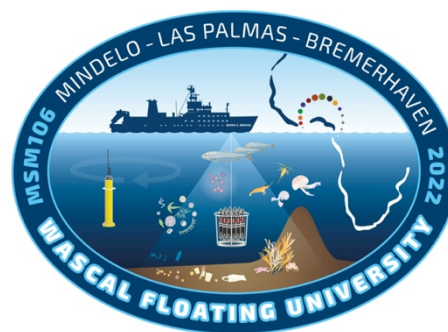


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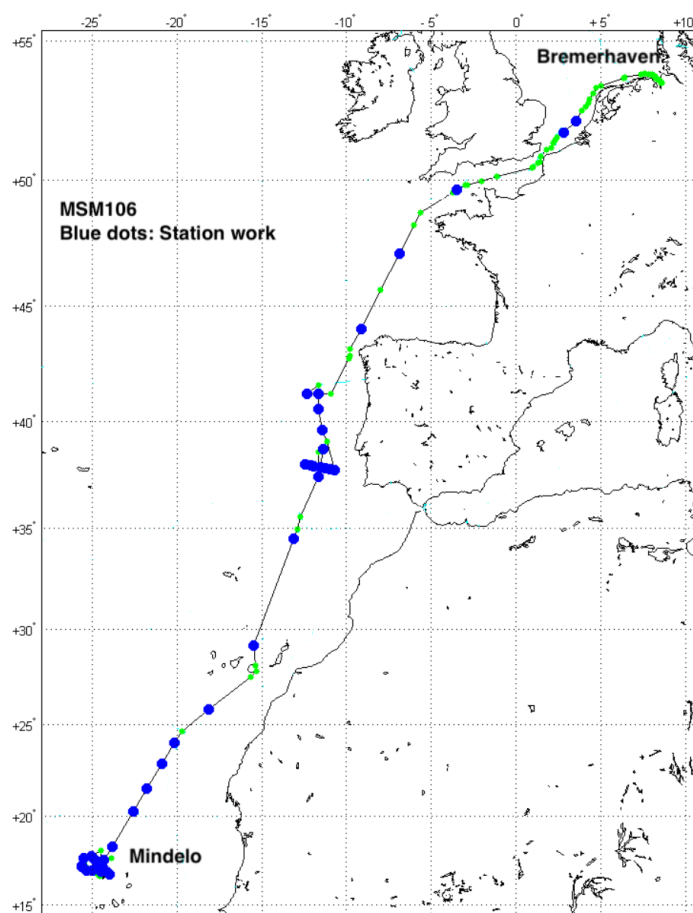
**Short Cruise Report**  
**RV Maria S. Merian MSM106**

**Mindelo, Cabo Verde – Bremerhaven, Germany**

**February 26<sup>th</sup> 2022 – March 19<sup>th</sup> 2022**

**Chief Scientist: Dr. Björn Fiedler**

**Captain: Ralf Schmidt**



## Objectives

Primary objective of this cruise was the academic education of students from the West African program WASCAL (West African Science Service Centre on Climate Change and Adapted Land Use) during an authentic research expedition. Therefore, theoretical lecture modules were combined with practical training sessions about classical oceanographic field-sampling methods (e.g., gear deployment/recovery, analytical lab techniques, data reduction and visualization, etc.). Scientific data obtained during the cruise have been used instantaneously for teaching and training purposes but also for scientific exploitation.

The following lecture modules of the MRP-CCMS curriculum were taught on board:

- 1) Ocean Observations
- 2) Hydroacoustics in fisheries and marine ecology
- 3) Communication and scientific writing

Besides teaching modules also research modules have been carried out in order to (i) contribute to current research efforts in the region and to global ocean observing programs, (ii) teach the students with state-of-the-art oceanographic technologies and real scientific data, and (iii) carry out dedicated surveys and collect scientific data for individual master thesis projects. Therefore, the following research modules have been an integral part of this cruise:

**Module 1, Surface ocean biogeochemistry:** Underway measurements of key surface properties (temperature, salinity, CO<sub>2</sub> partial pressure, O<sub>2</sub> partial pressure, total gas tension, chlorophyll, turbidity) that allowed to assess the saturation state for CO<sub>2</sub> and O<sub>2</sub>, de-convolute the observed disequilibrium into its physical and biological drivers and calculate air-sea CO<sub>2</sub> and O<sub>2</sub> fluxes.

