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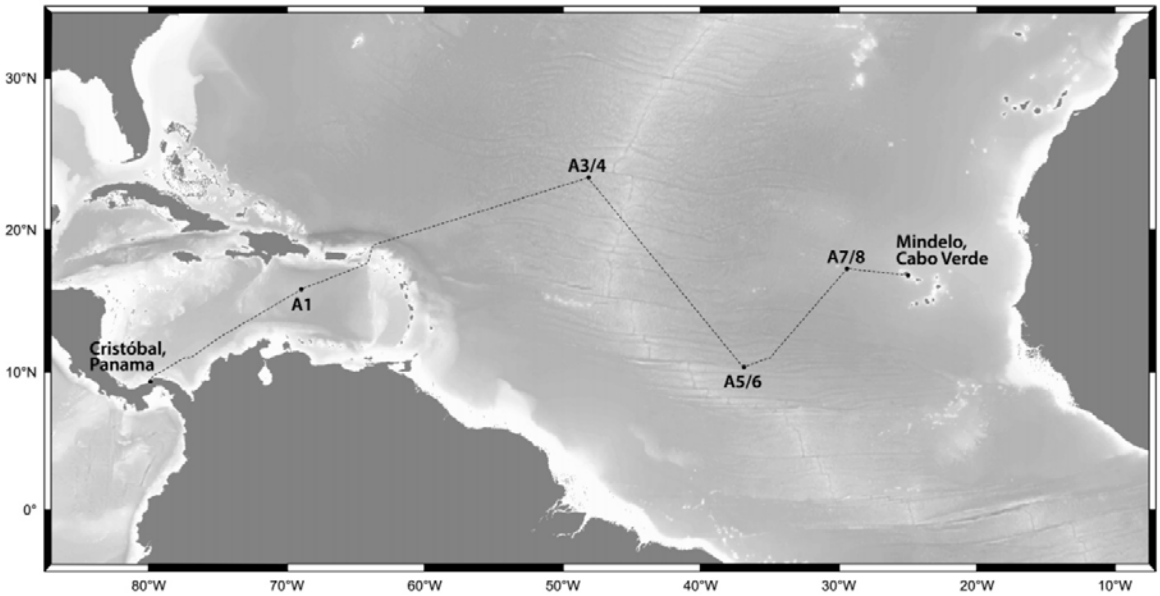
Short Cruise Report
R/V Meteor M139

Cristóbal (Panamá) – Mindelo (Cabo Verde)
July 7 – August 8, 2017

Chief Scientist: Prof. Dr. Hartmut Arndt
Captain: Rainer Hammacher



Track chart of R/V METEOR Cruise M139 (Map: Tatum Herrero, GEOMAR, Kiel).

Objectives

Although the dark ocean represents the largest environment on this planet, microbial life in the deep sea is still a relatively uncharted territory. This is in striking contrast to its potential importance regarding the global carbon flux. Sampling deep-sea microbes (protists and prokaryotes) from different deep-sea basins were planned for an analysis of deep-sea microbial life and trophic interactions. We planned to use a specific water sampler ISMI, the *in-situ* microbial incubator, to analyze deep-sea microbial plankton community structure and activity in non-decompressed samples. Since activity measurements on deep-sea microbial communities are generally made on decompressed samples at surface pressure conditions, we hypothesized that microbial activity measured under *in-situ* pressure conditions would result in a major revision of our perception of deep-sea microbial activity and the relative contribution of the different groups of prokaryotes and protists. Further, it was planned to take sediment samples by means of a multicorer in the different deep-sea basins which allow us to compare the community structure of heterotrophic flagellates, ciliates and rhizopods in deep-sea sediments. We hypothesized that naked protists are much more diverse than the traditionally considered foraminiferans and microbial deep-sea communities are different from those of shallow-water and pelagic habitats. We assumed that grazing pressure by nanoprotists is essential for understanding the fate of heterotrophic prokaryote production. Establishing cultures from deep-sea sediment samples would result in the isolation of deep-sea protists for later evaluation of metabarcoding studies and ecological experiments (pressure, temperature). A further plan was to investigate microbes and fauna associated to floating macroalgae and marine snow to estimate the possible origin and influence on protistan deep-sea communities. To quantify the sedimentation of macroalgae to the deep-sea floor we carried out video-analyses in a short distance from the deep-sea floor (1.5m) with the help of an OFOS-system. We wanted to get more detailed information on the fate and role of hot spots of macroalgal sedimentation for deep-sea ecosystems.

