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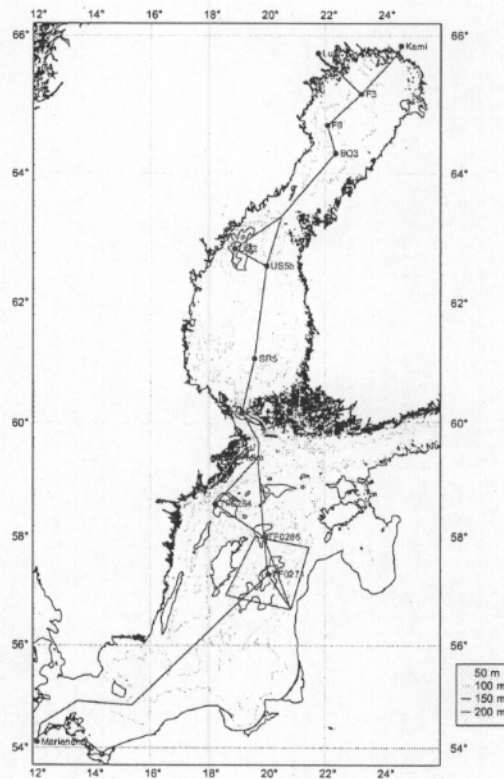


Short Cruise Report RV MARIA S. MERIAN Cruise 12-4a

Bremerhaven-Stockholm
25.August – 9.September 2009

Chief Scientist : Falk Pollehne
Captain: Klaus Bergmann

Track of Maria S. Merian
in the Central Baltic
working area



Scientific objectives of the cruise

Main objective of this cruise was the evaluation of recent transport processes and mixing of dissolved organic constituents between Baltic and North Sea and the reconstruction of deep water inflow events from the North into the Baltic Sea during the Holocene.

With an increased transport of river derived DOC into the northern Baltic ecosystem due to the thawing arctic permafrost soils the question arises, whether these high loads of organic constituents are simply mixed into the world ocean or if degradation, conversion to gaseous forms or retainment in modified forms is already proceeding in the Baltic basins. As these conversion processes cover broad temporal and spatial scales an expanded suite of methodological approaches was applied on the cruise to solve parts of this question. The approaches ranged from isotopic analysis over optical measurements, microbiological rate estimations to gas measurements. By means of stable isotope signatures of carbon, nitrogen, oxygen and sulfur in dissolved and particulate material collected on the cruise the fate of the introduced organic material can be tracked. In addition to the stocks of organic material in the water those in sediment and sedimenting particles were included in sampling and analysis. Sediment trap arrays, that are collecting particles already for a longer period of time, were serviced and exchanged on this cruise.

The study of the inflow of saline North Sea water into the Baltic aims at a high resolution reconstruction of holocene variations, their coupling to climate variability in the North Atlantic and their effects on the Baltic ecosystem. Special importance is attached to three time slices:

- (i) the last 100 years with the opportunity of a coupling to time series measurements
- (ii) historical natural climate variations: medieval warm phase and little ice age
- (iii) palaeo-development until 8000 years before today

These studies were conducted in the sediments, which are deposited in the Baltic gradient under different diagenetic conditions and redox-settings and sampling was performed by means of gravity coring and Multicorer sampling for sediment surface analysis.

Narrative of the cruise

The research vessel Maria S. Merian left Bremerhaven on the 25th of August and reached the first station off Helgoland after a few hours. Several CTD-Profiles were obtained and samples collected for the analyses of oxygen, plant nutrients and different variables of particulates that were suspended in the water. Geological samples were collected at the fringe of a depression close to the isle of Helgoland employing Multicorer and gravity corer and sediment cores of 6 m length were retrieved without problems. On this and the following day further stations were served in the shallow part of the eastern North Sea. Some hours were spent to calibrate the multibeam echosounder which was later employed in the survey of areas which were selected for the upcoming international Baltic IODP deep drilling programme. In the Norwegian Trough the water-column investigations were continued on August 27th and 28th, now including the measurements of partial pressures of CO₂ and N₂ in surface waters, microbiological rate measurements and marine optical surveys. Above all geological sampling was performed on the northern fringe of the trough in the frame of the joint EU-project "INFLOW" in order to investigate the historic development of deep water inflow-events from the North Sea into the Baltic in the holocene. For this task 14 gravity cores up to 9 m length were obtained in this area and complemented by several Muticorer surface samples. All cores contained high quantities of methane gas.

