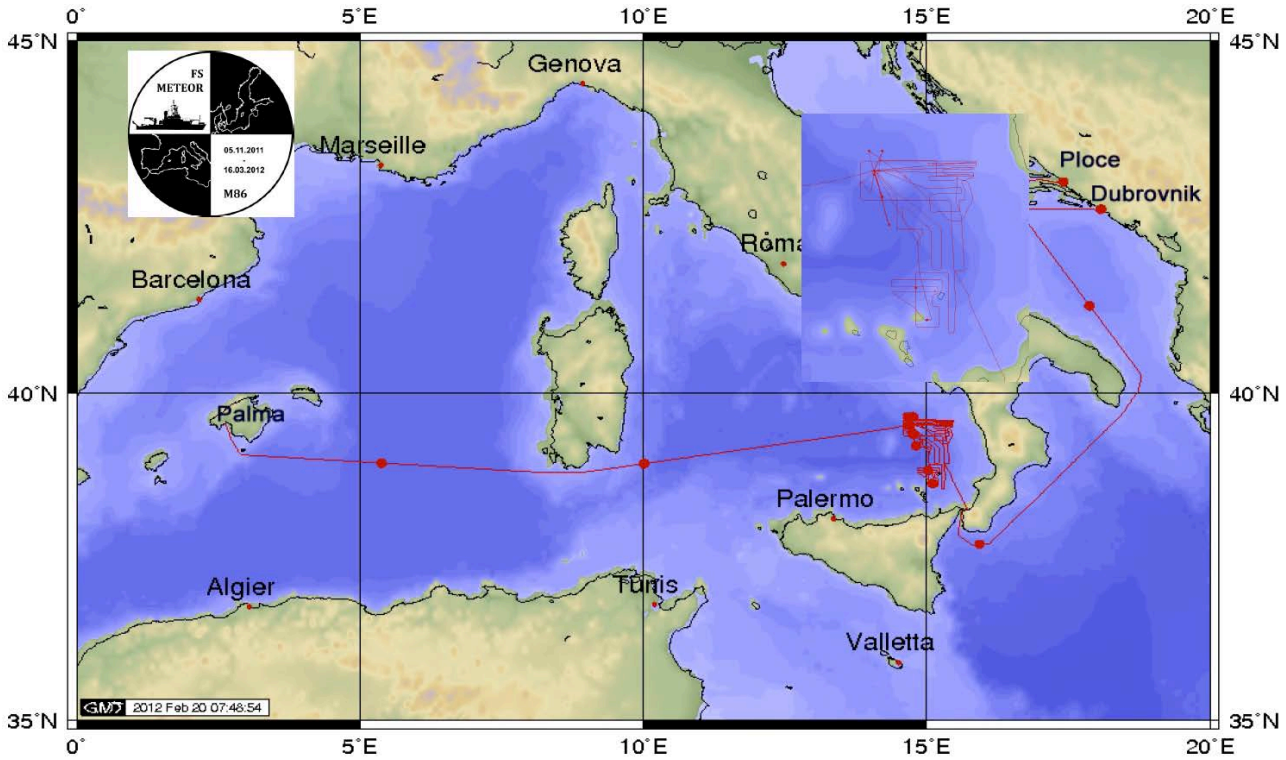
Sven Petersen
Helmholtz-Zentrum für Ozeanforschung Kiel
GEOMAR
Wischhofstr. 1-3
24148 Kiel
Tel.: +49-431-600-2110
Fax: +49-431-600-2924
email: spetersen@geomar.de

Short Cruise Report
RV METEOR Cruise M86/4

Dubrovnik – Palma de Mallorca
06. February – 20. February 2012
Chief Scientist: Sven Petersen
Captain: Stefan Schwarze



Ship track and close-up of the working area north of Sicily

Objectives

This leg was shifted from a Poseidon cruise in the spring 2011 to Meteor in 2012 because of the participation of GEOMAR's autonomous underwater vehicle (AUV) "Abyss" in the search for the lost Air France flight AF447 in the previous year. The investigation of submarine hydrothermal systems in the Tyrrhenian Sea is generally aimed at a better understanding of the formation of submarine mineral deposits in island arcs where the shallow water depth (usually < 1000 m) and the influence of the subducting plate result in enrichments of gases, precious metals as well as abundant toxic elements at the seafloor. These enrichments make such sites interesting from an economic geology point of view, but also because of the geogene input of toxic metals into the marine environment. During cruise M86/4 we aimed at investigating the geological setting of two known hydrothermal deposits (Palinuro and Panarea) in the Tyrrhenian Sea in high-resolution in order to answer questions related to the lateral and vertical extent of the partially sediment-covered mineralization as well as to the structural and physico-chemical controls of the venting and its associated faunal communities. Additionally, chemical sensors were to be used to investigate the water column for signs of hydrothermal activity in areas not previously investigated. The study is continuing previous geological, geochemical, and biological work at these sites in the past couple of years using remotely operated vehicles (ROV's) and lander-type mobile drilling platforms during Poseidon cruises P340 and P412 as well as Meteor cruise M73/2.

Cruise RV Meteor M86/4 aimed at answering the following questions:

- What geological structures host hydrothermal activity and its associated faunal communities at the two working sites?
- How widespread are faunal communities at Palinuro, and do they differ from those currently known?
- Is magmatic-hydrothermal activity at Palinuro focused on the western part or is there evidence for such activity in the underexplored eastern part of the volcano?
- How far does the known mineralization at Palinuro extent horizontally and vertically beneath the sediment cover and is the sediment thickness increasing away from the center of mineralization?
- What is the influence of ascending hot fluids and magmatic gases (SO_2, CO_2) on the chemical and sulfur-isotopic composition of the pore water?
- What is the influence of secondary microbial processes within the overlying sediments on the magmatic dominated sulfur cycle?
- What dimensions did gas eruptions in the vicinity of the Panarea islets have in the past and are such eruptions a future geohazard?

