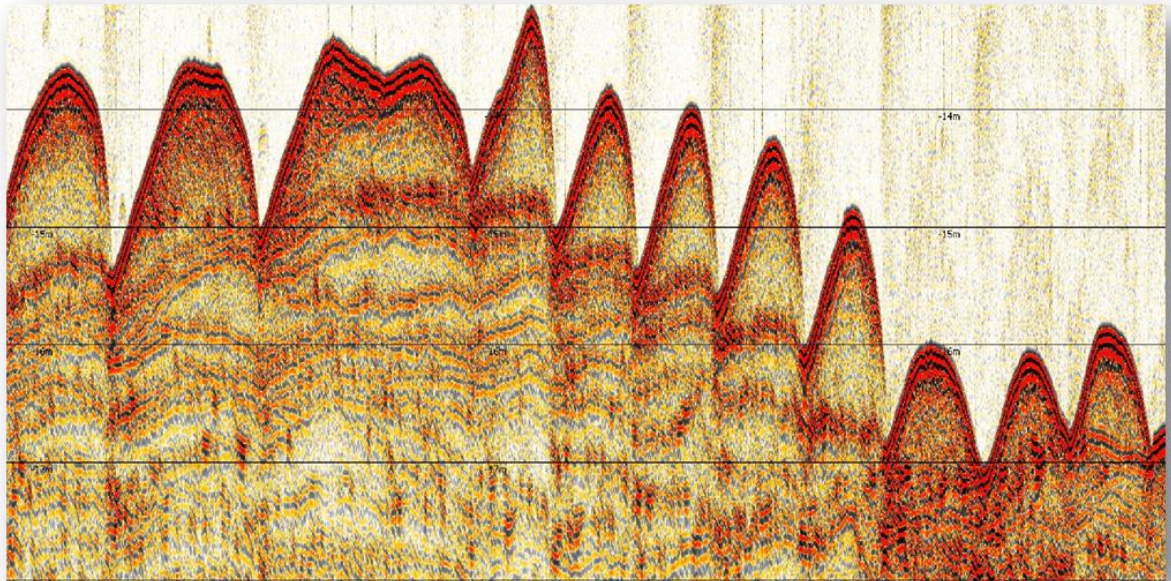


ALKOR -Bericht

MScMarineMeasure

Cruise No. AL536

30.4.2020 – 6.5.2020,
Kiel (Germany) – Kiel (Germany)
GPF 20-1_041



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2020

Table of Contents

1	Cruise Summary.....	3
1.1	Summary in English.....	3
1.2	Zusammenfassung.....	3
2	Participants.....	4
2.1	Principal Investigators.....	4
2.2	Scientific Party.....	4
2.3	Participating Institutions.....	4
3	Research Program.....	5
3.1	Description of the Work Area.....	5
3.2	Aims of the Cruise.....	6
3.3	Agenda of the Cruise.....	6
4	Narrative of the Cruise.....	8
5	Preliminary Results.....	10
6.1	Overall Station List.....	15
7	Data and Sample Storage and Availability.....	18
8	Acknowledgements.....	19

1 Cruise Summary

1.1 Summary in English

Cruise AL 536 had been planned as a teaching course for students of the MSc Marine Geosciences at Christian-Albrechts-Universität Kiel for hands-on experience on standard marine geoscientific instrumentation from Kiel to the Kiel and Mecklenburg Bay, Western Baltic Sea. Following regulations concerning the COVID19 pandemic no field courses for students of CAU were allowed. Anyway the cruise was carried out with a group of scientists from Institute of Geosciences CAU Kiel and instead of teaching in-situ, video footage was generated for later teaching of the students.

The research program was on sedimentological observations of seafloor and subseafloor structures and water column measurements. Research areas were North and East of Fehmarn island, in Mecklenburg Bay, and Kiel Bay. CTD profiles (density, oxygen) and ADCP measurements (velocities) were taken at two cross-sections. Three larger areas were mapped with MBES and SES. Grab samples, 2 box cores and 3 gravity cores were taken.

1.2 Zusammenfassung

Die Ausfahrt AL 536 war als Geländeübung für Studenten des MSc Marine Geosciences an der Christian-Albrechts-Universität Kiel geplant, um praktische Erfahrungen mit Methoden der marinen Geologie zu vermitteln. Wegen der Bestimmungen zur COVID19-Pandemie waren keine Feldkurse für CAU-Studierende möglich. Dennoch wurde die Reise mit einer Gruppe von Wissenschaftlern des Instituts für Geowissenschaften CAU Kiel durchgeführt, um anstatt vor Ort zu unterrichten, Videomaterial für den späteren Unterricht der zu erstellen.

Das Forschungsprogramm befasste sich mit sedimentologischen Beobachtungen von Strukturen am Meeresboden- und Untergrund, sowie Messungen in der Wassersäulen. Die Forschungsgebiete befanden sich nördlich und östlich der Insel Fehmarn in der Mecklenburger Bucht und in der Kieler Bucht. CTD-Profilen (Dichte, Sauerstoff) und ADCP-Messungen (Geschwindigkeiten) wurden an zwei Querschnitten durchgeführt. Drei größere Bereiche wurden mit Fächerecholot MBES und parametrischen Echolot SES kartiert. Greiferproben, 2 Kastengreifer und 3 Schwerelotkerne wurden entnommen.

2 Participants

2.1 Principal Investigators

Name	Institution
Winter, Christian, Prof.	Uni Kiel

2.2 Scientific Party

Name	Discipline	Institution
Prof. Dr. Winter, Christian	Marine Geosciences/Chief Scientist	CAU
Dr. Becker, Marius	Scientist	CAU
Dr. Krämer, Knut	Scientist	CAU
Avares, Tanita	Scientist	CAU
Herbst, Gabriel	Technician	CAU
Soares, Clayton	Student	CAU
Dr. Richter, Peter	Scientist	CAU

2.3 Participating Institutions

CAU Christian-Albrechts-Universität zu Kiel

3 Research Program

3.1 Description of the Work Areas

- Fehmarn transect (AL536_1-1): A transect (German waters only) S-N North of Fehmarn to measure stratification of the water column and possibly an exchange flow situation into and out of the Baltic Sea. Here an ADCP velocity transect and CTD profiles were carried out.
- Mecklenburg Bay transect (AL536_65-1): to measure stratification of the water column. Here an ADCP velocity transect and CTD profiles were carried out.
- Fehmarn North bedform field: A well-known location for the study of the morphology and sedimentology of subaquatic compound dunes.
- Fehmarn East: Study of Sea floor structures: Grab samples, one gravity corer was taken,