Another important focus of the expedition was the geology of the deep-sea floor in a special region with potential lava flows in the western North Atlantic. The geology of the oceanic crust is virtually unknown and even basic knowledge of bathymetry is missing in most areas. Multibeam bathymetric mapping combined with co-registered acoustic backscatter intensities can radically alter this situation. During the transit Barbados – Mid-Atlantic Ridge during cruise M127 (May 2016), an area of 20 Ma seafloor was crossed which showed high acoustic reflectivity linked to the presence of several small cones, implying the presence of lava flows. Calculations of acoustic attenuation by sediment at the sonar frequencies should be used to identify potential lava flows in the respective region and to determine the thickness of sediment cover for an estimate of the age of the potential lava fields. Visual observations and sampling of the flows at area A3/4 should be carried out to determine their age and composition and map out their full areal extent to estimate the potential magma volumes erupted. If lava flows in the respective region could be detected to be much younger compared to the surrounding old oceanic crust, this would be an exciting result.

In most cases the sampling with the deep-sea incubation system was successful and both microbiologists and protozoologists expect exciting results in their home laboratories. During the cruise, we managed to obtain useful sample material which was deep-frozen for later molecular biological studies. We were able to investigate deep-sea sediment samples directly after sampling for quantification and qualification of living deep-sea protists. Also video-observations of the deep-sea sediments were successful and will be elaborated in future. The geological survey of the target area revealed fascinating new insights into the geology of the earth crust far away from Mid-Atlantic Ridge.

Narrative

The expedition M139 united the projects "DEEP MICROBES" and "BRIGHT FLOWS" and was coordinated by the Institute of Zoology of the University of Cologne (Department of General Ecology). The project “DEEP MICROBES” was carried out in cooperation with the University of Vienna (Department of Limnology and Bio-Oceanography) and the ICBM Oldenburg (Dept. Marine Geochemistry). In addition, the proposal "BRIGHT FLOWS" of the GEOMAR in Kiel (Research Area 4: Dynamics of the Ocean Floor) was integrated into the expedition.

The good preparation of the trip by the captain and his crew in cooperation with the reliable agent in Panama allowed a completely smooth transfer of the containers and the various air freights to R/V Meteor, so that we could leave the port of Bahía las Minas (Panama) towards the territory of the Dominican Republic already in the evening of 7 July (10.15 pm local time). Special thanks goes to the government of the Dominican Republic. They positively responded to our request for a sampling station in their territory within 14 days (!). It should be noted that this expedition could be planned only from 21 May on. The originally planned expedition to the Cariaco Basin in Venezuela had to be cancelled due to the lack of approval by the Venezuelan government which had been requested a long time ago. With the help of IOW's thoughtful technical support, the Engineering (CTD and MUC) and a staff member, all the necessary arrangements for the expedition could be completed just in time. Furthermore, the uncomplicated support by the Senate Commission for Oceanography in Bremen and the *Leitstelle* in Hamburg was very appreciated.

Although we were able to leave the port a bit earlier than planned, we were behind our original schedule due to heavy waves and head wind allowing only a speed of 6-7 knots, so that we reached the first station on Wednesday (12 July). We used the extra time of the longer travel to carry out preparatory experiments and to set up an online blog (Oceanblog) on www.oceanblogs.org/m139 as a public outreach of the cruise. We rescheduled the sampling programme at area A1 and expanded the time for the first sampling area in the Caribbean (Dominican Republic) to compensate for possible weather-related reductions in the program at the Atlantic stations. We had agreed by thanks to consensus of all participants to have three main sampling areas from now on: the first in the Caribbean (A1), the second near the Mid-Atlantic Ridge (area A3/4) and the third area A5/6 at 10 ° 20'N / 36 ° 57'W. In a slight modification of the original program, we planned to carry out the full biological program (3 CTDs, 3 MUCs, 3-4 ISMIs) in all three areas, thereby achieving a comprehensive ecological and geological characterization of the three locations. The transfer time was expected to be enough to complete the wholerequired sample process and experiments on the way between the different areas.