Due to the late arrival of the AUV "ABYSS" in Europe from a previous cruise in the western Pacific the AUV was not available for the cruise. This drastically affected the planned research. Instead of high-resolution AUV surveys, we used gravity coring along several transects over and beyond the mineralized area in order to sample the vertical extent of seafloor mineralization at Palinuro and to investigate the chemical variability of the overlying sediment. The influence of magmatic degassing and microbial processes on pore water chemistry and its sulfur isotopic composition will be investigated on-shore using sediment with and without hydrothermal influence. Additionally, water column samples have been collected by standard CTD-multirosette for analyzing the stoichiogenomics of microbial communities in seawater in order to trace the limiting affect of nitrogen on the genetic material of marine microbial communities along a water depth gradient. This program was complemented by an extensive ship-based bathymetric mapping survey adding to the previously chartered parts of the Aeolian Island Arc.

Narrative

All scientific personnel arrived in Dubrovnik on February 05th and embarked the ship on the following morning. Dismantling the seismic equipment from the previous cruise continued during the day. A safety meeting was held at 14:20 UTC in the afternoon. R/V Meteor cruise M86/4 started at 17:00 UTC on February 06, 2012, when the vessel left the port of Dubrovnik (Croatia). Meteor headed for Ploce, the large container port north of Dubrovnik, in order to unload the scientific containers from the previous legs. We arrived at 07:00 UTC in the morning of February 07 at the pilot station, but were informed that we could not get into the harbor before afternoon. A scientific meeting was held in the afternoon. RV Meteor left Ploce at 19:45 UTC and started its transit to the Street of Messina where we arrived on February 09, at 16:00 (UTC). During the transit a pressure low provided gusty winds and moderate waves. The transit time was used to set up the labs, to discuss the working plans of the various groups and for talks by various scientists on their latest research. R/V Meteor reached the working area shortly after 19:30 (UTC) on February 09. The scientific program started at 19:47 (UTC) with a sound velocity profile (267SVP) that was acquired prior to starting a bathymetric survey in the eastern part of the working area (268MB) using the Kongsberg EM122 multibeam system. Mapping continued until the next morning (February 10) when a CTD/Multirosette was deployed southwest of Palinuro in order to sample surface, mid-water and bottom water for a metagenomic study and for associated nutrients and nitrogen analyses (269CTD). A first gravity corer station was targeted at the known area of hydrothermal activity near the western summit of Palinuro (270GC) and recovered 3 m of sediment intercalated with porous sulfide layers and abundant native sulfur. The sediment temperature measured on deck reached 58°C at the base of the core and indicates hydrothermal upflow in this area. Bathymetric mapping was conducted during the night despite heavy winds (8-9 Bft) and extended the coverage further to the N and NE of the Palinuro volcanic complex (271MB).

On February 11, two gravity corer stations (272GC and 273GC) were aimed at sampling the western limit of the hydrothermal activity at Palinuro with core 273GC recovering a full load of sediment. The temperature of 27°C at the bottom of the core indicated that this area is only weakly influenced by hydrothermal upflow. Station 274CTD collected a second water column profile to the south of Palinuro including additional samples from bottom water, mid-water, and surface water for metagenomic studies of microbial communities. Another gravity core (275GC) was deployed along the western flank of the mineralized summit, in an area where a previous dredge in 2006 recovered sulfidic material. The corer recovered homogeneous pelagic sediment. The nighttime was spent mapping the eastern extension of the Palinuro volcanic complex as well as Glabro Seamount in high-resolution (station 276MB).

The next two days (February 12 and 13) were used for sampling a series of gravity corer and CTD stations extending the survey area. Gravity corers were taken either within the mineralized area (277GC, 285GC) or at selected promising targets to the east (279GC, 282GC). Water samples for nutrients and metagenomic studies were collected to the NE

(278CTD) and NW of the western summit of Palinuro (283CTD). The western summit of Palinuro hosting the known mineralization was mapped in high-resolution (10m) using the EM710 shallow water system (280MB). Mapping was continued during the night and included mapping the area between Glabro, Alcioni and Lamentini Seamounts (281MB) as well as extending the survey area to the south of Palinuro (286MB).

The first gravity corer on February 14 recovered hot sediments with sulfide crusts and native sulfur to the north of the hydrothermal active area at Palinuro (41°C; 287GC) and was supposed to be followed by a CTD cast in the Marsili Basin. Due to an instrument failure, the station was repeated (290CTD). A second gravity corer probed the western extension of the mineralized area and recovered sulfide crusts but lacked the H_2S-smell and the presence of native sulfur seen in previous cores (291GC). The night was spent mapping the southeastern part of Marsili Basin (292MB) with a break for unwinding the cable on winch W3 due to the observed spin in the cable affecting CTD-work. Mapping continued while we moved to our second working area near Panarea.

In the morning of February 15 we approached the Central Islets of Panarea from the east and used the EM710/EM122 echosounding to map the distribution of gas venting to the north of Lisca Bianca on a single transect to obtain at least some information on the extent of gas venting in the area (293MB), a task that would have been far better suited for the AUV “Abyss”. Two gravity cores were taken in a channel-like depression and recovered full loads of sediment (stations 294GC and 296GC) for pore water chemistry and sedimentology. Further mapping of gas venting between the cores and while leaving the central islets of Panarea at slow ship speed obtained water-column data from the echosounding systems (295MB, 297MB). Strong winds prevented further gravity coring close to the islands. Therefore we used station 298CTD to collect a water column profile to the west of Castore Seamount for metagenomic studies in respect to environmental nutrient limitations.

Nighttime was used for mapping the area around Stromboli (299MB) and on February 16 we deployed a final water column station to the east of Castore Seamount for the metagenomic study (300CTD). Due to the strong winds in the south we extended the bathymetric map of the eastern part of Marsili Basin and worked our way back to the north (301MB) where we sampled the crater documented within Glabro Volcano using the gravity corer (302GC) recovering background pelagic sediment. This station was followed by mapping of the northern extension of the Palinuro volcanic complex (303MB) and a final gravity corer station testing the southern extent of hydrothermal activity at the western summit of Palinuro (304GC).

