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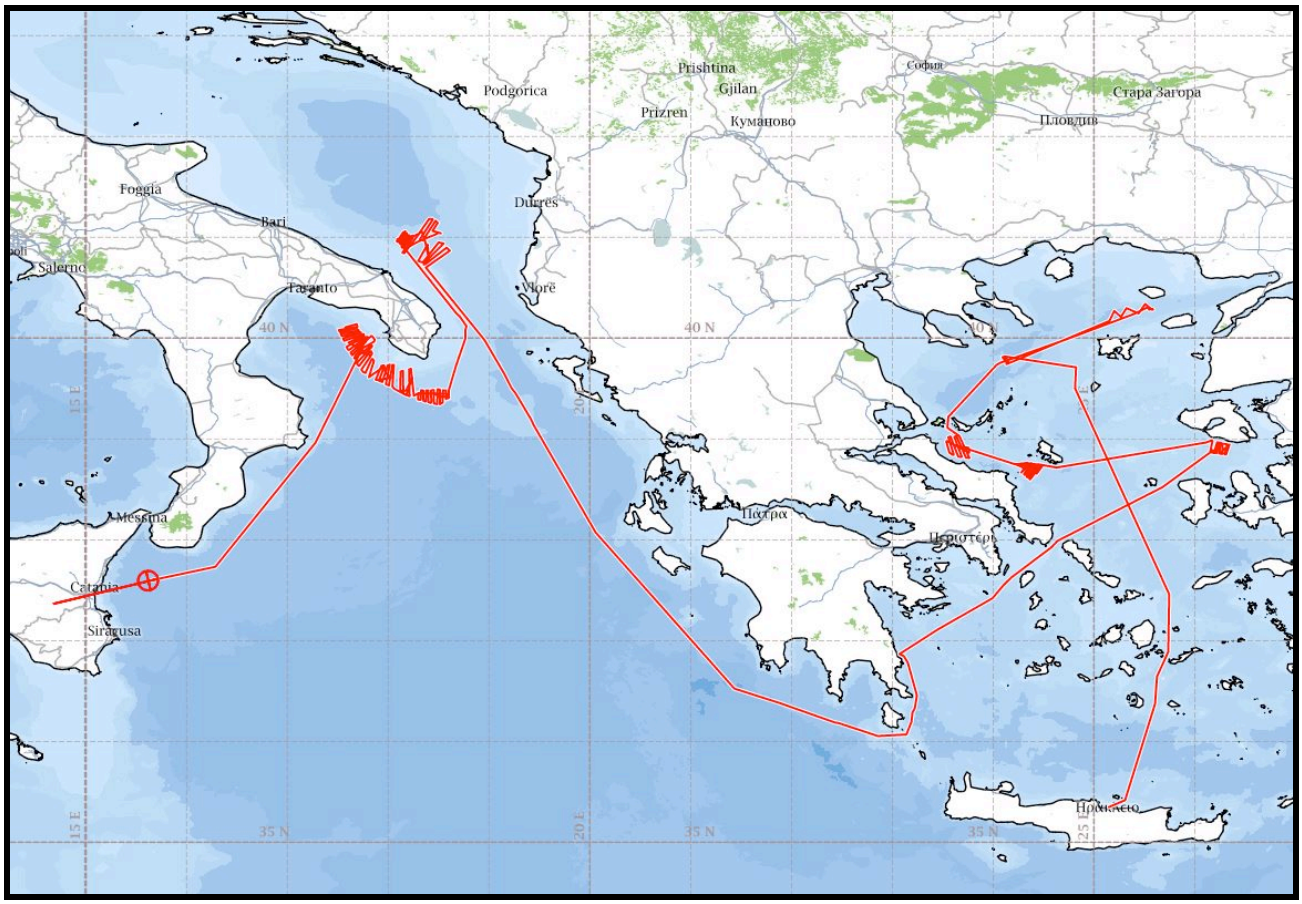
Short Cruise Report
M144

Heraklion (Crete, Greece) – Catania (Sicily, Italy)
December 27, 2017 – January 18, 2018
Chief Scientist: Jörg Pross
Captain: Rainer Hammacher



Objectives

Throughout the Holocene, Mediterranean civilizations have closely interacted with their environment, but it is still unclear to what extent climatic and environmental change has influenced their evolution. At the same time, the onset, early extent and consequences of anthropogenic change in terrestrial and notably in marine ecosystems are yet poorly constrained.

