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Short Cruise Report

METEOR M152

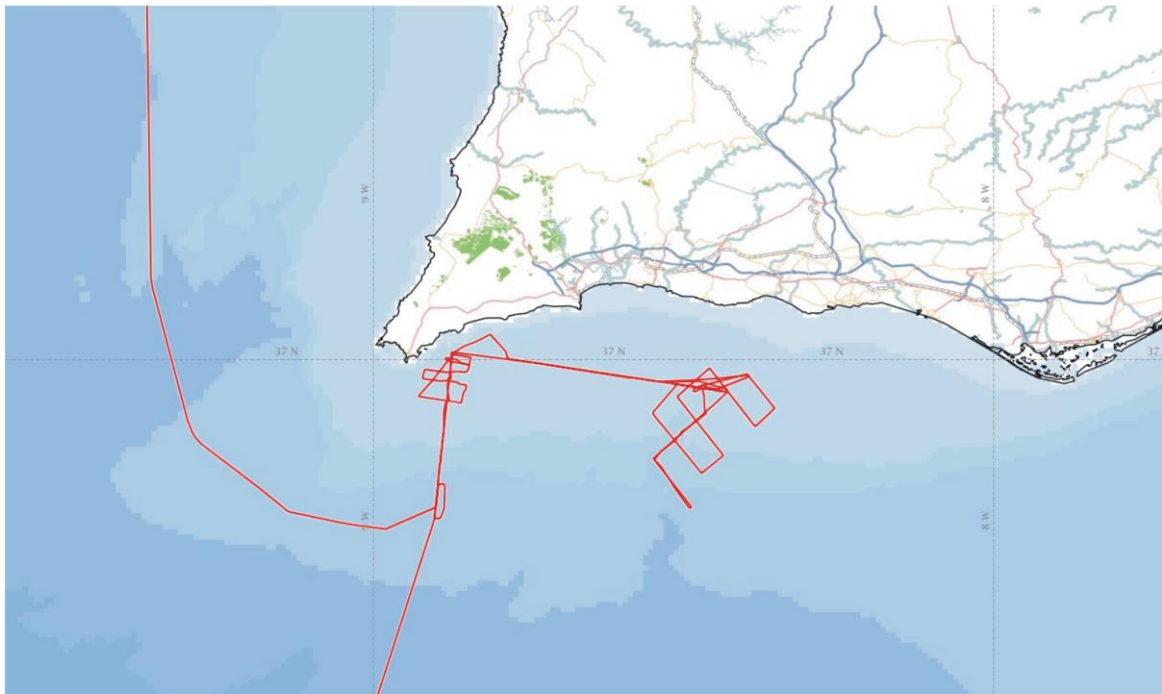
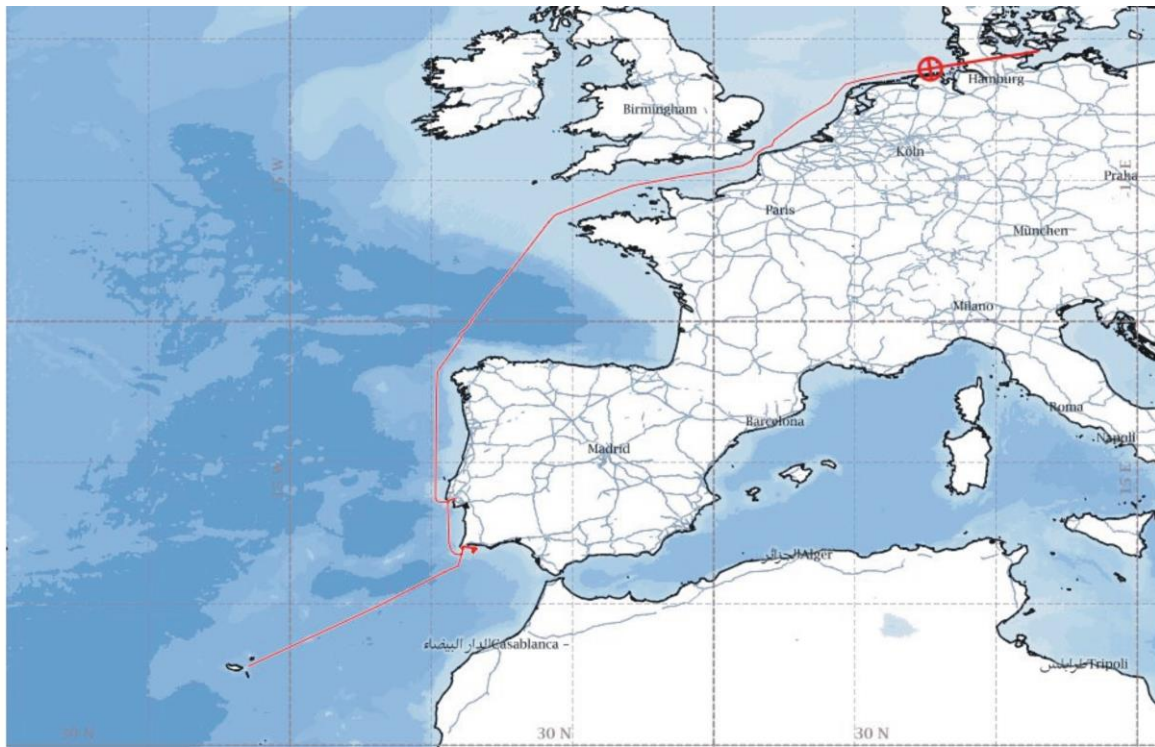
"LISBON 1755"