**Module 2, Marine ecology:** The cruise track covered different biomes and offered the opportunity to characterize the associated pelagic ecosystems as well as local communities (e.g., seamount, eddies). To facilitate integration of results, the main aim was to use methods that readily can be used to estimate zooplankton contribution to biomass, bulk metabolic rates and export flux. Specifically, the total integrated zooplankton biomass at each station and the contribution of larger taxonomic groups at selected sites have been determined.

**Module 3, Time-series observations:** Full-depth CTD hydrocasts including biogeochemical sampling at different time series sites (CVOO and ESTOC) have extended long-term data sets of these sites. Conducted samplings will facilitate the assessment of long-term biogeochemical (e.g., deoxygenation and acidification) and ecological (e.g. zooplankton) changes in the ETNA.

**Module 4, Microplastics:** a) Comparing the abundance of microplastics inside and outside mesoscale eddies of which presence along the cruise track will be assessed prior and during the cruise, b) collecting microplastic surface samples at stations along the cruise track, c) testing a newly developed hyperspectral camera system for onboard analysis of plastic particles.

## **Narrative**

Expedition MSM106 started on Feb 26<sup>th</sup> in the morning from the port of Mindelo, Sao Vicente, Cabo Verde. The first working area was located 12 nautical miles west of the island of Santo Antao at Nola Seamount. Approx. half way on the approach to the seamount a short stop south of the island has been carried out in order to calibrate the SIMRAD WBT Mini echosounder (38/200kHz) which got installed in the vessel's moonpool.

At the seamount an oceanographic mooring with a newly developed surface buoy was deployed at the southwestern flank of the seamount at a water depth of 200 m. The buoy was equipped with a new measurement system for CO<sub>2</sub> to measure both in atmosphere and in water.

Shortly after mooring operations were finished, an autonomous surface vehicle (Wave Glider) equipped with a similar CO<sub>2</sub> system got deployed in the vicinity of the mooring. The Wave Glider then got tasked to circumnavigate the mooring in a safe distance for several days in order to conduct simultaneous CO<sub>2</sub> measurements to compare data from both units with each other and to determine submesoscale variability at the seamount.

Right after deployment of the Wave Glider the initially planned scientific work program had to be paused because of a detected COVID-19 case on board. All scientific operations had to stop immediately on board and infection prevention measures were strengthened according to the expedition's outbreak management plan. Hence, the work program got immediately adapted to the new circumstances. Only hydroacoustic profile sections with the vessel-mounted 75 kHz Acoustic Doppler Current Profiler (ADCP) and the SIMRAD WBT Mini echosounder could be carried out. Hydroacoustic profiles with the two above mentioned instruments were conducted across the two summits of Nola Seamount during the evening of Feb. 26<sup>th</sup>, followed by a zonal section across a mesoscale eddy during the night of Feb. 27<sup>th</sup>, which has been detected via remote sensing before.

Later during the day, the near-coastal area north of the islands of Sao Vicente and Santa Luzia were approached for a high-resolution hydroacoustic grid survey in order to investigate the boundary currents as well as the distribution of biomass in the water column from the coast to the open ocean (see Fig 1). Measurements revealed a pronounced shear between near-coastal boundary currents and currents induced by the mesoscale eddy further north of the islands.

After the coastal survey a meridional section through the before-surveyed eddy candidate was performed on Feb 28<sup>th</sup> to determine the geometry and thus the centre of the eddy.

On March 1<sup>st</sup> station work - with scientific gear that could be operated single-handed – became possible again. A hydrographic section (down to 1200 m) with 9 CTD hydrocasts (incl. water sampling) across the eddy and through its centre was performed. Further, the sampling of organic surfactants at the sea surface has started with a so-called Garrett-Screen sampler which gets lowered to the sea surface by hand at every station during MSM106. Furthermore, the towed camera system PELAGIOS has been deployed during the section at eddy-outside and eddy-centre stations (2.5 hrs per tow, down to 1200 m).

