

SHORT CRUISE REPORT

R.V. METEOR
cruise 53, Leg 2

by: Prof. F. Schott

*Institut für Meereskunde
an der Universität Kiel*

from Mindelo, Cape Verde Islands
to Recife, Brasil

May 6 to June 2, 2002
chief scientist: Prof. F. Schott

Short cruise report of cruise METEOR M53/2

Meteor departed from the port of Mindelo, Cape Verdes Islands, Monday, 6 May 2002, in the morning, to begin the transit to the first measurement section along 35° W (Figure 1). In the afternoon of 7 May a CTD-test station was carried out (Table 1), which turned out that a leakage in the LADCP (the Doppler current profiler lowered with the CTD rosette) existed. Fortunately this problem could be solved with the competent help of the ship's engine staff. On 9 May the observational CTD/LADCP program began, working southwards from 8°N along 35° W, first with station separations of 30 nm, and reducing that to 20 nm in the equatorial zone with its known small meridional current scale. During station work CTD/LADCP profiles were gained and afterwards from the CTD rosette water samples were taken on most stations (see Table 1) for nutrients and CFC (Freon) measurements as well as oxygen and salinity samples the latter two used only for CTD-calibration purpose.

During these first days of the work our particular interest focused on the new 38 kHz „Ocean Surveyor“ (OS) shipboard ADCP, from which we saw indications of good acoustical velocity data retrieval down to 1200m depth and more. During 11-12 May a sequence of tests were carried out for determining whether there were mutual influences among the 38 kHz OS, the pre-existing 75 kHz OS and the other sounders and pingers of the ship, including the LADCP during station work.

Since the large depth range of the 38 kHz OS could only be accomplished by using 32m vertical bin length we wanted to combine both OS systems: the 38 kHz OS for the deeper currents, the 75 kHz OS at 8m bin width for the near-surface down to 200- 300m where good vertical resolution is required.

From these tests the important good news was that both OS systems do not affect each other, but the bad news was that the 75 kHz OS was strongly affected by the ship's Doppler Log (DL). Therefore the DL was in used the following only for operating the ship on station, but was turned off in between stations when the OS data were collected for processing. Since this interference was not observed during an earlier Meteor cruise when the OS was built into the ship's well, it must have to do with the proximity it has now to the Doppler log transducer after being mounted in the built-in RDI seachest during the last stay in the shipyard.

The 35° W section, consisting of 37 full-depth CTD/LADCP stations (profiles 2-38), was terminated near 5° S at the northeastern tip off Brazil early on 16 May, and immediately the slanted eastward leg near 5° S was begun, with closely spaced stations across the North Brazil Undercurrent (NBU), then increasing station spacings away from the boundary. Meanwhile Brazilian approval was obtained that we were allowed to carry out measurements along a meridional line along 28° W across the equator (which partially falls into Brazilian EEZ due to the presence of the St. Peter and Paul rocks). This additional section was made possible due to the fact that the originally planned mooring exchange during M53/2 could be organized earlier, already in February 2002, with the US/NOAA vessel „Ron Brown“, freeing up about 5 ship days for additional section work.

Hence the plan was to carry the 5° S section to 28° 10' W, then run the northward section to 2.5° N without stations and do the stations on the way back south. The 28° 10' W section would be continued southward to 11° 40' S, collecting the two University of Bremen sediment traps along the way. The eastward leg along 5° S was completed in the morning of 19 May at 28° 50' W and the northward leg was begun toward 2.5° N, 28° 10' W. This made for a

welcome interruption of station work, to be used for a table tennis tournament and decksparty during the Whitsun holiday.

Already during the 35° W section it had turned out, that the CTD-oxygen sensor showed severe problems, which made a good oxygen calibration impossible for the CTD profiles 1 to 56. Meanwhile, during the transit to 2.5° N, the oxygen sensor had decided to recover and not act up anymore and suddenly, with no doing of any of us, good oxygen profiles were obtained.

After the cruise it turned out that small salinity changes appeared at depth of larger conductivity gradients probably due to CTD-pump malfunction, which require a further calibration of the CTD profiles.

The station work along 28° 10' W began in the morning of 21 May and when arriving at the equator, more intercomparison tests between the two OS systems and the LADCP were carried out in the strongly sheared Equatorial Undercurrent and the Equatorial Intermediate Current below, to further explore the discrepancy between the depth of the first bin as calculated by RDI and as calculated by us (and found in agreement with the LADCP).

In the morning of 26 May, Meteor arrived, right on schedule, at the position of the first of the two University of Bremen sediment trap moorings at 7° S, 28° W. Although no replies were heard from the releases the mooring came up in time (with the top of the mooring near 4500m depth this required about 70 minutes) and was recovered without problems. Then the 28° W leg was continued southward with station work until the position of the second mooring at 11° 40' S was reached early on 28 May. Again that mooring was released and recovered without incident. Subsequently the cruise turned westward, toward the 11° S moored array, with decreasing station spacing as the boundary current was approached. The stations past the mooring array exchanged already in February were carried out during the night of 31 May to 1 June and station work was terminated in the afternoon of 1 June to begin the short transit (15 hours only) to the port of Recife, where we arrived in the morning of 2 June 2002. All the objectives of the cruise were met.

