

# RV MARIA S. MERIAN

## Cruise MSM09/2

21.08.2008 – 15.09.2008  
St. John's – Labrador Sea – Baffin Bay – St. John's



## Short Cruise Report

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## Scientific Programme

The RV Maria S MERIAN research cruise MSM09/2 followed a combined programme of physical oceanographic observations in the Labrador Sea and a biological and paleoceanographical programme focussing on plankton and sediment sampling in the Baffin Bay. The cruise track in the Labrador Sea was dictated by the position of the oceanographic profiles and the long-term mooring stations. North of the Davis Strait, the cruise was planned to reach the central Baffin Bay with the lowest salinity surface water (< 32 psu), representing the most extreme plankton habitat.

### *a) Physical oceanography*

The main objectives of the physical oceanographic programme were observations of the different deep circulation branches in the Labrador Sea and investigations of water mass characteristics and its variability. The focus is on the export of Labrador Sea Water and the other components of North Atlantic Deep Water from the subpolar to the subtropical North Atlantic. These observations form a part of a long-term monitoring project which aims to understand the variability of the Atlantic meridional overturning circulation, a major determinant in global climate. Specifically, the aims of the physical oceanographic investigations during the cruise were to determine:

- Multi-year variability of fresh water fluxes into the convective area
- Changes in water mass characteristics in relation to convection activity
- The role of eddy fluxes and re-circulation cells with respect to the exchange between the interior Labrador Sea and the boundary current
- Transformation of the deep water masses (inflow vs. outflow)
- Variability of the Deep Water export in relation to the large scale forcing

These objectives were followed during the cruise by maintenance work to the extensive mooring array, by direct observations of currents (LADCP) during station work, and through underway measurements of currents between stations (RV Merian's Ocean Surveyor ADCP). For water mass characterization, CTDO<sub>2</sub> stations were made along two sections passing by the moorings.

### *b) Micropalaeontology and paleoceanography*

Extensive sea-ice cover and strong salinity stratification in the summer make the Labrador Sea and the Baffin Bay potentially the best analogs for glacial conditions in the North Atlantic. This region is an important determinant in global ocean circulation and its dynamics controls climate in Europe. Yet, despite extensive efforts, our ability to reconstruct accurately the properties of North Atlantic polar waters in the past have been hampered by poor understanding of the behaviour of the main proxy carriers, planktonic foraminifera, in these extreme environments. The objective of the biological and paleoceanographic programme of this leg is to take advantage of the unique analogous conditions found in the Baffin Bay and collect data and samples that will make it possible to characterise the relationship between hydrographic conditions and living plankton and benthos across a gradient of salinity stratification and sea-ice extent as well as the transfer of the ecological signals from the plankton into the sedimentary archive. Specifically, the biological and paleoceanographical part of cruise MSM09/2 has been planned to pursue the following objectives:

- Collection of data and samples from the water column to understand how the habitats of planktonic and benthic foraminifera and phytoplankton are affected by the extreme environments of seasonal ice cover and large surface salinity

variations and how information on these pelagic habitats are incorporated into microfossil remains of the plankton.

- Sampling of foraminifera for DNA analyses in order to understand the taxonomy and the genetic diversity of the investigated species and to investigate the gene flow between populations of planktonic foraminifera (in particular *N. pachyderma*) in the marginal basins of the Arctic.
- Collection of surface sediment samples to characterise the transfer of habitat information into foraminiferal shells during life and its integration and modification during transport into the sediment, in order to facilitate the interpretation of paleoproxy records.
- Collection of sediment cores in the Baffin Bay, which could be used as archives of Holocene and late glacial dynamics of surface water parameters and benthic-pelagic coupling and where the newly developed proxies and ecological models could be tested.

The objectives of the biological oceanographic programme were carried out by following a comprehensive sampling and observation programme throughout the working area involving CTD casts, determination of phytoplankton pigment concentration by fluorescence probe, sampling and filtration of vertical water profiles, continuous pumping of surface waters and stratified plankton hauls; high-resolution sampling was planned for a transect across the northern Labrador Sea and through the central Baffin Bay. The micropalaeontological and paleoceanographical objectives were followed by sampling undisturbed surface sediments by means of a boxcorer and multicorer, including sampling of living benthic foraminifera for ecological observations, culturing experiments and genetic investigations. Sediment cores were collected mainly in the Baffin Bay in locations conducive to preservation of proxy signals and where sediment accumulation during the Holocene promised sediment archives with high temporal resolution.

## **Cruise narrative**

The mobilisation of the expedition MSM09/3 began in the port of St. John's on Newfoundland on August 19, 2008. The participants were busy assembling sampling gear, mooring components and setting up laboratories until the evening of August 20. With all cruise participants including the physician on board, the MERIAN left the port of St. John's according to the plan on the morning of August 21, heading NWN towards the shelf edge in the Labrador Sea. Due to excellent weather conditions and calm sea, the ship could steam at 13 kn and reached the first station ahead of schedule on August 22 at 12 UTC. The first station of the first of the two planned oceanographic lines in the Labrador Sea was used to test all equipment. Hardware problems with data transmission from the PARASOUND system and the release system of the multinet have been identified and resolved on the same day. Boxcore samples recovered from 300 m depth showed sediment unsuitable for coring and the test of the gravity corer has thus been postponed towards the second half of the cruise. CTD/LADCP deployment and water sampling from the rosette as well the water filtration bench and sampling of plankton with multinet and by filtering the ship's uncontaminated seawater supply were all tested successfully. The second of the 17 CTD stations of the first Labrador Sea line was reached on August 22 at 18 UTC and the measurements and sampling along the line proceeded without incidents until August 25. Following a successful deep-sea test of the Multibeam and PARASOUND systems and of the mooring releaser – hydrophone communication on

August 22, the IFM-GEOMAR Kiel long-term oceanographic mooring K9 was successfully re-deployed on August 23. The mooring array broke off from its anchor on May 21, 2008 but was promptly recovered by the Canadian RV Hudson, passing in the vicinity of the site. The mooring was delivered to the MERIAN in St John's and following maintenance and data capture, it could be reassembled and will continue monitoring the water column properties and water mass movement in the region. On three of the 17 stations of the first oceanographic line, plankton nets and surface sediment samples were taken in addition to the CTD/LADCP measurements. Weather conditions were generally good, although at times due to thick fog, the speed had to be reduced to 8 kn.

The first station of the second oceanographic line in the Labrador Sea was reached on August 26 at 15 UTC. Unlike the first oceanographic line, the second line traversed the entire Labrador Sea and the CTD/LADCP measurements were accompanied by plankton sampling (water filtration, multinet, phytoplankton pigment probe) at all 17 stations. All systems worked fine, apart from the phytoplankton pigment probe which failed to record data at several occasions. Sediment sampling took place at three stations. At the first sediment sampling station, in the early hours of August 27, a material fault was discovered on the deep-sea winch wire. Operations were aborted for five hours until the wire could be repaired. The boxcorer failed to close upon sediment contact when operations resumed. The station was abandoned for sediment work. Despite increasingly colder weather, the scientific programme proceeded well with scientists getting a routine in operating gear, sampling and working in 24-hour shifts.

On August 27 at 23:30 UTC the scientific programme had to be interrupted due to a medical emergency. One of the scientists of the CTD watch stumbled over the high sill of the door between the hangar and the midship gangway. The scientist fell on her right arm and remained immobile on the floor with arm bent at elbow pointing away from body. The injured remained conscious and called for help. The ship's physician assisted by ship's crew repositioned and fixed the arm after applying pain relief medication. Considering that no X-ray was available on ship and the working area for the coming weeks would have been significantly more remote (Davis Strait/Baffin Bay), the captain, the physician and the chief scientist jointly decided to interrupt the scientific programme and seek medical rescue for the injured. Following advice from Canadian authorities, a decision was made to head for the port of St. Anthony on Newfoundland Island at maximum speed (reaching at times 15 kn), where the injured was disembarked to the Canadian search and rescue team and taken to the local hospital for immediate attention. The scientific programme resumed on August 30 at 3 UTC, now running approximately two days behind schedule. This loss of time was, however, immediately partly compensated by an extremely smooth and successful exchange (recovery, maintenance and re-deployment) of the IFM-GEOMAR Kiel mooring array K1, which was completed by 20 UTC on August 30. The rest of the operations along the second oceanographic line went without further incidents, except of the sighting of the first iceberg on September 1. On the same day, a message from the injured scientist has reached us, informing us that she is back in Germany with friends and family and under medical observation. The weather turned rainy, foggy and cold, allowing only a small glimpse of the coast of Greenland near Cap Desolation, which was reached on September 2 at 2 UTC.

