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**INSTITUT FÜR MEERESKUNDE**  
an der  
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Nr. 110

**PLANKTOLOGICAL AND CHEMICAL DATA  
FROM THE EQUATORIAL ATLANTIC AT 22°W  
OBTAINED IN FEBRUARY TO JUNE 1979**

("FGGE - EQUATOR '79")

E. Bauerfeind, R. Boje, E. Fahrbach, J. Lenz, M. Meyerhöfer  
and M. Rolke

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E. BAUERFEIND, R. BOJE, E. FAHRBACH, J. LENZ,

M. MEYERHÖFER and M. ROLKE

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## Abstract

The volume presents planktological and chemical data collected during cruise No. 51 of RV "Meteor" to the equatorial Atlantic (FGGE '79) from February to June 1979. A standard section along the meridian  $22^{\circ}$  W across the equator was sampled ten times between  $2^{\circ}$  S and  $3^{\circ}$  N. Together with a temperature and salinity profile, concentrations of oxygen, nutrients and chlorophyll a were analyzed in water samples down to a depth of 250 m. Solar radiation and light depths were measured for determination of primary productivity of the euphotic zone according to the simulated in situ method. Zooplankton biomass was estimated in 5 depth intervals down to 300 m by means of a multiple opening and closing net equipped with a mesh size of  $100 \mu\text{m}$ .

## Zusammenfassung

Der Datenband enthält planktologische und chemische Meßdaten, die auf der 51. Reise von FS "Meteor" im Rahmen von FGGE '79 im Äquatorialen Atlantik gesammelt wurden. Ein Standardschnitt über den Äquator auf dem Meridian  $22^{\circ}$  W wurde zwischen  $2^{\circ}$  S und  $3^{\circ}$  N im Zeitraum vom Februar bis zum Juni 1979 10 mal wiederholt. Zusammen mit einem Tiefenprofil der Temperatur- und Salzgehaltsverteilung wurde der Gehalt an Sauerstoff, Nährsalzen und Chlorophyll a in Wasserproben bis zu 250 m Tiefe gemessen. Gleichzeitig wurde die Lichteinstrahlung und Lichtverteilung unter Wasser bestimmt, um die Primärproduktion in der euphotischen Zone nach der 'simulated in situ' Methode zu messen. Die Zooplanktonbiomasse wurde in 5 Tiefenstufen bis 300 m Tiefe mittels eines Mehrfachschlieβnetzes mit  $100 \mu\text{m}$  Maschenweite bestimmt.

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## Foreword

During the First Garp Global Experiment (FGGE) the German research vessel 'Meteor' worked in the equatorial Atlantic along the meridian  $22^{\circ}$  W from February to June 1979. During this period a standard section between  $3^{\circ}$  N and  $2^{\circ}$  S was repeated ten times, and three long-term stations (72-96 hours) were occupied at  $0^{\circ}$  N,  $3^{\circ}$  N, and  $2^{\circ}$  S (Fig. 1 and 2). At the sections, STD measurements were carried out at every station, whereas samples for planktological and chemical determinants were usually taken at every second station. For the time course of the sections, see Fig. 2.

The biological programme aimed at the investigation of regional and seasonal changes of plankton standing stock and productivity in relation to changes in the hydrographic regime, e.g. the rising of nutrient-rich water masses from below the thermocline to the upper euphotic layer through equatorial upwelling.

The data report contains the values for nutrients, oxygen, chlorophyll a, primary productivity, solar radiation and zooplankton biomass together with temperature, salinity and density in the depth of sampling.

We wish to thank all those who helped us in preparing the expedition, carrying out the measurements and collecting the various samples, analysing them aboard the vessel and at home, processing the data and presenting them in the data sheets of this volume. Our special thanks go to Dr. B. BABENERD, Dr. K.v. BRÖCKEL, I. CARSTENSEN, P. FRITSCHÉ, H. JOHANNSEN, P. MANGELSDORF, H. MEMPEL, M. MEMPEL, W. ROOCK, A. SCHNEIDER, P. STEGMANN, M. VENZMER, R. WERNER as well as to the officers and crew of RV 'Meteor'.

We also gratefully acknowledge the financial support we received from the "Deutsche Forschungsgemeinschaft".

