0.69

Analysis of Variance

	df	Sum of Squares	Mean Square	F	Significance F
Regression	1	-3.803343054	-3.803343054	-2.90310053	#NUM!
Residual	11	14.41106609	1.310096917		
Total	12	10.60772303			

	Coefficients	Standard Error	t Statistic	P-value	Lower 95%	Upper 95%
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A
x1	1.112205936	0.221913202	5.011896207	0.000303214	0.623778024	1.600633848

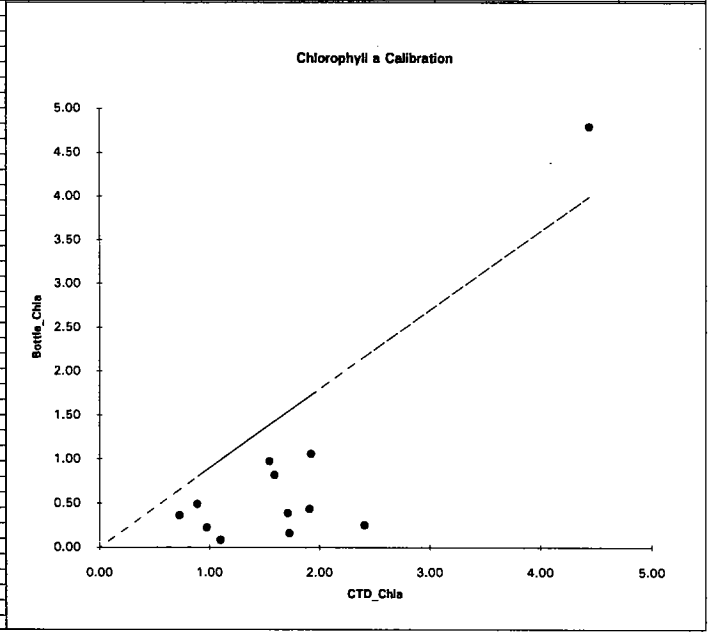
Regression Statistics

Multiple R	0.863829396
R Square	0.746201226
Adjusted R Square	0.720821348
Standard Error	0.518866756
Observations	12

Analysis of Variance

	df	Sum of Squares	Mean Square	F	Significance F
Regression	1	7.915495928	7.915495928	29.40129349	0.000292058
Residual	10	2.692227106	0.269222711		
Total	11	10.60772303			

	Coefficients	Standard Error	t Statistic	P-value	Lower 95%	Upper 95%
Intercept	1.195764257	0.181242115	6.597607075	3.87637E-05	0.79193159	1.599596924
x1	0.660031085	0.121725389	5.422295961	0.000209447	0.38880997	0.931252201



Survey W9306 Chlorophyll a Calibration

MARKER	STATION	DEPTH	BOTTLE_CHLA	CTD_CHLA	PREDICT_CH	RESIDUAL
248	N10P(6)	6.38	1.07	4.43	2.69	-1.62
249	N10P(1)	0.86	0.80	4.90	2.97	-2.17
286	N01P(27)	26.63	0.17	1.54	0.94	-0.77
289	N01P(4)	3.60	1.05	2.08	1.26	-0.21
290	N01P(2)	1.60	1.05	2.01	1.22	-0.16
331	N04P(46)	45.66	0.07	1.56	0.95	-0.88
334	N04P(4)	3.94	3.59	4.26	2.59	1.00
335	N04P(2)	2.00	1.56	1.31	0.80	0.76
373	N07P(7)	7.15	0.86	2.25	1.37	-0.51
374	N07P(2)	1.91	0.40	0.54	0.33	0.07
510	N17(10)	10.32	0.32	1.98	1.20	-0.88
				0	0	

Regression Statistics

Multiple R	#NUMI
R Square	-0.52201981
Adjusted R Square	-0.62201981
Standard Error	1.759840682
Observations	11

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	-10.62217331	-10.6221733	-3.42978327	#NUMI
Residual	10	30.97039227	3.097039227		
Total	11	20.34821895			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A
x1	1.647280991	0.390897431	4.214100325	0.001450714	0.776307087	2.51825489

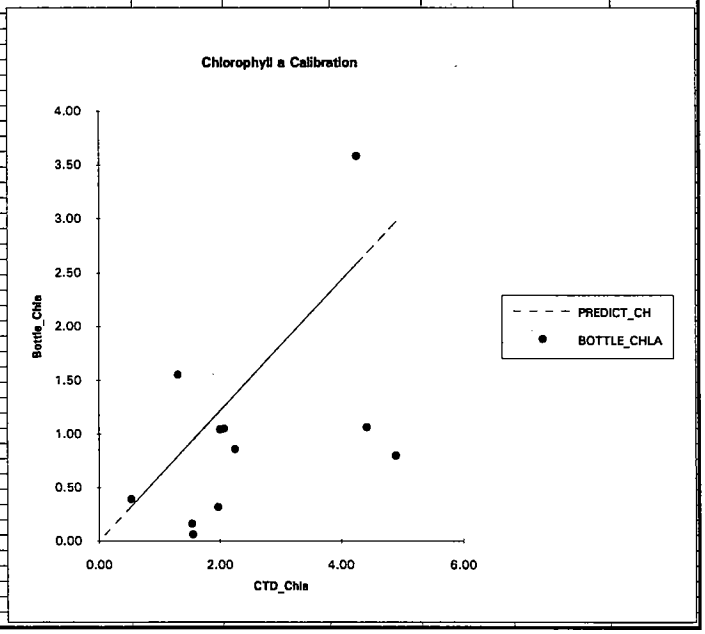
Regression Statistics

Multiple R	0.486784114
R Square	0.236958774
Adjusted R Square	0.152176415
Standard Error	1.313457268
Observations	11

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	4.821689007	4.821689007	2.794906603	0.128897152
Residual	9	15.52652995	1.725169994		
Total	10	20.34821895			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1.734604351	0.579746878	2.992002918	0.013527269	0.423124798	3.0460839
x1	0.714015886	0.427094742	1.671797417	0.125514141	-0.25214028	1.68017205



Survey W9304 Dissolved Oxygen Calibration

MARKER	STATION	DEPTH	BOTTLE_DO	CTD_DO	PREDICT_DO	RESIDUAL
18.00	F23P	20.36	11.47	11.43	11.56	-0.09
21.00	F23P	3.18	11.26	11.24	11.36	-0.11
22.00	F23P	2.21	11.06	11.22	11.34	-0.29
43.00	N20P	27.08	11.61	11.63	11.75	-0.14
45.00	N20P	11.10	12.53	12.41	12.55	-0.02
47.00	N20P	2.20	12.31	12.33	12.47	-0.16
59.00	N16P	39.38	11.41	11.46	11.59	-0.18
62.00	N16P	6.72	12.26	11.94	12.07	0.19
63.00	N16P	2.52	12.71	12.34	12.48	0.23
73.00	N10P	21.24	11.64	11.67	11.80	-0.16
76.00	N10P	5.84	12.20	11.94	12.07	0.14
77.00	N10P	2.59	12.20	12.02	12.15	0.05
142.00	F19	73.74	11.15	11.27	11.39	-0.24
144.00	F19	41.28	11.80	11.66	11.79	0.01
145.00	F19	21.90	12.23	12.25	12.38	-0.15
155.00	F22	74.18	10.92	11.19	11.31	-0.39
158.00	F22	12.23	12.12	12.09	12.22	-0.10
159.00	F22	1.72	12.09	12.04	12.17	-0.08
208.00	N01P	24.97	11.50	11.76	11.89	-0.39
210.00	N01P	10.14	12.26	12.09	12.23	0.03
212.00	N01P	2.58	12.38	12.26	12.39	-0.01
222.00	N04P	45.25	11.65	11.77	11.90	-0.24
224.00	N04P	24.06	12.78	12.55	12.69	0.09
226.00	N04P	2.73	12.23	11.97	12.10	0.13
238.00	N07P	44.74	11.52	11.56	11.69	-0.17
241.00	N07P	10.79	12.28	11.98	12.11	0.17
242.00	N07P	2.30	12.40	12.15	12.29	0.11
252.00	F13P	23.78	11.59	11.57	11.69	-0.11
254.00	F13P	11.11	12.73	12.46	12.60	0.13
256.00	F13P	1.37	11.65	11.48	11.61	0.04
274.00	F05	18.43	11.66	11.47	11.60	0.07
276.00	F05	7.47	11.86	11.62	11.75	0.12
278.00	F05	1.46	11.85	11.59	11.72	0.13
330.00	F12	83.49	10.99	10.91	11.03	-0.04
333.00	F12	31.35	11.97	11.61	11.73	0.24
335.00	F12	1.70	12.43	12.16	12.29	0.13
346.00	F04	55.93	11.50	11.66	11.79	-0.29
348.00	F04	18.81	11.70	11.51	11.64	0.07
350.00	F04	2.04	11.70	11.53	11.65	0.05
375.00	F02P	25.75	11.24	11.69	11.81	-0.57
377.00	F02P	13.03	11.82	11.76	11.89	-0.07
379.00	F02P	1.10	11.84	11.75	11.88	-0.04
397.00	F01P	21.59	11.84	11.82	11.95	-0.11
399.00	F01P	11.30	12.02	11.97	12.10	-0.08
401.00	F01P	1.49	11.90	11.70	11.83	0.07
498.00	N10P	19.18	12.44	12.36	12.49	-0.05
499.00	N10P	16.44	11.96	12.22	12.35	-0.39
500.00	N10P	11.56	11.86	12.02	12.15	-0.29
501.00	N10P	7.90	11.67	11.78	11.91	-0.24
502.00	N10P	2.24	11.68	11.82	11.94	-0.26
533.00	N01P	25.35	11.38	11.40	11.52	-0.15
534.00	N01P	17.63	11.65	11.35	11.48	0.17
535.00	N01P	10.82	12.63	12.04	12.18	0.45
536.00	N01P	4.50	12.69	12.42	12.56	0.13
537.00	N01P	1.16	12.77	12.50	12.64	0.14
566.00	N04P	43.54	11.74	11.35	11.47	0.27
567.00	N04P	22.27	12.41	11.90	12.03	0.38
568.00	N04P	10.50	12.67	12.30	12.44	0.24
569.00	N04P	5.09	12.79	12.41	12.55	0.24
570.00	N04P	1.37	12.59	12.12	12.26	0.33
615.00	N07P	45.46	11.53	11.44	11.56	-0.04
616.00	N07P	38.49	11.41	11.18	11.30	0.10
617.00	N07P	23.01	11.92	11.57	11.69	0.23
618.00	N07P	14.57	12.64	12.23	12.37	0.27
619.00	N07P	2.67	12.74	12.37	12.51	0.23
672.00	N20P	27.82	11.60	11.43	11.55	0.05
673.00	N20P	12.96	12.43	11.93	12.06	0.37
674.00	N20P	8.48	12.88	12.56	12.70	0.18
675.00	N20P	5.74	13.02	12.58	12.72	0.30
676.00	N20P	2.04	12.62	12.25	12.38	0.24
730.00	N16P	38.90	11.17	11.35	11.48	-0.31
731.00	N16P	26.36	11.24	11.22	11.34	-0.09
732.00	N16P	16.82	11.81	12.50	12.64	-0.83
733.00	N16P	6.92	13.01	13.05	13.19	-0.18
734.00	N16P	2.19	12.64	12.38	12.52	0.12
				0.00	0.00	

Regression Statistics

Multiple R	0.85
R Square	0.73
Adjusted R Square	0.71
Standard Error	0.23
Observations	75.00

Standard Deviation of Residual: 0.23

Analysis of Variance

	df	Sum of Squares	Mean Square	F	Significance F
Regression	1.00	10.18	10.18	196.87	0.00
Residual	74.00	3.83	0.05		
Total	75.00	14.00			

	Coefficients	Standard Error	t Statistic	P-value	Lower 95%	Upper 95%
Intercept	0.00	#N/A	#N/A	#N/A	#N/A	#N/A
x1	0.99	0.00	452.45	0.00	0.98	0.99

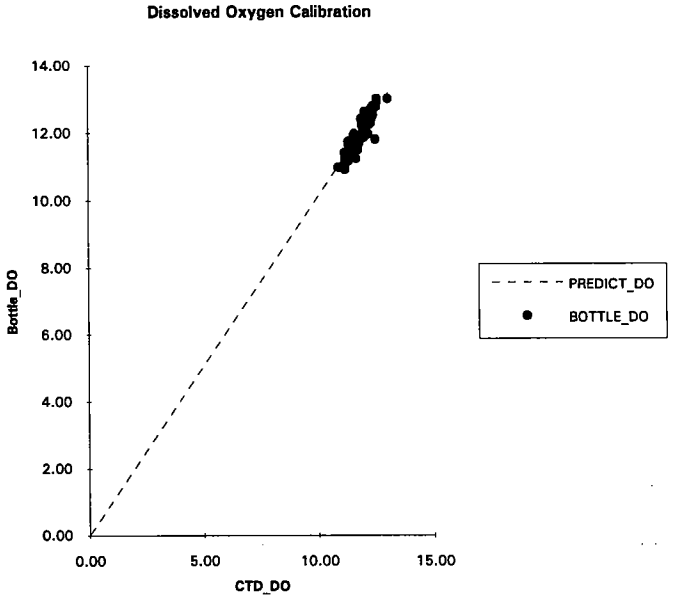
Regression Statistics

Multiple R	0.91
R Square	0.82
Adjusted R Square	0.82
Standard Error	0.18
Observations	75.00

Analysis of Variance

	df	Sum of Squares	Mean Square	F	Significance F
Regression	1.00	11.53	11.53	340.18	0.00
Residual	73.00	2.47	0.03		
Total	74.00	14.00			

	Coefficients	Standard Error	t Statistic	P-value	Lower 95%	Upper 95%
Intercept	3.03	0.48	6.31	0.00	2.07	3.99
x1	0.74	0.04	18.44	0.00	0.66	0.82



Survey W9305 Dissolved Oxygen Calibration

MARKER	STATION	DEPTH	BOTTLE_DO	CTD_DO	PREDICT_DO	RESIDUAL
184	N10P	24.49	10.83	11.01	10.80	0.03
185	N10P	19.10	10.83	11.08	10.88	-0.05
186	N10P	11.49	10.82	10.91	10.71	0.11
187	N10P	5.84	10.85	11.07	10.87	-0.03
188	N10P	2.52	10.74	11.09	10.89	-0.15
217	N01P	29.38	10.56	10.62	10.42	0.13
218	N01P	16.30	11.00	11.20	10.99	0.00
219	N01P	8.16	11.07	11.30	11.09	-0.02
220	N01P	3.20	11.13	11.29	11.09	0.05
221	N01P	2.60	11.06	11.29	11.08	-0.03
250	N04P	44.30	10.74	11.08	10.88	-0.14
251	N04P	32.08	10.81	10.67	10.47	0.13
252	N04P	18.17	11.02	11.11	10.91	0.12
253	N04P	7.58	11.04	11.15	10.94	0.10
254	N04P	2.40	11.02	11.22	11.01	0.01
285	N07P	39.14	10.85	10.95	10.75	0.11
286	N07P	28.37	10.88	11.02	10.82	0.06
287	N07P	16.32	11.08	11.16	10.96	0.13
288	N07P	7.39	11.11	11.29	11.08	0.03
289	N07P	2.51	10.93	11.20	10.99	-0.06
325	N20P	26.67	10.60	10.96	10.76	-0.15
326	N20P	20.14	11.04	11.09	10.89	0.16
327	N20P	10.60	11.17	11.31	11.10	0.07
328	N20P	4.75	11.09	11.31	11.10	-0.01
329	N20P	2.50	11.04	11.26	11.05	-0.01
361	N16P	36.56	10.81	11.27	11.07	-0.46
362	N16P	26.13	10.70	10.97	10.77	-0.07
363	N16P	15.15	11.01	11.25	11.05	-0.04
364	N16P	5.57	11.22	11.38	11.17	0.05
365	N16P	2.18	11.04	11.33	11.12	-0.08
				0	0.00	

Regression Statistics

Multiple R	0.737700026
R Square	0.544201328
Adjusted R Square	0.509718569
Standard Error	0.124731554
Observations	30

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.538687878	0.538687878	34.624582	2.49976E-06
Residual	29	0.451180853	0.01555796		
Total	30	0.989868732			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A
x1	1.018667785	0.002084548	488.6756899	4.417E-60	1.014404404	1.022931166

Standard Deviation of Residual: 0.12

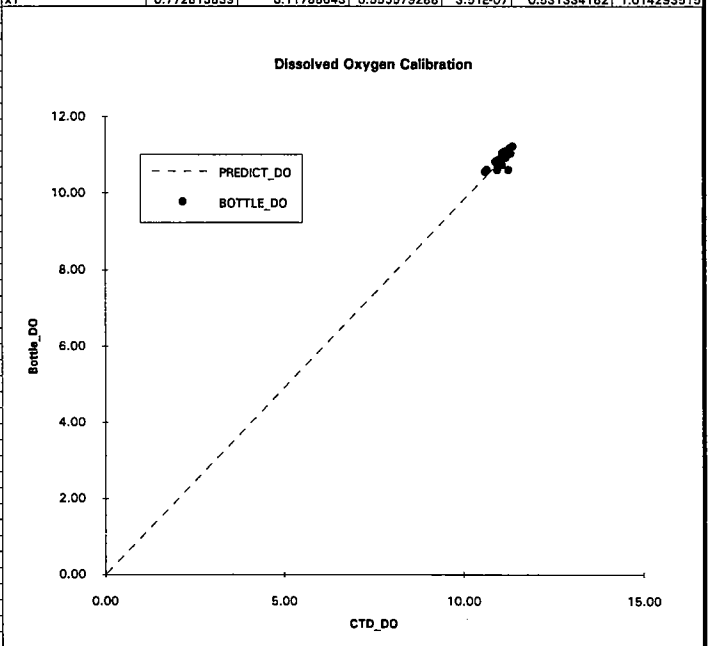
Regression Statistics

Multiple R	0.778137737
R Square	0.605498338
Adjusted R Square	0.591408993
Standard Error	0.118095733
Observations	30

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	0.599363872	0.599363872	42.97562	4.1602E-07
Residual	28	0.39050486	0.013946602		
Total	29	0.989868732			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	2.686222137	1.287857119	2.085807577	0.045903	0.048163454	5.32428082
x1	0.772813839	0.11788643	6.555579288	3.51E-07	0.531334162	1.014293515



Survey W9306 Dissolved Oxygen Calibration

MARKER	STATION	DEPTH	BOTTLE_DO	CTD_DO	PREDICT_DO	RESIDUAL
246	N10P	15.88	9.42	9.76	9.44	-0.02
247	N10P	11.70	8.59	9.00	8.70	-0.11
248	N10P	6.36	8.36	8.88	8.58	-0.22
249	N10P	0.86	8.55	8.73	8.44	0.11
286	N01P	26.63	9.96	10.27	9.92	0.04
287	N01P	17.92	10.66	11.05	10.68	-0.02
288	N01P	7.43	9.61	9.85	9.53	0.08
289	N01P	3.60	9.69	10.12	9.78	-0.09
290	N01P	1.60	9.83	10.10	9.76	0.07
331	N04P	45.66	10.14	10.64	10.29	-0.15
332	N04P	28.51	10.67	11.10	10.73	-0.06
333	N04P	12.97	10.66	11.01	10.65	0.02
334	N04P	3.94	10.08	10.22	9.88	0.20
335	N04P	2.00	9.94	10.26	9.92	0.03
371	N07P	26.72	9.96	10.25	9.91	0.05
372	N07P	15.15	10.02	10.30	9.96	0.06
373	N07P	7.15	9.79	10.13	9.79	0.00
374	N07P	1.91	9.85	10.23	9.89	-0.05
430	N20P	27.07	10.00	10.32	9.98	0.02
431	N20P	19.46	9.95	10.38	10.03	-0.09
432	N20P	12.90	10.35	10.74	10.38	-0.03
433	N20P	6.29	9.94	10.14	9.80	0.13
434	N20P	1.72	9.92	10.23	9.89	0.03
493	N16P	36.08	10.02	10.44	10.10	-0.07
494	N16P	23.82	10.14	10.57	10.22	-0.08
495	N16P	15.03	10.49	11.11	10.74	-0.25
496	N16P	9.57	9.92	9.96	9.63	0.29
497	N16P	1.81	10.02	10.40	10.05	-0.04
510	N17	10.32	10.26	10.47	10.12	0.14
				0	0	

Regression Statistics

Multiple R	0.978868129
R Square	0.958182814
Adjusted R Square	0.922468528
Standard Error	0.119697495
Observations	29

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	9.192247975	9.192247975	641.5811642	2.36805E-20
Residual	28	0.401169731	0.01432749		
Total	29	9.593417706			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A
x1	1.034343714	0.00224422	460.8923901	1.33829E-57	1.029746633	1.038940794

Standard Deviation of Residual: 0.12

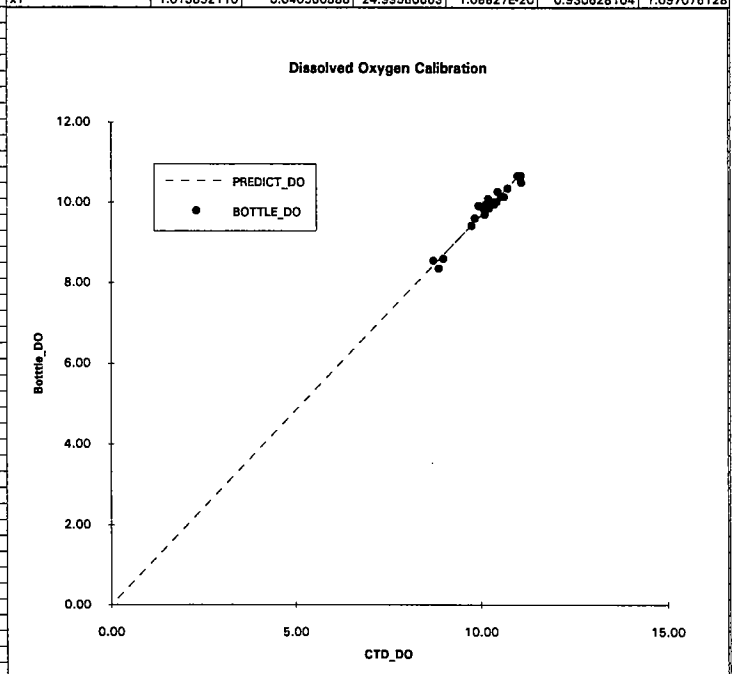
Regression Statistics

Multiple R	0.97906876
R Square	0.958575637
Adjusted R Square	0.957041401
Standard Error	0.121320087
Observations	29

Analysis of Variance

	df	*Sum of Squares*	*Mean Square*	*F*	*Significance F*
Regression	1	9.196016489	9.196016489	624.7903491	3.3399E-20
Residual	27	0.397401217	0.014718564		
Total	28	9.593417706			

	Coefficients	*Standard Error*	*t Statistic*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.203273395	0.401724369	0.506002152	0.616816011	-0.620996373	1.027543164
x1	1.013852116	0.040560888	24.99580663	1.08827E-20	0.930628104	1.097076128



APPENDIX B

VERTICAL PROFILE DATA FROM FARFIELD AND NEARFIELD STATIONS

Only post-survey calibrated data are presented, where calibrations have been performed as given in Appendix A. The data are from the downcast at stations and, therefore, may not match precisely the data in Appendix A because bottles were closed on the upcast.

For each station there is a one-page set of profiles, with station, cruise code, date and time listed across the bottom. Nearfield BioProductivity stations were sampled twice during the April farfield/nearfiled survey and two sets of profiles are presented.

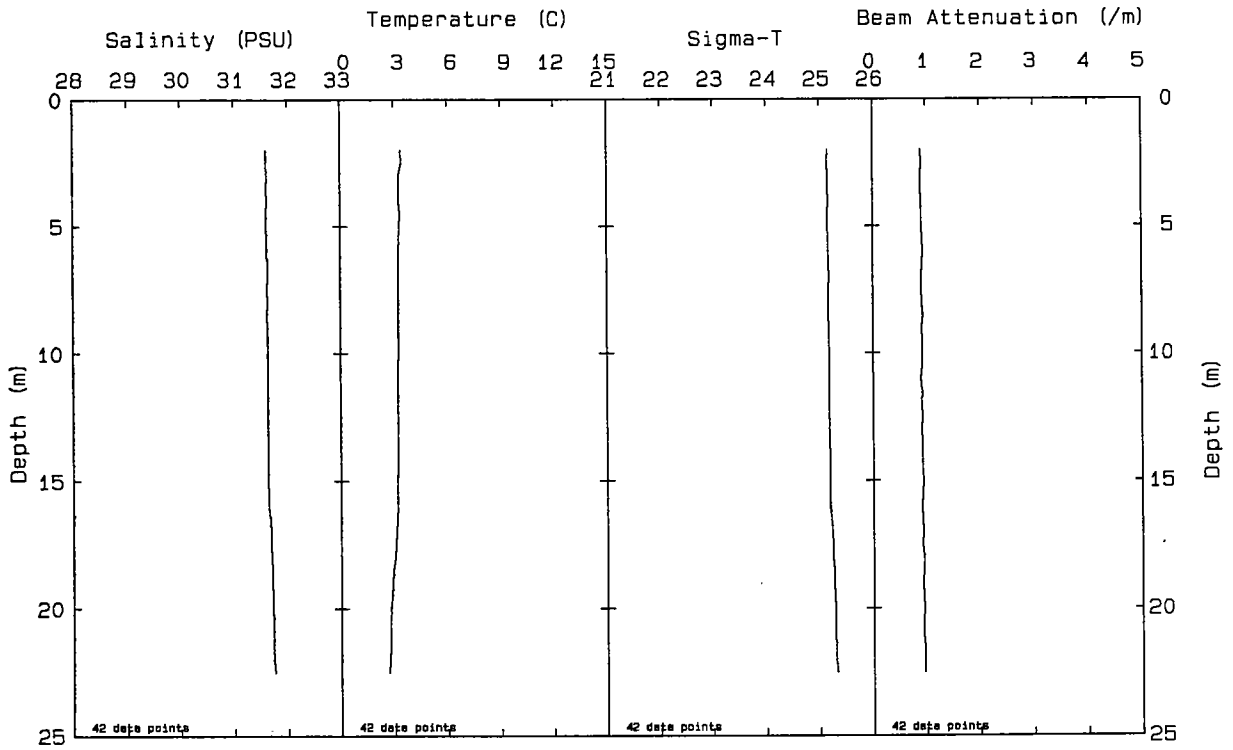
Where a panel is blank, no data were collected. For example, this occurred for irradiance readings.

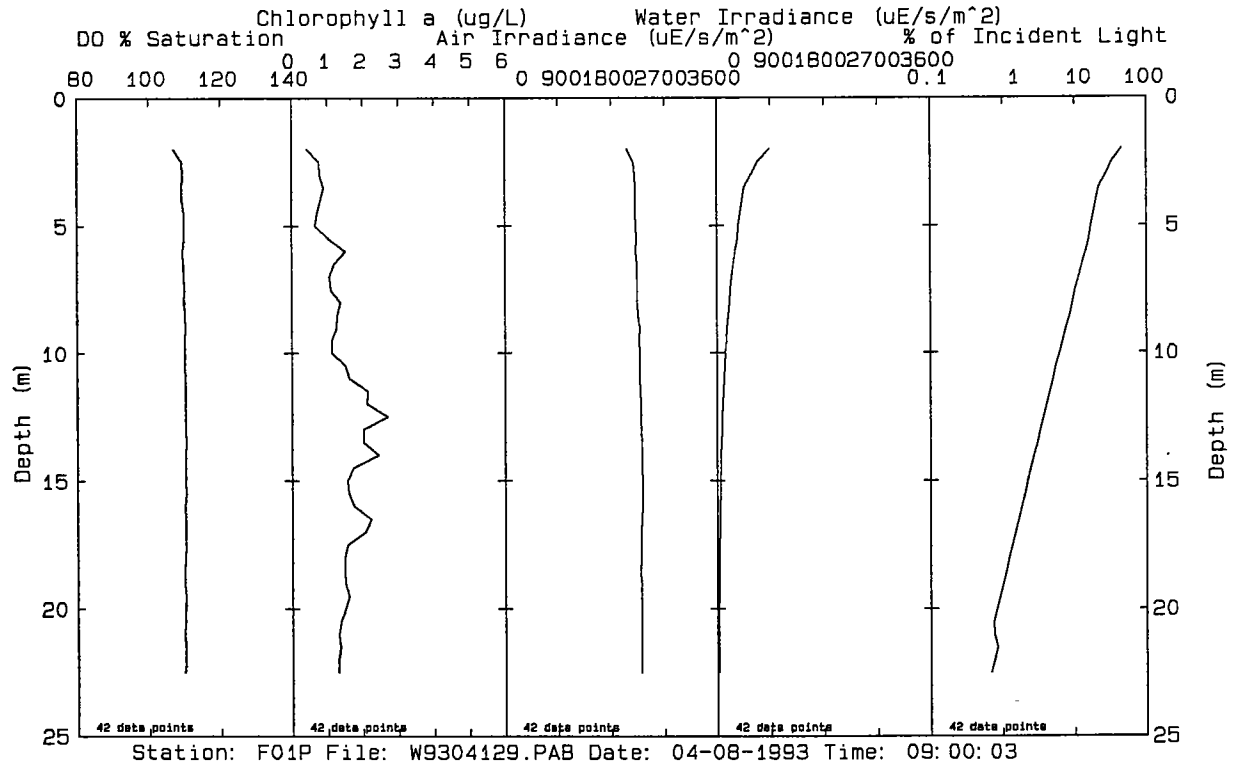
Due to electrical connection problems with the surface irradiance sensor on survey W9305, the surface irradiance and % of incident light are estimates at the following stations:

Station	File Name
N10P	W9305049
N11	W9305052
N12	W9305055
N05	W9305071
N09	W9305083
N20P	W9305087
N13	W9305089
N14	W9305092
N16P	W9305096
N17	W9305098
N18	W9305100

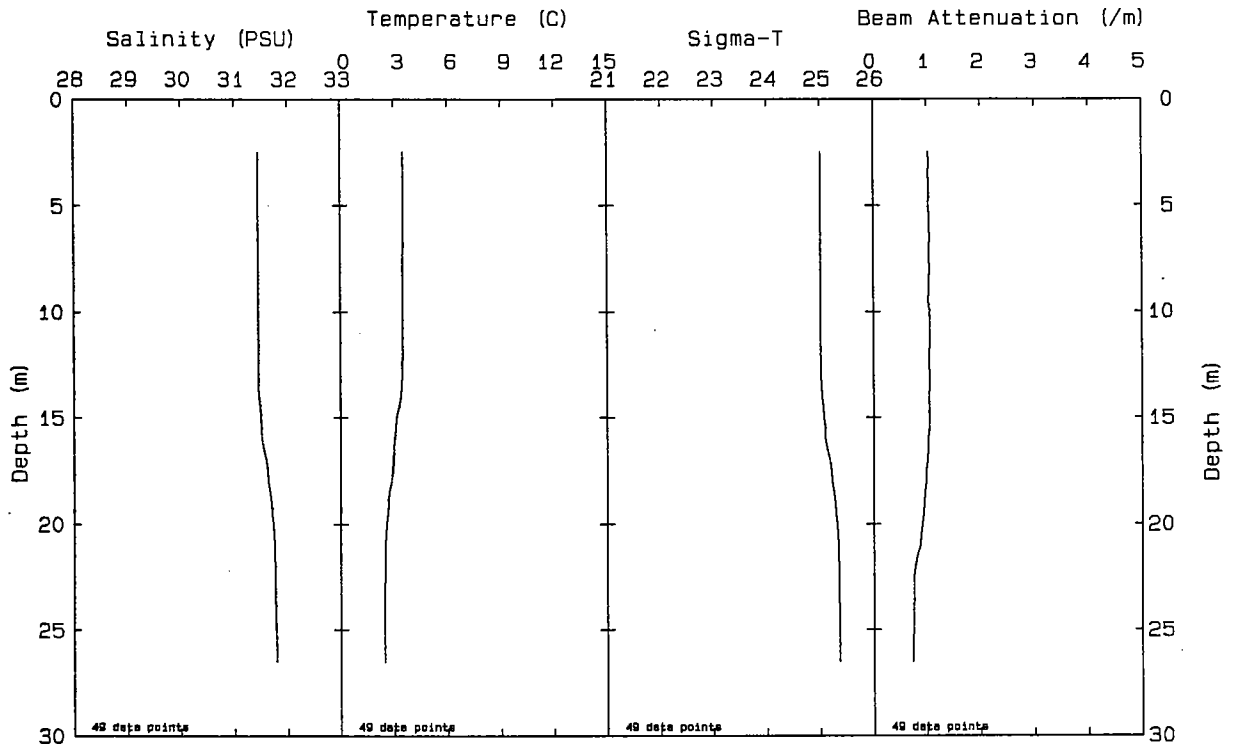
The estimates were made by examining the readings made during good casts at nearby stations to determine a reasonable range, then inspecting the data stream at these listed stations for intervals without the high degree of spikiness indicative of the electric problem.

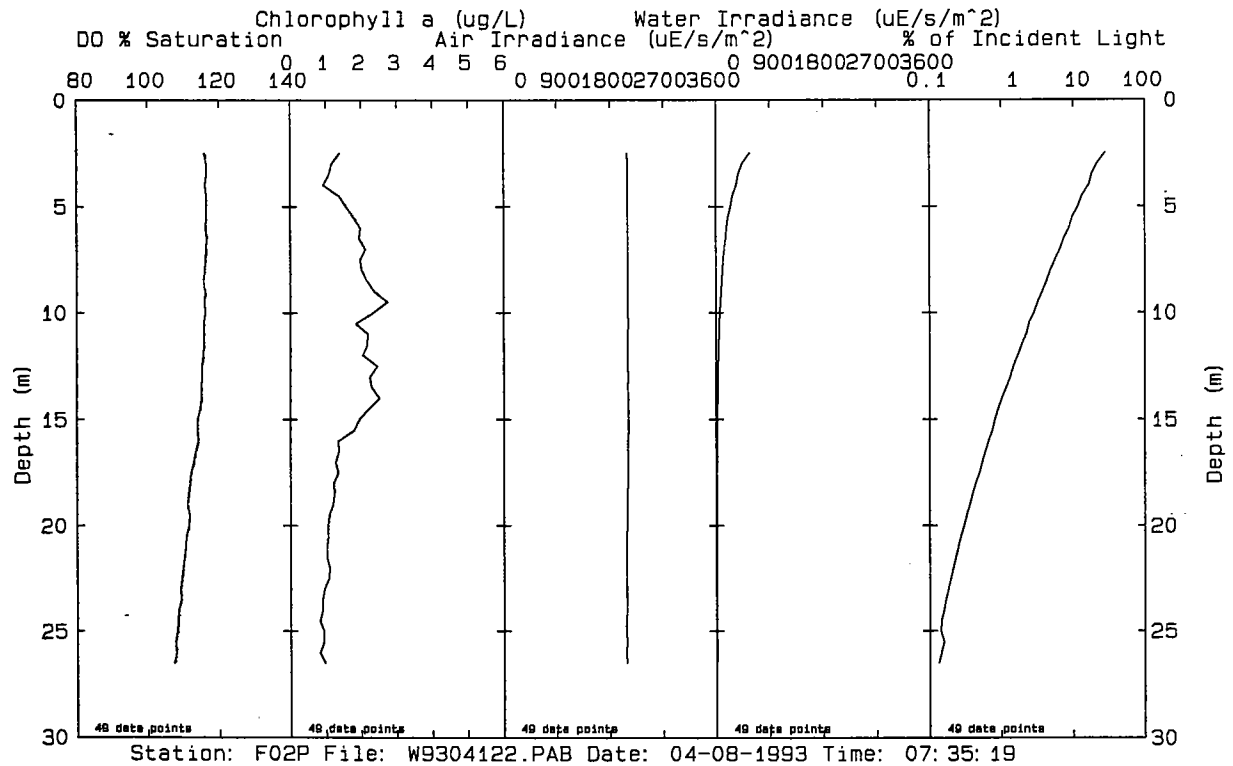
Early April 1993 Profiles

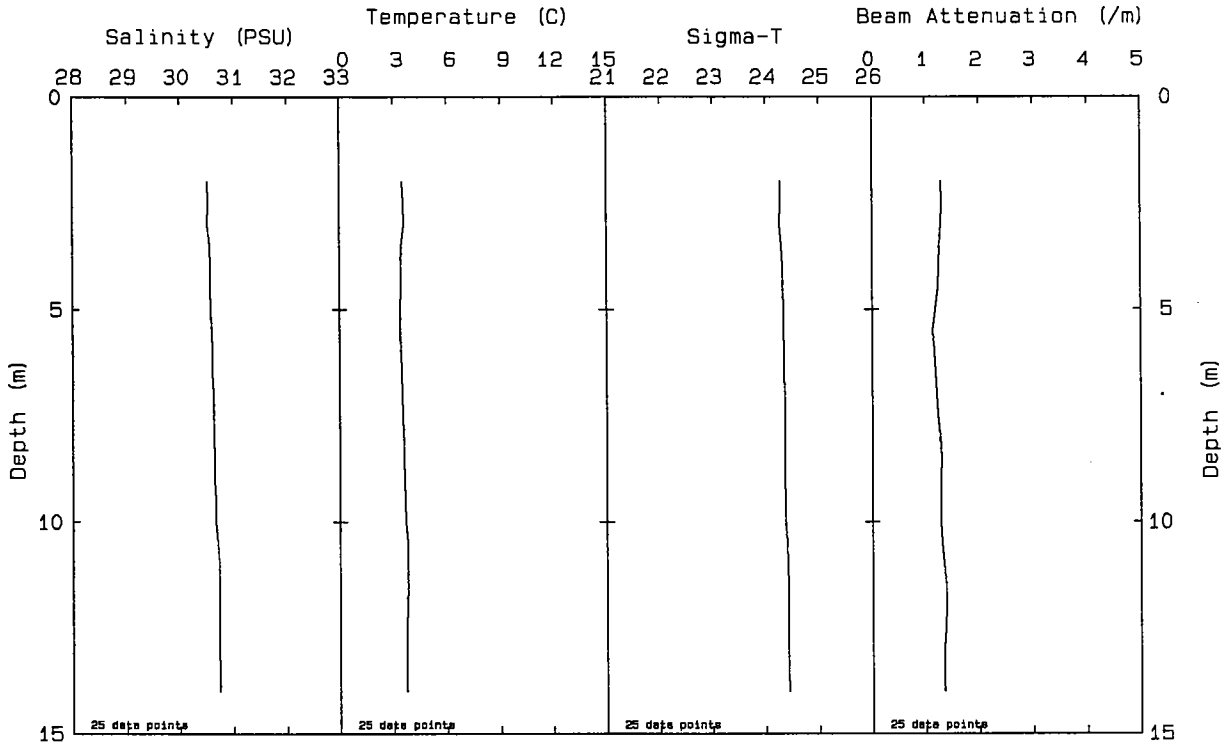


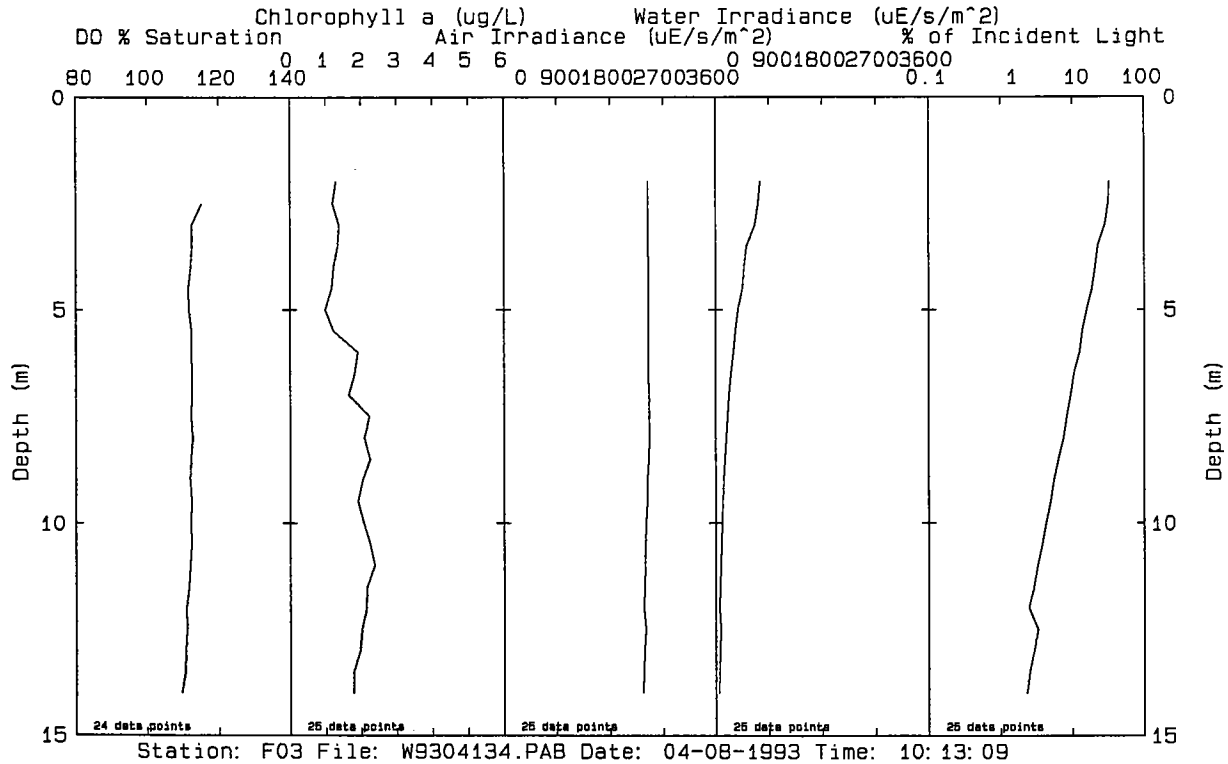


Station: F01P File: W9304129.PAB Date: 04-08-1993 Time: 09:00:03

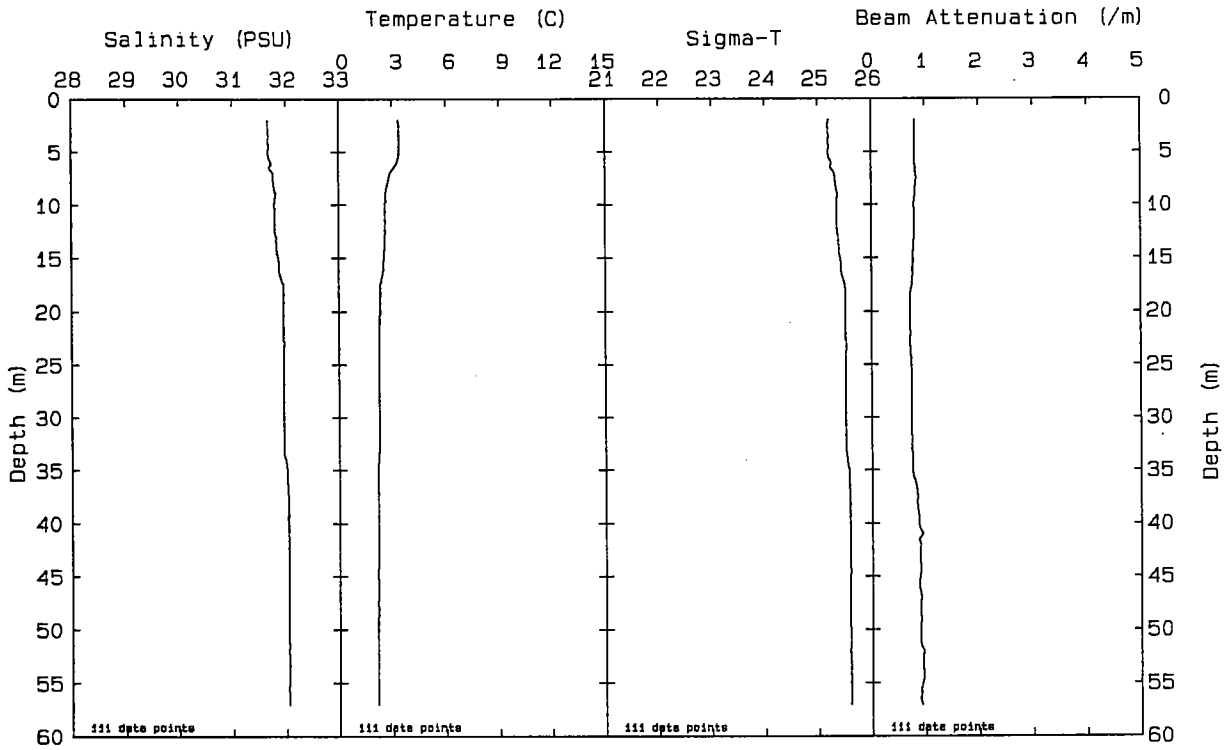

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30
49 data points

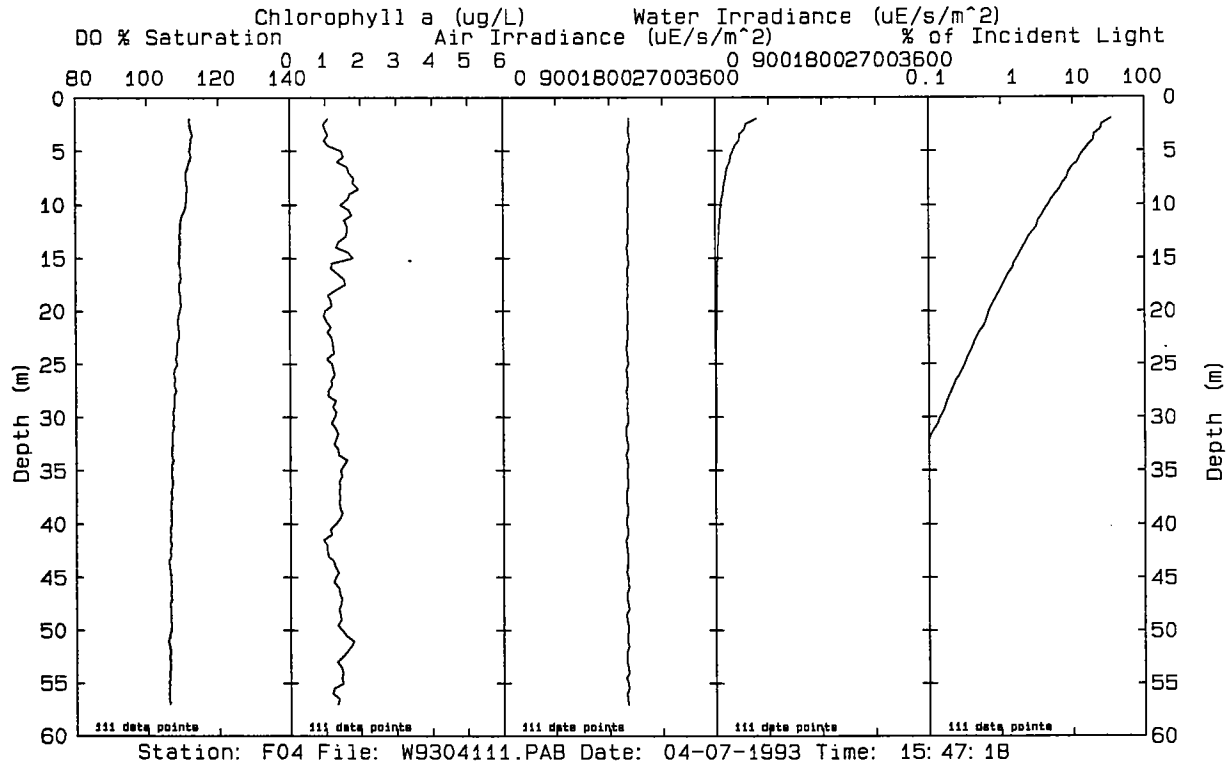

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30
49 data points
Station: F02P File: W9304122.PAB Date: 04-08-1993 Time: 07:35:19



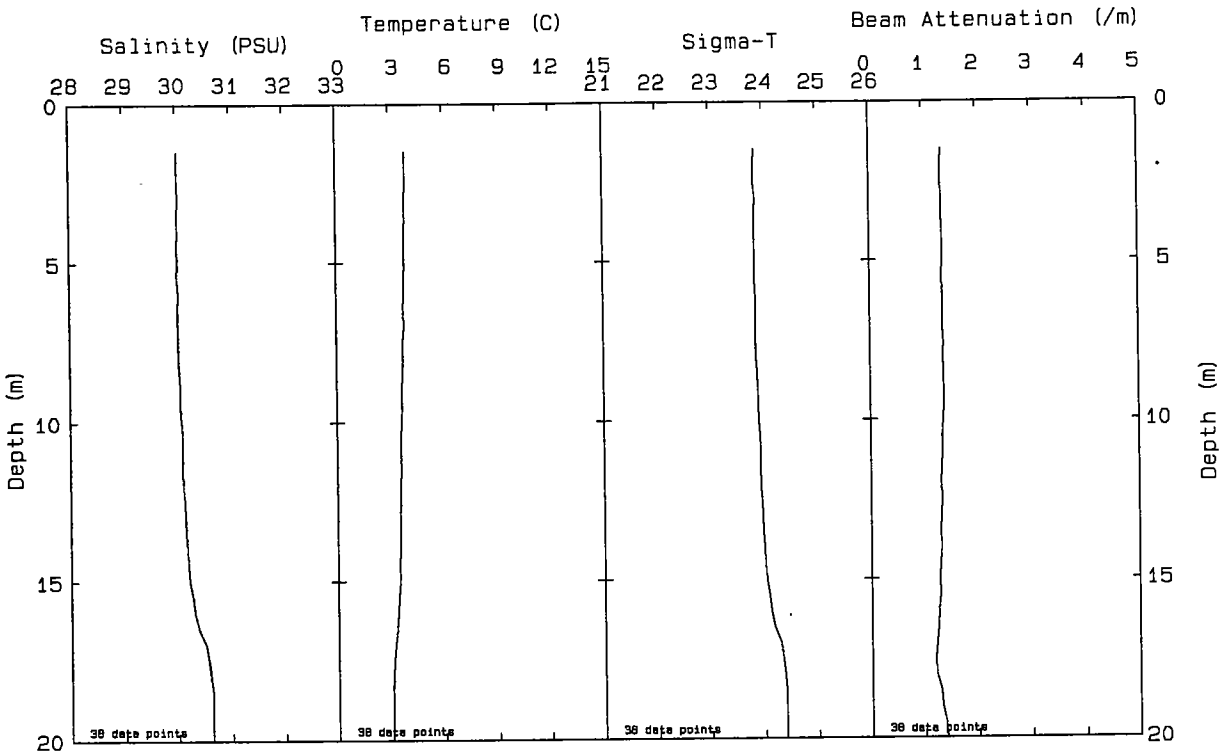


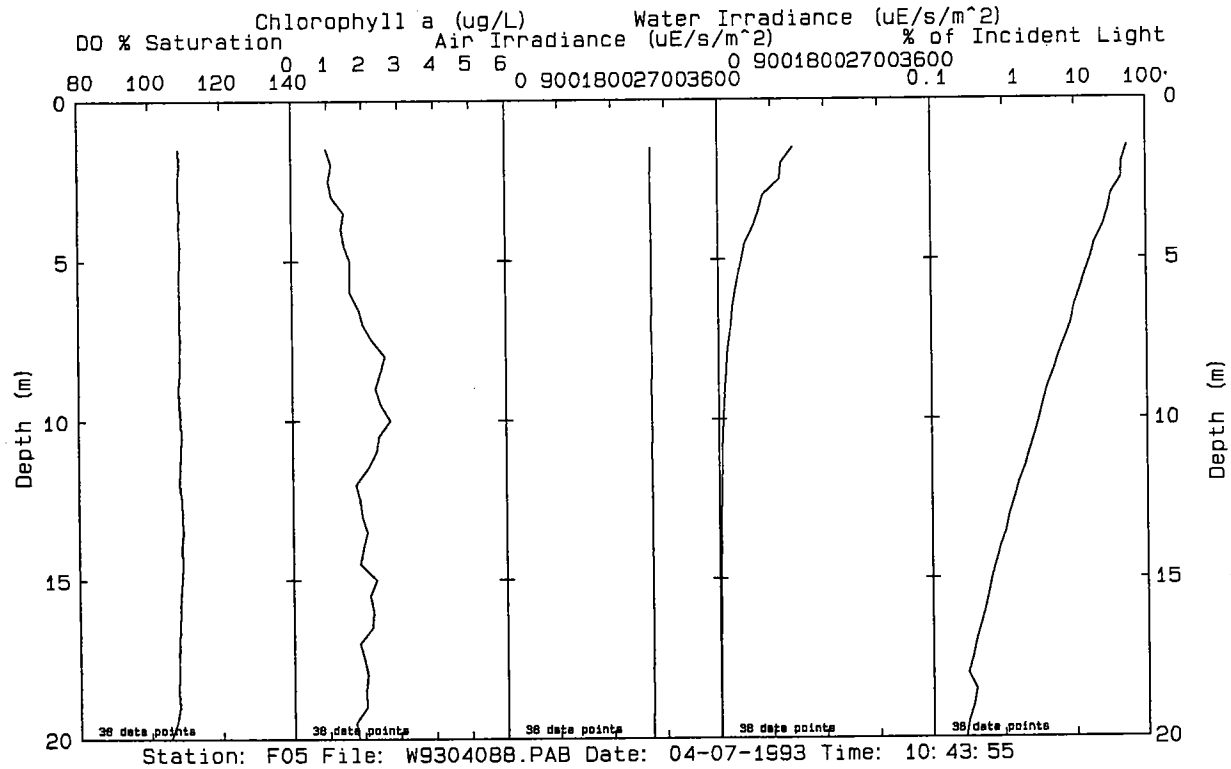
Station: F03 File: W9304134.PAB Date: 04-08-1993 Time: 10:13:09



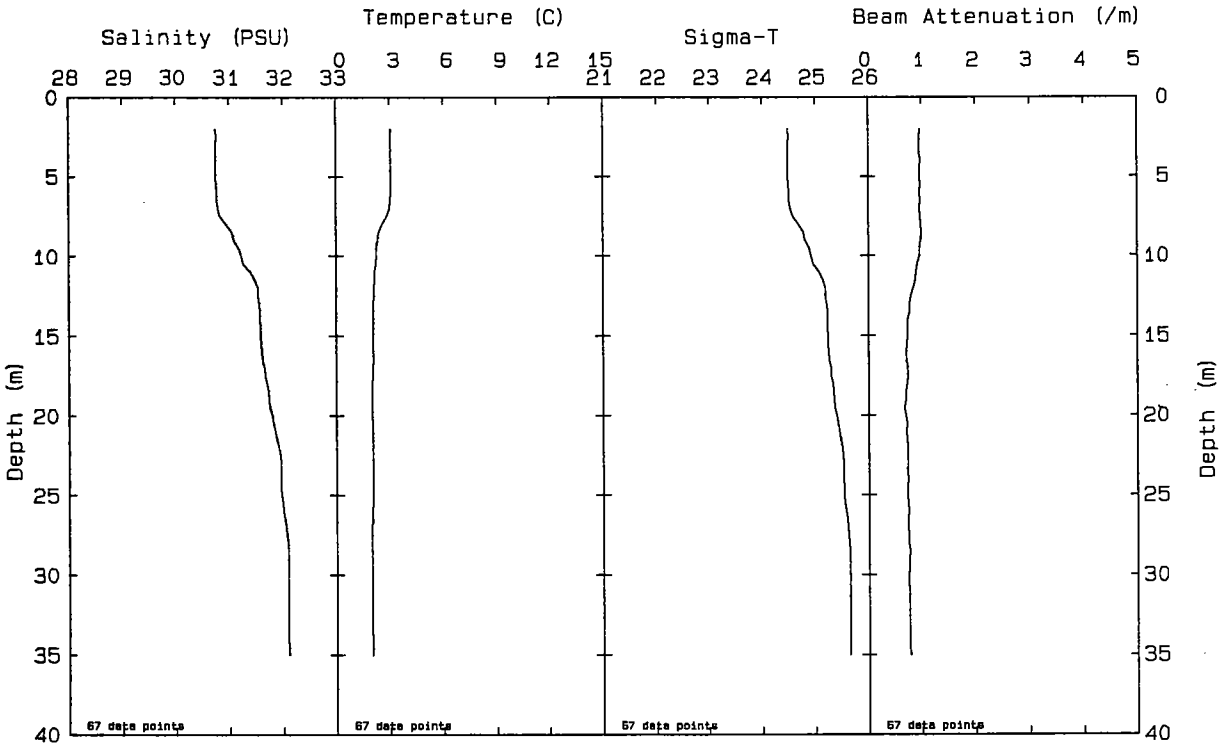


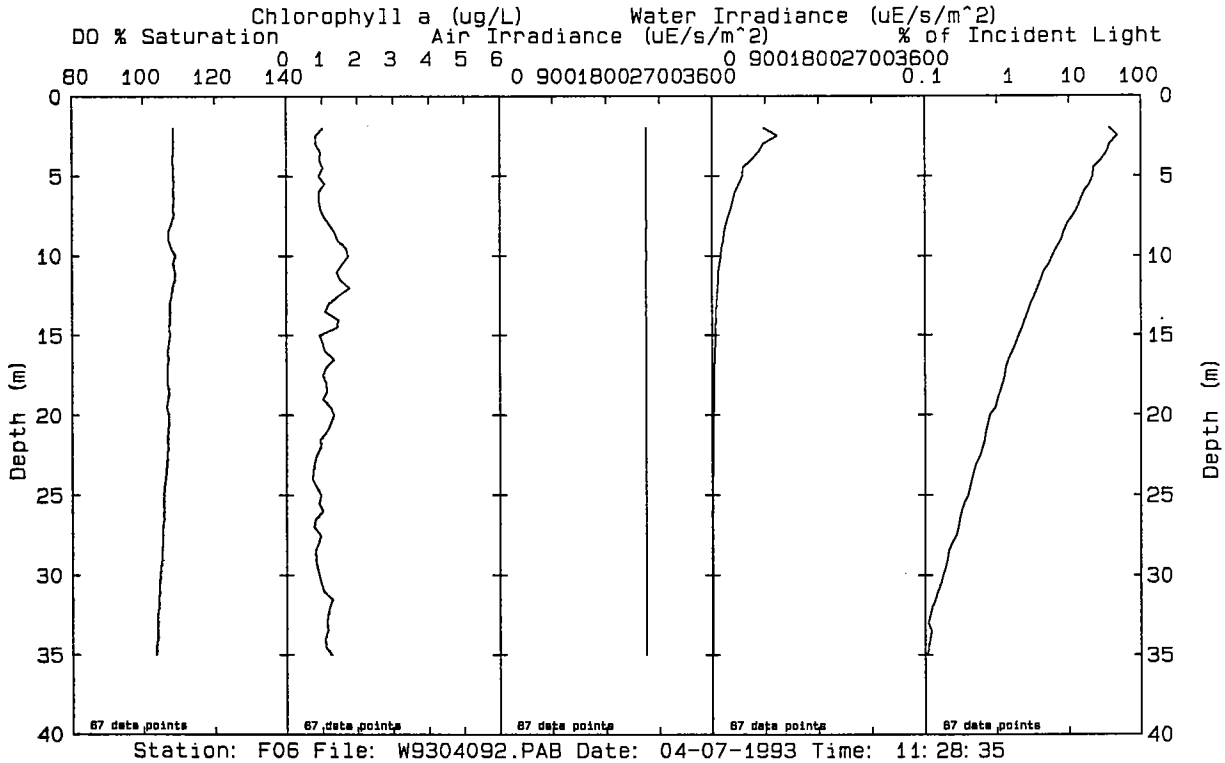
Station: F04 File: W9304111.PAB Date: 04-07-1993 Time: 15:47:18



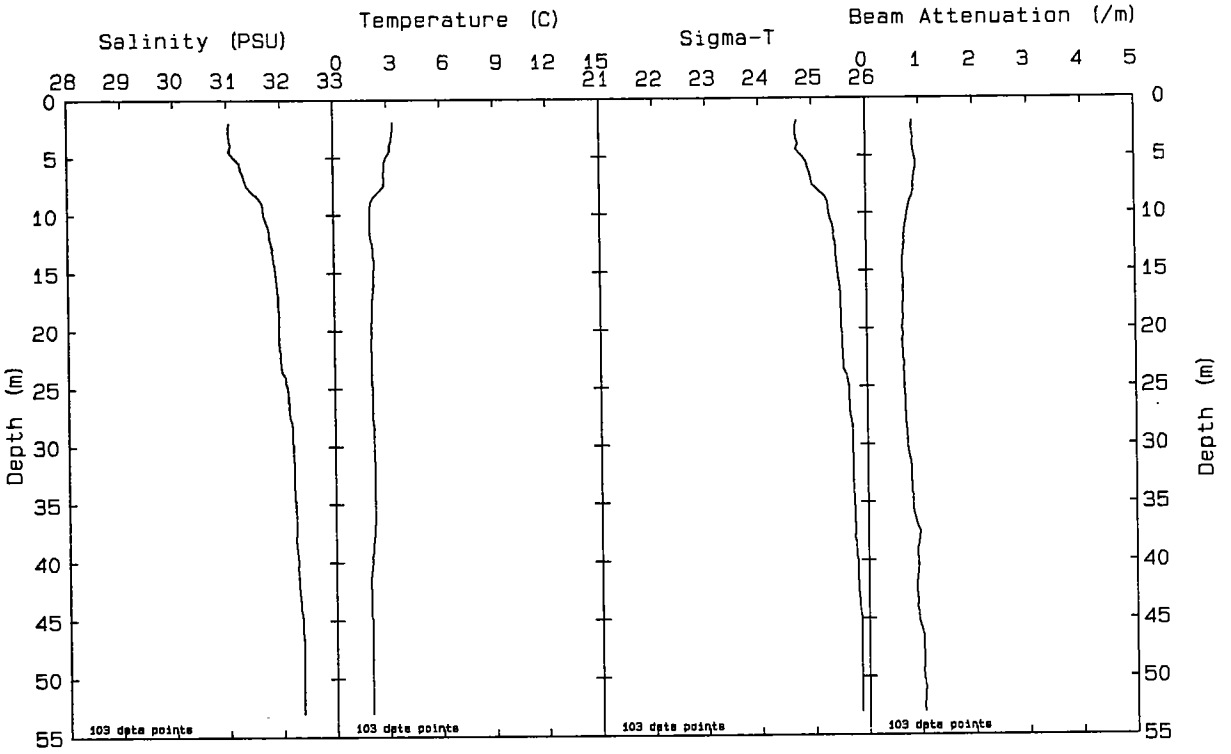


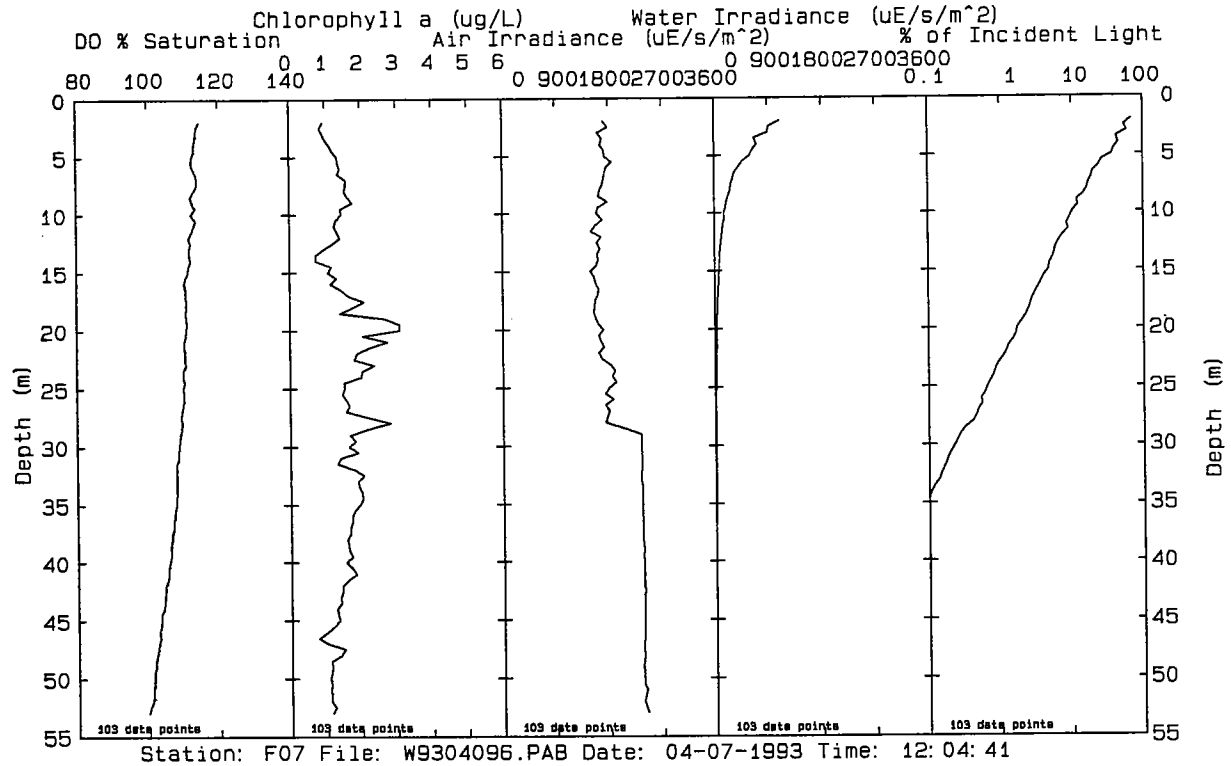
Station: F05 File: W9304088.PAB Date: 04-07-1993 Time: 10:43:55



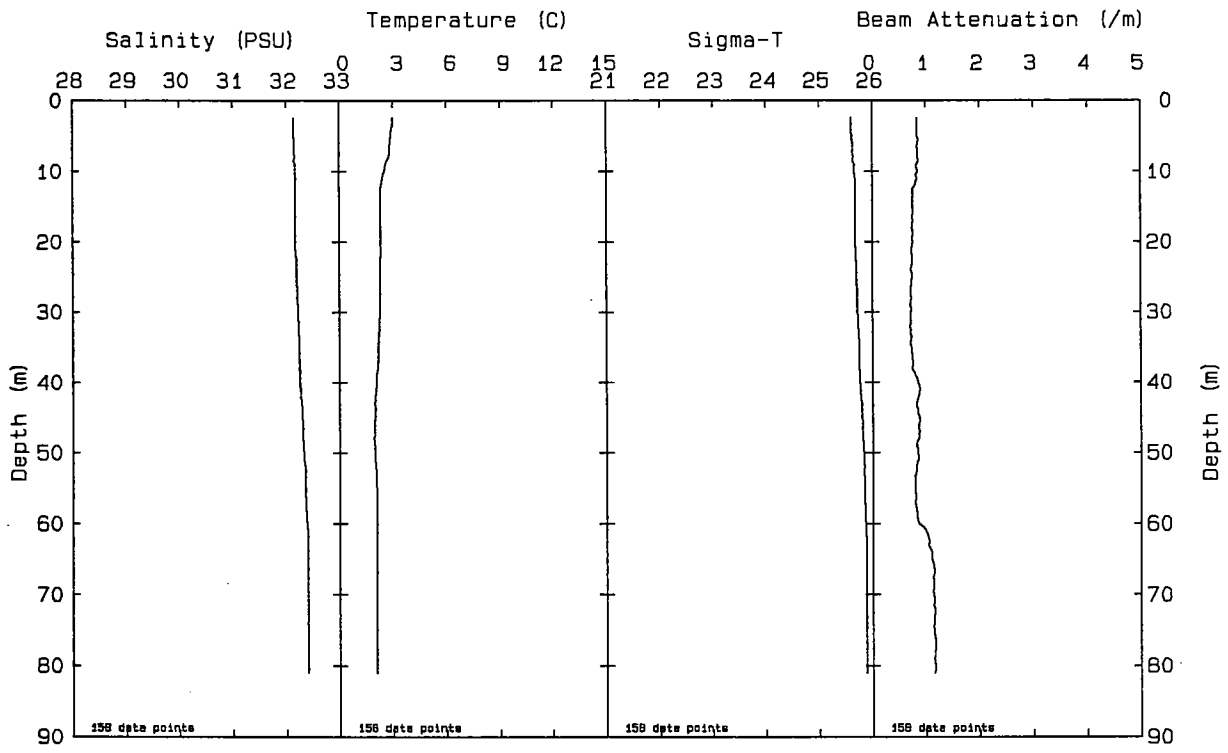


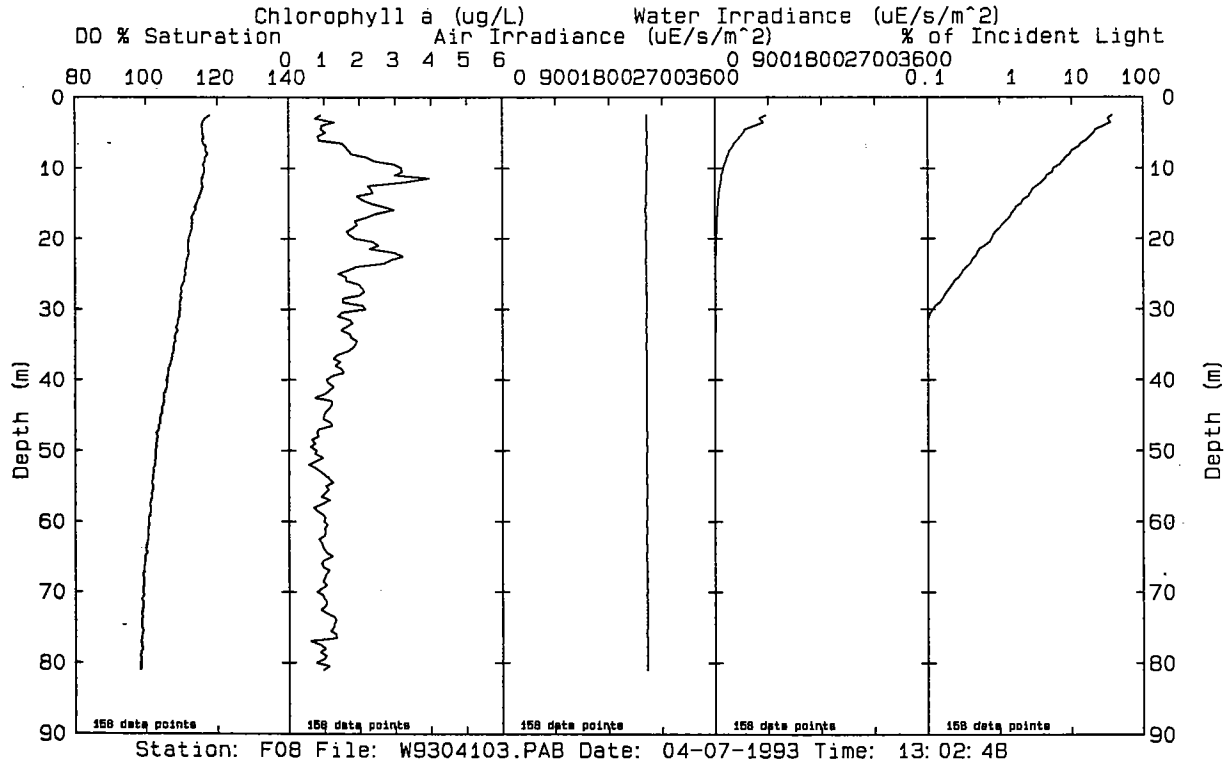
Station: F06 File: W9304092.PAB Date: 04-07-1993 Time: 11:28:35



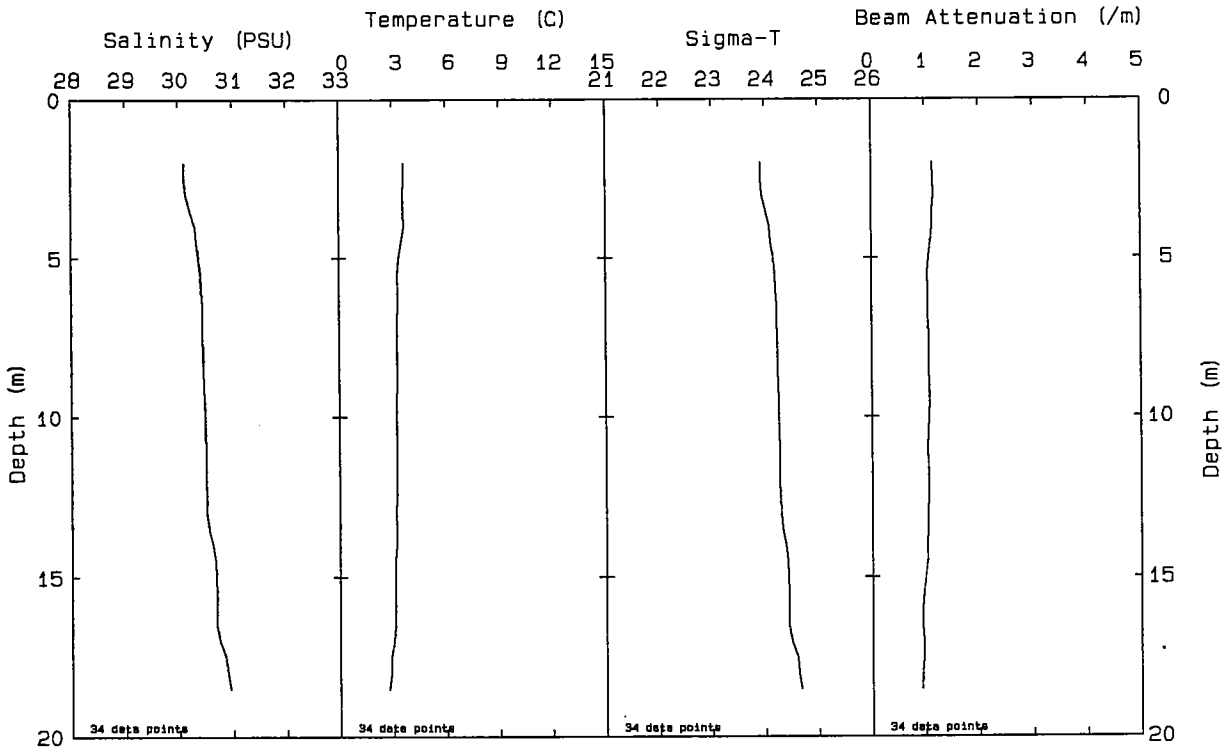


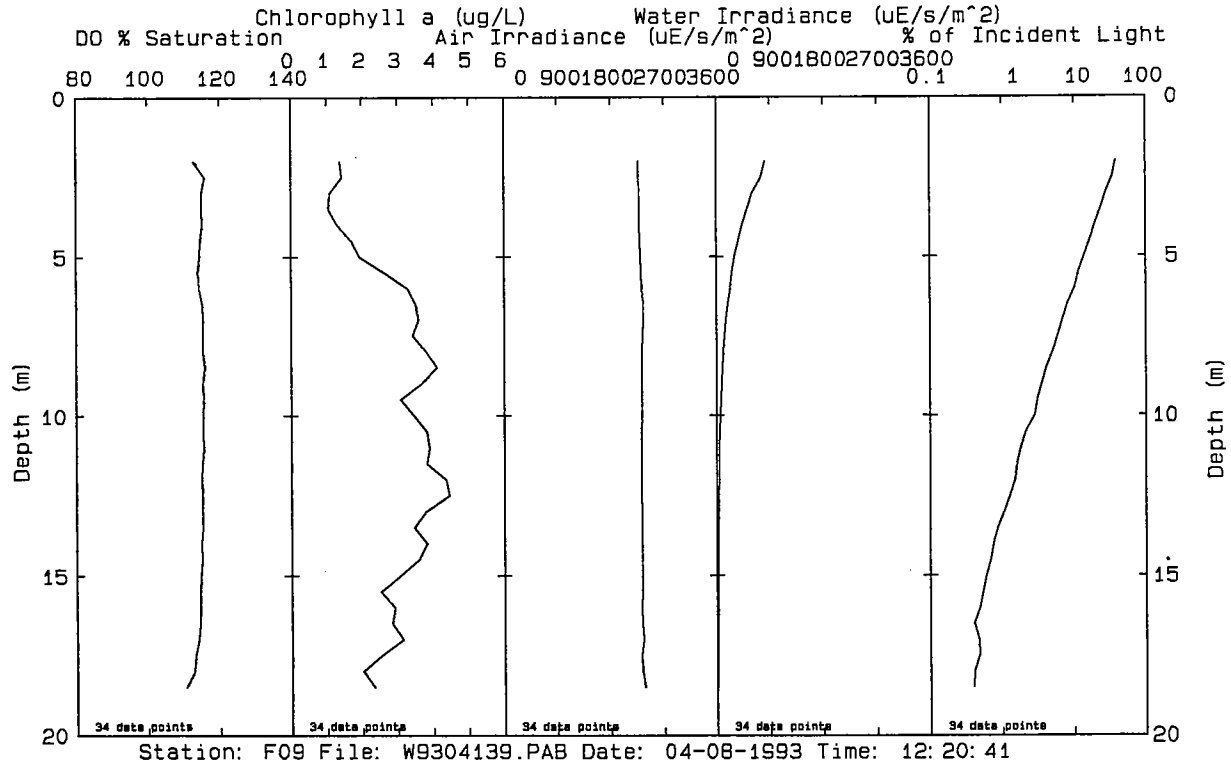
Station: F07 File: W9304096.PAB Date: 04-07-1993 Time: 12:04:41



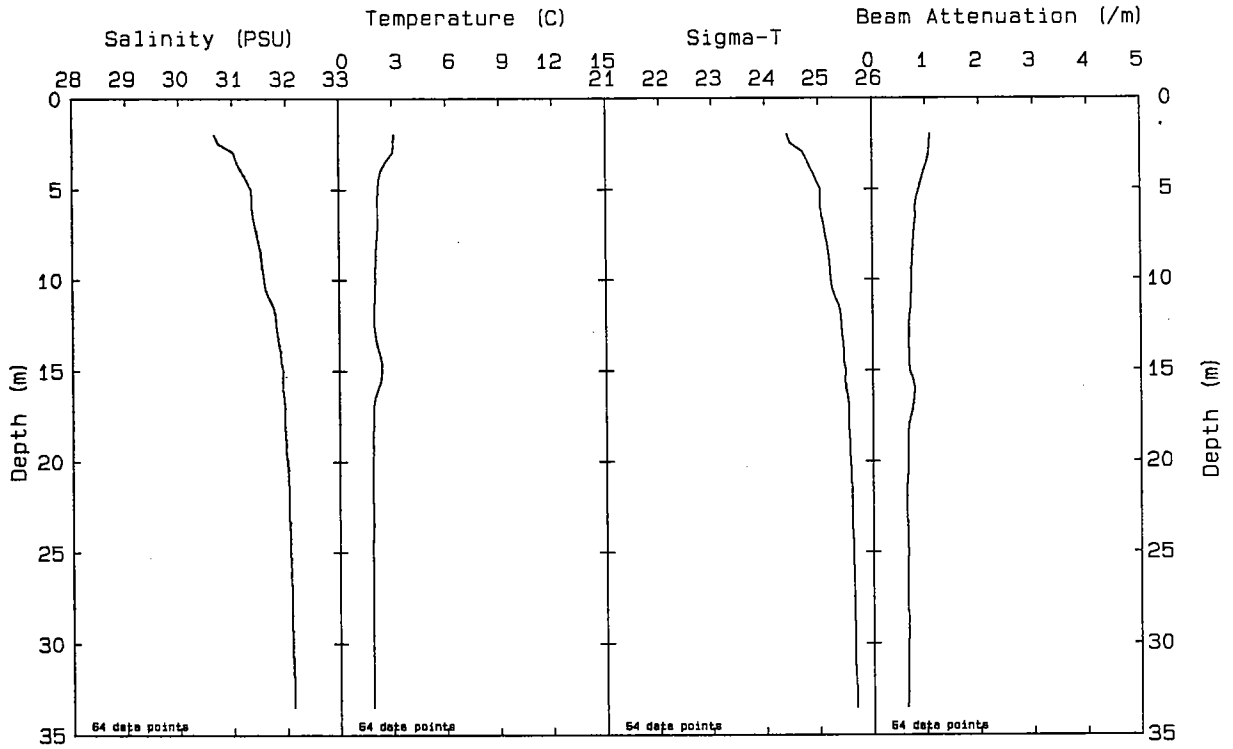


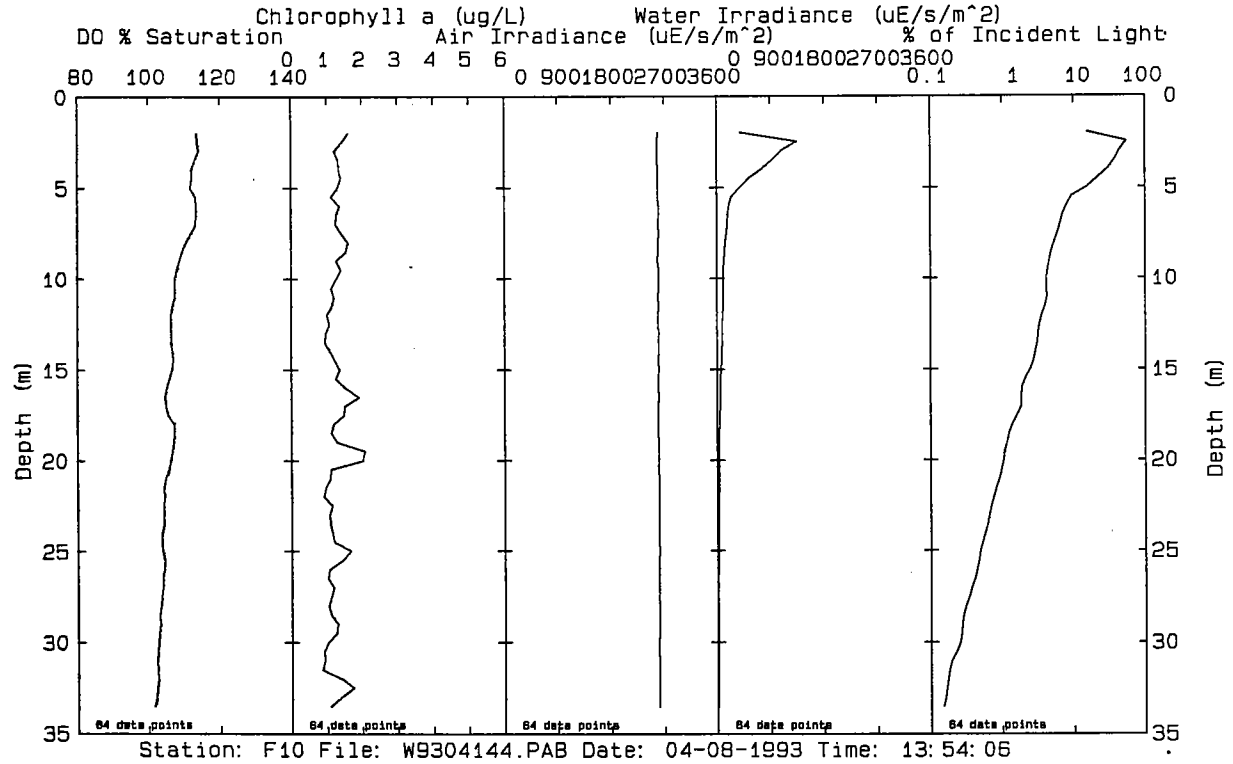
Station: F08 File: W9304103.PAB Date: 04-07-1993 Time: 13:02:48

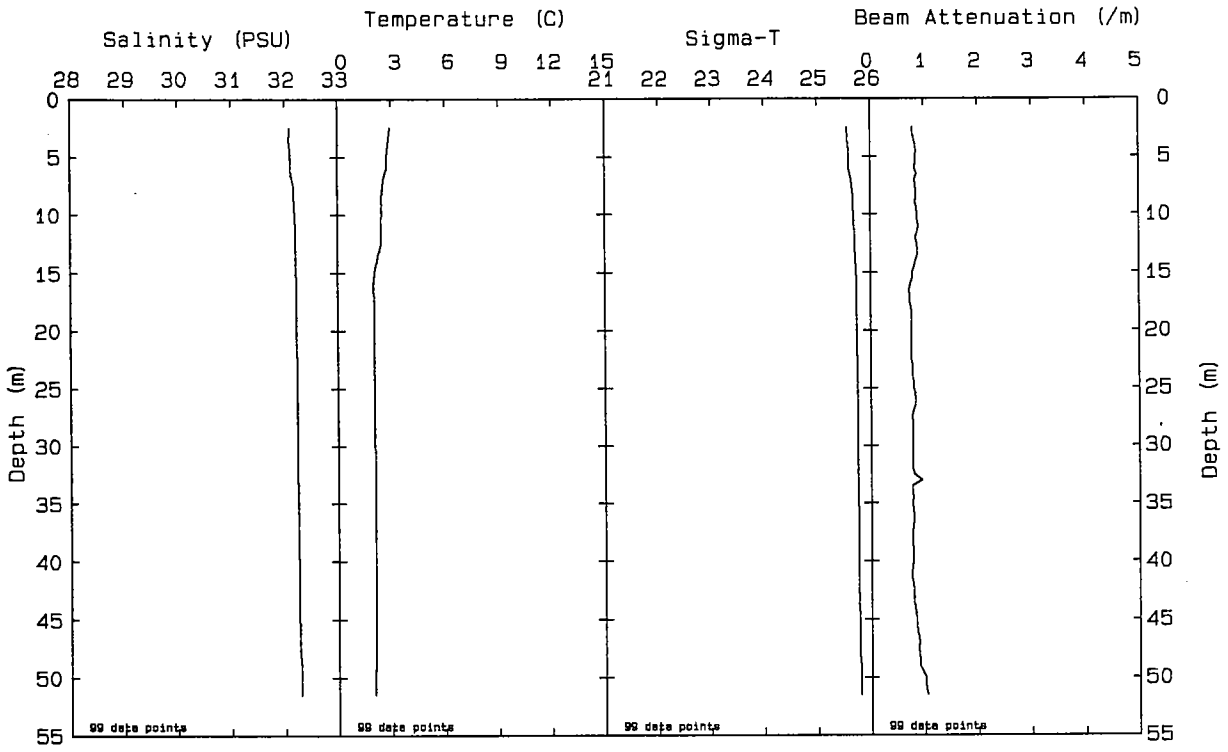


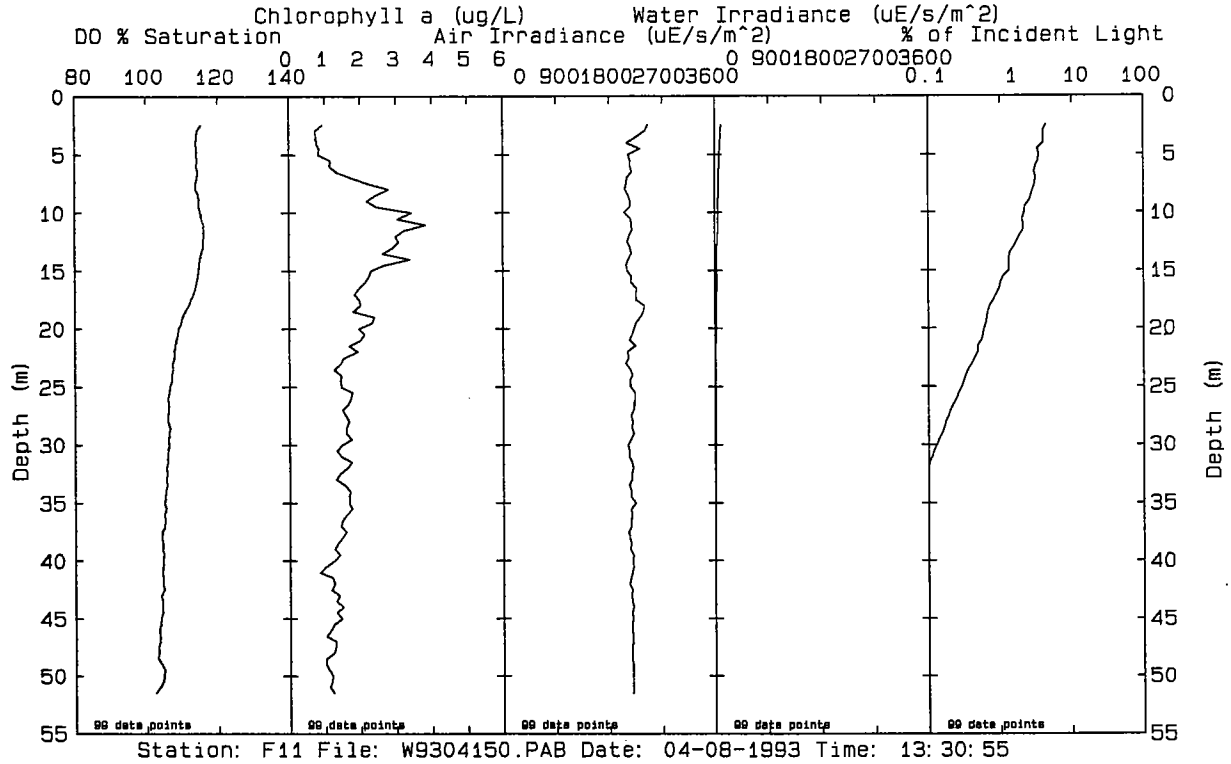


Station: F09 File: W9304139.PAB Date: 04-08-1993 Time: 12:20:41

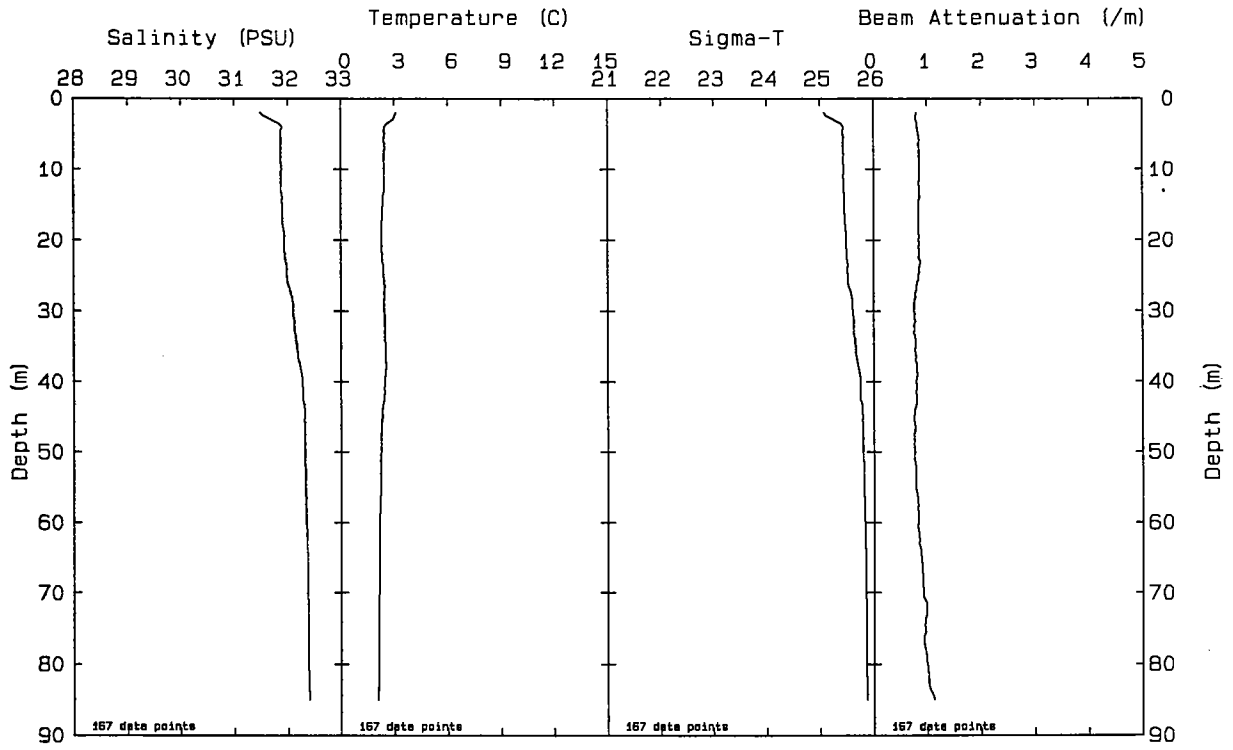

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35
64 data points
64 data points
64 data points
64 data points

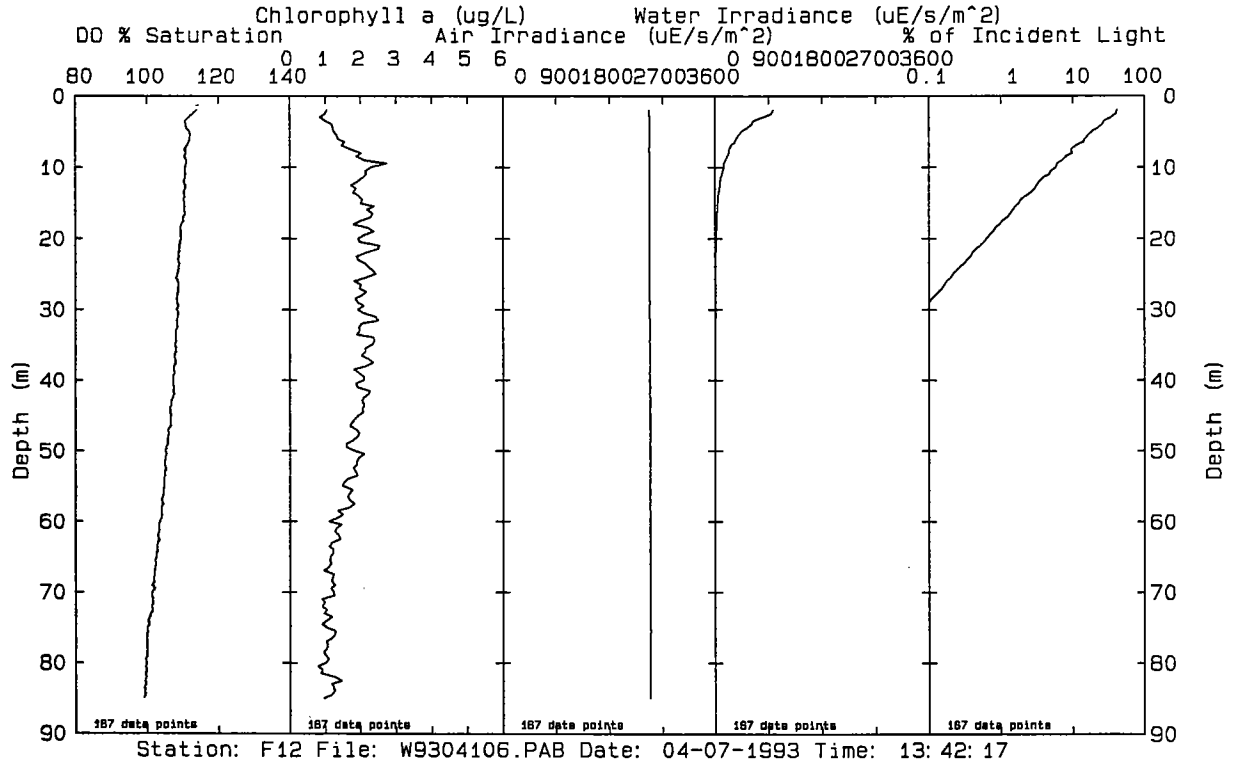

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35
64 data points
64 data points
64 data points
64 data points
64 data points
Station: F10 File: W9304144.PAB Date: 04-08-1993 Time: 13:54:06



