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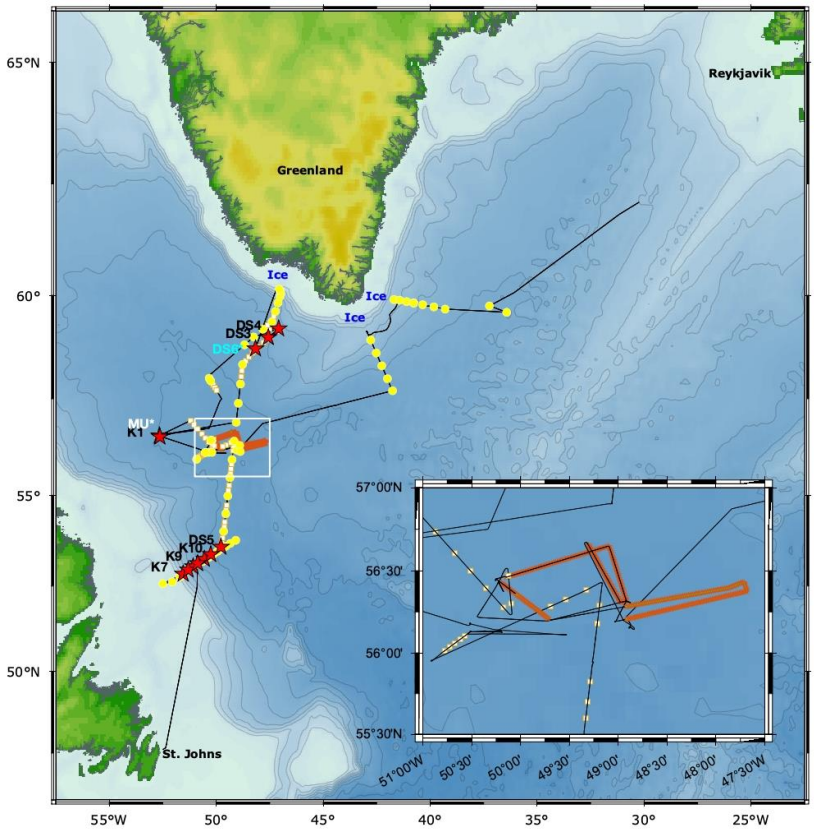
Short Cruise Report
RV Maria S Merian MSM129/2

St. John's, Canada – Reykjavik, Iceland
07. June 2024 – 06. July 2024
Chief scientist: Dr. Johannes Karstensen
Co-Chief scientist: Dr. Fehmi Dilmahamod
Captain: Björn Maaß



RV Maria S. Merian MSM129/2 cruise track (thin black) and station overview. Thicker black: ADCP/TSG Underway data; red dots Moving Vessel Profiler; yellow circles: CTD stations; yellow squares: underway CTD; red stars: Moorings. Areas with heavy ice conditions are indicated by the word (Ice).

Objectives

The scientific program of the RV MARIA S. MERIAN MSM129/2 expedition was dedicated to mooring recoveries (11) and deployments (11), ship-based observations, and operating autonomous devices (Argo float, underwater electric glider, surface drifter). Upper ocean surveys were done with ship based/towed profiling underway system (Moving Vessel Profiler, MVP, and underway CTD, UCTD). In total 80 CTD's were acquired to survey along standard sections, calibrate mooring instruments, and provide high quality reference data for autonomous observational platform sensors. In part, the DAM Underway Research project observations from leg 1 were continued. High resolved data (time, space) was acquired within and around mesoscale eddies and fronts, also in alignment with SWOT satellite overpasses. The expedition was a contribution to national and international projects (EU projects EuroGO-SHIP and ObsSea4Clim) and programs (OSNAP).

Narrative (all times are Local Time, LT, if not otherwise stated)