Station work ended at 14:20 on February 17, 2012. During the transit to Palma de Mallorca the cable on winch W3 was again unspooled in order to establish its use during the next cruise leg.

RV Meteor arrived in Palma de Mallorca in the morning of February 20, 2012. All equipment from M86/4 stayed on the vessel for the next Leg.

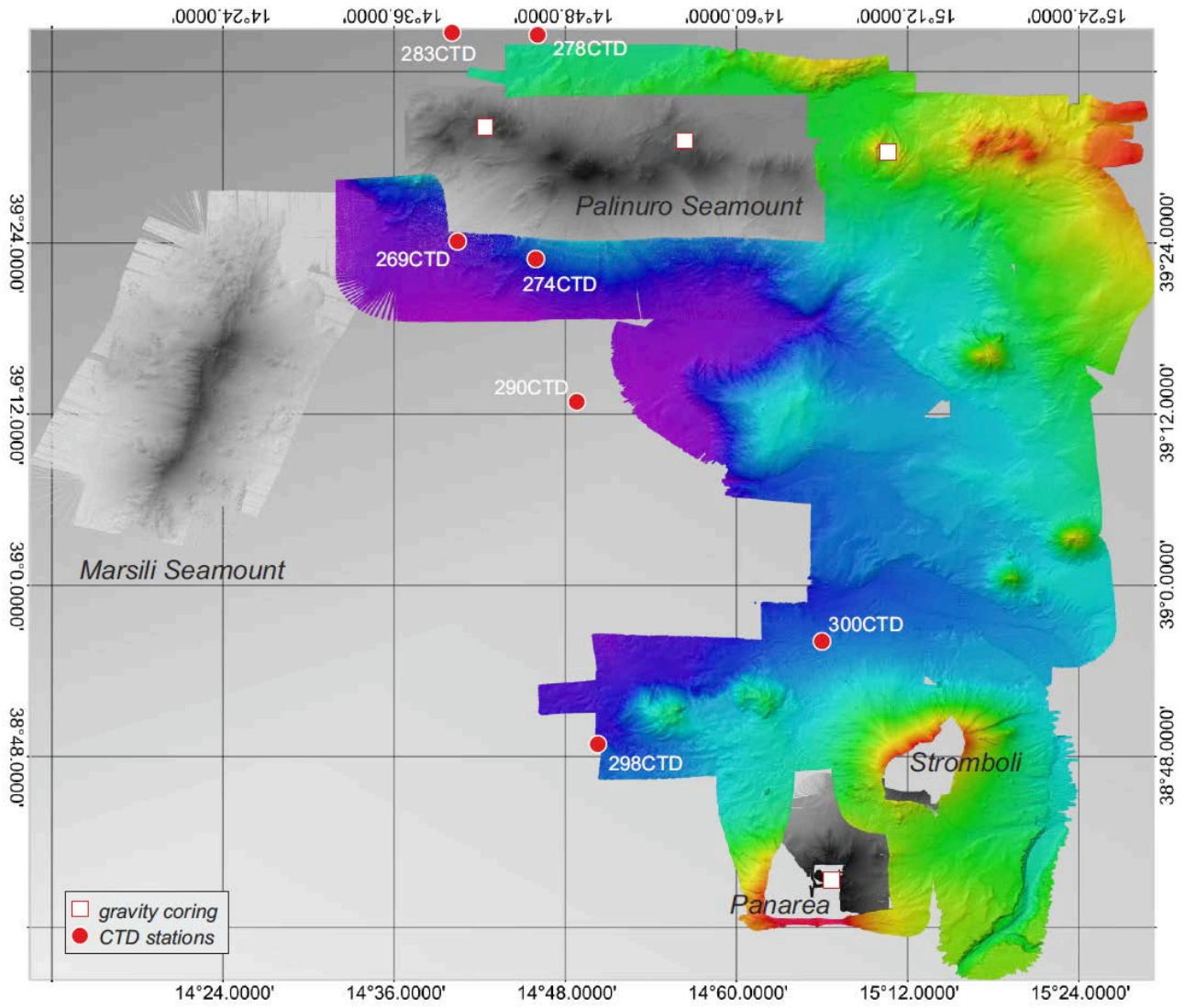


Fig. 2: Map of new bathymetry obtained during cruise M86/4 in the eastern part of the Aeolian Island Arc with location of CTD stations as well as areas where gravity corer stations were deployed. Bathymetry obtained during earlier cruise is grey shaded (Meteor cruise M73/2 in 2007).

Acknowledgements

We like to thank Captain Stefan Schwarze, his officers and crew of RV Meteor for their support of our measurement programme and for creating a very friendly atmosphere on board.

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Participants

Name		Institution
Dr. Sven Petersen	Chief scientist	GEOMAR
Dr. Nico Augustin	Bathymetry	GEOMAR
Kathrin Wegmann	Bathymetry	GEOMAR
Dr. Dieter Garbe-Schönberg	Geochemistry	CAU Kiel
Bettina Berg	Geochemistry	CAU Kiel
Xue-Gang Chen	Geochemistry	CAU Kiel
Prof. Dr. Harald Strauss	Sulfur geochemistry	IGP Münster
Maximilian Halama	Sulfur geochemistry	IGP Münster
Prof. Dr. Claudia Acquisti	Microbiology	IEB Münster
Dimitri Meier	Microbiology	GAU Göttingen
Christian Breuer	Geochemistry	GeoB/MARUM
Paul-Jasper Sahr	Geochemistry	GeoB
Dr. Peter Crowhurst	Structural geology	Nautilus
Juliane Hempel	Meteorology	DWD
Andreas Raecke	Meteorology/technician	DWD

