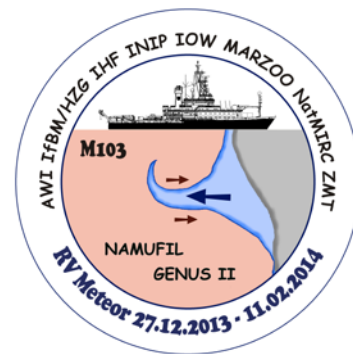


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Short Cruise Report
RV METEOR M-103/2
Project: GENUS II
Walvis Bay - Walvis Bay
21.01.2014 - 11.02.2014



Chief Scientist: Volker Mohrholz
Captain: Michael Schneider

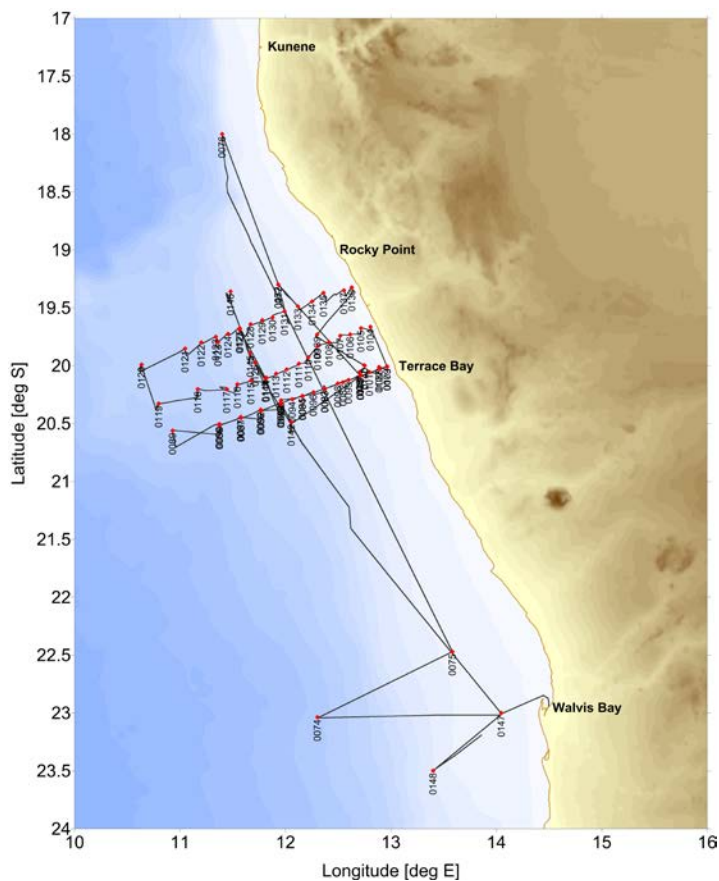


Abb.1: Schiffskurs und Stationen (rote Punkte) der Expedition 103/2.

Objectives

Coastal upwelling systems react directly to changes in external (climatic) forcing, and observed changes at lower trophic levels of upwelling ecosystems primarily reflect changes in this external physical forcing. In the Benguela Current coastal upwelling system off Namibia, the supply of oxygen to the shelf environment is directly coupled to hydrodynamic conditions, and fluctuating oxygen levels over the shelf have significant consequences for nutrient levels and nutrient ratios, for rates of exchange at the sediment-water interface, for gas exchange between the ocean and the atmosphere, and for biological production and therefore for the entire ecosystem. Work of expedition METEOR 103/2 in the coastal upwelling area off Namibia, funded by the BMBF and carried out within the project GENUS (Geochemistry and Ecology of the Namibian Upwelling System), phase II, was dedicated to upwelling areas in the eastern boundary currents, that respond sensitively to global, regional, and local changes in atmospheric circulation patterns. In the past several coastal upwelling systems have experienced dramatic changes (regime shifts) in ecosystem structure and fish catches, which are not fully understood yet. Using dedicated process studies and long term observations, the GENUS project aims to clarify the interactions between the particular trophic levels of the ecosystem in order to improve the knowledge about the system and to enhance the predictive capabilities of ecosystem models.

