Poseidon cruise 202

Cruise report

P202/1a-1b
01-23 Sep 1994
Bremerhaven - Funchal - Sta Cruz/TF
T.J. Müller

P202/1c
25 Sep - 08 Oct 1994
Sta. Cruz/TF - Las Palmas/GC
M. Knoll

Knoll

Institute of Marine Research

CRUISE REPORT [1)]

R.V. POSEIDON **Cruise No.:** 202/1a-1b

Dates of Cruise: 01 - 23 Sep 1994

General subject of research: Physical Oceanography
(physical, biological or geological oceanography)

Port Calls: Funchal.

IfM-Department / CAU Institute: Marine Physics

Chief Scientist: Dr. T.J. Müller

Number of Scientists: 10

Project: SFB 133/TP E7, JGOFS/ESTOC

Cruise Report

This Cruise Summery Report consists of ..7. pages and covers:

1) Scientific crew, list and institute affiliation

2) Research programme (short project summary, scientific goals etc.)

3) Report of cruise with technical details (port calls, cruise track, weather, special events)

4) Scientific report and first results

5) Scientific equipment, instruments, moorings etc.

6) Appendix of charts with cruise tracks, list of stations, diagrams etc.

~~7) Additional remarks~~

1) To be delivered 3 months after cruise to Provost of IfM in 3 copies for Institute files and Foreign Office.

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Institut für Meereskunde
an der Universität Kiel

C R U I S E R E P O R T

R/V POSEIDON

0. General

POSEIDON cruise no 202/1a-1b

01 - 23 Sep 1994, Bremerhaven - Sta. Cruz de Tenerife

General subject of research: physical oceanography

Port call: 12 - 15 Sep 1994, Funchal, Madeira

Marine Physics Department

Chief scientist: Dr. Thomas J. Müller

Number of scientists: 10

Projects: SFB 133/TP C7, JGOFS

1. List of participants

Name	Institut	202/1a	/1b
Müller *	IFMK-PH	------	-----
Busse	IFMK-PH	------	-----
Carlsen	IFMK-PH	------	-----
Haag	IFMK-PH	------	-----
Kipping	IFMK-PH	------	-----
Link	IFMK-PH	------	-----
Meyer	IFMK-PH	------	-----
Sanders	IFMK-CH		-----
Petersen	IFMK-CH		-----
Molina	IEO-T		-----
Total		7	10

* Chief scientist

IEO-T : Instituto Espanol de Oceanografia, Sta. Cruz/TF
IFMK-PH: Institut für Meereskunde, Kiel, Marine Physics
IFMK-CH: Institut für Meereskunde, Kiel, Marine Chemistry

2. Research programme

Both legs were designed to technically support different research programmes, mainly with mooring work and some additional CTD profiles in the Iberian and Canary Basins.

2.1 Observations of currents in the Mediterranean water level

To trace the path and to monitor the dynamics of salty lenses of Mediterranean origin in the 1000 m level of the Iberian Basin, floats of RAFOS type were launched during earlier cruises. The last operational float transmitted its track data via the ARGOS satellite system after it had surfaced on schedule in July 1994.

The method to track floats, measures the travelling times of sound pulses from a moored (fixed position) sound source to the freely drifting and listening float. Three pulses a day at prescribed times for a few seconds are required from two, better three, sources to get accurate positions and thereby track lines of the float. During leg 202/1a, three moorings with sound sources (Positions N2, G, and A2 in Fig. 1), and a moored float (MAFOS at position 346) were to be recovered. This programme thereby has terminated its observational phase in the Iberian Basin.

2.2 Long term current and particle flux measurements at 33N, 22W

Since 1980, the long term mooring KIEL276 with 8 current meters is maintained by IFM Kiel west of Madeira at the nominal position 33N, 22W at 5280 m water depth outside the economic zones of coastal states. Its aim is to monitor the variability of currents at the northern edge of the North Atlantic's subtropical gyre from mesocale to seasonal and interannual scales. Close to the same position, since 1993 and as part of the international Joint Global Ocean Flux Studies JGOFS open ocean monitoring stations, sediment traps were moored. Both moorings were to be recovered and reset as a combined mooring.

2.3 ESTOC time series station north of the Canary Islands

Both, the World Ocean Circulation Experiment WOCE and JGOFS, to observe seasonal and interannual changes and trends, require to set up time series stations with moored instruments and monthly casts of certain parameters from ships. In a joint effort to run such a station on the eastern part of the subtropical North Atlantic, the European Station for Time Series in the Ocean, Canary Islands, (ESTOC) was started January this year by two Spanish (ICCM, Telde, GC, and IEO, Sta. Cruz, TF) and two German (IFM Kiel and Univ. Bremen) institutes. As part of the station, a mooring was to be deployed at position ESTOC 60 nm north of the islands, equipped with current meters covering the major water masses from to to bottom.

2.4 Deep western boundary currents at the Mid Atlantic Ridge

According to the Stommel & Aarons scheme, bottom water flow that is fed by far even away sources of convection, is broad, poleward and upward within basins, and confined to a deep western boundary currents (DWBC) at western boundaries. If the Mid Atlantic Ridges (MAR) serves as a boundary between the western and the eastern Atlantic basins, one might expect DWBCs on its eastern flank. From earlier direct measurements, there are speculations that such a DWBC sets northeast at 34.75N, 23.08W at 5155 m water depth. To further test the hypothesis on the existence of such a DWBC, a mooring with current meters and thermistor strings between 4560 m depth and the bottom (5264 m) was deployed at position 364 in July 1993 and to be recovered during this cruise.

2.5 CTD test
With all the mooring work to be done, little time was left for hydrography. Therefore, in additon to CTD casts obtained at mooring positions with a standard MKIIIB, just some tests were to be performed with a new deep sea CTD (KMS) made by Meerestechnik Elektronik ME, Trappenkamp, Germany.

3. Cruise narrative

The cruise began in Bremerhaven on the 1st of September, 1994. Under fairly good wheather conditions which persisted throughout the cruise, we quickly reached position N2 where on the 6th of September mooring 326-2 with a sound source was recovered after 3 1/2 years of deployement (station #756, see list attached). A CTD profile with MKIIIB also was obtained. Two days leter, 8th September, the second sound source within mooring 345 at positon G within the economic zone of Portugal was recovered.

