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The South Atlantic Expedition ANT-XXIII/5 of the Research Vessel "Polarstern" in 2006

Edited by Wilfried Jokat
with contributions of the participants

HELMHOLTZ
GEMEINSCHAFT

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ANT-XXIII/5

13 April 2006 - 12 June 2006

Punta Arenas - South Atlantic - Cape Town

Fahrtleiter / Chief Scientist:

Wilfried Jokat

Koordinator / Coordinator:

Eberhard Fahrbach

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1. FAHRTVERLAUF UND ZUSAMMENFASSUNG

Wilfried Jokat
Alfred-Wegener-Institut

Die Fahrt ANT-XXIII/5 begann am 13. April 2006 in Punta Arenas und endete am 12. Juni 2006 in Kapstadt (Abb. 1). Neben biologischen Arbeiten, die zu Beginn der Reise durchgeführt wurden, bildeten geowissenschaftliche Fragestellungen im Südatlantik den Schwerpunkt des Messprogramms. Ziel der Expedition waren die Seegebiete der *Shona*, *Discovery* und *Cape Rise Seamounts* sowie der südliche Walfischrücken.

Die gesamte Reise war durch für diese Jahreszeit ungewöhnlich gutes Wetter begünstigt. Durch eine überdies sehr genaue Wettervorhersage konnte das Durchfahren von Sturmtiefs bis auf wenige Ausnahmen vermieden und die geplanten Arbeitsprogramme nahezu komplett abgearbeitet werden.

Multinetzstationen wurden auf dem Transit von Punta Arenas in das erste Messgebiet (12) sowie im Kapbecken (4) durchgeführt. Die 16 neuen Multinetz-Stationen mit daraus resultierenden 900 Proben werden neue Informationen zur Biodiversität und Ökologie von Tiefsee-Copepoden in polaren Regionen liefern. Die beiden Copepodenfamilien *Euchaetidae* und *Aetideidae* sind zwei wichtige Komponenten des Zooplanktons in den polaren Meeren und weltweit.

Das petrologische Programm begann an den *Young Shona Seamounts* südlich 50°S. Trotz starker Dünung wurden sechs erfolgreiche Dredgen gewonnen, damit gelang eine erstmalige Beprobung dieser unterseeischen Vulkane. Ähnlich erfolgreich waren die Dredgen an den *Discovery Seamounts* (5), dem südlichen Walfischrücken (9), dem Agulhas-Rücken (3) und den *Cape Rise Seamounts* (3). Die Gesteinsproben wurden nach Beendigung der Expedition an die beteiligten Institutionen verteilt. Erste Ergebnisse der petrologischen Analysen sind in 1-2 Jahren zu erwarten.

Das geophysikalische Programm sollte Beiträge zur Entstehung der *Discovery Seamounts*, dem Walvis-Rücken, dem Agulhas-Rücken und den Cape Rise Seamounts liefern. Informationen zur Krustenmächtigkeit und der Frage, ob die submarinen Vulkane „On-axis“ oder „Off-axis“ entstanden sind, standen im Mittelpunkt der Untersuchungen. Hierfür wurden folgende Experimente durchgeführt:

- 1843 km Mehrkanal-Seismik (800 m Streamer)
- 1020 km Refraktionsseismische Profile (Discovery Seamounts, Walfisch-Rücken, Agulhas- Rücken) an insgesamt 33 unterschiedlichen Positionen
- 10844 km Gravimeterdaten mit Hilfe des fest eingebauten KSS31 Gravimeters

- 10844 km Schiffsmagnetik mit Hilfe von zwei fest installierten Fluxgate-Magnetometern
- 24457 km Helikoptermagnetik
- 1843 km Parasound-Daten

Erste Resultate dieser Messungen werden in den nächsten 2 Jahren erwartet.

Einen wichtigen Beitrag zur erfolgreichen Beprobung und Interpretation sowohl der geophysikalischen als auch petrologischen Informationen sollen die während der gesamten Reise erhobenen bathymetrischen Daten liefern.

Insgesamt war die Expedition in den Südatlantik sehr erfolgreich. Neue Ergebnisse/Interpretationen zur Ausdehnung und globalen Bedeutung des känozoischen, submarinen Vulkanismus im Südatlantik können in den nächsten Jahren erwartet werden.