The second leg of the cruise M103 was dedicated to a filament and succession study. This study consisted of a high spatial resolution measuring program in a single upwelling filament of the northern Benguela, which can be found throughout the year. The focus of this study was on filament dynamics, offshore transport of coastal waters and plankton communities in the filament, and the biogeochemical fluxes between the filament and ambient waters. Satellite images of TMI/AMSRE were used to identify a feasible filament and to select the positions of transects for data collection. The in situ measurements were carried out with a combination of towed instruments for basic hydrographic data with high spatial resolution (ScanFish, TADCP), station work for sampling the filament (CTD probe, nets) and a drifter deployment. The upwelling filament was covered with three cross shelf transects from the coast towards the open ocean (ca. 120n.m. length) and an along shore transect crossing the axis of the filament (ca. 80n.m. length). Each transect was sampled with 16 stations. Eight stations at each transect were selected for an intense interdisciplinary sampling that supplied hydrographic, biological and biogeochemical data in parallel. The gathered data will be used to test the following hypotheses:

- The structure of upwelling filaments are determined by balances between pressure gradients, Coriolis-force, advection and meteorological forcing. The offshore transport of coastal water is enhanced by surface and deep filaments, and exceeds the wind driven offshore Ekman-transport considerably.
- Optical properties of sea water change regionally in relation to upwelling filaments.
- The primary production in an upwelling filament depends on the filament age and the related succession of phytoplankton community, which is controlled by the available nutrients.
- Micro- and mesozooplankton abundance and composition will change along an upwelling filament and in relation to the adjacent ocean and hence contributes differently to the flux of organic matter and to benthopelagic interactions.
- Fish larvae show distinct aggregation behavior related to borders of upwelling filaments and borders of oxygen minimum zones
- Upwelling filaments influence the distribution of krill

Narrative

After partial exchange of the scientific crew the second leg of M103 started on 21st January in Walvis Bay. All scientists and the necessary technical and scientific equipment were on board in time. However, for unknown reason the announced Angolan observer did not participate in the cruise.

After leaving the port two moorings were deployed at the long term mooring position 20n.m. off Walvis Bay. One of the moorings was the long term mooring which is operated by the IOW in close cooperation with NatMIRC since 2003. The second mooring was deployed for the time of the cruise. This mooring gathered hydrographic data on a high temporal resolution to supply information on short term physical processes e.g. turbulent mixing and internal waves. From the mooring station we proceeded to another mooring position nearly 90n.m. offshore. There a sediment trap mooring could not be recovered during the first leg. After deploying a search wire during the night the mooring was successfully dredged at the first trial. All parts of the mooring were recovered without any damage.

After finishing the mooring operations we started on 22. January an along shelf transect with towed devices to gather hydrographic information and to localize active upwelling filaments in the investigation area. Due to high cloud coverage satellite derived SST data were not available in sufficient quality for identification of upwelling filaments. The transect was finished in the late evening on 24th January. The hydrographic patterns revealed no signatures of active upwelling cells in the Northern Benguela. Only a weak signature of an old filament was observed (Figure 2). After a discussion with all scientists we decided to sample this old filament. The second option to shift the entire program to the Lüderitz upwelling cell was rejected, since we were seeking for the seasonal contrast to the investigations carried out in the northern Namibian upwelling cell during the cruise M100/1. However, the sampling strategy was changed to adapt the measurements to the actual situation. On 25 January two stations were worked inside and outside of the filament structure to collect water for a mesocosm experiment, which investigated the response of phytoplankton to mixing between filament and oceanic water. During the station inside the filament a drifting surface mooring (Drifter) was deployed to follow the way of filament water during the next two weeks. This mooring consisted of a surface drifter with a 70m long chain of hydrographic instruments, which measures stratification and current in the upper layer.

From 25. to 28. January we performed the first cross shelf transect from the coast up to 120n.m. offshore. This transect with 16 stations was located south of the filament structure. Eight of the stations were extensively sampled with the full set of gear: CTD, Microstructure Profiler (MSS), optical instruments, and several plankton nets (MSN, MOCNESS, Ringtrawl, ...). The other stations were worked with CTD and MSS to get a high spatial resolution of hydrographic data along the transect.

Additionally, to the *in situ* measurements some lab experiments were started for physiological investigation on zoo- and ichthyoplankton.