Prof. F. Schott
Institut für Meereskunde
Düsternbrooker Weg 20
24105 Kiel
Germany

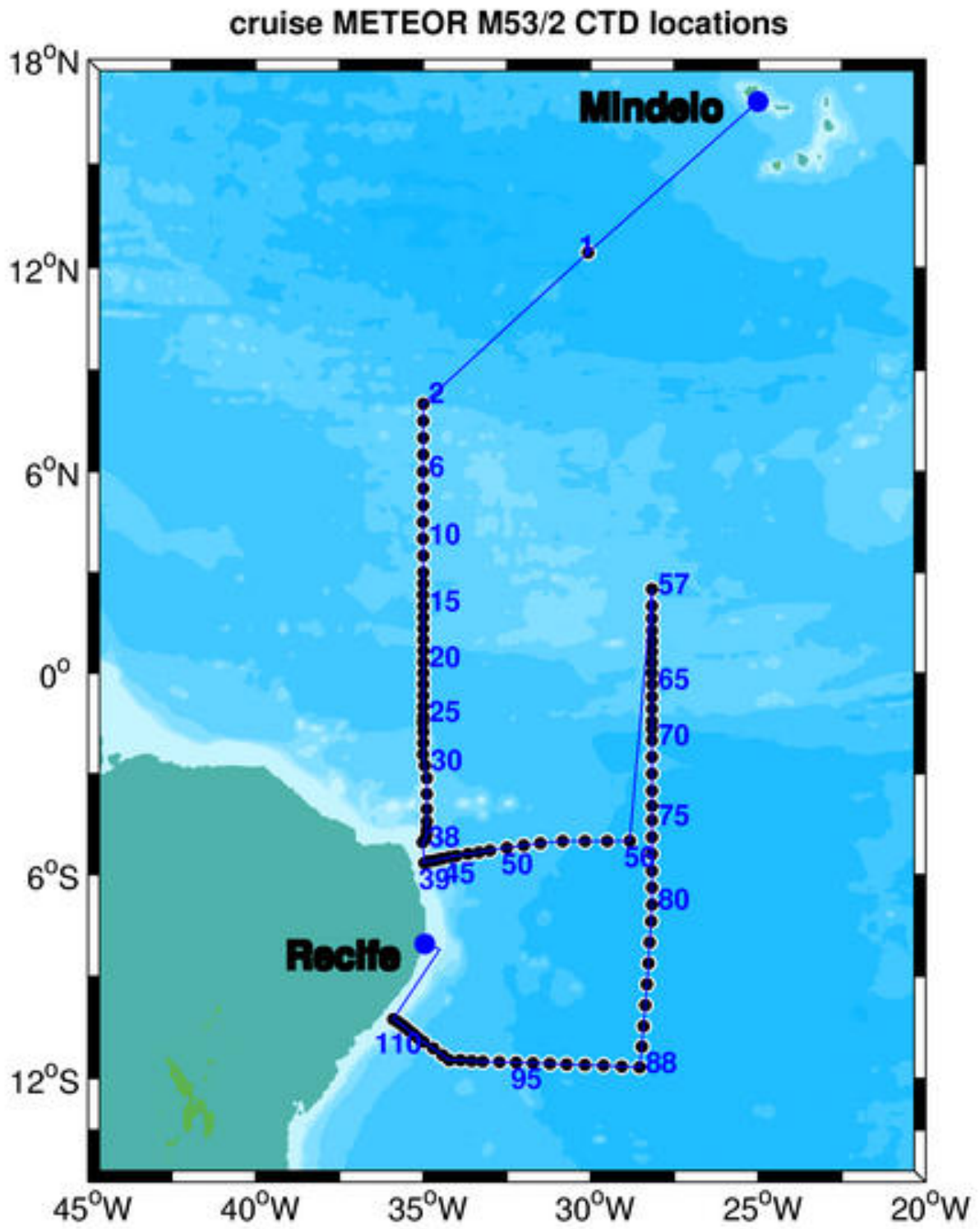


Fig. 1: CTD-station distribution of Meteor cruise M53/2, May 6 to June 2, 2002.

Table 1*CTD/LADCP/O2/nutrient/Tracer stations, Meteor cruise M53/2 in May/June 2002*

Profile No.	Date (mo/day)	UTC Time (hhmm)	CODE*	Latitude	Longitude	Nav Type	ADCP -** Type	Sounding Depth (m)	Max. Press (dbar)	No. of bottles	Bottle parameters			
											Nutr./CFC/O ₂ /S			
1	05/07	19:00	BE	12 26.53 N	30 04.40 W	GPS	NB	5791	3875	21	X	-	X	X
1	05/07	20:14	BO	12 26.65 N	30 04.31 W	GPS	NB	5793						
1	05/07	21:27	EN	12 26.70 N	30 04.26 W	GPS	NB	5792						
2	05/09	06:26	BE	07 59.97 N	35 00.07 W	GPS	NB	4111		21	X	X	X	X
2	05/09	07:45	BO	08 00.02 N	35 00.11 W	GPS	NB	4116						
2	05/09	09:16	EN	07 59.99 N	35 00.05 W	GPS	NB	4085						
3	05/09	12:10	BE	07 30.14 N	34 59.96 W	GPS	NB	3800	3799	21	X	X	X	X
3	05/09	13:24	BO	07 30.08 N	35 00.03 W	GPS	NB	3745						
3	05/09	14:25	EN	07 30.00 N	35 00.07 W	GPS	NB	3759						
4	05/09	17:15	BE	07 00.02 N	35 00.11 W	GPS	NB	2915	3050	21	X	X	X	X
4	05/09	18:14	BO	07 00.03 N	35 00.11 W	GPS	NB	3025						
4	05/09	19:06	EN	07 00.06 N	35 00.15 W	GPS	NB	3025						
5	05/09	21:57	BE	06 30.01 N	35 00.04 W	GPS	NB	3912	3820	21	X	X		X
5	05/09	23:15	BO	06 30.02 N	35 00.01 W	GPS	NB	3803						
5	05/10	00:14	EN	06 29.97 N	35 00.03 W	GPS	NB	3808						
6	05/10	03:16	BE	05 59.06 N	35 00.13 W	GPS	NB	4213	4283	21	X	X	X	X
6	05/10	04:38	BO	05 59.99 N	35 00.06 W	GPS	NB	4219						
6	05/10	05:45	EN	06 00.00 N	35 00.07 W	GPS	NB	4219						
7	05/10	08:34	BE	05 30.00 N	35 00.08 W	GPS	NB		3908	21	X	X	X	X
7	05/10	09:48	BO	05 30.16 N	34 59.93 W	GPS	NB	3910						
7	05/10	10:52	EN	05 30.17 N	35 00.03 W	GPS	NB	3851						
8	05/10	13:49	BE	05 00.09 N	35 00.07 W	GPS	NB	3730	3750	21	X	X	X	X
8	05/10	15:01	BO	05 00.00 N	35 00.06 W	GPS	NB	3725						
8	05/10	15:59	EN	05 00.07N	35 00.10 W	GPS	NB	3732						
9	05/10	19:00	BE	04 30.05 N	35 00.10 W	GPS	NB	3884	3928	07	X	X	X	X
9	05/10	20:14	BO	04 30.07 N	35 00.04 W	GPS	NB	3881						
9	05/10	21:25	EN	04 30.05 N	35 00.02 W	GPS	NB	3884						
10	05/11	00:27	BE	03 59.99 N	30 00.15 W	GPS	NB	3497	3521	21	X	X	X	X
10	05/11	01:36	BO	04 00.01 N	35 00.09 W	GPS	NB	3495						
10	05/11	02:29	EN	04 00.10 N	35 00.06 W	GPS	NB	3491						
11	05/11	05:23	BE	03 29.90 N	34 59.98 W	GPS	NB	3956	3945	21	X	X	X	X
11	05/11	06:38	BO	03 30.06 N	34 59.99 W	GPS	NB	3965						
11	05/11	07:54	EN	03 30.00 N	34 59.95 W	GPS	NB	3957						
12	05/11	10:51	BE	03 00.12 N	35 00.01 W	GPS	NB	3831	3860	21	X	X	X	X
12	05/11	12:03	BO	03 00.08 N	34 59.99 W	GPS	NB	3813						
12	05/11	13 :08	EN	03 00.08 N	34 59.98 W	GPS	NB	3830						
13	05/11	15:13	BE	02 39.89 N	34 59.91 W	GPS	NB	4009	4065	7	X	-	X	X
13	05/11	16:31	BO	02 40.06 N	34 59.72 W	GPS	NB	4009						
13	05/11	17:38	EN	02 40.15 N	34 59.99 W	GPS	NB							
14	05/11	20:02	BE	02 19.99 N	35 00.16 W	GPS	NB	4140	4170	21	X	X	X	X
14	05/11	21:18	BO	02 20.12 N	34 59.97 W	GPS	NB	4136						
14	05/11	22:32	EN	02 20.26 N	35 59.69 W	GPS	NB	4131						