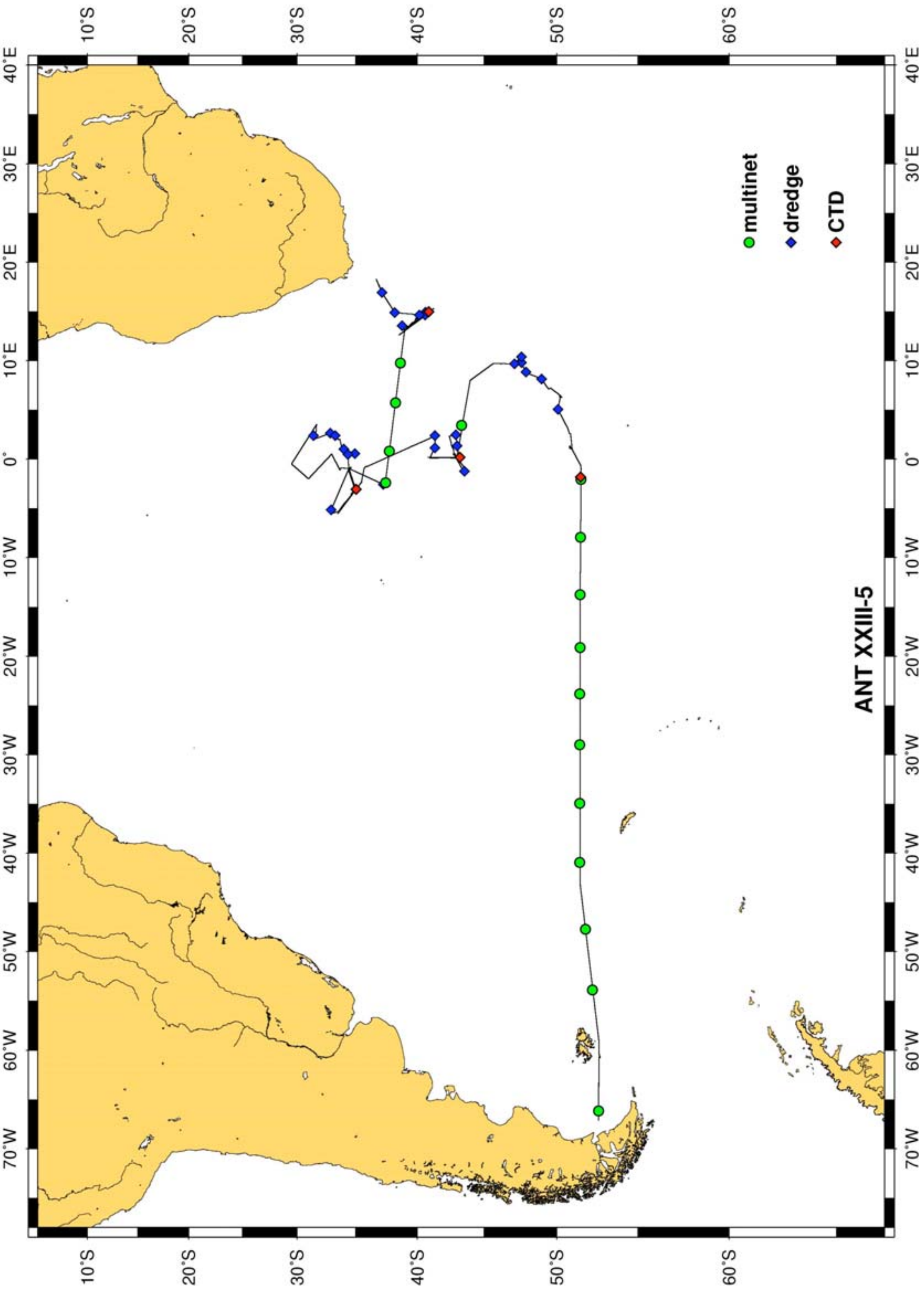


Fig. 1: Polarstern route and station locations during ANT-XXIII/5

SUMMARY AND ITINERARY

The expedition ANT-XXIII/5 started on April 13, 2006 in Punta Arenas and terminated in Cape Town on June 12, 2006 (Fig. 1). Beside biological experiments, which were carried out during the first part of the expedition, the main objective of the cruise was to conduct geoscientific research in the South Atlantic. The target area of the expedition was the region around the Young Shona, Discovery and Cape Rise seamounts as well as the southern Walvis Ridge.

The entire leg was favoured by unusual good and stable weather, which is uncommon during this part of the year. Excellent weather forecasts allowed us to avoid, with one exception, a few low-pressure systems, which would have delayed our research programme. Thus, most of the planned experiments could be completed.

Biological multi-net stations were performed during the transit from Punta Arenas to our first petrological research area (12), and in the Cape Basin (4). The multi-net stations, 16 in total, will provide new information about the biodiversity and ecology of deep-sea copepods in polar seas. The two copepod families *Euchaetidae* and *Aetideidae* are important components of zooplankton communities throughout the World Ocean, especially in deep oceanic waters and polar regions.

The petrological programme started at the Young Shona seamounts south of 50°S. In total, 6 dredges could be recovered in this previously un-sampled area. Similarly successful were the dredges at the Discovery Seamounts (5), the southern Walvis Ridge (9), the Agulhas Ridge (3), and the Cape Rise Seamounts (3). After completing the cruise the rock samples were distributed among the three involved institutions. First results from the petrological analyses can be expected in 1-2 years. The geophysical programme should provide new information on the evolution of the Discovery Seamounts, the Walvis Ridge, the Agulhas Ridge and the Cape Rise seamounts. The main objective of the geophysical experiments was to gather information about the crustal thickness of these features, and to provide information whether the submarine volcanoes erupted on-axis or off-axis. In detail the following data sets were acquired:

- 1,843 km multi-channel seismic (800 m Streamer)
- 1,020 km refraction profiles (Discovery Seamounts, Walvis Ridge, Agulhas Ridge) at altogether 33 different positions.
- 10,844 km gravity data gathered by the fixed-mounted KSS31 gravity meter
- 10,844 km ship magnetic gathered with two fixed-mounted fluxgate magnetometers
- 24,457 km helicopter magnetic
- 1,843 km Parasound data

First results of these measurements can be expected in the next two years.