The Maria S Merian arrived on the 5th June at pier 12 in the port of St. Johns, Canada. On the same day, loading of equipments for leg 2 started for items shipped from Dalhousie University (Darria Atamanchuk/Douglas Wallace lab, and OTN), from Memorial University ("Uta Passow lab"), and some air freight goods incl. OPUS nitrate sensor, UVP parts, SeaBird spare parts, and spare parts from AML for the Moving Vessel Profiler (MVP). On the one full harbor day we had (06th June) nine visitors from Northwest Atlantic Fisheries Centre, Fisheries and Oceans Canada (DFO), St. John's, Newfoundland, Canada, visited Maria S Merian for a tour of the ship and an introduction to the science of MSM129. Further installation of equipment and preparations for the leg 2 were done. Also, a meeting with a colleague from Memorial University (Uta Passow) took place to finalize details for the planned installation of a sediment trap mooring close to the K1 mooring site in the central Labrador Sea. A harbor test of the two underwater electric glider was done with the help of the Maria S Merian dinghy. The weather was overcast in the morning but cleared up later in the day. The cruise participants and crew enjoyed the welcoming atmosphere of St. John's and used the time to eat in a restaurant and walked up toward Signal Hill, a site overlooking the harbor. On 7th June the MSM129 leg 2 started at 08:30, steaming northeast, towards the 53°N observatory. Fortunately, bunkering was done already on the 6th June via truck and so we could leave directly on the 7th June without the need of a stopover for bunkering. It was planned to use the MVP on the track towards 53°N observatory but the device required further repair after winch problems during MSM129/leg 1. It wasn't until much later in the cruise that some loose screws were identified being the main reason for the malfunctioning. We arrived in the afternoon of the 9th at the 53°N observatory and did a CTD close to the K7 position. Because it was too foggy, K7 could not be recovered. Instead, we did a couple of CTDs overnight along the mooring array before recovering our first mooring (DSOW1) on the 8th June. This was the first of the 22 mooring operations planned during MSM129 leg 2. CTDs followed on the next day because it was too foggy for moorings recovery. But on the 10th June, we could recover DSOW5 and K10, which is a 3400m long mooring. We then headed west and started with CTDs in the Labrador shelf area. After completing the CTDs towards the coast we headed back to K7 position to try a recovery again of K7 and K8, and also deployed DSOW1 – the 11th June was a long day. DSOW1 design was changed and now is about 2000m longer, extending close to the surface where we hope we can record velocity, hydrography, and oxygen in the core of the DWBC at the LSW level. We spotted some whales at the aft during recovery of K8. The work continued with CTDs during night, including a first calibration cast with MicroCats and Aquadopp current meters mounted on the rosette for calibration T, C(S), P and T, and P, respectively. On 12th June we started with the DSOW2 recovery at 09:30, a short (500m) mooring and that followed recovery of K9,

and thus the last of the 53°N observatory moorings. Later that day the DSOW2 was re-deployed. During the next couple of days, the DSOW5, K10, and K9 deployments followed. The EM soccer game was broadcasted live in the hangar. In the night of the 14th June the A-Z-A bottom pressure sensor data (sensor was deployed in 2022 with RV Meteor during M184) of Scottish Association for Marine Science (SAMS) was read out using the ships own Sonardyne Ranger 2 and SAMS software. The data readout took 6 hours and then data was sent to SAMS for inspection. Some days later we were informed the