* BE = Begin, BO = Bottom, EN = End;

** NB = Narrow Band, WH = Work House

Profile No.	Date (mo/day)	UTC Time (hhmm)	CODE*	Latitude	Longitude	Nav Type	ADCP ** Type	Sounding Depth (m)	Max. Press (dbar)	No. of bottles	Bottle parameters			
											Nutr./CFC/O ₂ /S			
15	05/12	00:36	BE	01 59.96 N	35 00.03 W	GPS	NB	4163	4000	21	-	-	X	X
15	05/12	01:57	BO	01 59.95 N	34 59.99 W	GPS	NB	4175						
15	05/12	03:00	EN	02 00.02 N	34 59.98 W	GPS	NB	4152						
16	05/12	04:53	BE	01 40.03 N	34 59.64 W	GPS	NB	4043	4032	21	X	X	X	X
16	05/12	06:12	BO	01 40.02 N	35 00.00 W	GPS	NB	4042						
16	05/12	07:31	EN	01 40.20 N	35 00.02 W	GPS	NB	4036						
17	05/12	09:31	BE	01 19.99 N	34 59.92 W	GPS	NB	4059	4090	21	-	-	X	X
17	05/12	11:51	BO	01 20.13 N	34 59.86 W	GPS	NB	4059						
17	05/12	11:53	EN	01 20.22 N	34 59.63 W	GPS	NB	4060						
18	05/12	13:59	BE	01 00.08 N	35 00.01 W	GPS	NB	(4060)	3642	21	X	X	X	X
18	05/12	15:08	BO	00 59.95 N	34 59.87 W	GPS	NB	3594						
18	05/12	16:06	EN	00 59.91 N	34 59.91 W	GPS	NB	3595						
19	05/12	18:01	BE	00 40.01 N	34 59.93 W	GPS	NB	4532	4601	12	-	-	X	X
19	05/12	19:26	BO	00 40.04 N	34 59.85 W	GPS	NB	4532						
19	05/12	20:40	EN	00 40.03 N	34 59.79 W	GPS	NB	4533						
20	05/12	22:40	BE	00 20.00 N	35 00.00 W	GPS	NB	4520	21	X	X	X	X	X
20	05/13	00:10	BO	00 19.96 N	34 59.95 W	GPS	NB	4546						
20	05/13	01:20	EN	00 19.95 N	34 59.91 W	GPS	NB	4546						
21	05/13	03:18	BE	00 00.00 N	34 59.90 W	GPS	NB	4526	4580	21	X	X	X	X
21	05/13	04:43	BO	00 00.03 S	34 59.87 W	GPS	NB	4526						
21	05/13	05:53	EN	00 00.04 S	34 59.84 W	GPS	NB	4527						
22	05/13	07:49	BE	00 20.09 S	35 00.02 W	GPS	NB	4518	4581	21	X	X	X	X
22	05/13	09:11	BO	00 20.14 S	34 59.88 W	GPS	NB	4517						
22	05/13	10:31	EN	00 20.46 S	34 59.70 W	GPS	NB	4517						
23	05/13	12:24	BE	00 40.14 S	34 59.98 W	GPS	NB	4472	4500	21	-	X	X	X
23	05/13	13:53	BO	00 39.86 S	35 00.11 W	GPS	NB	4449						
23	05/13	15:04	EN	00 39.98 S	35 00.13 W	GPS	NB	4448						
24	05/13	17:04	BE	00 59.98 S	35 00.02 W	GPS	NB	4328	4462	21	X	X	X	X
24	05/13	18:26	BO	00 59.96 S	35 00.01 W	GPS	NB	4325						
24	05/13	19:35	EN	01 00.00 S	34 59.87 W	GPS	NB	4301						
25	05/13	21:20	BE	01 18.05 S	35 00.01 W	GPS	NB	4348	4410	21	-	X	X	X
25	05/13	22:43	BO	01 17.96 S	34 59.93 W	GPS	NB	4347						
25	05/13	23:48	EN	01 18.02 S	34 59.98 W	GPS	NB	4346						
26	05/14	01:05	BE	01 28.18 S	35 00.17 W	GPS	NB	4290	4360	21	X	X	X	X
26	05/14	02:29	BO	01 27.97 S	34 59.98 W	GPS	NB	4296						
26	05/14	03:36	EN	01 28.19 S	34 59.89 W	GPS	NB	4283						
27	05/14	05:18	BE	01 45.02 S	34 59.98 W	GPS	NB	4101	4145	21	X	X	X	X
27	05/14	06:34	BO	01 45.01 S	35 00.10 W	GPS	NB	4101						
27	05/14	07:44	EN	01 44.98 S	35 00.05 W	GPS	NB	4102						
28	05/14	09:50	BE	02 05.02 S	35 00.09 W	GPS	NB	4043	4075	21	X	X	X	X
28	05/14	11:06	BO	02 04.96 S	35 00.10 W	GPS	NB	4043						
28	05/14	12:07	EN	02 04.10 S	35 00.03 W	GPS	NB	4042						
29	05/14	14:15	BE	02 25.00 S	35 00.19 W	GPS	NB	3011	3054	21	X	X	X	X
29	05/14	15:30	BO	02 24.97 S	35 00.07 W	GPS	NB	3012						
29	05/14	16:32	EN	02 24.98 S	35 00.18 W	GPS	NB	3914						
30	05/14	18:49	BE	02 44.98 S	34 57.08 W	GPS	NB	3862	3896	21	X	X	X	X
30	05/14	20:02	BO	02 44.87 S	34 57.16 W	GPS	NB	3865						
30	05/14	21:07	EN	02 44.87 S	34 57.27 W	GPS	NB	3860						