Rolf Boje and Jürgen Lenz

Kiel, February 1983

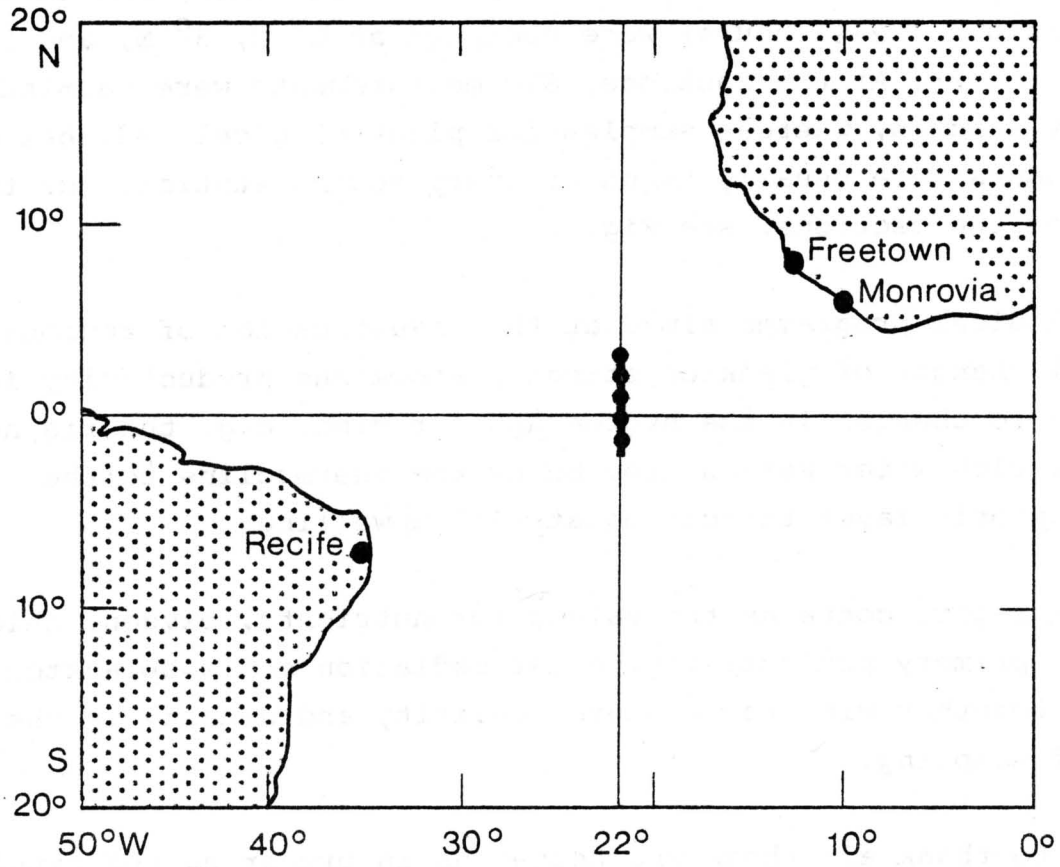


Fig. 1: Position of the section across the equator

Fig. 2: Position and time table for single stations, biological sample taking is marked by a square

