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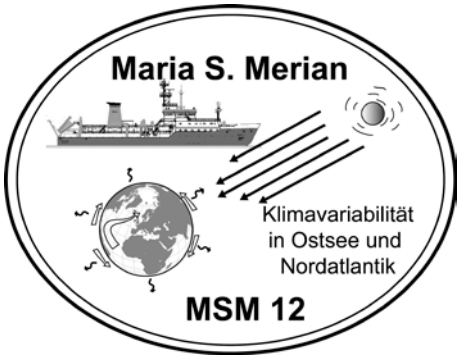
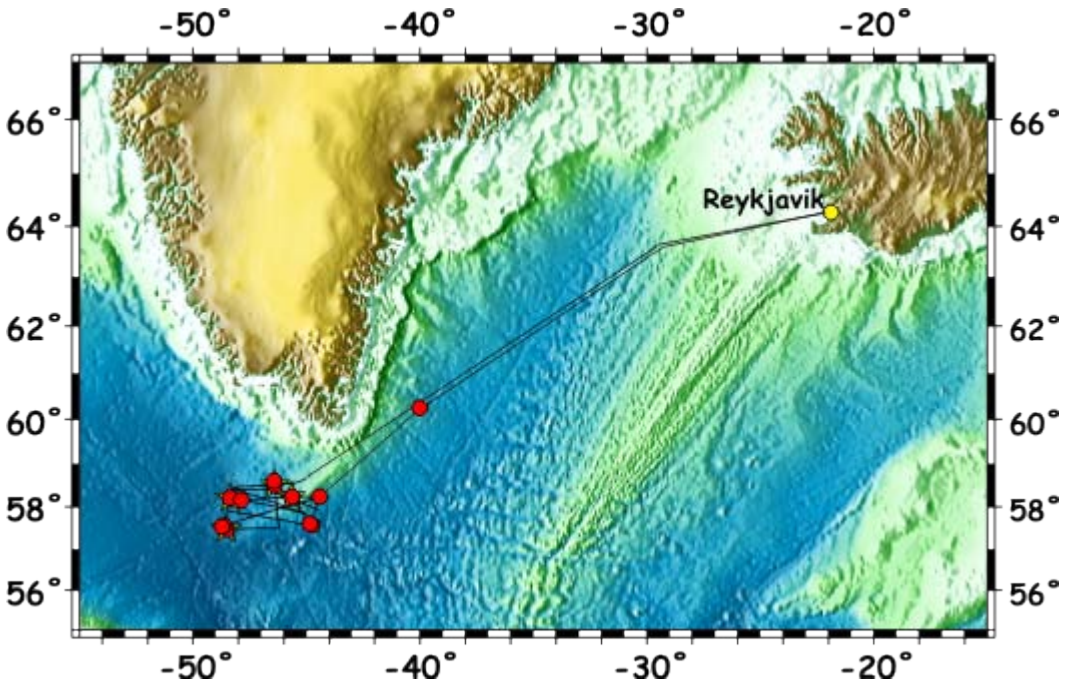
Cruise Report
RV MARIA S. MERIAN Cruise MSM12-2

Reykjavik - Reykjavik
17. June – 13. July 2009
Chief Scientist: Gabriele Uenzelmann-Neben
Captain: Karl Friedhelm von Staa





Ship track of RV Maria S. Merian cruise MSM12-2 in the Labrador Sea with locations of seismic profiles (black lines) and geological sampling (red dots) marked.

Objectives

During this leg both the palaeo as well as the recent sedimentation processes and oceanographic conditions in the area of the Eirik Drift were studied. Proxies determined at recent and sub-recent samples will enable a better interpretation of IODP data and hence lead to a better reconstruction of the long-term development of sedimentation processes, the glacial history, and oceanographic conditions during the Neogene and Quaternay. We have aimed to solve the following questions:

1) What is the detailed structure of the Eirik Drift? Can we distinguish between contouritic and turbiditic deposition? Do the turbiditic deposits lead to information on the extension (frequency and dimension) of the Greenland ice shield? To answer those questions we needed to gather seismic data across the entire Eirik Drift from the shallower parts into the deep sea. The profiles further had to cover the locations of ODP and IODP sites.
2) Can we reconstruct the development of the Western Boundary Undercurrent (WBUC) in this region? Have modifications in the current system been documented in the sediment transport? In what way did those oceanographic modifications affect the sedimentary sequences? Why did the build-up of the Eirik Drift start with a delay of about 1.1 my relative to the oceanographic modifications (i.e. 4.5 Ma)?
3) Can we identify analogies to the build-up and the creation of sediment drifts on the southern hemisphere? Do chronological matches exist between the Eirik Drift and Drift 7 at the Antarctic Peninsula or the Agulhas Drift in the Transkei Basin? Can we identify global climatic and oceanographic events in those drift systems?
4) Can we detect short-term variations of oceanic currents (NADW), sea-ice extent, surface water productivity, and terrigenous input within the upper 15 m of the sedimentary column (Milankovich and sub-Milankovic cycles)? How do those parameters correlate with instabilities of the Greenland ice shield?

The project comprised geophysical and marin-geological operations in the area of the Eirik Drift. (Fig. 1.1). Streamer, airguns, gravity corer, giant box corer, as well as PARASOUND and multi-beam systems were used. Seismic reflection profiles were gathered in order to study the sedimentary distribution in relation to the tectonic and oceanographic evolution (black lines in Fig. 1.1). Those profiles cover the whole Eirik Drift with the transition into the deep sea. Furthermore, the profiles cover the locations of ODP Leg 105 Site 646 and IODP Expedition 303 Site2 1305, 1306, and 1307.

The marin-geological programme concentrated on sampling the near-surface sediments (0-15 m) using giant box corer and gravity corer. Undisturbed sediments not affected by e.g. turbidity currents were sampled. Sample locations were picked based on PARASOUND recordings, which were gathered parallel to the seismic profiling. This saved on ship time. The cores were opened already during the cruise, described and sampled.