download was a success, although the zero calibration could not be found. On the 15th June the K7 and K8 moorings were deployed. This ended the mooring operations at the 53°N observatory for 2024. We then moved northward along the standard OSNAP West section, up to about the latitude of the K1 mooring, while conducting some uCTDs tests. On route, we identified mesoscale eddies, also with the aid of satellite Chl-a and surface temperature maps (accessed via soto.podaac.earthdatacloud.nasa.gov). After an ADCP surveys through one eddy we decided to deploy the two gliders (ifm03, ifm13) we had on board in that eddy. Our intention was to have the gliders operating here for 10 days or so. Deployment was done by crane because the sea was found to be too rough to use the Zodiac and all went well with the deployment. Also, we launched a BGC Argo float for the BSH, Hamburg, and as a contribution to the EuroArgo ERIC. This particular BGC float had been recovered from the area in summer 2022 during RV Meteor M184 cruise because of a malfunctioning sensor. For the float deployment, the German Argo office at the BSH was particular involved and helped a lot for a successful deployment. However, about 2 hours after its launch, the glider ifm03 reported problems with its Iridium phone and went into an emergency mode drifting at the surface. In response, the Maria S Merian turned and the glider was successfully recovered, despite foggy conditions. No new deployment of ifm03 took place because the technical reason for the Iridium problem could not be resolved. Next, we headed for the recovery of the K1 mooring and we reached the site at around 04:00 am on the 19th June. A CTD reference profile was taken to get a synoptic view of the vertical stratification, but also to have a reference for the instruments mounted on the K1 mooring. At 08:30am the mooring recovery began with fresh wind (7Bft) and some swell. At 09:20, the first instrument was on deck and 2.5h later all instruments were recovered. We then headed northeast towards the OSNAP West CTD section that we reached on the 21st June. With CTDs on our way, we headed northeast toward the three remaining moorings (DSOW6, DSOW3, DSOW4) which are installed as a contribution to the OSNAP west section under the coordination of Woods Hole Oceanographic Institution (WHOI), USA. In the evening of the 20th, a rather large iceberg was identified in the radar. Because of foggy conditions the ship had to slow down from 10kn to 8kn for further passage towards Greenland. After some more CTDs, the DSOW4 mooring was recovered in the morning of the 21st June. Recovery was complex because of 7Bft wind and wave coming from different directions, augmented by a strong surface current. Fortunately, the mooring was short and recovery went well. We checked regularly the ice maps from the Dansk Meteorologiske Instituter (DMI, ocean.dmi.dk) and identified that the originally planned course could not be maintained but needed adjustment now roughly following the 47°W longitude. This course correction enabled CTDs to be taken all across the DWBC off western Greenland. In the afternoon, the DSOW3 mooring was recovered under rather harsh wind and wave conditions. Later that day the sky cleared up and the wind calmed down completely. We continued with CTDs along the slightly modified (for ice reasons) OSNAP west section. However, the ice was getting denser but fortunately we had low wind and sunny conditions and nautical officers found ways to even do a CTD in less than 370m water depth. Overnight four pair of Hereon drifter were deployed at the flank of the West Greenland Coastal current and in different areas of a filament that we detected from satellite data in combination with the Thermosalinograph data. We returned

