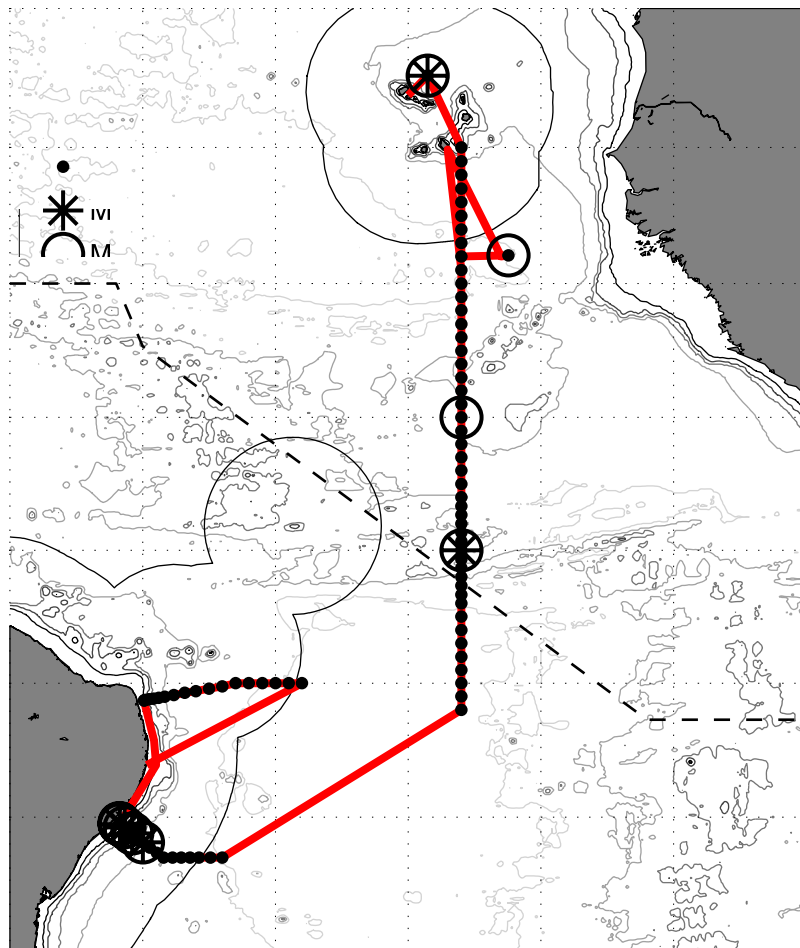


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Short Cruise Report
R/V METEOR M145 Mindelo – Recife
13th February – 14th March 2018
Chief Scientists: Prof. Dr. Peter Brandt, Dr. Rebecca Hummels
Captain: Detlef Korte



Bathymetric map with ship track of R/V METEOR cruise M145, including locations of CTD/UVP/LADCP stations and mooring recoveries and deployments. Black solid lines mark exclusive economic zones of Brazil and Cape Verde, black dashed line marks the SAR zone of Brazil. .

Objectives

The research program is an integral component of the DFG Collaborative Research Center "Climate-Biogeochemistry Interactions in the Tropical Ocean" (SFB 754) and the BMBF-collaborative project "Regional Atlantic Circulation and Global Change" (RACE II). Within the framework of the SFB 754, the main scientific questions addressed during M145 are (1) How does subsurface dissolved oxygen in the tropical ocean respond to variability in ocean circulation and ventilation? and (2) what are the relations and feedbacks linking low or variable oxygen levels and key nutrient source/sink mechanisms in the water column? The cruise contributed to the research objectives by quantifying the variability of ventilation processes of the oxygen minimum zone (OMZ) of the eastern tropical North Atlantic (ETNA), including oxygen fluxes due to lateral mixing, vertical mixing and lateral advective fluxes. A particular objective related to research question (2) was to quantify oxygen consumption within the OMZ. This was approached by tracer concentration measurements to assess the age of the tracers and hence water masses in the OMZ and by investigating the role of zooplankton and its vertical migration for fluxes of particulate and dissolved matter. Additionally, the quantitative understanding of nitrogen fixation in the tropical Atlantic was advanced by measuring nitrogen fixation rates.