Narrative

date	approx. board time (UTC)	programme and event	weather
17.6.	8:00-22:00	participants go on-board RV Maria S Merian; Loading of containers and streamer winch; unpacking and installation of equipment;	fine

		safety instructions	
18.6.	9:00 departure from Reykjavik	continued installation of equipment; safety procedure	fine; increasing winds
19.6.	13:00-19:30	continued installation of equipment; test of streamer and airguns	rain; medium winds
20.6.		approach to working area	stormy conditions, high swell
21.6	16:00	Multibeam and Parasound – start of profiling	stormy conditions; high swell
22.6.	6:08-7:26 8:15 10:13	CTD/rosette sampler; deployment of streamer and airguns; start profile AWI-20090001	medium winds and swell
23.6.		continued seismic profiling	medium winds and swell
24.6.		continued seismic profiling	medium winds and swell
25.6.	10:49 14:32-16:47	end of profile; retrieval of streamer and airguns; CDT/rosette sampler	increasing winds; high swell
26.6.	16:39-	Gravity corer and giant box corer	strong winds and swell
27.6.	-4:14 5:43 7:14	Gravity corer and giant box corer; Deployment of streamer and airguns; start of profile AWI-20090005	decreasing winds; high swell
28.6.		continued seismic profiling	light air; low swell
29.6.	13:35 17:39-19:56 20:14-23:33	end of profile; retrieval of streamer and airguns; CTD/rosette sampler; Gravity corer and giant box corer	fine; low swell
30.6.	1:50-10:29 11:49 13:49	Gravity corer and giant box corer; deployment of streamer and airguns; start of profile AWI-20090007	increasing winds and swell
01.7.		continued seismic profiling	strong winds and swell
02.7.	1:37 5:38-7:19 8:04-12:03 14:50-16:22 16:31-	end of profile; retrieval of streamer and airguns; CTD/rosette sampler; Gravity corer and giant box corer; CTD/rosette sampler; Giant box corer and gravity corer	fine; low swell
03.7.	-1:01 6:09 8:09	Giant box corer and gravity corer; deployment of streamer and airguns; start profile AWI-20090010	fine; low swell
04.7.		continued seismic profiling	fine; low swell
05.7.		continued seismic profiling	medium winds and swell
06.7.	10:41 14:30-16:51 16:57-23:55	end of profile; retrieval of streamer and airguns; CD/rosette sampler; Gravity corer and giant box	medium winds and swell

		corer	
07.7.	7:23-8:54 9:10-10:20	CTD/rosette sampler; Gravity corer and giant box corer	storm; very high swell (10 m)
08.7.		no activity due to extremely bad weather	storm; very high swell (10 m)
09.7.	8:01-10:33 12:15-14:08 14:45-20:12	Gravity corer and giant box corer; CTD/rosette sampler; Multibeam calibration survey; end of scientific programme	medium winds and swell
10.7.		de-installation and packing of equipment; transit to Reykjavik	medium winds and swell
11.7.	16:00	end of multibeam and Parasound profiling	medium winds and swell
12.7.	9:00 -18:00	Pilot on board; enter Reykjavik; Packing of equipment	fine; low winds
13.7	9:00 13:00	Unloading of containers and streamer winch; departure of participants	fine; low winds

6. Acknowledgements

We like to thank captain Friedrich von Staa, his officers and crew of RV Maria S. Merian for their support of our measurement programme and for creating a very friendly atmosphere on board. We also appreciate that Thor was in a good mood during almost all the time providing us with weather allowing an efficient use of the cruise time.

The ship time of Merian was provided by the Deutsche Forschungsgemeinschaft within the core program METEOR/MERIAN. We also benefited from financial contributions by the research institutes involved. We gratefully acknowledge all this support.

Cruise participants

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EGGERS, Thorsten	Seismics	Optimare
FISCHEL, Andrea	student, Parasound	Uni Aarhus/GEUS
FREIBOTHE, Ronald	student, Seismics	AWI
HØJDAL, Jesper	Simrad	Scansurvey
KORDANSKA, Matylda	student, Seismics	AWI
LISS, Barbara	student, Seismics	AWI
MÜLLER-MICHAELIS, Antje	CTD	IfM-ZMAW
NAAFS, Bernhard David	Geology	AWI
NIELD, Mark	compressor technician	EEL
NIESSEN, Frank	Parasound, core logging	AWI
OBERMANN, Anne	student, Seismics	AWI
PETERS, Carl	student, Geology	AWI
SAUKEL, Cornelia	Geology	AWI
SCHMIDT, Daniela	Geology	Uni Bristol
SLABY, Beate	student, Parasound	AWI
SOMMERFELD, Robert	student, Geology	AWI
STEIN, Rüdiger	Geology	AWI
WEIGELT, Estella	Seismics	AWI
MÜLLER, Reinhard	doctor	Briese

AWI	Alfred-Wegener-Institut für Polar- und Meeresforschung Bremerhaven, Germany
EEL	Exploration Electronics Ltd/ Airbridge Compressors Great Yarmouth, UK
GEUS	Geological Survey of Denmark and Greenland Copenhagen, Denmark
IfM-ZMAW	Institut für Meerskunde, Zentrum für Marine und Atmosphärische Wissenschaften, University Hamburg Hamburg, Germnay
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Uni Aarhus	University of Aarhus Department of Earth Sciences Aarhus, Denmark
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Seismic profiles

Line	begin				end			
	date	UTC	lat	lon	date	UTC	lat	lon
AWI-20090001	22.6.09	10:13:00/16:06:00	58.64	-45.05	22.6.09	18:52:38	58.56	-45.47
AWI-20090002	22.6.09	18:52:38	58.56	-45.47	23.6.09	12:09:38	58.46	-48.2
AWI-20090003	23.6.09	13:26:58	58.42	-48.17	24.6.09	10:13:00	57.84	-45.09
AWI-20090004	24.6.09	12:09:20	57.86	-45.09	25.6.09	10:49:00	58.2475	-48.6787
AWI-20090005	27.6.09	8:00	58.1473	-48.0945	28.6.09	6:26:45	58.2325	-44.4825
AWI-20090006	28.6.09	8:13	58.199	-44.5345	29.6.09	13:36:55	57.64857	-48.9558
AWI-20090007	30.6.09	13:48:43	57.60259	-48.62114	30.6.09	16:47	57.42337	-48.94505
AWI-20090008	30.6.09	18:38	57.47286	-48.93522	1.7.09	12:23:21	57.50340	-46.16263
AWI-20090009	1.7.09	13:25:50	57.53555	-46.21445	2.7.09	1:34:13	58.5278	-46.402
AWI-20090010	3.7.09	8:08:50	58.50564	-46.40040	3.7.09	23:24:48	57.59	-44.7925
AWI-20090011	4.7.09	00:43:13	57.56501	-44.84871	5.7.09	00:29:07	57.90694	-48.52443
AWI-20090012	5.7.09	1:48:50	57.91	-48.482	5.7.09	7:42:10	58.39239	-48.30316
AWI-20090013	5.7.09	9:16	58.3968	-48.3125	5.7.09	19:08:10	58.41576	-46.75071
AWI-20090014	5.7.09	19:12:30	58.41391	-46.73975	6.7.09	10:40	57.933	-44.4827