south to the DSOW6 site, and finally recovered this mooring. During the 23rd June the deployment of DSOW3 and DSOW4 followed. Because of some other changes in the mooring configuration of the WHOI array, we redeployed DSOW3 about 5nm more “uphill” (towards the coast). After the mooring operations we headed for two remaining CTD stations to close the occupation of the OSNAP West CTD section. Then we moved southwest to occupy a CTD in an anticyclonic eddy. The profile looked quite remarkable with a layer from about 500 to 1800m depth that was nearly homogenous in density (and other properties). Another CTD profile was acquired when moving out of the eddy and that revealed a similar homogenous vertical structure. We then left the Greenland EEZ and headed further south, towards the K1 area where the Trap mooring of the Memorial university and the K1 mooring were both deployed on the 25th June. Operations continued towards the area where the glider ifm13 was operating in. Along the route we did zig-zag tracks connected to mesoscale structures that we identified from inspecting the most recent SWOT satellite SLA map and we aimed to gather in-situ data in. We reached again the eddy which the glider had been profiling in and we determined again its center by fitting a simple eddy-model to the velocities observed from our ADCP section. In the center of the eddy, we did repeat CTD/lADCP profiling for about 14 hours. At one point, a tiny deep-sea fish cloaked the CTD pump and we had to take the device out of the water. The ADCP survey continued, now also paired with underway CTDs (uCTD) over the night from 26th to the 27th June. In the morning we switched from uCTD profiling to Moving vessel profiler (MVP) profiling. As the SWOT satellite would be crossing over our operations area on the 27th and 28th June, we surveyed intensively the ocean mesoscale crossing the SWOT swaths with underway profiling (MVP) and uCTD. The glider ifm13 was recovered after about 11 days of operation on the 29th June in the morning, as visibility and weather were favorable. A transit of about 200nm was followed with the start of the “Kap Farvel CTD section” from its most southern point. We arrived at the station on 30th June around noon and started the section that we originally planned to end 01st July at the shelf waters off the Kap Farvel (southern tip of Greenland). However, the ice situation was again much stronger than expected, even after modifying the track we failed to reach water depth shallow than 1800m. The process in maneuvering in the ice also was time consuming because sudden onset of foggy conditions occurred frequently. We the decided to move out of the icefield to the southeast and try out a DWBC section along the OSNAP east section. However, again we could not reach close to the coast because of ice and here the shallowest depth we surveyed was 1900m. On the 2nd July we decided to move offshore and follow the standard OSNAP east section eastward. A last mesoscale structure was surveyed on the 3rd July close to the border of the Greenland EEZ. It showed at the rim very interesting interleaving structures but the center was very difficult to detect from the ADCP section data. Because of further time constrains, the OSNAP east section was not surveyed completely but the ADCP section was continued while heading northeast, towards Reykjavik. On the transit during the 4th and 5th July, remaining salinometer measurements of the CTD samples for calibrating the CTD and the titration for oxygen calibration were continued and finalized. On board, the clean-up work and packing up of the equipment took place. At the same time, the details for the return of the packages and containers to Germany but also to Canada were finalized. On entering the Icelandic EEZ, the underway systems were switched off, including the ADCP, the thermosalinograph and the Ferrybox system, that had run through the entire RV Maria S Merian MSM129 Leg 1 and Leg 2 without any problems. We moored on the 6th July 2024 in Reykjavik, next to the RV Neil Armstrong that was preparing for OSNAP related operations to start later the week. Unloading and loading of containers started shortly after arrival. A group also had a very informative visit to the RV Neil Armstrong later in the afternoon.

Acknowledgement

We thank Captain Björn Maaß, his officers and the crew of RV Maria S. Merian for their support of our observational program and the hospitality and friendliness on board. We also thank the crew on deck, in the engine rooms and the galley for providing and supporting an excellent working environment. The ship time was provided by the Deutsche Forschungsgemeinschaft within the METEOR/MERIAN core program. We benefited from financial contributions by the research institutions involved.