After finishing the first transect another two cross shelf transects were worked in the core and north of the filament from 28th January to 02nd February and from 02nd to 06th February, respectively. The sampling strategy was similar to the first transect (Figure 3).

On 6th February we recovered successfully the drifting mooring. All devices have worked properly. On the same day the ADCP mooring at 20°S was recovered and redeployed after maintenance. In the evening of the 6th February we started with the cross filament transect along the 500m depth isobaths. This transect consisted of 6 stations, with 4 extended stations. The cross filament transect was finished on 8th February. The same transect was now measured with a combined TADCP/ScanFish transect to get high spatial resolution hydrographic data across the fronts between the filament and the ambient oceanic waters.

The towed devices were recovered on the afternoon of 9th February. Afterwards we began the transit back to the Walvis Bay area. The remaining two tasks, the recovery of the short term mooring of Walvis Bay and an additional phytoplankton station south of Walvis Bay kept us busy on 10 February. The scientific work of the cruise was completed at 18:00 of the 10th February.

On 11 February arrived the port of Walvis Bay, where the cruise was finished after unloading of the scientific equipment and disembarking of scientific crew on 12th February.

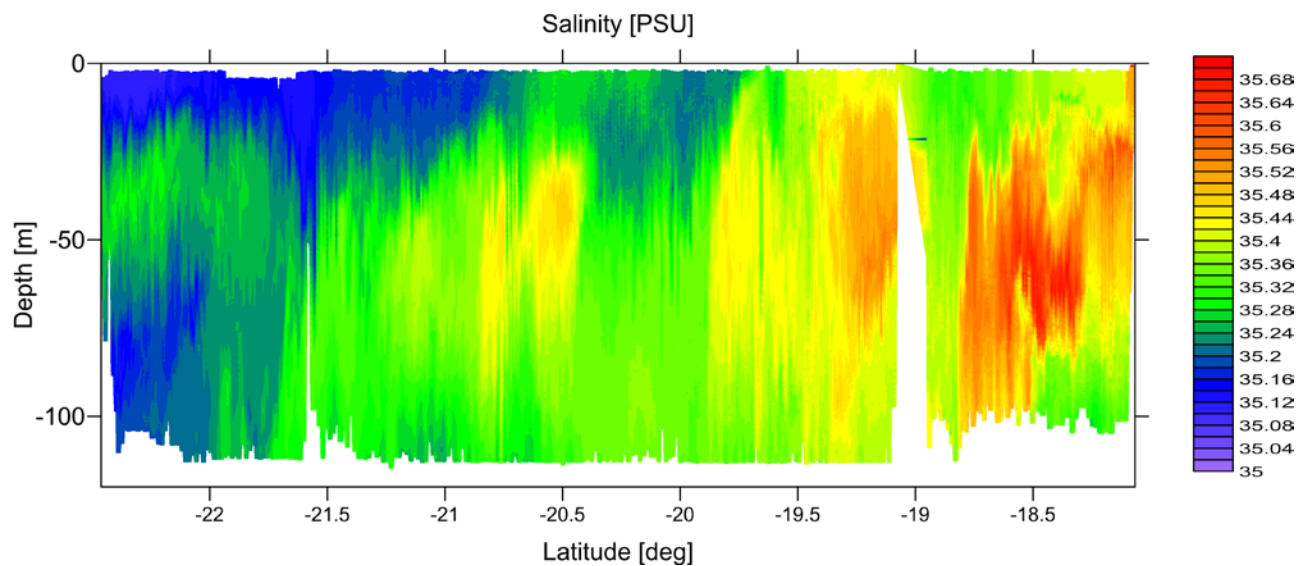


Figure 2: Salinity distribution in the upper 100m of the water column at the along shelf transect performed with the towed CTD (ScanFish). The low salinity pattern between 20S and 20.5°S indicate the old upwelling filament.