With all oceanographic work in the Labrador Sea completed, the focus of the rest of the cruise was on plankton ecology, micropalaeontology and sediment sampling in the Davis Strait and Baffin Bay. The transit to the Davis Strait is slower than expected due to thick fog limiting visibility to less than 2 nm. The last station in the Labrador Sea was at 62.5N. The deep-water setting was used to repair the deep-

sea wire to enable the deployment of the gravity corer in the Baffin Bay. Following the repair, surface sediment samples were recovered showing signs of winnowing by deep currents. The station was close to the expected position of the floating telemetry buoy of the IFM-GEOMAR Kiel mooring V434-07, which broke away in the Irminger Sea and drifted in the East Greenland Current since May 2007. Given the time loss and the unfavourable timing of arrival at the presumed position (night), it was decided not to pursue the mooring at this stage but reconsider a recovery when returning back from the Baffin Bay. The Davis Strait was reached on September 3; weather was still foggy and the cold was exacerbated by high humidity, resulting from the sea-surface temperature being several degrees warmer than the air. The sediment sampling station was located on the Sukkertop Bank, 5 nm dowtrack from the planned position since bottom topography and parasound indicated poor sediment yield there. Good samples were recovered with soft silty sediment, highly bioturbated, with living ophiurids. Plankton sampling revealed for the first time during the cruise an assemblage of planktonic foraminifera entirely dominated by *N. pachyderma*, as is typical for polar waters.

The polar circle was crossed during the night of September 4 in the region of the Kong Fredrik IX Land. Sporadic icebergs, fog and the danger of growlers have slowed the ship to 6-8 kn. The position of the first Baffin Bay station was reached at 17 UTC, a CTD cast (from now on without LADCP, which relies on a compass that is in this region useless due to the proximity of the magnetic pole) was used to calibrate the Multibeam and PARASOUND systems and sediment sampling commenced on location identified in collaboration with Dr. Kuijpers from GEUS (Copenhagen). Because of previous work on this location, only a quick survey by PARASOUND was necessary, indicating 40 m penetration and continuous sedimentary structures, and a confirmation of favourable sediment properties by boxcorer and multicorer allowed us to deploy a gravity corer in the night of September 5. The first attempt with 5m barrel showed more than full penetration through soft sediment, so a second attempt with 10m barrel was carried out, yielding again full sediment recovery. Due to these for this region unusually favourable sediment properties, it was decided to carry out an extensive bathymetric survey of the deep sediment furrows identified as iceberg ploughmarks by Dr. Kuijpers. The profile revealed new details of the furrows and allowed us to locate a third core in the region. Weather conditions are stable, but icebergs are becoming more frequent, one causing an interruption to the survey. The wind has picked up during the day (Bf6), blowing away the fog, so transfer to the next sampling area proceeded at good speed.

The northernmost point of the cruise was reached in the night to September 6 at 72.5N in the Baffin Bay off the Kangek Peninsula in the Upernavik region. PARASOUND survey revealed thick apron of homogenous sound-transparent sediment. Sediment sampling was carried out at 1200 m; gravity core penetrated about 5 m of fine mud with occasional clasts, probably representing glacial sediments. Having cancelled two stations of the original plan, the ship was now only a day behind schedule. Plankton sampling at six stations along a line through the central Baffin Bay was successfully completed on September 7. The CTD casts confirmed strong density stratification in the surface waters and the fluorescence probe identified a strong phytoplankton pigment maximum at 20-30 m below surface.

The last plankton station along the Baffin Bay line was completed at 20 UTC and a bathymetric survey was carried out to locate a position for the next sediment sampling station. The conditions on the slope and deep shelf were deemed unsuitable and the MERIAN was directed towards the Scott Inlet off Baffin Island, where a glacial trough cutting the shelf was expected. Enjoying a clear view of the coast of the Baffin Island with glaciers calving into the sea, the glacial trough was

located exactly in the continuation of the Inlet. The narrow trough is deepening towards the coast and contains little sediment. In order to remain within the 12nm zone for which permission was obtained, the sediment sampling commenced in the early hours of September 8 in a small basin inside the trough, recovering soft fossiliferous sediment without coarse glacial clastics. Informed by the situation in the Scott Inlet, it was decided to attempt sampling in the Home Bay, where a sediment basin was expected. A survey in the night to September 9 revealed a narrow channel in the Home Bay, analogous to the previous station, only this time with more obvious sediment infill. A gravity core reveals sediment unexpectedly rich calcareous benthic fauna. The MERIAN then headed for the original position of the next station in the southern Baffin Bay to carry out plankton sampling and a PARASOUND survey of the deeper slope. This revealed again suitable conditions for sediment sampling, with minimal signs of downslope transport and sediment deformation. A core was at 1550m depth, recovering almost 8m of fossiliferous sediment.

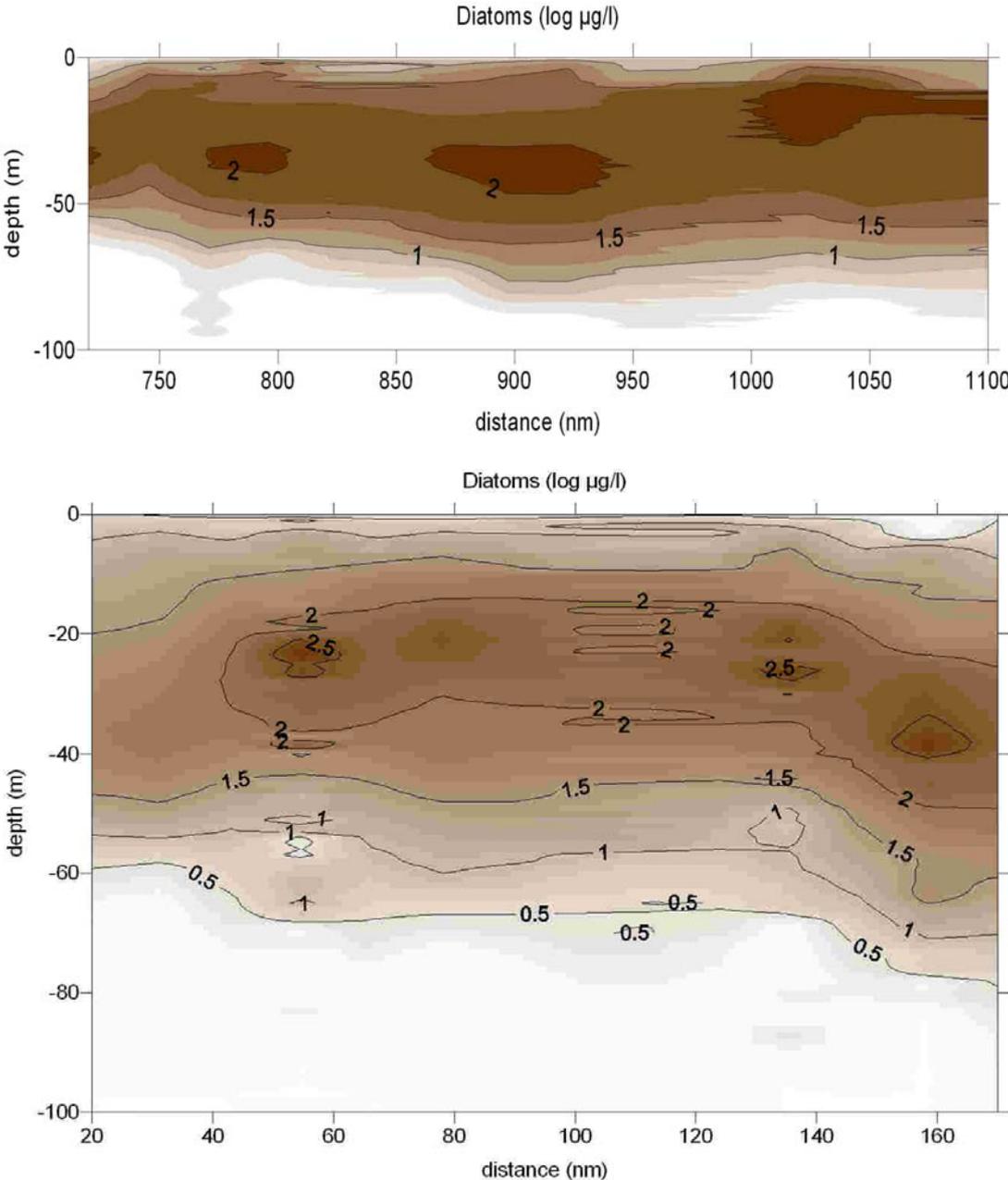
The sampling programme in the Baffin Bay completed, the MERIAN headed SE, reaching the first station in the Davis Strait on September 10 at 5 UTC. The transit through the Davis Strait was completed on the same day, with sediment sampling at two more stations, all revealing soft bioturbated sediment with coarse clasts. Now being back on schedule, it was decided to attempt to recover the drifting telemetry buoy in the northernmost Labrador Sea. The MERIAN reached the expected position in the early morning of September 11 but failed to register the buoy's signal. Because of ideal weather conditions (sunshine, clam sea), it was decided to continue the search visually. The buoy was sighted at 11 UTC and was taken on deck an hour later. The last station of the cruise was located due west off the buoy recovery site. A PARASOUND and Multibeam survey revealed complex bathymetry with submarine mounts. Surface sediment was taken from the plane between the mounts and revealed sediment suitable for coring with significant biogenic carbonate (planktonic foraminifera) content. A gravity core was taken subsequently, recovering almost 8m of sandy clay with foraminifera.