Again outside the economic zone of Portugal, on station #758 the first test with the new KMS CTD was performed. The position is close to a station of CTD tests made in 1992, and chosen to test the response of CTDs to step like structures with scales of 0.2 m and less below the saline Mediterranean water tongue.

On the 9th of September we reached position A where the third sound source within mooring 324-3 was recovered. To control eventual drifts of clocks in sound sources by measuring travel times between fixed positions, two RAFOS floats were moored; they were recovered in mooring 346 on the 10th of September. At the same position, another test with the KMS was performed with repeated profiles at great depths.

POSEIDON called port of Funchal, Madeira, in the morning of the 12th of September to exchange mooring equipment, and to embark a colleague from the IEO at Sta. Cruz, Tenerife, and two scientists for the JGOFS programme. During our stay, the captain and four members of the scientific crew enjoyed an evening reception in the house of the German consulate, Frau E. Gesche.

POSEIDON sailed again on the 15th of September to reach position L1 on the 16th of September. Here we recovered the JGOFS mooring L1 with particle traps. However, due to a strong barotropic event in the Azores Current after 4 months of of recording, the mooring tilted extremely which forced the top buoy down to overpressure. As a result, the top buoy scrunched and the uppermost trap and the uppermost current meter at 200 m nominal depth came upside down. Nevertheless, due to enough back up bouyancy, the mooring stayed vertically in the rest of the line.

On the 17th of September, close to L1, mooring 276-14 at position KIEL276 was recovered. Here, too, the Azores Current event had tilted the mooring and scrunched the top bouyancy. But contrary to L1, less back up bouyancy put the upper most instruments down to the bottom. Thus data are only available from 3000 m depth. The combined current meter and particle trap mooring 276-15 was deployed on the 18th of September at the position of KIEL276. Two CTD stations and a hydrocast down to 2000 m completed the waork on this positions.

On the 19th of September we recovered mooring 364, supplemented with a CTD on that position.

Heading towards the Canary Islands, we reached the ESTOC position on the 22th of September to deploy the ESTOC current meter mooring 367 at a water depth of 3600 m. A CTD station was taken afterwards. Next day, 23rd of September POSEIDON called port of Sta. Cruz de Tenerife where the scientific crew changed with Dr. M. Knoll as new chief scientist.

4. Scientific report

Data will be processed in the institute. We therefore refer to later publications.

5. Scientific equipment

5.1 Moorings

Seven moorings were recovered and two moorings were deployed:

ID	Date 1994 mmdd	Lat N	Long W	Depth m	R/ D	Intru- ments	Coastal state 200 nm
326-2/N	0906	43 01.61	014 00.92	5300	r	1s	
345/G	0908	36 42.41	011 59.28	4400	r	1s	P
324-3/A	0909	35 20.93	012 48.48	3380	r	1s, 1m	
346	0910	36 39.94	015 48.95	4040	r	3m	
L1	0916	33 08.5	021 58.5	5275	r	4t, 2c	
KIEL276-14	0917	32 59.63	022 00.10	5275	r	8c	
KIEL276-15	0918	32 57.45	022 01.98	5275	d	8c, 4t	
364	0919	33 18.91	024 51.70	5310	r	3c	
367/ESTOC	0922	29 11.06	015 40.25	3620	d	7c, 1a	E

R/D r: recovered
d: deployed

Instruments: a: ADCP (moored) current meter
c: RCM8 current meter
m: moored RAFOS float
s: sound source
t: particle trap

5.2 CTD-rosette

A standard MKIIIB made by Neil Brown Instruments (NB2) in combination with a rosette sampler for salinity calibration was used for standard profiling on 6 casts. A newly developed KMS CTD made by Meerestechnik Elektronik was tested on two stations in the deep sea.

5.3 Shipborne 150 Khz ADCP

This instrument was in use during the whole cruise. The instrument was in-situ calibrated for errors in heading and disalignment at the beginning of the cruise leaving the English Channel.

6. Appendix

Station list

Figure 1: POSEIDON 202/1a-1b, cruise track with stations (*) and mooring identifications

Figure 2: Design of the current meter mooring on the ESTOC position.

POSEIDON 202/1a-1b
01 - 23 Sep 1994
Bremerhaven - Sta. Cruz, Tenerife, Spain

Station list

Date 1994 mmdd	Time UTC hhmm	Stat	Lat N	Long W	Depth m	Remarks
						start leg 202/1a
0901	0900					sail Bremerhaven
0906	0800	756	43 01.61	014 00.92	5300	V326-2/N recover
0906	1025	756	43 01.42	014 00.36	5260	NB2/1
0908	0700	757	36 42.41	011 59.28	4400	V345/G recover
0908	1535	758	35 55.00	013 08.08	4800	KMS/1 test
0909	0700	759	35 20.93	012 48.48	3380	V324-3/A recover
0910	0700	760	36 39.94	015 48.95	4040	V346 recover
0910	0929	760	36 39.95	015 48.05	4000	KMS/2 test
0910	1250	760	36 40.42	015 48.78	3950	NB2/2
0912	1000					call port of Funchal
						end leg 202/1a
						start leg 202/1b
0915	0800					sail Funchal
0916	1200	762	33 08.5	021 58.5	5275	recover L1
0916	1700	762	33 07.57	021 56.46	5275	hydrocast, 2000 m
0916	1845	762	33 08.23	021 56.05	5275	NB2/3
0917	0800	763	32 59.63	022 00.10	5275	V276-14 recover
0918	0830	764	32 57.45	022 01.98	5275	V276-15 deploy
0918	1250	764	32 55.36	022 01.96	5275	NB2/4
0919	0800	765	33 18.91	024 51.70	5310	V364 recover
0919	1010	765	33 18.83	024 51.88	5310	NB2/5
0922	0830	766	29 11.06	015 40.25	3620	V367 deploy
0922	1130	766			3620	NB2/6
0923	0800					call port of S. Cruz

VXXX : mooring identifier
NB2/X: profile X with MKIIIB CTD and rosette sampler
KMS/X: profile X with KMS CTD, no rosette sampler

