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Short Cruise Report

RV SONNE Cruise SO260/1+2

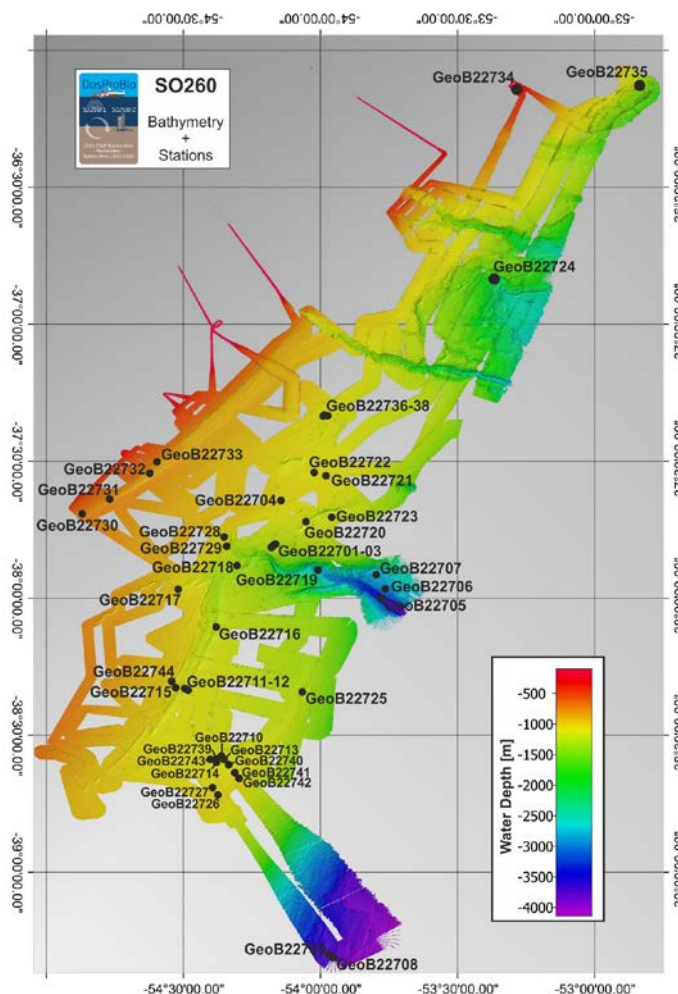
Buenos Aires (Argentina) – Montevideo (Uruguay)

12.01.2018 – 30.01.2018

Montevideo (Uruguay) - Buenos Aires (Argentina) 02.02.2018 – 14.02.2018

Chief Scientist: Prof. Dr. Sabine Kasten

Captain: Oliver Meyer



Map of Stations and Bathymetry

Cruise objectives

The continental slope off Argentina and Uruguay represents a highly dynamic depositional environment and is also a key location of the global thermohaline circulation due to the confluence of northward and southward flowing contour currents. Results from Meteor Cruise M78/3 in 2009 and cruises before show that this region offers a unique depositional setting to study the fundamental interaction between bottom currents and sediment deposition as well as how sedimentation processes control biogeochemical reactions and element cycling. Moreover, the sediments deposited in contourites and canyons represent valuable high resolution archives to study paleo-oceanographic changes.

The main scientific goals of the cruise were:

- Analyze the sedimentation of contourite systems in a process-oriented approach with respect to the interaction with regional and local factors as ocean currents, sediment supply and bottom topography.
- Determine the sedimentation modes in submarine canyons in relation to the regional oceanography and climatic regime.
- Utilize the deposits in contourites and canyons for paleo-oceanographic and – climatic reconstructions with special respect to the shifting of the BMCZ over longer and shorter time scales.
- Determine the factors other than mass transport deposits (contourites) that can induce transient pore-water profile shapes in the study area – including the role of changes in upward methane flux.
- Determine the changes in origin of the contourite material by investigating the palynomorph composition (pollen/spores, dinoflagellates) of nepheloid layers and slope sediments.
- Investigate how depositional conditions control the preservation and reduction of Fe(III) and Mn(IV)-bearing minerals in sub-seafloor sediments, in particular methanic zones.
- Elucidate the processes and microbial communities that mediate iron and manganese reduction below the sulfate-methane transition.
- Identify the carbon sources of iron and manganese reducing microbial communities below the sulfate-methane transition.
- Investigate how variations in the depositional regime and other environmental factors control the distribution, abundance and composition of benthic archaeal communities in marine sediments.