The scientific programme of the cruise was completed by plankton/CTD sampling in the night to September 12. The transit to St. John's was used for demobilisation of equipment so that the cruise participants could leave the ship on the day of arrival. Following 2.5 days of comfortable steaming under splendid weather conditions, the MERIAN reached the port of St. John's according to plan on September 15 in the morning.

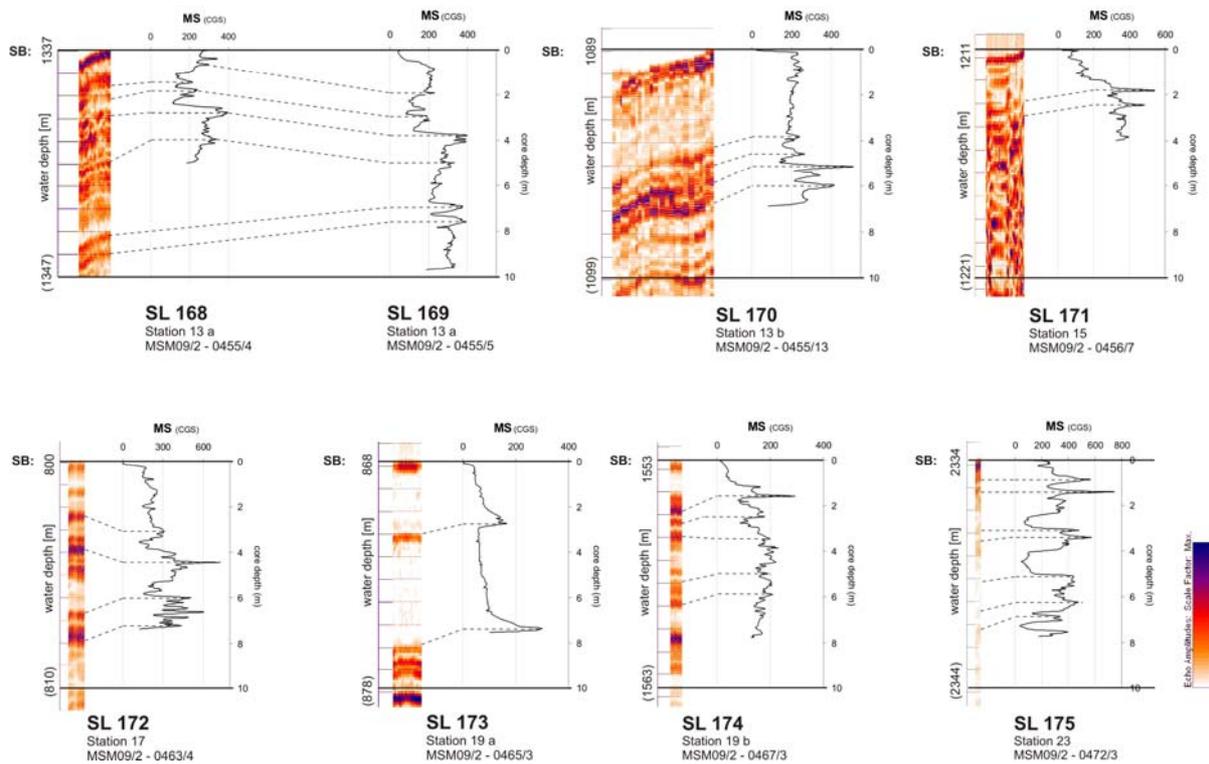
## **Cruise results**

Despite the significant time loss early during the cruise, the scientific programme could be successfully completed and all aims of the cruise have been met. The long-term monitoring programme of physical oceanography of the Labrador Sea will benefit by data from 34 new CTD/LADCP casts distributed along two lines. Two mooring arrays have been successfully (re)deployed and a drifting telemetry buoy was recovered (Table 3). Within our plankton sampling programme (Table 1), 310 filter samples from 36 stations (typically 11 depths per station) were collected to supplement phytoplankton pigment concentration profiles obtained at 24 stations by the fluorescence probe, providing important data on the vertical distribution of phytoplankton groups (Figure 1). 77 plankton net hauls at 37 stations were used to collect planktonic foraminifera for genetic investigations and for the development of paleoproxies. This collection was supplemented by 41 samples obtained by filtering water from the ship's uncontaminated seawater supply. 71 net hauls and 7 filtered

samples have been conserved and chemically stabilised for further investigations, along with 198 samples for seawater stable isotope measurements and further 36 samples for measurements of stable isotopes in diatom silica. Sediment sampling (Table 2) included 15 boxcorer and 12 multicorer grabs of undisturbed surface sediments and 8 sediment cores recovering over 50m of sediment profile from the Baffin Bay (Figure 2). Physical oceanography data from the cruise MSM09/2 are stored at the Leibniz-Institut für Meereswissenschaften (IFM-GEOMAR) in Kiel (group of Dr. Jürgen Fischer). All other data and samples are stored at the Institute of Geoscience at the University of Tübingen (group of Prof. Michal Kucera). An overview of the samples and data is given in Tables 1-3 and Figure 3, a complete list of stations is given in Appendix 1.



**Figure 1.** Profiles of diatom pigment concentrations in the Labrador Sea (upper panel, west-east along the second sampling line) and in the Baffin Bay (lower panel, west-east along a line at 72.5N), interpolated from fluorescence probe profiles.



**Figure 2.** Summary of sediment cores from cruise MSM09/2, showing PARASOUND profiles at site of core recovery (left) correlated with (dashed lines) 1-cm resolution magnetic susceptibility curves for each core (right). Core positions are listed in Table 2.