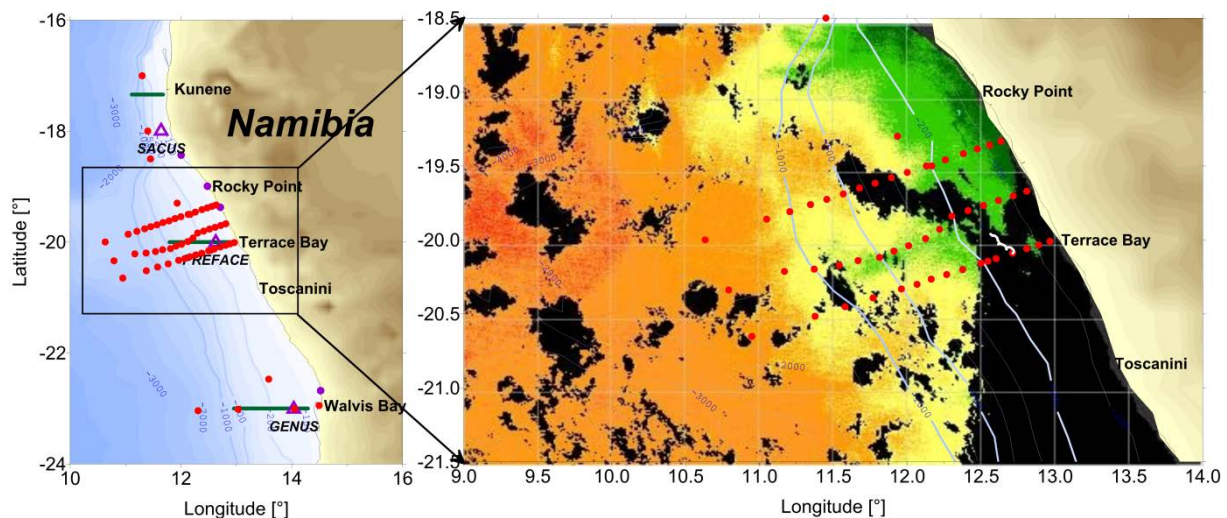


Figure 3: Station positions of the three across shelf transects in relation of the surface temperature pattern of the old upwelling filament off the northern Namibian coast.

Acknowledgements

We thank Captain Michael Schneider, his officers and the crew of R/V METEOR for their outstanding support. They ensured a highly professional working environment and contribute a lot to the success of this cruise. The friendly, and family-like atmosphere aboard is greatly acknowledged. We thank the Namibian Ministry of Foreign Affairs and

Ministry of Mines and Energy for their support and we would like to acknowledge the contribution of the German Ministry of Foreign Affairs (Wolfgang Mahrle) as well. We would also like to express our gratitude to the Leitstelle METEOR/MERIAN for its valuable support. The ship time of R/V METEOR was provided by the Deutsche Forschungsgemeinschaft. The GENUS II project is funded by the Federal Ministry of Education and Research.

Teilnehmerliste

1. Mohrholz, Volker	Fahrtleiter / <i>Chief Scientist</i>	IOW
2. Angenendt, Svenja	Carbon Biogeochemistry	ZMT
3. Beier, Sebastian	Oceanography / Moorings	IOW
4. Bohata, Karolina	Microzooplankton	IHF
5. Brust-Möbius, Juliane	Remote sensing	IOW
6. Buchholz, Fritz	Krill	AWI
7. Chikwililwa ,Chibo	Phytoplankton	IOW
8. Cordts, Hannah Marlene	Zoo-Planktology	IHF
9. Denda, Anneke	Zoo-Planktology, Copepods	MarZoo
10. Flohr, Anita	Carbon Biogeochemistry	ZMT
11. Frame, Caitlin	Geochemistry	HZG
12. Geist, Simon	Ichthyoplanktology	ZMT
13. Heene, Toralf	Oceanography / Moorings	IOW
14. Hörung, Flavia	Zoo-Planktology, Copepods	MarZoo
15. Koppelman, Rolf	Zoo-Planktology	IHF
16. Langenberg, Frauke	Biogeochemistry	IfBM
17. Martin, Bettina	Zoo-Planktology	IHF
18. Muyongo, Aphary	Observer	
19. Nickel, Gerald	Hydroacoustic, Parasound	IOW
20. Numwa, Oliver	Oceanography	NatMIRC
21. Rejoice Ndapewa Edward, Josephine	Ichthyoplanktology	NatMIRC
22. Schmidt, Martin	Oceanography	IOW
23. Schukat, Anna	Zoo-Planktology, Copepods	MarZoo
24. Siegel, Herbert	Remote sensing	IOW
25. Simon, Stephanie	Ichthyoplanktology	ZMT
26. Wasmund, Norbert	Phytoplankton	IOW
27. Werner, Torsten	Krill	AWI