MSM 129/leg 2 cruise participants (science crew)

Name	Discipline	Institution
Dr Johannes Karstensen	Fahrtleiter/Chief scientist	GEOMAR
Dr Fehmi Dilmahamod	Co-chief scientist	GEOMAR
Hannah Olbricht	PO technician	GEOMAR
Wiebke Martens	CTD technician	GEOMAR
René Witt	PO technician	GEOMAR
Matthias Klopfer	PO technician	GEOMAR
Vasile-Sorin Balan	CTD	GeoEcoMar
Dr Gerd Krahmann	Glider, lADCP, CTD	GEOMAR
Dr Abed Hassoun	Oxygen, carbon	GEOMAR
Kim Ripke	CTD, mooring data	CAU Kiel
Yurid Behr	Salinometer, CTD	CAU Kiel
Lasse Glüsen	X-Band, CTD	CAU Kiel
Stefanie Brechtelsbauer	ADCP, CTD	CAU Kiel
Christiane Lösel	Blogs etc. CTD,	CAU Kiel
Neele Sander	CTD	CAU Kiel
Grete Boskamp	UVP, CTD	IOW
Carl Miller		Dalhousie
Emma O'Brian		Dalhousie

Institution

GEOMAR: Helmholtz Zentrum für Ozeanforschung Kiel, Kiel, Germany
CAU Kiel: Christian-Albrechts-Universität Kiel, Kiel, Germany
GeoEcoMar: National Institute for Research and Development on Marine Geology and Geo-ecology, Constantza, Romania
IOW: Institut für Ostseeforschung Rostock/Warnemünde, Rostock, Germany
Dalhousie: Dalhousie University, PO BOX 15000, Halifax, Nova Scotia, Canada

Science crew participants Maria S. Merian MSM129/2 expedition

Station List RV MARIA S. MERIAN MSM129/ leg 2

Gear coding:
WST: Weather Station
FBOX: FerryBox
RADAR: X-Band Radar
ADCP: Acoustic Doppler Current Profiler
EM122: Multibeam echo sounder
TSG: Thermosalinograph (and Fluorometer),
CTD: CTD and rosette sampler
MOOR: mooring
UCTD: underway CTD
MVP: Moving vessel profiler
BPR: Bottom pressure recorder
FLOAT: Argo float
GLIDER: underwater Electric Glider

Ship station number	Date (dd.mm.yyyy)	Gear	Time (UTC)	Latitude	Longitude	Water depth (m)	Comment
MSM129/2_0_Underway-8	05.06.2024	WST	11:46	47°33.971'N	52°42.147'W	180	
MSM129/2_0_Underway-11	07.06.2024	FBOX	12:06	47°36.872'N	52°29.576'W	161	
MSM129/2_0_Underway-12	07.06.2024	RADAR	12:06	47°36.873'N	52°29.572'W	180	
MSM129/2_0_Underway-10	07.06.2024	ADCP	12:06	47°36.872'N	52°29.576'W	161	75kHz
MSM129/2_0_Underway-13	07.06.2024	EM122	12:06	47°36.873'N	52°29.572'W	180	
MSM129/2_0_Underway-14	07.06.2024	TSG	12:06	47°36.873'N	52°29.572'W	180	
MSM129/2_0_Underway-9	07.06.2024	ADCP	12:06	47°36.872'N	52°29.576'W	161	38kHz
MSM129/2_1-1	08.06.2024	CTD	21:05	53°07.007'N	50°52.825'W	2917	CTD#01
MSM129/2_2-1	09.06.2024	CTD	01:21	53°01.856'N	51°04.871'W	2578	CTD#02
MSM129/2_3-1	09.06.2024	CTD	04:20	52°56.420'N	51°19.229'W	2195	CTD#03
MSM129/2_4-1	09.06.2024	CTD	06:53	52°48.994'N	51°32.914'W	1248	CTD#04
MSM129/2_5-1	09.06.2024	CTD	08:24	52°47.707'N	51°36.565'W	1006	CTD#05
MSM129/2_6-1	09.06.2024	MOOR	13:04	53°02.687'N	51°05.217'W	2596	DSOW1 rec
MSM129/2_7-1	09.06.2024	CTD	20:11	53°14.482'N	50°32.158'W	3200	CTD#06
MSM129/2_8-1	10.06.2024	CTD	00:05	53°22.310'N	50°13.138'W	3449	CTD#07
MSM129/2_9-1	10.06.2024	CTD	04:32	53°34.716'N	49°45.893'W	3604	CTD#08
MSM129/2_10-1	10.06.2024	CTD	08:45	53°41.369'N	49°20.873'W	3723	CTD#09
MSM129/2_11-1	10.06.2024	MOOR	11:58	53°35.853'N	49°47.200'W	3604	DSOW5 rec
MSM129/2_12-1	10.06.2024	MOOR	15:54	53°23.235'N	50°13.325'W	3400	K10 rec
MSM129/2_13-1	11.06.2024	CTD	02:19	52°45.315'N	51°42.780'W	494	CTD#10
MSM129/2_14-1	11.06.2024	CTD	04:45	52°37.088'N	52°03.410'W	300	CTD#11
MSM129/2_15-1	11.06.2024	CTD	07:03	52°33.882'N	52°29.781'W	257	CTD#12
MSM129/2_16-1	11.06.2024	MOOR	11:01	52°49.562'N	51°32.411'W	1700	K7 rec
MSM129/2_17-1	11.06.2024	MOOR	14:14	52°57.161'N	51°18.315'W	2222	K8 rec
MSM129/2_18-1	11.06.2024	MOOR	18:50	53°01.728'N	51°00.375'W	2675	DSOW1 dep
MSM129/2_19-1	12.06.2024	CTD	00:24	53°11.689'N	50°37.630'W	3135	CTD#13
MSM129/2_20-1	12.06.2024	CTD	04:40	53°17.798'N	50°22.323'W	3308	CTD#14
MSM129/2_21-1	12.06.2024	CTD	08:23	53°24.006'N	50°07.086'W	3470	CTD#15
MSM129/2_22-1	12.06.2024	MOOR	11:37	53°15.356'N	50°32.611'W	3300	DSOW2 rec
MSM129/2_23-1	12.06.2024	MOOR	14:40	53°08.277'N	50°52.058'W	3200	K9 rec
MSM129/2_24-1	12.06.2024	MOOR	19:26	53°16.009'N	50°30.885'W	3185	DSOW2 dep
MSM129/2_25-1	13.06.2024	CTD	00:59	53°32.507'N	49°45.166'W	3593	CTD#16