An important contribution to the successful petrological sampling and the following interpretation of the geophysical/petrological data will be provided by the swath bathymetric data, which were gathered along the entire cruise track.

Finally, the results of this successful expedition will provide important new interpretations on the extent and the global importance of the Cenozoic submarine volcanism in the South Atlantic in the upcoming years.

2. WEATHER CONDITIONS DURING ANT-XXIII/5

Reinhard Hering-Zieringer, Hartmut Sonnabend
Deutscher Wetterdienst

RV *Polarstern* left Punta Arenas in the evening under calm weather conditions in cold air flowing in. Reaching the Atlantic Ocean the next morning we already encountered a low-pressure system that had developed beneath a northbound secondary trough. Satellite images had helped to reveal the typical comma cloud often associated with intense storm development (Figs. 2.1, 2.2). Strong winds from the south with gusts up to Bft 9 hit the ship on its way to the east with wave heights reaching 5 to 6 m.

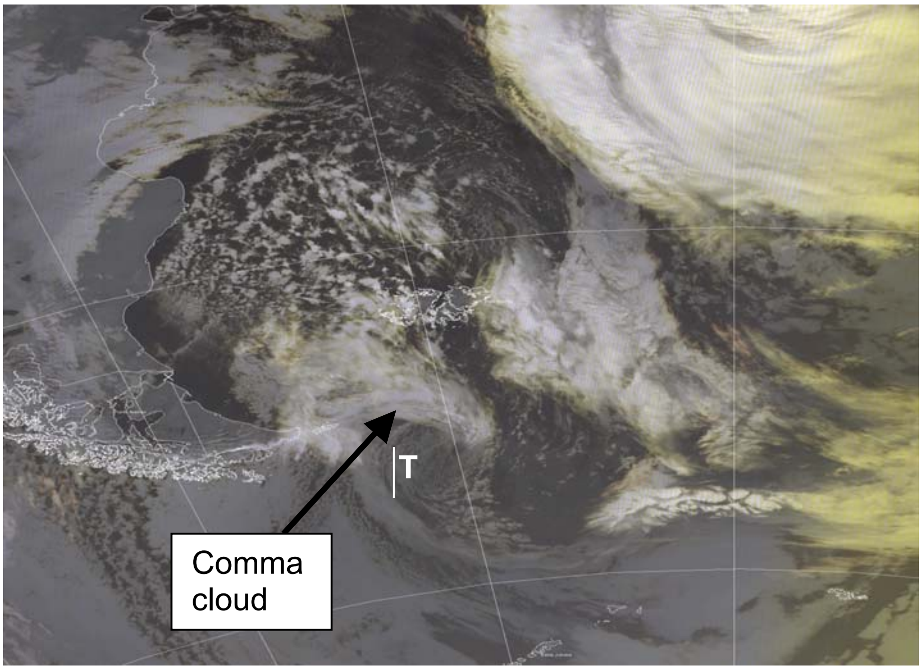


Fig. 2.1: IR-picture (NOAA) from 14.04.2006 08.12 UTC. Centre of low pressure labelled by the letter "T"

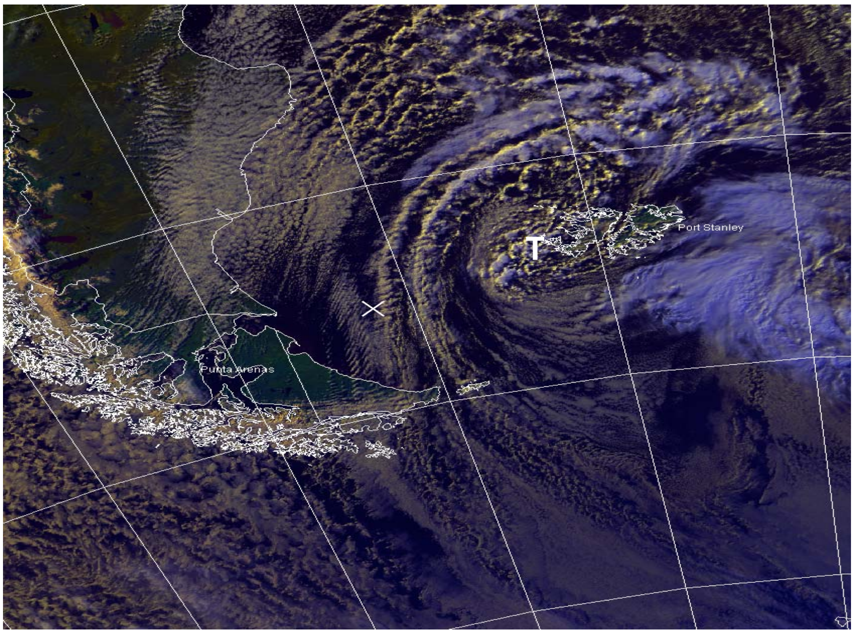


Fig. 2.2: VIS-Picture (NOAA) from 14 April 2006 19.04 UTC. Position of RV Polarstern indicated by a cross. Centre of storm low (labelled by "T") close to Falkland Islands.