Funchal, Madeira (Portugal) – Hamburg (Germany)
02. – 14. November 2018

Chief Scientist: Prof. Dr. Klaus Reicherter
Captain: Rainer Hammacher

Ship track of M152



FS METEOR

Cruise M152
Funchal - Hamburg
02.11.2018 - 14.11.2018



Objectives

The aim of the interdisciplinary expedition M152 bringing together geologists, biologists, ecotoxicologists, coastal engineers, geographers, marine hydrologists and more was to map and sample a coast-parallel transect and two transects perpendicular to the coast of the Algarve off Portugal. This part of the coast was heavily affected by tsunami inundation exactly 263 years ago on All Saints Day 1755 following a strong earthquake offshore. Deposits of the Lisbon 1755 tsunami have been well studied along the southern Portuguese coast, but the impact of back-wash, the retreating flood into the sea has not been well understood and studied yet.

Hydroacoustic profiling and drilling of short sediment cores were our major goals during expedition M152.

In our research we focus on the following scientific questions:

- Do we find variations in thickness and sediment composition, distribution and preservation of the tsunami layer?
- What effects on benthic life after tsunami deposition can be observed?
- Can we develop a tool for the identification of historic and prehistoric tsunami deposits on the shelf?
- Can we detect predecessor events along the Algarve coast, and obtain information about timing, frequency and magnitude of these natural hazards?

Scientific program:

Sediment cores of ocean floor deposits off Portugal along the Algarve coast serve as proxies for the effects of the Lisbon 1755 tsunami. In the focus of expedition M152 was a mapping of the sea bottom by hydroacoustic methods and coring (gravity and vibro coring) of sediments in varying water depths. Basically, the study area stretches between Portimão and Sagres where the rocky Algarve coast is situated. On the contrary, the sand banks and bars along the sandy Algarve coast (Faro) prevented the landfall of the tsunami according to reports. We already obtained samples from Boca do Río and other areas onshore that serve for comparison between on- and offshore cores. To date no data on back-wash deposits are available from other areas, so this is unknown terrain, especially in deeper water depth.

Furthermore, we collected pre- and post-tsunami deposits (the background sedimentation) along the transects. These are used for comparison, e.g. of the benthic life and its resilience. Of course, other proxies such as geochemistry and physical properties are included as well.

Radiocarbon (^{14}C) and optically stimulated luminescence (OSL) dating methods are used for establishing a geochronological framework and to estimate ages of predecesing events identified in the sediment cores.

Narrative

The cruise 152 of the German research vessel RV METEOR was called “LISBON 1755”. We left Funchal harbor/Madeira Island on early Friday morning on schedule. Some participants arrived just three hours before the departure of METEOR due to turbulence in the air traffic and cancelled flights. We left berth 2 at 05:30 am and clearing it for the huge cruise ships. Before that we had placed and towed containers on the working deck and set up our labs.