In the Kattegat the first surface sediment mapping for one proposed IODP-site was performed off the isle of Anholt on the 29th of August again complemented by water column stations,

multicorer-surface and gravity coring. The ship then proceeded through the Oresund into the first Baltic basin, the Arkona-Sea, with occasional water column sampling and online measurements of partial pressure of dissolved carbon dioxide and nitrogen gas in the surface layer. From here the mixture between water column work for the characterization of mixing processes between North Sea and Baltic and the sediment surveys for the reconstruction of historical inflow-events continued through the central basins of the Bornholm and the Gotland Sea and the Landsort deep. In the Danish sector of the Hanö-bight off Bornholm a second larger area was mapped for the joint Baltic deep drilling programme employing multibeam and parasound echosounding devices.

On the 2nd and 3rd of September intense sampling of the oxic and anoxic water masses of the Gotland- and Landsort-deep was performed including profiling measurements of CO₂- and N₂ concentrations. This provided important data for long term balances of respiratory processes in these deep basins. At these end-points of deep water renewal long sediment cores were obtained for the evaluation of historic inflow-events. In the frame of a long-term study on vertical particle flux a sediment trap mooring was deployed in the Lithuanian sector of the central Gotland sea. The recovery of the precursor, however, failed, as the both the main and the accessory acoustic releaser emitted no signals. A short multibeam survey of the area showed a few suspect objects off the original mooring position, which will be inspected closer on a later regular monitoring cruise with an ROV.

The survey of the northern Baltic basins started in the Aland Sea on the 3rd of September followed by stations in the central Bothnian Sea and the central Bothnian Bay over the next 2 days with discrete CTD/rosette sampling of the watercolumn, pump-CTD casts for gas measurements, optical measurements in the surface layer and coring for the assessment of the historic sedimentation conditions. We reached the northernmost station of the cruise at 65°42'N and 23°08'E close to the mouth of the river Kalix on Sept. 5th, where the water had a pronounced brown colour due to the input of river derived yellow substances. The high organic content and the presence of methane gas in all sediment cores from the northern basins points towards a sedimentary accumulation of river-derived material in these otherwise rather oligotrophic areas.

On the way to Stockholm a few more stations on the western parts of the basins were serviced and a mooring, which was laid out on the first cruise with R.V Merian in 2006 in the Bothnian Bay and could not be retrieved in the following year, was searched for. The search was not successful and it has to be assumed that the steel parts of the mooring have meanwhile been corroded and that the instruments are lost. The retrieval of a sediment trap in the Bothnian Sea, however, worked out well and provided time resolved samples of vertical particle flux for the period of one year. The last station of this leg was performed on Sept., 8th of in the central Bothnian Sea with a detailed pumpcast on the vertical gas distribution in the watercolumn. Maria S. Merian reached Stockholm harbour early in the morning on the 9th of September for the exchange of the scientific crew

Acknowledgements

We would like to thank Captain Klaus Bergmann, the officers and crew of Maria S. Merian for their strong support of our scientific aims and the provision of a cooperative and friendly atmosphere that made us feel at home on the ship.