* BE = Begin, BO = Bottom, EN = End;
** NB = Narrow Band, WH = Work House

Profile No.	Date (mo/day)	UTC Time (hhmm)	CODE*	Latitude	Longitude	Nav Type	ADCP ** Type	Sounding Depth (m)	Max. Press (dbar)	No. of bottles	Bottle parameters			
											Nutr./CFC/O ₂ /S			
31	05/14	23:40	BE	03 07.82 S	34 53.41 W	GPS	NB	3821	3852	21	-	X	X	X
31	05/15	01:00	BO	03 07.84 S	34 53.42 W	GPS	NB	3819						
31	05/15	02:00	EN	03 07.88 S	34 53.17 W	GPS	NB	3821						
32	05/15	04:57	BE	03 35.97 S	34 53.12 W	GPS	NB	2766	3128	21	X	X	X	X
32	05/15	05:29	BO	03 35.74 S	34 53.26 W	GPS	NB							
32	05/15	06:50	EN	03.35.67 S	34 53.41 W	GPS	NB	3091						
33	05/15	09:50	BE	04 02.93 S	34 53.09 W	GPS	NB	3551	3570	21	-	X	X	X
33	05/15	11:01	BO	04 02.76 S	34 53.34 W	GPS	NB	3544						
33	05/15	11:58	EN	04 02.67 S	34 53.41 W	GPS	NB	3544						
34	05/15	14:34	BE	04 24.26 S	34 53.06 W	GPS	NB	3275	3410	21	X	X	X	X
34	05/15	15:42	BO	04 24.72 S	34 53.50 W	GPS	NB	3444						
34	05/15	16:38	EN	04 24.19 S	34 53.78 W	GPS	NB	3484						
35	05/15	18:37	BE	04 40.30 S	34 52.59 W	GPS	NB	2500	2434	17	X	X	X	X
35	05/15	19:29	BO	04 39.38 S	34 53.10 W	GPS	NB	2560						
35	05/15	20:16	EN	04 38.57 S	34 53.45 W	GPS	NB	2670						
36	05/15	21:29	BE	04 48.00 S	34 53.00 W	GPS		1011	975	8	-	-	X	-
36	05/15	21:54	BO	04 47.26 S	34 53.51 W	GPS		1043						
36	05/15	22:16	EN	04 46.67 S	34 53.84 W	GPS		1082						
37	05/15	23:25	BE	04 55.50 S	34 55.50 W	GPS		811	785	7	-	X	X	-
37	05/15	23:46	BO	04 55.03 S	34 55.79 W	GPS		809						
37	05/15	23:59	EN	04 54.64 S	34 56.02 W	GPS		806						
38	05/16	01:01	BE	05 02.25 S	35 00.55 W	GPS	NB	479	419	0	-	-	-	-
38	05/16	01:17	BO	05 01.56 S	35 00.83 W	GPS	NB	491						
38	05/16	01:29	EN	05 01.06 S	35 01.06 W	GPS	NB	495						
39	05/16	05:40	BE	05 39.02 S	34 57.41 W	GPS	NB	455	400	0	-	-	-	-
39	05/16	05:55	BO			GPS	NB							
39	05/16	06:07	EN	05 38.40 S	34 57.42 W	GPS	NB	419						
40	05/16	06:36	BE	05 38.43 S	34 54.48 W	GPS	NB	1288	1192	21	-	X	X	X
40	05/16	07:09	BO	05 37.84 S	34 54.50 W	GPS	NB	1277						
40	05/16	07:33	EN	05 37.43 S	34 54.70 W	GPS	NB	1664						
41	05/16	08:05	BE	05 37.22 S	34 51.02 W	GPS	NB	2522	2420	14	X	X	X	-
41	05/16	08:57	BO	05 36.30 S	34 51.12 W	GPS	NB	2372						
41	05/16	09:39	EN	05 35.65 S	34 51.16 W	GPS	NB	2290						
42	05/16	10:53	BE	05 35.67 S	34 42.78 W	GPS	NB	3072	3033	21	-	X	X	X
42	05/16	11:55	BO	05 34.87 S	34 42.82 W	GPS	NB	2956						
42	05/16	12:43	EN	05 34.29 S	34 42.89 W	GPS	NB	2936						
43	05/16	13:50	BE	05 33.80 S	34 34.42 W	GPS	NB	3495	3523	21	X	X	X	X
43	05/16	15:00	BO	05 33.39 S	34 34.41 W	GPS	NB	3509						
43	05/16	15:56	EN	05 33.02 S	34 34.42 W	GPS	NB	3514						
44	05/16	16:58	BE	05 31.85 S	34 25.95 W	GPS	NB	3750	3782	21	X	X	X	X
44	05/16	18:10	BO	05 31.51 S	34 25.99 W	GPS	NB	3765						
44	05/16	19:13	EN	05 31.28 S	34 25.95 W	GPS	NB	3757						
45	05/16	20:42	BE	05 29.06 S	34 13.01 W	GPS	NB	4059	4105	21	-	-	X	X
45	05/16	21:59	BO	05 28.79 S	34 13.03 W	GPS	NB	4057						
45	05/16	23:02	EN	05 28.58 S	34 13.09 W	GPS	NB	4063						
46	05/17	00:33	BE	05 26.38 S	33 59.96 W	GPS	NB	4207	4248	21	X	X	X	X
46	05/17	01:54	BO	05 26.05 S	34 00.02 W	GPS	NB	4205						
46	05/17	03:00	EN	05 26.03 S	34 00.01 W	GPS	NB	4205						