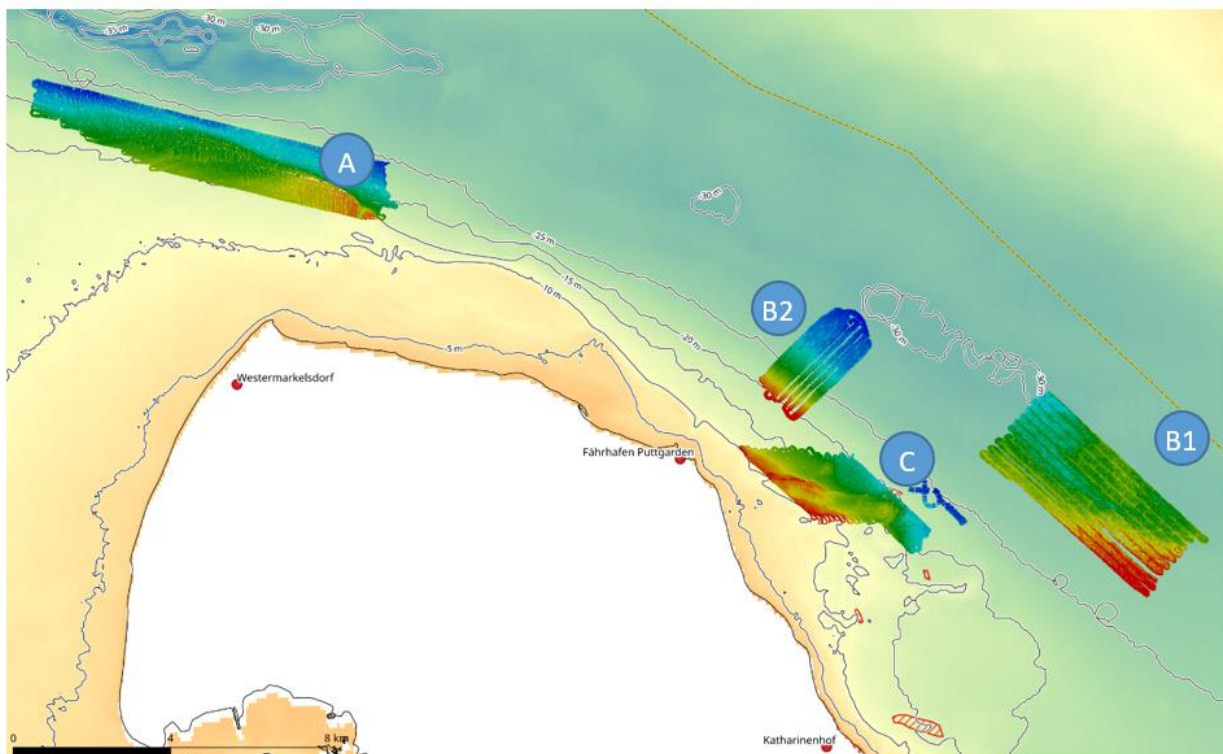


Fig. 3.1 Main working areas of AL536: Shown is MBES bathymetry of the areas A: Fehmarn North bedform field; B1: Fehmarn East I, B2: Fehmarn East II, C: Fehmarn Sandbank

3.2 Aims of the Cruise

The aims of this short cruise were threefold: To teach marine geoscientific methodology and operations (derive video footage); to test procedures and the combination of different hydroacoustic instrumentation, and to derive data on the hydrodynamics and sedimentology of different sites in the Western Baltic Sea.

3.3 Agenda of the Cruise

Wed 29.04.2020

Load and set-up at Kiel port, GEOMAR pier

Thu 30.04.2020

08:00 Departure, transit to Fehmarnbelt Crosssection begin

11:00 Fehmarnbelt Cross-section to North: ADCP transect [1-1]

At Northern position MBES Heading Alignment

14:00 Fehmarnbelt Cross-section to South: 15 CTD Stations (ship rosette CTD) [2-16]

18:00 Mapping Fehmarn North Bedform field: MBES, ADCP 600, SES 2000 [17]

Fri 01.05.2020

16:20 End Mapping, CTD Station (handheld) [18]

17:00 Transit to Fehmarn North-East I area, CTD station [19]

18:00 Mapping Fehmarn North-East I MBES, SES [20]

Sat 02.05.2020

07:00 End Mapping, SVP Station (CTD handheld) [21]

08:00 9 Shipek grab samples [22-31]

11:00 3 Van Veen grab samples [32-35], CTD Station (handheld)

12:00 UW Video test [36], transit to

13:30 Boxcorer 1 (54.504, 11.380) [37]

14:20 Boxcorer 2 (54.474, 11.4555) [38]

18:00 Anchorstation 1 (30m) (54.515, 11.367), ADCP 600, 1200, 14 hourly CTD profiles [39-52]

Sun 03.05.2020

07:00 End Anchorstation, transit to Mecklenburger Bay, Kellenhusen core location 1

10:15 Gravity core 1 (plastic tube, no liner, test of procedure) Mecklenburger Bay, Kellenhusen [53]

10:37 Gravity core 2 (liner, test of procedure) Mecklenburger Bay, Kellenhusen [54]

11:50 Mecklenburg Bay cross-section 10 CTD profiles west to east [55-64]

15:00 ADCP profile Mecklenburg Bay cross-section east to west [65]

17:00 transit to Anchor station 2 (18m) (54.495393, 11.294263)

20:15 Anchor station 2 (18m) near Sandbank, 1200, 600 kHz ADCP, 12 hourly CTD [66-77]

Mon 04.05.2020

07:00 End Anchorstation, Transit Fehmarn North-East area

08:40 Gravity corer (plastic tube, liner) Fehmarn North-East area bedform crest [78]

Transit to Fehmarn Sandbank area

10:40 MBES / SES Mapping Sandbank area [79]

Tue 05.05.2020

01:00 MBES / SES Mapping Fehmarn North-East I gravity corer position area [80]

03:00 MBES / SES Mapping Fehmarn North-East II area [81]

09:40 5 Van Veen Grab samples Fehmarn North-East II area on top and around a bedform [82-86]

10:30 Transit to Kiel

15:00 At Kiel West

Wed 06.05.2020

08:00 Transit 1h Kiel -> Stoller Grund / Stohler Kliff

09:00 Stoller Grund: Mapping (Sidescan + MBES + SES) + SVPs

14:00 Transit 1h Stoller Grund / Stohler Kliff -> Kiel

Thu 7.5.2020

8:00 Set-down

4 Narrative of the Cruise

Day 1: On Thu 30.04.2020 we left Ostufer pier at 8:00 for a three hour transit to Fehmarn cross-section. Starting in the South we first measured a water velocity profiles with Acoustic Current Profilers (ADCP) going North, turning at the border to Danish waters. On the way back, CTD profiles were taken for information on the water column physical properties. The cross-section shows a typical situation of eastward transport of higher saline and cold water at the bottom, and less dense water flowing westward in the upper layer.

The rest of the first day and night was spent in calibrating the positioning of a multi-beam echo sounder (MBES) and mapping of the Fehmarn North Bedform field: simultaneously with MBES, ADCP, and the hull mounted parametric echo sounder Innomar SES 2000. Parallel to all operations, videos were taken, and processed throughout the whole cruise.

Day2: On Fri 01.05.2020 we continued the mapping of the Fehmarn bedform field from about 15 to 25m water depth. The compound dune pattern is a prominent example for large dune patterns in micro tidal environments. Afterwards the cruise continued at the Fehmarn North-East I area, for a continuation of combined MBES and SES hydroacoustic mapping for the rest of the day and night.

Day 3: On Sat 02.05.2020 distinct bedform features in the Fehmarn North-East I area were chosen for detailed observation and sampling. 9 Shipek grab samples and 3 Van Veen grab samples were taken, and the sediments described. A new UW Video camera set-up was tested, but then postponed due to bad visibility of the bottom waters at that location. Two boxcorer deployments were taken at chosen bedform features, to further learn about the sedimentology and upper sediment layer. All bed sampling was carried out with high precision positioning (RTK GPS from MBES). We then went on anchor at Anchorstation 1 (54.515, 11.367) in 30m water depth. Here continuous recording of two ADCP (600 and 1200 kHz) and hourly CTD profiles was carried out in order to study water column dynamics, us working in shifts of two hours.