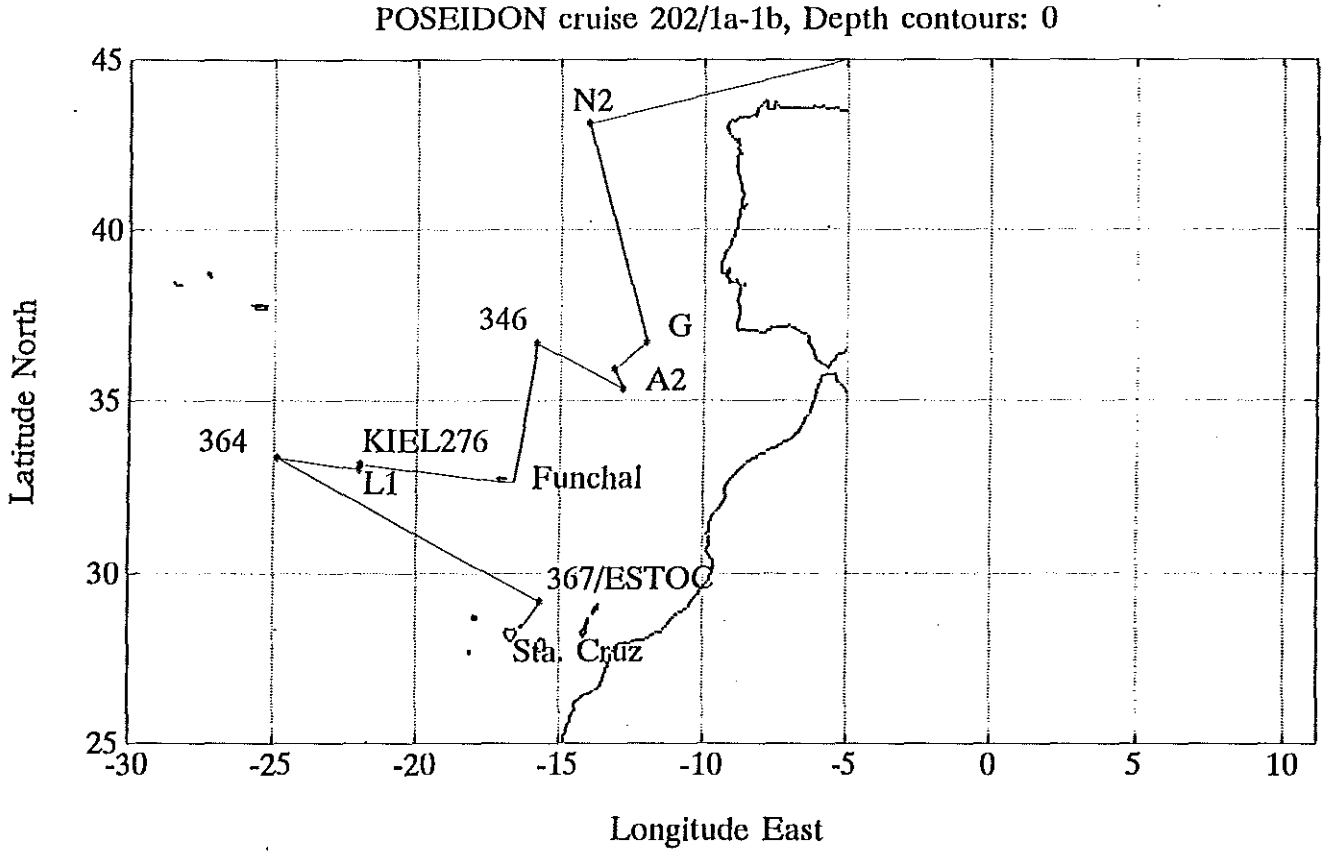


Fig 1: POSEIDON cruise 202/1a-1b, Bremerhaven - Funchal - Sta. Cruz. Track line with CTD stations (*) and identifications for sound source moorings N2, G, A2, MAFOS (moored RAFOS) 246, JGOFS particle trap mooring L1, and current meter moorings KIEL276, 364 and 367/ESTOC.