At the first area A1 in Caribbean waters, the samples were taken over a period of 51 hours with daily and nightly missions of the various sampling systems. The multicorer (MUC) system yielded intact sediment cores being fractionated and examined for different size classes of benthic protists. Immediately after sampling, microscopic examination of the upper 2 mm sediment layer allowed the identification of living protists and nematodes. The first living ciliate could be recorded from 4050 m depth. Living single cells were isolated and stored at -80°C for later molecular investigations. In addition, the upper two millimeters of the sediment surface were conserved to identify the microbial community through subsequent metabarcoding studies and to compare with data from other deep-sea expeditions. The cultivation flasks of the supernatant water of the cores and the associated sediment surface were checked for cultivable deep-sea protists. Several monocultures of deep-sea protists have successfully been established. In order to determine the sediment composition, sediment layers of the cores were taken for later granulometric analyzes.

Depending on the photometrically determined chlorophyll *a* - maximum, the CTD rosette sampler was activated at several points in the vertical profile and water samples were taken for viral, bacterial and protist communities. Viruses were precipitated by ferric chloride in surface and deep waters, filtered and preserved for subsequent metagenome analyzes. Second, cultivation of oceanic water via the liquid aliquot method allowed the investigation of marine snow associated protist communities. The *in-situ*-microbial incubator (ISMI) was successfully used by the colleagues of Vienna at depths of 2000 and 3750m to determine the activity of archaea and bacteria under *in situ* conditions. At 3750m depths we carried out first experiments to determine the uptake rate of protists regarding virus-like fluorescent microparticles under *in-situ* conditions. Differences in microbial activity were examined between surface and deep-sea exposures.

Samples of the brown alga *Sargassum natans* were collected from surface waters and were investigated regarding its microbial communities under surface conditions. In addition, isolated protist communities obtained from surface waters were exposed to various hydrostatic pressure conditions with the aid of a high-pressure microscope chamber (up to 500 bar) to study initial evidence for the survival of protists on sedimenting algae mats.

Bathymetric data were collected to determine local seabed morphology showing a surprisingly hilly sediment surface. These bottom structures were characterized by 20m high hills with an approximate diameter of 800m, probably created by landslides of the 100 km away, located southern slope of the Hispaniola landslides (Turbidite), as they clearly cover volcanic elevations.

We reached the next sampling area near the Mid-Atlantic Ridge (area A3/A4) on Thursday night (20 July). This sampling area was both the main area of the BRIGHT FLOWS project and an important sampling area for the biology of the dark ocean. Though we reached working area A3/4 later than expected, the wind and the swell subsided punctually shortly before reaching the station. This was a good prerequisite for the launch of the first device, the OFOS camera system. Already the OFOS pictures in about 4000m depth were spectacular, when the OFOS reached the seabed. For the geologists on board it was already the first confirmation for their assumption that the "Balerion Lava Fields" baptized surfaces must be much younger than the surrounding, old oceanic crust. Two camera tracks were recorded in the area followed by the biological program. The ISMI sampler had again been successfully used at depths of 4000m in order to conduct microbiological investigations *in situ*, such as the determination of the bacterial production and respiration, as well as initial attempts to carry out bacterial consumption by protists. The live investigations of the sediment showed - as expected in this very oligotrophic area - lower abundances of protists compared to the Caribbean stations. After the sampling for biologists, the geological program was continued with the gravity corer to get an indication of the approximate age of the sediments on the lava flows. In addition, stone dredges were used to extract rock samples. The findings from the OFOS observations were clearly supported and the lava fields have to be classified as much younger than the surrounding old oceanic crust. After a final mapping, the expedition continued to area A5/6 on Tuesday evening (25 July).