Within the framework of RACE II, the aim of this cruise was to investigate the variability of the western boundary current system off Brazil as well as providing a contribution for an estimate of the Atlantic meridional overturning circulation (AMOC) at 11°S. With the end of the funding for mooring work at 11°S within RACE II, the redeployment of the mooring array required to preserve this long-term climate record was internally funded by GEOMAR. A particular focus at the western boundary was on the transport variability of the North Brazil Undercurrent (NBUC) – as part of the AMOC and the subtropical cells (STCs) – on timescales from intraseasonal to decadal.

Narrative

R/V METEOR cruise M145 from Mindelo to Recife started on Tuesday, February 13, 2018, at the height of the Cape Verdean carnival. On the one hand, we were able to observe some great festivities and processions throughout the city, while on the other hand, the preparations for our journey came through without any problems. A smaller part of our equipment was already delivered to Catania, the departure port of M144-2, and thus was already on board when R/V METEOR arrived in Mindelo. The remaining containers were then brought to the pier and the part of the scientific crew that had arrived early was able to start unpacking the containers directly after R/V METEOR's arrival. With R/V METEOR's departure from Mindelo began the last research cruise of the Kiel Collaborative Research Center 754 "Climate-Biogeochemical Interactions in the Tropical Ocean" with a funding period from 2008 to 2019. As part of this project, a total of 18 SFB754 research cruises into the tropical Atlantic and 13 cruises into the tropical Pacific were conducted.

After departure from the port of Mindelo, our first activity was the recovery of the CVOO mooring in the afternoon of February 13. The mooring was equipped with various instruments measuring physical (temperature, salinity, pressure, velocity) and biogeochemical and biological (oxygen, CO₂, chlorophyll, fish tag signals, plankton settlement) variables. Most of

the instruments provided clean and complete data, whereas the upper two MicroCATs were lost during the mooring period due to cutoff of the mooring wire below the surface drifting buoy. During the night, some CTD stations were used for the calibration of moored instrumentation; microstructure profiles of velocity shear and temperature were collected to infer mixing levels required for determining diapycnal oxygen and nutrient fluxes. In the morning of the next day, the CVOO mooring was deployed successfully. Upon departure from the CVOO, we started the trace metal clean water sampling using a towed fish.

CTD/UVP/LADCP section work along 23°W started at 15°N on February 15, 07:00 UTC and ended at 6°S on February 28, 06:00 UTC. CTD/O₂ profiles were collected to a depth of 1300m between 15°N and 5.5°N and between 5.5°S and 6°S with half degree latitude resolution. Full ocean depth profiles were taken between 5°N and 5°S with spatial resolution between 2°N and 2°S being enhanced to 20' latitude. The CTD rosette was equipped with conductivity, temperature, pressure, oxygen and chlorophyll sensors. In addition, an underwater vision profiler for particle counting and an up- and down-looking acoustic Doppler current profilers (LADCP) to measure full depth velocity profiles were attached to the rosette frame. During shallow stations (<2000 m) an optical nitrate sensor (SUNA) and a light sensor measuring photosynthetically active radiation (PAR) were installed as well. Near the PIRATA buoys at 11°N and at the equator, microstructure profiles were taken. Water samples were analyzed for numerous variables, including salinity, oxygen concentrations mainly for calibrating CTD sensors, tracer concentrations (CFC-12, SF₆), and nutrients. Filtered samples were taken for NanoSIMS, flow cytometry, DNA/RNA, and chlorophyll *a*. Additionally, two shipboard ADCPs with frequencies of 38 kHz and 75 kHz were continuously sampling horizontal velocities in the upper 600 and 1000 m, respectively. The 38 kHz ADCP could initially not be lowered into the moonpool due to the installation of zinc anodes during R/V METEOR's recent stay in the shipyard. Once the ADCP-mounting frame was adjusted, it was able to pass the anodes to be properly fixed in position by the hydraulic system.