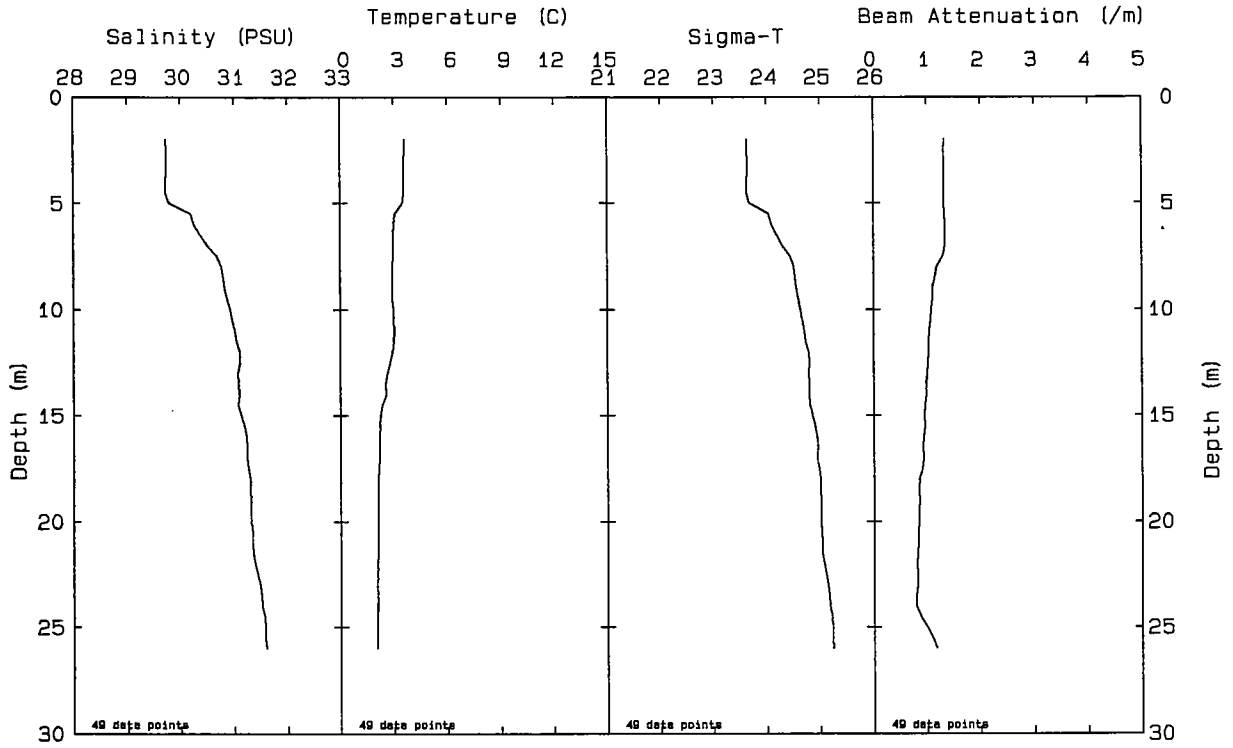


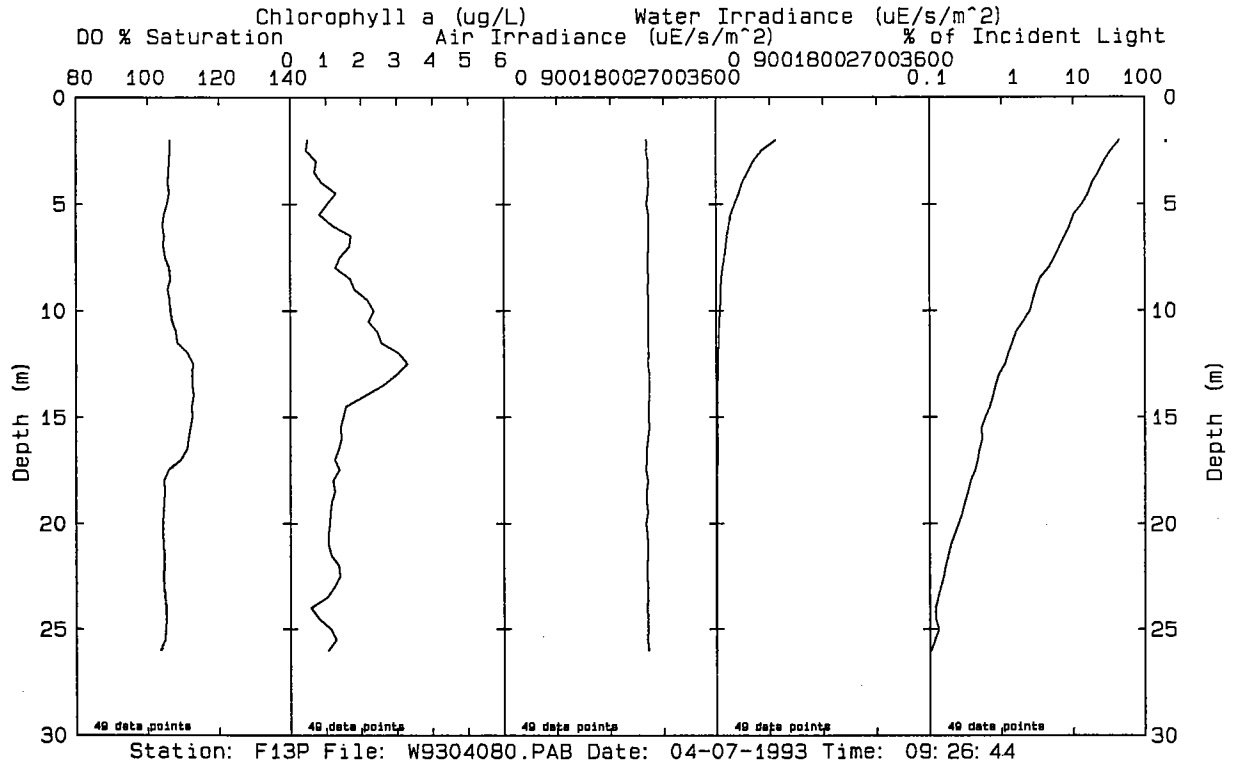
Station: F11 File: W9304150.PAB Date: 04-08-1993 Time: 13:30:55



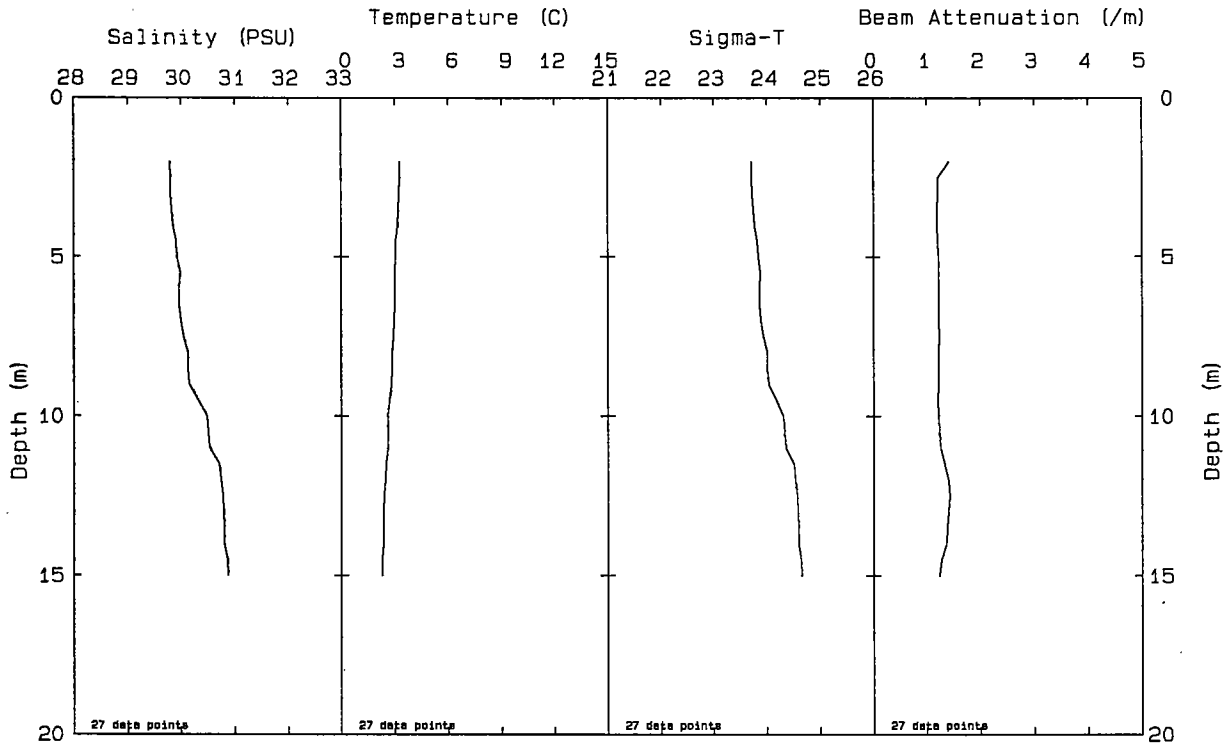


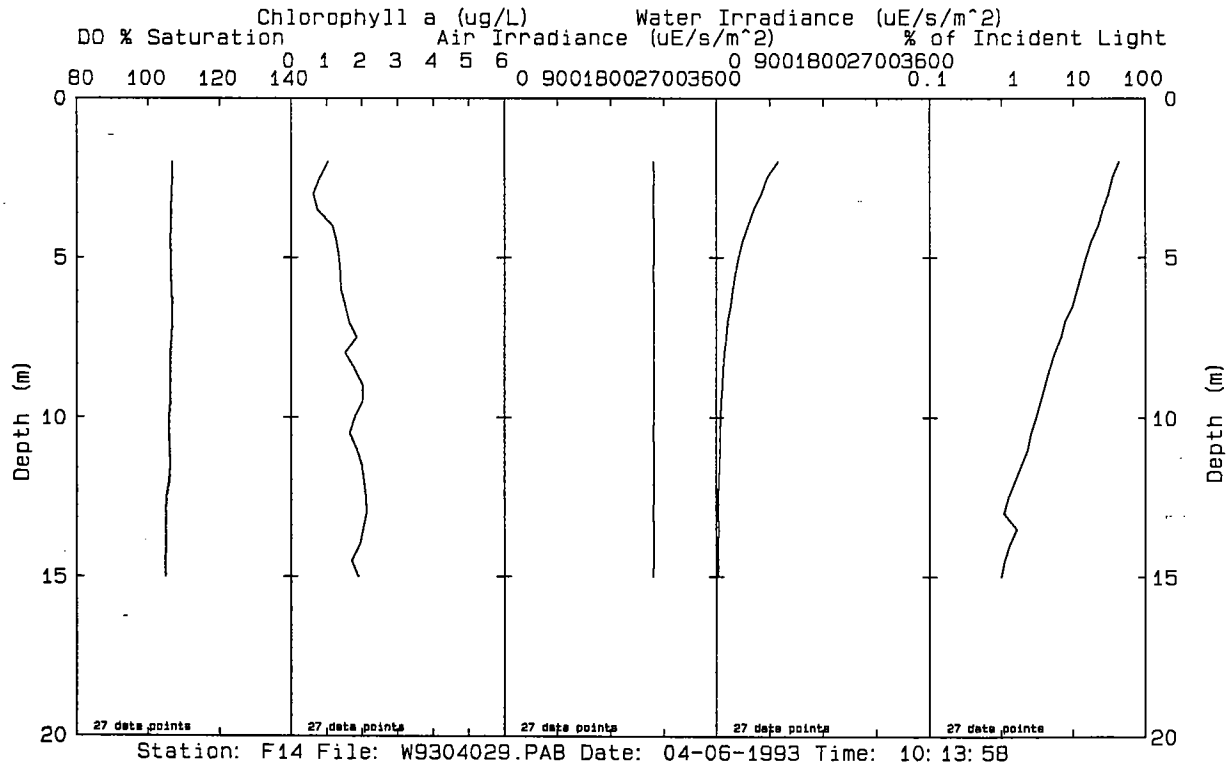
Station: F12 File: W9304106.PAB Date: 04-07-1993 Time: 13:42:17

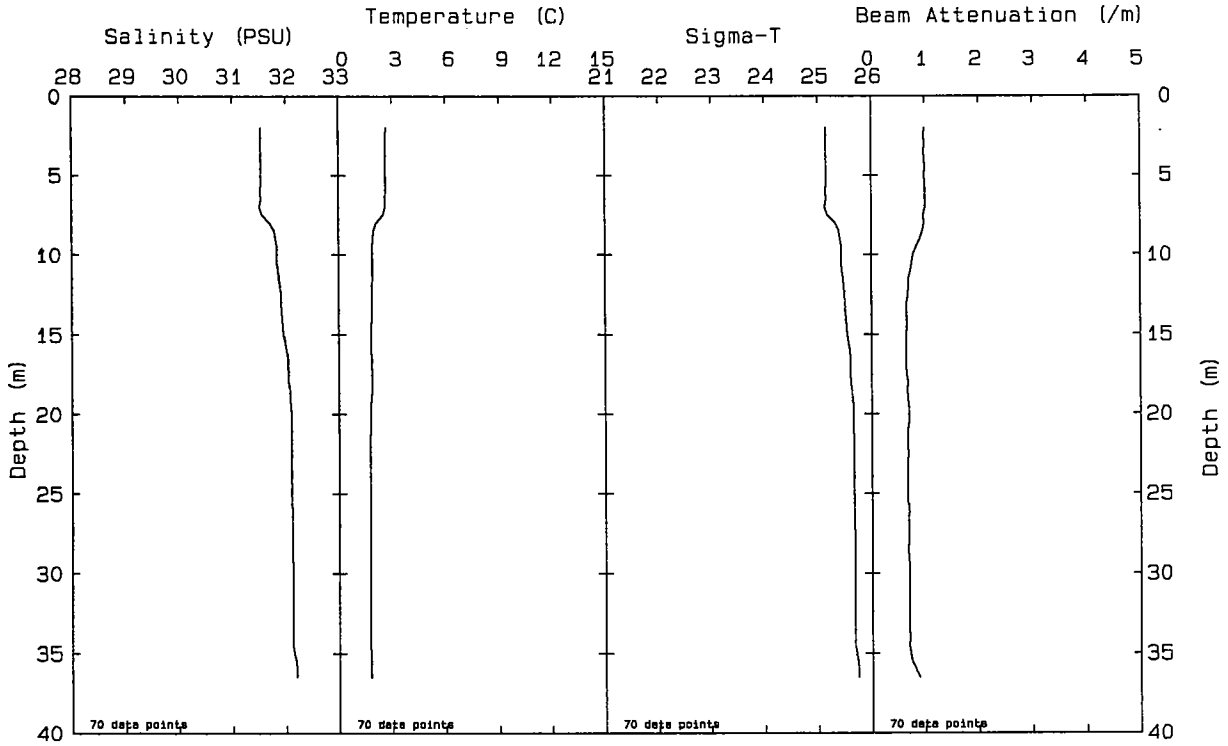


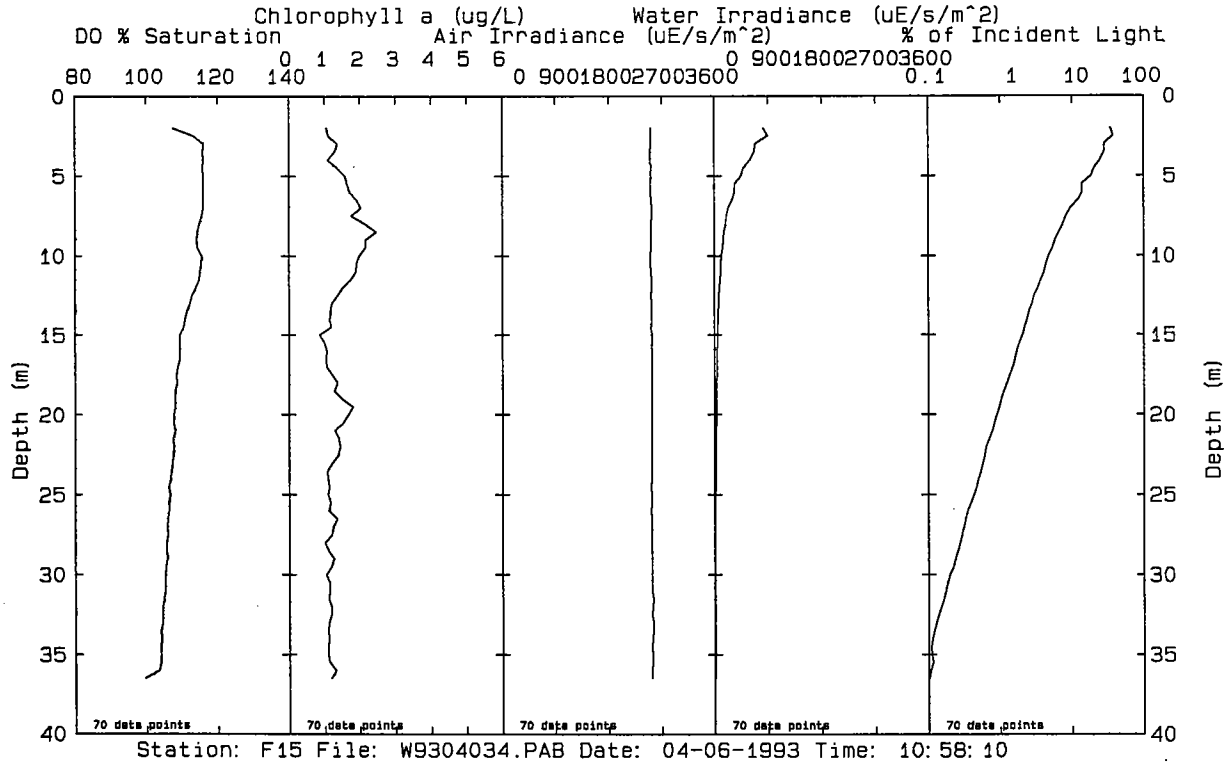


Station: F13P File: W9304080.PAB Date: 04-07-1993 Time: 09:26:44

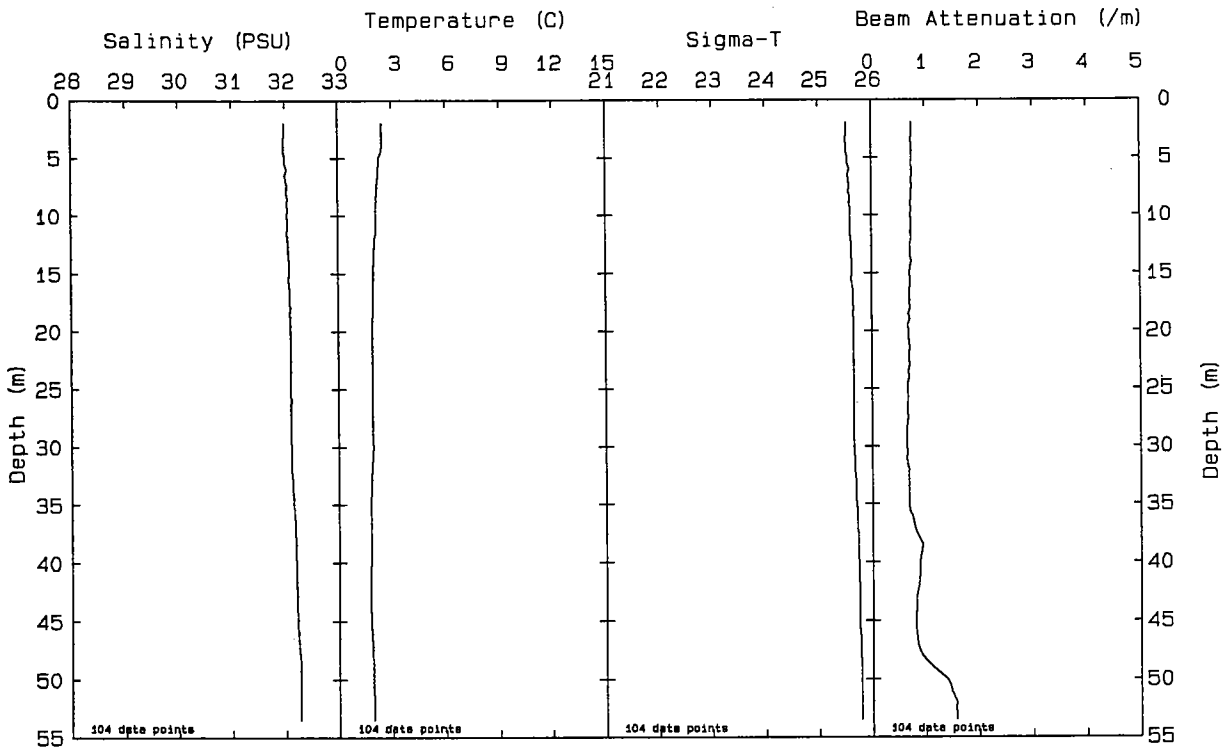

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20
27 data points
27 data points
27 data points
27 data points

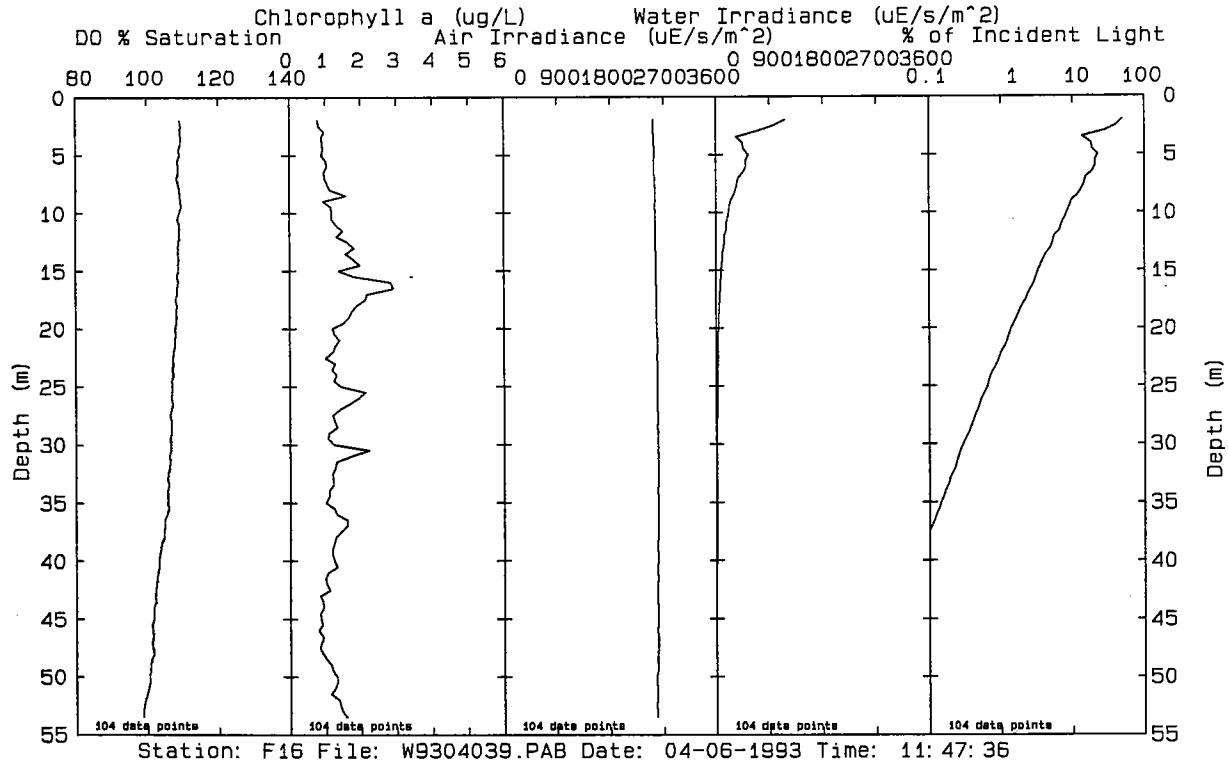

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
% of Incident Light
0 900180027003600
0.1 1 10 100
Depth (m)
0 5 10 15 20
27 data points
27 data points
27 data points
27 data points
27 data points
Station: F14 File: W9304029.PAB Date: 04-06-1993 Time: 10:13:58



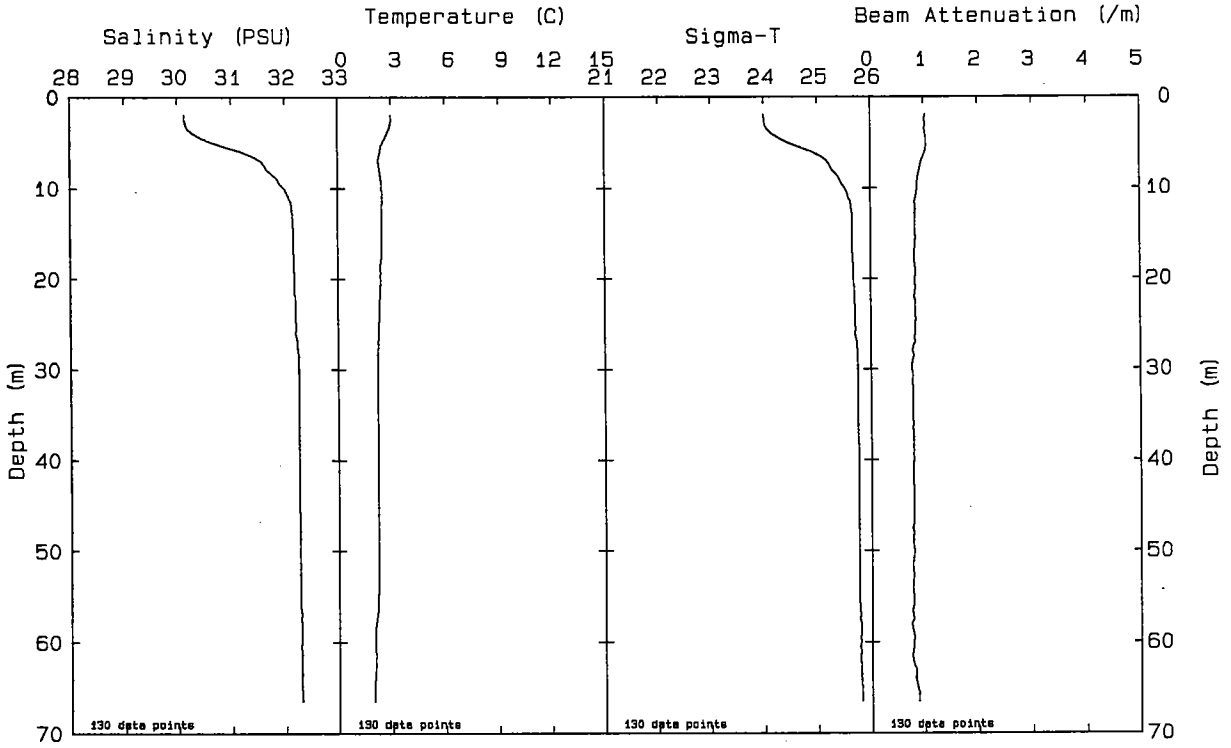


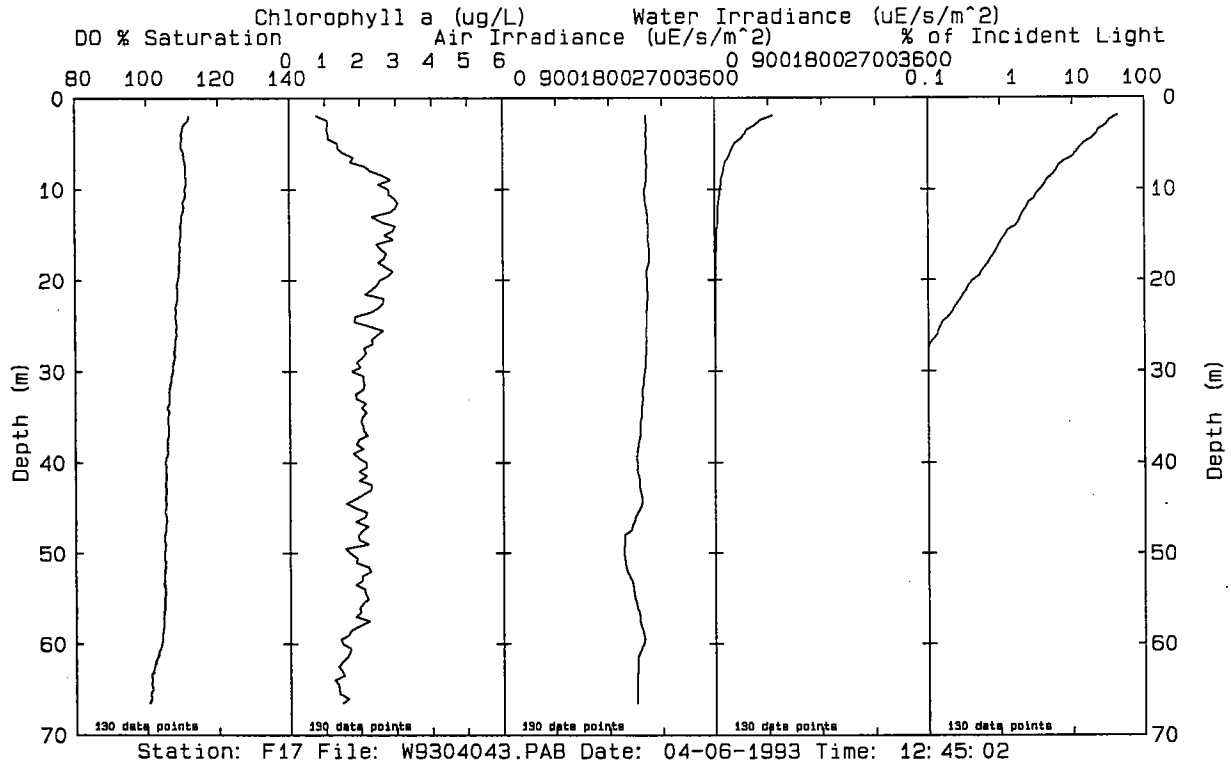
Station: F15 File: W9304034.PAB Date: 04-06-1993 Time: 10:58:10



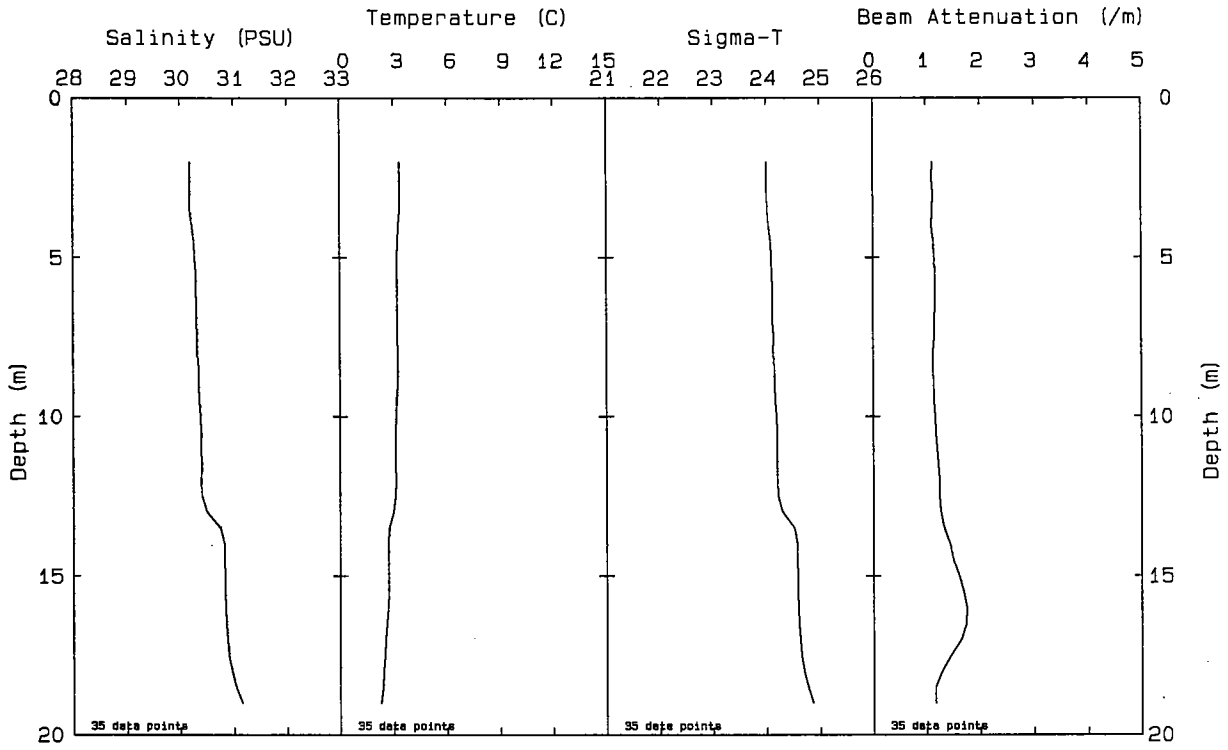


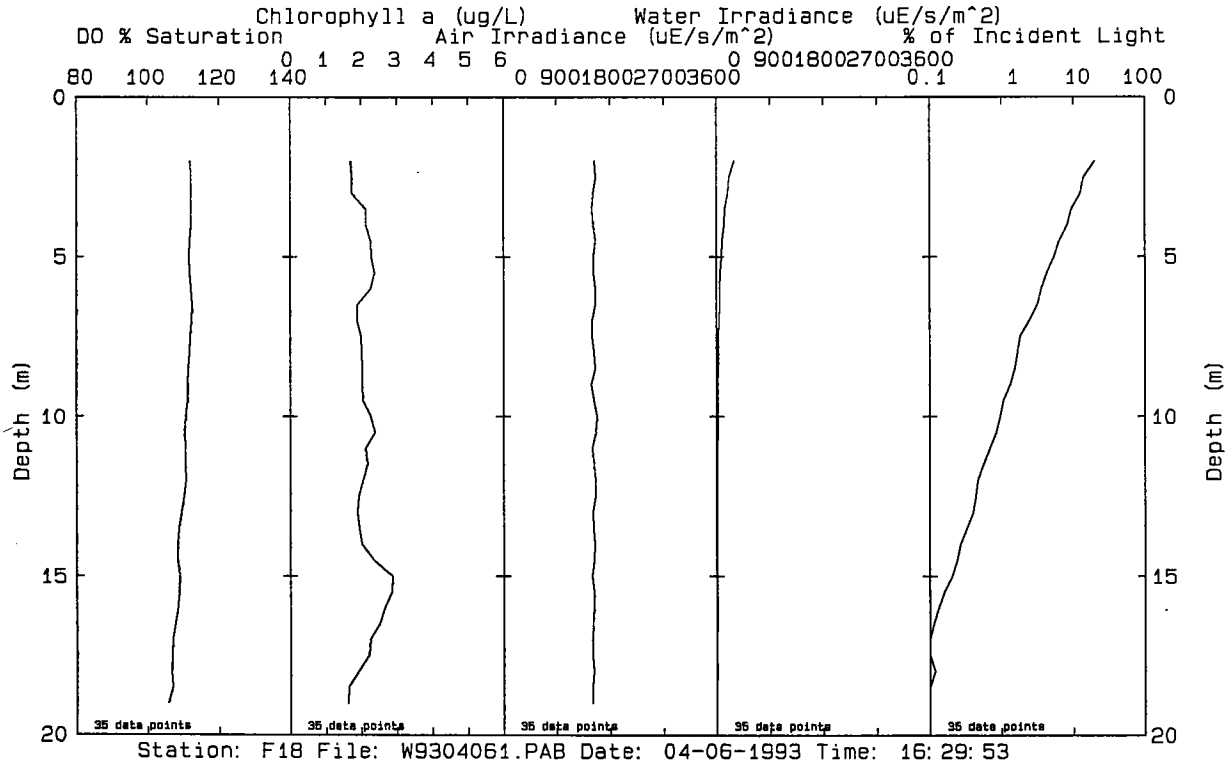
Station: F16 File: W9304039.PAB Date: 04-06-1993 Time: 11:47:36



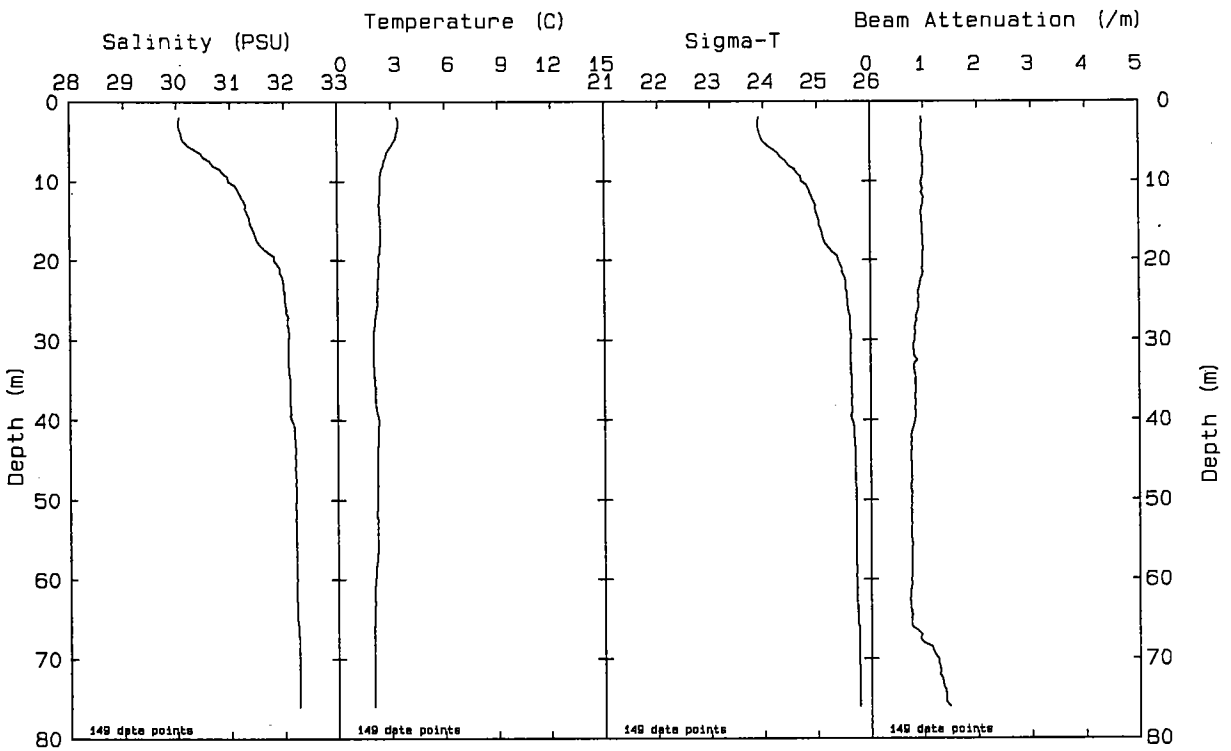


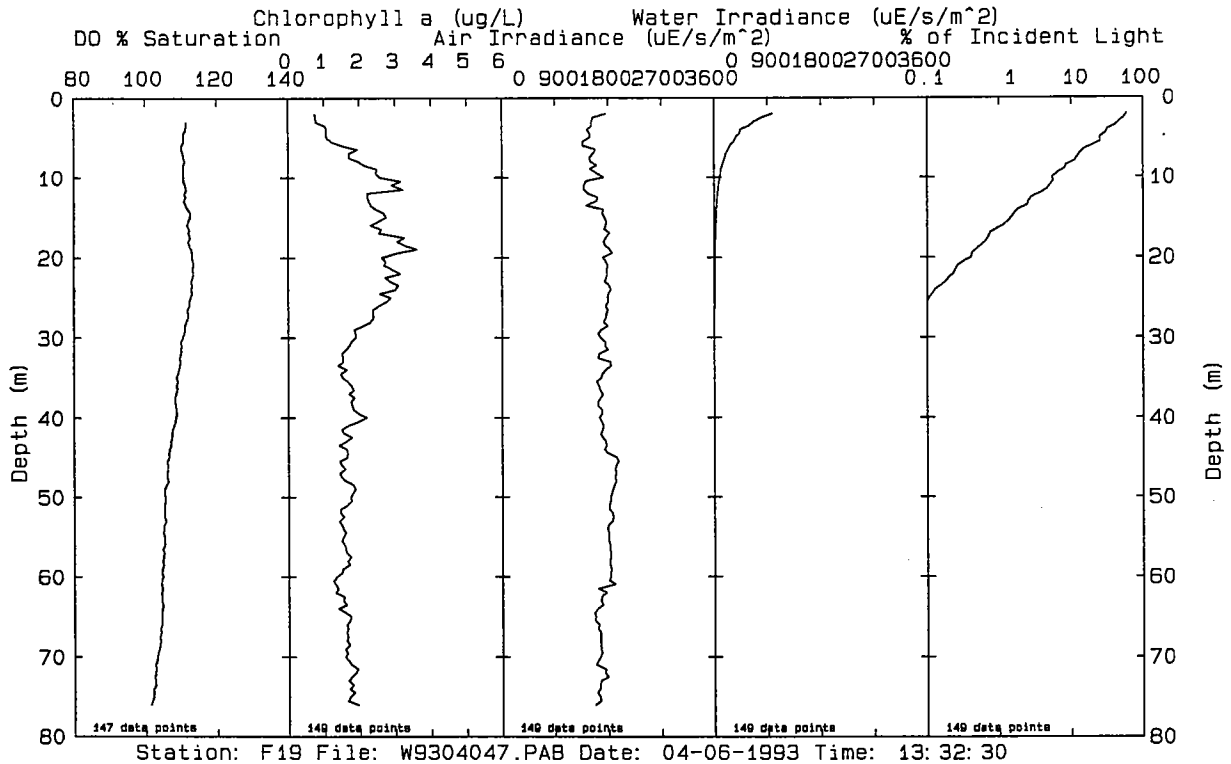
Station: F17 File: W9304043.PAB Date: 04-06-1993 Time: 12:45:02



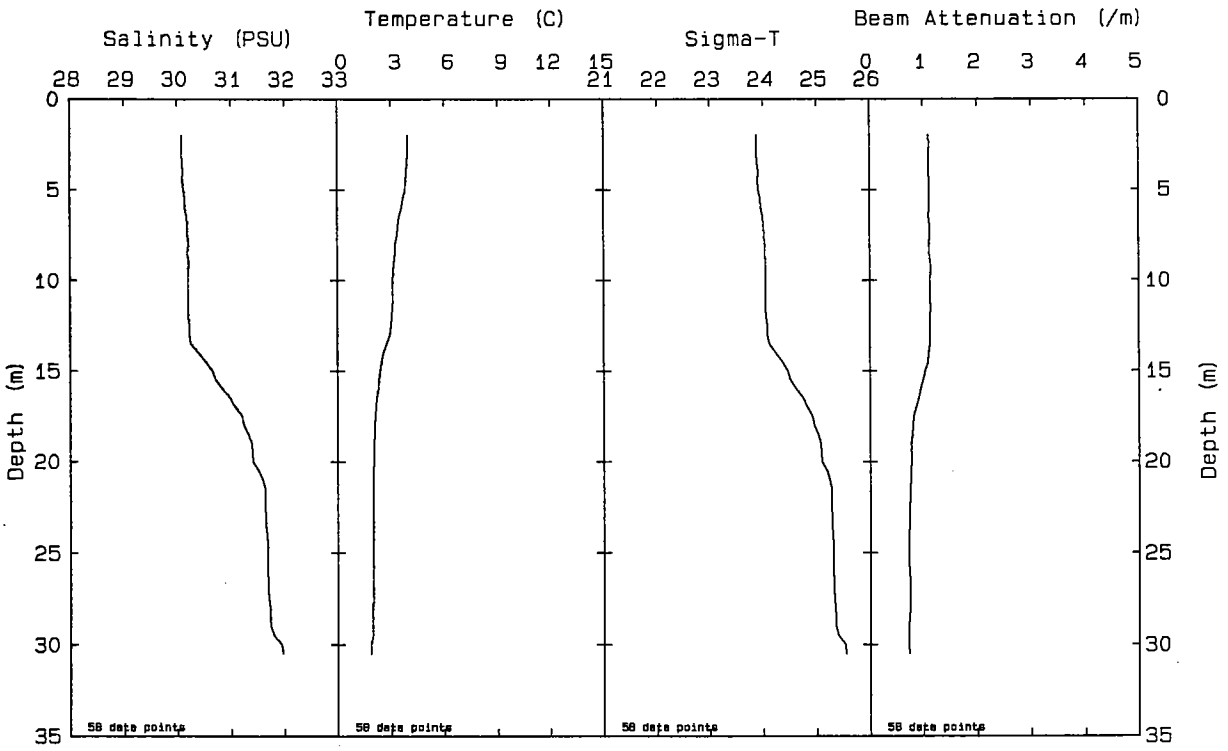


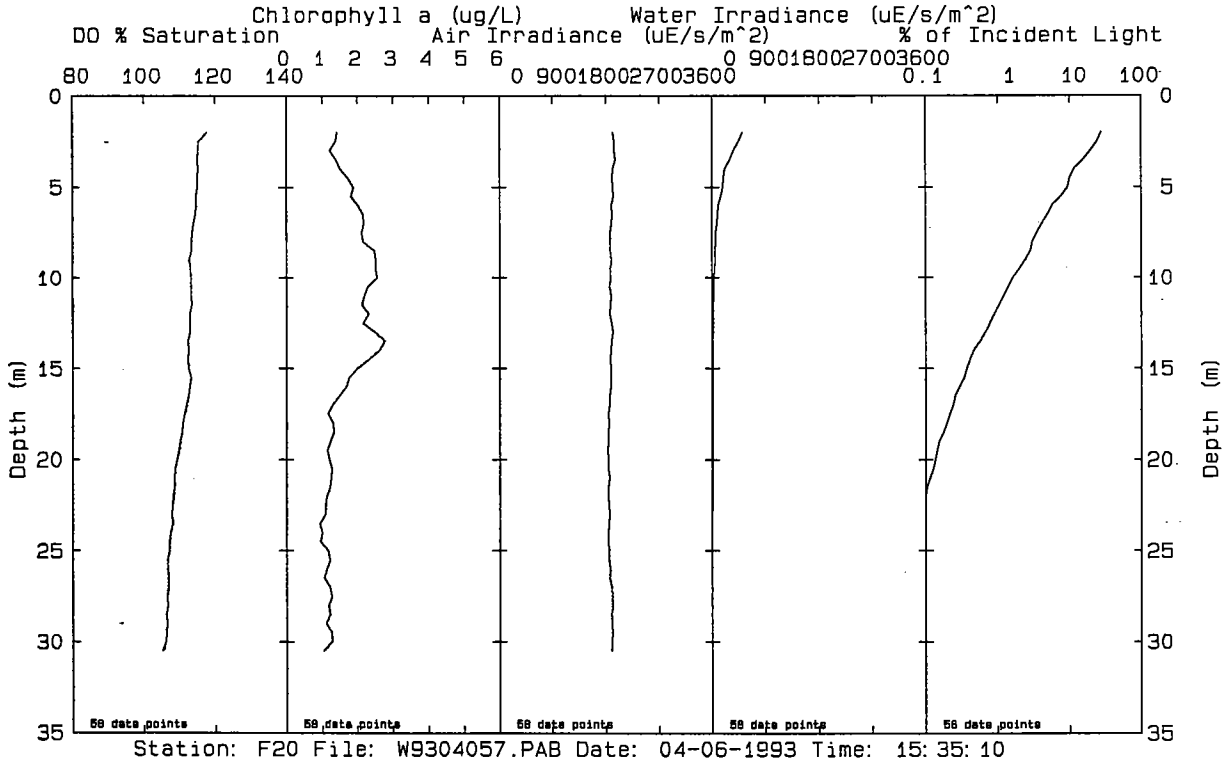
Station: F18 File: W9304061.PAB Date: 04-06-1993 Time: 16:29:53



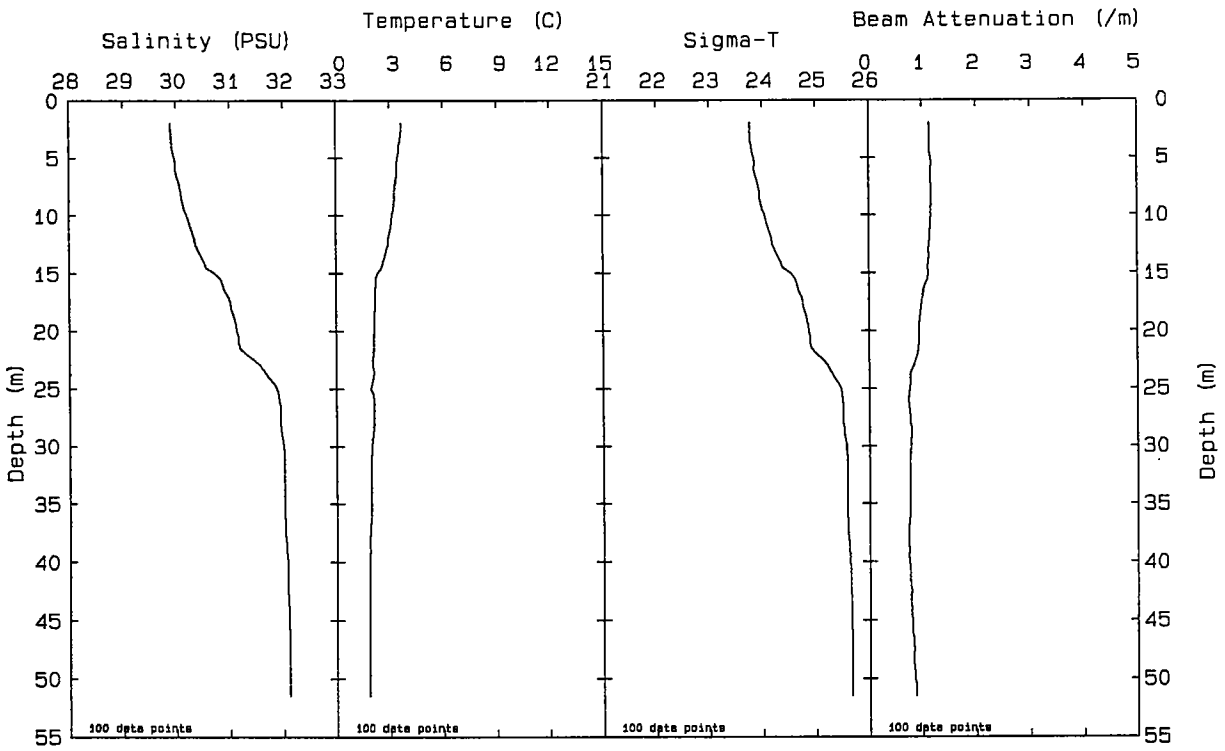


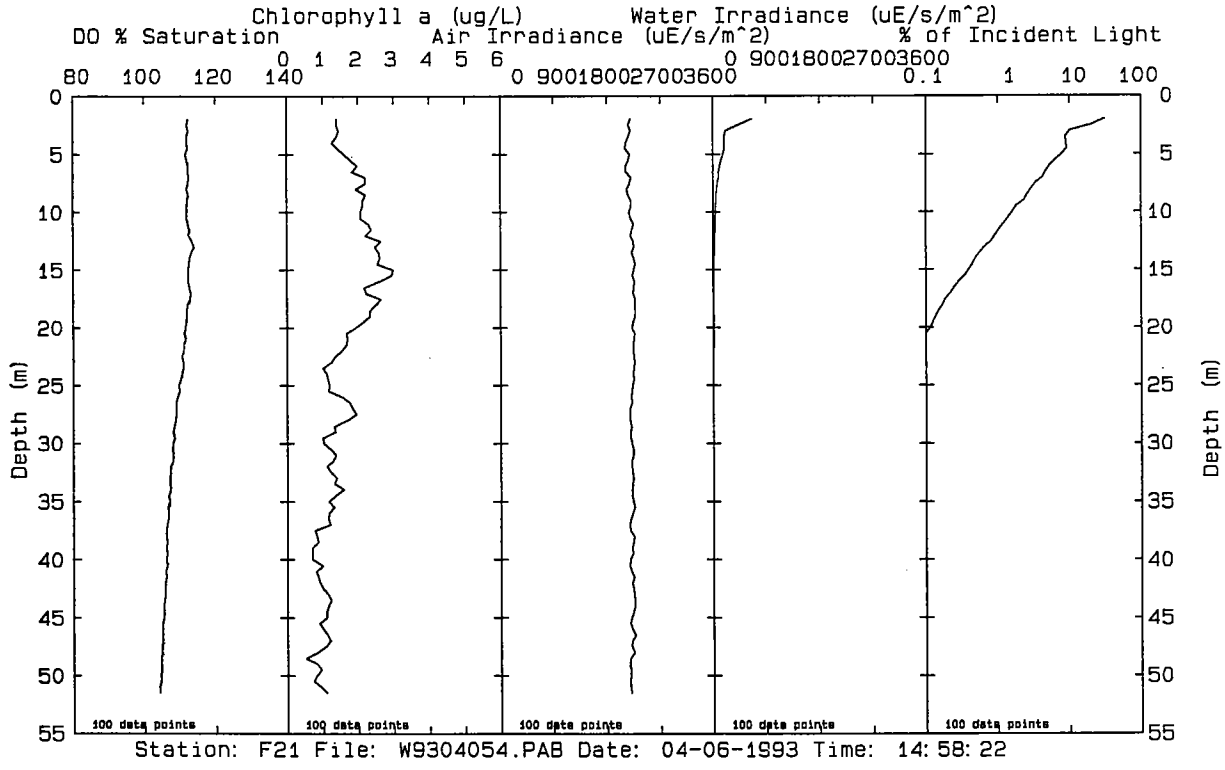
Station: F19 File: W9304047.PAB Date: 04-06-1993 Time: 13:32:30

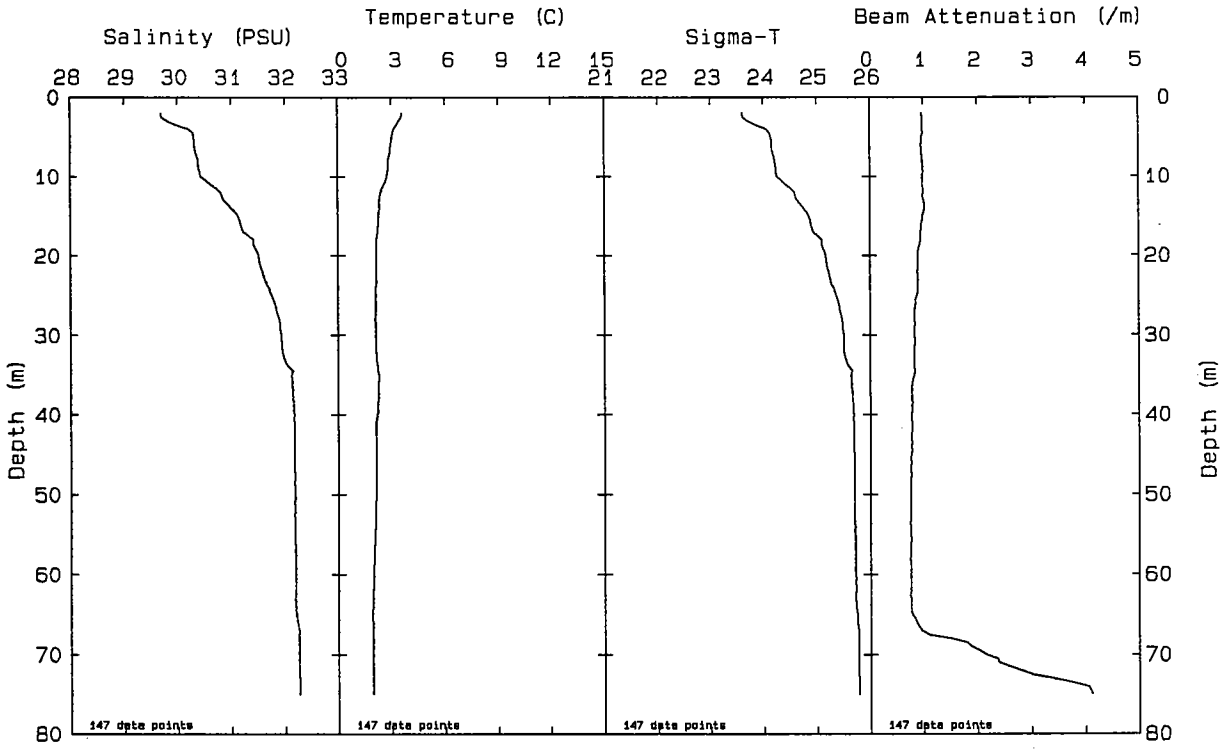


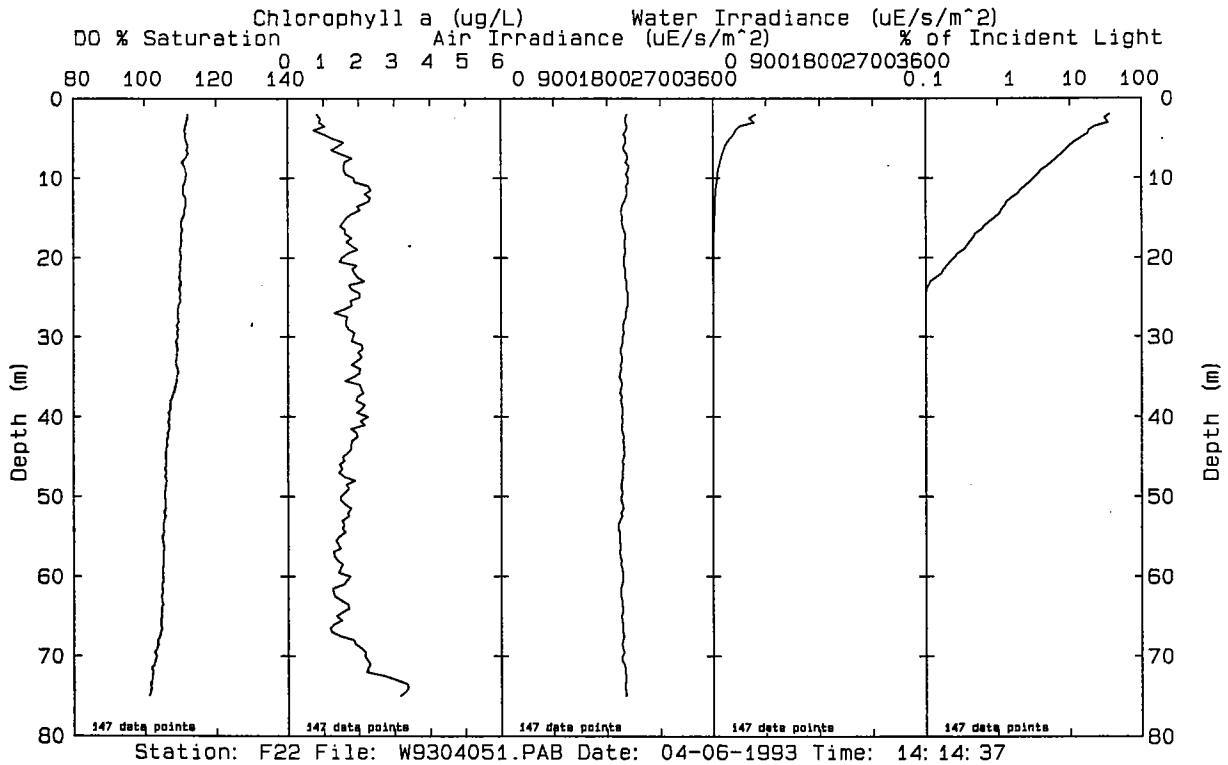


Station: F20 File: W9304057.PAB Date: 04-06-1993 Time: 15:35:10

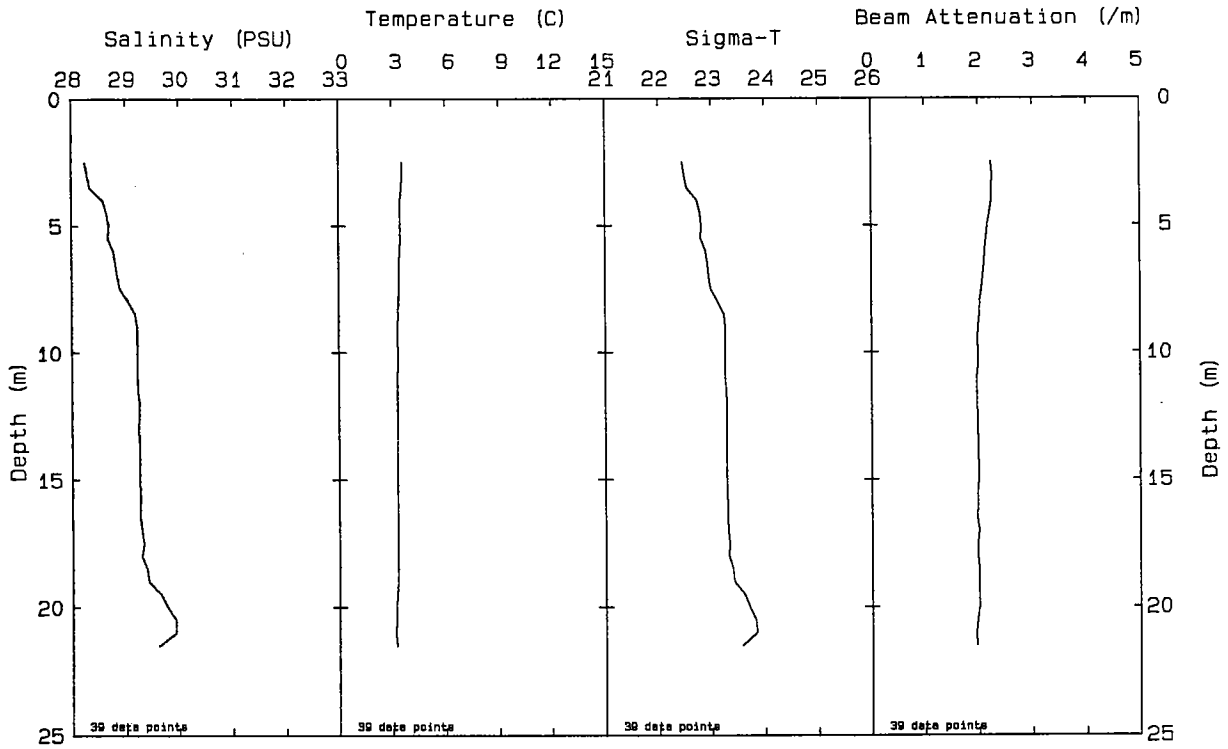

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40 45 50 55
100 data points
100 data points
100 data points
100 data points

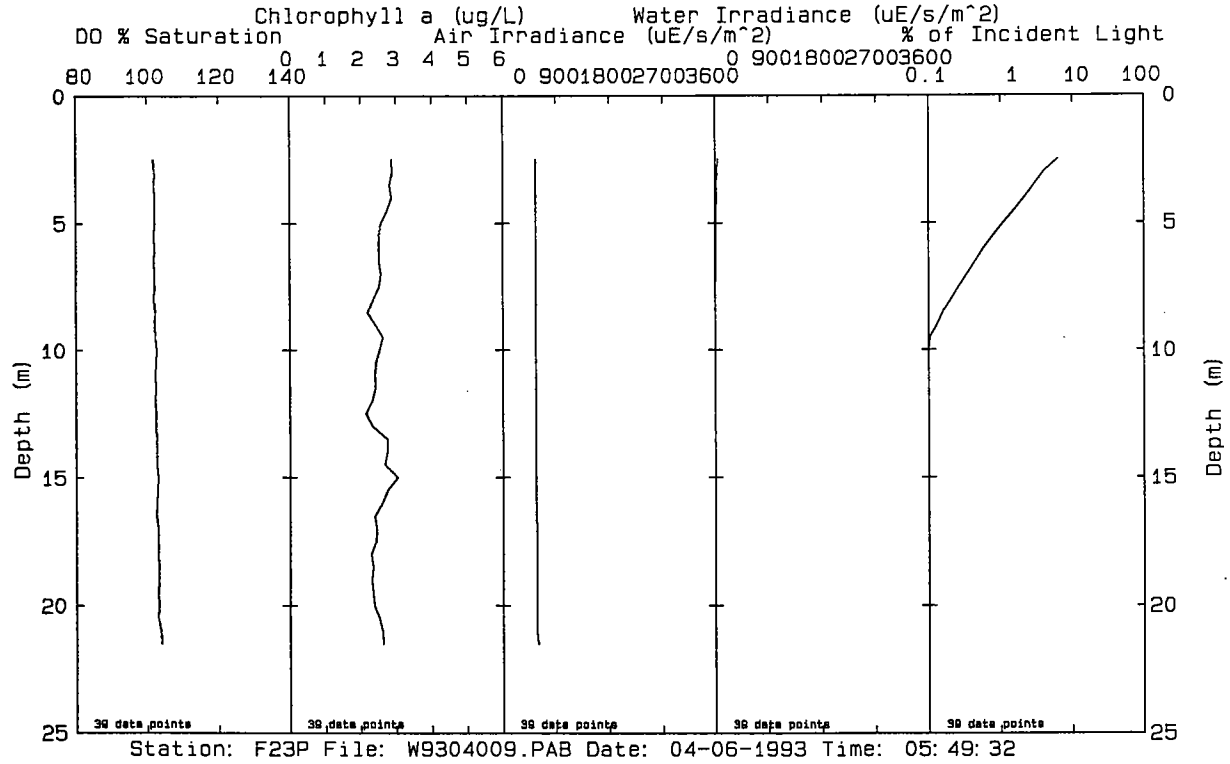

Chlorophyll a (ug/L)
DO % Saturation
80 100 120 140
0 1 2 3 4 5 6
Water Irradiance (uE/s/m^2)
Air Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0 900180027003600
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40 45 50 55
100 data points
100 data points
100 data points
100 data points
100 data points
Station: F21 File: W9304054.PAB Date: 04-06-1993 Time: 14:58:22

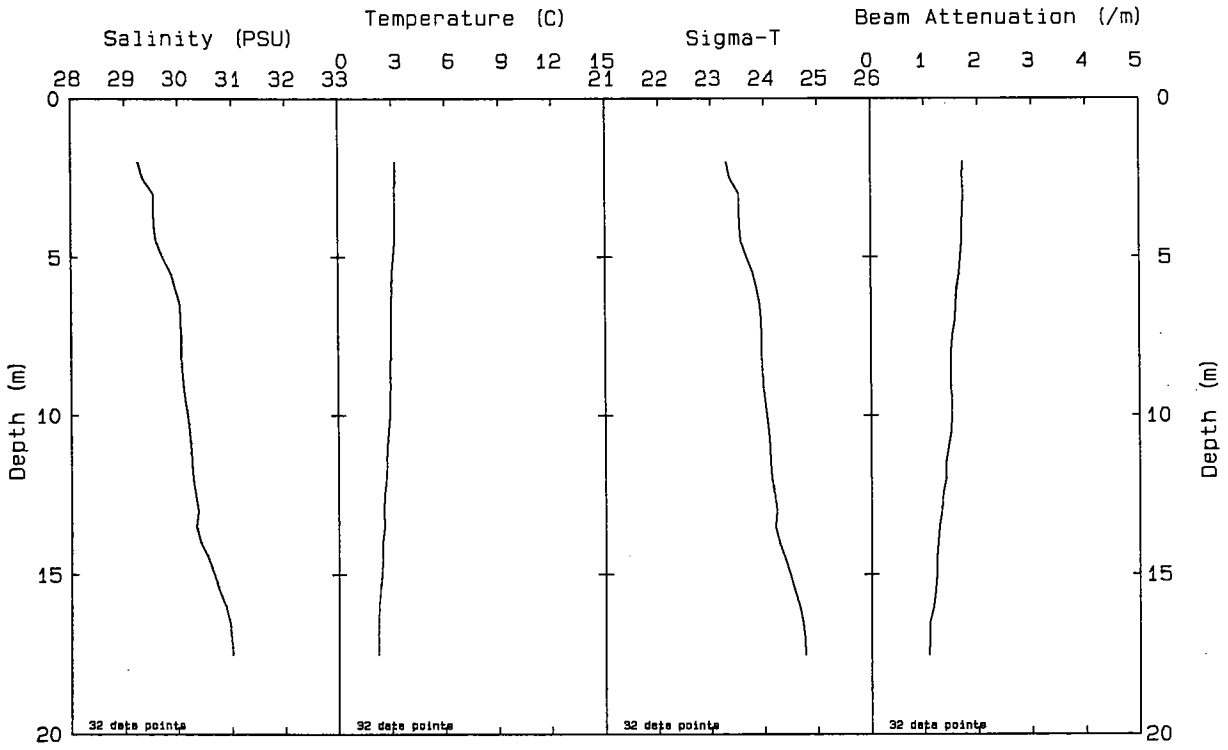


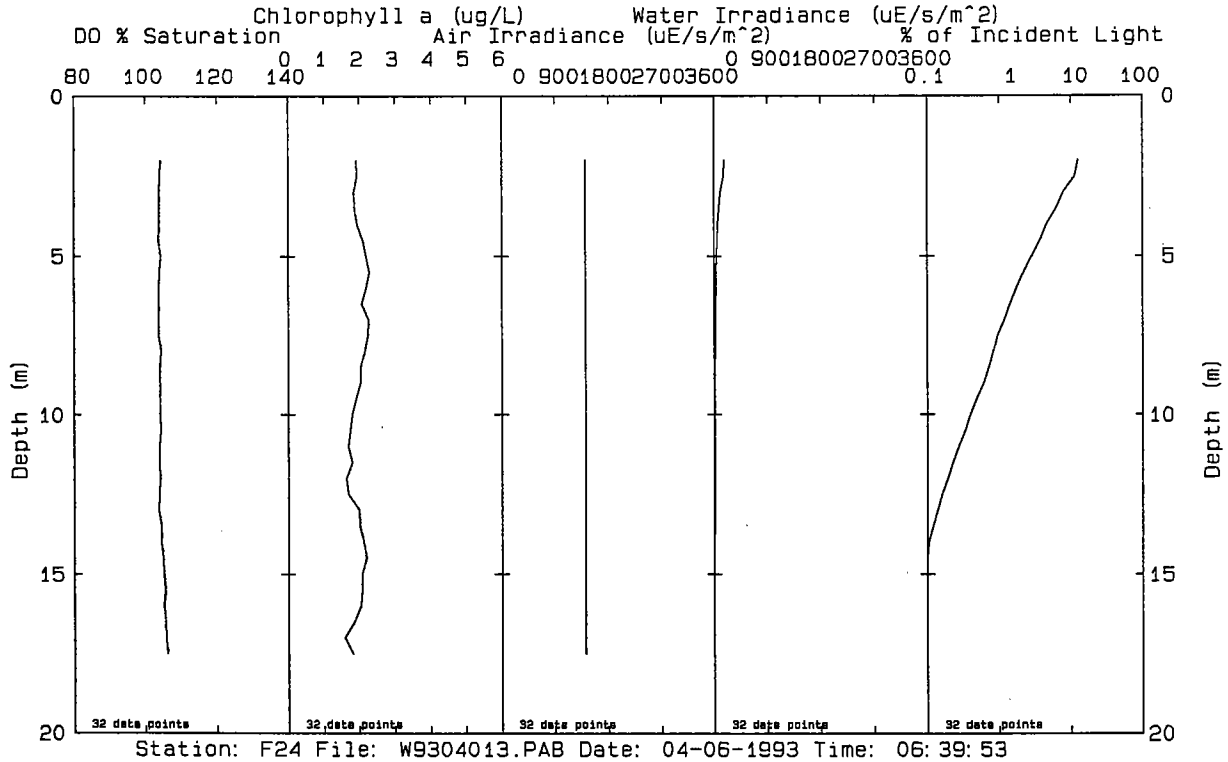


Station: F22 File: W9304051.PAB Date: 04-06-1993 Time: 14:14:37


Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25
39 data points

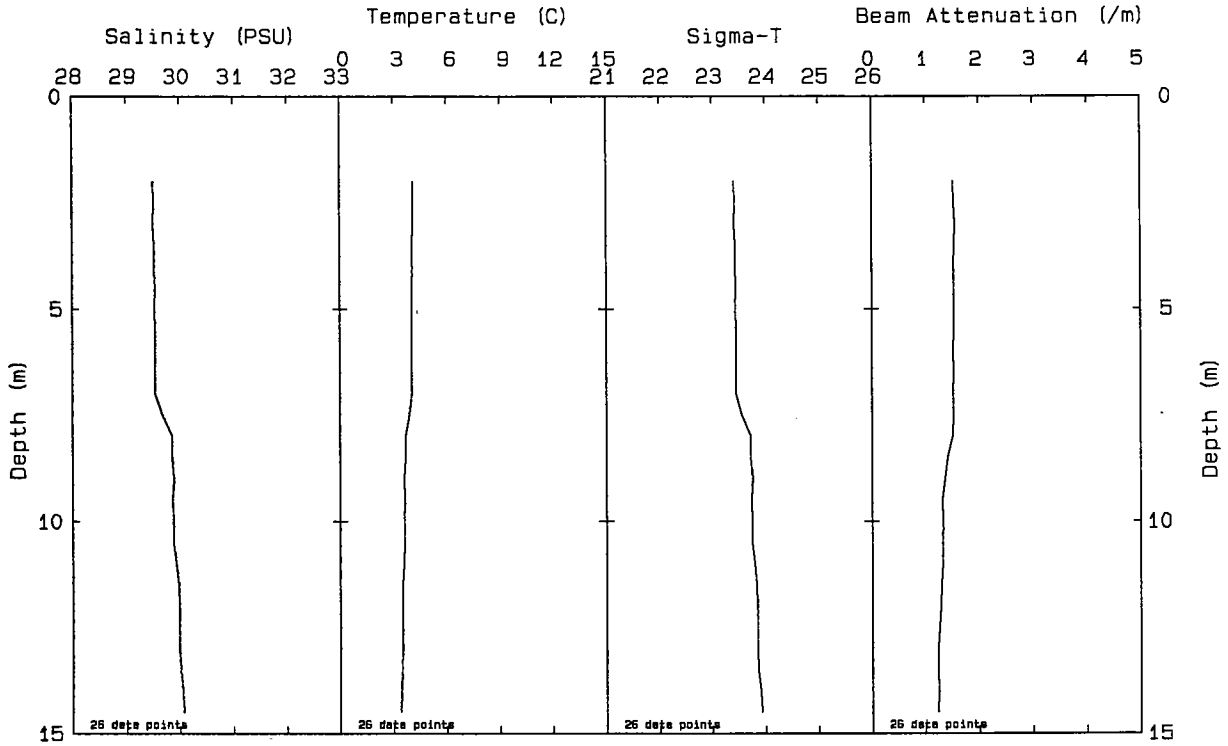

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25
39 data points
Station: F23P File: W9304009.PAB Date: 04-06-1993 Time: 05:49:32

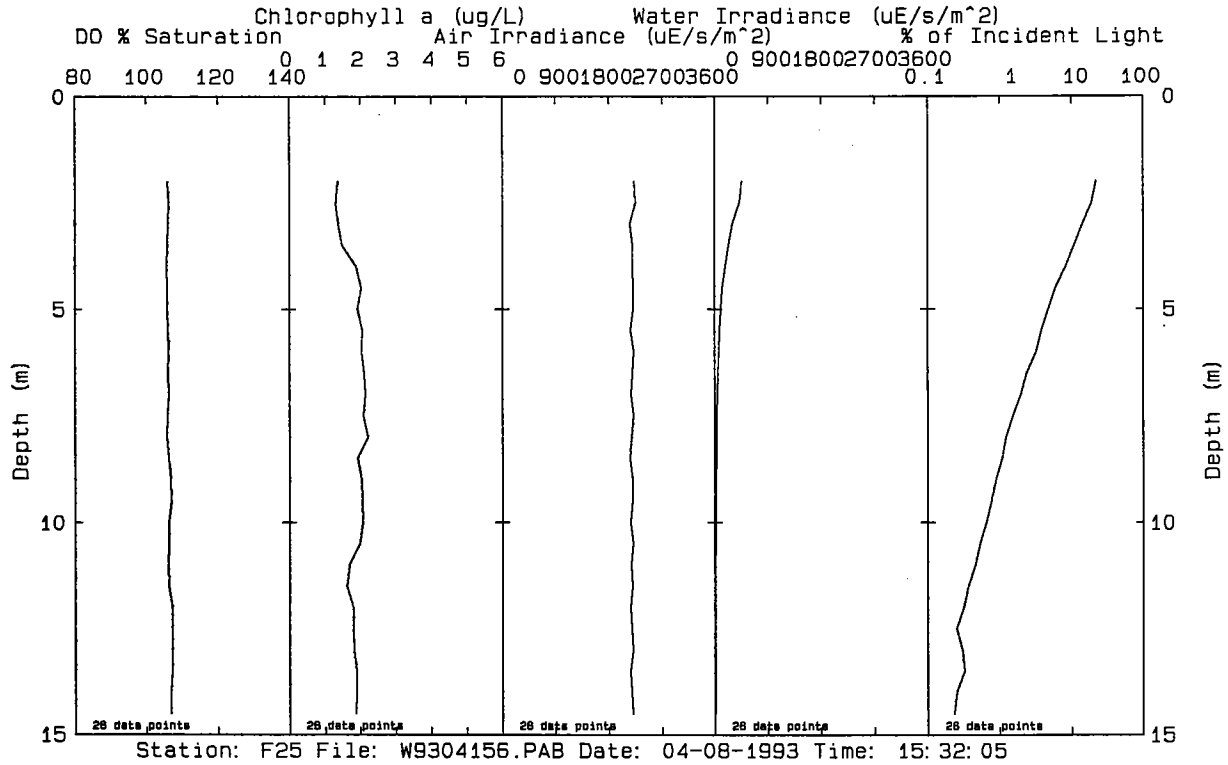


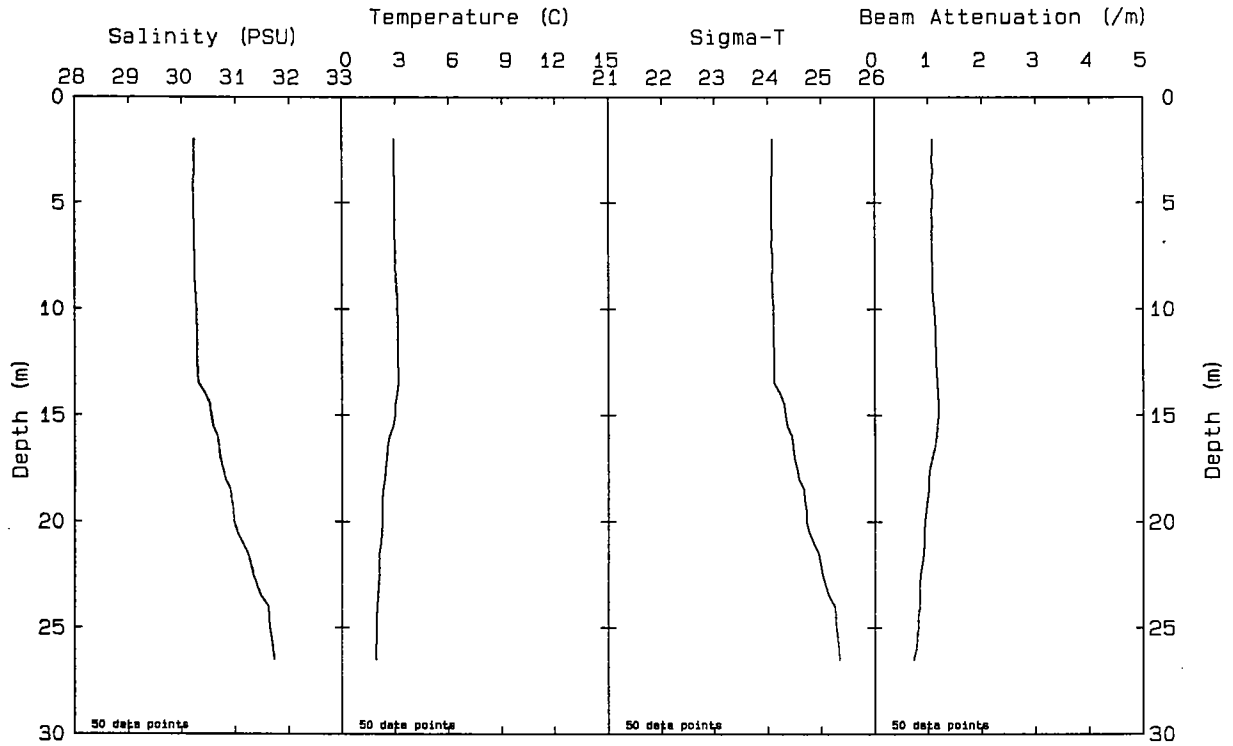


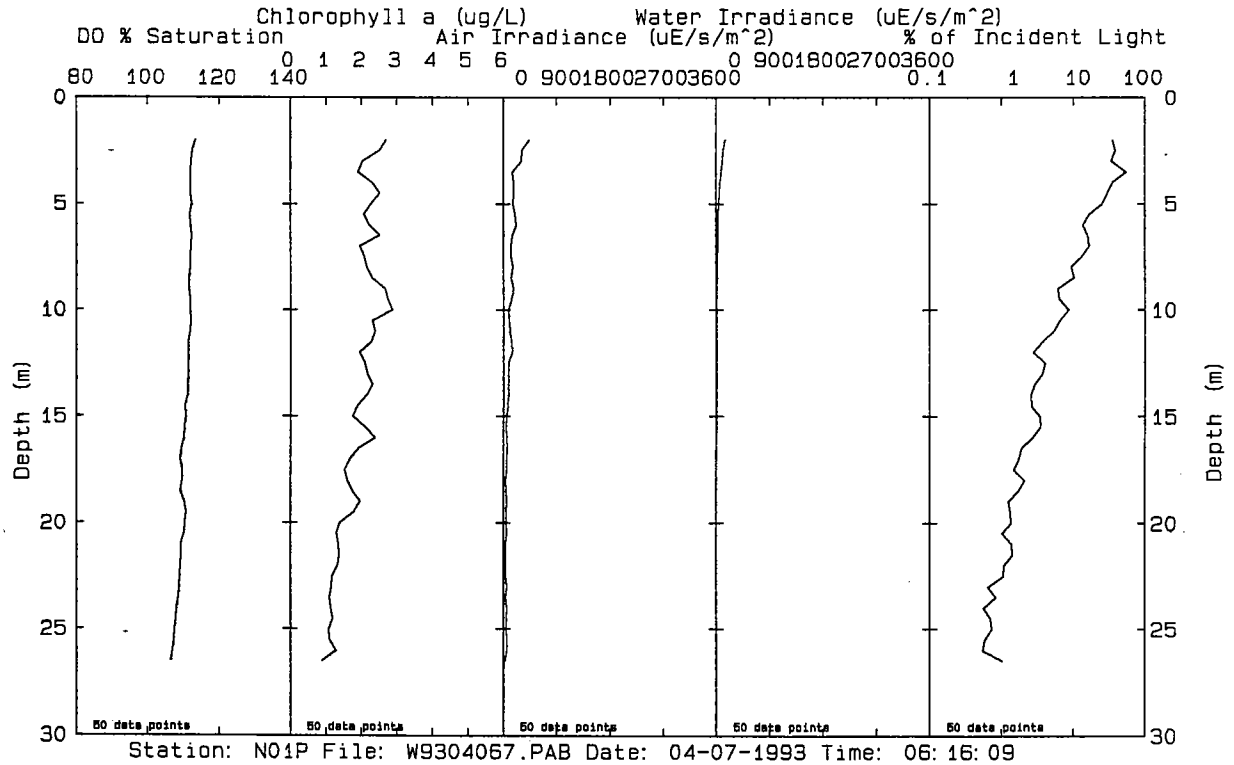
Station: F24 File: W9304013.PAB Date: 04-06-1993 Time: 06:39:53

000046

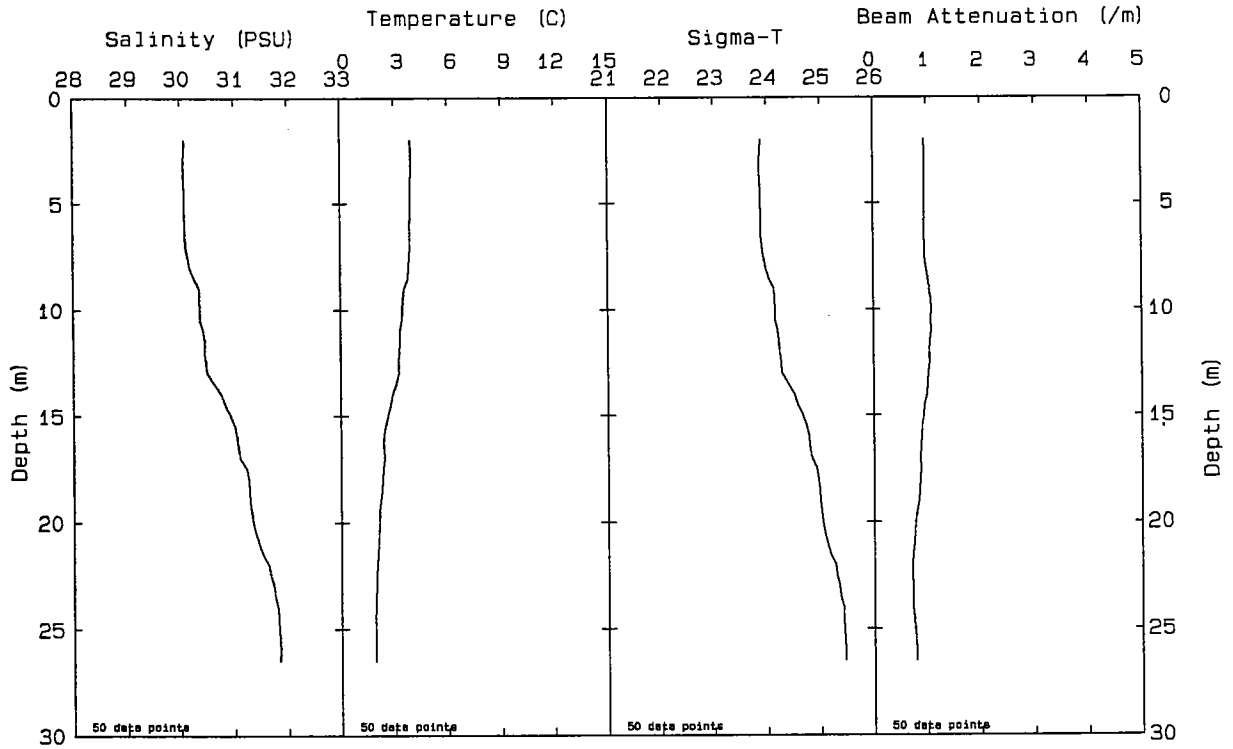

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0
5
10
15
26 data points

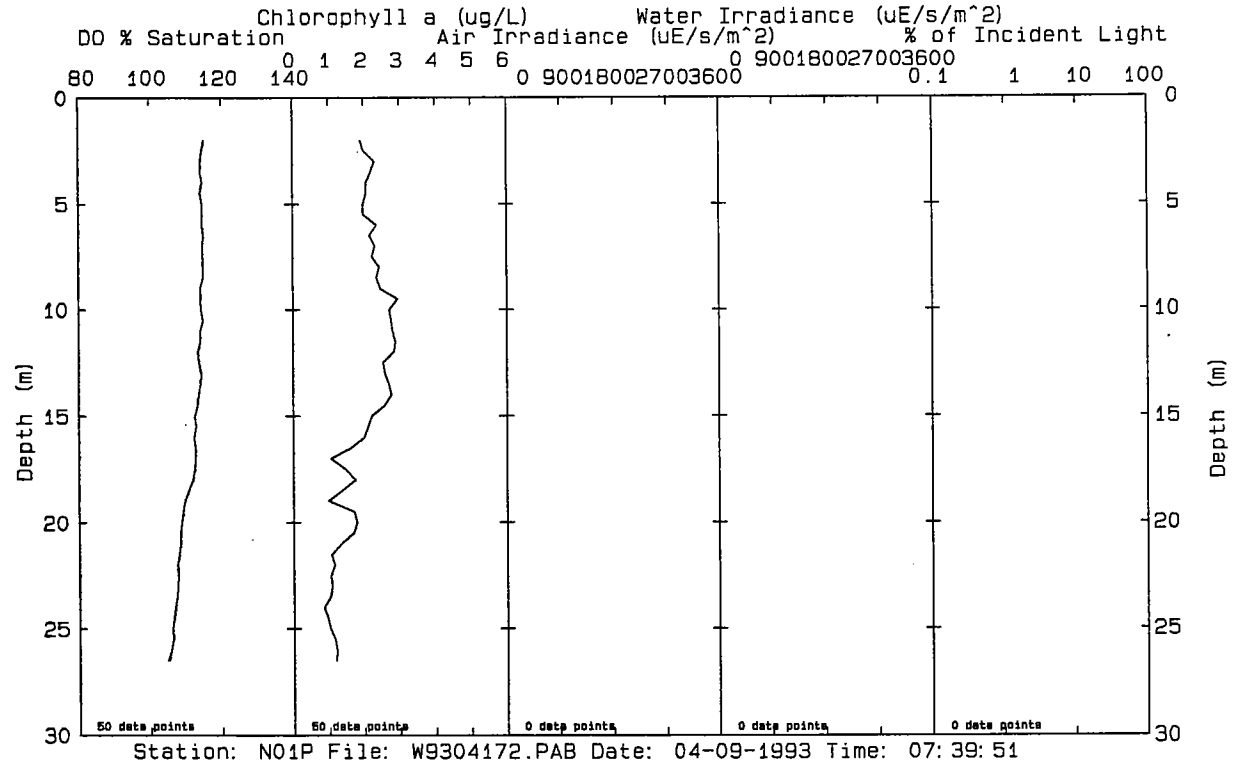

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0
5
10
15
26 data points
Station: F25 File: W9304156.PAB Date: 04-08-1993 Time: 15:32:05

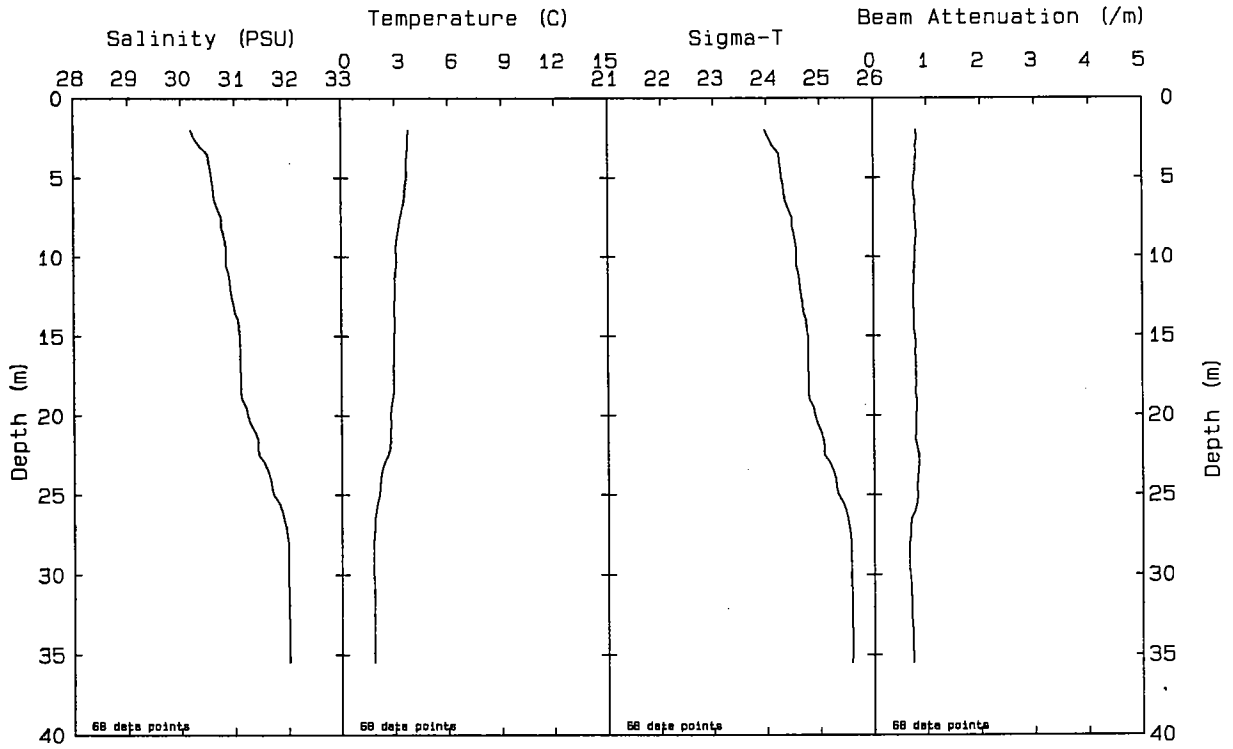


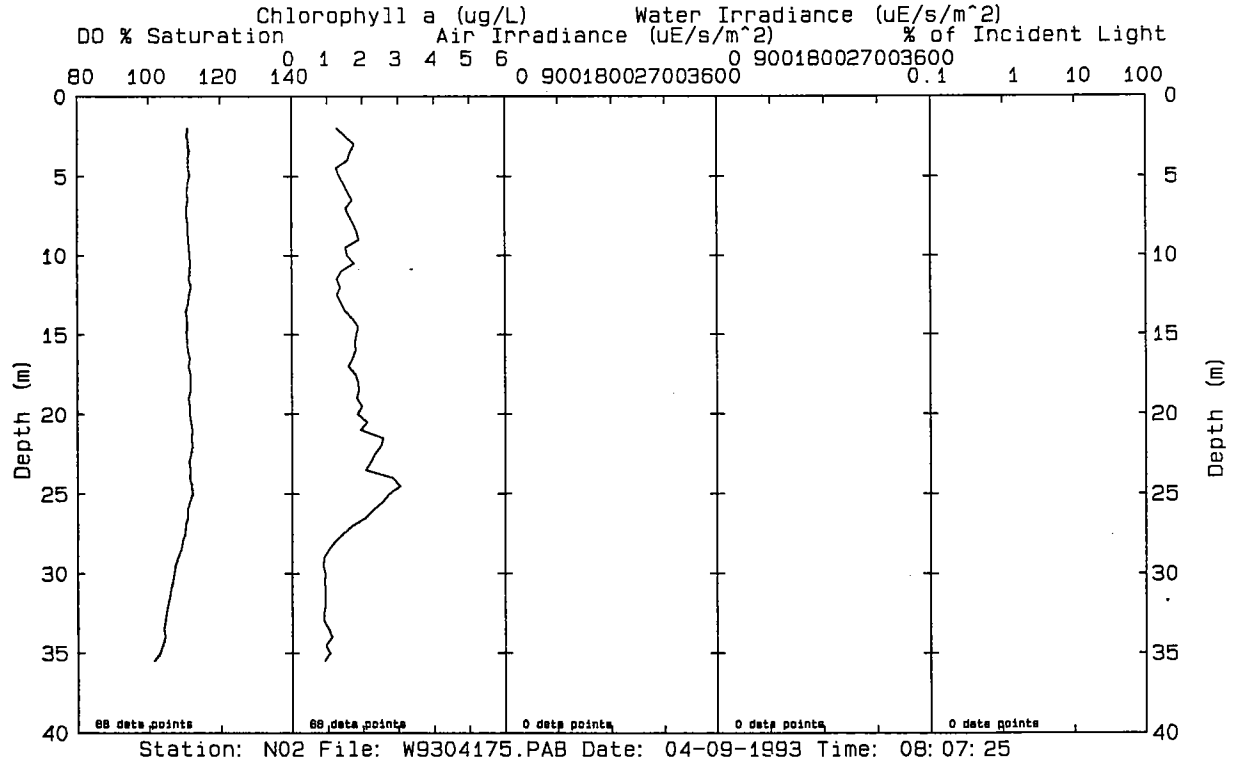


Station: N01P File: W9304067.PAB Date: 04-07-1993 Time: 06:16:09

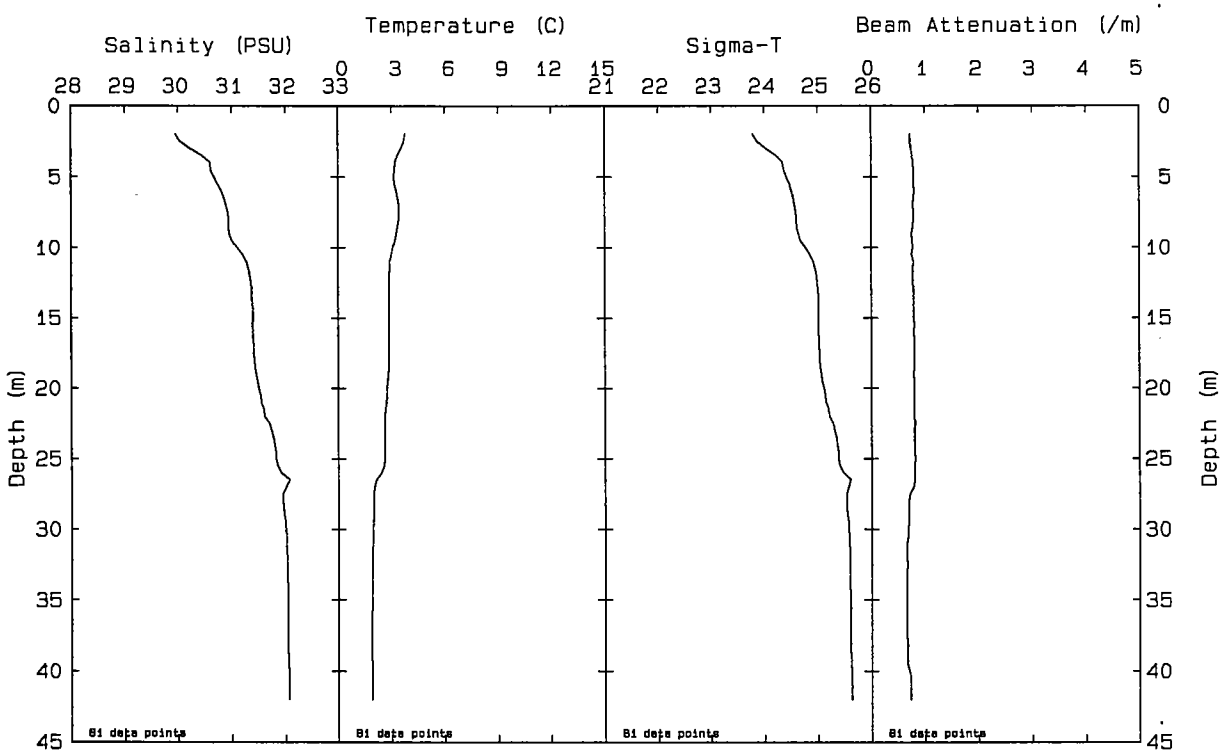

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30
50 data points
50 data points
50 data points
50 data points