In order to reach these goals we conducted detailed sediment echosounder and seismic surveys. Based on these mappings we chose suitable sites for sediment and water column sampling. The water column was sampled using a Rosette/CTD system and in situ pumps. The sediment surface and the uppermost meters of the sediments were sampled by means of a multiple corer, giant box corer, sediment grab, and gravity corer. To retrieve older/deeper sediments the MeBo70 drill rig was deployed.

The expedition contributes to and was carried out in the framework of the DFG-funded Cluster of Excellence MARUM “The Ocean in the Earth System” (MARUM – Center for Marine Environmental Sciences).

Cruise narrative

In the morning of January 9, 2018 RV SONNE entered the port in Buenos Aires, Argentina. A few members of the scientific party arrived at noon onboard the vessel to delegate laboratory space among the scientists and to talk to the ship's command and ship agents. All scientists boarded the RV SONNE on January 10, 2018. Container and transport boxes that were loaded onto the vessel in the shipyard in Emden, Germany, were unloaded with highly appreciated help from the deck personnel. Large equipment was assembled on deck and labs and workspaces were prepared.

After an official opening ceremony on January 11, 2018, an Open Ship Event was carried out on board the RV SONNE organized by the German Embassy in Buenos Aires and the Leitstelle Deutsche Forschungsschiffe. Representatives from the Argentine Ministry of Science (MinCyT), the German Embassy in Buenos Aires, the port authority, and numerous universities and research institutes of Argentina participated in the official opening ceremony. Between 11 am and 5 pm the RV SONNE was open to the public, and about 600 visitors toured the ship and were informed on research and life onboard the RV SONNE. The high participation was remarkable, as there were summer holidays in Argentina, and with a temperature around 38°C it was one of the warmest days of the summer. Because of the perfect organization by the ship's command, the German Embassy in Buenos Aires, the Ship agency AMI / Ultramar, as well as the wonderful help of the crew and science party, the event was a great success. We were all impressed by the great interest the visitors showed towards the ship and our research.

In the morning of January 12, 2018 the RV SONNE embarked from Buenos Aires on schedule beginning research expedition SO260. On board was an international team of researchers from the Alfred Wegener Institute Helmholtz-Centre for Polar and Marine Research, the faculties of Geosciences and Biology/Chemistry at the University of Bremen, the MARUM – Center for Marine Environmental Sciences, the Oklahoma State University, the Coastal Carolina University, the Royal Holloway University of London, des Servicio de Hidrografia Naval in Buenos Aires as well as one observer from the Argentine Navy (Dirección de Investigación de la Armada, DIIV). After a 24-hour transit, we arrived at our first work area off Argentina. We were running a survey program with multi-channel seismics to gain information about the sediment structure on the upper continental margin off Argentina near the Mar del Plata Canyon.

After an extended seismic survey along the continental slope off Argentina during the first two days of our expedition, we started to collect water column samples and to core seabed sediments. The main geographic target were contouritic drift bodies, and associated terraces and channels around the Mar del Plata Canyon. Our scientific aim was to understand how the interaction between water masses, bottom current regimes and seabed topography controls the sediment dynamics inside and outside this canyon system.

We focused on a major morphological terrace on Jan 16 which is located inside the canyon's lower reach. Thick packages of accumulated sediment suggest that this location will provide us with a high-resolution sediment archive. The successful sampling program resulted in two 9-m long sediment cores which seem to cover 5 to 6 meters of Holocene within the uppermost part of the core.

On Jan 17 we proceeded to our up to now deepest sampling station located at about 3.600 m water depth in the South of the Argentine working area. The objective was to recover sediment cores at sites where we had indication from previous expedition M78/3 that intense iron reduction occurs in the deeper sediments. As yet it is not known which biogeochemical process is responsible for the observed liberation of reduced iron into the pore water of these deep subsurface sediments and how this process is controlled by the particular sedimentation conditions. There is evidence that iron oxides can be reduced by methane, which is present in these sediment layers in dissolved form. There may thus exist a strong coupling between the biogeochemical cycles of iron and methane. By means of joint sampling of the pore water and the sediments by the Inorganic and Organic Geochemistry groups as well as the Microbiologists we seek to elucidate by which biogeochemical process, based on which organic substrates and by which microbial organisms this process is mediated.