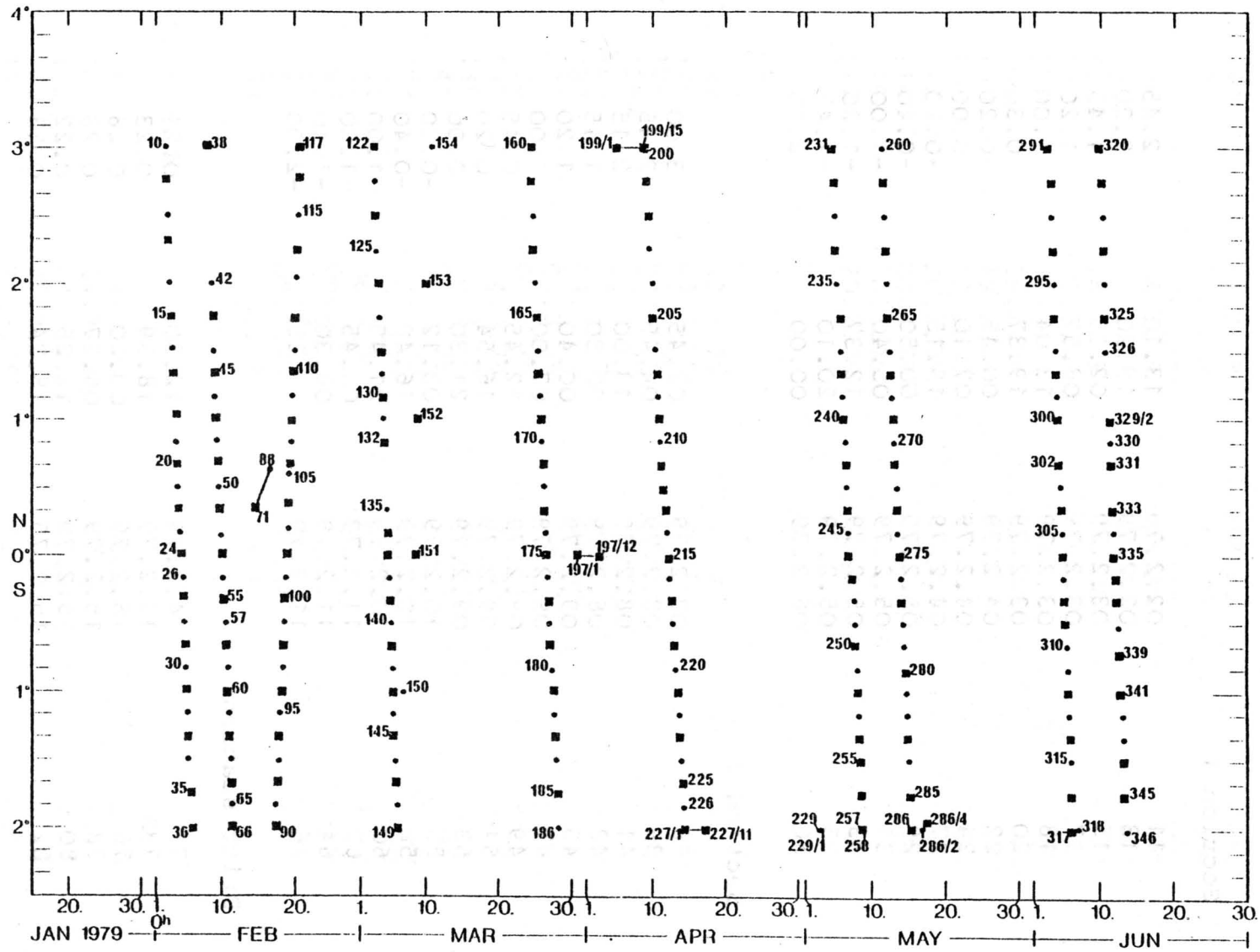




Table of station positions

Station No.	Date	Time GMT	Latitude N,S (-)
Section 1			
11	02.2.79	13.10	2.45
13	02.2.79	19.20	2.20
15	03.2.79	02.15	1.45
17	03.2.79	08.57	1.20
18	03.2.79	13.04	1.00
20	03.2.79	19.37	0.30
22	04.2.79	00.45	0.20
24	04.2.79	07.10	0.00
27	04.2.79	19.15	-0.20
29	05.2.79	00.50	-0.40
31	05.2.79	05.40	-1.00
33	05.2.79	12.37	-1.20
35	05.2.79	20.10	-1.45
36	06.2.79	00.00	-2.00
Section 2			
38	08.2.79	02.45	3.00
39	08.2.79	04.45	2.45
41	08.2.79	13.00	2.15
43	08.2.79	20.30	1.45
45	09.2.79	00.40	1.20
47	09.2.79	07.00	1.00
49	09.2.79	12.45	0.45
51	09.2.79	16.54	0.20
53	09.2.79	21.30	0.00
55	10.2.79	03.12	-0.20
58	10.2.79	16.48	-0.40
60	10.2.79	21.45	-1.00
62	11.2.79	02.45	-1.20
64	11.2.79	08.30	-1.40
66	11.2.79	13.25	-2.00
Drift stations			
71	14.2.79	12.30	0.21
73A	14.2.79	18.39	0.23
76	15.2.79	00.20	0.26
78	15.2.79	06.37	0.28
80	15.2.79	12.25	0.22
82	15.2.79	18.24	0.33