Geological stations

Station	Latitude	Longitude	WD (m)	Gear	Pen_SL	Rec_SL	Remarks
MSM12/2-01-01	58,21	-48,37	3450	SL-10	10	9,68	ODP Site 646
MSM12/2-01-02	58,21	-48,37	3451	GKG			ODP Site 646
MSM12/2-01-03	58,21	-48,37	3450	SL-10	10	9,34	ODP Site 646
MSM12/2-02-01	58,16	-47,87	3306	SL-10	10	9,81	
MSM12/2-02-02	58,16	-47,87	3307	GKG			
MSM12/2-03-01	57,48	-48,53		SL-10	10	9,88	U1305
MSM12/2-03-02	57,48	-48,53		GKG			U1305
MSM12/2-04-01	57,56	-48,60	3492	SL-10	10,2	9,96	Mt Merian
MSM12/2-04-02	57,56	-48,60		GKG			Mt Merian
MSM12/2-05-01	57,54	-48,74	3489	SL-15	15	14,94	High-resolution section Holocene
MSM12/2-05-02	57,54	-48,74		GKG			GKG nicht ausgelöst
MSM12/2-06-01	58,51	-46,40	2578	GKG			IODP U1307; GKG nicht ausgelöst
MSM12/2-06-02	58,51	-46,40	2579	SL-10	5	2,97	IODP U1307
MSM12/2-06-03	58,51	-46,40	2579	GKG			IODP U1307
MSM12/2-07-01	58,27	-45,64	2273	GKG			IODP U1306
MSM12/2-07-02	58,27	-45,64	2273	SL-10	10	9,53	IODP U1306
MSM12/2-08-01	58,60	-46,43	2563	GKG			High-resolution section (close to U1307)
MSM12/2-08-02	58,60	-46,43	2563	SL-15	15	14,16	High-resolution section (close to U1307)
MSM12/2-09-01	57,57	-44,75	3275	SL-15	15	14,53	High-resolution section
MSM12/2-09-02	57,57	-44,75	3275	GKG			
MSM12/2-10-01	57,60	-44,85	3193	GKG			
MSM12/2-10-02	57,60	-44,85	3192	SL-15	15	14,18	More condensed section
MSM12/2-11-01	58,24	-44,42	2384	SL-10	10	9,53	
MSM12/2-12-01	60,17	-40,12	2370	SL-15		10,00	
MSM12/2-12-02	60,17	-40,12	2370	GKG	14	12,75	

CTD stations

Cast No.	Date	Start time	Latitude	Longitude
001	22.06.2009	06:06	58° 46.83' N	044° 17.41' W
002	25.06.2009	14:29	58° 12.62' N	048° 22.16' W

003	29.06.2009	17:37	57° 28.52’ N	048° 31.81’ W
004	02.07.2009	05:36	58° 30.34’ N	046° 24.05’ W
005	02.07.2009	14:48	58° 14.23’ N	045° 38.54’ W
006	06.07.2009	14:29	57° 34.16’ N	044° 44.73’ W
007	07.07.2009	07:19	58° 14.32’ N	044° 24.87’ W
008	09.07.2009	12:13	60° 17.25’ N	039° 40.14’ W

Station book

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear	Action	Comment
MSM12/639-1	6/21/2009	16:00	59° 10,53' N	42° 9,70' W	2192.4	Multibeam und ParaSound	start profil	
MSM12/640-1	6/22/2009	6:08	58° 46,83' N	44° 17,40' W	1825.6	CTD/rosette water sampler	surface	
MSM12/640-1	6/22/2009	6:44	58° 46,83' N	44° 17,40' W	1826.3	CTD/rosette water sampler	at depth	SL max 1796 m
MSM12/639-1	6/22/2009	6:50	58° 46,83' N	44° 17,40' W	1827.6	Multibeam und ParaSound	Information	Techn. Defekt des PS-PC Profile weiter ohne PS
MSM12/640-1	6/22/2009	7:26	58° 46,83' N	44° 17,40' W	1826.7	CTD/rosette water sampler	on deck	
MSM12/640-2	6/22/2009	8:15	58° 46,76' N	44° 17,82' W	1830.6	Seismic reflection profile	Streamer into water	
MSM12/640-2	6/22/2009	9:25	58° 45,86' N	44° 22,52' W	1858.9	Seismic reflection profile	Remark	3175m Streamer ausgebracht
MSM12/640-2	6/22/2009	9:37	58° 45,72' N	44° 23,31' W	1865	Seismic reflection profile	airguns in the water	
MSM12/640-2	6/22/2009	10:13	58° 45,00' N	44° 27,19' W	1894.3	Seismic reflection profile	profile start	Profil AWI 20090001
MSM12/640-2	6/22/2009	10:27	58° 44,68' N	44° 28,91' W	1908.4	Seismic reflection profile	Remark	Unterbrechung wg. Kompressor-Problemen
MSM12/640-2	6/22/2009	10:47	58° 44,25' N	44° 31,27' W	1922.7	Seismic reflection profile	Remark	techn. Probleme behoben
MSM12/640-2	6/22/2009	10:54	58° 44,10' N	44° 32,09' W	1928.8	Seismic reflection profile	Remark	Unterbrechung wg. Kompressor-Problemen
MSM12/640-2	6/22/2009	12:25	58° 42,09' N	44° 42,84' W	1956	Seismic reflection profile	Remark	Beginn Hieven Streamer zur Kontrolle (Lauftiefe nicht korrekt und zu hoher Zug)
MSM12/640-2	6/22/2009	13:45	58° 41,02' N	44° 49,16' W	1979.9	Seismic reflection profile	streamer on deck	Streamerzug zu hoch da Endboje leckge-schlagen & gesunken. Ändern auf gr. Blase
MSM12/640-2	6/22/2009	14:27	58° 40,73' N	44° 50,87' W	1983.3	Seismic reflection profile	Streamer into water	
MSM12/640-2	6/22/2009	15:40	58° 38,98' N	44° 59,46' W	2009	Seismic reflection profile	Remark	Streamer mit 3175m ausgesteckt
MSM12/640-2	6/22/2009	15:47	58° 38,81' N	45° 0,36' W	2017.1	Seismic reflection profile	Remark	Kompressor i.O. - Fortsetzung Profil
MSM12/640-2	6/22/2009	16:07	58° 38,27' N	45° 3,28' W	2057.5	Seismic reflection profile	Remark	Alle 4 Airguns in Betrieb
MSM12/640-2	6/22/2009	18:52	58° 33,62' N	45° 28,12' W	2352.4	Seismic reflection profile	alter course	Neuer Kurs 261°rw
MSM12/640-2	6/22/2009	22:27	58° 30,63' N	46° 2,01' W	2480.3	Seismic reflection profile	alter course	Neuer Kurs 267°
MSM12/640-2	6/23/2009	12:25	58° 28,16' N	48° 14,40' W	3463.8	Seismic reflection profile	alter course	Neuer Kurs 109°
MSM12/640-2	6/23/2009	13:27	58° 25,22' N	48° 10,41' W	3447.5	Seismic reflection profile	Remark	Auf neuem Kurs 109°
MSM12/640-2	6/24/2009	10:12	57° 50,26' N	45° 5,29' W	2702.3	Seismic reflection profile	alter course	Neuer Kurs 281°
MSM12/640-2	6/24/2009	12:08	57° 51,57' N	45° 7,52' W	2652.8	Seismic reflection profile	Remark	Auf neuem Kurs 281°
MSM12/639-1	6/24/2009	21:36	58° 1,19' N	46° 36,36' W	3062.1	Multibeam und ParaSound	Information	Techn. Defekte behoben, Fortsetzung Profil mit PS
MSM12/640-2	6/25/2009	8:51	58° 12,61' N	48° 22,26' W	3447.2	Seismic reflection profile	alter course	Neuer Kurs 283°
MSM12/640-2	6/25/2009	8:52	58° 12,63' N	48° 22,42' W	3450.6	Seismic reflection profile	Remark	Auf neuem Kurs 283°
MSM12/640-2	6/25/2009	10:49	58° 14,85' N	48° 40,72' W	3475.6	Seismic reflection profile	end of profile	
MSM12/640-2	6/25/2009	11:20	58° 15,33' N	48° 43,54' W	13.4	Seismic reflection profile	array on deck	
MSM12/640-	6/25/2009	12:32	58° 17,59' N	48° 48,84' W	3485.5	Seismic reflection	streamer on	