Institutes

IOW	Leibniz-Institut für Ostseeforschung Warnemünde, Seestraße 15, D-18199 Rostock-Warnemünde, Germany
AWI	Alfred-Wegener-Institut für Polar- und Meeresforschung, Am Handelshafen 12, D-27570 Bremerhaven, Germany
GSN	Geological Survey of Namibia Ministry of Mines and Energy, Windhoek, Namibia
HZG	Helmholtz Zentrum Geesthacht, Institut für Material und Küstenforschung, Max-Planck-Straße 1, D-21502 Geesthacht, Germany
IfBM	Institut für Biogeochemie und Meereschemie, Universität Hamburg, Bundesstraße 55, D-20146 Hamburg, Germany
IHF	Institut für Hydrobiologie und Fischereiwissenschaft, Universität Hamburg, Große Elbstraße 133, D-22767 Hamburg, Germany

MarZoo Department of Microbial Ecophysiology, Faculty of Biology, University of Bremen, Leobener Straße, 28359 Bremen, Germany

NatMIRC National Marine Information and Research Centre
Strand Street, Swakopmund, Namibia

ZMT Leibniz-Zentrum für Marine Tropenökologie GmbH, Bremen
Fahrenheitstraße 6, D-28359 Bremen, Germany

Stationsliste

<i>Stat No.</i>	<i>Stat.Name (Depth)</i>		<i>Date</i>	<i>Time [UTC]</i>	<i>Latitude</i>	<i>Longitude</i>
0073	M_LTMB (129m)	Begin	21.01.2014	11:21	23° 00.33'S	14° 02.89'E
		End	21.01.2014	13:21	23° 00.96'S	14° 02.67'E
0074	M_ST2100 (2115m)	Begin	21.01.2014	23:18	23° 02.24'S	12° 18.19'E
		End	22.01.2014	19:32	22° 28.73'S	13° 33.75'E
0075	SFT_01s (...)	Begin	22.01.2014	19:47	22° 28.28'S	13° 35.02'E
		End	24.01.2014	21:49	18° 03.48'S	11° 24.33'E
0076	SFT_01b (...)	Begin	24.01.2014	22:21	17° 59.97'S	11° 23.97'E
		End	25.01.2014	07:15	19° 17.86'S	11° 55.94'E
0077	PHY_1 (123m)	Begin	25.01.2014	07:21	19° 17.98'S	11° 55.96'E
		End	25.01.2014	15:10	20° 05.42'S	12° 42.72'E
0078	CT2_03 (122m)	Begin	25.01.2014	15:11	20° 05.42'S	12° 42.73'E
		End	25.01.2014	18:41	20° 00.51'S	12° 57.92'E
0079	CT2_01 (47m)	Begin	25.01.2014	18:45	20° 00.56'S	12° 57.92'E
		End	25.01.2014	20:39	20° 01.81'S	12° 57.91'E
0080	CT2_02 (92m)	Begin	25.01.2014	21:22	20° 00.71'S	12° 53.33'E
		End	26.01.2014	01:33	20° 03.44'S	12° 53.13'E
0081	CT2_03 (121m)	Begin	26.01.2014	02:41	20° 03.28'S	12° 42.33'E
		End	26.01.2014	07:49	20° 05.40'S	12° 42.66'E
0082	CT2_04 (152m)	Begin	26.01.2014	08:59	20° 08.61'S	12° 32.77'E
		End	26.01.2014	09:16	20° 08.62'S	12° 32.80'E
0083	CT2_05 (253m)	Begin	26.01.2014	10:29	20° 11.98'S	12° 22.50'E
		End	26.01.2014	17:01	20° 13.47'S	12° 23.26'E
0084	CT2_06 (303m)	Begin	26.01.2014	18:25	20° 15.91'S	12° 09.75'E
		End	26.01.2014	18:44	20° 15.91'S	12° 09.75'E
0085	CT2_07 (468m)	Begin	26.01.2014	20:01	20° 17.99'S	11° 57.54'E
		End	27.01.2014	03:10	20° 22.63'S	11° 58.55'E
0086	CT2_08 (842m)	Begin	27.01.2014	04:27	20° 23.53'S	11° 46.08'E
		End	27.01.2014	12:04	20° 26.66'S	11° 46.28'E
0087	CT2_09 (1081m)	Begin	27.01.2014	13:23	20° 27.07'S	11° 34.75'E
		End	27.01.2014	14:13	20° 27.07'S	11° 34.75'E
0088	CT2_10 (1178m)	Begin	27.01.2014	15:35	20° 31.01'S	11° 22.55'E
		End	27.01.2014	18:42	20° 30.95'S	11° 22.59'E
0089	CT2_11 (1676m)	Begin	28.01.2014	01:55	20° 33.72'S	10° 55.81'E
		End	28.01.2014	11:21	20° 41.98'S	10° 57.50'E
0090	CT2_10 (1176m)	Begin	28.01.2014	13:56	20° 30.32'S	11° 22.43'E
		End	28.01.2014	14:57	20° 30.81'S	11° 22.52'E
0091	CT2_09 (1077m)	Begin	28.01.2014	16:11	20° 26.59'S	11° 34.58'E
		End	28.01.2014	17:13	20° 27.21'S	11° 34.80'E
0092	CT2_08 (8334m)	Begin	28.01.2014	18:26	20° 22.90'S	11° 46.00'E
		End	28.01.2014	19:22	20° 23.43'S	11° 46.08'E
0093	CT2_07 (493m)	Begin	28.01.2014	20:36	20° 19.23'S	11° 57.47'E
		End	28.01.2014	21:41	20° 19.65'S	11° 57.55'E