Station No.	Date	Time GMT	Latitude N,S(-)
Section 3			
90	17.2.79	13.22	-2.00
92	17.2.79	17.30	-1.40
94	17.2.79	23.18	-1.20
96	18.2.79	05.29	-1.00
98	18.2.79	10.59	-0.40
100	18.2.79	16.08	-0.20
102	18.2.79	21.57	0.00
104	19.2.79	02.59	0.20
106	19.2.79	08.41	0.40
108	19.2.79	14.37	1.00
110	19.2.79	09.42	1.20
112	20.2.79	02.52	1.45
114	20.2.79	10.18	2.15
116	20.2.79	16.28	2.45
117	20.2.79	20.31	3.00

Section 4

122	02.3.79	20.41	3.00
124	03.3.79	02.50	2.30
126	03.3.79	12.11	2.00
128A	03.3.79	19.46	1.20
130	04.3.79	00.37	1.00
132	04.3.79	05.34	0.50
134	04.3.79	13.14	0.30
136	04.3.79	16.56	0.00
137	04.3.79	19.48	0.00
139	05.3.79	01.56	-0.20
141	05.3.79	07.19	-0.40
143	05.3.79	12.28	-1.00
145	05.3.79	19.58	-1.20
147	06.3.79	01.09	-1.40
149	06.3.79	05.40	-2.00
151	07.3.79	12.12	0.00
152	08.3.79	12.19	1.00
153	09.3.79	13.11	2.00

Section 5

160	24.3.79	08.46	3.00
161	24.3.79	13.20	2.45
163	24.3.79	21.31	2.15
165	25.3.79	05.32	1.45
167	25.3.79	12.53	1.20
169	25.3.79	19.23	1.00
171	26.3.79	01.57	0.40
173	26.3.79	07.37	0.20
175	26.3.79	13.00	0.00
177	26.3.79	19.20	-0.20
179	27.3.79	02.14	-0.40
181	27.3.79	12.37	-1.00
183	27.3.79	18.06	-1.20
185	28.3.79	13.20	-1.45

Station No.	Date	Time GMT	Latitude N,S (-)
Section 6			
201	09.4.79	06.07	2.45
202	09.4.79	13.05	2.30
203	09.4.79	17.57	2.15
205	10.4.79	04.00	1.45
207	10.4.79	15.43	1.20
209	10.4.79	XXXXX	1.00
211	11.4.79	08.09	0.40
212	11.4.79	12.20	0.30
213	11.4.79	17.28	0.20
215	12.4.79	04.20	0.00
217	12.4.79	13.00	-0.20
219	12.4.79	22.32	-0.40
221	13.4.79	12.35	-1.00
223	13.4.79	20.18	-1.20
225	14.4.79	05.10	-1.40
227	14.4.79	13.09	-2.00

## Section 7

231	04.5.79	13.24	3.00
232	04.5.79	19.33	2.45
234	05.5.79	01.00	2.15
236	05.5.79	16.07	1.45
238	05.5.79	21.23	1.20
240	06.5.79	02.15	1.00
242	06.5.79	12.33	0.40
244	06.5.79	16.32	0.20
246	06.5.79	21.26	0.00
247	07.5.79	13.00	-0.10
250	07.5.79	20.00	-0.40
252	08.5.79	02.00	-1.00
254	08.5.79	08.51	-1.20
255	08.5.79	12.35	-1.30
256	08.5.79	15.23	-1.45
258	09.5.79	12.14	-2.00

## Section 8

261	11.5.79	12.59	2.45
263	11.5.79	21.28	2.15
265	12.5.79	01.45	
267	12.5.79	12.52	1.20
269	12.5.79	20.57	1.00
271	13.5.79	03.50	0.40
273	13.5.79	12.23	0.20
275	13.5.79	18.26	0.00
277	14.5.79	03.20	-0.20
280	14.5.79	13.52	-1.00
283	14.5.79	23.50	-1.20
285	15.5.79	07.00	-1.45
286	15.5.79	12.51	-2.00
286,4	17.5.79	13.48	-2.00