Ship station number	Date (dd.mm.yyyy)	Gear	Time (UTC)	Latitude	Longitude	Water depth (m)	Comment
MSM129/2_26-1	13.06.2024	CTD	06:53	53°46.702'N	49°05.298'W	3762	CTD#17
MSM129/2_27-1	13.06.2024	CTD	12:40	53°35.513'N	49°46.930'W	3602	CTD#18
MSM129/2_28-1	13.06.2024	MOOR	15:50	53°36.315'N	49°51.943'W	3567	DSOW5 dep
MSM129/2_29-1	13.06.2024	CTD	21:25	53°36.865'N	49°33.319'W	3661	CTD#19
MSM129/2_30-1	14.06.2024	CTD	02:31	53°28.361'N	49°55.938'W	3584	CTD#20
MSM129/2_31-1	14.06.2024	CTD	07:21	53°19.601'N	50°18.001'W	3373	CTD#21
MSM129/2_32-1	14.06.2024	MOOR	10:31	53°21.735'N	50°11.953'W	3449	K10 dep
MSM129/2_33-1	14.06.2024	MOOR	16:05	53°06.131'N	50°50.113'W	2934	K9 dep
MSM129/2_34-1	14.06.2024	BPR	20:30	52°56.898'N	51°18.697'W	2205	Acoustic data retrieval
MSM129/2_35-1	15.06.2024	CTD	04:51	52°56.899'N	51°18.696'W	2204	CTD#22
MSM129/2_36-1	15.06.2024	MOOR	10:13	52°51.693'N	51°34.486'W	1341	K7 dep
MSM129/2_37-1	15.06.2024	MOOR	13:57	52°59.512'N	51°21.160'W	2194	K8 dep
MSM129/2_38-1	15.06.2024	UCTD	21:08	53°23.191'N	50°16.841'W	3345	
MSM129/2_39-1	15.06.2024	UCTD	23:27	53°36.455'N	49°46.640'W	3601	
MSM129/2_40-1	16.06.2024	UCTD	00:25	53°44.425'N	49°44.290'W	3609	
MSM129/2_41-1	16.06.2024	UCTD	01:12	53°49.996'N	49°42.650'W	3648	
MSM129/2_42-1	16.06.2024	CTD	03:50	54°01.370'N	49°39.294'W	3642	CTD#23
MSM129/2_43-1	16.06.2024	UCTD	05:59	54°09.169'N	49°37.697'W	3631	
MSM129/2_44-1	16.06.2024	UCTD	06:49	54°16.358'N	49°36.222'W	3619	
MSM129/2_45-1	16.06.2024	CTD	09:27	54°30.210'N	49°33.419'W	3616	CTD#24
MSM129/2_46-1	16.06.2024	UCTD	11:20	54°36.246'N	49°32.144'W	3623	
MSM129/2_47-1	16.06.2024	UCTD	12:08	54°43.681'N	49°30.628'W	3628	
MSM129/2_48-1	16.06.2024	CTD	15:02	54°59.036'N	49°27.520'W	3646	CTD#25
MSM129/2_49-1	16.06.2024	UCTD	17:11	55°07.186'N	49°25.838'W	3638	
MSM129/2_50-1	16.06.2024	UCTD	18:12	55°15.899'N	49°24.036'W	3638	
MSM129/2_51-1	16.06.2024	CTD	20:43	55°28.138'N	49°21.580'W	3669	CTD#26
MSM129/2_52-1	16.06.2024	UCTD	22:50	55°35.824'N	49°20.010'W	3688	
MSM129/2_53-1	16.06.2024	UCTD	23:35	55°41.979'N	49°18.751'W	3683	
MSM129/2_54-1	17.06.2024	UCTD	00:29	55°49.402'N	49°17.224'W	3830	
MSM129/2_55-1	17.06.2024	CTD	02:46	55°56.649'N	49°15.681'W	3765	CTD#27
MSM129/2_56-1	17.06.2024	UCTD	05:53	56°10.574'N	49°12.904'W	3700	
MSM129/2_57-1	17.06.2024	UCTD	06:40	56°17.422'N	49°11.509'W	3688	
MSM129/2_58-1	17.06.2024	CTD	08:53	56°25.521'N	49°09.798'W	3675	CTD#28
MSM129/2_59-1	17.06.2024	UCTD	10:49	56°23.055'N	49°19.228'W	3686	
MSM129/2_60-1	17.06.2024	UCTD	11:43	56°19.882'N	49°30.855'W	3721	
MSM129/2_61-1	17.06.2024	UCTD	12:29	56°17.265'N	49°40.562'W	3634	
MSM129/2_62-1	17.06.2024	UCTD	12:46	56°16.445'N	49°43.585'W	3635	
MSM129/2_63-1	17.06.2024	UCTD	13:14	56°14.713'N	49°50.008'W	3643	
MSM129/2_64-1	17.06.2024	CTD	18:44	55°57.121'N	50°55.012'W	3578	CTD#29
MSM129/2_65-1	17.06.2024	UCTD	20:35	56°00.733'N	50°46.691'W	3620	
MSM129/2_66-1	17.06.2024	CTD	23:31	56°07.813'N	50°30.579'W	3671	CTD#30
MSM129/2_67-1	18.06.2024	CTD	02:58	56°07.912'N	50°21.293'W	3685	CTD#31
MSM129/2_68-1	18.06.2024	CTD	06:11	56°08.001'N	50°12.015'W	3664	CTD#32
MSM129/2_69-1	18.06.2024	CTD	09:50	56°07.799'N	50°30.587'W	3668	CTD#33
MSM129/2_70-1	18.06.2024	GLIDER	11:30	56°07.787'N	50°30.610'W	3669	Ifm13 dep
MSM129/2_71-1	18.06.2024	GLIDER	12:35	56°07.169'N	50°32.191'W	3667	Ifm03 dep
MSM129/2_72-1	18.06.2024	FLOAT	15:04	56°06.960'N	50°32.393'W	3668	#4903798
MSM129/2_73-1	19.06.2024	CTD	06:46	56°33.511'N	52°40.384'W	3489	CTD#34
MSM129/2_74-1	19.06.2024	MOOR	10:10	56°34.195'N	52°39.361'W	3488	K1 rec
MSM129/2_75-1	20.06.2024	CTD	03:14	56°54.366'N	49°03.894'W	3617	CTD#35