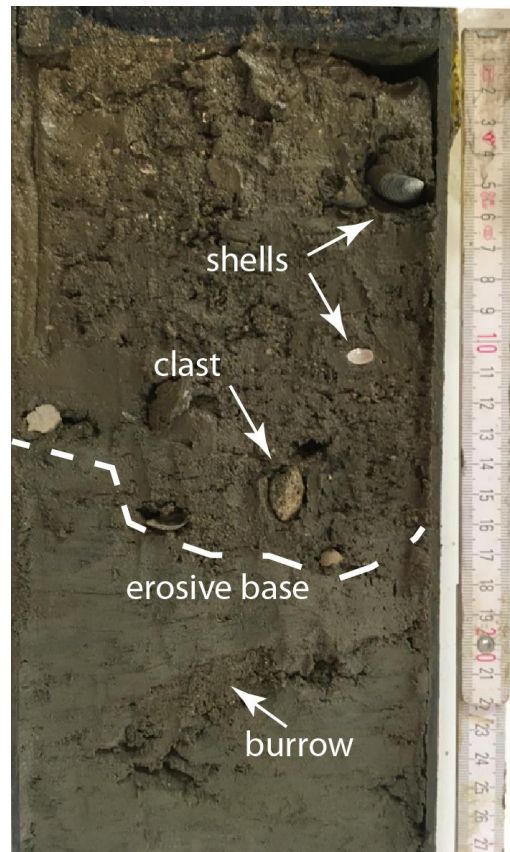


Research vessel RV METEOR in the harbor of Funchal/Madeira

Our short expedition lead us from Funchal to the Algarve coast of Portugal, later on via the Bay of Biscay to Hamburg, where RV METEOR entered the wharf for refurbishing. The team was composed of researchers from RWTH Aachen University, Cologne and Mainz universities, and the hydroacoustic team of Prof. Huhn of MARUM and Univ. of Bremen. The Portuguese team of Dr. Pedro Costa and the Hydrological Institute and a Spanish colleague of Complutense Univ. Madrid supplemented the scientific crew. On November 4th, the German research vessel METEOR reached the target area off and along the western Algarve coast. We started bathymetric and Parasound mapping in water depths of 800 to 60 meters. The special focus was on the eastern Portimão and the western Sagres/Martinhal transects, close to the famous Boca do Rio outcrops. Our scientific program mainly resembled gravity and vibracoring and collection of micro-plastics. After a gravity coring campaign in water depths of 200 and 500 m, we started our vibracoring program on the shelf platform in water depths shallower than 100 m. On Nov 6th, when we had accomplished our drilling program, we had retrieved ca. 80 m of core material. Additionally, we had the chance to obtain seafloor sediments by grab sampling. The micro-plastic collecting catamaran worked fine at speeds of 4 kn, and collected many samples during station transit. In the evening of Nov 6th, we dismantled and stored the vibracorer and the other equipment. After midnight we took course to Lisbon harbor, where we arrived during late afternoon of Nov 7th. After a little bumpy cruise off western Portugal, we entered the Tejo and reached the harbor of the beautiful city of Lisbon in sunny weather around 04:30 pm, half of the scientific crew left the ship.



After sampling of the sea floor the vibracorer returns on board RV METEOR



Gravity core with event layer



Participants of the METEOR Expedition M152 "Lisbon 1755"

We started opening and cutting cores on board, measured magnetic susceptibility, hand-held XRF, and sampled some layers for dating (^{14}C , OSL) and organic geochemistry during the next 6 days on the transit from Lisbon to Hamburg. As first results, we found a high-energy layer at a depth of approx. 16-20 cm depth in many cores (photo), characterized by an erosive base, shell debris and well-rounded extra-clasts of fluvial origin. A much bigger surprise was the finding of a second layer at depths of around 150-180 cm with indications of a high-energy depositional environment. Both of the layers are found within cores of the two transects; they are preliminarily interpreted as two events.

