

Primary production in the Sargasso Sea northeast of Bermuda in April 1984

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Les numéros 1 à 25 de cette série ont été publiés à titre de Records statistiques, Service des pêches et de la mer. Les numéros 26-160 ont été publiés à titre de Rapports statistiques du Service des pêches et de la mer, Ministère des Pêches et de l'Environnement. Le nom de la série a été modifié à partir du numéro 161.

Le titre exact paraît au haut du résumé de chaque rapport.

Canadian Data Report of
Fisheries and Aquatic Sciences No. 550

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BERMUDA IN APRIL 1984

by

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Abstract

Irwin, B. Caverhill, C., Harrison, W.G., and Platt, T. 1985. Primary production in the Sargasso Sea northeast of Bermuda in April 1984. Can. Data Rep. Fish. Aquat. Sci. No. 550: iv + 83 p.

During the period 11 to 20 April, primary productivity and other related variables were measured at a station 220 nautical miles northeast of Bermuda. In this report we make available the raw data and some fitted parameters.

Résumé

Irwin, B. Caverhill, C., Harrison, W.G., and Platt, T. 1985. Primary production in the Sargasso Sea northeast of Bermuda in April 1984. Can. Data Rep. Fish. Aquat. Sci. No. 550: iv + 83 p.

Pendant la période du 11 au 20 avril, la production primaire et plusieurs autres variables ont été mesuré à une station située à 220 milles nautiques au nord-est des Bermudes. Dans ce rapport nous présentons les données brutes ainsi que les paramètres calculés.

Introduction

This is the first in a series of data reports giving the results of primary productivity experiments and related nutrient measurements at stations in the open ocean. These stations were occupied for several days and samples were collected on a 24 hour basis at each station.

For this experiment, a location 220 nautical miles NE of Bermuda in the Northern Sargasso Sea, was chosen. Samples were collected from CSS Hudson from 11 April to 20 April 1983. This was a joint cruise with the Chemical Oceanography Division of the Atlantic Oceanographic Laboratory.

Sampling

Water samples were collected using a modified continuous pump sampler (Herman et al. 1984). The P.T. probe was replaced with a model 8709 Guildline® C.T.D. and an Aquatracka® submersible fluorometer and an Oregon® attenuation meter were added. The signals from both instruments were digitised in the C.T.D. and all digitised signals were logged using an HP 9826 computer. Sampling depths were usually standard oceanographic depths (5, 10, 15, 20 m etc.) but were occasionally selected to match the fluorescence maximum. Samples from depths greater than 110 m were collected with 30 l Niskin bottles.

Methods

Productivity

Primary productivity was measured using the ^{14}C method and the oxygen evolution method. The ^{14}C method was essentially as described in Strickland and Parsons (1972). For light saturation experiments from 20 to 50 μci of sodium bicarbonate ^{14}C was added to 100 mls of sample. A total of 42 light and 2 dark bottles were incubated for each light saturation experiment. Incubations were done in temperature controlled incubators

illuminated with 2000 w tungsten halogen lamps (New Haline OHS 2000) (Irwin et al. 1983). Incubation times ranged from 2 to 4 hours.

For in situ experiments, 50 μ ci of sodium bicarbonate ^{14}C was added to each bottle. There were 3 light and 1 dark bottles at each depth. Incubation period was from sunrise to sunset - approximately 12 hours.

Oxygen evolution was measured on two in situ experiments. For each depth 4 time zero, 4 dark and 6 light bottles were filled. Time zero bottles were fixed immediately. Dark bottles were incubated on deck in a darkened tank cooled with running sea water. Light bottles were deployed at sampled depths on the same wire as the ^{14}C bottles. Incubation periods were from sunrise to sunset. Oxygen bottles were titrated using the micro-Winkler technique of Williams and Jenkinson (1982).

Chlorophyll a

Replicate 100 ml samples were filtered onto 25 mm Whatman GF/F glass fibre filters or 1.0 μm Nuclepore filters. Filters were placed in 20 ml glass vials containing 10 mls of 85% acetone. Chlorophyll was extracted for 24 hours at 0°C in the dark. The fluorometric technique of Yentsch and Menzel (1963) as modified by Holm-Hansen et al. (1965) was used to estimate chlorophyll and phaeophytin concentrations.

Organic Particulates

Samples for particulate organic carbon and nitrogen and adenosine triphosphate were collected from most depths. Precombusted Whatman GF/F glass fibre filters or 1.0 μm Nuclepore filters were used. Samples were analysed using methods described in Irwin et al. (1982).

Nutrients

Three inorganic nutrients were routinely measured from all sampled depths. All analysis was carried out on board within a few hours of

collection. Phosphate values are not presented in this report because of suspected contamination in some of the samples. Silicate and nitrate was measured on a Technicon II autoanalyser using industrial methods 186-72W and 158-71W respectively.

Incubation and Incident Light

Photosynthetically active radiation (P.A.R.) was measured at each bottle position in the incubators using a Biospherical Instrument quantum meter (model Q.S.L. 100).

Total incident light was measured with an Eppley 40 Junction black and white pyranometer. Incident PAR was measured with a Licor Li 190S quantum sensor. The output from both instruments was logged each hour on a Licor Li 550 printing integrator.

Estimation of Photosynthetic Parameters

Measurements of specific production P^B and irradiance, I, were used to estimate parameters in the equation of Platt et al. (1981).

$$P^B = P_s (1 - e^{-\alpha I/P_s}) e^{-\beta I/P_s}$$

P_s ($\text{mg c mg chl}^{-1} \text{h}^{-1}$) is the light saturated rate of specific production in the absence of photoinhibition, α ($\text{mg c} (\text{mg chl})^{-1} \text{h}^{-1} \text{w}^{-1} \text{m}^{-2}$) is the initial slope of the PI curve and β (same units as α) is a parameter that characterises photoinhibition. Complete details of the fitting routine are given in Irwin et al. (1982) and a discussion of the mathematical basis for this technique is in Irwin et al. (1980).

Acknowledgements

We wish to thank Paul Dickie, Mark Hodgson, Dave Rudderham and Claire Carver for their assistance in the analysis of samples and the preparation of this report.

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Photosynthetically Active Radiation

Totals are W m^{-2} for each hour ending at hour indicated. All times are
Atlantic Standard Time.

SARGASSO SEA
P.A.R.

	7/4	8/4	9/4	10/4*	11/4*	12/4*	13/4*	14/4
0000	-	0	0	0	0	0	0	0
0100	-	0	0	0	0	0	0	0
0200	-	0	0	0	0	0	0	0
0300	-	0	0	0	0	0	0	0
0400	-	0	0	0	0	0	0	0
0500	-	0	0	0	0	0	0	0
0600	-	0	0	0	0	0	0	0
0700	-	12	22	1	1	9	4	6
0800	-	60	156	7	6	33	22	19
0900	-	152	202	22	24	64	37	179
1000	-	255	262	33	46	100	38	92
1100	152	263	230	110	60	101	44	128
1200	166	382	138	58	44	90	43	515
1300	232	399	286	54	57	95	69	473
1400	253	294	222	39	52	74	75	373
1500	162	149	119	31	52	65	43	260
1600	123	120	133	15	54	45	16	68
1700	54	109	98	9	29	15	11	68
1800	26	58	29	3	18	10	6	60
1900	5	20	5	0	4	2	4	21
2000	0	0	4	4	0	4	0	0
2100	0	0	0	0	0	3	0	0
2200	0	0	4	0	0	5	3	1
2300	0	0	0	0	0	1	0	0

* Data suspect.