**Table 1.** Water sampling and water-column measurements during cruise MSM09/2.

Station					CTD Profile				Plankton				
Nr.	Date	Time	Latitude	Longitude	Depth	depth	LADCP	Filter	Iso	D-iso	USW	Nets	Pigment
415	22.08.08	12:06	52° 40.01' N	51° 57.99' W	302	279	x	x	x	x	x (T)	2	x
416	22.08.08	18:31	52° 46.45' N	51° 43.93' W	497	477	x	-	-	-	-	-	-
417	22.08.08	20:45	52° 52.48' N	51° 29.54' W	1703	1684	x	-	-	-	-	-	-
419	23.08.08	00:15	52° 57.92' N	51° 17.87' W	2261	2222	x	x	x	x	x (T)	2	x
420	23.08.08	06:46	53° 3.39' N	51° 3.96' W	2632	2594	x	-	-	-	-	-	-
421	23.08.08	09:51	53° 7.93' N	50° 51.83' W	2891	2871	x	-	-	-	-	-	-
422	23.08.08	17:51	53° 12.44' N	50° 39.39' W	3165	3152	x	-	-	-	-	-	-
423	23.08.08	20:51	53° 18.30' N	50° 27.28' W	3266	3220	x	-	-	-	-	-	-
424	24.08.08	01:11	53° 23.03' N	50° 14.97' W	3372	3345	x	x	-	-	x	2	x
425	24.08.08	11:15	53° 29.58' N	49° 59.78' W	3534	3519	x	-	-	-	-	-	-
426	24.08.08	14:45	53° 36.23' N	49° 42.53' W	3619	3608	x	-	-	-	-	-	-
427	24.08.08	18:16	53° 43.11' N	49° 25.28' W	3713	3683	x	-	-	-	-	-	-
428	24.08.08	21:53	53° 50.00' N	49° 8.57' W	3752	3739	x	-	-	-	-	-	-
429	25.08.08	01:25	53° 56.67' N	48° 51.24' W	3777	3765	x	-	-	-	-	-	-
430	25.08.08	05:04	54° 3.55' N	48° 34.17' W	3773	3772	x	-	-	-	-	-	-
431	25.08.08	08:51	54° 10.08' N	48° 18.18' W	3788	3763	x	-	-	-	-	-	-
432	25.08.08	12:40	54° 17.05' N	48° 0.05' W	3841	3831	x	x	-	-	x (T)	2	x
433	26.08.08	15:46	54° 55.98' N	54° 20.09' W	320	297	x	x	x	x	x (T)	2	failed
434	26.08.08	18:55	55° 11.11' N	54° 3.00' W	1601	1564	x	x	-	-	x	2	x
435	26.08.08	23:24	55° 26.98' N	53° 43.96' W	2761	2760	x	x	x	x	-	2	x
436	27.08.08	11:49	55° 50.40' N	53° 27.27' W	3105	3082	x	x	-	-	-	2	x
437	27.08.08	16:41	56° 13.50' N	53° 10.80' W	3405	3383	x	x	x	x	-	2	x
438	27.08.08	20:43	56° 36.62' N	52° 53.75' W	3463	3444	x	x	-	-	-	2	failed
439	30.08.08	03:47	56° 53.19' N	52° 41.38' W	3474	3457	x	x	x	x	-	2	failed
443	31.08.08	03:30	57° 18.15' N	52° 14.11' W	3499	3493	x	x	-	-	-	2	x
444	31.08.08	08:33	57° 41.09' N	51° 47.06' W	3503	3494	x	x	x	x	-	2	x
445	31.08.08	14:04	58° 4.36' N	51° 20.50' W	3548	3546	x	x	-	-	-	2	x
446	31.08.08	19:15	58° 27.84' N	50° 52.79' W	3533	3523	x	x	x	x	-	2	failed
447	01.09.08	00:29	58° 50.84' N	50° 25.88' W	3501	3489	x	x	-	-	-	2	failed
448	01.09.08	05:28	59° 14.00' N	49° 57.53' W	3444	3430	x	x	x	x	-	2	failed
449	01.09.08	10:24	59° 37.13' N	49° 28.86' W	3336	3325	x	x	-	-	-	2	x
450	01.09.08	15:30	60° 0.03' N	49° 0.06' W	3002	2985	x	x	x	x	-	2	x
451	01.09.08	23:31	60° 16.18' N	48° 46.13' W	2829	2821	x	x	-	-	-	2	failed
452	02.09.08	03:03	60° 32.07' N	48° 28.77' W	165	140	-	x	x	x	x (T)	1	x
453	02.09.08	17:41	62° 32.58' N	52° 38.44' W	2618	2584	-	x	x	x	-	4	x
454	03.09.08	17:16	64° 57.87' N	56° 26.39' W	736	712	-	x	x	x	x	4	failed
455	04.09.08	17:49	68° 58.12' N	59° 34.38' W	1350	1318	-	x	x	x	x	4	failed
456	06.09.08	04:28	72° 28.61' N	61° 54.62' W	1172	1158	-	x	x	x	x	2	x
457	06.09.08	14:23	72° 31.33' N	63° 0.00' W	2128	1511	-	x	x	x	x (T)	2	x
458	06.09.08	18:12	72° 30.94' N	64° 30.24' W	2300	1500	-	x	-	-	x (T)	2	x
459	07.09.08	05:12	72° 29.98' N	65° 59.93' W	2364	2332	-	x	x	x	x	2	failed
460	07.09.08	09:27	72° 20.57' N	67° 21.41' W	2367	1504	-	x	-	-	x	2	x
461	07.09.08	13:36	72° 10.53' N	68° 41.36' W	2166	1500	-	x	x	x	-	2	failed
462	07.09.08	17:27	72° 0.00' N	69° 59.96' W	1795	1767	-	x	-	-	x (T)	2	x
466	09.09.08	08:47	68° 30.00' N	63° 29.96' W	1474	1447	-	x	-	-	x (T)	2	failed
468	10.09.08	05:29	65° 59.97' N	60° 29.98' W	389	369	-	x	-	-	x	2	x
469	10.09.08	12:25	65° 0.01' N	59° 0.08' W	464	444	-	x	-	-	x	2	x
470	10.09.08	20:29	64° 0.00' N	57° 59.96' W	1010	998	-	x	-	-	x (T)	2	x
472	12.09.08	00:18	62° 29.83' N	56° 27.26' W	2119	2098	-	x	-	-	x (T)	2	x

Depths are given in meters below sea surface; time and date as UTC; Filter: water samples filtered for phytoplankton, Iso: water samples for stable isotopes, D-iso: samples for stable isotope measurements in diatom silica, USW: plankton samples from ship's uncontaminated sea water supply, (T): additional samples taken during transit to next station, Nets: number of multinet hauls, Pigment: vertical profiles of phytoplankton pigment concentration measured with fluorescence probe.