Day 4. We ended the anchor station in the morning of Sun 03.05.2020. A short transit took us to Mecklenburger Bay, Kellenhusen core location 1. Here a former (student) cruise had revealed interesting core material and it was decided to recover a core for lab analysis. In order to provide video footage on different sampling strategies with the gravity corer, two 5m cores were taken at that location. The coring went well and the initial description revealed similar characteristics as expected.

To derive further examples for the stratification and circulation of the Baltic Sea, another cross-section of first CTD profiles and continuous ADCP profiling on the way back was carried out across Mecklenburg Bay cross-section. It is understood that cross-sectional measurements of the water column are merely a snapshot in time. Thus another anchoring station was installed in the vicinity of anchorstation 1. At this location in a water depth of 18m continuous recording of two ADCP (600 and 1200 kHz) and hourly CTD profiles was carried out in order to study water column dynamics for 12 hours throughout the night.

Day 5: On Mon 04.05.2020 the presumably more sandy extension of the Fehmarn North-East area was in the focus of our observations. Based on the mappings of 1.5.2020 and bed surface sampling of 2.5.2020, a location for one gravity core was defined at the crest of a bedform feature. This operation went smooth, and a 5 m core was recovered which revealed an interesting sediment archive, extending a series of locations known from literature on the development of the Baltic Sea. Another area of different sedimentological characteristics was chosen for mapping, again combining SES and MBES devices for high resolution bathymetric and sub-bottom data.

Day 6: In the early morning of Tue 05.05.2020 we surveyed the subbottom of the Fehmarn North-East I gravity corer position area again. And went to continue bathymetric mapping of another part of the Fehmarn East II area. Here the bedform features detected before were sampled by 5 Van Veen grab samples, positioned exactly at the top and trough of these forms. After these activities the ship went back to Kiel.

Day 7: Leaving from Kiel, we mapped a small area offshore Stohl cliff with Multibeam Echo Sounder and Side Scan Sonar, to derive video footage and test simultaneous operation of these devices.

5 Preliminary Results

This cruise provided interesting data on the hydrodynamics and sedimentology of the research areas, video footage for teaching marine geosciences classes, and also this cruise provided opportunities to develop and test new technical set-up and procedures (e.g. in exact positioning of cores and grab samples).

ADCP transects

The two ADCP transects give an example for Western Baltic Sea hydrodynamics and circulation patterns. Stratification and different layers of the water column can be distinguished based on their flow speed and direction. It is understood that the complex interplay of density and wind driven currents, stratification, mixing, and transport cannot be entangled and revealed by a single cross-section, however it shall serve as a motivation for students to deepen their knowledge on oceanographic process. In this line, also time series station data from anchoring positions will be discussed.

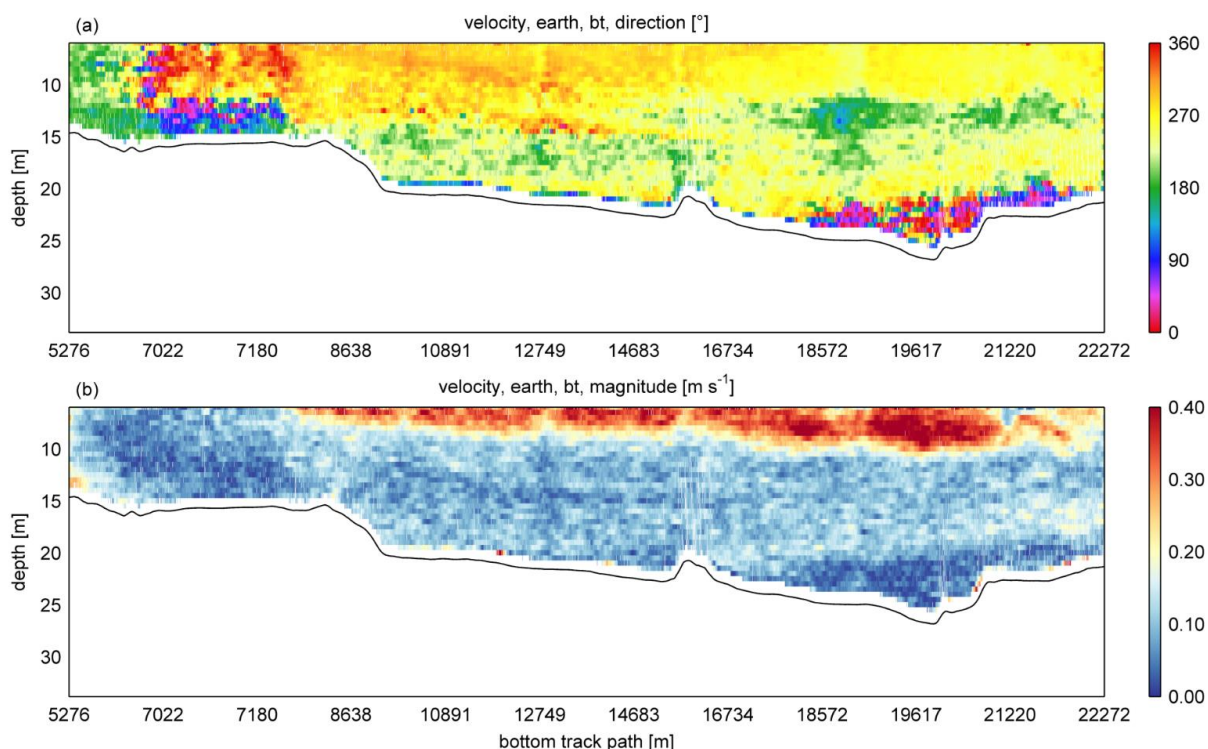


Fig. 5.1 Main working areas of AL536: Shown is MBES bathymetry of the areas A: Fehmarn North bedform field; B1: Fehmarn East I, B2: Fehmarn East II, C: Fehmarn Sandbank Figure 1 Example for the hydrodynamics at an ADCP transect at cross-section Fehmarn North: a) Current velocity directions, b) Current velocity magnitudes