SARGASSO SEA
P.A.R.

	15/4	16/4	17/4	18/4	19/4	20/4	21/4
0000	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0
0300	0	0	1	0	0	0	0
0400	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0
0600	1	1	2	0	2	0	1
0700	15	35	45	22	32	13	37
0800	55	136	113	44	140	24	128
0900	94	188	192	24	248	12	223
1000	152	325	265	115	338	37	234
1100	197	409	508	346	507	99	448
1200	307	307	554	476	572	199	615
1300	414	469	578	384	596	365	615
1400	421	508	297	290	415	280	485
1500	401	472	269	292	280	137	-
1600	251	444	217	399	258	174	-
1700	184	266	121	274	207	144	-
1800	116	52	62	135	92	57	-
1900	25	20	8	18	16	3	-
2000	0	0	2	0	0	0	-
2100	0	1	0	0	0	0	-
2200	0	0	0	0	0	0	-
2300	0	0	0	0	0	0	-

Total Radiation

Totals are W m^{-2} for each hour ending at hour indicated. All times are

Atlantic Standard Time.

SARGASSO SEA
TOTAL RADIATION

	7/4	8/4	9/4	10/4*	11/4*	12/4*	13/4*	14/4
0000	-	0	0	0	0	0	0	0
0100	-	0	0	0	0	0	0	0
0200	-	0	0	0	0	0	0	0
0300	-	0	0	0	0	0	0	0
0400	-	0	0	0	0	0	0	0
0500	-	0	0	0	0	0	0	0
0600	-	0	0	0	0	0	0	0
0700	-	15	29	0	1	15	5	9
0800	-	77	232	11	8	54	29	27
0900	-	205	270	27	35	115	55	258
1000	-	339	339	46	70	185	56	117
1100	191	345	285	162	93	175	64	186
1200	204	516	163	79	66	151	66	697
1300	294	540	358	78	86	159	104	643
1400	323	388	267	53	78	118	121	498
1500	203	188	138	46	78	104	67	334
1600	153	152	162	22	70	70	22	78
1700	65	143	120	12	35	20	14	86
1800	31	78	35	3	20	16	8	76
1900	6	28	4	0	5	2	0	24
2000	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0

* Data suspect.

SARGASSO SEA
TOTAL RADIATION

	15/4	16/4	17/4	18/4	19/4	20/4	21/4
0000	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0
0200	0	0	0	0	0	0	0
0300	0	0	0	0	0	0	0
0400	0	0	0	0	0	0	0
0500	0	0	0	0	0	0	0
0600	1	2	3	0	3	0	0
0700	20	44	63	29	43	-	0
0800	73	185	149	55	218	-	4
0900	120	249	260	27	370	-	117
1000	199	431	366	147	486	-	324
1100	278	539	713	497	710	-	553
1200	441	395	770	664	796	-	771
1300	578	635	781	518	813	-	762
1400	596	689	381	386	552	-	585
1500	565	645	348	395	378	-	-
1600	339	542	282	573	366	-	-
1700	255	371	160	393	288	-	-
1800	163	63	81	203	126	-	-
1900	38	21	9	26	21	0	-
2000	0	0	0	0	0	0	-
2100	0	0	0	0	0	0	-
2200	0	0	0	0	0	0	-
2300	0	0	0	0	0	0	-

Light Saturation Data and Related Biomass
and Nutrient Measurements

Units

$$P = \text{mg C m}^{-3} \text{ h}^{-1} (\text{mg Chl})^{-1}$$

$$I = \text{W m}^{-2}$$

$$P_s = \text{mg C mg Chl}^{-1} \text{ h}^{-1}$$

$$\alpha = \text{mg C} (\text{mg Chl})^{-1} \text{ h}^{-1} \text{ W}^{-1} \text{ m}^{-2}$$

$$\beta = \text{mg C} (\text{mg Chl})^{-1} \text{ h}^{-1} \text{ W}^{-1} \text{ m}^{-2}$$

Organic particulate concentrations are in mg m^{-3} and nutrients are in mg at m^{-3} . The 90% confidence interval for P_s , α and β are shown in the closed brackets below the estimates for each parameter.

SARGASSO 1983

LAT	41 50.00'N	LONG	62 55.50'W	DATE	07/04/83	DEPTH	60 M
T	P	T	P	I	P	I	P
658	.81	638	.89	578	1.05	359	1.68
351	1.58	343	1.40	231	1.55	203	1.69
163	1.67	144	1.61	104	1.73	100	1.54
88	1.67	62	1.50	56	1.34	52	1.44
46	1.57	40	1.40	32	1.26	24	1.09
24	1.10	23	.87	22	.94	21	.72
18	.65	15	.56	14	.55	10	.39
8	.24	7	.30	6	.18	6	.22
5	.13	4	.08	4	.12	4	.11
3	.06						

PARAMETER VALUES

$P^c :$
 $(2.01, 2.12)$

$\text{ALPHA} :$
 $(.049, .055)$

$\text{BETA} :$
 $(.0021, .0030)$

FRACTION : WHOLE

SAMPLE TEMP 9.2 C

INCUBATION TEMP 9.4 C

CHLOROPHYLL : 1.96

NITRATE : 5.34

CARBON : 79.

SILICATE : 3.78

NITROGEN : -

ATP : .23

SARGASSO 1983

LAT	41 50.00'N	LONG	62 55.50'W	DATE	07/04/83	DEPTH	60 M
T	P	I	P	I	P	I	P
618	.92	598	1.08	558	1.15	375	1.57
335	1.51	335	1.46	227	1.69	159	1.54
120	1.58	112	1.59	108	1.57	80	1.64
80	1.60	76	1.52	60	1.50	56	1.37
44	1.21	30	.94	26	.93	24	.90
20	.66	19	.72	14	.48	13	.42
12	.39	12	.38	10	.29	10	.30
8	.11	7	.12	5	.13	5	.11
4	.07	4	.06	3	.04		

PARAMETER VALUES

(PS : 2.03, 2.15)

ALPHA : .041
(.039, .044)BETA : .0025
(.0020, .0029)

FRACTION : >1 MICRON

SAMPLE TEMP	9.2 C	INCUBATION TEMP	9.4 C
CHLOROPHYLL :	1.72	NITRATE :	5.34
CARBON :	-	SILICATE :	3.78
NITROGEN :	-	ATP :	.14

