NameAndré BahrInstitutHeidelberg University, Institute of Earth SciencesAdresseIm Neuenheimer Feld 234Adresse69120 HeidelbergAdresseGermany

 Tel.:
 06221-54 6062

 Fax:
 06221-54 5503

 email:
 andre.bahr@geow.uni-heidelberg.de

Short Cruise Report M125

Rio de Janeiro (Brazil) – Fortaleza (Brazil) March 21 – April 15, 2016 Chief Scientist: André Bahr Captain: Rainer Hammacher



Objectives

The main scientific objective of R/V METEOR cruise M125 was to investigate the influence of changes in ocean circulation and insolation on the continental climate in eastern Brazil. The hydrological cycle in this region strongly depends on the intensity of the South American Summer Monsoon and the latitudinal migration of the Intertropical Convergence Zone. Especially in NE Brazil, precipitation is extremely seasonal with a long (8 months) draught season and a short rainy season. The long dry season make this region highly sensitive to changes in the rainfall amount with potentially severe effects on the terrestrial ecosystems, agriculture and energy supply (90% of Brazil's energy derives from water power). Considering that NE Brazil currently experiences historic droughts, there is an urgent need to better understand the natural climate variability in this region. With the material gathered during METEOR expedition M125 cruise we aim to get insights into the climate dynamics of the past to shed light on the forcings and feedbacks within the South American climate system.

Existing paleo-records demonstrate that orbitally forced modulation of solar irradiation and changes in the mode of the oceanic circulation lead to abrupt shifts in the regional distribution of precipitation. This is evident for the Holocene, and is expressed by large-scale fluctuations during the late Pleistocene. While there is ample evidence for the North Atlantic ocean mitigating climate change in South America, the degree of this northern-hemisphere impact varies strongly between different records. Hence, the spatial expression of the past climate changes as well as the response time of the terrestrial and marine ecosystems to the external forcing are far from being understood.

In the light of the above, we specifically focus on three major aspects within the framework of the M125 cruise:

Topic 1: The sensitivity of the hydrological cycle and environment in Eastern Brazil to external forcing.

Topic 2: What drives surface and deep water mass variability off eastern Brazil, and what is the influence of low- and high-latitudes forcing?

Topic 3: How do strong bottom currents on the Eastern Brazilian margin influence sediment transport, and what drives bottom current variability?

We aim on integrating climatic proxies of terrestrial and marine origin on the same material to develop a comprehensive picture of the climate dynamics in E Brazil. For this purpose, sediment cores from the shelf and continental slope off eastern Brazil ($10^{\circ}S - 23^{\circ}S$) have been obtained. We focused on seven research areas adjacent to the debouchments of the Paraiba do Sul, Rio Doce, Rio Jequitinhonha, Rio de Contas and Rio Sao Francisco. The particular location close to river moths allows for obtaining terrestrial signals in marine sediment cores, while the N-S extension covered by all sites will provide insights into the spatial variability of past climate change. Additionally, a comprehensive surface sediment, water and plankton sampling program was conducted for a precise local proxy calibration.

Narrative

In the morning of the 21st of March 2016 the R/V METEOR left the port of Rio de Janeiro. As during the entire cruise, the weather conditions were excellent with only sporadic showers but generally calm seas. The first station off Cabo Frio was reached after 9 hours of transit. As in all following research areas we conducted multibeam/Parasound (MBPS) pre-site surveys during the night in the search for accumulations of muddy sediments as coring targets. Subbottom profiling indicates that the shelf off Cabo Frio is dominated by coastal dune-like and channel-fill deposits likely of Pleistocene age with a thin (approx. 2-4 m) Holocene veneer of muddy-sandy sediments. We successfully deployed the multicorer (MUC), however, during 9 attempts of gravity coring, recovery never exceeded 1.40 m, and cores were severely disturbed. Apparently, the low recovery is likely due to the indurated and coarse grained-sediment texture. In addition to sediment sampling, we routinely deployed the CTD to get insights into the water column structure and to sample water. As during the following days until the end of the voyage, we took samples from the ship's pump for plankton filtering twice a day, between 8–10 am and 5–7 pm, respectively.

On the 24th March, we started a downslope echosounder transect at the slope off the Paraiba do Sul. Aside of channel/levee systems and drapes of hemipelagic sediments we found mound-like structures concentrated in a patch in about 850 to 870 m water depth, with occasional strong acoustic backscatter on the top. Box coring confirmed the presence of dead cold water corals on the top of these structures. Further, we took 3 gravity cores on the slope, accompanied by MUC, CTD, and multinet deployments.

On the 28th March we entered the area on the shelf south of the Doce River mouth. MBPS surveys on the shelf indicated a blanket of up to 8 m of Holocene sediments. We deployed in total three gravity cores, complemented by MUC and CTD casts in varying distances to the river mouth. Surface samples close to the river mouth clearly showed the presence of reddish clay on top (max thickness: 4 cm) that relates to the collapse of a dam of an ore mine in the upper reaches of the Rio Doce in November 2015, which lead to the discharge of enormous amounts of heavy metal-enriched sediment and water into the sea. Strict measures have been taken to avoid contamination of man and material by this potentially hazardous mud.

On the 29th March we steamed to the fourth working area, the southern slope of the Abrolhos Bank east off the Rio Doce. Here, we successfully deployed 6 gravity and piston cores on the slope, that based on the preliminary shipboard stratigraphy comprise sediments with a maximum age of approx. 250 kyrs. As in the previous sections, coring was complemented by CTD and MUC casts, as well as multinet hauls in station deeper than 700 m.

On the 2nd of April we steamed to the shelf off the Rio Jequitinhonha (Section 5) where we concentrated on finding a suitable coring position on the shelf. On April 3rd, after the successful retrieval of 5 m of Holocene mud, we steamed further northward to the shelf and slope off the Rio de Contas. The very narrow shelf and steep slope made the identification of undisturbed sediment packages challenging, however, after long MBPS pre-site surveys we obtained 5 cores on the slope and one on the shelf. As the de Contas delivers only limited suspension load, both shelf and slope are characterized by low sedimentation rates. While this prohibits high resolution studies (at least on the slope), the cores from the deeper slope (ca. 2000 m water depth) appear to comprise continuous sediment records of the last almost 900 kyrs.

After steaming for 22 h, we arrived our final research area off the Rio Sao Francisco on April 7th. It turned out the shelf in this area had the thickest Holocene sediment cover of all

research areas (almost 20 m). This is in accordance with the Sao Francisco being the biggest river in terms of sediment and water load we investigated during the M125 cruise. Hence, we had no problems to sample surface sediment and obtained an almost 8 m long gravity core on the shelf. Contrary, the slope exhibited a very active topography, with abundant channel-levee systems and only limited places of undisturbed, continuous hemipelagic sedimentation. Finally, we obtained a total of 5 cores on the slope retrieving sediment of the last glacial period. On a NW-SE trending ridge between deeply incised channels, we further identified a position with potential cold water mounds on top of a pinnacle (927 m) with high acoustic backscatter. This site (M125-107) was probed via box corer, however, without retrieving coral specimens. One reason for not retrieving corals might be that the required exact positioning of the cox corer was impeded by strong bottom currents and a non-functioning POSIDONIA transponder. After completing our last station, we started with steaming to Fortaleza at 12:30 am on the 11th. We arrived at Fortaleza in the morning of the 14th April, and after one day on anchorage, entered the harbor at 8:30 am on the 15th, where we could start with unloading our samples and equipment.

Acknowledgements

We would like to express our gratitude to Captain Rainer Hammacher and his team of the RV METEOR. Their great support and expertise made this cruise a successful voyage. We thank Joachim Schönfeld, Martin Frank, Dirk Nürnberg, and Jutta Heinze (GEOMAR) for their immense help during the preparation of the cruise. Leitstelle Deutsche Forschungsschiffe, Reederei Briese, and LPL/Klaus Bohn, and Ira Weigert (Contiways) have provided great logistic and organizational support. We finally would like to thank the Brazilian authorities for their permissions to work in their national waters and the German Federal Foreign Office for pathing the diplomatic ways for obtaining the research permissions and visa.

