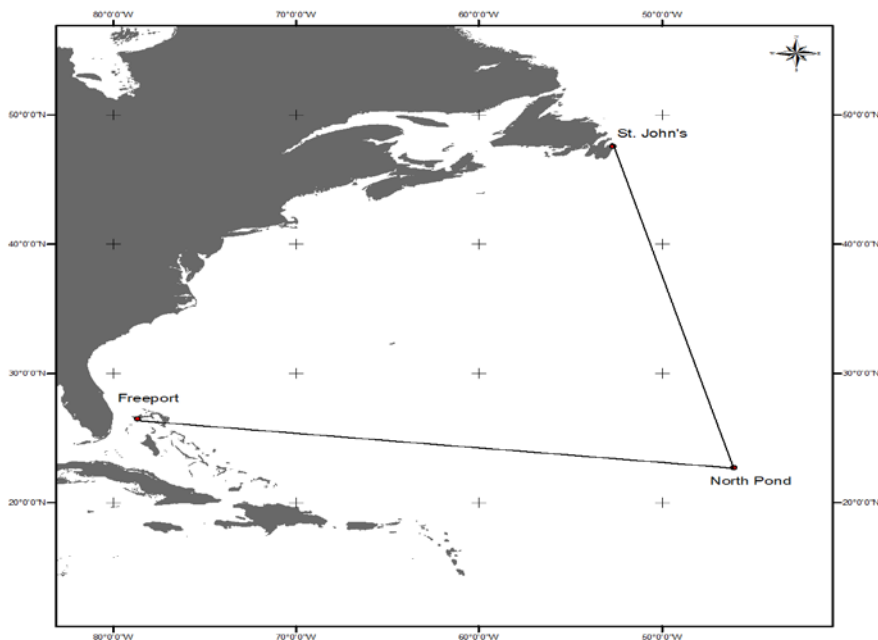


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Short Cruise Report
RV MARIA S: MERIAN Cruise MSM 20-5
Freeport – St. John's
11. April – 10. May 2012
Chief Scientist: Wolfgang Bach
Captain: Friedhelm von Staa



Shiptrack of Cruise MSM20-5 to and from our work area "North Pond"

Objectives

The extent and activity of microbial life in the upper ocean crust is unknown, but hydrologically active, young ridge flanks may host a large microbial biomass that is possibly supported by oxidative alteration reactions of basalt. Maria S. Merian cruise 20/5 had the primary objective of conducting operations on subseafloor observatories (CORKs) installed to examine hydrological-geochemical-microbiological interactions in a sedimented area (North Pond) on the western flank of the mid-Atlantic Ridge at 22°45'N, 46°05'W in 4450 m water depth. The remotely operated vehicle (ROV) *Jason* of the Woods Hole Oceanographic Institution was the main operational tool, used to carry out installations of a shallow observatory and numerous operations on two deep observatories, installed during Expedition 336 of the Integrated Ocean Drilling Program in the fall of 2011. In nine *Jason* lowerings, the following objectives were achieved: At observatories in Holes U1382A and U1383C, seafloor Osmo samplers were retrieved and new ones were installed, GeoMICROBE sleds were deployed and attached to fluid sampling lines, basement fluid samples were recovered from all observatory zones in the subseafloor (down to 331.5 m subbasement in Hole U1383C) and sediment samples were push-cored. In Hole U1383B, a scaled-down observatory was fully installed by ROV operations to seal off the seafloor near close-by Hole U1383C and set up for future sampling and inter-borehole experimentation. Pressure data were downloaded from all holes. A partially installed observatory in Hole 395A was inspected and prepared for future operations. Seafloor mapping using the ROV's multibeam system, rock sampling from the steep slopes surrounding the sedimented area around the drill holes, further sediment sampling and heat flow surveys complemented the ROV-based work conducted during the cruise.