SARGASSO 1983

LAT	41 50.00'N	LONG	62 55.50'W	DATE	07/04/83	DEPTH	60 M
T	P	T	P	I	P	I	P
618	.72	598	.95	558	1.08	375	.95
335	1.38	251	1.06	227	1.08	163	1.24
159	1.38	159	1.42	112	1.39	108	1.28
80	1.40	80	1.21	76	1.42	56	1.43
54	1.23	44	1.45	40	1.34	30	1.25
26	1.01	24	1.11	20	1.21	19	1.13
14	1.17	13	1.05	12	.63	12	.71
10	.72	10	.69	8	.19	7	.33
5	.31	5	.20	4	.19	4	.12
3	.03						

PARAMETER VALUES

(PS : 1.42, 1.50)

ALPHA : (.079, .095)

BETA : (.0009, .0013)

FRACTION : <1 MICRON

SAMPLE TEMP	9.2 C	INCUBATION TEMP	9.4 C
CHLOROPHYLL :	.11	NITRATE :	5.34
CARBON :	33.	SILICATE :	3.78
NITROGEN :	-	ATP :	.05

SARGASSO 1983

LAT	41 50.00'N	LONG	62 55.50'W	DATE	08/04/83	DEPTH	25 M
T	P	T	P	I	P	I	P
698	.94	666	1.17	598	1.20	458	1.66
390	2.00	359	1.76	335	2.00	303	1.87
247	1.82	231	1.88	219	1.83	167	1.82
163	1.76	132	1.73	112	1.74	110	1.79
90	1.89	82	1.46	80	1.71	71	1.52
60	1.57	54	1.37	45	1.06	41	.96
33	.85	30	.83	26	.64	23	.80
20	.46	18	.37	15	.37	13	.32
11	.26	11	.25	85	.23	84	.16
6	.13	6	.10	5	.10		.08
3	.06						

PARAMETER VALUES

(PS : 2.88
(2.63, 3.13)ALPHA : .033
(.031, .034)BETA : .0039
(.0030, .0048)

FRACTION : WHOLE

SAMPLE TEMP	9.4 C	INCUBATION TEMP	10.0 C
CHLOROPHYLL :	2.21	NITRATE :	6.30
CARBON :	153.	SILICATE :	4.00
NITROGEN :	34.	ATP :	.56

SARGASSO 1983

LAT	41 50.00'N	LONG	62 55.50'W	DATE	08/04/83	DEPTH	25 M
I	P	I	P	I	P	I	P
658	.77	618	.80	558	.93	447	1.65
411	1.28	375	1.74	307	1.65	287	1.82
263	1.68	215	1.86	179	1.94	179	1.84
144	1.74	128	1.93	124	1.64	111	1.70
100	1.64	91	1.40	83	1.56	79	1.40
73	1.19	58	1.33	57	1.30	41	1.04
41	1.03	33	.75	33	.79	26	.63
23	.57	18	.45	16	.36	13	.33
12	.29	9	.23	8	.19	7	.15
7	.13	6	.12	5	.10	4	.05
4	.05	3	.07				

PARAMETER VALUES

ρ_s : 4.28
 (3.47, 5.10)

ALPHA : .028
 (.027, .030)

BETA : .0108
 (.0072, .0144)

FRACTION : >1 MICRON

SAMPLE TEMP	9.4 C	INCUBATION TEMP	10.0 C
CHLOROPHYLL :	2.24	NITRATE :	6.30
CARBON :	-	SILICATE :	4.00
NITROGEN :	-	ATP :	.43

SARGASSO 1983

LAT	41 50.00'N	LONG	62 55.50'W	DATE	08/04/83	DEPTH	25 M
T	P	I	P	I	P	I	P
658	.57	618	.92	558	1.14	447	1.10
307	1.56	287	1.34	263	1.41	215	1.47
144	1.47	128	1.69	124	1.44	111	1.46
93	1.55	79	1.69	57	1.47	33	1.30
33	1.45	26	1.25	23	1.46	18	1.22
16	1.27	13	.86	12	.85	9	.69
8	.76	7	.72	7	.55	6	.45
5	.34	4	.20	4	.30	3	.39

PARAMETER VALUES

(PS :
(1.69, 1.77)ALPHA :
(.097, .111)¹⁰⁴BETA :
(.0015, .0022)

FRACTION : <1 MICRON

SAMPLE TEMP 9.4 C

INCUBATION TEMP 10.0 C

CHLOROPHYLL : .18

NITRATE : 6.30

CARBON : 81.

SILICATE : 4.00

NITROGEN : 18.

ATP : .05

SARGASSO 1983

LAT	41 50.00'N	LONG	62 55.50'W	DATE	08/04/83	DEPTH	25 M
T	P	T	P	I	P	I	P
658	.74	618	.61	447	.98	411	1.04
375	1.17	307	1.23	263	1.32	215	1.34
179	1.23	128	1.25	100	1.15	73	1.10
58	1.12	57	1.00	41	1.00	41	.88
33	.70	33	.68	23	.55	18	.41
16	.41	13	.34	12	.34	9	.26
8	.26	7	.16	7	.18	6	.13
5	.11	4	.09	4	.07	3	.07

PARAMETER VALUES

(PS : (1.73, 1.84)

ALPHA : (.028, .031)

BETA : (.0022, .0026)

FRACTION : WHOLE

SAMPLE TEMP	9.4 C	INCUBATION TEMP	10.0 C	25
CHLOROPHYLL :	2.70	NITRATE :	6.30	
CARBON :	153.	SILICATE :	4.00	
NITROGEN :	34.	ATP :	.56	

SARGASSO 1983

LAT	36 10.00'N	LONG	62 35.80'W	DATE	09/04/83	DEPTH	50 M
T	P	T	P	I	P	T	P
399	.31	375	.38	335	.49	279	.85
271	1.24	239	1.25	179	1.35	175	1.42
120	1.57	108	1.43	96	1.42	88	1.50
80	1.51	64	1.59	58	1.45	52	1.51
48	1.57	44	1.44	44	1.57	40	1.48
31	1.32	26	1.24	23	1.33	19	1.17
17	1.04	13	.96	13	.85	9	.76
9	.71	7	.63	7	.54	6	.44
5	.44	4	.37	3	.21	3	.33
3	.16	3	.19	?	.14	2	.08

PARAMETER VALUES

 $\rho_c :$
(1.94, 2.06) $\alpha :$
(.086, .099) $\beta :$
(.0054, .0064)

FRACTION : WHOLE

SAMPLE TEMP 18.4 C

INCUBATION TEMP 19.0 C

CHLOROPHYLL : .57

NITRATE : .54

CARBON : 338.

SILICATE : 1.42

NITROGEN : 186.