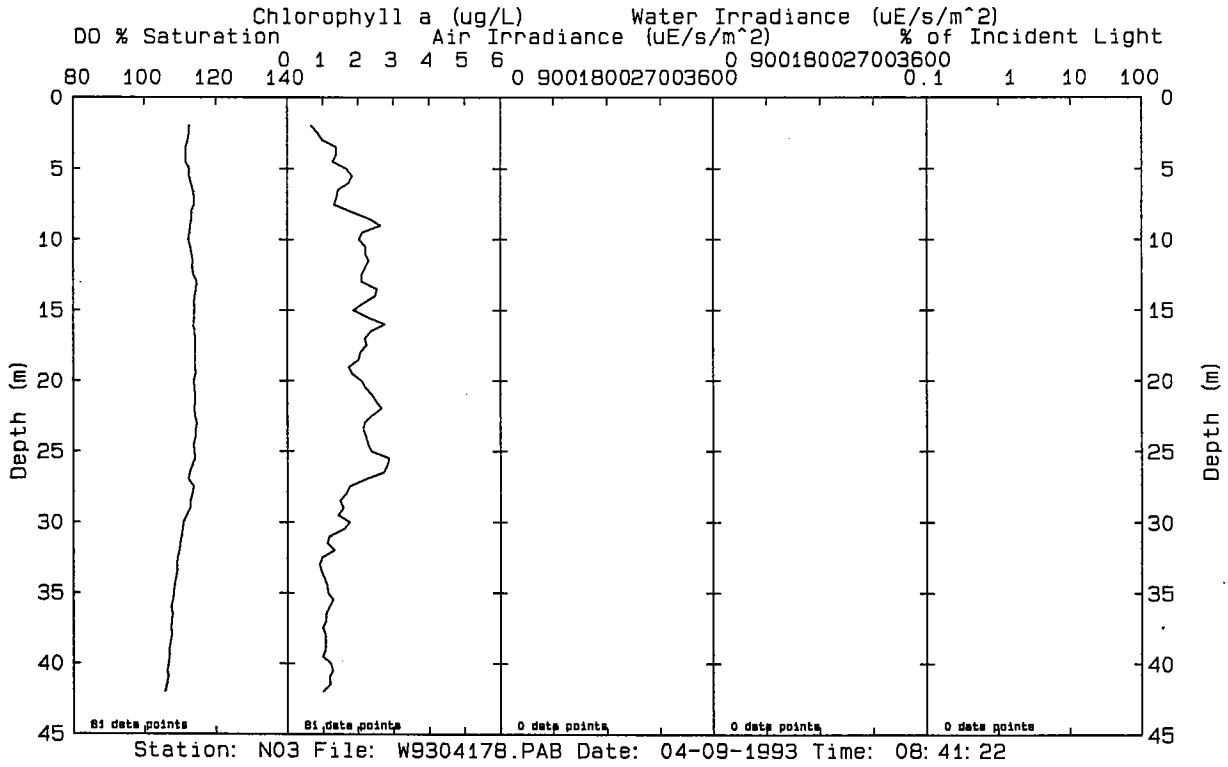

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30
50 data points
50 data points
0 data points
0 data points
0 data points
Station: N01P File: W9304172.PAB Date: 04-09-1993 Time: 07:39:51



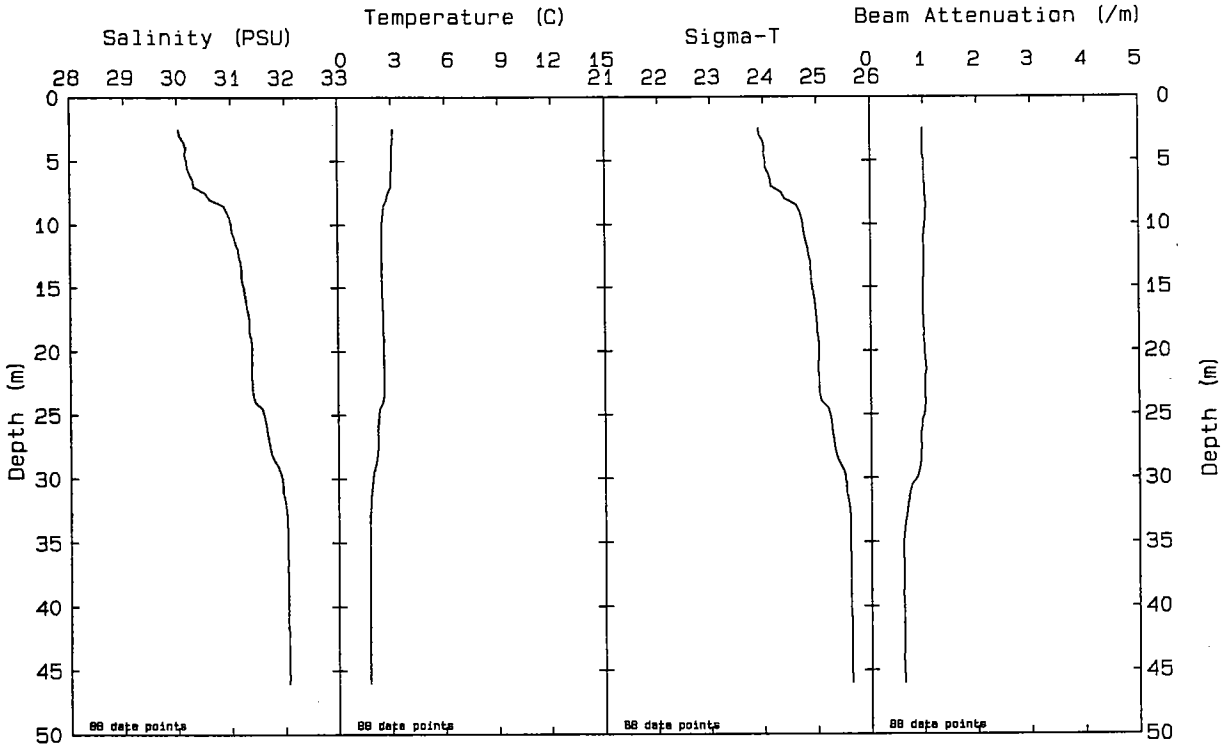


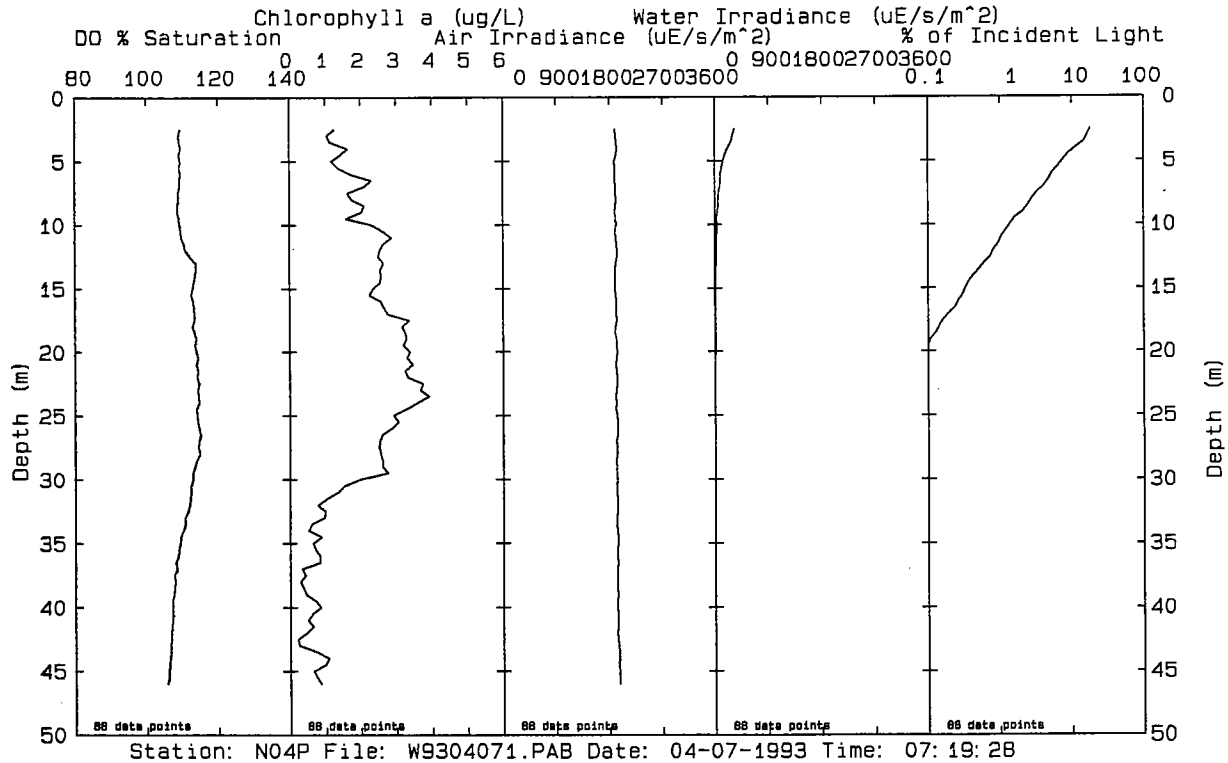
Station: N02 File: W9304175.PAB Date: 04-09-1993 Time: 08:07:25



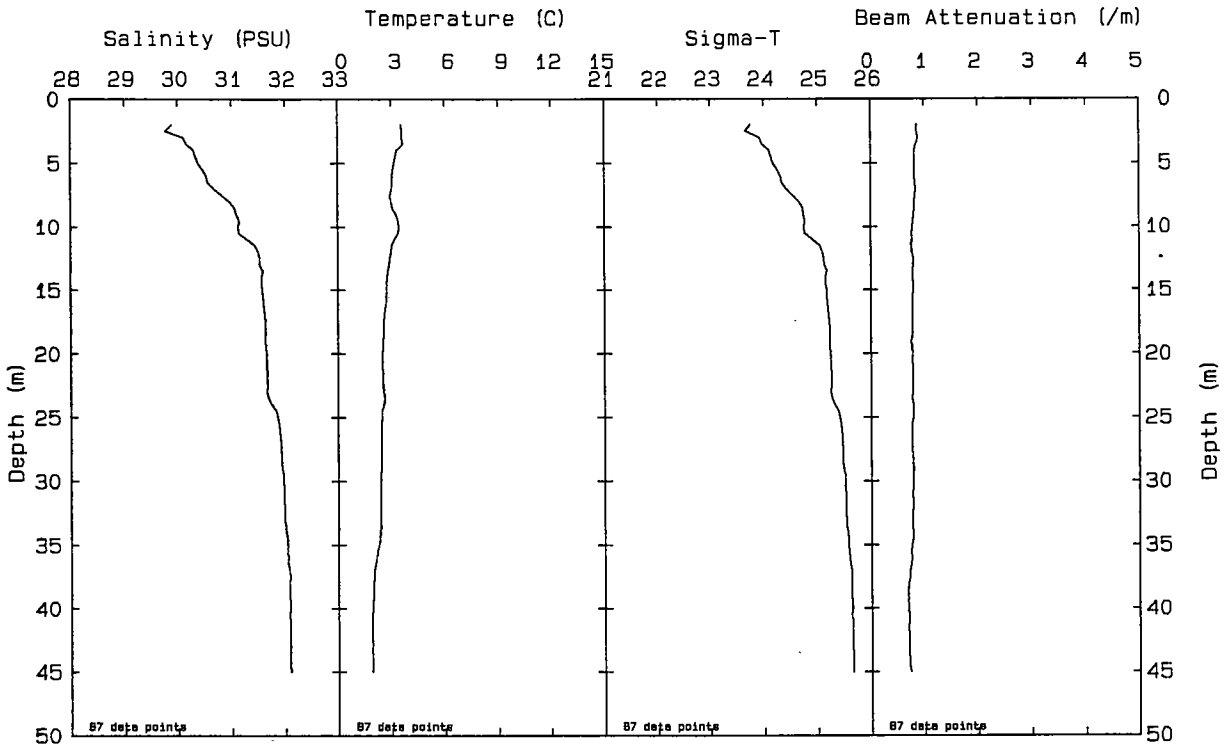


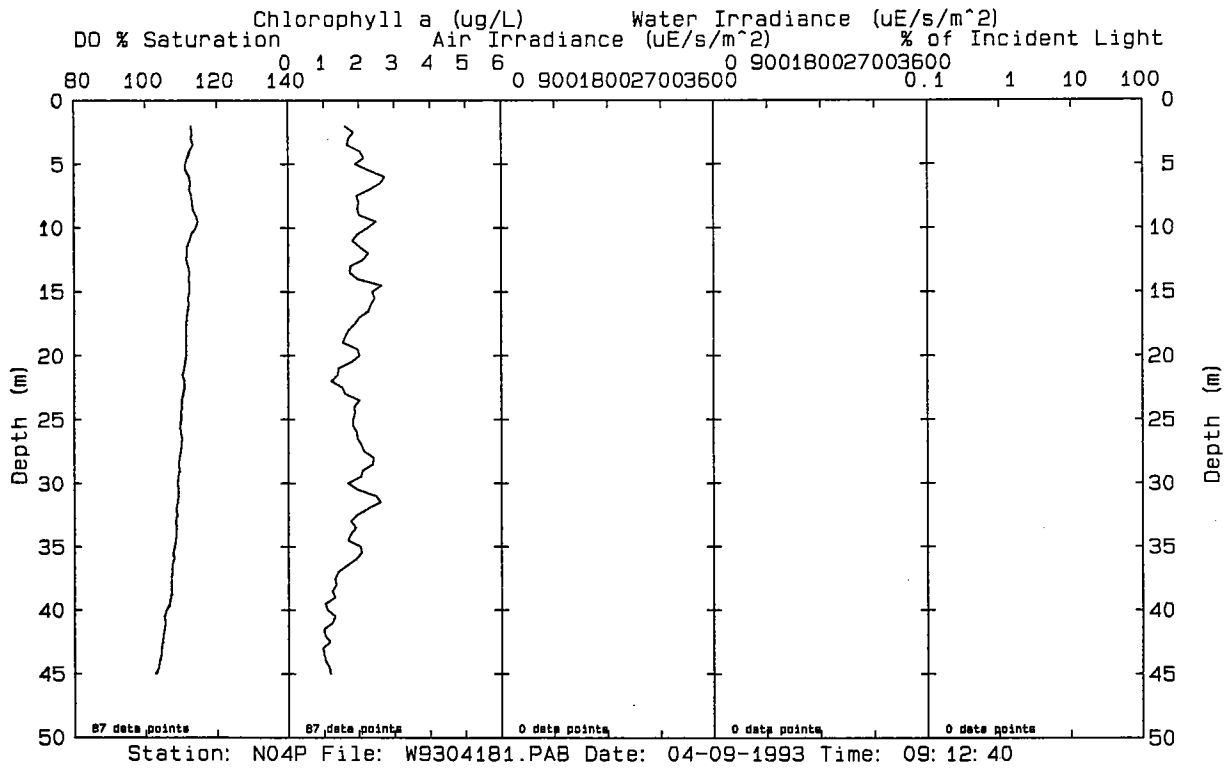
Station: N03 File: W9304178.PAB Date: 04-09-1993 Time: 08:41:22



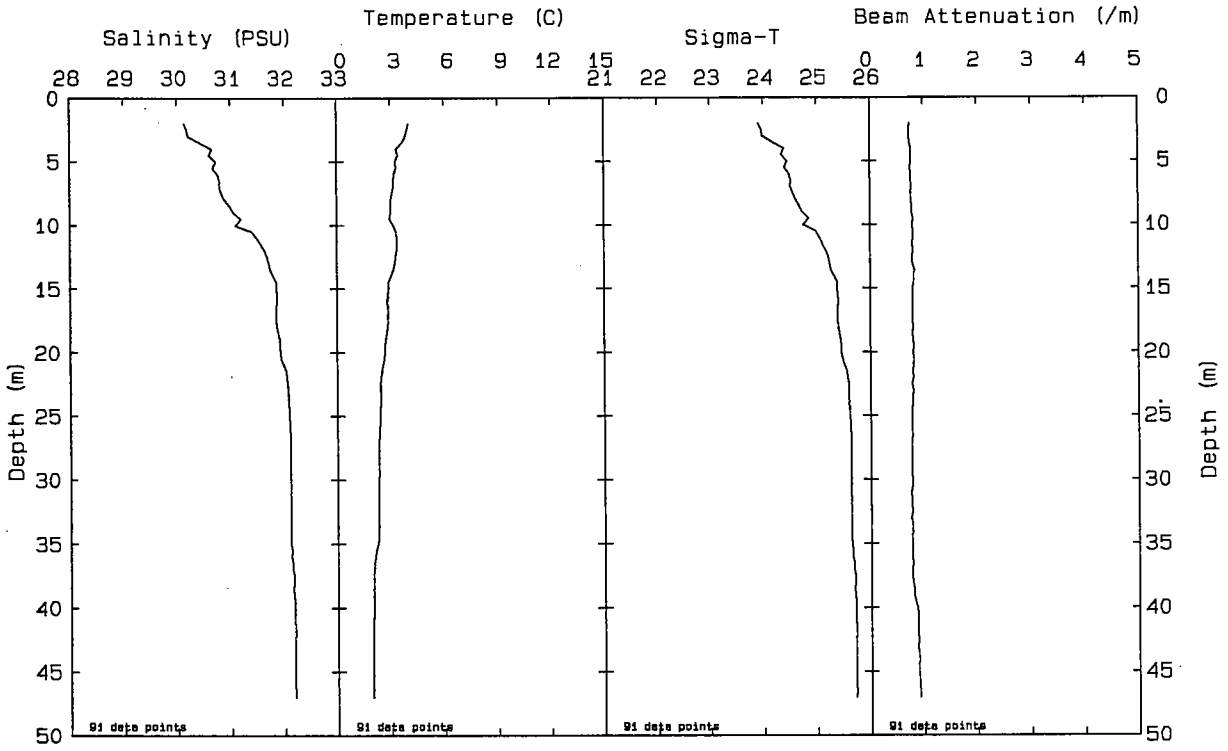


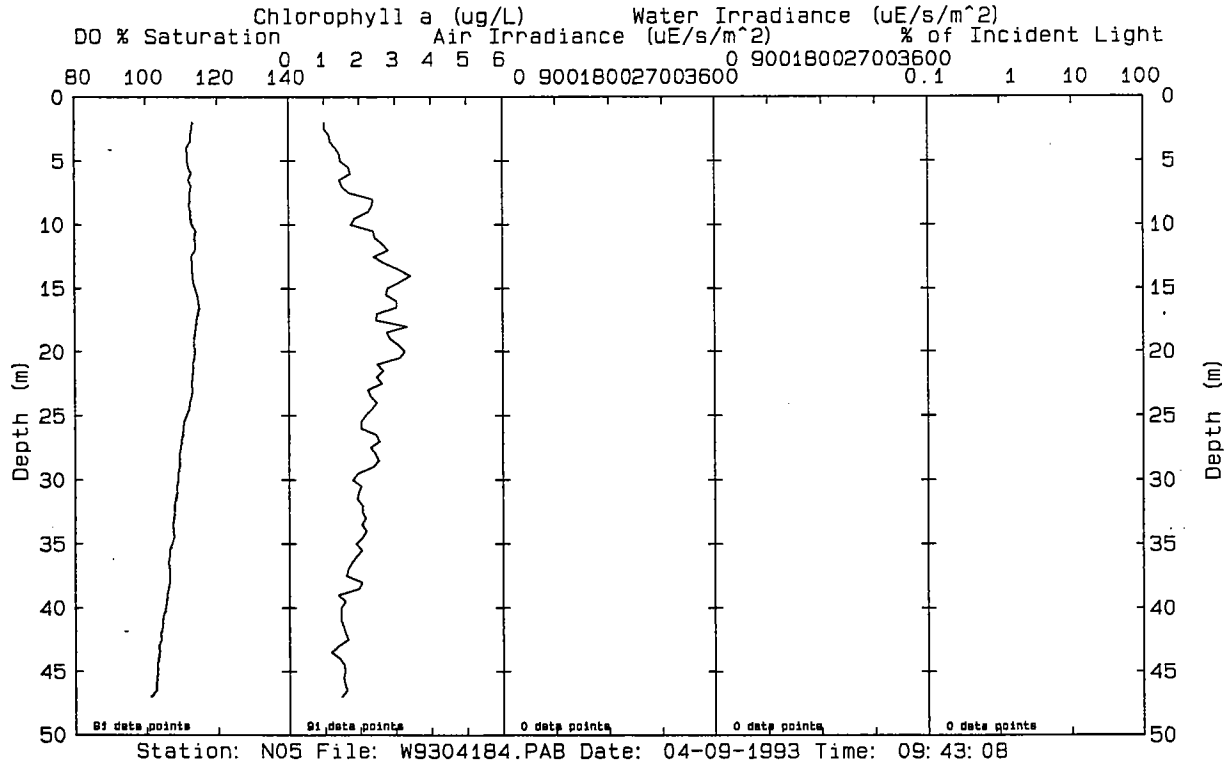
Station: N04P File: W9304071.PAB Date: 04-07-1993 Time: 07:19:28



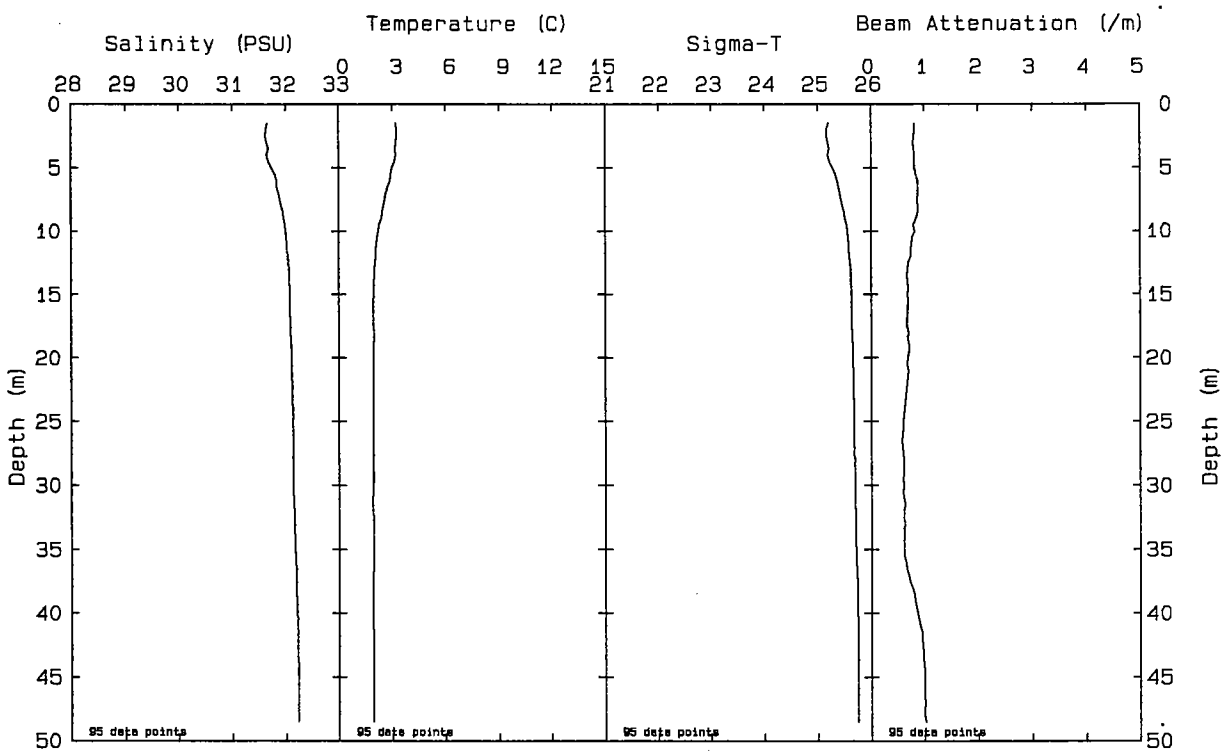


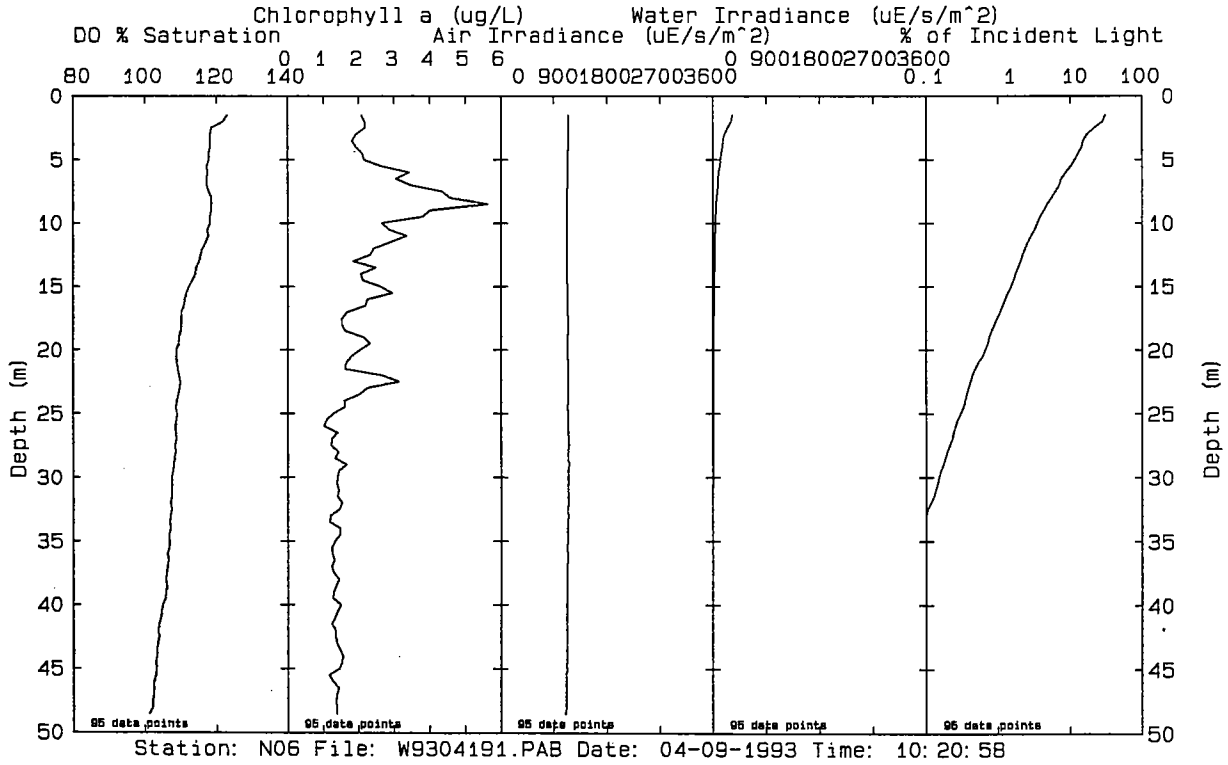
Station: N04P File: W9304181.PAB Date: 04-09-1993 Time: 09:12:40

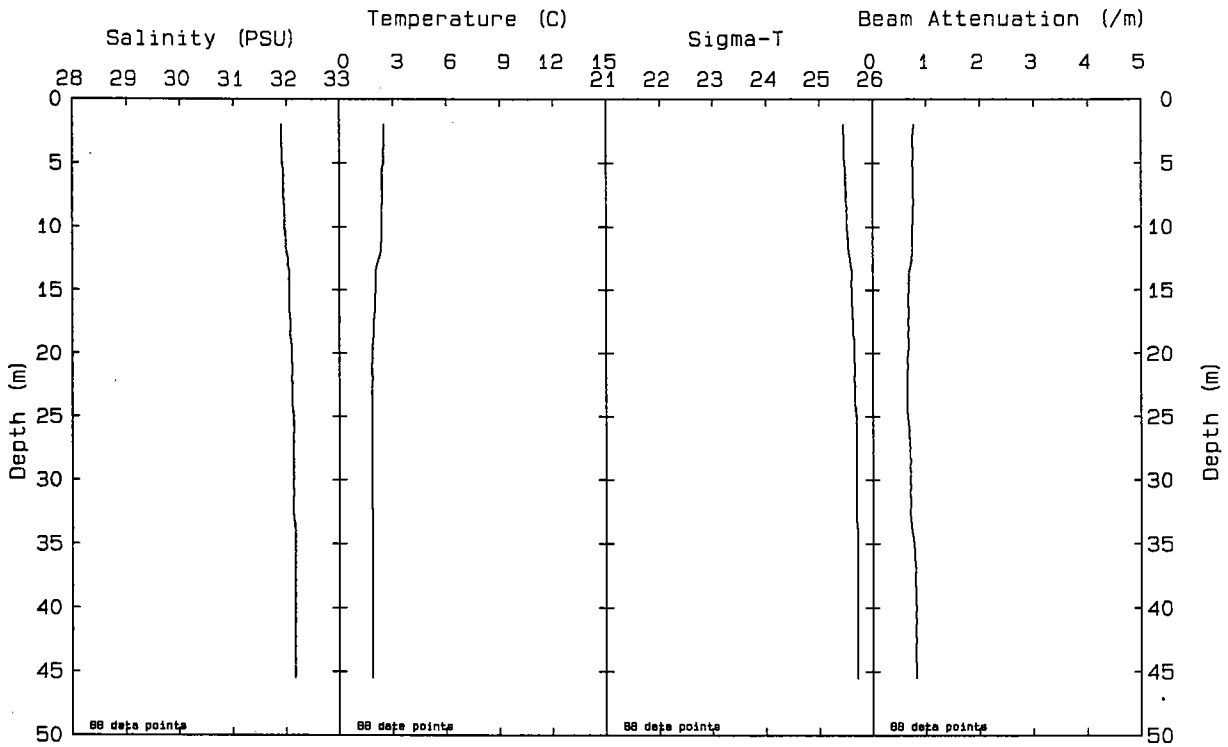


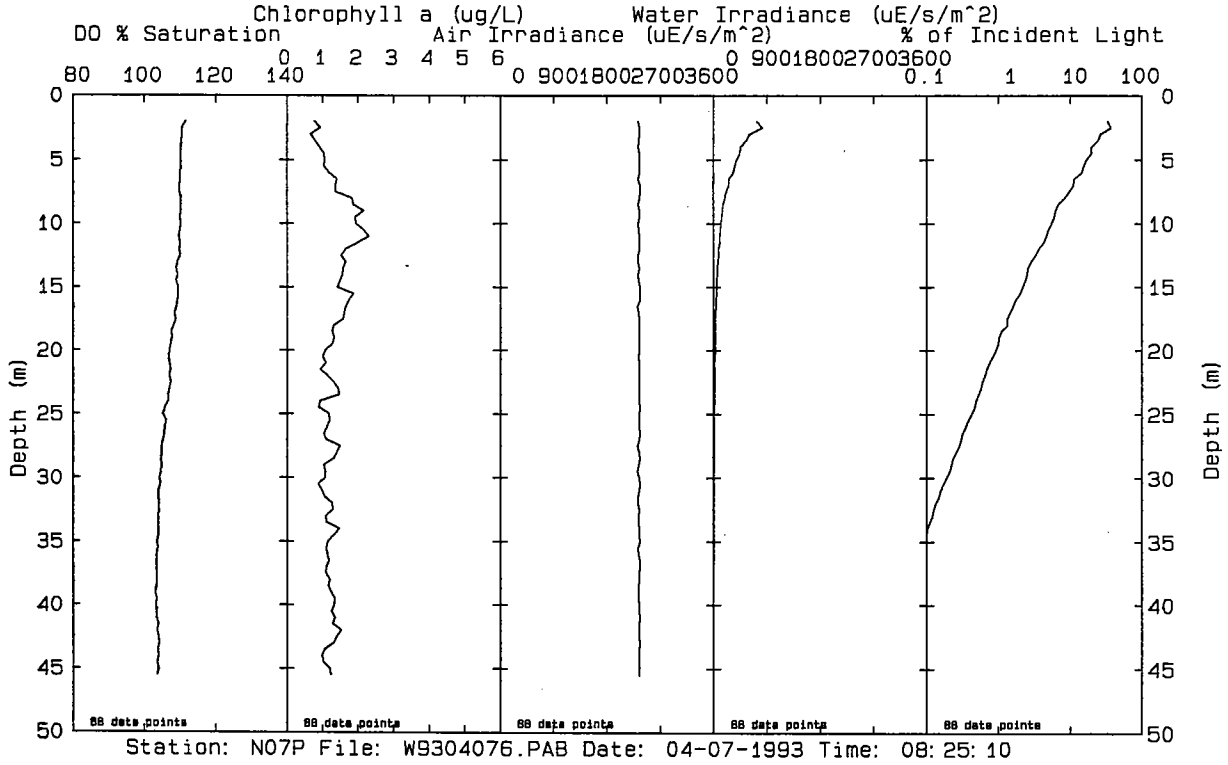


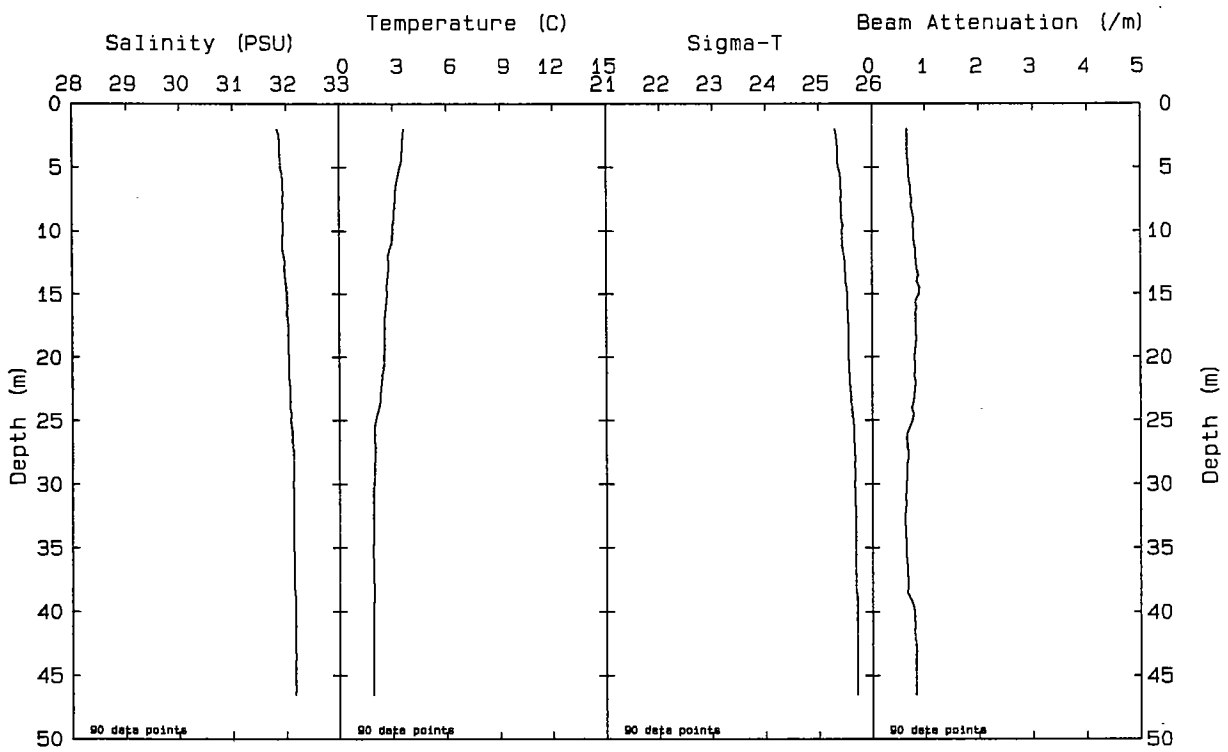
Station: N05 File: W9304184.PAB Date: 04-09-1993 Time: 09:43:08

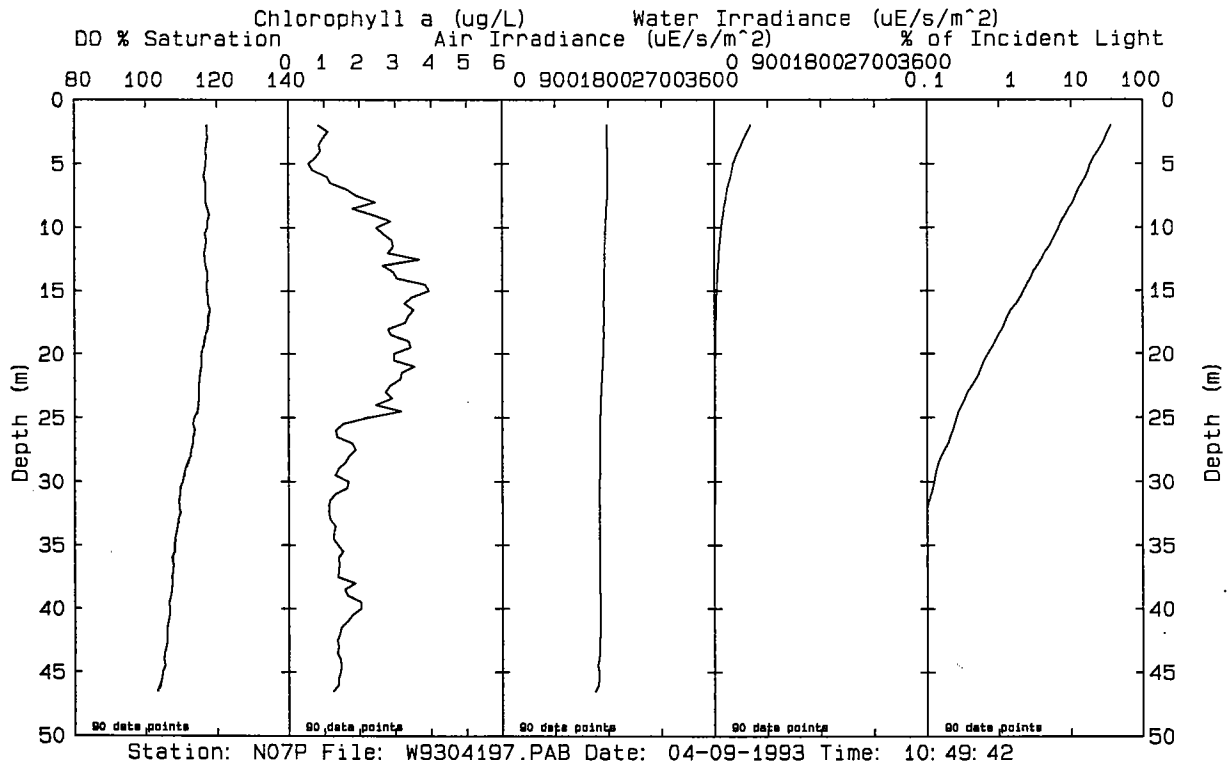

Salinity (PSU)
Temperature (C)
Sigma-T
Beam Attenuation (/m)
Depth (m)
95 data points


DO % Saturation
Chlorophyll a (ug/L)
Air Irradiance (uE/s/m^2)
Water Irradiance (uE/s/m^2)
% of Incident Light
Depth (m)
95 data points
Station: N06 File: W9304191.PAB Date: 04-09-1993 Time: 10:20:58

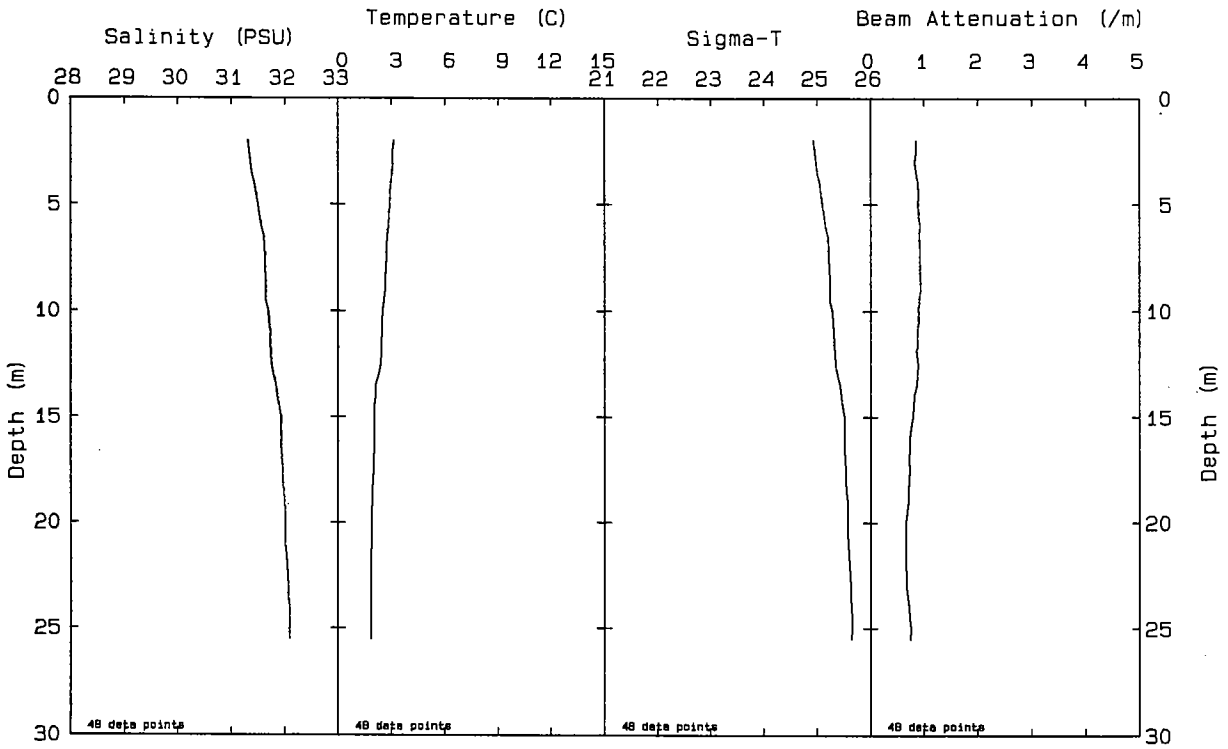

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40 45 50
88 data points

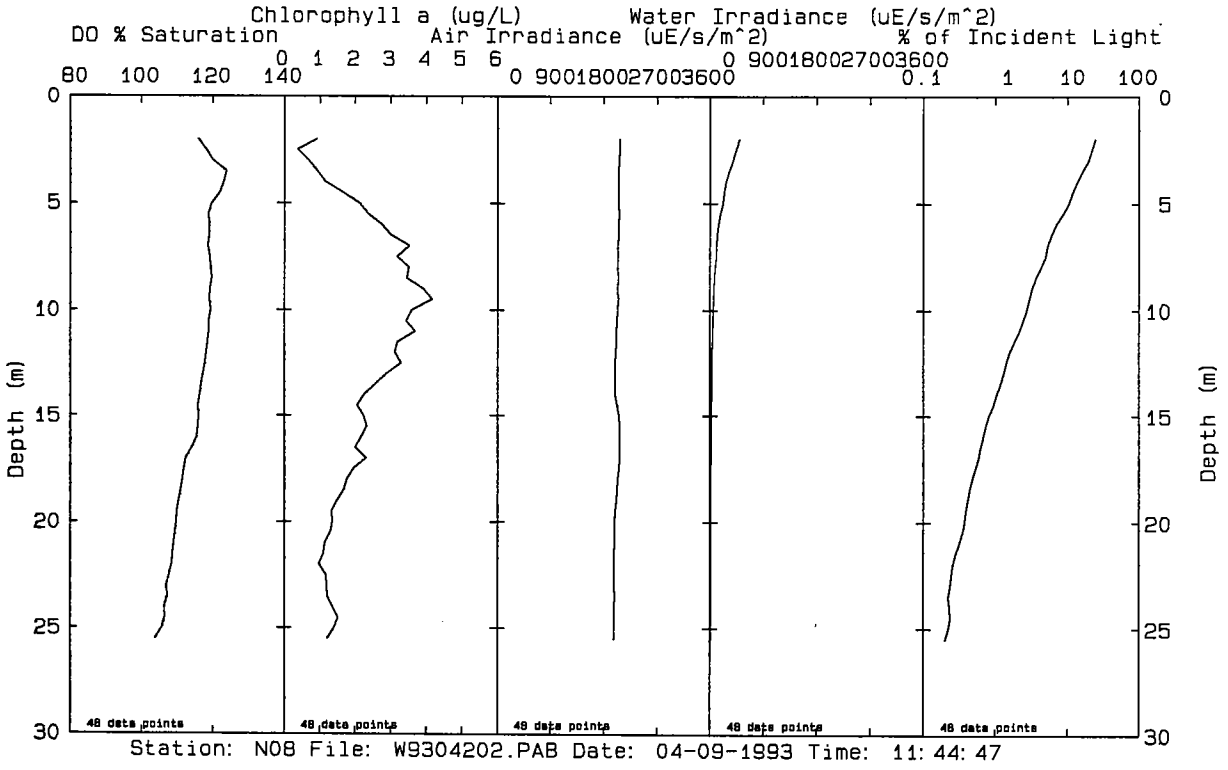

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40 45 50
88 data points
Station: N07P File: W9304076.PAB Date: 04-07-1993 Time: 08:25:10



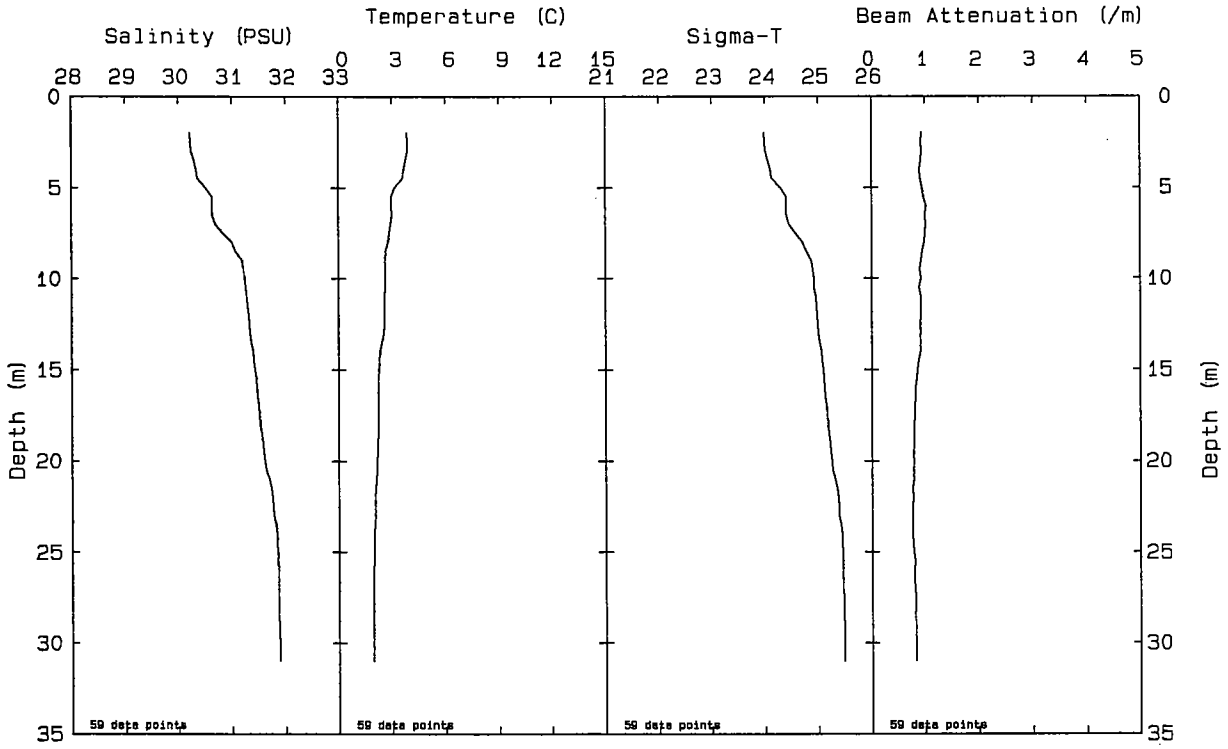


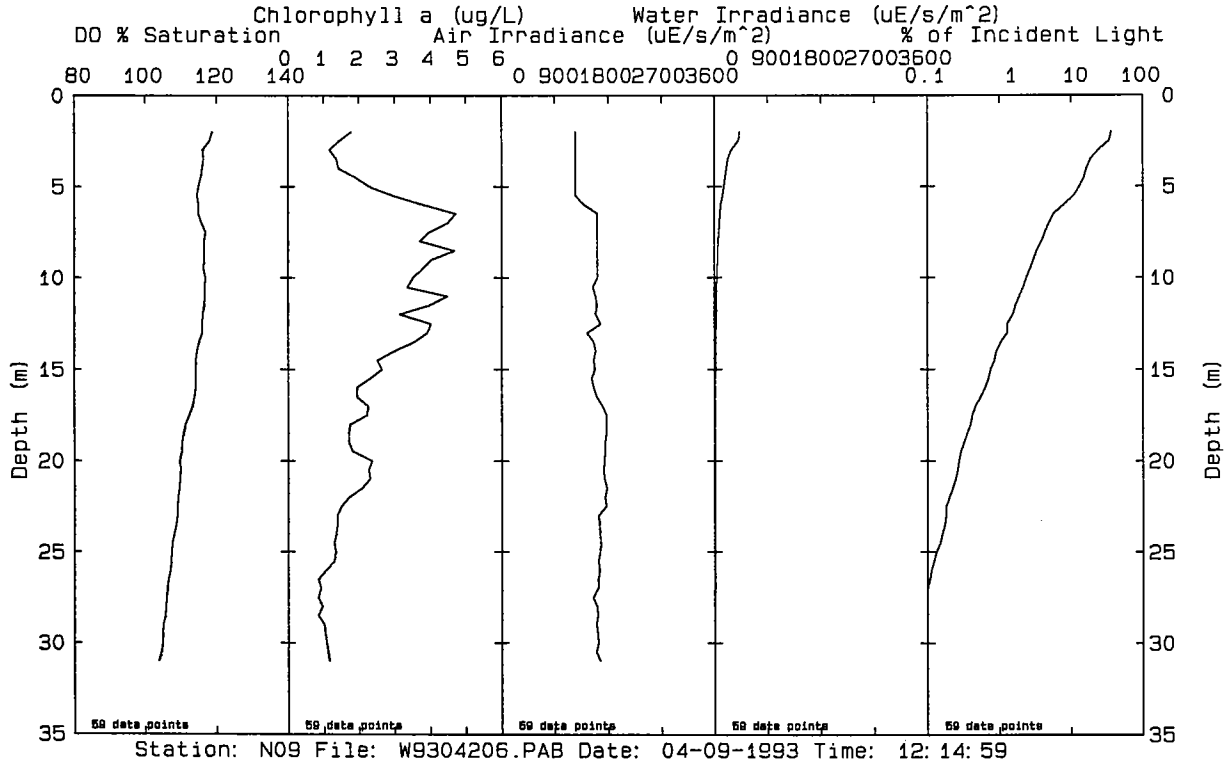
Station: N07P File: W9304197.PAB Date: 04-09-1993 Time: 10:49:42

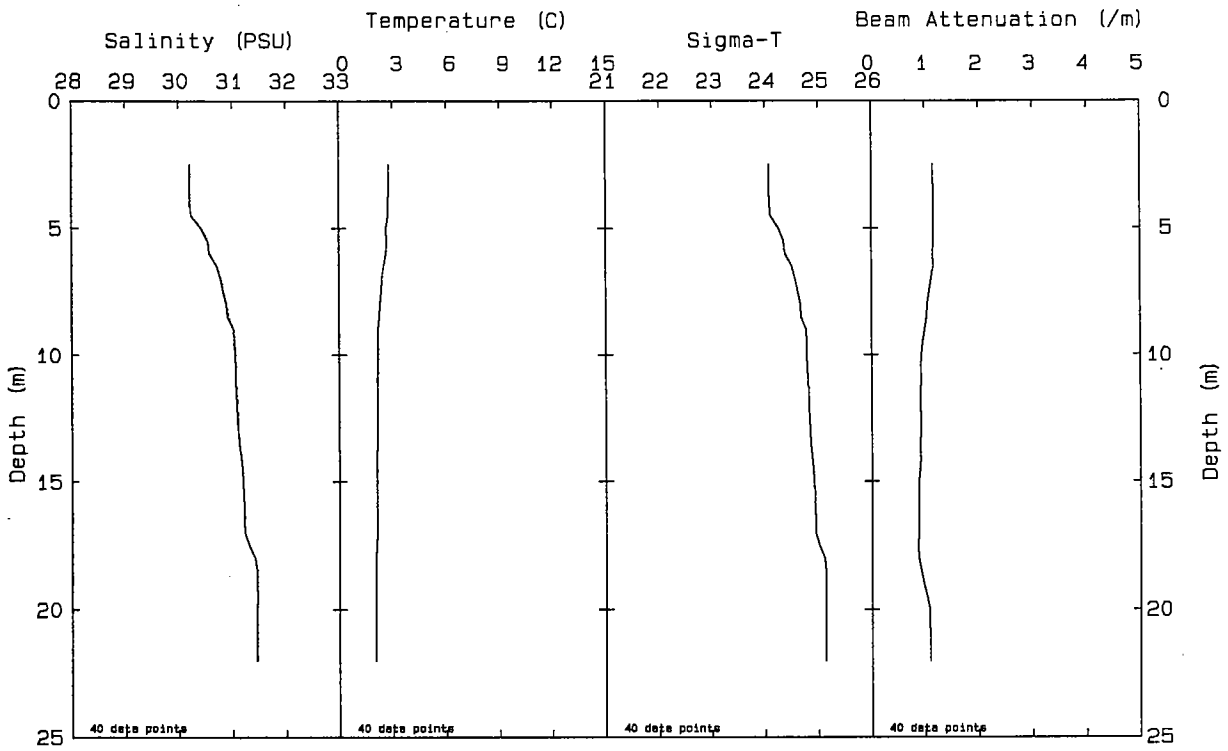


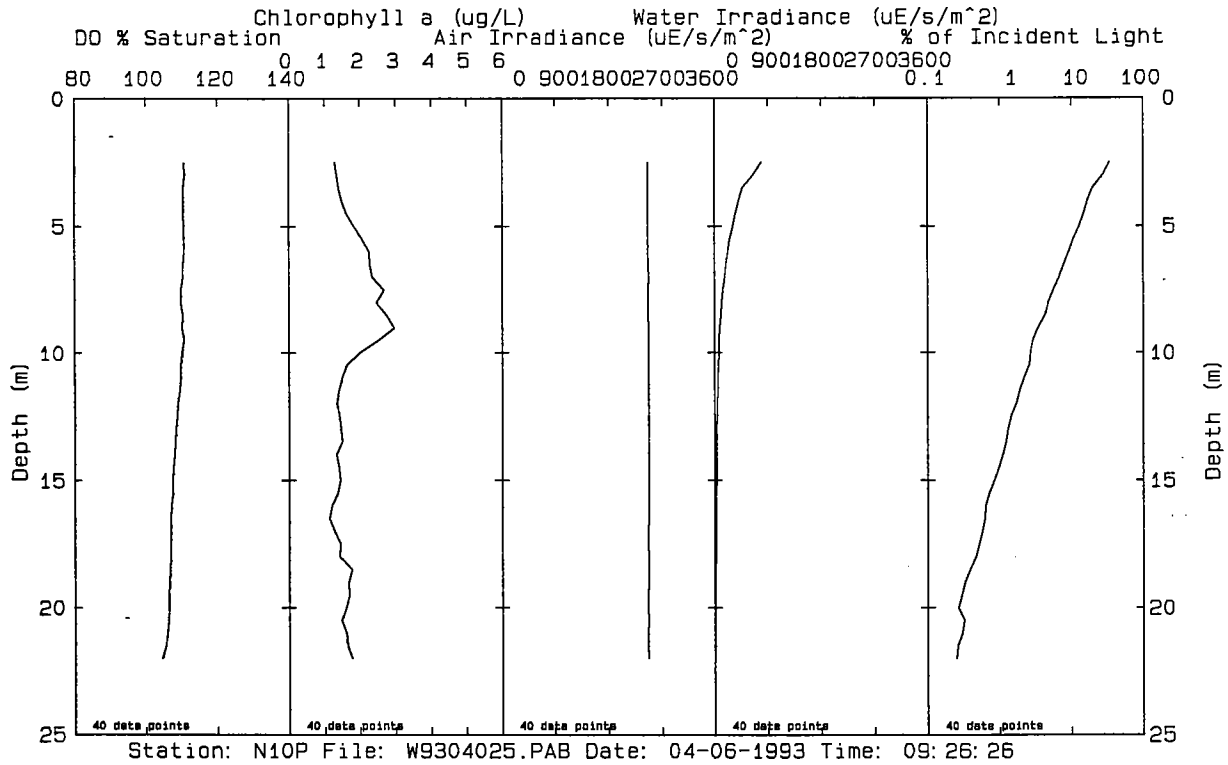


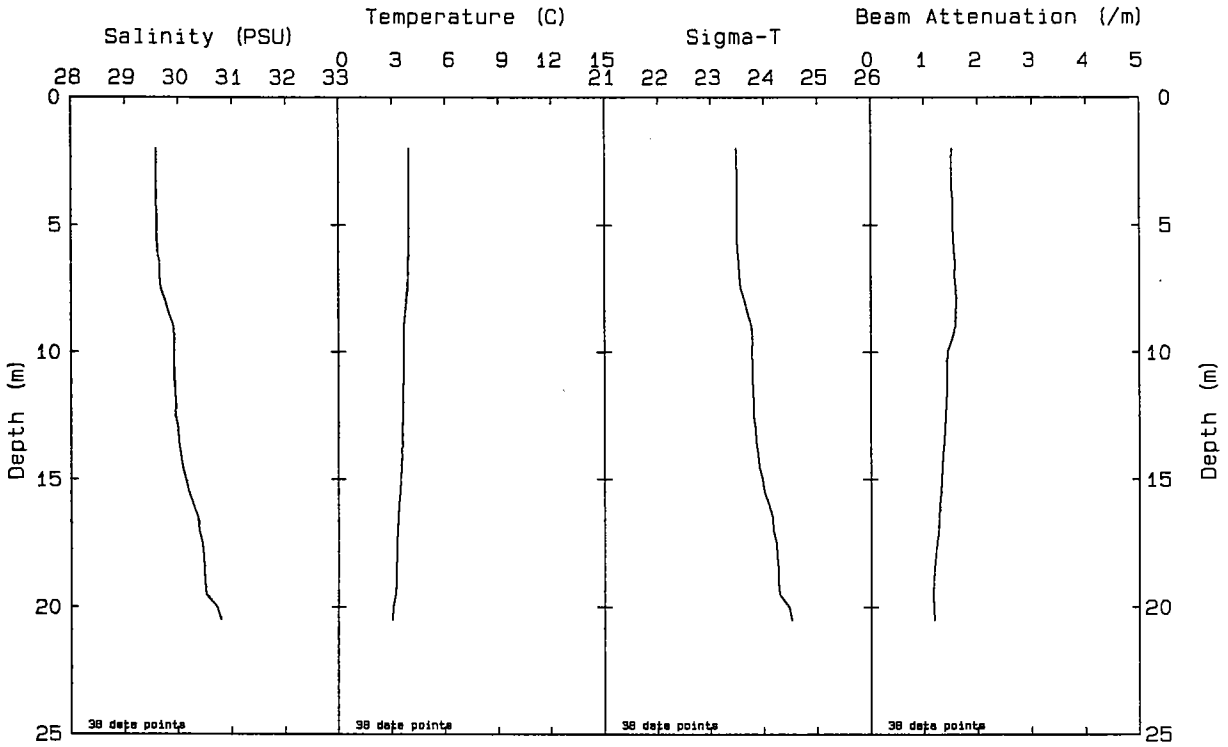
Station: N08 File: W9304202.PAB Date: 04-09-1993 Time: 11:44:47

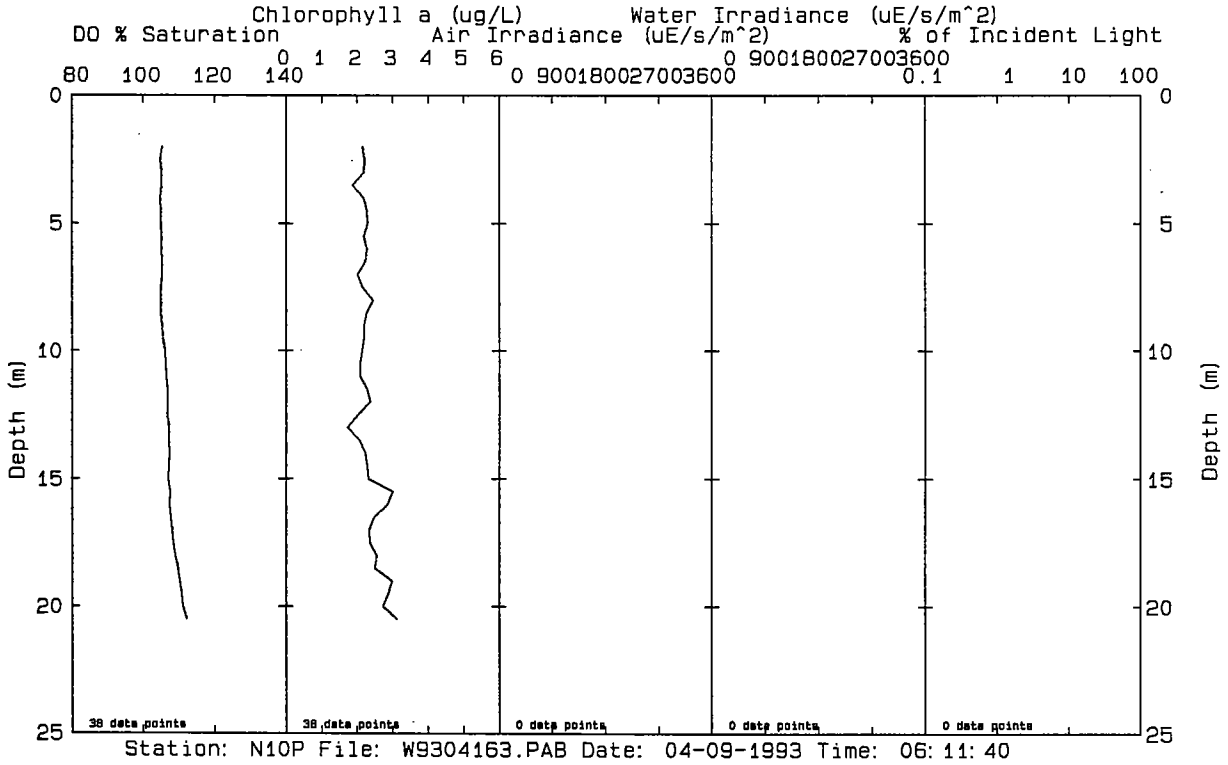

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35
59 data points
59 data points
59 data points
59 data points


DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35
59 data points
59 data points
59 data points
59 data points
59 data points
Station: N09 File: W9304206.PAB Date: 04-09-1993 Time: 12:14:59

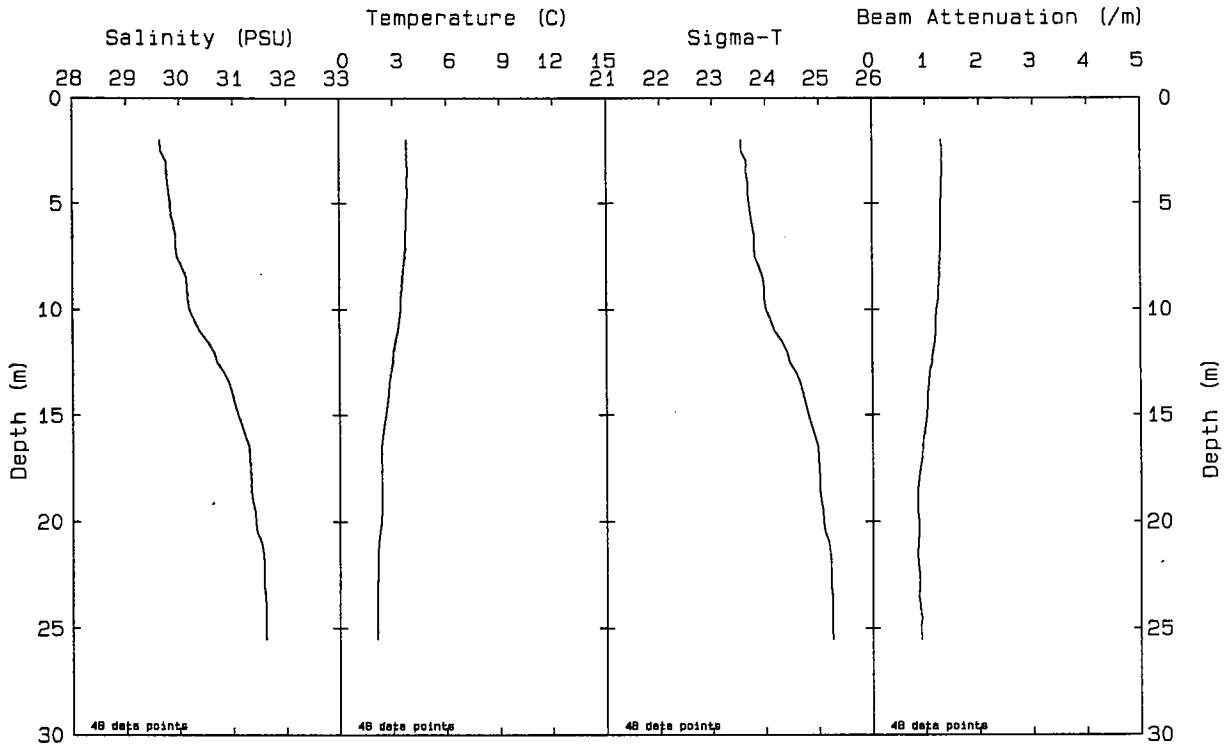

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25
40 data points

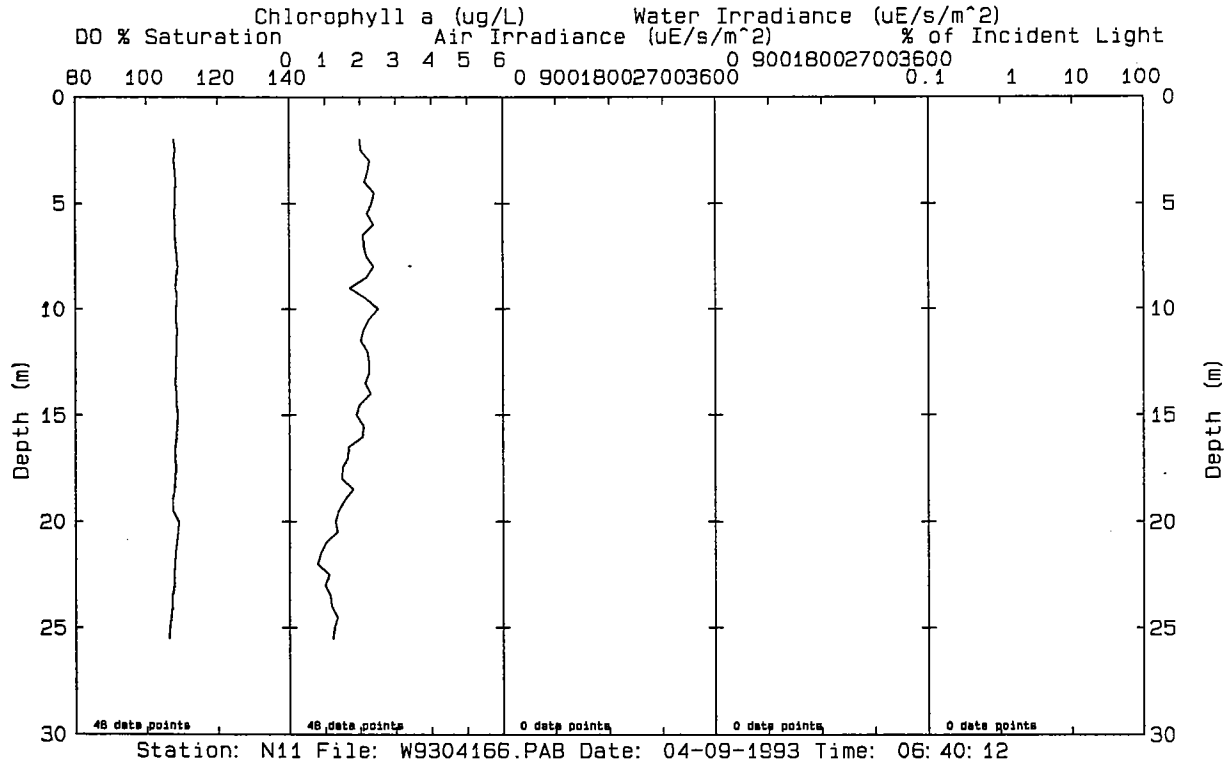

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25
40 data points
Station: N10P File: W9304025.PAB Date: 04-06-1993 Time: 09:26:26



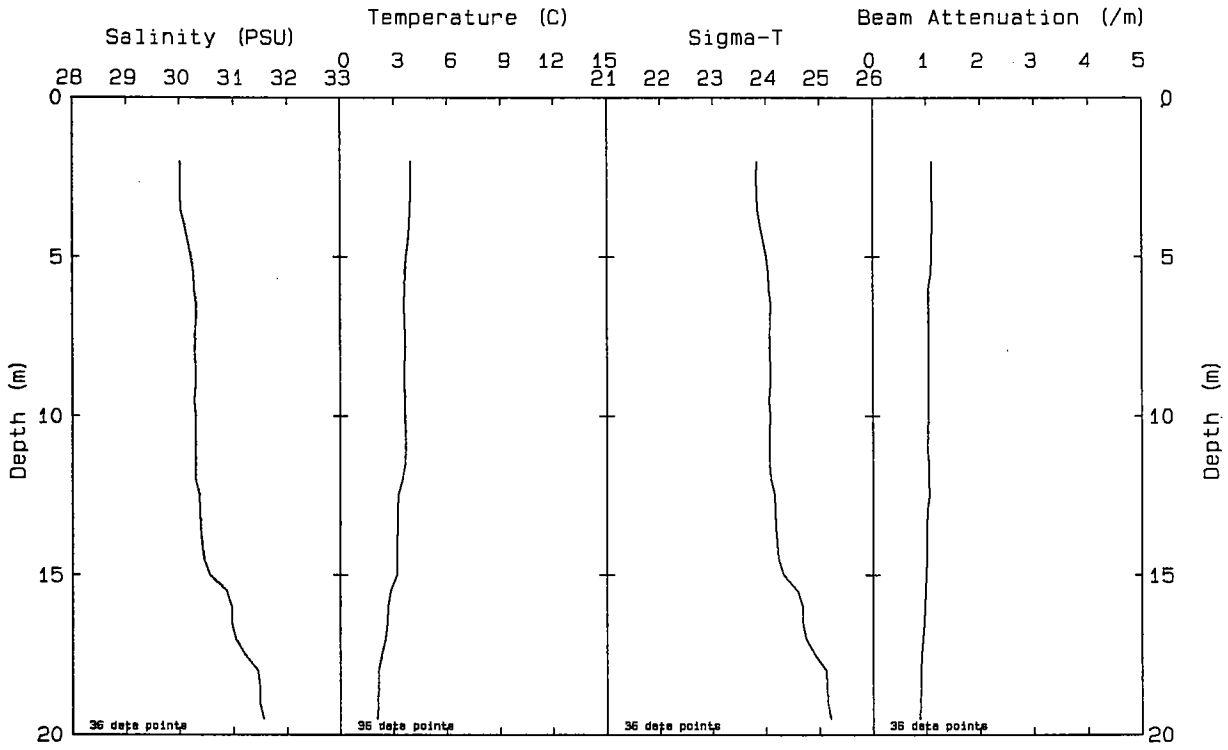


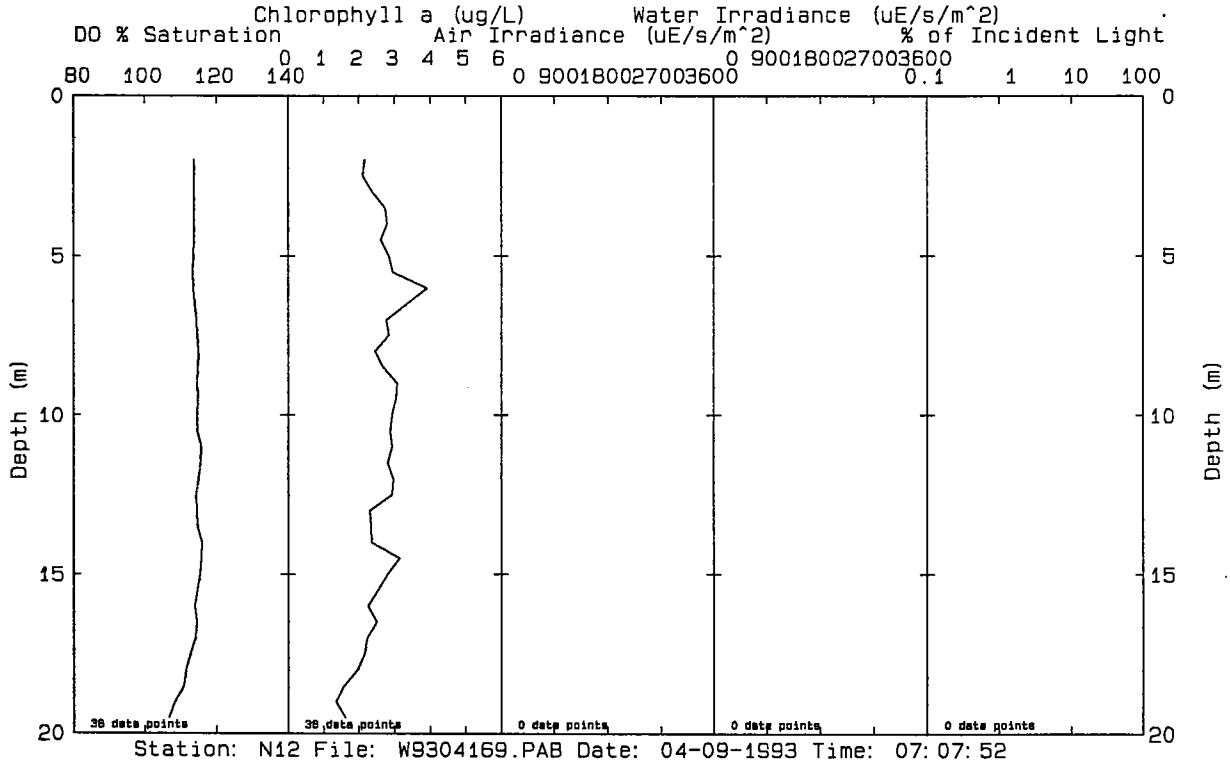
Station: N10P File: W9304163.PAB Date: 04-09-1993 Time: 06:11:40



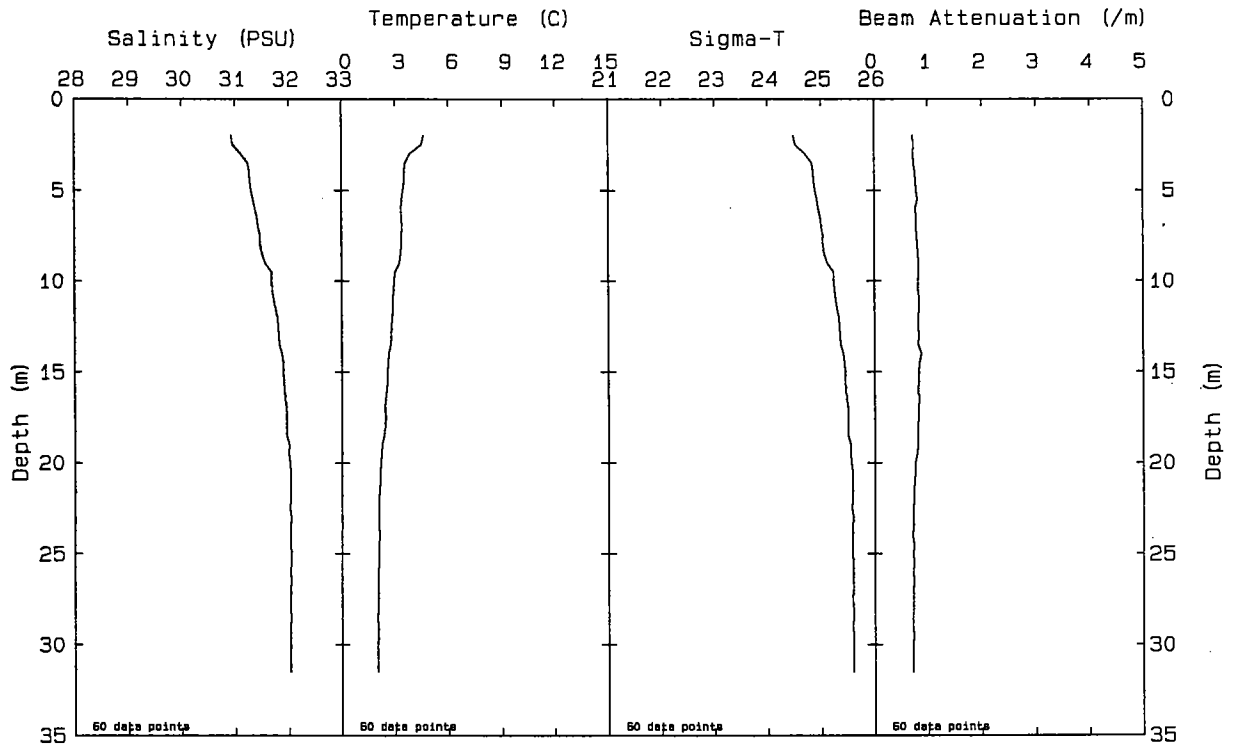


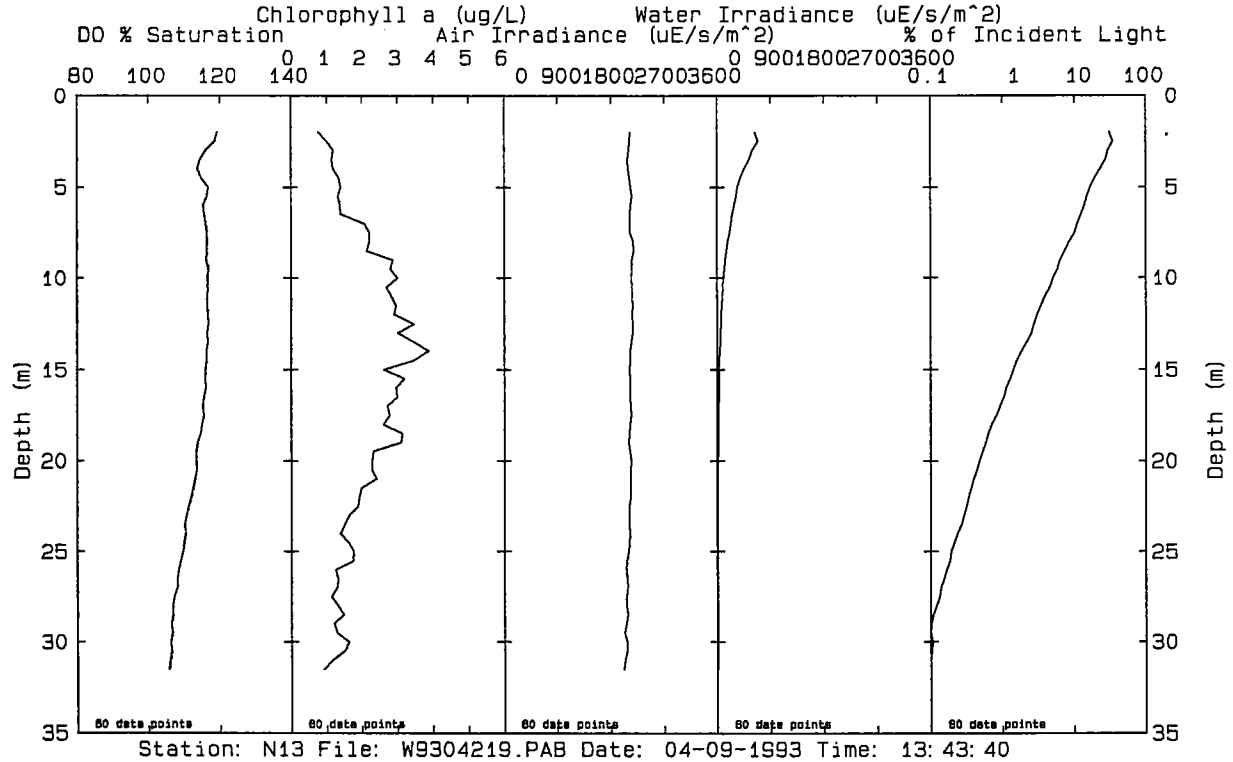
Station: N11 File: W9304166.PAB Date: 04-09-1993 Time: 06:40:12



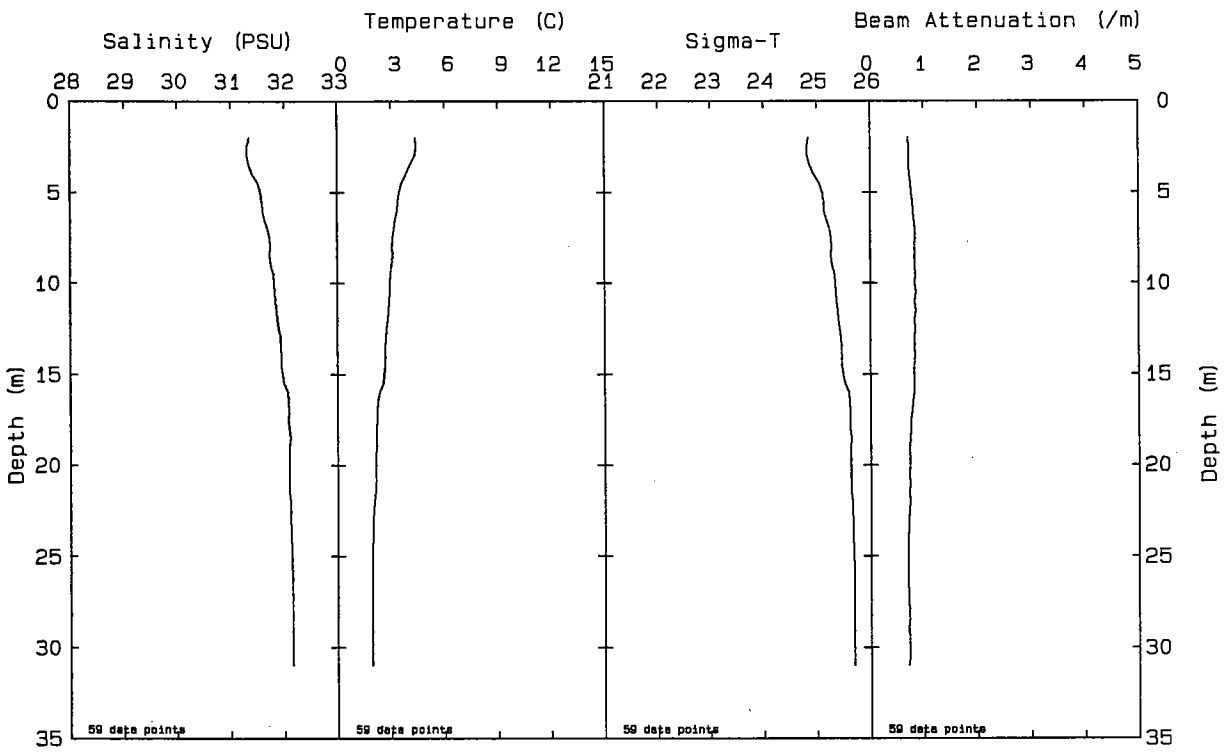


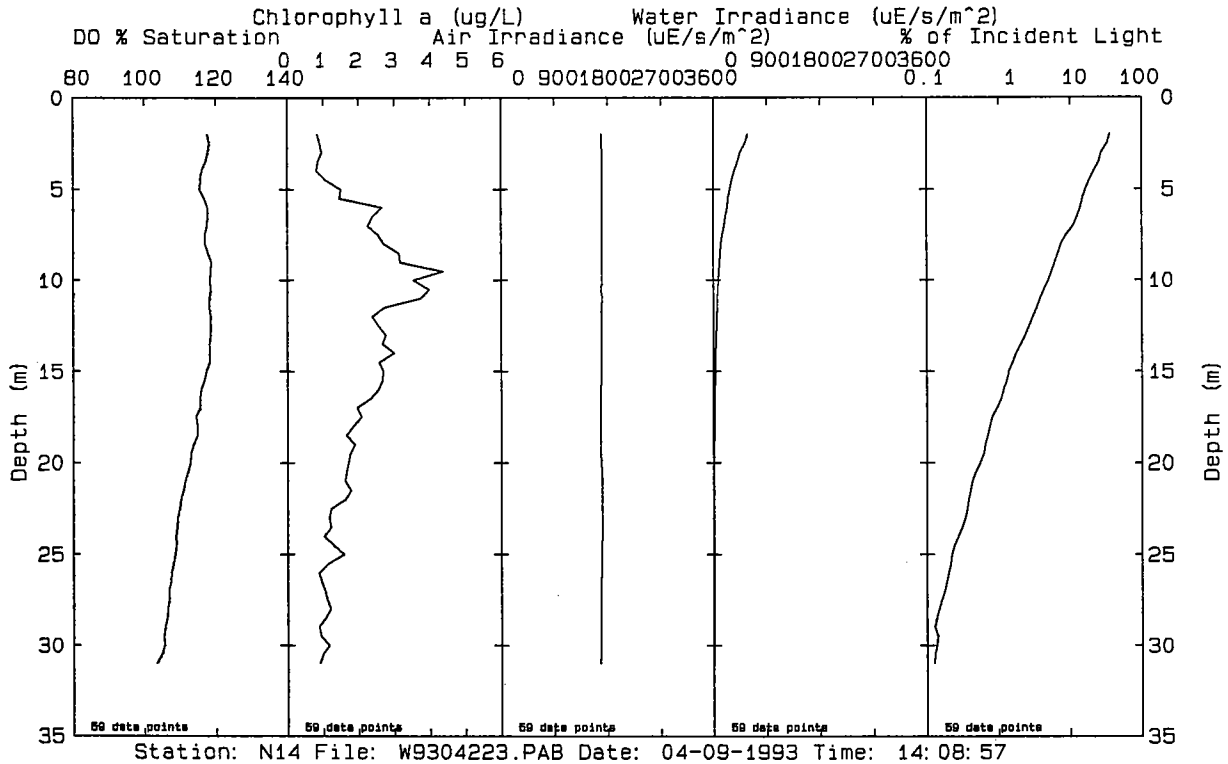
Station: N12 File: W9304169.PAB Date: 04-09-1993 Time: 07:07:52



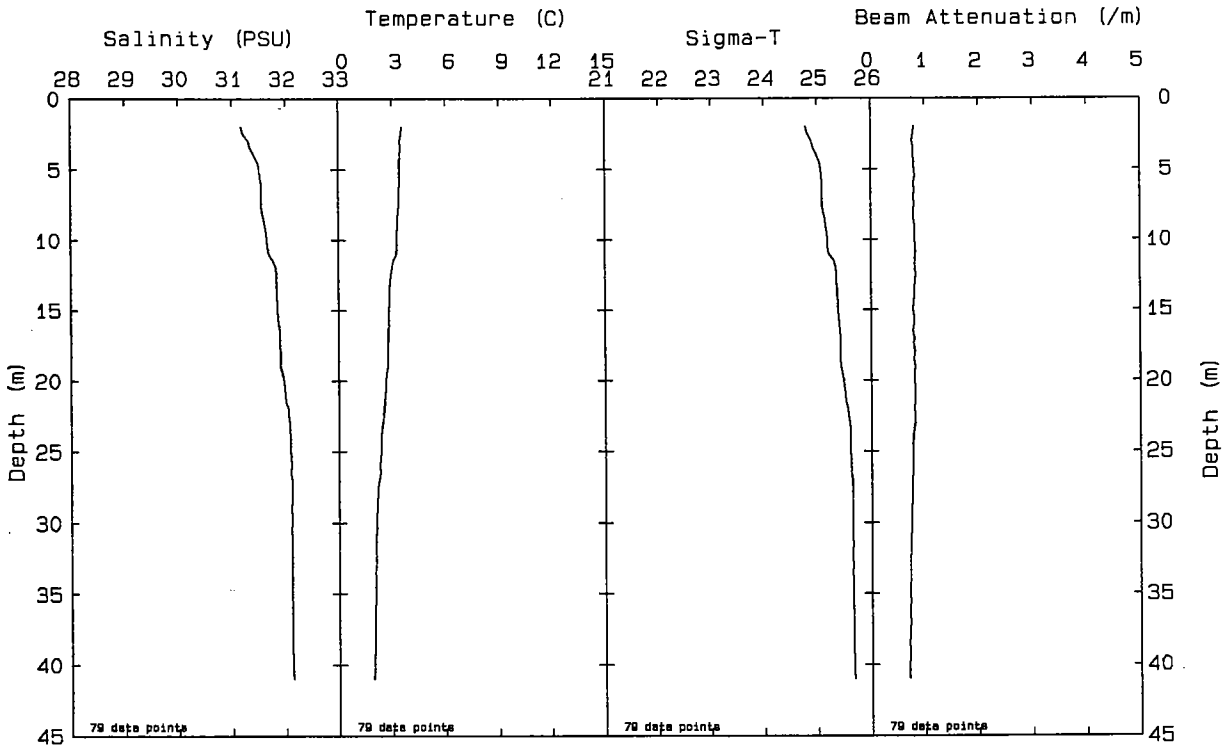


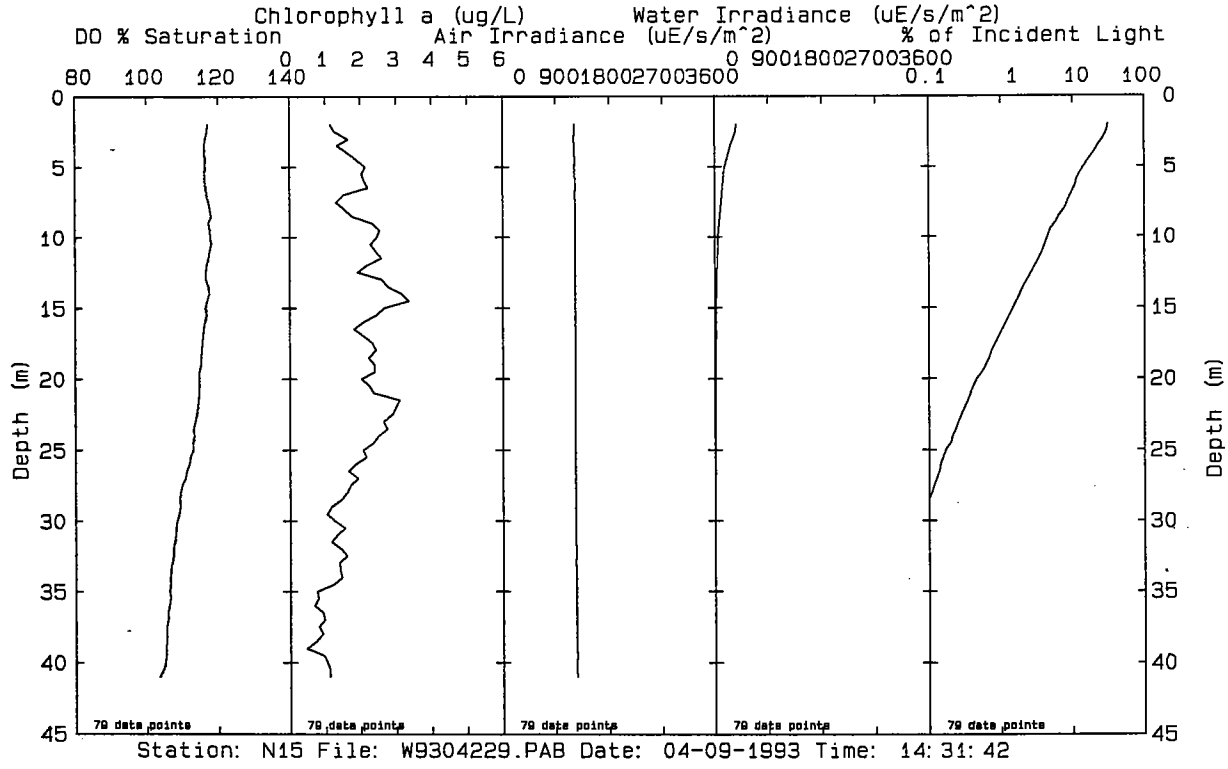
Station: N13 File: W9304219.PAB Date: 04-09-1993 Time: 13:43:40



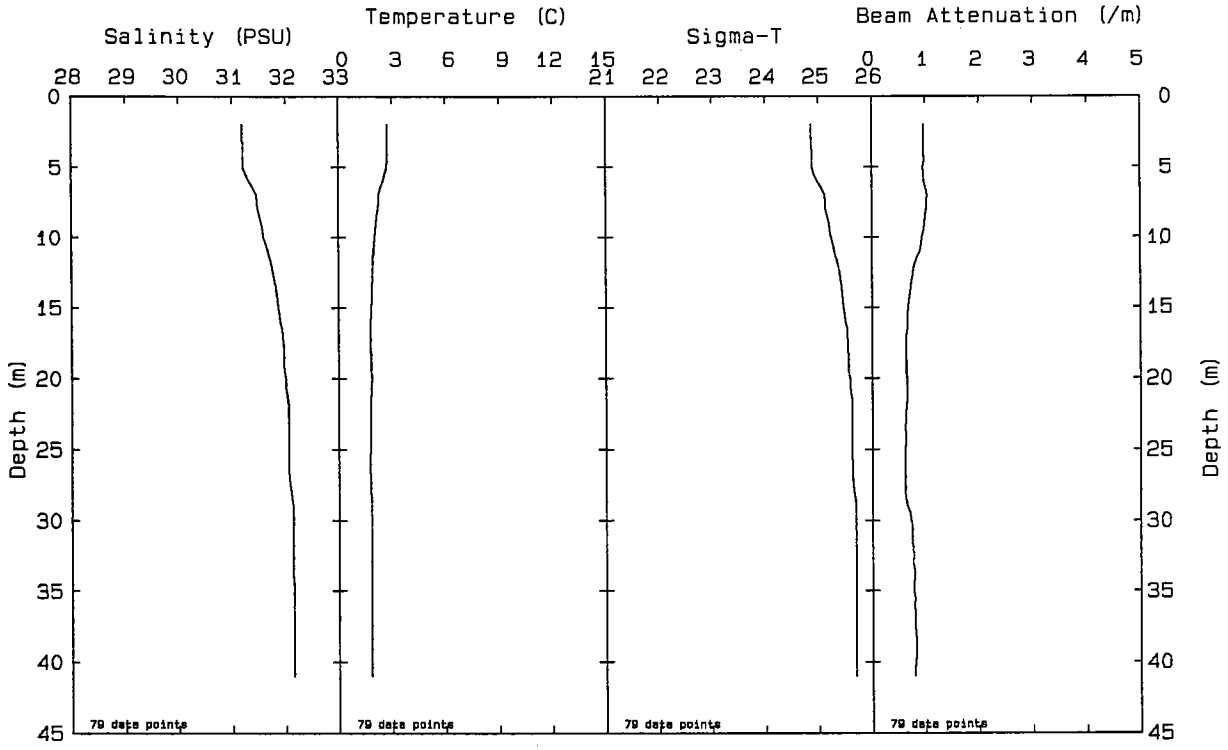


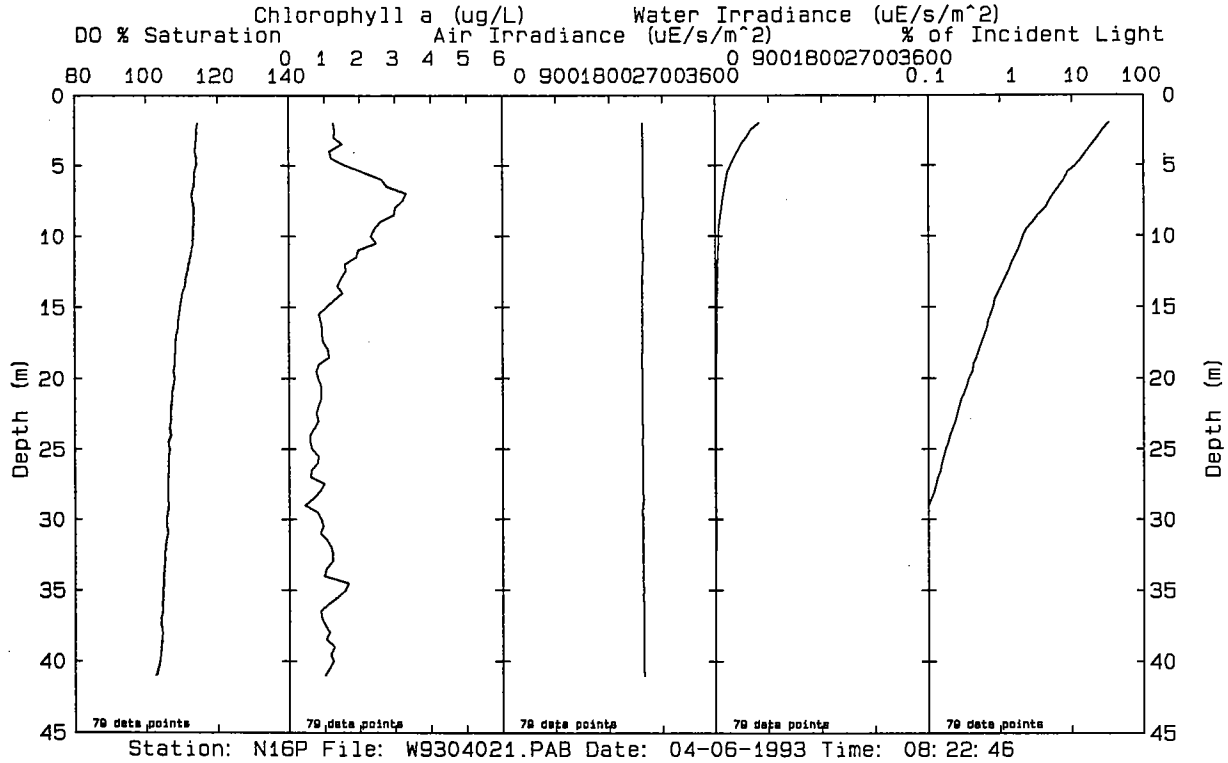
Station: N14 File: W9304223.PAB Date: 04-09-1993 Time: 14:08:57