Based on Parasound and Airgun data, which we collected during a previous cruise in 2009, we found hints on assumedly deep water coral mounds in association with a slope-parallel contouritic channel. A combined echosounder-seismic survey illustrates now that these mounds are very common in the region. Coring brought confirmation that these mounds represent an ancient deep-sea coral habitat. On Jan 21 research activity focused on the sampling of various contouritic channels with giant box corer and grab sampler. We received large amounts of gravel and rock fragments which indicates that the channel floors are very much influenced by strong bottom currents. These currents probably transport a lot of finer material but do not allow for a permanent deposition.

On Monday Jan 22 we continued sediment and water sampling with a focus on erosion structures and canyons. Box corer, multi corer (MUC), gravity corer, and grab corer were deployed again. The recovered sediments were sampled by each scientific group, including geochemistry, microbiology, and organic geochemistry. During the night of January 23 to 24, CDT/Rosette and *in situ* pumps were deployed and water column samples were collected. Our colleagues from MARUM and the Faculty of Geosciences of the University of Bremen were interested in sampling nepheloid layers within the water column and near the seafloor to gain information about the origin of particles within these layers.

According to the weather forecast, on January 24, wind intensity increased to 5-7 with gusts reaching 9. Despite the tough weather conditions and waves up to 4 meters high, the RV SONNE stayed steady in the waters and we were able to continue our sediment sampling program using MUC and gravity corer at a designated biogeochemistry-MeBo station. Unfortunately, during the day the weather conditions worsened, with increasing waves, and coring activity had to be stopped. We decided to move to the most northern station in our planned research area for further water column sampling. This location was intended to sample the transition to the warm Brazil current from the cold Malvinas current in the uppermost water column. Preliminary shipboard results indicated that the plankton-community in the warm surface water differs distinctively from the community found in the cold Malvinas current sampled in the southernmost research area, which is characterized by Antarctic species.

In the night of Thursday Jan 25 to Friday Jan 26, strong winds were chased away by sunny weather and blue sky and a calm sea. The remaining part of the week was used

for seismic survey to find a suitable location for MeBo70 deployment during the second leg of SO260.

During the cruise, the richness of seismoacoustic data from multibeam, sediment echosounder and multichannel seismic has revealed a particularly detailed image of the seafloor, which is a clear step forward in understanding the seafloor processes shaping the Northern Argentine Margin. Based on the combined survey and sampling program to visit the most relevant structures as channels, scours and canyons and associated contouritic deposits, we could develop a possible sampling strategy for the upcoming second leg of our cruise.

Most of the work had so far been concentrated on the Ewing Terrace north and south of the Mar del Plata Canyon, with the hope that sampling may allow the evaluation of the influence of the canyon on along-slope currents and deposition. Several potential areas had been picked for more detailed surveying. A particularly suitable site was found in ~1100 m water depth, representing a very fine-grained succession of drift sediments – Parasound penetrates over 80 meters - resembling the rapid fill of a previous depression. This site was assumed to likely provide a good stratigraphic and contouritic record and to document biogeochemical processes and zonation on the terrace. South of the Mar del Plata Canyon, several sites had been surveyed, including scours, the most recent drift body on the terrace and an area of mixed erosion and accumulation next to a contourite channel. Further data processing and site selection kept us busy until the following week, when the first MeBo deployment was planned.

On Monday January 29, 2018 we continued our surface-sediment sampling program with the grab corer and giant box corer on the upper continental margin off Argentina in water depths of 600 to 800 m. Most of the sampled sites are characterized by strong erosive conditions. Samples with rock fragments with sessile organisms, cold-water coral pieces, and other macro faunal organisms such as solitary corals, mollusca, bryozoans, and sponges were retrieved. Coring activities of RV SONNE cruise Leg SO260-1 were completed January 29 at noon and we left the working area towards Montevideo, Uruguay. After reaching the pilot station at 6 am, we entered port in Montevideo at 8 am on January 30. Briefly after the arrival in Montevideo, the MARUM-MeBo Team came on board to set up the seafloor drill rig MeBo70. The work on the MeBo continued through January 31, and was successfully completed February 1 with a practice run in the harbor.