<i>Stat No.</i>	<i>Stat.Name (Depth)</i>		<i>Date</i>	<i>Time [UTC]</i>	<i>Latitude</i>	<i>Longitude</i>
0094	CT2_m5 (341m)	Begin	28.01.2014	22:28	20° 17.42'S	12° 03.87'E
		End	28.01.2014	23:33	20° 17.63'S	12° 03.91'E
0095	CT2_06 (302m)	Begin	29.01.2014	00:19	20° 15.67'S	12° 09.70'E
		End	29.01.2014	01:15	20° 15.85'S	12° 09.74'E
0096	CT2_m4 (279m)	Begin	29.01.2014	02:03	20° 13.80'S	12° 15.93'E
		End	29.01.2014	03:06	20° 14.00'S	12° 15.96'E
0097	CT2_05 (252m)	Begin	29.01.2014	03:53	20° 11.81'S	12° 22.37'E
		End	29.01.2014	05:00	20° 12.07'S	12° 22.51'E
0098	CT2_m3 (?)	Begin	29.01.2014	05:49	20° 09.22'S	12° 29.85'E
		End	29.01.2014	06:45	20° 09.37'S	12° 29.95'E
0099	CT2_m2 (144m)	Begin	29.01.2014	07:32	20° 07.38'S	12° 36.01'E
		End	29.01.2014	08:19	20° 07.65'S	12° 36.12'E
0100	CT2_03 (124m)	Begin	29.01.2014	09:08	20° 05.12'S	12° 42.65'E
		End	29.01.2014	10:30	20° 05.57'S	12° 42.77'E
0101	CT2_m1 (113m)	Begin	29.01.2014	11:05	20° 03.32'S	12° 47.86'E
		End	29.01.2014	11:52	20° 03.68'S	12° 48.50'E
0102	CT2_02 (95m)	Begin	29.01.2014	12:32	20° 01.67'S	12° 53.30'E
		End	29.01.2014	13:08	20° 01.87'S	12° 53.28'E
0103	CT2_01 (47m)	Begin	29.01.2014	13:44	20° 00.38'S	12° 57.91'E
		End	29.01.2014	14:03	20° 00.54'S	12° 57.87'E
0104	CT3_1 (43m)	Begin	29.01.2014	16:13	19° 39.88'S	12° 48.38'E
		End	29.01.2014	19:30	19° 41.55'S	12° 48.24'E
0105	CT3_2 (86m)	Begin	29.01.2014	20:21	19° 40.60'S	12° 42.98'E
		End	30.01.2014	01:40	19° 43.60'S	12° 42.96'E
0106	CT3_3 (116m)	Begin	30.01.2014	02:21	19° 43.82'S	12° 36.89'E
		End	30.01.2014	02:58	19° 44.10'S	12° 36.89'E
0107	CT3_4 (129m)	Begin	30.01.2014	03:40	19° 44.50'S	12° 31.15'E
		End	30.01.2014	09:52	19° 48.11'S	12° 30.01'E
0108	CT3_5 (152m)	Begin	30.01.2014	10:31	19° 47.84'S	12° 24.85'E
		End	30.01.2014	11:18	19° 48.11'S	12° 24.69'E
0109	CT3_6 (202m)	Begin	30.01.2014	12:02	19° 49.95'S	12° 18.30'E
		End	30.01.2014	13:29	19° 50.29'S	12° 18.10'E
0110	CT3_7 (258m)	Begin	30.01.2014	14:20	19° 55.61'S	12° 13.09'E
		End	30.01.2014	22:23	19° 58.44'S	12° 12.25'E
0111	CT3_8 (287m)	Begin	30.01.2014	22:58	19° 58.96'S	12° 07.74'E
		End	31.01.2014	00:00	19° 59.40'S	12° 07.51'E
0112	CT3_9 (336m)	Begin	31.01.2014	00:47	20° 01.91'S	12° 00.81'E
		End	31.01.2014	02:02	20° 02.29'S	12° 00.61'E
0113	CT3_10 (385m)	Begin	31.01.2014	02:44	20° 04.18'S	11° 54.75'E
		End	31.01.2014	03:38	20° 04.99'S	11° 54.34'E
0114	CT3_11 (482m)	Begin	31.01.2014	04:14	20° 06.24'S	11° 49.22'E
		End	31.01.2014	14:57	20° 08.44'S	11° 48.01'E
0115	CT3_12 (687m)	Begin	31.01.2014	15:46	20° 07.61'S	11° 40.39'E
		End	31.01.2014	16:46	20° 08.01'S	11° 39.92'E
0116	CT3_13 (847m)	Begin	31.01.2014	17:33	20° 09.67'S	11° 32.74'E
		End	01.02.2014	01:25	20° 13.47'S	11° 31.36'E