Our expedition was very successful, our hopes and expectations were by far exceeded. Since we got duplicates of many cores, it will be possible to apply many research tools from different disciplines on these valuable sediments from the shelf and the continental rise.

Acknowledgements

We thank the entire crew lead by Captain Rainer Hammacher for their support and patience during the short cruise M152. It was three intensive days work off the Algarve back on the way to the home base of RV Meteor. We sailed storm in the Bay of Biscay together, celebrated 11th Nov – start of the Carnival season – on board, and reached the docks in Hamburg safely. Thanks are extended to the German Science Foundation for financial support and the Leitstelle Deutsche Forschungsschiffe for helping with all the little administrative things. A big “Thank you” goes to Andreas and Holger of the METEOR on board weather service of the DWD; their exact weather forecasting helped us to successfully plan the expedition.

Participants list

Name	Institute	Discipline
Reicherter, Klaus	NUG Aachen	chief scientist
Andrade, César	IDL Lisbon	coastal science, tsunami science
Bartzke, Gerhard	MARUM Bremen	hydroacoustics
Bellanova, Piero	NUG & LEK Aachen	tsunami science, geochemistry
Brückner, Helmut	GEO Köln	OSL dating, tsunami science
Costa, Pedro	IDL Lisbon	tsunami science
Deutschmann, Björn	ESA Aachen	ecotoxicology
Duarte, João Francisco	IH Lisbon	technician, marine science
Eichner, Daniela	NUG Aachen	student, tsunami science
Fatela, Francisco	IDL Lisbon	paleontology, marine science
Feist, Lisa	NUG Aachen	student, tsunami science
Frenken, Mike	NUG & LEK Aachen	tsunami science, geochemistry
Hadler, Hanna	NHR+G Mainz	paleontology, tsunami science
Höbig, Nicole	NUG Aachen	paleontology, paleoclimate
Hönekopp, Leonie	MARUM Bremen	student, hydroacoustics
Jens, Holger	DWD	meteorology
Koch, Lena	NHR+G Mainz	student, tsunami science
Köhler, Tamara	NHR+G Mainz	student, tsunami science
Kuhlmann, Jannis	MARUM Bremen	hydroacoustics
Lapa, Nuno	IH Lisbon	technician, marine science
Lechthaler, Simone	IWW Aachen	micro plastic
Mathes-Schmidt, Margret	NUG Aachen	paleontology, tsunami science
Pallapies, Kilian	MARUM Bremen	student, hydroacoustics
Pombo, Joaquim	IH Lisbon	technician, marine science
Raeke, Andreas	DWD	meteorology
Santisteban, Juan	GEP Madrid	paleontology, paleoclimate
Schüttrumpf, Holger	IWW Aachen	coastal engineering
Schwarzbauer, Jan	LEK Aachen	geochemistry
Silva, Ana Nobre	IDL Lisbon	coastal science
Vött, Andreas	NHR+G Mainz	tsunami science

Participating institutions

NUG

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IH

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GEP

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Facultad de Ciencias Geológicas, Complutense University of Madrid
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DWD

Deutscher Wetterdienst
Seeschiffahrtsberatung
Bernhard-Nocht-Straße 76
20359 Hamburg, Germany