While the first leg of our research cruise was dominated by seismic surveys; the second leg focussed on the retrieval of long sediment cores using the seafloor drill rig MeBo70. We therefore had to say goodbye to 15 of our first leg colleagues, including most of the seismic group from the Faculty of Geosciences, University of Bremen. In return, 15 new scientists came onboard the ship, including 9 members of the MeBo Team and two Uruguayan observers from the Servicio de Oceanografía, Hidrografía y Meteorología de la Armada (SOHMA).

Besides preparation and device assembly work for the second leg of RV SONNE expedition SO260, a ship tour was carried out on February 1, for invited guests and the press initiated by the German ambassador in Montevideo, Ingo von Voss. In the evening of February 1, a reception was hosted by Ambassador von Voss in a nearby Hotel for members of SONNE crew and of the scientific party. It was a very nice

evening with stimulating conversations with, among others, Uruguayan scientists and Naval officers, and other ambassadors in Montevideo.

In the morning of February 2, we disembarked for our second leg of the research expedition and arrived after a 12-hour transit at our working area on the continental margin off Uruguay. After sampling two sites with the gravity corer and multi corer, we headed towards our first MeBo station off Argentina, where we arrived Sunday, February 3. This first MeBo target was a deep-depression structure near the Mar del Plata Canyon filled with 80-meter thick, undisturbed sediments. The site was picked based on detailed seismic surveys taken during our first expedition leg. After the first MeBo70 deployment had to be cancelled due to technical difficulties, drilling was continued at this location on Monday February 5, 2018. Sediments down to 32.80 m depth were retrieved and revealed, in contrast to the expected fine-grained material, mostly sandy deposits with some intercalated cohesive sediment intervals.

Prior to the next deployment of MeBo70, surface sediments were sampled using the grab corer in areas where, based on Parasound surveys, coral mounds were expected. In contrast to our expectations, the hard substance turned out to be sandstone and not a coral mound and thus no gravity cores were taken at this location.

The goal of the second MeBo70 deployment was the recovery of sediments for biogeochemical and microbial studies with a focus on the impact depositional conditions, as well as the quality and quantity of organic material, have on biogeochemical processes and the microbial communities – especially regarding deep-subsurface iron reduction processes. The selected site for these studies was located off Uruguay, at 1400 m water depth. Pore water data of a 10-meter long gravity core retrieved during a previous expedition (M78/3) indicated iron reduction processes below the sulfate-methane transition as well as the occurrence of deep sub-seafloor gas hydrates at this location. The MeBo70 drilling was very successful, and after 36 hours of drilling the maximum drill depth of 70.2 meters was accomplished on February 8, 2018. Sediments were recovered on the morning of February 9, after the retrieval of MeBo70. As expected, the sediments showed gas expansion below approximately 20-meter sediment depth related to high methane concentrations. Preliminary data from samples taken for geochemistry revealed the occurrence of dissolved iron for the entire sediment column below approximately 7 m sediment depth, indicating the iron reduction process. Core recovery less gas-expansion gaps was almost 80 %.

After our way back to the Argentine work area we reached again the southern part of the Ewing Terrace and dedicated the entire weekend to the third MeBo70 drilling. Seismic surveys in this area suggested the occurrence of buried coral mound structures. On Monday February 12, 2018, we completed the third and last MeBo drill site in the area of the Southern Ewing Terrace at a sediment depth of 20 meters and the MeBo70 drill rig was brought back on deck of the RV SONNE around lunch time. The retrieved sediments were mostly sand with a layer of coarse sand and shell fragments at the base. The remaining station time was used to deploy the gravity corer and the giant box corer in an area where – based on Parasound surveys – we expected a coral mound structure. The 5 m long sediment core and the sediments retrieved by means of the box corer contained numerous fragments of cold-water corals and sessile fauna at the sediment surface and thus confirmed our assumption. Coring activities of RV SONNE cruise SO260 were completed February 12 in the late afternoon and we

left the working area towards Buenos Aires. After reaching the pilot station located within the inner Rio de la Plata mouth at around 10:00 pm of February 13 we entered port in Buenos Aires at 8 am the next day. Loading of containers took place on February 15.