On March 2<sup>nd</sup> all gears could finally be operated when the COVID-19 outbreak turned out to be under control. The multinet (down to 1000 m) for zooplankton sampling, the IKMT for nekton sampling (down to 800 m) and the catamaran for microplastic sampling at the sea surface were deployed for the first time at the eddy centre station. This station got revisited for a second time after the section got accomplished. At the end of station work in the eddy centre (the eddy was found to be an anticyclonic mode-water eddy with a low-oxygen core) a biogeochemical Argo float got deployed.

In the evening of March 2<sup>nd</sup> Maria S. Merian arrived at the Cape Verde Ocean Observatory (CVOO) to carry out a full time series sampling which included a full-depth CTD hydrocast (3600 m) incl. water sampling, Zooplankton and microplastic samplings.

Due to the significant changes in the scientific work program caused by the COVID-10 case on board, the working areas at Senghor Seamount and at the Cape Blanc time series site had to be canceled and the transit to Las Palmas started on March 3<sup>rd</sup> early during the night. Along the transit, daily

stations with different gears have been performed to facilitate the student training program on board. Further, 4 Argo floats as a contribution to the international Argo program were deployed along the transit.

On March 7<sup>th</sup> a short port call of 9 hrs was carried out to exchange a few scientific crew members. After 4 new scientists have embarked, Maria S. Merian proceeded in the late afternoon with its transit towards Bremerhaven in Germany. Already at midnight the Spanish time series site ESTOC 60 nautical miles north of Gran Canaria was reached. A full time-series sampling equivalent to the CVOO sampling has been carried out until the next morning.

Along the transit, the daily station work has continued until March 10<sup>th</sup> when a second mesoscale eddy candidate off the COAST of Portugal got reached. A first meridional ADCP section was conducted to determine the eddy geometry and its centre. Consecutively, a hydrographic section with 7 stations across the eddy was conducted, equivalent to the survey off Cabo Verde.

During the eddy survey a 45-minute livestream event (performed by the students) as part of an UN Decade of Ocean Sciences for Sustainable Development event was broadcasted to explain and illustrate marine research to a wide international public.

After the eddy survey was accomplished, another daily station was performed on March 12<sup>th</sup> and on March 13<sup>th</sup> a third eddy candidate was surveyed by two orthogonal ADCP sections and one centre station including CTD, multinet and catamaran.

The daily station works then continued until March 16<sup>th</sup> in the English Channel with its last daily station carried out off the British Channel Islands. The final station work was then conducted with two microplastic samplings off the Rhine River delta on March 17<sup>th</sup>.

Due to beneficial currents in the English Channel Maria S. Merian reached the port of Bremerhaven already during late evening of March 18<sup>th</sup>.