M125 Participants

Name		Discipline	Institution
1. André Bahr		Fahrtleiter / Chiefscientist	UH
2. Silke Voigt		Sedimentology	GUF
3. Ana Luiza Spad	ano Albuquerque	Paleoceanography	UFF
4. Stefan Reissig		Paleoceanography	GEOMAR
5. Sietske Batenbe	urg	Paleoceanography	OXF
6. Philipp Munz		Paleoceanography	ΤÜ
7. Nancy Taniguch	ni	Paleoceanography	USP
8. Igor Martins Ver	nancio	Paleoceanography	UFF
9. Ulrich Sebastia	n	Mapping, GIS	FST
10. Lisa Egger		Geology	UH
11. Tobias Fischer		Geology	UH
12. Alexander Wa	chholz	Geology	GUF
13. Julia Hoffmanr	า	Paleoceanography	GUF
14. Jacek Raddatz	Ζ	Paleoceanography	GUF
15. Stephanie Kus	sch	Water geochemistry	UC
16. Rut Diaz Ram	os	Pore water chemistry	UFF
17. Maria Carolina	a Catunda	Geochemistry	USP
18. Eva Niederme	yer	Organic geochemistry	BIK-F
19. Margret Beyer		Technician, multinet	ΤÜ
20. Alessandro Co	onforti	Geophysics	IAMC
21. Anne Osborne	Grüne	Water geochemistry	GEOMAR
22. Barbara Henn	rich	Micropaleontology	UH
23. Nicolò Ardeng	hi	Organic geochemistry	BIK-F
24. Bruna Borba D	Dias	Micropaleontology	UFF
25. Sandra Jivcov		Organic geochemistry	UC
26. Kenji Hatsuka	no	Sedimentology	UH
27. Florian Evers		Technician	GEOMAR
28. Tenente Jose	Celso	Observer	
29. Andreas Wolfg	jang Raeke	Bordwetterwarte	DWD
BIK-F Senck Gesel	enberg Biodiversity Ischaft für Naturfor	y and Climate Research Cer schung, Senckenberganlage	ntre (BiK-F), Senckenberg ∋ 25, D-60325 Frankfurt

 Gesellschaft für Naturforschung, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany
 DWD Deutscher Wetterdienst, Seeschifffahrtsberatung, Bernhard-Nocht-Straße 76, 20359 Hamburg, Germany

FST Fachschule für Technik, Schachtweg 2, 09599 Freiberg, Germany

- GEOMAR GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel, Wischhofstrasse 1-3, 24148 Kiel, Germany
- GUF Institut für Geowissenschaften, Goethe-Universität Frankfurt, 60438 Frankfurt am Main, Germany
- IAMC Istituto per l'Ambiente Marino Costiero del CNR, Località Sa Mardini, 09170, Torregrande, Oristano, Italy
- OXF Shell Geosciences Research Administrator, Department of Earth Sciences, University of Oxford, South Parks Road Oxford, OX1 3AN, United Kingdom
- TÜ Universität Tübingen, Mikropaläontologie, Hölderlinstraße 12, 72076 Tübingen UC Institute of Geology and Mineralogy, University of Cologne, Zülpicher Str. 49a,
 - 50674 Cologne, Germany

UFF Departamento de Geoquímica, Universidade Federal Fluminense, Outeiro São João Baptista s./n., CEP24020-015 Niterói, RJ, Brazil

- UH Institut für Geowissenschaften, Universität Heidelberg, Im Neuenheimer Feld 234-236, 69120 Heidelberg, Germany
- USP School of Arts, Sciences and Humanities, University of Sao Paulo, Av. ArlindoBettio, 1000, CEP03828-000 Sao Paulo, SP, Brazil

Stations

Station	No.	Date	Gear	Time	Latitude	Longitude	Water Depth	Remarks/Recovery
METEOR	M125-			[UTC]	[°N]	[°W]	[m]	
Off Cabo F	rio	•						
403-1	1-1	21/03/16	CTD	21:49	23°06.704'	041°28.719'	80.1	9 bottles
		21/03/16-						first file: SLF1603212202, last
404-1	2-1	22/03/16	MBPS	10:05	22°51.084'	041°15.002'	70.0	file: SLF1603220933
	3-1	22/03/16	Pump	14:49	22°51.546'	041°05.583'	79.0	
406-1	4-1	22/03/16	CTD	11:28	22°51.345'	041°05.585'	78.4	7 bottles
								samples: forams, trace ele-
		/ /						ments, biomarker; fauna on
406-2	4-2	22/03/16	VVG	11:53	22°51.546'	041°05.584'	79.2	sediment surface
406-3	4-3	22/03/16	MUC	12.54	22°51.545'	041°05.585'	79.6	number of filled tubes:11
406-4	4-4	22/03/16	GC	14:50	22°51.546	041°05.583	79.5	liner length: 5m; recovery: 1m
407-1	5-1	22/03/16		n/a	n/a	n/a	n/a	14 bottles
407-2	5-2	22/03/16	VVG	17:30	23°04.774	041°21.378	80.9	EMPTY
407-3	5-3	22/03/16	WG	17 45	23°04 774'	041°21 377'	80.6	stopped at 61 m rope length; samples: trace elements, forams, biomarker, forams (Munz, test sample)
407-4	5-4	22/03/16	MUC	18.18	23°04 773'	041°21.379'	81.0	number of filled tubes:12
408-1	6-1	22/03/16	VVG	19:27	23°06 204'	041°26 780'	80.7	samples: biomarker, forams, trace elements, forams (Munz)
408-2	6-2	22/03/16	MUC	19:49	23°06 204'	041°26 781'	80.5	number of filled tubes: 12
408-3	6-3	22/03/16	GC	21:48	23°06.204'	041°26.782'	79.8	no recovery
408-4	6-4	22/03/16	GC	20:57	23°06.204'	041°26.780'	79.8	no recovery
	7-1	22/03/16	Pump	20:08	23°06.204'	041°26.780'	81.5	
409-1	8-1	22/03/16	CTD	23:42	22°55.972'	041°38.287'	62.7	4 bottles
	-	22/03/16-	-	-				first file SLF163222353; last
410-1	9-1	23/03/16	MBPS	11:45	22°54.116'	041°16.500'	85.0	file SLF163221145
	10-1	23/03/16	Pump	13:17	22°37.315'	041°27.945'	47.6	
411-1	11-1	23/03/16	CTD	12:56	22°37.317'	041°27.944'	46.2	4 bottles
411-2	11-2	23/03/16	MUC	13:11	22°37.314'	041°27.945'	46.6	number of filled tubes: 11
411-3	11-3	23/03/16	GC	13:50	22°37.314	041°27.945'	46.9	no reovery
411-4	11-4	23/03/16	GC	14:18	22°37.315'	041°27.944'	48.2	no reovery
412-1	12-1	23/03/16	CTD	15:25	22°42.399'	041°29.642'	52.8	
412-2	12-2	23/03/16	MUC	15:42	22°42.395'	041°29.651'	52.4	number of filled tubes: 12
	13-1	23/03/16	Pump	20:14	22°44.730'	041°31.077'	54.7	
413-1	14-1	23/03/16	CTD	16:20	22°44.731'	041°31.077'	54.7	no samples
413-2	14-2	23/03/16	MUC	16:46	22°44.728	041°31.078'	55.7	number of filled tubes: 12
413-3	14-3	23/03/16	GC	17:28	22°44.729'	041°31.078'	55.9	no recovery
414-1	15-1	23/03/16- 24/03/16	MBPS	07:52	22°57.713'	041°08.533'	90.0	first Parasound file: SLF1603232147; last Para- sound file: SLF1603240733
416-1	16-1	24/03/16	CTD	09:06	22°54.932'	041°17.234'	69.6	6 bottles
416-2	16-2	24/03/16	MUC	09:22	22°54.932'	041°17.233'	69.4	number of filled tubes: 12
416-3	16-3	24/03/16	GC	10:02	22°54.930	041°17.228	69.2	core length: 1.4m
	17-1	24/03/06	Pump	13:35	22°49.263'	041°27.739'	58.2	
417-1	18-1	24/03/16	CTD	10:56	22°50.544	041°21.340'	60.5	2 bottles
417-2	18-2	24/03/16	GC	11:15	22°50.544'	041°21.341'	60.8	no recovery
417-3	18-3	24/03/16	MUC	11:43	22°50.545'	041°21.340'	60.1	number of filled tubes: 12
418-1	19-1	24/03/16	CTD	12:36	22°49.261'	041°27.738'	58.5	2 bottles
418-2	19-2	24/03/16	MUC	12:47	22°49.263'	041°27.739'	58.6	number of filled tubes: 11
418-3	19-3	24/03/16	GC	13:23	22°49.263'	041°27.735'	58.3	no recovery
Ott Paraiba	a do Sul	04/00/40	D	00.00	00040 404		00.0	1
440.4	20-1	24/03/16	Pump	20:36	22°10.484'	040°30.475	63.0	
419-1	21-1	24/03/16	CID	23:18	21°58.375'	040~11.130'	64.0	
420-1	22-1 23-1	24/03/16- 25/03/16 24/03/16	MBPS	11:37	21°53.170' 21°55 927'	040°04.00	605.0 870.7	first file: SLF160324329; last file: SLF1603251124
	20-1	27/03/10	i unip	10.20	21 00.021	000 04.122	010.1	