**Participants Leg MSM 12/4A
Bremerhaven-Stockholm
25.August – 9.September 2009**

1. Pollehne, Falk	Fahrtleiter / <i>Chief Scientist</i>	IOW
2. Hagenmeier ,Anna	nutrients/oxygen	IOW
3. Hehl , Uwe	moorings/oxygen	IOW
4. Krüger, Siegfried	instrumentation/CTD	IOW
5. Wlost, Peter	instrumentation/CTD	IOW
6. Jost, Günter	microbiology	IOW
7. Anna Jentzen	microbiology/nutrients	IOW
8. Struck, Ulrich	nat. Isotopes	MNB
9. Falk , Marianne	Isotopes/filtration	MNB
10. Brüchert, Volker	dissolved organic carbon	ITM
11. Deutsch, Barbara	sulfur isotopes	ITM
12. Korth, Frederike	nitrate N-isotopes	IOW
13. Rahm, Lars	sediment prep.	WEL
14. Ohde, Thomas	marine optics	IOW
15. Gerth, Monika	marine optics	IOW
16. Jeschek , Jenny	organic pollutants	IOW
17. Löffler, Anne	CO2/N2 gas	IOW
18. Kupsch, Hildegard	CO2/N2 gas	IOW
19. Leipe, Thomas	geology	IOW
20. Moros, Matthias	geology	IOW
21. Deutschmann, Andre	geochemistry	UGR
22. Florian Adolphi	coring	UGR

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MNB - Museum für Naturkunde der Humboldt-Universität zu Berlin, Invalidenstr. 43, 10115 Berlin

ITM - Department of Applied Environmental Science, Stockholm University, Svante Arrhenius väg 8c, SE-10691 Stockholm, Sweden

WEL - Department of Water and Environmental Studies Linköping University, Linköpings universitetet ,581 83 Linköping, Sweden

UGR - Institut für Geographie und Geologie der Universität Greifswald, Friedrich-Ludwig-Jahn-Straße 16/17a, 17487 Greifswald