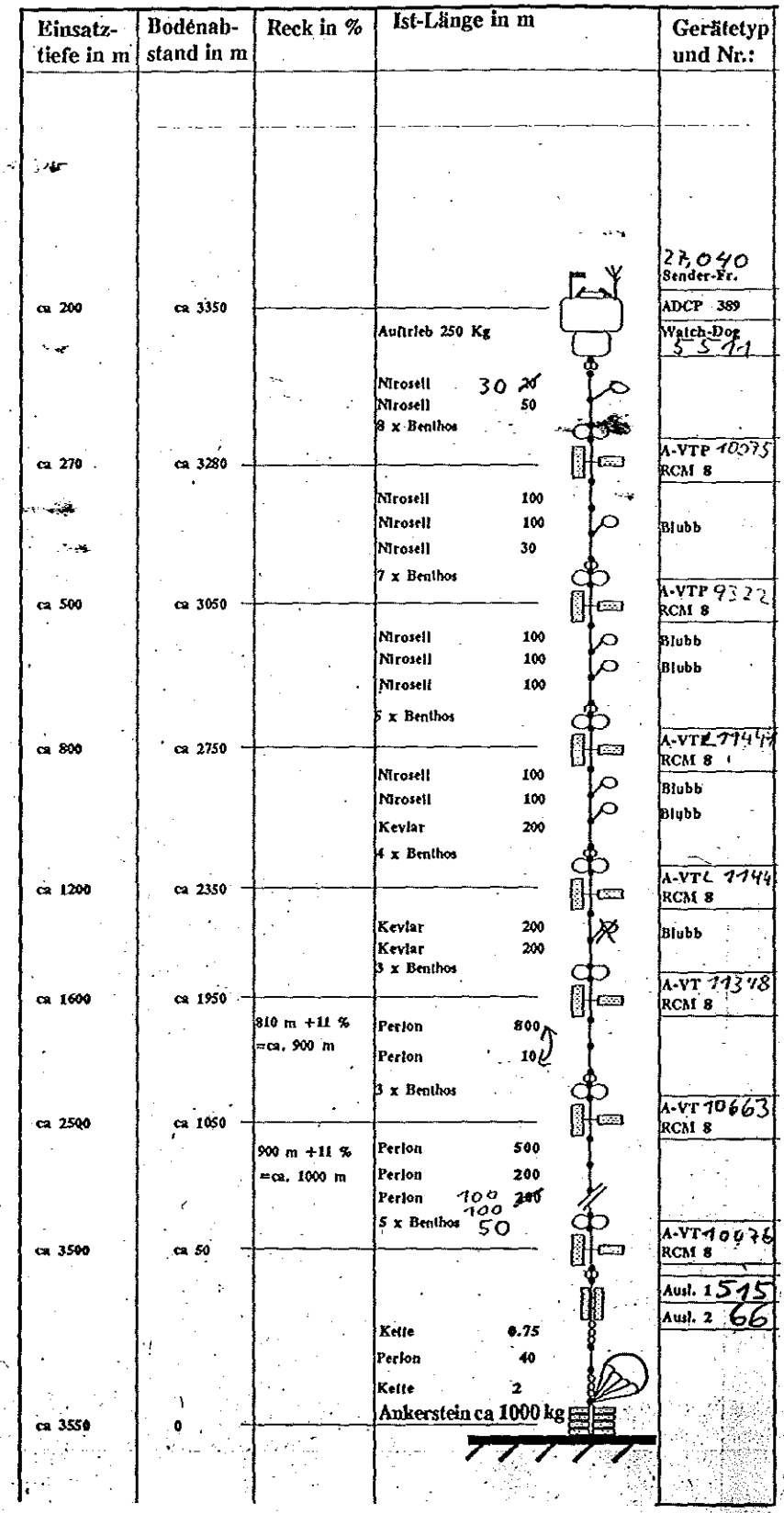


Fig 2: Design of the current meter mooring 367 north of the Canary Islands at a water depth of 3620 m close to the ESTOC position. The Position is 29°10.09'N, 015°40.25'W. The mooring was deployed September 22, 1994, by R/V POSEIDON during cruise 202/1b.

Institute of Marine Research

CRUISE REPORT [1)]

R.V. POSEIDON **Cruise No.:** 202/1C

Dates of Cruise: 25.9.94 - 8.10.94

General subject of research:
(physical, biological or geological oceanography)
physical, biological and chemical

Port Calls:
sta. Cruz de Tenerife, Las Palmas/Gran Canaria

IfM-Department / CAU Institute:
IFM / Meteorphysik

Chief Scientist: Dr. M. Knoll

Number of Scientists: 10

Project:
ESTOC, JGOFS

Cruise Report

This Cruise Summery Report consists of 12 pages and covers:

1) Scientific crew, list and institute affiliation

2) Research programme (short project summary, scientific goals etc.)

3) Report of cruise with technical details (port calls, cruise track, weather, special events)

4) Scientific report and first results

5) Scientific equipment, instruments, moorings etc.

6) Appendix of charts with cruise tracks, list of stations, diagrams etc.

7) Additional remarks

1) To be delivered 3 months after cruise to Provost of IfM in 3 copies for Institute files and Foreign Office.

1. Scientific crew, list and institute affiliation

Markus Busse	Institut für Meereskunde, Kiel
Cayetano Collado	University Las Palmas, Gran Canaria
Esther Delgado	ICCM, Telde, Gran Canaria
Jose Escanez	IEO , Tenerife
Christian Haag	Institut für Meereskunde, Kiel
Dr. Michaela Knoll	Institut für Meereskunde, Kiel
Uwe Koy	Institut für Meereskunde, Kiel
Dr. Susanne Neuer	University Bremen
Cristina Rodriguez	ICCM, Telde, Gran Canaria
Rosa Santana	ICCM, Telde, Gran Canaria

2. Research programme

Study of the spatial and temporal variability of physical, chemical and biological parameters around the Canary Islands
Continuation of the long-term observations at the ESTOC station

3. Report of cruise with technical details

FS Poseidon left Sta. Cruz de Tenerife on 25th September 1994 at 9:00 am for station work around the Canary Islands. CTD observations were obtained on 63 station. The CTD (NB2) was either equipped with an oxygen sensor (24 stations) or a fluorometer and a lowered ADCP (39 stations), which were only applicable in the upper 3000 m. All CTD profiles were down to the bottom, unless the profile depth is noted explicitly in the station list.

On each station water samples were obtained with a GO multisampler (21 x 10 l) if possible from the following 20 depth/pressure levels: 2 x bottom, 3000 dbar, 2500 dbar, 2000 dbar, 1500 dbar, 1300 dbar, 1200 dbar, 1100 dbar, 1000 dbar, 800 dbar, 600 dbar, 400 dbar, 200 dbar, 150 dbar, 100 dbar, 75 dbar, 50 dbar, 25 dbar, 10 dbar and the depth level of maximum chlorophyll content. The water samples were or will be analyzed for salinity, oxygen, nutrients, chlorophyll and heavy metals (lead, copper). Some water samples were already analyzed onboard of the ship, others will be analyzed in the laboratory. Some salinity measurements were already done onboard using a Guildline salinometer. With a titration unit some of the oxygen measurements were carried out on the ship. Also chlorophyll was partly determined onboard using a Turner 10 fluorometer. Therefore water samples (100 ml or 200 ml, respectively) were filtered onto GF/F filters (vacuum$\leq$100 mg HG) in replicates or triplicates and extracted in 10 ml of 90% acetone for 24 hours in a refrigerator. Chlorophyll samples were measured 24 to 36 hours after filtration. The concentration of pigment was determined after measuring chlorophyll fluorescence before and after acidification with a few drops of 10% HCL, and applying a calibration factor determined using standards of pure chl a. Thus, not only chlorophyll but also phaeopigments can be measured. At the stations 771, 796, 822 and 829 additional, shallow CTD profiles were obtained. At those stations and at the stations 788 and 815 water samples were taken in the upper 500 m to study either phytoplancton growth and microzooplancton grazing rates and/or the background level for heavy metals.

A surface tethered sediment trap was deployed three times (stations 769, 792, 815) close to the ESTOC station. The trap consisted of four cylinders mounted in a welded iron frame.

Each cylinder was topped with a baffle to reduce turbulence at the mouth of the cylinder and had a sample bottle screwed on from below. The sample bottles were filled with a 0.2 μm filtered 40 $^{\circ}/_{oo}$ density gradient solution (achieved with Suprapur NACL) that was poisoned with 2% formalin. Before deployment, the cylinders were filled with 0.2 μm filtered water from 1000 m to 2000 m depth. The trap array consisted of a surface bouy, containing an Argos transmitter integrated in a Benthos sphere, an IBAK transmitter 27 MHz and a Xenon flasher; 12 (first deployment) or 11 (second and third deployment) Benthos spheres as floats; the trap at about 150 m depth and an Aanderaa RCM8 current meter about 10 m below the trap. Three or four of the spheres were afloat, in addition to the surface buoy, while the trap was drifting for 3 to 4 days. Due to the ARGOS system the position of the drifting trap was recorded several times per day

Two XBT sections were carried out, a meridional one along 15° 3.0' W with 19 XBT profiles and a zonal one along 29° 7.0' N with 15 XBT profiles. Since T5 probes were used, the XBT profiles were reaching a depth level of 1800 m. Close to the ESTOC station a bongo net was lowered once to a depth level of 200 m. On the 7th October at 9:00 pm the station work was finished and we reached Las Palmas, Gran Canaria, on the 8th October 1994 at 9:00 am.