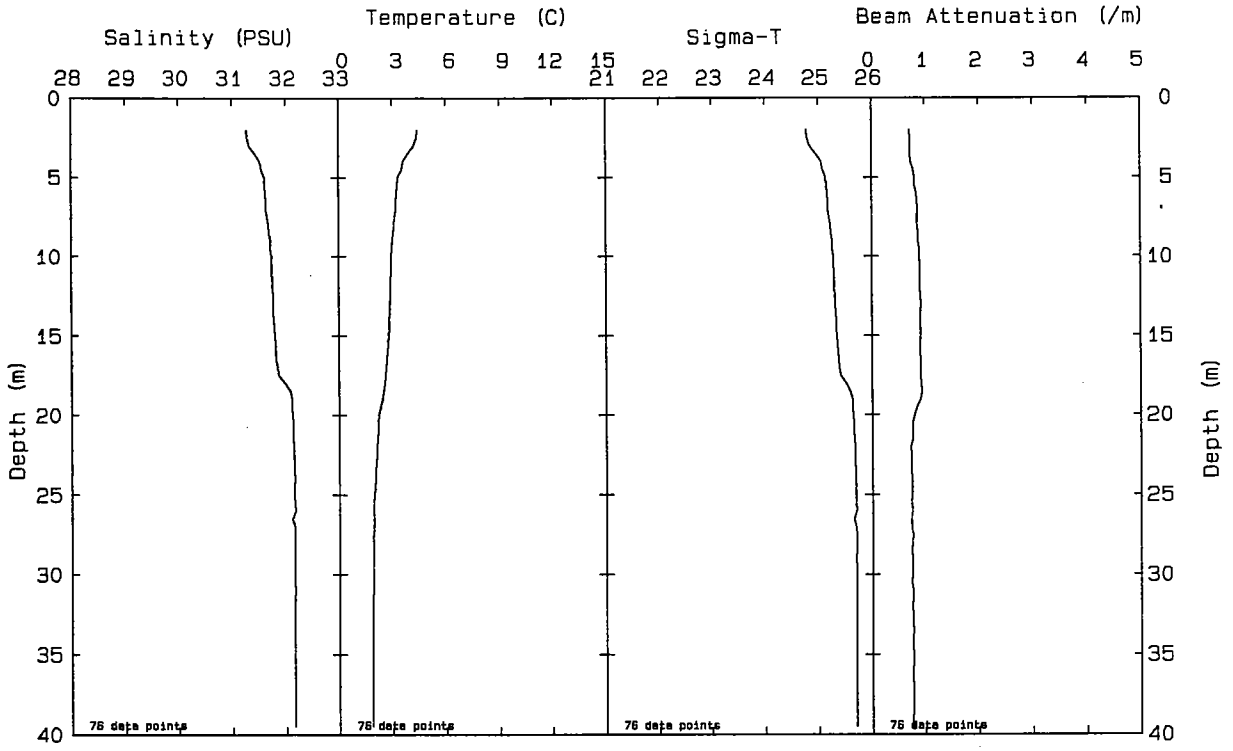


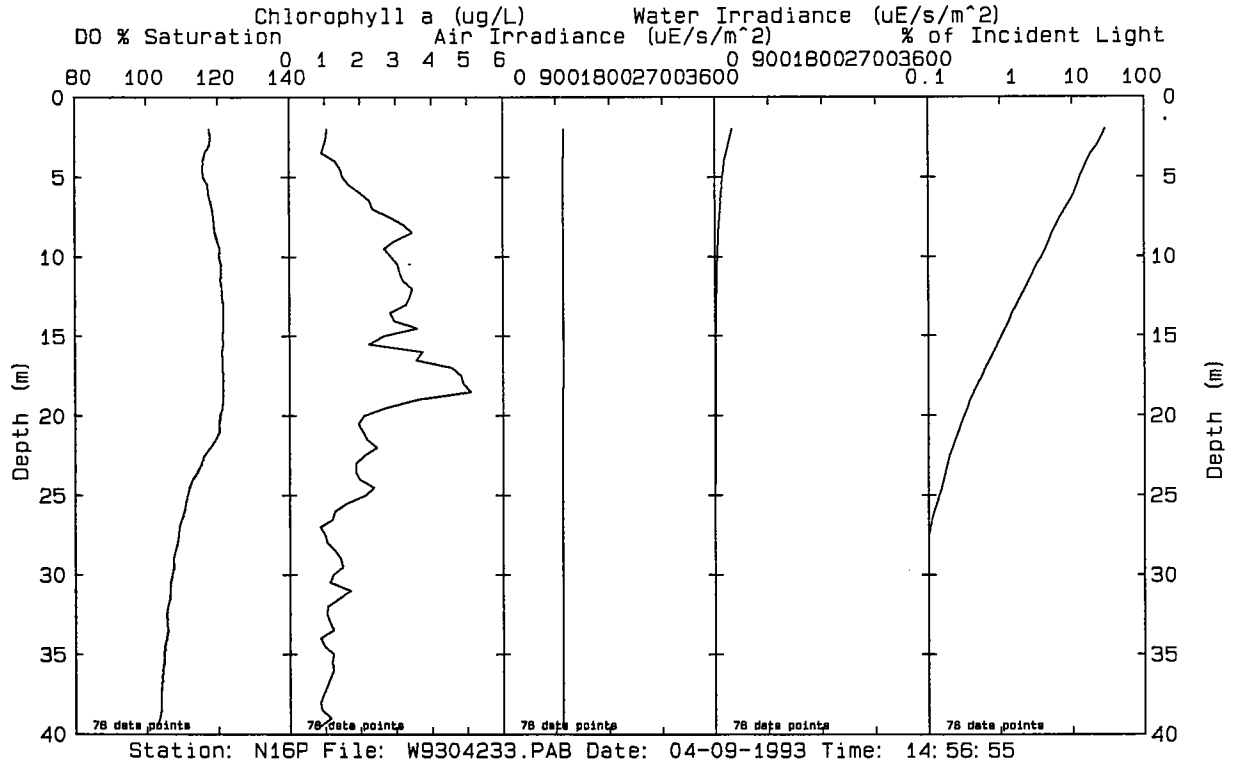


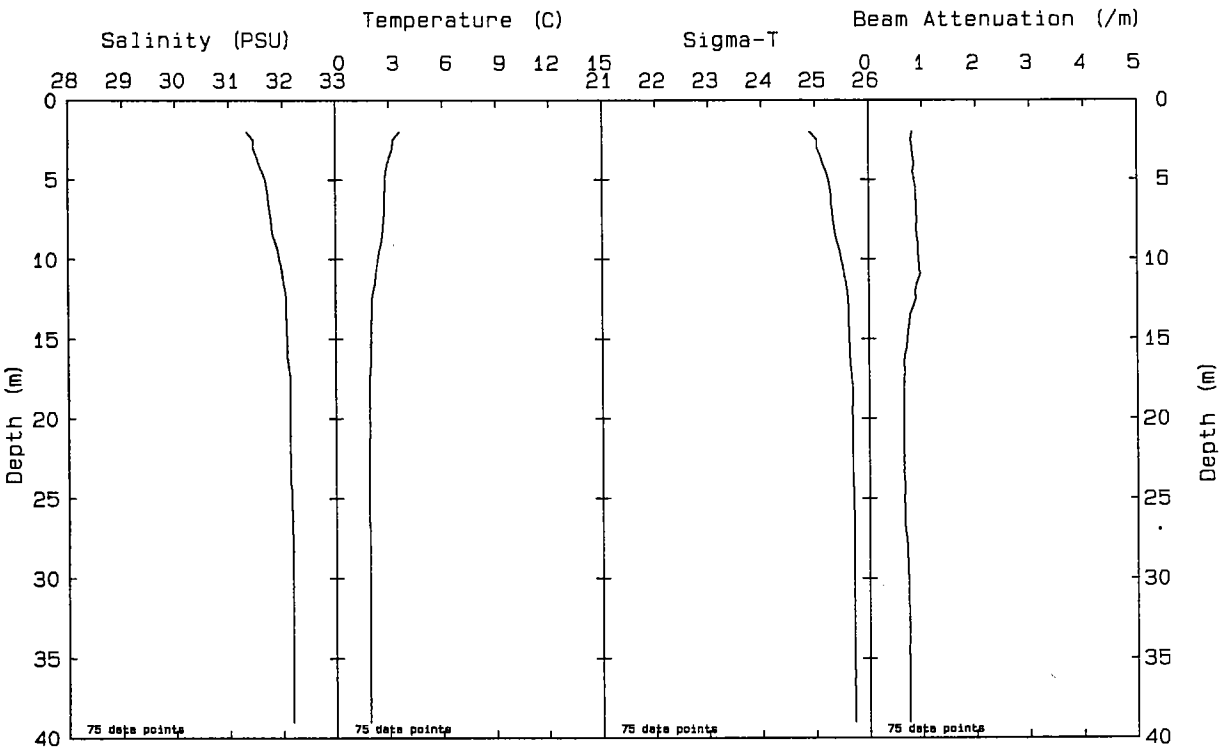
Station: N15 File: W9304229.PAB Date: 04-09-1993 Time: 14:31:42

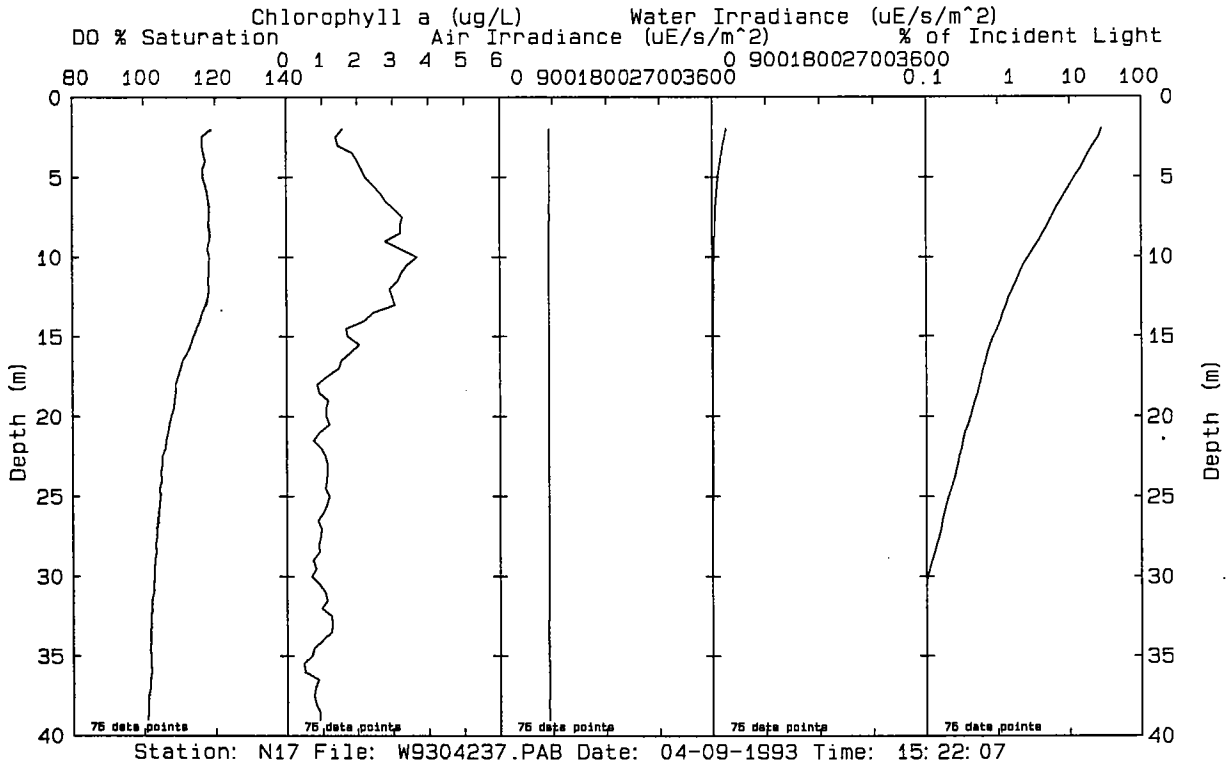

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40 45
79 data points

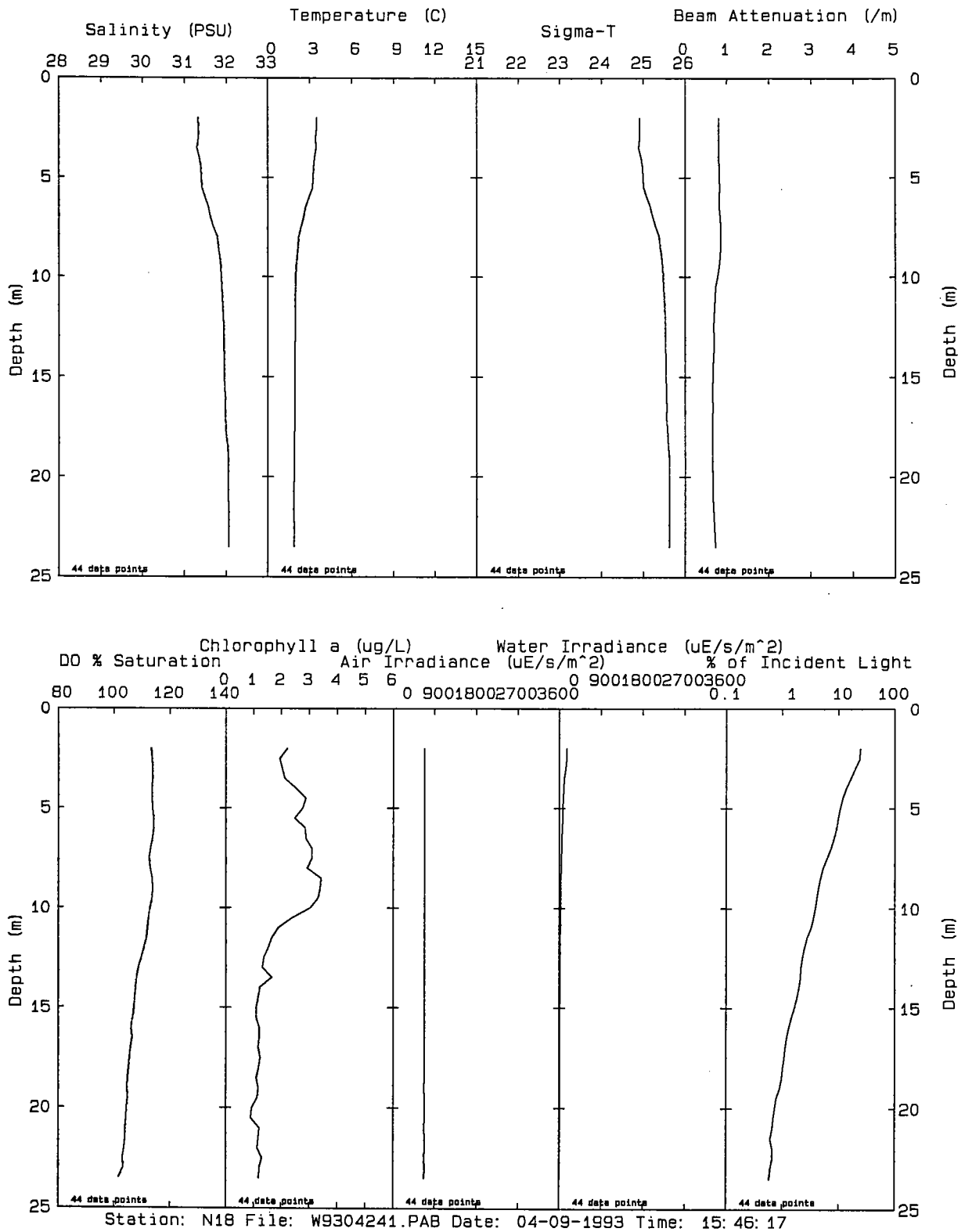

Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Water Irradiance (uE/s/m^2)
0 900180027003600
DO % Saturation
80 100 120 140
Air Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40 45
79 data points
Station: N16P File: W9304021.PAB Date: 04-06-1993 Time: 08:22:46

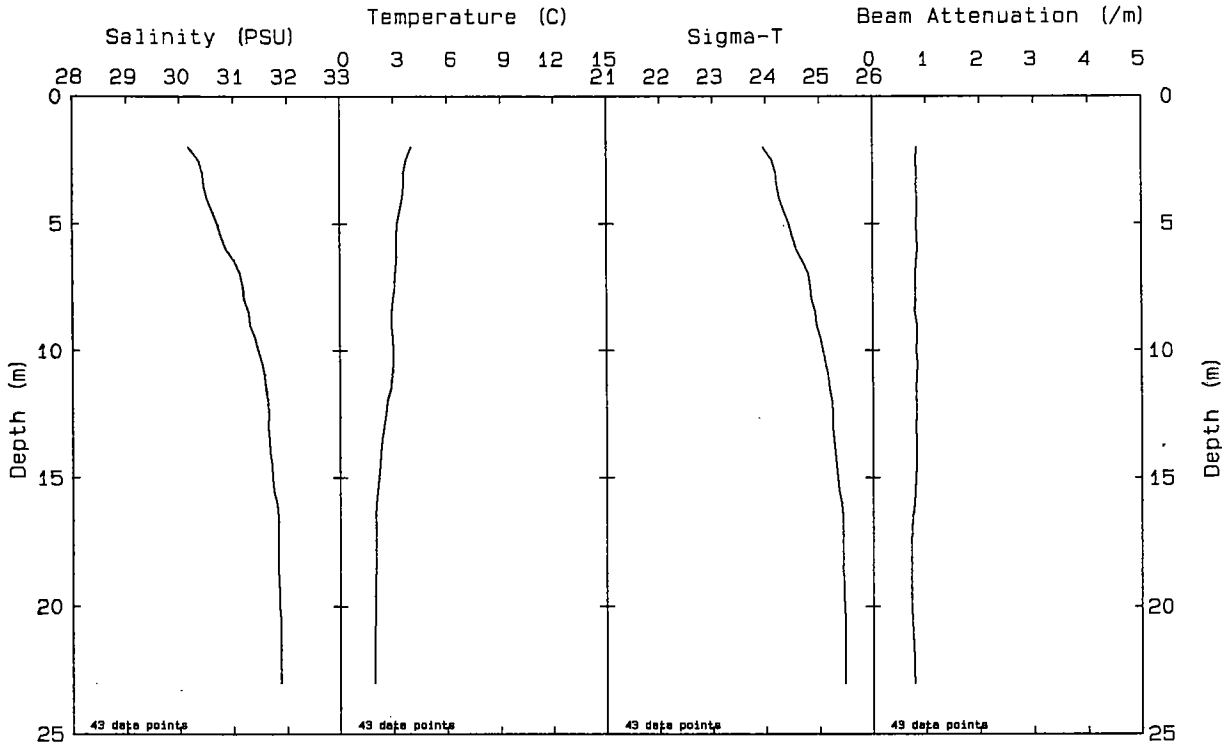

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40
76 data points

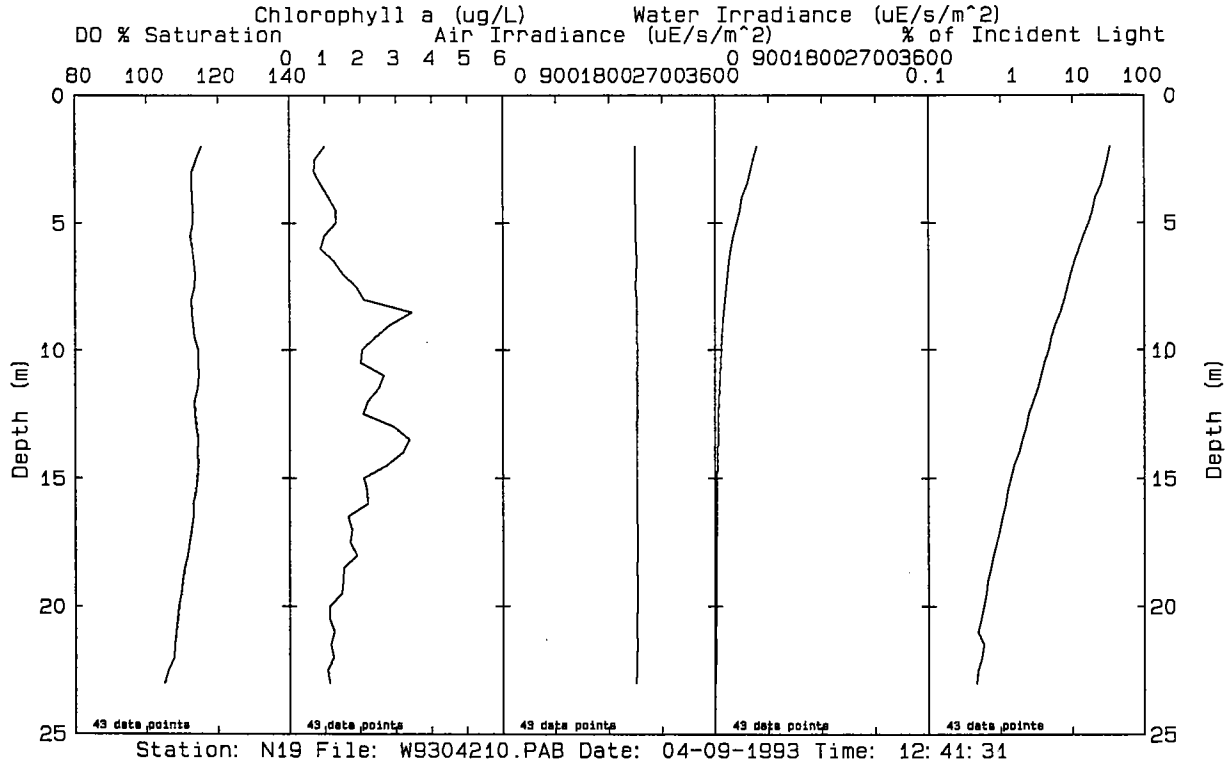

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40
76 data points
Station: N16P File: W9304233.PAB Date: 04-09-1993 Time: 14:56:55


Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40
75 data points

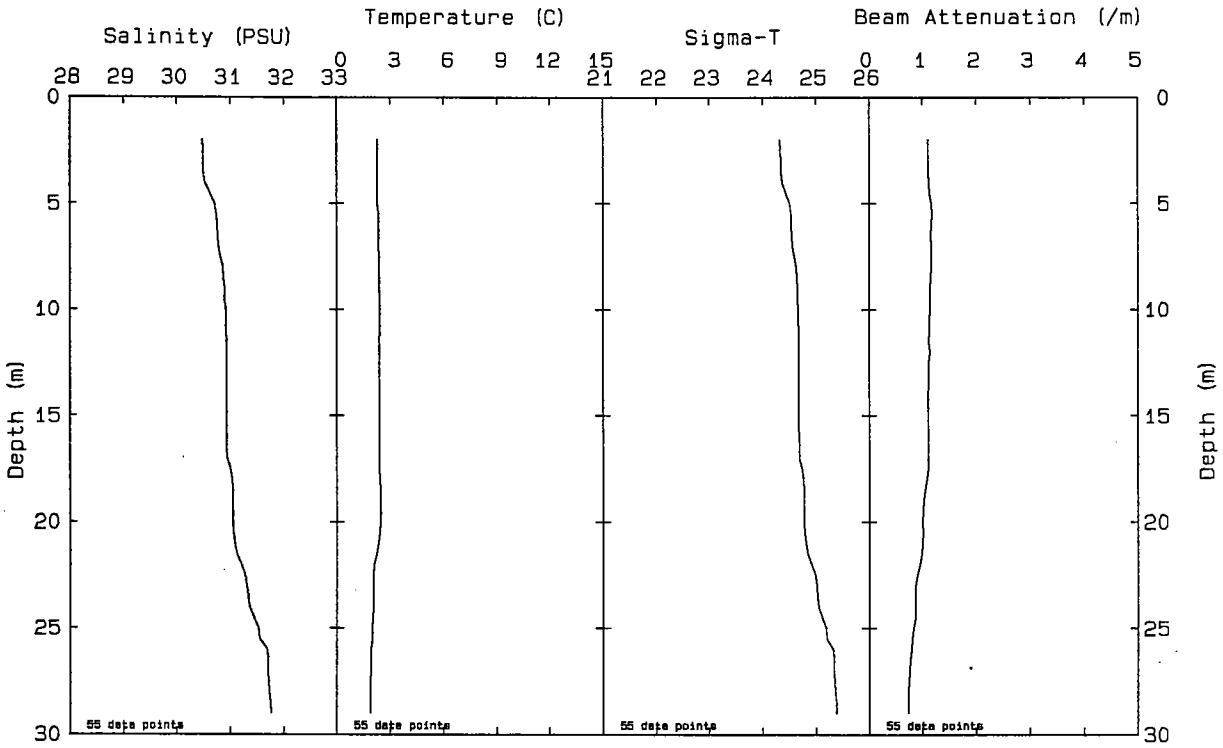

Chlorophyll a (ug/L)
DO % Saturation
80 100 120 140
Air Irradiance (uE/s/m^2)
0 1 2 3 4 5 6
Water Irradiance (uE/s/m^2)
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40
75 data points
Station: N17 File: W9304237.PAB Date: 04-09-1993 Time: 15:22:07

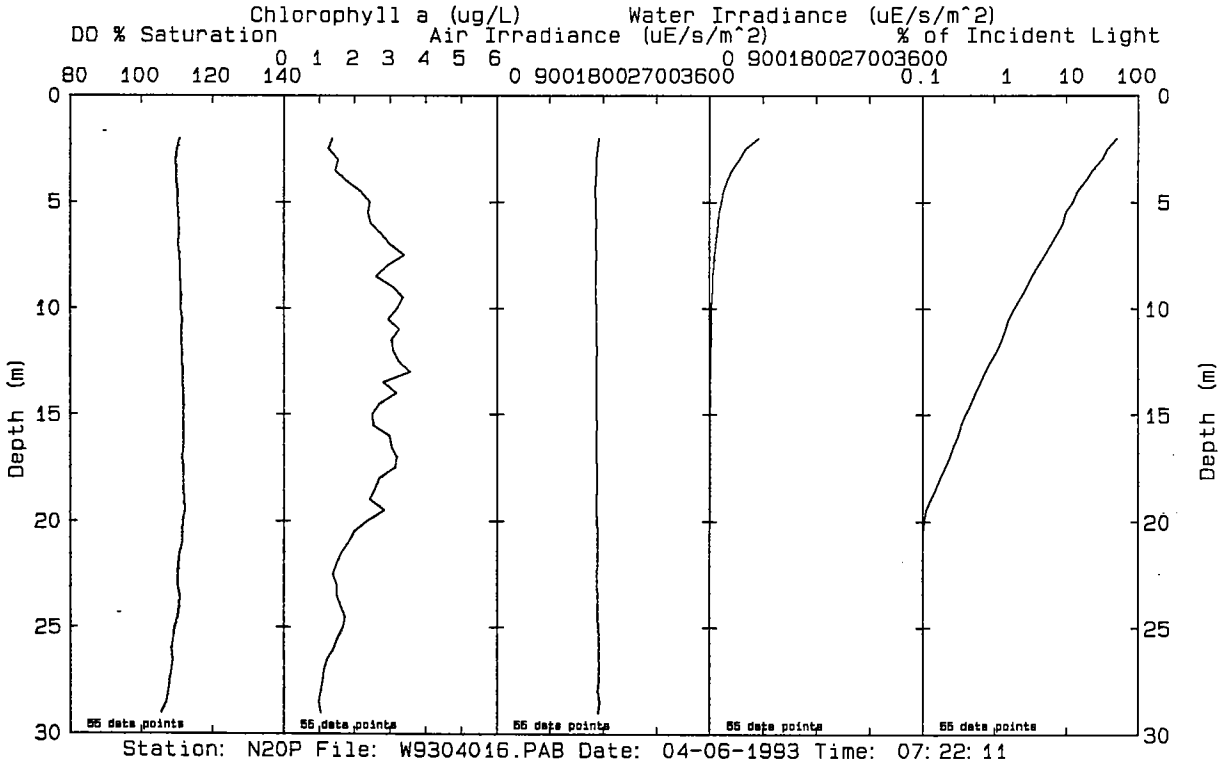

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25
44 data points
DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Station: N18 File: W9304241.PAB Date: 04-09-1993 Time: 15:46:17

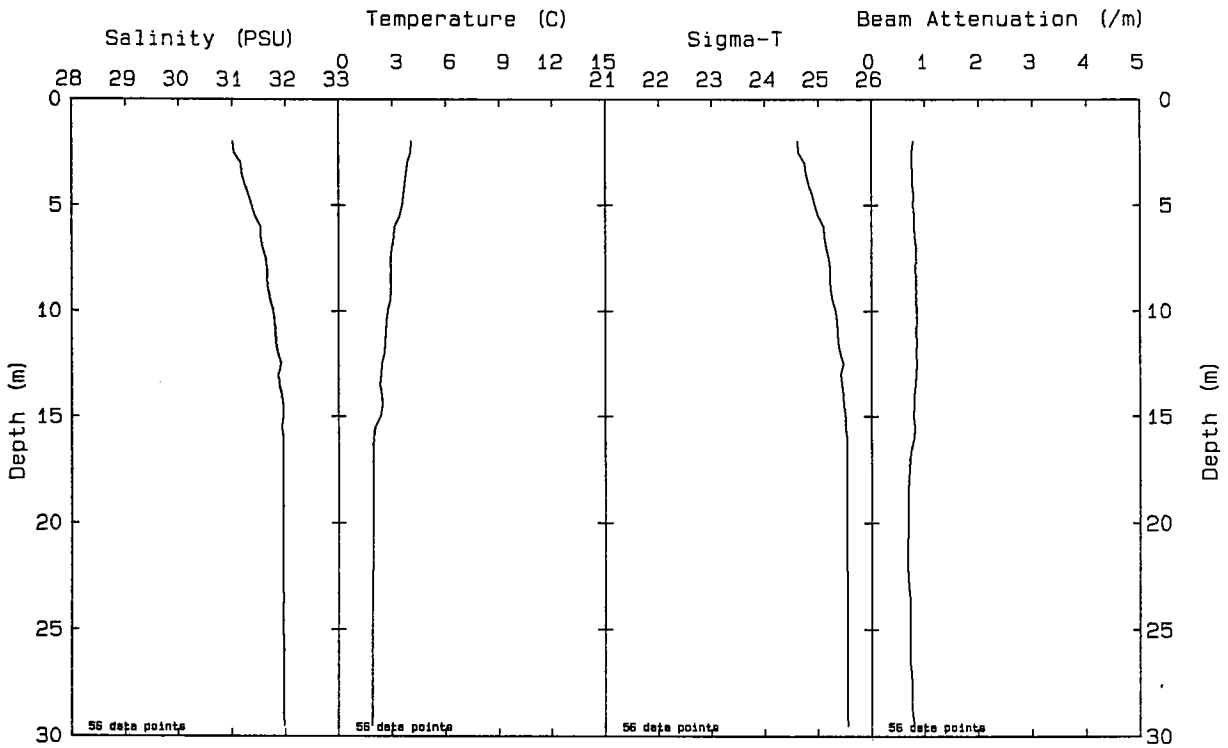


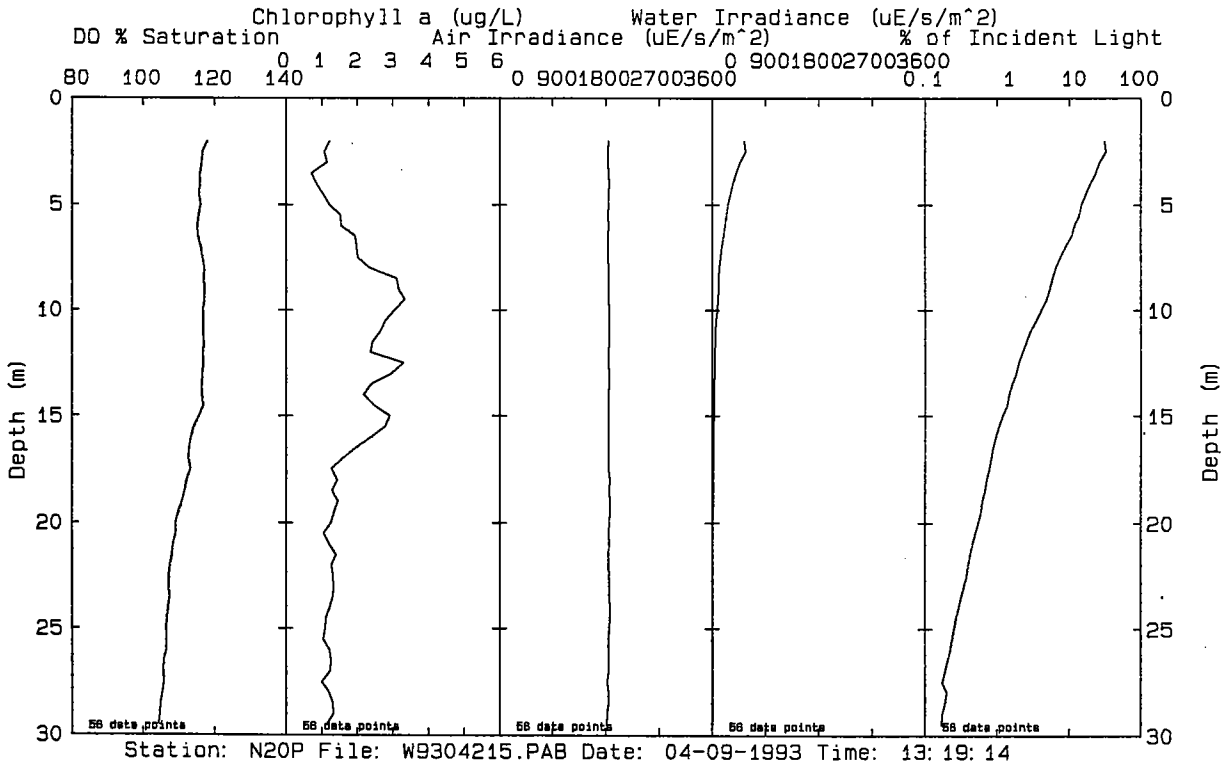


Station: N19 File: W9304210.PAB Date: 04-09-1993 Time: 12:41:31

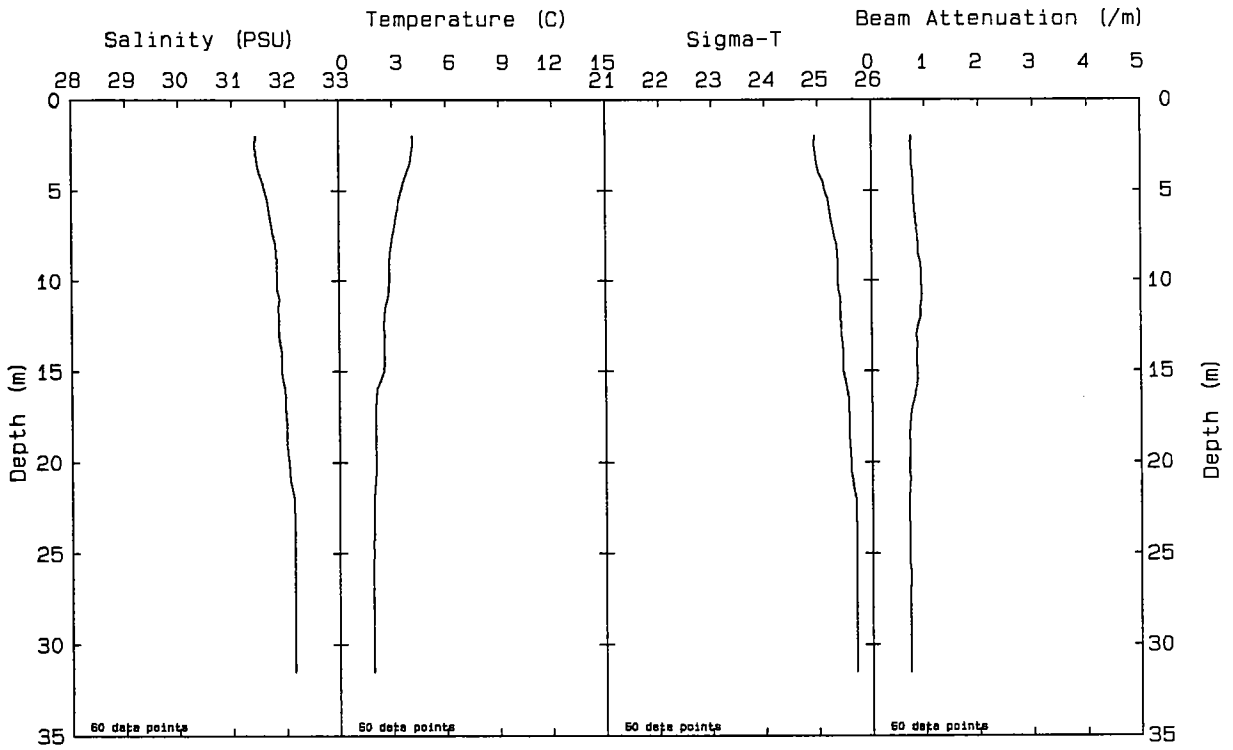

Salinity (PSU)
28 29 30 31 32
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30
55 data points

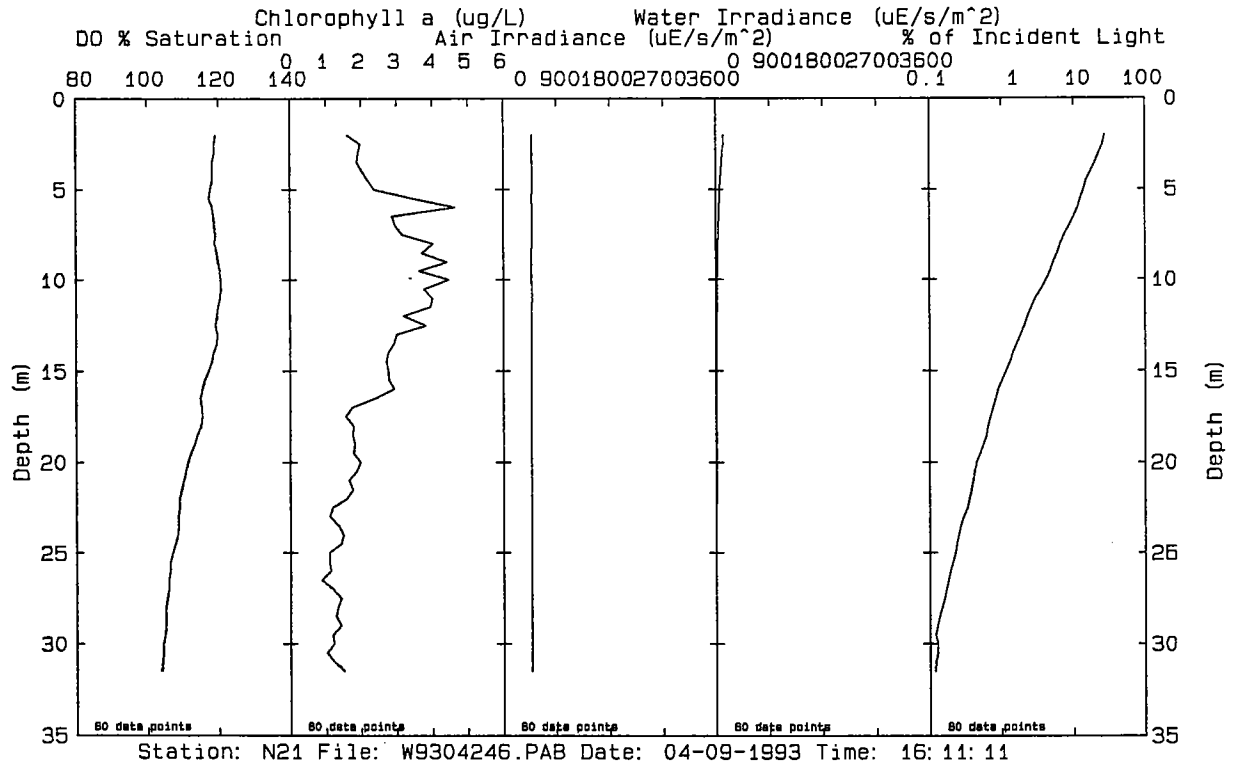

Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Water Irradiance (uE/s/m^2)
0 900180027003600
DO % Saturation
80 100 120 140
Air Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30
55 data points
Station: N20P File: W9304016.PAB Date: 04-06-1993 Time: 07:22:11





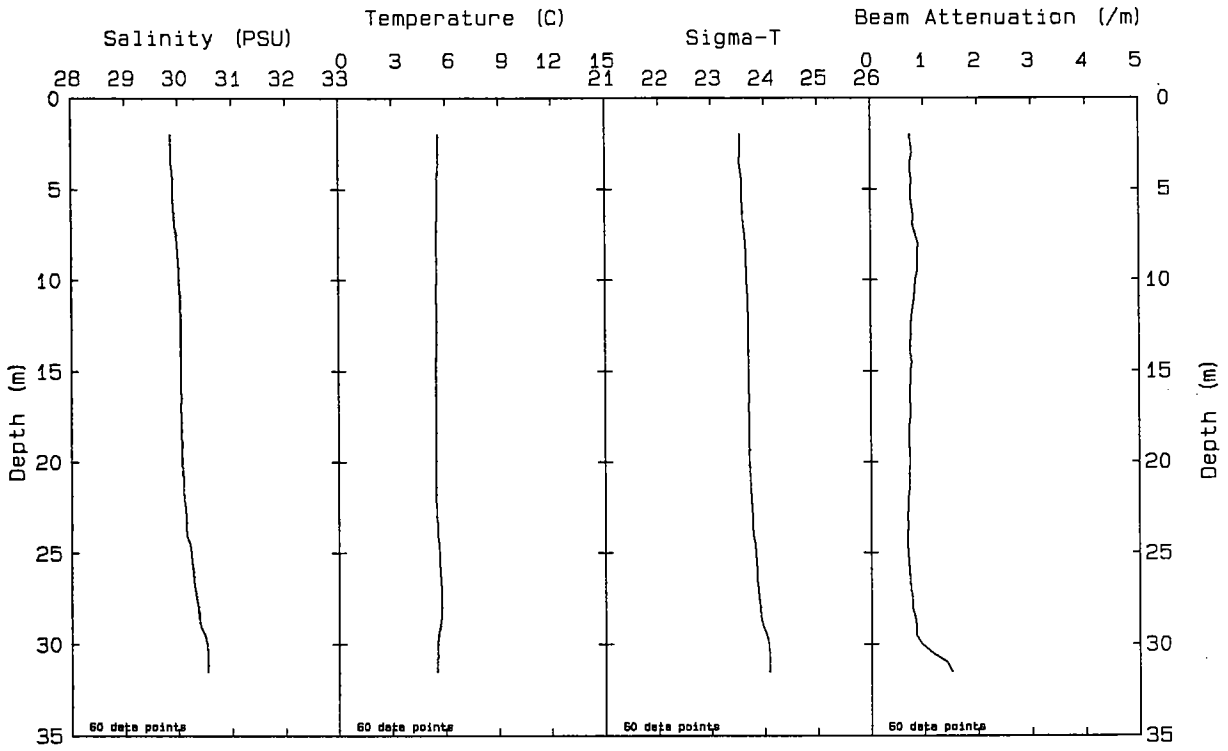
Station: N20P File: W9304215.PAB Date: 04-09-1993 Time: 13:19:14

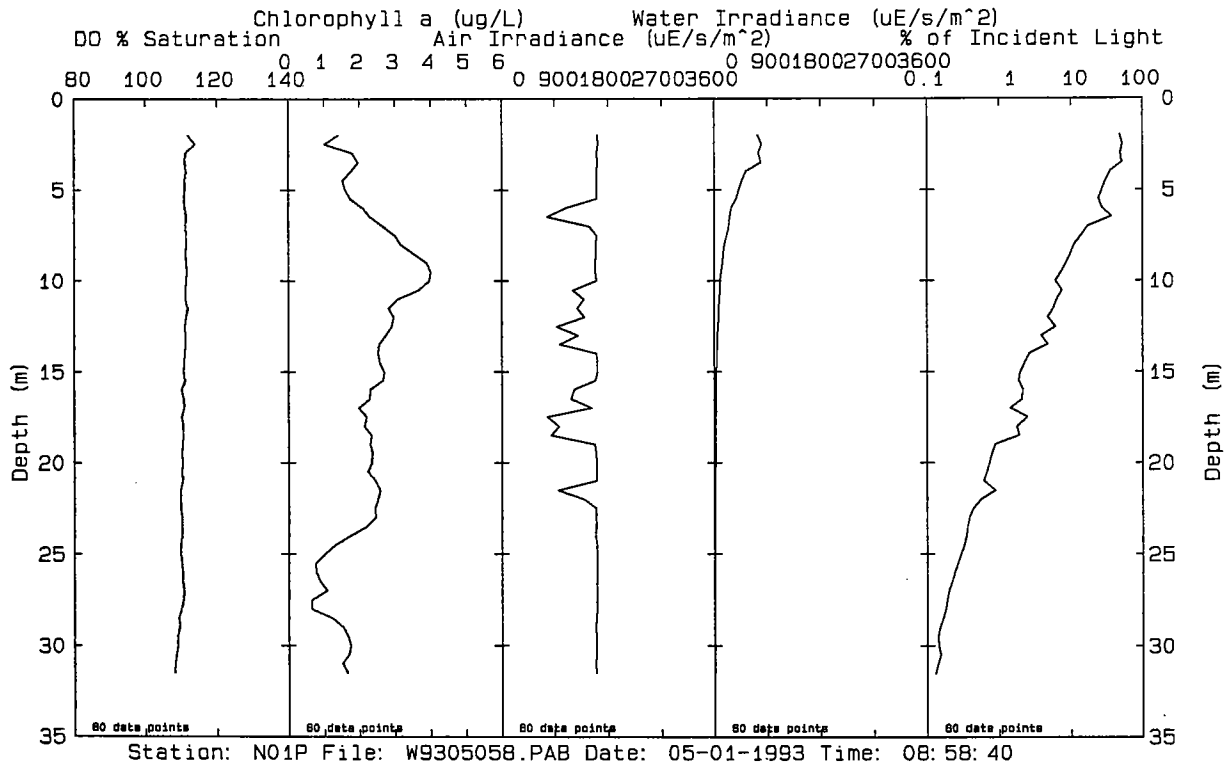




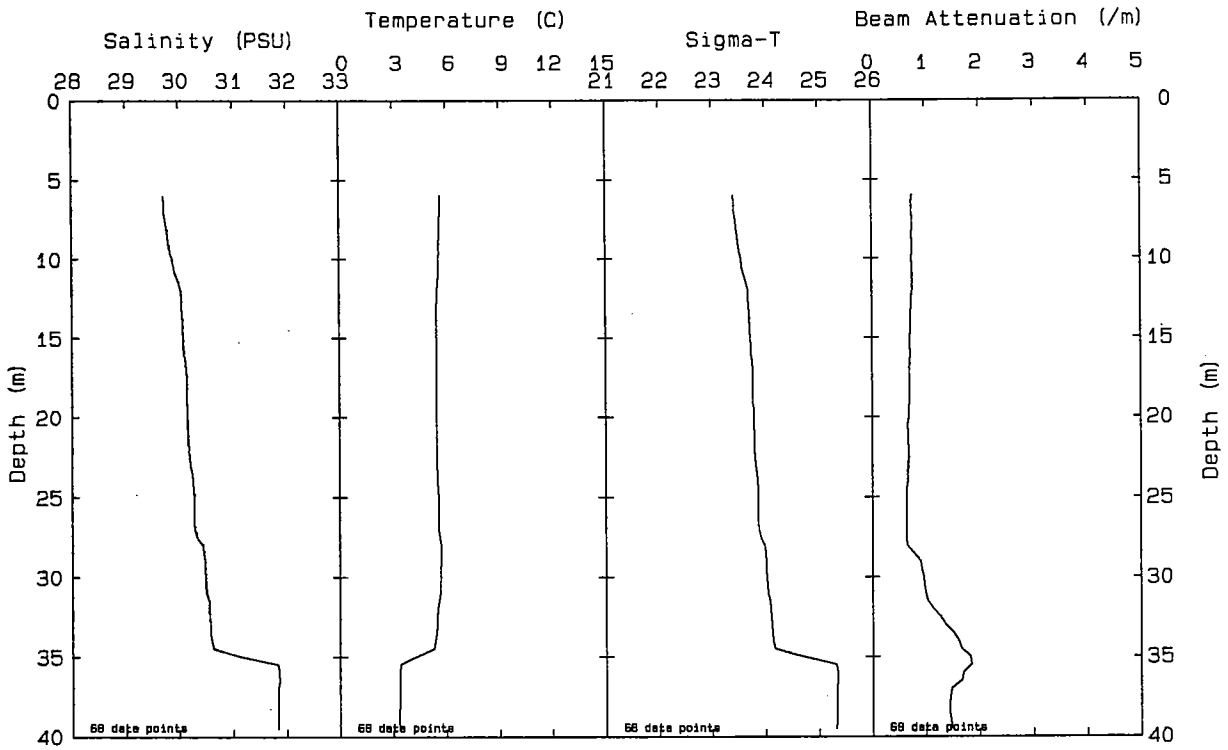
Station: N21 File: W9304246.PAB Date: 04-09-1993 Time: 16:11:11

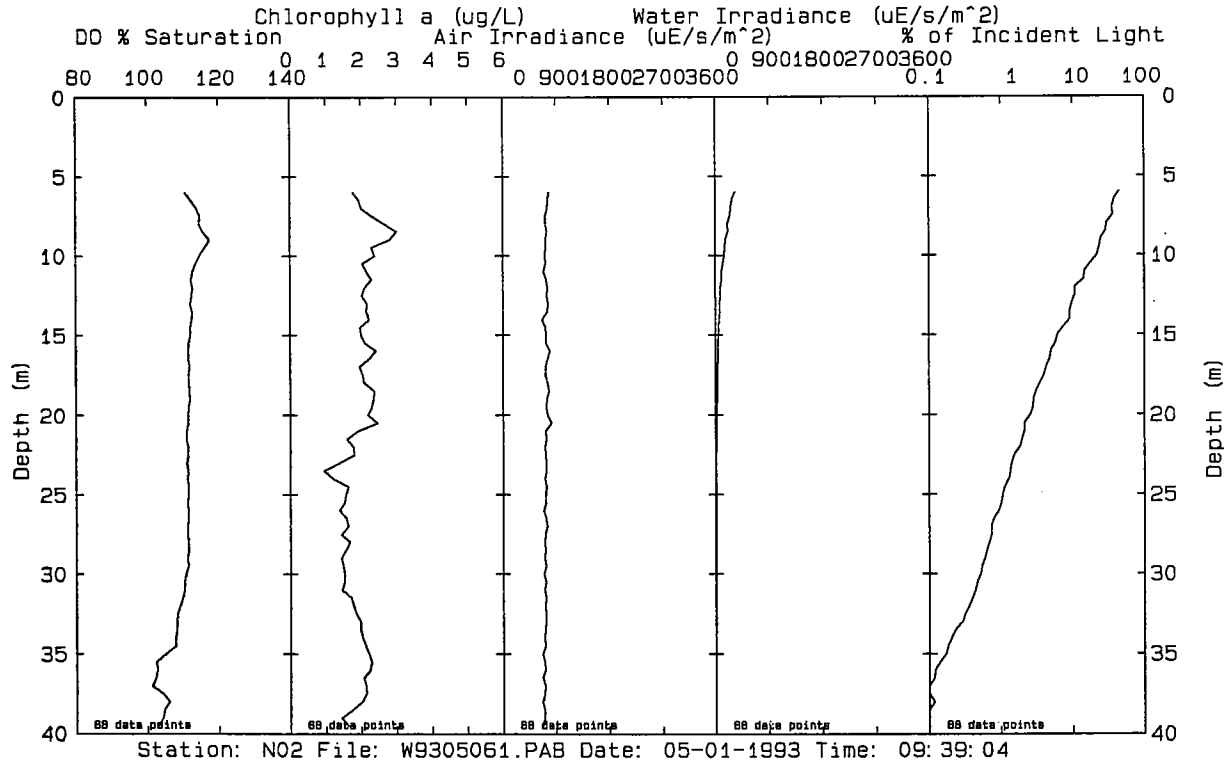
Early May 1993 Profiles

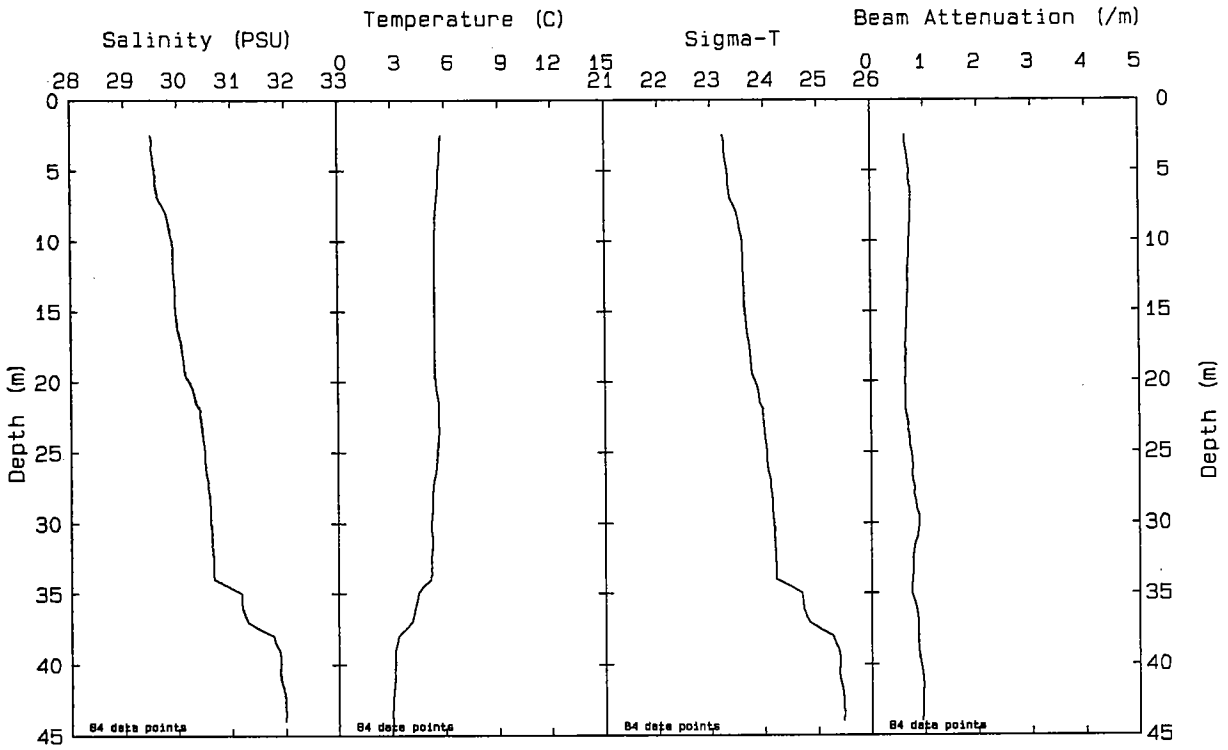


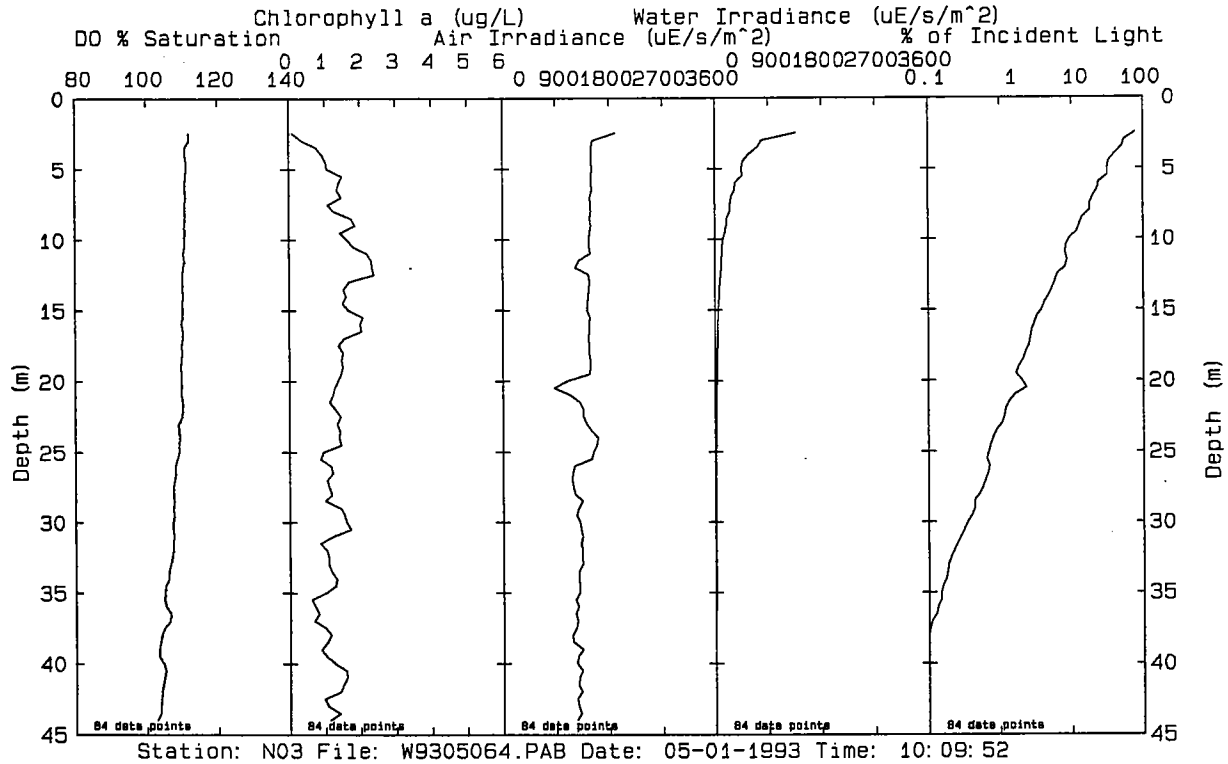


Station: N01P File: W9305058.PAB Date: 05-01-1993 Time: 08:58:40

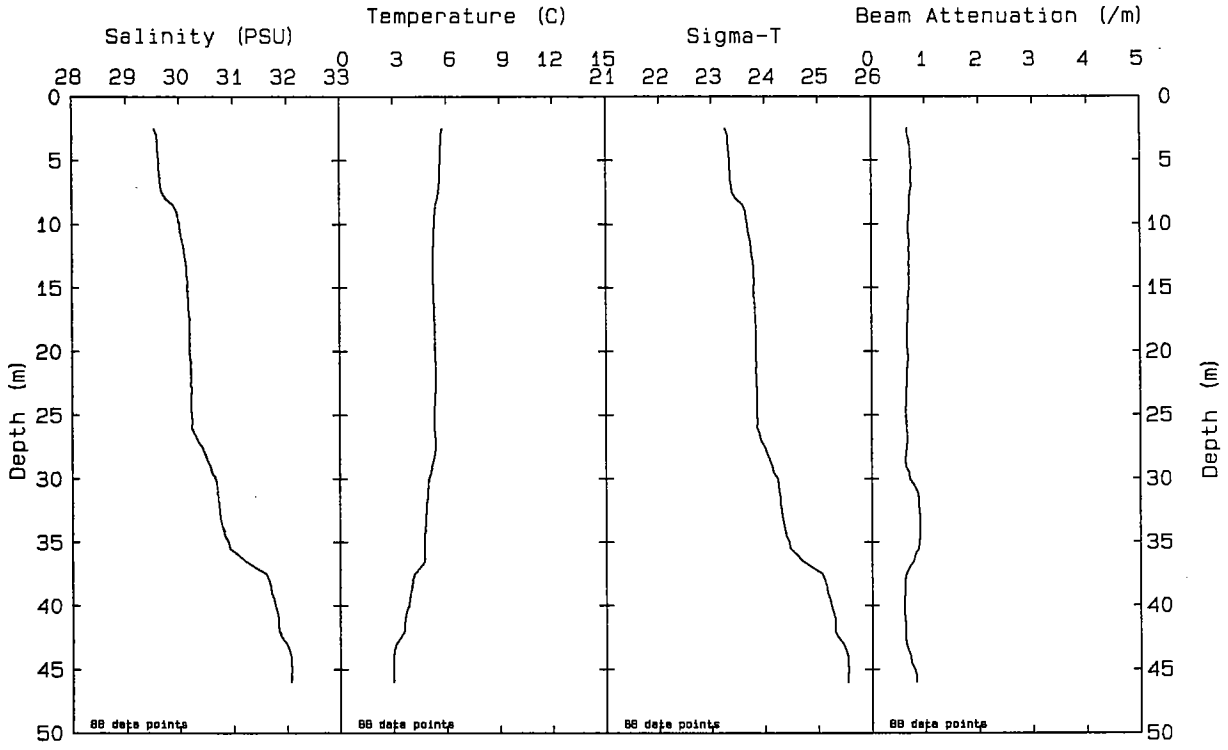

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40
68 data points

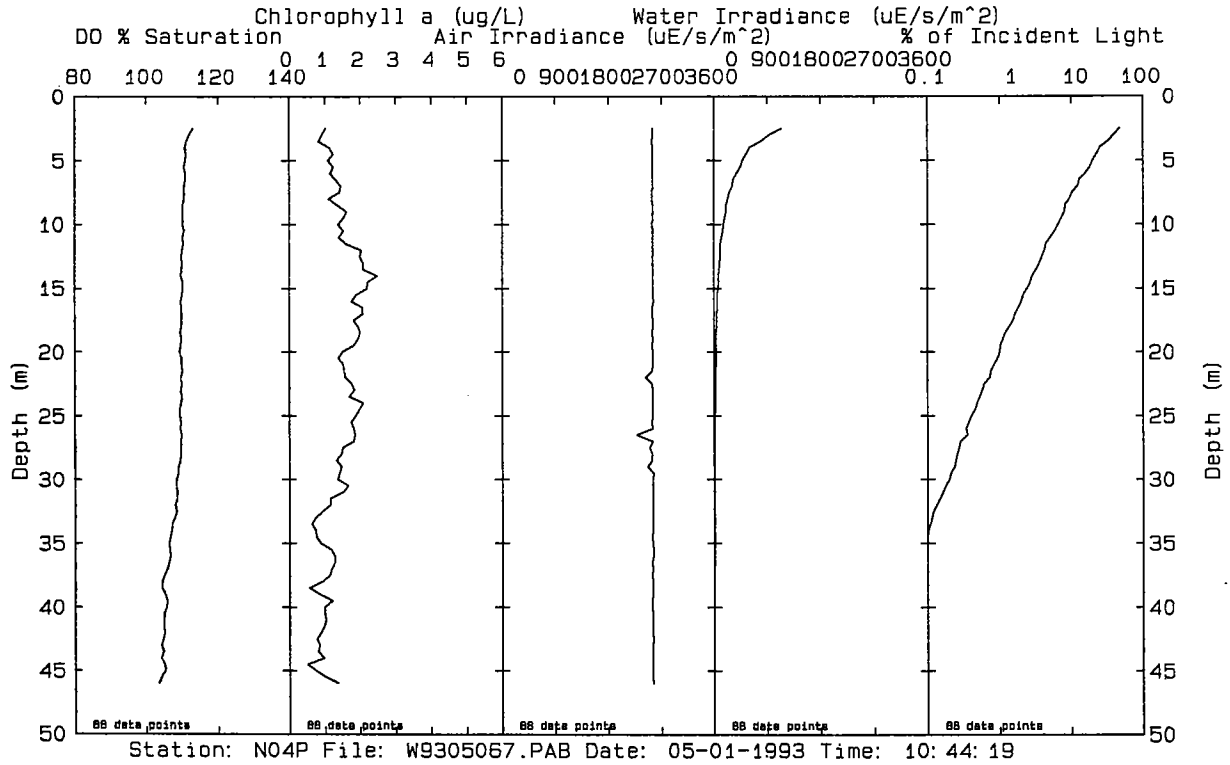

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40
68 data points
Station: N02 File: W9305061.PAB Date: 05-01-1993 Time: 09:39:04



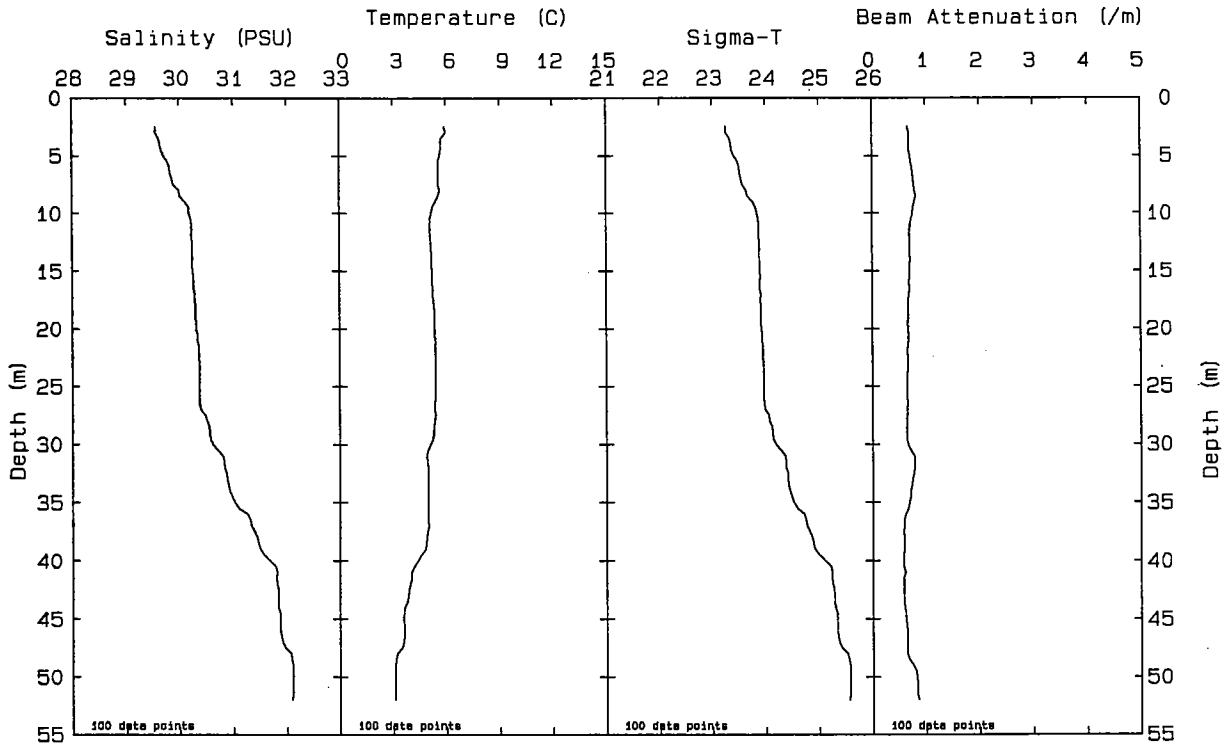


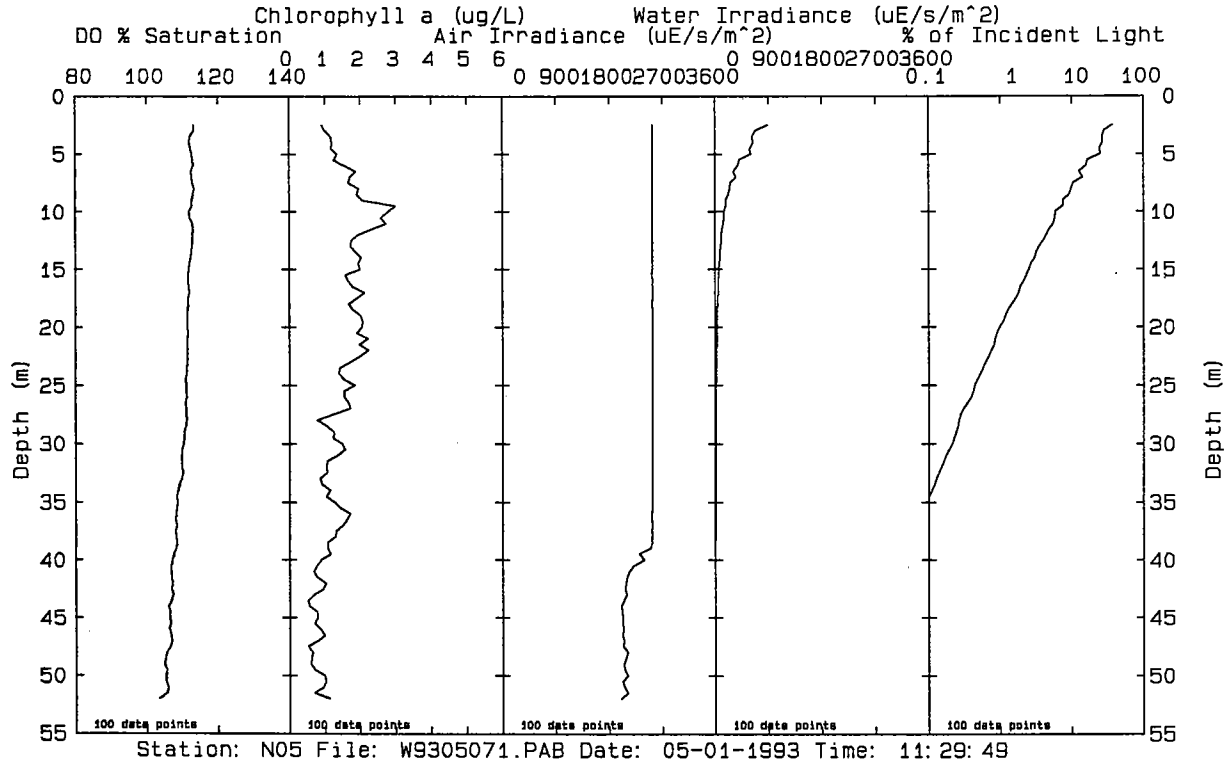
Station: N03 File: W9305064.PAB Date: 05-01-1993 Time: 10:09:52

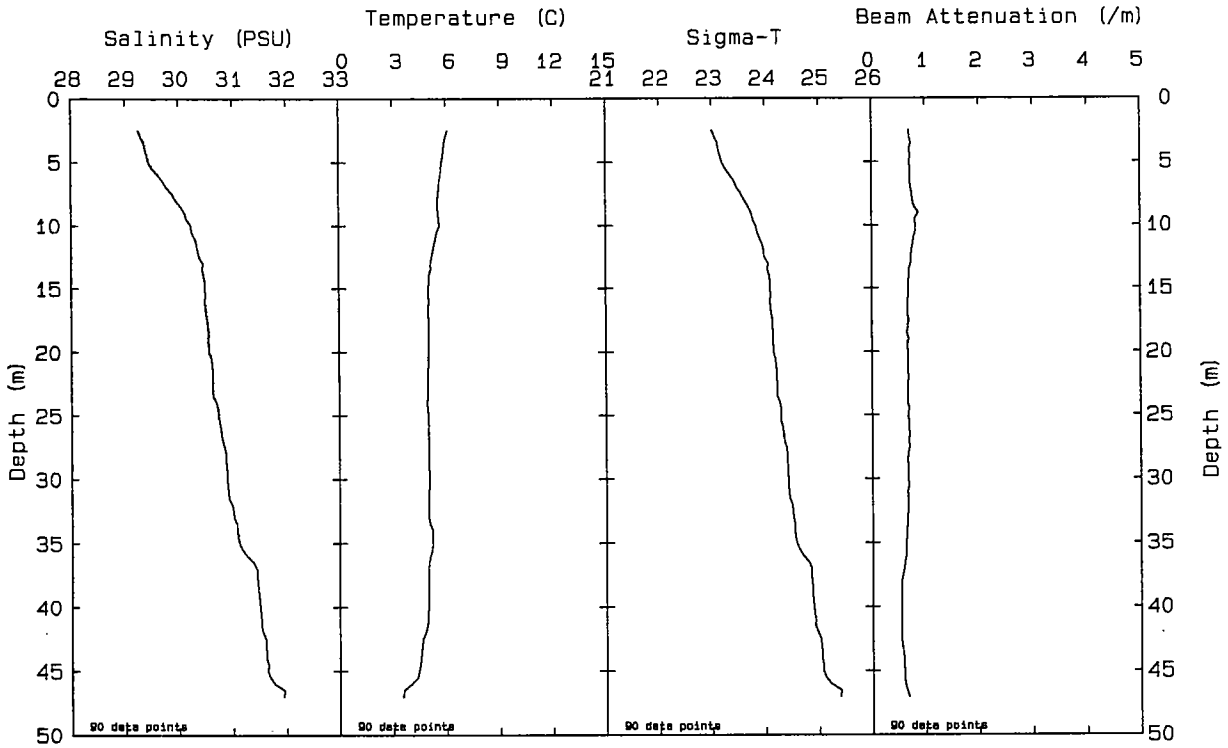


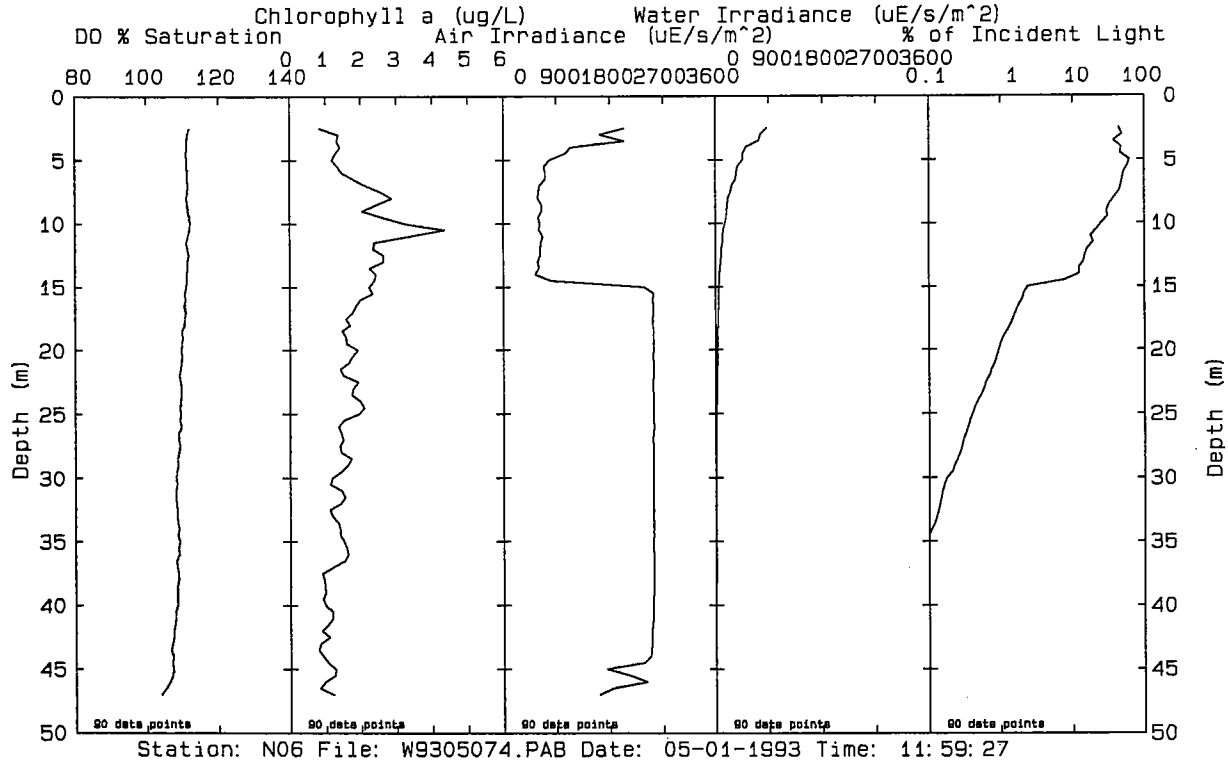


Station: N04P File: W9305067.PAB Date: 05-01-1993 Time: 10:44:19

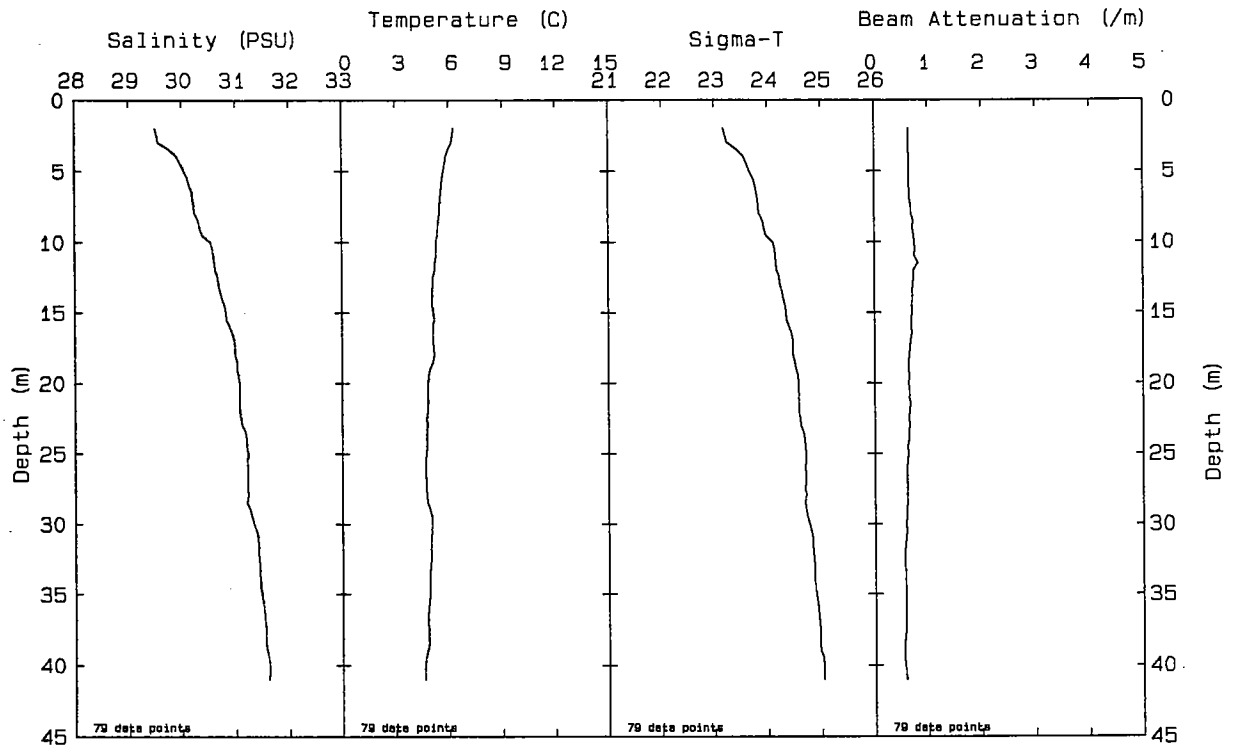

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40 45 50 55
100 data points

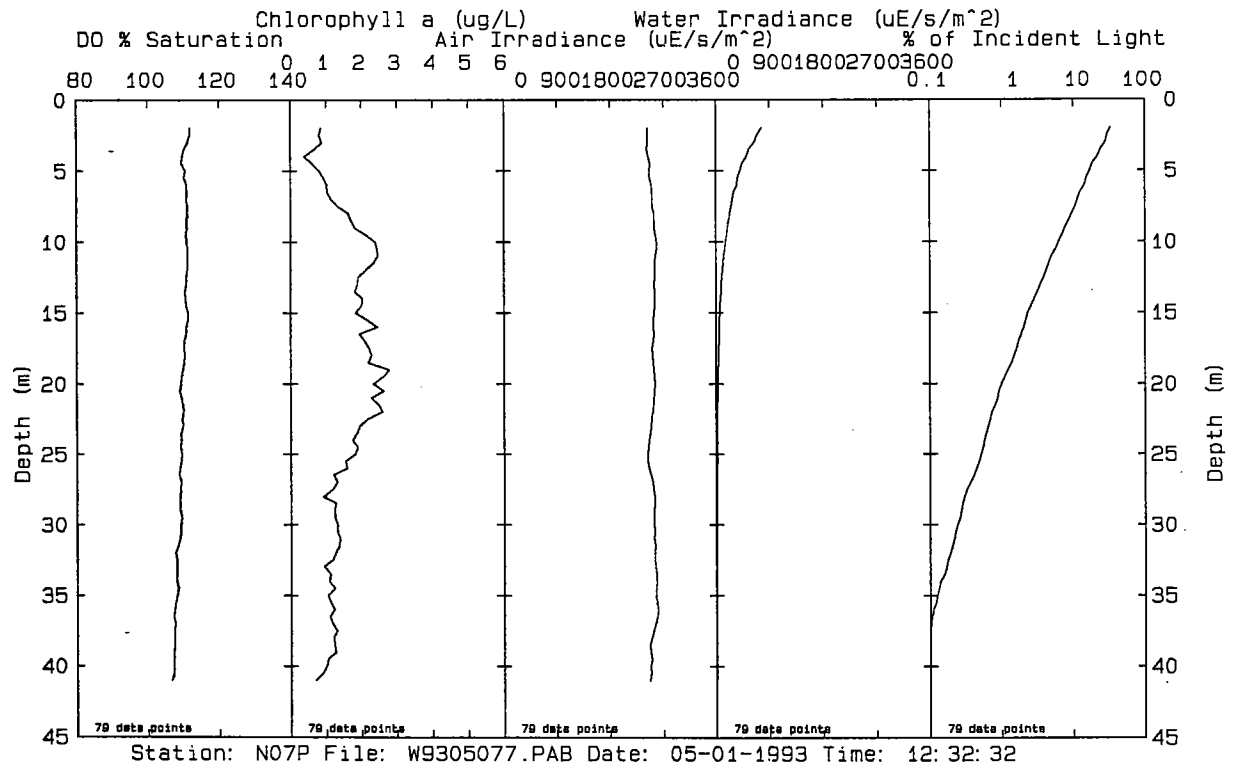

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40 45 50 55
100 data points
Station: N05 File: W9305071.PAB Date: 05-01-1993 Time: 11:29:49



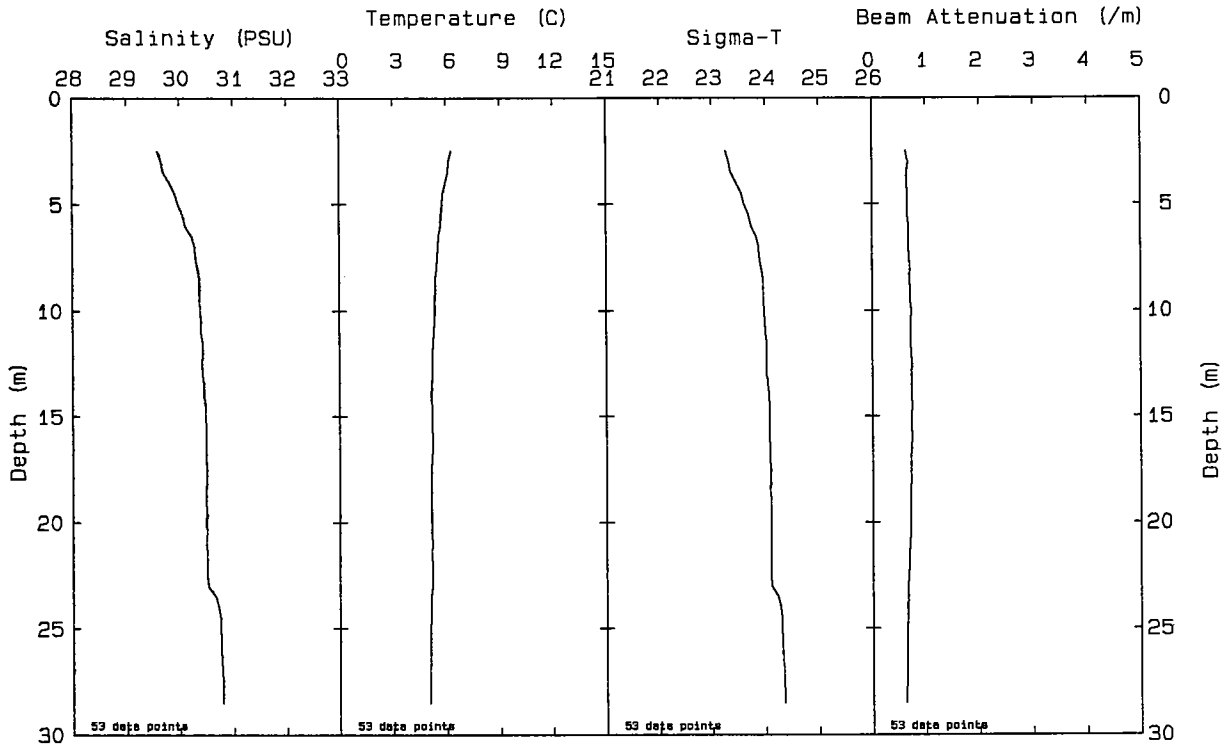


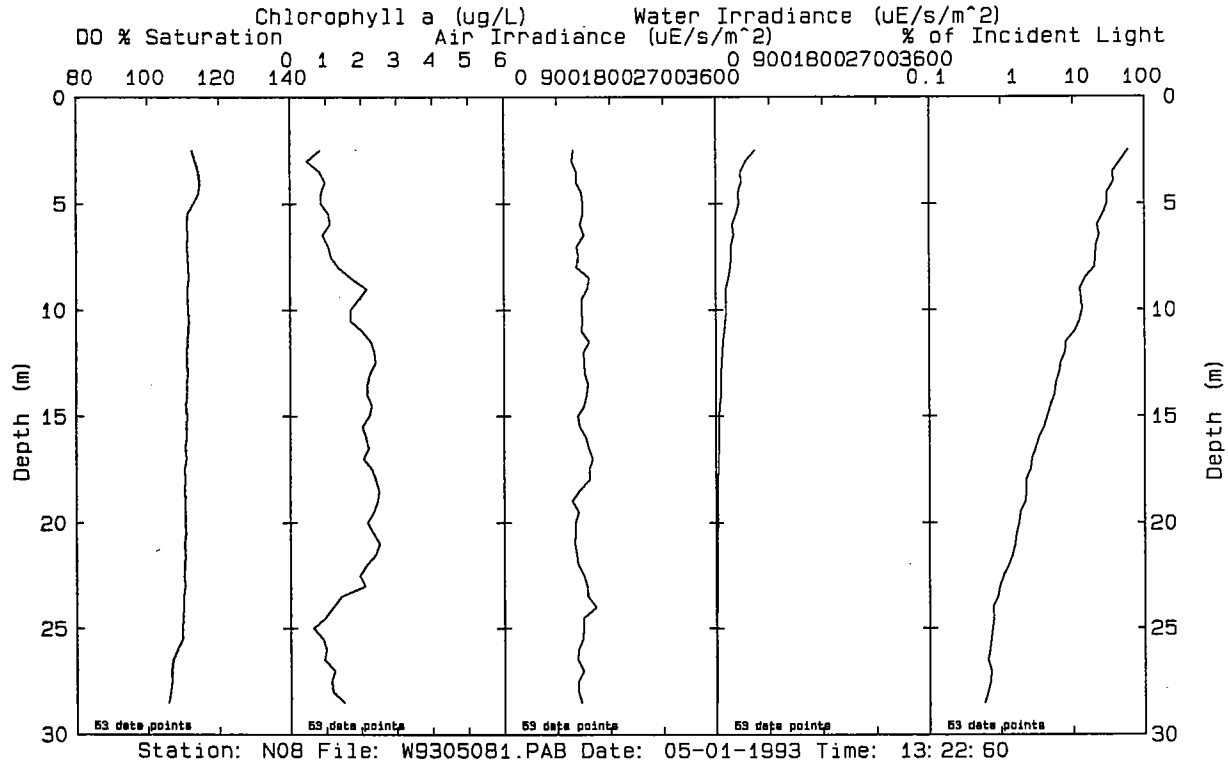
Station: N06 File: W9305074.PAB Date: 05-01-1993 Time: 11:59:27





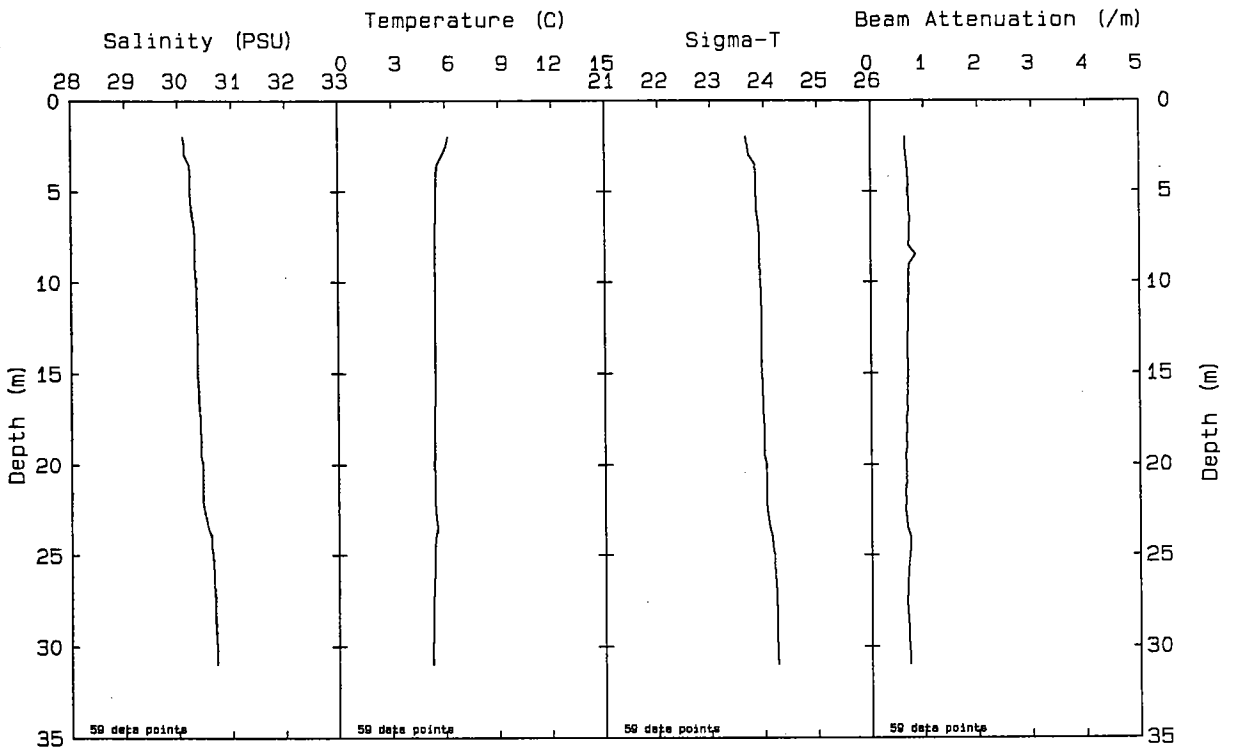
Station: N07P File: W9305077.PAB Date: 05-01-1993 Time: 12:32:32

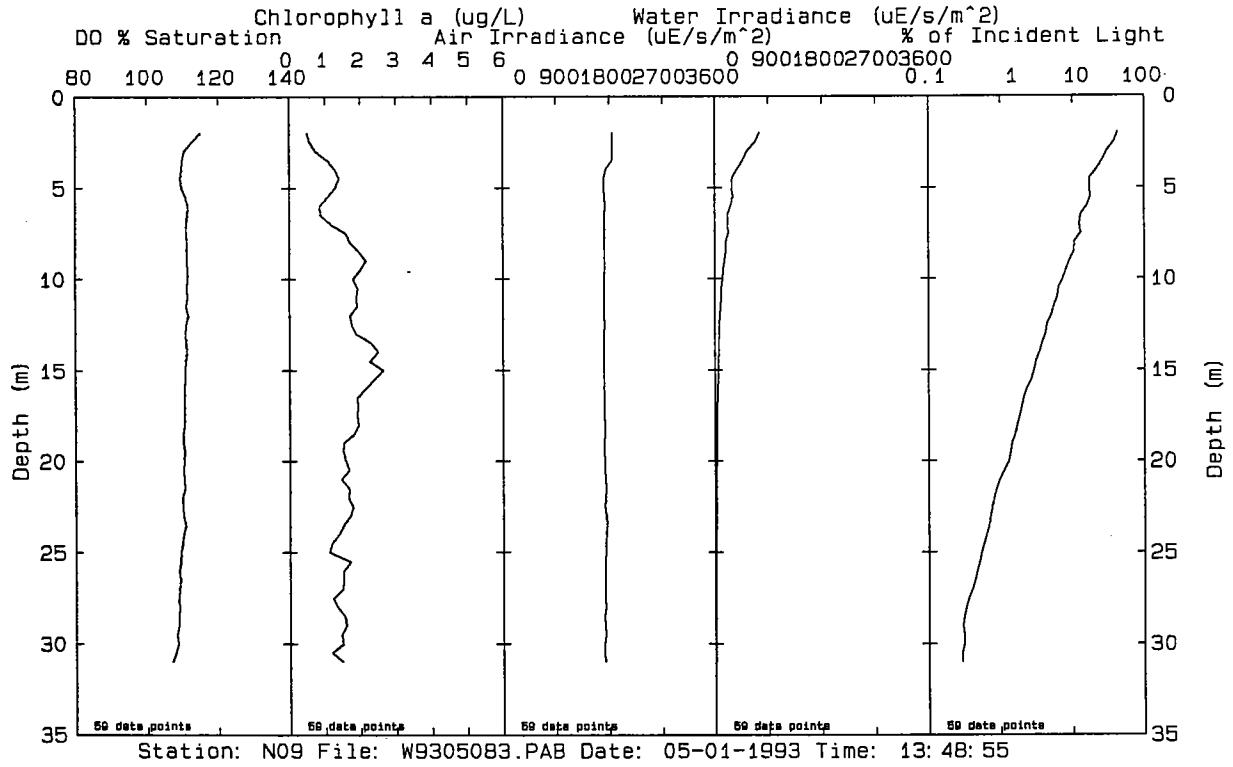




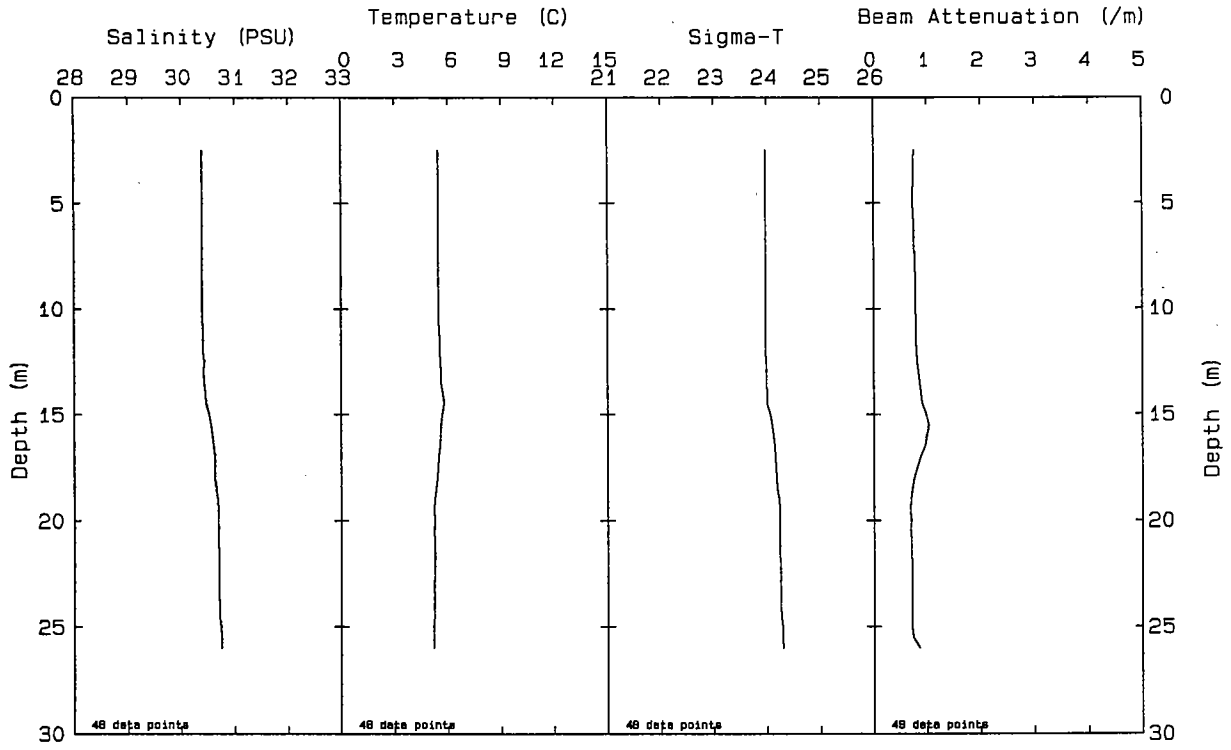
Station: N08 File: W9305081.PAB Date: 05-01-1993 Time: 13:22:60