CAU Kiel
Christian-Albrechts Universität zu Kiel
Institut für Geowissenschaften
Christian-Albrechts-Platz 4
24118 Kiel, Germany

DWD
Deutscher Wetterdienst
Bernhard-Nocht-Straße 76
20359 Hamburg, Germany

GAU Göttingen
Georg-August Universität Göttingen
Institut für Mikrobiologie und Genetik
Grisebachstraße 8
37077 Göttingen, Germany

GeoB
Fachbereich 5 - Geowissenschaften
Universität Bremen
Klagenfurter Straße
28359 Bremen, Germany

GEOMAR
Helmholtz-Zentrum für Ozeanforschung
Kiel
Wischhofstr. 1-3
24148 Kiel, German

IEB Münster
Institut für Evolution und Biodiversität
Westfälische Wilhelms-Universität Münster
Hüfferstraße 1
48149 Münster, Germany

IGP Münster
Institut für Geologie und Paläontologie,
Westfälische Wilhelms-Universität Münster
Corrensstraße 24
48149 Münster, Germany

MARUM - Zentrum für Marine
Umweltwissenschaften
der Universität Bremen
Leobener Str.
28359 Bremen, Germany

Nautilus
Nautilus Minerals Inc.
303 Coronation Drive
Milton, Queensland, Australia 4064

Stationsliste

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Wind [m/s]	Course [°]	Speed [kn]	Gear	Gear Abbrev.	Action
ME864/267	09.02.12	19:46	38°56.98'N	15°19.03'E	2446	NW 8	5	0.2	Sound Velocity Profiler	SVP	to water
ME864/267	09.02.12	20:35	38°56.98'N	15°19.03'E	2446	N 2	205	0	Sound Velocity Profiler	SVP	at depth
ME864/267	09.02.12	21:18	38°56.98'N	15°19.03'E	2446	NW 4	0	0	Sound Velocity Profiler	SVP	on deck
ME864/268	09.02.12	21:46	38°56.98'N	15°19.03'E	2484	WNW 3	90	0	Multibeam-Profil	MB	Begin Profile
ME864/268	10.02.12	01:57	39°21.63'N	15°17.38'E	1901	WNW 4	333	5.7	Multibeam-Profil	MB	alter course
ME864/268	10.02.12	07:13	39°21.80'N	14°36.35'E	3195	SSW 7	272	6	Multibeam-Profil	MB	alter course
ME864/268	10.02.12	08:19	39°28.35'N	14°36.00'E	2590	S 9	3	5.9	Multibeam-Profil	MB	end of profile
ME864/269	10.02.12	09:05	39°24.05'N	14°40.47'E	2972	SSW 13	170	0	CTD/rosette water sampler	CTD/RO	surface
ME864/269	10.02.12	10:08	39°24.00'N	14°40.51'E	2988	SSE 8	354	0	CTD/rosette water sampler	CTD/RO	at depth
ME864/269	10.02.12	11:18	39°24.00'N	14°40.51'E	2986	S 10	198	0	CTD/rosette water sampler	CTD/RO	on deck
ME864/270	10.02.12	12:42	39°32.40'N	14°42.39'E	633	SSW 10	90	0.1	Gravity corer	GC	surface
ME864/270	10.02.12	13:21	39°32.40'N	14°42.39'E	633	SSW 11	0	0	Gravity corer	GC	at sea bottom
ME864/270	10.02.12	13:22	39°32.40'N	14°42.39'E	633	SSW 10	0	0	Gravity corer	GC	off ground hoisting
ME864/270	10.02.12	13:42	39°32.40'N	14°42.39'E	634	SW 14	218	-0.1	Gravity corer	GC	on deck
ME864/271	10.02.12	15:16	39°27.94'N	14°36.00'E	2781	SW 19	356	6.2	Multibeam-Profil	MB	Begin Profile
ME864/271	10.02.12	16:36	39°35.83'N	14°36.19'E	2058	SW 18	86	4.3	Multibeam-Profil	MB	alter course
ME864/271	10.02.12	23:17	39°35.80'N	15°28.90'E	379	WSW 12	93	5.4	Multibeam-Profil	MB	alter course
ME864/271	11.02.12	02:01	39°34.79'N	15°06.99'E	1572	W 8	181	6.5	Multibeam-Profil	MB	alter course
ME864/271	11.02.12	05:06	39°34.02'N	15°28.79'E	350	SW 5	87	6	Multibeam-Profil	MB	alter course
ME864/271	11.02.12	05:33	39°35.32'N	15°26.76'E	863	SW 5	263	10.4	Multibeam-Profil	MB	end of profile
ME864/272	11.02.12	09:03	39°32.42'N	14°42.40'E	638	WSW 14	118	0.3	Gravity corer	GC	surface
ME864/272	11.02.12	09:27	39°32.40'N	14°42.37'E	630	WSW 8	262	-0.1	Gravity corer	GC	at sea bottom
ME864/272	11.02.12	09:27	39°32.40'N	14°42.37'E	630	WSW 8	262	-0.1	Gravity corer	GC	off ground hoisting
ME864/272	11.02.12	09:45	39°32.40'N	14°42.37'E	630	WSW 10	18	0.1	Gravity corer	GC	Surface
ME864/272	11.02.12	09:48	39°32.40'N	14°42.37'E	628	WSW 8	354	0.1	Gravity corer	GC	on deck
ME864/273	11.02.12	09:57	39°32.39'N	14°42.37'E	628	W 8	336	0.1	Gravity corer	GC	surface
ME864/273	11.02.12	10:17	39°32.40'N	14°42.37'E	629	W 6	219	-0.1	Gravity corer	GC	at sea bottom
ME864/273	11.02.12	10:17	39°32.40'N	14°42.37'E	629	W 6	219	-0.1	Gravity corer	GC	off ground hoisting
ME864/273	11.02.12	10:35	39°32.39'N	14°42.37'E	629	WSW 6	52	0	Gravity corer	GC	Surface
ME864/273	11.02.12	10:37	39°32.39'N	14°42.37'E	628	WSW 6	32	0	Gravity corer	GC	on deck
ME864/274	11.02.12	11:48	39°23.00'N	14°45.99'E	2703	SW 6	82	-0.2	CTD	CTD	surface
ME864/274	11.02.12	12:43	39°23.00'N	14°46.00'E	2701	SSW 4	348	-0.2	CTD	CTD	at depth
ME864/274	11.02.12	13:39	39°23.00'N	14°46.00'E	2703	WSW 9	358	0.4	CTD	CTD	on deck
ME864/275	11.02.12	14:55	39°32.20'N	14°41.97'E	707	SW 7	319	0	Gravity corer	GC	surface