Moreover, a 5500 km² area around our North Pond study site was mapped using the Ship's EM 120 multibeam echosounding system. Despite lost time due to the delayed delivery of a container with critical observatory gear and rough weather around mid-cruise, all major cruise objectives were achieved. The observatories are fully operational and the North Pond experiment is underway.

Narrative

The science crew boarded the R/V Merian in the morning hours of April 10, 2012 in Freeport, Bahamas. The delivery of a container with crucial observatory gear from the University of Hawaii was delayed so a *Jason* dive test in 500 m water depth 12 nm off the coast of Freeport was conducted. The 6-day transit to the NORTH Pond work area around 22°45'N, 46°05'W was used to prepare the labs and observatory instruments. In the early morning hours of the 20th, we arrived at North Pond and conducted a CTD/hydrocast in

4400 water depth close to the site of the first dive with *Jason*. We also recorded a sound velocity profile needed for the multibeam echosounding surveys that made up most of our night program.

The first dive (J2-623) on April 20th visited two bore holes (U1383B and U1383C) and downloaded data and retrieved water samples from the subseafloor. An Osmo package that was mounted in the wellhead during IODP Expedition 336 was recovered. During the following dives, *Jason* installed a full downhole CORK observatory in Hole U1382B, attached Osmo packages and GeoMicrobe sleds to the wellheads and collected sediment and rock samples from the vicinity of the boreholes.

At Hole U1382A – 6 km SSW of site U1383 – similar wellhead installments were conducted and nearby Hole 395A was prepared for subsequent manipulations. Samples of mantle peridotite were recovered from a site 3 km SE of Site 395. This was remarkable, as Hole 395A, when drilled in 1976, penetrated 600 m of basaltic basement.

Between April 25 and April 29, two GeoMICROBE sleds were lowered and connected to the wellheads in Holes U1382A and U1383C. More samples of fluids, rocks and sediments were collected at these sites. Heavy seas forced us to pause the ROV diving and multibeam echosounder bathymetric mapping of the seafloor was the main activity until the final dive on May 2. Sediment sampling and heat flow measurements near basement outcrops in the area NW of North Pond were carried out. Hard rock samples were also recovered.

Shortly before midnight on May 3rd, our transit to St. John's started. Leaving the North Pond site, we conducted a 5-hr long bathymetry survey with a heading of 350 to map the 8-Ma time slice of crust up to the Kane Fracture Zone. We arrived in St. John's in the afternoon of May 9th, after an uneventful transit. Unloading proceeded swiftly on the following day, and on May 11th all samples and gear had been sent on their way to the various labs and the return travel of the science crew began.

Acknowledgements

The science party thanks the Captain and crew of RV Maria S. Merian for their enthusiastic and friendly support during the entire cruises. Wolfgang Bach, Heiner Villinger, and Janis Thal thank the Deutsche Forschungsgemeinschaft for funding of the cruise and the Leitstelle (Univ. Hamburg), in particular Niels Jakobi, for their support. We thank Verena Heuer and Götz Ruhland for helping with shipping and container logistics. Funding of the US science party was from the Gordon and Betty Moore Foundation and NSF through the STC Center for Dark Energy Biosphere Investigations (C-DEBI).

Cruise participants

Name	Discipline	Institution
Wolfgang Bach	Geology/Chief scientist	Univ. Bremen
Katrina Edwards	Microbiology/Chief scientist ROV	USC
C. Geoff Wheat	Geochemistry	Univ. Alaska
Sam Hulme	Geochemistry/ROV mapping	MLML
Brian Glazer	Geochemistry	Univ. Hawaii
Chih-Chiang Hsieh	Biogeochemistry	Univ. Hawaii
Huei-Ting Lin	Biogeochemistry	Univ. Hawaii
Peter Girguis	Microbiology	Harvard Univ.
Ulrike Jaekel	Microbiology	Harvard Univ.
Beth Orcutt	Microbiology	Bigelow Lab
Janis Thal	Geology/EM120 mapping	Univ. Bremen
Heinrich Villinger	Geophysics	Univ. Bremen
Michael Brown	Viedography	Los Angeles
Alberto Collasius	ROV Expedition leader	WHOI
Mario Fernandez	ROV	WHOI
Scott Hansen	ROV	WHOI
Baxter Hutchinson	ROV	WHOI
Akel Kevis-Stirling	ROV	WHOI
James Pelowski	ROV	WHOI
Ben Tradd	ROV	WHOI
James Varnum	ROV	WHOI
Korey Verhein	ROV	WHOI