In the evening of February 16, 2018, a reception took place on board of the RV SONNE on invitation of the German ambassador in Buenos Aires, Jürgen Christian Mertens. Among others the reception was joined by the Argentine parliamentarian Cornelia Schmidt-Liermann (Cambiemos), representatives of MinCyT, of the port authorities and numerous universities and research institutes, the Master of RV AUSTRAL (the former/old SONNE) and ambassadors of several G20 countries (AUS, EU, FRA, GBR, ITA, MEX). After the welcoming speeches of Master Oliver Meyer and Ambassador Mertens as well as a short scientific presentation of RV SONNE expedition SO260 by chief scientist Sabine Kasten, the guests of the reception had the opportunity to tour the ship and talk to members of the crew and the scientific party to find out about research and life onboard the RV SONNE. After the Open Ship Event in January 2018 also this reception was again a great success due to the perfect organization by the ship's command, the German Embassy in Buenos Aires – in particular by Mrs Kathrin Megerle – the Ship Agency AMI / Ultramar, as well as the wonderful help of the crew and science party.

Acknowledgements

We thank Master Oliver Meyer and the crew of the RV SONNE for their excellent support and helpfulness during cruise SO260. Only with their great help we were able to carry out our research and sampling activities as planned and to collect data and samples of great scientific value. All cruise participants have enjoyed the friendly and supportive atmosphere on board of the ship and for some of them – in particular some of the younger colleagues of whom some were on board of a ship for the very first time – the cruise will be a memorable, lifetime experience.

We gratefully acknowledge the German Research Foundation (DFG) for funding this expedition in the framework of the Excellence Cluster „The Ocean in the Earth System“ MARUM (MARUM - Center for Marine Environmental Sciences at the University of Bremen) and the Helmholtz Association (Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Bremerhaven) for additional financial support. We also thank the Leitstelle Deutsche Forschungsschiffe, Institute of Geology, University of Hamburg and BRIESE Research for their comprehensive support in logistic preparation of the cruise.

Cruise Participants

List of Participants

Leg SO260-1

Name	Task	Institute
1. Kasten, Sabine	Chief Scientist	AWI / MARUM
2. Spieß, Volkhard	Geophysics	UBremen-FB5
3. Wenau, Stefan	Geophysics	UBremen-FB5
4. Steinmann, Lena	Geophysics	UBremen-FB5
5. Brune, Rouven	Geophysics	UBremen-FB5
6. Thieblemont, Antoine	Geophysics	RHU-London
7. Warnke, Fynn	Geophysics	UBremen-FB5
8. Ogunleye, Opeyemi Jesse	Geophysics	UBremen-FB5
9. Riedinger, Natascha	Geochemistry	OSU
10. Köster, Male	Geochemistry	AWI
11. Volz, Jessica	Geochemistry	AWI
12. Dohrmann, Ingrid	Geochemistry	AWI
13. Dröllner, Maximillian	Geochemistry	AWI
14. Melcher, Anne-Christin	Geochemistry	AWI
15. Jones, Chris	Geochemistry	OSU
16. Bösche, Janina	Sedimentology	UBremen-FB5
17. Warratz, Grit	Sedimentology	UBremen-FB5
18. Kockisch, Brit	Sedimentology	UBremen-FB5
19. Hanebuth, Till	Sedimentology	CCU
20. Long, Joshua Handfield	Sedimentology	CCU
21. Durica, John Taylor	Sedimentology	CCU
22. Bozzano, Graziella	Sedimentology	SHN
23. Crivellari, Stefano	Sedimentology	UniSP
24. Frederichs, Thomas	Sediment physics, MSCL	UBremen-FB5
25. Hilgenfeldt, Christian	MSCL	UBremen-FB5
26. Coffinet, Sarah	Organic geochemistry	MARUM
27. Schnakenberg, Annika	Microbiology	UBremen-FB2, MARUM
28. Aromokeye, David	Microbiology	UBremen-FB2, MARUM
29. Dehning, Klaus	Core technician	MARUM
30. Klann, Marco	Geo Lab, sample labelling	MARUM
31. Zonneveld, Karin	Palynology, Water column	UBremen-FB5, MARUM
32. Baumann, Karl-Heinz	Palynology, Water column	UBremen-FB5
33. Baqués, Michèle	Observer, Argentina	DIIV