The transit time from working area A3/4 was intensively used for processing the obtained geological and biological samples on board. At area A5/6, a very extensive work program was carried out again including the use of the OFOS camera system, MUC, CTD, ISMI, and dredge. The third working area corresponded to a sampling area of the VEMA Transit Expedition (SO237) from January 2015, where we had encountered relatively high abundances of the sedimented brown algae *Sargassum*. We were curious whether this was only a seasonal or occasional event and whether we could get better close-ups of the *Sargassum* using the OFOS system. Not only did we find many smaller pieces of *Sargassum*, but we also found all stages of degradation. This was a very important discovery as the supply of organic carbon is usually a major bottleneck in the deep sea. On Wednesday (2 August) we started the transfer to the port in Mindelo.

On our transit to Mindelo, the weather was fine and we used the saved time for a final survey in the vicinity of a not yet studied large seamount system west of Mindelo (area A7/8). With the help of a detailed Parasound mapping and an OFOS dive we were able to study the structure of the seamounts more closely.

During the whole cruise, we had regular science meetings to report on plans and first results of our scientfic work and to discuss details of sampling procedures..

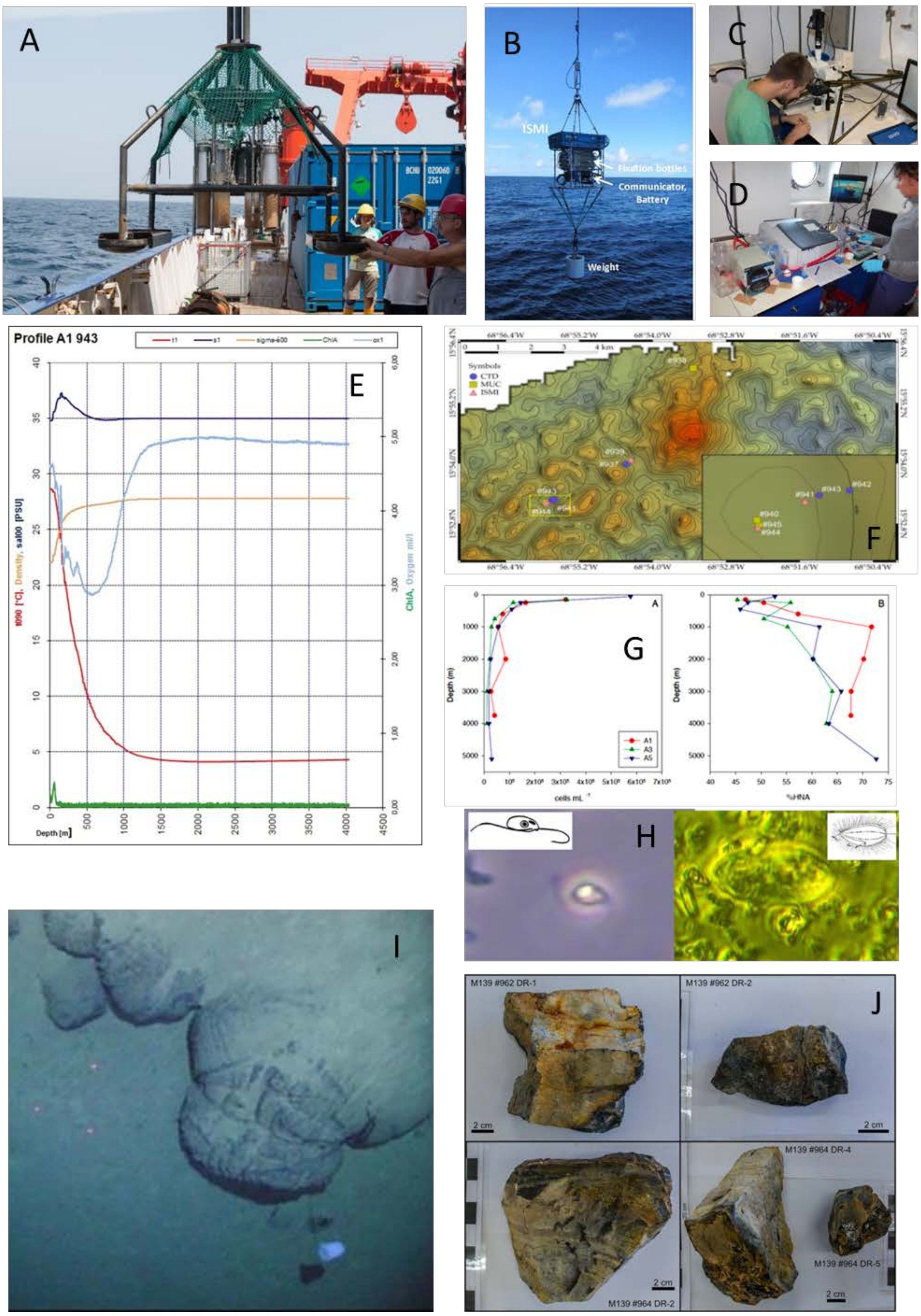


Fig. 1. Impressions of the work and findings during the M139 expedition - A) Multicorer used for sediment sampling, B) ISMI sampler used for microbial studies under in-situ pressure conditions, C) live-ounting of protists, D)lLab experiments, E) typical vertical profile of abiotic parameters at station A1, F) Corresponding Parasound map, G) vertical profile of microbial abundances, H) isolated deep-sea protists, I) lava flows observed with OFOS, J) collected stones from the lava flow area (station A3/4).

Acknowledgements

We had a very successful expedition and we would like to express our thanks to the entire crew under the direction of Captain Rainer Hammacher for their professional and heartfelt support. We thank the crew for all their help during technical difficulties and other urgent requests. The very good preparation of the trip by the captain and his crew