After the low had moved further north, wind speeds significantly decreased on Saturday, 15 April. High-pressure influence became dominant for more than one week as the RV *Polarstern* moved eastward nearly at the same speed as the anti-cyclonic system. Wind speeds went sometimes up to Bft 7 only after the wind had veered to northwesterly directions. The surface analysis (Fig. 2.3) is representative for this period. Due to the advection of warm and moist air over cold water (4° C) visibility became worse and on some occasions fog developed.

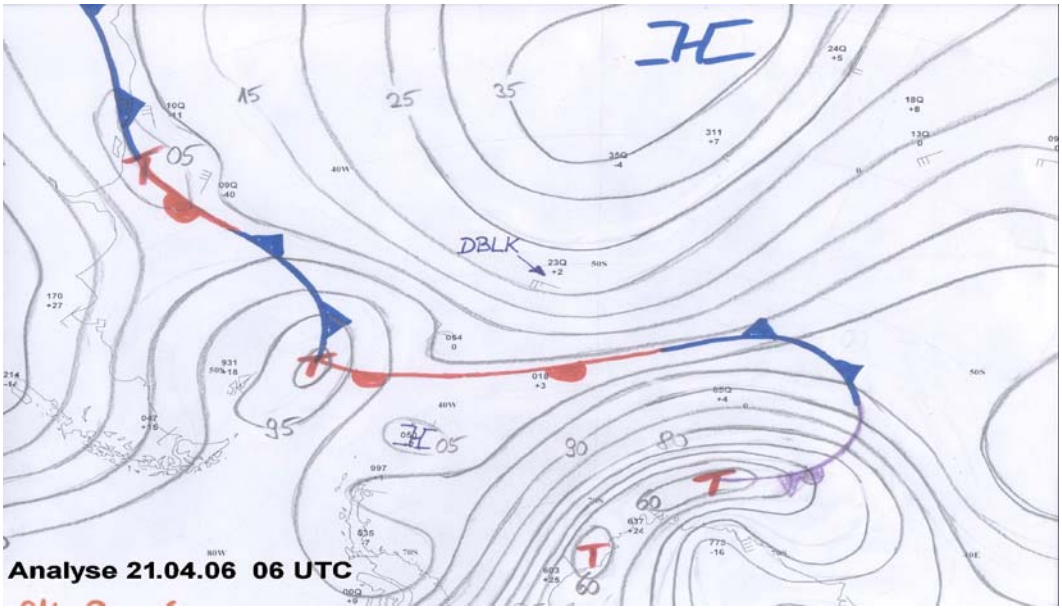


Fig. 2.3: Surface analysis of 21 April, 2006 06 UTC. Position of RV Polarstern (DBLK): 51,5°S – 25°W

On our way further east along 51°S an extended surface trough, stretching from east to west, had formed around 25 April, near 5°W as a result of an occlusion process. Visibility was significantly reduced again, and cloud bases went down beyond a limit, which would allow helicopters to take off. Winds from northwest with gusts up to 7 Bft and waves up to 4 m high, made it all the more difficult. Finally, on 27 April, cold air from the south penetrated into this area. Visibility and height of clouds rapidly increased while temperatures went down to only 1° C.

An unusual event happened in the morning of 27 April while many people had breakfast. Although winds had become very weak the ship suddenly started to roll heavily. This unexpected movement was induced by a long swell from west-northwest and another swell from southwest. High-pressure influence was prevailing until a severe storm development threatened the working area between 0° -10°E and 44°-50°S on 30 April (Fig. 2.4). Various routes were discussed in order to escape the storm. Nevertheless we had to put up with strong crosswinds.

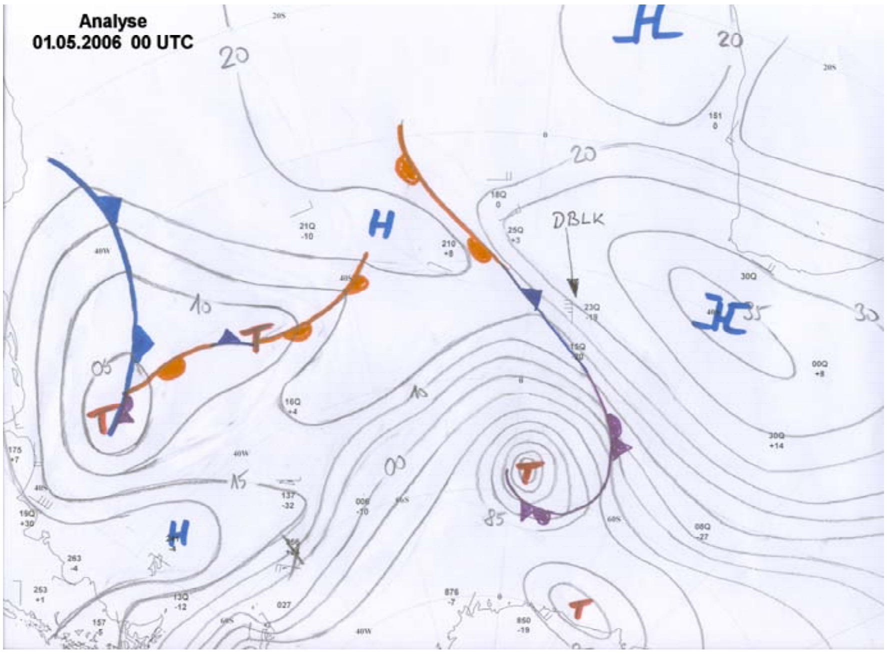


Fig. 2.4: Surface analysis of 01 May 2006 00 UTC. Position of RV Polarstern near 43°S – 5°E

Until 3 May shallow depressions again caused extremely low cloud bases and reduced visibility.