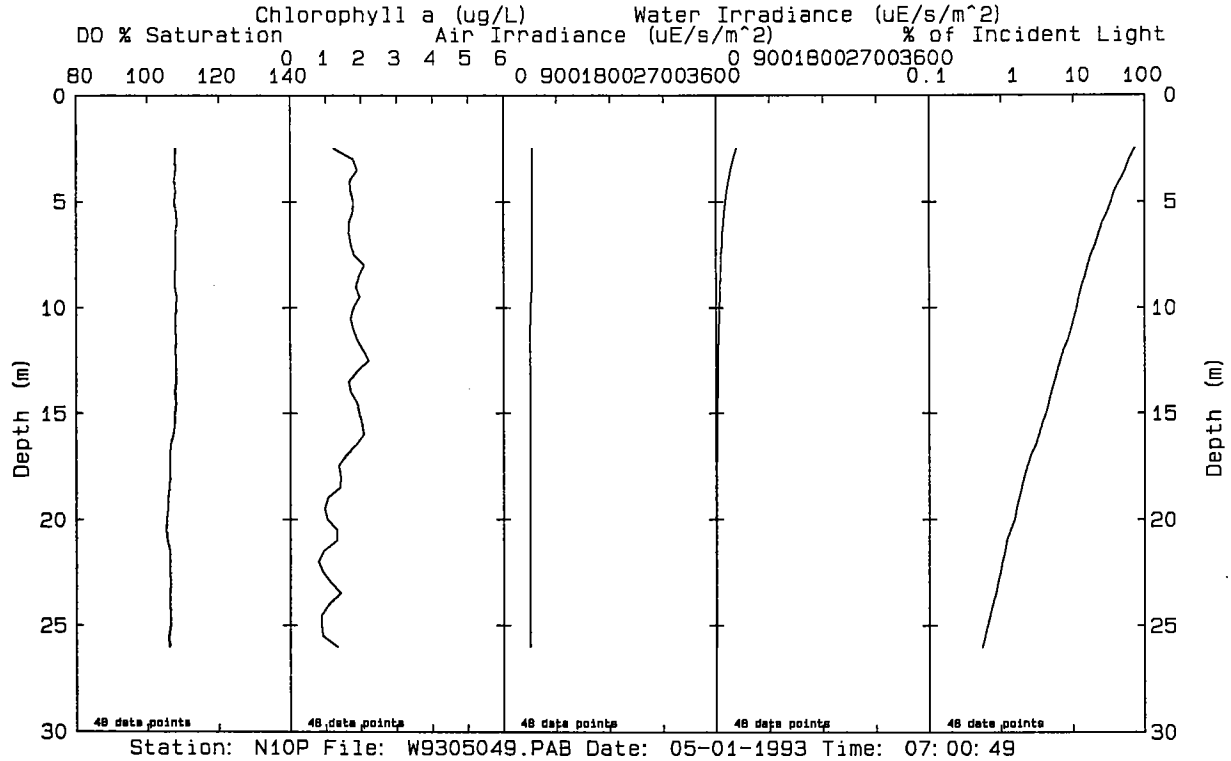
000082



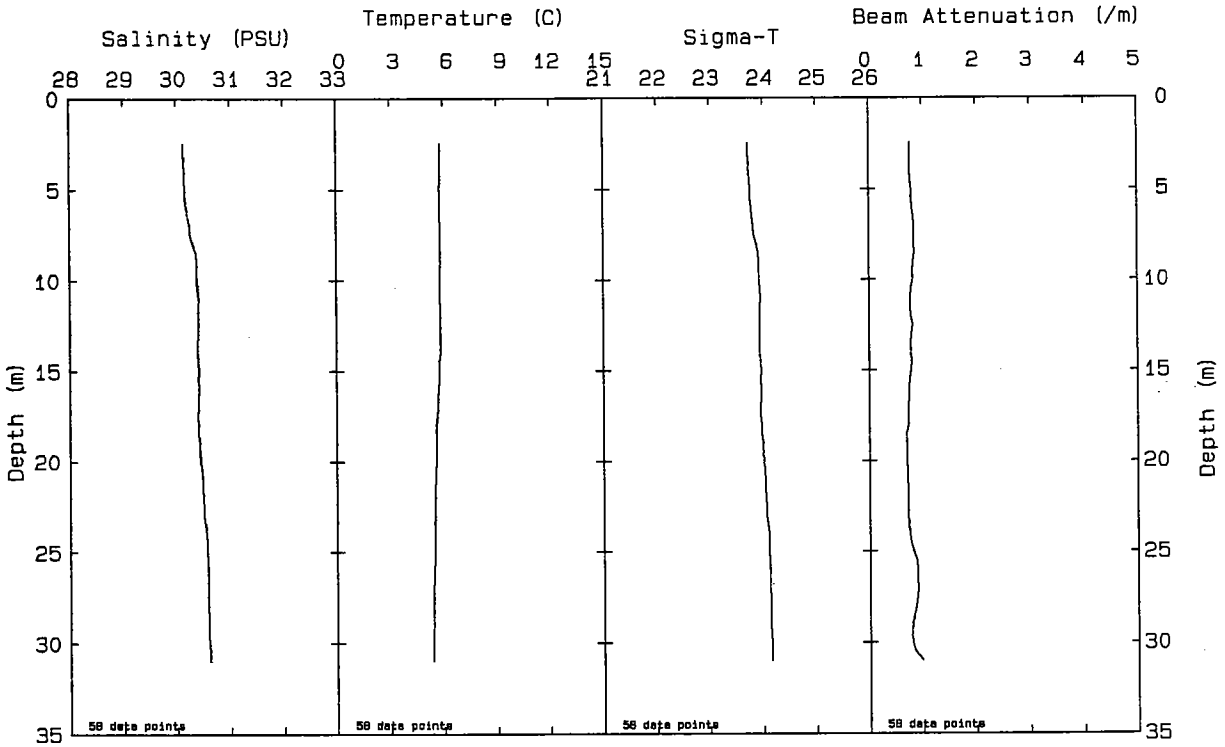


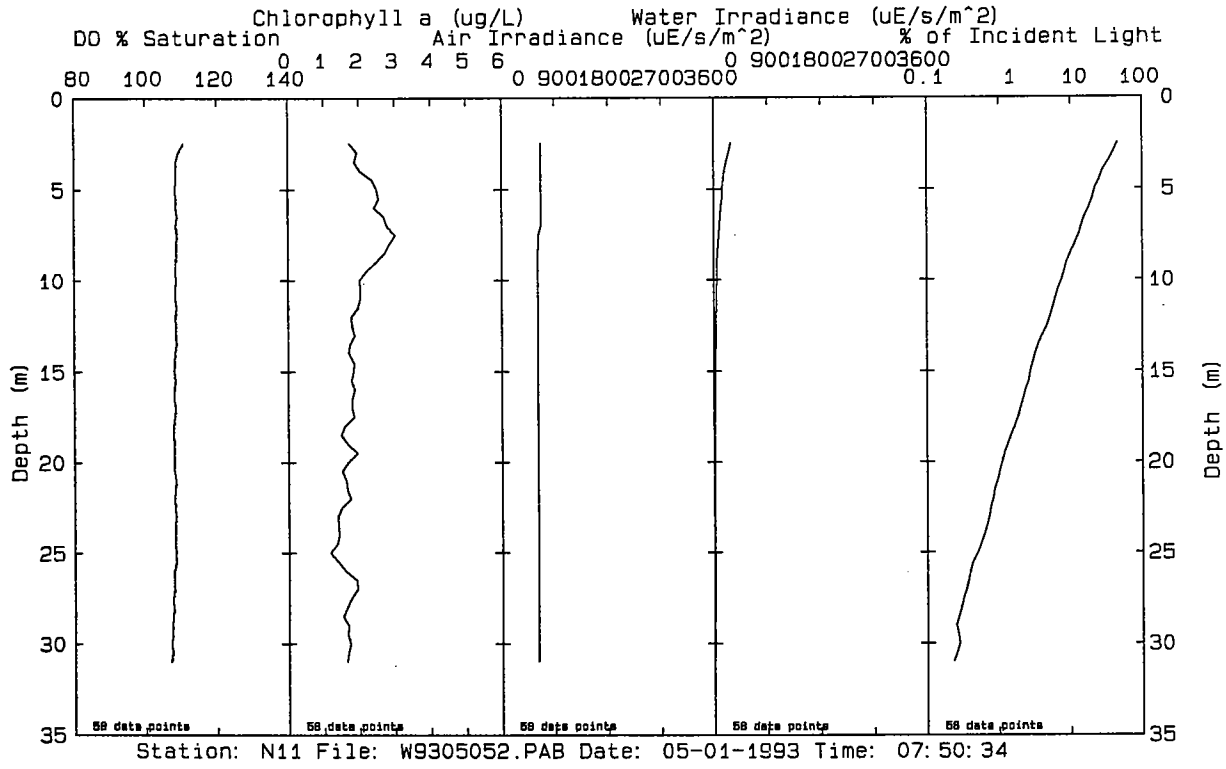
Station: N09 File: W9305083.PAB Date: 05-01-1993 Time: 13:48:55



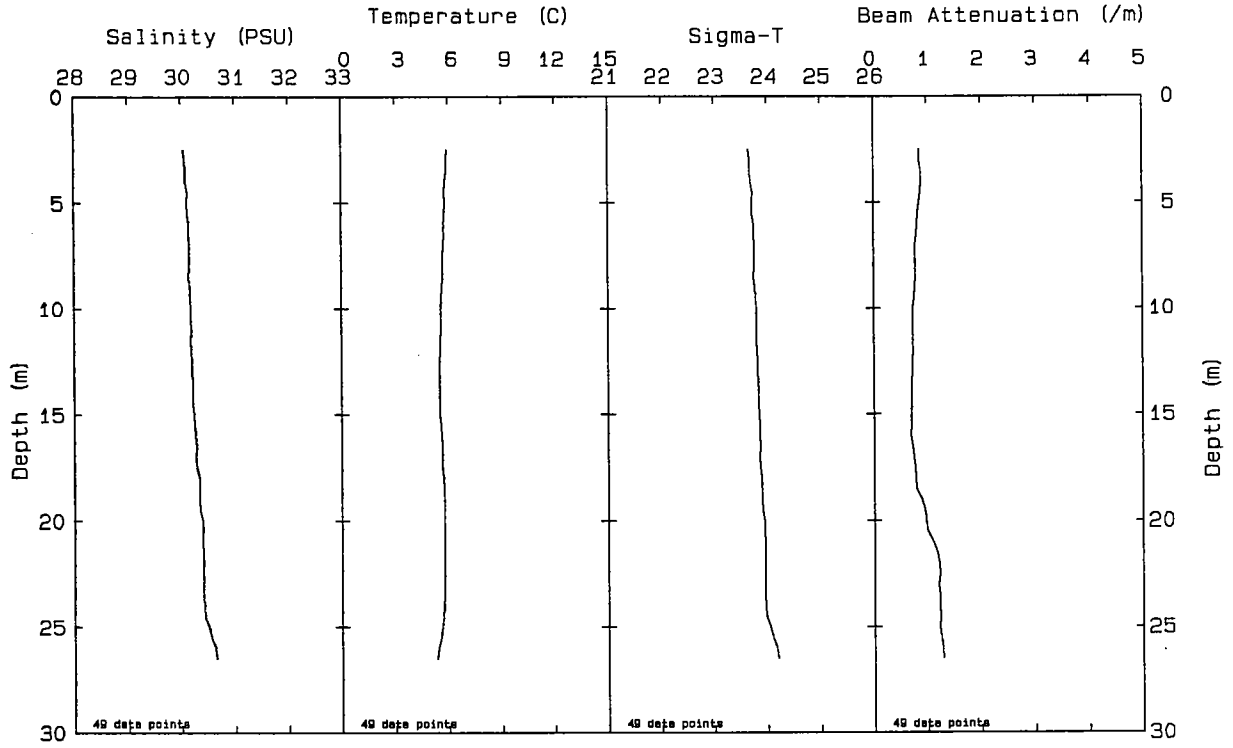


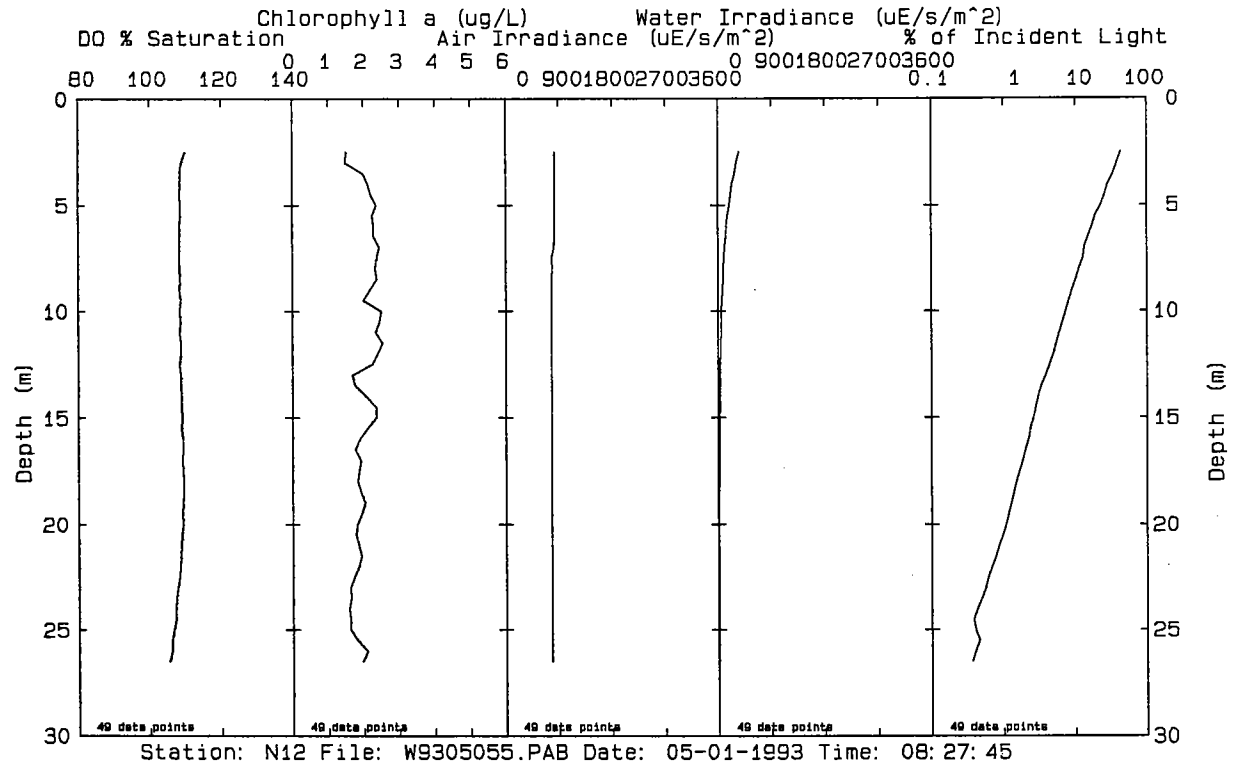
Station: N10P File: W9305049.PAB Date: 05-01-1993 Time: 07:00:49



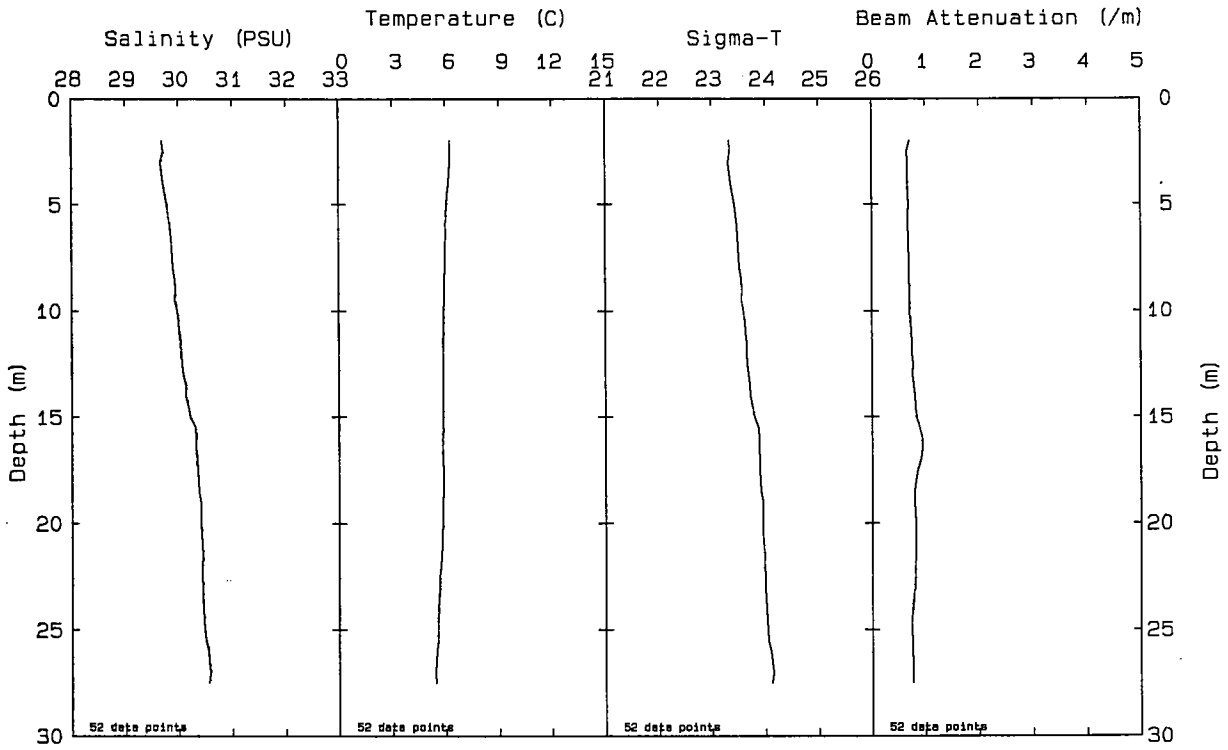


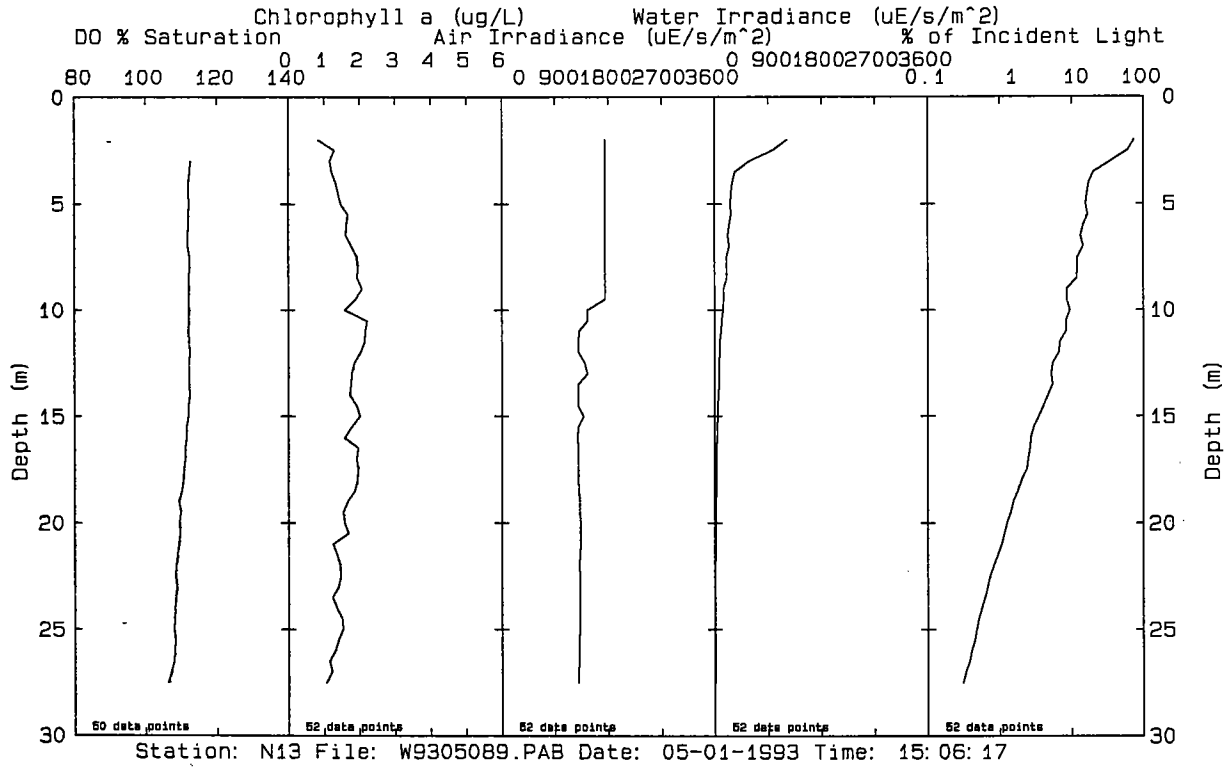
Station: N11 File: W9305052.PAB Date: 05-01-1993 Time: 07:50:34



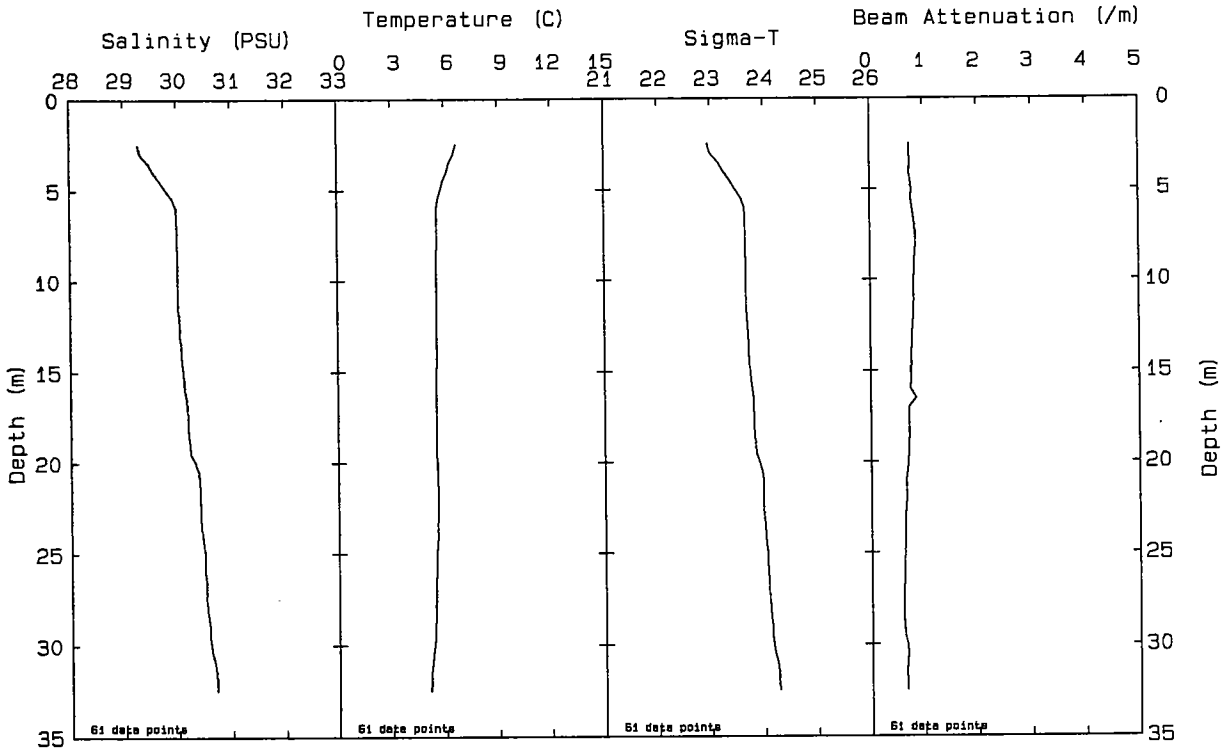


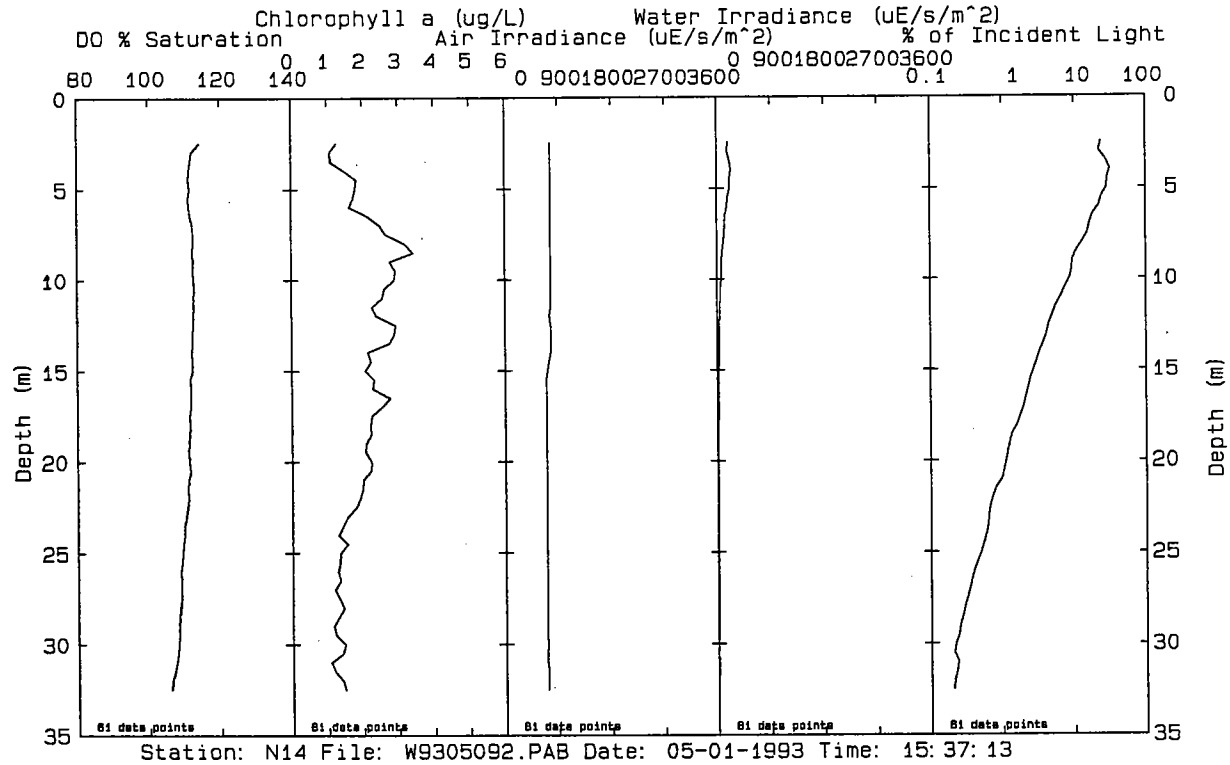
Station: N12 File: W9305055.PAB Date: 05-01-1993 Time: 08:27:45



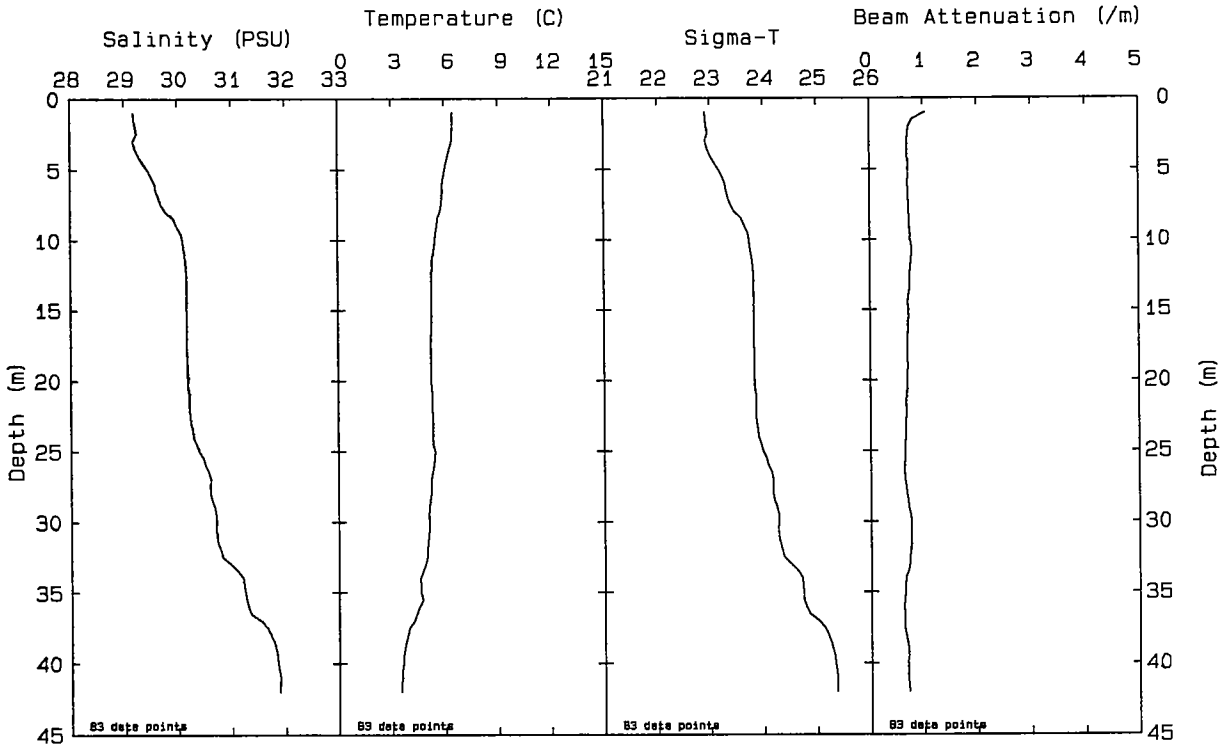


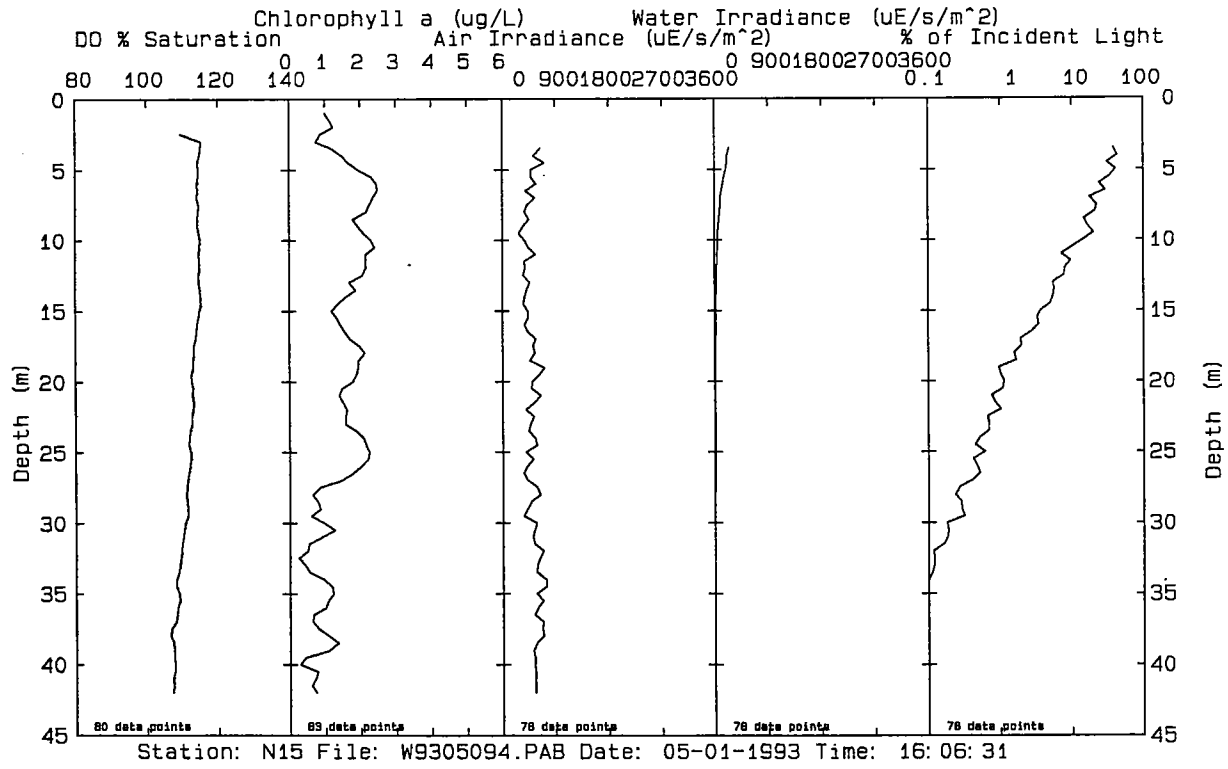
Station: N13 File: W9305089.PAB Date: 05-01-1993 Time: 15:06:17



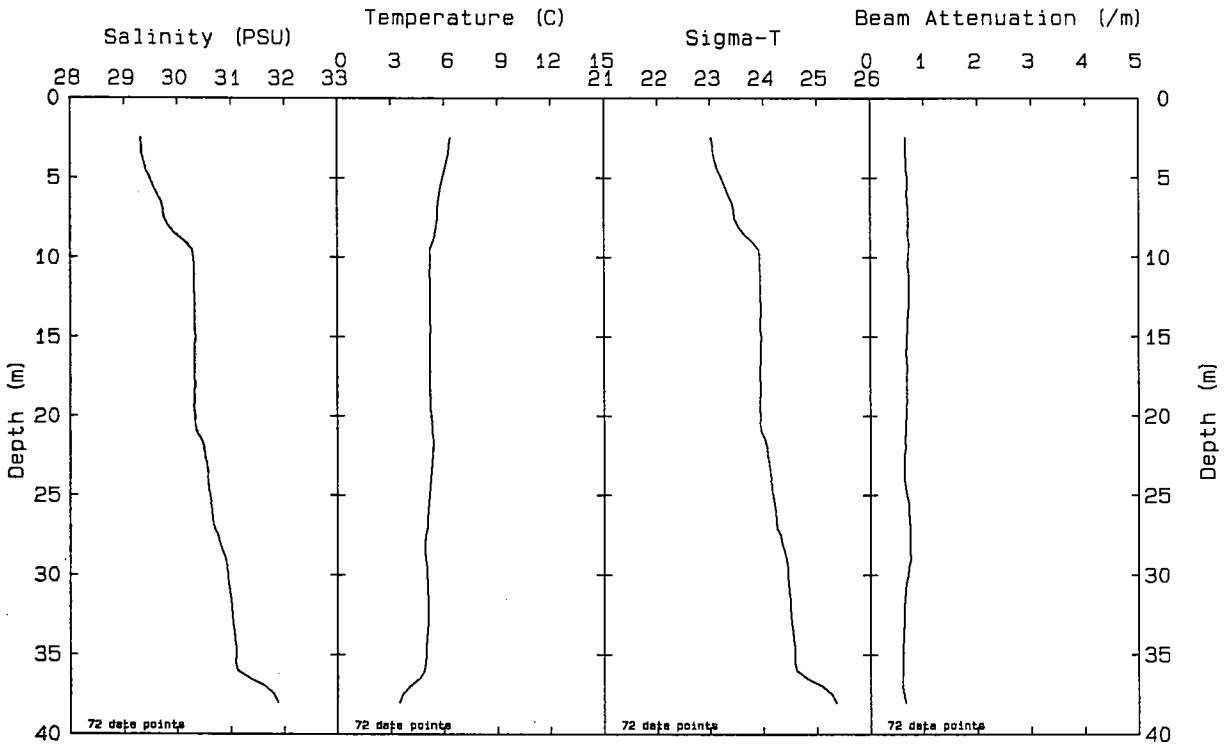


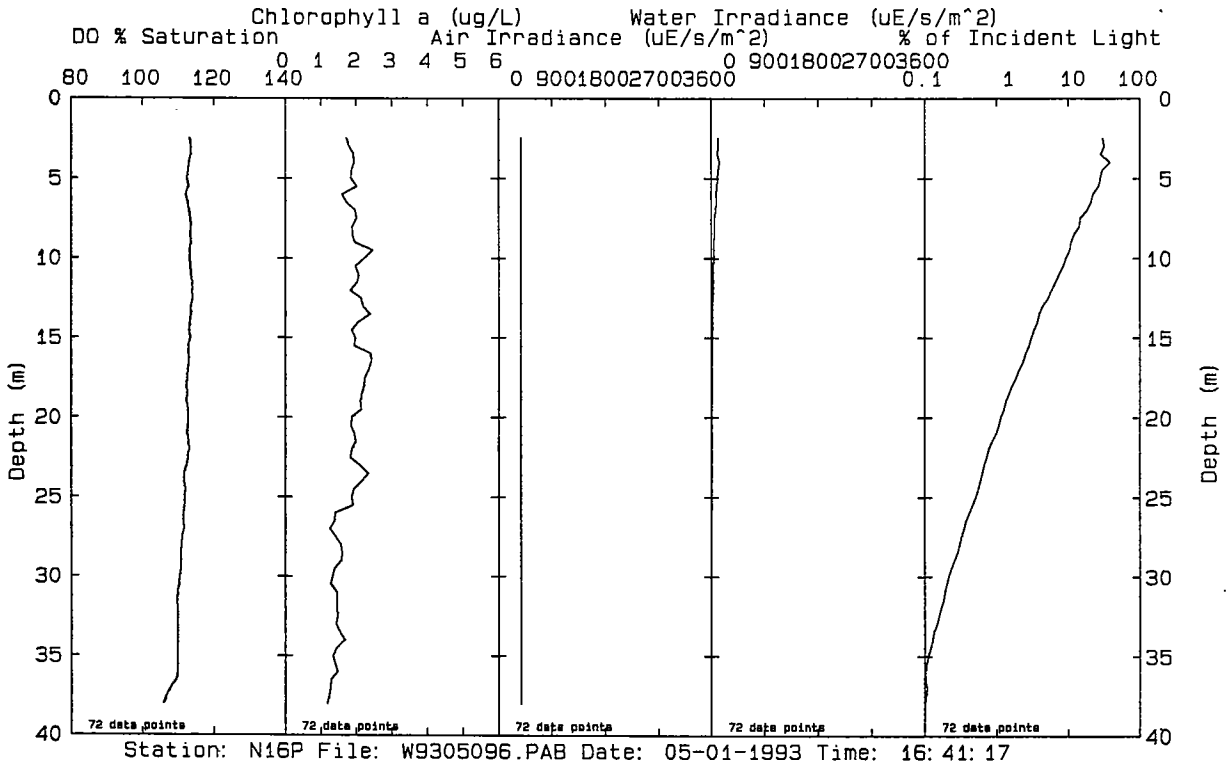
Station: N14 File: W9305092.PAB Date: 05-01-1993 Time: 15:37:13



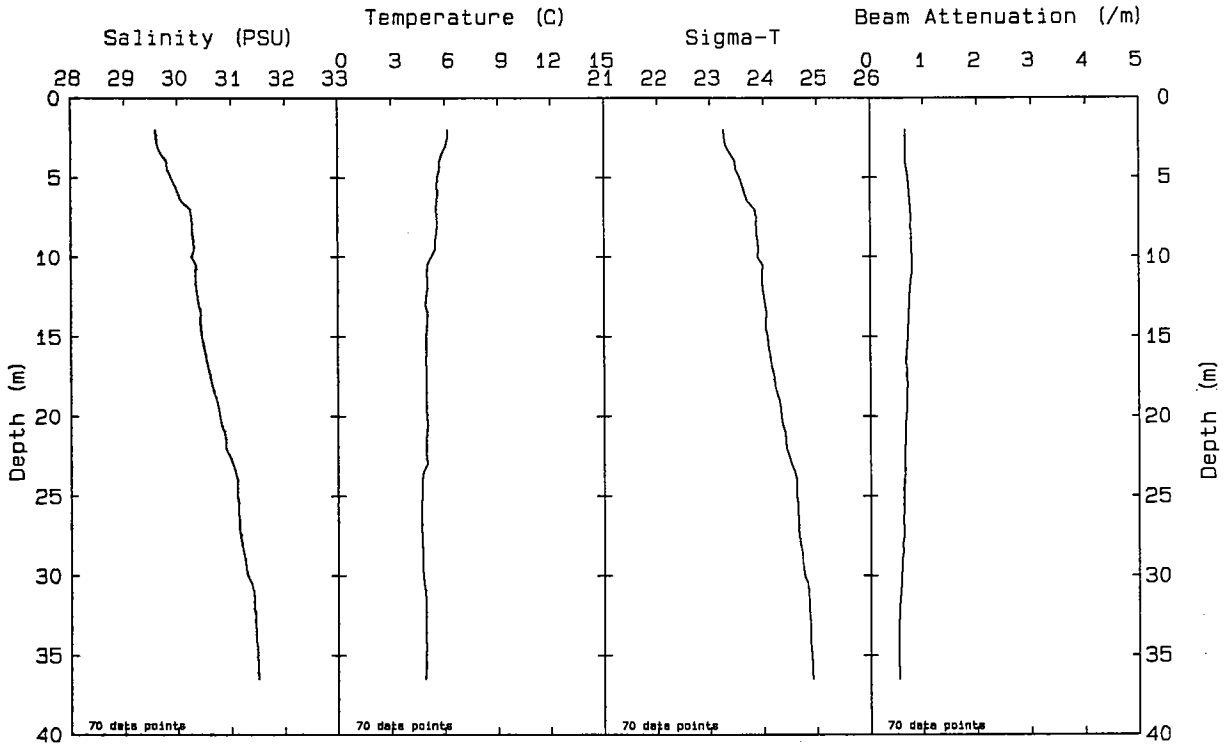


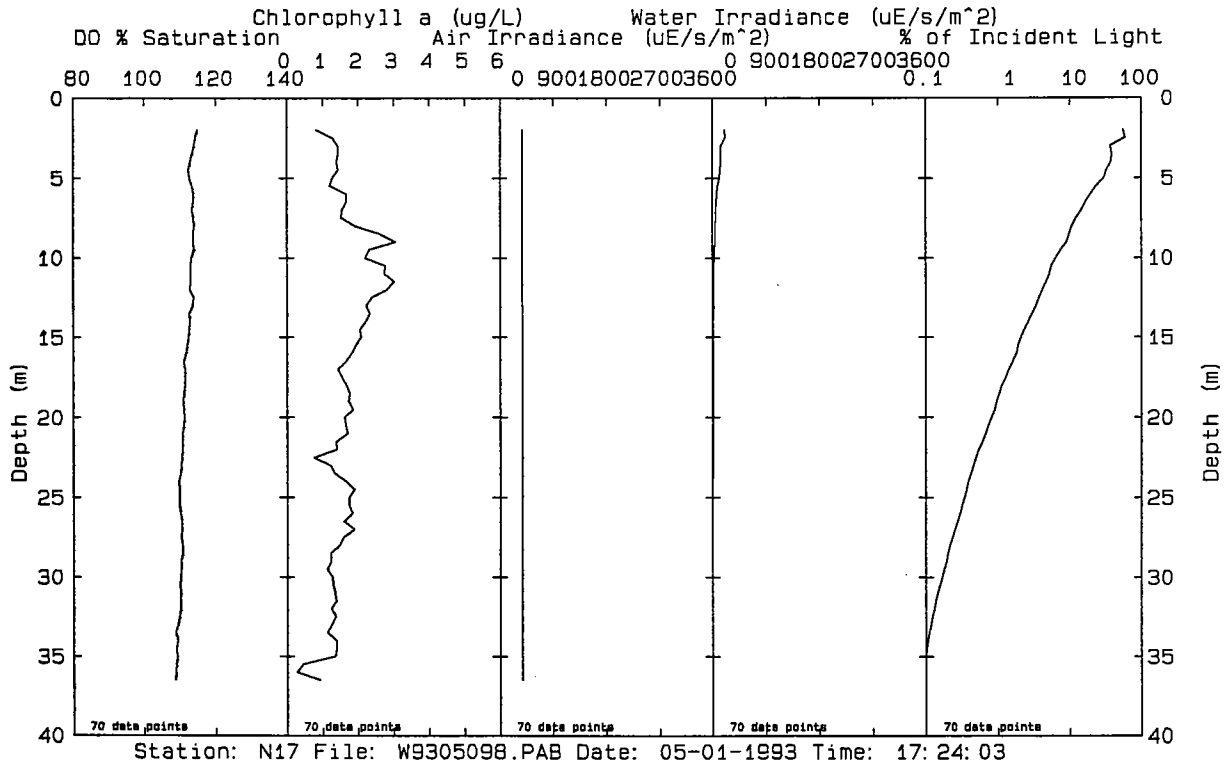
Station: N15 File: W9305094.PAB Date: 05-01-1993 Time: 16:06:31

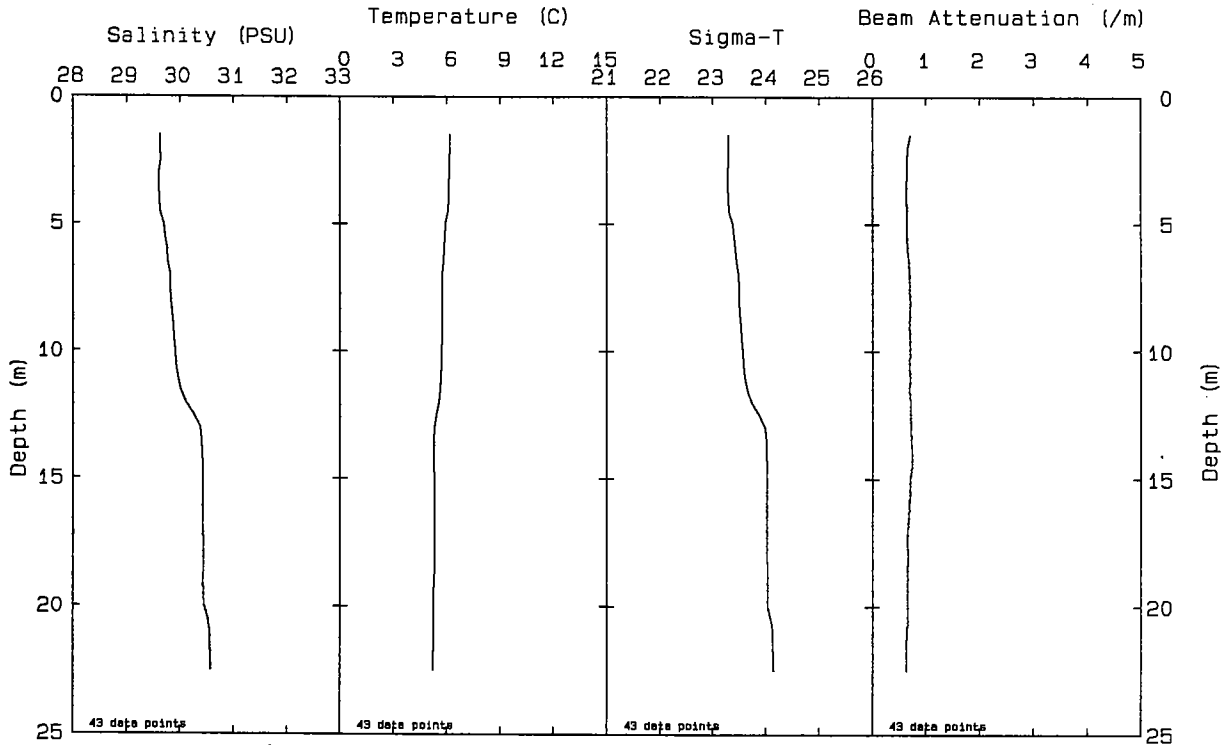


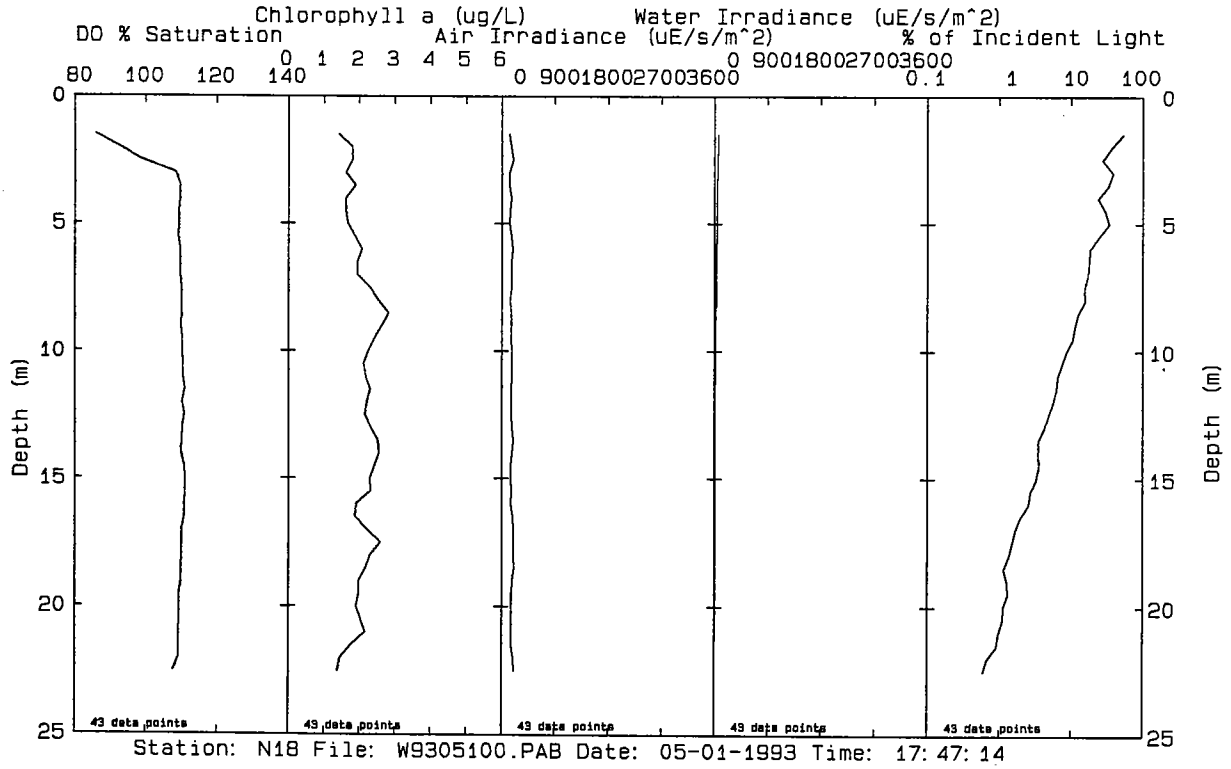


Station: N16P File: W9305096.PAB Date: 05-01-1993 Time: 16:41:17

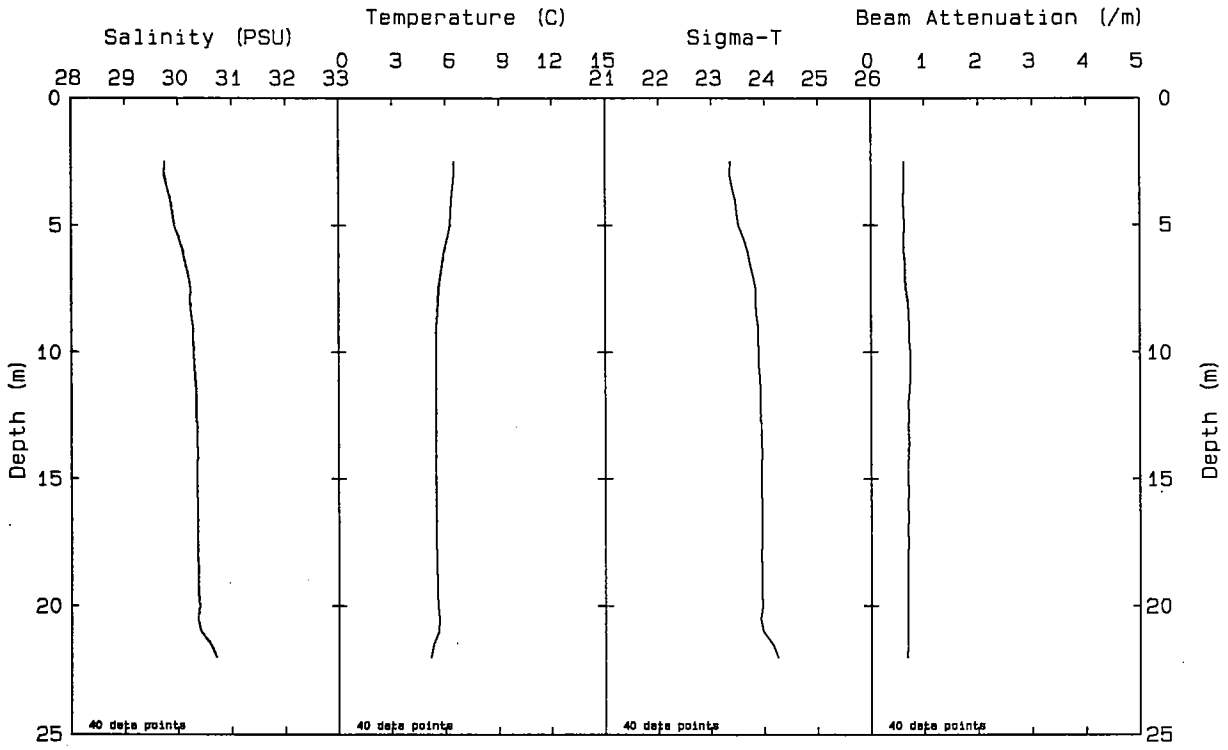

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40
70 data points

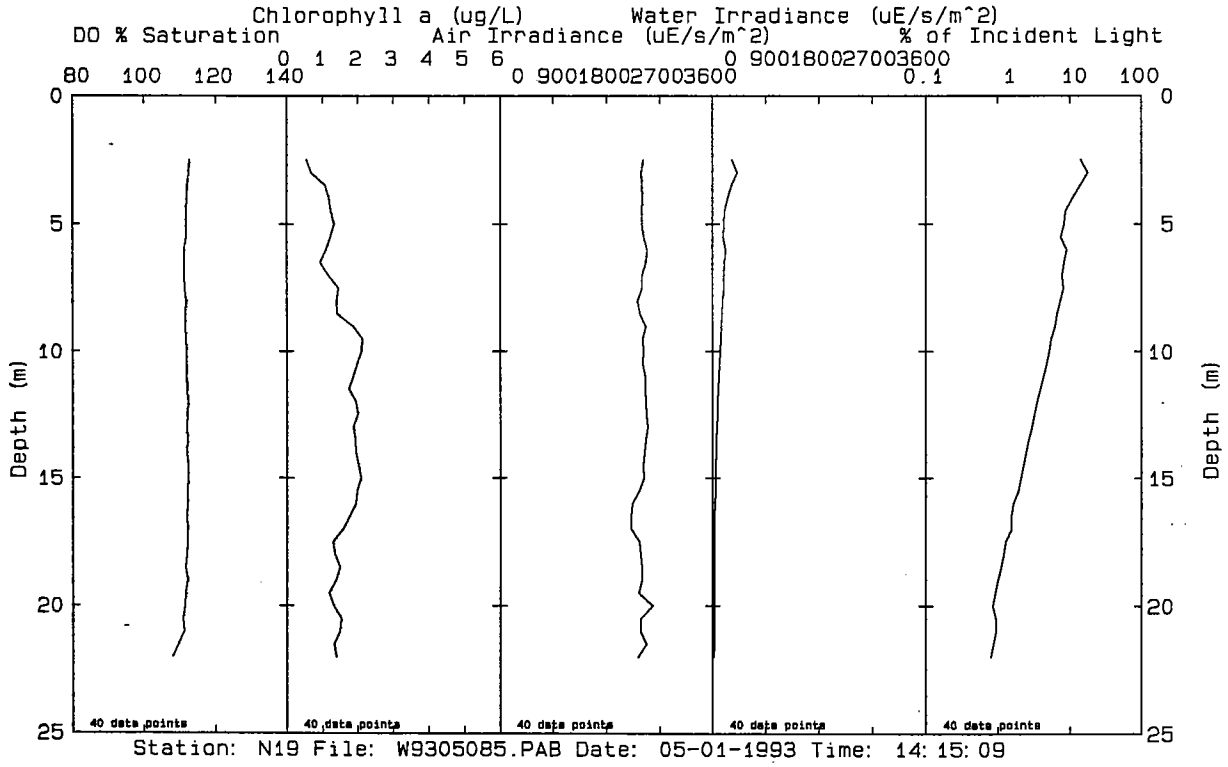

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40
70 data points
Station: N17 File: W9305098.PAB Date: 05-01-1993 Time: 17:24:03



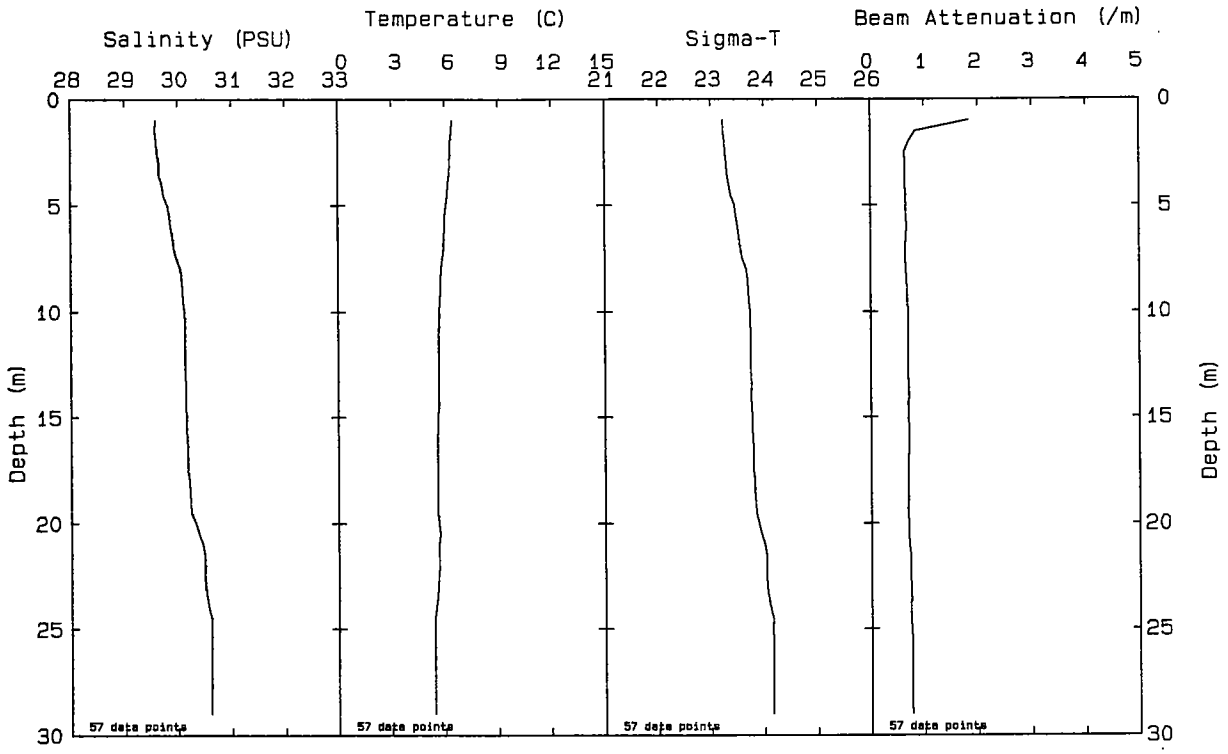


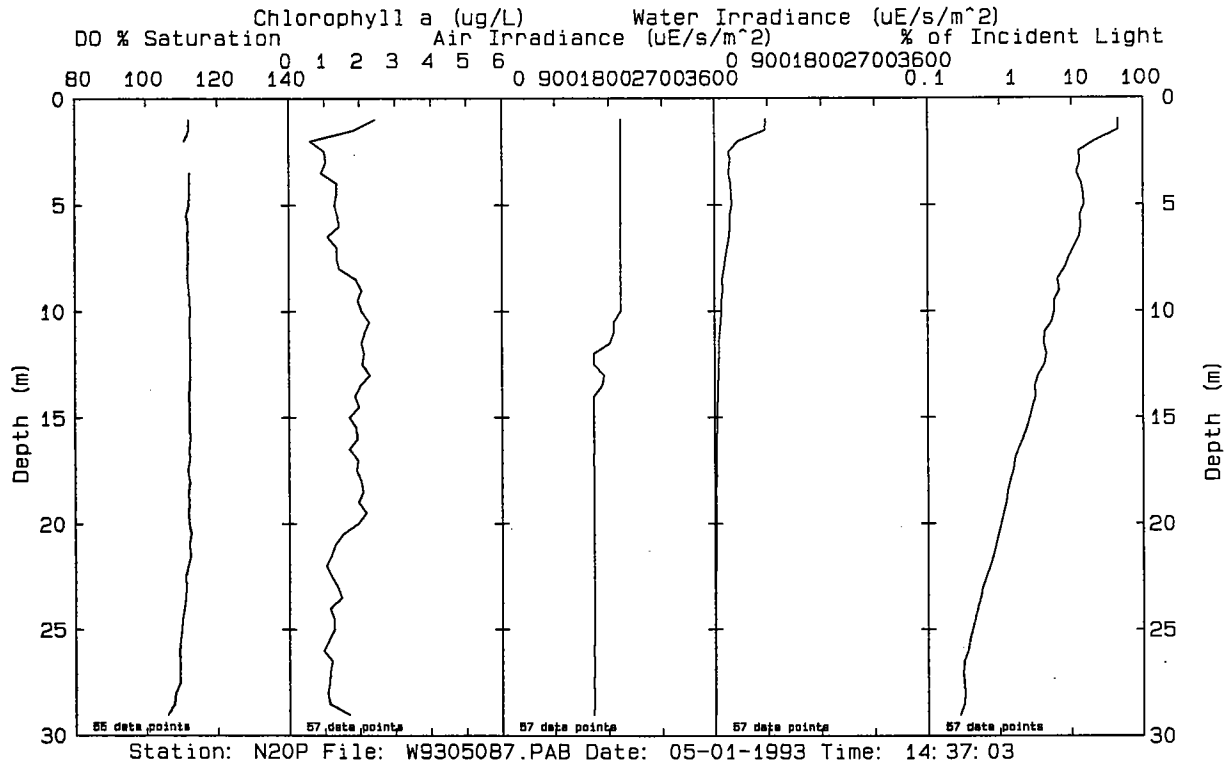
Station: N18 File: W9305100.PAB Date: 05-01-1993 Time: 17:47:14

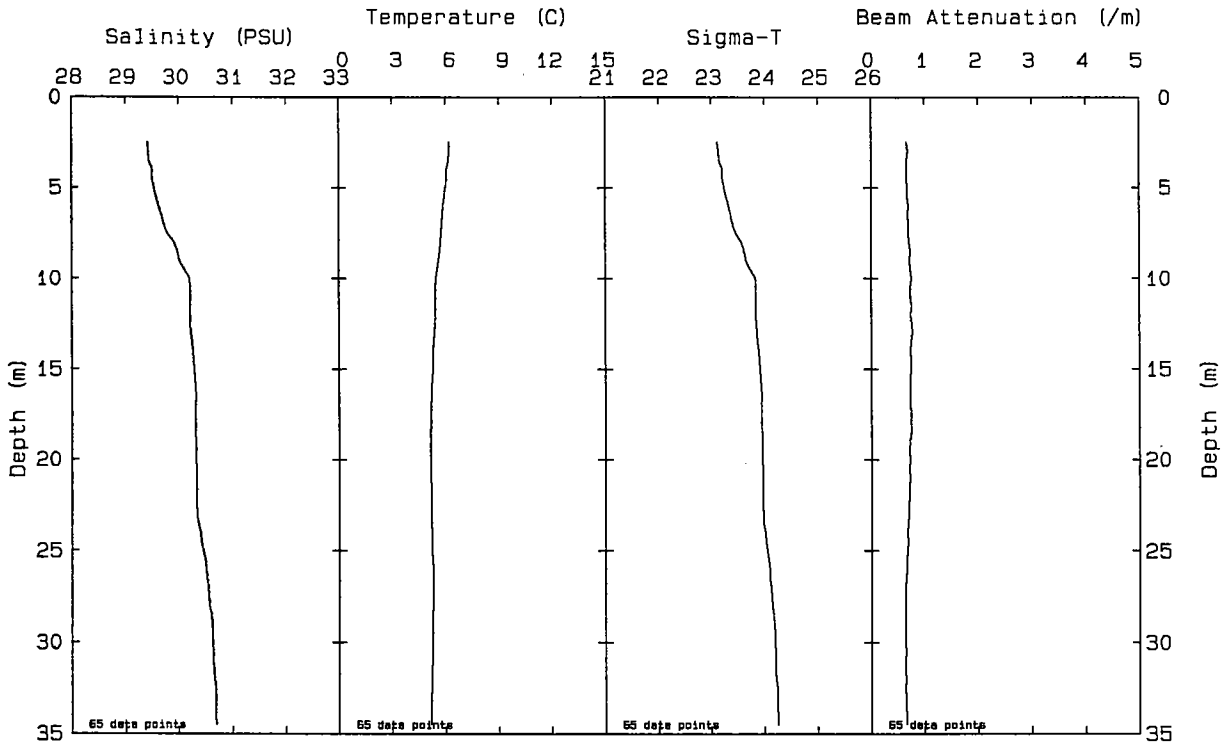


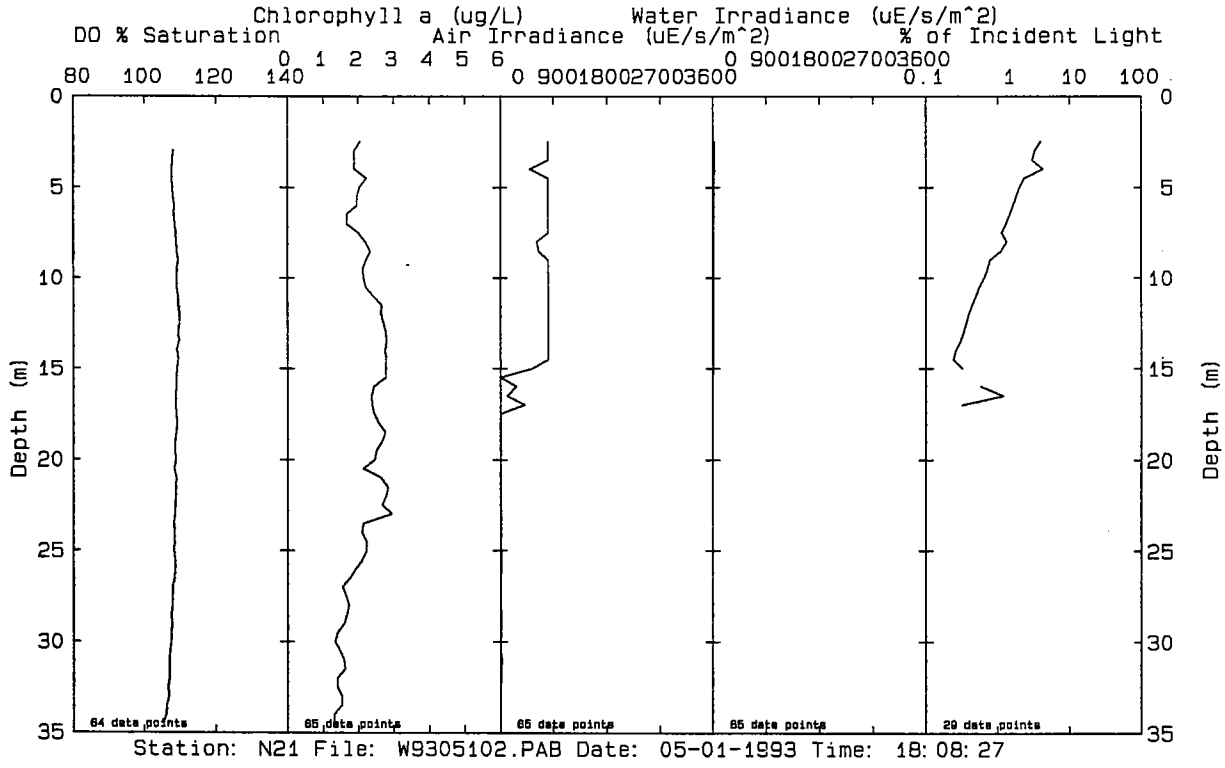


Station: N19 File: W9305085.PAB Date: 05-01-1993 Time: 14:15:09

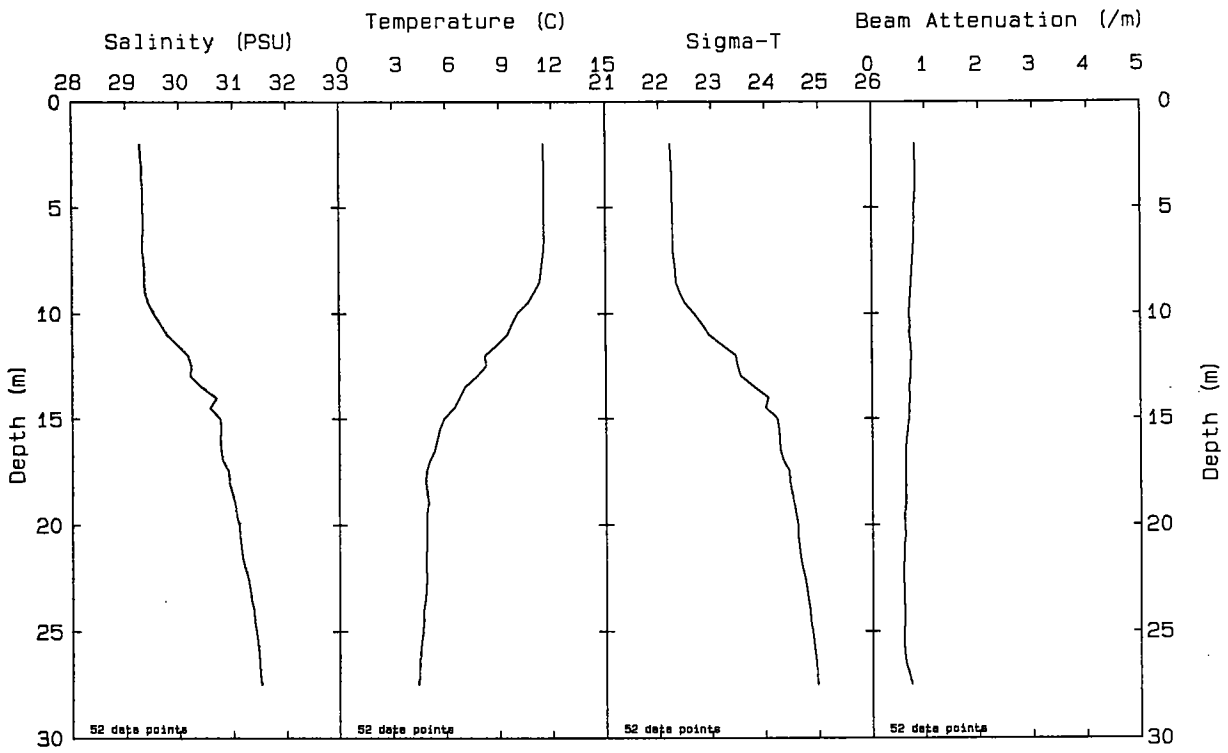

Salinity (PSU)
28 29 30 31 32
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30
57 data points
57 data points
57 data points
57 data points

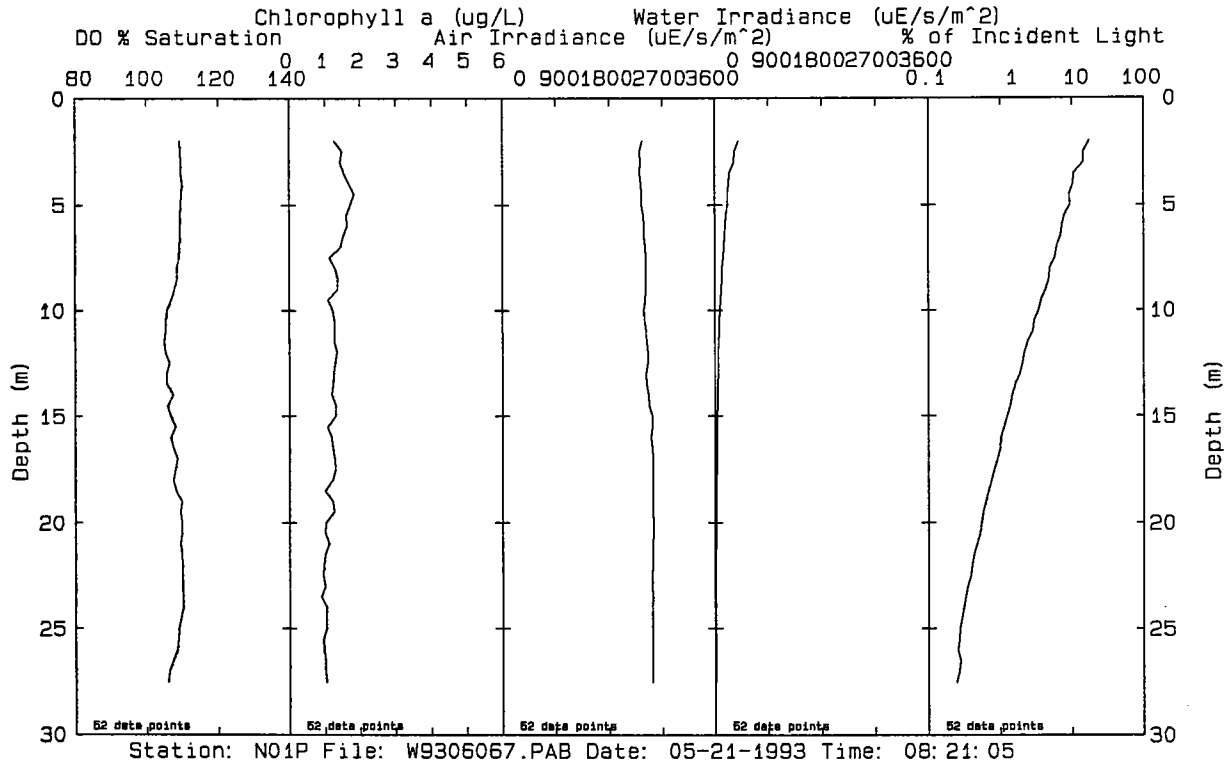

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30
55 data points
57 data points
57 data points
57 data points
57 data points
Station: N20P File: W9305087.PAB Date: 05-01-1993 Time: 14:37:03

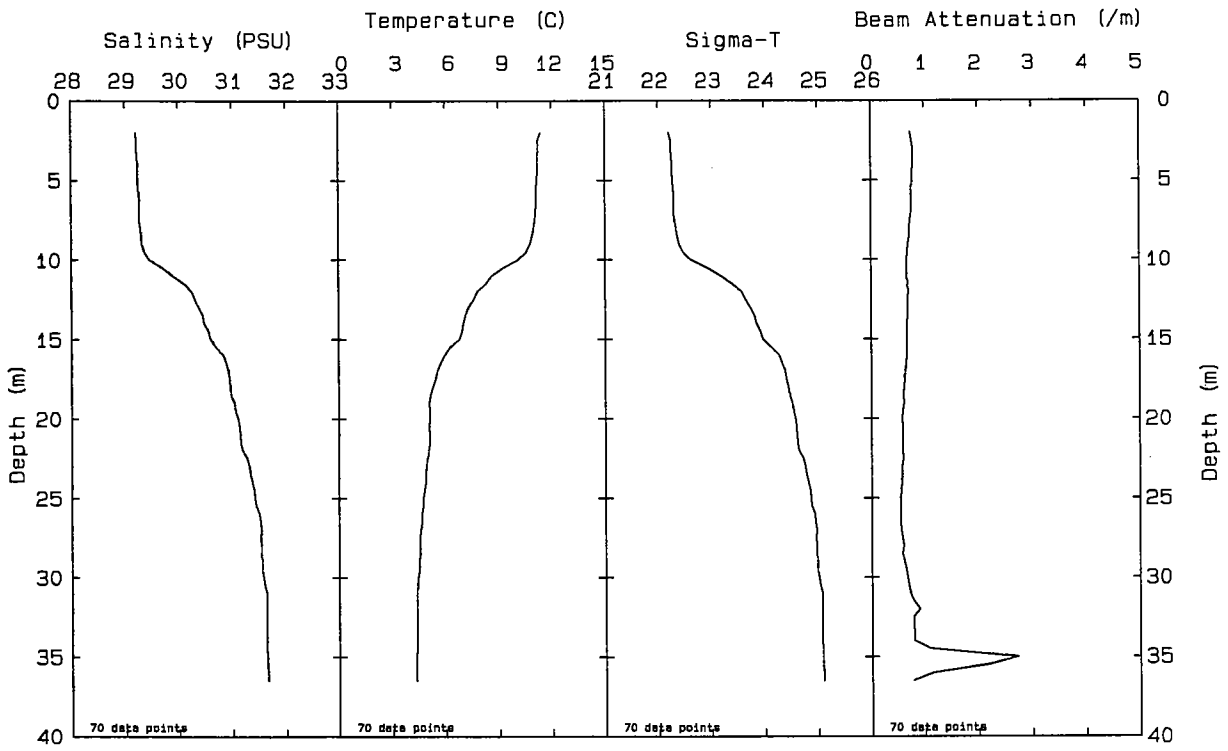

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35
65 data points
65 data points
65 data points
65 data points

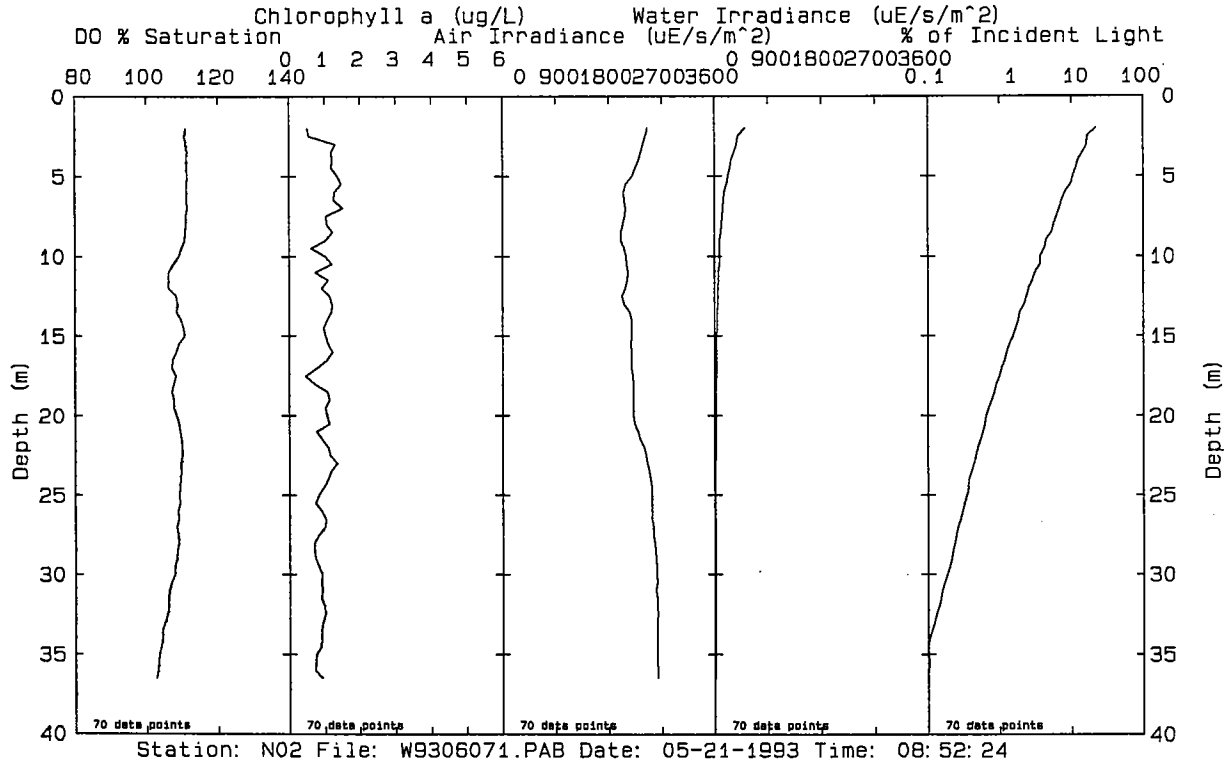

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35
64 data points
65 data points
65 data points
65 data points
29 data points
Station: N21 File: W9305102.PAB Date: 05-01-1993 Time: 18:08:27

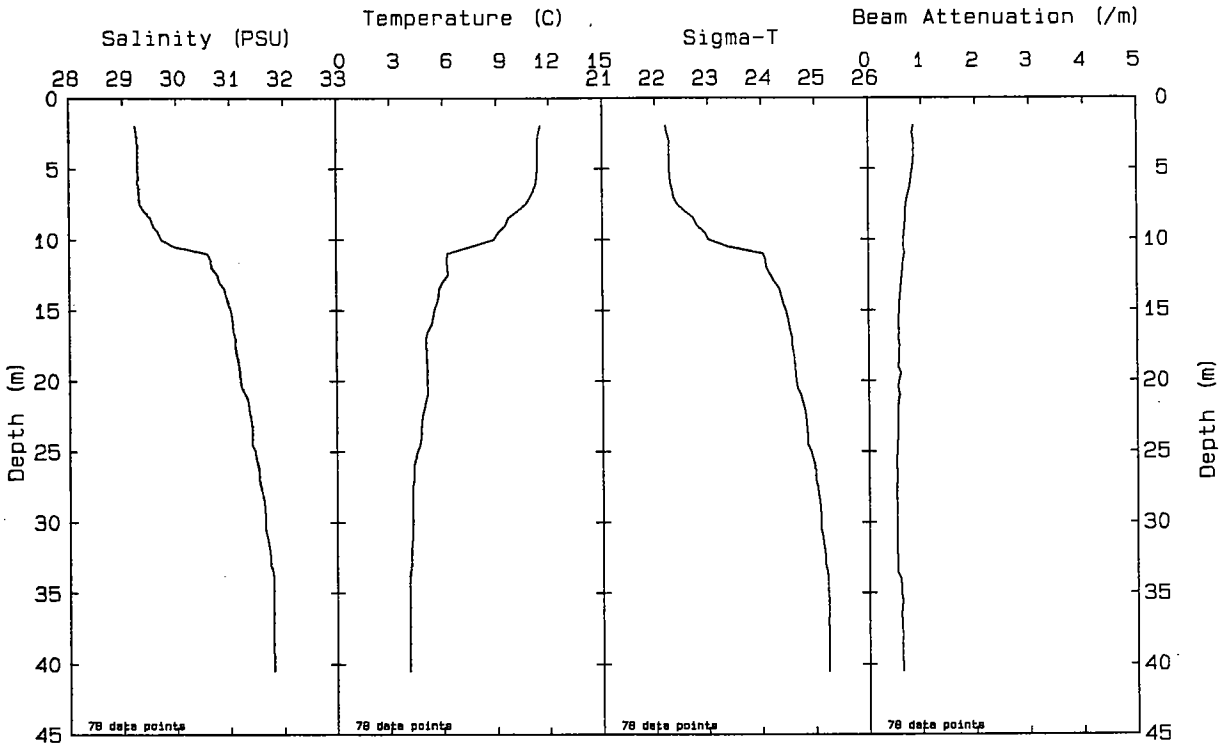
Late May 1993 Profiles

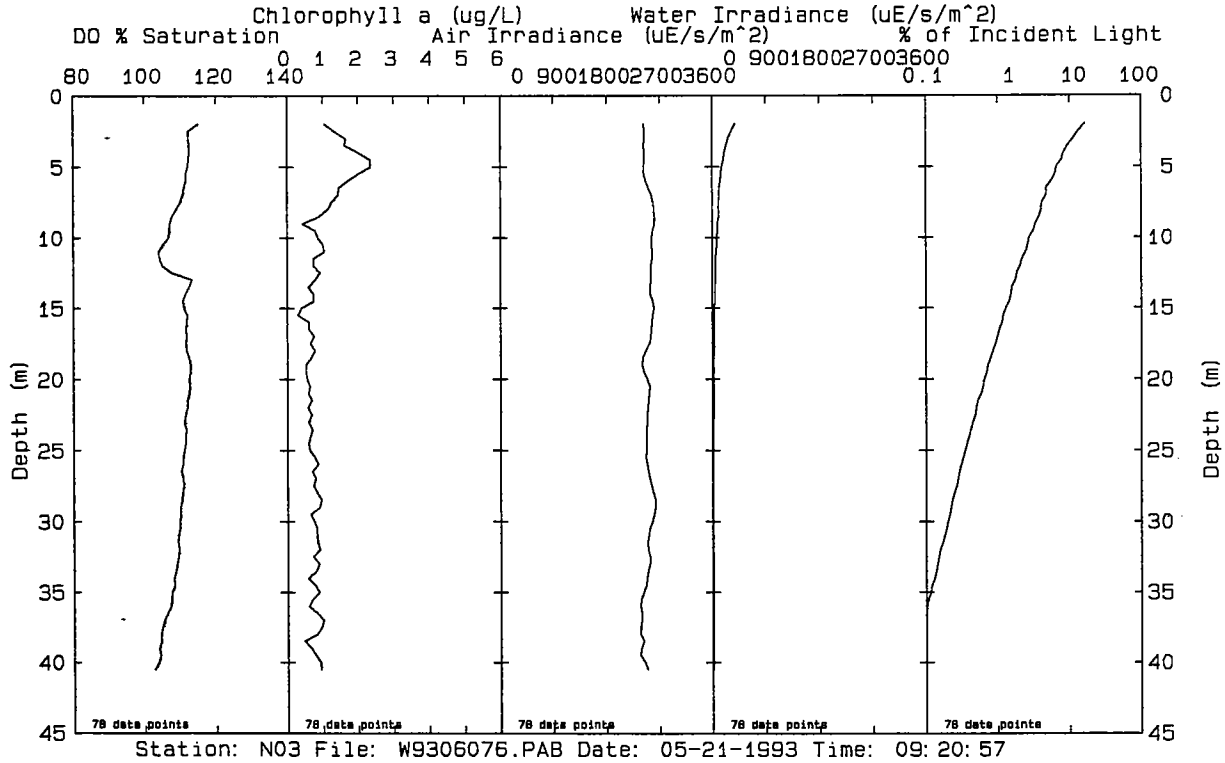

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30
52 data points

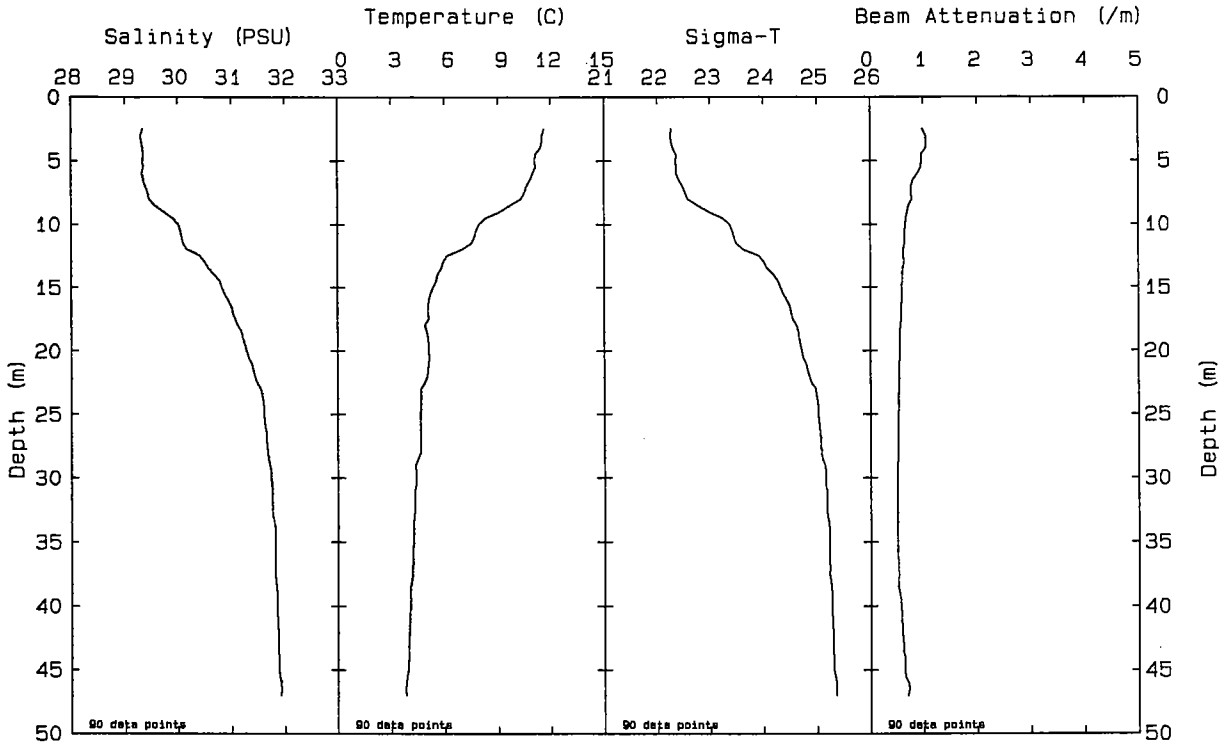

Chlorophyll a (ug/L)
DO % Saturation
80 100 120 140
Air Irradiance (uE/s/m^2)
0 1 2 3 4 5 6
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0 900180027003600
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30
52 data points
Station: N01P File: W9306067.PAB Date: 05-21-1993 Time: 08:21:05

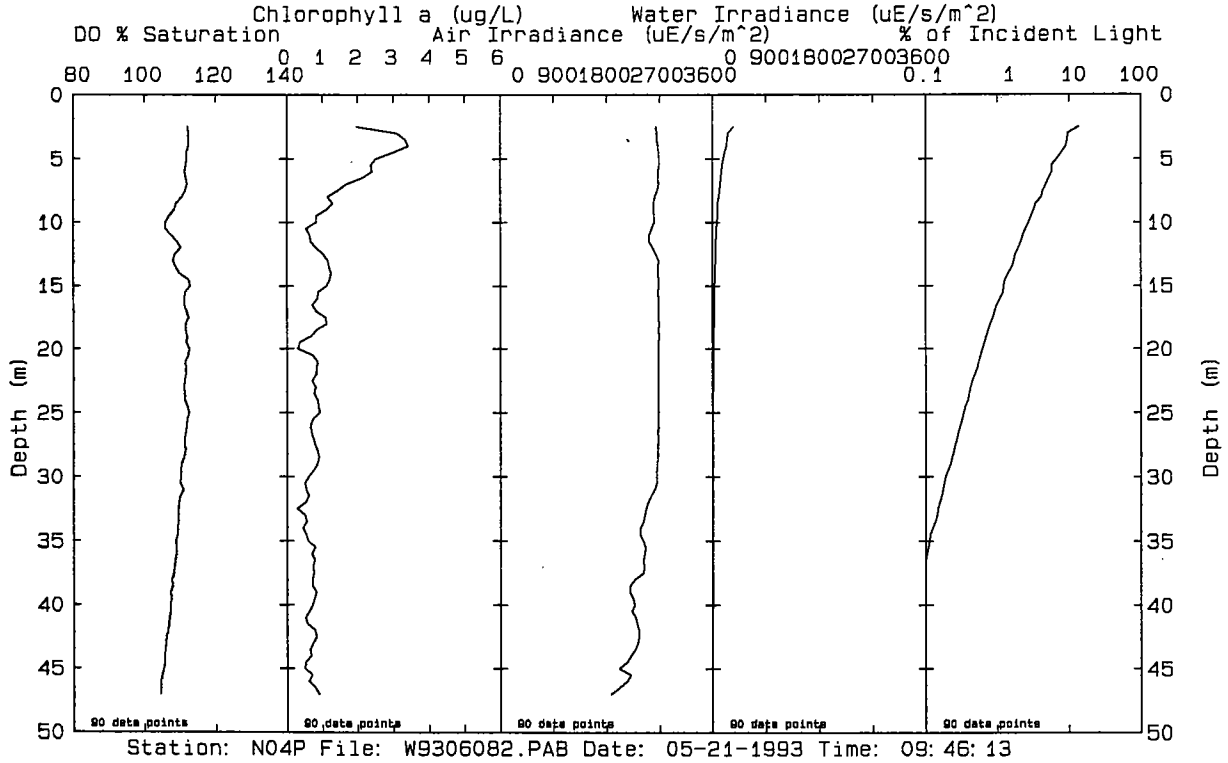

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40
70 data points

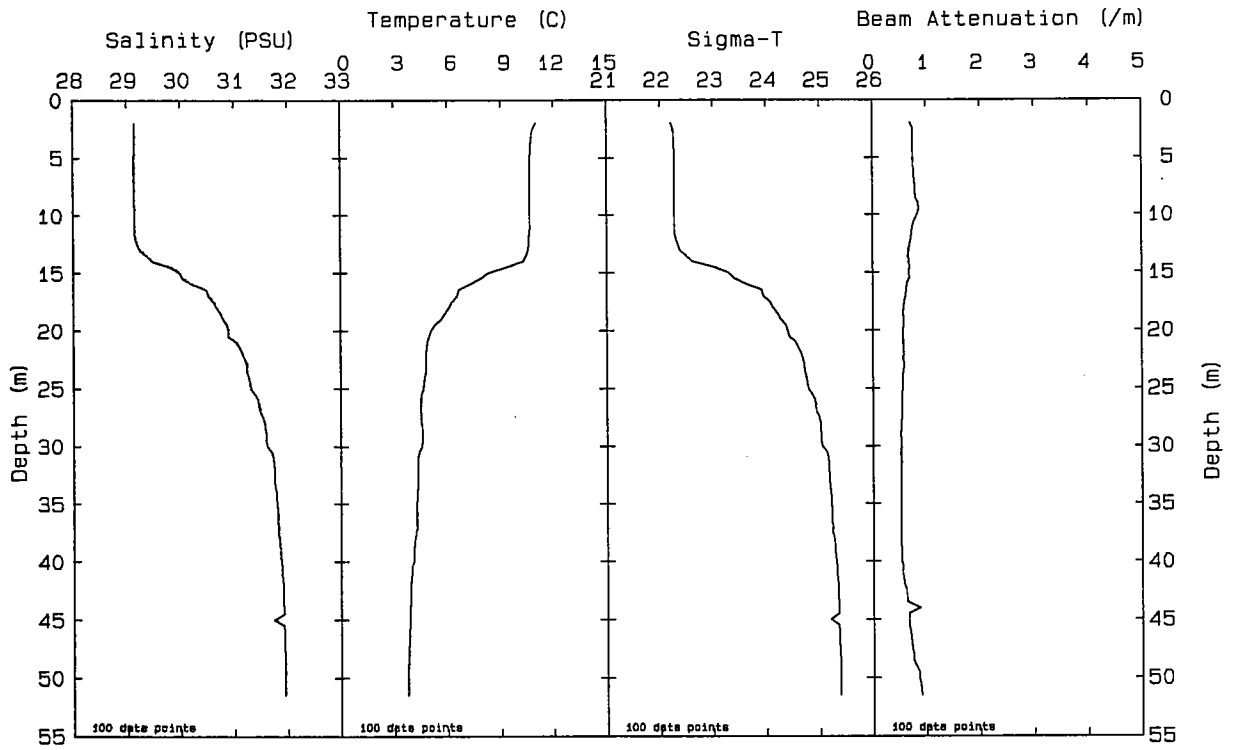

Chlorophyll a (ug/L)
DO % Saturation
80 100 120 140
Air Irradiance (uE/s/m^2)
0 1 2 3 4 5 6
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40
70 data points
Station: N02 File: W9306071.PAB Date: 05-21-1993 Time: 08:52:24