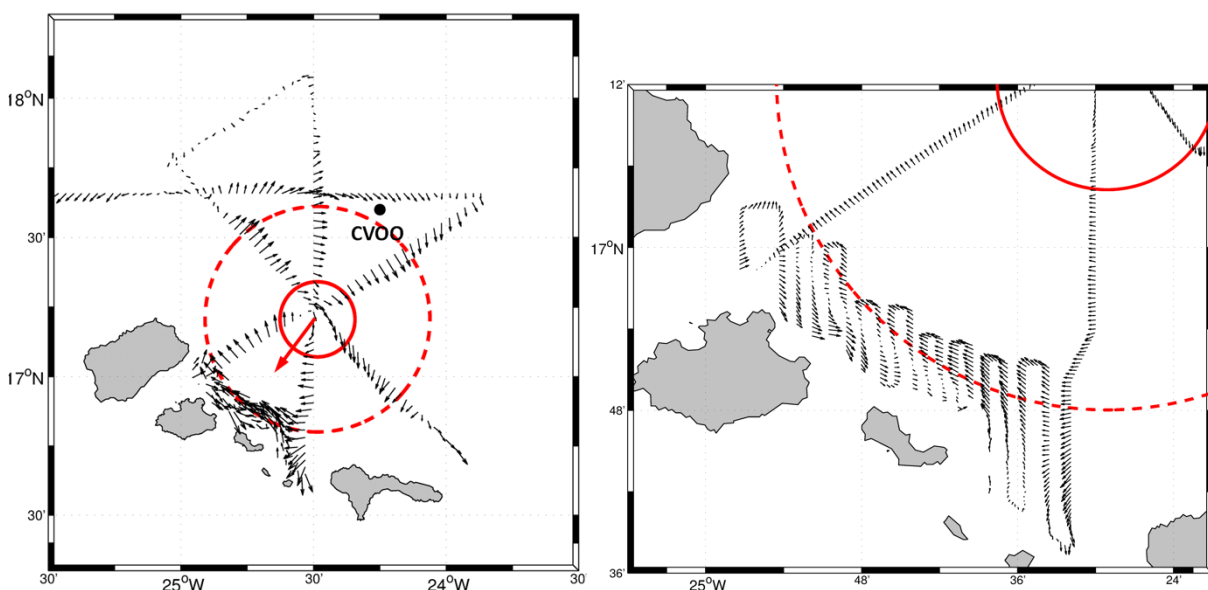


Figure 1: The eddy north of Cabo Verde drifted southwest at about 2 miles per day directly towards the island chain. The inner solid circle is the area in solid rotation (about 30 km diameter, 15 km radius), the outer dashed circle delimits the area of trapped water (about 90 km diameter, 45 km radius). Arrows denote currents measured by the vessel-mounted ADCP during the eddy and coastal surveys.

## Acknowledgements

We like to thank Captain Ralf Schmidt and his entire crew for their motivated and professional support on board. Major financial support was provided by the Deutsche Forschungsgemeinschaft (DFG) via the Leitstelle Deutsche Forschungsschiffe as well as from the BMBF-funded program WASCAL. We also would like to thank the Leibniz-Institute for Baltic Sea Research Warnemünde as well as the Leibniz Centre for Tropical Marine Research Bremen for technical support.

## Participant List

### Leg 1 (Mindelo – Las Palmas, 26.2. – 07.3.22):

No.	Name	Task	Institute
1	Björn Fiedler	Chief Scientist	GEOMAR
2	Corrine Almeida	Chl-a analysis	UTA
3	Tim Fischer	TSG/CTD/ADCP	GEOMAR
4	Andreas Pinck	CTD/mooring	GEOMAR
5	Matthias Schaber	EK80/IKMT	vTI
6	Tobias Steinhoff	bgc underway/CTD	GEOMAR
7	Helena Hauss	Multinet/UVP/Pelagios	GEOMAR
8	Erik Borchert	microplastics	GEOMAR
9	Nuno Vieira	Oxygen	OSCM/IMAR
10	Degbe Attannon	student	UTA
11	Nongma Kabore	student	UTA
12	Sandra Fernandes	student	UTA
13	Gilles Soro	student	UTA
14	Daniel Quaye	student	UTA
15	Djibril Konate	student	UTA
16	Samira Idrissa	student	UTA
17	Gnilane Diouf	student	UTA
18	Dkawlma Tora	student	UTA
19	Abubacarr Kujabie	student	UTA
20	Melissa Ndure	student	UTA

GEOMAR: GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany

UTA: Universidade Técnica do Atlântico, Mindelo, Cabo Verde

vTI: Thünen Institut für Seefischerei, Bremerhaven, Germany

OSCM: Ocean Science Centre Mindelo, Mindelo, Cabo Verde

IMAR: Instituto do Mar, Mindelo, Cabo Verde



Figure 2: Scientific cruise participants of Maria S. Merian MSM106 expedition (leg1)