Another storm approaching from the west hit the RV *Polarstern* on 4 and 5 May. The centre of this intense low moved along 50°S eastwards, while its upper trough crossed the position of the ship in northeast direction (Figs. 2.5, 2.6). Wind speeds went up rapidly to Bft 9 with gusts up to 12 Bft, mainly caused by strong showers associated with deep convective cells within the polar air. Waves reached a maximum height of 8 to 10 m during the night of 4 May to 5 May.

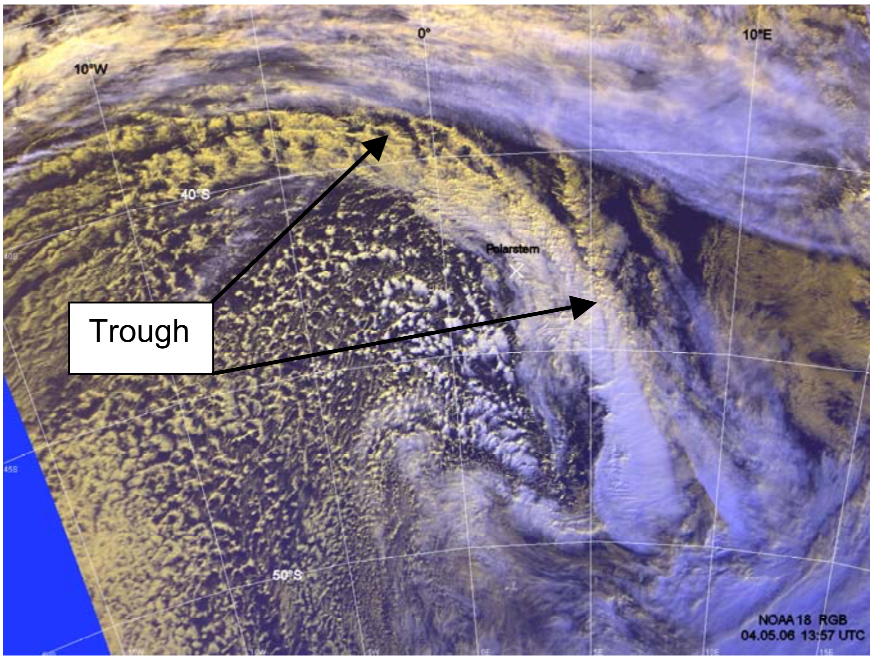


Fig. 2.5: VIS-picture (NOAA) from 4 May 2006 13:57 UTC

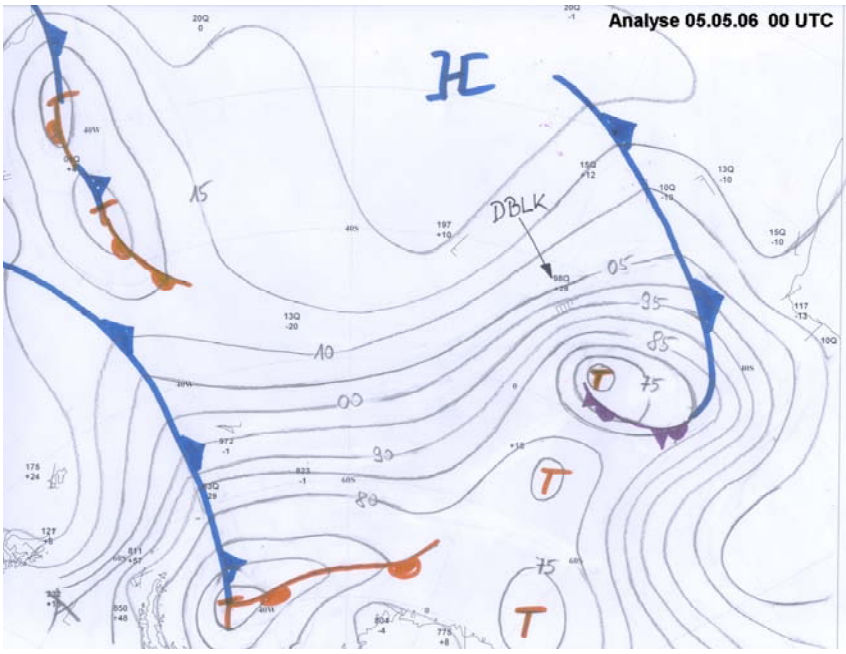


Fig. 2.6: Surface analysis of 5 May 2006 00 UTC. Position of RV Polarstern (DBLK) near 42°S – 1°E. Average wind velocity at that time: 45 kts. Note that former trough line has been transformed into a cold front due to horizontal shear of the temperature field.