421-1	24-1	25/03/16	CTD	13:25	21°55.927'	039°54.122'	870.0	12 bottles
								samples: 3x surface samples
								Brazil, 2x surface samples
421-2	24-2	25/03/16	BC	14:24	21°55.927'	039°54.121'	871.2	Munz, 2x Liner Raddatz
421-3	24-3	25/03/16	GC	16:04	21°55.930'	039°54.097'	869.3	core length: 6.86m
422-1	25-1	25/03/16	CTD	17:43	21°51.461'	039°53.181'	954.4	13 bottles
422-2	25-2	25/03/16	MUC	18:44	21°51.533'	039°53.065'	961.0	number of filled tubes: 11
								tool not deployed due to
422-3	25-3	25/03/16	PC	20:28	21°51.533'	039°53.065'	961.3	technical failure
422-4	25-4	25/03/16	GC	21:57	21°51.534'	039°53.064'	959.3	core length: 6.52m
	26-1	25/03/16	Pump	20:51	21°51.534'	039°53.065'	958.5	
		25/03/16-					,	first file: SLF1603252337. last
423-1	27-1	26/03/16	MBPS	09:39	21°33.440'	039°38.295'	n/a	file: SLF1603260939
10.1.1	28-1	26/03/16	Pump	13:11	21°48.764	039°32.025	2018.1	
424-1	29-1	26/93/16	CID	12:38	21°48.763	039°32.024	2017.7	24 bottles
424-2	29-2	26/03/16	MN	13:27	21°48.760'	039°32.020'	2017.0	shallow cast: 100-80m, 80- 60m, 60-40m, 40-20m, 20- 0m; samples to be stored in Tübingen; preserved with ethanol deep cast: 700-500m, 500-
424-3	29-3	26/03/16	MN	14:24	21°48.760'	039°32.020'	2017.0	300m, 300-200m, 200-100m, 100-0m; samples to be stored in Tübingen; preserved with ethanol
424-4	29-4	26/03/16	CTD	16:04	21°48.761'	039°32.024'	2018.0	16 bottles
424-5	29-5	26/03/16	MN	16:29	21°48.760'	039°32.020'	2018.0	shallow cast: 100-80m. 80- 60m, 60-40m, 40-20m, 20- 0m; samples to be stored in Kiel; preserved with ethanol deep cast: 700-500m, 500- 300m, 300-200m, 200-100m. 100-0m; samples to be stored
424-6	29-6	26/03/16	MN	17:26	21°48.740'	039°32.070'	2018.0	in Kiel; preserved with etha- nol
								tool not deployed due to
424-7	29-7	26/03/16	PC	18:34	21°48.729'	039°32.029'	2020.7	technical failure
424-8	29-8	26/03/16	GC	20:16	21°48.732'	039°32.030'	2019.0	length <5.52 m
424-9	29-9	26/03/16	MUC	21:59	21°48.731'	039°32.029'	2023.8	number of filled tubes: 9
	30-1	26/03/16	Pump	20:12	21°48.732'	039°32.030'	2019.2	
425-1	30-1 31-1	26/03/16 26/03/16	Pump CTD	20:12 n/a	21°48.732' n/a	039°32.030' n/a	2019.2 n/a	9 bottles
425-1 425-2	30-1 31-1 31-2	26/03/16 26/03/16 27/03/16	Pump CTD MUC	20:12 n/a 01:43	21°48.732' n/a 21°49.328'	039°32.030' n/a 039°41.861'	2019.2 n/a 1875.1	9 bottles number of filled tubes: 9
425-1 425-2	30-1 31-1 31-2	26/03/16 26/03/16 27/03/16 26/03/16- 07/00/10	Pump CTD MUC	20:12 n/a 01:43	21°48.732' n/a 21°49.328'	039°32.030' n/a 039°41.861'	2019.2 n/a 1875.1	9 bottles number of filled tubes: 9
425-1 425-2 426-1	30-1 31-1 31-2 32-1 23 1	26/03/16 26/03/16 27/03/16 26/03/16- 27/03/16 27/03/16	Pump CTD MUC MBPS	20:12 n/a 01:43 13:05	21°48.732' n/a 21°49.328' 21°51.464' 21°50.055'	039°32.030' n/a 039°41.861' 039°52.920' 020°52.652'	2019.2 n/a 1875.1 30.0	9 bottles number of filled tubes: 9
425-1 425-2 426-1 427-1	30-1 31-1 31-2 32-1 33-1 34-1	26/03/16 26/03/16 27/03/16 26/03/16- 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC	20:12 n/a 01:43 13:05 13:18 14:32	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113'	2019.2 n/a 1875.1 30.0 1329.9 873.5	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer
425-1 425-2 426-1 427-1	30-1 31-1 31-2 32-1 33-1 34-1	26/03/16 26/03/16 27/03/16 26/03/16- 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC	20:12 n/a 01:43 13:05 13:18 14:32	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113'	2019.2 n/a 1875.1 30.0 1329.9 873.5	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x sur- face sample Munz, 1x sur- face sample Niedermeyer core length: 5.83m; no sam-
425-1 425-2 426-1 427-1 427-2	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2	26/03/16 26/03/16 27/03/16 26/03/16- 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC	20:12 n/a 01:43 13:05 13:18 14:32 15:40	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x sur- face sample Munz, 1x sur- face sample Niedermeyer core length: 5.83m; no sam- ples (corals)
425-1 425-2 426-1 427-1 427-2 428-1 429-2	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 25 2	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC CTD	20:12 n/a 01:43 13:05 13:18 14:32 14:32 15:40 n/a	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x sur- face sample Munz, 1x sur- face sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-2	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 35-2 25 2	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 19:42	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.607'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 429.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 orce length: 4.25m
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 35-2 35-3 35-3	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.606' 21°53.644'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.279' 040°00.290'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x sur- face sample Munz, 1x sur- face sample Munz, 1x sur- face sample Munz, 1x sur- face sample State State State State sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m po recovery
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 35-2 35-3 35-4 36-1	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC GC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.606' 21°53.610' 21°53.610'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.280' 040°00.280'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Bio Do	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 35-2 35-3 35-4 35-4 35-1 35-2	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC GC Pump	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.606' 21°53.610' 21°50.733'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-3 428-4 Off Rio Do	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf)	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.606' 21°53.610' 21°50.733'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file:
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-3 428-4 Off Rio Do	30-1 31-1 31-2 32-1 33-1 33-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.606' 21°53.610' 21°50.733'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603281622
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-3 428-4 Off Rio Do 429-1 431-1	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:02	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.610' 21°53.610' 21°50.733'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.280' 039°59.920' 040°0.280' 039°59.920'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603281622 2 bottles
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-2	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump Pump MBPS CTD MUC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:02 17:20	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.610' 21°53.610' 21°50.733' 19°46.575' 19°44.277' 19°44.284'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 039°59.920'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603281622 2 bottles number of filled tubes: 8
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3	30-1 31-1 31-2 32-1 33-1 33-1 34-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-2 38-3	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC GC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:02 17:20 19:07	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.610' 21°50.733' 19°46.575' 19°44.277' 19°44.283'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 039°59.920' 039°59.920'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 n/a 17.2 16.7 17.5	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603280902, last file: SLF1603281622 2 bottles number of filled tubes: 8 core length: 4.72m
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1	30-1 31-1 31-2 32-1 33-1 33-1 33-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-2 38-3 39-1	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16 28/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC Pump MBPS CTD MUC GC CTD	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:02 17:20 19:07 20:25	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.610' 21°50.733' 19°46.575' 19°44.277' 19°44.283' 19°42.058'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 039°59.920' 039°59.920' 039°59.920'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 n/a 17.2 16.7 17.5 23.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603281622 2 bottles number of filled tubes: 8 core length: 4.72m 1 bottle
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 432-2	30-1 31-1 31-2 32-1 33-1 33-1 33-1 33-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-2 38-3 39-1 39-2	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC GC CTD MUC GC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:02 17:20 19:07 20:25 20:43	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.610' 21°50.733' 19°46.575' 19°44.277' 19°44.283' 19°44.283' 19°42.050'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 039°59.920' 039°59.920' 039°59.920' 039°59.920'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 17.2 16.7 17.5 23.6 23.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603280902, last file: SLF1603281622 2 bottles number of filled tubes: 8 core length: 4.72m 1 bottle number of filled tubes: 12
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 432-2 433-1	30-1 31-1 31-2 32-1 33-1 33-1 33-1 33-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-2 38-3 39-1 39-2 40-1	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC GC CTD MUC GC CTD	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:02 17:20 19:07 20:25 20:43 21:55	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.606' 21°53.610' 21°50.733' 19°46.575' 19°44.284' 19°44.283' 19°42.058' 19°42.050' 19°35.224'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 039°59.920' 039°59.920' 039°50.756' 039°50.756' 039°50.738' 039°50.738' 039°45.776' 039°45.775' 039°41.706'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 17.2 16.7 17.5 23.6 23.6 21.7	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Nunz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603280902, last file: SLF1603281622 2 bottles number of filled tubes: 8 core length: 4.72m 1 bottle number of filled tubes: 12 3 bottles