2						profile	deck	
MSM12/639-1	6/25/2009	14:12	58° 13,13' N	48° 25,06' W	3479.6	Multibeam und ParaSound	profile break	
MSM12/641-1	6/25/2009	14:32	58° 12,62' N	48° 22,17' W	3447.2	CTD/rosette water sampler	surface	
MSM12/641-1	6/25/2009	15:37	58° 12,56' N	48° 22,14' W	3447.8	CTD/rosette water sampler	at depth	Sl max. 3438m, hieven
MSM12/641-1	6/25/2009	16:47	58° 12,56' N	48° 22,15' W	3448	CTD/rosette water sampler	on deck	
MSM12/639-1	6/25/2009	16:47	58° 12,56' N	48° 22,15' W	3448	Multibeam und ParaSound	continue the profile	
MSM12/639-1	6/26/2009	16:39	58° 12,57' N	48° 22,16' W	3450.6	Multibeam und ParaSound	profile break	
MSM12/642-1	6/26/2009	16:39	58° 12,57' N	48° 22,16' W	3450.6	Gravity corer	surface	10 m Kernrohr
MSM12/642-1	6/26/2009	17:22	58° 12,57' N	48° 22,16' W	3449.2	Gravity corer	at sea bottom	SL max 3473 m
MSM12/642-1	6/26/2009	17:26	58° 12,56' N	48° 22,16' W	3449.6	Gravity corer	off ground hoisting	
MSM12/642-1	6/26/2009	18:16	58° 12,57' N	48° 22,16' W	3450.1	Gravity corer	on deck	
MSM12/642-2	6/26/2009	18:25	58° 12,57' N	48° 22,16' W	3449.8	Box corer	surface	
MSM12/642-2	6/26/2009	19:08	58° 12,57' N	48° 22,16' W	3454.2	Box corer	at sea bottom	SL max. 3467m
MSM12/642-2	6/26/2009	19:57	58° 12,57' N	48° 22,16' W	3449.1	Box corer	on deck	
MSM12/642-3	6/26/2009	20:12	58° 12,57' N	48° 22,16' W	3450.2	Gravity corer	surface	10 m Kernrohr
MSM12/642-3	6/26/2009	20:53	58° 12,57' N	48° 22,16' W	3447.9	Gravity corer	at sea bottom	SL max 3473m
MSM12/642-3	6/26/2009	20:59	58° 12,57' N	48° 22,16' W	3450.1	Gravity corer	off ground hoisting	
MSM12/642-3	6/26/2009	21:48	58° 12,57' N	48° 22,17' W	3450.9	Gravity corer	on deck	
MSM12/639-1	6/26/2009	21:48	58° 12,57' N	48° 22,17' W	3450.9	Multibeam und ParaSound	continue the profile	
MSM12/639-1	6/27/2009	0:20	58° 9,48' N	47° 52,43' W	3306.6	Multibeam und ParaSound	profile break	
MSM12/643-1	6/27/2009	0:20	58° 9,48' N	47° 52,43' W	3306.6	Gravity corer	surface	
MSM12/643-1	6/27/2009	1:14	58° 9,49' N	47° 52,44' W	3305.5	Gravity corer	at sea bottom	Sl max. 3325m, Fz max. 62,8kN
MSM12/643-1	6/27/2009	2:14	58° 9,48' N	47° 52,44' W	3305.7	Gravity corer	on deck	
MSM12/643-2	6/27/2009	2:25	58° 9,48' N	47° 52,44' W	3304.8	Box corer	surface	
MSM12/643-2	6/27/2009	3:17	58° 9,48' N	47° 52,44' W	3306.4	Box corer	at sea bottom	Sl max. 3329m, Fz max. 42,7kN
MSM12/643-2	6/27/2009	4:14	58° 9,48' N	47° 52,44' W	3305	Box corer	on deck	
MSM12/639-1	6/27/2009	5:43	58° 10,32' N	48° 18,76' W	3429.2	Multibeam und ParaSound	continue the profile	
MSM12/644-1	6/27/2009	5:43	58° 10,32' N	48° 18,76' W	3429.2	Seismic reflection profile	Streamer into water	
MSM12/644-1	6/27/2009	7:09	58° 8,61' N	48° 12,27' W	3408.3	Seismic reflection profile	airguns in the water	
MSM12/644-1	6/27/2009	7:14	58° 8,62' N	48° 11,91' W	3404.5	Seismic reflection profile	profile start	
MSM12/644-1	6/27/2009	23:17	58° 14,22' N	45° 38,96' W	2272.2	Seismic reflection profile	alter course	Neuer Kurs 91°
MSM12/644-1	6/28/2009	6:30	58° 13,96' N	44° 28,42' W	2348.9	Seismic reflection profile	end of profile	Drehen auf neues Profil, neuer Kurs 254°rw
MSM12/644-1	6/28/2009	8:13	58° 11,94' N	44° 32,06' W	2371.1	Seismic reflection profile	profile start	Profil AWI 20090006
MSM12/644-1	6/29/2009	0:08	57° 48,85' N	46° 59,50' W	3114	Seismic reflection profile	Remark	Airgun aus wg. Problemen mit Kompressor
MSM12/644-1	6/29/2009	1:08	57° 47,83' N	47° 5,97' W	3127.7	Seismic reflection profile	Remark	Kompressor repariert
MSM12/644-1	6/29/2009	13:35	57° 29,31' N	48° 57,44' W	3503.7	Seismic reflection profile	end of profile	
MSM12/644-1	6/29/2009	13:53	57° 28,41' N	48° 56,53' W	3502.9	Seismic reflection profile	array on deck	
MSM12/644-1	6/29/2009	15:20	57° 26,10' N	48° 53,70' W	3508.1	Seismic reflection profile	streamer on deck	
MSM12/639-1	6/29/2009	17:39	57° 28,52' N	48° 31,82' W	3466.4	Multibeam und ParaSound	profile break	
MSM12/645-1	6/29/2009	17:39	57° 28,52' N	48° 31,82' W	3466.4	CTD/rosette water sampler	surface	
MSM12/645-1	6/29/2009	18:43	57° 28,52' N	48° 31,81' W	3465.7	CTD/rosette water sampler	at depth	SL max 3453 m