After a very short period under weak high pressure influence the next cyclonic system approached from the west on 6 May. However, the ship remained in a stable stratified air mass flowing in from northwest and the wind gusts were considerably weaker than those observed the two previous days. Apart from this aspect, the mean wind speed again increased sometimes to a 10-minute average of Bft 9 and wave heights reached up to 6 m. The passage of the cold front put an end to the stormy weather during the next day. There was another weak low following with very weak pressure gradient. While the ship was heading north, temperatures rose to 17° C on 11 May under the influence of a shallow subtropical low.

On our transit to the next destination (Walvis Ridge) weather conditions remained largely undisturbed with partly sunshine and weak pressure gradient until 13 May. Afterwards the trade wind zone was pushed back to the north by some shallow surface troughs. Showers and a few thunderstorms were observed as well as long lasting rain (more than 30 l/m^2 within 24 h on 14 May). The vicinity of the subtropical jet stream became obvious both in satellite pictures, showing a well defined cloud band close to us, and by wind speeds up to 150 kts in 10 km altitude according to our soundings.

Starting 19 May, the weather completely changed. The position of RV *Polarstern* at that time was 30°S - 0°. A strong high-pressure system developed in the trade wind belt west of us, and winds turned to southeast in our area. Cooler and dryer air flew in together with a lot of stratocumulus clouds, which had spread under a marked inversion. This phase ended on 25 May, when a warm front, belonging to a subtropical low, approached our working area around 34°S - 5°W. Moist and partly unstable air caused some showers.

By 28 May, a rather persistent northwesterly current with storm potential had formed in the transition area to our next destination at 39°S - 13°E. This had happened because the subtropical low intensified, and had thus been incorporated into the polar frontal zone. Stormy weather occurred on 29 and 31 May and with winds up to 9 Bft and gusts up to 10 Bft (Fig. 2.7).

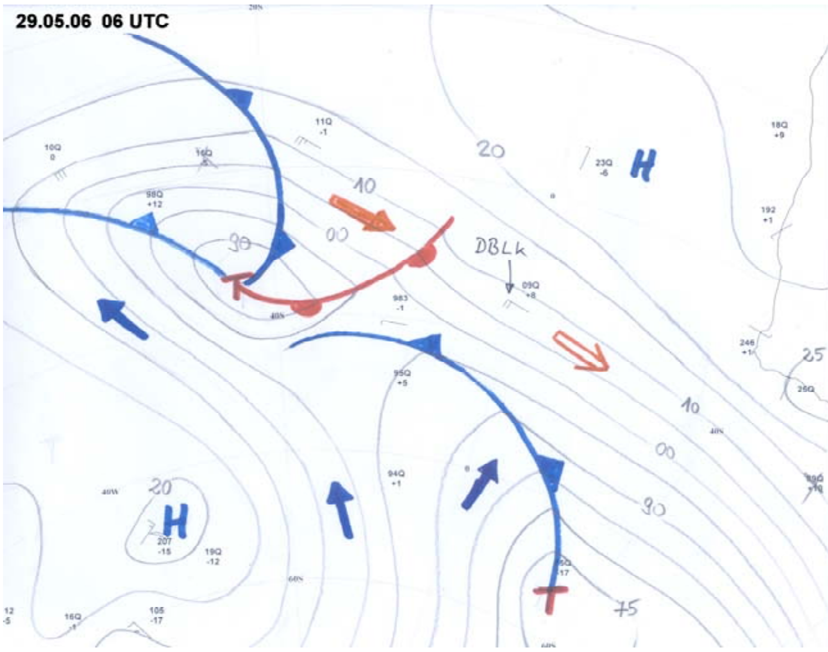


Fig. 2.7: Surface analysis from 29 May 06 UTC. Position of RV Polarstern (DBLK): 38°S – 0,5°E.

The situation was shortly interrupted on 1 June, when the cold front of the former subtropical low crossed our destination and cold air from southwest intruded into our new working area. Temperatures dropped about 9°K and gave a taste of the beginning winter season. By 3 June, however, the former pattern of strong winds up to 9 Bft from northwest (Fig. 2.8) had been restored, advecting warm air.

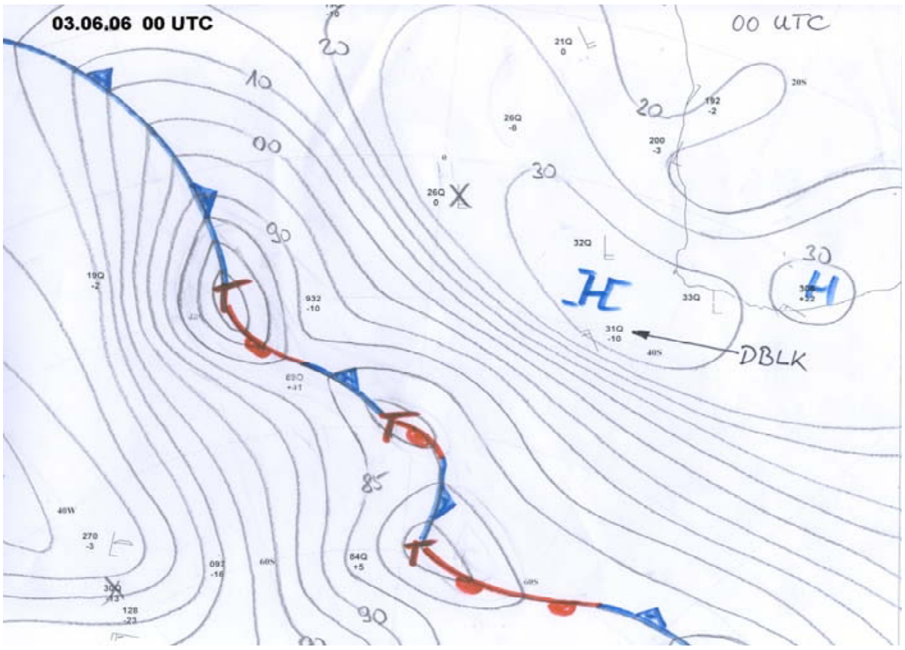


Fig. 2.8: Surface analysis from 3 June 06 00UTC. Position of RV Polarstern: 40°S – 15°E