ATP : .07

SARGASSO 1983

LAT	36 10.00'N	LONG	62 35.80'W	DATE	09/04/83	DEPTH	50 M
I	P	T	P	I	P	I	P
391	.52	367	.69	327	.73	279	1.40
255	1.66	251	1.54	199	1.98	183	1.93
159	.01	136	2.09	120	2.17	104	1.94
96	2.13	80	2.08	76	2.14	64	2.15
58	2.16	56	2.18	48	2.12	40	2.04
40	1.98	35	1.86	29	1.81	26	1.66
21	1.57	19	1.54	17	1.42	14	1.16
13	1.09	10	.76	10	.72	8	.59
7	.67	6	.41	6	.42	5	.31
4	.28	3	.12	3	.20	3	.23
2	.11	2	.13				

PARAMETER VALUES

(PS : 3.34
(3.10, 3.57)ALPHA : .098
(.093, .103)BETA : .0117
(.0097, .0137)

FRACTION : >1 MICRON

SAMPLE TEMP 18.4 C

INCUBATION TEMP 19.0 C

CHLOROPHYLL : .33

NITRATE : .54

CARBON : -

SILICATE : 1.42

NITROGEN : -

ATP : .06

SARGASSO 1983

LAT	36 10.00'N	LONG	62 35.80'W	DATE	09/04/83	DEPTH	50 M
T	P	T	P	T	P	T	P
391	.16	367	.20	327	.16	279	.50
255	.53	199	.62	183	.50	159	.58
120	.63	104	.60	96	.55	48	.66
19	.58	14	.56	13	.53	10	.38
10	.50	8	.34	7	.38	6	.35
5	.27	4	.27	3	.12	3	.19
3	.18	2	.15	2	.16		

PARAMETER VALUES

(PS : .76, :84 :91)

ALPHA : .067
(.061, .074)BETA : .0024
(.0018, .0030)

FRACTION : <1 MICRON

SAMPLE TEMP 18.4 C

INCUBATION TEMP 19.0 C

CHLOROPHYLL : .29

NITRATE : .54

CARBON : 64.

SILICATE : 1.42

NITROGEN : 19.

ATP : .04

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	10/04/83	DEPTH	10 M
T	P	I	P	I	P	I	P
399	.57	379	.56	359	.71	287	.98
251	1.10	199	1.04	195	1.05	187	1.08
151	1.09	144	1.14	116	1.05	58	1.16
60	1.09	48	1.11	48	1.09	38	1.02
36	1.03	32	.95	25	.92	21	.81
16	.73	16	.76	14	.65	13	.51
9	.39	9	.39	7	.34	7	.32
5	.20	5	.21	4	.16	4	.15
3	.14	3	.05	3	.12	2	.07

PARAMETER VALUES

PS : (1.40, 1.48)

ALPHA : (.053, .058)

BETA : (.0024, .0029)

FRACTION : WHOLE

SAMPLE TEMP 18.5 C

INCUBATION TEMP 19.0 C

29

CHLOROPHYLL : .78

NITRATE : .32

CARBON : 226.

SILICATE : 1.24

NITROGEN : 23.

ATP : .05

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	10/04/83	DEPTH	10 M
I	P	I	P	I	P	I	P
419	1.16	379	1.01	359	1.08	271	1.31
263	1.31	239	1.38	199	1.50	179	1.61
175	1.63	120	1.65	112	1.69	90	1.68
86	1.71	82	1.76	76	1.65	64	1.63
62	1.68	44	1.45	40	1.69	40	1.53
37	1.41	33	1.29	26	1.31	25	1.18
20	.94	19	1.14	14	.74	12	.79
10	.48	9	.66	8	.33	7	.44
6	.23	4	.17	4	.26	4	.14
3	.13	3	.11	2	.00	2	.05
2	.06						

PARAMETER VALUES

(PS : 2.04, 2.13)

ALPHA : .072
(.069, .075)BETA : .0037
(.0032, .0043)

FRACTION : >1 MICRON

SAMPLE TEMP 18.5 C

INCUBATION TEMP 19.0 C

CHLOROPHYLL : .45

NITRATE : .32

CARBON : -

SILICATE : 1.24

NITROGEN : -

ATP : .14

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	10/04/83	DEPTH	10 M
T	P	T	P	I	P	T	P
410	.04	379	.06	359	.05	263	.15
230	.16	199	.27	179	.33	175	.34
151	.35	120	.36	112	.35	76	.35
64	.36	62	.38	40	.35	20	.31
19	.31	14	.24	12	.34	10	.27
9	.22	8	.18	7	.23	6	.15
4	.20	4	.11	4	.09	3	.08
3	.09	2	.09	2	.07	2	.00

PARAMETER VALUES

(PS : .47, .57)

ALPHA : .033
(.030, .036)(BETA : .0021
(.0016, .0026)

FRACTION : <1 MICRON

SAMPLE TEMP 18.5 C

INCUBATION TEMP 19.0 C

CHLOROPHYLL : .27

NITRATE : .32

CARBON : 300.

SILICATE : 1.24

NITROGEN : 55.

ATP : .03

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	11/04/83	DEPTH	70 M
T	P	T	P	T	P	I	P
6.94	1.12	694	.99	504	1.51	498	2.44
4.50	2.07	415	2.32	311	2.32	299	2.63
2.91	2.68	211	2.65	155	2.59	151	2.39
1.44	2.54	107	2.57	98	2.34	82	2.25
.79	2.09	79	2.23	60	2.23	59	1.82
.45	1.67	43	1.82	31	1.38	30	1.43
.24	1.09	22	1.06	18	.78	16	.91
.15	.58	11	.47	10	.47	9	.32
.8	.37	6	.23	6	.22	5	.18

PARAMETER VALUES

(DS : 3.96
 (3.61, 4.31))ALPHA : .052
 (.049, .055)BETA : .0060
 (.0047, .0074)

FRACTION : WHOLE

SAMPLE TEMP 18.4 C

INCUBATION TEMP 20.0 C

CHLOROPHYLL : .35

NITRATE : .88

CARBON : 123.

SILICATE : 1.91

NITROGEN : 45.

ATP : .08

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	11/04/83	DEPTH	70 M
T	P	T	P	I	P	I	P
654	1.37	482	2.38	427	2.27	419	2.28
330	2.72	307	2.46	275	2.67	235	2.62
203	2.63	187	2.36	155	2.67	140	2.34
140	2.60	119	2.43	97	2.18	96	2.38
87	2.05	78	2.17	75	1.85	61	1.67
55	1.49	45	1.26	41	1.03	32	1.07
31	.83	24	.69	23	.54	18	.46
17	.37	13	.28	13	.36	11	.23
10	.18	8	.11	8	.14	6	.09
6	.12	5	.08	4	.05	3	.03

PARAMETER VALUES

PS : 5.65
(4.40, 6.89)ALPHA : .035
(.034, .037)BETA : .0111
(.0064, .0158)

FRACTION : >1 MICRON

SAMPLE TEMP 18.4 C

INCUBATION TEMP 20.0 C

3

CHLOROPHYLL : .30

NITRATE : .88

CARBON : -

SILICATE : 1.91

NITROGEN : -

ATP : .13

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	11/04/83	DEPTH	70 M
T	P	T	P	I	P	I	P
686	.33	654	.21	590	.45	482	.58
427	.82	410	.75	339	.99	307	1.01
275	.82	235	.92	203	.99	187	1.07
155	1.02	140	.93	119	.92	96	1.03
87	1.08	78	1.03	75	1.03	55	.91
45	1.08	41	1.06	32	.82	31	.89
24	.76	23	.66	18	.60	17	.44
13	.41	13	.31	11	.43	10	.28
8	.25	6	.17	5	.20	4	.05
3	.08						

PARAMETER VALUES

(PS : 1.35
(1.27, 1.44)ALPHA : .042
(.039, .045)BETA : .0022
(.0018, .0027)

FRACTION : <1 MICRON

SAMPLE TEMP 18.4 C

INCUBATION TEMP 20.0 C

CHLOROPHYLL : .14

NITRATE : .88

CARBON : 79.