**Leg 2 (Las Palmas - Bremerhaven, 07.3.-19.3.2022):**

No.	Name	Task	Institute
1	Björn Fiedler	Chief Scientist, bgc underway	GEOMAR
2	Corrine Almeida	Chl-a analysis	UTA
3	Tim Fischer	TSG/CTD/ADCP	GEOMAR
4	Heino Fock	EK80/IKMT	vTI
5	Sarah Kaehlert	communication	GEOMAR
6	Henrike Andresen	Multinet/UVP	vTI
7	Thea Hamm	microplastics	GEOMAR
8	Nuno Vieira	Oxygen	OSCM/IMAR
9	Degbe Attannon	student1	UTA
10	Sandra Fernandes	student3	UTA
11	Gilles Soro	student4	UTA
12	Daniel Quaye	student6	UTA
13	Djibril Konate	student7	UTA
14	Samira Idrissa	student8	UTA
15	Tolulope Oyikeke	student9	UTA
16	Gnilane Diouf	student10	UTA
17	Dkawlma Tora	student11	UTA
18	Abubacarr Kujabie	student12	UTA
19	Melissa Ndure	student13	UTA

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Figure 3: Scientific cruise participants of Maria S. Merian MSM106 expedition (leg2)

## Station List MSM106

### Gear Coding:

CTD: CTD rosette sampler  
 MSN: Multinet  
 PELAGIOS: PELAGIOS towed camera  
 MOOR: Mooring operations (deployment)  
 ADCP: Acoustic Doppler Current Profiler sections (75 kHz)  
 EK80: SIMRAD EK80 Echosounder (WBT Mini, 38/200 kHz)  
 WVGL: Autonomous surface vehicle (SV3 Wave Glider)  
 FLOAT: Argo Float deployment  
 IKMT: Isaacs-Kid Midwater Trawl Net  
 GSCRS: Garrett Screen  
 NEMICAT: Neuston Catamaran Trawl Net  
 PLA: Small plankton net (handheld)

Station	Date in 2022	Time [UTC]	Device	Latitude	Longitude	Water Depth (m)	Remarks
MSM106_1-1	26-Feb	12:24	EK80	16°56,985' N	025° 19,701' W	76	Begin calibration
MSM106_2-1	26-Feb	15:41	MOOR	17° 11,440' N	025° 36,055' W	194	Anchor, releaser & 3 floats in water
MSM106_2-2	26-Feb	17:26	WVGL	17° 11,183' N	025° 36,098' W	709	
MSM106_3-1	26-Feb	18:41	ADCP	17° 15,307' N	025° 36,888' W	33	COG=152∞, v=10kn
MSM106_3-2	26-Feb	20:11	ADCP	17° 12,091' N	025° 26,504' W	0	COG=332∞, v=10kn
MSM106_3-3	26-Feb	21:23	ADCP	17° 16,833' N	025° 25,089' W	0	COG=243∞, v=10kn
MSM106_4-1	27-Feb	02:03	ADCP	17° 39,458' N	025° 29,871' W	62	COG=090∞, v=10kn
MSM106_5-1	27-Feb	18:49	ADCP	16° 57,397' N	024° 57,386' W	87	v=10kn
MSM106_6-1	28-Feb	13:25	ADCP	16° 53,697' N	024° 30,051' W	67	COG=000∞, v=10kn
MSM106_7-1	01-Mar	00:01	CTD	17°46,224' N	025° 02,816' W	57	
MSM106_7-2	01-Mar	00:04	GSCRS	17° 46,224' N	025° 02,814' W	65	
MSM106_7-3	01-Mar	01:32	PELAGIOS	17° 46,225' N	025° 02,816' W	3565	
MSM106_8-1	01-Mar	06:17	CTD	17° 38,413' N	024° 54,604' W	58	
MSM106_8-2	01-Mar	06:21	GSCRS	17° 38,413' N	024° 54,604' W	67	
MSM106_9-1	01-Mar	08:50	CTD	17° 30,654' N	024° 46,466' W	67	
MSM106_9-2	01-Mar	09:06	GSCRS	17° 30,692' N	024° 46,428' W	66	
MSM106_10-1	01-Mar	11:21	CTD	17° 22,882' N	024° 38,312' W	65	
MSM106_10-2	01-Mar	11:26	GSCRS	17° 22,883' N	024° 38,313' W	73	
MSM106_11-1	01-Mar	13:34	CTD	17° 15,108' N	024° 30,181' W	63	
MSM106_11-2	01-Mar	13:44	GSCRS	17° 15,108' N	024° 30,181' W	68	
MSM106_11-3	01-Mar	14:50	PELAGIOS	17° 15,108' N	024° 30,183' W	60	
MSM106_12-1	01-Mar	18:37	CTD	17° 07,324' N	024° 22,027' W	61	
MSM106_12-2	01-Mar	19:08	GSCRS	17° 07,325' N	024° 22,027' W	63	
MSM106_13-1	01-Mar	20:53	CTD	16° 59,561' N	024° 13,901' W	0	
MSM106_13-2	01-Mar	21:02	GSCRS	16° 59,561' N	024° 13,903' W	0	
MSM106_14-1	01-Mar	23:04	CTD	16° 51,782' N	024° 05,782' W	0	
MSM106_14-2	01-Mar	23:15	GSCRS	16° 51,782' N	024° 05,783' W	0	