In light of these uncertainties, the main scientific objective of R/V METEOR cruise M144 was to recover core material that will allow to investigate changes in terrestrial and marine ecosystems in the E Mediterranean during the rise of human civilizations in that region. Based on the recovered material from high-deposition-rate, coastal settings, both terrestrial and marine proxy data will be generated; this will yield terrestrial data within a high-quality marine-based age frame. We will assess how climate and human resource demands interacted over the Holocene, both to unravel how environmental change affected socioeconomic evolution during the Holocene and to quantitatively assess the growing impact of settled society and industrialized economies on Mediterranean ecosystem structure and biodiversity.

The overarching research goal can be divided into two major research topics:

(i) The role of Holocene short-term climate and ecosystem change on early cultures

(ii) assessment and quantification of terrestrial and notably marine human-induced environmental change during the Holocene, including the rise of industrial economies.

For both research topics, the recovery of new core material is mandatory; they cannot be resolved via material of previous expeditions. Research Topic (i) requires exceptionally high sedimentation rates and coring locations strategically selected with respect to archeological sites, predominantly from near-coastal settings in the Aegean and Adriatic Seas. Research Topic (ii) inevitably necessitates large amounts of sediment as they are not available through the gravity cores of previous expeditions. Our ‘master records’ of Holocene ecosystem change in the E Mediterranean region will yield critical new insight into the sensitivity *vs*. resilience of Mediterranean civilizations to environmental change and the vulnerability of marine ecosystems to early anthropogenic impact.

Narrative

In the evening of December 27st, 2017, R/V METEOR left the port of Heraklion on Crete. As during nearly the entire cruise, the weather conditions were fair to very good, with only sporadically increased winds; the swell never exceeded 2.5 m.

The first work area off Samothraki was reached after nearly a day of transit. Shortly before reaching the work area, we were contacted by a Turkish naval vessel that claimed that a Turkish permission was required to work in the area. We decided to cancel our work in this area at least for the time being and proceeded to the next work area in the NW Aegean Sea. Upon reaching that area, we immediately started to conduct a multibeam/parasound survey during the night in the search for sites with high sediment accumulation rates as coring targets. However, shortly after parasound work commenced we were contacted by the Greek navy who requested us to return to the first work area and to carry out the previously announced work there because according to them it was situated exclusively in Greek and international waters. Following this request, we immediately transited back into the first work area and started a multibeam/parasound (MBPS) pre-site survey there, and were again contacted by the Turkish navy. After consultation with the German Federal Foreign Office we finished our parasound work and returned to the second work area, escorted by the Greek frigate ELLI that stayed with us until the next morning. On the evening of Friday, December 29th we were able to deploy our gravity-, kasten- and multicorers for the first time: In the close vicinity of the location of core GeoTü SL148, which had been taken during METEOR expedition M51/3 in 2001, we retrieved excellent cores that according to first estimates date back to c. 42 kyrs and – of particular importance with regard to the research objectives of our cruise – contain an apparently complete, high-quality Holocene sequence. Water sampling and CTD profiling completed the scientific program at the site.

After the successful completion of our operations in the second work area we steamed south, reaching the work area centered on the basin east of Euboia and south of the island of Skopelos on Friday, December 30th. With the exception of a short core from the deeper, northern part of the basin that had been recovered in 1982 by the research vessel DISCOVERY, the sedimentary filling of the basin has yet largely remained unexplored. For the scientific objective of our cruise, archives from this work area are of particular relevance because of their strategic position: Their proximal position with regard to the coastline in conjunction with a well-defined catchment area warrants that they contain particularly prominent, well-defined terrestrial signals. At the same time, their direct hinterland harbors not only countless remains from the bronze age, but also numerous prominent archeological sites from pre- and proto-historical periods (e.g., Youra – Paleolithic; Dimini and Seskio – Neolithic). After an extensive multibeam/parasound survey we were able to identify a site with high potential for expanded Holocene sections. Multicorer, gravity corer and kasten corer deployment indeed yielded a highly resolved early Holocene. Notably, the interval corresponding to Sapropel S1 exhibits multiple, quasi-cyclical interruptions of low-oxygen conditions. Water sampling and CTD profiling completed the work program in this area.

After having successfully probed this work area, we steamed southwest in order to take sediment cores from the basin between Euboia and Skyros. Upon arrival on Sunday, December 31th, we pursued the now well-established work flow of exploring the area via a multibeam/parasound survey, again followed by the identification of two sites that promised to yield complete Holocene sections with high deposition rates. From the more proximal, although deeper site (540 m) we retrieved multiple gravity and kasten cores up to 5.6 m long; as in the previous work area, the recovered sapropel S1 exhibits quasi-cyclical interruptions. The more distal, shallower site (390 m) yielded a gravity core that documents sapropel S1 within the first core segment and likely extends beyond the Last Glacial Maximum. At both sites, the multicorer was also deployed.