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 432-2 433-1 433-2	30-1 31-1 31-2 32-1 33-1 33-1 33-1 33-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-1 38-2 38-3 39-1 39-2 40-1 40-2	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC GC CTD MUC CTD MUC CTD MUC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:02 17:20 19:07 20:25 20:43 21:55 22:05	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.610' 21°53.610' 21°50.733' 19°46.575' 19°44.277' 19°44.284' 19°44.283' 19°42.058' 19°42.058' 19°42.050' 19°35.224' 19°35.226'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 039°59.920' 039°59.920' 039°50.756' 039°50.756' 039°50.738' 039°50.738' 039°45.776' 039°41.706' 039°41.706'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 430.6 429.4 540.6 n/a 17.2 16.7 17.5 23.6 23.6 21.7 22.7	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603280902, last file: SLF1603281622 2 bottles number of filled tubes: 8 core length: 4.72m 1 bottle number of filled tubes: 12 3 bottles number of filled tubes: 11
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 432-2 433-1 433-2 433-1	30-1 31-1 31-2 32-1 33-1 33-1 33-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-1 38-2 38-3 39-1 39-2 40-1 40-2 41-1	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC GC Pump MBPS CTD MUC CTD MUC CTD MUC CTD MUC CTD MUC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:20 19:07 20:25 20:43 21:55 22:05 10:13	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.606' 21°53.610' 21°53.610' 21°53.610' 21°53.733' 19°44.277' 19°44.284' 19°44.284' 19°44.284' 19°42.050' 19°35.226' 19°35.226' 19°35.226'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 039°59.920' 039°59.920' 039°50.738' 039°50.738' 039°45.775' 039°45.775' 039°45.775' 039°41.706' 039°34.230'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 17.2 16.7 17.5 23.6 23.6 21.7 22.7 46.0	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603290058, last file: SLF1603290058, last
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 433-2 433-1 433-2 433-1 433-2	30-1 31-1 31-2 32-1 33-1 33-1 33-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-1 38-2 38-3 39-1 39-2 40-1 40-2 41-1 42-1	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC GC Pump MBPS CTD MUC CTD MUC CTD MUC CTD MUC CTD MUC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:20 19:07 20:25 20:43 21:55 22:05 10:13 11:09	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.606' 21°53.606' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 19°44.277' 19°44.284' 19°44.284' 19°44.283' 19°42.050' 19°35.226' 19°35.226' 19°25.454' 19°28.308'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 040°00.280' 039°59.920' 039°59.920' 039°50.738' 039°50.738' 039°50.738' 039°45.775' 039°45.775' 039°41.706' 039°34.230' 039°34.230' 039°37.759'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 17.2 16.7 17.5 23.6 23.6 21.7 22.7 46.0 16.7	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF1603290058, last file: SLF1602191012 0 bottles
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 431-3 432-1 433-2 433-1 433-2 433-1	30-1 31-1 31-2 32-1 33-1 33-1 33-1 33-1 34-2 35-1 35-2 35-3 35-4 36-1 ce (Shelf) 37-1 38-1 38-1 38-2 38-3 39-1 39-2 40-1 40-2 40-1 40-2 41-1 42-2	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC GC CTD MUC CTD MUC CTD MUC CTD MUC CTD	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:20 19:07 20:25 20:43 21:55 22:05 10:13 11:09 11:29	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.600' 21°53.600' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.620' 19°46.575' 19°44.283' 19°44.283' 19°42.058' 19°42.050' 19°35.224' 19°35.226' 19°25.454' 19°28.308' 19°28.280'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 040°00.280' 039°59.920' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°45.775' 039°41.706' 039°341.706' 039°34.230' 039°37.759' 039°37.717'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 17.2 16.7 17.5 23.6 23.6 21.7 22.7 46.0 16.7 17.3	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: 1 bottle number of filled tubes: 12 3 bottles number of filled tubes: 11 first file: SLF1603290058, last file: SLF1602191012 0 bottles 1 bottle
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 431-3 432-1 433-2 433-1 433-2 433-1 433-2 433-1	30-1 31-1 31-2 32-1 33-1 33-1 33-1 33-1 33	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 29/03/16 29/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC GC CTD MUC CTD MUC CTD MUC CTD MUC CTD MUC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 20:15 16:24 17:20 19:07 20:25 20:43 21:55 22:05 10:13 11:09 11:29 11:36	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.600' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.620' 19°46.575' 19°46.575' 19°44.283' 19°44.283' 19°42.058' 19°42.050' 19°35.224' 19°35.226' 19°25.454' 19°28.308' 19°28.280'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 040°00.280' 039°59.920' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°45.775' 039°41.706' 039°341.706' 039°34.230' 039°37.759' 039°37.717'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 17.2 16.7 17.5 23.6 23.6 21.7 22.7 46.0 16.7 17.3 16.7	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x surface sample Niedermeyer core length: 5.83m; no sam- ples (corals) 7 bottles number of filled tubes: 10 core length: 4.25m no recovery depth range: 20/35m; first file: SLF1603280902, last file: SLF160280902, last file: SLF160280902, last file: SLF160280902, last fi
425-1 425-2 426-1 426-1 427-2 428-1 428-2 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 431-3 432-1 433-2 433-1 433-2 433-1 433-2 433-1	30-1 31-1 31-2 32-1 33-1 33-1 33-1 33-1 33	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 29/03/16 29/03/16 29/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC GC CTD MUC CTD MUC CTD MUC CTD MUC CTD	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 20:15 16:24 17:20 19:07 20:25 20:43 21:55 22:05 10:13 11:09 11:29 11:36 13:12	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.606' 21°53.606' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 21°53.610' 19°46.575' 19°46.575' 19°44.284' 19°44.283' 19°44.283' 19°42.058' 19°42.050' 19°35.224' 19°35.226' 19°25.454' 19°28.280' 19°28.280' 19°28.276' 19°27.994'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.281' 040°00.280' 039°59.920' 040°00.280' 039°59.920' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°45.775' 039°41.706' 039°341.706' 039°34.230' 039°37.717' 039°37.711' 039°37.711'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 17.2 16.7 17.5 23.6 23.6 21.7 22.7 46.0 16.7 17.3 16.7 38.2	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x sur- face samples Munz, 1x sur- face samples Munz, 1x sur- filled tubes: 10 core length: 4.25m number of filled tubes: 8 core length: 4.72m 1 bottle number of filled tubes: 12 3 bottles 1 bottles 1 bottle number of filled tubes: 12 2 bottles 1 bottle number of filled tubes: 12 2 bottles
425-1 425-2 426-1 427-1 427-2 428-1 428-2 428-3 428-3 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 431-3 432-1 433-2 433-1 433-2 433-1 433-2 433-1 435-2 435-3 436-1 436-2	30-1 31-1 31-2 32-1 33-1 33-1 33-1 33-1 33	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 29/03/16 29/03/16 29/03/16 29/03/16 29/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC CTD MUC CTD MUC CTD MUC CTD MUC CTD MUC	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 20:15 16:24 17:20 19:07 20:25 20:43 21:55 22:05 10:13 11:09 11:29 11:36 13:12 13:23	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.600' 21°53.610' 21°53.600' 19°44.283' 19°42.058' 19°42.058' 19°25.454' 19°28.280' 19°28.280' 19°28.280' 19°28.280' 19°28.280'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.280' 040°00.280' 040°00.280' 039°59.920' 040°00.280' 039°59.920' 039°50.738' 039°50.738' 039°50.738' 039°50.738' 039°45.776' 039°45.776' 039°41.706' 039°41.706' 039°37.759' 039°37.711' 039°37.711' 039°26.374' 039°26.332'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6 7 17.2 16.7 17.5 23.6 23.6 21.7 22.7 46.0 16.7 17.3 16.7 38.2 37.5	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x sur- face sample filled tubes: 12 2 bottles number of filled tubes: 9
425-1 425-2 426-1 426-1 427-2 428-1 428-2 428-3 428-3 428-4 Off Rio Do 429-1 431-1 431-2 431-3 432-1 431-3 432-1 433-2 433-1 433-2 433-1 433-2 433-1 435-2 435-3 436-1 436-2 436-3	30-1 31-1 31-2 32-1 33-1 33-1 33-1 33-1 33	26/03/16 26/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 27/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 28/03/16 29/03/16 29/03/16 29/03/16 29/03/16 29/03/16 29/03/16 29/03/16	Pump CTD MUC MBPS Pump BC GC CTD MUC GC GC Pump MBPS CTD MUC GC CTD MUC CTD MUC CTD MUC CTD MUC CTD MUC CTD MUC CTD	20:12 n/a 01:43 13:05 13:18 14:32 15:40 n/a 17:46 18:42 19:41 20:15 16:24 17:20 19:07 20:25 20:43 21:55 22:05 10:13 11:09 11:29 11:36 13:12 13:23 14:09	21°48.732' n/a 21°49.328' 21°51.464' 21°59.955' 21°56.959' 21°56.959' 21°56.957' n/a 21°53.607' 21°53.607' 21°53.610' 21°53.600' 19°46.575' 19°44.283' 19°42.058' 19°25.454' 19°28.280' 19°28.280' 19°28.280' 19°28.280' 19°28.280' 19°28.280' 19°27.987'	039°32.030' n/a 039°41.861' 039°52.920' 039°52.653' 039°53.113' 039°53.117' n/a 040°00.281' 040°00.280' 040°00.280' 039°59.920' 040°00.280' 039°59.920' 039°50.756' 039°50.738' 039°50.738' 039°50.738' 039°45.776' 039°45.776' 039°41.706' 039°41.706' 039°37.759' 039°37.711' 039°37.711' 039°26.374' 039°26.332' 039°26.332'	2019.2 n/a 1875.1 30.0 1329.9 873.5 866.3 n/a 429.4 430.6 429.4 540.6	9 bottles number of filled tubes: 9 samples: 3x coral samples (Raddatz), 2x Liner, 3x sur- face samples Brazil, 1x sur- face sample Munz, 1x sur- fa