MSM106_15-1	02-Mar	01:06	CTD	16° 44,163' N	023° 57,824' W	0	
MSM106_15-2	02-Mar	02:05	GSCRS	16° 44,162' N	023° 57,825' W	0	
MSM106_16-1	02-Mar	06:43	PELAGIOS	17° 15,111' N	024° 30,178' W	0	
MSM106_16-2	02-Mar	09:54	MSN	17° 15,104' N	024° 30,171' W	0	
MSM106_16-3	02-Mar	12:24	NEMICAT	17° 15,072' N	024° 30,196' W	0	
MSM106_16-4	02-Mar	14:17	IKMT	17° 15,237' N	024° 30,084' W	0	
MSM106_16-5	02-Mar	17:09	FLOAT	17° 15,143' N	024° 30,183' W	0	
MSM106_17-1	02-Mar	19:57	CTD	17° 35,013' N	024° 14,872' W	0	
MSM106_17-2	02-Mar	20:01	GSCRS	17° 35,013' N	024° 14,872' W	0	
MSM106_17-3	02-Mar	22:56	NEMICAT	17° 35,079' N	024° 14,816' W	3591	
MSM106_17-4	03-Mar	00:25	MSN	17° 37,817' N	024° 12,222' W	0	
MSM106_17-5	03-Mar	02:36	MSN	17° 42,348' N	024° 09,099' W	0	
MSM106_17-6	03-Mar	04:57	PELAGIOS	17° 46,990' N	024° 06,365' W	0	
MSM106_18-1	03-Mar	12:04	CTD	18° 19,236' N	023° 46,720' W	3707	
MSM106_18-2	03-Mar	12:31	GSCRS	18° 19,236' N	023° 46,718' W	0	
MSM106_18-3	03-Mar	13:21	NEMICAT	18° 19,271' N	023° 46,691' W	0	
MSM106_18-4	03-Mar	14:37	MSN	18° 21,873' N	023° 44,784' W	0	
MSM106_18-5	03-Mar	16:31	PELAGIOS	18° 25,520' N	023° 42,234' W	0	
MSM106_19-1	04-Mar	10:04	CTD	20° 22,540' N	022° 29,709' W	0	
MSM106_19-2	04-Mar	10:15	GSCRS	20° 22,540' N	022° 29,708' W	0	
MSM106_19-3	04-Mar	10:31	PLA	20° 22,587' N	022° 29,653' W	0	
MSM106_19-4	04-Mar	11:14	FLOAT	20° 22,744' N	022° 29,484' W	0	
MSM106_20-1	04-Mar	20:01	FLOAT	21° 33,328' N	021° 43,765' W	0	
MSM106_21-1	05-Mar	05:03	IKMT	22° 51,987' N	020° 52,366' W	0	
MSM106_21-2	05-Mar	06:06	NEMICAT	22° 53,657' N	020° 50,160' W	0	
MSM106_21-3	05-Mar	07:32	CTD	22° 55,640' N	020° 47,481' W	0	
MSM106_21-4	05-Mar	07:34	GSCRS	22° 55,639' N	020° 47,480' W	0	
MSM106_21-5	05-Mar	07:55	PLA	22° 55,640' N	020° 47,480' W	0	
MSM106_21-6	05-Mar	08:37	FLOAT	22V 55,650' N	020° 47,441' W	0	
MSM106_22-1	05-Mar	17:24	FLOAT	24° 13,220' N	019° 58,704' W	0	
MSM106_23-1	06-Mar	09:01	MSN	25° 59,335' N	017° 50,241' W	0	
MSM106_23-2	06-Mar	10:25	PELAGIOS	26° 01,865' N	017° 48,486' W	0	
MSM106_23-3	06-Mar	12:08	CTD	26° 02,540' N	017° 48,052' W	0	
MSM106_23-4	06-Mar	12:17	GSCRS	26° 02,540' N	017° 48,052' W	0	
MSM106_23-5	06-Mar	12:45	NEMICAT	26° 02,594' N	017° 48,010' W	0	
MSM106_24-1	07-Mar	22:33	CTD	29° 10,013' N	015° 30,013' W	0	
MSM106_24-2	07-Mar	23:01	GSCRS	29° 10,013' N	01° 30,013' W	3609	
MSM106_24-3	08-Mar	01:39	MSN	29° 10,283' N	015° 30,013' W	3609	
MSM106_24-4	08-Mar	02:44	NEMICAT	29° 12,069' N	015° 30,046' W	3609	
MSM106_24-5	08-Mar	04:21	IKMT	29° 15,735' N	015° 30,045' W	3610	
MSM106_25-1	09-Mar	09:03	CTD	34° 31,961' N	013° 07,178' W	0	
MSM106_25-2	09-Mar	09:25	GSCRS	34° 31,960' N	013° 07,178' W	4424	
MSM106_25-3	09-Mar	10:28	MSN	34° 32,039' N	013° 07,237' W	4424	
MSM106_25-4	09-Mar	11:30	NEMICAT	34° 34,070' N	013° 08,788' W	4406	