On the evening of Monday, January 1st, we started a nine-hours-long transect to our next working area, situated within the Greek six-mile zone off southern Lesbos. This area had special relevance with respect to the scientific objectives of the expedition as it can provide insight into the paleoenvironmental conditions along the coast of Asia Minor. The parasound survey suggested the presence of an expanded Holocene section for the southern part of the working area; for the northern part of the area and close to the coast of Lesbos, even higher deposition rates appeared likely. The multicorer, gravity corer and kasten corer based sections retrieved from the southern site confirmed the suspicion of exceptionally high sedimentation rates. The cores reach the lowermost part of Sapropel S1, which again exhibits quasi-cyclical changes in oxygen availability. For the first time during the expedition, we also deployed the multi-closure net.

In the late evening of Tuesday, January 2nd, shortly before we reached the northern, proximal site to be studied within the work area, we were contacted by the Greek authorities. They requested that we terminated our research activities immediately because we had allegedly applied for a research permit from the Turkish authorities. Following the request of the Greek authorities, we stopped our research activities immediately. On January 3rd, we left the work area, thereby following an instruction of the Greek authorities, and steamed towards the work area east of the Peloponnesus. After arriving there on Thursday, January 4th, we awaited further developments in close contact with the German Federal Foreign Office (“Auswärtiges Amt”). Since the re-issuing of the withdrawn permission to carry out research in Greek waters appeared unlikely in the very near future, we left the area and began our transit to the work areas in the Adriatic Sea.

The northern of our two work areas in the Adriatic Sea was reached on the early evening of Saturday, January 6th. After parasound surveys in two parts of the work area we again deployed the multicorer, gravity corer and kasten corer; water sampling and CTD casts was also carried out. The retrieved cores comprise highly resolved Holocene sections; notably, they also include a considerable number of macroscopically visible tephra layers.

On Tuesday, January 9th we left the northern work area and steamed south for nine hours in order to reach the southern work area. Upon arrival and before starting a parasound survey, water sampling and CTD profiling was carried out, and the multi-closure net was deployed.

The days from January 10th onwards were dedicated to the retrieval of further core material from sites with high deposition rates, as well as to water sampling, CTD, and

multi-closure net deployment. Interestingly, at a site for which the parasound survey had indicated the presence of a truncation surface and that we targeted in order to probe older strata (M144-28-1), we recovered deep-water corals. Another site (M 144-33-1) yielded an extended, apparently fully laminated sapropel S1 section.

After completing our last station, we started the transit to Catania on January 17th. We arrived at Catania in the morning of January 18th, where we started to unload our samples and equipment.

Acknowledgments

We would like to express our sincere gratitude to Captain Rainer Hammacher and his crew of the RV METEOR. Their great support and expertise made this cruise a successful voyage. We thank Martin Frank and Dirk Nürnberg for their immense help during the preparation of the cruise. Reederei Briese, LPL/Klaus Bohn, and Ira Weigert (Contiways) have provided great logistic and organizational support. We would like to thank the Greek authorities for their temporary permission to work in the Aegean Sea. The Italian authorities are thanked for issuing us a research permit to work in the Adriatic Sea. Finally, the Leitstelle Deutsche Forschungsschiffe and the German Federal Foreign Office are thanked for administrative support.

M144 Participants

Name	Discipline	Institution
1. Jörg Pross	Fahrtleiter / Chief scientist	UHEIDEL
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3. Melissa Berke	Geochemistry	UND
4. Marie Blum	Geophysics	UH
6. Swaantje Brzelinski	Paleoceanography	UHEIDEL
7. Hernan Campos	Sedimentology	UHEIDEL
8. Maria Carolina Catunda	Geochemistry	UHEIDEL
9. Florian Evers	Technician	GEOMAR
10. Stefanie Kaboth	Paleoceanography	TNU
11. Ulrich Kotthoff	Sedimentology	UH
12. Andreas Koutsodendris	Palynology	UHEIDEL
13.Thomas Krengel	Sedimentology	UHEIDEL
14. Danae Lange	Archeology	UHEIDEL
15. Jörg Lippold	Paleoceanography	UHEIDEL
16. Bertil Mächtle	Sedimentology	UHEIDEL
17. Kyriaki Manta	Geophysics	HCMR
18. Doris Maicher	Sedimentology	GEOMAR
19. Richard Norris	Paleoceanography	SCRIPPS
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21. Alexandra Ravani	Sedimentology	UATHENS
22. Hartmut Schulz	Sedimentology	UTÜ
23. Finn Süfke	Paleoceanography	UHEIDEL
24. Rishi Sugla	Sedimentology	SCRIPPS
25. Vakhrameeva, Polina	Tephrochronology	UHEIDEL
26. Vannacci, Martina	Sedimentology	UHEIDEL
28. Frank Otte	Bordwetterwarte	DWD
29. Andreas Wolfgang Raeke	Bordwetterwarte	DWD