Station No.	Date	Time GMT	Latitude N,S(-)
Section 9			
291	03.6.79	00.50	3.00
292	03.6.79	06.45	2.45
294	03.6.79	12.30	2.15
296	03.6.79	20.50	1.45
298	04.6.79	03.24	1.20
300	04.6.79	09.26	1.00
301	04.6.79	12.44	0.50
302	04.6.79	14.45	0.40
304	04.6.79	20.24	0.20
306	05.6.79	02.40	0.00
308	05.6.79	08.32	-0.20
309	05.6.79	12.45	-0.30
312	05.6.79	21.03	-1.00
314	06.6.79	02.01	-1.20
316	06.6.79	08.26	-1.45
317	06.6.79	13.00	-2.00

Section 10

320	09.6.79	09.40	3.00
321	10.6.79	05.25	2.45
323	10.6.79	12.36	2.15
325	10.6.79	17.30	1.45
329	11.6.79	14.06	1.00
331	11.6.79	18.14	0.40
333	11.6.79	23.23	0.20
336	12.6.79	04.05	0.00
336	12.6.79	12.26	-0.10
337	12.6.79	14.23	-0.20
339	12.6.79	19.43	-0.45
341	13.6.79	00.34	-1.00
344	13.6.79	12.20	-1.30
345	13.6.79	15.18	-1.45

Long-term stations

197,01	30.3.79	19.21	0.00
197,02	31.3.79	01.29	0.00
197,03	31.3.79	07.57	0.00
197,04	31.3.79	13.16	0.00
197,05	31.3.79	19.50	0.00
197,06	01.4.79	01.28	0.00
197,07	01.4.79	08.00	0.00
197,08	01.4.79	13.55	0.00
197,09	01.4.79	22.56	0.00
197,10	02.4.79	01.23	0.00
197,11	02.4.79	09.01	0.00
197,12	02.4.79	13.33	0.00

Station No.	Date	Time GMT	Latitude N,S (-)
199,01	05.4.79	01.15	3.00
199,02	05.4.79	07.15	3.00
199,03	05.4.79	13.03	3.00
199,04	05.4.79	18.42	3.00
199,05	06.4.79	01.31	3.00
199,06	06.4.79	07.02	3.00
199,07	06.4.79	12.40	3.00
199,08	06.4.79	18.56	3.00
199,09	07.4.79	00.51	3.00
199,10	07.4.79	07.18	3.00
199,11	07.4.79	12.38	3.00
199,12	07.4.79	18.00	3.00
199,13	08.4.79	06.56	3.00
199,14	08.4.79	12.47	3.00
199,15	09.4.79	01.38	3.00

227,01	14.4.79	13.09	-2.00
227,02	15.4.79	01.38	-2.00
227,03	15.4.79	07.27	-2.00
227,04	15.4.79	12.39	-2.00
227,05	15.4.79	18.50	-2.00
227,06	16.4.79	01.08	-2.00
227,07	16.4.79	07.37	-2.00
227,08	16.4.79	12.56	-2.00
227,09	16.4.79	18.34	-2.00
227,10	17.4.79	01.07	-2.00

Description of methods

Water samples

Sample taking

Samples were taken with 10 l Niskin bottles mounted together with the Bathysonde in a rosette sampler. Sampling depths were chosen due to prior determination of the light levels in the euphotic layer (100%, 50%, 30%, 10%, 1% light level). In the deeper layers down to 250 m, samples were taken at a depth of 75 m, 100 m, 125 m, 150 m, 200 m, and 250 m. Subsamples were drawn for the analysis of nutrients ( $\text{NO}_3$ ,  $\text{SiO}_4$ ,  $\text{PO}_4$ ), oxygen content, chlorophyll concentration, primary productivity, particulate organic carbon and particulate organic nitrogen and for the analysis of phytoplankton content and species composition ('Utermöhl' samples). The data of the latter 4 analysis methods are not listed in this volume.

Temperature and salinity

Temperature, salinity and depth were measured with a Howaldt Bathysonde (temperature  $\pm 0.01^\circ \text{C}$ , salinity  $\pm 0.03\text{‰}$ , depth  $\pm 1$  dbar; SY and MEINCKE, 1981). Density was calculated from temperature and salinity values.