List of Participants**Leg SO260-2**

Name	Task	Institute
1. Kasten, Sabine	Chief scientist	AWI / MARUM
2. Schwenk, Tilmann	Geophysics	UBremen-FB5
3. Spieß, Volkhard	Geophysics	UBremen-FB5
4. Riedinger, Natascha	Geochemistry	OSU
5. Köster, Male	Geochemistry	AWI
6. Volz, Jessica	Geochemistry	AWI
7. Dohrmann, Ingrid	Geochemistry	AWI
8. Dröllner, Maximilian	Geochemistry	AWI
9. Melcher, Anne-Christin	Geochemistry	AWI
10. Jones, Chris	Geochemistry	OSU
11. Lantzsch, Hendrik	Sedimentology	UBremen-FB5
12. Kockisch, Brit	Sedimentology	UBremen-FB5
13. Bösche, Janina	Sedimentology	UBremen-FB5
14. Long, Joshua Handfield	Sedimentology	CCU
15. Chapori, Natalia Garcia	Sedimentology	SHN
16. Chiessi, Christiano	Sedimentology	UniSP
17. Frederichs, Thomas	Sediment physics, MSCL	UBremen-FB5
18. Coffinet, Sarah	Organic geochemistry	MARUM
19. Schnakenberg, Annika	Microbiology	UBremen-FB2, MARUM
20. Aromokeye, David	Microbiology	UBremen-FB2, MARUM
21. Hüttich, Daniel	Core technician	MARUM
22. Klann, Marco	Geo Lab, MeBo sample labelling	MARUM
23. Bergenthal, Markus	MeBo	MARUM
24. Klein, Thorsten	MeBo	MARUM
25. Düßmann, Ralf	MeBo	MARUM
26. Bülden, Jutta	MeBo	MARUM
27. Linowski, Erik	MeBo	MARUM
28. Schmidt, Werner	MeBo	MARUM
29. Klar, Steffen	MeBo	MARUM
30. Rosiak, Uwe	MeBo	MARUM
31. Rehage, Ralf	MeBo	MARUM
32. Baqués, Michèle	Observer, Argentina	DIIV
33. Pereyra, Noelia	Observer, Uruguay	SOHMA
34. González, Lorena	Observer, Uruguay	SOHMA

Participating Institutions / List of Abbreviations

AWI

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CCU

Coastal Carolina University
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DIIV