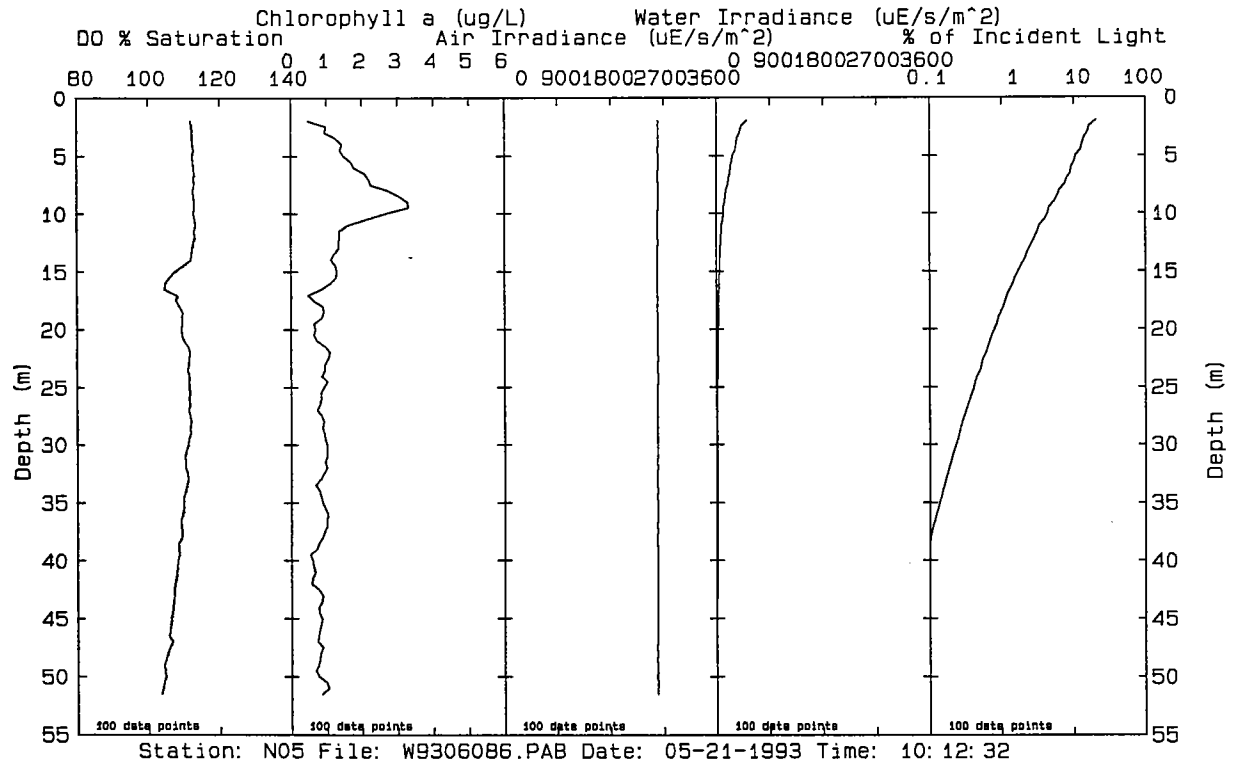

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40 45
78 data points

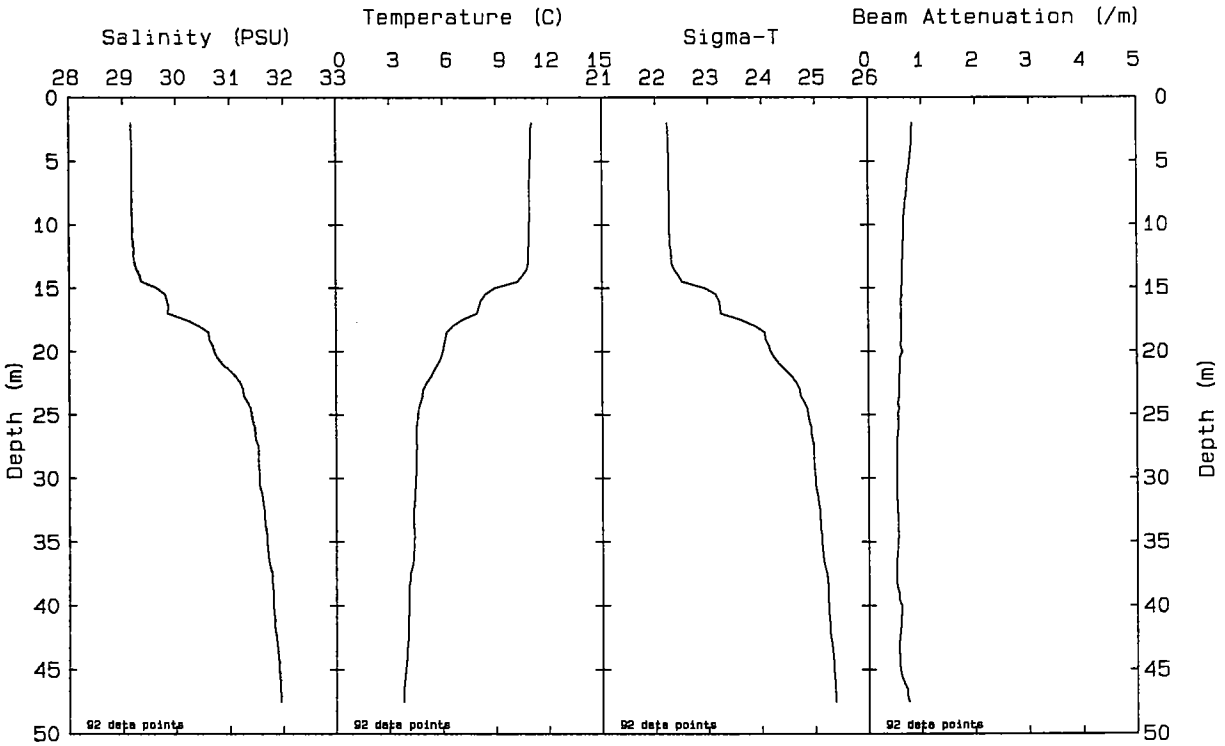

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40 45
78 data points
Station: N03 File: W9306076.PAB Date: 05-21-1993 Time: 09:20:57

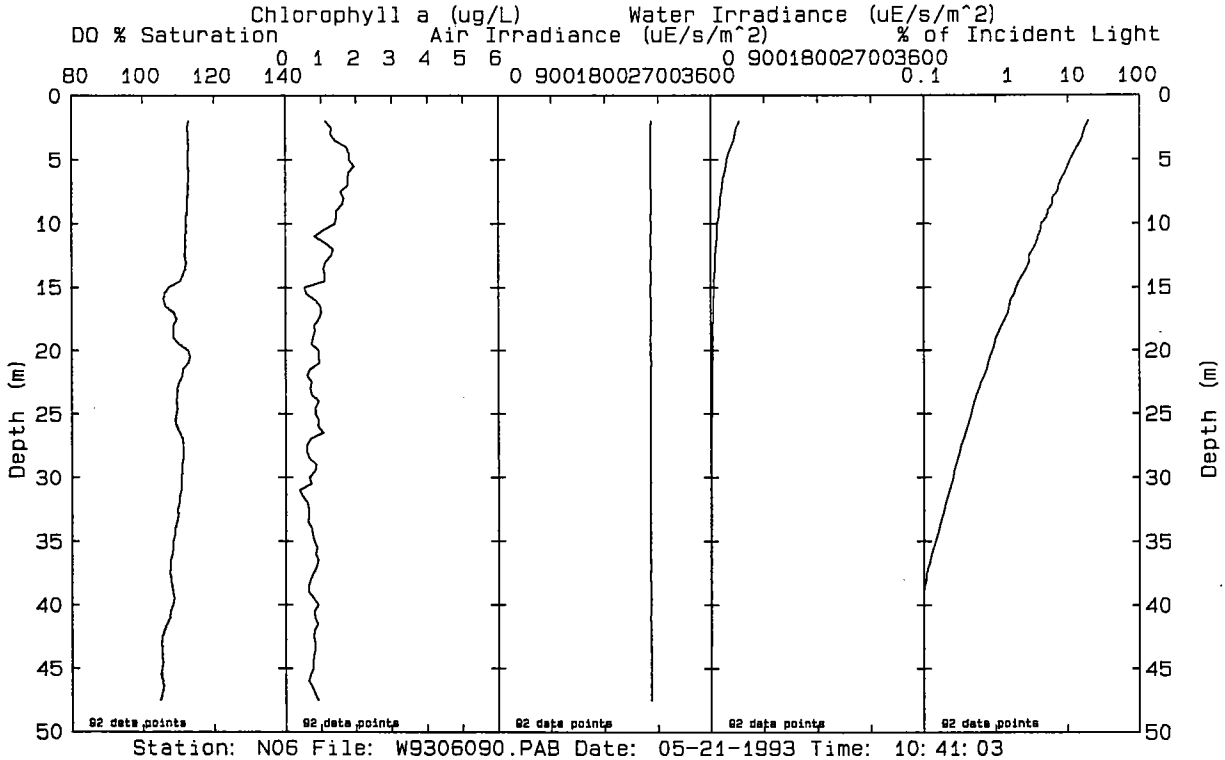

Salinity (PSU)
28 29 30 31 32
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40 45 50
90 data points


DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40 45 50
90 data points
Station: N04P File: W9306082.PAB Date: 05-21-1993 Time: 09:46:13

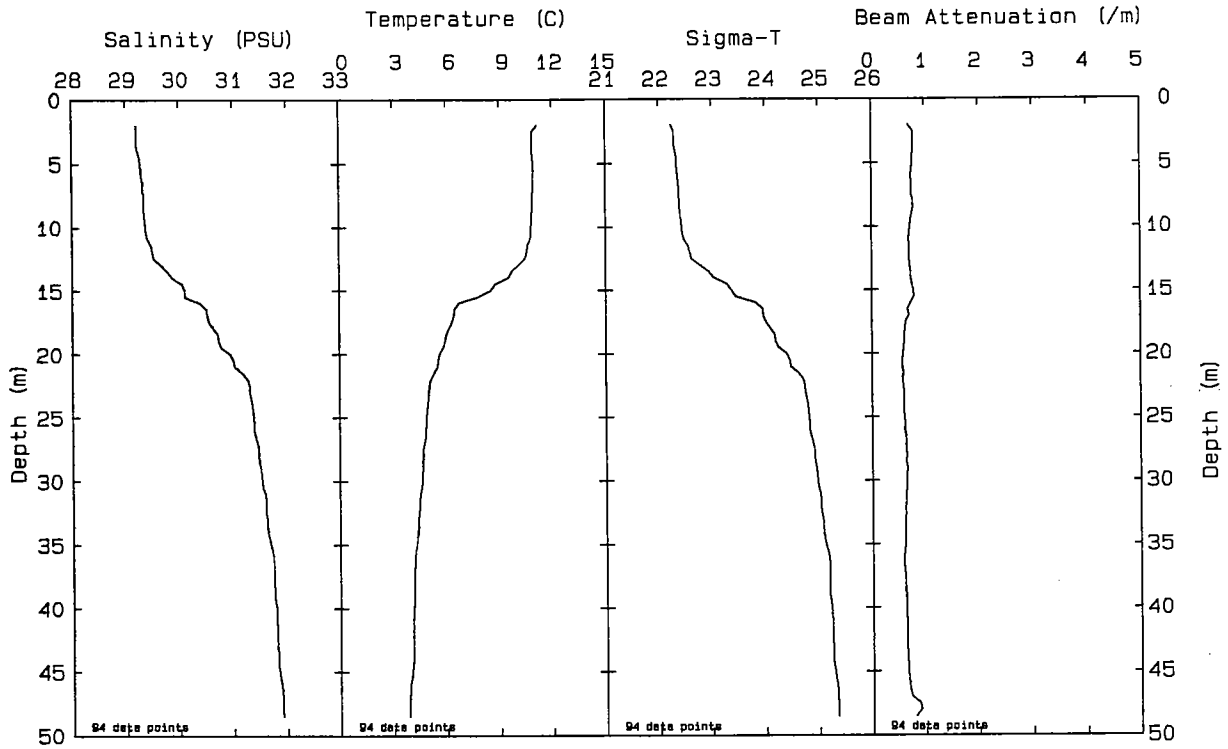

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40 45 50 55
100 data points
100 data points
100 data points
100 data points
Depth (m)

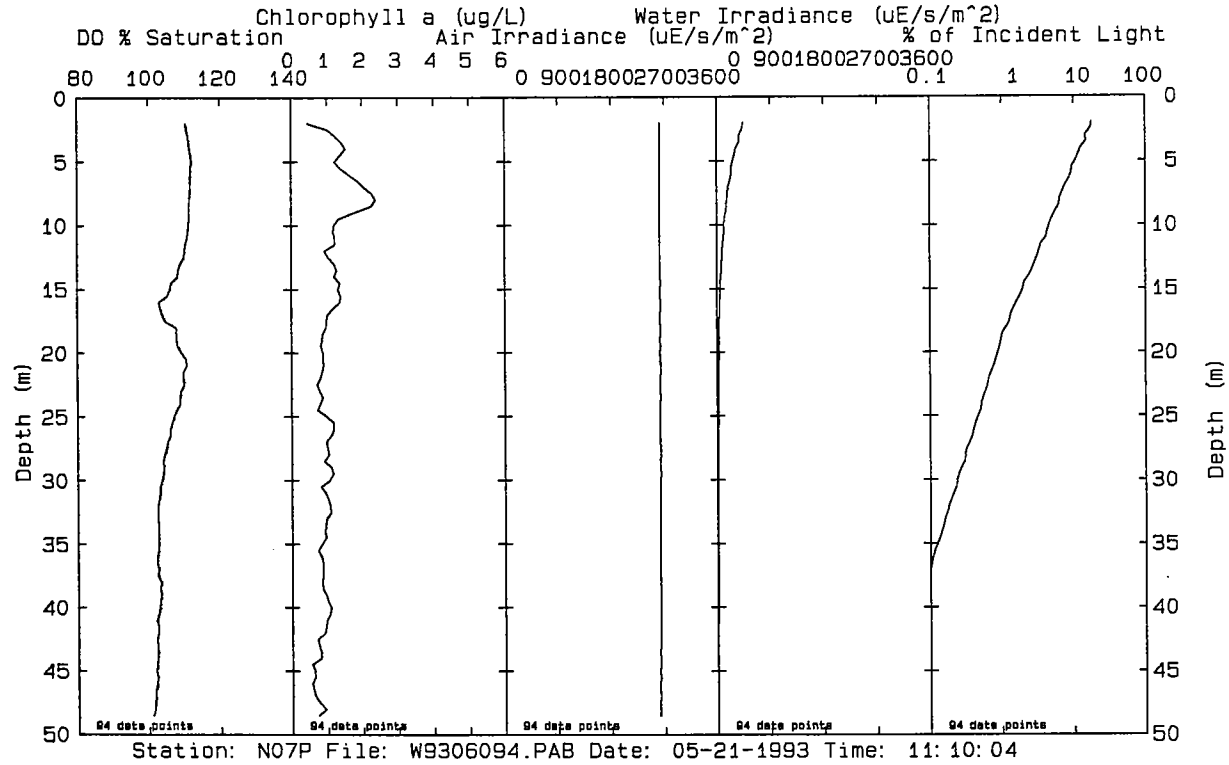

Chlorophyll a (ug/L)
DO % Saturation
80 100 120 140
0 1 2 3 4 5 6
Water Irradiance (uE/s/m^2)
Air Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0 900180027003600
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40 45 50 55
100 data points
100 data points
100 data points
100 data points
100 data points
Depth (m)
Station: N05 File: W9306086.PAB Date: 05-21-1993 Time: 10:12:32



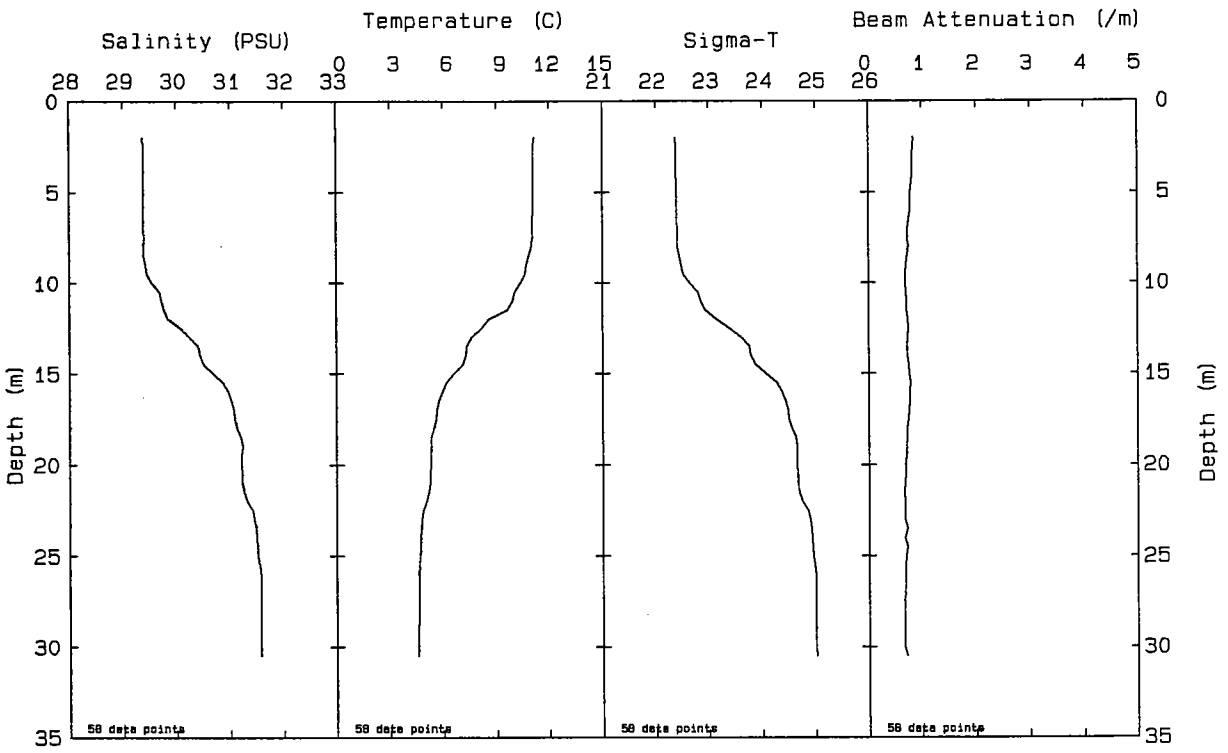


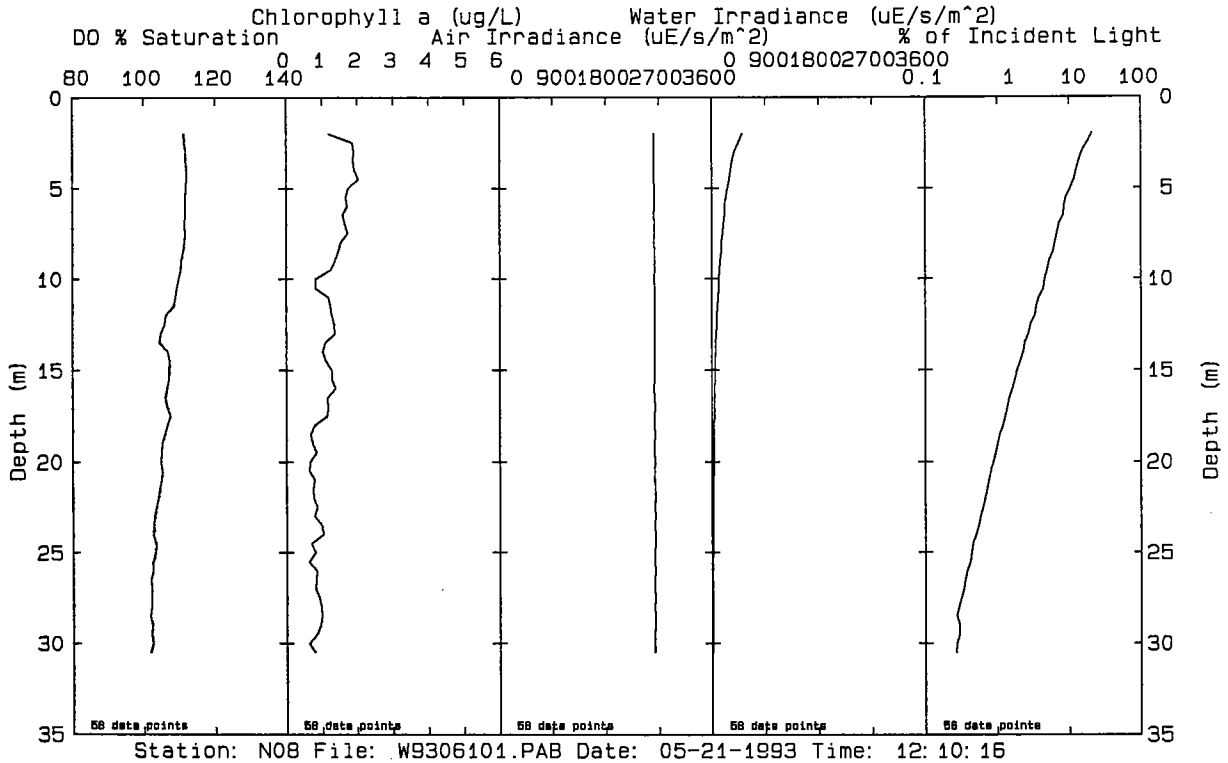
Station: N06 File: W9306090.PAB Date: 05-21-1993 Time: 10:41:03



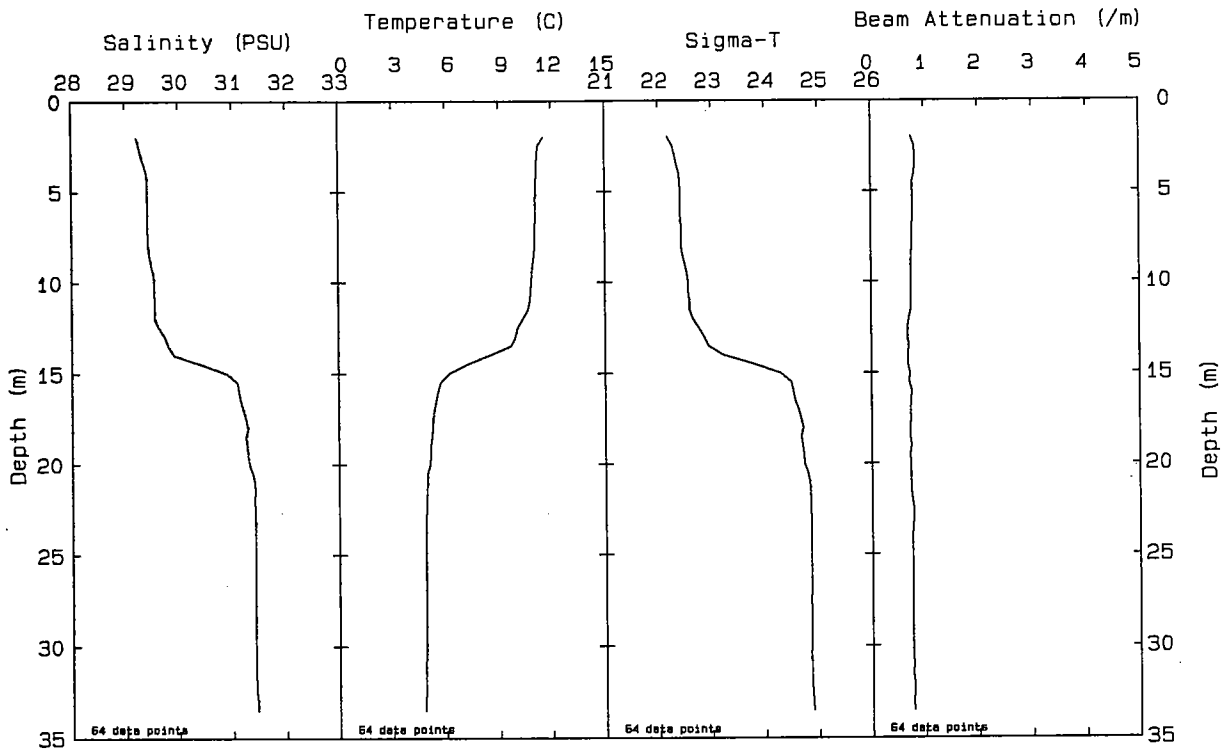


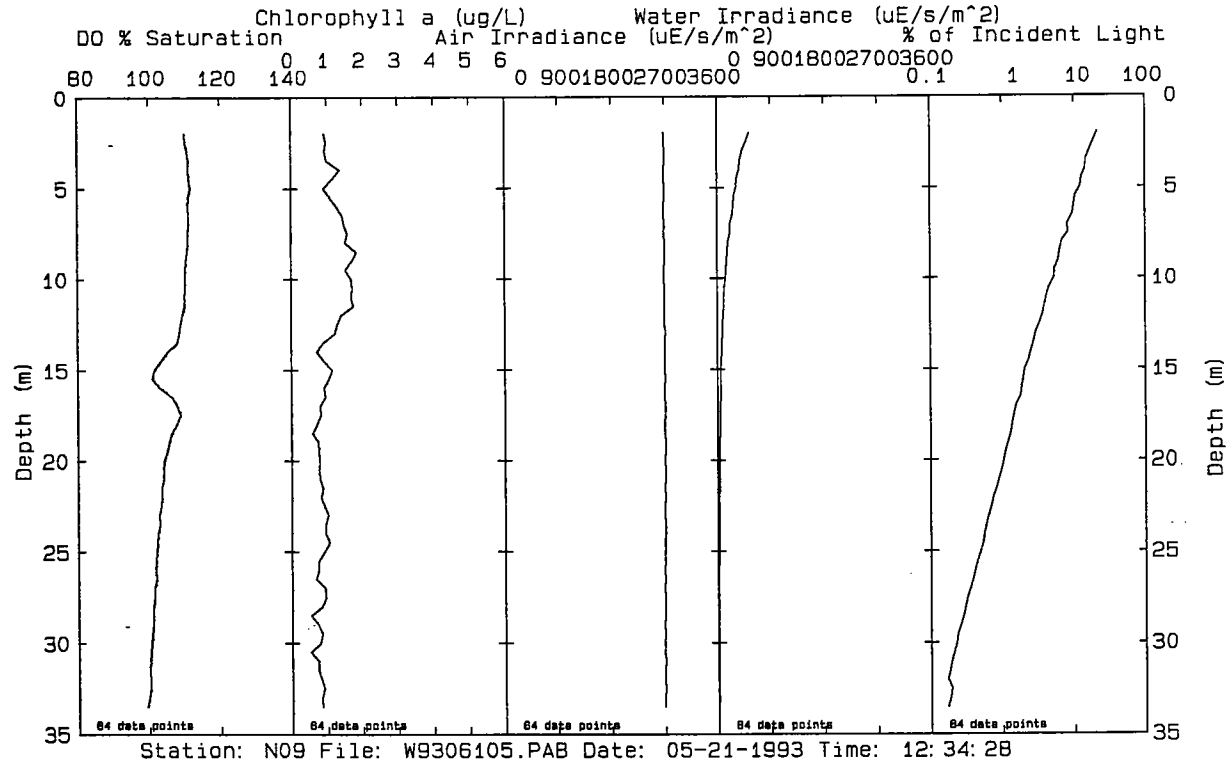
Station: N07P File: W9306094.PAB Date: 05-21-1993 Time: 11:10:04



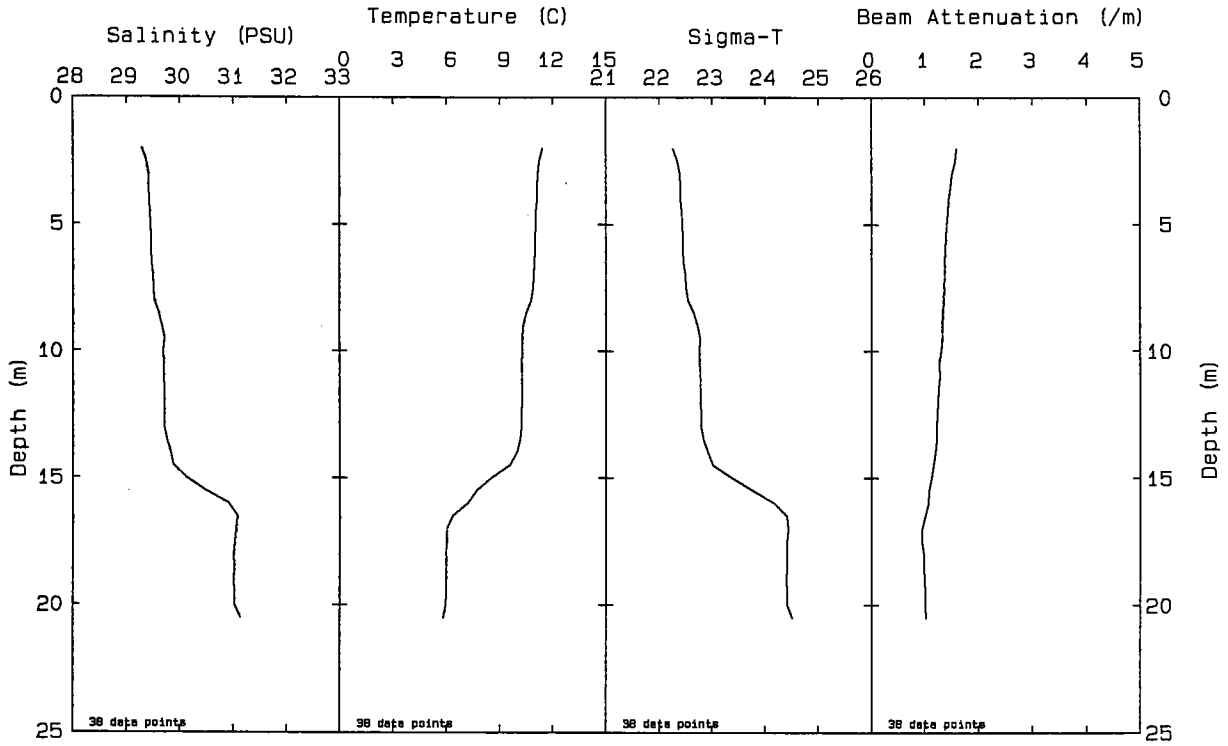


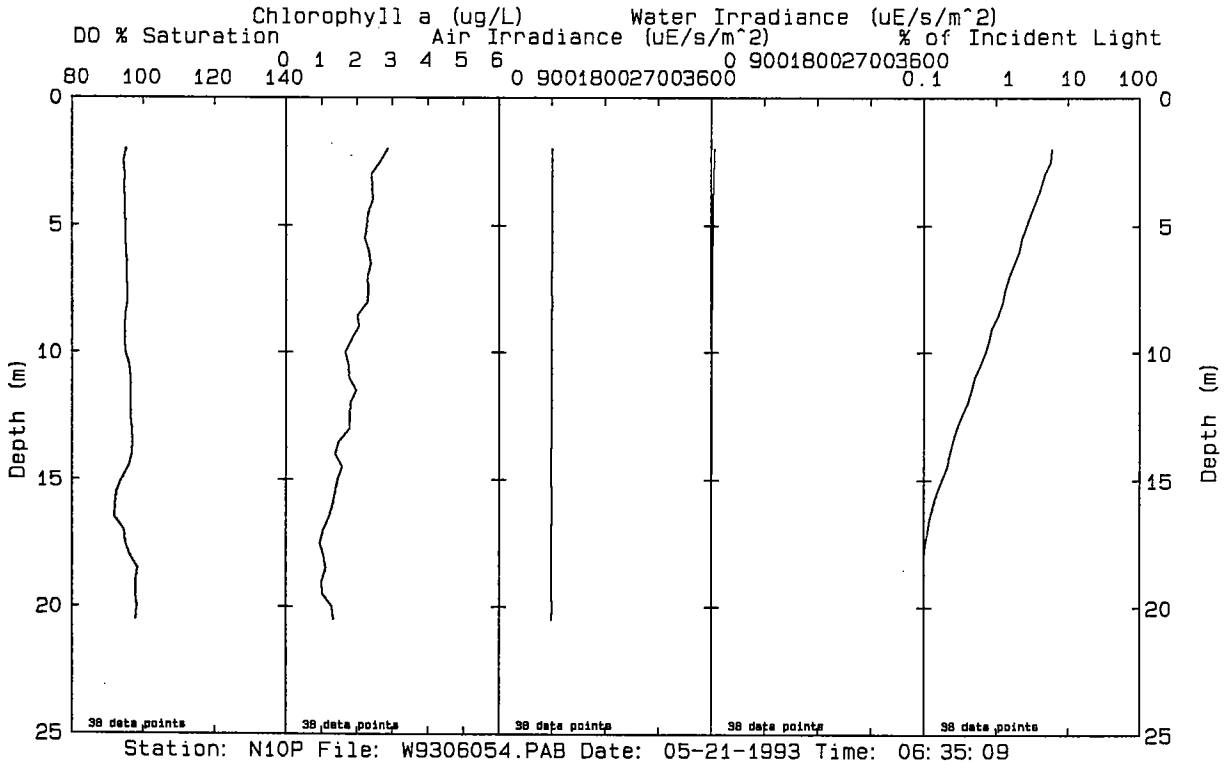
Station: N08 File: W9306101.PAB Date: 05-21-1993 Time: 12:10:16

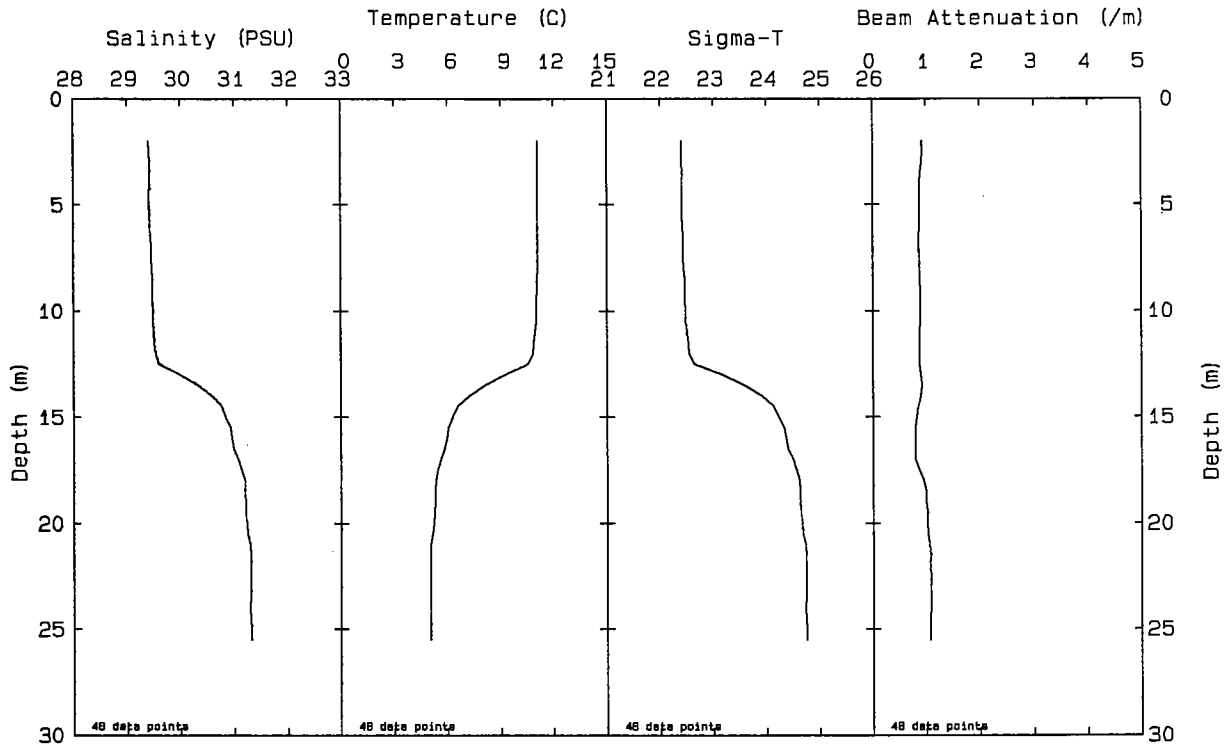


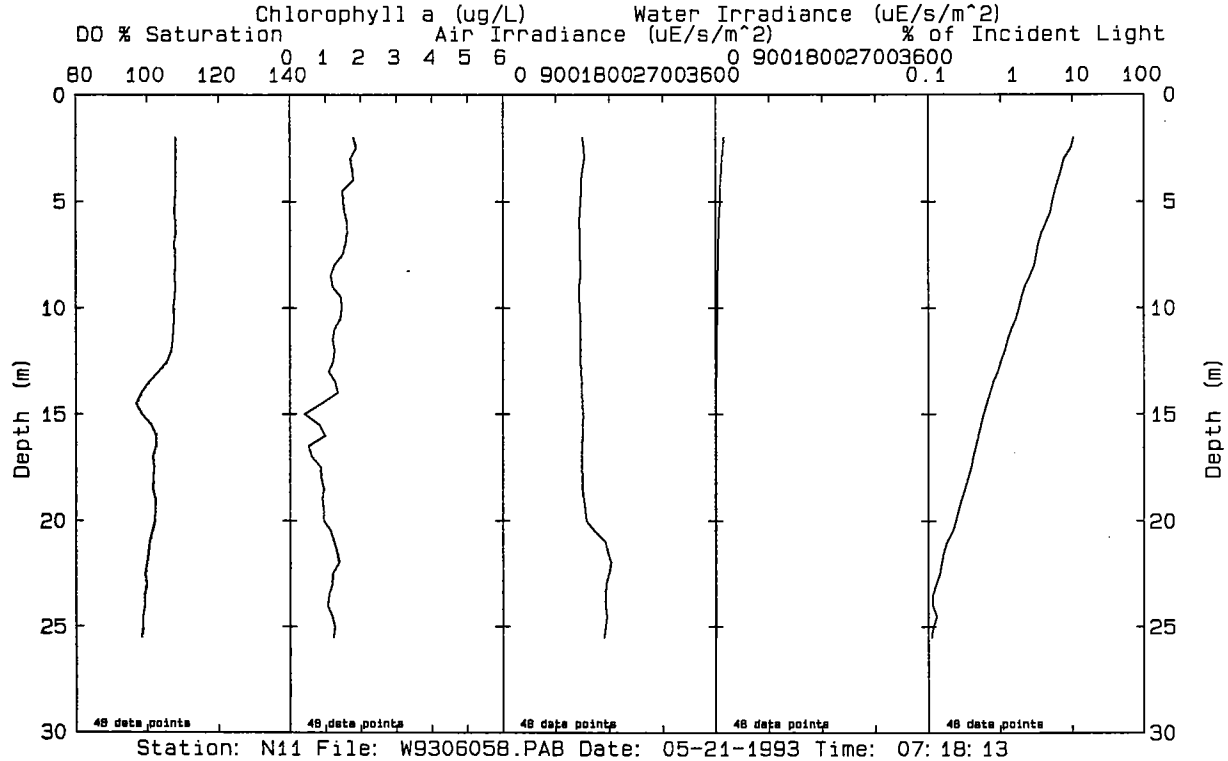


Station: N09 File: W9306105.PAB Date: 05-21-1993 Time: 12:34:28

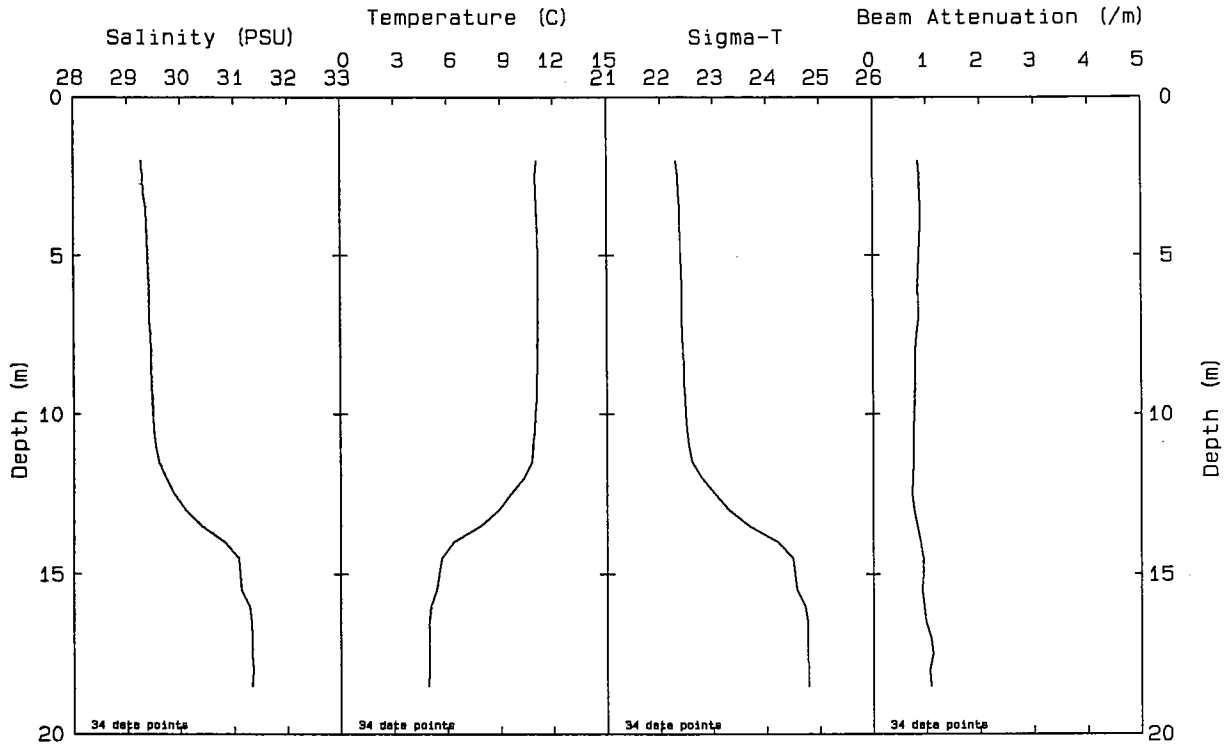

Salinity (PSU)
28 29 30 31 32
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25
38 data points

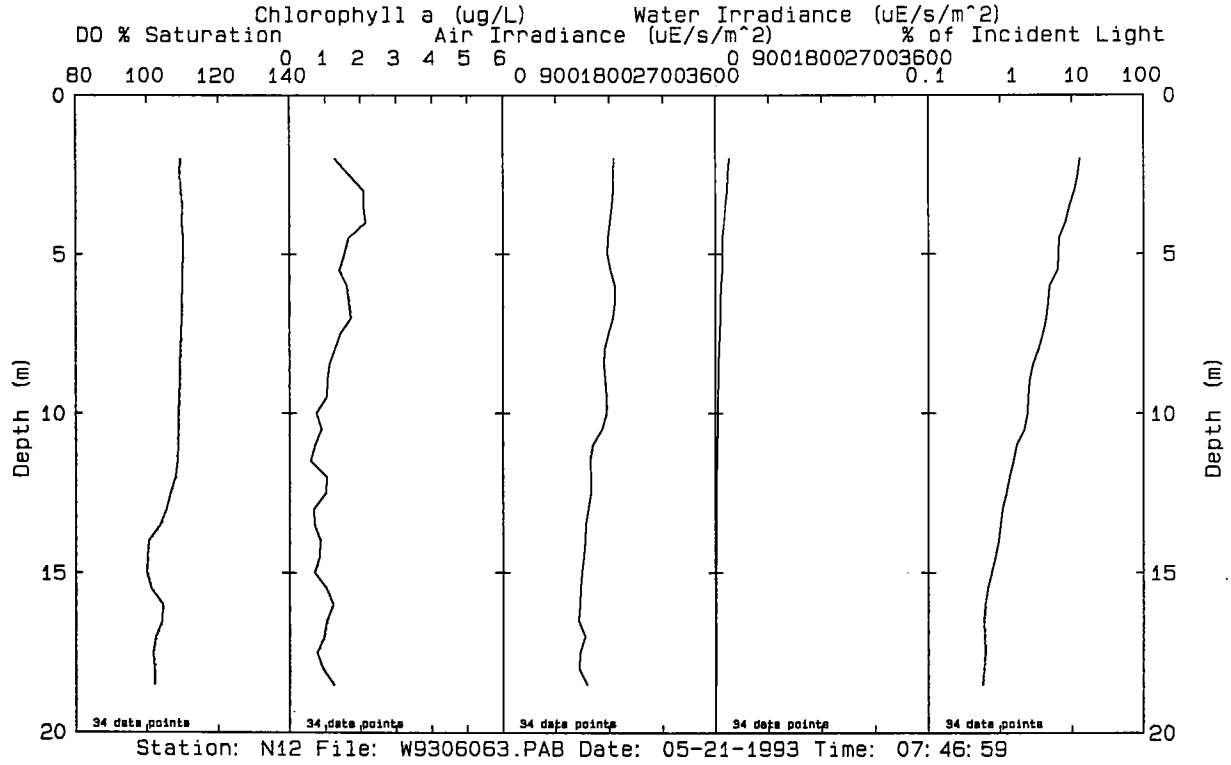

Chlorophyll a (ug/L)
DO % Saturation
80 100 120 140
Air Irradiance (uE/s/m^2)
0 1 2 3 4 5 6
Water Irradiance (uE/s/m^2)
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25
38 data points
Station: N10P File: W9306054.PAB Date: 05-21-1993 Time: 06:35:09



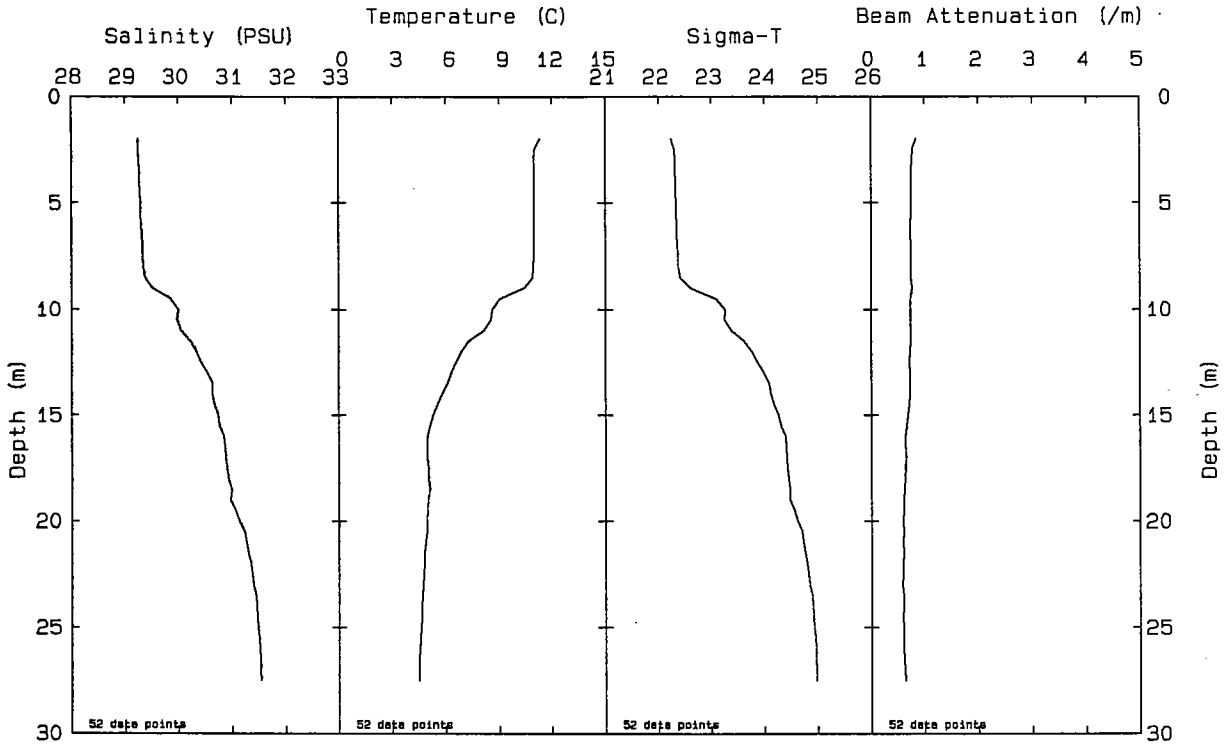


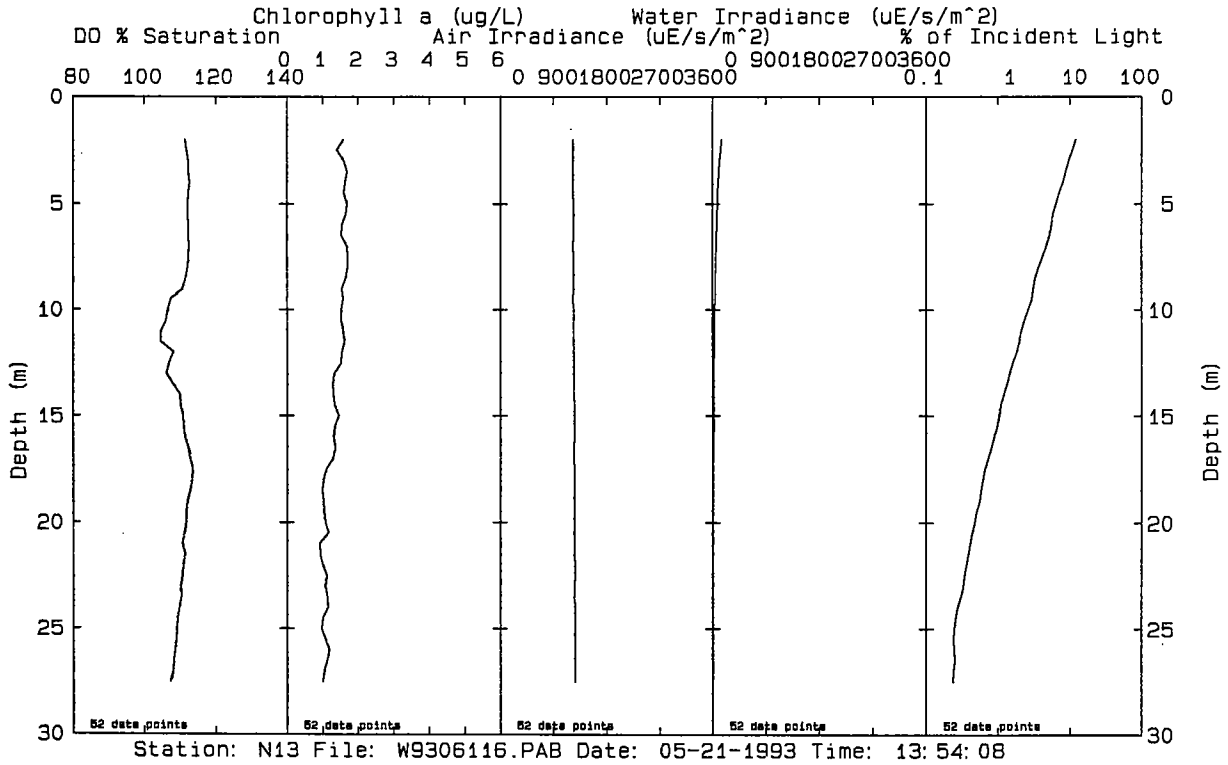
Station: N11 File: W9306058.PAB Date: 05-21-1993 Time: 07:18:13



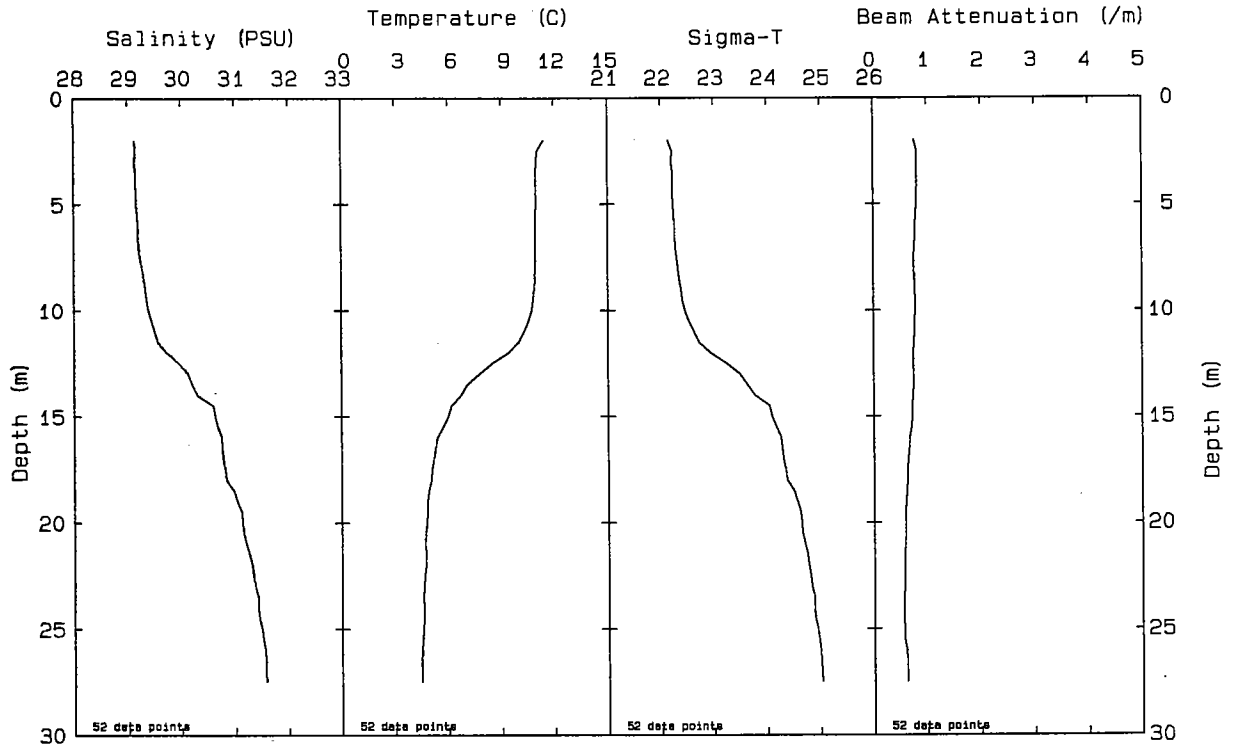


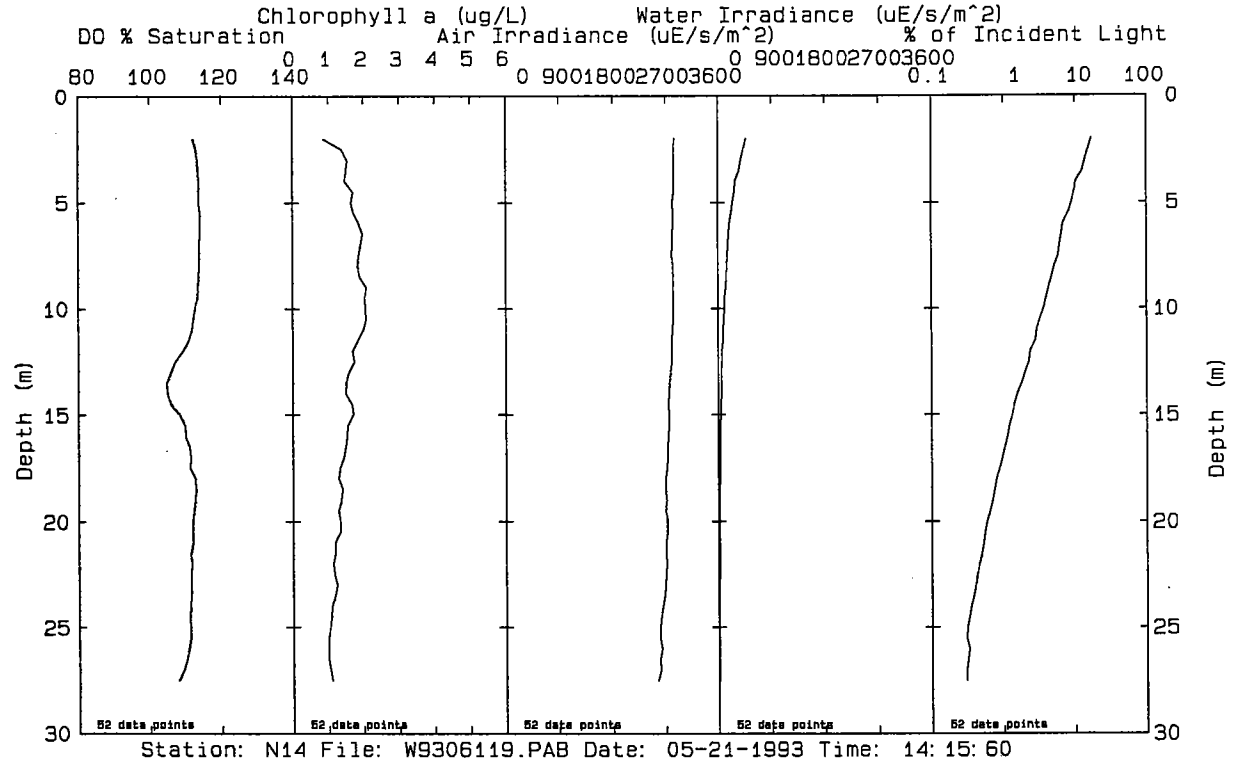
Station: N12 File: W9306063.PAB Date: 05-21-1993 Time: 07:46:59

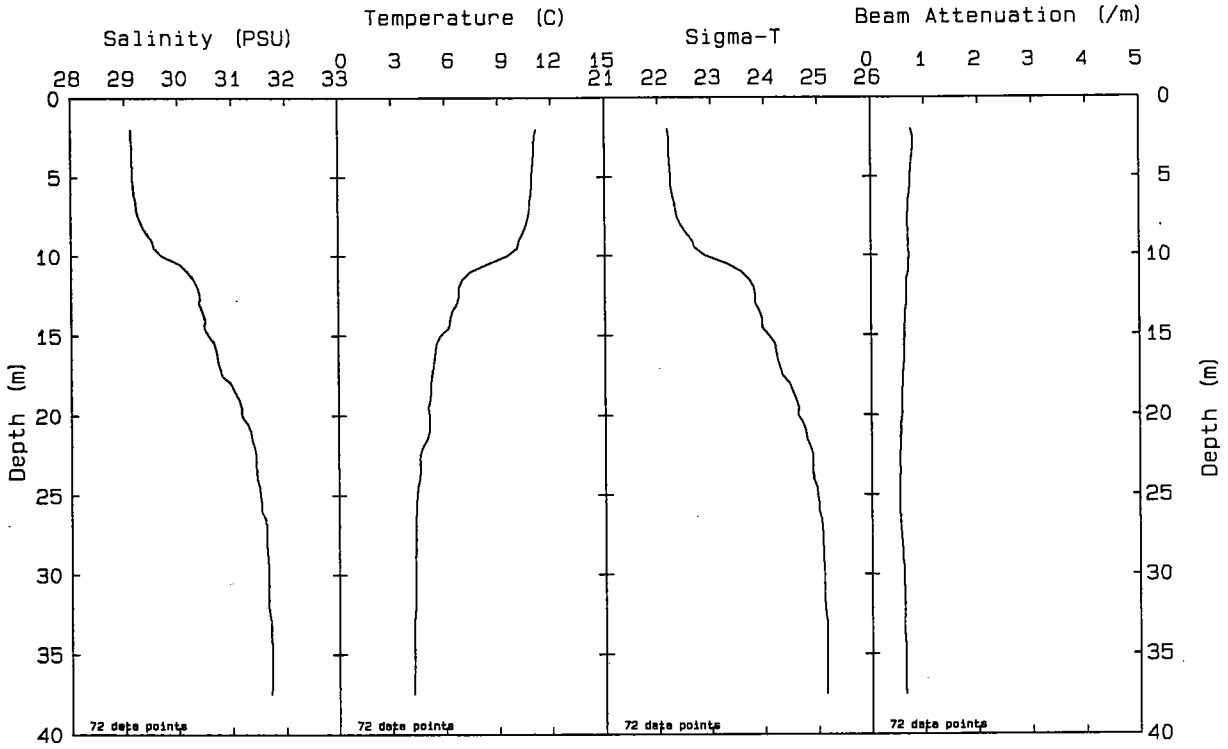


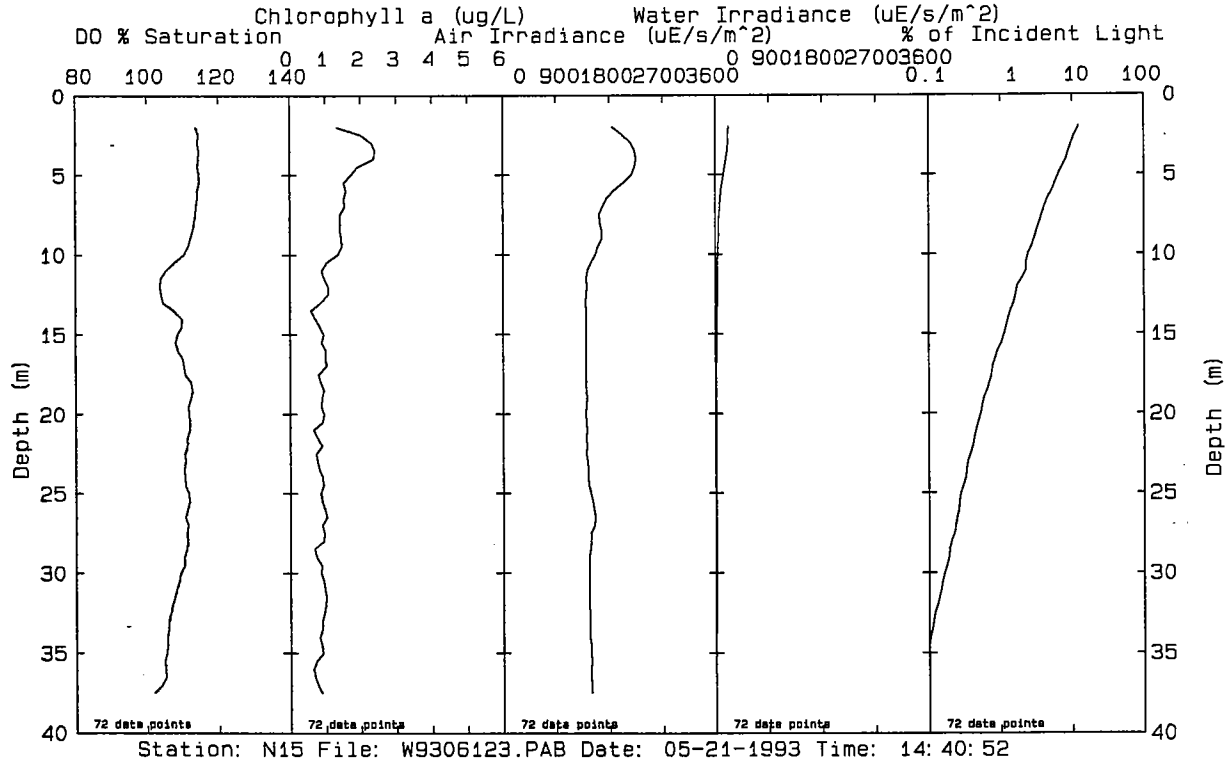


Station: N13 File: W9306116.PAB Date: 05-21-1993 Time: 13:54:08

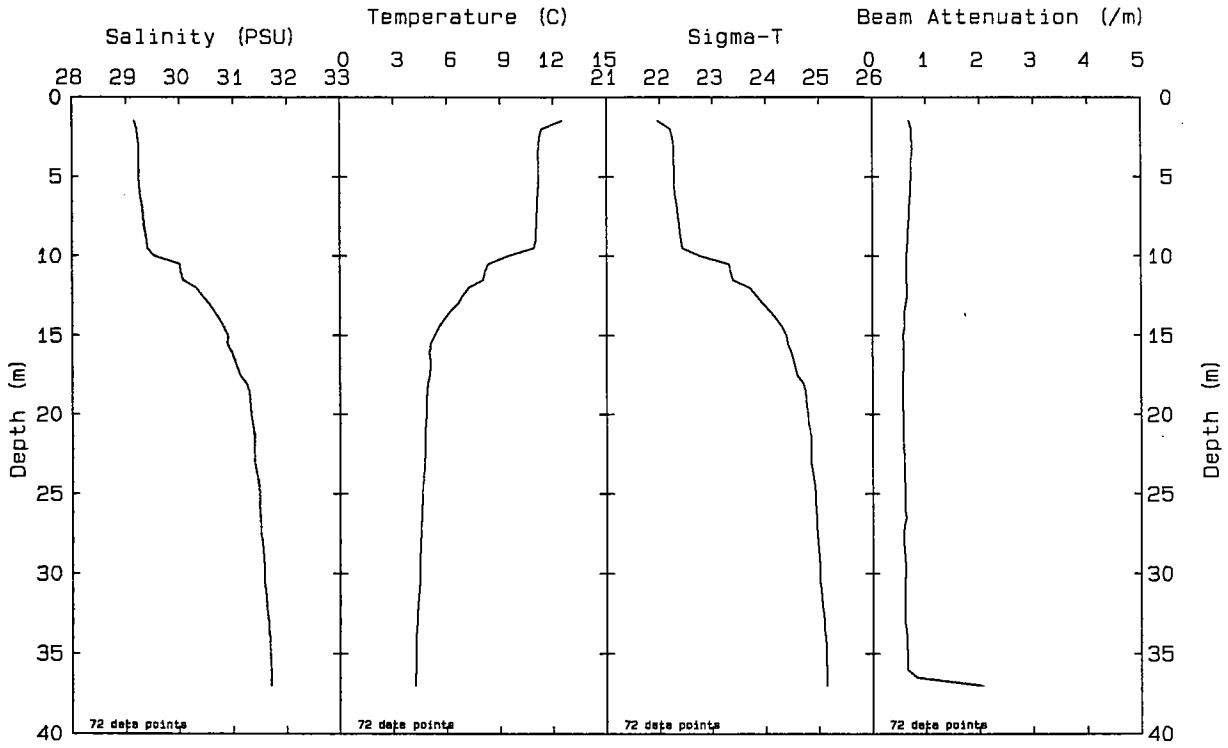

Salinity (PSU)
28 29 30 31 32
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30
52 data points
52 data points
52 data points
52 data points

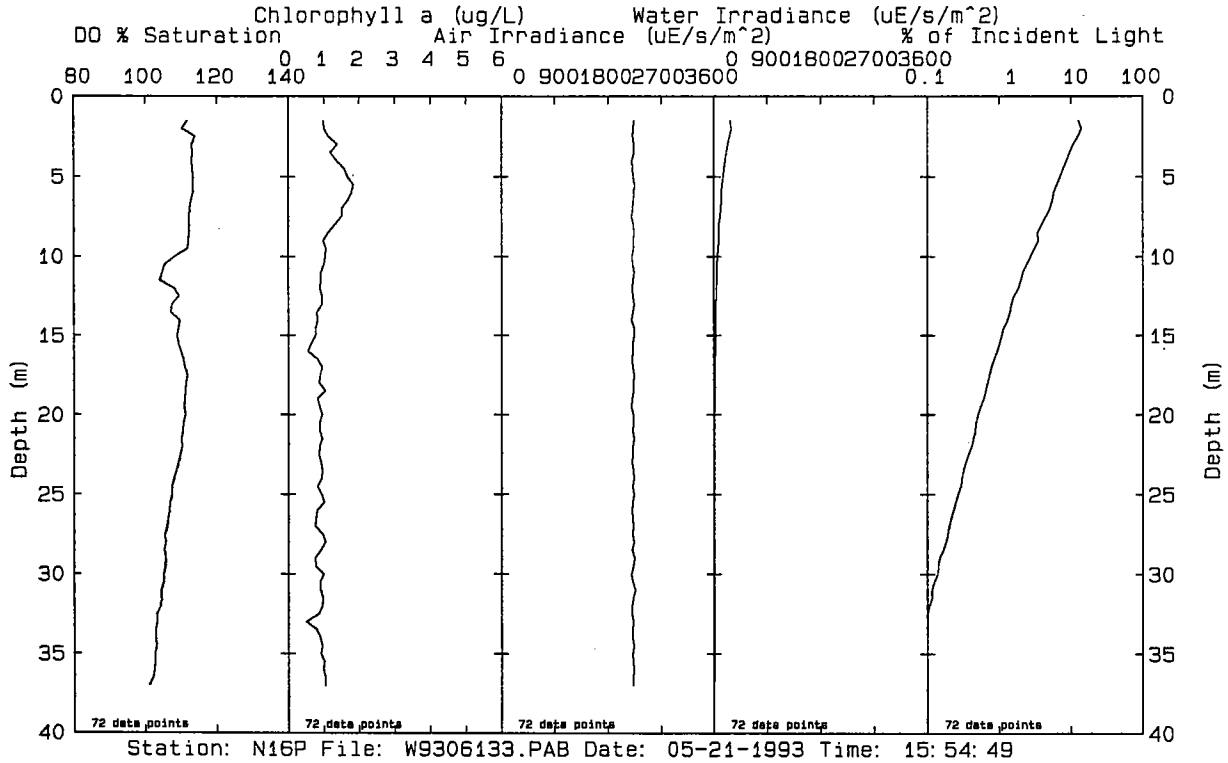

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30
52 data points
52 data points
52 data points
52 data points
52 data points
Station: N14 File: W9306119.PAB Date: 05-21-1993 Time: 14:15:60



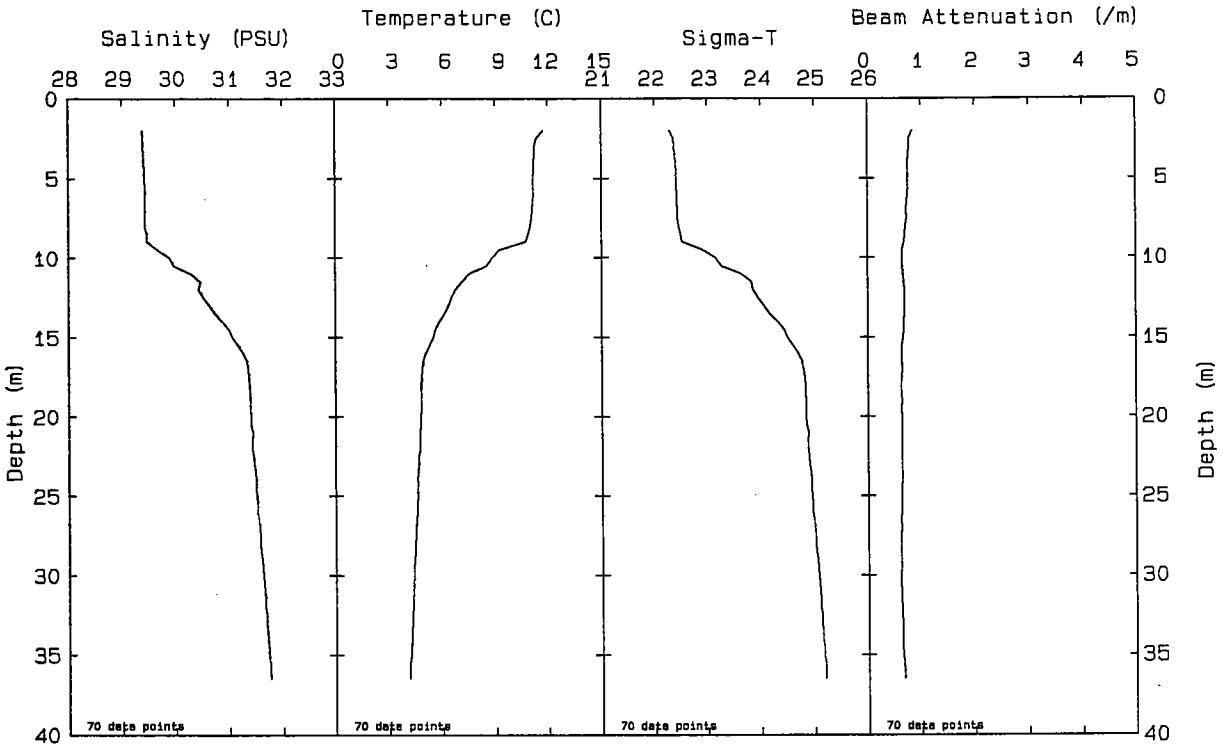


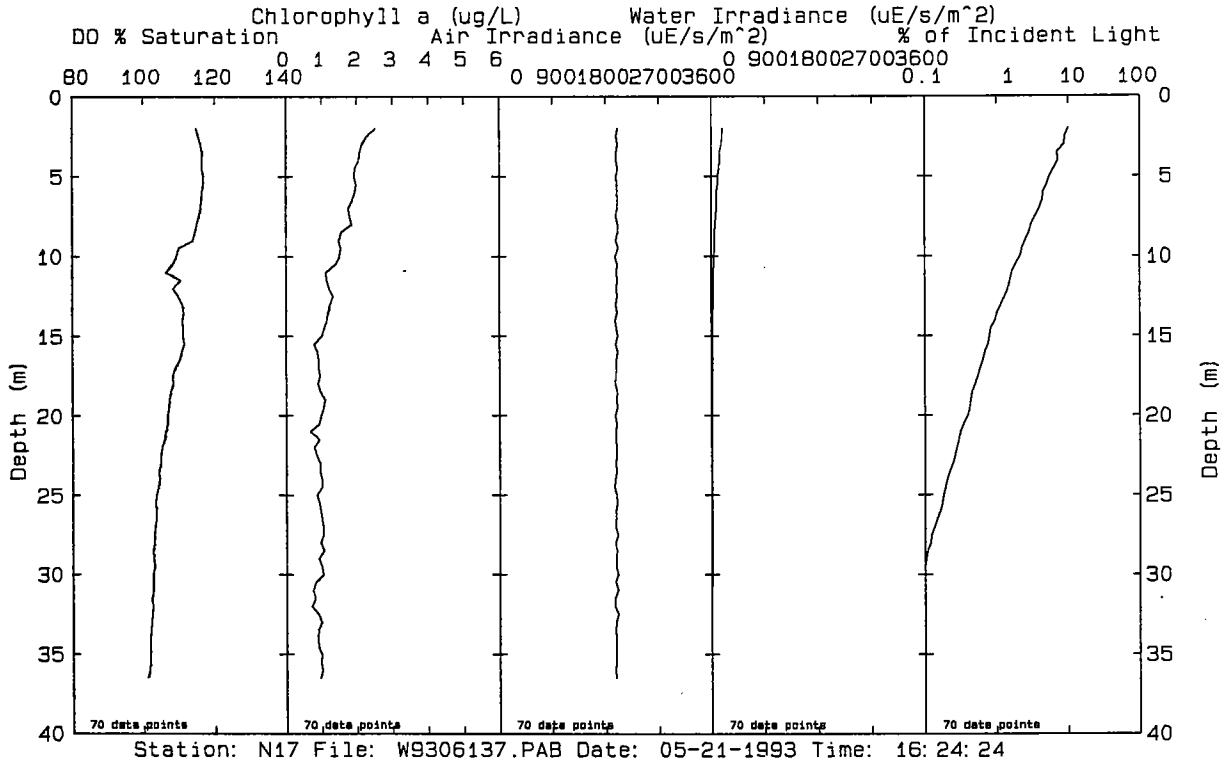
Station: N15 File: W9306123.PAB Date: 05-21-1993 Time: 14:40:52

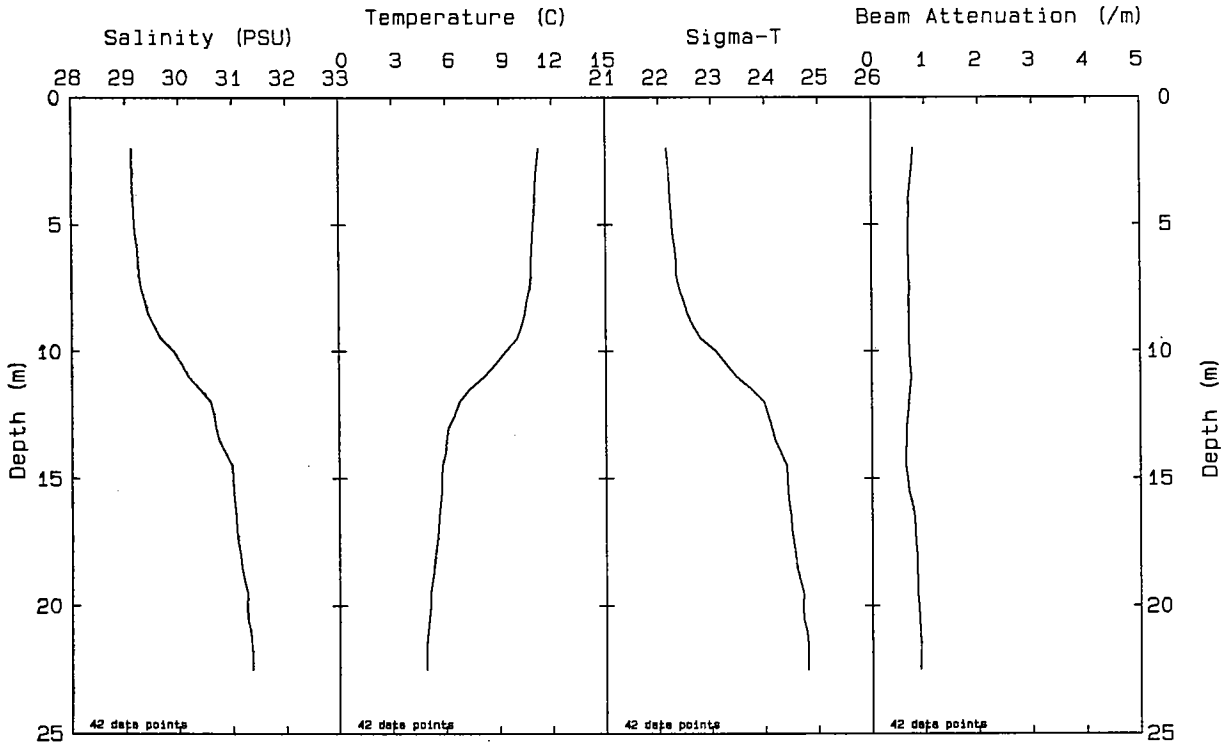


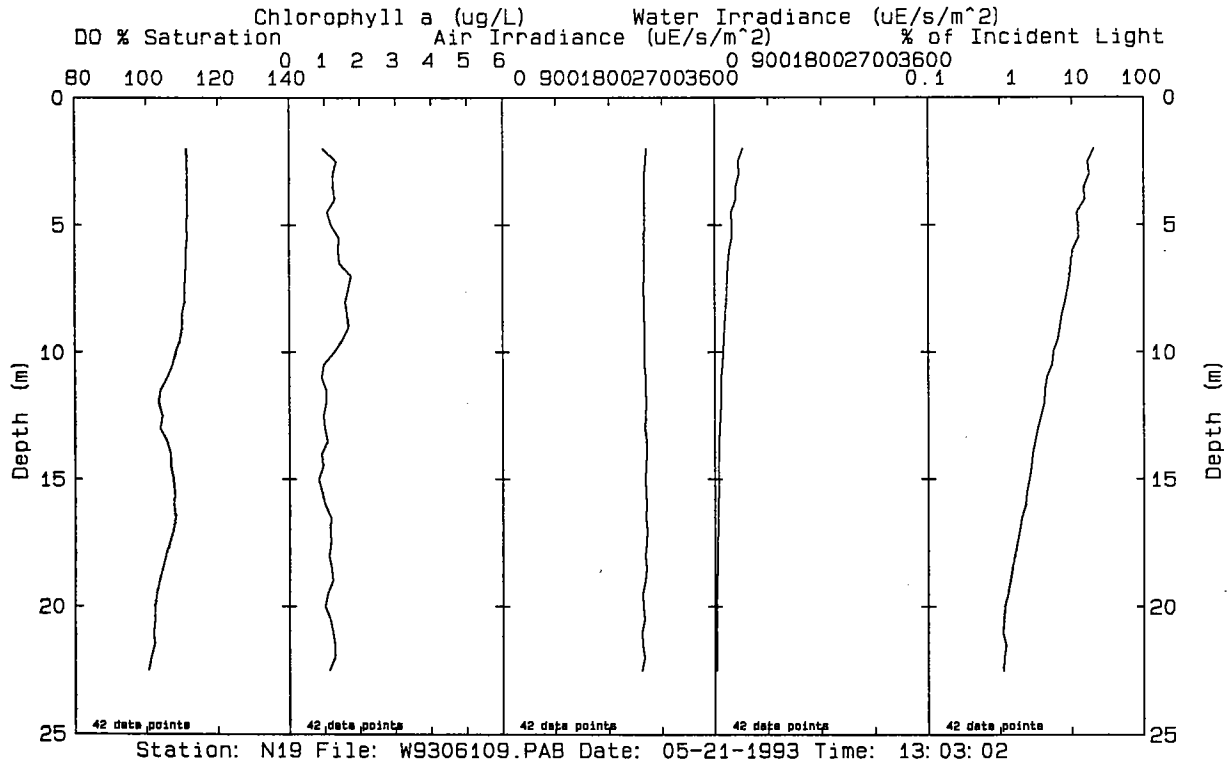


Station: N16P File: W9306133.PAB Date: 05-21-1993 Time: 15:54:49

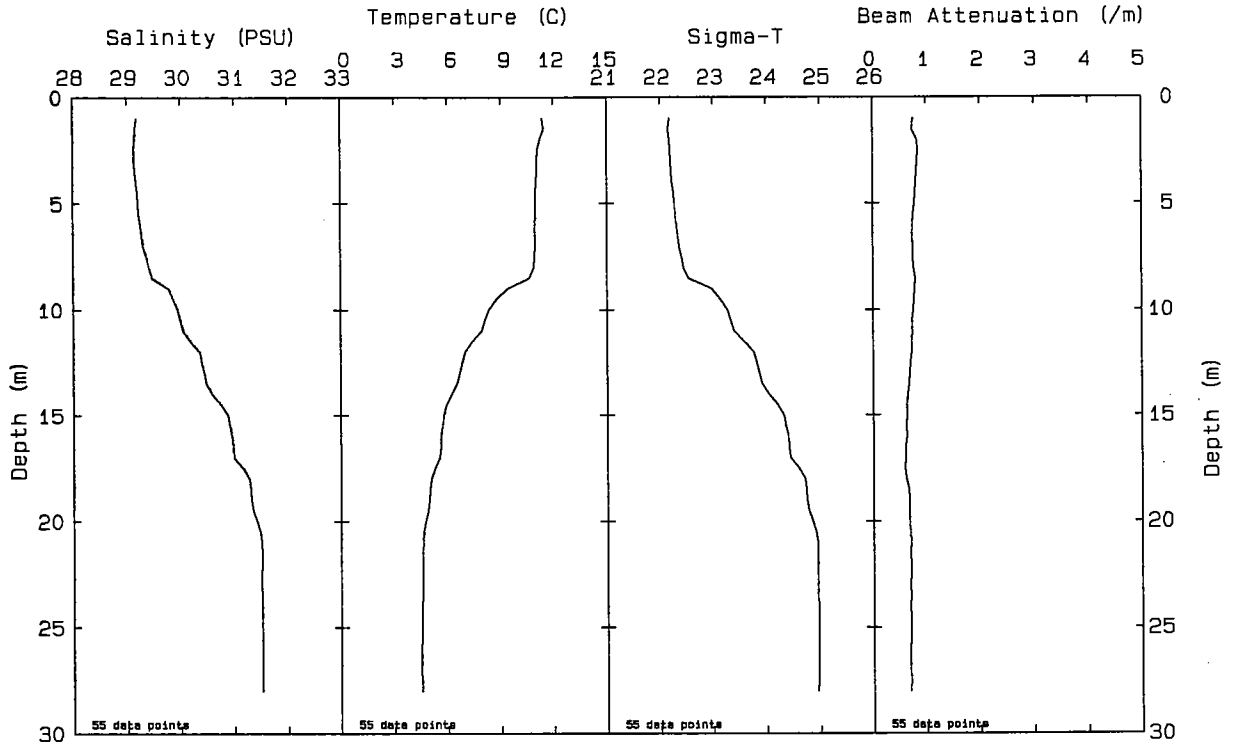

Salinity (PSU)
28 29 30 31 32 33
Temperature (C)
0 3 6 9 12 15
Sigma-T
21 22 23 24 25 26
Beam Attenuation (/m)
0 1 2 3 4 5
Depth (m)
0 5 10 15 20 25 30 35 40
70 data points

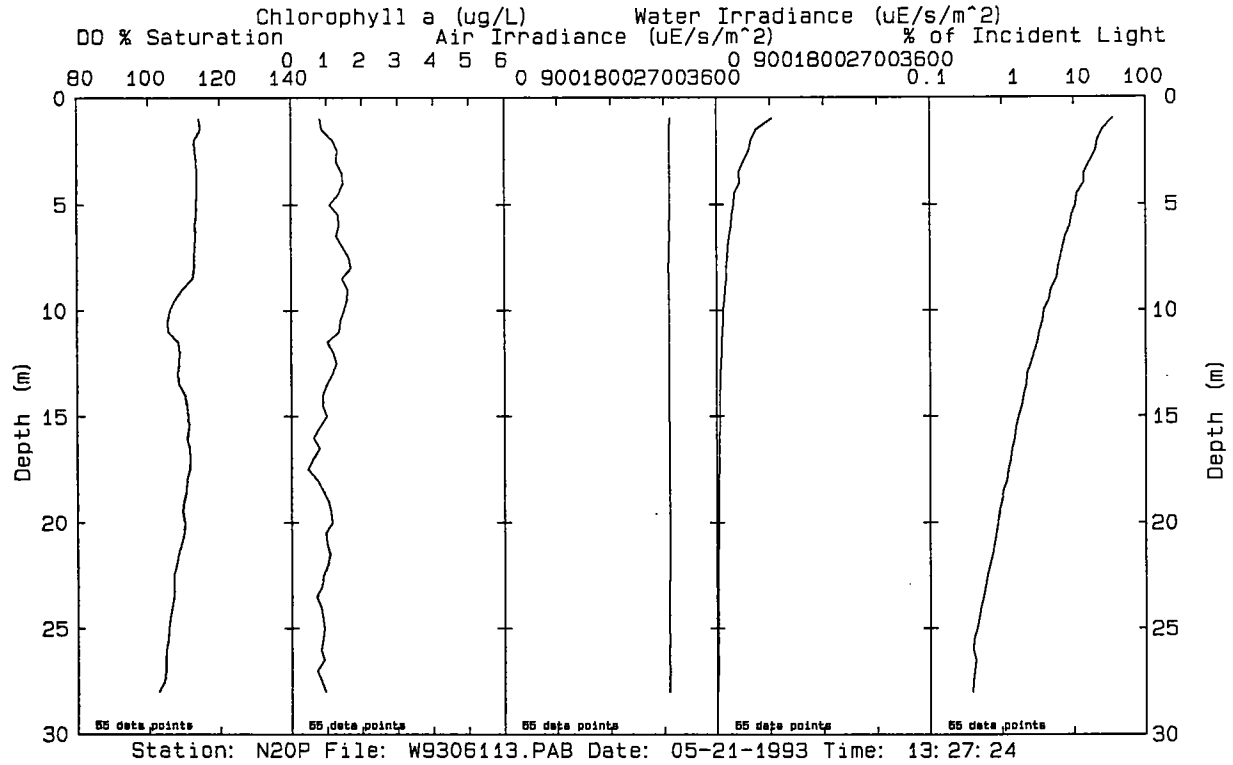

DO % Saturation
80 100 120 140
Chlorophyll a (ug/L)
0 1 2 3 4 5 6
Air Irradiance (uE/s/m^2)
0 900180027003600
Water Irradiance (uE/s/m^2)
0 900180027003600
% of Incident Light
0.1 1 10 100
Depth (m)
0 5 10 15 20 25 30 35 40
70 data points
Station: N17 File: W9306137.PAB Date: 05-21-1993 Time: 16:24:24



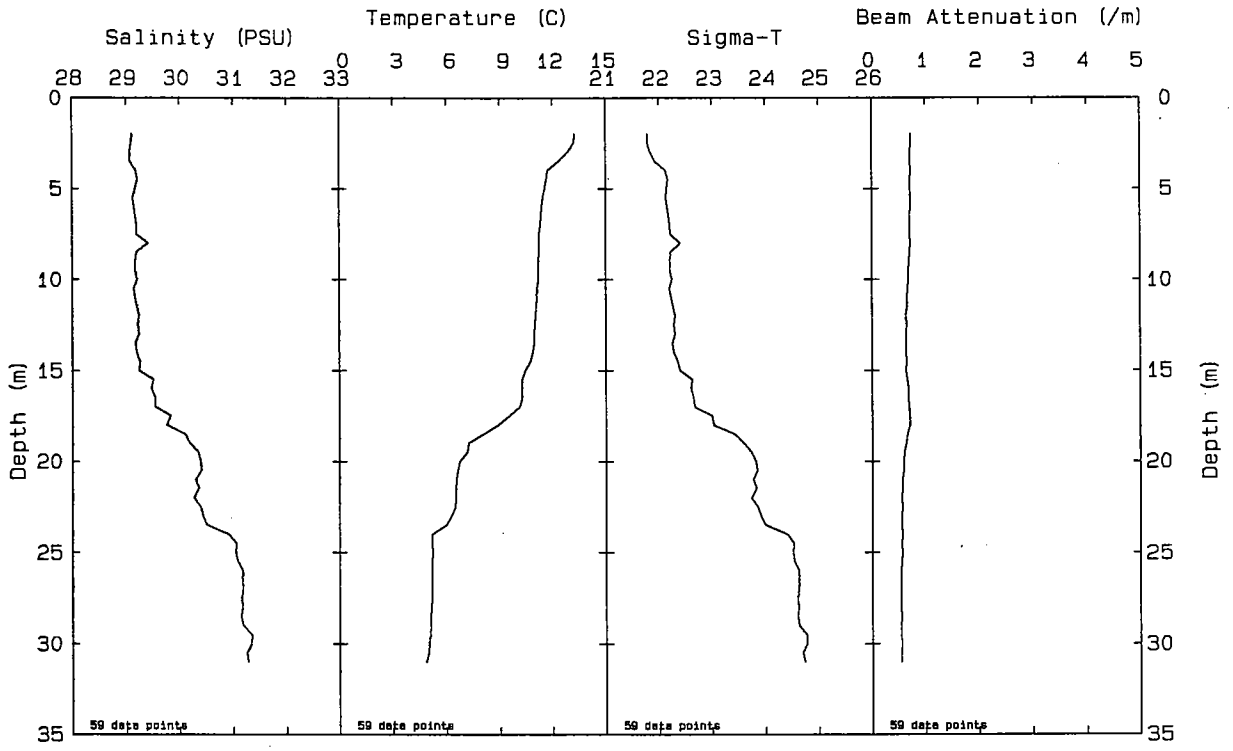


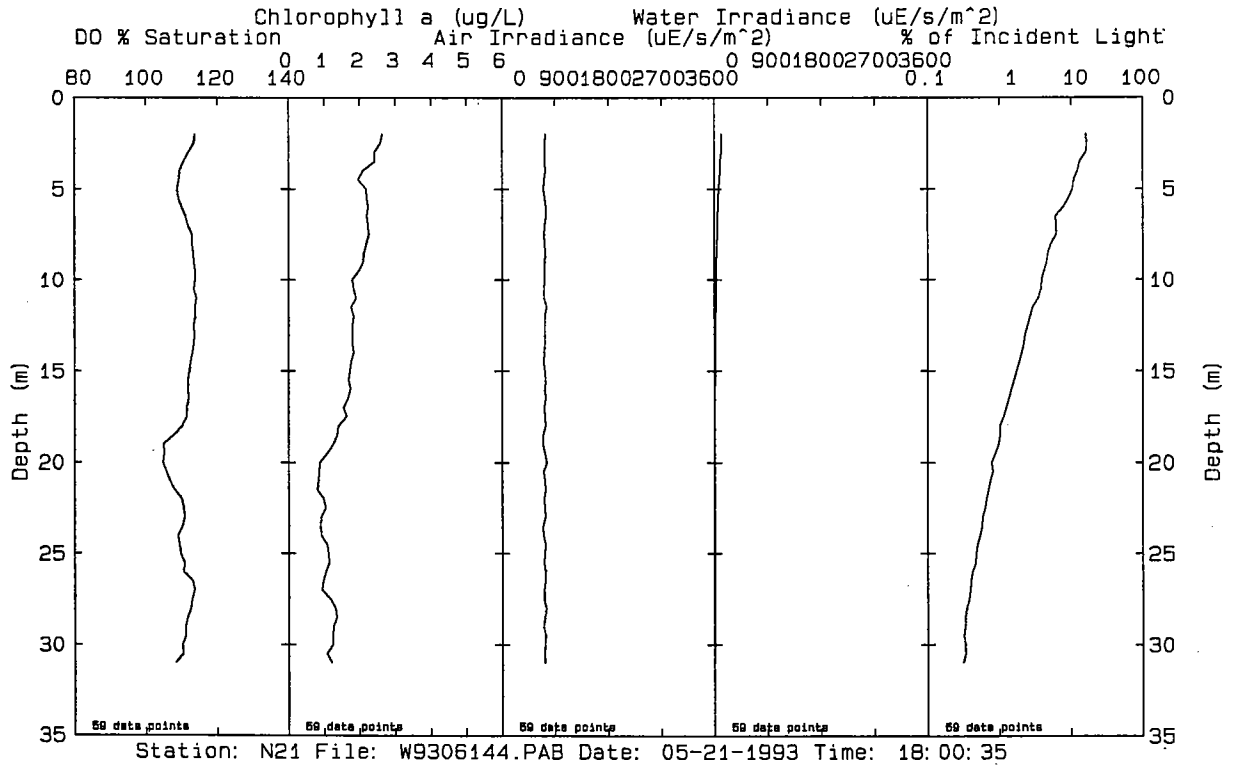
Station: N19 File: W9306109.PAB Date: 05-21-1993 Time: 13:03:02





Station: N20P File: W9306113.PAB Date: 05-21-1993 Time: 13:27:24





Station: N21 File: W9306144.PAB Date: 05-21-1993 Time: 18:00:35

APPENDIX C

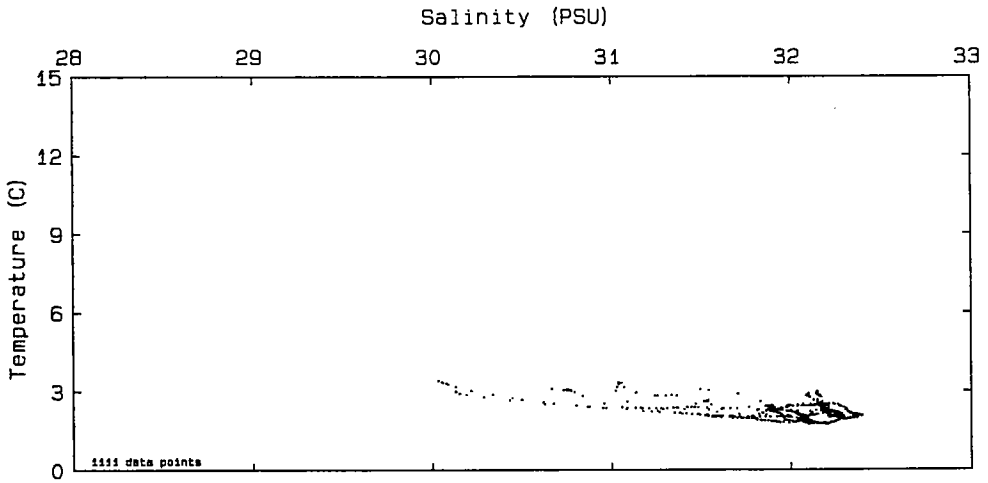
COMPARISON OF VERTICAL PROFILE DATA: SCATTER PLOTS

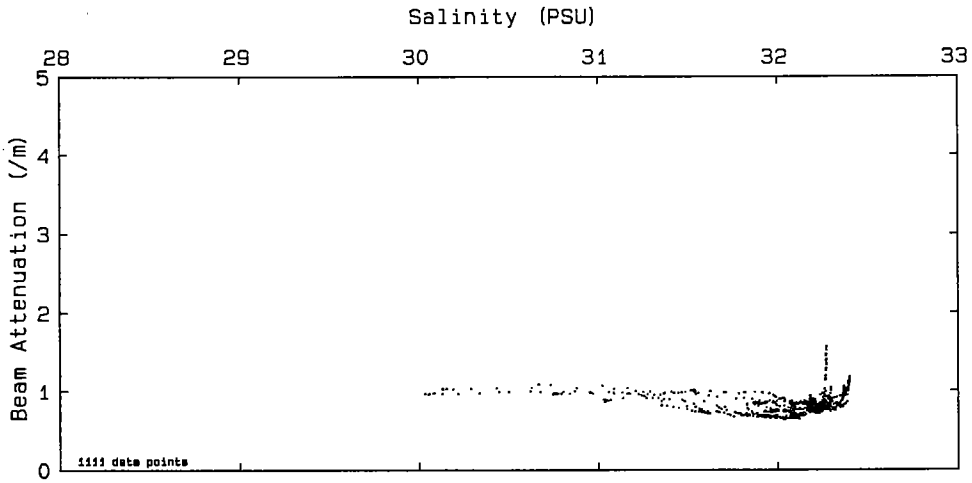
Parameter-Parameter Plots of Vertical Profile Data, Combined Surveys

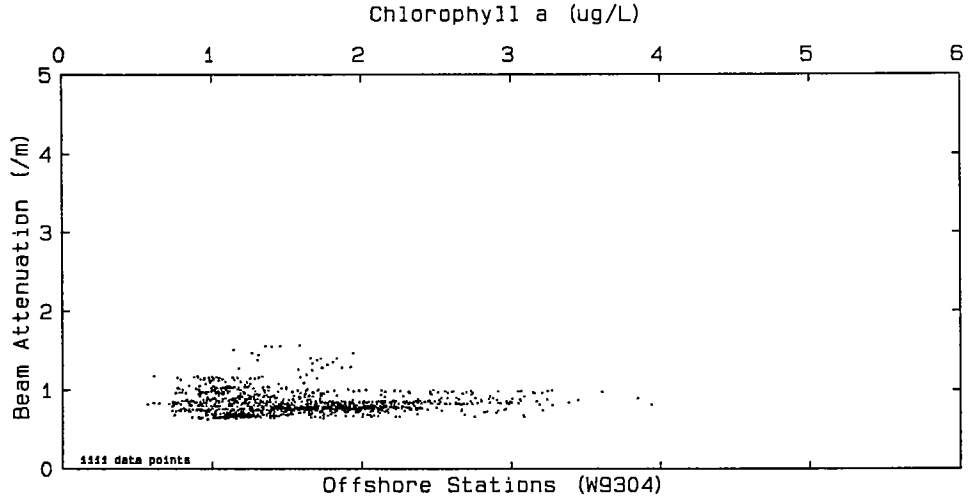
Note that for nearfield surveys, all plots are given as figures in the accompanying text report. For combined surveys, composite plots (all stations) are given as figures in the accompanying text report.

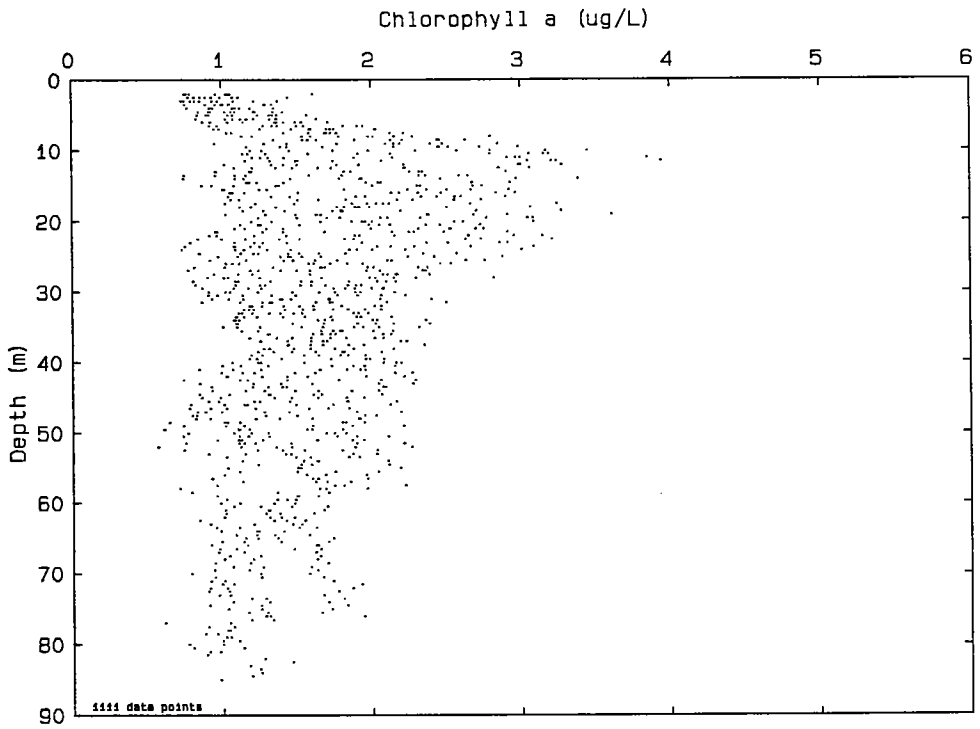
The plots for the early April survey (W9304) given here separate stations by station groups as defined in the text report.