MBES mappings

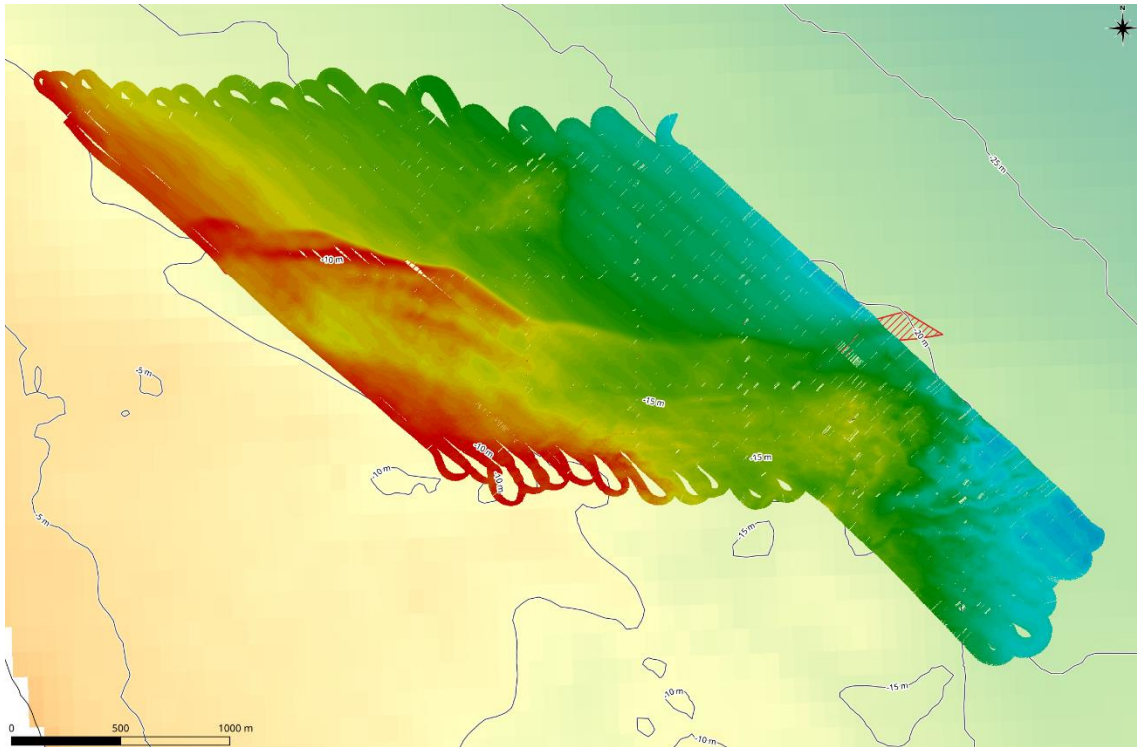


Figure 5.2 Example for MBES survey. Unprocessed data shows a part of the Fehmarn Sandbank area

SES sub-bottom

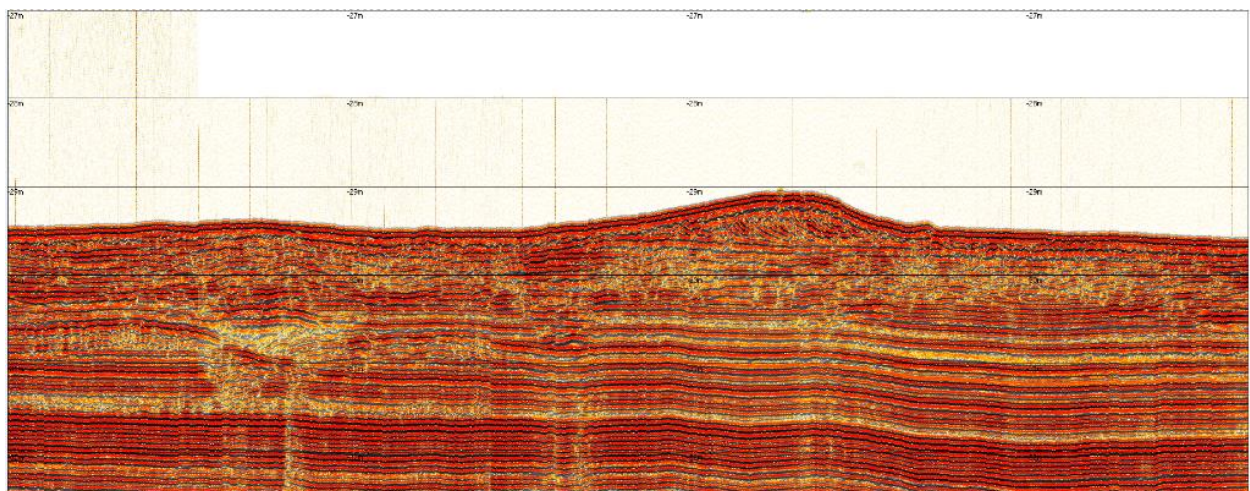


Figure 5.3 Subbottom profiler bedform feature at area Fehmarn East (location of core AL536_78-1). Vertical lines depict meters.

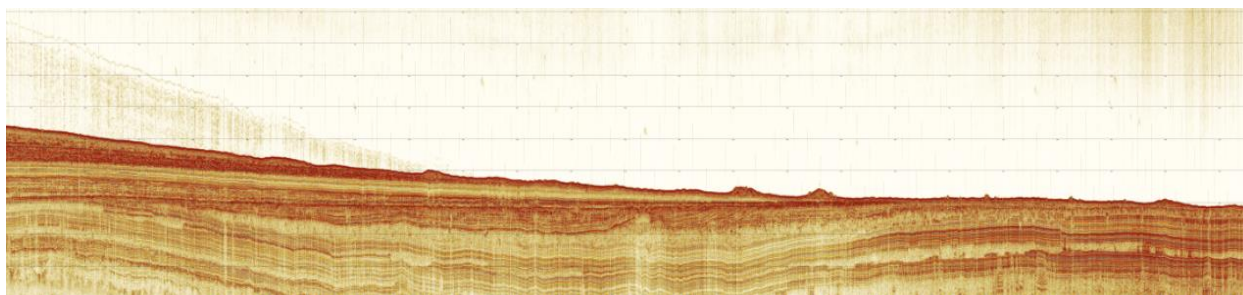


Figure 5.4 Subbottom structures at a cross-section of the Fehmarn Sandbank area. Vertical lines depict meters.

Gravity Cores

During the cruise three gravity cores were taken for training and for research purposes.