Stations list

Station	Date / Time UTC	Device	Action	Latitude	Longitude	Depth (m)	Comment
M152_1-1	04/11/2018 01:03	XSV	in the water	36° 44,581' N	008° 54,140' W	500	
M152_1-1	04/11/2018 01:19	XSV	information	36° 45,893' N	008° 53,998' W	0	not successful
M152_1-1	04/11/2018 01:32	XSV	in the water	36° 46,899' N	008° 53,893' W	0	
M152_1-1	04/11/2018 01:37	XSV	information	36° 47,221' N	008° 53,857' W	0	
M152_2-1	04/11/2018 02:19	MB-PS	profile start	36° 44,723' N	008° 54,158' W	676	
M152_2-1	04/11/2018 12:06	MB-PS	profile end	36° 45,696' N	008° 29,323' W	740	
M152_3-1	04/11/2018 11:47	XSV	in the water	36° 47,376' N	008° 30,648' W	407	
M152_3-1	04/11/2018 11:50	XSV	station end	36° 47,128' N	008° 30,452' W	442	
M152_4-1	04/11/2018 12:46	GC	in the water	36° 50,181' N	008° 32,875' W	476	
M152_4-1	04/11/2018 12:56	GC	max depth/on ground	36° 50,182' N	008° 32,872' W	475	
M152_4-1	04/11/2018 12:56	GC	hoisting	36° 50,182' N	008° 32,872' W	477	
M152_4-1	04/11/2018 13:09	GC	on deck	36° 50,182' N	008° 32,873' W	478	
M152_5-1	04/11/2018 13:35	GC	in the water	36° 50,183' N	008° 32,873' W	477	
M152_5-1	04/11/2018 13:47	GC	max depth/on ground	36° 50,182' N	008° 32,873' W	476	
M152_5-1	04/11/2018 13:47	GC	hoisting	36° 50,182' N	008° 32,873' W	476	
M152_5-1	04/11/2018 14:04	GC	on deck	36° 50,182' N	008° 32,873' W	478	
M152_6-1	04/11/2018 14:21	PN	in the water	36° 50,392' N	008° 32,771' W	428	
M152_6-1	04/11/2018 14:23	PN	on deck	36° 50,443' N	008° 32,720' W	416	
M152_6-1	04/11/2018 14:30	PN	in the water	36° 50,678' N	008° 32,510' W	419	
M152_6-1	04/11/2018 14:34	PN	on deck	36° 50,775' N	008° 32,432' W	435	
M152_7-1	04/11/2018 15:28	GC	in the water	36° 52,329' N	008° 30,789' W	335	
M152_7-1	04/11/2018 15:37	GC	max depth/on ground	36° 52,329' N	008° 30,789' W	338	
M152_7-1	04/11/2018 15:37	GC	hoisting	36° 52,329' N	008° 30,789' W	338	
M152_7-1	04/11/2018 15:49	GC	on deck	36° 52,329' N	008° 30,789' W	338	
M152_8-1	04/11/2018 15:58	PN	in the water	36° 52,445' N	008° 30,706' W	329	
M152_8-1	04/11/2018 16:07	PN	on deck	36° 52,666' N	008° 30,348' W	191	
M152_9-1	04/11/2018 16:54	GC	in the water	36° 52,678' N	008° 30,403' W	219	
M152_9-1	04/11/2018 17:03	GC	max depth/on ground	36° 52,675' N	008° 30,405' W	221	
M152_9-1	04/11/2018 17:04	GC	hoisting	36° 52,675' N	008° 30,406' W	220	
M152_9-1	04/11/2018 17:13	GC	on deck	36° 52,676' N	008° 30,405' W	220	
M152_10-1	04/11/2018 17:22	PN	in the water	36° 52,752' N	008° 30,380' W	205	
M152_10-1	04/11/2018 18:03	PN	on deck	36° 54,647' N	008° 27,983' W	112	
M152_11-1	04/11/2018 18:22	VC	in the water	36° 54,853' N	008° 27,964' W	111	
M152_11-1	04/11/2018 18:58	VC	max depth/on ground	36° 54,853' N	008° 27,957' W	111	
M152_11-1	04/11/2018 19:23	VC	on deck	36° 54,853' N	008° 27,958' W	112	
M152_12-1	04/11/2018 19:41	PN	in the water	36° 54,950' N	008° 27,988' W	111	
M152_12-1	04/11/2018 20:17	PN	on deck	36° 57,058' N	008° 28,210' W	82	
M152_13-1	04/11/2018 20:42	VC	in the water	36° 57,184' N	008° 28,281' W	77	
M152_13-1	04/11/2018 20:49	VC	max depth/on ground	36° 57,183' N	008° 28,281' W	77	
M152_13-1	04/11/2018 21:08	VC	on deck	36° 57,183' N	008° 28,281' W	77	electrical failure
M152_13-2	04/11/2018 22:29	VC	in the water	36° 57,179' N	008° 28,280' W	79	
M152_13-2	04/11/2018 22:35	VC	max depth/on ground	36° 57,182' N	008° 28,283' W	78	
M152_13-2	04/11/2018 22:50	VC	on deck	36° 57,184' N	008° 28,282' W	78	gear lost
M152_13-3	04/11/2018 23:09	VC	in the water	36° 57,173' N	008° 28,274' W	79	
M152_13-3	04/11/2018 23:16	VC	max depth/on ground	36° 57,173' N	008° 28,275' W	79	
M152_13-3	04/11/2018 23:30	VC	on deck	36° 57,173' N	008° 28,275' W	79	
M152_14-1	05/11/2018 00:25	MB-PS	profile start	36° 57,233' N	008° 28,763' W	70	
M152_14-1	05/11/2018 06:28	MB-PS	profile end	36° 54,384' N	008° 32,777' W	106	
M152_15-1	05/11/2018 07:58	VC	in the water	36° 57,564' N	008° 30,878' W	66	
M152_15-1	05/11/2018 08:06	VC	max depth/on ground	36° 57,563' N	008° 30,876' W	66	
M152_15-1	05/11/2018 08:25	VC	on deck	36° 57,565' N	008° 30,874' W	66	
M152_16-1	05/11/2018 08:41	PN	in the water	36° 57,580' N	008° 30,656' W	64	