SILICATE : 1.91

NITROGEN : 22.

ATP : .03

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	12/04/83	DEPTH	50 M
I	P	T	P	I	P	I	P
702	1.24	670	1.15	562	1.65	522	2.10
431	2.10	427	2.55	383	2.58	315	2.70
275	2.57	243	2.85	207	2.75	171	2.76
159	2.70	124	2.63	113	2.78	108	2.55
84	2.49	75	2.62	69	2.71	55	2.47
38	1.94	37	2.13	30	1.76	30	1.77
22	1.31	22	1.35	18	1.15	16	1.09
12	.76	12	.86	10	.61	9	.57
8	.46	7	.44	6	.42	5	.33
4	.18	4	.20	3	.12		

PARAMETER VALUES

(PS : 3.60
 (3.43, 3.77))ALPHA : .078
 (.074, .082)BETA : .0044
 (.0038, .0051)

FRACTION : WHOLE

SAMPLE TEMP 18.4 C

INCUBATION TEMP 19.0 C

33

CHLOROPHYLL : .28

NITRATE : .73

CARBON : 212.

SILICATE : 1.26

NITROGEN : 74.

ATP : .06

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	12/04/83	DEPTH	50 M
T	P	I	P	I	P	I	P
646	1.60	630	1.52	566	1.90	470	2.59
458	2.79	395	2.72	323	2.51	299	2.92
275	2.74	219	2.61	191	2.75	187	2.72
155	2.60	107	2.77	104	2.77	77	2.49
60	2.50	55	2.28	52	2.12	42	1.75
41	1.89	30	1.33	28	1.45	23	1.06
22	1.06	18	.79	17	.77	14	.62
13	.64	10	.55	9	.48	6	.34
6	.26	5	.19	4	.14	4	.18
4	.12	3	.08				

PARAMETER VALUES

(PS : 3.71
 (3.48, 3.94))ALPHA : .061
 (.058, .064)BETA : .0040
 (.0031, .0048)

FRACTION : >1 MICRON

SAMPLE TEMP 18.4 C

INCUBATION TEMP 19.0 C

CHLOROPHYLL : .25

NITRATE : .73

CARBON : -

SILICATE : 1.26

NITROGEN : -

ATP : .03

SARGASSO 1983

LAT 35 23.45'N	LONG 62 35.84'W	DATE 12/04/83	DEPTH	50 M			
T	P	I	P	I	P	I	P
646	.34	630	.25	566	.47	470	.64
458	1.15	395	1.05	323	1.16	299	1.20
275	1.35	219	1.22	187	1.54	155	1.32
148	1.43	107	1.29	104	1.50	102	1.55
87	1.59	77	1.27	75	1.30	69	1.55
55	1.53	52	1.41	42	1.31	30	1.24
28	1.23	23	1.32	22	1.21	18	1.15
14	.85	13	.89	9	.68	6	.58
6	.63	5	.52	4	.38	4	.37
3	.36						

PARAMETER VALUES

(PS : 1.73
1.65, 1.81)ALPHA : .099
(.090, .109)(BETA : .0029
.0024, .0033)

FRACTION : <1 MICRON

SAMPLE TEMP 18.4 C

INCUBATION TEMP 19.0 C

CHLOROPHYLL : .10

NITRATE : .73

CARBON : 165.

SILICATE : 1.26

NITROGEN : 59.

ATP : .02

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	13/04/83	DEPTH	30 M
I	P	T	P	I	P	T	P
702	2.50	670	2.95	562	3.65	522	3.57
431	3.35	427	3.61	383	3.50	315	3.22
275	3.67	243	3.38	171	3.64	159	3.27
136	3.27	124	3.07	113	2.53	108	2.94
90	2.38	75	2.66	69	1.86	50	1.66
38	1.21	37	1.05	30	1.04	30	.72
22	.67	22	.47	18	.31	12	.26
12	.29	10	.09	9	.17	7	.09
6	.00	5	.05	4	.01	4	.05
3	.03						

PARAMETER VALUES

(PS : 5.79
(4.75, 6.84)ALPHA : .039
(.036, .041)BETA : .0059
(.0031, .0087)

FRACTION : WHOLE

SAMPLE TEMP	18.6 C	INCUBATION TEMP	19.5 C
CHLOROPHYLL :	.33	NITRATE :	.01
CARBON :	268.	SILICATE :	.57
NITROGEN :	49.	ATP :	.07

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	13/04/83	DEPTH	30 M
T	P	I	P	I	P	I	P
646	3.01	630	3.66	566	3.27	470	3.18
458	2.94	395	3.66	323	3.49	299	3.89
275	3.13	187	3.18	155	2.39	148	2.43
107	2.87	104	2.26	102	2.58	77	2.28
75	1.86	69	1.71	55	1.77	52	1.66
42	1.54	41	1.27	30	1.03	28	1.16
23	.65	22	.78	18	.40	17	.52
14	.31	13	.32	10	.22	9	.22
6	.10	6	.10	5	.08	4	.06
4	.07	4	.02	3	.02		

PARAMETER VALUES

(PS : 3.80
(3.36, 4.24)ALPHA : .038
(.036, .041)BETA : .0009
(.0000, .0019)

FRACTION : >1 MICRON

SAMPLE TEMP	18.6 C	INCUBATION TEMP	19.5 C
CHLOROPHYLL :	.25	NITRATE :	.01
CARBON :	-	SILICATE :	.57
NITROGEN :	-	ATP :	.03

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	13/04/83	DEPTH	30 M
T	P	T	P	I	P	I	P
646	3.75	630	4.00	566	3.94	470	4.82
458	5.26	395	5.98	323	4.70	299	5.09
275	5.32	191	5.26	187	5.91	107	4.92
104	4.92	55	4.45	52	4.03	42	4.22
41	4.02	30	2.91	28	3.26	23	2.62
22	2.50	18	1.76	17	2.10	14	1.28
13	1.35	10	1.18	9	1.12	6	.87
6	.74	5	.68	4	.40	4	.50
4	.58	3	.58				

PARAMETER VALUES

(PS : 6.36
(6.03, 6.69)ALPHA : .142
(.134, .149)BETA : .0042
(.0032, .0053)

FRACTION : <1 MICRON

SAMPLE TEMP 18.6 C

INCUBATION TEMP 19.5 C

CHLOROPHYLL : .04

NITRATE : .01

CARBON : 52.