USC Department of University of Southern California

MLML Moss Landing Marine Laboratories

WHOI Woods Hole Oceanographic Institution

List of Stations

Station No.	Date	Gear	Time	Latitude	Longitude	Depth	Remarks/Recovery
	2012		[UTC]	[x°y.z'N]	[x°y.z'W]	[m]	
MSM20/175-1	20-Apr	CTD/RO	3:52	22° 47.00	46° 04.00	4448.5	surface
MSM20/175-1	20-Apr	CTD/RO	5:28	22° 47.00	46° 04.00	4447.2	at depth
MSM20/175-1	20-Apr	CTD/RO	7:05	22° 47.00	46° 04.00	4451.3	on deck
MSM20/175-2	20-Apr	ELEV	9:40	22° 48.12	46° 03.16	4407.3	elevator in water
MSM20/175-2	20-Apr	ELEV	9:42	22° 48.12	46° 03.16	4407.3	elevator released
MSM20/175-3	20-Apr	ROV	10:44	22° 48.12	46° 03.16	4407.3	ROV in water (J2-623)
MSM20/175-3	20-Apr	ROV	10:52	22° 48.12	46° 03.17	4410.4	MEDEA in water
MSM20/175-3	20-Apr	ROV	13:26	22° 48.11	46° 03.17	4422.3	at depth
MSM20/175-3	20-Apr	ROV	19:35	22° 48.11	46° 03.17	4422.3	off bottom
MSM20/175-2	20-Apr	ELEV	20:07	22° 48.07	46° 03.09	4422.4	elevator released
MSM20/175-2	20-Apr	ELEV	21:50	22° 48.04	46° 03.07	4425.7	elevator sighted
MSM20/175-3	20-Apr	ROV	22:40	22° 48.06	46° 03.04	4428.1	MEDEA on deck
MSM20/175-3	20-Apr	ROV	22:47	22° 48.06	46° 03.04	4431.7	ROV on deck (end of dive)
MSM20/175-2	20-Apr	ELEV	23:30	22° 49.60	46° 03.12	4236.7	on board
MSM20/176-1	21-Apr	MB+PS	0:29	22° 47.36	45° 57.64	3835.1	start profil
MSM20/176-1	21-Apr	MB+PS	2:18	22° 47.31	46° 13.33	4677.3	profile end
MSM20/176-1	21-Apr	MB+PS	2:37	22° 48.67	46° 13.30	4686.7	start profil
MSM20/176-1	21-Apr	MB+PS	4:26	22° 48.66	45° 57.61	3753.3	profile end
MSM20/176-1	21-Apr	MB+PS	4:44	22° 50.00	45° 57.50	3618.5	start profil
MSM20/176-1	21-Apr	MB+PS	6:34	22° 49.99	46° 13.31	4565.3	profile end
MSM20/176-1	21-Apr	MB+PS	6:51	22° 51.30	46° 13.45	4462.3	start profil
MSM20/176-1	21-Apr	MB+PS	8:08	22° 51.33	46° 02.37	3892.7	profile end
MSM20/177-1	21-Apr	ROV	9:03	22° 48.12	46° 03.16	4421.3	CORK in water
MSM20/177-1	21-Apr	ROV	9:21	22° 48.12	46° 03.16	4422.1	CORK released
MSM20/177-1	21-Apr	ROV	10:47	22° 48.13	46° 03.13	4423.1	ROV in water (dive J2-624)
MSM20/177-1	21-Apr	ROV	10:50	22° 48.14	46° 03.12	4423.1	MEDEA in water
MSM20/177-1	21-Apr	ROV	13:38	22° 48.13	46° 03.13	4421.9	at depth
MSM20/177-1	21-Apr	ROV	20:37	22° 48.09	46° 03.14	4418.8	start rising to the surface
MSM20/177-1	21-Apr	ROV	20:37	22° 48.09	46° 03.14	4418.8	floats released
MSM20/177-1	21-Apr	ROV	21:18	22° 47.99	46° 03.13	4424.2	floats sighted
MSM20/177-1	21-Apr	ROV	23:05	22° 48.02	46° 03.13	4423.9	MEDEA on deck
MSM20/177-1	21-Apr	ROV	23:16	22° 48.02	46° 03.13	4423.9	ROV on deck (end of dive)
MSM20/177-1	22-Apr	ROV	0:00	22° 50.63	46° 03.44	4316.8	floats recovered
MSM20/178-1	22-Apr	MB+PS	0:53	22° 44.97	45° 58.22	4015.2	start profil
MSM20/178-1	22-Apr	MB+PS	3:08	22° 44.93	46° 12.81	4462.5	profile end
MSM20/178-1	22-Apr	MB+PS	3:32	22° 43.40	46° 12.98	4531.9	start profil
MSM20/178-1	22-Apr	MB+PS	5:49	22° 43.40	45° 58.27	4055.5	profile end
MSM20/178-1	22-Apr	MB+PS	6:14	22° 41.92	45° 58.18	4077.3	start profil
MSM20/178-1	22-Apr	MB+PS	8:32	22° 41.86	46° 12.87	4455.4	profile end
MSM20/179-1	22-Apr	ROV	9:48	22° 45.35	46° 04.90	4489.9	Osmo sampler in water
MSM20/179-1	22-Apr	ROV	9:50	22° 45.35	46° 04.90	4490.2	Osmo sampler released
MSM20/179-1	22-Apr	ROV	11:07	22° 45.35	46° 04.90	4488.9	ROV in water (dive J2-625)
MSM20/179-1	22-Apr	ROV	11:11	22° 45.35	46° 04.90	4489.6	MEDEA in water
MSM20/179-1	22-Apr	ROV	11:54	22° 45.43	46° 04.88	4493.6	at depth
MSM20/179-1	22-Apr	ROV	20:04	22° 45.37	46° 04.92	4490.8	off bottom
MSM20/179-1	22-Apr	ROV	22:33	22° 45.48	46° 05.43	4495.7	MEDEA on deck
MSM20/179-1	22-Apr	ROV	22:44	22° 45.47	46° 05.46	4493	ROV on deck (end of dive)
MSM20/180-1	22-Apr	MB+PS	23:51	22° 40.38	45° 58.22	4087.5	start profil
MSM20/180-1	23-Apr	MB+PS	2:08	22° 40.33	46° 12.81	4530	profile end
MSM20/180-1	23-Apr	MB+PS	2:32	22° 38.95	46° 12.83	4490.3	start profil
MSM20/180-1	23-Apr	MB+PS	4:47	22° 38.96	45° 58.27	3969.5	profile end
MSM20/180-1	23-Apr	MB+PS	5:12	22° 37.47	45° 58.23	3971.1	start profil
MSM20/180-1	23-Apr	MB+PS	7:27	22° 37.43	46° 12.78	4283.8	profile end