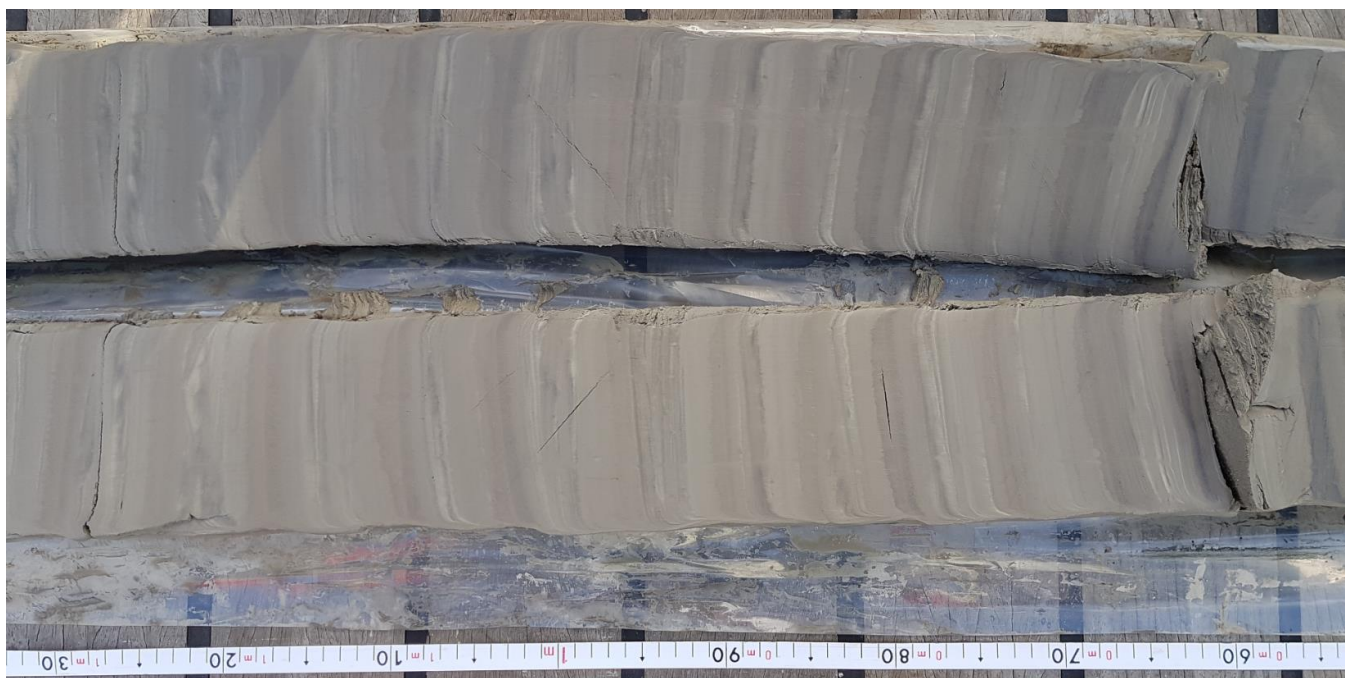


Figure 5.5 Part of core AL36_78-1

Table 1 Cores taken at AL 536

Core title	Date	Latitude	Longitude	Water depth [m]	Recovery length [m]	Method
AL536_53-1	03.05.2020	54° 09,094' N	11° 04,640' E	21	3.5	Foil
AL536_54-2	03.05.2020	54° 09,131' N	11° 04,663' E	21	5.7	Liner
AL536_78-1	04.05.2020	54° 30,245' N	11° 22,974' E	29	4.8	Liner

AL536_53-1: The core shows three distinguishable layers. The uppermost layer (xx – xx) seems relatively homogeneous, greenish-brownish muddy material. Sporadic mussel shells or stones are observed in different depths. Evidence of bioturbation is partly visible.

A transitional boundary occurs to the layer beneath, which is made of thin horizontal layers that slightly vary in grain size (mud, sandy mud, muddy sand) and colour. The layer beneath the transition zone consists of brownish material, including plant residues and a high amount of shell fragments. The transition to the next layer is abrupt and irregular, including thin deposition (~ 1 mm) of coarser material (coarse sand). The lowermost layer is made of horizontally layered fine, light-grey sediment including plant residues and mostly intact snail shells.

AL536_54-2: The main part of the core consist of brownish-greenish sandy mud. Sporadic mussel shells or stones ae observed in different depths. Evidence of bioturbation is partly visible. Towards the end of the section, starting xx cm depth, horizontally layering occurs, possibly representing the transitional boundary observed in core 53-1.

AL536_78-1: The core shows three distinguishable layers. The uppermost layer consist of brownish-greenish muddy material with moderate amount of shell fragments. Beneath, a rather thin layer (xx – xx cm) appears with a dominant grain size fraction of medium sand. Starting from xx cm, the lower and largest part of the core is made of alternating layers consisting of presumably clay and silt/fine sand.

Underwater Photogrammetry

Underwater video handling and processing was tested on a transect on the last day, near Stohl. The tests provided information on necessary optimisation of camera settings, operations, and provided material for post-processing of sea floor imagery.

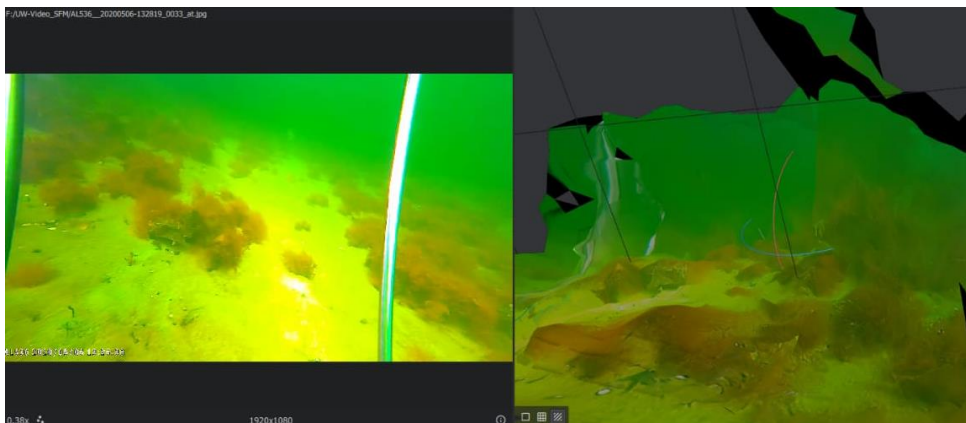
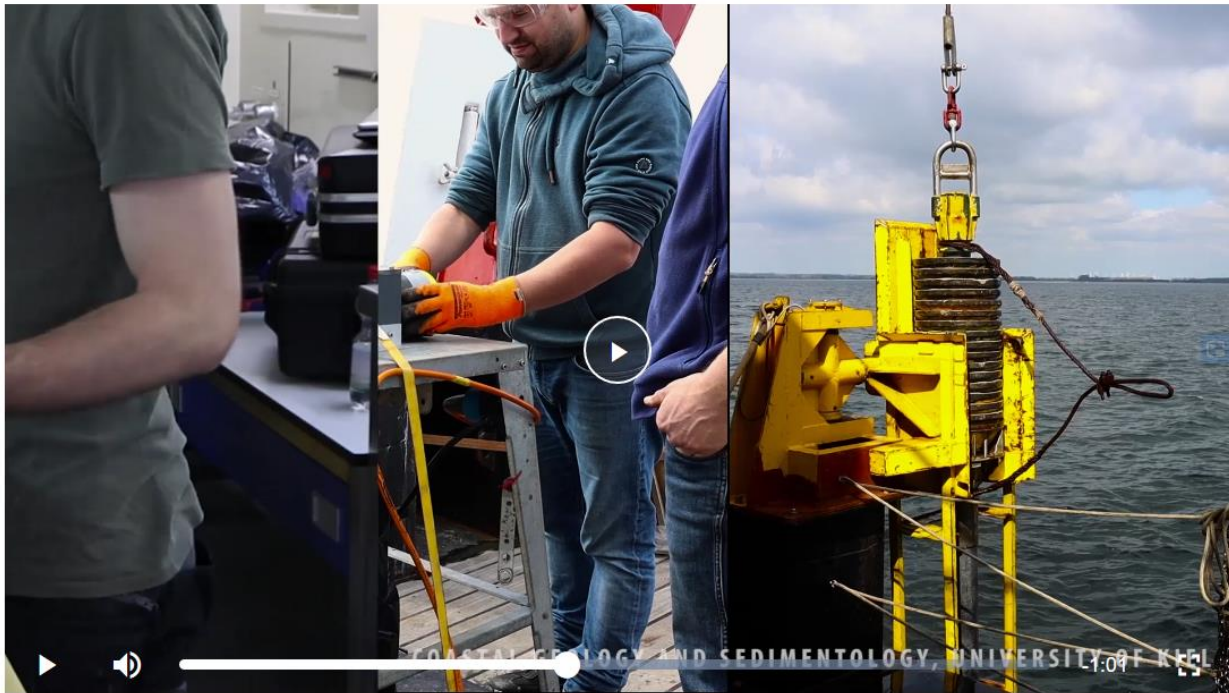


Figure 5.6 Example for photogrammetry of the sea floor near Stohl

Video footage

Videos were taken to explain to the (onshore) students the operation and handling of devices.