M152_16-1	05/11/2018 09:02	PN	on deck	36° 57,284' N	008° 28,976' W	67
M152_17-1	05/11/2018 09:17	VC	in the water	36° 57,260' N	008° 28,703' W	69
M152_17-1	05/11/2018 09:24	VC	max depth/on ground	36° 57,260' N	008° 28,702' W	69
M152_17-1	05/11/2018 09:44	VC	on deck	36° 57,259' N	008° 28,703' W	69
M152_17-2	05/11/2018 10:25	VC	in the water	36° 57,251' N	008° 28,708' W	71
M152_17-2	05/11/2018 10:33	VC	max depth/on ground	36° 57,250' N	008° 28,709' W	70
M152_17-2	05/11/2018 11:00	VC	on deck	36° 57,251' N	008° 28,707' W	70
M152_18-1	05/11/2018 11:12	PN	in the water	36° 57,396' N	008° 28,321' W	71
M152_18-1	05/11/2018 11:18	PN	on deck	36° 57,460' N	008° 27,943' W	72
M152_19-1	05/11/2018 12:27	VC	in the water	36° 57,408' N	008° 28,055' W	73
M152_19-1	05/11/2018 12:34	VC	max depth/on ground	36° 57,408' N	008° 28,056' W	73
M152_19-1	05/11/2018 12:39	VC	hoisting	36° 57,410' N	008° 28,053' W	73
M152_19-1	05/11/2018 12:51	VC	on deck	36° 57,410' N	008° 28,054' W	73
M152_20-1	05/11/2018 13:18	PN	in the water	36° 57,230' N	008° 27,844' W	82
M152_20-1	05/11/2018 13:38	PN	on deck	36° 57,054' N	008° 26,703' W	93
M152_21-1	05/11/2018 14:06	VC	in the water	36° 56,963' N	008° 26,894' W	93
M152_21-1	05/11/2018 14:20	VC	max depth/on ground	36° 56,963' N	008° 26,893' W	93
M152_21-1	05/11/2018 14:23	VC	hoisting	36° 56,964' N	008° 26,892' W	94
M152_21-1	05/11/2018 14:37	VC	on deck	36° 56,963' N	008° 26,892' W	94
M152_22-1	05/11/2018 15:25	VC	in the water	36° 56,968' N	008° 26,905' W	92
M152_22-1	05/11/2018 15:40	VC	max depth/on ground	36° 56,968' N	008° 26,906' W	92
M152_22-1	05/11/2018 15:40	VC	hoisting	36° 56,968' N	008° 26,905' W	93
M152_22-1	05/11/2018 15:57	VC	on deck	36° 56,968' N	008° 26,906' W	92
M152_23-1	05/11/2018 16:48	VC	in the water	36° 58,445' N	008° 23,792' W	69
M152_23-1	05/11/2018 17:00	VC	max depth/on ground	36° 58,447' N	008° 23,793' W	70
M152_23-1	05/11/2018 17:14	VC	on deck	36° 58,445' N	008° 23,794' W	71
M152_24-1	05/11/2018 18:35	VC	in the water	36° 58,447' N	008° 23,807' W	69
M152_24-1	05/11/2018 18:46	VC	max depth/on ground	36° 58,447' N	008° 23,808' W	69
M152_24-1	05/11/2018 18:50	VC	hoisting	36° 58,448' N	008° 23,807' W	69