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UATHENS Faculty of Geology and Geoenvironment, National and Kapodistrian University of Athens, 15784, Zografou, Athens, Greece

UTÜ Institute of Geosciences, Universität Tübingen, Hölderlinstraße 12, 72076 Tübingen, Germany

DWD Deutscher Wetterdienst, Seeschifffahrtsberatung, Bernhard-Nocht-Straße 76, 20359 Hamburg, Germany

Stations

Station No.	Date	Gear	Time at depth	Latitude [dec.min]	Longitude [dec.min]	Water Depth	Remarks/ Recovery
M144-			**[UTC]**	**[°N]**	**[°E]**	**[m]**	
WA 6.1 SE Agion Oros							
1-1	28.12.2017	MB_ PS	18:27- 21:52	39° 48,838' N 39° 44,452' N	024° 07,032' E 024° 08,155' E	971.7 1057.5	d = 15 sm
WA 6.2 SW Samothraki							
2-1	29.12.2017	MB_ PS	03:04- 09:00	40° 10,281' N 40° 17,050' N	025° 09,574'E 025° 35,431'E	1133.3 950.2	d = 37 sm
WA 6.1 SE Agion Oros							
3-1	29.12.2017	CTD	19:34	39° 45,232' N	024° 05,760' E	1089,2	9 bottles
3-2	29.12.2017	GC	21:09	39° 45,230' N	024° 05,756' E	1087,5	core length 483 cm, 35 kN
3-3	29.12.2017	MUC	22:09	39° 45,230' N	024° 05,756' E	1086,1	11 tubes
3-4	29.12.2017	GC	23:14	39° 45,229' N	024° 05,756' E	1088,5	core length 404 cm, 34 kN
3-5	29.12.2017	GC	00:10	39° 45,229' N	024° 05,756' E	1091	core length 474 cm, 35.3 kN
3-6	30.12.2017	GC	01:05	39° 45,233' N	024° 05,762' E	1087,3	core length 482 cm, 34.6 kN
3-7	30.12.2017	GC	02:04	39° 45,232' N	024° 05,762' E	1084,7	core length 487 cm, 34.6 kN
3-8	30.12.2017	KC	06:35	39° 45,231' N	024° 05,767' E	1084,7	length 291 cm, 71.7 kN
WA 5.1 S Skopelos							
4-1	30.12.2017- 31.12.2018	MB_ PS	13:10- 04:48	39° 01,265' N 38° 52,449' N	023° 40,202' E 023° 45,619' E	998.4 408.4	
5-1	31.12.2017	GC	5:54	38° 55,537' N	023° 38,683' E	557,7	hose length 500 cm
5-2	31.12.2017	GC	6:48	38° 55,535' N	023° 38,685' E	611,2	core length 500 cm, 31.6 kN
5-3	31.12.2017	GC	07:31	38° 55,535' N	023° 38,685' E	608,5	core length 500 cm, overpenetrated, 31.3 kN
5.4	31.12.2017	CTD	08:48	38° 55,814' N	023° 38,627' E	573,5	no samples
5-5	31.12.2017	MUC	09:58	38° 55,541' N	023° 38,683' E	560,9	11 tubes , 20.5 kN
5-6	31.12.2017	KC	11:00	38° 55,545' N	023° 38,684' E	559,2	core length 345 cm, 69.5 kN
5-7	31.12.2017	KC	12:29	38° 55,547' N	023° 38,683' E	602,1	core length 342 cm, 69.1 kN
5-8	31.12.2017	CTD	13:52	38° 55,474' N	023° 38,970' E	553,9	no samples
WA 5.2 SW Skyros							
6-1	31.12.2017- 01.01.2018	MB_ PS	16:35- 09:05	38° 44,678' N 38° 44,814' N	024° 13,401' E 024° 13,128' E	160.0 138.1	d = 93 sm
7-1	01.01.2018	GC	10:18	38° 43,934' N	024° 20,072' E	533,7	hose length