4. Scientific report and first results

Below the surface layer, which was about 40 m deep, pure North Atlantic Central Water (NACW) was observed on all CTD stations in a depth range between 100 m and 700 m. The NACW is characterized by a fixed temperature/salinity relationship. In a depth level of about 800 m we found Antartic Intermediate Water (AAIW), which enters the area from the south and is characterized by a salinity minimum. The lowest salinity values were observed at the eastern CTD stations between the Canary Islands and the African coast. In this area the AAIW reached a depth level of more than 1100 m. The highest salinity values of the AAIW were observed at the western CTD stations north of the Canary Islands. The Mediterranean Water (MW), which enters the area from the north, is characterized by a high temperature and salinity. The MW signal was much stronger north of the Canary Islands than in the south. Especially at the stations south and east of Gran Canaria the influence of MW was hardly seen. The MW was observed in a depth level of about 1200 m, but at the CTD stations between the Canary Islands and the African coast the MW was found at the bottom in about 1400 - 1500 m. Within the upper 1000 m the isotherms and isohalines were oriented from the Northeast to the Southwest with decreasing temperatures and salinities towards the African coast.

A meddy was observed at 29° 8' N, 15° 0' W in a depth range between 900 m and 1500 m with temperatures and salinities of more than 11°C and 36.3 psu, respectively. The meddy was shaped like a disk with a diameter of about 35 km. Since a meddy had been observed in August '94 at the ESTOC station, which is about 20 nm further west, the meddy had probably moved towards the east with about 1.5 cm/s.

Some CTD stations just north of Gran Canaria showed cold and fresh water intrusions of AAIW within the warm and salty MW. The AAIW moves northward and probably crosses the sill at the bottom between Gran Canaria and Fuerteventura.

5. Scientific equippment, instruments, moorings etc.

CTD (NB2) equipped with an oxygen sensor or an in-situ flurometer, ADCP profiler, GO multisampler (21 x 10 *l*), Guildline salinometer, RDI 150kHz Profiler, XBT's with recording unit, bongo net, oxygen titration unit, filtration unit, clean bench, sediment trap equipped with an Aanderaa current meter, incubator, Turner 10 fluorometer