SILICATE : .57

NITROGEN : 17.

ATP : .03

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	14/04/83	DEPTH	40 M
T	P	I	P	I	P	I	P
662	3.24	662	2.95	562	3.09	522	3.37
435	3.64	395	3.87	367	3.38	315	3.01
279	3.59	255	3.44	223	3.32	211	3.43
175	3.51	159	3.43	155	3.40	132	3.00
116	3.44	112	2.53	94	2.81	83	2.62
81	2.61	67	2.23	61	2.09	51	1.89
35	1.21	35	1.44	27	1.01	22	1.05
20	.76	16	.71	15	.44	12	.50
11	.33	9	.25	7	.22	6	.12
5	.25	5	.04	4	.14	3	.06

PARAMETER VALUES

P^* :
 (3.95, 4.22)

ALPHA :
 (.047, .051)

BETA :
 (.0013, .0020)

FRACTION : WHOLE

SAMPLE TEMP 18.6 C

INCUBATION TEMP 20.0 C

CHLOROPHYLL : .28

NITRATE : .29

CARBON : 87.

SILICATE : 1.80

NITROGEN : 18.

ATP : .05

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	14/04/83	DEPTH	40 M
T	P	T	P	I	P	I	P
622	4.25	618	4.78	598	4.64	486	4.63
423	4.45	375	5.04	291	4.82	283	5.03
267	5.34	211	4.74	195	4.84	171	4.08
167	4.62	136	3.78	124	4.59	118	4.22
90	3.78	85	3.15	83	3.18	81	2.68
61	2.56	61	2.57	45	2.05	44	2.01
32	1.47	32	1.55	27	1.06	26	.98
20	.68	19	.60	15	.45	13	.49
11	.26	10	.33	8	.16	8	.16
6	.10	6	.05	4	.00	4	.03
4	.02						

PARAMETER VALUES

(PS : 6.10, 6.96
7.81)ALPHA : .054
.051, .057BETA : .0050
.0029, .0072

FRACTION : >1 MICRON

SAMPLE TEMP 18.6 C INCUBATION TEMP 20.0 C

CHLOROPHYLL : .18 NITRATE : .29

CARBON : - SILICATE : 1.80

NITROGEN : - ATP : .06

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	14/04/83	DEPTH	40 M
T	P	T	P	I	P	I	P
622	.98	618	1.30	598	1.70	486	1.46
423	2.16	375	1.96	291	2.13	283	1.98
195	2.36	171	2.31	167	1.91	136	2.09
124	1.82	118	1.69	90	2.19	85	1.98
83	1.61	81	1.83	61	1.95	61	1.40
45	1.69	44	1.25	33	1.20	32	1.22
27	.93	26	1.14	20	.85	19	.78
15	.46	13	.56	11	.26	10	.41
8	.19	8	.20	6	.06	6	.06
4	.03	4	.00	4	.00		

PARAMETER VALUES

(PS : 2.55, 3.10)

ALPHA : .044
(.041, .048)BETA : .0032
(.0022, .0042)

FRACTION : <1 MICRON

SAMPLE TEMP 18.6 C

INCUBATION TEMP 20.0 C

43

CHLOROPHYLL : .09

NITRATE : .29

CARBON : 22.

SILICATE : 1.80

NITROGEN : -

ATP : .03

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	15/04/83	DEPTH	80 M
I	P	T	P	I	P	I	P
319	1.54	255	1.44	243	1.46	171	1.47
167	1.40	128	1.40	124	1.55	89	1.40
89	1.48	77	1.46	72	1.23	65	1.24
55	1.14	46	1.24	38	1.03	29	.97
25	.88	20	.68	13	.51	13	.67
10	.58	10	.41	8	.47	7	.29
5	.35	5	.21	4	.14	4	.21
3	.05	2	.06	1	.07	1	.07
1	.08						

PARAMETER VALUES

(PS :
(1.39, 1.46
 , 1.53)ALPHA :
(.050, .056)BETA :
(-.0003, :0000
 , :0003)

FRACTION : WHOLE

SAMPLE TEMP 18.6 C

INCUBATION TEMP 20.0 C

CHLOROPHYLL : .30

NITRATE : .47

CARBON : 368.

SILICATE : 1.55

NITROGEN : 49.

ATP : .04

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	15/04/83	DEPTH	80 M
I	P	T	P	I	P	I	P
287	2.49	259	2.45	231	2.42	195	2.31
183	2.32	155	2.12	132	2.23	120	2.08
116	2.22	90	2.16	87	1.94	76	1.84
66	1.76	62	1.90	56	1.81	47	1.51
41	1.46	33	1.16	31	1.15	24	.95
24	1.07	19	.66	17	.61	14	.45
11	.32	10	.36	8	.21	7	.21
6	.19	5	.07	5	.16	4	.08
3	.04	3	.02	2	.03	2	.02
2	.01	1	.00	1	.02		

PARAMETER VALUES

PS : 2.42
 (2.21, 2.64) ALPHA : .048
 (.046, .051) BETA : .0000
 (-.0009, .0009)

FRACTION : >1 MICRON

SAMPLE TEMP 18.6 C INCUBATION TEMP 20.0 C

CHLOROPHYLL :	.15	NITRATE :	.47
CARBON :	-	SILICATE :	1.55
NITROGEN :	-	ATP :	.07

SARGASSO 1983

LAT 35 23.45'N	LONG 62 35.84'W	DATE 15/04/83	DEPTH 80 M				
I	P	I	P	I	P	I	P
297	.33	259	.31	231	.25	195	.40
183	.33	155	.39	132	.42	116	.38
90	.33	87	.38	66	.38	62	.32
56	.36	24	.33	19	.25	17	.30
14	.19	13	.20	11	.16	8	.17
7	.12	6	.08	5	.07	5	.10
4	.04	3	.04	3	.03	2	.00
?	.01	2	.02	1	.01	1	.00
1	.00						

PARAMETER VALUES

(PS : .40, .43, .46)

ALPHA : .020
(.018, .022)BETA : .0005
(.0003, .0007)

FRACTION : <1 MICRON

SAMPLE TEMP 18.6 C INCUBATION TEMP 20.0 C

CHLOROPHYLL : .24

NITRATE : .47

CARBON : 81.

SILICATE : 1.55

NITROGEN : 23.