* BE = Begin, BO = Bottom, EN = End;
** NB = Narrow Band, WH = Work House

Profile No.	Date (mo/day)	UTC Time (hhmm)	CODE*	Latitude	Longitude	Nav Type	ADCP ** Type	Sounding Depth (m)	Max. Press (dbar)	No. of bottles	Bottle parameters			
											Nutr./CFC/O ₂ /S			
47	05/17	05:08	BE	05 23.16 S	33 39.82 W	GPS	NB	4396	4450	21	-	X	X	X
47	05/17	06:29	BO	05 23.13 S	33 39.81 W	GPS	NB	4397						
47	05/17	07:45	EN	05 23.08 S	33 39.74 W	GPS	NB	4399						
48	05/17	09:49	BE	05 20.07 S	33 20.02 W	GPS	NB	4486	4542	21	X	X	X	X
48	05/17	11:14	BO	05 20.01 S	33 20.06 W	GPS	NB	4487						
48	05/17	12:24	EN	05 19.98 S	33 20.01 W	GPS	NB	4486						
49	05/17	14:31	BE	05 16.96 S	33 00.10 W	GPS	NB	4546	4616	21	-	X	X	X
49	05/17	15:57	BO	05 16.98 S	33 00.01 W	GPS	NB	4546						
49	05/17	17:06	EN	05 17.06 S	32 59.94 W	GPS	NB	4546						
50	05/17	20:21	BE	05 12.03 S	32 30.05 W	GPS	NB	4584	4651	21	X	X	X	X
50	05/17	21:43	BO	05 12.00 S	32 30.00 W	GPS	NB	4583						
50	05/17	22:54	EN	05 11.98 S	32 30.06 W	GPS	NB	4587						
51	05/18	02:01	BE	05 08.00 S	32 00.05 W	GPS	NB	4598	4665	21	X	X	X	X
51	05/18	03:29	BO	05 08.00 S	34 00.04 W	GPS	NB	4597						
51	05/18	04:39	EN	05 07.99 S	32 00.02 W	GPS	NB	4598						
52	05/18	07:43	BE	05 03.10 S	31 30.03 W	GPS	NB	4670	4741	21	X	X	X	X
52	05/18	09:11	BO	05 03.96 S	31 30.05 W	GPS	NB	4671						
52	05/18	10:25	EN	05 04.00 S	31 30.03 W	GPS	NB	4670						
53	05/18	14:19	BE	05 00.05 S	30 49.97 W	GPS	NB	4872	4957	21	X	X	X	X
53	05/18	15:56	BO	05 00.04 S	30 50.04 W	GPS	NB	4872						
53	05/18	17:10	EN	05 00.08 S	30 50.00 W	GPS	NB	4872						
54	05/18	21:13	BE	04 59.98 S	30 10.05 W	GPS	NB	4949	5037	21	X	X	X	X
54	05/18	22:48	BO	05 00.00 S	30 10.03 W	GPS	NB	4950						
54	05/19	00:03	EN	04 59.99 S	30 10.00 W	GPS	NB	4950						
55	05/19	04:10	BE	05 00.02 S	29 30.08 W	GPS	NB	5040	?	21	X	X	X	X
55	05/19	05:42	BO	04 59.97 S	29 30.04 W	GPS	NB	5159						
55	05/19	06:56	EN	04 50.96 S	29 30.00 W	GPS	NB	5171						
56	05/19	11:05	BE	04 59.97 S	28 50.08 W	GPS	NB		5000	21	X	X	X	X
56	05/19	12:37	BO	04 59.96 S	28 50.00 W	GPS	NB	5315						
56	05/19	13:51	EN	05 00.01 S	28 50.05 W	GPS	NB	5386						
57	05/21	07:13	BE	02 30.05 N	28 10.05 W	GPS	NB	3698	3685	21	X	X	X	X
57	05/21	08:24	BO	02 29.99 N	28 09.98 W	GPS	NB	3695						
57	05/21	09:26	EN	02 30.04 N	28 09.84 W	GPS	NB	3688						
58	05/21	12:35	BE	02 00.11 N	28 10.04 W	GPS	NB	3426	3458	21	X	X	X	X
58	05/21	13:42	BO	02 00.01 N	28 10.02 W	GPS	NB	3472						
58	05/21	14:35	EN	02 00.00 N	28 10.01 W	GPS	NB	3425						
59	05/21	16:53	BE	01 38.16 N	28 09.99 W	GPS	NB	3351	3368	21	X	X	X	X
59	05/21	17:59	BO	01 38.05 N	28 10.01 W	GPS	NB	3349						
59	05/21	18:56	EN	01 38.00 N	28 10.02 W	GPS	NB	3350						
60	05/21	21:20	BE	01 16.03 N	29 10.02 W	GPS	NB	2502	2300	21	X	X	X	X
60	05/21	22:09	BO	01 16.01 N	28 10.01 W	GPS	NB	2510						
60	05/21	22:47	EN	01 16.02 N	28 10.03 W	GPS	NB	2439						
61	05/22	00:53	BE	00 57.14 N	28 10.05 W	GPS	NB	3283	2801	21	X	X	X	X
61	05/22	01:51	BO	00 57.13 N	28 09.99 W	GPS	NB	3499						
61	05/22	02:44	EN	00 57.08 N	28 09.92 W	GPS	NB	3149						
62	05/22	04:45	BE	00 37.97 N	28 10.03 W	GPS	NB	3237	3310	21	X	X	X	X
62	05/22	05:48	BO	00 37.93 N	28 09.90 W	GPS	NB	4038						
62	05/22	06:39	EN	00 37.89 N	28 09.58 W	GPS	NB	3264						