436-4	43-4	29/03/16	GC	14:47	19°27.989'	039°26.333'	38.2	core length: 1.71m		
437-1	44-1	29/03/16	CTD	16:11	19°26.376'	039°17.211'	48.7	3 bottles		
437-2	44-2	29/03/16	MUC	16:23	19°26.691'	039°17.210'	48.6	number of filled tubes: 12		
Off Rio Doce (Slope)										
438-1	45-1	29/03/16	MN	21:07	19°47.356'	038°40.389'	1031.2	shallow cast		
438-2	45-2	29/03/16	MN	22.08	19°47 356'	038°40 389'	1031.0	deep cast		
438-3	45-3	29/03/16	CTD	22.00	10°47.356'	038°40 389'	1032.1	24 bottles		
430-3	45-5	20/02/16		22.43	10°47.350	030 40.303	1032.1	24 Dotties		
430-4	45-4	29/03/16	IVIN	23.20	19 47.356	036 40.369	1032.3	shallow cast		
438-5	45-5	29/03/16	MN	00:16	19°47.356	038°40.389	1033.2	deep cast		
438-6	45-6	29/03/16	CTD	01:22	19°47.356'	038°40.390'	1029.0	24 bottles		
		29/03/16-						first file: SLF1603300139, last		
439-1	46-1	30/03/16	MBPS	11:07	19°32.327'	038°31.824'	200.0	file: SLF1603301105		
	47-1	30/03/16	Pump	13:39	19°34.314'	038°40.576'	448.0			
440-1	48-1	30/03/16	СТр	12:14	19°33.068'	038°36,160'	263.2	9 bottles		
440-2	48-2	30/03/16	MUC	12.38	19°33 068'	038°36 159'	264.2	number of filled tubes: 11		
440-2	40-2	20/02/16		12.50	19 33.000	030 30.133	204.2	A bottles		
441-1	49-1	30/03/16		13.54	19'34.313	038 40.576	447.0	4 bollies		
441-2	49-2	30/03/16	MUC	14:25	19°34.313	038°40.577	447.6	number of filled tubes: 12		
441-3	49-3	30/03/16	GC	15:13	19°34.315'	038°40.577'	448.4	core length: 7.16m		
442-1	50-1	30/03/16	CTD	17:12	19°42.620'	038°35.987'	903.2	17 bottles		
442-2	50-2	30/03/16	MUC	17:59	19°42.620'	038°35.979'	903.7	number of filled tubes: 12		
442-3	50-3	30/03/16	PC	19:32	19°42.621'	038°35.978'	902.7	core length: 13.16m		
	51-1	30/03/16	Pump	20.01	19°42 622'	038°35 978'	902.5	<u> </u>		
443-1	52-1	30/03/16		21.34	10°35 046'	038°36.062'	644.7	18 hottles		
445-1	52-1	30/03/10	CID	21.54	13 33.340	030 30.002	044.7	number of filled tubees 10:		
442.0	50.0	20/02/40	MUC	00.40	10005 040	000800 0001	040.0	number of filled tubes. 12,		
443-2	52-2	30/03/16	NUC	22:18	19-35.946	038-30.062	643.9	pore water: backup		
443-3	52-3	30/03/16	GC	23:30	19°35.946'	038°36.062'	644.8	core lengh: 8.42m		
		30/03/16-								
444-1	53-1	31/03/16	MBPS	10:19	20°06.169'	038°40.313'	1300.0			
	54-1	31/03/16	Pump	13:26	20°21.807'	038°37.386'	1960.5			
445-1	55-1	31/03/16	СТр	13:12	20°21.808'	038°37,387'	1960.4	19 bottles		
445-2	55-2	31/03/16	MN	13.32	20°21.808'	038°37 387'	1960.3	shallow cast		
445-2	55-2	31/03/10	MAN	14.07	20 21.000	030 37.307	1000.0	deep east		
445-3	55-3	31/03/16		14.27	20121.606	036 37.366	1960.6			
445-4	55-4	31/03/16	CID	16:02	20°21.808	038°37.388	1959.7	15 bottles		
445-5	55-5	31/03/16	MN	16:24	20°21.808'	038°37.388'	1960.3	shallow cast		
445-6	55-6	31/03/16	MN	17:17	20°21.808'	038°37.386'	1960.0	deep cast		
445-7	55-7	31/03/16	PC	19:35	20°21.808'	038°37.387'	1960.1	core length: 11.75m		
445-8	55-8	31/03/16	MUC	21:19	20°21.808'	038°37,389'	1961.2	number of filled tubes: 12		
	56-1	31/03/16	Pump	20.00	20°21 808'	038°37 388'	1962.2			
	30-1	31/03/10	i unp	20.03	20 21.000	030 37.300	1302.2	first file: CLE1602212217 lest		
440.4	F7 4	31/03/10-		00.00	40040.0001	000044.0001	4400.0	IIIST IIIE: SEF 1003312317, IAST		
446-1	57-1	01/04/16	MBP5	09:32	19°42.032	038°44.606	1100.0	file: SLF1604010924		
	58-1	01/04/16	Pump	13:46	20°01.043'	038°50.859'	1763.5			
447-1	59-1	01/04/16	CTD	12:44	20°01.044'	038°50.858'	1763.0	8 bottles		
447-2	59-2	01/04/16	MUC	13:57	20°01.046'	038°50.859'	1763.5	number of filled tubes: 12		
447-3	59-3	01/04/16	PC	15:51	20°01.044'	038°50.858'	1762.9			
	60-1	01/04/16	Pump	21.10	20°02 373'	038°34 798'	1328.2			
110 1	61 1	01/04/16		10:05	20 02.373	020024.700	1220.2	22 hottlog		
440-1	01-1	01/04/10		19.05	20 02.371	030 34.709	1320.3	22 Dollies		
448-2	61-2	01/04/16	PC	20:40	20°02.372	038°34.748	1328.7	core length: 10.17m		
448-3	61-3	01/04/16	MUC	22:02	20°02.372'	038°34.798'	1328.9			
	62-1	02/04/16	Pump	13:21	17°20.355'	038°23.700'	1181.5			
	63-1	02/04/16	Pump	20:18	16°03.334'	038°37.412'	24.8			
Rio Jeauiti	inhonha		•					•		
								no bottles fired: sound veloci-		
449-1	64-1	02/04/16	СТП	21.25	15°52 965'	038°30 208'	30.5	ty profile only		
443-1	04-1	02/04/10	CID	21.25	10 02.000	030 33.200	50.5	first file: SL E1604022140, lest		
450.4	CE 1	02/04/10-	MDDC	00.22	15910 200	028946 606	50.0	file: SLF 1004022 140, 1851		
450-1	1-60	03/04/16	INIDPS	09.32	15 19.308	038 40.090	50.0	IIIE. SLF 1604030959		
	66-1	03/04/16	Pump	13:25	15°11.345'	038°52.394'	29.6			
451-1	67-1	03/04/16	CTD	11:20	15°16.965'	038°54.800'	27.7	11 bottles		
								3x surface samples Brazil, 1x		
								surface samples Munz, 1x		
451-2	67-2	03/04/16	VVG	11:38	15°16.965'	038°54.801'	28.4	organic Niedermeyer		
451-3	67-3	03/04/16	MUC	11:56	15°16,964'	038°54.801'	28.4	number of filled tubes: 12		
151-4	67-4	03/04/16		12:37	15°16 065'	038°54 801'	28.3	core length / 97m		
Off Pio do	Contas	00/04/10	00	12.57	10 10.000	000 04.001	20.0			
OII RIO de		00/04/40	D	00.45		000000.0041	4000.0			
	68-1	03/04/16	Pump	20:15	14°15.445	038°36.061	1860.6			
452-1	69-1	03/04/16	CTD	20:27	14°15.447'	038°36.061'	1858.3	24 bottles		
452-2	69-2	03/04/16	MN	20:44	14°15.447'	038°36.061'	1859.2	shallow cast		
452-3	69-3	03/04/16	MN	21:40	14°15.445'	038°36.060'	1859.3	deep cast		
452-4	69-4	03/04/16	CTD	n/a	n/a	n/a	n/a	24 bottles		
452-5	60-5	03/04/16	MNI	22.12	14º15 //6'	038°36 061'	1850.2	shallow cast		
452 6	60.6	03/04/10	IVII N MANI	22.42	14 10.440	030 30.001	1003.0	doop cost		
492-0	09-6	03/04/16	IVIIN	23:38	14 15.446	030 30.001	1000.1			
		03/04/16-						TIRST TILE: SLF 1604032358, last		
453-1	70-1	04/03/16	MBPS	10:07	14°12.134'	038°48.137'	1022.0	file: SLF1604041003		
	71-1	04/04/16	Pump	13:39	14°12.774'	038°38.530'	1737.3			
454-1	72-1	04/04/16	CTD	12:19	14°12.775'	038°38.530'	1735.6	24 bottles		
454.0	70.0	04/04/16	MUC	13.30	1/012 77/	038°38 520'	1738.6	number of filled tubes: 12		