In the evening of February 16, the 23°W transect was discontinued to recover a mooring at 11°N, 21°13'W. This position approximately marks the center of the oxygen minimum zone of the tropical Atlantic. The mooring equipped with velocity, temperature, salinity and oxygen sensors was successfully recovered with full data records on February 17 after performing a CTD and MSS station near the mooring site. During the deployment of the towed fish following the mooring work, a crewmember unfortunately suffered a severe hand injury, which required a stopover in Praia and resulted in a 44-hour interruption of our research work.

In the morning of February 21, the mooring at 23°W, 5°N was recovered. The mooring's instrumentation was identical to the one deployed at the 11°N mooring. Similar to the 11°N mooring, all sensors (except one with only 50% data coverage) had worked well. Both moorings were deployed in the frame of the SFB754 and were not redeployed due to the end of the observational work of this program. R/V METEOR reached the equator in the morning of February 24. Upon our arrival, the equatorial mooring was successfully recovered and redeployed in the afternoon. Again, all sensors had worked well and we were particularly happy to have retrieved almost complete velocity, temperature, oxygen and salinity time

series from a moored profiler that traveled the mooring wire up and down between 900 m and 3300 m depth.

After finalizing the 23°W section in the morning of February 28, R/V METEOR headed southwest towards the western boundary off Brazil. During the two-day transit the “Bergfest” provided a welcome change. The work program along the 11°S section started at 11.5°S, 32°W at lunchtime of March 2. During the 11°S section work, 4 moorings were recovered and redeployed. Additionally, two PIES (pressure inverted echo sounders) were recovered. The two instruments were serviced and prepared for redeployment during R/V METEOR cruise M148 from Belém to Walvis Bay. All mooring operations went well and we were very happy about the data return - all instruments mounted to the moorings recorded full data sets (except one instrument, which stopped data recording after 60% of the mooring period). Additionally, 22 full-depth CTD/O₂ profiles were collected along the 11°S section. The work along 11°S was completed with the mooring deployments of the two shallow moorings at the continental slope at about noon of March 7. The final CTD/O₂ section along 5°S was started in the evening of March 8 and was completed in the evening of March 12. A total of 19 full depth CTD/O₂ stations were collected along 5°S. R/V METEOR arrived as scheduled in the old port of Recife at 8:00 in the morning of March 14.

Acknowledgements

We greatly appreciate the cooperative working atmosphere as well as the professionalism and seamanship of crew, officers and Captain of R/V METEOR who made this work a success. The ship time of METEOR was provided by the German Science Foundation (DFG) within the core program METEOR/MERIAN. Financial support was provided by the German Science Foundation (DFG) as part of the Sonderforschungsbereich 754 “Climate-Biogeochemistry Interactions in the Tropical Ocean” and by the German Federal Ministry of Education and Research as part of the cooperative projects RACE (03F0605B).