List of operations

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear
MSM12/756-1	25.08.2009	10:43	54° 6,68' N	8° 2,41' E	19,9	CTD/rosette water sampler
MSM12/756-2	25.08.2009	11:20	54° 6,70' N	8° 2,20' E	20,6	CTD/rosette water sampler
MSM12/756-3	25.08.2009	11:50	54° 6,73' N	8° 2,47' E	27,6	Optiksonde Trios
MSM12/756-4	25.08.2009	12:00	54° 6,73' N	8° 2,47' E	27,1	Optiksonde Satlantik
MSM12/756-5	25.08.2009	12:23	54° 6,80' N	8° 2,92' E	27,1	Multi corer
MSM12/756-6	25.08.2009	12:41	54° 6,80' N	8° 2,93' E	27,1	Gravity corer
MSM12/757-1	25.08.2009	14:06	54° 5,70' N	7° 52,80' E	41,9	CTD/rosette water sampler
MSM12/758-1	25.08.2009	22:57	55° 18,94' N	7° 16,20' E	27,2	CTD/rosette water sampler
MSM12/759-1	26.08.2009	06:56	56° 54,10' N	7° 29,05' E	33,0	CTD/rosette water sampler
MSM12/759-2	26.08.2009	07:04	56° 54,12' N	7° 29,18' E	31,4	IOW Pump-CTD/Rosette
MSM12/759-1	26.08.2009	07:12	56° 54,18' N	7° 29,27' E	31,1	CTD/rosette water sampler
MSM12/759-4	26.08.2009	07:51	56° 54,19' N	7° 29,28' E	31,2	Optiksonde Trios
MSM12/759-5	26.08.2009	08:00	56° 54,19' N	7° 29,29' E	31,4	Optiksonde Satlantik
MSM12/760-1	26.08.2009	10:26	57° 13,87' N	7° 8,46' E	65,2	CTD/rosette water sampler
MSM12/761-1	27.08.2009	00:38	57° 41,05' N	6° 40,99' E	319,6	CTD/rosette water sampler
MSM12/761-2	27.08.2009	01:13	57° 41,05' N	6° 41,00' E	319,0	Multi corer
MSM12/761-3	27.08.2009	01:46	57° 41,04' N	6° 41,00' E	321,4	Gravity corer
MSM12/761-4	27.08.2009	02:52	57° 41,04' N	6° 40,99' E	319,0	Gravity corer
MSM12/762-1	27.08.2009	04:47	57° 40,06' N	7° 5,36' E	314,9	Multi corer
MSM12/763-1	27.08.2009	06:20	57° 40,55' N	7° 9,97' E	330,7	Multi corer
MSM12/763-2	27.08.2009	06:53	57° 40,55' N	7° 9,97' E	314,5	Gravity corer
MSM12/764-1	27.08.2009	13:39	57° 32,21' N	8° 30,56' E	87,3	CTD/rosette water sampler
MSM12/764-2	27.08.2009	14:05	57° 32,44' N	8° 31,28' E	86,8	Optiksonde Trios
MSM12/764-3	27.08.2009	14:11	57° 32,47' N	8° 31,42' E	88,4	Optiksonde Satlantik
MSM12/765-1	27.08.2009	18:24	58° 1,95' N	9° 37,25' E	296,6	CTD/rosette water sampler
MSM12/765-2	27.08.2009	18:47	58° 1,98' N	9° 37,30' E	297,8	Multi corer
MSM12/765-3	27.08.2009	19:17	58° 1,98' N	9° 37,30' E	297,2	Multi corer
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MSM12/765-5	27.08.2009	20:33	58° 1,98' N	9° 37,30' E	297,5	Gravity corer
MSM12/766-1	27.08.2009	23:53	58° 29,76' N	9° 35,91' E	547,9	CTD/rosette water sampler
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MSM12/766-3	28.08.2009	01:26	58° 29,76' N	9° 35,91' E	549,8	Multi corer
MSM12/766-4	28.08.2009	02:08	58° 29,76' N	9° 35,91' E	553,5	Gravity corer
MSM12/767-1	28.08.2009	05:08	58° 43,95' N	10° 12,03' E	229,1	CTD/rosette water sampler
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MSM12/768-1	28.08.2009	09:53	57° 58,04' N	10° 17,14' E	86,1	CTD/rosette water sampler
MSM12/768-2	28.08.2009	10:36	57° 58,03' N	10° 17,15' E	86,5	CTD/rosette water sampler
MSM12/768-3	28.08.2009	11:05	57° 58,10' N	10° 17,30' E	86,6	Optiksonde Trios
MSM12/768-4	28.08.2009	11:17	57° 58,19' N	10° 17,52' E	88,8	Optiksonde Satlantik
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MSM12/770-1	28.08.2009	23:34	56° 43,66' N	11° 49,14' E	42,1	CTD/rosette water sampler
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MSM12/770-3	29.08.2009	00:19	56° 43,66' N	11° 49,13' E	41,7	Gravity corer
MSM12/771-1	29.08.2009	01:42	56° 36,27' N	11° 46,55' E	39,9	Multi corer
MSM12/771-2	29.08.2009	02:10	56° 36,26' N	11° 46,54' E	37,2	Multi corer
MSM12/771-3	29.08.2009	02:32	56° 36,26' N	11° 46,53' E	38,4	Gravity corer
MSM12/771-4	29.08.2009	03:57	56° 36,26' N	11° 46,52' E	37,1	Gravity corer
MSM12/772-1	29.08.2009	05:20	56° 37,09' N	11° 42,71' E	35,8	Multibeam und ParaSound
MSM12/772-1	29.08.2009	07:18	56° 37,53' N	11° 41,05' E	32,3	Multibeam und ParaSound
MSM12/773-1	29.08.2009	08:02	56° 40,38' N	11° 46,72' E	42,4	Multibeam und ParaSound
MSM12/773-1	29.08.2009	10:02	56° 40,02' N	11° 48,18' E	39,7	Multibeam und ParaSound
MSM12/774-1	29.08.2009	10:30	56° 40,67' N	11° 47,35' E	42,8	Multi corer
MSM12/775-1	29.08.2009	13:34	56° 15,38' N	12° 22,65' E	26,5	CTD/rosette water sampler
MSM12/775-1	29.08.2009	13:41	56° 15,39' N	12° 22,65' E	26,3	CTD/rosette water sampler
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MSM12/775-3	29.08.2009	14:07	56° 15,49' N	12° 23,01' E	19,5	Optiksonde Satlantik