MSM12/645-1	6/29/2009	19:56	57° 28,52' N	48° 31,81' W	3463.1	CTD/rosette water sampler	on deck	
MSM12/645-2	6/29/2009	20:14	57° 28,52' N	48° 31,81' W	3463.1	Gravity corer	surface	10 m Kernrohr
MSM12/645-2	6/29/2009	20:58	57° 28,52' N	48° 31,82' W	3465.1	Gravity corer	at sea bottom	SL max. 3481m
MSM12/645-2	6/29/2009	20:59	57° 28,52' N	48° 31,82' W	3465.8	Gravity corer	off ground hoisting	
MSM12/645-2	6/29/2009	21:50	57° 28,52' N	48° 31,82' W	3463.7	Gravity corer	on deck	
MSM12/645-3	6/29/2009	21:57	57° 28,52' N	48° 31,82' W	3464.1	Box corer	surface	
MSM12/645-3	6/29/2009	22:03	57° 28,52' N	48° 31,82' W	3464.4	Box corer	information	Abbruch, SL max. 165m
MSM12/645-3	6/29/2009	22:06	57° 28,52' N	48° 31,82' W	3466.2	Box corer	information	Oberfläche, erneut fieren
MSM12/645-3	6/29/2009	22:47	57° 28,52' N	48° 31,81' W	3464.5	Box corer	at sea bottom	SLmax. 3477m
MSM12/645-3	6/29/2009	23:33	57° 28,52' N	48° 31,82' W	3464.6	Box corer	on deck	
MSM12/639-1	6/29/2009	23:33	57° 28,52' N	48° 31,82' W	3464.6	Multibeam und ParaSound	continue the profile	
MSM12/639-1	6/30/2009	1:50	57° 33,45' N	48° 37,03' W	3491.4	Multibeam und ParaSound	profile break	
MSM12/646-1	6/30/2009	1:50	57° 33,45' N	48° 37,03' W	3491.4	Gravity corer	surface	
MSM12/646-1	6/30/2009	2:38	57° 33,45' N	48° 37,02' W	3490.5	Gravity corer	at sea bottom	Sl max. 3510m, Fz max. 63,9kN
MSM12/646-1	6/30/2009	3:33	57° 33,45' N	48° 37,03' W	3491.9	Gravity corer	on deck	
MSM12/646-2	6/30/2009	3:42	57° 33,45' N	48° 37,02' W	3491.9	Box corer	surface	
MSM12/646-2	6/30/2009	4:24	57° 33,45' N	48° 37,03' W	3491.9	Box corer	at sea bottom	SL max 3510 m
MSM12/646-2	6/30/2009	5:10	57° 33,45' N	48° 37,02' W	3491.4	Box corer	on deck	
MSM12/639-1	6/30/2009	5:10	57° 33,45' N	48° 37,02' W	3491.4	Multibeam und ParaSound	continue the profile	
MSM12/639-1	6/30/2009	5:52	57° 32,31' N	48° 44,32' W	3490.9	Multibeam und ParaSound	profile break	
MSM12/647-1	6/30/2009	5:52	57° 32,31' N	48° 44,32' W	3490.9	Gravity corer	surface	10 m Kernrohr
MSM12/647-1	6/30/2009	6:34	57° 32,31' N	48° 44,32' W	3492.1	Gravity corer	at sea bottom	SL max 3504 m
MSM12/647-1	6/30/2009	6:34	57° 32,31' N	48° 44,32' W	3492.1	Gravity corer	off ground hoisting	
MSM12/647-1	6/30/2009	7:28	57° 32,31' N	48° 44,32' W	3491.5	Gravity corer	on deck	
MSM12/647-2	6/30/2009	7:32	57° 32,31' N	48° 44,32' W	3487.6	Box corer	surface	
MSM12/647-2	6/30/2009	8:14	57° 32,31' N	48° 44,32' W	3490	Box corer	at sea bottom	SL max. 3497m
MSM12/647-2	6/30/2009	8:58	57° 32,31' N	48° 44,32' W	3490	Box corer	on deck	BC hat nicht ausgelöst
MSM12/647-3	6/30/2009	9:03	57° 32,31' N	48° 44,32' W	3491.1	Box corer	surface	
MSM12/647-3	6/30/2009	9:45	57° 32,31' N	48° 44,32' W	3490.6	Box corer	at sea bottom	SL max. 3501m
MSM12/647-3	6/30/2009	10:29	57° 32,31' N	48° 44,32' W	3490	Box corer	on deck	
MSM12/639-1	6/30/2009	10:29	57° 32,31' N	48° 44,32' W	3490	Multibeam und ParaSound	continue the profile	
MSM12/648-1	6/30/2009	11:49	57° 43,87' N	48° 31,27' W	3444.9	Seismic reflection profile	Streamer into water	
MSM12/648-1	6/30/2009	13:05	57° 39,17' N	48° 34,69' W	3481.9	Seismic reflection profile	Remark	Streamer ausgesteckt, 3190m
MSM12/648-1	6/30/2009	13:10	57° 38,87' N	48° 34,90' W	3492.3	Seismic reflection profile	airguns in the water	
MSM12/648-1	6/30/2009	13:40	57° 36,73' N	48° 36,47' W	3492.9	Seismic reflection profile	alter course	Auf neuen Kurs 225°
MSM12/648-1	6/30/2009	13:49	57° 36,14' N	48° 37,31' W	3491.4	Seismic reflection profile	profile start	
MSM12/648-1	6/30/2009	16:26	57° 26,76' N	48° 54,72' W	3506.1	Seismic reflection profile	end of profile	
MSM12/648-1	6/30/2009	16:48	57° 25,46' N	48° 57,03' W	3534.5	Seismic reflection profile	alter course	Beginn Wendemanöver auf 090°rw
MSM12/648-1	6/30/2009	18:39	57° 28,44' N	48° 55,97' W	3497.7	Seismic reflection profile	profile start	Profil AWI 20090008
MSM12/648-1	6/30/2009	21:13	57° 28,51' N	48° 31,82' W	3466.6	Seismic reflection profile	alter course	Am Wegpunkt IODP 1305, neuer Kurs 089°
MSM12/648-1	7/1/2009	12:06	57° 30,18' N	46° 12,42' W	3156.5	Seismic reflection profile	end of profile	