Participants M145

No.	Name	Discipline	Institution
1	Brandt, Peter, Prof. Dr.	Physical Oceanography / Chief scientist	GEOMAR
2	Hummels, Rebecca, Dr.	Physical Oceanography / Chief scientist, LADCP, moorings	GEOMAR
3	Araujo, Julia	Physical Oceanography	UFPE
4	Beaudin, Élise	Physical Oceanography	GEOMAR
5	Begler, Christian	Physical Oceanography / Mooring tech.	GEOMAR
6	Bogner, Boie	Marine Chemistry / Nutrients, O ₂	GEOMAR
7	Bruckert, Julia Rebecca	Marine Chemistry / Tracer, CFC-12, SF ₆	GEOMAR
8	Bruto, Leonardo, Dr.	Physical Oceanography / Mooring tech.	UFPE
9	Damião, André Luiz Araujo	Observer	Brazilian Navy
10	Detoni, Amália Maria Sacilotto, Dr.	Marine Biology / N ₂ -fixation, incubation	FURG
11	Dürschlag, Julia	Marine Biology / N ₂ -fixation, incubation	MPIMM
12	Fernández Carrera, Ana, Dr.	Marine Biology / N ₂ -fixation, incubation	UVIGO
13	Fischer, Tim, Dr.	Physical Oceanography / CTD, MSS	GEOMAR
14	Gawinski, Christine	Marine Biology / UVP	GEOMAR
15	Hahn, Johannes, Dr.	Physical Oceanography / O ₂ , T, S, P-logger	GEOMAR
16	Karimi, Mona	Meteorology / Aerosols	MPIHH
17	Kraabs, Isabell	Marine Chemistry / Oxygen	GEOMAR
18	Lübbecke, Joke, Prof. Dr.	Physical Oceanography / ADCP	GEOMAR
19	Papenburg, Uwe	Physical Oceanography / Mooring tech.	GEOMAR
20	Philippi, Miriam	Marine Biology / N ₂ -fixation, incubation	MPIMM
21	Pinck, Andreas	Physical Oceanography / Mooring tech.	GEOMAR
22	Qelaj, Kastriot	Marine Chemistry / Nutrients, O ₂	GEOMAR
23	Roch, Marisa	Physical Oceanography / Salinometer	GEOMAR
24	Schlosser, Christian, Dr.	Marine Chemistry / Towed FISH	GEOMAR
25	Schrandt, Julia Catherine	Marine Chemistry / Tracer, CFC-12, SF ₆	GEOMAR
26	Stelzner, Martin	Meteorology	DWD
27	Stöven, Tim, Dr.	Marine Chemistry / Tracer, CFC-12, SF ₆	GEOMAR
28	Tuchen, Franz Philip	Physical Oceanography / Salinometer	GEOMAR
29	Wünsche, Anna (Student)	Physical Oceanography / T, S, P - logger	GEOMAR

GEOMAR GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel, Germany

DWD Deutscher Wetterdienst, Germany

FURG Universidade Federal do Rio Grande, Brazil

MPIHH Max-Planck-Institut für Meteorologie, Germany

MPIMM Max-Planck-Institute für Marine Mikrobiologie, Germany

UFPE Universidade Federal de Pernambuco, Brazil

UVIGO Universidade de Vigo, Spain

Tab. 1.1: Station list of R/V METEOR cruise M145.