							500 cm, 28.7 kN
7-2	01.01.2018	GC	11:19	38° 43,928' N	024° 20,078' E	538,8	core length 489 cm, 24,5 kN
7-3	01.01.2018	GC	12:00	38° 43,929' N	024° 20,076' E	544,6	core length 466 cm, 22.5 kN
7-4	01.01.2018	MUC	13:02	38° 43,930' N	024° 20,076' E	560,6	10 tubes , 20.3 kN
7-5	01.01.2018	KC	14:08	38° 43,930' N	024° 20,077' E	537,6	core length 543 cm, 63,9 kN
7-6	01.01.2018	KC	15:33	38° 43,929' N	024° 20,079' E	543	core length 567 cm, 63.2 kN
7-7	01.01.2018	CTD	16:55	38° 44,146' N	024° 20,006' E	546,1	no samples
8-1	01.01.2018	MUC	18:06	38° 44,518' N	024° 27,330' E	389,6	11 tubes, 23.5 kN
8-2	01.01.2018	GC	18:40	38° 44,517' N	024° 27,330' E	389,7	core length 363 cm, 23.9 kN
9-1	02.01.2018	MB_ PS	03:17- 11:03	38° 58,296' N 38° 56,274' N	026° 10,679' E 026° 20,777' E	516.9 461.1	d = 46 sm
10-1	02.01.2018	GC	12:00	38° 51,126' N	026° 14,796' E	438,9	hose length 500 cm
10-2	02.01.2018	GC	12:48	38° 51,126' N	026° 14,795' E	438,8	core length 489 cm, 23.5 kN
10-3	02.01.2018	GC	13:37	38° 51,127' N	026° 14,794' E	439,1	core length 482 cm, 20.9 kN
10-4	02.01.2018	MUC	14:24	38° 51,128' N	026° 14,795' E	437,8	8 tubes, 17.1 kN
10-5	02.01.2018	KC	15:08	38° 51,127' N	026° 14,795' E	437,9	length 496 cm, 62.4 kN
11-1	02.01.2018	CTD	17:14	38° 57,474' N	026° 15,698' E	693,7	no samples
11-2	02.01.2018	MSN	18:28	38° 57,449' N	026° 15,704' E	643,3	sampling depths (x100 m): 6-5, 5-3, 3-2, 2-1, 1-0
11-3	02.01.2018	MSN	19:12	38° 57,449' N	026° 15,703' E	642,9	sampling depths (x100 m): 1-0.8, 0.8-0.6, 0.6-0.4, 0.4-0.2, 0.2-0
12-1	02.01.2018	MB_ PS	19:57- 21:40	38° 57,256' N 38° 52,554' N	026° 15,543' E 026° 10,585' E	643.2 431.1	d = 11sm
WA 2 NW Brindisi							
13-1	06.01.2018- 07.01.2018	MB_ PS	17:01- 05:54	40° 41,955' N 40° 54,787' N	018° 22,626' E 018° 23,135' E	139.3 867.2	d = 76 sm
14-1	07.01.2018	GC	07:35	40° 47,152' N	018° 24,221' E	609,7	hose length 180 cm, 19 kN
14-2	07.01.2018	GC	08:51	40° 47,153' N	018° 24,220' E	615,6	core length 675 cm, 41 kN
14-3	07.01.2018	GC	09:51	40° 47,153' N	018° 24,221' E	616,9	core length 654 cm, 41.5