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Wind [m/s]	Course [°]	Speed [kn]	Gear	Gear Abbrev.	Action
ME864/275	11.02.12	14:59	39°32.20'N	14°41.95'E	717	WSW 8	206	0.1	Gravity corer	GC	information
ME864/275	11.02.12	15:17	39°32.19'N	14°41.94'E	724	SW 3	169	0.1	Gravity corer	GC	at sea bottom
ME864/275	11.02.12	15:38	39°32.19'N	14°41.94'E	722	SSW 6	199	-0.2	Gravity corer	GC	on deck
ME864/276	11.02.12	17:31	39°31.68'N	15°07.53'E	1596	SW 7	93	6.2	Multibeam-Profil	MB	Begin profile
ME864/276	11.02.12	20:05	39°31.68'N	15°27.72'E	493	WNW 5	92	6.2	Multibeam-Profil	MB	alter course
ME864/276	11.02.12	20:19	39°30.40'N	15°27.86'E	269	WNW 6	181	6.2	Multibeam-Profil	MB	alter course
ME864/276	11.02.12	22:58	39°30.22'N	15°07.58'E	1547	SE 7	262	5.7	Multibeam-Profil	MB	alter course
ME864/276	11.02.12	23:14	39°28.84'N	15°07.50'E	1601	ESE 8	157	5.2	Multibeam-Profil	MB	alter course
ME864/276	12.02.12	00:48	39°28.88'N	15°19.56'E	893	SE 5	45	5.7	Multibeam-Profil	MB	Information
ME864/276	12.02.12	04:00	39°31.90'N	15°13.55'E	1135	WNW 6	1	7	Multibeam-Profil	MB	alter course
ME864/276	12.02.12	04:09	39°32.85'N	15°13.98'E	1212	NNW 2	94	6.1	Multibeam-Profil	MB	alter course
ME864/276	12.02.12	06:00	39°33.30'N	15°28.37'E	256	NW 5	350	7.3	Multibeam-Profil	MB	alter course
ME864/276	12.02.12	06:35	39°33.42'N	15°24.05'E	979	NNE 9	272	6	Multibeam-Profil	MB	End profile
ME864/277	12.02.12	09:30	39°32.40'N	14°42.42'E	638	SSE 7	188	-0.1	Gravity corer	GC	surface
ME864/277	12.02.12	09:50	39°32.40'N	14°42.41'E	638	SE 8	266	0	Gravity corer	GC	at sea bottom
ME864/277	12.02.12	09:50	39°32.40'N	14°42.41'E	638	SE 8	266	0	Gravity corer	GC	off ground hoisting
ME864/277	12.02.12	10:09	39°32.40'N	14°42.41'E	637	S 6	145	0	Gravity corer	GC	on deck
ME864/278	12.02.12	11:05	39°39.02'N	14°46.02'E	1901	SSW 9	175	0.2	CTD	CTD	surface
ME864/278	12.02.12	12:00	39°39.00'N	14°46.01'E	1899	S 8	183	0.1	CTD	CTD	at depth
ME864/278	12.02.12	12:46	39°39.00'N	14°46.01'E	1902	WNW 3	212	0	CTD	CTD	on deck
ME864/279	12.02.12	13:44	39°31.40'N	14°43.86'E	885	W 9	191	-0.1	Gravity corer	GC	surface
ME864/279	12.02.12	14:09	39°31.39'N	14°43.84'E	1721	WNW 6	0	-0.1	Gravity corer	GC	at sea bottom
ME864/279	12.02.12	14:10	39°31.39'N	14°43.84'E	889	WNW 6	0	0	Gravity corer	GC	off ground hoisting
ME864/279	12.02.12	14:32	39°31.39'N	14°43.84'E	888	W 6	328	0	Gravity corer	GC	on deck
ME864/280	12.02.12	14:54	39°32.07'N	14°44.30'E	975	W 6	282	2.1	Multibeam-Profil	MB	Begin Profile
ME864/280	12.02.12	15:40	39°32.54'N	14°41.32'E	922	WNW 5	92	4.2	Multibeam-Profil	MB	alter course
ME864/280	12.02.12	16:13	39°32.54'N	14°44.44'E	1062	W 5	91	5.5	Multibeam-Profil	MB	end of profile
ME864/281	12.02.12	17:47	39°26.06'N	15°07.23'E	1858	WNW 6	88	6	Multibeam-Profil	MB	Begin profile
ME864/281	12.02.12	19:39	39°26.40'N	15°22.11'E	1221	WNW 5	88	6.2	Multibeam-Profil	MB	alter course
ME864/281	12.02.12	20:00	39°24.46'N	15°22.36'E	1180	WNW 7	178	5.9	Multibeam-Profil	MB	alter course
ME864/281	12.02.12	21:52	39°23.96'N	15°08.02'E	2045	SW 6	264	6	Multibeam-Profil	MB	alter course
ME864/281	12.02.12	22:54	39°17.76'N	15°08.02'E	2641	WNW 6	179	6.4	Multibeam-Profil	MB	alter course
ME864/281	13.02.12	00:39	39°17.94'N	15°21.45'E	1590	WNW 9	88	6.3	Multibeam-Profil	MB	alter course
ME864/281	13.02.12	01:18	39°21.60'N	15°21.29'E	1474	WNW 12	359	6	Multibeam-Profil	MB	alter course
ME864/281	13.02.12	01:40	39°21.85'N	15°23.90'E	1274	WNW 10	89	5.8	Multibeam-Profil	MB	alter course
ME864/281	13.02.12	02:22	39°25.76'N	15°24.05'E	975	ENE 5	358	6.3	Multibeam-Profil	MB	Information
ME864/281	13.02.12	06:06	39°14.37'N	15°19.83'E	1981	E 1	273	6.7	Multibeam-Profil	MB	End profile
ME864/282	13.02.12	08:18	39°30.61'N	14°56.29'E	800	WSW 7	0	-0.1	Gravity corer	GC	surface