Station No.		Date	Gear	Time	Latitude	Longitude	Water Depth	Remarks
METEOR (M145)	GEOMAR	2018		[UTC]	[°]	[°]	[m]	
1-1	KPO 1179 (CVOO)	13.02.	Mooring	16:10-20:50	17°36.394'N	024°14.98'W	3600	Mooring recovery
2-1	CTD 1	13.02.	CTD	21:30-00:40	17°36.394'N	024°14.98'W	3600	CTD station (to bottom)
3-1	CTD 2	14.02.	CTD	01:40-03:00	17°36.394'N	024°14.98'W	3600	CTD station (to 1000 m)
4-1	CTD 3	14.02.	CTD	03:55-04:15	17°36.394'N	024°14.98'W	3600	CTD station (to 300 m)
5-1	MSS 1	14.02.	MSS	04:35-6:30	17°36.394'N	024°14.98'W	3600	MSS station
6-1	KPO 1202 (CVOO)	14.02.	Mooring	08:45-15:55	17°36.394'N	024°14.98'W	3600	Mooring deployment
7-1	FISH 1	14.02.-17.02.	FISH	16:15-08:50	17°36.394'N-11°03.3'N	024°15.0'W-021°13.6'W		Towed-Fish
8-1	CTD 4	15.02.	CTD	06:55-08:00	15°00'N	023°00'W	2730	CTD station (to 1300 m)
9-1	CTD 5	15.02.	CTD	11:00-12:00	14°30'N	023°00'W	4130	CTD station (to 1300 m)
10-1	CTD 6	15.02.	CTD	15:00-16:05	14°00'N	023°00'W	4370	CTD station (to 1300 m)
11-1	CTD 7	15.02.	CTD	18:55-19:59	13°30'N	023°00'W	4550	CTD station (to 1300 m)
12-1	CTD 8	15.02.	CTD	22:50-00:00	13°00'N	023°00'W	5000	CTD station (to 1300 m)
13-1	CTD 9	16.02.	CTD	03:15-04:10	12°30'N	023°00'W	5180	CTD station (to 1300 m)
14-1	CTD 10	16.02.	CTD	05:50-06:10	12°15'N	023°00'W	5030	CTD station (to 300 m)
15-1	CTD 11	16.02.	CTD	07:45-08:50	12°00'N	023°00'W	5060	CTD station (to 1300 m)
16-1	CTD 12	16.02.	CTD	11:50-12:40	11°30'N	023°00'W	5120	CTD station (to 1300 m)
17-1	MSS 2	16.02.	MSS	14:30-15:50	11°30'N	022°59'W	5120	MSS station
18-1	CTD 13	16.02.	CTD	18:50-20:15	11°00'N	023°00'W	5160	CTD station (to 1300 m)
19-1	CTD 14	17.02.	CTD	06:50-07:50	11°02.5'N	021°14'W	5123	CTD station (to 1300 m)
20-1	MSS 3	17.02.	MSS	07:55-09:30	11°02.5'N	021°14'W		MSS station
21-1	KPO 1178	17.02.	Mooring	08:15-14:40	11°02.22'N	021°13.27'W	5072	Mooring recovery
22-1	FISH 2	17.02.	FISH	14:55-20:55	11°02.2'N-11°46.7'N	021°13.4'W-021°51.0'W		Towed-Fish
23-1	CTD 15	19.02.	CTD	15:05-16:20	10°30'N	023°00'W	5197	CTD station (to 1300 m)
24-1	FISH 3	19.02.-24.02.	FISH	16:30-08:00	10°29.9'N-00°00.6'N	023°00.0'W-023°06.8'W		Towed-Fish
25-1	CTD 16	19.02.	CTD	19:25-20:30	10°00'N	023°00'W	5047	CTD station (to 1300 m)
26-1	CTD 17	19.02.	CTD	23:25-00:25	09°30'N	023°00'W	4640	CTD station (to 1300 m)
27-1	CTD 18	20.02.	CTD	03:25-04:25	09°00'N	023°00'W	4907	CTD station (to 1300 m)
28-1	CTD 19	20.02.	CTD	05:35-06:00	08°50'N	023°00'W	4951	CTD station (to 300 m)
29-1	CTD 20	20.02.	CTD	08:00-08:55	08°30'N	023°00'W	4792	CTD station (to 1300 m)