MSM106_26-1	10-Mar	04:00	ADCP	37° 28,215' N	011° 40,006' W	0	COG=360∞, v=10kn
MSM106_26-2	10-Mar	04:00	EK80	37° 28,215' N	011° 40,006' W	0	COG=360∞, v=10kn
MSM106_27-1	10-Mar	14:08	CTD	38° 43,829' N	011° 20,978' W	0	
MSM106_27-2	10-Mar	14:15	GSCRS	38° 43,830' N	011° 20,977' W	3965	
MSM106_27-3	10-Mar	15:11	MSN	38° 43,845' N	011° 21,163' W	4965	
MSM106_27-4	10-Mar	16:44	NEMICAT	38° 43,892' N	011° 26,155' W	4048	
MSM106_28-1	10-Mar	22:45	NEMICAT	37° 53,929' N	011° 28,412' W	0	
MSM106_28-2	11-Mar	00:10	CTD	37° 53,928' N	011° 32,261' W	5060	
MSM106_28-3	11-Mar	00:59	GSCRS	37° 53,928' N	011° 32,262' W	5060	
MSM106_28-4	11-Mar	01:34	MSN	37° 53,948' N	011° 32,546' W	5061	
MSM106_28-5	11-Mar	03:11	IKMT	37° 54,302' N	011° 36,690' W	5061	Ranger Sonardyne deployed
MSM106_29-1	11-Mar	05:46	CTD	37° 57,707' N	011° 55,055' W	0	
MSM106_29-2	11-Mar	06:35	GSCRS	37° 57,707' N	011° 55,055' W	0	
MSM106_30-1	11-Mar	08:03	CTD	38° 00,332' N	012° 09,741' W	0	
MSM106_30-2	11-Mar	08:56	GSCRS	38° 00,332' N	012° 09,740' W	0	
MSM106_31-1	11-Mar	10:45	CTD	38° 02,977' N	012° 24,881' W	4889	
MSM106_31-2	11-Mar	11:22	GSCRS	38° 02,977' N	012° 24,881' W	4891	
MSM106_32-2	11-Mar	11:58	EK80	38° 02,977' N	012° 24,881' W	0	COG=103∞, v=10kn
MSM106_32-1	11-Mar	12:08	ADCP	38° 03,029' N	012° 25,042' W	0	COG=103∞, v=10kn
MSM106_33-1	11-Mar	16:33	NEMICAT	37° 54,002' N	011° 34,162' W	0	
MSM106_34-1	11-Mar	20:05	CTD	37° 51,070' N	011° 17,263' W	5054	
MSM106_34-2	11-Mar	20:46	GSCRS	37° 50,958' N	011° 17,350' W	5055	
MSM106_35-1	11-Mar	23:07	CTD	37° 48,136' N	011° 00,324' W	5038	
MSM106_35-2	11-Mar	23:19	GSCRS	37° 48,137' N	011° 00,326' W	5038	
MSM106_36-1	12-Mar	02:14	CTD	37° 45,185' N	010° 43,299' W	5013	