MSM12/775-4	29.08.2009	14:28	56° 15,38' N	12° 22,66' E	19,5	CTD/rosette water sampler
MSM12/776-1	29.08.2009	17:21	55° 46,49' N	12° 46,52' E	20,5	CTD/rosette water sampler
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MSM12/777-3	30.08.2009	01:02	54° 53,73' N	13° 33,55' E	49,4	Multi corer
MSM12/777-4	30.08.2009	01:20	54° 53,73' N	13° 33,55' E	49,0	Gravity corer
MSM12/778-1	30.08.2009	12:42	55° 32,29' N	14° 57,89' E	83,3	CTD/rosette water sampler
MSM12/778-1	30.08.2009	12:51	55° 32,29' N	14° 57,89' E	83,2	CTD/rosette water sampler
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MSM12/778-3	30.08.2009	13:26	55° 32,24' N	14° 58,64' E	92,7	Optiksonde Satlantik
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MSM12/778-5	30.08.2009	14:30	55° 32,31' N	14° 57,90' E	86,9	Gravity corer
MSM12/778-6	30.08.2009	15:31	55° 32,31' N	14° 57,90' E	83,1	Gravity corer
MSM12/779-1	30.08.2009	17:30	55° 28,71' N	15° 26,59' E	114,5	CTD/rosette water sampler
MSM12/779-2	30.08.2009	17:49	55° 28,42' N	15° 26,95' E	89,7	Multibeam und ParaSound
MSM12/779-2	30.08.2009	20:03	55° 27,63' N	15° 27,66' E	94,1	Multibeam und ParaSound
MSM12/780-1	30.08.2009	21:20	55° 17,90' N	15° 28,39' E	96,9	Multibeam und ParaSound
MSM12/780-1	30.08.2009	22:50	55° 17,58' N	15° 29,48' E	97,2	Multibeam und ParaSound
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MSM12/781-2	31.08.2009	00:49	55° 15,67' N	15 28,21' E	96,2	Multi corer
MSM12/781-3	31.08.2009	01:18	55° 15,67' N	15° 28,21' E	96,3	Gravity corer
MSM12/781-4	31.08.2009	02:14	55° 15,67' N	15° 28,21' E	96,4	Gravity corer
MSM12/782-1	31.08.2009	05:07	55° 7,28' N	16° 11,37' E	93,7	CTD/rosette water sampler
MSM12/782-2	31.08.2009	06:02	55° 7,28' N	16° 11,37' E	93,2	CTD/rosette water sampler
MSM12/782-3	31.08.2009	06:24	55° 7,14' N	16° 11,44' E	91,5	Optiksonde Trios
MSM12/782-5	31.08.2009	06:55	55° 7,06' N	16° 11,87' E	92,6	CTD/rosette water sampler
MSM12/783-1	31.08.2009	20:53	57° 18,02' N	20° 2,20' E	264,5	CTD/rosette water sampler
MSM12/783-2	31.08.2009	21:31	57° 18,02' N	20° 2,20' E	252,8	IOW Pump-CTD/Rosette
MSM12/783-3	01.09.2009	06:09	57° 18,02' N	20° 2,23' E	266,9	CTD/rosette water sampler
MSM12/783-4	01.09.2009	08:44	57° 18,02' N	20° 2,24' E	252,5	CTD/rosette water sampler
MSM12/783-4	01.09.2009	09:06	57° 18,02' N	20° 2,23' E	265,4	CTD/rosette water sampler
MSM12/783-5	01.09.2009	09:36	57° 18,02' N	20° 2,23' E	255,2	Optiksonde Trios