30-1	CTD 21	20.02.	CTD	11:55-13:00	08°00'N	023°00'W	4426	CTD station (to 1300 m)
31-1	CTD 22	20.02.	CTD	15:50-16:45	07°30'N	023°00'W	4399	CTD station (to 1300 m)
32-1	CTD 23	20.02.	CTD	19:35-20:40	07°00'N	023°00'W	1484	CTD station (to 1300 m)
33-1	CTD 24	20.02.	CTD	23:35-00:30	06°30'N	023°00'W	3156	CTD station (to 1300 m)
34-1	CTD 25	21.02.	CTD	03:15-04:20	06°00'N	023°00'W	4105	CTD station (to 1300 m)
35-1	CTD 26	21.02.	CTD	07:05-08:00	05°30'N	023°00'W	4246	CTD station (to 1300 m)
36-1	KPO 1177	21.02.	Mooring	10:40-13:40	05°01.005'N	023°00'W	4217	Mooring recovery
37-1	CTD 27	21.02.	CTD	14:05-17:05	05°01'N	023°00'W	4225	CTD station (to bottom)
38-1	CTD 28	21.02.	CTD	19:55-22:30	04°30'N	023°00'W	4129	CTD station (to bottom)
39-1	CTD 29	22.02.	CTD	01:20-04:05	04°00'N	023°00'W	4226	CTD station (to bottom)
40-1	CTD 30	22.02.	CTD	05:40-06:00	03°45'N	023°00'W		CTD station (to 300 m)
41-1	CTD 31	22.02.	CTD	07:35-10:15	03°30'N	023°00'W	4395	CTD station (to bottom)
42-1	CTD 32	22.02.	CTD	13:05-16:00	03°00'N	023°00'W	4648	CTD station (to bottom)
43-1	CTD 33	22.02.	CTD	18:50-21:45	02°30'N	023°00'W	4755	CTD station (to bottom)
44-1	CTD 34	23.02.	CTD	01:25-04:15	02°00'N	023°00'W	4337	CTD station (to bottom)
45-1	CTD 35	23.02.	CTD	06:30-09:15	01°40'N	023°00'W	4129	CTD station (to bottom)
46-1	CTD 36	23.02.	CTD	11:40-15:20	01°20'N	023°00'W	4722	CTD station (to bottom)
47-1	CTD 37	23.02.	CTD	17:20-19:30	01°00'N	023°00'W	3226	CTD station (to bottom)
48-1	CTD 38	23.02.	CTD	21:45-00:15	00°40'N	023°00'W	3903	CTD station (to bottom)
49-1	CTD 39	24.02.	CTD	02:20-05:00	00°20'N	023°00'W	3921	CTD station (to bottom)
50-1	CTD 40	24.02.	CTD	06:00-06:20	00°11.7'N	023°00'W		CTD station (to 300 m)
51-1	KPO 1176	24.02.	Mooring	08:00-11:50	00°00.055'N	023°06.78'W	3930	Mooring recovery
52-1	KPO 1201	24.02.	Mooring	13:55-17:55	00°00.00'N	023°06.80'W	3930	Mooring deployment
53-1	CTD 41	24.02.	CTD	19:55-22:25	00°00'N	023°00'W	3961	CTD station (to bottom)
54-1	FISH 4	24.02.	FISH	20:00	00°00'N	023°02'W		Towed-Fish
55-1	MSS 4	24.02.	MSS	22:35-00:15	00°00'N	023°02'W		MSS station
56-1	CTD 42	25.02.	CTD	02:15-05:25	00°20'S	023°00'W	4624	CTD station (to bottom)
57-1	CTD 43	25.02.	CTD	07:35-09:45	00°40'S	023°00'W	3572	CTD station (to bottom)
58-1	CTD 44	25.02.	CTD	11:45-14:25	01°00'S	023°00'W	4117	CTD station (to bottom)
59-1	CTD 45	25.02.	CTD	16:30-19:30	01°20'S	023°00'W	4858	CTD station (to bottom)
60-1	CTD 46	25.02.	CTD	21:35-00:50	01°40'S	023°00'W	4945	CTD station (to bottom)
61-1	CTD 47	26.02.	CTD	02:45-06:00	02°00'S	023°00'W	5239	CTD station (to bottom)