Nutrients and oxygen

The concentration of the nutrients  $\text{NO}_3$ ,  $\text{SiO}_4$ , and  $\text{PO}_4$  was determined with an autoanalyzer (technicon-type) following the methods outlined by GRASSHOFF (1976). The oxygen content was measured by the Winkler technique (see GRASSHOFF, 1976). The standard deviations for each determinant are as follows (GRASSHOFF, 1976)

$\text{NO}_3$	:	5	$\mu\text{M NO}_3\text{-N l}^{-1}$	:	$\pm$	0.1 $\mu\text{M}$
	:	10	$\mu\text{M NO}_3\text{-N l}^{-1}$	:	$\pm$	0.3 $\mu\text{M}$
$\text{PO}_4$	:	0.2	$\mu\text{M PO}_4\text{-P l}^{-1}$	:	$\pm$	15%
	:	0.9	$\mu\text{M PO}_4\text{-P l}^{-1}$	:	$\pm$	5%
	:	2.8	$\mu\text{M PO}_4\text{-P l}^{-1}$	:	$\pm$	2%
$\text{SiO}_4$	:	4.5	$\mu\text{M SiO}_4\text{-Si l}^{-1}$	:	$\pm$	4%
	:	45	$\mu\text{M SiO}_4\text{-Si l}^{-1}$	:	$\pm$	2.5%
$\text{O}_2$	:	<2	$\text{ml O}_2 \text{ l}^{-1}$	:	$\pm$	0.02 ml
	:	>2	$\text{ml O}_2 \text{ l}^{-1}$	:	$\pm$	0.04 ml

### Solar radiation

The incoming daily solar radiation was measured with a solarimeter (Kipp und Zonen, Solarimeter Integrator CC 1). The incoming light energy during incubation of the primary productivity samples was also registered. Light levels were determined by means of a secchi disc reading at noon time. 1% light level corresponds to secchi depth multiplied by the factor 2.7.

### Primary productivity

Primary productivity was measured by the  $^{14}\text{C}$  method according to the simulated in situ technique. Water samples were incubated in 100 ml bottles in a seawater cooled incubator ( $^{14}\text{C}$  activity added was  $4\ \mu\text{C}$ ) from about local noon ( $\pm 60$  min.) to sunset (mean incubation time 6 h). After incubation, samples were immediately filtered through Sartorius membrane filters (pore size  $0.25\ \mu\text{m}$ ,  $\varnothing 4.5$  cm), rinsed with filtered seawater, dried and stored in an exsiccator till analysis of the  $^{14}\text{C}$  activity. Activity measurements of the samples were carried out with a Geiger Müller counter by the International  $^{14}\text{C}$  Agency in Hørsholm, Denmark. Daily production was calculated by using the ratio of daily radiation to radiation during incubation period.

### Chlorophyll a

For determination of chlorophyll a content, 1.5 l seawater were filtered through glassfiber filters (Whatman GF/C,  $\varnothing 2.5$  cm). The filters were stored deep-frozen up to sample analysis in the laboratory. After grinding and extraction in 90% acetone, the extract was analyzed with a fluorometer (Turner Design, model 10) that was calibrated against the spectrophotometric method (UNESCO, 1966). The detection limit of the method used is  $0.03\ \mu\text{g chl a l}^{-1}$ . All analyses were performed within 6 months after the end of the expedition.

Literature

GRASSHOFF, K. (1976):

Methods of seawater analysis. Verlag Chemie, Weinheim,  
New York, 317 p

SY, A. and J. MEINCKE (1981):

A comparison of hydrographic features in the equatorial Atlantic during FGGE using a conventional CTD and a towed system, p 55-60. In: McCREARY, J.P., Jr., D.W. MOORE and J.M. WITTE (Eds.), Recent progress in equatorial Oceanography. A report of the final meeting of SCOR working group 47 in Venice, Italy, April 27-30, 1981

UNESCO (1966):

Determination of photosynthetic pigments in sea water. Monographs on oceanographic methodology I. UNESCO, Paris, 69 p