↓ Download Summary.mp4 (126.9 MB)



↓ Download Summary.mp4 (126.9 MB)

6 Station List AL536

6.1 Overall Station List

Activity	Timestamp	Device	Action	Latitude	Longitude	Depth (m)
AL536_86-1	05.05.2020 08:28	van Veen Grab	on deck	54° 31,562' N	011° 16,505' E	27
AL536_86-1	05.05.2020 08:27	van Veen Grab	in the water	54° 31,561' N	011° 16,500' E	27
AL536_85-1	05.05.2020 08:19	van Veen Grab	on deck	54° 31,547' N	011° 16,560' E	27
AL536_85-1	05.05.2020 08:18	van Veen Grab	in the water	54° 31,553' N	011° 16,560' E	27
AL536_84-1	05.05.2020 08:11	van Veen Grab	on deck	54° 31,550' N	011° 16,563' E	27
AL536_84-1	05.05.2020 08:10	van Veen Grab	in the water	54° 31,553' N	011° 16,564' E	27
AL536_83-1	05.05.2020 08:00	van Veen Grab	on deck	54° 31,565' N	011° 16,577' E	27
AL536_83-1	05.05.2020 07:48	van Veen Grab	in the water	54° 31,562' N	011° 16,573' E	27
AL536_82-1	05.05.2020 07:43	van Veen Grab	on deck	54° 31,552' N	011° 16,576' E	27
AL536_82-1	05.05.2020 07:40	van Veen Grab	in the water	54° 31,552' N	011° 16,608' E	27
AL536_81-1	05.05.2020 06:56	Multibeam	profile end	54° 31,133' N	011° 15,808' E	22
AL536_81-1	05.05.2020 01:08	Multibeam	profile start	54° 31,956' N	011° 17,374' E	29
AL536_80-1	05.05.2020 00:58	SES2000	alter course	54° 32,454' N	011° 17,981' E	30
AL536_80-1	05.05.2020 00:58	SES2000	profile end	54° 32,443' N	011° 18,006' E	30
AL536_80-1	04.05.2020 22:57	SES2000	profile start	54° 27,513' N	011° 31,192' E	26
AL536_79-1	04.05.2020 21:50	Multibeam	on deck	54° 30,010' N	011° 17,736' E	1401
AL536_79-1	04.05.2020 21:49	Multibeam	profile end	54° 29,969' N	011° 17,801' E	20
AL536_79-1	04.05.2020 08:56	Multibeam	profile start	54° 30,164' N	011° 15,114' E	9
AL536_79-1	04.05.2020 08:43	Multibeam	in the water	54° 30,024' N	011° 17,321' E	19
AL536_79-1	04.05.2020 08:43	Multibeam	in Moonpool	54° 30,020' N	011° 17,371' E	19
AL536_78-1	04.05.2020 06:41	Gravity Corer	on deck	54° 30,245' N	011° 22,794' E	29
AL536_78-1	04.05.2020 06:37	Gravity Corer	in the water	54° 30,248' N	011° 22,787' E	29
AL536_77-1	04.05.2020 05:00	CTD	on deck	54° 29,717' N	011° 17,642' E	19
AL536_77-1	04.05.2020 04:57	CTD	in the water	54° 29,723' N	011° 17,650' E	19
AL536_76-1	04.05.2020 03:59	CTD	on deck	54° 29,718' N	011° 17,646' E	19
AL536_76-1	04.05.2020 03:57	CTD	in the water	54° 29,716' N	011° 17,639' E	19
AL536_75-1	04.05.2020 03:00	CTD	on deck	54° 29,715' N	011° 17,632' E	19
AL536_75-1	04.05.2020 02:57	CTD	in the water	54° 29,720' N	011° 17,648' E	19
AL536_74-1	04.05.2020 01:58	CTD	on deck	54° 29,720' N	011° 17,647' E	19
AL536_74-1	04.05.2020 01:54	CTD	in the water	54° 29,722' N	011° 17,652' E	19
AL536_73-1	04.05.2020 00:57	CTD	on deck	54° 29,718' N	011° 17,642' E	19
AL536_73-1	04.05.2020 00:51	CTD	in the water	54° 29,719' N	011° 17,648' E	19
AL536_72-1	03.05.2020 23:59	CTD	on deck	54° 29,727' N	011° 17,660' E	19
AL536_72-1	03.05.2020 23:54	CTD	in the water	54° 29,728' N	011° 17,658' E	19
AL536_71-1	03.05.2020 22:59	CTD	on deck	54° 29,730' N	011° 17,661' E	19
AL536_71-1	03.05.2020 22:54	CTD	in the water	54° 29,731' N	011° 17,661' E	19
AL536_70-1	03.05.2020 22:00	CTD	on deck	54° 29,732' N	011° 17,664' E	19
AL536_70-1	03.05.2020 21:57	CTD	in the water	54° 29,733' N	011° 17,664' E	19
AL536_69-1	03.05.2020 21:00	CTD	on deck	54° 29,729' N	011° 17,661' E	18
AL536_69-1	03.05.2020 20:57	CTD	in the water	54° 29,730' N	011° 17,663' E	19
AL536_68-1	03.05.2020 20:01	CTD	on deck	54° 29,731' N	011° 17,658' E	19
AL536_68-1	03.05.2020 19:57	CTD	in the water	54° 29,729' N	011° 17,660' E	18
AL536_67-1	03.05.2020 19:00	CTD	on deck	54° 29,719' N	011° 17,648' E	18