454-3	72-3	04/04/16	PC	15:24	14°12.776'	038°38.529'	1738.1	core length 13.43m
455-1	73-1	04/04/16	CTD	18:18	14°10.605'	038°32.176'	2111.0	21 bottles
455-2	73-2	04/04/16	MUC	19:44	14°10.607'	038°32,178'	2107.6	number of filled tubes: 7
455-3	73-3	04/04/16	PC.	21.50	14°10 608'	038°21 178'	2106.9	core length 12 49m
400 0	7/ 1	04/04/16	Bump	21.00	14°10.000	030 21.170	2100.5	
	/4-1	04/04/10	Fullp	21.15	14 10.000	030 32.170	2107.0	
156 1	75 1	04/04/16-	MPDS	10.00	11011 552	020040 420'	1000.0	
430-1	70-1	05/04/10	NIDF 3	10.09	14 14.000	030 40.150	1099.0	
457.4	76-1	05/04/16	Pump	13:31	14-23.200	038-43.551	1393.9	
457-1	//-1	05/04/16	CID	12:22	14°23.200	038°43.551	1393.1	24 bottles
457-2	11-2	05/04/16	MUC	13:19	14°23.200'	038°43.551'	1393.0	number of filled tubes: 8
457-3	77-3	05/04/16	GC	14:36	14°23.201'	038°43.551'	1394.4	core length 6.00m
458-1	78-1	05/04/16	CTD	16:20	14°24.359'	038°50.067'	842.8	24 bottles
458-2	78-2	05/04/16	MUC	17:05	14°24.356'	038°50.070'	842.9	number of filled tubes: 8
458-3	78-3	05/04/16	PC	18:39	14°24.357'	038°50.068'	840.5	core length 13.86m
	79-1	05/04/16	Pump	20:23	14°24.560'	038°53.367'	421.9	
459-1	80-1	05/04/16	CTD	20:28	14°24.559'	038°53.307'	422.4	24 bottles
459-2	80-2	05/04/16	GC	21.07	14°24 559'	038°53 307'	421.3	core length 8 55m
459-3	80-3	05/04/16	MUC	21.44	14°24 559'	038°53 307'	420.5	number of filled tubes: 12
400 0	00 0	05/04/16	WICO	21.77	14 24.000	000 00.007	420.0	first file: SI E1604052222 last
460-1	81-1	06/04/16	MRDS	10.18	1/1020 238	038°56 423'	50.0	file: SI E1604060957
400-1	01-1	00/04/10	NIDF 3	10.10	14 29.230	030 50.425	50.0	THE. SET 1004000937
404.4	02-1	06/04/16	Pump	13.20	14 15.706	036 55.276	52.5	
461-1	82-2	06/04/16		12:46	14°17.517	038°55.509	58.9	12 bottles
461-2	82-3	06/04/16	MUC	12:59	14°17.516'	038°55.511'	59.0	number of filled tubes: 12
462-1	83-1	06/04/16	CTD	11:11	14°24.285'	038°57.024'	38.0	11 bottles
								number of filled tubes: 11;
462-2	83-2	06/04/16	MUC	11:23	14°24.284'	038°57.024'	37.0	surface samples
	84-1	06/04/16	Bucket	12:32	14°17.517'	038°55.514'	59.3	114-2
	85-1	06/04/16	Bucket	14:08	14°10.631'	038°54.536'	42.3	
463-1	85-2	06/04/16	CTD	14:21	14°10.633'	038°54.534'	42.2	10 bottles
				1				number of filled tubes: 11:
463-2	85-3	06/04/16	MUC	14:32	14°10.633'	038°54,534'	n/a	surface samples
	86-1	06/04/16	Bucket	15:30	14°04 766'	038°53 195'	34.8	
464-1	86-2	06/04/16	CTD	15:43	14°04.757'	038°53 190'	36.1	10 bottles
1 101	00 2	00/04/10	010	10.40	14 04.707	000 00.100	00.1	number of filled tubes: 11:
464.2	96.3	06/04/16	MUC	15.52	14004 756'	028052 187	24.0	surface camples
404-2	00-3	00/04/10		10.00	14 04.730	030 33.107	34.9	
465-1	87-1	06/04/16		16:50	13-58.647	038-52.116	46.4	8 bottles
465-7	87-2	116/11/116		17.05	13°58 646	1138°57 115	///	number of filled fuber 17
405 2	07.0	00/04/10		17.05	10 00.040	000 02.110	47.0	
465-3	87-3	06/04/16	GC	17:55	13°58.646'	038°52.116'	47.0	core length: 2.55m
465-3	87-3 88-1	06/04/16 06/04/16	GC Pump	17:55 20:16	13°58.646' 13°38.037'	038°52.116' 038°34.353'	47.0 597.2	core length: 2.55m
465-3 Off Rio Sa	87-3 88-1 o Francis	06/04/16 06/04/16 06/04/16 co	GC Pump	17:55 20:16	13°58.646' 13°38.037'	038°52.116' 038°52.116' 038°34.353'	47.0 47.0 597.2	core length: 2.55m
465-3 Off Rio Sa	87-3 88-1 5 Francis 89-1	06/04/16 06/04/16 06/04/16 co 07/04/16	GC Pump Pump	17:55 20:16 13:55	13°58.646' 13°38.037' 11°08.733'	038°52.116' 038°34.353' 036°26.519'	47.0 597.2 2116.9	core length: 2.55m
465-3 Off Rio Sac 466-1	87-3 88-1 5 Francis 89-1 90-1	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16	GC Pump Pump CTD	17:55 20:16 13:55 16:21	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005'	47.0 47.0 597.2 2116.9 2002.4	core length: 2.55m
465-3 Off Rio Sac 466-1 466-2	87-3 88-1 5 Francis 89-1 90-1 90-2	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16	GC Pump Pump CTD MN	17:55 20:16 13:55 16:21 16:42	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848'	036°26.519' 036°26.519' 036°17.005' 036°17.620'	47.0 47.0 597.2 2116.9 2002.4 2038.9	23 bottles shallow cast
465-3 Off Rio Sa 466-1 466-2 466-3	87-3 88-1 5 Francis 89-1 90-1 90-2 90-3	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16	GC Pump Pump CTD MN MN	17:55 20:16 13:55 16:21 16:42 17:35	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°14.263'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3	23 bottles shallow cast deep cast
465-3 Off Rio Sa 466-1 466-2 466-3 466-4	87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16	GC Pump CTD MN MN CTD	17:55 20:16 13:55 16:21 16:42 17:35 18:39	13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°14.263' 036°17.146'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2	23 bottles shallow cast deep cast 24 bottles
465-3 Off Rio Sa 466-1 466-2 466-3 466-3 466-4 466-5	87-3 87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4 90-5	06/04/16 06/04/16 co 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16	GC Pump CTD MN MN CTD MN	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05	13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.687'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°14.263' 036°17.146' 036°17.396'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1	23 bottles shallow cast 24 bottles shallow cast
465-3 Off Rio Sac 466-1 466-2 466-3 466-3 466-5 466-5 466-6	87-3 87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4 90-5 90-6	06/04/16 06/04/16 co 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16	GC Pump CTD MN MN CTD MN MN	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.098' 10°57.098' 10°57.687' 10°56.562'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°14.263' 036°17.396' 036°16.635'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast
465-3 Off Rio Sac 466-1 466-2 466-3 466-3 466-4 466-5 466-6	87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1	06/04/16 06/04/16 co 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16	GC Pump CTD MN MN CTD MN MN Bump	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13	13°58.646' 13°58.646' 13°38.037' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.687' 10°56.562' 11°00 246'	038°52.116' 038°52.116' 038°34.353' 036°17.005' 036°17.005' 036°17.620' 036°14.263' 036°17.146' 036°17.396' 036°16.355' 036°18.156'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast
465-3 Off Rio Sac 466-1 466-2 466-3 466-3 466-4 466-5 466-6	87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1	06/04/16 06/04/16 co 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16	GC Pump CTD MN MN CTD MN MN Pump	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13	13°58.646' 13°58.646' 13°38.037' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.687' 10°56.562' 11°00.246'	038°52.116' 038°52.116' 038°34.353' 036°17.005' 036°17.620' 036°17.620' 036°17.146' 036°17.396' 036°16.635' 036°18.156'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast grant file: SI E1604072049 last
465-3 0ff Rio Sa 466-1 466-2 466-3 466-4 466-5 466-6 466-6	87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16	GC Pump CTD MN MN CTD MN MN Pump	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.098' 10°57.687' 10°56.562' 11°00.246'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.146' 036°17.396' 036°16.635' 036°18.156' 038°26.480'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast deep cast first file: SLF1604072049. last file: SLF1604072049. last
465-3 0ff Rio Sa 466-1 466-2 466-3 466-3 466-4 466-5 466-6 467-1 468 1	87-3 88-1 o Francis 89-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 92-1	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16	GC Pump CTD MN MN CTD MN MN Pump MBPS CTD	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°38.820' 10°51.786'	036°26.519' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.396' 036°16.635' 036°16.635' 036°18.156' 038°26.489' 036°22.204'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast deep cast deep cast first file: SLF1604072049. last file: SLF1604080949
465-3 466-1 466-1 466-2 466-3 466-4 466-5 466-6 466-6 466-1 468-1 468-1 468-1	87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 92-1 92-1	06/04/16 06/04/16 06/04/16 co 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16	GC Pump CTD MN MN CTD MN MN Pump MBPS CTD	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 42:47	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°38.820' 10°51.786'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.146' 036°17.396' 036°16.635' 036°18.156' 038°26.489' 036°22.394'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles
465-3 466-1 466-1 466-2 466-3 466-3 466-4 466-5 466-6 467-1 468-1 468-2 468-2 468-2	87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 93-1 93-2	06/04/16 06/04/16 06/04/16 co 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16	GC Pump CTD MN CTD MN CTD MN Pump MBPS CTD MUC	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17	13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°58.820' 10°51.786' 10°52.117'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.623' 036°17.146' 036°17.396' 036°16.635' 036°16.635' 036°26.489' 036°22.394' 036°22.686'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 202.4	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12
465-3 466-1 466-1 466-2 466-3 466-3 466-4 466-5 466-6 467-1 468-1 468-2 468-3	87-3 88-1 5 Francis 89-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 93-1 93-2 93-3	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN CTD MN CTD MN MN Pump MBPS CTD MUC GC	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 42:00	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°58.820' 10°51.786' 10°52.117' 10°52.122'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.46' 036°17.396' 036°16.635' 036°16.635' 036°18.156' 038°26.489' 036°22.394' 036°22.855'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m
465-3 466-1 466-1 466-2 466-3 466-4 466-5 466-6 467-1 468-1 468-1 468-2 468-3 46	87-3 88-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 93-1 93-2 93-3 94-1	06/04/16 06/04/16 06/04/16 co 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN CTD MN CTD MN MN Pump MBPS CTD MUC GC Pump	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.098' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°58.820' 10°51.786' 10°52.117' 10°52.122' 10°52.054'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.46' 036°17.396' 036°17.396' 036°16.635' 036°16.635' 036°26.489' 036°22.394' 036°22.686' 036°22.685' 036°22.602' 036°22.602'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 40.0	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m
465-3 466-1 466-1 466-2 466-3 466-4 466-5 466-6 467-1 468-1 468-2 468-3 469-1	87-3 88-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 93-1 93-2 93-3 94-1 95-1	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN MN CTD MN CTD MN MN Pump MBPS CTD MUC GC Pump CTD	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.098' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°58.820' 10°51.786' 10°52.117' 10°52.122' 10°52.054' 10°56.490'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.46' 036°17.396' 036°18.156' 038°26.489' 036°22.394' 036°22.686' 036°22.855' 036°22.602' 036°12.234'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m
465-3 466-1 466-1 466-2 466-3 466-4 466-5 466-6 466-6 467-1 468-1 468-2 468-3 469-1 469-2	87-3 88-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 93-1 93-2 93-3 94-1 95-1 95-2	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN MN CTD MN CTD MN Pump MBPS CTD MUC GC Pump CTD MUC	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07 18:29	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°58.820' 10°51.786' 10°52.117' 10°52.122' 10°52.054' 10°52.054' 10°56.674'	036°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°14.263' 036°17.146' 036°17.396' 036°18.156' 038°26.489' 036°22.394' 036°22.686' 036°22.685' 036°22.602' 036°12.234' 036°12.324'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 1906.8	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m
465-3 466-1 466-1 466-2 466-3 466-4 466-5 466-6 466-6 467-1 468-2 468-3 468-3 469-1 469-2 469-3	87-3 88-1 b Francis 89-1 90-2 90-3 90-4 90-5 90-6 91-1 93-1 93-2 93-3 94-1 95-1 95-2 95-3	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN MN CTD MN CTD MN Pump MBPS CTD MUC GC Pump CTD MUC PC	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07 18:29 20:23	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.098' 10°57.098' 10°56.562' 11°00.246' 10°58.117' 10°52.122' 10°52.122' 10°52.122' 10°52.054' 10°56.490' 10°56.674' 10°56.465'	036°26.519' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.146' 036°17.396' 036°16.635' 036°18.156' 036°22.686' 036°22.686' 036°22.685' 036°22.685' 036°22.685' 036°22.602' 036°12.234' 036°12.324' 036°1.325' 036°1.355' 036°1.355'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 1906.8 1990.6	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m number of filled tubes: 10 core length: 10.40m
465-3 466-1 466-1 466-2 466-3 466-4 466-5 466-6 466-6 466-1 468-1 468-1 468-2 468-3 469-1 469-2 469-3	87-3 88-1 90-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 93-1 93-1 93-2 93-3 94-1 95-1 95-2 95-3 96-1	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN MN CTD MN CTD MN Pump MBPS CTD MUC GC Pump CTD MUC PC Pump	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07 18:29 20:23 21:19	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°38.820' 10°58.177' 10°56.490' 10°56.490' 10°56.674' 10°56.465' 10°55.851'	036°32.116' 038°52.116' 038°34.353' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.396' 036°17.396' 036°16.635' 036°16.635' 036°18.156' 036°22.394' 036°22.394' 036°22.686' 036°22.686' 036°22.685' 036°22.602' 036°12.234' 036°12.324' 036°10.858' 036°1	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 1906.8 1990.6 2012.2	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m number of filled tubes: 10 core length: 10.40m
465-3 466-1 466-2 466-3 466-4 466-5 466-6 467-1 468-1 468-2 468-3 469-1 469-2 469-3 470-1	87-3 88-1 90-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 93-1 93-1 93-2 93-3 94-1 95-1 95-2 95-3 96-1 97-1	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN MN CTD MN CTD MN Pump MBPS CTD MUC GC Pump CTD MUC PC Pump MN	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07 18:29 20:23 21:19 21:53	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.098' 10°57.098' 10°57.687' 10°56.662' 11°00.246' 10°58.177' 10°52.122' 10°56.490' 10°56.674' 10°56.674' 10°56.851' 10°56.851' 10°56.720'	036°26.519' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.396' 036°17.396' 036°16.635' 036°16.635' 036°16.635' 036°22.394' 036°22.394' 036°22.855' 036°22.686' 036°22.855' 036°12.234' 036°12.324' 036°12.324' 036°11.356'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 1906.8 1990.6 2012.2 2078.6	core length: 2.55m 23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m number of filled tubes: 10 core length: 10.40m shallow cast
465-3 466-1 466-2 466-3 466-4 466-5 466-6 468-1 468-2 468-3 469-1 468-3 469-1 469-2 469-3 470-1 470-2	87-3 88-1 90-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 93-1 93-1 93-2 93-3 94-1 95-1 95-1 95-2 95-3 96-1 97-1 97-2	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN MN CTD MN CTD MN Pump MBPS CTD MUC GC Pump CTD MUC PC PC Pump MN MN	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07 18:29 20:23 21:19 21:53 22:51	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.098' 10°57.687' 10°56.562' 11°00.246' 10°52.117' 10°52.122' 10°52.054' 10°56.674' 10°56.465' 10°56.851' 10°56.720' 10°56.720' 10°56.060'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.146' 036°17.396' 036°16.635' 036°16.635' 036°26.489' 036°22.394' 036°22.855' 036°22.602' 036°12.234' 036°12.234' 036°12.234' 036°12.858' 036°10.858' 036°11.356' 036°10.858' 036°10.870'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 1990.6 2012.2 2078.6 2014.5	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m number of filled tubes: 10 core length: 10.40m shallow cast deep cast
465-3 466-1 466-1 466-2 466-3 466-4 466-5 466-6 467-1 468-1 468-2 468-3 469-1 469-2 469-3 470-1 470-2 470-3	87-3 87-3 88-1 90-1 90-1 90-2 90-3 90-4 90-5 90-6 91-1 93-1 93-1 93-2 93-3 94-1 95-1 95-2 95-3 96-1 97-1 97-2 97-3	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16	GC Pump CTD MN CTD MN CTD MN Pump MBPS CTD MUC GC Pump CTD MUC PC PC Pump MN MN CTD	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07 18:29 20:23 21:19 20:23 21:19 22:51 22:51 23:44	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.0098' 10°57.098' 10°57.098' 10°56.662' 11°00.246' 10°58.8520' 10°52.117' 10°52.122' 10°52.054' 10°56.490' 10°56.455' 10°56.851' 10°56.851' 10°56.851' 10°56.720' 10°57.145'	038°52.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°14.263' 036°17.396' 036°17.396' 036°16.635' 036°26.489' 036°22.394' 036°22.686' 036°22.685' 036°22.602' 036°12.234' 036°12.234' 036°12.234' 036°12.324' 036°1.356' 036°10.870' 036°10.870' 036°11.366' 036°10.870' 036°11.668'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 19906.8 1990.6 2012.2 2078.6 2014.5 2010.0	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m number of filled tubes: 10 core length: 10.40m shallow cast deep cast