M152_24-1	05/11/2018 19:01	VC	on deck	36° 58,446' N	008° 23,807' W	69
M152_25-1	05/11/2018 19:12	PN	in the water	36° 58,453' N	008° 23,843' W	69
M152_25-1	05/11/2018 19:44	PN	on deck	36° 58,177' N	008° 26,088' W	58
M152_26-1	05/11/2018 20:34	GS	in the water	36° 57,825' N	008° 32,615' W	70
M152_26-1	05/11/2018 20:36	GS	max depth/on ground	36° 57,826' N	008° 32,616' W	69
M152_26-1	05/11/2018 20:40	GS	on deck	36° 57,825' N	008° 32,616' W	70
M152_27-1	05/11/2018 21:05	GS	in the water	36° 58,183' N	008° 35,010' W	71
M152_27-1	05/11/2018 21:07	GS	max depth/on ground	36° 58,179' N	008° 35,010' W	71
M152_27-1	05/11/2018 21:11	GS	on deck	36° 58,181' N	008° 35,009' W	72
M152_28-1	05/11/2018 21:38	PN	in the water	36° 58,168' N	008° 35,054' W	73
M152_28-1	05/11/2018 22:03	PN	on deck	36° 58,425' N	008° 36,787' W	70
M152_29-1	05/11/2018 22:34	GS	in the water	36° 59,226' N	008° 41,880' W	81
M152_29-1	05/11/2018 22:37	GS	max depth/on ground	36° 59,223' N	008° 41,879' W	80
M152_29-1	05/11/2018 22:41	GS	on deck	36° 59,225' N	008° 41,881' W	80
M152_30-1	05/11/2018 23:27	GS	in the water	36° 59,559' N	008° 44,077' W	77
M152_30-1	05/11/2018 23:30	GS	max depth/on ground	36° 59,554' N	008° 44,077' W	77
M152_30-1	05/11/2018 23:33	GS	on deck	36° 59,556' N	008° 44,076' W	78
M152_31-1	06/11/2018 00:09	MB-PS	profile start	36° 59,555' N	008° 44,157' W	78
M152_31-1	06/11/2018 05:35	MB-PS	profile end	37° 00,405' N	008° 52,309' W	68
M152_32-1	06/11/2018 06:27	VC	in the water	37° 00,656' N	008° 52,248' W	66
M152_32-1	06/11/2018 06:45	VC	max depth/on ground	37° 00,656' N	008° 52,247' W	65
M152_32-1	06/11/2018 06:52	VC	hoisting	37° 00,656' N	008° 52,247' W	65
M152_32-1	06/11/2018 07:03	VC	on deck	37° 00,656' N	008° 52,247' W	66
M152_32-2	06/11/2018 08:08	VC	in the water	37° 00,654' N	008° 52,261' W	66
M152_32-2	06/11/2018 08:21	VC	max depth/on ground	37° 00,654' N	008° 52,260' W	65
M152_32-2	06/11/2018 08:34	VC	on deck	37° 00,653' N	008° 52,261' W	65
M152_32-3	06/11/2018 09:20	VC	in the water	37° 00,643' N	008° 52,259' W	66
M152_32-3	06/11/2018 09:28	VC	max depth/on ground	37° 00,643' N	008° 52,258' W	66
M152_32-3	06/11/2018 09:42	VC	on deck	37° 00,643' N	008° 52,259' W	66