62-1	CTD 48	26.02.	CTD	07:00-07:20	02°10'S	023°00'W		CTD station (to 300m)
63-1	CTD 49	26.02.	CTD	09:20-12:30	02°30'S	023°00'W	5776	CTD station (to bottom)
64-1	CTD 50	26.02.	CTD	15:30-18:35	03°00'S	023°00'W	5500	CTD station (to bottom)
65-1	CTD 51	26.02.	CTD	21:35-00:45	03°30'S	023°00'W	5484	CTD station (to bottom)
66-1	CTD 52	27.02.	CTD	03:50-07:10	04°00'S	023°00'W	5886	CTD station (to bottom)
67-1	CTD 53	27.02.	CTD	10:40-13:50	04°30'S	023°00'W	5171	CTD station (to bottom)
68-1	CTD 54	27.02.	CTD	17:15-21:20	05°00'S	023°00'W	5195	CTD station (to bottom)
69-1	CTD 55	28.02.	CTD	00:25-01:55	05°30'S	023°00'W	5087	CTD station (to 1300m)
70-1	CTD 56	28.02.	CTD	04:55-06:05	06°00'S	023°00'W	5221	CTD station (to 1300m)
71-1	CTD 57	02.03.	CTD	13:15-16:15	11°30'S	032°00'W	5030	CTD station (to bottom)
72-1	CTD 58	02.03.	CTD	18:45-21:30	11°30'S	032°27'W	4703	CTD station (to bottom)
73-1	CTD 59	02.03.	CTD	22:55-23:15	11°30'S	032°40'W		CTD station (to 300m)
74-1	CTD 60	03.03.	CTD	00:45-02:50	11°30'S	032°53'W	3505	CTD station (to bottom)
75-1	CTD 61	03.03.	CTD	04:45-07:25	11°30'S	033°13'W	4283	CTD station (to bottom)
76-1	CTD 62	03.03.	CTD	09:20-12:15	11°30'S	033°33'W	4953	CTD station (to bottom)
77-1	CTD 63	03.03.	CTD	14:15-17:40	11°30'S	033°53'W	4623	CTD station (to bottom)
78-1	CTD 64	03.03.	CTD	19:35-22:15	11°30'S	034°13'W	4581	CTD station (to bottom)
79-1	CTD 65	04.03.	CTD	00:05-02:50	11°18.8'S	034°28.2'W	4639	CTD station (to bottom)
80-1	CTD 66	04.03.	CTD	04:40-07:10	11°07.6'S	34°43.9'W	4255	CTD station (to bottom)
81-1	KPO_1172	04.03.	Mooring	09:05-13:10	10°56.4'S	034°59.6'W	4110	Mooring Recovery
82-1	KPO_1173	04.03.	Mooring	16:00-19:10	10°36.5'S	035°23.6'W	3520	Mooring Recovery
83-1	CTD 67	04.03.	CTD	19:40-20:00	10°36.5'S	035°23.6'W	3520	CTD station (to 300m)
84-1	CTD 68	04.03.	CTD	21:35-00:20	10°46.4'S	035°11.6'W	3882	CTD station (to bottom)
85-1	CTD 69	05.03.	CTD	01:20-04:10	10°51.4'S	035°05.6'W	3968	CTD station (to bottom)
86-1	CTD 70	05.03.	CTD	05:10-07:45	10°56.4'S	034°59.6'W	4110	CTD station (to bottom)
87-1	KPO_1198	05.03.	Mooring	09:05-13:25	10°56.4'S	034°59.6'W	4110	Mooring Deployment
88-1	KPO_1197	05.03.	Mooring	17:40-21:10	10°36.5'S	035°23.6'W	3520	Mooring Deployment
89-1	CTD 71	05.03.	CTD	21:40-23:50	10°36.5'S	035°23.6'W	3520	CTD station (to bottom)
90-1	CTD 72	06.03.	CTD	01:35-03:45	10°41.4'S	035°17.6'W	3685	CTD station (to bottom)
91-1	CTD 73	06.03.	CTD	05:25-07:20	10°32.0'S	035°29.3'W	3214	CTD station (to bottom)
92-1	CTD 74	06.03.	CTD	08:10-09:55	10°27.4'S	035°34.9'W	2868	CTD station (to bottom)