MSM12/648-1	7/1/2009	12:25	57° 30,20' N	46° 9,51' W	3175.4	Seismic reflection profile	alter course	Beginn Wendmanöver auf rw 354°
MSM12/648-1	7/1/2009	13:26	57° 32,16' N	46° 12,86' W	3107.1	Seismic reflection profile	profile start	Profil AWI-20090009
MSM12/648-1	7/2/2009	1:19	58° 30,22' N	46° 24,00' W	2580.8	Seismic reflection profile	alter course	WP IODP_1307 - KÄ auf rw 358°
MSM12/648-1	7/2/2009	1:37	58° 31,67' N	46° 24,13' W	2566.1	Seismic reflection profile	Remark	Abbruch Profil, Beide Auftriebskörper der Airguns verloren
MSM12/648-1	7/2/2009	2:25	58° 34,90' N	46° 24,36' W	2552.6	Seismic reflection profile	array on deck	
MSM12/648-1	7/2/2009	3:43	58° 39,09' N	46° 26,90' W	2553.2	Seismic reflection profile	streamer on deck	
MSM12/639-1	7/2/2009	5:38	58° 30,34' N	46° 24,05' W	2579.8	Multibeam und ParaSound	profile break	
MSM12/649-1	7/2/2009	5:38	58° 30,34' N	46° 24,05' W	2579.8	CTD/rosette water sampler	surface	
MSM12/649-1	7/2/2009	6:26	58° 30,34' N	46° 24,05' W	2580.1	CTD/rosette water sampler	at depth	SL max 2569 m
MSM12/649-1	7/2/2009	7:19	58° 30,34' N	46° 24,05' W	2578.3	CTD/rosette water sampler	on deck	
MSM12/649-2	7/2/2009	8:04	58° 30,34' N	46° 24,05' W	2580	Box corer	surface	
MSM12/649-2	7/2/2009	8:37	58° 30,34' N	46° 24,05' W	2577.5	Box corer	at sea bottom	SL max. 2638m
MSM12/649-2	7/2/2009	9:17	58° 30,34' N	46° 24,05' W	2581.1	Box corer	on deck	
MSM12/649-3	7/2/2009	9:26	58° 30,34' N	46° 24,05' W	2578.3	Gravity corer	surface	10 m Kernrohr
MSM12/649-3	7/2/2009	10:00	58° 30,34' N	46° 24,05' W	2579.9	Gravity corer	at sea bottom	SL max. 2591m
MSM12/649-3	7/2/2009	10:00	58° 30,34' N	46° 24,05' W	2579.9	Gravity corer	off ground hoisting	
MSM12/649-3	7/2/2009	10:42	58° 30,34' N	46° 24,05' W	2579.4	Gravity corer	on deck	
MSM12/649-4	7/2/2009	10:52	58° 30,34' N	46° 24,05' W	2579.6	Box corer	surface	
MSM12/649-4	7/2/2009	11:24	58° 30,34' N	46° 24,05' W	2579.3	Box corer	at sea bottom	SL max. 2595m
MSM12/649-4	7/2/2009	12:03	58° 30,34' N	46° 24,05' W	2577.9	Box corer	on deck	
MSM12/639-1	7/2/2009	12:03	58° 30,34' N	46° 24,05' W	2577.9	Multibeam und ParaSound	continue the profile	
MSM12/639-1	7/2/2009	14:50	58° 14,23' N	45° 38,55' W	2276.1	Multibeam und ParaSound	profile break	
MSM12/650-1	7/2/2009	14:50	58° 14,23' N	45° 38,55' W	2276.1	CTD/rosette water sampler	surface	
MSM12/650-1	7/2/2009	15:36	58° 14,23' N	45° 38,56' W	2274	CTD/rosette water sampler	at depth	Sl max. 2263m
MSM12/650-1	7/2/2009	16:22	58° 14,23' N	45° 38,56' W	2279.4	CTD/rosette water sampler	on deck	
MSM12/650-2	7/2/2009	16:31	58° 14,23' N	45° 38,56' W	2271.8	Box corer	surface	
MSM12/650-2	7/2/2009	16:59	58° 14,23' N	45° 38,56' W	2274	Box corer	at sea bottom	SL max. 2291m
MSM12/650-2	7/2/2009	17:32	58° 14,23' N	45° 38,56' W	2273.9	Box corer	on deck	
MSM12/650-3	7/2/2009	17:42	58° 14,23' N	45° 38,56' W	2273.8	Gravity corer	surface	10 m Kernrohr
MSM12/650-3	7/2/2009	18:10	58° 14,23' N	45° 38,56' W	2272.4	Gravity corer	at sea bottom	SL max. 2291m
MSM12/650-3	7/2/2009	18:10	58° 14,23' N	45° 38,56' W	2272.4	Gravity corer	off ground hoisting	
MSM12/650-3	7/2/2009	18:48	58° 14,23' N	45° 38,56' W	2273.3	Gravity corer	on deck	
MSM12/639-1	7/2/2009	18:48	58° 14,23' N	45° 38,56' W	2273.3	Multibeam und ParaSound	continue the profile	
MSM12/639-1	7/2/2009	22:23	58° 36,12' N	46° 25,82' W	2560.1	Multibeam und ParaSound	profile break	
MSM12/651-1	7/2/2009	22:23	58° 36,12' N	46° 25,82' W	2560.1	Box corer	surface	
MSM12/651-1	7/2/2009	22:53	58° 36,12' N	46° 25,83' W	2561	Box corer	at sea bottom	SL max. 2575m
MSM12/651-1	7/2/2009	23:30	58° 36,12' N	46° 25,83' W	2564.4	Box corer	on deck	
MSM12/651-2	7/2/2009	23:41	58° 36,12' N	46° 25,82' W	2560.5	Gravity corer	surface	10 m Kernrohr
MSM12/651-2	7/3/2009	0:14	58° 36,12' N	46° 25,82' W	2560.1	Gravity corer	at sea bottom	SL max. 2582m, Fz max. 59,0 kN
MSM12/651-2	7/3/2009	1:01	58° 36,12' N	46° 25,83' W	2562.6	Gravity corer	on deck	
MSM12/639-1	7/3/2009	1:01	58° 36,12' N	46° 25,83' W	2562.6	Multibeam und ParaSound	continue the profile	