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Wind [m/s]	Course [°]	Speed [kn]	Gear	Gear Abbrev.	Action
ME864/282	13.02.12	08:43	39°30.59'N	14°56.29'E	802	WSW 7	263	0	Gravity corer	GC	at sea bottom
ME864/282	13.02.12	08:43	39°30.59'N	14°56.29'E	802	WSW 7	263	0	Gravity corer	GC	off ground hoisting
ME864/282	13.02.12	09:05	39°30.59'N	14°56.29'E	801	WNW 5	281	0	Gravity corer	GC	on deck
ME864/283	13.02.12	11:47	39°39.06'N	14°40.10'E	1987	NW 4	139	-0.3	CTD	CTD	surface
ME864/283	13.02.12	12:30	39°39.00'N	14°40.01'E	1991	WNW 6	120	0	CTD	CTD	at depth
ME864/283	13.02.12	13:24	39°39.00'N	14°40.01'E	1991	W 10	0	0	CTD	CTD	on deck
ME864/284	13.02.12	14:21	39°31.42'N	14°42.42'E	1121	NNW 6	28	0.1	Gravity corer	GC	surface
ME864/284	13.02.12	14:30	39°31.43'N	14°42.40'E	1123	NW 6	333	1.3	Gravity corer	GC	information
ME864/284	13.02.12	14:31	39°31.46'N	14°42.40'E	1101	NW 6	10	2.3	Gravity corer	GC	on deck
ME864/285	13.02.12	14:46	39°32.43'N	14°42.42'E	638	NW 4	36	0.4	Gravity corer	GC	surface
ME864/285	13.02.12	15:06	39°32.41'N	14°42.37'E	627	WNW 4	0	0	Gravity corer	GC	at sea bottom
ME864/285	13.02.12	15:29	39°32.41'N	14°42.36'E	625	NNW 4	135	0	Gravity corer	GC	on deck
ME864/286	13.02.12	17:17	39°19.17'N	15°02.00'E	3073	N 2	130	6	Multibeam-Profil	MB	Begin profile
ME864/286	13.02.12	19:08	39°11.81'N	15°12.97'E	2358	SSE 4	136	6.1	Multibeam-Profil	MB	alter course
ME864/286	13.02.12	21:34	38°57.05'N	15°13.07'E	2581	SE 6	181	5.9	Multibeam-Profil	MB	alter course
ME864/286	13.02.12	21:58	38°56.90'N	15°10.21'E	2545	SW 8	270	5.7	Multibeam-Profil	MB	alter course
ME864/286	13.02.12	22:14	38°57.80'N	15°08.78'E	2661	SW 10	347	6.3	Multibeam-Profil	MB	alter course
ME864/286	14.02.12	00:24	39°10.91'N	15°08.52'E	2357	S 11	354	6.1	Multibeam-Profil	MB	alter course
ME864/286	14.02.12	01:08	39°13.05'N	15°05.88'E	2251	N 8	127	5.1	Multibeam-Profil	MB	Information
ME864/286	14.02.12	03:12	39°19.14'N	14°56.93'E	3159	WNW 2	275	5.7	Multibeam-Profil	MB	alter course
ME864/286	14.02.12	03:36	39°18.65'N	14°54.40'E	3123	WSW 3	128	6	Multibeam-Profil	MB	alter course
ME864/286	14.02.12	06:14	39°06.25'N	15°02.60'E	2732	WSW 7	322	11.3	Multibeam-Profil	MB	End profile
ME864/287	14.02.12	09:25	39°32.44'N	14°42.38'E	623	NW 6	0	0	Gravity corer	GC	surface
ME864/287	14.02.12	09:46	39°32.44'N	14°42.38'E	622	NNW 7	320	0	Gravity corer	GC	at sea bottom
ME864/287	14.02.12	09:46	39°32.44'N	14°42.38'E	622	NNW 7	320	0	Gravity corer	GC	off ground hoisting
ME864/287	14.02.12	10:03	39°32.44'N	14°42.38'E	625	NNW 5	281	0.1	Gravity corer	GC	on deck
ME864/288	14.02.12	12:07	39°12.99'N	14°49.00'E	3304	WNW 12	348	0.6	CTD/rosette water sampler	CTD/RO	surface
ME864/288	14.02.12	12:12	39°12.99'N	14°49.00'E	3305	WNW 11	158	0	CTD/rosette water sampler	CTD/RO	on deck
ME864/289	14.02.12	13:16	39°12.99'N	14°49.00'E	3304	NNW 6	0	-0.1	Sound Velocity Profiler	SVP	to water
ME864/289	14.02.12	14:24	39°13.00'N	14°49.00'E	3304	NNW 10	113	-0.1	Sound Velocity Profiler	SVP	at depth
ME864/289	14.02.12	15:38	39°13.00'N	14°49.00'E	3304	NNW 7	0	0	Sound Velocity Profiler	SVP	on deck
ME864/290	14.02.12	15:56	39°13.00'N	14°49.00'E	3304	NW 6	321	0	CTD/rosette water sampler	CTD/RO	surface
ME864/290	14.02.12	17:07	39°13.00'N	14°49.00'E	3310	NW 5	0	0	CTD/rosette water sampler	CTD/RO	at depth
ME864/290	14.02.12	18:34	39°13.00'N	14°49.00'E	3310	N 5	344	0	CTD/rosette water sampler	CTD/RO	on deck
ME864/291	14.02.12	20:24	39°32.44'N	14°42.39'E	627	NNW 4	82	0	Gravity corer	GC	surface
ME864/291	14.02.12	20:55	39°32.42'N	14°42.36'E	625	NW 5	62	0	Gravity corer	GC	at sea bottom
ME864/291	14.02.12	20:55	39°32.42'N	14°42.36'E	625	NW 5	62	0	Gravity corer	GC	off ground hoisting
ME864/291	14.02.12	21:14	39°32.42'N	14°42.36'E	625	NNW 4	190	0	Gravity corer	GC	on deck