Ship station number	Date (dd.mm.yyyy)	Gear	Time (UTC)	Latitude	Longitude	Water depth (m)	Comment
MSM129/2_76-1	20.06.2024	CTD	09:20	57°23.201'N	48°58.029'W	3553	CTD#36
MSM129/2_77-1	20.06.2024	CTD	14:49	57°52.066'N	48°52.166'W	3482	CTD#37
MSM129/2_78-1	20.06.2024	UCTD	18:06	58°02.711'N	48°49.954'W	3479	
MSM129/2_79-1	20.06.2024	UCTD	19:03	58°11.347'N	48°48.167'W	3465	
MSM129/2_80-1	20.06.2024	CTD	21:19	58°20.943'N	48°46.273'W	3487	CTD#38
MSM129/2_81-1	20.06.2024	UCTD	23:17	58°25.936'N	48°38.051'W	3482	
MSM129/2_82-1	21.06.2024	UCTD	00:19	58°31.997'N	48°28.079'W	3259	
MSM129/2_83-1	21.06.2024	UCTD	01:20	58°37.893'N	48°18.360'W	3703	
MSM129/2_84-1	21.06.2024	CTD	03:31	58°42.987'N	48°10.058'W	3373	CTD#39
MSM129/2_85-1	21.06.2024	UCTD	05:27	58°46.482'N	48°02.283'W	3303	
MSM129/2_86-1	21.06.2024	UCTD	06:40	58°52.630'N	47°48.736'W	3146	
MSM129/2_87-1	21.06.2024	CTD	09:05	58°59.494'N	47°33.627'W	3117	CTD#40
MSM129/2_88-1	21.06.2024	MOOR	10:30	59°00.526'N	47°34.289'W	3100	DSOW4 rec
MSM129/2_89-1	21.06.2024	CTD	15:44	59°12.008'N	47°04.804'W	2935	CTD#41
MSM129/2_90-1	21.06.2024	MOOR	17:03	59°13.315'N	47°05.575'W	2940	DSOW3 rec
MSM129/2_91-1	21.06.2024	UCTD	20:07	59°12.575'N	47°30.321'W	2951	
MSM129/2_92-1	21.06.2024	CTD	22:17	59°12.018'N	47°49.186'W	3096	CTD#42
MSM129/2_93-1	22.06.2024	UCTD	00:16	59°17.897'N	47°35.710'W	2998	
MSM129/2_94-1	22.06.2024	CTD	02:18	59°22.794'N	47°23.875'W	2974	CTD#43
MSM129/2_95-1	22.06.2024	UCTD	04:29	59°30.543'N	47°18.610'W	2834	
MSM129/2_96-1	22.06.2024	CTD	07:01	59°37.500'N	47°13.900'W	2689	CTD#44
MSM129/2_97-1	22.06.2024	CTD	10:08	59°49.567'N	47°07.049'W	2662	CTD#45
MSM129/2_98-1	22.06.2024	UCTD	11:37	59°54.362'N	47°03.406'W	2526	
MSM129/2_99-1	22.06.2024	CTD	13:07	59°58.489'N	47°01.086'W	2371	CTD#46
MSM129/2_100-1	22.06.2024	CTD	15:40	60°02.980'N	46°59.320'W	1825	CTD#47
MSM129/2_101-1	22.06.2024	CTD	17:39	60°06.474'N	46°59.971'W	1181	CTD#48
MSM129/2_102-1	22.06.2024	CTD	19:07	60°08.654'N	47°03.376'W	374	CTD#49
MSM129/2_107-1	23.06.2024	MOOR	09:49	58°44.001'N	48°09.386'W	3360	DSOW6 rec
MSM129/2_108-1	23.06.2024	MOOR	15:17	59°03.803'N	47°23.407'W	2995	DSOW3 dep
MSM129/2_109-1	23.06.2024	MOOR	17:36	59°12.854'N	47°01.844'W	2902	DSOW4 dep
MSM129/2_110-1	23.06.2024	CTD	23:30	59°00.854'N	48°14.756'W	3289	CTD#50
MSM129/2_111-1	24.06.2024	CTD	03:32	58°49.710'N	48°40.365'W	3421	CTD#51
MSM129/2_112-1	24.06.2024	CTD	15:35	58°00.606'N	50°19.751'W	3560	CTD#52
MSM129/2_113-1	24.06.2024	UCTD	17:14	57°58.547'N	50°17.460'W	3560	
MSM129/2_114-1	24.06.2024	CTD	20:12	57°56.858'N	50°15.505'W	3564	CTD#53
MSM129/2_115-1	24.06.2024	UCTD	22:12	57°54.376'N	50°12.708'W	3563	
MSM129/2_116-1	24.06.2024	UCTD	22:43	57°50.535'N	50°08.324'W	3567	
MSM129/2_117-1	24.06.2024	UCTD	23:13	57°46.737'N	50°03.981'W	3573	
MSM129/2_118-1	24.06.2024	UCTD	23:45	57°42.815'N	49°59.518'W	3583	
MSM129/2_119-1	25.06.2024	MOOR	13:03	56°33.298'N	52°34.365'W	3501	Trap dep
MSM129/2_120-1	25.06.2024	MOOR	17:26	56°33.528'N	52°38.377'W	3493	K1 dep
MSM129/2_121-1	25.06.2024	CTD	20:58	56°33.295'N	52°41.442'W	3488	CTD#54
MSM129/2_122-1	26.06.2024	UCTD	03:39	56°56.398'N	51°11.065'W	3587	
MSM129/2_123-1	26.06.2024	UCTD	04:30	56°50.658'N	51°02.267'W	3596	
MSM129/2_124-1	26.06.2024	UCTD	05:33	56°44.119'N	50°52.260'W	3596	
MSM129/2_125-1	26.06.2024	UCTD	06:34	56°36.853'N	50°41.162'W	3610	
MSM129/2_126-1	26.06.2024	UCTD	07:31	56°30.410'N	50°31.362'W	3626	
MSM129/2_127-1	26.06.2024	UCTD	08:29	56°23.888'N	50°21.464'W	3634	
MSM129/2_128-1	26.06.2024	UCTD	09:30	56°16.836'N	50°10.814'W	3653	
MSM129/2_129-1	26.06.2024	UCTD	10:27	56°18.053'N	50°05.785'W	3650	
MSM129/2_130-1	26.06.2024	UCTD	11:30	56°27.873'N	50°07.346'W	3631	