Station No.	Date	Gear	Time	Latitude	Longitude	Depth	Remarks/Recovery
	2012		[UTC]	[x°y.z'N]	[x°y.z'W]	[m]	
MSM20/181-1	23-Apr	ROV	8:45	22° 48.20	46° 03.12	4423.1	borehole osmo package in water
MSM20/181-1	23-Apr	ROV	9:13	22° 48.13	46° 03.16	4420.0	borehole osmo package released
MSM20/181-1	23-Apr	ROV	10:41	22° 48.13	46° 02.15	4008.6	ROV in water (dive J2-626)
MSM20/181-1	23-Apr	ROV	10:44	22° 48.13	46° 02.15	3999.5	MEDEA in water
MSM20/181-1	23-Apr	ROV	13:10	22° 48.13	46° 02.15	4021.1	at depth
MSM20/181-1	23-Apr	ROV	19:16	22° 48.12	46° 03.18	4419.3	floates released
MSM20/181-1	23-Apr	ROV	19:24	22° 48.12	46° 03.18	4420.3	off bottom
MSM20/181-1	23-Apr	ROV	20:03	22° 48.12	46° 03.30	4421.1	floats sighted
MSM20/181-1	23-Apr	ROV	21:58	22° 47.80	46° 03.30	4445.7	MEDEA on deck
MSM20/181-1	23-Apr	ROV	22:06	22° 47.81	46° 03.30	4459.4	ROV on deck (end of dive)
MSM20/181-1	23-Apr	ROV	23:07	22° 50.86	46° 03.60	4304.0	floats retrieved
MSM20/182-1	23-Apr	MB+PS	23:40	22° 52.33	46° 01.50	3542.7	start profil
MSM20/182-1	24-Apr	MB+PS	0:12	22° 52.34	45° 58.06	3031.9	profile end
MSM20/182-1	24-Apr	MB+PS	0:41	22° 53.97	45° 57.89	3060.2	start profil
MSM20/182-1	24-Apr	MB+PS	3:08	22° 53.95	46° 13.76	4120.1	profile end
MSM20/182-1	24-Apr	MB+PS	3:36	22° 55.59	46° 13.73	3780.7	start profil
MSM20/182-1	24-Apr	MB+PS	6:03	22° 55.56	45° 57.88	3109.2	profile end
MSM20/182-1	24-Apr	MB+PS	6:30	22° 57.20	45° 57.96	3293.8	start profil
MSM20/182-1	24-Apr	MB+PS	7:40	22° 57.18	46° 05.53	3375.8	profile end
MSM20/183-1	24-Apr	ROV	9:12	22° 45.35	46° 04.86	4490.1	floats&weights released
MSM20/183-1	24-Apr	ROV	9:20	22° 45.35	46° 04.86	4490.7	Information
MSM20/183-1	24-Apr	ROV	10:36	22° 45.10	46° 03.50	4076.3	ROV in water (dive J2-627)
MSM20/183-1	24-Apr	ROV	10:39	22° 45.10	46° 03.50	4075.9	MEDEA in water
MSM20/183-1	24-Apr	ROV	13:05	22° 45.10	46° 03.50	4076.2	at depth
MSM20/183-1	24-Apr	ROV	19:20	22° 45.35	46° 04.92	4491.1	floats released
MSM20/183-1	24-Apr	ROV	19:39	22° 45.35	46° 04.92	4491.0	off bottom
MSM20/183-1	24-Apr	ROV	19:56	22° 45.35	46° 05.13	4491.0	floats sighted