in cooperation with the reliable agent in Panama allowed a completely smooth transfer of the containers and the various air freights to R/V Meteor. Furthermore, we especially thank Klaus Jürgens and colleagues at the IOW in Warnemünde, Germany. With the help of IOW's thoughtful technical support, the Engineering (CTD and MUC) and a staff member, all the necessary arrangements for the expedition could be completed just in time. The cruise was financed by German Research Foundation grant MerMet 16-97 (H. Arndt, main user; “Deep-sea microbial food webs of the Atlantic and Caribbean”) and MerMet 17-82 (N. Augustin, C. Devey, secondary users: “Investigation of young non-hotspot and non-MOR related volcanism on 20 Ma crust south of Kane Fracture Zone”). Last but not least, we thank the government of the Dominican Republic for their generous
and fast permission - within two weeks after request - to work in their territorial waters.

List of participants

Name	**Discipline**	**Institution**
1. Prof. Dr. Hartmut Arndt	Marine Biology / Chief Scientist	UoC
2. Dr. Anja Scherwaß	Microfauna	UoC
3. Dr. Alexandra Jeuck	Protozoan Feeding	UoC
4. Alexandra Schoenle, MSc	Nanofauna	UoC
5. Manon Hohlfeld, BSc	Nanofauna	UoC
6. Suzana Živaljić, MSc	Influence of Hydrostatic Pressure	UoC
7. Sabine Schiwitza, BSc	Virus Diversity	UoC
8. Marco Podobnik, BSc	Meiofauna, Public Relations	UoC
9. Claudia Meyer, BSc	Protozoan Feeding	UoC
10. Dennis Prausse, MSc	Oceanography, Deployments	UoC
11. René Meißner	Marine Snow	UoC
12. Benjamin Wildermuth	*Sargassum* Community	UoC
13. Johanna Ahlers	Cultivation of Protists	UoC
14. Yana Feuling	Cultivation of Protists	UoC
15. Johannes Werner, BA	Oceanography, Documentation	UoC
16. Tobias Romankiewicz, MSc	Oceanography, Protist Dynamics	UoC
17. Ingo Schuffenhauer, Dipl.-Ing.	Oceanography, Deployments	IOW
18. Matthias Marx, BSc	Marine Chemistry	ICBM
19. Dr. Chie Amano	Microbiology	UoV
20. Dr. Eva Sintes	Microbiology	UoV
21. Barbara Mähnert, MSc	Microbiology	UoV
22. Julia Stefanschitz, BSc	Microbiology	UoV
23. Gabriela Dangl, BSc	Microbiology	UoV
24. Dr. Nico Augustin	Geology	GEOMAR
25. Dr. Dominik Palgan	Petrology	GEOMAR
26. Tatum Herrero, MSc	Bathymetry	GEOMAR
27. Martin Schade	Bathymetry	UoK
28. Christian Paulmann, Dipl.-Met.	Meteorology	DWD
29. Andreas Raeke	Meteorology	DWD