**Table 2.** Sediment sampling during cruise MSM09/2.

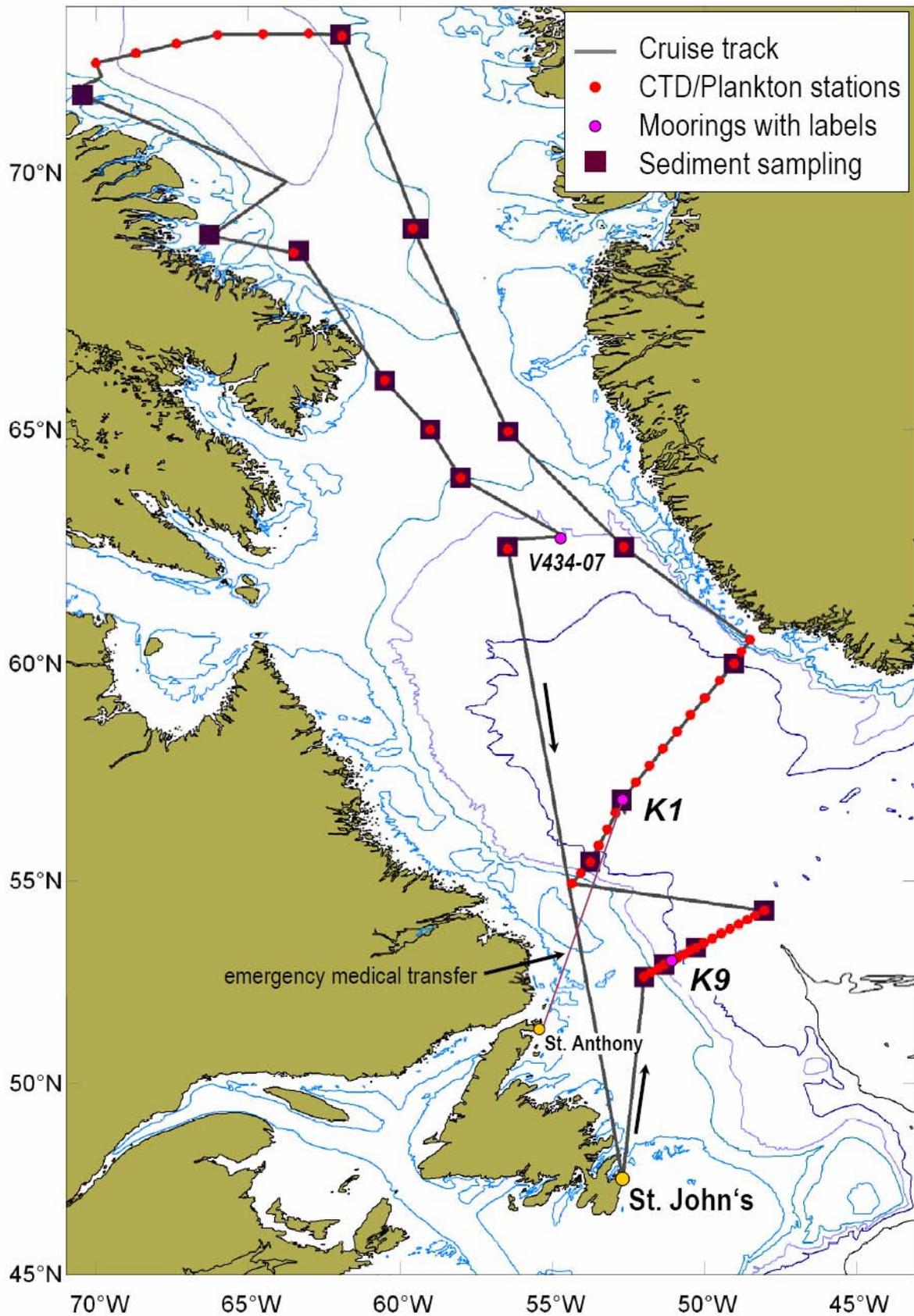
Station		Sampling								
Nr.	Date	Time	Latitude	Longitude	Depth (m)	BC	MUC	Survey	GC -	recovery (cm)
415	22.08.08	15:34	52° 40.01' N	51° 57.99' W	302	x	fail	-	-	
419	23.08.08	03:37	52° 57.69' N	51° 17.60' W	2241	x	-	x	-	
424	24.08.08	05:20	53° 23.03' N	50° 14.97' W	3369	x	x	-	-	
432	25.08.08	17:06	54° 17.14' N	48° 0.06' W	3842	x	x	-	-	
435	27.08.08	06:53	55° 26.92' N	53° 43.81' W	2763	fail	-	-	-	
439	30.08.08	07:48	56° 53.19' N	52° 41.38' W	3476	x	x	-	-	
450	01.09.08	19:28	60° 0.05' N	49° 0.06' W	3004	x	-	-	-	
453	02.09.08	22:37	62° 32.59' N	52° 37.93' W	2632	x	x	-	-	
454	03.09.08	19:34	64° 57.87' N	56° 26.40' W	735	x	x	-	-	
455	04.09.08	19:09	68° 58.12' N	59° 34.40' W	1340	x	x	x	GeoTü SL-168	500
455b	04.09.08	19:09	68° 58.12' N	59° 34.40' W	1340	-	-	-	GeoTü SL-169	1000
455c	05.09.08	09:10	68° 58.15' N	59° 23.58' W	1078	x	-	x	GeoTü SL-170	600
456	06.09.08	09:34	72° 30.40' N	61° 57.32' W	1210	x	x	x	GeoTü SL-171	405
463	08.09.08	05:34	71° 25.53' N	70° 26.40' W	798	x	x	x	GeoTü SL-172	730
465	09.09.08	00:26	68° 50.30' N	66° 16.26' W	865	x	x	x	GeoTü SL-173	750
467	09.09.08	13:46	68° 31.88' N	63° 19.82' W	1559	x	x	x	GeoTü SL-174	773
468	10.09.08	06:41	65° 59.97' N	60° 29.98' W	393	x	-	-	-	
469	10.09.08	13:52	64° 59.99' N	59° 0.03' W	464	fail	x	-	-	
470	10.09.08	22:07	64° 0.00' N	57° 59.96' W	1009	x	x	-	-	
472	11.09.08	21:23	62° 33.17' N	56° 28.08' W	2333	-	x	x	GeoTü SL-175	773

Time and date as UTC, BC: boxcorer; MUC: multicorer; Survey: marks stations where multibeam/PARASOUND survey has been carried out to position the cores; GC: gravity corer, stating core name and sediment recovery.

**Table 3.** Mooring recovered and deployed during cruise MSM09/2.

Mooring Nr.	Action	Date	Time	Latitude	Longitude	Depth	Notes
K9_08	Deployment	23.08.08	15:02	53° 8.78' N	50° 51.99' W	2909	Broke off on 21.05.2008; recovered by the Canadian RV Hudson
K1_07	Recovery	30.08.08	11:38	56° 37.64' N	52° 37.17' W	3500	
K1_08	Deployment	30.08.08	19:41	56° 37.75' N	52° 37.10' W	3499	
V434-07 (CIS)	Recovery	11.09.08	10:49	62° 46.57' N	54° 36.36' W	2179	Drifting top float, broken off in October 2007

Depth is given in meters, time and date as UTC, positions refer to the place of first sighting of a recovered mooring or the place of last visual contact after deployment.