* BE = Begin, BO = Bottom, EN = End;
** NB = Narrow Band, WH = Work House

Profile No.	Date (mo/day)	UTC Time (hhmm)	CODE*	Latitude	Longitude	Nav Type	ADCP ** Type	Sounding Depth (m)	Max. Press (dbar)	No. of bottles	Bottle parameters			
											Nutr./CFC/O ₂ /S			
63	05/22	08:38	BE	00 19.00 N	08 09.41 W	GPS	NB	2970	3250	21	X	X	X	X
63	05/22	09:38	BO	00 19.01 N	28 09.69 W	GPS	NB	3089						
63	05/22	10:30	EN	00 19.00 N	28 09.55 W	GPS	NB	3087						
64	05/22	14:35	BE	00 00.03 S	28 10.03 W	GPS	NB	4123	4172	21	X	X	X	X
64	05/22	15:55	BO	00 00.03 S	28 10.09 W	GPS	NB	4125						
64	05/22	16:58	EN	00 00.46 S	28 10.04 W	GPS	NB	4127						
65	05/22	19:10	BE	00 19.92 S	28 09.92 W	GPS	NB	3824	3844	21	X	X	X	X
65	05/22	20:20	BO	00 20.06 S	28 09.80 W	GPS	NB	3820						
65	05/22	21:21	EN	00 20.05 S	28 09.51 W	GPS	NB	3812						
66	05/22	23:34	BE	00 41.98 S	28 10.29 W	GPS	NB	4099	4044	21	-	X	X	X
66	05/23	00:49	BO	00 42.01 S	28 10.02 W	GPS	NB	4096						
66	05/23	01:50	EN	00 41.98 S	28 09.96 W	GPS	NB	4097						
67	05/23	04:02	BE	01 04.04 S	28 10.03 W	GPS	NB	4116	4073	21	X	X	X	X
67	05/23	05:17	BO	01 04.05 S	28 10.00 W	GPS	NB	4105						
67	05/23	06:21	EN	01 04.00 S	28 09.95 W	GPS	NB	4098						
68	05/23	08:28	BE	01 26.01 S	28 10.05 W	GPS	NB	5031	5000	21	X	X	X	X
68	05/23	09:59	BO	01 26.00 S	28 10.00 W	GPS	NB	5031						
68	05/23	11:13	EN	01 26.00 S	28 10.03 W	GPS	NB	5031						
69	05/23	13:59	BE	01 40.02 S	28 10.11 W	GPS	NB	5063	5010	21	X	X	X	X
69	05/23	15:30	BO	01 40.00 S	28 10.01 W	GPS	NB	5039						
69	05/23	16:46	EN	01 39.80 S	28 10.06 W	GPS	NB	5063						
70	05/23	18:44	BE	02 00.13 S	28 10.20 W	GPS	NB	4904	4918	21	X	X	X	X
70	05/23	20:13	BO	02 00.03 S	28 10.00 W	GPS	NB	4904						
70	05/23	21:28	EN	02 00.03 S	28 10.01 W	GPS	NB	4856						
71	05/24	00:13	BE	02 30.02 S	28 10.13 W	GPS	NB	4890	5047	21	X	X	X	X
71	05/24	01:46	BO	02 30.02 S	28 10.01 W	GPS	NB	4977						
71	05/24	03:00	EN	02 30.00 S	28 10.02 W	GPS	NB	4977						
72	05/24	05:52	BE	03 00.11 S	28 10.00 W	GPS	NB	5040	5000	21	X	X	X	X
72	05/24	07:20	BO	03 00.15 S	28 10.05 W	GPS	NB	5040						
72	05/24	08:36	EN	03 00.10 S	28 10.07 W	GPS	NB	5039						
73	05/24	11:22	BE	03 29.97 S	028 10.12 W	GPS	NB	5040	5002	21	X	X	X	X
73	05/24	12:53	BO	03 30.00S	028 10.06 W	GPS	NB	5040						
73	05/24	14:07	EN	03 29.98 S	028 10.04 W	GPS	NB	5040						
74	05/24	18:00	BE	03 56.94 S	028 10.09 W	GPS	NB	5184	5000	21	X	X	X	X
74	05/24	19:26	BO	03 56.98 S	028 10.03 W	GPS	NB	5185						
74	05/24	20:43	EN	03 57.00 S	028 10.01 W	GPS	NB	5187						
75	05/24	23:15	BE	04 23.02 S	028 10.09 W	GPS	NB	5115	5000	21	X	X	X	X
75	05/25	00:49	BO	04 22.97 S	028 10.05 W	GPS	NB	5272						
75	05/25	02:04	EN	04 22.97 S	028 10.05 W	GPS	NB	5273						
76	05/25	04:59	BE	04 52.99 S	028 10.08 W	GPS	NB	5190	5000	21	X	X	X	X
76	05/25	06:30	BO	04 52.96 S	028 10.03 W	GPS	NB	5364						
76	05/25	07:50	EN	04 52.95 S	028 09.99 W	GPS	NB	5364						
77	05/25	10:51	BE	05 23.03 S	028 10.05 W	GPS	NB	5495	4999	21	X	X	X	X
77	05/25	12:25	BO	05 22.99 S	028 10.01 W	GPS	NB	5494						
77	05/25	13:38	EN	05 23.01 S	028 10.00 W	GPS	NB	5494						
78	05/25	16:31	BE	05 53.01 S	028 10.01 W	GPS	NB	5572	5000	21	X	X	X	X
78	05/25	18:04	BO	05 53.04 S	028 10.03 W	GPS	NB	5572						
78	05/25		EN	05 53.10 S	028 10.01 W	GPS	NB	5572						