Key to the data sheet

STA.NO.:	Station number
DAT:	Day and month of sampling
URZ:	Time (GMT), beginning of station
POS:	Position, latitude, negative values indicate stations south of the equator
EINGESTR.ENERGIE:	Daily solar radiation ( $\text{cal cm}^{-2} \text{d}^{-1}$ )
TIEFE:	Depth in m, ".1" indicates the 1% light level
NO <sub>3</sub> :	Concentration of NO <sub>3</sub> -N ( $\mu\text{M l}^{-1}$ )
SiO <sub>4</sub> :	" " SiO <sub>4</sub> -Si ( $\mu\text{M l}^{-1}$ )
PO <sub>4</sub> :	" " PO <sub>4</sub> -P ( $\mu\text{M l}^{-1}$ )
O <sub>2</sub> :	Dissolved oxygen ( $\text{ml O}_2 \text{l}^{-1}$ )
T:	Temperature ( $^{\circ} \text{C}$ )
S $^{\circ}/\text{‰}$ :	Salinity ( $^{\circ}/\text{‰}$ )
SIG:	Density ( $\sigma_t$ )
CHLORO:	Chl <u>a</u> concentration ( $\mu\text{g l}^{-1}$ )
PRIM.PROD:	Primary productivity ( $\text{mg C m}^{-3} \text{d}^{-1}$ )
INTEG 1%:	Integrated values for the euphotic zone
INTEG ALL:	Integrated values for the whole water column

Figures in front of the integrated values indicate the number of values used, the units are

$\text{mM m}^{-2}$	(nutrients)
$\text{mg m}^{-2}$	(chl <u>a</u> )
$\text{mg C m}^{-2} \text{d}^{-1}$	(primary prod)

STAT NR 11.00 DAT 2 2 79 URZ 13.10 POS 2.45 EING. ENERGIE 304

TIEFE	NO3	SI04	PO4	O2	T,	S%	SIG	CHLORO	PRIM.PRO
0	0.00		0.10	4.83	27.73	35.85	23.14	0.07	1.82
10								0.04	
20	0.00		0.52	4.68	27.65	35.58	22.97	0.06	5.10
39	0.00		0.00	4.69	27.59	35.58	22.99	0.08	2.10
50	0.00		0.00	4.79	27.54	35.61	23.02	0.09	
89.1	0.00		0.00	3.18	19.09	35.72	25.57	0.17	2.40
101	5.20		0.38	2.71	15.59	35.61	26.33	0.05	
125	18.90		1.22	2.68	14.66	35.50	26.45	0.04	
150	18.30		1.27	2.98	14.01	35.44	26.54	0.00	
200									
251	23.70		1.75	2.94	12.16	35.22	26.75	0.00	

INTEG: ALL 9 2906.40 9 216.25 8 10.79 4 250.10  
 INTEG: 1% 5 0.00 5 11.14 6 8.39 4 250.10

STAT NR 13.00 DAT 2 2 79 URZ 19.20 POS 2.20 EING. ENERGIE\*\*\*\*\*

TIEFE	NO3	SI04	PO4	O2	T,	S%	SIG	CHLORC	PRIM.PRO
0				4.69	27.79	35.57	22.91	0.02	
10				4.63	27.80	35.57	22.91	0.04	
19				4.78	27.68	35.59	22.96	0.07	
30				4.66	27.55	35.59	23.01	0.17	
50				4.64	27.42	35.64	23.09	0.10	
80.1				3.70	22.17	35.88	24.86	0.07	
101				2.37	15.58	35.56	26.29	0.04	
124				2.77	14.37	35.48	26.50	0.05	
150				3.14	13.57	35.37	26.58	0.05	
200									
250				2.61	11.97	35.17	26.75	0.00	

INTEG: ALL 9 10.86  
 INTEG: 1% 6 7.37

STAT NR 15.00 DAT 3 2 79 URZ 2.15 POS 1.45 EING. ENERGIE\*\*\*\*\*

TIEFE	NO3	SI04	PO4	O2	T.	S%	SIG	CHLORO	PRIM.PRO
0	0.00	0.00		4.67	27.48	35.62	23.05	0.03	
10	0.00	0.00		4.63	27.48	35.61	23.04	0.03	
19	0.00	0.10		4.62	27.43	35.63	23.07	0.03	
38					27.02	35.74	23.29		
50	0.30	8.30		4.66	26.78	35.81	23.42	0.11	
80.1	9.20	9.00		3.16	20.11	35.87	25.41	0.16	
101	20.20	8.60		2.55	14.72	35.51	26.44	0.04	
125	19.30	10.10		3.12	13.45	35.37	26.61	0.00	
150	21.50	10.00		2.94	12.53	35.24	26.69		
200									
250	24.30	11.10		2.90	11.41	35.11	26.80		