The cold front of the southerly low complex (Fig. 2.8) approached the working area associated with a marked drop in pressure. Finally, the long lasting situation with strong winds from northwest ended by 6/7 June, when the cold front had pushed forward further northeast. Temperatures dropped by 4°K, and high-pressure influence became dominant for several days. Wind speeds remained low, and the sea surface became smooth.

On 10 June, the surface pressure started dropping significantly. Winds turned from easterly to northwesterly directions, but remained weak. On 11 June, however, wind speeds increased in the evening up to 7 Bft, and remained high until we arrived in Cape Town the next morning. Another subtropical low approaching the southwest of the African coast was the reason for this situation, which is not unusual for this season as June being the month with the highest values of precipitation.

For detailed information about weather parameters in the various working areas see figures 2.9 to 2.12.

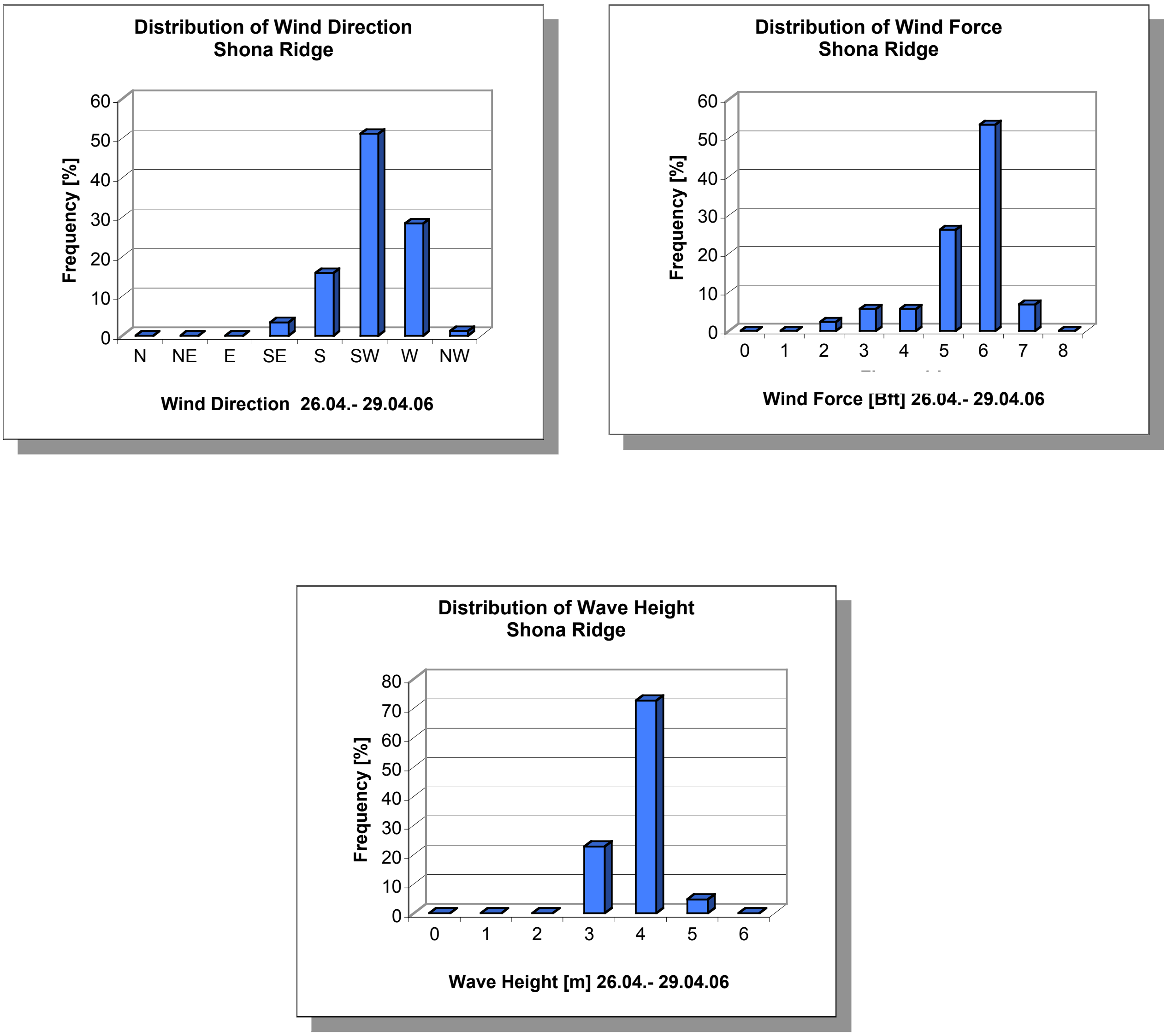

Distribution of Wind Direction
Shona Ridge
Frequency [%]
60
50
40
30
20
10
0
N
NE
E
SE
S
SW
W
NW
Wind Direction 26.04.- 29.04.06
Distribution of Wind Force
Shona Ridge
Frequency [%]
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
Wind Force [Bft] 26.04.- 29.04.06
Distribution of Wave Height
Shona Ridge
Frequency [%]
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
Wave Height [m] 26.04.- 29.04.06