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MARUM

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OSU

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RHU-London

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SHN

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SOHMA

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UBremen-FB2

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UniSP

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Station List

Station GeoB_No.	Gear	Date	Time	Latitude	Longitude	Water depth (m)
GeoB22701-1	CTD+RO	15.01.18	09:54:00	37°48.924'S	54°10.703'W	1391
GeoB22701-2	GBC	15.01.18	11:13:00	37°48.900'S	54°10.700'W	1390
GeoB22702-1	GBC	15.01.18	13:11:00	37°48.557'S	54°10.218'W	1780
GeoB22702-2	MUC	15.01.18	14:33:00	37°48.558'S	54°10.217'W	1354
GeoB22702-3	GC	15.01.18	16:02:00	37°48.567'S	54°10.220'W	1355
GeoB22703-1	GBC	15.01.18	18:07:00	37°48.251'S	54° 9.806'W	1317
GeoB22704-1	GBC	15.01.18	21:04:00	37°38.637'S	54° 8.525'W	1041
GeoB22704-2	GC	22.01.18	12:56:00	37°38.639'S	54° 8.495'W	1038
GeoB22704-3	GC	22.01.18	14:09:00	37°38.633'S	54° 8.479'W	1038
GeoB22705-1	CTD+RO	16.01.18	09:39:00	37°59.997'S	53°46.771'W	3565
GeoB22706-1	MUC	16.01.18	13:16:00	37°57.966'S	53°45.780'W	2997
GeoB22706-2	GC	16.01.18	16:00:00	37°57.608'S	53°45.691'W	2967
GeoB22707-1	GC	16.01.18	19:34:00	37°54.829'S	53°47.722'W	2762
GeoB22707-2	MUC	16.01.18	20:40:00	37°54.638'S	53°47.613'W	2778
GeoB22708-1	GC	17.01.18	09:18:00	39°18.699'S	53°57.186'W	3686
GeoB22708-2	GC	17.01.18	12:36:00	39°18.704'S	53°57.162'W	3681
GeoB22708-3	MUC	17.01.18	15:01:00	39°18.698'S	53°57.160'W	3675
GeoB22709-1	GC	17.01.18	18:22:00	39°18.060'S	53°58.026'W	3608
GeoB22709-2	GC	17.01.18	21:18:00	39°18.056'S	53°58.039'W	3609
GeoB22710-1	CTD+RO	18.01.18	05:06:00	38°34.602'S	54°21.616'W	1128
GeoB22710-2	ISP	18.01.18	09:45:00	38°34.563'S	54°21.711'W	1128
GeoB22711-1	MUC	19.01.18	23:49:00	38°20.034'S	54°28.961'W	1130
GeoB22711-2	GC	20.01.18	00:55:00	38°20.030'S	54°28.969'W	1130
GeoB22711-3	GC	20.01.18	15:45:00	38°20.032'S	54°28.956'W	1129
GeoB22712-1	CTD+RO	20.01.18	02:09:00	38°19.887'S	54°29.577'W	1217
GeoB22712-2	ISP	20.01.18	03:31:00	38°19.884'S	54°29.581'W	1217
GeoB22712-3	GBC	20.01.18	17:11:00	38°19.917'S	54°29.544'W	1218
GeoB22713-1	MUC	20.01.18	10:07:00	38°35.301'S	54°21.083'W	1115
GeoB22713-2	GC	20.01.18	11:14:00	38°35.326'S	54°21.076'W	1115
GeoB22714-1	GC	20.01.18	13:04:00	38°37.775'S	54°22.717'W	1111
GeoB22715-1	GBC	20.01.18	19:12:00	38°19.615'S	54°31.647'W	1121
GeoB22715-2	GC	20.01.18	21:00:00	38°19.477'S	54°31.645'W	1105
GeoB22716-1	GBC	21.01.18	11:46:00	38° 6.332'S	54°22.782'W	1292
GeoB22717-1	GS	21.01.18	15:23:00	37°58.059'S	54°30.996'W	1167
GeoB22718-1	GS	21.01.18	19:46:00	37°52.850'S	54°18.213'W	1412
GeoB22718-2	CTD+RO	21.01.18	22:10:00	37°52.880'S	54°18.267'W	1415
GeoB22718-3	ISP	21.01.18	23:25:00	37°52.885'S	54°18.250'W	1415
GeoB22719-1	CTD+RO	22.01.18	05:33:00	37°53.781'S	54° 0.483'W	2785
GeoB22720-1	GS	22.01.18	09:34:00	37°43.259'S	54° 3.111'W	1282
GeoB22721-1	MUC	22.01.18	16:19:00	37°33.287'S	53°58.746'W	1060
GeoB22721-2	GC	22.01.18	17:54:00	37°33.315'S	53°58.714'W	1060
GeoB22722-1	CTD+RO	24.01.18	02:40:00	37°32.404'S	54° 1.349'W	1076
GeoB22722-2	ISP	24.01.18	03:41:00	37°32.391'S	54° 1.329'W	1075
GeoB22722-3	MUC	24.01.18	09:21:00	37°32.395'S	54° 1.338'W	1077
GeoB22722-4	GC	24.01.18	11:28:00	37°32.358'S	54° 1.390'W	1077