							kN
14-4	07.01.2018	MUC	10:52	40° 47,153’ N	018° 24,220’ E	612,8	11 tubes, 19.9 kN
14-5	07.01.2018	KC	12:20	40° 47,152’ N	018° 24,219’ E	613,6	length 475 cm, overpenetrated, 58.1 kN
14-6	07.01.2018	CTD	13:59	40° 46,861’ N	018° 24,376’ E	598	no samples
14-7	07.01.2018	CTD	14:30	40° 46,860’ N	018° 24,377’ E	596,8	no samples
14-8	07.01.2018	MSN	15:05	40° 46,860’ N	018° 24,376’ E	596,8	sampling depths (x100 m):5.7-5, 5-3, 3-2, 2-1, 1-0
14-9	07.01.2018	MSN	15:49	40° 46,860’ N	018° 24,376’ E	600	sampling depths (x100 m): 1-0.8, 0.8-0.6, 0.6-0.4, 0.4-0.2, 0.2-0
14-10	07.01.2018	KC	16:33	40° 46,860’ N	018° 24,375’ E	600,8	length 468 cm, 43 kN
15-1	07.01.2018-08.01.2018	MB_PS	18:52-07:00	41° 02,494’ N 41° 03,202’ N	018° 18,926’ E 018° 10,399’ E	967.0 919.1	72 sm
16-1	08.01.2018	GC	08:02	40° 58,566’ N	018° 06,221’ E	427,8	hose length 0 cm!, 18 kN
16-2	08.01.2018	GC	09:17	40° 58,566’ N	018° 06,228’ E	431,8	core length 520 cm, 32.8 kN
16-3	08.01.2018	GC	10:54	40° 58,566’ N	018° 06,228’ E	424,2	core length 623 cm, 40.8 kN
16-4	08.01.2018	MUC	11:44	40° 58,566’ N	018° 06,231’ E	424,7	3 tubes, 18.8 kN
16-5	08.01.2018	CTD	12:39	40° 58,378’ N	018° 06,319’ E	417,5	9 bottles
17-1	08.01.2018	MUC	13:52	40° 58,096’ N	018° 09,783’ E	643	3 tubes, 20.0 kN
17-2	08.01.2018	GC	14:59	40° 58,097’ N	018° 09,783’ E	648,5	core length 612 cm, 40.9 kN
17-3	08.01.2018	CTD	15:49	40° 58,020’ N	018° 09,825’ E	640,9	23 bottles
18-1	08.01.2018	GC	17:19	40° 59,717’ N	018° 13,615’ E	850,1	core length 686 cm, 42 kN
18-2	08.01.2018	MUC	18:20	40° 59,717’ N	018° 13,616’ E	878,2	3 tubes, 20.3 kN
18-3	08.01.2018	CTD	19:33	40° 59,552’ N	018° 13,721’ E	810,6	23 bottles
18-4	08.01.2018	MSN	20:33	40° 59,551’ N	018° 13,722’ E	810,1	sampling depths (x100 m):7-5, 5-3, 3-2, 2-1, 1-0
18-5	08.01.2018	MSN	21:24	40° 59,551’ N	018° 13,719’ E	810	sampling depths (x100 m): 1-0.8, 0.8-0.6, 0.6-0.4, 0.4-0.2, 0.2-0
19-1	08.01.2018-09.01.2018	MB_PS	22:17-06:39	41° 02,382’ N 41° 02,241’ N	018° 18,848’ E 018° 31,359’ E	900.2 914.6	50 sm
20-1	09.01.2018	MUC	07:32	41° 02,504’ N	018° 30,249’ E	920,9	3 tubes