Ship station number	Date (dd.mm.yyyy)	Gear	Time (UTC)	Latitude	Longitude	Water depth (m)	Comment
MSM129/2_131-1	26.06.2024	CTD	13:59	56°25.832'N	50°13.183'W	3636	CTD#55
MSM129/2_133-1	26.06.2024	CTD	18:42	56°26.111'N	50°13.199'W	3640	CTD#56
MSM129/2_134-1	26.06.2024	CTD	20:01	56°26.113'N	50°13.194'W	3639	CTD#57
MSM129/2_134-1	26.06.2024	CTD	20:01	56°26.113'N	50°13.194'W	3639	CTD#58
MSM129/2_134-1	26.06.2024	CTD	20:01	56°26.113'N	50°13.194'W	3639	CTD#59
MSM129/2_135-1	27.06.2024	CTD	01:46	56°26.112'N	50°13.195'W	3639	CTD#60
MSM129/2_135-1	27.06.2024	CTD	01:46	56°26.112'N	50°13.195'W	3639	CTD#61
MSM129/2_139-1	27.06.2024	UCTD	07:03	56°16.794'N	50°22.927'W	3645	
MSM129/2_140-1	27.06.2024	UCTD	08:01	56°12.792'N	50°20.516'W	3653	
MSM129/2_141-1	27.06.2024	UCTD	09:01	56°12.350'N	50°05.993'W	3657	
MSM129/2_142-1	27.06.2024	UCTD	10:01	56°11.882'N	49°50.872'W	3651	
MSM129/2_143-1	27.06.2024	MVP	11:08	56°12.809'N	49°33.862'W	3773	
MSM129/2_144-1	27.06.2024	MVP	14:05	56°16.908'N	48°55.717'W	3714	
MSM129/2_145-1	28.06.2024	CTD	05:10	56°11.433'N	49°01.634'W	3723	CTD#62
MSM129/2_146-1	28.06.2024	UCTD	06:50	56°14.180'N	48°59.310'W	3722	
MSM129/2_147-1	28.06.2024	UCTD	07:18	56°16.539'N	48°57.199'W	3713	
MSM129/2_148-1	28.06.2024	CTD	09:06	56°18.726'N	48°54.122'W	3710	CTD#63
MSM129/2_149-1	28.06.2024	UCTD	11:13	56°17.524'N	49°04.776'W	3683	
MSM129/2_150-1	28.06.2024	UCTD	12:15	56°15.314'N	49°19.586'W	3714	
MSM129/2_151-1	28.06.2024	UCTD	13:16	56°13.164'N	49°33.867'W	3769	
MSM129/2_152-1	28.06.2024	MVP	13:59	56°12.618'N	49°42.990'W	3646	
MSM129/2_153-1	28.06.2024	CTD	19:06	56°26.924'N	50°14.973'W	3627	CTD#64
MSM129/2_154-1	28.06.2024	MVP	21:25	56°27.770'N	50°09.214'W	3690	
MSM129/2_155-1	29.06.2024	CTD	14:46	56°09.308'N	48°52.710'W	3718	CTD#65
MSM129/2_156-1	30.06.2024	CTD	18:52	57°42.034'N	41°45.471'W	3308	CTD#66
MSM129/2_158-1	30.06.2024	CTD	23:17	57°59.994'N	42°00.025'W	3177	CTD#67
MSM129/2_159-1	01.07.2024	CTD	03:34	58°18.925'N	42°15.649'W	2916	CTD#68
MSM129/2_160-1	01.07.2024	CTD	07:45	58°37.751'N	42°31.206'W	2458	CTD#69
MSM129/2_161-1	01.07.2024	CTD	11:35	58°56.555'N	42°46.742'W	1925	CTD#70
MSM129/2_162-1	02.07.2024	CTD	03:54	59°54.140'N	41°41.499'W	1834	CTD#71
MSM129/2_163-1	02.07.2024	CTD	07:01	59°53.214'N	41°25.512'W	1905	CTD#72
MSM129/2_164-1	02.07.2024	CTD	09:34	59°51.258'N	41°05.890'W	2092	CTD#73
MSM129/2_165-1	02.07.2024	CTD	12:17	59°49.352'N	40°46.322'W	2565	CTD#74
MSM129/2_166-1	02.07.2024	CTD	14:15	59°49.353'N	40°46.323'W	2566	CTD#75
MSM129/2_167-1	02.07.2024	CTD	17:35	59°46.905'N	40°20.914'W	2575	CTD#76
MSM129/2_168-1	02.07.2024	CTD	21:25	59°43.843'N	39°49.535'W	2729	CTD#77
MSM129/2_169-1	03.07.2024	CTD	01:13	59°40.755'N	39°18.101'W	2851	CTD#78
MSM129/2_170-1	03.07.2024	CTD	12:12	59°36.214'N	36°25.432'W	3039	CTD#79
MSM129/2_171-1	03.07.2024	CTD	17:00	59°45.217'N	37°13.699'W	3109	CTD#80