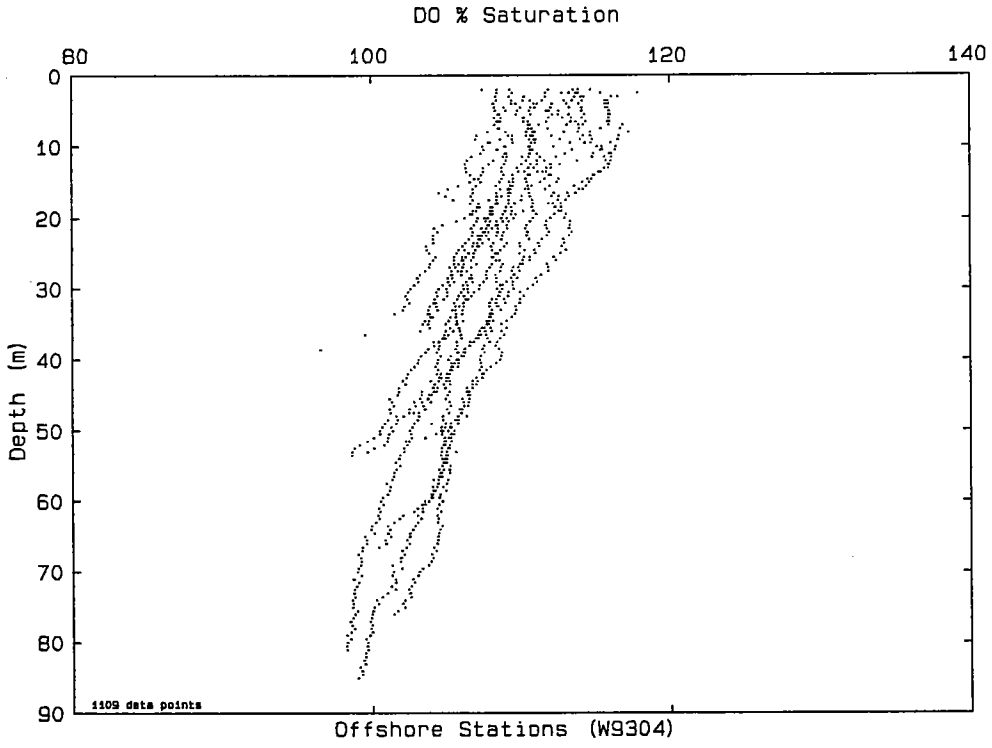
Data are as described in Appendix B and include the entire profile at each station.

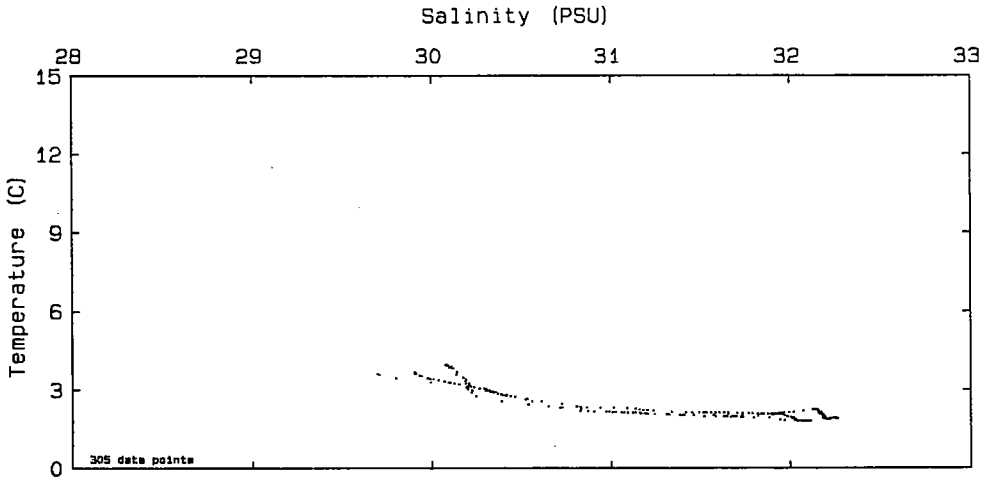

Salinity (PSU)
28
29
30
31
32
33
15
12
9
6
3
0
Temperature (C)
1111 data points

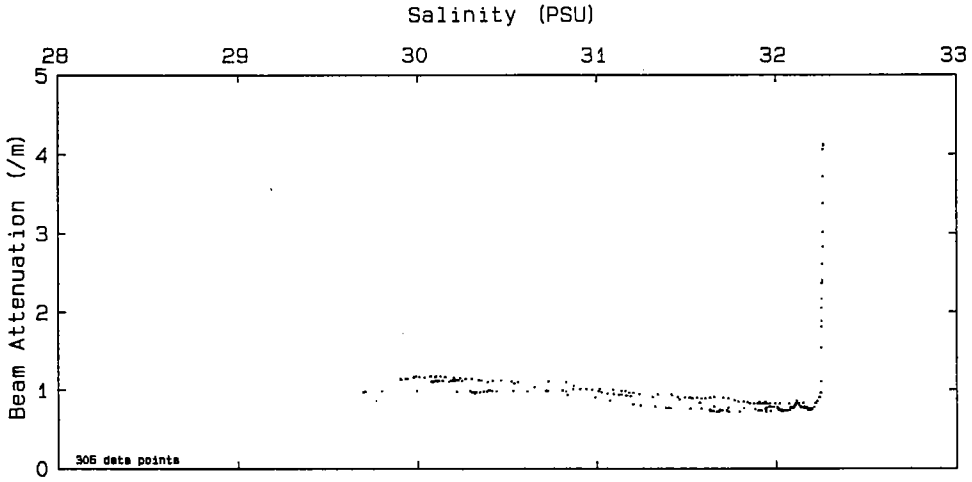

Salinity (PSU)
28
29
30
31
32
33
5
4
3
2
1
0
Beam Attenuation (/m)
1111 data points

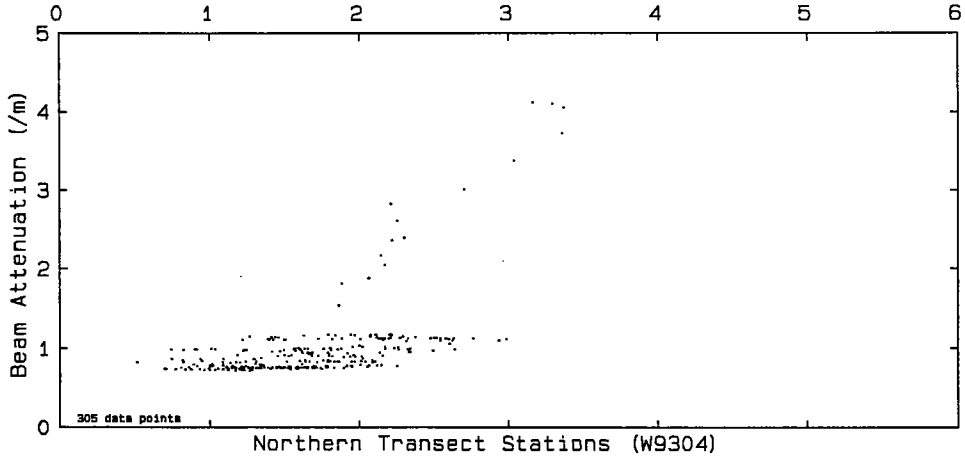

Chlorophyll a (ug/L)
0
1
2
3
4
5
6
5
4
3
2
1
0
Beam Attenuation (/m)
1111 data points
Offshore Stations (W9304)

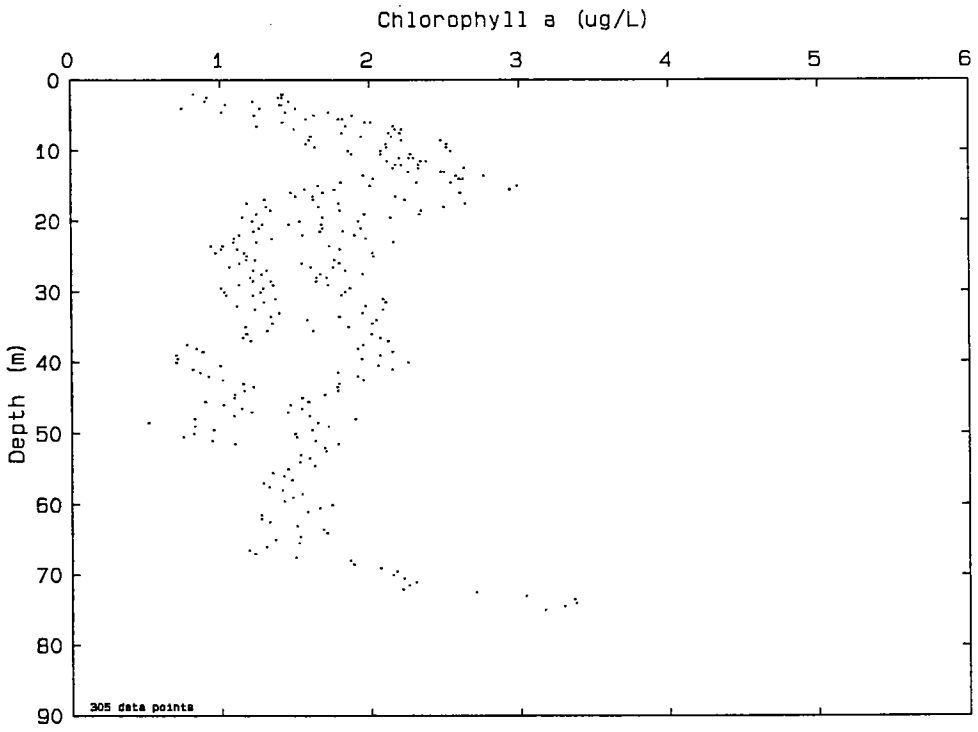

Chlorophyll a (ug/L)
0
1
2
3
4
5
6
Depth (m)
0
10
20
30
40
50
60
70
80
90
1111 data points

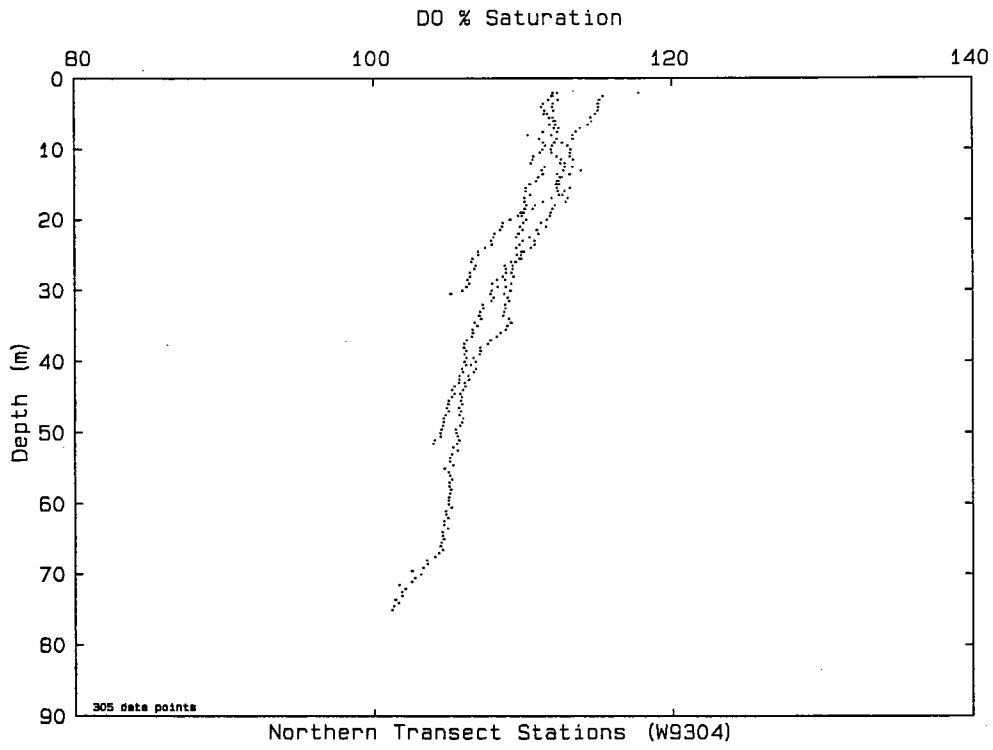

DO % Saturation
80
100
120
140
Depth (m)
0
10
20
30
40
50
60
70
80
90
1109 data points
Offshore Stations (W9304)


Salinity (PSU)
28
29
30
31
32
33
15
12
9
6
3
0
Temperature (C)
305 data points

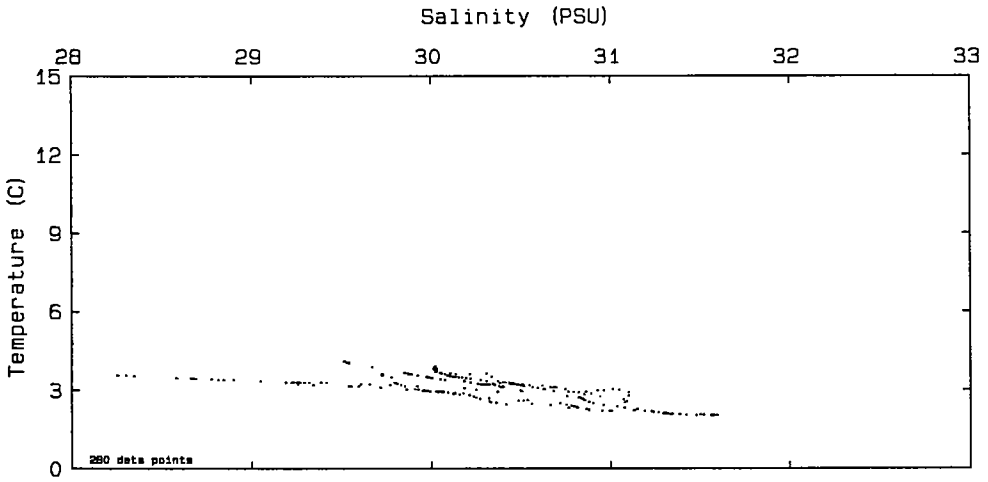

Salinity (PSU)
28
29
30
31
32
33
5
4
3
2
1
0
Beam Attenuation (/m)
305 data points

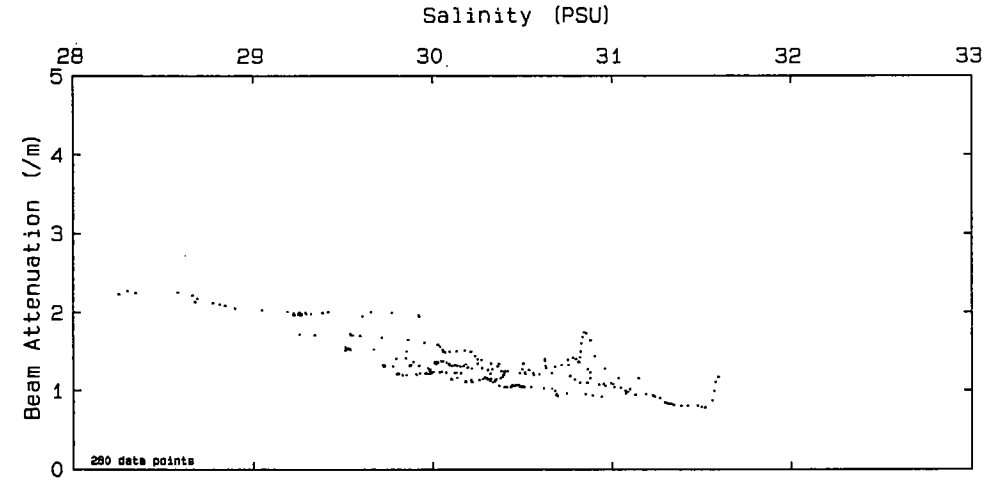

Chlorophyll a (ug/L)
0
1
2
3
4
5
6
5
4
3
2
1
0
Beam Attenuation (/m)
305 data points
Northern Transect Stations (W9304)

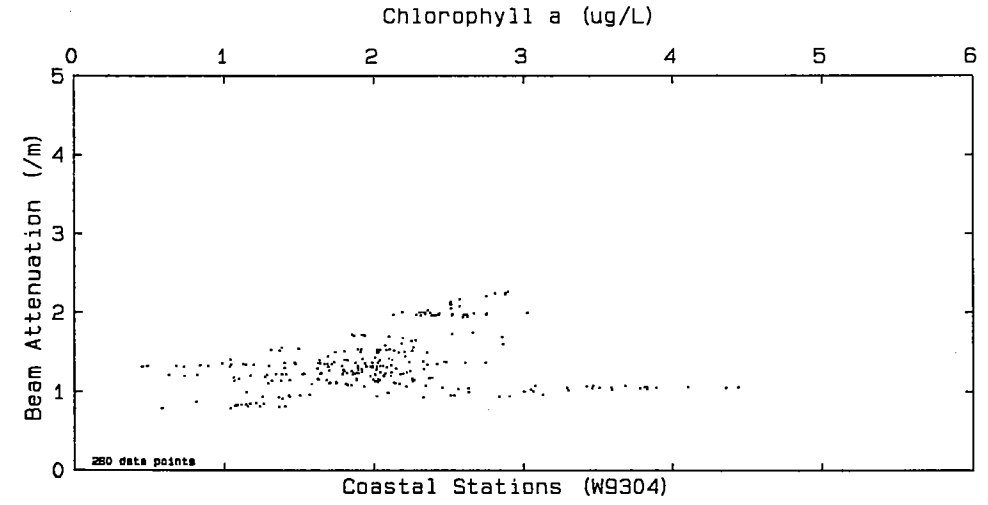


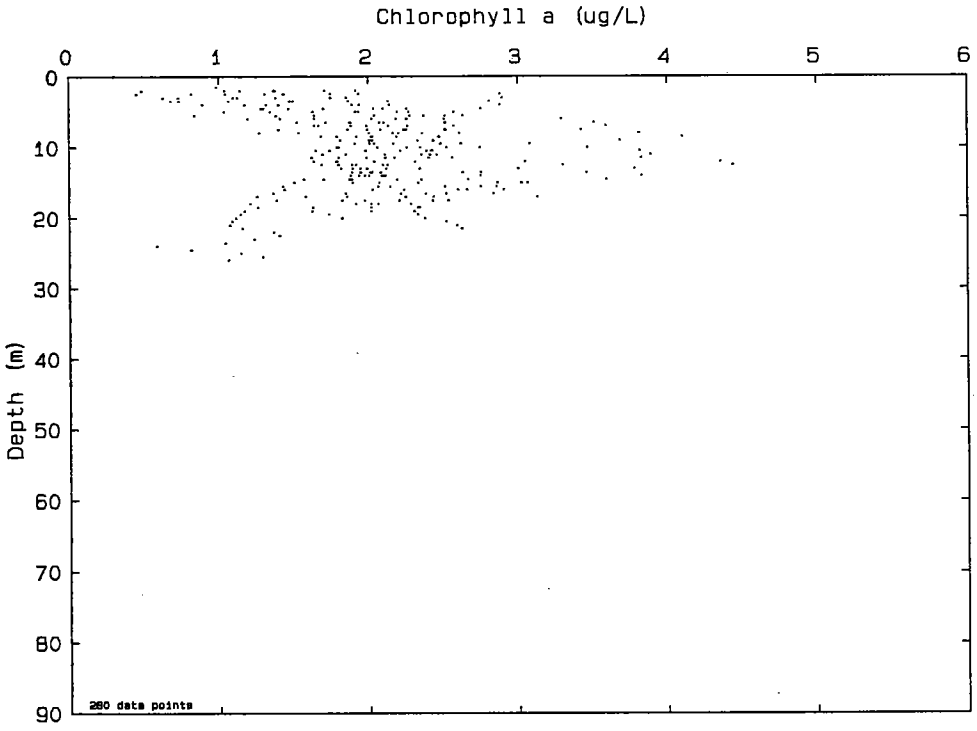


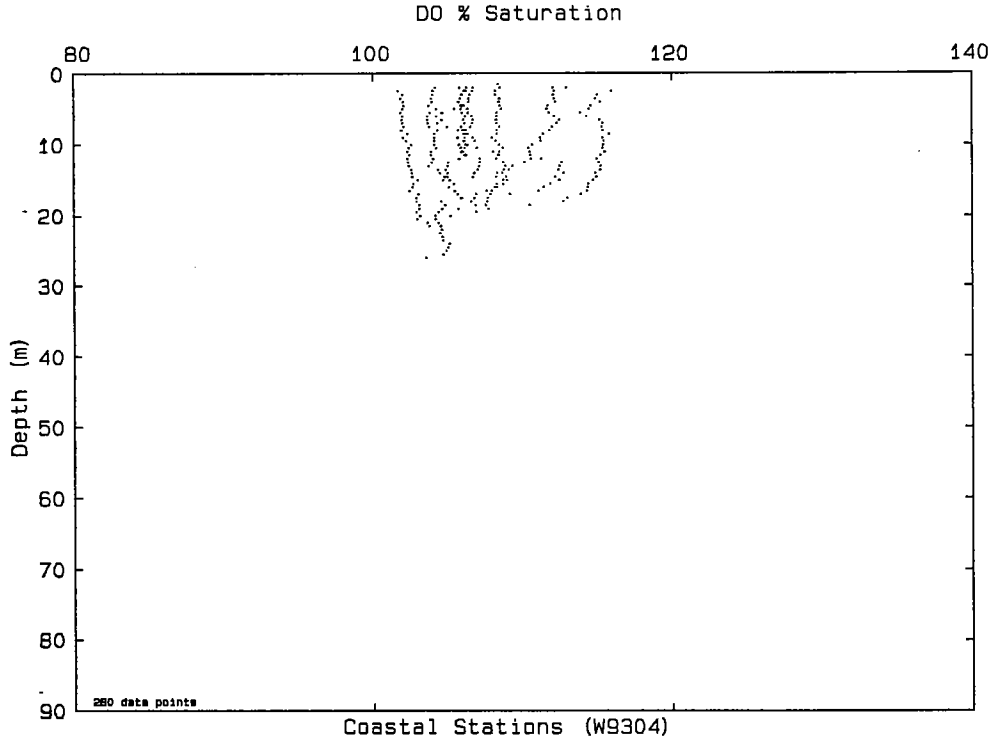
08-13-1993 09:45:50 Battelle

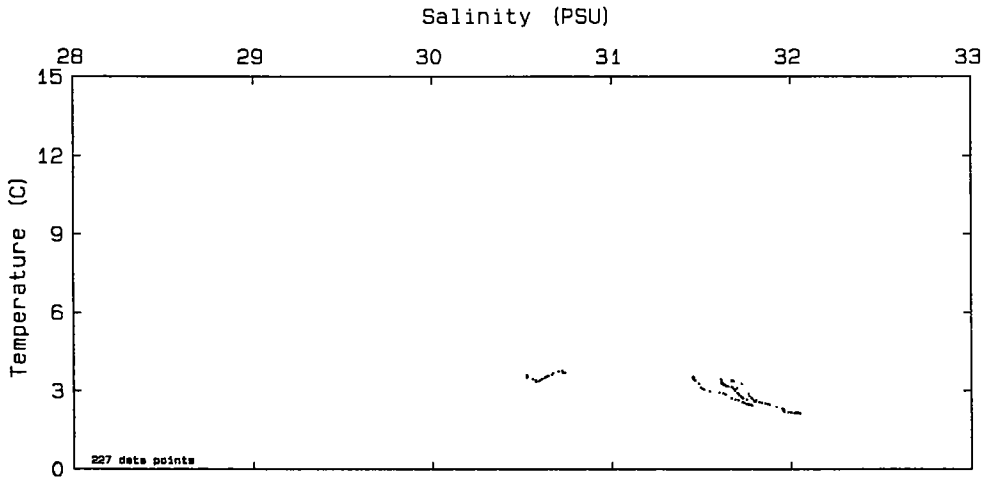

Salinity (PSU)
28
29
30
31
32
33
15
12
9
6
3
0
Temperature (C)
280 data points

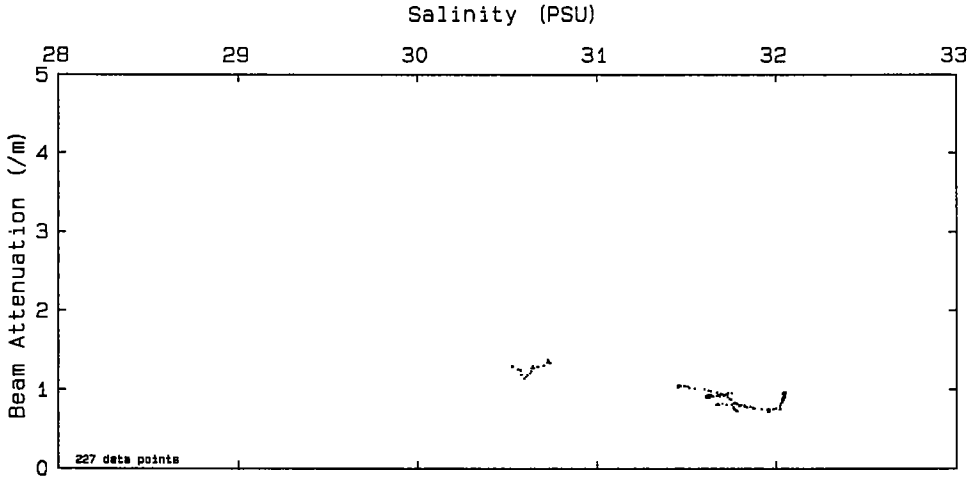

Salinity (PSU)
28
29
30
31
32
33
5
4
3
2
1
0
Beam Attenuation (/m)
280 data points

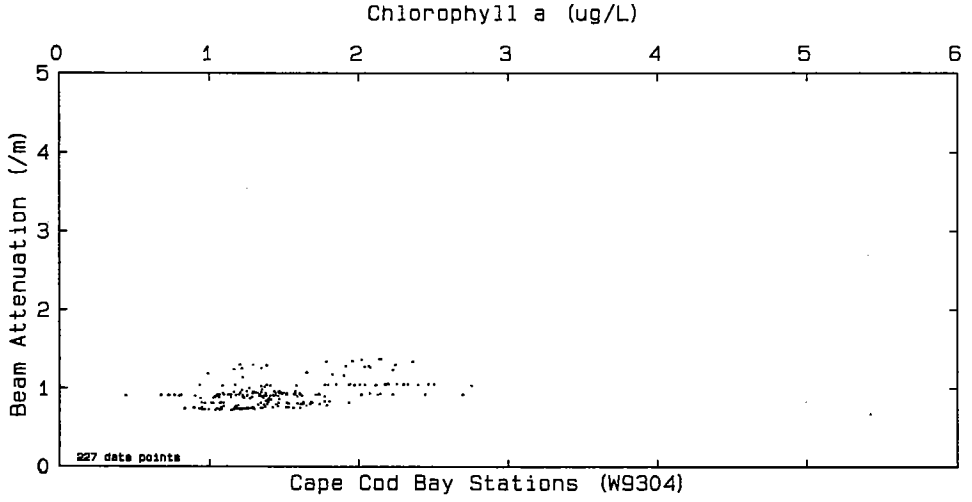

Chlorophyll a (ug/L)
0
1
2
3
4
5
6
5
4
3
2
1
0
Beam Attenuation (/m)
280 data points
Coastal Stations (W9304)

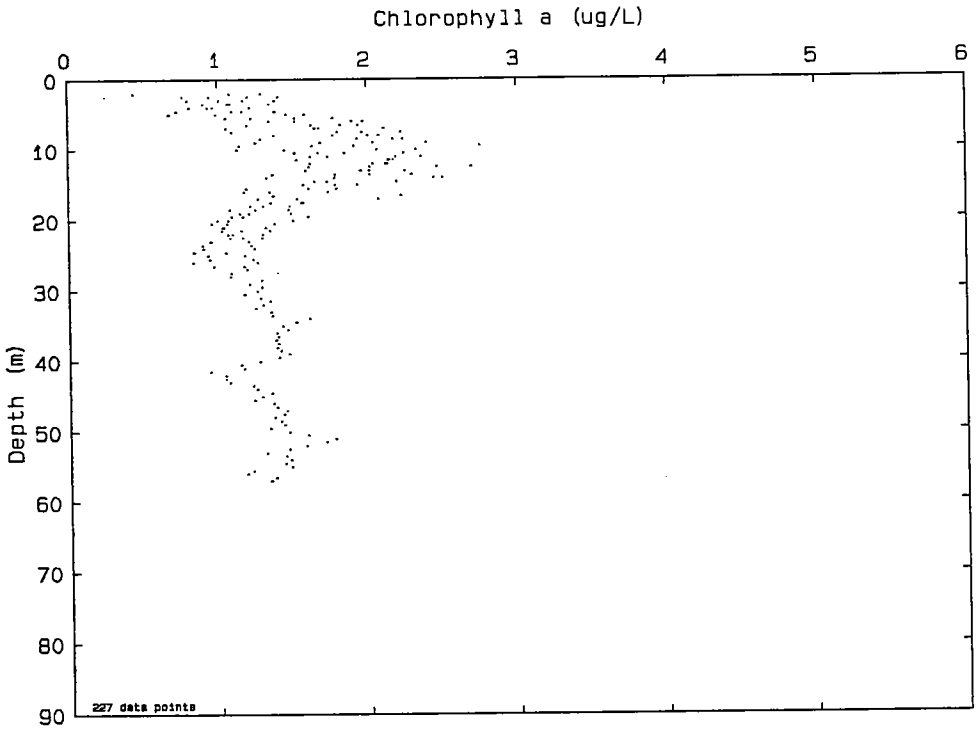

Chlorophyll a (ug/L)
0
1
2
3
4
5
6
Depth (m)
0
10
20
30
40
50
60
70
80
90
280 data points

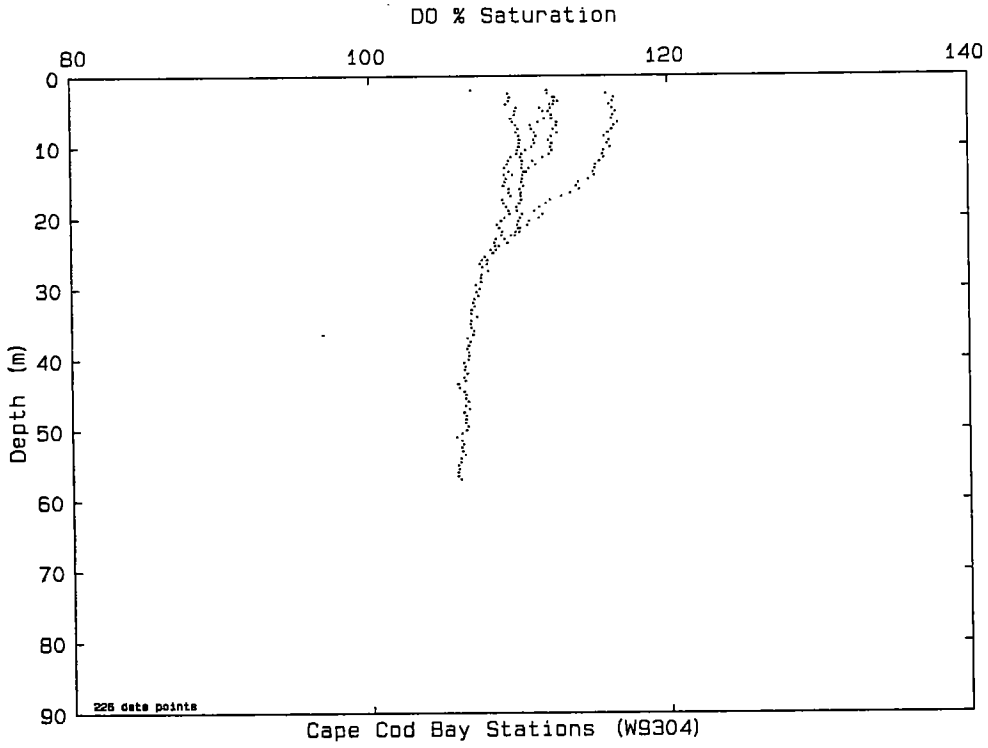

DO % Saturation
80
100
120
140
Depth (m)
0
10
20
30
40
50
60
70
80
90
280 data points
Coastal Stations (W9304)


Salinity (PSU)
28
29
30
31
32
33
15
12
9
6
3
0
Temperature (C)
227 data points


Salinity (PSU)
28
29
30
31
32
33
5
4
3
2
1
0
Beam Attenuation (/m)
227 data points


Chlorophyll a (ug/L)
0
1
2
3
4
5
6
5
4
3
2
1
0
Beam Attenuation (/m)
227 data points
Cape Cod Bay Stations (W9304)


Chlorophyll a (ug/L)
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90
Depth (m)
227 data points


DO % Saturation
80
100
120
140
0
10
20
30
40
50
60
70
80
90
Depth (m)
226 data points
Cape Cod Bay Stations (W9304)

00123

APPENDIX D

ADDITIONAL TOWING PROFILE DATA FROM NEARFIELD STATIONS

For this report, all plots are included directly in the text report and this appendix is intentionally left blank.

APPENDIX E

METABOLISM DATA AND PRODUCTIVITY—IRRADIANCE MODELING

Part 1

^{14}C Incubation Data

Table E1-1 includes data from the early April (W9304) survey. The table includes data for samples from the BioProductivity stations that were incubated from surface and chlorophyll maximum depths (dark and light bottles). ^{14}C-Production was calculated using measured DIC and after subtraction of the mean (n=3) dark bottle uptake rates as described in the text report. Where ^{14}C (DPM) for a dark bottle are labeled with an "s" qualifier the data were suspect and were not used in calculating production. In Appendix E, Part 2, the criterion used for rejecting suspect data is given.

Table E1-1. C14 Production at Bioproductivity Stations in April of 1993.

Event	Station	Date	Time	Depth (M)	Sample id	Rep	Level	Light uEm/m²/sec	C14 (DPM)	Dissolved Inorganic Carbon (mg C/L)	Length of incubation (hours)	Production (Dark corrected) (mg C/m³/hr)	Stock (DPM)
W9304	F01P	08-APR-93	0907	2.40	W93040401					25.3	6.0		6220000.0
W9304	F01P	08-APR-93	0907	2.40	W93040401	-3	DARK	0	435.9				
W9304	F01P	08-APR-93	0907	2.40	W93040401	-2	DARK	0	329.9				
W9304	F01P	08-APR-93	0907	2.40	W93040401	-1	DARK	0	846.6				
W9304	F01P	08-APR-93	0907	2.40	W93040401	1	LIGHT	4	184.8			-0.3	
W9304	F01P	08-APR-93	0907	2.40	W93040401	2	LIGHT	4	272.0			-0.2	
W9304	F01P	08-APR-93	0907	2.40	W93040401	3	LIGHT	28	1886.7			1.0	
W9304	F01P	08-APR-93	0907	2.40	W93040401	4	LIGHT	44	2453.9			1.4	
W9304	F01P	08-APR-93	0907	2.40	W93040401	5	LIGHT	73	4573.7			2.9	
W9304	F01P	08-APR-93	0907	2.40	W93040401	6	LIGHT	231	7642.7			5.1	
W9304	F01P	08-APR-93	0907	2.40	W93040401	7	LIGHT	279	8778.0			5.9	
W9304	F01P	08-APR-93	0907	2.40	W93040401	8	LIGHT	292	9336.0			6.3	
W9304	F01P	08-APR-93	0907	2.40	W93040401	9	LIGHT	593	10293.0			7.0	
W9304	F01P	08-APR-93	0907	2.40	W93040401	10	LIGHT	1452	11328.0			7.7	
W9304	F01P	08-APR-93	0907	2.40	W93040401	11	LIGHT	919	11484.0			7.8	
W9304	F01P	08-APR-93	0907	2.40	W93040401	12	LIGHT	1281	11664.0			7.9	
W9304	F01P	08-APR-93	0905	12.20	W93040399					25.3	6.0		6220000.0
W9304	F01P	08-APR-93	0905	12.20	W93040399	-3	DARK	0	232.3				
W9304	F01P	08-APR-93	0905	12.20	W93040399	-2	DARK	0	219.3				
W9304	F01P	08-APR-93	0905	12.20	W93040399	-1	DARK	0	196.1				
W9304	F01P	08-APR-93	0905	12.20	W93040399	1	LIGHT	2	243.2			0.0	
W9304	F01P	08-APR-93	0905	12.20	W93040399	2	LIGHT	5	307.3			0.1	
W9304	F01P	08-APR-93	0905	12.20	W93040399	3	LIGHT	19	1755.0			1.1	
W9304	F01P	08-APR-93	0905	12.20	W93040399	4	LIGHT	34	3564.1			2.4	
W9304	F01P	08-APR-93	0905	12.20	W93040399	5	LIGHT	149	11544.0			8.1	
W9304	F01P	08-APR-93	0905	12.20	W93040399	6	LIGHT	267	13543.0			9.5	
W9304	F01P	08-APR-93	0905	12.20	W93040399	7	LIGHT	355	14437.0			10.1	
W9304	F01P	08-APR-93	0905	12.20	W93040399	8	LIGHT	236	14646.0			10.3	
W9304	F01P	08-APR-93	0905	12.20	W93040399	9	LIGHT	319	16350.0			11.5	
W9304	F01P	08-APR-93	0905	12.20	W93040399	10	LIGHT	1358	17391.0			12.2	
W9304	F01P	08-APR-93	0905	12.20	W93040399	11	LIGHT	940	17412.0			12.2	
W9304	F02P	08-APR-93	0741	2.10	W93040379					25.3	6.0		6220000.0
W9304	F02P	08-APR-93	0741	2.10	W93040379	-3	DARK	0	2115.8				
W9304	F02P	08-APR-93	0741	2.10	W93040379	-2	DARK	0	973.5				
W9304	F02P	08-APR-93	0741	2.10	W93040379	-1	DARK	0	447.0				
W9304	F02P	08-APR-93	0741	2.10	W93040379	1	LIGHT	7	810.6			-0.3	
W9304	F02P	08-APR-93	0741	2.10	W93040379	2	LIGHT	8	855.2			-0.2	
W9304	F02P	08-APR-93	0741	2.10	W93040379	3	LIGHT	34	4952.0			2.7	
W9304	F02P	08-APR-93	0741	2.10	W93040379	4	LIGHT	39	5895.8			3.4	
W9304	F02P	08-APR-93	0741	2.10	W93040379	5	LIGHT	105	15626.0			10.3	
W9304	F02P	08-APR-93	0741	2.10	W93040379	6	LIGHT	145	17654.0			11.7	

Table E1-1. C14 Production at Bioproductivity Stations in April of 1993.

Event	Station	Date	Time	Depth (M)	Sample id	Rep	Level	Light uEm/m²/sec	C14 (DPM)	Dissolved Inorganic Carbon (mg C/L)	Length of incubation (hours)	Production (Dark corrected) (mg C/m³/hr)	Stock (DPM)
W9304	F02P	08-APR-93	0741	2.10	W93040379	7	LIGHT	221	21239.0			14.3	
W9304	F02P	08-APR-93	0741	2.10	W93040379	8	LIGHT	598	22029.0			14.9	
W9304	F02P	08-APR-93	0741	2.10	W93040379	9	LIGHT	361	26344.0			17.9	
W9304	F02P	08-APR-93	0741	2.10	W93040379	10	LIGHT	872	28146.0			19.2	
W9304	F02P	08-APR-93	0741	2.10	W93040379	11	LIGHT	1212	28495.0			19.5	
W9304	F02P	08-APR-93	0741	2.10	W93040379	12	LIGHT	794	32530.0			22.4	
W9304	F02P	08-APR-93	0741	9.10	W93040378					25.3	6.0		6220000.0
W9304	F02P	08-APR-93	0741	9.10	W93040378	-3	DARK	0	488.5				
W9304	F02P	08-APR-93	0741	9.10	W93040378	-2	DARK	0	1281.1				
W9304	F02P	08-APR-93	0741	9.10	W93040378	-1	DARK	0	670.8				
W9304	F02P	08-APR-93	0741	9.10	W93040378	1	LIGHT	3	501.4			-0.2	
W9304	F02P	08-APR-93	0741	9.10	W93040378	2	LIGHT	7	962.6			0.1	
W9304	F02P	08-APR-93	0741	9.10	W93040378	3	LIGHT	16	4967.5			3.0	
W9304	F02P	08-APR-93	0741	9.10	W93040378	4	LIGHT	32	6541.2			4.1	
W9304	F02P	08-APR-93	0741	9.10	W93040378	5	LIGHT	186	19568.0			13.4	
W9304	F02P	08-APR-93	0741	9.10	W93040378	6	LIGHT	234	24676.0			17.0	
W9304	F02P	08-APR-93	0741	9.10	W93040378	7	LIGHT	375	24770.0			17.1	
W9304	F02P	08-APR-93	0741	9.10	W93040378	8	LIGHT	388	26206.0			18.1	
W9304	F02P	08-APR-93	0741	9.10	W93040378	9	LIGHT	1338	26235.0			18.1	
W9304	F02P	08-APR-93	0741	9.10	W93040378	10	LIGHT	244	26535.0			18.3	
W9304	F02P	08-APR-93	0741	9.10	W93040378	11	LIGHT	604	27783.0			19.2	
W9304	F02P	08-APR-93	0741	9.10	W93040378	12	LIGHT	876	31365.0			21.8	
W9304	F13P	07-APR-93	0936	2.10	W93040256					23.2	6.0		6160000.0
W9304	F13P	07-APR-93	0936	2.10	W93040256	-3	DARK	0	1524.5				
W9304	F13P	07-APR-93	0936	2.10	W93040256	-2	DARK	0	528.8				
W9304	F13P	07-APR-93	0936	2.10	W93040256	-1	DARK	0	1452.0				
W9304	F13P	07-APR-93	0936	2.10	W93040256	1	LIGHT	5	364.9			-0.5	
W9304	F13P	07-APR-93	0936	2.10	W93040256	2	LIGHT	4	1468.3			0.2	
W9304	F13P	07-APR-93	0936	2.10	W93040256	3	LIGHT	19	1969.0			0.5	
W9304	F13P	07-APR-93	0936	2.10	W93040256	4	LIGHT	40	4879.6			2.5	
W9304	F13P	07-APR-93	0936	2.10	W93040256	5	LIGHT	57	6301.9			3.4	
W9304	F13P	07-APR-93	0936	2.10	W93040256	6	LIGHT	170	10365.0			6.1	
W9304	F13P	07-APR-93	0936	2.10	W93040256	7	LIGHT	226	14435.0			8.8	
W9304	F13P	07-APR-93	0936	2.10	W93040256	8	LIGHT	243	16520.0			10.1	
W9304	F13P	07-APR-93	0936	2.10	W93040256	9	LIGHT	499	19652.0			12.2	
W9304	F13P	07-APR-93	0936	2.10	W93040256	10	LIGHT	1176	19914.0			12.4	
W9304	F13P	07-APR-93	0936	2.10	W93040256	11	LIGHT	672	20128.0			12.5	
W9304	F13P	07-APR-93	0936	2.10	W93040256	12	LIGHT	261	20169.0			12.6	
W9304	F13P	07-APR-93	0933	11.30	W93040254					23.3	6.0		6160000.0
W9304	F13P	07-APR-93	0933	11.30	W93040254	-3	DARK	0	363.0				
W9304	F13P	07-APR-93	0933	11.30	W93040254	-2	DARK	0	624.3				

Table E1-1. C14 Production at Bioproductivity Stations in April of 1993.

Event	Station	Date	Time	Depth (M)	Sample id	Rep	Level	Light uEm/m²/sec	C14 (DPM)		Dissolved Inorganic Carbon (mg C/L)	Length of incubation (hours)	Production (Dark corrected) (mg C/m³/hr)	Stock (DPM)
W9304	F13P	07-APR-93	0933	11.30	W93040254	-1	DARK	0	758.9					
W9304	F13P	07-APR-93	0933	11.30	W93040254	1	LIGHT	5	913.6				0.2	
W9304	F13P	07-APR-93	0933	11.30	W93040254	2	LIGHT	2	962.8				0.3	
W9304	F13P	07-APR-93	0933	11.30	W93040254	3	LIGHT	26	5911.4				3.5	
W9304	F13P	07-APR-93	0933	11.30	W93040254	4	LIGHT	30	8080.5				5.0	
W9304	F13P	07-APR-93	0933	11.30	W93040254	5	LIGHT	103	25964.0				16.8	
W9304	F13P	07-APR-93	0933	11.30	W93040254	6	LIGHT	149	32869.0				21.4	
W9304	F13P	07-APR-93	0933	11.30	W93040254	7	LIGHT	170	40170.0				26.2	
W9304	F13P	07-APR-93	0933	11.30	W93040254	8	LIGHT	269	42030.0				27.4	
W9304	F13P	07-APR-93	0933	11.30	W93040254	9	LIGHT	1127	45549.0				29.7	
W9304	F13P	07-APR-93	0933	11.30	W93040254	10	LIGHT	396	45552.0				29.7	
W9304	F13P	07-APR-93	0933	11.30	W93040254	11	LIGHT	697	47051.0				30.7	
W9304	F13P	07-APR-93	0933	11.30	W93040254	12	LIGHT	806	49695.0				32.5	
W9304	F23P	06-APR-93	0556	2.20	W93040022						22.5	6.0		5950000.0
W9304	F23P	06-APR-93	0556	2.20	W93040022	-3	DARK	0	1020.8					
W9304	F23P	06-APR-93	0556	2.20	W93040022	-2	DARK	0	1751.6					
W9304	F23P	06-APR-93	0556	2.20	W93040022	-1	DARK	0	1371.8					
W9304	F23P	06-APR-93	0556	2.20	W93040022	1	LIGHT	7	829.5				-0.4	
W9304	F23P	06-APR-93	0556	2.20	W93040022	2	LIGHT	8	886.3				-0.3	
W9304	F23P	06-APR-93	0556	2.20	W93040022	3	LIGHT	41	3289.3				1.3	
W9304	F23P	06-APR-93	0556	2.20	W93040022	4	LIGHT	35	3581.2				1.5	
W9304	F23P	06-APR-93	0556	2.20	W93040022	5	LIGHT	109	7846.4				4.3	
W9304	F23P	06-APR-93	0556	2.20	W93040022	6	LIGHT	149	11528.0				6.7	
W9304	F23P	06-APR-93	0556	2.20	W93040022	7	LIGHT	229	11918.0				7.0	
W9304	F23P	06-APR-93	0556	2.20	W93040022	8	LIGHT	928	14403.0				8.6	
W9304	F23P	06-APR-93	0556	2.20	W93040022	9	LIGHT	345	15070.0				9.0	
W9304	F23P	06-APR-93	0556	2.20	W93040022	10	LIGHT	1245	15415.0				9.3	
W9304	F23P	06-APR-93	0556	2.20	W93040022	11	LIGHT	644	15420.0				9.3	
W9304	F23P	06-APR-93	0556	2.20	W93040022	12	LIGHT	841	16709.0				10.1	
W9304	F23P	06-APR-93	0556	4.20	W93040021						22.4	6.0		5950000.0
W9304	F23P	06-APR-93	0556	4.20	W93040021	-3	DARK	0	523.7					
W9304	F23P	06-APR-93	0556	4.20	W93040021	-2	DARK	0	1371.5					
W9304	F23P	06-APR-93	0556	4.20	W93040021	-1	DARK	0		e				
W9304	F23P	06-APR-93	0556	4.20	W93040021	1	LIGHT	7	1176.1				0.2	
W9304	F23P	06-APR-93	0556	4.20	W93040021	2	LIGHT	3	1184.2				0.2	
W9304	F23P	06-APR-93	0556	4.20	W93040021	3	LIGHT	17	2726.9				1.2	
W9304	F23P	06-APR-93	0556	4.20	W93040021	4	LIGHT	33	4071.8				2.1	
W9304	F23P	06-APR-93	0556	4.20	W93040021	5	LIGHT	192	10788.0				6.5	
W9304	F23P	06-APR-93	0556	4.20	W93040021	6	LIGHT	253	12650.0				7.7	
W9304	F23P	06-APR-93	0556	4.20	W93040021	7	LIGHT	242	12839.0				7.8	
W9304	F23P	06-APR-93	0556	4.20	W93040021	8	LIGHT	389	13573.0				8.3	

Table E1-1. C14 Production at Bioproductivity Stations in April of 1993.

Event	Station	Date	Time	Depth (M)	Sample id	Rep	Level	Light uEm/m²/sec	C14 (DPM)	Dissolved Inorganic Carbon (mg C/L)	Length of incubation (hours)	Production (Dark corrected) (mg C/m³/hr)	Stock (DPM)
W9304	F23P	06-APR-93	0556	4.20	W93040021	9	LIGHT	391	14450.0			8.9	
W9304	F23P	06-APR-93	0556	4.20	W93040021	10	LIGHT	624	14634.0			9.0	
W9304	F23P	06-APR-93	0556	4.20	W93040021	11	LIGHT	1349	14660.0			9.0	
W9304	F23P	06-APR-93	0556	4.20	W93040021	12	LIGHT	921	15538.0			9.6	
W9304	N01P	07-APR-93	0624	2.40	W93040212					24.1	6.0		6160000.0
W9304	N01P	07-APR-93	0624	2.40	W93040212	-3	DARK	0	1315.7				
W9304	N01P	07-APR-93	0624	2.40	W93040212	-2	DARK	0	667.7				
W9304	N01P	07-APR-93	0624	2.40	W93040212	-1	DARK	0	1083.7				
W9304	N01P	07-APR-93	0624	2.40	W93040212	1	LIGHT	6	817.8			-0.1	
W9304	N01P	07-APR-93	0624	2.40	W93040212	2	LIGHT	7	1092.2			0.0	
W9304	N01P	07-APR-93	0624	2.40	W93040212	3	LIGHT	31	5027.8			2.7	
W9304	N01P	07-APR-93	0624	2.40	W93040212	4	LIGHT	36	8693.0			5.3	
W9304	N01P	07-APR-93	0624	2.40	W93040212	5	LIGHT	96	19181.0			12.4	
W9304	N01P	07-APR-93	0624	2.40	W93040212	6	LIGHT	133	21998.0			14.4	
W9304	N01P	07-APR-93	0624	2.40	W93040212	7	LIGHT	203	28269.0			18.7	
W9304	N01P	07-APR-93	0624	2.40	W93040212	8	LIGHT	339	34671.0			23.0	
W9304	N01P	07-APR-93	0624	2.40	W93040212	9	LIGHT	809	35623.0			23.7	
W9304	N01P	07-APR-93	0624	2.40	W93040212	10	LIGHT	1110	36005.0			24.0	
W9304	N01P	07-APR-93	0624	2.40	W93040212	11	LIGHT	735	37750.0			25.2	
W9304	N01P	07-APR-93	0624	2.40	W93040212	12	LIGHT	592	39767.0			26.5	
W9304	N01P	07-APR-93	0620	10.30	W93040210					24.6	6.0		6160000.0
W9304	N01P	07-APR-93	0620	10.30	W93040210	-3	DARK	0	650.0				
W9304	N01P	07-APR-93	0620	10.30	W93040210	-2	DARK	0	1463.7				
W9304	N01P	07-APR-93	0620	10.30	W93040210	-1	DARK	0	262.1				
W9304	N01P	07-APR-93	0620	10.30	W93040210	1	LIGHT	3	870.6			0.1	
W9304	N01P	07-APR-93	0620	10.30	W93040210	2	LIGHT	6	1120.7			0.2	
W9304	N01P	07-APR-93	0620	10.30	W93040210	3	LIGHT	15	6868.3			4.2	
W9304	N01P	07-APR-93	0620	10.30	W93040210	4	LIGHT	29	6904.3			4.3	
W9304	N01P	07-APR-93	0620	10.30	W93040210	5	LIGHT	171	31795.0			21.6	
W9304	N01P	07-APR-93	0620	10.30	W93040210	6	LIGHT	215	34070.0			23.2	
W9304	N01P	07-APR-93	0620	10.30	W93040210	7	LIGHT	357	38212.0			26.1	
W9304	N01P	07-APR-93	0620	10.30	W93040210	8	LIGHT	224	39828.0			27.3	
W9304	N01P	07-APR-93	0620	10.30	W93040210	9	LIGHT	364	40162.0			27.5	
W9304	N01P	07-APR-93	0620	10.30	W93040210	10	LIGHT	817	40664.0			27.8	
W9304	N01P	07-APR-93	0620	10.30	W93040210	11	LIGHT	1206	41023.0			28.1	
W9304	N01P	07-APR-93	0620	10.30	W93040210	12	LIGHT	561	41084.0			28.1	
W9304	N04P	07-APR-93	0727	2.70	W93040226					24.0	6.0		6160000.0
W9304	N04P	07-APR-93	0727	2.70	W93040226	-3	DARK	0	1348.3				
W9304	N04P	07-APR-93	0727	2.70	W93040226	-2	DARK	0	1952.8				
W9304	N04P	07-APR-93	0727	2.70	W93040226	-1	DARK	0	922.9				
W9304	N04P	07-APR-93	0727	2.70	W93040226	1	LIGHT	3	686.2			-0.5	

Table E1-1. C14 Production at Bioproductivity Stations in April of 1993.

Event	Station	Date	Time	Depth (M)	Sample id	Rep	Level	Light uEm/m²/sec	C14 (DPM)		Dissolved Inorganic Carbon (mg C/L)	Length of incubation (hours)	Production (Dark corrected) (mg C/m³/hr)	Stock (DPM)
W9304	N04P	07-APR-93	0727	2.70	W93040226	2	LIGHT	3	945.6				-0.3	
W9304	N04P	07-APR-93	0727	2.70	W93040226	3	LIGHT	40	3314.1				1.3	
W9304	N04P	07-APR-93	0727	2.70	W93040226	4	LIGHT	26	4846.3				2.3	
W9304	N04P	07-APR-93	0727	2.70	W93040226	5	LIGHT	67	7713.9				4.3	
W9304	N04P	07-APR-93	0727	2.70	W93040226	6	LIGHT	557	18721.0				11.8	
W9304	N04P	07-APR-93	0727	2.70	W93040226	7	LIGHT	292	19113.0				12.1	
W9304	N04P	07-APR-93	0727	2.70	W93040226	8	LIGHT	215	19154.0				12.1	
W9304	N04P	07-APR-93	0727	2.70	W93040226	9	LIGHT	258	19470.0				12.3	
W9304	N04P	07-APR-93	0727	2.70	W93040226	10	LIGHT	1279	20068.0				12.7	
W9304	N04P	07-APR-93	0727	2.70	W93040226	11	LIGHT	1209	20716.0				13.2	
W9304	N04P	07-APR-93	0727	2.70	W93040226	12	LIGHT	839	21987.0				14.0	
W9304	N04P	07-APR-93	0724	24.10	W93040224						25.1	6.0		5450000.0
W9304	N04P	07-APR-93	0724	24.10	W93040224	-3	DARK	0	1448.5					
W9304	N04P	07-APR-93	0724	24.10	W93040224	-2	DARK	0	1157.2					
W9304	N04P	07-APR-93	0724	24.10	W93040224	-1	DARK	0	1574.5					
W9304	N04P	07-APR-93	0724	24.10	W93040224	1	LIGHT	4	2152.1				0.6	
W9304	N04P	07-APR-93	0724	24.10	W93040224	2	LIGHT	2	2505.6				0.9	
W9304	N04P	07-APR-93	0724	24.10	W93040224	3	LIGHT	18	12697.0				9.1	
W9304	N04P	07-APR-93	0724	24.10	W93040224	4	LIGHT	31	17209.0				12.8	
W9304	N04P	07-APR-93	0724	24.10	W93040224	5	LIGHT	138	50823.0				39.9	
W9304	N04P	07-APR-93	0724	24.10	W93040224	6	LIGHT	1197	62924.0				49.6	
W9304	N04P	07-APR-93	0724	24.10	W93040224	7	LIGHT	247	64081.0				50.6	
W9304	N04P	07-APR-93	0724	24.10	W93040224	8	LIGHT	219	64738.0				51.1	
W9304	N04P	07-APR-93	0724	24.10	W93040224	9	LIGHT	332	65509.0				51.7	
W9304	N04P	07-APR-93	0724	24.10	W93040224	10	LIGHT	1292	67049.0				52.9	
W9304	N04P	07-APR-93	0724	24.10	W93040224	11	LIGHT	298	67914.0				53.6	
W9304	N04P	07-APR-93	0724	24.10	W93040224	12	LIGHT	885	67990.0				53.7	
W9304	N07P	07-APR-93	0832	2.30	W93040242						24.5	6.0		6160000.0
W9304	N07P	07-APR-93	0832	2.30	W93040242	-3	DARK	0	1626.0	s				
W9304	N07P	07-APR-93	0832	2.30	W93040242	-2	DARK	0	1030.8					
W9304	N07P	07-APR-93	0832	2.30	W93040242	-1	DARK	0	1034.8					
W9304	N07P	07-APR-93	0832	2.30	W93040242	1	LIGHT	8	508.9				-0.4	
W9304	N07P	07-APR-93	0832	2.30	W93040242	2	LIGHT	6	519.0				-0.4	
W9304	N07P	07-APR-93	0832	2.30	W93040242	3	LIGHT	45	5587.0				3.2	
W9304	N07P	07-APR-93	0832	2.30	W93040242	4	LIGHT	44	7458.3				4.5	
W9304	N07P	07-APR-93	0832	2.30	W93040242	5	LIGHT	84	13950.0				9.0	
W9304	N07P	07-APR-93	0832	2.30	W93040242	6	LIGHT	182	20877.0				13.8	
W9304	N07P	07-APR-93	0832	2.30	W93040242	7	LIGHT	284	22013.0				14.6	
W9304	N07P	07-APR-93	0832	2.30	W93040242	8	LIGHT	1601	22909.0				15.2	
W9304	N07P	07-APR-93	0832	2.30	W93040242	9	LIGHT	1172	23474.0				15.6	
W9304	N07P	07-APR-93	0832	2.30	W93040242	10	LIGHT	465	24713.0				16.5	

Table E1-1. C14 Production at Bioproductivity Stations in April of 1993.

Event	Station	Date	Time	Depth (M)	Sample id	Rep	Level	Light uEm/m²/sec	C14 (DPM)		Dissolved Inorganic Carbon (mg C/L)	Length of incubation (hours)	Production (Dark corrected) (mg C/m³/hr)	Stock (DPM)
W9304	N07P	07-APR-93	0832	2.30	W93040242	11	LIGHT	794	25258.0				16.9	
W9304	N07P	07-APR-93	0832	2.30	W93040242	12	LIGHT	1039	27098.0				18.2	
W9304	N07P	07-APR-93	0831	11.10	W93040241						25.5	6.0		6160000.0
W9304	N07P	07-APR-93	0831	11.10	W93040241	-3	DARK	0	564.8					
W9304	N07P	07-APR-93	0831	11.10	W93040241	-2	DARK	0	212.0					
W9304	N07P	07-APR-93	0831	11.10	W93040241	-1	DARK	0	968.9					
W9304	N07P	07-APR-93	0831	11.10	W93040241	1	LIGHT	3	609.7				0.0	
W9304	N07P	07-APR-93	0831	11.10	W93040241	2	LIGHT	6	685.5				0.1	
W9304	N07P	07-APR-93	0831	11.10	W93040241	3	LIGHT	103	5379.6				3.5	
W9304	N07P	07-APR-93	0831	11.10	W93040241	4	LIGHT	43	5778.0				3.8	
W9304	N07P	07-APR-93	0831	11.10	W93040241	5	LIGHT	273	20835.0				14.7	
W9304	N07P	07-APR-93	0831	11.10	W93040241	6	LIGHT	451	21934.0				15.5	
W9304	N07P	07-APR-93	0831	11.10	W93040241	7	LIGHT	1106	23262.0				16.4	
W9304	N07P	07-APR-93	0831	11.10	W93040241	8	LIGHT	1539	24241.0				17.1	
W9304	N07P	07-APR-93	0831	11.10	W93040241	9	LIGHT	402	25342.0				17.9	
W9304	N07P	07-APR-93	0831	11.10	W93040241	10	LIGHT	663	25564.0				18.1	
W9304	N07P	07-APR-93	0831	11.10	W93040241	11	LIGHT	227	27556.0				19.5	
W9304	N07P	07-APR-93	0831	11.10	W93040241	12	LIGHT	326	29018.0				20.6	
W9304	N10P	06-APR-93	0933	2.40	W93040077						23.5	6.0		5950000.0
W9304	N10P	06-APR-93	0933	2.40	W93040077	-3	DARK	0	481.7					
W9304	N10P	06-APR-93	0933	2.40	W93040077	-2	DARK	0	341.5					
W9304	N10P	06-APR-93	0933	2.40	W93040077	-1	DARK	0	369.6					
W9304	N10P	06-APR-93	0933	2.40	W93040077	1	LIGHT	5	438.7				0.0	
W9304	N10P	06-APR-93	0933	2.40	W93040077	2	LIGHT	6	480.7				0.1	
W9304	N10P	06-APR-93	0933	2.40	W93040077	3	LIGHT	21	3257.7				2.0	
W9304	N10P	06-APR-93	0933	2.40	W93040077	4	LIGHT	44	4869.7				3.1	
W9304	N10P	06-APR-93	0933	2.40	W93040077	5	LIGHT	63	11372.0				7.6	
W9304	N10P	06-APR-93	0933	2.40	W93040077	6	LIGHT	188	18425.0				12.4	
W9304	N10P	06-APR-93	0933	2.40	W93040077	7	LIGHT	249	22777.0				15.4	
W9304	N10P	06-APR-93	0933	2.40	W93040077	8	LIGHT	1315	25844.0				17.6	
W9304	N10P	06-APR-93	0933	2.40	W93040077	9	LIGHT	740	25945.0				17.6	
W9304	N10P	06-APR-93	0933	2.40	W93040077	10	LIGHT	280	26764.0				18.2	
W9304	N10P	06-APR-93	0933	2.40	W93040077	11	LIGHT	569	27641.0				18.8	
W9304	N10P	06-APR-93	0933	2.40	W93040077	12	LIGHT	259	27751.0				18.9	
W9304	N10P	06-APR-93	0932	6.30	W93040076						23.8	6.0		5950000.0
W9304	N10P	06-APR-93	0932	6.30	W93040076	-3	DARK	0	741.3	s				
W9304	N10P	06-APR-93	0932	6.30	W93040076	-2	DARK	0	264.7					
W9304	N10P	06-APR-93	0932	6.30	W93040076	-1	DARK	0	237.3					
W9304	N10P	06-APR-93	0932	6.30	W93040076	1	LIGHT	2	490.3				0.2	
W9304	N10P	06-APR-93	0932	6.30	W93040076	2	LIGHT	6	564.4				0.2	
W9304	N10P	06-APR-93	0932	6.30	W93040076	3	LIGHT	33	6855.2				4.6	

Table E1-1. C14 Production at Bioproductivity Stations in April of 1993.

Event	Station	Date	Time	Depth (M)	Sample id	Rep	Level	Light uEm/m²/sec	C14 (DPM)	Dissolved Inorganic Carbon (mg C/L)	Length of incubation (hours)	Production (Dark corrected) (mg C/m³/hr)	Stock (DPM)
W9304	N10P	06-APR-93	0932	6.30	W93040076	4	LIGHT	29	7266.9			4.9	
W9304	N10P	06-APR-93	0932	6.30	W93040076	5	LIGHT	114	22655.0			15.7	
W9304	N10P	06-APR-93	0932	6.30	W93040076	6	LIGHT	164	25303.0			17.5	
W9304	N10P	06-APR-93	0932	6.30	W93040076	7	LIGHT	188	31058.0			21.5	
W9304	N10P	06-APR-93	0932	6.30	W93040076	8	LIGHT	291	34868.0			24.2	
W9304	N10P	06-APR-93	0932	6.30	W93040076	9	LIGHT	443	35399.0			24.6	
W9304	N10P	06-APR-93	0932	6.30	W93040076	10	LIGHT	1245	38585.0			26.8	
W9304	N10P	06-APR-93	0932	6.30	W93040076	11	LIGHT	864	39152.0			27.2	
W9304	N10P	06-APR-93	0932	6.30	W93040076	12	LIGHT	776	42139.0			29.3	
W9304	N16P	06-APR-93	0831	2.40	W93040063					23.6	6.0		5950000.0
W9304	N16P	06-APR-93	0831	2.40	W93040063	-3	DARK	0	506.4				
W9304	N16P	06-APR-93	0831	2.40	W93040063	-2	DARK	0	960.8				
W9304	N16P	06-APR-93	0831	2.40	W93040063	-1	DARK	0	234.8				
W9304	N16P	06-APR-93	0831	2.40	W93040063	1	LIGHT	6	1201.5			0.4	
W9304	N16P	06-APR-93	0831	2.40	W93040063	2	LIGHT	8	1299.2			0.5	
W9304	N16P	06-APR-93	0831	2.40	W93040063	3	LIGHT	45	9448.0			6.2	
W9304	N16P	06-APR-93	0831	2.40	W93040063	4	LIGHT	44	11989.0			7.9	
W9304	N16P	06-APR-93	0831	2.40	W93040063	5	LIGHT	84	26714.0			18.2	
W9304	N16P	06-APR-93	0831	2.40	W93040063	6	LIGHT	284	35745.0			24.4	
W9304	N16P	06-APR-93	0831	2.40	W93040063	7	LIGHT	182	35776.0			24.4	
W9304	N16P	06-APR-93	0831	2.40	W93040063	8	LIGHT	1123	36644.0			25.0	
W9304	N16P	06-APR-93	0831	2.40	W93040063	9	LIGHT	1589	38641.0			26.4	
W9304	N16P	06-APR-93	0831	2.40	W93040063	10	LIGHT	480	40317.0			27.6	
W9304	N16P	06-APR-93	0831	2.40	W93040063	11	LIGHT	809	42383.0			29.0	
W9304	N16P	06-APR-93	0831	2.40	W93040063	12	LIGHT	1042	44351.0			30.4	
W9304	N16P	06-APR-93	0830	7.60	W93040062					24.1	6.0		5950000.0
W9304	N16P	06-APR-93	0830	7.60	W93040062	-3	DARK	0	507.1				
W9304	N16P	06-APR-93	0830	7.60	W93040062	-2	DARK	0	413.1				
W9304	N16P	06-APR-93	0830	7.60	W93040062	-1	DARK	0	282.1				
W9304	N16P	06-APR-93	0830	7.60	W93040062	1	LIGHT	3	1293.0			0.6	
W9304	N16P	06-APR-93	0830	7.60	W93040062	2	LIGHT	6	1682.1			0.9	
W9304	N16P	06-APR-93	0830	7.60	W93040062	3	LIGHT	103	10503.0			7.2	
W9304	N16P	06-APR-93	0830	7.60	W93040062	4	LIGHT	43	10760.0			7.3	
W9304	N16P	06-APR-93	0830	7.60	W93040062	5	LIGHT	421	33274.0			23.3	
W9304	N16P	06-APR-93	0830	7.60	W93040062	6	LIGHT	273	34424.0			24.1	
W9304	N16P	06-APR-93	0830	7.60	W93040062	7	LIGHT	710	35525.0			24.9	
W9304	N16P	06-APR-93	0830	7.60	W93040062	8	LIGHT	326	35863.0			25.1	
W9304	N16P	06-APR-93	0830	7.60	W93040062	9	LIGHT	486	36177.0			25.3	
W9304	N16P	06-APR-93	0830	7.60	W93040062	10	LIGHT	227	37053.0			26.0	
W9304	N16P	06-APR-93	0830	7.60	W93040062	11	LIGHT	1624	37318.0			26.1	
W9304	N16P	06-APR-93	0830	7.60	W93040062	12	LIGHT	1083	41569.0			29.1	

Table E1-1. C14 Production at Bioproductivity Stations in April of 1993.

Event	Station	Date	Time	Depth (M)	Sample id	Rep	Level	Light uEm/m²/sec	C14 (DPM)	Dissolved Inorganic Carbon (mg C/L)	Length of incubation (hours)	Production (Dark corrected) (mg C/m³/hr)	Stock (DPM)
W9304	N20P	06-APR-93	0731	2.10	W93040047					23.4	6.0		5950000.0
W9304	N20P	06-APR-93	0731	2.10	W93040047	-3	DARK	0	252.2				
W9304	N20P	06-APR-93	0731	2.10	W93040047	-2	DARK	0	241.6				
W9304	N20P	06-APR-93	0731	2.10	W93040047	-1	DARK	0	299.4				
W9304	N20P	06-APR-93	0731	2.10	W93040047	1	LIGHT	4	592.3			0.2	
W9304	N20P	06-APR-93	0731	2.10	W93040047	2	LIGHT	4	610.7			0.2	
W9304	N20P	06-APR-93	0731	2.10	W93040047	3	LIGHT	28	5686.3			3.7	
W9304	N20P	06-APR-93	0731	2.10	W93040047	4	LIGHT	44	7534.5			5.0	
W9304	N20P	06-APR-93	0731	2.10	W93040047	5	LIGHT	73	12777.0			8.6	
W9304	N20P	06-APR-93	0731	2.10	W93040047	6	LIGHT	232	21378.0			14.5	
W9304	N20P	06-APR-93	0731	2.10	W93040047	7	LIGHT	278	22890.0			15.5	
W9304	N20P	06-APR-93	0731	2.10	W93040047	8	LIGHT	279	24923.0			16.9	
W9304	N20P	06-APR-93	0731	2.10	W93040047	9	LIGHT	603	26471.0			18.0	
W9304	N20P	06-APR-93	0731	2.10	W93040047	10	LIGHT	1244	28655.0			19.5	
W9304	N20P	06-APR-93	0731	2.10	W93040047	11	LIGHT	910	28954.0			19.7	
W9304	N20P	06-APR-93	0731	2.10	W93040047	12	LIGHT	1475	30543.0			20.8	
W9304	N20P	06-APR-93	0728	12.10	W93040045					23.4	6.0		5950000.0
W9304	N20P	06-APR-93	0728	12.10	W93040045	-3	DARK	0	235.6				
W9304	N20P	06-APR-93	0728	12.10	W93040045	-2	DARK	0	292.4				
W9304	N20P	06-APR-93	0728	12.10	W93040045	-1	DARK	0	339.2				
W9304	N20P	06-APR-93	0728	12.10	W93040045	1	LIGHT	2	944.3			0.5	
W9304	N20P	06-APR-93	0728	12.10	W93040045	2	LIGHT	5	1367.5			0.7	
W9304	N20P	06-APR-93	0728	12.10	W93040045	3	LIGHT	19	6947.8			4.6	
W9304	N20P	06-APR-93	0728	12.10	W93040045	4	LIGHT	34	11862.0			8.0	
W9304	N20P	06-APR-93	0728	12.10	W93040045	5	LIGHT	149	37241.0			25.5	
W9304	N20P	06-APR-93	0728	12.10	W93040045	6	LIGHT	1353	46741.0			32.0	
W9304	N20P	06-APR-93	0728	12.10	W93040045	7	LIGHT	237	48269.0			33.1	
W9304	N20P	06-APR-93	0728	12.10	W93040045	8	LIGHT	963	48431.0			33.2	
W9304	N20P	06-APR-93	0728	12.10	W93040045	9	LIGHT	1307	48708.0			33.4	
W9304	N20P	06-APR-93	0728	12.10	W93040045	10	LIGHT	353	48895.0			33.5	
W9304	N20P	06-APR-93	0728	12.10	W93040045	11	LIGHT	267	49129.0			33.7	
W9304	N20P	06-APR-93	0728	12.10	W93040045	12	LIGHT	342	53241.0			36.5	

s = Suspect data, value not used in calculating production
e = Data not reported

APPENDIX E

METABOLISM DATA AND PRODUCTIVITY—IRRADIANCE MODELING

Part 2

Summary of P-I Modeling

The modeling effort is described in Section 2 of the accompanying text report. All parameters were estimated using SAS (1985). P-I incubations were performed using water from two depths (surface and chlorophyll maximum) at ten BioProductivity stations. Volumetric net production rates for these are given in Table E1-1. The rates were normalized for each sample by dividing the volumetric rate by the average chlorophyll value for that sample (Appendix A), to yield an estimate of net production as μg C (μg Chl)$^{-1}$ hr^{-1} after correcting for dark uptake; rates thus expressed were used in the modeling and graphics that follow.

Table E2-1 summarizes the statistics used as a basis for rejecting certain outliers in the dark bottle replicates. This appendix provides the following sequence for early April data: modeled parameters for a 3-parameter model of Platt *et al.* (1980) (Table E2-2), followed by graphs of situations which were fit by this model; modeled parameters for a 2-parameter model of Webb *et al.* (1974) (Table E2-3), followed by graphs of situations which were fit by this model, which assumes zero photoinhibition.

Table E2-1. Basis for excluding dark bottle outliers using the Dixon Criteria for high values (X_3) and low values (X_1) [Cruise 9304].

OBS	STA	BOT [1]	_NAME_	COL1 [2]	COL2	COL3	X_3 [3]	X_1 [3]
1	F13P	6	DARKDPM	363.02	624.26	758.93	0.34015	0.65985
2	F13P	10	DARKDPM	528.76	1452.02	1524.47	0.07276	0.92724
3	F1P	6	DARKDPM	196.08	219.27	232.27	0.35922	0.64078
4	F1P	10	DARKDPM	329.86	435.87	846.62	0.79486	0.20514
5	F23P	8	DARKDPM	.	523.74	1371.52	.	.
6	F23P	10	DARKDPM	1020.81	1371.81	1751.58	0.51968	0.48032
7	F2P	8	DARKDPM	488.46	670.84	1281.13	0.76992	0.23008
8	F2P	10	DARKDPM	447.03	973.53	2115.84	0.68451	0.31549
9	N10P	8	DARKDPM	237.29	264.65	741.31*	0.94572	0.05428
10	N10P	10	DARKDPM	341.46	369.64	481.67	0.79902	0.20098
11	N16P	8	DARKDPM	282.09	413.13	507.05	0.41750	0.58250
12	N16P	10	DARKDPM	234.79	506.40	960.76	0.62587	0.37413
13	N1P	6	DARKDPM	262.06	649.96	1463.75	0.67720	0.32280
14	N1P	10	DARKDPM	667.73	1083.71	1315.72	0.35805	0.64195
15	N20P	6	DARKDPM	235.62	292.36	339.21	0.45226	0.54774
16	N20P	10	DARKDPM	241.57	252.19	299.42	0.81642	0.18358
17	N4P	6	DARKDPM	1157.16	1448.49	1574.49	0.30192	0.69808
18	N4P	10	DARKDPM	922.91	1348.27	1952.76	0.58697	0.41303
19	N7P	8	DARKDPM	211.96	564.82	968.86	0.53381	0.46619
20	N7P	10	DARKDPM	1030.83	1034.78	1626.02*	0.99336	0.00664

[1] 6,8 = Subsurface chlorophyll maximum sample
10 = Surface sample

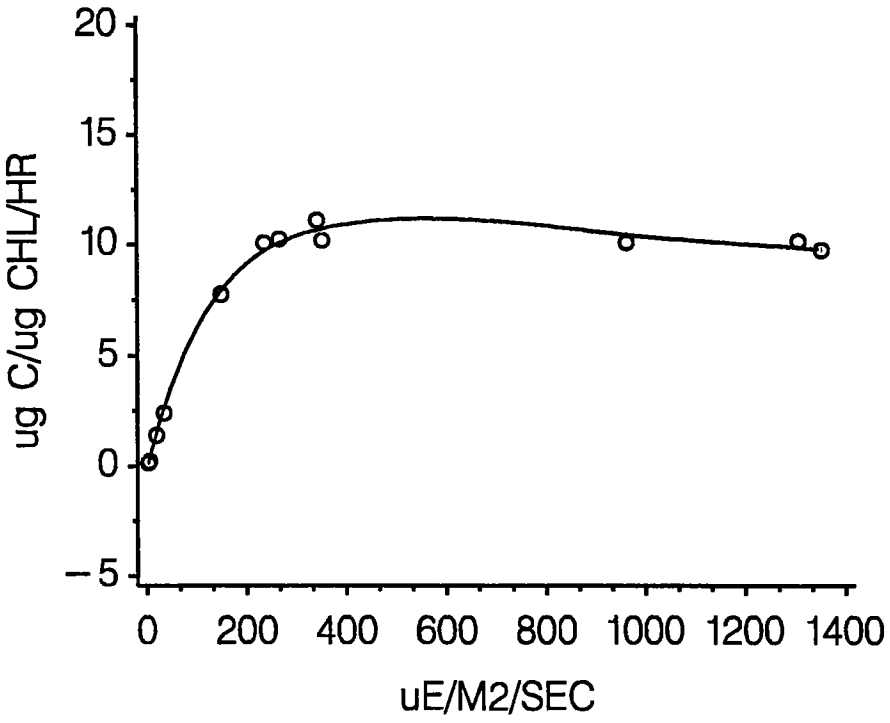
[2] COL# = Replicate dark bottle value (dpm)

[3] Calculated values to be judged against the Dixon Criteria, see text report for full description.
If X_3 > 0.941, then the high replicate value exceeded the criteria and was not used in production calculations.
If X_1 > 0.941, then the low replicate value exceeded the criteria and was not used in production calculations.
*denotes high values excluded; no low values were rejected.

Table E2-2. P vs. I Curve Parameters for the Platt *et al.* (1980) Model: April 1993.
Numbers in parentheses are standard errors of the estimates.

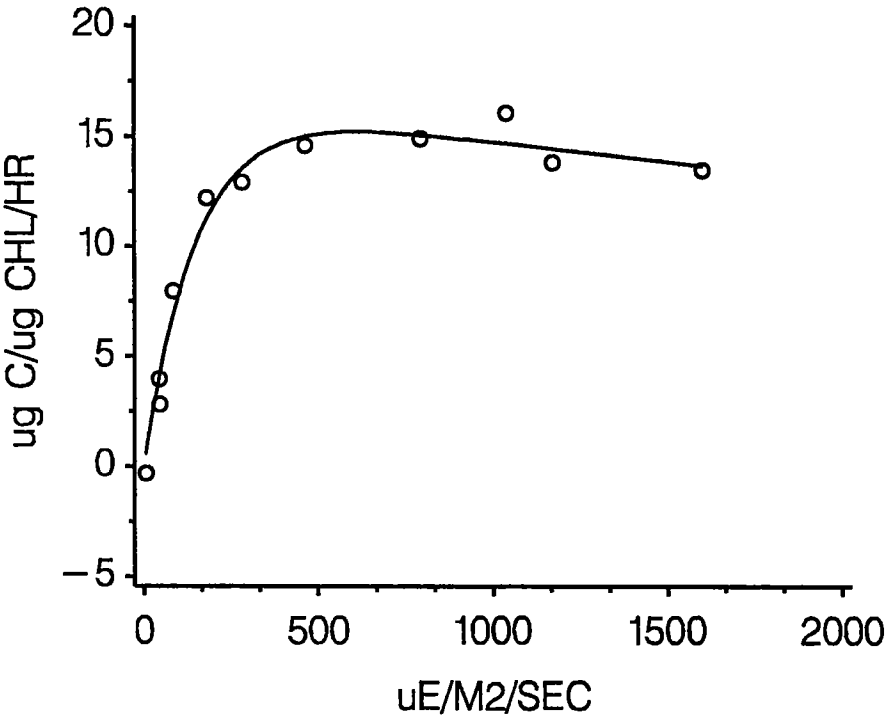
STA	DEPTH	P_SB	ALPHA	BETA	R_2
F13P	CHL	. .	. .	. .	.
F13P	SUR	. .	. .	. .	.
F1P	CHL	. .	. .	. .	.
F1P	SUR	. .	. .	. .	.
F23P	CHL	. .	. .	. .	.
F23P	SUR	. .	. .	. .	.
F2P	CHL	. .	. .	. .	.
F2P	SUR	. .	. .	. .	.
N10P	CHL	. .	. .	. .	.
N10P	SUR	. .	. .	. .	.
N16P	CHL	. .	. .	. .	.
N16P	SUR	. .	. .	. .	.
N1P	CHL	. .	. .	. .	.
N1P	SUR	. .	. .	. .	.
N20P	CHL	12.52(0.72)	0.088(0.005)	0.002(0.001)	0.996
N20P	SUR	. .	. .	. .	.
N4P	CHL	. .	. .	. .	.
N4P	SUR	. .	. .	. .	.
N7P	CHL	. .	. .	. .	.
N7P	SUR	16.83(0.89)	0.107(0.010)	0.002(0.001)	0.982

STATION N20P CHLA MAXIMUM



NEGATIVE EXPONENTIAL MODEL WITH INHIBITION PLATT ET AL, 1980
CRUISE NUMBER 9304 APRIL, 1993

STATION N7P SURFACE

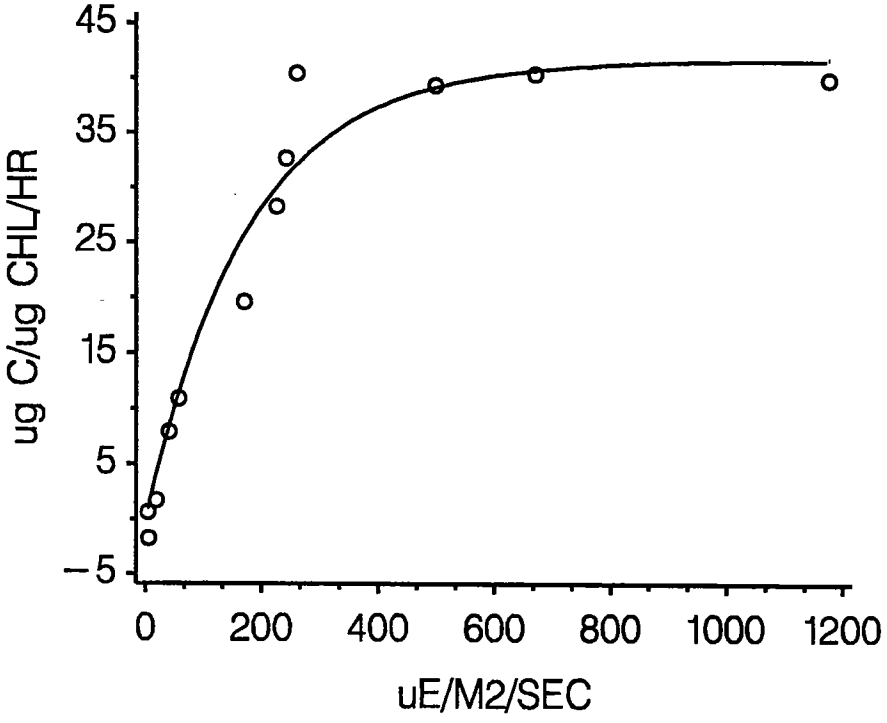


NEGATIVE EXPONENTIAL MODEL WITH INHIBITION PLATT ET AL, 1980
CRUISE NUMBER 9304 APRIL, 1993

Table E2-3. P vs. I Curve Parameters for the Webb *et al.* (1974) Model: April 1993.
Numbers in parentheses are standard errors of the estimates.

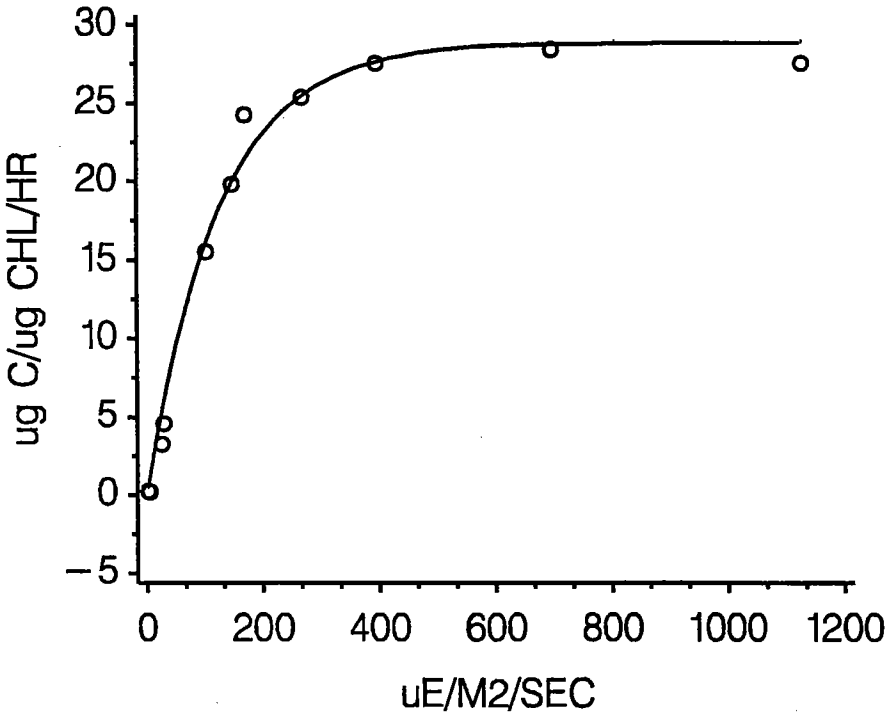
STATION	DEPTH	PMAX	ALPHA	R_2
F13P	CHL	28.96(0.74)	0.228(0.017)	0.990
	SUR	41.83(2.54)	0.233(0.030)	0.963
F1P	CHL	9.63(0.25)	0.065(0.004)	0.991
	SUR	8.57(0.00)	0.043(0.000)	0.993
F23P	CHL	12.69(0.20)	0.088(0.002)	0.996
	SUR	16.10(0.06)	0.099(0.010)	0.981
F2P	CHL	8.71(0.08)	0.065(0.005)	0.978
	SUR	13.97(0.05)	0.085(0.011)	0.959
N10P	CHL	13.56(0.09)	0.094(0.004)	0.991
	SUR	17.15(0.81)	0.129(0.017)	0.969
N16P	CHL	15.23(0.78)	0.098(0.003)	0.938
	SUR	10.90(0.28)	0.010(0.005)	0.969
N1P	CHL	16.18(0.22)	0.141(0.013)	0.990
	SUR	13.21(0.25)	0.087(0.005)	0.991
N20P	CHL	. .	. .	.
	SUR	12.36(0.22)	0.081(0.004)	0.991
N4P	CHL	12.50(0.10)	0.133(0.010)	0.993
	SUR	27.22(1.14)	0.199(0.028)	0.974
N7P	CHL	28.03(2.39)	0.194(0.055)	0.877
	SUR	. .	. .	.