20-2	09.01.2018	GC	08:42	41° 02,506' N	018° 30,264' E	923,5	core length 688 cm, 50.8 kN
20-3	09.01.2018	CTD	10:36	41° 02,394' N	018° 30,304' E	922,8	9 bottles
21-1	09.01.2018	GC	13:12	40° 52,598' N	018° 09,924' E	341,8	core length 688 cm, 41.8 kN
21-2	09.01.2018	MUC	13:54	40° 52,599' N	018° 09,921' E	341,6	3 tubes, 16.5 kN
21-3	09.01.2018	CTD	14:36	40° 52,430' N	018° 10,030' E	350,8	9 bottles
22-1	09.01.2018	MUC	15:49	40° 57,713' N	018° 08,345' E	600,9	3 tubes, 8.3 kN
22-2	09.01.2018	GC	16:42	40° 57,713' N	018° 08,343' E	575,2	core length 618 cm, 39.3 kN
22-3	09.01.2018	CTD	17:36	40° 57,641' N	018° 08,378' E	528,7	23 bottles
22-4	09.01.2018	MSN	18:24	40° 57,642' N	018° 08,378' E	580,4	sampling depths (x100 m): 5-4, 4-3, 3-2, 2-1, 1-0
22-5	09.01.2018	MSN	19:08	40° 57,641' N	018° 08,380' E	532,6	sampling depths (x100 m): 1-0.8, 0.8-0.6, 0.6-0.4, 0.4-0.2, 0.2-0
23-1	09.01.2018	MB_PS	20:15-23:13	41° 00,392' N 40° 51,599' N	018° 14,600' E 018° 11,334' E	833.8 409.1	17 sm
WA 2 S/SW Capo St. Maria di Leuca							
24-1	10.01.2018	CTD	08:31	39° 28,859' N	018° 36,363' E	976,2	23 bottles
24-2	10.01.2018	MSN	10:25	39° 28,858' N	018° 36,363' E	939	sampling depths (x100 m): 7-5, 5-3, 3-2, 2-1, 1-0
24-3	10.01.2018	MSN	11:19	39° 28,858' N	018° 36,363' E	935,2	sampling depths (x100 m): 1-0.8, 0.8-0.6, 0.6-0.4, 0.4-0.2, 0.2-0
25-1	10.01.2018	MB_PS	11:44-07:03	39° 28,863' N 39° 25,159' N	018° 36,411' E 018° 30,542' E	930.5 791.8	114 nm
26-1	11.01.2018	CTD	08:42	39° 24,603' N	018° 36,377' E	981	8 bottles
26-2	11.01.2018	MUC	09.35	39° 24,602' N	018° 36,378' E	978	3 tubes, 18.3 kN
26-3	11.01.2018	GC	10:48	39° 24,603' N	018° 36,378' E	979,3	core length 537 cm, 45.8 kN
27-1	11.01.2018	GC	12:12	39° 25,077' N	018° 30,879' E	795	core length 565 cm, 50.0 kN
27-2	11.01.2018	MUC	13:07	39° 25,076' N	018° 30,880' E	801,9	3 tubes
27-3	11.01.2018	CTD	14:01	39° 25,172' N	018° 30,759' E	793,8	8 bottles
28-1	11.01.2018	GC	15:16	39° 26,841' N	018° 27,095' E	755,1	hose length 060 cm, corals on top, 21.4 kN
28-2	11.01.2018	CTD	16:29	39° 26,841' N	018° 27,095' E	827,8	23 bottles
28-3	11.01.2018	MSN	17:26	39° 26,841' N	018° 27,094' E	825,6	sampling depths (x100

							m):7-5, 5-3, 3-2, 2-1, 1-0
28-4	11.01.2018	MSN	18:18	39° 26,841' N	018° 27,095' E	724,7	sampling depths (x100 m): 1-0.8, 0.8-0.6, 0.6-0.4, 0.4-0.2, 0.2-0
29-1	11.01.2018-12.01.2018	MB_PS	19:15-06:36	39° 26,858' N 39° 28,452' N	018° 18,033' E 018° 10,679' E	1082.4 947.3	68 sm
30-1	12.01.2018	MUC	07:51	39° 36,723' N	018° 14,418' E	411	6 tubes
30-2	12.01.2018	GC	08:39	39° 36,723' N	018° 14,417' E	410,7	hose length 380 cm,19.5 kN
30-3	12.01.2018	GC	09:37	39° 36,723' N	018° 14,418' E	421,8	core length 664 cm, 42.8 kN
30-4	12.01.2018	CTD	10:24	39° 36,644' N	018° 14,438' E	411,6	8 bottles
31-1	12.01.2018	GC	12:24	39° 25,979' N	018° 11,003' E	1219,6	core length 132 cm, 52.4 kN
31-2	12.01.2018	MUC	13:33	39° 25,976' N	018° 11,002' E	1219,7	3 tubes, 25.9 kN
31-3	12.01.2018	CTD	14:47	39° 25,811' N	018° 10,927' E	1245,8	23 bottles
31-4	12.01.2018	MSN	15:52	39° 25,810' N	018° 10,924' E	1246,9	sampling depths (x100 m):7-5, 5-3, 3-2, 2-1, 1-0
31-5	12.01.2018	MSN	16:43	39° 25,812' N	018° 10,926' E	1245	sampling depths (x100 m): 1-0.8, 0.8-0.6, 0.6-0.4, 0.4-0.2, 0.2-0
32-1	12.01.2018-13.01.2018	MB_PS	17:37-06:03	39° 29,606' N 39° 35,056' N	018° 03.932' E 017° 52.809' E	1249.5 1217.5	3 profiles, 83 sm
33-1	13.01.2018	MUC	07:33	39° 36,407' N	018° 01,538' E	946,4	10 tubes, 28.5 kN
33-2	13.01.2018	GC	08:44	39° 36,405' N	018° 01,538' E	944,5	hose length 400 cm,27.1 kN
33-3	13.01.2018	GC	10:18	39° 36,405' N	018° 01,538' E	947,3	core length 569 cm, 52.4 kN
33-4	13.01.2018	CTD	11:26	39° 36,347' N	018° 01,642' E	950,3	8 bottles
33-5	13.01.2018	KC	12:31	39° 36,418' N	018° 01,548' E	945,9	length 463 cm, 52.2 kN
34-1	13.01.2018	MUC	14:22	39° 39,408' N	017° 58,555' E	851	3 tubes, 20.7 kN
35-1	13.01.2018	GC	15:32	39° 42,933' N	017° 57,899' E	242,8	core length 637 cm, 41.6 kN
35-2	13.01.2018	CTD	16:14	39° 43,014' N	017° 57,890' E	238,3	23 bottles
35-3	13.01.2018	MUC	16:47	39° 42,917' N	017° 57,910' E	242,6	3 tubes, 16.3 kN
35-4	13.01.2018	MSN	17:26	39° 42,985' N	017° 57,904' E	239,7	sampling depths (x100 m):2.3-2, 2-1.5, 1.5-1, 1-0.5, 0.5-0