6. Appendix of list of stations, cruise tracks, sediment trap

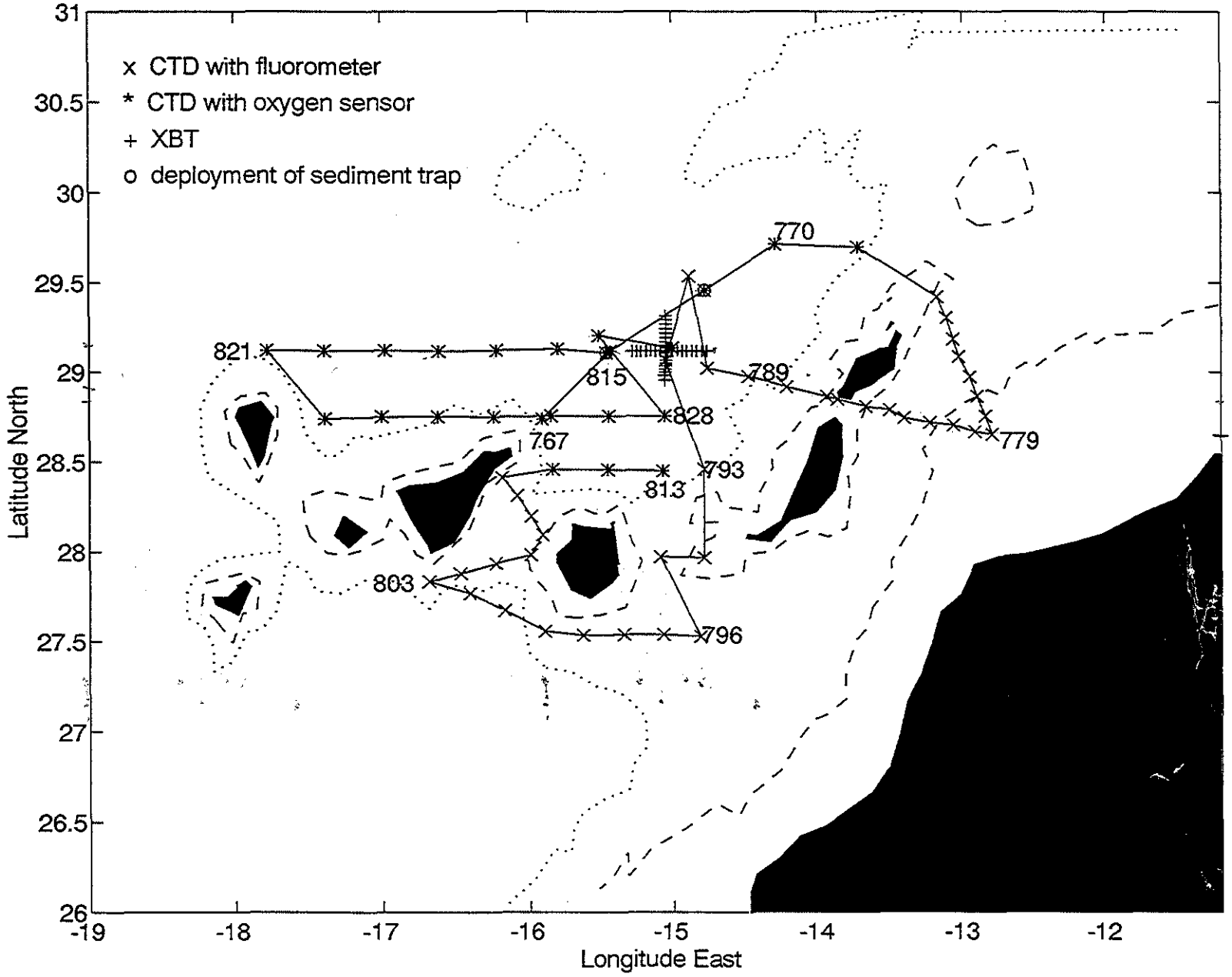
STATION	DATE 1994	TIME	POSITION φ[°N]	POSITION λ[°W]	DEPTH [m]	INSTRUMENTS (profile depth)
767	25.09.	12:21	28°44.3'	15°54.4'	3514	CTD/Rosette
768	25.09.	20:00	29°07.1'	15°25.9'	3606	CTD/Rosette
769	26.09.	4:07	29°27.4'	14°46.8'	3519	CTD/Rosette
		8:15	29°26.8'	14°47.1'	3508	deploy sediment trap
770	26.09.	12:15	29°42.7'	14°17.7'	3382	CTD/Rosette
771	26.09.	18:10	29°42.4'	13°44.5'	3144	CTD/Rosette (500 m)
		19:51	29°41.9'	13°43.8'	3153	CTD/Rosette
772	27.09.	2:45	29°25.1'	13°10.8'	1318	CTD/Rosette/ADCP
773	27.09.	5:13	29°18.2'	13°07.1'	1430	CTD/Rosette/ADCP
774	27.09.	8:20	29°10.9'	13°04.5'	1463	CTD/Rosette/ADCP
775	27.09.	11:04	29°05.1'	13°02.0'	1412	CTD/Rosette/ADCP
776	27.09.	13:50	28°58.3'	12°57.4'	1277	CTD/Rosette/ADCP
777	27.09.	17:30	28°51.8'	12°54.4'	1001	CTD/Rosette/ADCP
778	27.09.	19:45	28°45.2'	12°50.9'	573	CTD/Rosette/ADCP
779	27.09.	21:30	28°39.2'	12°48.0'	278	CTD/Rosette/ADCP
780	27.09.	23:30	28°40.0'	12°55.2'	497	CTD/Rosette/ADCP
781	28.09.	1:25	28°42.3'	13°04.1'	818	CTD/Rosette/ADCP
782	28.09.	3:30	28°43.0'	13°13.9'	1128	CTD/Rosette/ADCP
783	28.09.	5:57	28°44.6'	13°24.6'	1345	CTD/Rosette/ADCP
784	28.09.	8:30	28°47.2'	13°30.6'	1254	CTD/Rosette/ADCP
785	28.09.	11:15	28°48.6'	13°40.5'	985	CTD/Rosette/ADCP
786	28.09.	13:45	28°50.9'	13°52.1'	78	CTD/Rosette/ADCP
787	28.09.	15:00	28°51.9'	13°56.5'	1250	CTD/Rosette/ADCP
788	28.09.	18:25	28°55.0'	14°13.0'	2803	Rosette (30 m)
		19:08	28°55.0'	14°13.0'	2803	CTD/Rosette/ADCP
789	28.09.	23:00	28°58.5'	14°28.8'	3162	CTD/Rosette/ADCP (2000 m)
790	29.09.	3:45	29°01.3'	14°45.9'	3521	CTD/Rosette (3000 m)
791	29.09.	10:35	29°31.4'	14°51.9'	3517	recover sediment trap
		11:10	29°32.1'	14°53.1'	3515	CTD/Rosette/ADCP (500 m)
792	29.09.	14:40	29°03.9'	15°02.9'	3569	CTD/Rosette/ADCP (3000 m)
		18:15	29°04.1'	15°02.8'	3569	deploy sediment trap
XBT01	29.09.	19:10	28°58.9'	15°03.4'	3577	XBT
XBT02	29.09.	19:30	28°57.2'	15°03.2'	3577	XBT
XBT03	29.09.	20:20	29°00.0'	15°03.0'	3573	XBT
XBT04	29.09.	20:30	29°01.0'	15°03.0'	3572	XBT
XBT05	29.09.	20:40	29°02.0'	15°03.0'	3570	XBT
XBT06	29.09.	20:49	29°03.0'	15°02.7'	3570	XBT
XBT07	29.09.	20:59	29°04.0'	15°02.7'	3570	XBT
XBT08	29.09.	21:08	29°05.0'	15°02.7'	3570	XBT
XBT09	29.09.	21:16	29°06.4'	15°02.9'	3570	XBT
XBT10	29.09.	21:24	29°07.2'	15°02.9'	3572	XBT
XBT11	29.09.	21:31	29°08.0'	15°02.8'	3567	XBT
XBT12	29.09.	21:39	29°09.0'	15°02.8'	3562	XBT
XBT13	29.09.	21:48	29°10.0'	15°02.9'	3556	XBT
XBT14	29.09.	22:01	29°11.5'	15°02.8'	3560	XBT
XBT15	29.09.	22:15	29°13.0'	15°02.8'	3563	XBT
XBT16	29.09.	22:29	29°14.5'	15°02.9'	3561	XBT
XBT17	29.09.	22:42	29°16.0'	15°02.9'	3559	XBT
XBT18	29.09.	22:55	29°17.5'	15°02.9'	3561	XBT
XBT19	29.09.	23:07	29°18.8'	15°02.8'	3565	XBT
793	30.09.	4:30	28°27.5'	14°47.3'	3024	CTD/Rosette/ADCP (3000 m)
794	30.09.	10:05	27°58.0'	14°47.1'	165	CTD/Rosette/ADCP
795	30.09.	12:15	27°58.3'	15°05.1'	1414	CTD/Rosette/ADCP