AL536_67-1	03.05.2020 18:57	CTD	in the water	54° 29,733' N	011° 17,667' E	18
AL536_66-1	03.05.2020 18:17	CTD	on deck	54° 29,717' N	011° 17,644' E	18
AL536_66-1	03.05.2020 18:14	CTD	in the water	54° 29,724' N	011° 17,656' E	18
AL536_65-1	03.05.2020 15:53	ADCP	profile end	54° 12,680' N	011° 10,445' E	15
AL536_65-1	03.05.2020 13:59	ADCP	profile start	54° 04,953' N	011° 26,402' E	18
AL536_64-1	03.05.2020 13:48	CTD	on deck	54° 04,793' N	011° 26,740' E	14
AL536_64-1	03.05.2020 13:46	CTD	in the water	54° 04,804' N	011° 26,746' E	14
AL536_63-1	03.05.2020 13:22	CTD	on deck	54° 05,683' N	011° 24,917' E	17
AL536_63-1	03.05.2020 13:20	CTD	in the water	54° 05,685' N	011° 24,901' E	16
AL536_62-1	03.05.2020 12:59	CTD	on deck	54° 06,497' N	011° 23,161' E	18
AL536_62-1	03.05.2020 12:55	CTD	in the water	54° 06,528' N	011° 23,150' E	18
AL536_61-1	03.05.2020 12:32	CTD	on deck	54° 07,356' N	011° 21,299' E	20
AL536_61-1	03.05.2020 12:29	CTD	in the water	54° 07,375' N	011° 21,316' E	20
AL536_60-1	03.05.2020 12:07	CTD	on deck	54° 08,284' N	011° 19,549' E	23
AL536_60-1	03.05.2020 12:03	CTD	in the water	54° 08,280' N	011° 19,518' E	23
AL536_59-1	03.05.2020 11:41	CTD	on deck	54° 09,138' N	011° 17,727' E	25
AL536_59-1	03.05.2020 11:37	CTD	in the water	54° 09,150' N	011° 17,726' E	25
AL536_58-1	03.05.2020 11:14	CTD	on deck	54° 10,035' N	011° 15,844' E	22
AL536_58-1	03.05.2020 11:10	CTD	in the water	54° 10,023' N	011° 15,878' E	21
AL536_57-1	03.05.2020 10:47	CTD	on deck	54° 10,911' N	011° 14,102' E	22
AL536_57-1	03.05.2020 10:43	CTD	in the water	54° 10,893' N	011° 14,110' E	22
AL536_56-1	03.05.2020 10:19	CTD	on deck	54° 11,781' N	011° 12,295' E	21
AL536_56-1	03.05.2020 10:16	CTD	in the water	54° 11,765' N	011° 12,313' E	21
AL536_55-1	03.05.2020 09:52	CTD	on deck	54° 12,680' N	011° 10,483' E	16
AL536_55-1	03.05.2020 09:50	CTD	in the water	54° 12,676' N	011° 10,497' E	16
AL536_54-2	03.05.2020 08:43	Gravity Corer	on deck	54° 09,131' N	011° 04,663' E	21
AL536_54-2	03.05.2020 08:37	Gravity Corer	in the water	54° 09,124' N	011° 04,675' E	21
AL536_53-1	03.05.2020 08:24	Gravity Corer	on deck	54° 09,094' N	011° 04,640' E	21
AL536_53-1	03.05.2020 08:15	Gravity Corer	in the water	54° 09,096' N	011° 04,646' E	21
AL536_52-1	03.05.2020 05:01	CTD	on deck	54° 30,903' N	011° 22,121' E	30
AL536_52-1	03.05.2020 04:57	CTD	in the water	54° 30,901' N	011° 22,117' E	30
AL536_51-1	03.05.2020 04:02	CTD	on deck	54° 30,895' N	011° 22,113' E	30
AL536_51-1	03.05.2020 03:57	CTD	in the water	54° 30,898' N	011° 22,117' E	30
AL536_50-1	03.05.2020 03:00	CTD	on deck	54° 30,898' N	011° 22,116' E	30
AL536_50-1	03.05.2020 02:56	CTD	in the water	54° 30,897' N	011° 22,120' E	30
AL536_49-1	03.05.2020 02:01	CTD	on deck	54° 30,890' N	011° 22,112' E	30
AL536_49-1	03.05.2020 02:00	CTD	in the water	54° 30,890' N	011° 22,111' E	30
AL536_48-1	03.05.2020 02:00	CTD	on deck	54° 30,890' N	011° 22,112' E	30
AL536_48-1	03.05.2020 02:00	CTD	in the water	54° 30,891' N	011° 22,114' E	30
AL536_47-1	03.05.2020 01:59	CTD	on deck	54° 30,891' N	011° 22,115' E	30
AL536_47-1	03.05.2020 01:56	CTD	in the water	54° 30,893' N	011° 22,116' E	30
AL536_46-1	02.05.2020 22:01	CTD	on deck	54° 30,882' N	011° 22,105' E	30
AL536_46-1	02.05.2020 21:57	CTD	in the water	54° 30,908' N	011° 22,126' E	30
AL536_44-1	02.05.2020 21:02	CTD	on deck	54° 30,879' N	011° 22,099' E	30
AL536_44-1	02.05.2020 20:57	CTD	in the water	54° 30,889' N	011° 22,112' E	30
AL536_43-1	02.05.2020 20:02	CTD	on deck	54° 30,917' N	011° 21,998' E	30
AL536_43-1	02.05.2020 19:56	CTD	in the water	54° 30,933' N	011° 22,016' E	30

AL536_42-1	02.05.2020 19:01	CTD	on deck	54° 30,948' N	011° 22,016' E	30
AL536_42-1	02.05.2020 18:57	CTD	in the water	54° 30,931' N	011° 22,006' E	30
AL536_41-1	02.05.2020 18:04	CTD	on deck	54° 30,941' N	011° 22,013' E	30
AL536_41-1	02.05.2020 17:59	CTD	in the water	54° 30,949' N	011° 22,015' E	30
AL536_40-1	02.05.2020 17:04	CTD	on deck	54° 30,953' N	011° 22,018' E	30
AL536_40-1	02.05.2020 17:04	CTD	in the water	54° 30,952' N	011° 22,017' E	30
AL536_39-1	02.05.2020 16:05	CTD	on deck	54° 30,933' N	011° 22,011' E	30
AL536_39-1	02.05.2020 16:00	CTD	in the water	54° 30,948' N	011° 22,013' E	30
AL536_38-1	02.05.2020 12:28	Box Corer	on deck	54° 28,414' N	011° 27,330' E	27
AL536_38-1	02.05.2020 12:23	Box Corer	in the water	54° 28,404' N	011° 27,320' E	27
AL536_37-1	02.05.2020 11:33	Box Corer	on deck	54° 30,244' N	011° 22,801' E	30
AL536_37-1	02.05.2020 11:29	Box Corer	in the water	54° 30,245' N	011° 22,802' E	30
AL536_36-1	02.05.2020 10:55	Underwater Video System	on deck	54° 30,229' N	011° 22,738' E	30
AL536_36-1	02.05.2020 10:46	Underwater Video System	in the water	54° 30,272' N	011° 22,756' E	30
AL536_35-1	02.05.2020 10:36	van Veen Grab	on deck	54° 30,257' N	011° 22,808' E	30
AL536_35-1	02.05.2020 10:32	van Veen Grab	in the water	54° 30,246' N	011° 22,809' E	30
AL536_34-1	02.05.2020 10:17	CTD	in the water	54° 30,271' N	011° 22,754' E	30
AL536_34-1	02.05.2020 10:15	CTD	in the water	54° 30,269' N	011° 22,754' E	30
AL536_33-1	02.05.2020 10:07	van Veen Grab	on deck	54° 30,265' N	011° 22,760' E	30
AL536_33-1	02.05.2020 10:07	van Veen Grab	in the water	54° 30,266' N	011° 22,761' E	30
AL536_32-1	02.05.2020 09:52	van Veen Grab	on deck	54° 30,265' N	011° 22,736' E	30
AL536_32-1	02.05.2020 09:48	van Veen Grab	in the water	54° 30,294' N	011° 22,709' E	30
AL536_31-1	02.05.2020 09:09	Grab	on deck	54° 29,630' N	011° 23,745' E	29
AL536_31-1	02.05.2020 09:05	Grab	in the water	54° 29,643' N	011° 23,746' E	29
AL536_30-1	02.05.2020 08:55	Grab	on deck	54° 29,673' N	011° 23,613' E	29
AL536_30-1	02.05.2020 08:53	Grab	in the water	54° 29,669' N	011° 23,609' E	29
AL536_29-1	02.05.2020 08:29	Grab	on deck	54° 29,667' N	011° 23,694' E	29
AL536_29-1	02.05.2020 08:24	Grab	in the water	54° 29,685' N	011° 23,712' E	28
AL536_28-1	02.05.2020 08:18	Grab	on deck	54° 29,660' N	011° 23,741' E	29
AL536_28-1	02.05.2020 08:09	Grab	in the water	54° 29,657' N	011° 23,739' E	29
AL536_27-1	02.05.2020 07:59	Grab	on deck	54° 29,616' N	011° 23,806' E	29
AL536_27-1	02.05.2020 07:44	Grab	in the water	54° 29,614' N	011° 23,811' E	29
AL536_26-1	02.05.2020 07:43	Grab	on deck	54° 29,614' N	011° 23,812' E	29
AL536_26-1	02.05.2020 07:35	Grab	in the water	54° 29,621' N	011° 23,771' E	29
AL536_25-2	02.05.2020 07:29	Grab	on deck	54° 29,622' N	011° 23,719' E	29
AL536_25-2	02.05.2020 07:27	Grab	in the water	54° 29,623' N	011° 23,702' E	29
AL536_24-1	02.05.2020 07:21	Grab	on deck	54° 29,614' N	011° 23,699' E	29
AL536_24-1	02.05.2020 07:15	Grab	in the water	54° 29,618' N	011° 23,685' E	29
AL536_23-1	02.05.2020 07:08	Grab	on deck	54° 29,634' N	011° 23,686' E	29
AL536_23-1	02.05.2020 06:54	Grab	in the water	54° 29,621' N	011° 23,646' E	29
AL536_22-1	02.05.2020 06:40	Grab	on deck	54° 29,615' N	011° 23,582' E	29
AL536_22-1	02.05.2020 06:37	Grab	in the water	54° 29,619' N	011° 23,586' E	29
AL536_21-1	02.05.2020 06:27	CTD	on deck	54° 29,617' N	011° 23,596' E	29
AL536_21-1	02.05.2020 06:25	CTD	in the water	54° 29,622' N	011° 23,604' E	29
AL536_20-1	02.05.2020 05:39	ADCP	profile end	54° 29,826' N	011° 21,139' E	28
AL536_20-1	01.05.2020 17:09	ADCP	profile start	54° 30,752' N	011° 22,514' E	30