ATP : .02

SARGASSO 1983

LAT	35 23.45'N	LONG	62 35.84'W	DATE	20/04/83	DEPTH	50 M
T	P	T	P	I	P	I	P
666	.27	630	.24	518	.35	439	.53
383	.56	379	.62	327	.72	295	.78
253	.86	251	.82	203	.82	183	.86
116	.85	85	.87	78	.79	59	.65
54	.63	46	.65	43	.64	33	.69
33	.51	25	.58	25	.55	18	.46
18	.42	14	.33	13	.57	10	.22
9	.26	5	.20	5	.20	4	.05
3	.10	3	.01				

PARAMETER VALUES

PS : 1.26
(1.13, 1.40)ALPHA : .026
(.024, .029)BETA : .0026
(.0019, .0033)

FRACTION : WHOLE

SAMPLE TEMP 18.5 C

INCUBATION TEMP 19.5 C

CHLOROPHYLL : .27

NITRATE : -

CARBON : 31.

SILICATE : -

NITROGEN : -

ATP : .05

Inorganic nutrient, chlorophyll and "in situ"
primary productivity profiles

Units

P_w = mg c m^{-3} h^{-1} of whole samples

$P>1$ = mg c m^{-3} h^{-1} of fraction retained on a 1.0 μm Nuclepore filter

$P<1$ = mg c m^{-3} h^{-1} of fraction which passed through a 1.0 μm Nuclepore filter and was retained on a Whatman GF/F filter

P_g = gross production mg O_2 m^{-3} h^{-1}

P_n = net production mg O_2 m^{-3} h^{-1}

P_r = respiration mg O_2 m^{-3} h^{-1}

Chlorophyll values are in mg m^{-3} and inorganic nutrients are in mg at
 m^{-3}

SARGASSO 1983

LAT 41 50.00'N LONG 62 55.50'W DATE 07/04/1983 TIME 1005

7	CHL	N03	SI03
10	1.75	-	-
20	1.45	-	-
30	1.30	-	-
40	1.19	-	-
50	.59	-	-
60	.51	-	-
70	.14	-	-
80	.03	-	-
90	.02	-	-
110	.02	-	-

SARGASSO 1983

LAT 36 10.00'N LONG 62 35.80'W DATE 09/04/1983 TIME 0600

7	CHL	N03	SI03
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10	.54	-	-
20	.58	-	-
30	.56	-	-
40	.52	-	-
50	.50	-	-
60	.66	-	-
70	.50	-	-
80	.50	-	-
90	.49	-	-
110	.46	-	-

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 11/04/1983 TIME 0600

Z	CHL	N03	ST03
5	.44	-	-
10	.41	-	-
15	.40	-	-
20	.40	-	-
25	.41	-	-
30	.37	-	-
35	.42	-	-
40	.42	-	-
45	.43	-	-
50	.41	-	-
55	.46	-	-
60	.44	-	-
65	.42	-	-
70	.40	-	-
75	.41	-	-
80	.18	-	-
85	.11	-	-
90	.08	-	-
95	.08	-	-
100	.06	-	-
105	.04	-	-
110	.03	-	-

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 11/04/1983 TIME 1830

Z	CHL	N03	ST03
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10	.81	.38	1.57
20	.61	.52	1.80
30	.43	.51	1.56
40	.38	.70	1.56
50	.33	.97	1.80
60	.18	1.66	1.32
70	.06	2.43	1.61
80	.04	2.70	1.83
90	.04	2.90	1.36
100	.04	2.81	1.41
110	.04	2.91	1.46

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 12/04/1983 TIME 0630

Z	CHL	NO3	SIT3
10	.37	.16	1.56
20	.34	.16	1.05
30	.33	.16	1.32
40	.31	.16	1.14
50	.25	.73	1.26
60	.17	.92	1.10
70	.15	.99	1.29
80	.13	1.17	1.75
90	.09	1.74	1.54
100	.08	1.80	1.46
110	.06	2.32	1.58

SARGASSO 1983

LAT 35 23.45°N LONG 62 35.84°W DATE 12/04/1983 TIME 1900

Z	CHL	N03	ST03
10	.49	.00	.87
20	.47	.00	.90
30	.33	.00	.93
40	.28	.21	.95
50	.31	.58	1.22
60	.23	.75	.99
70	.21	.73	.94
80	.16	.82	1.10
90	.05	1.76	1.28
100	.04	1.90	1.24
110	.02	1.91	1.01

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 13/04/1983 TIME 0600

7	CHL	NO3	STO3	PW	P>1	P<1
3	.27	.11	2.14	.09	.05	.03
10	.28	.00	.69	.10	.07	.03
20	.28	.00	-	.12	.10	.02
30	.30	.00	.94	.12	.08	.03
40	.34	.08	1.43	.10	.08	.02
50	.35	.26	1.90	.12	.08	.02
60	.35	.35	2.37	.06	.04	.02
70	.34	.29	2.37	.05	.02	.01
80	.29	.99	1.67	.12	.02	.08
90	.16	1.41	1.67	.02	.01	.02
100	.15	1.40	1.67	.01	.01	.02

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 13/04/1983 TIME 0730

Z	CHL	N03	ST03
10	.39	.11	2.14
20	.45	.00	.69
30	.30	.00	-
40	.30	.00	.94
50	.33	.08	1.43
60	.34	.26	1.90
70	.35	.35	2.37
80	.27	.29	2.37
90	.23	.99	1.67
100	.17	1.41	1.67
110	.16	1.40	1.67

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 13/04/1983 TIME 1830

7	CHL	N03	SI03
5	.40	.00	1.07
10	.38	.00	.76
20	.39	.00	.70
30	.37	.00	.40
40	.38	.00	.34
50	.42	.00	.98
60	.40	.00	1.10
70	.39	.14	.78
80	.28	.43	.51
90	.20	.73	.65
100	.17	1.07	.79
110	.15	1.38	1.41

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.94'W DATE 14/04/1983 TIME 0600

7	CHL	NO3	SIO3
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10	.35	.18	1.81
20	.36	.19	1.75
30	.40	.19	1.98
40	.34	.35	2.08
50	.25	.72	1.67
60	.21	1.02	2.01
70	.09	1.36	2.00
80	.10	1.53	1.96
90	.08	1.78	1.68
100	.05	2.38	1.84
110	.04	2.39	1.57

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 14/04/1983 TIME 1830

Z	CHL	N03	S103
10	.31	.61	1.50
20	.30	.68	1.44
30	.31	.65	1.34
40	.30	.66	1.27
50	.30	.61	1.18
60	.27	.98	1.03
70	.17	1.63	1.04
80	.10	1.53	1.29
90	.09	1.73	1.29
100	.07	2.03	1.54
110	.07	2.05	1.80

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 15/04/1983 TIME 0600

Z	CHL	N03	ST03
10	.32	.69	1.01
20	.31	.30	.82
30	.29	.37	1.30
40	.31	.42	1.18
50	.31	.36	1.10
60	.32	.42	1.25
70	.30	.28	1.41
80	.32	.22	1.39
90	.21	.70	1.11
100	.25	.60	1.17
110	.12	1.03	1.22

LAT	35 23.45'N	LONG	62 35.84'W	DATE	15/04/1983	TIME	1200
			CHL	NO ₃	SIO ₃		
	10		•36				
	20		•34				
	30		•33				
	40		•35				
	50		•37				
	60		•23				
	70		•15				
	80		•12				
	90		•11				
	100		•08				
	110		•09				