MSM106_36-2	12-Mar	02:41	GSCRS	37° 45,185' N	010° 43,300' W	5012	
MSM106_37-1	12-Mar	13:51	MSN	39° 35,048' N	011° 20,362' W	4821	
MSM106_37-2	12-Mar	15:35	NEMICAT	39° 36,594' N	011° 24,751' W	4684	
MSM106_37-3	12-Mar	16:55	CTD	39° 37,548' N	011° 28,364' W	4412	
MSM106_38-1	12-Mar	23:06	ADCP	40° 32,383' N	011° 38,994' W	5160	
MSM106_38-2	12-Mar	23:06	EK80	40° 32,383' N	011° 38,994' W	5160	
MSM106_39-1	13-Mar	08:49	ADCP	41° 14,992' N	012° 18,248' W	5103	
MSM106_39-2	13-Mar	08:49	EK80	41° 14,992' N	012° 18,248' W	5103	
MSM106_40-1	13-Mar	12:00	CTD	41° 14,996' N	011° 39,006' W	3109	
MSM106_40-2	13-Mar	12:33	GSCRS	41° 14,996' N	011° 39,008' W	3020	
MSM106_40-3	13-Mar	13:13	NEMICAT	41° 15,089' N	011° 39,251' W	3164	
MSM106_40-4	13-Mar	14:31	MSN	41° 16,776' N	011° 42,890' W	3438	
MSM106_41-1	14-Mar	12:58	CTD	44° 05,419' N	009° 10,371' W	0	
MSM106_41-2	14-Mar	13:07	GSCRS	44° 05,419' N	009° 10,371' W	0	
MSM106_42-1	15-Mar	09:01	CTD	47° 14,623' N	006° 49,085' W	2907	
MSM106_42-2	15-Mar	09:33	GSCRS	47° 14,624' N	006° 49,085' W	2908	
MSM106_42-3	15-Mar	10:03	NEMICAT	47° 14,658' N	006° 49,191' W	2903	
MSM106_42-4	15-Mar	11:20	IKMT	47° 16,026' N	006° 53,500' W	3605	Ranger Sonadyne

							deployed
MSM106_43-1	16-Mar	08:02	CTD	49° 19,925' N	003° 43,656' W	87	
MSM106_43-2	16-Mar	08:08	GSCRS	49°19,925' N	003° 43,658' W	86	
MSM106_43-3	16-Mar	08:19	NEMICAT	49° 19,925' N	003° 43,658' W	86	
MSM106_43-4	16-Mar	09:48	MSN	49° 21,187' N	003° 48,211' W	87	
MSM106_44-1	17-Mar	10:27	NEMICAT	51° 46,808' N	002° 46,718' E	38	
MSM106_44-2	17-Mar	10:32	GSCRS	51° 46,871' N	002° 47,015' E	35	
MSM106_45-1	17-Mar	15:12	NEMICAT	52° 13,491' N	003° 34,224' E	28	
MSM106_45-2	17-Mar	15:46	GSCRS	52°15,024' N	003° 36,334' E	33	