<i>Stat No.</i>	<i>Stat.Name (Depth)</i>		<i>Date</i>	<i>Time [UTC]</i>	<i>Latitude</i>	<i>Longitude</i>
0117	CT3_14 (969m)	Begin	01.02.2014	03:11	20° 12.22'S	11° 26.64'E
		End	01.02.2014	03:53	20° 12.20'S	11° 26.54'E
0118	CT3_15 (1221m)	Begin	01.02.2014	05:22	20° 12.13'S	11° 10.17'E
		End	01.02.2014	13:44	20° 15.62'S	11° 10.30'E
0119	CT3_16 (1464m)	Begin	01.02.2014	16:00	20° 19.71'S	10° 47.91'E
		End	01.02.2014	23:29	20° 22.20'S	10° 46.94'E
0120	CT1_16 (1401m)	Begin	02.02.2014	01:57	19° 59.43'S	10° 38.13'E
		End	02.02.2014	10:48	20° 03.03'S	10° 37.68'E
0121	CT1_15 (1215m)	Begin	02.02.2014	13:43	19° 51.12'S	11° 02.93'E
		End	02.02.2014	22:58	19° 54.73'S	11° 03.72'E
0122	CT1_14 (1045m)	Begin	03.02.2014	00:20	19° 48.02'S	11° 12.12'E
		End	03.02.2014	02:14	19° 48.51'S	11° 12.31'E
0123	CT1_13 (842m)	Begin	03.02.2014	03:11	19° 45.07'S	11° 20.45'E
		End	03.02.2014	08:48	19° 47.35'S	11° 21.44'E
0124	CT1_12 (718m)	Begin	03.02.2014	12:36	19° 43.48'S	11° 27.31'E
		End	03.02.2014	13:38	19° 43.98'S	11° 27.30'E
0125	CT1_11 (498m)	Begin	03.02.2014	14:28	19° 40.58'S	11° 34.03'E
		End	03.02.2014	17:56	19° 43.26'S	11° 34.45'E
0126	(510m)	Begin	03.02.2014	19:58	19° 58.43'S	11° 42.77'E
		End	04.02.2014	00:46	20° 06.84'S	11° 48.77'E
0127	CT1_11 (481m)	Begin	04.02.2014	04:11	19° 41.28'S	11° 33.99'E
		End	04.02.2014	09:33	19° 44.60'S	11° 36.76'E
0128	(393m)	Begin	04.02.2014	10:35	19° 38.55'S	11° 40.16'E
		End	04.02.2014	11:31	19° 38.96'S	11° 40.55'E
0129	CT1_09 (354m)	Begin	04.02.2014	12:20	19° 36.44'S	11° 46.81'E
		End	04.02.2014	13:45	19° 36.98'S	11° 46.99'E
0130	(293m)	Begin	04.02.2014	14:29	19° 35.06'S	11° 52.70'E
		End	04.02.2014	15:28	19° 35.78'S	11° 52.70'E
0131	CT1_07 (301m)	Begin	04.02.2014	16:31	19° 31.87'S	11° 59.53'S
		End	04.02.2014	23:26	19° 38.10'S	12° 02.08'E
0132	PHY_1 (289m)	Begin	05.02.2014	01:43	19° 17.98'S	11° 55.99'E
		End	05.02.2014	02:21	19° 18.00'S	11° 55.99'E
0133	CT1_06 (248m)	Begin	05.02.2014	04:02	19° 29.26'S	12° 07.11'E
		End	05.02.2014	07:02	19° 31.03'S	12° 08.42'E
0134	CT1_05 (180m)	Begin	05.02.2014	08:01	19° 26.74'S	12° 15.24'E
		End	05.02.2014	08:41	19° 26.90'S	12° 15.29'E
0135	CT1_04 (130m)	Begin	05.02.2014	09:38	19° 22.32'S	12° 21.72'E
		End	05.02.2014	17:32	19° 23.34'S	12° 28.58'E
0137	CT1_02 (82m)	Begin	05.02.2014	18:11	19° 20.97'S	12° 33.27'E
		End	05.02.2014	22:52	19° 23.74'S	12° 34.27'E
0138	CT1_01 (49m)	Begin	05.02.2014	23:43	19° 19.43'S	12° 37.79'E
		End	06.02.2014	02:43	19° 21.56'S	12° 38.65'E
0139	(202m)	Begin	06.02.2014	05:27	19° 43.86'S	12° 18.15'E
		End	06.02.2014	06:00	19° 44.99'S	12° 17.36'E
0140	X_0140 (118m)	Begin	06.02.2014	09:57	19° 59.93'S	12° 44.92'E
		End	06.02.2014	10:49	20° 00.02'S	12° 45.20'E