AL536_19-1	01.05.2020 16:44	CTD	on deck	54° 30,842' N	011° 22,162' E	30
AL536_19-1	01.05.2020 16:42	CTD	in the water	54° 30,843' N	011° 22,163' E	30
AL536_18-1	01.05.2020 15:27	CTD	on deck	54° 34,253' N	011° 06,963' E	24
AL536_18-1	01.05.2020 15:26	CTD	in the water	54° 34,254' N	011° 06,964' E	24
AL536_17-1	01.05.2020 15:20	ADCP	profile end	54° 34,275' N	011° 06,706' E	24
AL536_17-1	30.04.2020 16:51	ADCP	profile start	54° 33,504' N	011° 06,476' E	11
AL536_16-1	30.04.2020 16:28	CTD	on deck	54° 33,152' N	011° 04,779' E	10
AL536_16-1	30.04.2020 16:27	CTD	in the water	54° 33,148' N	011° 04,783' E	10
AL536_15-1	30.04.2020 16:17	CTD	on deck	54° 33,453' N	011° 05,058' E	12
AL536_15-1	30.04.2020 16:15	CTD	in the water	54° 33,447' N	011° 05,058' E	12
AL536_14-1	30.04.2020 16:05	CTD	on deck	54° 33,777' N	011° 05,351' E	13
AL536_14-1	30.04.2020 16:04	CTD	in the water	54° 33,782' N	011° 05,352' E	13
AL536_13-1	02.05.2020 02:15	CTD	on deck	54° 28,706' N	011° 23,999' E	27
AL536_13-1	30.04.2020 15:51	CTD	in the water	54° 34,084' N	011° 05,650' E	19
AL536_12-1	30.04.2020 15:38	CTD	on deck	54° 34,386' N	011° 05,908' E	23
AL536_12-1	30.04.2020 15:35	CTD	in the water	54° 34,386' N	011° 05,919' E	23
AL536_11-1	30.04.2020 15:22	CTD	on deck	54° 34,700' N	011° 06,159' E	25
AL536_11-1	30.04.2020 15:19	CTD	in the water	54° 34,699' N	011° 06,159' E	25
AL536_10-1	30.04.2020 15:11	CTD	on deck	54° 35,011' N	011° 06,432' E	28
AL536_10-1	30.04.2020 15:08	CTD	in the water	54° 35,012' N	011° 06,427' E	28
AL536_9-1	30.04.2020 14:58	CTD	on deck	54° 35,319' N	011° 06,728' E	29
AL536_9-1	30.04.2020 14:55	CTD	in the water	54° 35,314' N	011° 06,717' E	29
AL536_8-1	30.04.2020 14:45	CTD	on deck	54° 35,623' N	011° 06,990' E	29
AL536_8-1	30.04.2020 14:43	CTD	in the water	54° 35,624' N	011° 07,009' E	29
AL536_7-1	30.04.2020 14:24	CTD	on deck	54° 35,936' N	011° 07,303' E	30
AL536_7-1	30.04.2020 14:22	CTD	in the water	54° 35,932' N	011° 07,292' E	30
AL536_6-1	30.04.2020 14:08	CTD	on deck	54° 36,233' N	011° 07,590' E	29
AL536_6-1	30.04.2020 14:05	CTD	in the water	54° 36,237' N	011° 07,583' E	29
AL536_5-1	30.04.2020 13:53	CTD	on deck	54° 36,542' N	011° 07,862' E	28
AL536_5-1	30.04.2020 13:49	CTD	in the water	54° 36,544' N	011° 07,857' E	28
AL536_4-1	30.04.2020 13:37	CTD	on deck	54° 36,851' N	011° 08,154' E	27
AL536_4-1	30.04.2020 13:34	CTD	in the water	54° 36,851' N	011° 08,160' E	27
AL536_3-1	30.04.2020 13:33	CTD	on deck	54° 36,850' N	011° 08,159' E	27
AL536_3-1	30.04.2020 13:18	CTD	in the water	54° 37,156' N	011° 08,431' E	26
AL536_2-1	30.04.2020 13:07	CTD	on deck	54° 37,446' N	011° 08,767' E	25
AL536_2-1	30.04.2020 13:04	CTD	in the water	54° 37,450' N	011° 08,761' E	26
AL536_1-1	30.04.2020 11:42	ADCP	on deck	54° 37,713' N	011° 08,990' E	25
AL536_1-1	30.04.2020 11:37	ADCP	profile end	54° 37,493' N	011° 08,798' E	25
AL536_1-1	30.04.2020 10:23	ADCP	profile start	54° 33,120' N	011° 04,769' E	10
AL536_1-1	30.04.2020 10:09	ADCP	in the water	54° 33,247' N	011° 05,420' E	11

7 Data and Sample Storage and Availability

Sediment samples and core material will be stored at Ifg CAU Kiel and is available for further analysis. Digital data is stored on the groups servers and will be subject to further analysis

8 Acknowledgements

We thank the captain and crew of AL 536 for the interesting and successful cruise.