35-5	13.01.2018	MSN	18:02	39° 42,985’ N	017° 57,906’ E	239,5	sampling depths (x100 m): 1-0.8, 0.8-0.6, 0.6-0.4, 0.4-0.2, 0.2-0
36-1	13.01.2018	MB_PS	19:16-12:40	39° 36,955’ N 39° 56,383’ N	017° 48,604’ E 017° 49,541’ E	1298.9 246.1	88 sm
37-1	14.01.2018	XSV	09:32	39° 50,162’ N	017° 41,204’ E	641.4	
38-1	14.01.2018-15.01.2018	MB_PS	20:04-06:26	40° 00,977’ N 39° 57,369’ N	017° 49,973’ E 017° 36,825’ E	218.9 814.7	62 sm
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39-1	15.01.2018	MUC	07:52	39° 49,517' N	017° 49,991' E	222	11 tubes, 14.9 kN
39-2	15.01.2018	GC	08:35	39° 49,517' N	017° 49,990' E	222,1	core length 627 cm, 39.7 kN
39-3	15.01.2018	CTD	11:07	39° 49,509' N	017° 49,996' E	222,1	9 bottles
39-4	15.01.2018	KC	11:53	39° 49,509' N	017° 49,997' E	221,9	length 520 cm, 44.4 kN
40-1	15.01.2018	MUC	13:33	39° 49,787' N	017° 48,003' E	270,8	3 tubes, 14.2 kN
40-2	15.01.2018	GC	14:16	39° 49,786' N	017° 48,003' E	270,7	core length 619 cm, 42.4 kN
41-1	15.01.2018	GC	15:18	39° 51,624' N	017° 42,715' E	554,5	hose length 460 cm, 22.0 kN
41-2	15.01.2018	GC	16:10	39° 51,625' N	017° 42,716' E	570,2	core length 624 cm, 42.2 kN
41-3	15.01.2018	MUC	16:54	39° 51,628' N	017° 42,715' E	479,6	3 tubes, 17.6 kN
41-4	15.01.2018	CTD	17:37	39° 51,581' N	017° 42,537' E	486,5	23 bottles
42-1	15.01.2018-16.01.2018	MB_PS	19:11-06:15	40° 02,250' N 40° 06,.526' N	017° 45,061' E 017° 34,976' E	251.8 435.3	6 profiles, 70 sm
43-1	15.01.2018	MUC	07:36	39° 55,261' N	017° 44,472' E	408,3	10 tubes, 18.5 kN, FTS
43-2	15.01.2018	GC	08:26	39° 55,260' N	017° 44,474' E	408,2	hose length 425 cm, 19.9 kN
43-3	15.01.2018	GC	09:16	39° 55,261' N	017° 44,473' E	406,2	core length 626 cm, 39.0 kN
43-4	15.01.2018	KC	10:43	39° 55,260' N	017° 44,475' E	407,5	length 515 cm, 43.4 kN
43-5	15.01.2018	CTD	12:01	39° 55,284' N	017° 44,301' E	420,2	1 bottle
44-1	16.01.2018	MUC	13:17	39° 57,530' N	017° 46,672' E	304,8	5 tubes, 15.6 kN
44-2	16.01.2018	GC	14:00	39° 57,529' N	017° 46,672' E	304,9	core length 480 cm, 18.7 kN
44-3	16.01.2018	GC	14:54	39° 57,528' N	017° 46,673' E	304,9	core length 618 cm, 40.0 kN
44-4	16.01.2018	CTD	15:25	39° 57,493' N	017° 46,549' E	308,2	no samples, 44.4 kN

FTS: fish tooth sampling; XSV - Expendable Sound Velocimeter, Sound velocity profiler