GeoB22722-5	GC	24.01.18	13:05:00	37°32.362'S	54° 1.371'W	1078
GeoB22722-6	MeBo	04.02.18	17:20:00	37°32.375'S	54° 1.342'W	1077
GeoB22722-7	MeBo	05.02.18	18:00:00	37°32.373'S	54° 1.308'W	1076
GeoB22723-1	GC	24.01.18	16:43:00	37°42.225'S	53°57.508'W	1167
GeoB22723-2	MUC	25.01.18	23:01:00	37°42.218'S	53°57.547'W	1170
GeoB22723-3	GC	26.01.18	00:08:00	37°42.231'S	53°57.503'W	1167
GeoB22724-1	CTD+RO	25.01.18	09:00:00	36°49.998'S	53°22.001'W	1820
GeoB22724-2	ISP	25.01.18	10:45:00	36°49.889'S	53°21.936'W	1822
GeoB22725-1	MUC	27.01.18	10:24:00	38°20.534'S	54° 3.871'W	1347
GeoB22725-2	GC	27.01.18	12:10:00	38°20.539'S	54° 3.859'W	1344
GeoB22726-1	GBC	27.01.18	16:18:00	38°43.139'S	54°22.313'W	1019
GeoB22726-2	GS	27.01.18	17:21:00	38°43.131'S	54°22.318'W	1019
GeoB22726-3	GC	27.01.18	19:01:00	38°43.128'S	54°22.332'W	1019
GeoB22727-1	GS	27.01.18	20:41:00	38°41.447'S	54°23.477'W	1044
GeoB22728-1	CTD+RO	28.01.18	09:30:00	37°46.581'S	54°21.025'W	1253
GeoB22728-2	ISP	28.01.18	10:59:00	37°46.589'S	54°21.024'W	1255
GeoB22728-3	GS	28.01.18	15:35:00	37°47.589'S	54°22.307'W	1055
GeoB22729-1	GC	28.01.18	18:05:00	37°48.572'S	54°20.440'W	1113
GeoB22730-1	GS	29.01.18	06:15:00	37°41.676'S	54°51.953'W	647
GeoB22731-1	GS	29.01.18	08:20:00	37°38.394'S	54°45.995'W	706
GeoB22732-1	GS	29.01.18	10:15:00	37°32.567'S	54°37.236'W	798
GeoB22733-1	GS	29.01.18	12:08:00	37°30.071'S	54°35.786'W	638
GeoB22733-2	GC	29.01.18	13:26:00	37°30.122'S	54°35.792'W	634
GeoB22733-3	GC	29.01.18	14:21:00	37°30.119'S	54°35.800'W	636
GeoB22734-1	MUC	03.02.18	09:00:00	36° 8.489'S	53°17.159'W	242
GeoB22734-2	GC	03.02.18	09:28:00	36° 8.486'S	53°17.159'W	240
GeoB22734-3	GC	03.02.18	10:43:00	36° 8.485'S	53°17.155'W	241
GeoB22735-1	GC	03.02.18	14:48:00	36° 7.685'S	52°49.960'W	1381
GeoB22735-2	MUC	03.02.18	16:10:00	36° 7.671'S	52°49.898'W	1382
GeoB22735-3	MeBo	07.02.18	14:32:00	36° 7.369'S	52°49.670'W	1392
GeoB22735-4	GBC	07.02.18	16:09:00	36° 7.633'S	52°49.882'W	1391
GeoB22735-5	MeBo	07.02.18	17:01:00	36° 7.630'S	52°49.892'W	1392
GeoB22736-1	GS	06.02.18	18:28:00	37°19.928'S	53°59.319'W	1112
GeoB22737-1	GS	06.02.18	20:12:00	37°20.049'S	53°59.393'W	1114
GeoB22738-1	GS	06.02.18	21:48:00	37°19.973'S	53°58.394'W	1117
GeoB22739-1	MeBo	11.02.18	10:25:00	38°35.507'S	54°22.777'W	1113
GeoB22739-2	MeBo	11.02.18	10:36:00	38°35.530'S	54°22.806'W	1112
GeoB22740-1	GC	10.02.18	14:41:00	38°36.518'S	54°20.051'W	1103
GeoB22740-2	GC	10.02.18	21:12:00	38°36.506'S	54°20.075'W	1104
GeoB22741-1	GC	10.02.18	16:41:00	38°38.202'S	54°18.649'W	1072
GeoB22742-1	GC	10.02.18	18:23:00	38°39.357'S	54°17.678'W	1056
GeoB22743-1	GC	10.02.18	23:02:00	38°35.277'S	54°24.014'W	1108
GeoB22744-1	GC	12.02.18	18:32:00	38°18.223'S	54°32.348'W	975
GeoB22744-2	GBC	12.02.18	20:03:00	38°18.248'S	54°32.371'W	992

CTD+RO : CTD and Rosette water sampler
ISP : in situ pumps
MUC : multi corer
GBC : giant box corer

GS : grab sampler
GC : gravity corer
MeBo : MeBo70 drill rig