MSM20/183-1	24-Apr	ROV	21:50	22° 45.35	46° 05.13	4492.3	MEDEA on deck
MSM20/183-1	24-Apr	ROV	22:02	22° 45.35	46° 05.12	4491.1	ROV on deck
MSM20/183-1	24-Apr	ROV	22:53	22° 45.76	46° 03.10	4135.5	floats retrieved
MSM20/184-1	25-Apr	MB+PS	0:36	22° 35.38	46° 12.90	3850.7	start profil
MSM20/184-1	25-Apr	MB+PS	2:53	22° 35.34	45° 58.17	3937.9	profile end
MSM20/184-1	25-Apr	MB+PS	3:22	22° 33.63	45° 58.26	3888.3	start profil
MSM20/184-1	25-Apr	MB+PS	5:31	22° 33.60	46° 13.70	3605.1	profile end
MSM20/184-1	25-Apr	MB+PS	5:47	22° 34.17	46° 14.54	3808.8	start profil
MSM20/184-1	25-Apr	MB+PS	7:45	22° 49.84	46° 14.59	4359.9	profile end
MSM20/185-1	25-Apr	SLED	8:53	22° 45.34	46° 04.88	4488.7	GEOMICROBE sled in water
MSM20/185-1	25-Apr	SLED	9:04	22° 45.35	46° 04.89	4492.3	GEOMICROBE sled released
MSM20/185-2	25-Apr	ROV	10:34	22° 45.35	46° 04.89	4492.1	ROV in water (dive J2-628)
MSM20/185-2	25-Apr	ROV	10:38	22° 45.35	46° 04.89	4491.5	MEDEA in water
MSM20/185-2	25-Apr	ROV	13:17	22° 45.38	46° 04.80	4495.6	at depth
MSM20/185-1	25-Apr	ELEV	20:00	22° 45.39	46° 04.85	4495.2	floats released
MSM20/185-2	25-Apr	ROV	20:29	22° 45.38	46° 04.84	4494.0	off bottom
MSM20/185-1	25-Apr	ELEV	22:05	22° 45.43	46° 04.74	4491.9	floats sighted
MSM20/185-2	25-Apr	ROV	22:45	22° 45.48	46° 04.66	4487.1	MEDEA on deck
MSM20/185-2	25-Apr	ROV	22:53	22° 45.50	46° 04.61	4486.0	ROV on deck (end of dive)
MSM20/185-1	25-Apr	ELEV	23:05	22° 45.47	46° 04.37	4476.0	floats retrieved
MSM20/186-1	26-Apr	MB+PS	0:56	22° 31.47	46° 16.07	4066.9	start profil
MSM20/186-1	26-Apr	MB+PS	5:11	22° 31.39	45° 43.90	3451.2	profile end
MSM20/186-1	26-Apr	MB+PS	5:37	22° 33.57	45° 43.82	3758.6	start profil
MSM20/186-1	26-Apr	MB+PS	7:14	22° 33.55	45° 57.77	3778.7	profile end
MSM20/187-1	26-Apr	ROV	8:58	22° 48.12	46° 03.17	4416.8	Osmo sampler in water
MSM20/187-1	26-Apr	ROV	8:59	22° 48.12	46° 03.17	4418.3	Osmo sampler released
MSM20/187-1	26-Apr	ROV	14:30	22° 48.12	46° 03.17	4418.1	Dive abandoned
MSM20/187-2	26-Apr	CTD/RO	15:05	22° 48.12	46° 03.17	4416.5	surface