MSM12/783-6	01.09.2009	09:44	57° 18,03' N	20° 2,23' E	269,2	Optiksonde Satlantik
MSM12/783-7	01.09.2009	10:09	57° 18,13' N	20° 2,17' E	264,5	Multi corer
MSM12/784-1	01.09.2009	10:57	57° 18,75' N	20° 10,47' E	250,0	Mooring search
MSM12/785-1	01.09.2009	13:49	57° 19,11' N	20° 10,48' E	249,2	Mooring deployed
MSM12/786-1	01.09.2009	14:46	57° 23,12' N	20° 15,50' E	256,5	Multi corer
MSM12/786-2	01.09.2009	15:07	57° 23,11' N	20° 15,50' E	256,9	Multi corer
MSM12/786-3	01.09.2009	15:26	57° 23,11' N	20° 15,50' E	254,5	Multi corer
MSM12/786-4	01.09.2009	16:13	57° 23,11' N	20° 15,50' E	245,6	Gravity corer
MSM12/786-5	01.09.2009	16:53	57° 23,10' N	20° 15,50' E	245,2	Gravity corer
MSM12/786-5	01.09.2009	17:49	57° 23,10' N	20° 15,50' E	232,3	Gravity corer
MSM12/786-5	01.09.2009	18:17	57° 23,09' N	20° 15,50' E	231,9	Multi corer
MSM12/787-1	01.09.2009	19:01	57° 19,56' N	20° 10,57' E	241,1	Multibeam Echosounder
MSM12/787-1	01.09.2009	19:27	57° 19,44' N	20° 10,55' E	244,0	Multibeam Echosounder
MSM12/788-1	02.09.2009	04:02	58° 35,02' N	18° 14,04' E	452,5	CTD/rosette water sampler
MSM12/788-2	02.09.2009	07:00	58° 35,02' N	18° 14,06' E	451,9	IOW Pump-CTD/Rosette
MSM12/788-3	02.09.2009	09:32	58° 35,02' N	18° 14,05' E	452,0	Optiksonde Trios
MSM12/788-5	02.09.2009	15:25	58° 35,02' N	18° 14,07' E	452,0	IOW Pump-CTD/Rosette
MSM12/788-6	02.09.2009	23:39	58° 35,02' N	18° 14,08' E	452,2	Multi corer
MSM12/789-1	03.09.2009	00:38	58° 37,59' N	18° 15,31' E	451,4	Multi corer
MSM12/789-2	03.09.2009	01:16	58° 37,60' N	18° 15,32' E	450,4	Multi corer
MSM12/789-3	03.09.2009	01:52	58° 37,60' N	18° 15,32' E	450,1	Gravity corer
MSM12/790-1	03.09.2009	08:14	59° 31,06' N	19° 44,66' E	31,3	CTD/rosette water sampler
MSM12/790-2	03.09.2009	08:51	59° 31,06' N	19° 44,66' E	29,4	CTD/rosette water sampler
MSM12/790-3	03.09.2009	09:15	59° 31,13' N	19° 44,56' E	29,4	Optiksonde Trios
MSM12/790-4	03.09.2009	09:22	59° 31,19' N	19° 44,55' E	44,0	Optiksonde Satlantik
MSM12/791-1	03.09.2009	14:42	60° 13,01' N	19° 1,91' E	243,3	Optiksonde Trios
MSM12/791-2	03.09.2009	14:48	60° 13,01' N	19° 1,93' E	243,3	Optiksonde Satlantik
MSM12/791-3	03.09.2009	15:24	60° 12,86' N	19° 1,80' E	241,9	CTD/rosette water sampler
MSM12/791-3	03.09.2009	15:44	60° 12,86' N	19° 1,80' E	241,9	CTD/rosette water sampler
MSM12/791-4	03.09.2009	16:04	60° 12,86' N	19° 1,80' E	242,6	Multi corer