* BE = Begin, BO = Bottom, EN = End;
** NB = Narrow Band, WH = Work House

Profile No.	Date (mo/day)	UTC Time (hhmm)	CODE*	Latitude	Longitude	Nav Type	ADCP -** Type	Sounding Depth (m)	Max. Press (dbar)	No. of bottles	Bottle parameters			
											Nutr./CFC/O ₂ /S			
79	05/25	22:15	BE	06 23.01 S	028 10.05 W	GPS	NB	5588	5000	21	X	X	X	X
79	05/25	23:53	BO	06 23.02 S	028 10.04 W	GPS	NB	5586						
79	05/26	01:10	EN	06 23.03 S	028 10.01 W	GPS	NB	5587						
80	05/26	03:59	BE	06 53.03 S	028 10.01 W	GPS	NB	5940	5002	21	X	X	X	X
80	05/26	05:30	BO	06 52.99 S	028 10.01 W	GPS	NB	5584						
80	05/26	06:44	EN	06 53.96 S	028 09.98 W	GPS	NB	5584						
81	05/26	12:11	BE	07 22.91 S	028 11.67 W	GPS	NB	5563	4999	21	X	X	X	X
81	05/26	13:43	BO	07 22.87 S	028 11.69 W	GPS	NB	5563						
81	05/26	14:59	EN	07 22.98 S	28 11.62 W	GPS	NB	5564						
82	05/26	18:21	BE	08 00.04 S	028 14.01 W	GPS	NB	5552	5001	21	X	X	X	X
82	05/26	19:55	BO	07 59.28 S	028 14.97 W	GPS	NB	5556						
82	05/26	21:10	EN	07 59.89 S	028 13.88 W	GPS	NB	5554						
83	05/27	00:42	BE	08 37.01 S	028 16.00 W	GPS	NB		5000	21	X	X	X	X
83	05/27	02:13	BO	08 37.02 S	28 16.02 W	GPS	NB	5385						
83	05/27	03:28	EN	08 37.19 S	28 15.99 W	GPS	NB	5382						
84	05/27	06:55	BE	09 14.03 S	028 18.99 W	GPS	NB	5546	5000	21	X	X	X	X
84	05/27	08:27	BO	09 14.02 S	028 18.95 W	GPS	NB	5547						
84	05/27	09:45	EN	09 14.06 S	028 18.93 W	GPS	NB	5546						
85	05/27	13:13	BE	09 51.09 S	028 21.98 W	GPS	NB	5419	5085	20	X	X	X	X
85	05/27	14:44	BO	09 51.14 S	028 21.89 W	GPS	NB	5432						
85	05/27	16:00	EN	09 51.11 S	028 21.88 W	GPS	NB	5431						
86	05/27	19:25	BE	10 28.07 S	028 25.01 W	GPS	NB	4970	4821	21	X	X	X	X
86	05/27	20:52	BO	10 28.17 S	028 24.96 W	GPS	NB	4941						
86	05/27	22:06	EN	10 28.14 S	028 24.78 W	GPS	NB	5106						
87	05/28	01:22	BE	11 04.01 S	028 28.14 W	GPS	NB	5465	5000	21	X	X	X	X
87	05/28	02:52	BO	11 04.01 S	028 27.99 W	GPS	NB	5466						
87	05/28	04:08	EN	11 04.00 S	028 28.01 W	GPS	NB	5466						
88	05/28	11:00	BE	11 40.39 S	028 32.11 W	GPS	NB	5420	5000	21	X	X	X	X
88	05/28	12:32	BO	11 40.46 S	028 32.08 W	GPS	NB	5423						
88	05/28	13:53	EN	11 40.49 S	028 32.05 W	GPS	NB	5423						
89	05/28	16:37	BE	11 38.94 S	029 04.09 W	GPS	NB	5456	5000	21	X	X	X	X
89	05/28	18:08	BO	11 38.96 S	029 04.06 W	GPS	NB	5457						
89	05/28	19:22	EN	11 38.94 S	029 03.94 W	GPS	NB	5457						
90	05/28	22:23	BE	11 36.96 S	029 37.09 W	GPS	NB	5415	5000	21	X	X	X	X
90	05/28	23:56	BO	11 36.98 S	029 37.03 W	GPS	NB	5424						
90	05/29	01:09	EN	11 36.92 S	029 37.05 W	GPS	NB	5424						
91	05/29	03:57	BE	11 36.06 S	030 10.17 W	GPS	NB	5386	5000	21	X	X	X	X
91	05/29	05:30	BO	11 36.00 S	030 10.04 W	GPS	NB	5387						
91	05/29	06:47	EN	11 35.97 S	030 10.05 W	GPS	NB	5388						
92	05/29	09:40	BE	11:35.03 S	030 42.99 W	GPS	NB	5276	5001	21	X	X	X	X
92	05/29	11:11	BO	11 35.00 S	030 43.06 W	GPS	NB	5276						
92	05/29	12:24	EN	11 34.98 S	030 43.02 W	GPS	NB	5276						
93	05/29	15:05	BE	11 34.05 S	031 13.06 W	GPS	NB	5272	5000	21	X	X	X	X
93	05/29	16:40	BO	11 34.09 S	031 12.98 W	GPS	NB	5272						
93	05/29	17:55	EN	11 34.00 S	031 12.97 W	GPS	NB	5273						
95	05/29	20:38	BE	11 33.04 S	031 43.02 W	GPS	NB	5123	5001	21	X	X	X	X
95	05/29	22:11	BO	11 33.03 S	031 42.97 W	GPS	NB	5148						
95	05/29	23:28	EN	11 32.98 S	031 42.97 W	GPS	NB	5154						