**Figure 3.** Cruise track and the positions of CTD/plankton stations, moorings and sediment stations.

## Appendix 1. MSM09/3 complete log of stations and surveys.

Station	Date	Time	Latitude	Longitude	Depth (m)	Gear	Comment
MSM9/415-1	22.08.08	12:06	52° 40.01' N	51° 57.99' W	302	CTD/RO	SL max. 279m
MSM9/415-2	22.08.08	12:36	52° 40.01' N	51° 57.99' W	303	MN	Aborted; data cable problem
MSM9/415-3	22.08.08	13:24	52° 40.01' N	51° 57.99' W	302	BC	SL max. 300m
MSM9/415-4	22.08.08	13:55	52° 40.01' N	51° 57.99' W	302	MUC	SL max. 300m
MSM9/415-5	22.08.08	14:57	52° 40.01' N	51° 57.99' W	302	MUC	SL max. 305m
MSM9/415-6	22.08.08	15:34	52° 40.01' N	51° 57.99' W	302	BC	SL max. 300m
MSM9/415-7	22.08.08	16:37	52° 40.01' N	51° 58.26' W	300	MN	SL max. 220m
MSM9/415-8	22.08.08	16:59	52° 40.01' N	51° 58.26' W	300	MN	SL max. 100m
MSM9/416-1	22.08.08	18:31	52° 46.45' N	51° 43.93' W	497	CTD/RO	SL max. 477m
MSM9/416-1	22.08.08	18:57	52° 46.19' N	51° 43.51' W	498	CTD/RO	SL max. 470m
MSM9/417-1	22.08.08	20:45	52° 52.48' N	51° 29.54' W	1703	CTD/RO	SL max. 1684m
MSM9/417-1	22.08.08	21:08	52° 52.45' N	51° 29.51' W	1701	CTD/RO	Releaser Test
MSM9/418-1	22.08.08	22:34	52° 58.08' N	51° 18.76' W	2274	MB+PS	start profile
MSM9/418-1	22.08.08	23:05	52° 58.00' N	51° 17.94' W	2255	MB+PS	profile end
MSM9/419-1	23.08.08	00:15	52° 57.92' N	51° 17.87' W	2261	CTD/RO	SL max. 2222m
MSM9/419-2	23.08.08	01:23	52° 57.89' N	51° 17.82' W	2247	MN	SL max. 300m
MSM9/419-3	23.08.08	01:49	52° 57.74' N	51° 17.64' W	2243	MN	SL max. 100m
MSM9/419-4	23.08.08	03:37	52° 57.69' N	51° 17.60' W	2241	BC	SL max. 2256m
MSM9/420-1	23.08.08	06:46	53° 3.39' N	51° 3.96' W	2632	CTD/RO	SL max. 2594m
MSM9/421-1	23.08.08	09:51	53° 7.93' N	50° 51.83' W	2891	CTD/RO	SL max. 2871m
MSM9/421-2	23.08.08	12:30	53° 10.68' N	50° 49.28' W	2989	MOR	Deployment: first float in water
MSM9/421-2	23.08.08	15:02	53° 8.78' N	50° 51.99' W	2909	MOR	Deployment: last float submerged
MSM9/422-1	23.08.08	17:51	53° 12.44' N	50° 39.39' W	3165	CTD/RO	SL max. 3152m
MSM9/423-1	23.08.08	20:51	53° 18.30' N	50° 27.28' W	3266	CTD/RO	SL max. 3220m
MSM9/424-1	24.08.08	01:11	53° 23.03' N	50° 14.97' W	3372	CTD/RO	SL max. 3345m
MSM9/424-2	24.08.08	02:45	53° 23.03' N	50° 14.97' W	3368	MN	SL max. 300m
MSM9/424-3	24.08.08	03:08	53° 23.03' N	50° 14.97' W	3369	MN	SL max. 100m
MSM9/424-4	24.08.08	05:20	53° 23.03' N	50° 14.97' W	3369	BC	SL max. 3391m
MSM9/424-5	24.08.08	07:59	53° 23.03' N	50° 14.97' W	3366	MUC	SL max. 3382m
MSM9/425-1	24.08.08	11:15	53° 29.58' N	49° 59.78' W	3534	CTD/RO	SL max. 3519m
MSM9/426-1	24.08.08	14:45	53° 36.23' N	49° 42.53' W	3619	CTD/RO	SL max. 3608m
MSM9/427-1	24.08.08	18:16	53° 43.11' N	49° 25.28' W	3713	CTD/RO	SL max. 3683m
MSM9/428-1	24.08.08	21:53	53° 50.00' N	49° 8.57' W	3752	CTD/RO	SL max. 3739m
MSM9/429-1	25.08.08	01:25	53° 56.67' N	48° 51.24' W	3777	CTD/RO	SL max. 3765m
MSM9/430-1	25.08.08	05:04	54° 3.55' N	48° 34.17' W	3773	CTD/RO	SL max. 3772m
MSM9/431-1	25.08.08	08:51	54° 10.08' N	48° 18.18' W	3788	CTD/RO	SL max. 3763m
MSM9/432-1	25.08.08	12:40	54° 17.05' N	48° 0.05' W	3841	CTD/RO	SL max. 3831m
MSM9/432-2	25.08.08	14:11	54° 17.07' N	48° 0.05' W	3841	MN	SL max. 300m
MSM9/432-3	25.08.08	14:30	54° 17.12' N	48° 0.07' W	3883	MN	SL max. 100m
MSM9/432-4	25.08.08	17:06	54° 17.14' N	48° 0.06' W	3842	BC	SL max. 3876m
MSM9/432-5	25.08.08	20:05	54° 17.14' N	48° 0.05' W	3845	MUC	SL max. 3874m
MSM9/433-1	26.08.08	15:46	54° 55.98' N	54° 20.09' W	320	CTD/RO	SL max. 297m
MSM9/433-2	26.08.08	16:20	54° 55.98' N	54° 20.08' W	320	MN	SL max. 250m
MSM9/433-3	26.08.08	16:38	54° 55.98' N	54° 20.08' W	321	MN	SL max. 100m
MSM9/434-1	26.08.08	18:55	55° 11.11' N	54° 3.00' W	1601	CTD/RO	SL max. 1564m
MSM9/434-2	26.08.08	19:58	55° 11.02' N	54° 2.69' W	1540	MN	SL max. 300m
MSM9/434-3	26.08.08	20:20	55° 10.76' N	54° 2.30' W	1484	MN	SL max. 100m
MSM9/435-1	26.08.08	23:24	55° 26.98' N	53° 43.96' W	2761	CTD/RO	SL max. 2760m
MSM9/435-2	27.08.08	00:31	55° 26.96' N	53° 43.92' W	2760	MN	SL max. 300m