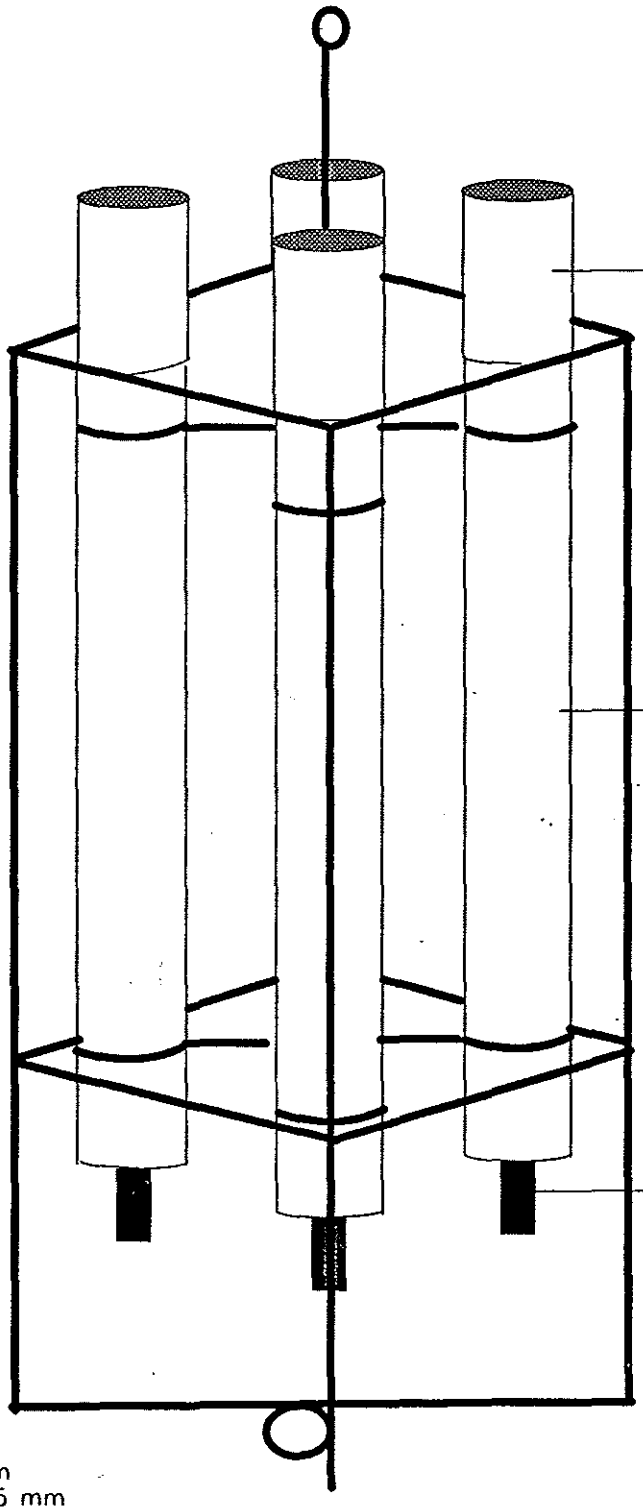
STATION	DATE 1994	TIME	POSITION φ[°N]	POSITION λ[°W]	DEPTH [m]	INSTRUMENTS
796	30.09.	16:28	27°32.1'	14°48.8'	2516	CTD/Rosette/ADCP
		19:48	27°31.7'	14°48.8'	2520	CTD/Rosette/ADCP (100 m)
797	30.09.	21:35	27°32.3'	15°04.1'	2624	CTD/Rosette/ADCP
798	1.10.	1:20	27°32.3'	15°20.5'	2452	CTD/Rosette/ADCP
799	1.10.	5:15	27°32.1'	15°37.5'	2262	CTD/Rosette/ADCP
800	1.10.	9:15	27°33.4'	15°53.6'	2028	CTD/Rosette/ADCP
801	1.10.	12:32	27°40.4'	16°10.4'	3357	CTD/Rosette/ADCP (3000 m)
802	1.10.	17:10	27°46.1'	16°24.7'	3301	CTD/Rosette/ADCP (3000 m)
803	1.10.	21:10	27°50.0'	16°41.0'	2223	CTD/Rosette/ADCP
804	2.10.	0:20	27°52.7'	16°28.4'	2341	CTD/Rosette/ADCP
805	2.10.	3:55	27°56.0'	16°13.8'	2530	CTD/Rosette/ADCP
806	2.10.	8:20	27°58.9'	15°59.2'	709	CTD/Rosette/ADCP
807	2.10.	10:15	28°05.6'	15°54.4'	715	CTD/Rosette/ADCP
808	2.10.	12:05	28°11.8'	15°59.2'	2772	CTD/Rosette/ADCP
809	2.10.	15:40	28°18.7'	16°05.0'	2273	CTD/Rosette/ADCP
810	2.10.	18:55	28°24.8'	16°11.3'	1746	CTD/Rosette/ADCP
811	2.10.	22:55	28°27.5'	15°50.2'	3419	CTD/Rosette
812	3.10.	3:45	28°27.4'	15°27.1'	3431	CTD/Rosette
813	3.10.	9:20	28°27.0'	15°04.3'	3377	CTD/Rosette (2000 m)
814	3.10.	19:55	29°20.3'	15°21.3'	3600	recover sediment trap
XBT20	4.10.	0:01	29°07.0'	14°46.1'	3535	XBT
XBT21	4.10.	0:19	29°07.0'	14°48.0'	3545	XBT
XBT22	4.10.	0:35	29°07.0'	14°50.1'	3553	XBT
XBT23	4.10.	0:52	29°07.1'	14°52.0'	3557	XBT
XBT24	4.10.	1:08	29°07.0'	14°54.2'	3558	XBT
XBT25	4.10.	1:24	29°07.0'	14°56.0'	3558	XBT
XBT26	4.10.	1:42	29°07.1'	14°58.0'	3563	XBT
XBT27	4.10.	2:00	29°07.1'	15°00.0'	3568	XBT
XBT28	4.10.	2:18	29°07.1'	15°02.0'	3570	XBT
XBT29	4.10.	2:34	29°07.0'	15°05.0'	3572	XBT
XBT30	4.10.	2:51	29°07.0'	15°07.0'	3576	XBT
XBT31	4.10.	3:06	29°07.1'	15°09.0'	3580	XBT
XBT32	4.10.	3:22	29°07.0'	15°11.0'	3585	XBT
XBT33	4.10.	3:41	29°07.0'	15°13.3'	3588	XBT
XBT34	4.10.	3:55	29°07.0'	15°15.0'	3591	XBT
XBT35	4.10.	4:12	29°07.0'	15°17.0'	3594	XBT
815	4.10.	5:15	29°06.5'	15°27.7'	3606	Rosette (30 m)
	4.10.	6:05	29°06.5'	15°27.7'	3606	CTD/Rosette
		9:14	29°07.6'	15°26.9'	3606	deploy sediment trap
816	4.10.	11:40	29°07.7'	15°48.0'	3625	CTD/Rosette
817	4.10.	17:27	29°07.3'	16°13.6'	3652	CTD/Rosette
818	4.10.	22:50	29°07.0'	16°37.0'	3703	CTD/Rosette
819	5.10.	3:40	29°07.2'	16°58.7'	3852	CTD/Rosette
820	5.10.	9:30	29°07.1'	17°23.2'	3868	CTD/Rosette
821	5.10.	14:40	29°07.3'	17°46.5'	3462	CTD/Rosette
822	5.10.	21:25	28°44.9'	17°22.9'	3372	CTD/Rosette (140 m)
		22:16	28°44.4'	17°22.9'	3385	CTD/Rosette
823	6.10.	3:25	28°45.0'	16°59.9'	3425	CTD/Rosette
824	6.10.	9:00	28°45.1'	16°37.3'	3061	CTD/Rosette
825	6.10.	13:30	28°45.0'	16°14.6'	2941	CTD/Rosette
826	6.10.	18:15	28°45.3'	15°50.6'	3572	CTD/Rosette
827	6.10.	23:15	28°45.3'	15°26.5'	3586	CTD/Rosette
828	7.10.	4:35	28°45.3'	15°03.2'	3572	CTD/Rosette
829	7.10.	13:25	29°11.9'	15°31.1'	3611	recover sediment trap
		13:52	29°12.0'	15°30.7'	3613	bongo net (200 m)
		14:30	29°12.2'	15°30.8'	3613	CTD/Rosette (200 m)
		15:10	29°12.2'	15°30.9'	3613	CTD/Rosette (200 m)
830	7.10.	18:34	29°08.0'	15°00.2'	3554	CTD/Rosette