Station No.	Date	Gear	Time	Latitude	Longitude	Depth	Remarks/Recovery
	2012		[UTC]	[x°y.z'N]	[x°y.z'W]	[m]	
MSM20/187-2	26-Apr	CTD/RO	16:27	22° 48.12	46° 03.17	4417.1	at depth
MSM20/187-2	26-Apr	CTD/RO	17:51	22° 48.12	46° 03.17	4420.0	on deck
MSM20/188-1	26-Apr	MB+PS	20:25	22° 35.47	45° 58.05	3950.6	start profil
MSM20/188-1	26-Apr	MB+PS	22:45	22° 36.40	45° 42.89	3630.6	profile end
MSM20/188-1	26-Apr	MB+PS	23:00	22° 37.30	45° 43.90	3531.3	start profil
MSM20/188-1	27-Apr	MB+PS	2:25	22° 57.76	45° 43.91	2997.9	profile end
MSM20/188-1	27-Apr	MB+PS	2:49	22° 57.94	45° 45.54	2982.1	start profil
MSM20/188-1	27-Apr	MB+PS	6:17	22° 37.31	45° 45.54	3570.5	profile end
MSM20/188-1	27-Apr	MB+PS	6:36	22° 37.23	45° 47.13	3223.3	start profil
MSM20/188-1	27-Apr	MB+PS	10:01	22° 57.80	45° 47.21	3320.8	profile end
MSM20/188-1	27-Apr	MB+PS	10:26	22° 57.91	45° 48.84	2997.3	start profil
MSM20/188-1	27-Apr	MB+PS	13:54	22° 37.30	45° 48.82	3680.0	profile end
MSM20/188-1	27-Apr	MB+PS	14:19	22° 37.21	45° 50.67	3412.6	start profil
MSM20/188-1	27-Apr	MB+PS	17:47	22° 57.84	45° 50.69	3501.5	profile end
MSM20/188-1	27-Apr	MB+PS	18:15	22° 57.90	45° 52.71	3421.6	start profil
MSM20/188-1	27-Apr	MB+PS	21:42	22° 37.34	45° 52.74	3765.1	profile end
MSM20/188-1	27-Apr	MB+PS	22:07	22° 37.25	45° 54.64	3774.7	start profil
MSM20/188-1	28-Apr	MB+PS	1:36	22° 57.83	45° 54.68	3513.9	profile end
MSM20/188-1	28-Apr	MB+PS	1:46	22° 58.58	45° 54.57	3506.7	start profil
MSM20/188-1	28-Apr	MB+PS	3:28	22° 58.58	45° 43.63	3191.4	profile end
MSM20/188-1	28-Apr	MB+PS	3:52	23° 0.24	45° 43.47	3250.1	start profil
MSM20/188-1	28-Apr	MB+PS	8:59	23° 0.12	46° 17.47	4014.2	profile end
MSM20/188-1	28-Apr	MB+PS	9:28	22° 58.52	46° 16.43	3349.5	start profil
MSM20/188-1	28-Apr	MB+PS	11:01	22° 58.51	46° 06.44	3313.8	profile end
MSM20/188-1	28-Apr	MB+PS	12:06	22° 52.64	46° 12.67	4571.9	start profil
MSM20/188-1	28-Apr	MB+PS	12:27	22° 50.56	46° 12.51	4684.1	alter course
MSM20/188-1	28-Apr	MB+PS	12:57	22° 47.59	46° 12.39	4693.5	alter course