MSM12/652-1	7/3/2009	6:09	58° 33,76' N	46° 37,80' W	2705.8	Seismic reflection profile	Streamer into water	
MSM12/652-1	7/3/2009	7:44	58° 31,13' N	46° 27,17' W	2610.4	Seismic reflection profile	airguns in the water	
MSM12/652-1	7/3/2009	8:09	58° 30,34' N	46° 24,01' W	2577.7	Seismic reflection profile	profile start	Profil AWI 20090010
MSM12/639-1	7/3/2009	13:35	58° 15,05' N	45° 40,85' W	2285.4	Multibeam und ParaSound	Information	erneut techn. Defekt des Parasound-PC; Profil weiter nur mit EM120 (MB)
MSM12/652-1	7/3/2009	13:50	58° 14,32' N	45° 38,84' W	2274.7	Seismic reflection profile	alter course	WP IODP_1306 - neuer Kurs 146°
MSM12/639-1	7/3/2009	18:15	57° 55,68' N	45° 15,39' W	2477.3	Multibeam und ParaSound	Information	PS-PC repariert; PS wieder gestartet
MSM12/652-1	7/3/2009	23:24	57° 35,41' N	44° 47,67' W	3229.3	Seismic reflection profile	end of profile	Kursänderung: Neuer Kurs 280°, Kanonen abgesoffen
MSM12/652-1	7/3/2009	23:39	57° 35,16' N	44° 45,50' W	3240	Seismic reflection profile	Remark	Beginn einholen der Kanonen
MSM12/652-1	7/3/2009	23:48	57° 34,61' N	44° 44,82' W	3257.7	Seismic reflection profile	array on deck	
MSM12/652-1	7/4/2009	0:10	57° 33,16' N	44° 46,16' W	3292.1	Seismic reflection profile	airguns in the water	Airguns nun mit 3 Blasen
MSM12/652-1	7/4/2009	0:44	57° 33,93' N	44° 51,03' W	3235.7	Seismic reflection profile	profile start	Profil AWI_20090011
MSM12/652-1	7/5/2009	0:31	57° 54,44' N	48° 31,76' W	3393.1	Seismic reflection profile	end of profile	Beginn KÄ auf 011°
MSM12/652-1	7/5/2009	1:49	57° 54,19' N	48° 28,90' W	3387.8	Seismic reflection profile	profile start	Profil AWI_20090012
MSM12/652-1	7/5/2009	5:28	58° 12,53' N	48° 22,17' W	3448	Seismic reflection profile	Remark	Passieren Wegpunkt IODP 646
MSM12/652-1	7/5/2009	7:22	58° 21,92' N	48° 18,77' W	3465.4	Seismic reflection profile	end of profile	
MSM12/652-1	7/5/2009	7:50	58° 24,19' N	48° 18,04' W	3465.4	Seismic reflection profile	alter course	Neuer Kurs 089°rw
MSM12/652-1	7/5/2009	9:16	58° 23,81' N	48° 18,75' W	3469.5	Seismic reflection profile	profile start	AWI-2009013
MSM12/652-1	7/5/2009	18:48	58° 24,77' N	46° 48,38' W	2922.1	Seismic reflection profile	end of profile	
MSM12/652-1	7/5/2009	19:07	58° 24,81' N	46° 45,25' W	2913.1	Seismic reflection profile	alter course	Neuer Kurs 112°rw
MSM12/652-1	7/5/2009	19:10	58° 24,81' N	46° 44,77' W	2914.3	Seismic reflection profile	profile start	Profil AWI 20090014
MSM12/639-1	7/5/2009	21:43	58° 20,17' N	46° 22,48' W	2801.1	Multibeam und ParaSound	Information	erneut techn. Defekt des Parasound-PC; Profil weiter nur mit EM120 (MB)
MSM12/652-1	7/6/2009	10:41	57° 56,01' N	44° 28,82' W	2901.6	Seismic reflection profile	end of profile	
MSM12/652-1	7/6/2009	10:56	57° 55,62' N	44° 27,03' W	2928.1	Seismic reflection profile	array on deck	
MSM12/652-1	7/6/2009	12:12	57° 55,36' N	44° 17,40' W	3028.9	Seismic reflection profile	streamer on deck	
MSM12/639-1	7/6/2009	14:30	57° 34,16' N	44° 44,74' W	3275.7	Multibeam und ParaSound	profile break	
MSM12/653-1	7/6/2009	14:30	57° 34,16' N	44° 44,74' W	3275.7	CTD/rosette water sampler	surface	
MSM12/653-1	7/6/2009	15:35	57° 34,16' N	44° 44,75' W	3273.4	CTD/rosette water sampler	at depth	Sl max. 3279m
MSM12/653-1	7/6/2009	16:51	57° 34,16' N	44° 44,74' W	3272.9	CTD/rosette water sampler	on deck	
MSM12/653-2	7/6/2009	16:57	57° 34,16' N	44° 44,74' W	3274.4	Gravity corer	surface	15 m Kernrohr
MSM12/653-2	7/6/2009	17:38	57° 34,16' N	44° 44,74' W	3274.7	Gravity corer	at sea bottom	SL max 3291 m
MSM12/653-2	7/6/2009	17:39	57° 34,16' N	44° 44,74' W	3274.4	Gravity corer	off ground hoisting	
MSM12/653-2	7/6/2009	18:27	57° 34,16' N	44° 44,74' W	3274.5	Gravity corer	on deck	
MSM12/653-3	7/6/2009	18:34	57° 34,16' N	44° 44,74' W	3273.5	Box corer	surface	
MSM12/653-3	7/6/2009	19:14	57° 34,16' N	44° 44,74' W	3274.5	Box corer	at sea bottom	SL max 3295 m
MSM12/653-3	7/6/2009	19:58	57° 34,16' N	44° 44,74' W	3273.9	Box corer	on deck	
MSM12/639-1	7/6/2009	19:58	57° 34,16' N	44° 44,74' W	3273.9	Multibeam und ParaSound	continue the profile	
MSM12/639-1	7/6/2009	20:52	57° 36,08' N	44° 51,18' W	3192.3	Multibeam und ParaSound	profile break	