MSM12/791-5	03.09.2009	16:23	60° 12,86' N	19° 1,81' E	242,4	Gravity corer
MSM12/792-1	03.09.2009	21:04	60° 59,06' N	19° 34,89' E	134,5	CTD/rosette water sampler
MSM12/792-1	03.09.2009	21:16	60° 59,07' N	19° 34,89' E	135,6	CTD/rosette water sampler
MSM12/792-2	03.09.2009	21:58	60° 59,06' N	19° 34,89' E	134,7	CTD/rosette water sampler
MSM12/792-3	03.09.2009	22:12	60° 59,06' N	19° 34,89' E	123,4	Multi corer
MSM12/792-4	03.09.2009	22:41	60° 59,06' N	19° 34,90' E	133,6	Gravity corer
MSM12/792-5	03.09.2009	23:21	60° 59,06' N	19° 34,90' E	133,9	Gravity corer
MSM12/793-1	04.09.2009	08:34	62° 39,07' N	19° 59,99' E	139,7	CTD/rosette water sampler
MSM12/793-2	04.09.2009	09:14	62° 39,07' N	20° 0,12' E	134,8	CTD/rosette water sampler
MSM12/793-3	04.09.2009	09:39	62° 39,46' N	20° 0,47' E	133,4	Optiksonde Trios
MSM12/793-4	04.09.2009	09:41	62° 39,48' N	20° 0,57' E	133,2	Optiksonde Satlantik
MSM12/793-5	04.09.2009	10:30	62° 39,99' N	20° 1,02' E	115,8	CTD/rosette water sampler
MSM12/793-6	04.09.2009	10:49	62° 39,99' N	20° 1,03' E	113,7	Multi corer
MSM12/793-7	04.09.2009	11:05	62° 40,00' N	20° 1,04' E	114,8	Multi corer
MSM12/793-8	04.09.2009	11:24	62° 40,00' N	20° 1,03' E	115,4	Gravity corer
MSM12/794-1	04.09.2009	20:45	64° 17,07' N	22° 27,88' E	97,7	CTD/rosette water sampler
MSM12/794-1	04.09.2009	20:58	64° 17,07' N	22° 27,90' E	97,8	CTD/rosette water sampler
MSM12/794-2	04.09.2009	21:34	64° 17,07' N	22° 27,90' E	98,3	CTD/rosette water sampler
MSM12/794-3	04.09.2009	21:46	64° 17,07' N	22° 27,90' E	98,0	Multi corer
MSM12/794-4	04.09.2009	22:06	64° 17,06' N	22° 27,91' E	98,9	Gravity corer
MSM12/794-5	04.09.2009	22:33	64° 17,06' N	22° 27,92' E	98,2	Gravity corer
MSM12/794-6	04.09.2009	23:32	64° 17,06' N	22° 27,95' E	98,0	Gravity corer
MSM12/795-1	05.09.2009	07:28	65° 41,69' N	23° 4,97' E	39,6	CTD/rosette water sampler
MSM12/795-1	05.09.2009	07:35	65° 41,69' N	23° 4,97' E	39,9	CTD/rosette water sampler
MSM12/796-1	05.09.2009	08:59	65° 41,02' N	23° 10,04' E	27,3	CTD/rosette water sampler
MSM12/796-1	05.09.2009	09:03	65° 41,02' N	23° 10,04' E	27,5	CTD/rosette water sampler
MSM12/796-2	05.09.2009	09:22	65° 41,03' N	23° 10,04' E	27,5	CTD/rosette water sampler
MSM12/796-3	05.09.2009	09:43	65° 41,02' N	23° 10,04' E	27,0	Optiksonde Trios
MSM12/796-4	05.09.2009	09:58	65° 41,04' N	23° 10,04' E	26,8	Optiksonde Satlantik
MSM12/796-5	05.09.2009	10:13	65° 41,08' N	23° 10,00' E	25,8	Multi corer
MSM12/797-1	05.09.2009	13:31	65° 14,06' N	23° 42,11' E	25,7	Optiksonde Trios