<i>Stat No.</i>	<i>Stat.Name (Depth)</i>		<i>Date</i>	<i>Time [UTC]</i>	<i>Latitude</i>	<i>Longitude</i>
0141	CT2_03 (123m)	Begin	06.02.2014	13:11	20° 05.42'S	12° 42.77'E
		End	06.02.2014	13:28	20° 05.42'S	12° 42.77'E
0142	LT_01 (491m)	Begin	06.02.2014	17:40	20° 29.27'S	12° 03.36'E
		End	07.02.2014	01:49	20° 34.39'S	12° 03.30'E
0143	CT2_07 (504m)	Begin	07.02.2014	03:32	20° 19.92'S	11° 57.52'E
		End	07.02.2014	06:03	20° 25.73'S	11° 57.54'E
0144	CT3_11 (497m)	Begin	07.02.2014	08:21	20° 06.53'S	11° 48.66'E
		End	07.02.2014	15:48	20° 09.47'S	11° 48.36'E
0145	LT_05 (508m)	Begin	07.02.2014	17:34	19° 53.58'S	11° 40.11'E
		End	08.02.2014	00:02	19° 58.55'S	11° 39.41'E
0146	(518m)	Begin	08.02.2014	03:51	19° 21.60'S	11° 28.78'E
		End	09.02.2014	13:34	20° 52.14'S	12° 19.17'E
0147	M_LTBM (125m)	Begin	10.02.2014	05:40	23° 00.06'S	14° 02.84'E
		End	10.02.2014	07:43	23° 00.96'S	14° 02.69'E
0148	Cocco (265m)	Begin	10.02.2014	12:20	23° 29.99'S	13° 24.01'E
		End	10.02.2014	14:03	23° 30.12'S	13° 23.79'E