* BE = Begin, BO = Bottom, EN = End;
** NB = Narrow Band, WH = Work House

Profile No.	Date (mo/day)	UTC Time (hhmm)	CODE*	Latitude	Longitude	Nav Type	ADCP -** Type	Sounding Depth (m)	Max. Press (dbar)	No. of bottles	Bottle parameters			
											Nutr./CFC/O ₂ /S			
96	05/30	02:09	BE	11 32.04 S	32 13.09 W	GPS	NB	5790	5000	21	X	X	X	X
96	05/30	03:45	BO	11 31.93 S	032 13.01 W	GPS	NB	4954						
96	05/30	05:00	EN	11 31.96 S	032 12.97 W	GPS	NB	4954						
97	05/30	07:47	BE	11 30.97 S	032 43.00 W	GPS	NB	4449	4505	21	X	X	X	X
97	05/30	09:09	BO	11 30.97 S	032 43.00 W	GPS	NB	4452						
97	05/30	10:18	EN	11 30.95 S	032 42.98 W	GPS	NB	4457						
98	05/30	17:42	BE	11 29.05 S	033 33.04 W	GPS	NB	4963	5000	21	X	X	X	X
98	05/30	19:10	BO	11 28.97 S	033 32.89 W	GPS	NB	4959						
98	05/30	20:28	EN	11 28.91 S	033 32.77 W	GPS	NB	4958						
99	05/30	22:27	BE	11 27.92 S	033 53.05 W	GPS	NB	4613	4617	21	X	X	X	X
99	05/30	23:52	BO	11 27.93 S	033 53.02 W	GPS	NB	4630						
99	05/31	01:02	EN	11 28.01 S	033 53.00 W	GPS	NB	4610						
100	05/31	02:58	BE	11 27.99 S	034 13.11 W	GPS	NB	4570	4630	21	-	-	X	X
100	05/31	04:26	BO	11 28.00 S	034 13.08 W	GPS	NB	4568						
100	05/31	05:38	EN	11 27.99 S	034 12.96 W	GPS	NB	4568						
101	05/31	07:07	BE	11 18.95 S	034 25.05 W	GPS	NB	4639	4709	21	X	X	X	X
101	05/31	08:32	BO	11 18.96 S	034 25.02 W	GPS	NB	4641						
101	05/31	09:44	EN	11 18.95 S	034 25.00 W	GPS	NB	4639						
102	05/31	11:41	BE	11 06.99 S	034 42.03 W	GPS	NB	4244	4299	21	-	-	X	X
102	05/31	13:02	BO	11 07.01 S	034 42.01 W	GPS	NB	4245						
102	05/31	14:03	EN	11 06.98 S	034 41.96 W	GPS	NB	4266						
103	05/31	16:00	BE	10 55.44 S	034 59.56 W	GPS	NB	4118	4130	21	X	X	X	X
103	05/31	17:25	BO	10 55.61 S	034 59.58 W	GPS	NB	4122						
103	05/31	18:28	EN	10 55.59 S	024 59.46 W	GPS	NB	4118						
104	05/31	22:20	BE	10 48.99 S	35 09.02 W	GPS	NB	3951	3971	21	X	-	X	X
104	05/31	23:42	BO	10 48.00 S	035 09.00 W	GPS	NB	3953						
104	06/01	00:40	EN	10 49.00 S	035 08.97 W	GPS	NB	3931						
105	06/01	01:52	BE	10 41.87 S	035 17.00 W	GPS	NB	3702	3737	21	X	X	X	X
105	06/01	03:05	BO	10 41.88 S	035 16.87 W	GPS	NB	3703						
105	06/01	04:03	EN	10 41.90 S	035 17.05 W	GPS	NB	3721						
106	06/01	05:08	BE	10 36.00 S	035 25.14 W	GPS	NB	3466		0	-	-	-	-
106	06/01	06:15	BO	10 35.96 S	035 25.00 W	GPS	NB	3486						
106	06/01	07:09	EN	10 35.89 S	035 24.77 W	GPS	NB	3495						
107	06/01	08:10	BE	10 29.96 S	035 32.01 W	GPS	NB	3081	3088	21	X	X	X	X
107	06/01	09:09	BO	10 29.69 S	035 31.63 W	GPS	NB	3089						
107	06/01	09:59	EN	10 29.51 S	035 31.36 W	GPS	NB	3098						
108	06/01	11:02	BE	10 25.41 S	035 39.05 W	GPS	NB	2581	2471	0	-	-	-	-
108	06/01	11:51	BO	10 24.82 S	035 38.69 W	GPS	NB	2557						
108	06/01	12:30	EN	10 24.49 S	035 38.52 W	GPS	NB	2557						
109	06/01	14:36	BE	10 20.06 S	035 46.10 W	GPS	NB	1800	1766	0	-	-	-	-
109	06/01	15:16	BO	10 19.61 S	035 45.02 W	GPS	NB	1787						
109	06/01	15:46	EN	10 19.27 S	035 45.40 W	GPS	NB	1806						
110	06/01	16:48	BE	10 16.01 S	035 53.40 W	GPS	NB	735		0	-	-	-	-
110	06/01	17:11	BO	10 15.88 S	035 53.27 W	GPS	NB	840						
110	06/01	17:26	EN	10 15.88 S	035 53.12 W	GPS	NB	740						

* BE = Begin, BO = Bottom, EN = End;
** NB = Narrow Band, WH = Work House