Institutions:

UoC University of Cologne, Institute for Zoology, Cologne, Germany
UoV University of Vienna, Department of Limnology and Bio-Oceanography, Austria
IOW Leibniz-Institute for Baltic Sea Research Rostock-Warnemünde, Germany
ICBM University of Oldenburg, Institute for Chemistry and Biological of the Marine Environment (ICBM), Marine Geochemistry (ICBM-MPI Bridging Group)
GEOMAR GEOMAR Helmholtz Centre for Ocean Research, Kiel, Germany
UoK University of Kiel, Kiel, Germany
DWD Deutscher Wetterdienst, Geschäftsfeld Seeschifffahrt, Germany

List of stations

Table 1. Station list of the M139 cruise. Data were obtained from either the RV METEOR data sets or by means of the Posidonia (PS). MB=Multibeam, MUC=Multicorer, ISMI=In-situ Microbial Incubator, DRG=Dredge, PS=Parasound, GC=Gravity corer, SCF=Scanfish, OFOS=Ocean Floor Observation System, CTD/RO=Rosette sampler

Station	Area	Date	Time	PositionLat	PositionLon	Depth	Gear	Action
ME1390/937-1	A1	12.07.2017	13:23	15° 53.98'	068° 54.43'	4020	CTD/RO 1	at depth
ME1390/938-1	A1	12.07.2017	16:25	15° 55.98'	068° 53.28'	4004.1	MUC 1	at sea bottom
ME1390/939-1	A1	12.07.2017	18:45	15° 54.01'	068° 54.42'	4019.2	ISMI3750m	
ME1390/940-1	A1	13.07.2017	11:49	15° 53.21'	068° 55.74'	4033.1	MUC 2	at sea bottom
ME1390/941-1	A1	13.07.2017	13:26	15° 53.21'	068° 55.74'	4031.4	ISMI2000m	
ME1390/942-1	A1	14.07.2017	02:27	15° 53.28'	068° 55.60'	4030.4	CTD/RO 2	at depth
ME1390/943-1	A1	14.07.2017	05:06	15° 53.27'	068° 55.65'	4031.9	CTD/RO 3	at depth
ME1390/944-1	A1	14.07.2017	06:49	15° 53.21'	068° 55.74'	4032.2	ISMI3750m	
ME1390/945-1	A1	14.07.2017	13:41	15° 53.21'	068° 55.73'	4035.3	MUC 3	at sea bottom
ME1390/946-1	A3/4	20.07.2017	23:04	23° 31.29'	048° 14.11'	3850.4	MB-PS	Begin Profile
ME1390/946-1	A3/4	21.07.2017	00:06	23° 36.65'	048° 07.12'	3925.5	MB-PS	end of profile