MSM9/435-3	27.08.08	00:54	55° 26.94' N	53° 43.86' W	2760	MN	SL max. 100m
MSM9/435-4	27.08.08	06:53	55° 26.92' N	53° 43.81' W	2763	BC	SL max. 2787m
MSM9/436-1	27.08.08	11:49	55° 50.40' N	53° 27.27' W	3105	CTD/RO	SL max. 3082m
MSM9/436-2	27.08.08	12:57	55° 50.40' N	53° 27.27' W	3101	MN	SL max. 300m
MSM9/436-3	27.08.08	13:18	55° 50.40' N	53° 27.28' W	3100	MN	SL max. 100m
MSM9/437-1	27.08.08	16:41	56° 13.50' N	53° 10.80' W	3405	CTD/RO	SL max. 3383m
MSM9/437-2	27.08.08	18:03	56° 13.50' N	53° 10.79' W	3407	MN	SL max. 300m
MSM9/437-3	27.08.08	18:23	56° 13.50' N	53° 10.80' W	3406	MN	SL max. 100m
MSM9/438-1	27.08.08	20:43	56° 36.62' N	52° 53.75' W	3463	CTD/RO	SL max. 3444m
MSM9/438-2	27.08.08	23:08	56° 36.61' N	52° 53.79' W	3462	MN	SL max. 300m
MSM9/438-3	27.08.08	23:36	56° 36.61' N	52° 53.87' W	3464	MN	SL max. 100m
MSM9/439-1	30.08.08	03:47	56° 53.19' N	52° 41.38' W	3474	CTD/RO	SL max. 3457m
MSM9/439-2	30.08.08	04:56	56° 53.18' N	52° 41.38' W	3476	MN	SL max. 300m
MSM9/439-3	30.08.08	05:18	56° 53.18' N	52° 41.38' W	3476	MN	SL max. 100m
MSM9/439-4	30.08.08	07:48	56° 53.19' N	52° 41.38' W	3476	BC	SL max. 3493m
MSM9/440-1	30.08.08	11:38	56° 37.64' N	52° 37.17' W	3500	MOR	Recovery: spotted on the surface
MSM9/440-1	30.08.08	13:59	56° 39.49' N	52° 37.64' W	3498	MOR	Recovery: mooring on deck
MSM9/441-1	30.08.08	16:15	56° 40.73' N	52° 41.46' W	3492	MOR	Deployment: first float in water
MSM9/441-1	30.08.08	19:41	56° 37.75' N	52° 37.10' W	3499	MOR	Deployment: last float submerged
MSM9/442-1	30.08.08	22:31	56° 53.23' N	52° 41.40' W	3476	MUC	SL max. 3494m
MSM9/443-1	31.08.08	03:30	57° 18.15' N	52° 14.11' W	3499	CTD/RO	SL max. 3493m
MSM9/443-2	31.08.08	04:42	57° 18.15' N	52° 14.11' W	3501	MN	SL max. 300m
MSM9/443-3	31.08.08	05:02	57° 18.15' N	52° 14.11' W	3499	MN	SL max. 100m
MSM9/444-1	31.08.08	08:33	57° 41.09' N	51° 47.06' W	3503	CTD/RO	SL max. 3494m
MSM9/444-2	31.08.08	09:51	57° 41.09' N	51° 47.07' W	3503	MN	SL max. 300m
MSM9/444-3	31.08.08	10:13	57° 41.09' N	51° 47.07' W	3505	MN	SL max. 100m
MSM9/445-1	31.08.08	14:04	58° 4.36' N	51° 20.50' W	3548	CTD/RO	SL max. 3546m
MSM9/445-2	31.08.08	15:17	58° 4.35' N	51° 20.51' W	3547	MN	SL max. 300m
MSM9/445-3	31.08.08	15:38	58° 4.35' N	51° 20.51' W	3545	MN	SL max. 100m
MSM9/446-1	31.08.08	19:15	58° 27.84' N	50° 52.79' W	3533	CTD/RO	SL max. 3523m
MSM9/446-2	31.08.08	20:32	58° 27.82' N	50° 52.81' W	3531	MN	SL max. 300m
MSM9/446-3	31.08.08	20:52	58° 27.77' N	50° 52.89' W	3535	MN	SL max. 100m
MSM9/447-1	01.09.08	00:29	58° 50.84' N	50° 25.88' W	3501	CTD/RO	SL max. 3489m
MSM9/447-2	01.09.08	01:41	58° 50.86' N	50° 25.85' W	3502	MN	SL max. 300m
MSM9/447-3	01.09.08	02:01	58° 50.86' N	50° 25.85' W	3502	MN	SL max. 100m
MSM9/448-1	01.09.08	05:28	59° 14.00' N	49° 57.53' W	3444	CTD/RO	SL max. 3430m
MSM9/448-2	01.09.08	06:38	59° 14.01' N	49° 57.53' W	3445	MN	SL max. 300m
MSM9/448-3	01.09.08	06:58	59° 14.01' N	49° 57.53' W	3444	MN	SL max. 100m
MSM9/449-1	01.09.08	10:24	59° 37.13' N	49° 28.86' W	3336	CTD/RO	SL max. 3325m
MSM9/449-2	01.09.08	11:33	59° 37.14' N	49° 28.82' W	3335	MN	SL max. 300m
MSM9/449-3	01.09.08	11:54	59° 37.16' N	49° 28.73' W	3336	MN	SL max. 100m
MSM9/450-1	01.09.08	15:30	60° 0.03' N	49° 0.06' W	3002	CTD/RO	SL max. 2985m
MSM9/450-2	01.09.08	17:02	60° 0.05' N	49° 0.06' W	3003	MN	SL max. 300m
MSM9/450-3	01.09.08	17:21	60° 0.05' N	49° 0.06' W	3002	MN	SL max. 100m
MSM9/450-4	01.09.08	19:28	60° 0.05' N	49° 0.06' W	3004	BC	SL max. 3016m
MSM9/451-1	01.09.08	23:31	60° 16.18' N	48° 46.13' W	2829	CTD/RO	SL max. 2821m
MSM9/451-2	02.09.08	00:38	60° 16.22' N	48° 46.53' W	2831	MN	SL max. 300m
MSM9/451-3	02.09.08	00:59	60° 16.26' N	48° 46.86' W	2834	MN	SL max. 100m
MSM9/452-1	02.09.08	03:03	60° 32.07' N	48° 28.77' W	165	CTD/RO	SL max. 140m
MSM9/452-2	02.09.08	03:20	60° 32.10' N	48° 28.92' W	167	MN	SL max. 100m
MSM9/453-1	02.09.08	17:41	62° 32.58' N	52° 38.44' W	2618	CTD/RO	SL max. 2584m
MSM9/453-2	02.09.08	18:38	62° 32.59' N	52° 37.93' W	2627	MN	SL max. 300m