M152_33-1	06/11/2018 10:18	VC	in the water	37° 00,469' N	008° 52,455' W	68	
M152_33-1	06/11/2018 10:25	VC	max depth/on ground	37° 00,469' N	008° 52,455' W	69	
M152_33-1	06/11/2018 10:39	VC	on deck	37° 00,468' N	008° 52,454' W	69	
M152_34-1	06/11/2018 11:52	VC	in the water	36° 59,716' N	008° 52,549' W	74	
M152_34-1	06/11/2018 12:07	VC	max depth/on ground	36° 59,717' N	008° 52,549' W	74	
M152_34-1	06/11/2018 12:29	VC	on deck	36° 59,716' N	008° 52,548' W	74	
M152_35-1	06/11/2018 13:26	VC	in the water	36° 58,132' N	008° 52,701' W	88	
M152_35-1	06/11/2018 13:38	VC	max depth/on ground	36° 58,120' N	008° 52,703' W	88	
M152_35-1	06/11/2018 13:49	VC	on deck	36° 58,125' N	008° 52,705' W	88	
M152_36-1	06/11/2018 14:31	VC	in the water	36° 58,114' N	008° 52,704' W	88	
M152_36-1	06/11/2018 14:41	VC	max depth/on ground	36° 58,114' N	008° 52,705' W	88	
M152_36-1	06/11/2018 14:51	VC	on deck	36° 58,114' N	008° 52,703' W	88	
M152_37-1	06/11/2018 15:22	PN	in the water	36° 58,058' N	008° 52,816' W	88	
M152_37-1	06/11/2018 15:53	PN	on deck	36° 56,187' N	008° 52,767' W	110	
M152_38-1	06/11/2018 16:26	VC	in the water	36° 55,950' N	008° 52,938' W	113	
M152_38-1	06/11/2018 16:35	VC	max depth/on ground	36° 55,951' N	008° 52,938' W	113	
M152_38-1	06/11/2018 16:43	VC	hoisting	36° 55,951' N	008° 52,938' W	113	
M152_38-1	06/11/2018 17:02	VC	on deck	36° 55,951' N	008° 52,938' W	112	
M152_38-2	06/11/2018 18:12	VC	in the water	36° 55,940' N	008° 52,939' W	112	
M152_38-2	06/11/2018 18:18	VC	max depth/on ground	36° 55,940' N	008° 52,938' W	112	
M152_38-2	06/11/2018 18:21	VC	hoisting	36° 55,940' N	008° 52,938' W	112	
M152_38-2	06/11/2018 18:30	VC	on deck	36° 55,939' N	008° 52,939' W	112	electrical failure
M152_38-3	06/11/2018 18:57	GS	in the water	36° 55,940' N	008° 52,938' W	112	
M152_38-3	06/11/2018 19:01	GS	max depth/on ground	36° 55,940' N	008° 52,938' W	113	
M152_38-3	06/11/2018 19:05	GS	on deck	36° 55,940' N	008° 52,937' W	112	
M152_39-1	06/11/2018 19:12	PN	in the water	36° 55,862' N	008° 52,941' W	113	
M152_39-1	06/11/2018 20:14	PN	on deck	36° 52,071' N	008° 53,386' W	127	
M152_40-1	06/11/2018 20:29	GS	in the water	36° 51,484' N	008° 53,382' W	133	
M152_40-1	06/11/2018 20:37	GS	max depth/on ground	36° 51,484' N	008° 53,381' W	133	
M152_40-1	06/11/2018 20:41	GS	on deck	36° 51,485' N	008° 53,382' W	133	
M152_41-1	06/11/2018 21:10	GS	in the water	36° 50,041' N	008° 53,542' W	314	
M152_41-1	06/11/2018 21:19	GS	max depth/on ground	36° 50,044' N	008° 53,545' W	314	
M152_41-1	06/11/2018 21:27	GS	on deck	36° 50,042' N	008° 53,545' W	314	
M152_42-1	06/11/2018 22:07	GS	in the water	36° 45,659' N	008° 53,991' W	625	
M152_42-1	06/11/2018 22:22	GS	max depth/on ground	36° 45,662' N	008° 53,993' W	625	
M152_42-1	06/11/2018 22:43	GS	on deck	36° 45,662' N	008° 53,992' W	626	

Used devices

XSV	Expendable Sound Velocimeter
MB-PS	Multibeam and Parasound Profile
GC	Gravity Corer
PN	Plankton Net (Catamaran used for micro plastic sampling)
VC	Vibro Corer
GS	Grab Sampler