ME1390/947-1	A3/4	21.07.2017	02:31	23° 44.65'	048° 04.97'	3786	OFOS 1	at depth
ME1390/947-1	A3/4	21.07.2017	06:41	23° 43.24'	048° 03.14'	4197.1	OFOS 1	Start Hoisting
ME1390/948-1	A3/4	21.07.2017	10:51	23° 33.69'	048° 08.35'	4006.8	OFOS 2	at depth
ME1390/948-1	A3/4	21.07.2017	16:44	23° 33.23'	048° 05.04'	4474.5	OFOS 2	Start Hoisting
ME1390/949-1	A3/4	21.07.2017	21:07	23° 33.23'	048° 05.04'	4290.1	CTD/RO 1	at depth
ME1390/950-1	A3/4	21.07.2017	22:33	23° 33.23'	048° 05.04'	4507.7	ISMI-RNA4000	
ME1390/951-1	A3/4	22.07.2017	03:28	23° 33.23'	048° 05.04'	4482.4	MUC 1	at sea bottom
ME1390/952-1	A3/4	22.07.2017	05:01	23° 33.23'	048° 05.04'	4484	ISMI 4050m	
ME1390/953-1	A3/4	22.07.2017	12:32	23° 33.23'	048° 05.04'	4281.9	MUC 2	at sea bottom
ME1390/954-1	A3/4	22.07.2017	15:28	23° 33.23'	048° 05.04'	4278.4	CTD/RO 2	at depth
ME1390/955-1	A3/4	22.07.2017	17:04	23° 33.23'	048° 05.04'	4279.6	ISMI4000m	
ME1390/956-1	A3/4	23.07.2017	09:54	23° 33.23'	048° 05.04'	4281.6	CTD/RO 3	at depth
ME1390/957-1	A3/4	23.07.2017	11:30	23° 33.23'	048° 05.04'	4280.8	ISMI2000m	
ME1390/958-1	A3/4	24.07.2017	00:52	23° 33.23'	048° 05.04'	4280.7	MUC 3	at sea bottom
ME1390/959-1	A3/4	24.07.2017	02:15	23° 33.23'	048° 05.04'	4272.8	PS	Begin profile
ME1390/959-1	A3/4	24.07.2017	03:06	23° 32.84'	048° 05.88'	4235.9	PS	End of profile
ME1390/960-1	A3/4	24.07.2017	04:55	23° 32.90'	048° 05.69'	4250.6	GC 1	at sea bottom
ME1390/959-1	A3/4	24.07.2017	06:20	23° 32.90'	048° 05.68'	4347.6	PS	Begin profile
ME1390/959-1	A3/4	24.07.2017	06:50	23° 33.28'	048° 04.90'	4280.4	PS	End of profile
ME1390/961-1	A3/4	24.07.2017	09:11	23° 43.39'	048° 03.71'	4166.4	GC 2	at sea bottom
ME1390/962-1	A3/4	24.07.2017	13:38	23° 44.58'	048° 05.15'	3777.9	DRG 1	start dredging
ME1390/962-1	A3/4	24.07.2017	14:08	23° 44.58'	048° 05.15'	3768.6	DRG 1	stop dredging