Appendix 1 (continued). MSM09/3 complete log of stations and surveys.

Station	Date	Time	Latitude	Longitude	Depth (m)	Gear	Comment
MSM9/453-3	02.09.08	18:58	62° 32.59' N	52° 37.93' W	2629	MN	SL max. 100m
MSM9/453-4	02.09.08	19:17	62° 32.59' N	52° 37.93' W	2630	MN	SL max. 300m
MSM9/453-5	02.09.08	19:36	62° 32.59' N	52° 37.93' W	2631	MN	SL max. 100m
MSM9/453-6	02.09.08	22:37	62° 32.59' N	52° 37.93' W	2632	BC	SL max. 2641m
MSM9/453-7	03.09.08	00:43	62° 32.59' N	52° 37.93' W	2634	MUC	SL max. 2641 m
MSM9/454-1	03.09.08	17:16	64° 57.87' N	56° 26.39' W	736	CTD/RO	SL max. 712m
MSM9/454-2	03.09.08	17:48	64° 57.87' N	56° 26.40' W	735	MN	SL max. 300m
MSM9/454-3	03.09.08	18:10	64° 57.87' N	56° 26.40' W	735	MN	SL max. 100m
MSM9/454-4	03.09.08	18:34	64° 57.87' N	56° 26.40' W	735	MN	SL max. 300m
MSM9/454-5	03.09.08	18:56	64° 57.87' N	56° 26.39' W	735	MN	SL max. 100m
MSM9/454-6	03.09.08	19:34	64° 57.87' N	56° 26.40' W	735	BC	SL max. 738m
MSM9/454-7	03.09.08	20:19	64° 57.87' N	56° 26.40' W	735	MUC	SL max. 738m
MSM9/455-1	04.09.08	17:49	68° 58.12' N	59° 34.38' W	1350	CTD/RO	SL max. 1318m
MSM9/455-2	04.09.08	19:09	68° 58.12' N	59° 34.40' W	1340	BC	SL max. 1346m
MSM9/455-3	04.09.08	20:28	68° 58.12' N	59° 34.39' W	1339	MUC	SL max. 1343m
MSM9/455-4	04.09.08	21:49	68° 58.12' N	59° 34.39' W	1342	GC	SL max. 1351m
MSM9/455-5	04.09.08	23:43	68° 58.12' N	59° 34.39' W	1341	GC	SL max. 1360m
MSM9/455-6	05.09.08	00:44	68° 58.14' N	59° 29.09' W	1249	MB+PS	start profile
MSM9/455-6	05.09.08	04:57	69° 1.46' N	59° 8.97' W	705	MB+PS	profile end
MSM9/455-7	05.09.08	06:08	68° 58.15' N	59° 23.60' W	1088	MN	SL max. 300m
MSM9/455-8	05.09.08	06:35	68° 58.20' N	59° 23.67' W	1108	MN	SL max. 300m
MSM9/455-9	05.09.08	06:55	68° 58.25' N	59° 23.77' W	1085	MN	SL max. 100m
MSM9/455-10	05.09.08	07:07	68° 58.26' N	59° 23.79' W	1093	MN	SL max. 100m
MSM9/455-11	05.09.08	08:00	68° 58.15' N	59° 23.58' W	1088	BC	SL max. 1094m
MSM9/455-12	05.09.08	09:10	68° 58.15' N	59° 23.58' W	1078	BC	SL max. 1091m
MSM9/455-13	05.09.08	10:13	68° 58.15' N	59° 23.58' W	1091	GC	SL max. 1114m
MSM9/456-1	06.09.08	04:28	72° 28.61' N	61° 54.62' W	1172	CTD/RO	SL max. 1158m
MSM9/456-2	06.09.08	05:06	72° 28.60' N	61° 54.70' W	1174	MN	SL max. 300m
MSM9/456-3	06.09.08	05:25	72° 28.60' N	61° 54.69' W	1177	MN	SL max. 100m
MSM9/456-4	06.09.08	05:34	72° 28.60' N	61° 54.69' W	1176	MB+PS	start profile
MSM9/456-4	06.09.08	08:42	72° 30.36' N	61° 57.33' W	1217	MB+PS	profile end
MSM9/456-5	06.09.08	09:34	72° 30.40' N	61° 57.32' W	1210	BC	SL max. 1216m
MSM9/456-6	06.09.08	10:39	72° 30.38' N	61° 57.35' W	1215	MUC	SL max. 1216m
MSM9/456-7	06.09.08	11:41	72° 30.40' N	61° 57.31' W	1210	GC	SL max. 1226m
MSM9/457-1	06.09.08	14:23	72° 31.33' N	63° 0.00' W	2128	CTD/RO	SL max. 1511m
MSM9/457-2	06.09.08	15:03	72° 31.33' N	63° 0.00' W	2130	MN	SL max. 300m
MSM9/457-3	06.09.08	15:25	72° 31.33' N	63° 0.00' W	2127	MN	SL max. 100m
MSM9/458-1	06.09.08	18:12	72° 30.94' N	64° 30.24' W	2300	CTD/RO	SL max. 1500m
MSM9/458-2	07.09.08	01:49	72° 31.02' N	64° 30.04' W	2306	MN	SL max. 300m
MSM9/458-3	07.09.08	02:09	72° 31.02' N	64° 30.04' W	2300	MN	SL max. 100m
MSM9/459-1	07.09.08	05:12	72° 29.98' N	65° 59.93' W	2364	CTD/RO	SL max. 2332m
MSM9/459-2	07.09.08	06:07	72° 29.97' N	66° 0.00' W	2363	MN	SL max. 300m
MSM9/459-3	07.09.08	06:29	72° 29.97' N	66° 0.16' W	2364	MN	SL max. 100m
MSM9/460-1	07.09.08	09:27	72° 20.57' N	67° 21.41' W	2367	CTD/RO	SL max. 1504m
MSM9/460-2	07.09.08	10:15	72° 20.57' N	67° 21.41' W	2368	MN	SL max. 300m
MSM9/460-3	07.09.08	10:37	72° 20.57' N	67° 21.41' W	2368	MN	SL max. 100m
MSM9/461-1	07.09.08	13:36	72° 10.53' N	68° 41.36' W	2166	CTD/RO	SL max. 1500m
MSM9/461-2	07.09.08	14:18	72° 10.50' N	68° 41.30' W	2167	MN	SL max. 300m
MSM9/461-3	07.09.08	14:40	72° 10.44' N	68° 41.11' W	2166	MN	SL max. 100m
MSM9/462-1	07.09.08	17:27	72° 0.00' N	69° 59.96' W	1795	CTD/RO	SL max. 1767m
MSM9/462-2	07.09.08	18:12	72° 0.00' N	69° 59.96' W	1795	MN	SL max. 300m
MSM9/462-3	07.09.08	18:31	72° 0.00' N	69° 59.96' W	1788	MN	SL max. 100m
MSM9/463-1	07.09.08	19:48	71° 45.71' N	69° 49.96' W	1477	MB+PS	start profile
MSM9/463-1	08.09.08	04:53	71° 25.44' N	70° 25.71' W	798	MB+PS	profile end
MSM9/463-2	08.09.08	05:34	71° 25.53' N	70° 26.40' W	798	BC	SL max. 804m
MSM9/463-3	08.09.08	06:21	71° 25.53' N	70° 26.40' W	798	MUC	SL max. 799m
MSM9/463-4	08.09.08	07:14	71° 25.53' N	70° 26.40' W	793	GC	SL max. 805m
MSM9/464-1	08.09.08	23:09	68° 51.01' N	66° 11.43' W	864	MB+PS	start profile
MSM9/464-1	08.09.08	23:35	68° 50.24' N	66° 16.35' W	872	MB+PS	profile end
MSM9/465-1	09.09.08	00:26	68° 50.30' N	66° 16.26' W	865	BC	SL max. 850m
MSM9/465-2	09.09.08	01:16	68° 50.30' N	66° 16.26' W	865	MUC	SL max. 865m
MSM9/465-3	09.09.08	02:19	68° 50.29' N	66° 16.26' W	872	GC	SL max. 877m
MSM9/466-1	09.09.08	08:47	68° 30.00' N	63° 29.96' W	1474	CTD/RO	SL max. 1447m
MSM9/466-2	09.09.08	09:30	68° 30.01' N	63° 30.00' W	1469	MN	SL max. 300m
MSM9/466-3	09.09.08	09:50	68° 30.01' N	63° 30.00' W	1468	MN	SL max. 100m
MSM9/466-4	09.09.08	10:00	68° 30.01' N	63° 29.98' W	1473	MB+PS	start profile
MSM9/466-4	09.09.08	12:04	68° 34.97' N	63° 6.12' W	1663	MB+PS	profile end
MSM9/467-1	09.09.08	13:46	68° 31.88' N	63° 19.82' W	1559	BC	SL max. 1561m
MSM9/467-2	09.09.08	15:03	68° 31.88' N	63° 19.83' W	1550	MUC	SL max. 1559m
MSM9/467-3	09.09.08	16:13	68° 31.87' N	63° 19.83' W	1551	GC	SL max. 1566m
MSM9/468-1	10.09.08	05:29	65° 59.97' N	60° 29.98' W	389	CTD/RO	SL max. 369m
MSM9/468-2	10.09.08	05:54	65° 59.97' N	60° 29.98' W	389	MN	SL max. 300m
MSM9/468-3	10.09.08	06:14	65° 59.97' N	60° 29.98' W	391	MN	SL max. 100m
MSM9/468-4	10.09.08	06:41	65° 59.97' N	60° 29.98' W	393	BC	SL max. 404m
MSM9/469-1	10.09.08	12:25	65° 0.01' N	59° 0.08' W	464	CTD/RO	SL max. 444m
MSM9/469-2	10.09.08	12:52	65° 0.00' N	59° 0.06' W	465	MN	SL max. 300m
MSM9/469-3	10.09.08	13:15	64° 59.99' N	59° 0.03' W	465	MN	SL max. 100m
MSM9/469-4	10.09.08	13:52	64° 59.99' N	59° 0.03' W	464	BC	SL max. 475 m
MSM9/469-5	10.09.08	14:29	64° 59.99' N	59° 0.03' W	466	BC	SL max. 474m
MSM9/469-6	10.09.08	15:05	64° 59.99' N	59° 0.03' W	466	MUC	SL max. 470m
MSM9/470-1	10.09.08	20:29	64° 0.00' N	57° 59.96' W	1010	CTD/RO	SL max. 998m
MSM9/470-2	10.09.08	21:04	64° 0.00' N	57° 59.96' W	1009	MN	SL max. 300m
MSM9/470-3	10.09.08	21:24	64° 0.00' N	57° 59.96' W	1010	MN	SL max. 100m
MSM9/470-4	10.09.08	22:07	64° 0.00' N	57° 59.96' W	1009	BC	SL max. 1027m
MSM9/470-5	10.09.08	23:13	64° 0.00' N	57° 59.96' W	1009	MUC	SL max. 1022m
MSM9/471-1	11.09.08	10:49	62° 46.57' N	54° 36.36' W	2179	MOR	Recovery: mooring spotted on surface
MSM9/471-1	11.09.08	11:08	62° 47.41' N	54° 35.17' W	2098	MOR	Recovery: mooring on deck
MSM9/472-1	11.09.08	14:55	62° 42.22' N	56° 28.80' W	2474	MB+PS	start profile
MSM9/472-1	11.09.08	18:52	62° 33.18' N	56° 28.10' W	2332	MB+PS	profile end
MSM9/472-2	11.09.08	19:44	62° 33.17' N	56° 28.08' W	2330	MUC	SL max. 2339m
MSM9/472-3	11.09.08	21:23	62° 33.17' N	56° 28.08' W	2333	GC	SL max. 2358m
MSM9/472-4	11.09.08	22:56	62° 29.84' N	56° 27.20' W	2138	MN	SL max. 300m
MSM9/472-5	11.09.08	23:15	62° 29.84' N	56° 27.20' W	2136	MN	SL max. 100m
MSM9/472-6	12.09.08	00:18	62° 29.83' N	56° 27.26' W	2119	CTD/RO	SL max. 2098m

Positions refer to gear at maximum depth (SL max.), time and date as UTC. Gear abbreviations: BC boxcorer, CTD/RO conductivity, temperature and depth device combined with a rosette; GC gravity corer; MB+PS multibeam and PARASOUND systems, MSN multiple opening-closing plankton net; MOR mooring, MUC multicorer.