MSM20/188-1	28-Apr	MB+PS	13:46	22° 42.81	46° 11.40	4531.1	profile end
MSM20/188-1	28-Apr	MB+PS	15:42	22° 29.51	46° 21.76	3878.4	start profil
MSM20/188-1	28-Apr	MB+PS	20:53	23° 0.39	46° 21.79	3669.1	profile end
MSM20/188-1	28-Apr	MB+PS	21:19	23° 0.50	46° 19.69	3871.8	start profil
MSM20/188-1	29-Apr	MB+PS	2:31	22° 29.61	46° 19.68	3012.5	profile end
MSM20/188-1	29-Apr	MB+PS	2:54	22° 29.53	46° 17.57	4014.3	start profil
MSM20/188-1	29-Apr	MB+PS	6:40	22° 56.98	46° 17.57	3572.9	profile end
MSM20/189-1	29-Apr	ROV	8:30	22° 48.12	46° 03.17	4420.3	GEOMICROBE sled in water
MSM20/189-1	29-Apr	ROV	8:39	22° 48.12	46° 03.17	4419.5	GEOMICROBE sled released
MSM20/189-1	29-Apr	ROV	10:40	22° 48.12	46° 03.16	4421.8	ROV in water (dive J2-629)
MSM20/189-1	29-Apr	ROV	10:44	22° 48.13	46° 03.15	4418.5	MEDEA in water
MSM20/189-1	29-Apr	ROV	13:38	22° 48.13	46° 03.05	4419.7	at depth
MSM20/189-1	30-Apr	ROV	12:06	22° 49.90	46° 02.82	4123.1	off bottom
MSM20/189-1	30-Apr	ROV	14:26	22° 49.89	46° 02.43	4063.5	MEDEA on deck
MSM20/189-1	30-Apr	ROV	14:32	22° 49.89	46° 02.41	4064.9	ROV on deck
MSM20/190-1	30-Apr	MB+PS	17:02	22° 31.18	45° 43.94	3457.5	start profil
MSM20/190-1	30-Apr	MB+PS	20:15	22° 12.17	45° 43.90	3143.8	profile end
MSM20/190-1	30-Apr	MB+PS	20:37	22° 12.04	45° 45.76	3320.1	start profil
MSM20/190-1	30-Apr	MB+PS	23:49	22° 31.00	45° 45.78	3886.7	profile end
MSM20/190-1	1-May	MB+PS	0:13	22° 31.14	45° 47.86	3576.3	start profil
MSM20/190-1	1-May	MB+PS	3:25	22° 12.16	45° 47.88	3396.4	profile end
MSM20/190-1	1-May	MB+PS	3:49	22° 12.02	45° 50.06	3874.9	start profil
MSM20/190-1	1-May	MB+PS	7:03	22° 31.14	45° 50.10	3491.0	profile end
MSM20/191-1	1-May	ROV	10:39	22° 48.12	46° 03.17	4416.7	ROV in water (dive J2-630)
MSM20/191-1	1-May	ROV	10:42	22° 48.12	46° 03.17	4421.0	MEDEA in water
MSM20/191-1	1-May	ROV	13:21	22° 48.11	46° 03.19	4417.0	at depth
MSM20/191-1	1-May	ROV	20:13	22° 48.11	46° 03.16	4420.1	off bottom
MSM20/191-1	1-May	ROV	22:34	22° 47.98	46° 02.84	4425.1	MEDEA on deck