93-1	KPO_1170	06.03.	Mooring	10:50-13:10	10°22.8'S	035°40.8'W	2290	Mooring Recovery
95-1	KPO_1169	06.03.	Mooring	14:35-15:43	10°16.0'S	035°51.7'W	900	Mooring Recovery
96-1	KPO_1135	06.03.	Mooring	16:10-17:30	10°13.97'S	035°51.74'W	500	PIES Recovery
97-1	KPO_1134	06.03.	Mooring	17:50-18:55	10°13.58'S	035°52.42'W	300	PIES Recovery
	SADCP	06.03.	ADCP		10°14.2'S	035°54.2'W	70	ADCP section
98-1	CTD 75	06.03.	CTD	20:10-20:35	10°14.6'S	035°53.6'W	228	CTD station (to bottom)
99-1	CTD 76	06.03.	CTD	20:55-21:25	10°15.3'S	035°52.6'W	520	CTD station (to bottom)
100-1	CTD 77	06.03.	CTD	21:50-22:30	10°16.0'S	035°51.7'W	895	CTD station (to bottom)
101-1	CTD 78	06.03.	CTD	23:25-00:35	10°19.5'S	035°46.1'W	1711	CTD station (to bottom)
102-1	CTD 79	07.03.	CTD	01:25-03:10	10°22.8'S	035°40.8'W	2284	CTD station (to bottom)
	SADCP	07.03.	ADCP		10°36.5'S	035°23.6'W		ADCP section
103-1	KPO_1195	07.03.	Mooring	10:05-11:10	10°16.0'S	035°51.7'W	900	Mooring Deployment
104-1	KPO_1196	07.03.	Mooring	13:15-15:40	10°22.8'S	035°40.8'W	2292	Mooring Deployment
105-1	CTD 80	09.03.	CTD	00:40-01:05	05°39.0'S	034°57.6'W	376	CTD station (to bottom)
106-1	CTD 81	09.03.	CTD	01:45-02:50	05°38.3'S	034°56.0'W	688	CTD station (to bottom)
107-1	CTD 82	09.03.	CTD	03:45-05:05	05°38.0'S	034°54.0'W	1525	CTD station (to bottom)
108-1	CTD 83	09.03.	CTD	06:00-08:05	05°36.6'S	034°46.0'W	2640	CTD station (to bottom)
109-1	CTD 84	09.03.	CTD	09:20-11:30	05°34.8'S	034°36.0'W	3371	CTD station (to bottom)
110-1	CTD 85	09.03.	CTD	12:55-15:25	05°32.7'S	034°24.0'W	3765	CTD station (to bottom)
111-1	CTD 86	09.03.	CTD	16:55-20:00	05°30.2'S	034°10.0'W	4125	CTD station (to bottom)
112-1	CTD 87	09.03.	CTD	22:10-00:50	05°26.6'S	033°50.0'W	4323	CTD station (to bottom)
113-1	CTD 88	10.03.	CTD	03:40-06:35	05°21.7'S	033°25.0'W	4489	CTD station (to bottom)
114-1	CTD 89	10.03.	CTD	09:10-12:05	05°17.7'S	033°00.0'W	4568	CTD station (to bottom)
115-1	CTD 90	10.03.	CTD	15:50-19:25	05°12.3'S	032°30.0'W	4606	CTD station (to bottom)
116-1	CTD 91	10.03.	CTD	22:30-01:25	05°07.0'S	032°00.0'W	4617	CTD station (to bottom)
117-1	CTD 92	11.03.	CTD	04:35-07:30	05°00.0'S	031°30.0'W	4699	CTD station (to bottom)
118-1	CTD 93	11.03.	CTD	10:45-14:00	05°00.0'S	031°00.0'W	4863	CTD station (to bottom)
119-1	CTD 94	11.03.	CTD	17:30-20:10	05°00.0'S	030°30.0'W	4300	CTD station (to bottom)
120-1	CTD 95	11.03.	CTD	23:15-02:30	05°00.0'S	030°00.0'W	5005	CTD station (to bottom)
121-1	CTD 96	12.03.	CTD	05:45-08:55	05°00.0'S	029°30.0'W	5217	CTD station (to bottom)
122-1	CTD 97	12.03.	CTD	12:10-15:20	05°00.0'S	029°00.0'W	5311	CTD station (to bottom)
123-1	CTD 98	12.03.	CTD	18:45-21:55	05°00.0'S	029°00.0'W	5451	CTD station (to bottom)