INTEG: ALL 9 3729.85 9 2105.60  
 INTEG: 1% 5 147.15 5 390.15

6 8.89  
 5 6.79

STAT NR 17.00 DAT 3 2 79 URZ 8.57 POS 1.20 EING. ENERGIE\*\*\*\*\*

TIEFE	NO3	SI04	PO4	O2	T.	S%	SIG	CHLORO	PRIM.PRO
0	0.00	0.40	0.00	4.45	27.10	35.69	23.23	0.06	
9	0.00	0.30	0.00	4.55	27.09	35.68	23.22	0.06	
19	0.00	0.30	0.00	4.56	27.08	35.69	23.23	0.06	
38					26.75	35.77	23.40		
50	0.10	1.80	0.00	4.52	26.20	35.76	23.56	0.10	
79.1	9.40	2.20	0.09	3.12	20.69	35.78	25.19	0.07	
100	19.50	9.70	0.88	2.29	15.51	35.54	26.29	0.05	
124	16.90	6.80	0.80	3.47	13.43	35.40	26.63	0.00	
148	18.60	6.70	0.98	3.44	12.40	35.21	26.69	0.00	
200									
250	22.60	9.10	1.25	2.72	11.55	35.10	26.77	0.00	

INTEG: ALL 9 3406.75 9 1387.45 9 166.74  
 INTEG: 1% 5 139.30 5 96.70 5 1.30

6 7.35  
 5 6.09

STAT NR 18.00 DAT 3 2 79 URZ 13.04 POS 1.00 EING. ENERGIE 511

TIEFE	NO3	SI04	PO4	O2	T,	S%	SIG	CHLORO	PRIM,PRO
0	0.00			4.47	26.79	35.96	23.53	0.07	7.20
8	0.10			4.61	26.82	35.95	23.51	0.07	8.00
14	0.20			4.64	26.75	35.96	23.54	0.08	5.70
32	0.10			4.63	26.71	35.94	23.54	0.11	1.90
50									
75.1	8.50			2.64	22.11	35.85	24.85	0.03	0.00
100	18.80			2.67	15.28	35.55	26.35	0.03	
125	16.80			3.47	13.60	35.37	26.57	0.04	
146	17.70			3.52	13.00	35.37	26.70	0.00	
200									
250	24.50			2.56	11.58	35.10	26.76	0.00	

INTEG: ALL 9 3531.80 7 7.36 4 170.30  
 INTEG: 1% 5 188.90 5 5.73 4 170.30

STAT NR 20.00 DAT 3 2 79 URZ 19.37 POS 0.30 EING. ENERGIE\*\*\*\*\*

TIEFE	NO3	SI04	PO4	O2	T,	S%	SIG	CHLORO	PRIM,PRO
0	0.00	0.20	0.00	4.61	26.91	36.07	23.57	0.06	
9	0.00	0.20	0.00	4.65	26.86	36.07	23.59	0.06	
15	0.50	0.10	0.00	4.64	26.64	36.06	23.65	0.07	
33	0.20	2.30	0.00	4.63	26.55	36.05	23.67	0.10	
68	8.50	3.10	0.14	3.27	21.83	35.84	24.92	0.15	
76.1	9.50	3.00	0.35	3.26	20.64	36.06	25.42	0.11	
99	16.40	7.10	1.01	3.45	15.13	35.58	26.41	0.00	
125	17.20	6.70	1.17	3.51	13.83	35.41	26.56	0.00	
148	17.30	6.90	1.18	3.64	12.83	35.34	26.71	0.00	
200									
248	24.20	9.90	1.81	2.60	11.68	35.13	26.77	0.00	

INTEG: ALL 10 3438.45 10 1435.15 10 224.92 6 7.88  
 INTEG: 1% 6 232.05 6 143.20 6 4.41 6 7.88