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Wind [m/s]	Course [°]	Speed [kn]	Gear	Gear Abbrev.	Action
ME864/292	14.02.12	22:33	39°21.77'N	14°52.71'E	2777	WNW 6	179	6.5	Multibeam-Profil	MB	Begin profile
ME864/292	15.02.12	00:15	39°11.55'N	14°52.75'E	3300	NW 5	182	5.9	Multibeam-Profil	MB	Information
ME864/292	15.02.12	03:26	39°11.55'N	14°52.90'E	3298	NNW 3	90	5.8	Multibeam-Profil	MB	Information
ME864/292	15.02.12	04:52	39°11.26'N	15°04.42'E	2095	WNW 4	171	5.8	Multibeam-Profil	MB	alter course
ME864/292	15.02.12	05:14	39°08.99'N	15°04.38'E	2465	NW 8	217	5.3	Multibeam-Profil	MB	alter course
ME864/292	15.02.12	05:36	39°07.47'N	15°02.20'E	2759	WNW 6	175	5.3	Multibeam-Profil	MB	alter course
ME864/292	15.02.12	07:13	38°56.38'N	15°02.95'E	2688	WNW 7	174	8.3	Multibeam-Profil	MB	End profile
ME864/293	15.02.12	08:51	38°38.99'N	15°08.93'E	609	W 11	43	-0.1	Multibeam-Profil	MB	Begin profile
ME864/293	15.02.12	09:55	38°38.95'N	15°06.32'E	73	NW 10	90	-0.7	Multibeam-Profil	MB	End profile
ME864/294	15.02.12	10:05	38°38.96'N	15°06.40'E	75	WNW 11	32	0.1	Gravity corer	GC	surface
ME864/294	15.02.12	10:10	38°38.96'N	15°06.40'E	75	WNW 11	311	0	Gravity corer	GC	at sea bottom
ME864/294	15.02.12	10:11	38°38.96'N	15°06.39'E	75	WNW 10	0	0	Gravity corer	GC	off ground hoisting
ME864/294	15.02.12	10:18	38°38.95'N	15°06.39'E	74	WNW 12	0	-0.1	Gravity corer	GC	on deck
ME864/295	15.02.12	10:26	38°38.95'N	15°06.39'E	72	WNW 12	274	-0.1	Multibeam-Profil	MB	Begin profile
ME864/295	15.02.12	10:47	38°38.90'N	15°05.63'E	59	WNW 12	261	2.2	Multibeam-Profil	MB	alter course
ME864/295	15.02.12	11:31	38°38.95'N	15°06.42'E	76	WNW 10	240	0.1	Multibeam-Profil	MB	End profile
ME864/296	15.02.12	11:32	38°38.95'N	15°06.42'E	76	WNW 11	142	0	Gravity corer	GC	surface
ME864/296	15.02.12	11:40	38°38.94'N	15°06.42'E	77	WNW 10	0	0.1	Gravity corer	GC	at sea bottom
ME864/296	15.02.12	11:40	38°38.94'N	15°06.42'E	77	WNW 10	0	0.1	Gravity corer	GC	off ground hoisting
ME864/296	15.02.12	11:44	38°38.94'N	15°06.42'E	77	WNW 12	225	0	Gravity corer	GC	on deck
ME864/297	15.02.12	12:29	38°38.92'N	15°07.44'E	105	WNW 11	273	1.2	Multibeam-Profil	MB	Begin Profile
ME864/297	15.02.12	13:31	38°38.92'N	15°06.29'E	72	WNW 17	257	0.9	Multibeam-Profil	MB	end of profile
ME864/298	15.02.12	15:30	38°48.99'N	14°50.51'E	2821	NW 12	82	0.4	CTD/rosette water sampler	CTD/RO	surface
ME864/298	15.02.12	15:55	38°49.00'N	14°50.51'E	2822	NW 15	105	0	CTD/rosette water sampler	CTD/RO	Information
ME864/298	15.02.12	16:07	38°49.00'N	14°50.51'E	2825	WNW 15	142	-0.1	CTD/rosette water sampler	CTD/RO	on deck
ME864/298	15.02.12	16:17	38°49.00'N	14°50.51'E	2824	WNW 12	274	0.1	CTD/rosette water sampler	CTD/RO	surface
ME864/298	15.02.12	17:16	38°49.00'N	14°50.50'E	2824	WNW 11	58	-0.1	CTD/rosette water sampler	CTD/RO	at depth
ME864/298	15.02.12	18:26	38°49.00'N	14°50.51'E	2822	WNW 8	301	0	CTD/rosette water sampler	CTD/RO	on deck
ME864/299	15.02.12	18:33	38°49.05'N	14°50.70'E	2877	WNW 10	93	5.3	Multibeam-Profil	MB	Begin profile
ME864/299	15.02.12	21:00	38°49.04'N	15°09.78'E	1228	W 5	68	3.4	Multibeam-Profil	MB	Information
ME864/299	15.02.12	22:10	38°48.98'N	15°09.62'E	1254	W 9	101	6.7	Multibeam-Profil	MB	Information
ME864/299	15.02.12	22:22	38°49.00'N	15°11.21'E	811	WSW 10	91	6.4	Multibeam-Profil	MB	alter course
ME864/299	15.02.12	22:45	38°50.90'N	15°11.41'E	1609	W 10	358	5.8	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	01:37	38°51.07'N	14°50.33'E	2936	WSW 10	273	5.8	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	02:00	38°53.18'N	14°50.07'E	2969	WNW 6	0	5.6	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	05:06	38°53.01'N	15°13.61'E	2212	WNW 9	160	6.1	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	05:39	38°49.59'N	15°13.49'E	582	WNW 9	232	5.2	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	06:21	38°47.39'N	15°09.00'E	1248	WNW 10	177	7	Multibeam-Profil	MB	alter course