ME1390/963-1	**A3/4**	**24.07.2017**	**18:04**	**23° 34.09'**	**048° 08.22'**	**3937.8**	**DRG 2**	**start dredging**
ME1390/963-1	A3/4	24.07.2017	18:22	23° 34.09'	048° 08.22'	3929	DRG 2	stop dredging
ME1390/964-1	A3/4	24.07.2017	23:10	23° 23.42'	047° 55.37'	3756.8	DRG 3	start dredging
ME1390/964-1	A3/4	25.07.2017	00:36	23° 23.42'	047° 55.37'	3769.7	DRG 3	stop dredging
ME1390/965-1	A3/4	25.07.2017	02:17	23° 23.61'	047° 52.90'	4196.3	MB	Begin profile
ME1390/965-1	A3/4	25.07.2017	05:33	23° 23.61'	048° 13.45'	4346.4	MB	alter course
ME1390/965-1	A3/4	25.07.2017	06:31	23° 28.74'	048° 13.90'	4070.4	MB	alter course
ME1390/965-1	A3/4	25.07.2017	09:43	23° 29.11'	047° 54.57'	3816.7	MB	alter course
ME1390/965-1	A3/4	25.07.2017	10:42	23° 34.37'	047° 54.33'	4138.3	MB	alter course
ME1390/966-1	A3/4	25.07.2017	11:30	23° 34.58'	047° 59.02'	3887.8	ScanFish	into the water
ME1390/965-1	A3/4	25.07.2017	13:14	23° 34.55'	048° 09.55'	4124.8	MB	alter course
ME1390/966-1	A3/4	25.07.2017	13:59	23° 37.61'	048° 10.02'	4177.9	SCF	on deck
ME1390/965-1	A3/4	25.07.2017	14:24	23° 39.75'	048° 09.97'	4110.5	MB	alter course
ME1390/965-1	A3/4	25.07.2017	17:24	23° 40.01'	047° 52.41'	4182.5	MB	alter course
ME1390/965-1	A3/4	25.07.2017	18:13	23° 45.01'	047° 52.15'	4209.1	MB	alter course
ME1390/965-1	A3/4	25.07.2017	20:54	23° 45.45'	048° 08.41'	4012.4	MB	End profile
ME1390/967-1	A5/6	30.07.2017	10:27	10° 20.41'	036° 57.74'	5123.9	CTD/RO 1	at depth
ME1390/968-1	A5/6	30.07.2017	14:41	10° 20.37'	036° 58.69'	5091.1	OFOS 1	action
ME1390/968-1	A5/6	30.07.2017	18:51	10° 20.46'	036° 56.65'	5106.8	OFOS	Start Hoisting
ME1390/969-1	A5/6	30.07.2017	20:58	10° 20.40'	036° 57.75'	5123.3	ISMI4000m	
ME1390/970-1	A5/6	31.07.2017	13:26	10° 19.99'	036° 56.99'	5093.8	CTD/RO 2	at depth
ME1390/971-1	A5/6	31.07.2017	17:51	10° 20.36'	036° 58.71'	5379.6	DRG 1	start dredging
ME1390/971-1	A5/6	31.07.2017	18:28	10° 20.37'	036° 58.71'	5094.5	DRG 1	
ME1390/972-1	A5/6	31.07.2017	21:02	10° 20.37'	036° 57.73'	5119.7	CTD/RO 3	at depth
ME1390/973-1	A5/6	31.07.2017	21:49	10° 20.37'	036° 57.73'	5121.8	ISMI3000m	
ME1390/974-1	A5/6	01.08.2017	13:43	10° 20.36'	036° 58.71'	5739.1	DRG 2	start dredging
ME1390/974-1	A5/6	01.08.2017	14:32	10° 20.36'	036° 58.71'	5088.5	DRG 2	stop dredging
ME1390/975-1	A5/6	01.08.2017	16:33	10° 20.38'	036° 57.74'	5120.5	ISMI450m	
ME1390/976-1	A5/6	02.08.2017	01:46	10° 20.42'	036° 57.46'	5122.2	DRG 2	start dredging
ME1390/976-1	A5/6	02.08.2017	02:49	10° 20.42'	036° 57.45'	5124.8	DRG 2	stop dredging
ME1390/977-1	A5/6	02.08.2017	07:09	10° 20.38'	036° 57.76'	5121.7	MUC 1	at sea bottom
ME1390/978-1	A5/6	02.08.2017	10:14	10° 20.38'	036° 57.76'	5121.8	MUC 2	at sea bottom
ME1390/979-1	A5/6	02.08.2017	13:34	10° 20.38'	036° 57.77'	5121.6	MUC 3	at sea bottom
ME1390/980-1	A5/6	02.08.2017	16:42	10° 20.38'	036° 57.78'	5121.5	MUC 4	at sea bottom
ME1390/981-1	A5/6	02.08.2017	18:24	10° 20.39'	036° 57.77'	5121.5	ISMI4000m	
ME1390/982-1	A7/8	05.08.2017	20:30	17° 09.92'	029° 33.06'	4749.1	MB-PS	Begin Profile
ME1390/982-1	A7/8	06.08.2017	05:00	17° 21.29'	029° 24.68'	3515.5	MB-PS	end of profile
ME1390/983-1	A7/8	06.08.2017	13:14	17° 16.28'	029° 26.32'	1354.8	OFOS 1	surface
ME1390/983-1	A7/8	06.08.2017	21:43	17° 18.91'	029° 23.45'	3218	OFOS 1	Start Hoisting