Station No.	Date	Gear	Time	Latitude	Longitude	Depth	Remarks/Recovery
	2012		[UTC]	[x°y.z'N]	[x°y.z'W]	[m]	
MSM20/191-1	1-May	ROV	22:42	22° 48.01	46° 02.80	4417.5	ROV on deck
MSM20/192-1	1-May	MB+PS	23:32	22° 41.29	46° 04.33	3185.4	start profil
MSM20/192-1	2-May	MB+PS	0:03	22° 38.74	46° 04.31	3160.1	profile end
MSM20/192-1	2-May	MB+PS	1:30	22° 29.11	45° 51.40	3617.5	start profil
MSM20/192-1	2-May	MB+PS	5:16	22° 29.06	46° 22.66	3880.7	profile end
MSM20/192-1	2-May	MB+PS	5:44	22° 30.09	46° 24.08	3702.2	start profil
MSM20/192-1	2-May	MB+PS	8:47	22° 54.31	46° 24.17	3571.1	profile end
MSM20/193-1	2-May	ROV	10:44	22° 48.71	46° 05.35	4465.7	ROV in water (dive J2-631)
MSM20/193-1	2-May	ROV	10:48	22° 48.71	46° 05.35	4466.5	MEDEA in water
MSM20/193-1	2-May	ROV	13:25	22° 48.71	46° 05.35	4465.9	at depth
MSM20/193-1	3-May	ROV	21:38	22° 49.18	46° 11.57	4687.3	off bottom
MSM20/193-1	3-May	ROV	23:54	22° 48.78	46° 11.32	4396.5	MEDEA on deck
MSM20/193-1	4-May	ROV	0:03	22° 48.78	46° 11.27	4382.7	ROV on deck
MSM20/194-1	4-May	MB+PS	0:56	22° 47.73	46° 05.28	4483.3	start profil
MSM20/194-1	4-May	MB+PS	5:08	23° 39.53	45° 54.73	2373.4	profile end