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Wind [m/s]	Course [°]	Speed [kn]	Gear	Gear Abbrev.	Action
ME864/299	16.02.12	06:55	38°43.86'N	15°09.25'E	1324	WNW 11	115	6.9	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	07:15	38°43.82'N	15°11.95'E	1229	NNW 8	132	5.4	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	08:28	38°36.50'N	15°12.05'E	991	WNW 13	215	4.8	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	09:52	38°36.41'N	15°01.98'E	367	NW 10	272	5.9	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	12:28	38°55.60'N	15°01.50'E	2726	N 8	355	7.4	Multibeam-Profil	MB	alter course
ME864/299	16.02.12	13:04	38°55.88'N	15°05.84'E	2591	NNE 9	50	4	Multibeam-Profil	MB	End profile
ME864/300	16.02.12	13:13	38°55.99'N	15°05.99'E	2587	N 10	123	-0.1	CTD/rosette water sampler	CTD/RO	surface
ME864/300	16.02.12	14:06	38°55.99'N	15°05.99'E	2588	N 8	69	-0.1	CTD/rosette water sampler	CTD/RO	at depth
ME864/300	16.02.12	15:03	38°55.99'N	15°05.99'E	2588	NE 10	298	-0.1	CTD/rosette water sampler	CTD/RO	on deck
ME864/301	16.02.12	15:12	38°55.93'N	15°06.29'E	2559	NE 8	90	4.3	Multibeam-Profil	MB	Begin profile
ME864/301	16.02.12	16:30	38°55.79'N	15°16.40'E	2397	NNE 8	152	6.4	Multibeam-Profil	MB	alter course
ME864/301	16.02.12	19:46	38°34.65'N	15°16.47'E	1415	N 8	183	6.2	Multibeam-Profil	MB	alter course
ME864/301	16.02.12	20:09	38°34.38'N	15°18.87'E	1278	N 11	56	5.2	Multibeam-Profil	MB	alter course
ME864/301	16.02.12	21:00	38°39.20'N	15°19.07'E	1489	NNE 12	7	6.3	Multibeam-Profil	MB	alter course
ME864/301	16.02.12	21:58	38°45.08'N	15°19.80'E	1767	N 10	2	5.8	Multibeam-Profil	MB	alter course
ME864/301	16.02.12	22:28	38°48.07'N	15°19.60'E	1642	NNE 14	355	5.6	Multibeam-Profil	MB	alter course
ME864/301	16.02.12	22:58	38°51.05'N	15°19.06'E	1684	NNE 11	351	6.1	Multibeam-Profil	MB	alter course
ME864/301	16.02.12	23:51	38°56.33'N	15°19.04'E	2446	NNE 10	359	6.3	Multibeam-Profil	MB	alter course
ME864/301	17.02.12	00:27	38°56.65'N	15°23.39'E	2348	N 11	89	5.8	Multibeam-Profil	MB	alter course
ME864/301	17.02.12	03:50	39°16.93'N	15°22.22'E	1566	NNE 12	342	6.6	Multibeam-Profil	MB	alter course
ME864/301	17.02.12	04:30	39°20.91'N	15°20.05'E	1569	NNE 8	355	6.3	Multibeam-Profil	MB	alter course
ME864/301	17.02.12	04:50	39°23.10'N	15°19.79'E	1532	N 13	12	6.3	Multibeam-Profil	MB	alter course
ME864/301	17.02.12	05:30	39°27.29'N	15°20.53'E	1271	N 14	1	6.6	Multibeam-Profil	MB	alter course
ME864/301	17.02.12	06:00	39°30.53'N	15°20.18'E	406	NNE 10	278	6.9	Multibeam-Profil	MB	alter course
ME864/301	17.02.12	06:24	39°30.53'N	15°16.78'E	436	N 9	275	7	Multibeam-Profil	MB	End profile
ME864/302	17.02.12	06:58	39°30.45'N	15°10.84'E	1097	NNE 9	251	-0.4	Gravity corer	GC	surface
ME864/302	17.02.12	07:26	39°30.41'N	15°10.81'E	1112	N 7	202	0.1	Gravity corer	GC	at sea bottom
ME864/302	17.02.12	07:28	39°30.41'N	15°10.81'E	1110	NNE 8	67	0	Gravity corer	GC	off ground hoisting
ME864/302	17.02.12	07:58	39°30.41'N	15°10.81'E	1105	N 8	84	-0.1	Gravity corer	GC	on deck
ME864/303	17.02.12	08:40	39°35.89'N	15°10.80'E	1472	NNE 9	0	7.4	Multibeam-Profil	MB	Begin profile
ME864/303	17.02.12	11:35	39°36.00'N	14°44.31'E	1878	N 3	270	7.2	Multibeam-Profil	MB	End profile
ME864/304	17.02.12	13:44	39°32.39'N	14°42.36'E	628	NW 6	124	-0.1	Gravity corer	GC	surface
ME864/304	17.02.12	14:03	39°32.39'N	14°42.36'E	629	NW 7	309	0	Gravity corer	GC	at sea bottom
ME864/304	17.02.12	14:03	39°32.39'N	14°42.36'E	629	NW 7	309	0	Gravity corer	GC	off ground hoisting
ME864/304	17.02.12	14:20	39°32.39'N	14°42.36'E	628	NW 7	266	0	Gravity corer	GC	on deck