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 15/04/1983 TIME 1800

Z	CHL	N03	SJ03
10	.34	.86	1.47
20	.37	.83	1.62
30	.39	.51	1.89
40	.42	.69	1.55
50	.35	.51	1.70
60	.36	.79	1.32
70	.38	.76	1.37
80	.33	.51	1.24
90	.29	.60	.92
100	.27	1.92	1.19
110	.18	1.73	1.20

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 16/04/1983 TIME 0500

Z	CHL	NO3	ST03	PW	P>1	P<1
5	.21	.16	1.30	.39	.30	.07
10	.22	.15	1.29	.57	.27	.14
20	.23	.13	1.29	.35	.25	.07
30	.25	.11	1.28	.45	.26	.06
40	.30	.03	1.28	.24	.19	.05
50	.19	.20	1.26	.29	.10	.05
60	.23	.45	1.25	.15	.11	.06
70	.19	.61	1.23	.11	.02	.06
75	.18	.71	1.21	.13	.06	.03
80	.17	.77	1.19	.06	.02	.02
85	.15	.61	1.42	.15	.04	.11
90	.13	.69	1.65	.06	.01	.02
95	.12	.73	1.40	.14	.02	.11
100	.13	.69	.86	.05	.00	.02

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 16/04/1983 TIME 0800

Z	CHL	N03	S103
10	.25	.18	1.02
20	.27	.12	1.06
30	.27	.05	.89
40	.30	.10	.64
50	.28	.09	.64
60	.22	.20	.88
70	.18	-	-
80	.16	.37	1.13
90	.12	.84	1.33
100	.10	-	-
110	.10	-	-

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 16/04/1983 TIME 1230

Z	CHL.	NO3	SI03
10	.32	-	-
20	.36	-	-
30	.42	-	-
40	.45	-	-
50	.44	-	-
60	.44	-	-
70	.35	-	-
80	.24	-	-
90	.10	-	-
100	.08	-	-
110	.08	-	-

SARGASSO 1983

LAT 35 23.45°N LONG 62 35.84°W DATE 16/04/1983 TIME 1830

Z	CHL	NO3	STO3
10	.35	.08	1.13
20	.40	.00	.81
30	.38	.00	1.06
40	.37	.11	.97
50	.41	.06	1.21
60	.39	.51	1.08
70	.29	.28	1.38
80	.20	.52	1.01
90	.07	1.07	1.22
100	.07	1.11	1.05
110	.06	1.27	1.46

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 17/04/1983 TIME 0530

7	CHL	N03	ST03	PW	P>1	P<1
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5	.39	.00	.73	.52	.37	.09
10	.41	.00	1.11	.39	.29	.07
20	.38	.00	1.14	.30	.25	.06
30	.40	.01	1.13	.24	.20	.03
40	.37	.21	.68	.14	.09	.03
50	.38	.17	.85	.14	.09	.03
60	.33	.25	.81	.09	.06	.03
70	.29	.20	.99	.05	.03	.01
75	.29	.28	.78	.03	.03	.01
80	.30	.29	.79	.03	.01	.01
85	.30	.29	1.01	.03	.01	.00
90	.28	.43	1.02	.03	.01	.01
95	.28	.38	.64	.01	.01	.00
100	.23	.55	2.08	.01	.01	.00

SARGASSO 1983

LAT 35 23.45°N

LONG 62 35.84°W

DATE 17/04/1983

TIME 0745

Z	CHL	ND3	ST03
10	.43	.00	1.11
20	.45	.00	1.14
30	.47	.01	1.13
40	.39	.21	.68
50	.38	.17	.85
60	.30	.25	.81
70	.22	.20	.99
80	.21	.28	.78
90	.09	.29	.79
100	.07	.43	1.02
110	.07	.55	2.08

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.841W DATE 17/04/1983 TIME 1230

Z	CHL	N03	ST03
10	.44	-	-
20	.43	-	-
30	.52	-	-
40	.52	-	-
50	.49	-	-
60	.46	-	-
70	.43	-	-
80	.40	-	-
90	.20	-	-
100	.11	-	-

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 17/04/1983 TIME 1830

Z	CHL	N03	S103
10	.38	.07	1.27
20	.44	.00	1.39
30	.46	.41	.90
40	.36	.59	.84
50	.35	.75	.96
60	.23	.95	1.26
70	.19	1.00	.77
80	.17	1.04	.73
90	.13	1.22	.70
100	.11	.73	.83
110	.08	.78	.99

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 18/04/1983 TIME 0600

Z	CHL	N03	ST03	PW	PG	PN	PR
10	.43	.00	.80	.61	11.40	10.40	.90
20	.43	.00	.88	.51	8.70	4.90	3.70
30	.40	.00	.79	.27	4.40	6.50	-2.10
40	.45	-	-	.24	5.30	1.10	4.20
50	.41	-	-	.23	7.60	6.60	1.10
60	.40	-	-	.11	6.70	3.90	2.80
70	.36	-	-	.09	4.40	7.60	-3.20
80	.26	1.10	.81	.02	7.60	5.00	2.70
90	.21	1.46	.80	.01	11.70	-1.40	13.00

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 18/04/1983 TIME 0745

Z	CHL	N03	S103
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10	.39	.00	.80
20	.41	.00	.88
30	.65	.00	.79
40	.51	-	-
50	.43	-	-
60	.38	-	-
70	.31	-	-
80	.27	-	-
90	.26	-	-
100	.23	1.10	.81
110	.19	1.46	.80

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 18/04/1983 TIME 1400

Z	CHL	NO3	SIO3
10	.41	-	-
20	.40	-	-
30	.43	-	-
40	.65	-	-
50	.44	-	-
60	.39	-	-
70	.33	-	-
80	.17	-	-
90	.16	-	-
100	.13	-	-
110	.12	-	-

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 18/04/1983 TIME 1900

Z	CHL	ND3	ST03
40	.45	.46	1.50
50	.43	.58	1.69
60	.38	.19	1.25
70	.39	.46	.94
80	.27	.51	1.21
90	.18	.63	.91
100	.16	.76	1.01
110	.12	.60	.93

SARGASSO 1983

LAT 35 23.45'N LONG 62 35.84'W DATE 19/04/1983 TIME 0700

7	CHL	N03	ST03	PW	PG	PN	PR
10	.30	.00	.92	.26	5.10	3.40	1.80
30	.33	.09	1.12	.26	5.10	2.10	3.00
50	.45	.18	.92	.16	4.60	4.00	.60
70	.27	.52	1.13	.04	5.10	2.50	2.60
90	.18	.57	1.13	.04	9.30	2.40	6.90
100	.15	.61	.72	.02	-	-	-
110	.14	.45	1.03	.02	2.80	-.10	2.90
120	.12	.92	1.30	.07	.80	-.50	1.30
125	.09	-	-	.01	2.80	.20	2.60

Location of sampling station occupied from

10 to 20 April 1984