STATION F13P SURFACE



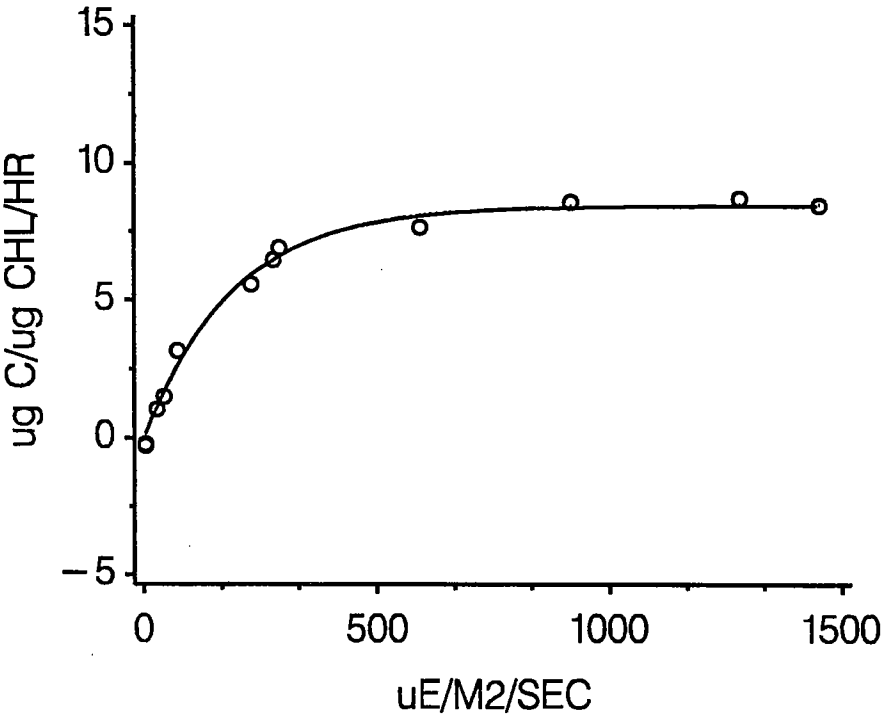
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION F13P CHLA MAXIMUM



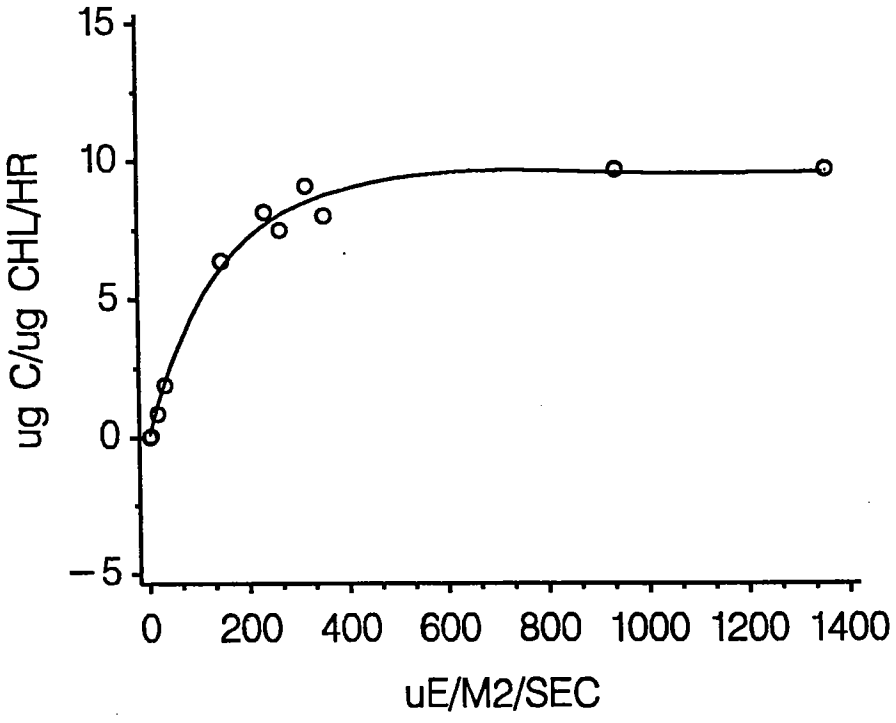
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION F1P SURFACE



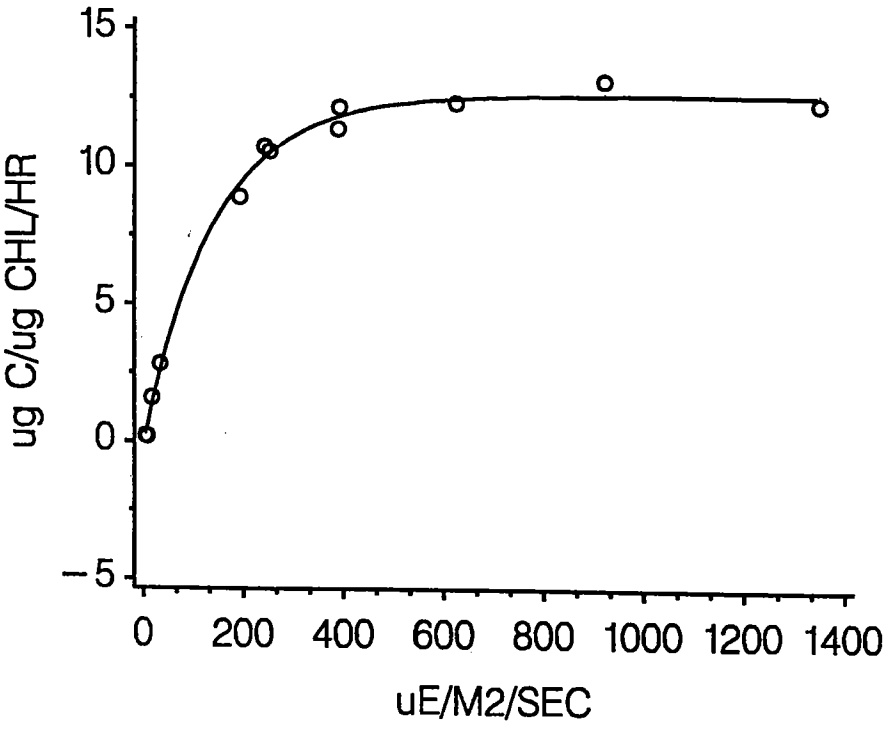
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION F1P CHLA MAXIMUM



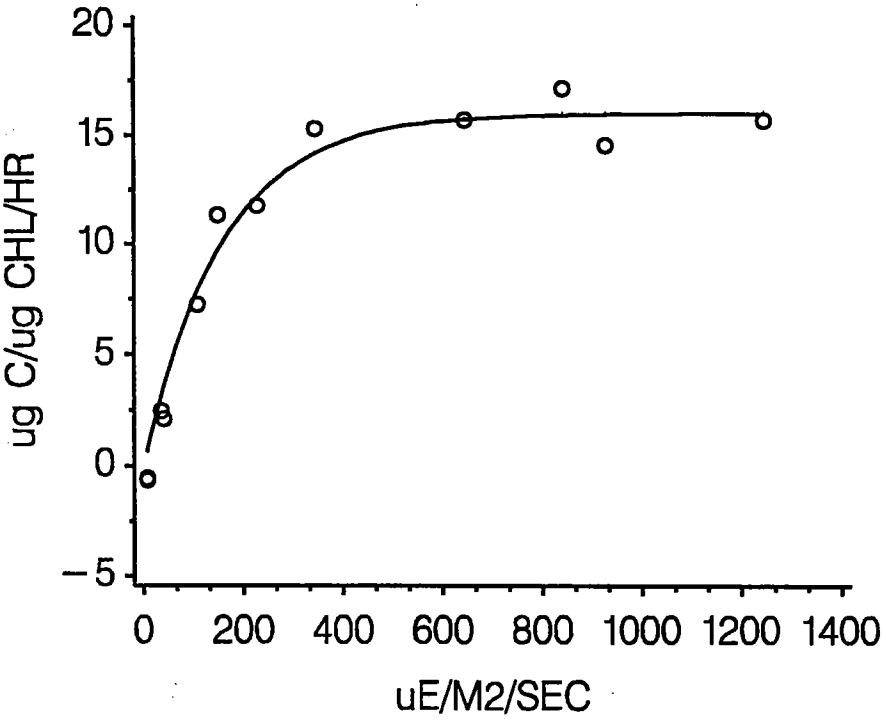
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION F23P CHLA MAXIMUM



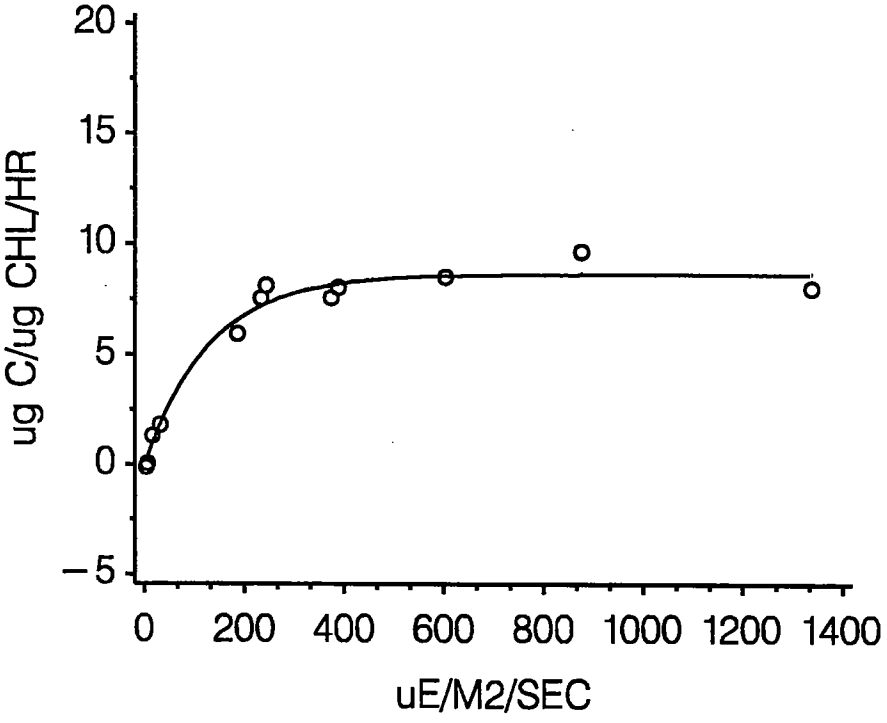
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION F23P SURFACE



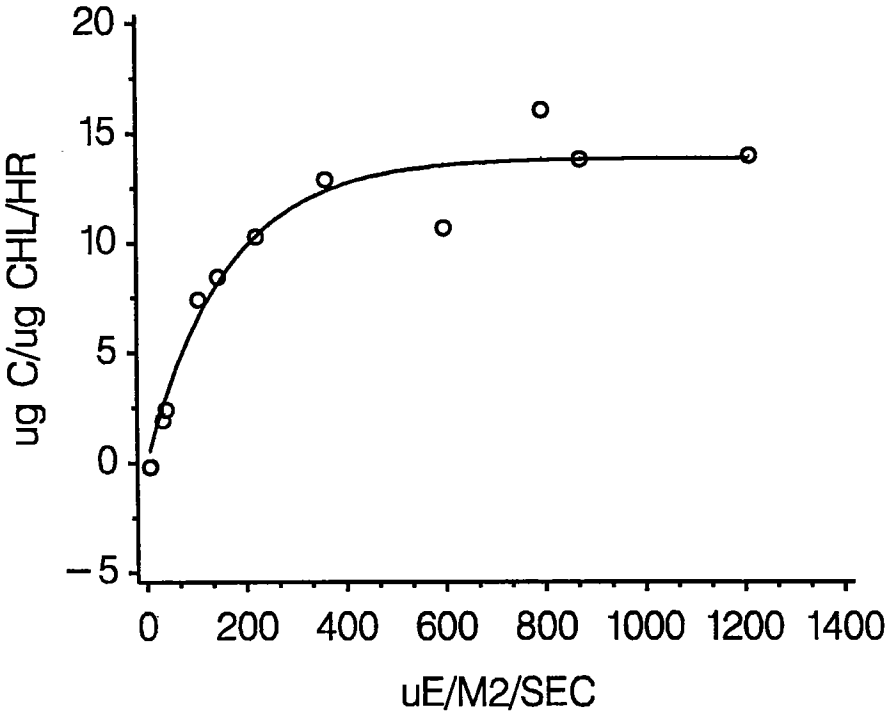
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION F2P CHLA MAXIMUM



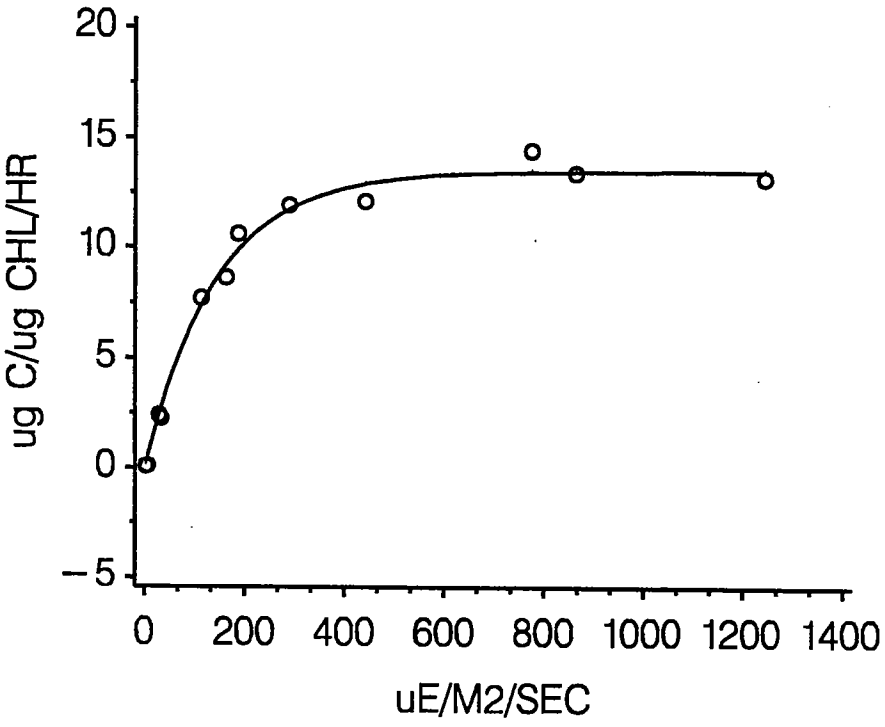
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION F2P SURFACE



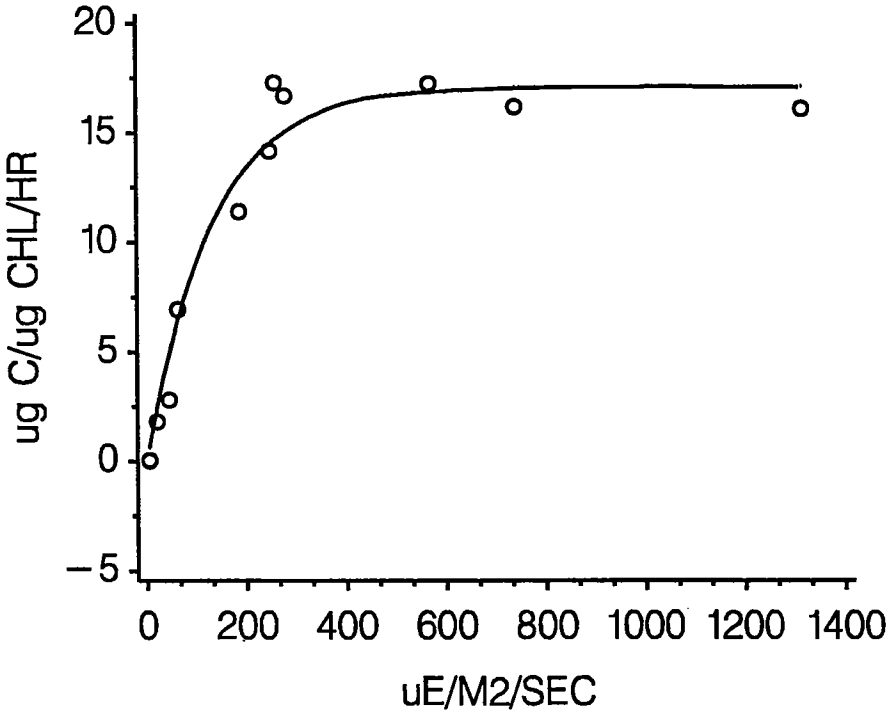
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N10P CHLA MAXIMUM



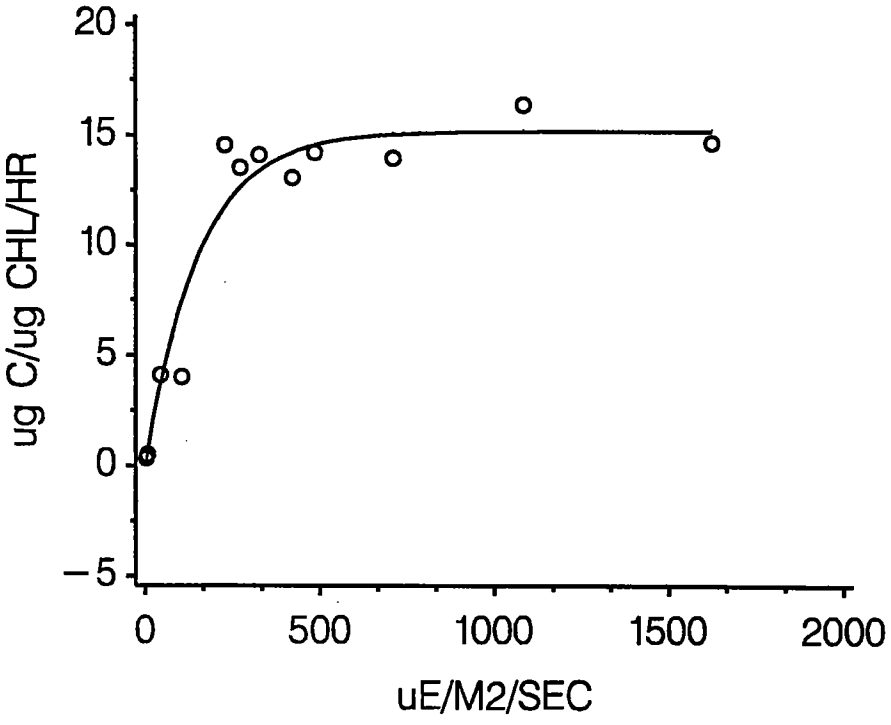
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N10P SURFACE



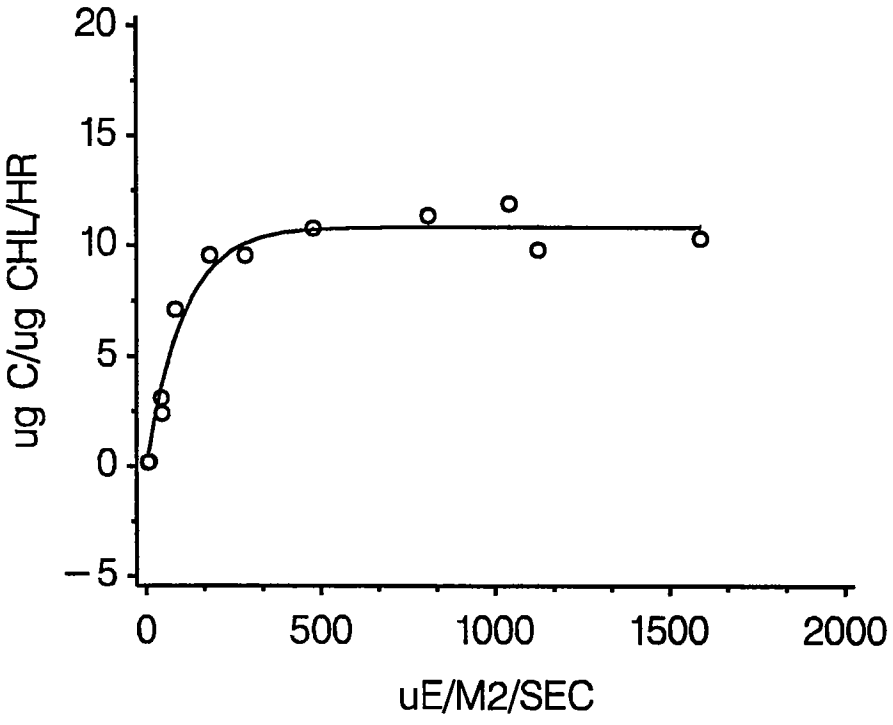
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N16P CHLA MAXIMUM



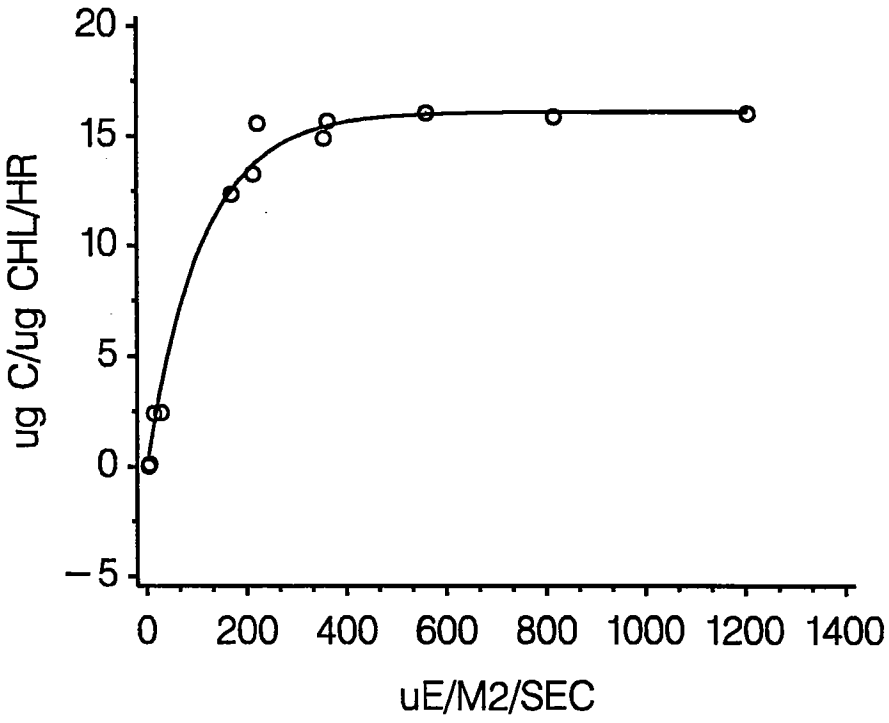
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N16P SURFACE



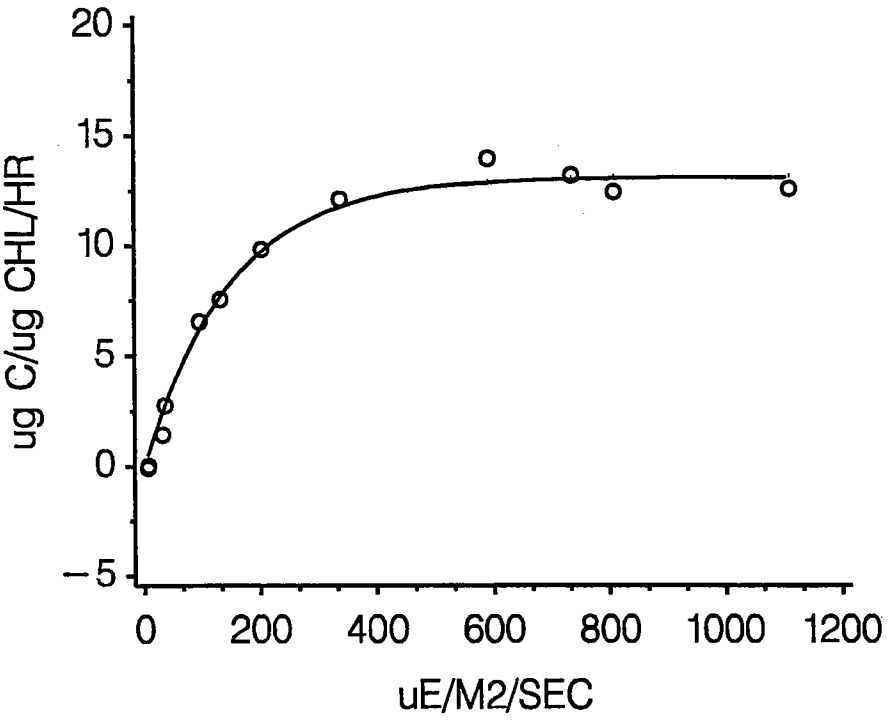
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N1P CHLA MAXIMUM



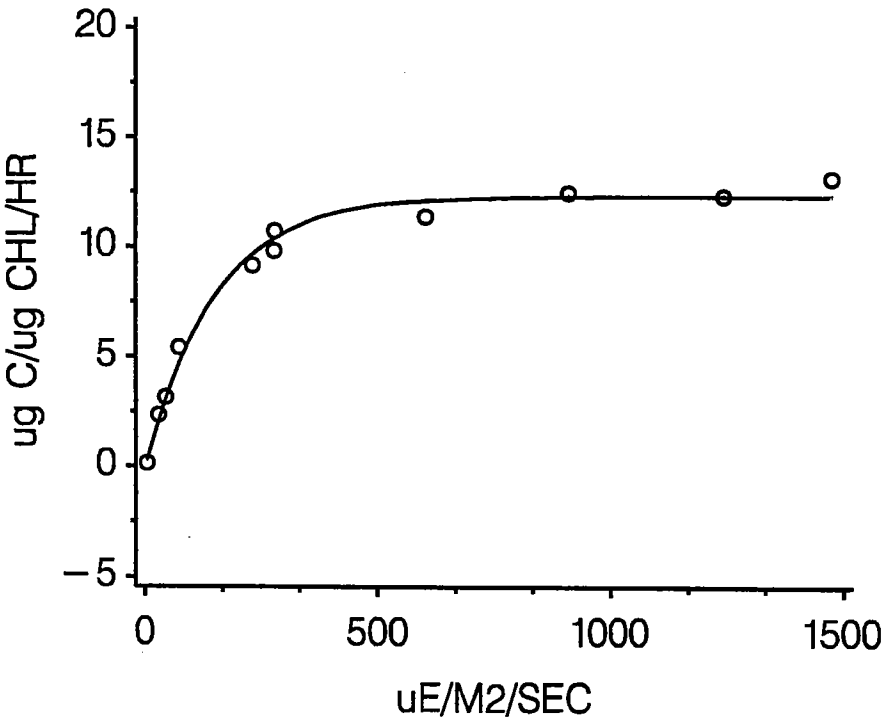
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N1P SURFACE



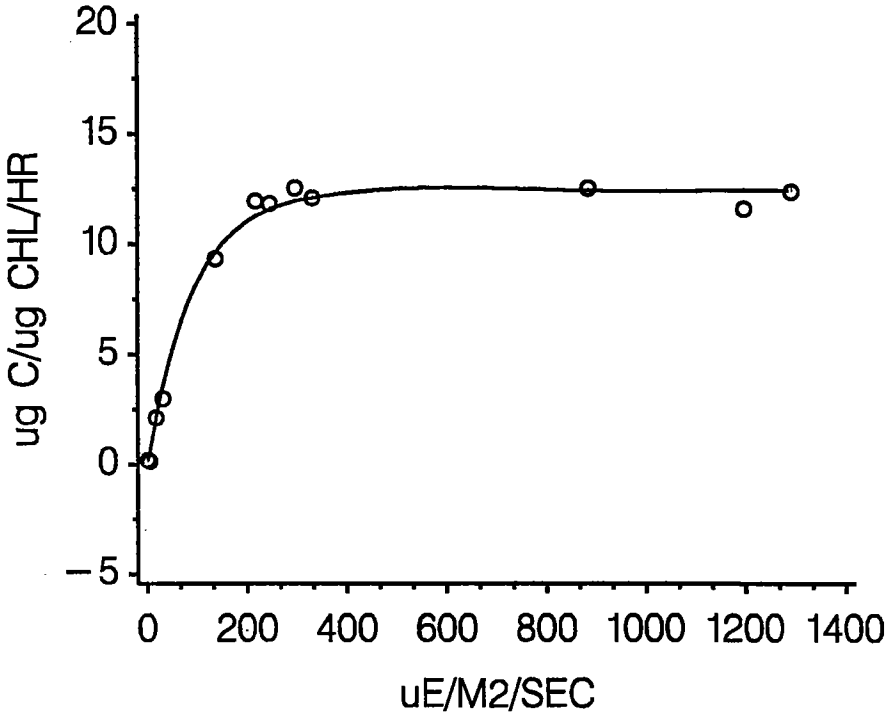
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N20P SURFACE



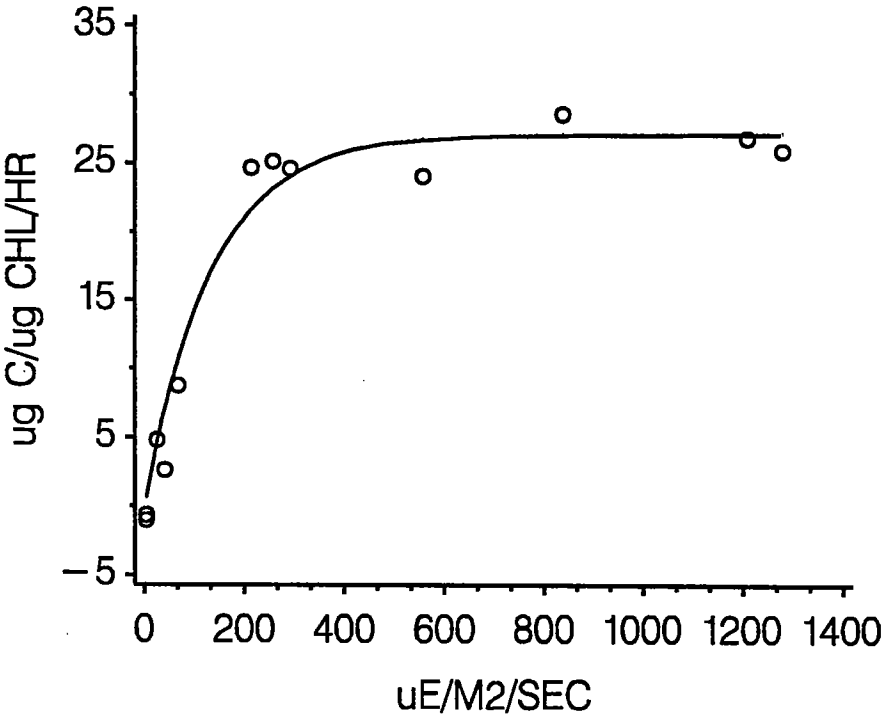
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N4P CHLA MAXIMUM



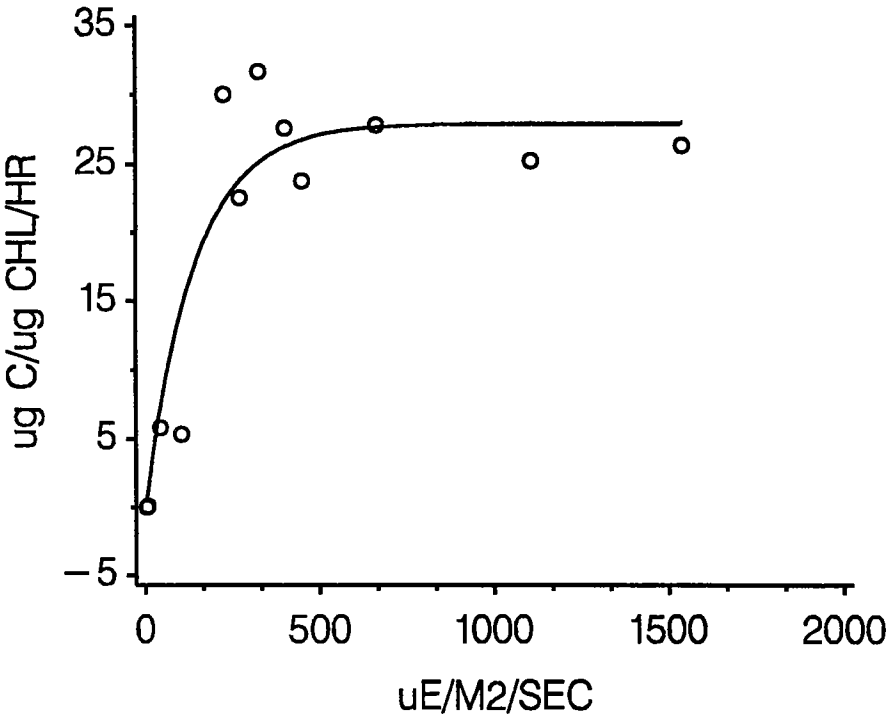
NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N4P SURFACE



NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

STATION N7P CHLA MAXIMUM



NEGATIVE EXPONENTIAL MODEL, WEBB ET AL 1974
CRUISE NUMBER 9304 APRIL, 1993

APPENDIX F

PHYTOPLANKTON SPECIES DATA TABLES

A complete listing, by survey, is given for taxonomic analyses of whole-water samples analyzed for W9304, W9305, and W9306 (Table F-1). Table F-2 provides a listing for all surface samples, screened (20 μm), for W9304, W9305, and W9306. Chlorophyll maximum sample results, given in the text report, are repeated in Table F-3.

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93040021	F23P	04-06-93	05:56	4.2	CHAETOCEROS DEBILIS	.007
W93040021	F23P	04-06-93	05:56	4.2	CHAETOCEROS SOCIALIS	.025
W93040021	F23P	04-06-93	05:56	4.2	CHAETOCEROS SPP. (10-20UM)	.034
W93040021	F23P	04-06-93	05:56	4.2	COSCINODISCUS SPP.	.001
W93040021	F23P	04-06-93	05:56	4.2	CRYPTOMONADS	.117
W93040021	F23P	04-06-93	05:56	4.2	CYLINDROTHECA CLOSTERIUM	.008
W93040021	F23P	04-06-93	05:56	4.2	DICTYOCHA SPECULUM	.003
W93040021	F23P	04-06-93	05:56	4.2	GYMNODINIUM SPP.	.003
W93040021	F23P	04-06-93	05:56	4.2	GYRODINIUM SPIRALE	.001
W93040021	F23P	04-06-93	05:56	4.2	HETEROSIGMA AKASHIWO	.001
W93040021	F23P	04-06-93	05:56	4.2	KATODINIUM SPP.	.001
W93040021	F23P	04-06-93	05:56	4.2	MICROFLAGELLATES	.22
W93040021	F23P	04-06-93	05:56	4.2	NAVICULOID DIATOMS	.004
W93040021	F23P	04-06-93	05:56	4.2	NAVICULOIDS (LYRATE)	.007
W93040021	F23P	04-06-93	05:56	4.2	NITZSCHIA LONGISSIMA	.001
W93040021	F23P	04-06-93	05:56	4.2	PROTOPERIDINIUM DENTICULATUM	.003
W93040021	F23P	04-06-93	05:56	4.2	PYRAMIMONAS/TETRASELMIS SPP.	.001
W93040021	F23P	04-06-93	05:56	4.2	SKELETONEMA COSTATUM	.018
W93040021	F23P	04-06-93	05:56	4.2	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.078
W93040021	F23P	04-06-93	05:56	4.2	THALASSIOSIRA NORDENSKIOELDII	.005
W93040021	F23P	04-06-93	05:56	4.2	UNID. CENTRALES	.005
W93040022	F23P	04-06-93	05:56	2.2	CHAETOCEROS DEBILIS	.013
W93040022	F23P	04-06-93	05:56	2.2	CHAETOCEROS SOCIALIS	.012
W93040022	F23P	04-06-93	05:56	2.2	CHAETOCEROS SPP. (10-20UM)	.002
W93040022	F23P	04-06-93	05:56	2.2	COSCINODISCUS SPP.	.001
W93040022	F23P	04-06-93	05:56	2.2	CRYPTOMONADS	.115
W93040022	F23P	04-06-93	05:56	2.2	CYLINDROTHECA CLOSTERIUM	.003
W93040022	F23P	04-06-93	05:56	2.2	DETONULA CONFERVACEA	.004
W93040022	F23P	04-06-93	05:56	2.2	GRAMMATOPHORA MARINA	.001
W93040022	F23P	04-06-93	05:56	2.2	GYMNODINIUM SPP.	.001
W93040022	F23P	04-06-93	05:56	2.2	GYRODINIUM SPIRALE	.001
W93040022	F23P	04-06-93	05:56	2.2	GYROSIGMA SPP.	.002
W93040022	F23P	04-06-93	05:56	2.2	HETEROCAPSA TRIQUETRA	.001
W93040022	F23P	04-06-93	05:56	2.2	LEPTOCYLINDRUS DANICUS	.008
W93040022	F23P	04-06-93	05:56	2.2	MICROFLAGELLATES	.16
W93040022	F23P	04-06-93	05:56	2.2	NAVICULOID DIATOMS	.009
W93040022	F23P	04-06-93	05:56	2.2	NAVICULOIDS (LYRATE)	.002
W93040022	F23P	04-06-93	05:56	2.2	NITZSCHIA (CF) DELICATISSIMA	.007
W93040022	F23P	04-06-93	05:56	2.2	NITZSCHIA SPP.	.001
W93040022	F23P	04-06-93	05:56	2.2	PYRAMIMONAS/TETRASELMIS SPP.	.002
W93040022	F23P	04-06-93	05:56	2.2	SKELETONEMA COSTATUM	.011
W93040022	F23P	04-06-93	05:56	2.2	THALASSIONEMA NITZSCHOIDES	.004
W93040022	F23P	04-06-93	05:56	2.2	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.096
W93040022	F23P	04-06-93	05:56	2.2	THALASSIOSIRA NORDENSKIOELDII	.001
W93040022	F23P	04-06-93	05:56	2.2	UNID. CENTRALES	.001
W93040045	N20P	04-06-93	07:28	12.1	CHAETOCEROS DEBILIS	.16
W93040045	N20P	04-06-93	07:28	12.1	CHAETOCEROS SOCIALIS	.053
W93040045	N20P	04-06-93	07:28	12.1	CHAETOCEROS SPP. (10-20UM)	.06
W93040045	N20P	04-06-93	07:28	12.1	CRYPTOMONADS	.046
W93040045	N20P	04-06-93	07:28	12.1	GYMNODINIUM SPP.	.01
W93040045	N20P	04-06-93	07:28	12.1	GYRODINIUM SPIRALE	.002
W93040045	N20P	04-06-93	07:28	12.1	MESODINIUM RUBRUM	.002
W93040045	N20P	04-06-93	07:28	12.1	MICROFLAGELLATES	.06
W93040045	N20P	04-06-93	07:28	12.1	NAVICULOID DIATOMS	.003
W93040045	N20P	04-06-93	07:28	12.1	NAVICULOIDS (LYRATE)	.007
W93040045	N20P	04-06-93	07:28	12.1	NITZSCHIA SERIATA	.002
W93040045	N20P	04-06-93	07:28	12.1	NITZSCHIA SPP.	.005
W93040045	N20P	04-06-93	07:28	12.1	PROROCENTRUM MINIMUM	.002
W93040045	N20P	04-06-93	07:28	12.1	PYRAMIMONAS/TETRASELMIS SPP.	.007
W93040045	N20P	04-06-93	07:28	12.1	THALASSIONEMA NITZSCHOIDES	.002
W93040045	N20P	04-06-93	07:28	12.1	THALASSIOSIRA (CF) AESTIVALIS	.012
W93040045	N20P	04-06-93	07:28	12.1	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.268

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93040045	N20P	04-06-93	07:28	12.1	UNID. CENTRALES	.003
W93040045	N20P	04-06-93	07:28	12.1	UNID. DINOFLAGELLATES	.005
W93040045	N20P	04-06-93	07:28	12.1	UNID. NAKED DINOFLAGELLATE	.002
W93040047	N20P	04-06-93	07:31	2.1	CHAETOCEROS DEBILIS	.075
W93040047	N20P	04-06-93	07:31	2.1	CHAETOCEROS SOCIALIS	.018
W93040047	N20P	04-06-93	07:31	2.1	CHAETOCEROS SPP. (10-20UM)	.043
W93040047	N20P	04-06-93	07:31	2.1	COSCINODISCUS SPP.	.001
W93040047	N20P	04-06-93	07:31	2.1	CRYPTOMONADS	.036
W93040047	N20P	04-06-93	07:31	2.1	CYLINDROTHECA CLOSTERIUM	.007
W93040047	N20P	04-06-93	07:31	2.1	GYMNODINIUM SPP.	.003
W93040047	N20P	04-06-93	07:31	2.1	GYRODINIUM SPIRALE	.002
W93040047	N20P	04-06-93	07:31	2.1	HETEROSIGMA AKASHIWO	.001
W93040047	N20P	04-06-93	07:31	2.1	MICROFLAGELLATES	.085
W93040047	N20P	04-06-93	07:31	2.1	NAVICULOID DIATOMS	.018
W93040047	N20P	04-06-93	07:31	2.1	PROTOPERIDINIUM SPP.	.001
W93040047	N20P	04-06-93	07:31	2.1	PYRAMIMONAS/TETRASELMIS SPP.	.002
W93040047	N20P	04-06-93	07:31	2.1	THALASSIONEMA NITZSCHOIDES	.003
W93040047	N20P	04-06-93	07:31	2.1	THALASSIOSIRA (CF) AESTIVALIS	.009
W93040047	N20P	04-06-93	07:31	2.1	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.139
W93040047	N20P	04-06-93	07:31	2.1	UNID. CENTRALES	.002
W93040047	N20P	04-06-93	07:31	2.1	UNID. NAKED DINOFLAGELLATE	.007
W93040062	N16P	04-06-93	08:30	7.6	CHAETOCEROS COMPRESSUS	.006
W93040062	N16P	04-06-93	08:30	7.6	CHAETOCEROS DEBILIS	.098
W93040062	N16P	04-06-93	08:30	7.6	CHAETOCEROS SOCIALIS	.031
W93040062	N16P	04-06-93	08:30	7.6	CHAETOCEROS SPP. (10-20UM)	.06
W93040062	N16P	04-06-93	08:30	7.6	COSCINODISCUS SPP.	.001
W93040062	N16P	04-06-93	08:30	7.6	CRYPTOMONADS	.03
W93040062	N16P	04-06-93	08:30	7.6	CYLINDROTHECA CLOSTERIUM	.005
W93040062	N16P	04-06-93	08:30	7.6	GYRODINIUM SPIRALE	.007
W93040062	N16P	04-06-93	08:30	7.6	GYRODINIUM SPP.	.001
W93040062	N16P	04-06-93	08:30	7.6	KATODINIUM SPP.	.001
W93040062	N16P	04-06-93	08:30	7.6	MICROFLAGELLATES	.052
W93040062	N16P	04-06-93	08:30	7.6	NAVICULOID DIATOMS	.005
W93040062	N16P	04-06-93	08:30	7.6	NAVICULOIDS (LYRATE)	.002
W93040062	N16P	04-06-93	08:30	7.6	THALASSIOSIRA (CF) AESTIVALIS	.007
W93040062	N16P	04-06-93	08:30	7.6	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.162
W93040062	N16P	04-06-93	08:30	7.6	UNID. CENTRALES	.003
W93040062	N16P	04-06-93	08:30	7.6	UNID. NAKED DINOFLAGELLATE	.009
W93040063	N16P	04-06-93	08:31	2.4	CERATIUM LONGIPES	.002
W93040063	N16P	04-06-93	08:31	2.4	CHAETOCEROS DEBILIS	.176
W93040063	N16P	04-06-93	08:31	2.4	CHAETOCEROS SOCIALIS	.074
W93040063	N16P	04-06-93	08:31	2.4	CHAETOCEROS SPP. (10-20UM)	.071
W93040063	N16P	04-06-93	08:31	2.4	CRYPTOMONADS	.036
W93040063	N16P	04-06-93	08:31	2.4	CYLINDROTHECA CLOSTERIUM	.011
W93040063	N16P	04-06-93	08:31	2.4	GYMNODINIUM SPP.	.007
W93040063	N16P	04-06-93	08:31	2.4	GYRODINIUM SPIRALE	.002
W93040063	N16P	04-06-93	08:31	2.4	KATODINIUM ROTUNDATUM	.004
W93040063	N16P	04-06-93	08:31	2.4	MICROFLAGELLATES	.105
W93040063	N16P	04-06-93	08:31	2.4	NAVICULOID DIATOMS	.002
W93040063	N16P	04-06-93	08:31	2.4	NAVICULOIDS (LYRATE)	.007
W93040063	N16P	04-06-93	08:31	2.4	NITZSCHIA (CF) DELICATISSIMA	.005
W93040063	N16P	04-06-93	08:31	2.4	PARALIA MARINA	.007
W93040063	N16P	04-06-93	08:31	2.4	RHIZOSOLENIA HEBETATA F. SEMISPINA	.002
W93040063	N16P	04-06-93	08:31	2.4	STRIATELLA UNIPUNCTATA	.002
W93040063	N16P	04-06-93	08:31	2.4	THALASSIOSIRA (CF) AESTIVALIS	.018
W93040063	N16P	04-06-93	08:31	2.4	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.211
W93040063	N16P	04-06-93	08:31	2.4	UNID. CENTRALES	.005
W93040063	N16P	04-06-93	08:31	2.4	UNID. NAKED DINOFLAGELLATE	.005
W93040076	N10P	04-06-93	09:32	6.3	CHAETOCEROS COMPRESSUS	.011
W93040076	N10P	04-06-93	09:32	6.3	CHAETOCEROS CORONATUS	.004
W93040076	N10P	04-06-93	09:32	6.3	CHAETOCEROS DEBILIS	.142
W93040076	N10P	04-06-93	09:32	6.3	CHAETOCEROS SOCIALIS	.094

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93040076	N10P	04-06-93	09:32	6.3	CHAETOCEROS SPORE	.002
W93040076	N10P	04-06-93	09:32	6.3	CHAETOCEROS SPP. (10-20UM)	.055
W93040076	N10P	04-06-93	09:32	6.3	CRYPTOMONADS	.037
W93040076	N10P	04-06-93	09:32	6.3	CYLINDROTHECA CLOSTERIUM	.015
W93040076	N10P	04-06-93	09:32	6.3	GYMNODINIUM SPP.	.002
W93040076	N10P	04-06-93	09:32	6.3	GYRODINIUM SPIRALE	.002
W93040076	N10P	04-06-93	09:32	6.3	GYRODINIUM SPP.	.002
W93040076	N10P	04-06-93	09:32	6.3	MICROFLAGELLATES	.157
W93040076	N10P	04-06-93	09:32	6.3	NAVICULOID DIATOMS	.002
W93040076	N10P	04-06-93	09:32	6.3	NAVICULOIDS (LYRATE)	.004
W93040076	N10P	04-06-93	09:32	6.3	NITZSCHIA (CF) DELICATISSIMA	.009
W93040076	N10P	04-06-93	09:32	6.3	ODONTELLA (cf) SINENSIS	.002
W93040076	N10P	04-06-93	09:32	6.3	PROTOPERIDINIUM SPP.	.002
W93040076	N10P	04-06-93	09:32	6.3	PYRAMIMONAS/TETRASELMIS SPP.	.004
W93040076	N10P	04-06-93	09:32	6.3	RHIZOSOLENIA HEBETATA F. SEMISPINA	.002
W93040076	N10P	04-06-93	09:32	6.3	THALASSIONEMA NITZSCHOIDES	.002
W93040076	N10P	04-06-93	09:32	6.3	THALASSIOSIRA (CF) AESTIVALIS	.011
W93040076	N10P	04-06-93	09:32	6.3	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.195
W93040076	N10P	04-06-93	09:32	6.3	UNID. CENTRALES	.004
W93040076	N10P	04-06-93	09:32	6.3	UNID. NAKED DINOFLAGELLATE	.013
W93040077	N10P	04-06-93	09:33	2.4	CHAETOCEROS COMPRESSUS	.007
W93040077	N10P	04-06-93	09:33	2.4	CHAETOCEROS DEBILIS	.053
W93040077	N10P	04-06-93	09:33	2.4	CHAETOCEROS SOCIALIS	.074
W93040077	N10P	04-06-93	09:33	2.4	CHAETOCEROS SPP. (10-20UM)	.015
W93040077	N10P	04-06-93	09:33	2.4	CRYPTOMONADS	.031
W93040077	N10P	04-06-93	09:33	2.4	CYLINDROTHECA CLOSTERIUM	.005
W93040077	N10P	04-06-93	09:33	2.4	GYMNODINIUM SPP.	.004
W93040077	N10P	04-06-93	09:33	2.4	GYRODINIUM SPIRALE	.004
W93040077	N10P	04-06-93	09:33	2.4	GYRODINIUM SPP.	.001
W93040077	N10P	04-06-93	09:33	2.4	KATODINIUM SPP.	.001
W93040077	N10P	04-06-93	09:33	2.4	LICMOPHORA SPP.	.001
W93040077	N10P	04-06-93	09:33	2.4	MESODINIUM RUBRUM	.002
W93040077	N10P	04-06-93	09:33	2.4	MICROFLAGELLATES	.1
W93040077	N10P	04-06-93	09:33	2.4	NAVICULOID DIATOMS	.007
W93040077	N10P	04-06-93	09:33	2.4	NAVICULOIDS (LYRATE)	.001
W93040077	N10P	04-06-93	09:33	2.4	NITZSCHIA (CF) DELICATISSIMA	.004
W93040077	N10P	04-06-93	09:33	2.4	PROTOPERIDINIUM BREVE	.001
W93040077	N10P	04-06-93	09:33	2.4	PROTOPERIDINIUM SPP.	.001
W93040077	N10P	04-06-93	09:33	2.4	PYRAMIMONAS/TETRASELMIS SPP.	.005
W93040077	N10P	04-06-93	09:33	2.4	RHIZOSOLENIA DELICATULA	.001
W93040077	N10P	04-06-93	09:33	2.4	THALASSIONEMA NITZSCHOIDES	.001
W93040077	N10P	04-06-93	09:33	2.4	THALASSIOSIRA (CF) AESTIVALIS	.005
W93040077	N10P	04-06-93	09:33	2.4	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.163
W93040077	N10P	04-06-93	09:33	2.4	UNID. CENTRALES	.001
W93040077	N10P	04-06-93	09:33	2.4	UNID. NAKED DINOFLAGELLATE	.014
W93040210	N01P	04-07-93	06:20	10.3	CHAETOCEROS COMPRESSUS	.01
W93040210	N01P	04-07-93	06:20	10.3	CHAETOCEROS DEBILIS	.074
W93040210	N01P	04-07-93	06:20	10.3	CHAETOCEROS DECIPIENS	.003
W93040210	N01P	04-07-93	06:20	10.3	CHAETOCEROS SOCIALIS	.168
W93040210	N01P	04-07-93	06:20	10.3	CHAETOCEROS SPP. (10-20UM)	.032
W93040210	N01P	04-07-93	06:20	10.3	CRYPTOMONADS	.016
W93040210	N01P	04-07-93	06:20	10.3	CYLINDROTHECA CLOSTERIUM	.01
W93040210	N01P	04-07-93	06:20	10.3	DICTYOCHA SPECULUM	.002
W93040210	N01P	04-07-93	06:20	10.3	GRAMMATOPHORA MARINA	.002
W93040210	N01P	04-07-93	06:20	10.3	GYMNODINIUM SPP.	.006
W93040210	N01P	04-07-93	06:20	10.3	GYRODINIUM SPIRALE	.002
W93040210	N01P	04-07-93	06:20	10.3	GYRODINIUM SPP.	.005
W93040210	N01P	04-07-93	06:20	10.3	HETEROCAPSA TRIQUETRA	.006
W93040210	N01P	04-07-93	06:20	10.3	LICMOPHORA SPP.	.002
W93040210	N01P	04-07-93	06:20	10.3	MESODINIUM RUBRUM	.002
W93040210	N01P	04-07-93	06:20	10.3	MICROFLAGELLATES	.098
W93040210	N01P	04-07-93	06:20	10.3	NAVICULOID DIATOMS	.011

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93040210	NO1P	04-07-93	06:20	10.3	NITZSCHIA (CF) DELICATISSIMA	.013
W93040210	NO1P	04-07-93	06:20	10.3	PYRAMIMONAS/TETRASELMIS SPP.	.005
W93040210	NO1P	04-07-93	06:20	10.3	THALASSIONEMA NITZSCHOIDES	.005
W93040210	NO1P	04-07-93	06:20	10.3	THALASSIOSIRA (CF) AESTIVALIS	.011
W93040210	NO1P	04-07-93	06:20	10.3	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.165
W93040210	NO1P	04-07-93	06:20	10.3	THALASSIOSIRA SUBTILIS	.008
W93040210	NO1P	04-07-93	06:20	10.3	UNID. CENTRALES	.003
W93040210	NO1P	04-07-93	06:20	10.3	UNID. NAKED DINOFLAGELLATE	.013
W93040212	NO1P	04-07-93	06:24	2.4	CHAETOCEROS COMPRESSUS	.019
W93040212	NO1P	04-07-93	06:24	2.4	CHAETOCEROS DEBILIS	.091
W93040212	NO1P	04-07-93	06:24	2.4	CHAETOCEROS SOCIALIS	.134
W93040212	NO1P	04-07-93	06:24	2.4	CHAETOCEROS SPP. (10-20UM)	.031
W93040212	NO1P	04-07-93	06:24	2.4	CRYPTOMONADS	.018
W93040212	NO1P	04-07-93	06:24	2.4	CYLINDROTHECA CLOSTERIUM	.006
W93040212	NO1P	04-07-93	06:24	2.4	EUTREPTIA/EUTREPTIELLA SPP.	.002
W93040212	NO1P	04-07-93	06:24	2.4	GYMNODINIUM SPP.	.003
W93040212	NO1P	04-07-93	06:24	2.4	GYRODINIUM SPIRALE	.002
W93040212	NO1P	04-07-93	06:24	2.4	GYRODINIUM SPP.	.003
W93040212	NO1P	04-07-93	06:24	2.4	KATODINIUM SPP.	.002
W93040212	NO1P	04-07-93	06:24	2.4	MESODINIUM RUBRUM	.002
W93040212	NO1P	04-07-93	06:24	2.4	MICROFLAGELLATES	.087
W93040212	NO1P	04-07-93	06:24	2.4	NAVICULOID DIATOMS	.016
W93040212	NO1P	04-07-93	06:24	2.4	NITZSCHIA (CF) DELICATISSIMA	.01
W93040212	NO1P	04-07-93	06:24	2.4	PYRAMIMONAS/TETRASELMIS SPP.	.01
W93040212	NO1P	04-07-93	06:24	2.4	SKELETONEMA COSTATUM	.005
W93040212	NO1P	04-07-93	06:24	2.4	THALASSIOSIRA (CF) AESTIVALIS	.008
W93040212	NO1P	04-07-93	06:24	2.4	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.199
W93040212	NO1P	04-07-93	06:24	2.4	THALASSIOSIRA SUBTILIS	.008
W93040212	NO1P	04-07-93	06:24	2.4	UNID. CENTRALES	.003
W93040212	NO1P	04-07-93	06:24	2.4	UNID. NAKED DINOFLAGELLATE	.011
W93040224	NO4P	04-07-93	07:24	24.1	CERATIUM LONGIPES	.002
W93040224	NO4P	04-07-93	07:24	24.1	CHAETOCEROS BOREALIS	.012
W93040224	NO4P	04-07-93	07:24	24.1	CHAETOCEROS COMPRESSUS	.016
W93040224	NO4P	04-07-93	07:24	24.1	CHAETOCEROS DEBILIS	.234
W93040224	NO4P	04-07-93	07:24	24.1	CHAETOCEROS SOCIALIS	.104
W93040224	NO4P	04-07-93	07:24	24.1	CHAETOCEROS SPP. (10-20UM)	.044
W93040224	NO4P	04-07-93	07:24	24.1	CRYPTOMONADS	.028
W93040224	NO4P	04-07-93	07:24	24.1	CYLINDROTHECA CLOSTERIUM	.01
W93040224	NO4P	04-07-93	07:24	24.1	GYMNODINIUM SPP.	.002
W93040224	NO4P	04-07-93	07:24	24.1	GYRODINIUM SPIRALE	.004
W93040224	NO4P	04-07-93	07:24	24.1	GYRODINIUM SPP.	.004
W93040224	NO4P	04-07-93	07:24	24.1	HETEROCAPSA TRIQUETRA	.002
W93040224	NO4P	04-07-93	07:24	24.1	KATODINIUM SPP.	.004
W93040224	NO4P	04-07-93	07:24	24.1	MICROFLAGELLATES	.046
W93040224	NO4P	04-07-93	07:24	24.1	NAVICULOID DIATOMS	.012
W93040224	NO4P	04-07-93	07:24	24.1	NITZSCHIA (CF) DELICATISSIMA	.014
W93040224	NO4P	04-07-93	07:24	24.1	PROTOPERIDINIUM BIPES	.002
W93040224	NO4P	04-07-93	07:24	24.1	RHIZOSOLENIA HEBETATA F. SEMISPINA	.004
W93040224	NO4P	04-07-93	07:24	24.1	THALASSIONEMA NITZSCHOIDES	.002
W93040224	NO4P	04-07-93	07:24	24.1	THALASSIOSIRA (CF) AESTIVALIS	.008
W93040224	NO4P	04-07-93	07:24	24.1	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.262
W93040224	NO4P	04-07-93	07:24	24.1	UNID. CENTRALES	.004
W93040224	NO4P	04-07-93	07:24	24.1	UNID. NAKED DINOFLAGELLATE	.008
W93040226	NO4P	04-07-93	07:27	2.7	CHAETOCEROS BOREALIS	.006
W93040226	NO4P	04-07-93	07:27	2.7	CHAETOCEROS COMPRESSUS	.012
W93040226	NO4P	04-07-93	07:27	2.7	CHAETOCEROS DEBILIS	.095
W93040226	NO4P	04-07-93	07:27	2.7	CHAETOCEROS DECIPIENS	.005
W93040226	NO4P	04-07-93	07:27	2.7	CHAETOCEROS SOCIALIS	.088
W93040226	NO4P	04-07-93	07:27	2.7	CHAETOCEROS SPP. (10-20UM)	.015
W93040226	NO4P	04-07-93	07:27	2.7	CRYPTOMONADS	.017
W93040226	NO4P	04-07-93	07:27	2.7	GYMNODINIUM SPP.	.003
W93040226	NO4P	04-07-93	07:27	2.7	GYRODINIUM SPIRALE	.001

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93040226	N04P	04-07-93	07:27	2.7	GYRODINIUM SPP.	.001
W93040226	N04P	04-07-93	07:27	2.7	HETEROCAPSA TRIQUETRA	.006
W93040226	N04P	04-07-93	07:27	2.7	MICROFLAGELLATES	.069
W93040226	N04P	04-07-93	07:27	2.7	NAVICULOID DIATOMS	.007
W93040226	N04P	04-07-93	07:27	2.7	NITZSCHIA (CF) DELICATISSIMA	.002
W93040226	N04P	04-07-93	07:27	2.7	PROTOPERIDINIUM BIPES	.001
W93040226	N04P	04-07-93	07:27	2.7	PYRAMIMONAS/TETRASELMIS SPP.	.001
W93040226	N04P	04-07-93	07:27	2.7	RHIZOSOLENIA HEBETATA F. SEMISPINA	.001
W93040226	N04P	04-07-93	07:27	2.7	SKELETONEMA COSTATUM	.005
W93040226	N04P	04-07-93	07:27	2.7	THALASSIONEMA NITZSCHOIDES	.003
W93040226	N04P	04-07-93	07:27	2.7	THALASSIOSIRA (CF) AESTIVALIS	.003
W93040226	N04P	04-07-93	07:27	2.7	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.11
W93040226	N04P	04-07-93	07:27	2.7	THALASSIOSIRA SUBTILIS	.006
W93040226	N04P	04-07-93	07:27	2.7	UNID. CENTRALES	.002
W93040226	N04P	04-07-93	07:27	2.7	UNID. DINOFLAGELLATES	.001
W93040226	N04P	04-07-93	07:27	2.7	UNID. NAKED DINOFLAGELLATE	.01
W93040241	N07P	04-07-93	08:31	11.1	CHAETOCEROS BOREALIS	.005
W93040241	N07P	04-07-93	08:31	11.1	CHAETOCEROS COMPRESSUS	.022
W93040241	N07P	04-07-93	08:31	11.1	CHAETOCEROS DEBILIS	.103
W93040241	N07P	04-07-93	08:31	11.1	CHAETOCEROS SEPTENTRIONALIS	.002
W93040241	N07P	04-07-93	08:31	11.1	CHAETOCEROS SOCIALIS	.177
W93040241	N07P	04-07-93	08:31	11.1	CHAETOCEROS SPP. (10-20UM)	.032
W93040241	N07P	04-07-93	08:31	11.1	CRYPTOMONADS	.049
W93040241	N07P	04-07-93	08:31	11.1	CYANOPHYCEAE (NOSTOC-LIKE 4um diam)	.079
W93040241	N07P	04-07-93	08:31	11.1	CYLINDROTHECA CLOSTERIUM	.003
W93040241	N07P	04-07-93	08:31	11.1	GYRODINIUM SPIRALE	.002
W93040241	N07P	04-07-93	08:31	11.1	GYRODINIUM SPP.	.003
W93040241	N07P	04-07-93	08:31	11.1	MESODINIUM RUBRUM	.002
W93040241	N07P	04-07-93	08:31	11.1	MICROFLAGELLATES	.068
W93040241	N07P	04-07-93	08:31	11.1	NAVICULOID DIATOMS	.002
W93040241	N07P	04-07-93	08:31	11.1	NITZSCHIA (CF) DELICATISSIMA	.002
W93040241	N07P	04-07-93	08:31	11.1	ODONTELLA (cf) LONGICRURIS	.003
W93040241	N07P	04-07-93	08:31	11.1	PYRAMIMONAS/TETRASELMIS SPP.	.002
W93040241	N07P	04-07-93	08:31	11.1	THALASSIONEMA NITZSCHOIDES	.003
W93040241	N07P	04-07-93	08:31	11.1	THALASSIOSIRA (CF) AESTIVALIS	.007
W93040241	N07P	04-07-93	08:31	11.1	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.132
W93040241	N07P	04-07-93	08:31	11.1	UNID. NAKED DINOFLAGELLATE	.008
W93040242	N07P	04-07-93	08:32	2.3	CHAETOCEROS COMPRESSUS	.02
W93040242	N07P	04-07-93	08:32	2.3	CHAETOCEROS DEBILIS	.182
W93040242	N07P	04-07-93	08:32	2.3	CHAETOCEROS DECIPIENS	.002
W93040242	N07P	04-07-93	08:32	2.3	CHAETOCEROS SOCIALIS	.139
W93040242	N07P	04-07-93	08:32	2.3	CHAETOCEROS SPORE	.002
W93040242	N07P	04-07-93	08:32	2.3	CHAETOCEROS SPP. (10-20UM)	.016
W93040242	N07P	04-07-93	08:32	2.3	COSCINODISCUS SPP.	.002
W93040242	N07P	04-07-93	08:32	2.3	CRYPTOMONADS	.026
W93040242	N07P	04-07-93	08:32	2.3	CYANOPHYCEAE (NOSTOC-LIKE 4um diam)	.011
W93040242	N07P	04-07-93	08:32	2.3	CYLINDROTHECA CLOSTERIUM	.011
W93040242	N07P	04-07-93	08:32	2.3	HETEROCAPSA TRIQUETRA	.002
W93040242	N07P	04-07-93	08:32	2.3	MICROFLAGELLATES	.092
W93040242	N07P	04-07-93	08:32	2.3	NAVICULOID DIATOMS	.003
W93040242	N07P	04-07-93	08:32	2.3	NITZSCHIA (CF) DELICATISSIMA	.005
W93040242	N07P	04-07-93	08:32	2.3	ODONTELLA (cf) LONGICRURIS	.003
W93040242	N07P	04-07-93	08:32	2.3	THALASSIONEMA NITZSCHOIDES	.005
W93040242	N07P	04-07-93	08:32	2.3	THALASSIOSIRA (CF) AESTIVALIS	.005
W93040242	N07P	04-07-93	08:32	2.3	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.139
W93040242	N07P	04-07-93	08:32	2.3	THALASSIOSIRA SUBTILIS	.005
W93040242	N07P	04-07-93	08:32	2.3	UNID. CENTRALES	.002
W93040242	N07P	04-07-93	08:32	2.3	UNID. NAKED DINOFLAGELLATE	.002
W93040254	F13P	04-07-93	09:33	11.3	CERATIUM LONGIPES	.002
W93040254	F13P	04-07-93	09:33	11.3	CHAETOCEROS BOREALIS	.008
W93040254	F13P	04-07-93	09:33	11.3	CHAETOCEROS COMPRESSUS	.017
W93040254	F13P	04-07-93	09:33	11.3	CHAETOCEROS DEBILIS	.124

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93040254	F13P	04-07-93	09:33	11.3	CHAETOCEROS DECIPIENS	.002
W93040254	F13P	04-07-93	09:33	11.3	CHAETOCEROS SOCIALIS	.092
W93040254	F13P	04-07-93	09:33	11.3	CHAETOCEROS SPP. (10-20UM)	.041
W93040254	F13P	04-07-93	09:33	11.3	CRYPTOMONADS	.041
W93040254	F13P	04-07-93	09:33	11.3	CYLINDROTHECA CLOSTERIUM	.003
W93040254	F13P	04-07-93	09:33	11.3	DINOPHYSIS OVUM	.002
W93040254	F13P	04-07-93	09:33	11.3	GYMNODINIUM SPP.	.012
W93040254	F13P	04-07-93	09:33	11.3	GYRODINIUM SPIRALE	.003
W93040254	F13P	04-07-93	09:33	11.3	HETEROCAPSA TRIQUETRA	.007
W93040254	F13P	04-07-93	09:33	11.3	MESODINIUM RUBRUM	.007
W93040254	F13P	04-07-93	09:33	11.3	MICROFLAGELLATES	.11
W93040254	F13P	04-07-93	09:33	11.3	NAVICULOID DIATOMS	.003
W93040254	F13P	04-07-93	09:33	11.3	NITZSCHIA (CF) DELICATISSIMA	.003
W93040254	F13P	04-07-93	09:33	11.3	PROTOPERIDINIUM PELLUCIDUM	.002
W93040254	F13P	04-07-93	09:33	11.3	RHIZOSOLENIA HEBETATA F. SEMISPINA	.002
W93040254	F13P	04-07-93	09:33	11.3	THALASSIONEMA NITZSCHOIDES	.003
W93040254	F13P	04-07-93	09:33	11.3	THALASSIOSIRA (CF) AESTIVALIS	.003
W93040254	F13P	04-07-93	09:33	11.3	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.198
W93040254	F13P	04-07-93	09:33	11.3	UNID. CENTRALES	.003
W93040254	F13P	04-07-93	09:33	11.3	UNID. NAKED DINOFLAGELLATE	.02
W93040256	F13P	04-07-93	09:36	2.1	CHAETOCEROS COMPRESSUS	.008
W93040256	F13P	04-07-93	09:36	2.1	CHAETOCEROS DEBILIS	.021
W93040256	F13P	04-07-93	09:36	2.1	CHAETOCEROS SOCIALIS	.077
W93040256	F13P	04-07-93	09:36	2.1	CHAETOCEROS SPP. (10-20UM)	.019
W93040256	F13P	04-07-93	09:36	2.1	COCCONEIS SCUTELLUM	.001
W93040256	F13P	04-07-93	09:36	2.1	CRYPTOMONADS	.018
W93040256	F13P	04-07-93	09:36	2.1	CYLINDROTHECA CLOSTERIUM	.004
W93040256	F13P	04-07-93	09:36	2.1	DICTYOCHA SPECULUM	.001
W93040256	F13P	04-07-93	09:36	2.1	EUTREPTIA/EUTREPTIELLA SPP.	.001
W93040256	F13P	04-07-93	09:36	2.1	GYMNODINIUM SPP.	.001
W93040256	F13P	04-07-93	09:36	2.1	GYRODINIUM SPIRALE	.001
W93040256	F13P	04-07-93	09:36	2.1	GYRODINIUM SPP.	.001
W93040256	F13P	04-07-93	09:36	2.1	HETEROCAPSA TRIQUETRA	.002
W93040256	F13P	04-07-93	09:36	2.1	HETEROSIGMA AKASHIWO	.001
W93040256	F13P	04-07-93	09:36	2.1	LICMOPHORA SPP.	.002
W93040256	F13P	04-07-93	09:36	2.1	MICROFLAGELLATES	.095
W93040256	F13P	04-07-93	09:36	2.1	NAVICULOID DIATOMS	.005
W93040256	F13P	04-07-93	09:36	2.1	NITZSCHIA (CF) DELICATISSIMA	.001
W93040256	F13P	04-07-93	09:36	2.1	PROROCENTRUM MINIMUM	.001
W93040256	F13P	04-07-93	09:36	2.1	PROTOPERIDINIUM BIPES	.001
W93040256	F13P	04-07-93	09:36	2.1	PROTOPERIDINIUM SPP.	.001
W93040256	F13P	04-07-93	09:36	2.1	PYRAMIMONAS/TETRASELMIS SPP.	.001
W93040256	F13P	04-07-93	09:36	2.1	RHIZOSOLENIA HEBETATA F. SEMISPINA	.001
W93040256	F13P	04-07-93	09:36	2.1	THALASSIONEMA NITZSCHOIDES	.004
W93040256	F13P	04-07-93	09:36	2.1	THALASSIOSIRA (CF) AESTIVALIS	.003
W93040256	F13P	04-07-93	09:36	2.1	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.14
W93040256	F13P	04-07-93	09:36	2.1	UNID. CENTRALES	.002
W93040256	F13P	04-07-93	09:36	2.1	UNID. NAKED DINOFLAGELLATE	.008
W93040378	F02P	04-08-93	07:41	9.1	ASTERIONELLOPSIS GLACIALIS	.006
W93040378	F02P	04-08-93	07:41	9.1	CHAETOCEROS BOREALIS	.004
W93040378	F02P	04-08-93	07:41	9.1	CHAETOCEROS COMPRESSUS	.028
W93040378	F02P	04-08-93	07:41	9.1	CHAETOCEROS DEBILIS	.173
W93040378	F02P	04-08-93	07:41	9.1	CHAETOCEROS SOCIALIS	.129
W93040378	F02P	04-08-93	07:41	9.1	CHAETOCEROS SPP. (10-20UM)	.026
W93040378	F02P	04-08-93	07:41	9.1	CRYPTOMONADS	.042
W93040378	F02P	04-08-93	07:41	9.1	CYLINDROTHECA CLOSTERIUM	.004
W93040378	F02P	04-08-93	07:41	9.1	DICTYOCHA SPECULUM	.002
W93040378	F02P	04-08-93	07:41	9.1	GYMNODINIUM SPP.	.004
W93040378	F02P	04-08-93	07:41	9.1	GYRODINIUM SPIRALE	.018
W93040378	F02P	04-08-93	07:41	9.1	GYRODINIUM SPP.	.004
W93040378	F02P	04-08-93	07:41	9.1	KATODINIUM SPP.	.002
W93040378	F02P	04-08-93	07:41	9.1	MICROFLAGELLATES	.136

00160

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93040378	F02P	04-08-93	07:41	9.1	NAVICULOID DIATOMS	.006
W93040378	F02P	04-08-93	07:41	9.1	NITZSCHIA SERIATA	.007
W93040378	F02P	04-08-93	07:41	9.1	ODONTELLA (cf) LONGICRURIS	.002
W93040378	F02P	04-08-93	07:41	9.1	PROTOPERIDINIUM BIPES	.004
W93040378	F02P	04-08-93	07:41	9.1	PYRAMIMONAS/TETRASELMIS SPP.	.015
W93040378	F02P	04-08-93	07:41	9.1	STEPHANOPYXIS TURRIS	.004
W93040378	F02P	04-08-93	07:41	9.1	THALASSIONEMA NITZSCHOIDES	.017
W93040378	F02P	04-08-93	07:41	9.1	THALASSIOSIRA (CF) AESTIVALIS	.007
W93040378	F02P	04-08-93	07:41	9.1	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.122
W93040378	F02P	04-08-93	07:41	9.1	UNID. CENTRALES	.009
W93040378	F02P	04-08-93	07:41	9.1	UNID. NAKED DINOFLAGELLATE	.002
W93040379	F02P	04-08-93	07:41	2.1	ASTERIONELLOPSIS GLACIALIS	.009
W93040379	F02P	04-08-93	07:41	2.1	CHAETOCEROS COMPRESSUS	.025
W93040379	F02P	04-08-93	07:41	2.1	CHAETOCEROS DEBILIS	.163
W93040379	F02P	04-08-93	07:41	2.1	CHAETOCEROS SEPTENTRIONALIS	.003
W93040379	F02P	04-08-93	07:41	2.1	CHAETOCEROS SOCIALIS	.101
W93040379	F02P	04-08-93	07:41	2.1	CHAETOCEROS SPP. (10-20UM)	.009
W93040379	F02P	04-08-93	07:41	2.1	CRYPTOMONADS	.038
W93040379	F02P	04-08-93	07:41	2.1	CYLINDROTHECA CLOSTERIUM	.002
W93040379	F02P	04-08-93	07:41	2.1	EUTREPTIA/EUTREPTIELLA SPP.	.002
W93040379	F02P	04-08-93	07:41	2.1	GYMNODINIUM SPP.	.013
W93040379	F02P	04-08-93	07:41	2.1	GYRODINIUM SPIRALE	.005
W93040379	F02P	04-08-93	07:41	2.1	GYRODINIUM SPP.	.006
W93040379	F02P	04-08-93	07:41	2.1	HETEROCAPSA TRIQUETRA	.003
W93040379	F02P	04-08-93	07:41	2.1	MESODINIUM RUBRUM	.005
W93040379	F02P	04-08-93	07:41	2.1	MICROFLAGELLATES	.06
W93040379	F02P	04-08-93	07:41	2.1	NITZSCHIA SERIATA	.005
W93040379	F02P	04-08-93	07:41	2.1	ODONTELLA (cf) LONGICRURIS	.006
W93040379	F02P	04-08-93	07:41	2.1	PYRAMIMONAS/TETRASELMIS SPP.	.013
W93040379	F02P	04-08-93	07:41	2.1	STEPHANOPYXIS TURRIS	.003
W93040379	F02P	04-08-93	07:41	2.1	THALASSIONEMA NITZSCHOIDES	.009
W93040379	F02P	04-08-93	07:41	2.1	THALASSIOSIRA (CF) AESTIVALIS	.011
W93040379	F02P	04-08-93	07:41	2.1	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.159
W93040379	F02P	04-08-93	07:41	2.1	UNID. CENTRALES	.002
W93040379	F02P	04-08-93	07:41	2.1	UNID. DINOFLAGELLATES	.002
W93040399	F01P	04-08-93	09:05	12.2	CHAETOCEROS BOREALIS	.003
W93040399	F01P	04-08-93	09:05	12.2	CHAETOCEROS COMPRESSUS	.014
W93040399	F01P	04-08-93	09:05	12.2	CHAETOCEROS DEBILIS	.077
W93040399	F01P	04-08-93	09:05	12.2	CHAETOCEROS SOCIALIS	.077
W93040399	F01P	04-08-93	09:05	12.2	CHAETOCEROS SPP. (10-20UM)	.014
W93040399	F01P	04-08-93	09:05	12.2	CRYPTOMONADS	.057
W93040399	F01P	04-08-93	09:05	12.2	CYLINDROTHECA CLOSTERIUM	.003
W93040399	F01P	04-08-93	09:05	12.2	GYMNODINIUM SPP.	.008
W93040399	F01P	04-08-93	09:05	12.2	GYRODINIUM SPIRALE	.005
W93040399	F01P	04-08-93	09:05	12.2	HETEROCAPSA TRIQUETRA	.004
W93040399	F01P	04-08-93	09:05	12.2	MESODINIUM RUBRUM	.001
W93040399	F01P	04-08-93	09:05	12.2	MICROFLAGELLATES	.113
W93040399	F01P	04-08-93	09:05	12.2	NAVICULOID DIATOMS	.004
W93040399	F01P	04-08-93	09:05	12.2	NITZSCHIA (CF) DELICATISSIMA	.004
W93040399	F01P	04-08-93	09:05	12.2	PROROCENTRUM MINIMUM	.001
W93040399	F01P	04-08-93	09:05	12.2	PYRAMIMONAS/TETRASELMIS SPP.	.009
W93040399	F01P	04-08-93	09:05	12.2	THALASSIONEMA NITZSCHOIDES	.011
W93040399	F01P	04-08-93	09:05	12.2	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.096
W93040399	F01P	04-08-93	09:05	12.2	THALASSIOSIRA SUBTILIS	.005
W93040399	F01P	04-08-93	09:05	12.2	UNID. NAKED DINOFLAGELLATE	.009
W93040401	F01P	04-08-93	09:07	2.4	CHAETOCEROS BOREALIS	.001
W93040401	F01P	04-08-93	09:07	2.4	CHAETOCEROS COMPRESSUS	.007
W93040401	F01P	04-08-93	09:07	2.4	CHAETOCEROS DEBILIS	.069
W93040401	F01P	04-08-93	09:07	2.4	CHAETOCEROS DECIPIENS	.001
W93040401	F01P	04-08-93	09:07	2.4	CHAETOCEROS SOCIALIS	.119
W93040401	F01P	04-08-93	09:07	2.4	CHAETOCEROS SPP. (10-20UM)	.022
W93040401	F01P	04-08-93	09:07	2.4	CRYPTOMONADS	.046

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93040401	F01P	04-08-93	09:07	2.4	CYANOPHYCEAE	.005
W93040401	F01P	04-08-93	09:07	2.4	CYLINDROTHECA CLOSTERIUM	.004
W93040401	F01P	04-08-93	09:07	2.4	GYMNODINIUM SPP.	.004
W93040401	F01P	04-08-93	09:07	2.4	GYRODINIUM SPIRALE	.004
W93040401	F01P	04-08-93	09:07	2.4	GYRODINIUM SPP.	.008
W93040401	F01P	04-08-93	09:07	2.4	HETEROCAPSA TRIQUETRA	.001
W93040401	F01P	04-08-93	09:07	2.4	KATODINIUM SPP.	.001
W93040401	F01P	04-08-93	09:07	2.4	MICROFLAGELLATES	.114
W93040401	F01P	04-08-93	09:07	2.4	NAVICULOID DIATOMS	.001
W93040401	F01P	04-08-93	09:07	2.4	NITZSCHIA (CF) DELICATISSIMA	.007
W93040401	F01P	04-08-93	09:07	2.4	PROTOPERIDINIUM SPP.	.001
W93040401	F01P	04-08-93	09:07	2.4	PYRAMIMONAS/TETRASELMIS SPP.	.006
W93040401	F01P	04-08-93	09:07	2.4	THALASSIONEMA NITZSCHOIDES	.007
W93040401	F01P	04-08-93	09:07	2.4	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.067
W93040401	F01P	04-08-93	09:07	2.4	UNID. NAKED DINOFLAGELLATE	.006
W93040502	N10P	04-09-93	06:18	2.3	ASTERIONELLOPSIS GLACIALIS	.001
W93040502	N10P	04-09-93	06:18	2.3	CHAETOCEROS COMPRESSUS	.007
W93040502	N10P	04-09-93	06:18	2.3	CHAETOCEROS DEBILIS	.073
W93040502	N10P	04-09-93	06:18	2.3	CHAETOCEROS DECIPIENS	.001
W93040502	N10P	04-09-93	06:18	2.3	CHAETOCEROS SOCIALIS	.193
W93040502	N10P	04-09-93	06:18	2.3	CHAETOCEROS SPP. (10-20UM)	.012
W93040502	N10P	04-09-93	06:18	2.3	COSCINODISCUS SPP.	.001
W93040502	N10P	04-09-93	06:18	2.3	CRYPTOMONADS	.01
W93040502	N10P	04-09-93	06:18	2.3	CYLINDROTHECA CLOSTERIUM	.005
W93040502	N10P	04-09-93	06:18	2.3	EUTREPTIA/EUTREPTIELLA SPP.	.001
W93040502	N10P	04-09-93	06:18	2.3	GYMNODINIUM SPP.	.001
W93040502	N10P	04-09-93	06:18	2.3	GYRODINIUM SPIRALE	.004
W93040502	N10P	04-09-93	06:18	2.3	GYROSIGMA SPP.	.001
W93040502	N10P	04-09-93	06:18	2.3	HETEROCAPSA TRIQUETRA	.001
W93040502	N10P	04-09-93	06:18	2.3	MESODINIUM RUBRUM	.001
W93040502	N10P	04-09-93	06:18	2.3	MICROFLAGELLATES	.05
W93040502	N10P	04-09-93	06:18	2.3	NAVICULOID DIATOMS	.008
W93040502	N10P	04-09-93	06:18	2.3	NITZSCHIA (CF) DELICATISSIMA	.002
W93040502	N10P	04-09-93	06:18	2.3	NITZSCHIA SERIATA	.001
W93040502	N10P	04-09-93	06:18	2.3	NITZSCHIA SPP.	.002
W93040502	N10P	04-09-93	06:18	2.3	SKELETONEMA COSTATUM	.013
W93040502	N10P	04-09-93	06:18	2.3	THALASSIONEMA NITZSCHOIDES	.002
W93040502	N10P	04-09-93	06:18	2.3	THALASSIOSIRA (CF) AESTIVALIS	.005
W93040502	N10P	04-09-93	06:18	2.3	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.098
W93040502	N10P	04-09-93	06:18	2.3	UNID. NAKED DINOFLAGELLATE	.005
W93050188	N10P	05-01-93	07:08	2.59	CERATIUM LONGIPES	.003
W93050188	N10P	05-01-93	07:08	2.59	CHAETOCEROS DEBILIS	.089
W93050188	N10P	05-01-93	07:08	2.59	CHAETOCEROS LACINOSUS	.007
W93050188	N10P	05-01-93	07:08	2.59	CHAETOCEROS LORENZIANUS	.013
W93050188	N10P	05-01-93	07:08	2.59	CHAETOCEROS SEPTENTRIONALIS	.003
W93050188	N10P	05-01-93	07:08	2.59	CHAETOCEROS SOCIALIS	.119
W93050188	N10P	05-01-93	07:08	2.59	CHAETOCEROS SPP. (10-20UM)	.006
W93050188	N10P	05-01-93	07:08	2.59	CRYPTOMONADS	.135
W93050188	N10P	05-01-93	07:08	2.59	CYLINDROTHECA CLOSTERIUM	.003
W93050188	N10P	05-01-93	07:08	2.59	DICTYOCHA SPECULUM	.001
W93050188	N10P	05-01-93	07:08	2.59	DINOPHYSIS OVUM	.001
W93050188	N10P	05-01-93	07:08	2.59	EUTREPTIA/EUTREPTIELLA SPP.	.006
W93050188	N10P	05-01-93	07:08	2.59	GYRODINIUM SPP.	.001
W93050188	N10P	05-01-93	07:08	2.59	HETEROCAPSA TRIQUETRA	.006
W93050188	N10P	05-01-93	07:08	2.59	LEPTOCYLINDRUS DANICUS	.016
W93050188	N10P	05-01-93	07:08	2.59	MESODINIUM RUBRUM	.019
W93050188	N10P	05-01-93	07:08	2.59	MICROFLAGELLATES	.1
W93050188	N10P	05-01-93	07:08	2.59	NAVICULOID DIATOMS	.004
W93050188	N10P	05-01-93	07:08	2.59	NITZSCHIA SERIATA	.024
W93050188	N10P	05-01-93	07:08	2.59	PROTOPERIDINIUM DENTICULATUM	.003
W93050188	N10P	05-01-93	07:08	2.59	PYRAMIMONAS/TETRASELMIS SPP.	.001
W93050188	N10P	05-01-93	07:08	2.59	RHIZOSOLENIA FRAGILISSIMA	.003

Table F1. Phytoplankton Species Data for April and May 1993.

Event	Station	Date	Time (EST)	Depth (M)	Taxon	Millions of Cells per Liter
W93050188	N10P	05-01-93	07:08	2.59	RHIZOSOLENIA HEBETATA F. SEMISPINA	.006
W93050188	N10P	05-01-93	07:08	2.59	SKELETONEMA COSTATUM	.016
W93050188	N10P	05-01-93	07:08	2.59	THALASSIONEMA NITZSCHOIDES	.001
W93050188	N10P	05-01-93	07:08	2.59	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.004
W93050188	N10P	05-01-93	07:08	2.59	UNID. DINOFLAGELLATES	.001
W93050188	N10P	05-01-93	07:08	2.59	UNID. NAKED DINOFLAGELLATE	.007
W93060249	N10P	05-21-93	06:40	1.89	CERATAULINA PELAGICA	.001
W93060249	N10P	05-21-93	06:40	1.89	CERATIUM LONGIPES	.005
W93060249	N10P	05-21-93	06:40	1.89	CHAETOCEROS SOCIALIS	.005
W93060249	N10P	05-21-93	06:40	1.89	CHAETOCEROS SPP. (10-20UM)	.005
W93060249	N10P	05-21-93	06:40	1.89	COCCONEIS SCUTELLUM	.001
W93060249	N10P	05-21-93	06:40	1.89	COSCINODISCUS OCULUS-IRIDIS	.001
W93060249	N10P	05-21-93	06:40	1.89	CRYPTOMONADS	.122
W93060249	N10P	05-21-93	06:40	1.89	CYLINDROTHECA CLOSTERIUM	.001
W93060249	N10P	05-21-93	06:40	1.89	DINOPHYSIS ACUMINATA	.002
W93060249	N10P	05-21-93	06:40	1.89	GYMNODINIUM SPP.	.003
W93060249	N10P	05-21-93	06:40	1.89	GYRODINIUM SPIRALE	.001
W93060249	N10P	05-21-93	06:40	1.89	HETEROCAPSA TRIQUETRA	.21
W93060249	N10P	05-21-93	06:40	1.89	MICROFLAGELLATES	.088
W93060249	N10P	05-21-93	06:40	1.89	NAVICULOID DIATOMS	.002
W93060249	N10P	05-21-93	06:40	1.89	PYRAMIMONAS/TETRASELMIS SPP.	.001
W93060249	N10P	05-21-93	06:40	1.89	SKELETONEMA COSTATUM	.012
W93060249	N10P	05-21-93	06:40	1.89	THALASSIONEMA NITZSCHOIDES	.001
W93060249	N10P	05-21-93	06:40	1.89	THALASSIOSIRA (cf) GRAVIDA/ROTULA	.001
W93060249	N10P	05-21-93	06:40	1.89	THALASSIOSIRA SPP.	.002
W93060249	N10P	05-21-93	06:40	1.89	UNID. CENTRALES	.001
W93060249	N10P	05-21-93	06:40	1.89	UNID. DINOFLAGELLATES	.006
W93060249	N10P	05-21-93	06:40	1.89	UNID. NAKED DINOFLAGELLATE	.009

Table F-2. All identified taxa in near surface screened (20 um) samples collected in April and May 1993.

SPECIES	F01P W93040401	F02P W93040379	F13P W93040256	F23P W93040022	N01P W93040212	N04P W93040226	N07P W93040242	N10P W93040077	N10P W93040502	N10P W93050188	N10P W93060249	N16P W93040063	N20P W93040047
ALEXANDRIUM TAMARENSE		3									55		
ALORICATE CILIATES	20	43	10	38	20	48	28	10	30	365	55	5	20
CERATIUM FUSUS					3		5	5		15		15	
CERATIUM LINEATUM		3			5	3		3		13	63		
CERATIUM LONGIPES	15	18	3		18	33	15	30	10	215	275	43	20
CERATIUM TRIPOS	3	3					3			3		3	
DICTYOCHA SPECULUM	18	3			10	3	8	3	8	88	3	8	15
DINOPHYSIS ACUMINATA						8			3	28	263		
DINOPHYSIS NORVEGICA	8	35	8	3	13	3	5	8		10	130	5	8
DINOPHYSIS OVUM	5	5			18	10	3	8		43	110		3
DINOPHYSIS SPP.						3				23			
EBRIA TRIPARTITIA											3		
EUTREPTIA SPP.		3											
GYMNODINIUM SPP.	3		3										3
GYRODINIUM SPIRALE	5	55	13	8	8	13	25	13	20	3		13	5
GYRODINIUM SPP.	5	5	3		3	3	5					3	5
HETEROCAPSA TRIQUETRA	3		3		5	18		5	3		791	5	
KATODINIUM SPP.	3	5	23	10	10	5	28	13	13	3		13	5
MERISMOPEDIA SPP. COLONY								20					
MESODINIUM RUBRUM	8	43	8	3	18	10	5	18	10	218		13	20
PROTOPERIDINIUM (CF) BREVIPES	18	3	8		10	8		3		5		23	3
PROTOPERIDINIUM BIPES	3	3			3								
PROTOPERIDINIUM BREVE	3	5			20	10	3	3		8	68		
PROTOPERIDINIUM DENTICULATUM	5	10			20	5	5	13	10		63	40	28
PROTOPERIDINIUM DEPRESSUM					3		5	3	3	18	5	5	
PROTOPERIDINIUM PELLUCIDUM	8	13	3		8	13		15	5	13	15	8	5
PROTOPERIDINIUM SPP.	25	50	23	10	48	35	18	23	10	40	428	18	8
PROTOPERIDINIUM STEINII				3									
SCRIPPSIELLA TROCHOIDEA		3											
TINTINNIDS	10	135	8	75	63	70	13	35	45	13	180	48	50
UNID. ATHECATE DINOFLAGELLATE	10	18	8	5		10	25		5	3		3	3
UNID. THECATE DINOFLAGELLATES	3	3		3	8	23	15	20	5		43	18	18

Values are Cells/L

Table F-3. All identified taxa in chlorophyll maximum screened (20 um) samples collected in early April 1993.

SPECIES	F01P W93040399	F02P W93040378	F13P W93040254	F23P W93040021	N01P W93040210	N04P W93040224	N07P W93040241	N10P W93040076	N16P W93040062	N20P W93040045
ALORICATE CILIATES	28	118	115	23	38	40	20	13	15	3
CERATIUM FUSUS	5		3		3	10		5	10	8
CERATIUM LINEATUM		3				5		3		3
CERATIUM LONGIPES	38	15	20	5	10	48	30	15	20	38
CERATIUM TRIPOS			3		3	5				
DICTYOCHA SPECULUM	5	3	3	5	3			3	5	
DINOPHYSIS ACUMINATA						3		3		
DINOPHYSIS NORVEGICA	20	10	13	3	8	8	5	15	28	5
DINOPHYSIS OVUM	3		5		15	5		3	13	3
GYMNODINIUM SPP.			3		3					
GYRODINIUM SPIRALE	18	60	38	18	23	30	15	38	33	13
GYRODINIUM SPP.	5	10					5	5		
HETEROCAPSA TRIQUETRA	3	5	5		5		3			
KATODINIUM SPP.	15	5	10		28	30	15	28	40	13
MESODINIUM RUBRUM	10	33	133	3	23	5			10	
PROTOPERIDINIUM (CF) BREVIPES	5		3			15		8	15	
PROTOPERIDINIUM BIPES		3				3				
PROTOPERIDINIUM BREVE	8	5			5	18	3	3		
PROTOPERIDINIUM DENTICULATUM	10	13	35		20	35	30	30	53	25
PROTOPERIDINIUM DEPRESSUM		5		3	15		3		5	8
PROTOPERIDINIUM PELLUCIDUM	20	3		3	5	13	8	10	5	3
PROTOPERIDINIUM SPP.	23	63	50	5	20	53	23	18	63	20
PROTOPERIDINIUM STEINII				3						
TINTINNIDS	35	115	28	80	53	85	8	73	43	15
UNID. ATHECATE DINOFLAGELLATE	25	23	3			23	15			3
UNID. THECATE DINOFLAGELLATES		5	5	10	13	23	13	15		

Values are Cells/L

APPENDIX G

ZOOPLANKTON SPECIES DATA TABLES

A complete listing for survey W9304 is given for taxonomic analyses of zooplankton net tow samples (Table G-1).

Table G1. Zooplankton Species Data for April 1993.

Event	Station	Date	Time	Taxon	Qual[1]	Individuals Per M3
W93040025	F23P	04-06-93	0706	ACARTIA HUDSONICA	C	135
W93040025	F23P	04-06-93	0706	ACARTIA HUDSONICA	F	17
W93040025	F23P	04-06-93	0706	ACARTIA HUDSONICA	M	11
W93040025	F23P	04-06-93	0706	BARNACLE NAUPLII	N	936
W93040025	F23P	04-06-93	0706	CALANUS FINMARCHICUS	C	22
W93040025	F23P	04-06-93	0706	CALANUS FINMARCHICUS	M	6
W93040025	F23P	04-06-93	0706	COPEPOD NAUPLII	N	1014
W93040025	F23P	04-06-93	0706	DECAPOD LARVAE		6
W93040025	F23P	04-06-93	0706	EUCONCHOEICA SP.		28
W93040025	F23P	04-06-93	0706	GASTROPOD VELIGER		6
W93040025	F23P	04-06-93	0706	MEDUSA		11
W93040025	F23P	04-06-93	0706	MICROSETELLA NORVEGICA		11
W93040025	F23P	04-06-93	0706	OIKIOPLEURA DIOICA		319
W93040025	F23P	04-06-93	0706	OITHONA SIMILIS	C	286
W93040025	F23P	04-06-93	0706	OITHONA SIMILIS	M	22
W93040025	F23P	04-06-93	0706	OITHONA SIMILIS	F	129
W93040025	F23P	04-06-93	0706	PARACALANUS PARVUS	C	22
W93040025	F23P	04-06-93	0706	PARACALANUS PARVUS	F	6
W93040025	F23P	04-06-93	0706	POLYCHAETE LARVAE		930
W93040025	F23P	04-06-93	0706	POLYCHAETE TROCHOPHORES		62
W93040025	F23P	04-06-93	0706	TEMORA LONGICORNIS	C	22
W93040025	F23P	04-06-93	0706	TORTANUS DISCAUDATUS	M	28
W93040025	F23P	04-06-93	0706	TORTANUS DISCAUDATUS	F	6
W93040025	F23P	04-06-93	0706	UNIDENTIFIED HARPACTICOID		1182
W93040050	N20P	04-06-93	0842	BARNACLE NAUPLII	N	4618
W93040050	N20P	04-06-93	0842	CALANUS FINMARCHICUS	F	36
W93040050	N20P	04-06-93	0842	CALANUS FINMARCHICUS	C	655
W93040050	N20P	04-06-93	0842	COPEPOD NAUPLII	N	8436
W93040050	N20P	04-06-93	0842	GASTROPOD VELIGER		73
W93040050	N20P	04-06-93	0842	MICROSETELLA NORVEGICA		36
W93040050	N20P	04-06-93	0842	OIKIOPLEURA DIOICA		4400
W93040050	N20P	04-06-93	0842	OITHONA SIMILIS	F	655
W93040050	N20P	04-06-93	0842	OITHONA SIMILIS	M	145
W93040050	N20P	04-06-93	0842	OITHONA SIMILIS	C	1600
W93040050	N20P	04-06-93	0842	PARACALANUS PARVUS	C	145
W93040050	N20P	04-06-93	0842	POLYCHAETE LARVAE		255
W93040050	N20P	04-06-93	0842	TEMORA LONGICORNIS	C	36
W93040066	N16P	04-06-93	0943	BARNACLE NAUPLII	N	8590
W93040066	N16P	04-06-93	0943	CALANUS FINMARCHICUS	C	638
W93040066	N16P	04-06-93	0943	COPEPOD NAUPLII	N	7102
W93040066	N16P	04-06-93	0943	EUCONCHOEICA SP.		43
W93040066	N16P	04-06-93	0943	FISH EGG		43
W93040066	N16P	04-06-93	0943	GASTROPOD VELIGER		128
W93040066	N16P	04-06-93	0943	OIKIOPLEURA DIOICA		5486
W93040066	N16P	04-06-93	0943	OITHONA ATLANTICA	F	43
W93040066	N16P	04-06-93	0943	OITHONA SIMILIS	M	723
W93040066	N16P	04-06-93	0943	OITHONA SIMILIS	C	4975
W93040066	N16P	04-06-93	0943	OITHONA SIMILIS	F	1658
W93040066	N16P	04-06-93	0943	PARACALANUS PARVUS	C	213
W93040066	N16P	04-06-93	0943	POLYCHAETE LARVAE		1063
W93040066	N16P	04-06-93	0943	POLYCHAETE TROCHOPHORES		43
W93040080	N10P	04-06-93	1047	ACARTIA HUDSONICA	C	140
W93040080	N10P	04-06-93	1047	BARNACLE NAUPLII	N	2632
W93040080	N10P	04-06-93	1047	CALANUS FINMARCHICUS	F	20
W93040080	N10P	04-06-93	1047	CALANUS FINMARCHICUS	C	518
W93040080	N10P	04-06-93	1047	CENTROPAGES SPP.	C	40
W93040080	N10P	04-06-93	1047	COPEPOD NAUPLII	N	9251
W93040080	N10P	04-06-93	1047	FISH EGG		80
W93040080	N10P	04-06-93	1047	GASTROPOD VELIGER		80
W93040080	N10P	04-06-93	1047	MICROSETELLA NORVEGICA		80
W93040080	N10P	04-06-93	1047	OIKIOPLEURA DIOICA		2412
W93040080	N10P	04-06-93	1047	OITHONA SIMILIS	M	179

[1]C = COPEPIDITES, F = FEMALE, M = MALE, N = NAUPLII

Table G1. Zooplankton Species Data for April 1993.

Event	Station	Date	Time	Taxon	Qual[1]	Individuals Per M3
W93040080	N10P	04-06-93	1047	OITHONA SIMILIS	F	897
W93040080	N10P	04-06-93	1047	OITHONA SIMILIS	C	2014
W93040080	N10P	04-06-93	1047	PARACALANUS PARVUS	C	40
W93040080	N10P	04-06-93	1047	POLYCHAETE LARVAE		339
W93040080	N10P	04-06-93	1047	POLYCHAETE TROCHOPHORES		40
W93040080	N10P	04-06-93	1047	PSEUDOCALANUS NEWMANI	M	20
W93040080	N10P	04-06-93	1047	TEMORA LONGICORNIS	C	20
W93040215	N01P	04-07-93	0733	ACARTIA HUDSONICA	M	23
W93040215	N01P	04-07-93	0733	ACARTIA HUDSONICA	F	46
W93040215	N01P	04-07-93	0733	ACARTIA HUDSONICA	C	184
W93040215	N01P	04-07-93	0733	BARNACLE NAUPLII	N	1193
W93040215	N01P	04-07-93	0733	CALANUS FINMARCHICUS	C	138
W93040215	N01P	04-07-93	0733	CALANUS FINMARCHICUS	F	23
W93040215	N01P	04-07-93	0733	COPEPOD NAUPLII	N	4496
W93040215	N01P	04-07-93	0733	EUCONCHOEICA SP.		138
W93040215	N01P	04-07-93	0733	FISH EGG		161
W93040215	N01P	04-07-93	0733	GASTROPOD VELIGER		115
W93040215	N01P	04-07-93	0733	MICROSETELLA NORVEGICA		138
W93040215	N01P	04-07-93	0733	OIKIOPLEURA DIOICA		1904
W93040215	N01P	04-07-93	0733	OITHONA ATLANTICA	F	23
W93040215	N01P	04-07-93	0733	OITHONA SIMILIS	C	1881
W93040215	N01P	04-07-93	0733	OITHONA SIMILIS	M	92
W93040215	N01P	04-07-93	0733	OITHONA SIMILIS	F	413
W93040215	N01P	04-07-93	0733	PARACALANUS PARVUS	C	46
W93040215	N01P	04-07-93	0733	POLYCHAETE LARVAE		115
W93040215	N01P	04-07-93	0733	POLYCHAETE TROCHOPHORES		46
W93040215	N01P	04-07-93	0733	TEMORA LONGICORNIS	C	23
W93040229	N04P	04-07-93	0839	ACARTIA HUDSONICA	C	44
W93040229	N04P	04-07-93	0839	BARNACLE NAUPLII	N	308
W93040229	N04P	04-07-93	0839	CALANUS FINMARCHICUS	M	44
W93040229	N04P	04-07-93	0839	CALANUS FINMARCHICUS	F	88
W93040229	N04P	04-07-93	0839	CALANUS FINMARCHICUS	C	837
W93040229	N04P	04-07-93	0839	COPEPOD NAUPLII	N	13130
W93040229	N04P	04-07-93	0839	EUCONCHOEICA SP.		132
W93040229	N04P	04-07-93	0839	FISH EGG		397
W93040229	N04P	04-07-93	0839	GASTROPOD VELIGER		88
W93040229	N04P	04-07-93	0839	MICROSETELLA NORVEGICA		44
W93040229	N04P	04-07-93	0839	OIKIOPLEURA DIOICA		3833
W93040229	N04P	04-07-93	0839	OITHONA SIMILIS	M	132
W93040229	N04P	04-07-93	0839	OITHONA SIMILIS	C	2600
W93040229	N04P	04-07-93	0839	OITHONA SIMILIS	F	1102
W93040229	N04P	04-07-93	0839	PARACALANUS PARVUS	C	220
W93040229	N04P	04-07-93	0839	PARACALANUS PARVUS	F	44
W93040229	N04P	04-07-93	0839	POLYCHAETE LARVAE		132
W93040229	N04P	04-07-93	0839	POLYCHAETE TROCHOPHORES		44
W93040245	N07P	04-07-93	0944	ACARTIA HUDSONICA	C	82
W93040245	N07P	04-07-93	0944	BARNACLE NAUPLII	N	2048
W93040245	N07P	04-07-93	0944	CALANUS FINMARCHICUS	C	1393
W93040245	N07P	04-07-93	0944	CALANUS FINMARCHICUS	F	41
W93040245	N07P	04-07-93	0944	CALANUS FINMARCHICUS	M	41
W93040245	N07P	04-07-93	0944	COPEPOD NAUPLII	N	12534
W93040245	N07P	04-07-93	0944	ECHINODERM PLUTEI		164
W93040245	N07P	04-07-93	0944	FISH EGG		41
W93040245	N07P	04-07-93	0944	GASTROPOD VELIGER		246
W93040245	N07P	04-07-93	0944	MICROSETELLA NORVEGICA		164
W93040245	N07P	04-07-93	0944	OIKIOPLEURA DIOICA		2335
W93040245	N07P	04-07-93	0944	OITHONA SIMILIS	M	82
W93040245	N07P	04-07-93	0944	OITHONA SIMILIS	F	1475
W93040245	N07P	04-07-93	0944	OITHONA SIMILIS	C	4588
W93040245	N07P	04-07-93	0944	PARACALANUS PARVUS	F	41
W93040245	N07P	04-07-93	0944	PARACALANUS PARVUS	C	573
W93040245	N07P	04-07-93	0944	POLYCHAETE LARVAE		696

[1]C = COPEPIDITES, F = FEMALE, M = MALE, N = NAUPLII

Table G1. Zooplankton Species Data for April 1993.

Event	Station	Date	Time	Taxon	Qual[1]	Individuals Per M3
W93040245	N07P	04-07-93	0944	POLYCHAETE TROCHOPHORES		41
W93040261	F13P	04-07-93	1042	ACARTIA HUDSONICA	F	38
W93040261	F13P	04-07-93	1042	ACARTIA HUDSONICA	C	132
W93040261	F13P	04-07-93	1042	ACARTIA HUDSONICA	M	57
W93040261	F13P	04-07-93	1042	BARNACLE NAUPLII	N	2590
W93040261	F13P	04-07-93	1042	CALANUS FINMARCHICUS	C	416
W93040261	F13P	04-07-93	1042	COPEPOD NAUPLII	N	7279
W93040261	F13P	04-07-93	1042	ECHINODERM PLUTEI		19
W93040261	F13P	04-07-93	1042	EUCONCHOEICA SP.		38
W93040261	F13P	04-07-93	1042	GASTROPOD VELIGER		76
W93040261	F13P	04-07-93	1042	MICROSETELLA NORVEGICA		76
W93040261	F13P	04-07-93	1042	OIKIOPLEURA DIOICA		775
W93040261	F13P	04-07-93	1042	OITHONA SIMILIS	M	19
W93040261	F13P	04-07-93	1042	OITHONA SIMILIS	F	681
W93040261	F13P	04-07-93	1042	OITHONA SIMILIS	C	1758
W93040261	F13P	04-07-93	1042	PARACALANUS PARVUS	F	19
W93040261	F13P	04-07-93	1042	PARACALANUS PARVUS	C	76
W93040261	F13P	04-07-93	1042	PARACALANUS PARVUS	M	19
W93040261	F13P	04-07-93	1042	POLYCHAETE LARVAE		624
W93040261	F13P	04-07-93	1042	POLYCHAETE TROCHOPHORES		19
W93040261	F13P	04-07-93	1042	TEMORA LONGICORNIS	C	57
W93040261	F13P	04-07-93	1042	TORTANUS DISCAUDATUS	F	19
W93040261	F13P	04-07-93	1042	UNIDENTIFIED HARPACTICOID		76
W93040382	F02P	04-08-93	0847	ACARTIA HUDSONICA	C	305
W93040382	F02P	04-08-93	0847	BARNACLE NAUPLII	N	5332
W93040382	F02P	04-08-93	0847	CALANUS FINMARCHICUS	C	503
W93040382	F02P	04-08-93	0847	COPEPOD NAUPLII	N	3932
W93040382	F02P	04-08-93	0847	DECAPOD LARVAE		18
W93040382	F02P	04-08-93	0847	GASTROPOD VELIGER		90
W93040382	F02P	04-08-93	0847	MEDUSA		18
W93040382	F02P	04-08-93	0847	MICROSETELLA NORVEGICA		108
W93040382	F02P	04-08-93	0847	OIKIOPLEURA DIOICA		1095
W93040382	F02P	04-08-93	0847	OITHONA SIMILIS	C	3411
W93040382	F02P	04-08-93	0847	OITHONA SIMILIS	F	1652
W93040382	F02P	04-08-93	0847	OITHONA SIMILIS	M	251
W93040382	F02P	04-08-93	0847	PARACALANUS PARVUS	C	431
W93040382	F02P	04-08-93	0847	PARACALANUS PARVUS	F	18
W93040382	F02P	04-08-93	0847	POLYCHAETE LARVAE		1364
W93040382	F02P	04-08-93	0847	POLYCHAETE TROCHOPHORES		215
W93040382	F02P	04-08-93	0847	PSEUDOCALANUS NEWMANI	M	18
W93040382	F02P	04-08-93	0847	PSEUDOCALANUS NEWMANI	F	36
W93040382	F02P	04-08-93	0847	TORTANUS DISCAUDATUS	M	18
W93040404	F01P	04-08-93	1013	ACARTIA HUDSONICA	C	21
W93040404	F01P	04-08-93	1013	ACARTIA HUDSONICA	M	21
W93040404	F01P	04-08-93	1013	BARNACLE NAUPLII	N	966
W93040404	F01P	04-08-93	1013	CALANUS FINMARCHICUS	C	1117
W93040404	F01P	04-08-93	1013	CALANUS FINMARCHICUS	F	21
W93040404	F01P	04-08-93	1013	CENTROPAGES SPP.	C	21
W93040404	F01P	04-08-93	1013	COPEPOD NAUPLII	N	5240
W93040404	F01P	04-08-93	1013	EUCONCHOEICA SP.		64
W93040404	F01P	04-08-93	1013	GASTROPOD VELIGER		107
W93040404	F01P	04-08-93	1013	MICROSETELLA NORVEGICA		43
W93040404	F01P	04-08-93	1013	OIKIOPLEURA DIOICA		3157
W93040404	F01P	04-08-93	1013	OITHONA SIMILIS	F	902
W93040404	F01P	04-08-93	1013	OITHONA SIMILIS	C	1052
W93040404	F01P	04-08-93	1013	OITHONA SIMILIS	M	43
W93040404	F01P	04-08-93	1013	PARACALANUS PARVUS	C	43
W93040404	F01P	04-08-93	1013	POLYCHAETE LARVAE		193
W93040404	F01P	04-08-93	1013	PSEUDOCALANUS NEWMANI	F	21
W93040404	F01P	04-08-93	1013	SAGITTA ELEGANS		21
W93040404	F01P	04-08-93	1013	TEMORA LONGICORNIS	C	21

[1]C = COPEPIDITES, F = FEMALE, M = MALE, N = NAUPLII