MSM12/654-1	7/6/2009	20:52	57° 36,08' N	44° 51,18' W	3192.3	Box corer	surface	
MSM12/654-1	7/6/2009	21:31	57° 36,08' N	44° 51,18' W	3196.5	Box corer	at sea bottom	SL max. 3207m
MSM12/654-1	7/6/2009	22:14	57° 36,08' N	44° 51,18' W	3194.9	Box corer	on deck	
MSM12/654-2	7/6/2009	22:25	57° 36,08' N	44° 51,18' W	3197.6	Gravity corer	surface	15 m Kernrohr
MSM12/654-2	7/6/2009	23:07	57° 36,08' N	44° 51,18' W	3195	Gravity corer	at sea bottom	SL max. 3217m
MSM12/654-2	7/6/2009	23:07	57° 36,08' N	44° 51,18' W	3195	Gravity corer	off ground hoisting	
MSM12/654-2	7/6/2009	23:55	57° 36,08' N	44° 51,18' W	3193.6	Gravity corer	on deck	
MSM12/639-1	7/6/2009	23:55	57° 36,08' N	44° 51,18' W	3193.6	Multibeam und ParaSound	continue the profile	
MSM12/639-1	7/7/2009	7:23	58° 14,32' N	44° 24,88' W	2384.7	Multibeam und ParaSound	profile break	
MSM12/655-1	7/7/2009	7:23	58° 14,32' N	44° 24,88' W	2384.7	CTD/rosette water sampler	surface	
MSM12/655-1	7/7/2009	8:09	58° 14,32' N	44° 24,88' W	2383.8	CTD/rosette water sampler	at depth	SL max. 2373m
MSM12/655-1	7/7/2009	8:54	58° 14,32' N	44° 24,88' W	2384.5	CTD/rosette water sampler	on deck	
MSM12/655-2	7/7/2009	9:10	58° 14,31' N	44° 24,89' W	2383.4	Gravity corer	surface	10 m Kernrohr
MSM12/655-2	7/7/2009	9:43	58° 14,31' N	44° 24,89' W	2386.7	Gravity corer	at sea bottom	SL max 2405 m
MSM12/655-2	7/7/2009	9:44	58° 14,31' N	44° 24,89' W	2388.6	Gravity corer	off ground hoisting	
MSM12/655-2	7/7/2009	10:20	58° 14,31' N	44° 24,89' W	2382.6	Gravity corer	on deck	
MSM12/639-1	7/7/2009	10:20	58° 14,31' N	44° 24,89' W	2382.6	Multibeam und ParaSound	continue the profile	
MSM12/639-1	7/9/2009	8:01	60° 10,33' N	40° 7,02' W	2348.9	Multibeam und ParaSound	profile break	
MSM12/656-1	7/9/2009	8:01	60° 10,33' N	40° 7,02' W	2348.9	Gravity corer	surface	15 m Kernrohr
MSM12/656-1	7/9/2009	8:33	60° 10,34' N	40° 7,02' W	2347.9	Gravity corer	at sea bottom	SL max. 2364m
MSM12/656-1	7/9/2009	8:33	60° 10,34' N	40° 7,02' W	2347.9	Gravity corer	off ground hoisting	
MSM12/656-1	7/9/2009	9:12	60° 10,33' N	40° 7,02' W	2347.8	Gravity corer	on deck	
MSM12/656-2	7/9/2009	9:20	60° 10,33' N	40° 7,02' W	2350.3	Box corer	surface	
MSM12/656-2	7/9/2009	9:50	60° 10,34' N	40° 7,02' W	2347.6	Box corer	at sea bottom	SL max. 2368m
MSM12/656-2	7/9/2009	9:56	60° 10,33' N	40° 7,02' W	2346.9	Box corer	information	Stop hieven, Störung Winde
MSM12/656-2	7/9/2009	10:00	60° 10,34' N	40° 7,02' W	2346.7	Box corer	information	Störung behoben, weiter hieven
MSM12/656-2	7/9/2009	10:33	60° 10,33' N	40° 7,02' W	2347.3	Box corer	on deck	
MSM12/639-1	7/9/2009	10:33	60° 10,33' N	40° 7,02' W	2347.3	Multibeam und ParaSound	continue the profile	
MSM12/639-1	7/9/2009	12:10	60° 17,21' N	39° 40,16' W	2562.4	Multibeam und ParaSound	profile break	Unterbrechung der MB-Aufzeichnungen wegen Kalibrierung EM120
MSM12/657-1	7/9/2009	12:15	60° 17,24' N	39° 40,14' W	2563.5	CTD/rosette water sampler	surface	
MSM12/657-1	7/9/2009	13:05	60° 17,24' N	39° 40,14' W	2564.5	CTD/rosette water sampler	at depth	Sl max. 2553m
MSM12/657-1	7/9/2009	14:08	60° 17,24' N	39° 40,14' W	2561.9	CTD/rosette water sampler	on deck	
MSM12/639-1	7/9/2009	14:45	60° 14,83' N	39° 32,73' W	2555.8	Multibeam und ParaSound	continue the profile	5 Profile zur Kalibrierung des EM 120
MSM12/639-1	7/9/2009	15:31	60° 19,95' N	39° 29,91' W	2697.8	Multibeam und ParaSound	end of track	KÄ auf Gegenkurs
MSM12/639-1	7/9/2009	15:41	60° 20,01' N	39° 29,88' W	2699.9	Multibeam und ParaSound	start track	
MSM12/639-1	7/9/2009	16:25	60° 15,08' N	39° 32,66' W	2558.4	Multibeam und ParaSound	end of track	KÄ zum Parallelprofil
MSM12/639-1	7/9/2009	16:54	60° 15,39' N	39° 38,07' W	2514.5	Multibeam und ParaSound	start track	
MSM12/639-1	7/9/2009	17:42	60° 20,81' N	39° 35,04' W	2692	Multibeam und ParaSound	end of track	KÄ auf Gegenkurs
MSM12/639-1	7/9/2009	17:51	60° 20,86' N	39° 35,03' W	2694.7	Multibeam und ParaSound	start track	
MSM12/639-1	7/9/2009	18:38	60° 15,50' N	39° 38,03' W	2518	Multibeam und ParaSound	end of track	

MSM12/639-1	7/9/2009	19:16	60° 18,33' N	39° 38,88' W	2603.9	Multibeam und ParaSound	start track	Querprofil
MSM12/639-1	7/9/2009	20:12	60° 15,68' N	39° 26,91' W	2626.3	Multibeam und ParaSound	end of track	
MSM12/639-1	7/9/2009	20:28	60° 16,64' N	39° 21,68' W	2690.3	Multibeam und ParaSound	continue the profile	
MSM12/639-1	7/11/2009	16:00	63° 27,44' N	25° 34,19' W	313	Multibeam und ParaSound	profile end	