7. Additional remarks

Differences in the ship's position of sometimes more than 1nm were observed between the Magna Vox GPS receiver, displayed in the ship's laboratory and a mobile Magna Vox GPS receiver MX 4200 onboard owned by the department of marine physics.

Due to satellite communication problems the fax machine did not work for most of the time. Since there is no telex connection to the Institut für Meereskunde in Kiel and the quality of the phone calls through Norddeich Radio was very bad, we had problems to receive the ARGOS position of the sediment trap in time. A fixed directional antenna on the ship for the ARGOS platform receiver would be helpful for future work.


x CTD with fluorometer
* CTD with oxygen sensor
+ XBT
o deployment of sediment trap
770
821
815
789
828
779
767
793
813
803
796
Latitude North
Longitude East
31
30.5
30
29.5
29
28.5
28
27.5
27
26.5
26
-19
-18
-17
-16
-15
-14
-13
-12



Zylinder
Länge 1100 mm
Durchmesser:125 mm

Baffle
Länge: 180 mm

Gestänge:
Länge: 1500 mm
Breite 680 mm

UNIVERSITÄT BREMEN
FACHBEREICH GEOWISSENSCHAFTEN

Tiefe (m)	Gerät	ins Wasser	aus dem Wasser	Bemerk.
	Topboje m. Argos Watchdog 05507 IBAK-Sender 27mHz, Xenon Flasher	8:45	10:35	
Oberfläche (Topboje bis 4. Kugel)	Warbel			
	50m Meteorleine			
	Warbel			
5m				
	Warbel			
	50m Niro 8mm			
	50m Niro 8mm			
	30m Niro 8 mm			
	20m Niro 8 mm			
	Warbel			
156m	Treibfalle	8:22	10:51	
	Warbel			
	10m Niro 8mm			
167m	Aanderaa RCM 8 Nr. 9726 /P,L,C	8:15	10:53	
	2m Niro 8mm			
	10m Kette			

Verankerung Treibfalle CI T 1
Expedition: Poseidon 202/1C
Seegebiet: Kanarische Inseln
Wassertiefe: 3600 m
Ausbringen: 26.9.94 Position: 29°26.8'N; 14°47.1'W
Aufnahme: 29.9.94 Position: 29° 31.4'N; 14° 51.9'W

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FACHBEREICH GEOWISSENSCHAFTEN

Tiefe (m)	Gerät	ins Wasser	aus dem Wasser	Bemerk.
	Topboje m. ArgosWatchdog 05507 IBAK-Sender 27mHz, Xenon Flasher	18:35	19:55	
Oberfläche (Topboje bis 3. Kugel)	Warbel 50m Meteorleine			
5m	Warbel			
	Warbel			
	50m Niro 8mm			
	50m Niro 8mm			
	30m Niro 8 mm			
	20m Niro 8 mm			
	Warbel			
156m	Treibfalle	18:20	20:06	
	Warbel			
	10m Niro 8mm			
167m	Aanderaa RCM 8 Nr. 9726 /P,L,C	18:15	20:08	
	2m Niro 8mm			
	10m Kette			

Verankerung Treibfalle CI T 2
Expedition: Poseidon 202/1C
Seegebiet: Kanarische Inseln
Wassertiefe: 3600 m
Ausbringen: 29.9.94 Position: 29°04.06'N;15°02.77'W
Aufnahme: 3.10.94 Position: 29° 20.32'N; 15°21.35'W

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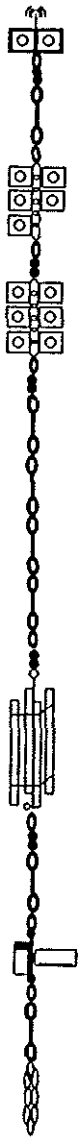
FACHBEREICH GEOWISSENSCHAFTEN

Tiefe (m)	Gerät	ins Wasser	aus dem Wasser	Bemerk.
	Topboje m. ArgosWatchdog 05507 IBAK-Sender 27mHz, Xenon Flasher	9:30	13:25	
Oberfläche (Topboje bis 3. Kugel)	Warbel 50m Meteorleine			Meteorleine war beim Aufnehmen mit beiden Paketen Benthos -kugeln verheddert
5m	Warbel			
	Warbel			
	50m Niro 8mm			
	50m Niro 8mm			
	30m Niro 8 mm			
	20m Niro 8 mm			
	Warbel			
156m	Treibfalle	9:20	13:43	
	Warbel			
	10m Niro 8mm			
167m	Aanderaa RCM 8 Nr. 9726 /P,L,C	9:14	13:45	
	2m Niro 8mm			
	10m Kette			



Verankerung Treibfalle CI T 3
Expedition: Poseidon 202/1C
Seegebiet: Kanarische Inseln
Wassertiefe: 3600 m
Ausbringen: 4.10.94 Position: 29°07.6'N;15°26.9'W
Aufnahme: 7.10.94 Position: 29° 11.9'N; 15°31.1'W

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