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465-3 466-1 466-2 466-3 466-4 466-5 466-6 468-1 468-2 468-3 469-1 468-3 469-1 469-2 469-3 470-1 470-2 470-3 470-4 470-5 471-1	87-3 87-3 88-1 9 Francis 90-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 93-3 94-1 95-2 95-3 96-1 97-2 97-3 97-4 97-5 98-1 99-1 100-1	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 09/04/16 09/04/16	GC Pump CTD MN MN CTD MN CTD MN Pump CTD MUC GC Pump CTD MUC PC Pump MN MN CTD MN MN CTD MN MN CTD MN	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 21:19 21:53 22:51 23:44 00:03 00:56 10:59 13:19 11:54	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.848' 10°57.098' 10°57.687' 10°56.662' 11°00.246' 10°52.117' 10°52.122' 10°52.054' 10°56.490' 10°56.674' 10°56.674' 10°56.674' 10°56.674' 10°56.674' 10°56.851' 10°56.720' 10°56.674' 10°56.674' 10°56.720' 10°56.674' 10°56.480' 10°57.145' 10°57.069' 10°57.45' 10°57.692' 10°37.592' 10°37.592' 10°37.592'	036°32.116' 038°52.116' 038°34.353' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.146' 036°17.396' 036°16.635' 036°16.635' 036°16.635' 036°16.635' 036°16.635' 036°16.635' 036°16.635' 036°12.394' 036°12.324' 036°12.324' 036°12.324' 036°12.324' 036°12.324' 036°12.324' 036°11.953' 036°11.953' 036°11.668' 036°11.668' 036°11.668' 036°11.601' 036°12.647' 036°12.647' 036°12.644' 036°1	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 1906.8 1990.6 2012.2 2078.6 2014.5 2010.0 2051.6 2045.2 25.0 72.9 54.8	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m number of filled tubes: 10 core length: 10.40m shallow cast deep cast shallow cast deep cast first file: SLF1604090200, last file: SLF1604091050
465-3 466-1 466-2 466-3 466-4 466-5 466-6 468-1 468-2 468-3 469-1 468-3 469-1 469-2 469-3 470-1 470-5 471-1 472-1	87-3 87-3 88-1 9 Francis 89-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 93-3 94-1 95-1 95-2 95-3 96-1 97-2 97-3 97-4 97-5 98-1 99-1 100-1 100-2	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16	GC Pump CTD MN MN CTD MN CTD MN Pump CTD MUC GC Pump CTD MUC PC Pump MN MN CTD MN MN CTD MN MN CTD MN MN CTD	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07 18:29 20:23 21:19 21:53 22:51 23:44 00:03 00:56 10:59 13:19 11:54 12:02	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.098' 10°57.098' 10°57.687' 10°56.662' 11°00.246' 10°52.117' 10°52.122' 10°52.054' 10°56.674' 10°56.674' 10°56.674' 10°56.674' 10°56.674' 10°56.674' 10°56.851' 10°56.851' 10°57.145' 10°57.069' 10°57.145' 10°57.069' 10°57.480' 10°27.865' 10°34.946'	036°32.116' 038°52.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.396' 036°17.396' 036°16.635' 036°16.635' 036°22.855' 036°22.686' 036°22.855' 036°22.602' 036°12.234' 036°12.234' 036°12.234' 036°10.858' 036°10.858' 036°10.858' 036°11.953' 036°10.858' 036°11.668' 036°11.668' 036°11.602' 036°12.647' 036°12.647' 036°15.036' 036°16.024' 036°16.021'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 1990.6 2012.2 2078.6 2014.5 2010.0 2051.6 2045.2 25.0 72.9 54.8 55.9	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m number of filled tubes: 10 core length: 10.40m shallow cast deep cast shallow cast deep cast shallow cast deep cast first file: SLF1604090200, last file: SLF1604091050 14 bottles
465-3 466-1 466-2 466-3 466-4 466-5 466-6 468-1 468-2 468-3 469-1 468-3 469-1 469-3 470-1 470-2 470-3 470-4 470-5 471-1	87-3 87-3 88-1 9 Francis 89-1 90-2 90-3 90-4 90-5 90-6 91-1 92-1 93-3 94-1 95-1 95-2 95-3 96-1 97-2 97-3 97-4 97-5 98-1 99-1 100-2 400-2	06/04/16 06/04/16 06/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 07/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 08/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16 09/04/16	GC Pump CTD MN MN CTD MN CTD MN Pump MBPS CTD MUC GC Pump CTD MUC GC Pump CTD MUC PC Pump MN MN CTD MN MN CTD MN MN CTD	17:55 20:16 13:55 16:21 16:42 17:35 18:39 19:05 20:02 21:13 10:05 12:16 13:17 14:18 13:23 17:07 18:29 20:23 21:19 21:53 22:51 23:44 00:03 00:56 10:59 13:19 11:54 12:02	13°58.646' 13°58.646' 13°38.037' 11°08.733' 10°57.520' 10°57.848' 10°57.100' 10°57.098' 10°57.098' 10°57.687' 10°56.662' 11°00.246' 10°52.117' 10°52.122' 10°52.054' 10°52.054' 10°56.480' 10°56.720' 10°56.720' 10°56.720' 10°56.745' 10°57.069' 10°57.145' 10°57.069' 10°57.445' 10°57.455' 10°57.455' 10°57.455' 10°57.455' 10°57.455' 10°57.455' 10°57.455' 10°57.455' 10°57.455' 10°34.946' 10°34.946'	036°32.116' 038°34.353' 036°26.519' 036°17.005' 036°17.620' 036°17.620' 036°17.620' 036°17.623' 036°17.146' 036°17.396' 036°16.635' 036°16.635' 036°22.855' 036°22.686' 036°22.855' 036°22.602' 036°12.234' 036°12.234' 036°12.234' 036°12.324' 036°11.356' 036°11.356' 036°11.688' 036°11.688' 036°11.6870' 036°11.6870' 036°11.6870' 036°11.6870' 036°11.6870' 036°11.6021' 036°12.647' 036°15.036' 036°16.021' 036°16.021' 026910.000'	47.0 47.0 597.2 2116.9 2002.4 2038.9 2011.3 1950.2 2142.1 1760.9 2223.3 40.0 949.2 952.7 939.1 954.5 1916 1990.6 2012.2 2078.6 2014.5 2010.0 2051.6 2045.2 25.0 72.9 54.8 55.9 55.4	23 bottles shallow cast deep cast 24 bottles shallow cast deep cast 24 bottles shallow cast deep cast first file: SLF1604072049. last file: SLF1604080949 23 bottles number of filled tubes: 12 core length: 6.56m number of filled tubes: 10 core length: 10.40m shallow cast deep cast shallow cast deep cast first file: SLF1604090200, last file: SLF1604091050 14 bottles 3x surface samples Brazil, 1x
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						1		
								samples: forams (geochem),
		/ /						bulk geochem
474-1	102-1	09/04/16	CTD	16:48	10°40.394'	036°03.877'	1327.7	19 bottles
474-2	102-2	09/04/16	MUC	17:58	10°40.812'	036°03.193'	1296.1	no recovery
								number of filled tubes: 1;
474-3	102-3	09/04/16	MUC	19:03	10°40.773'	036°03.145'	1310	samples: forams (geochem)
474-4	102-4	09/04/16	GC	20:21	10°40.626'	036°03.161'	1285.1	core length: 6.56m
474-5	102-5	09/04/16	MUC	21:30	10°39.822'	036°02.771'	1355.1	number of filled tubes: n/a
	103-1	09/04/16	Pump	20:53	10°40.312'	036°03.188'	1212.3	
		09/04/16-						first file: SLF1604093254; last
475-1	104-1	10/04/16	MBPS	09:34	11°00.125'	036°24.422'	1659.0	file: SLF1604100932
	105-1	10/04/16	Pump	14:13	10°42.614'	036°08.358'	1073.5	
476-1	106-1	10/04/16	CTD	12:51	10°41.990'	036°07.858'	1141.3	21 bottles
								number of filled tubes: 6;
								samples: forams (geochem),
								bulk geochem., mineralo-
476-2	106-2	10/04/16	MUC	14:03	10°42.397'	036°08.199'	1039.2	gy/sedimentology, organics
476-3	106-3	10/04/16	PC	15:40	10°42.593'	036°08.305'	1022.6	core length: 4.75m
								2x surface sample, 1x liner
477-1	107-1	10/04/16	BC	17:36	10°41.643'	036°09.058'	957.6	(60cm)
478-1	108-1	10/04/16	CTD	18:56	10°39.702'	036°10.589'	691.2	21 bottles
478-2	108-2	10/04/16	MUC	19:38	10°39.670'	036°10.529'	692.9	number of filled tubes: 12
478-3	108-3	10/04/16	GC	20:39	10°39.699'	036°10.552'	694.1	core length: 3.87m
	109-1	10/04/16	Pump	20:32	10°39.767'	036°10.625'	695.2	
479-1	110-1	10/04/16	MN	21:32	10°41.779'	036°09.744'	1004.2	shallow cast
479-2	110-2	10/04/16	MN	22:30	10°41.310'	036°09.238'	943.6	deep cast
479-3	110-3	10/04/16	MN	22:49	10°41.440'	036°09.420'	938.5	shallow cast
479-4	110-4	10/04/16	MN	23:47	10°40.789'	036°09.096'	981.1	deep cast
								first file: SLF1604110052; last
480-1	111-1	11/04/16	MBPS	09:50	10°40.170'	036°26.115'	53.0	file: SLF1604110946
481-1	112-1	11/04/16	Bucket	10:47	10°36.060'	036°19.203'	59.7	
481-2	112-2	11/04/16	CTD	11:11	10°36.065'	036°19.204'	59.7	12 bottles
								number of filled tubes: 12;
481-3	112-3	11/04/16	MUC	11:19	10°36.063'	036°19.202'	61.2	surface samples
	113-1	11/04/16	Pump	14:15	10°41.301'	036°26.607'	47.2	· · ·
482-1	114-1	11/04/16	Bucket	12:07	10°38.952'	036°23.202'	58.0	
482-2	114-2	11/04/16	CTD	12:21	10°38.952'	036°23.201'	56.8	9 bottles
								number of filled tubes: 12;
482-3	114-3	11/04/16	MUC	12:32	10°38.951'	036°23.202'	54.6	surface samples
483-1	115-1	11/04/16	Bucket	14:05	10°41.296'	036°26.606'	46.7	
483-2	115-2	11/04/16	CTD	14:20	10°41.297'	036°26.606'	46.6	8 bottles
483-3	115-3	11/04/16	MUC	14:32	10°41.301'	036°26.608'	46.3	number of filled tubes: 12
483-4	115-4	11/04/16	GC	15:20	10°41.297'	036°26.590'	45.8	core length: 7.76m
								number of filled tubes: 12:
481-3	112-3	11/04/16	MUC	11:19	10°36.063'	036°19.202'	61.2	surface samples
	113-1	11/04/16	Pump	14:15	10°41.301'	036°26.607'	47.2	
482-1	114-1	11/04/16	Bucket	12:07	10°38.952'	036°23.202'	58.0	
482-2	114-2	11/04/16	CTD	12:21	10°38.952'	036°23.201'	56.8	9 bottles
								number of filled tubes: 12
482-3	114-3	11/04/16	MUC	12:32	10°38.951'	036°23.202'	54.6	surface samples
483-1	115-1	11/04/16	Bucket	14:05	10°41.296'	036°26.606'	46.7	
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Abbreviations

- GC
- gravity corer multibeam/Parasound MBPS
- ΜN multi closure net
- MUC multicorer
- piston corer PC
- ship's pump filtrate Van Veen Grab Pump
- VVG