MSM12/797-2	05.09.2009	13:44	65° 14,07' N	23° 42,12' E	25,2	Optiksonde Satlantik
MSM12/797-3	05.09.2009	14:06	65° 14,09' N	23° 42,27' E	25,3	CTD/rosette water sampler
MSM12/797-3	05.09.2009	14:09	65° 14,09' N	23° 42,27' E	24,8	CTD/rosette water sampler
MSM12/798-1	05.09.2009	15:56	65° 10,70' N	23° 5,72' E	125,4	CTD/rosette water sampler
MSM12/798-1	05.09.2009	16:08	65° 10,71' N	23° 5,73' E	125,4	CTD/rosette water sampler
MSM12/798-2	05.09.2009	17:15	65° 10,71' N	23° 5,73' E	125,0	IOW Pump-CTD/Rosette
MSM12/798-3	06.09.2009	01:22	65° 10,70' N	23° 5,73' E	122,8	Multi corer
MSM12/798-4	06.09.2009	01:53	65° 10,71' N	23° 5,73' E	121,9	Gravity corer
MSM12/798-5	06.09.2009	02:24	65° 10,71' N	23° 5,73' E	122,5	Gravity corer
MSM12/798-6	06.09.2009	02:50	65° 10,68' N	23° 5,69' E	125,6	Gravity corer
MSM12/799-1	06.09.2009	06:32	64° 42,45' N	22° 3,98' E	5,0	CTD/rosette water sampler
MSM12/799-2	06.09.2009	07:20	64° 42,44' N	22° 3,93' E	123,8	CTD/rosette water sampler
MSM12/799-3	06.09.2009	07:57	64° 42,44' N	22° 3,93' E	124,1	Mooring search
MSM12/799-4	06.09.2009	16:02	64° 42,21' N	22° 4,37' E	115,2	Search abandoned
MSM12/800-1	07.09.2009	06:22	62° 51,00' N	18° 53,01' E	195,7	CTD/rosette water sampler
MSM12/800-1	07.09.2009	06:41	62° 51,00' N	18° 53,01' E	195,6	CTD/rosette water sampler
MSM12/800-2	07.09.2009	07:25	62° 50,99' N	18° 53,01' E	195,7	CTD/rosette water sampler
MSM12/800-3	07.09.2009	07:49	62° 51,00' N	18° 53,02' E	200,1	Optiksonde Trios
MSM12/801-1	07.09.2009	11:44	62° 24,98' N	19° 2,47' E	90,8	Mooring retrieved
MSM12/802-1	07.09.2009	12:55	62° 25,17' N	19° 5,73' E	88,3	Optiksonde Trios
MSM12/802-2	07.09.2009	13:09	62° 25,14' N	19° 5,78' E	89,8	Optiksonde Satlantik
MSM12/802-3	07.09.2009	13:46	62° 25,17' N	19° 5,47' E	96	CTD/rosette water sampler
MSM12/802-3	07.09.2009	13:58	62° 25,17' N	19° 5,47' E	96	CTD/rosette water sampler
MSM12/802-4	07.09.2009	14:12	62° 25,17' N	19° 5,46' E	96	Multi corer
MSM12/803-1	07.09.2009	17:48	61° 46,02' N	19° 17,09' E	57	CTD/rosette water sampler
MSM12/803-1	07.09.2009	17:58	61° 46,02' N	19° 17,09' E	57	CTD/rosette water sampler
MSM12/803-2	07.09.2009	18:11	61° 46,02' N	19° 17,09' E	57	Multi corer
MSM12/804-1	07.09.2009	23:19	61° 4,99' N	19° 35,01' E	134,9	CTD/rosette water sampler
MSM12/804-1	07.09.2009	23:36	61° 5,00' N	19° 35,01' E	135,5	CTD/rosette water sampler
MSM12/804-2	08.09.2009	00:22	61° 4,98' N	19° 35,00' E	123,8	IOW Pump-CTD/Rosette
MSM12/804-3	08.09.2009	14:18	61° 4,99' N	19° 35,01' E	123,7	Optiksonde Trios