Fig. 2.9 a - c

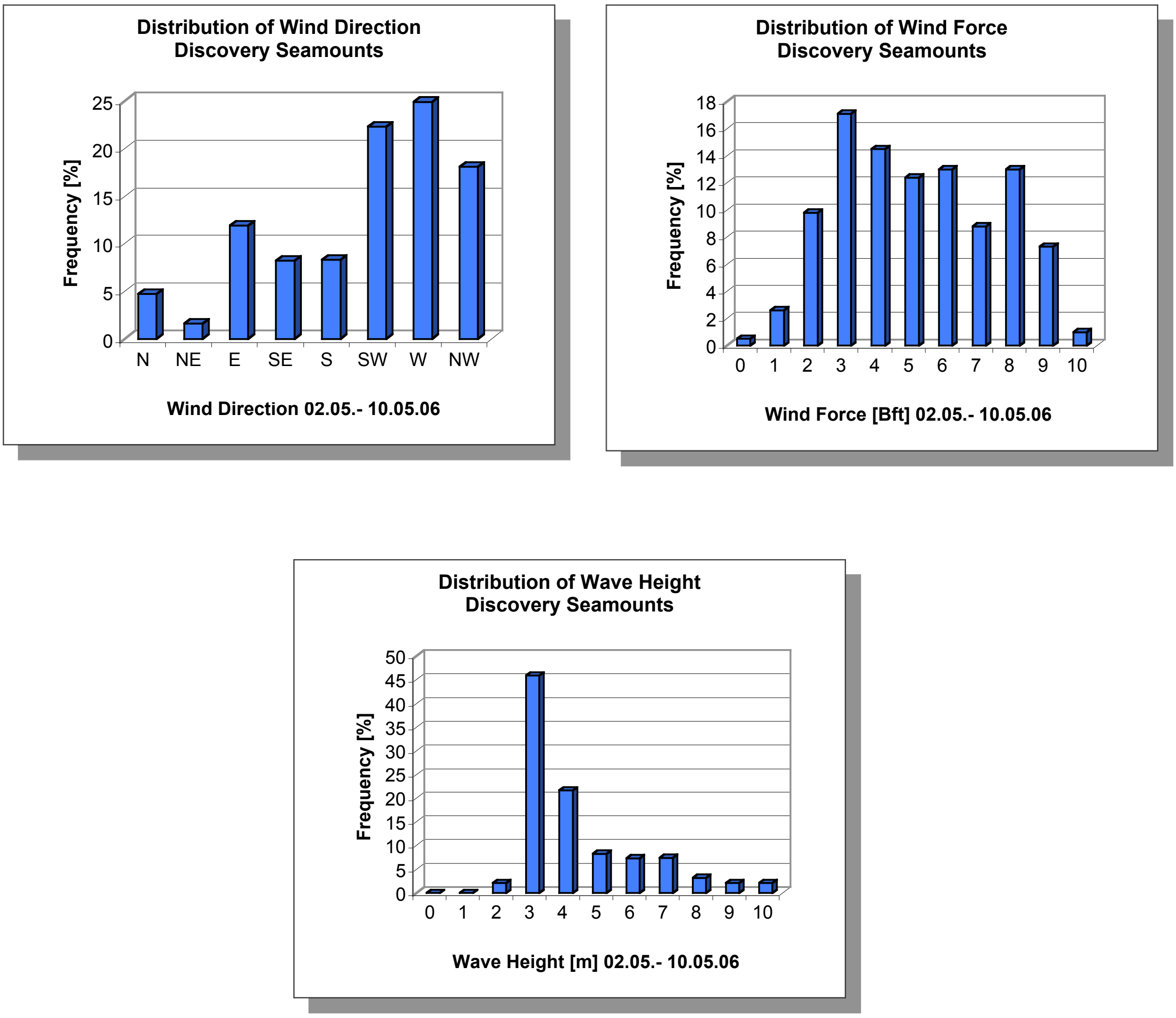

Distribution of Wind Direction
Discovery Seamounts
Frequency [%]
25
20
15
10
5
0
N
NE
E
SE
S
SW
W
NW
Wind Direction 02.05.- 10.05.06
Distribution of Wind Force
Discovery Seamounts
Frequency [%]
18
16
14
12
10
8
6
4
2
0
0 1 2 3 4 5 6 7 8 9 10
Wind Force [Bft] 02.05.- 10.05.06
Distribution of Wave Height
Discovery Seamounts
Frequency [%]
50
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5 6 7 8 9 10
Wave Height [m] 02.05.- 10.05.06

Fig. 2.10 a - c

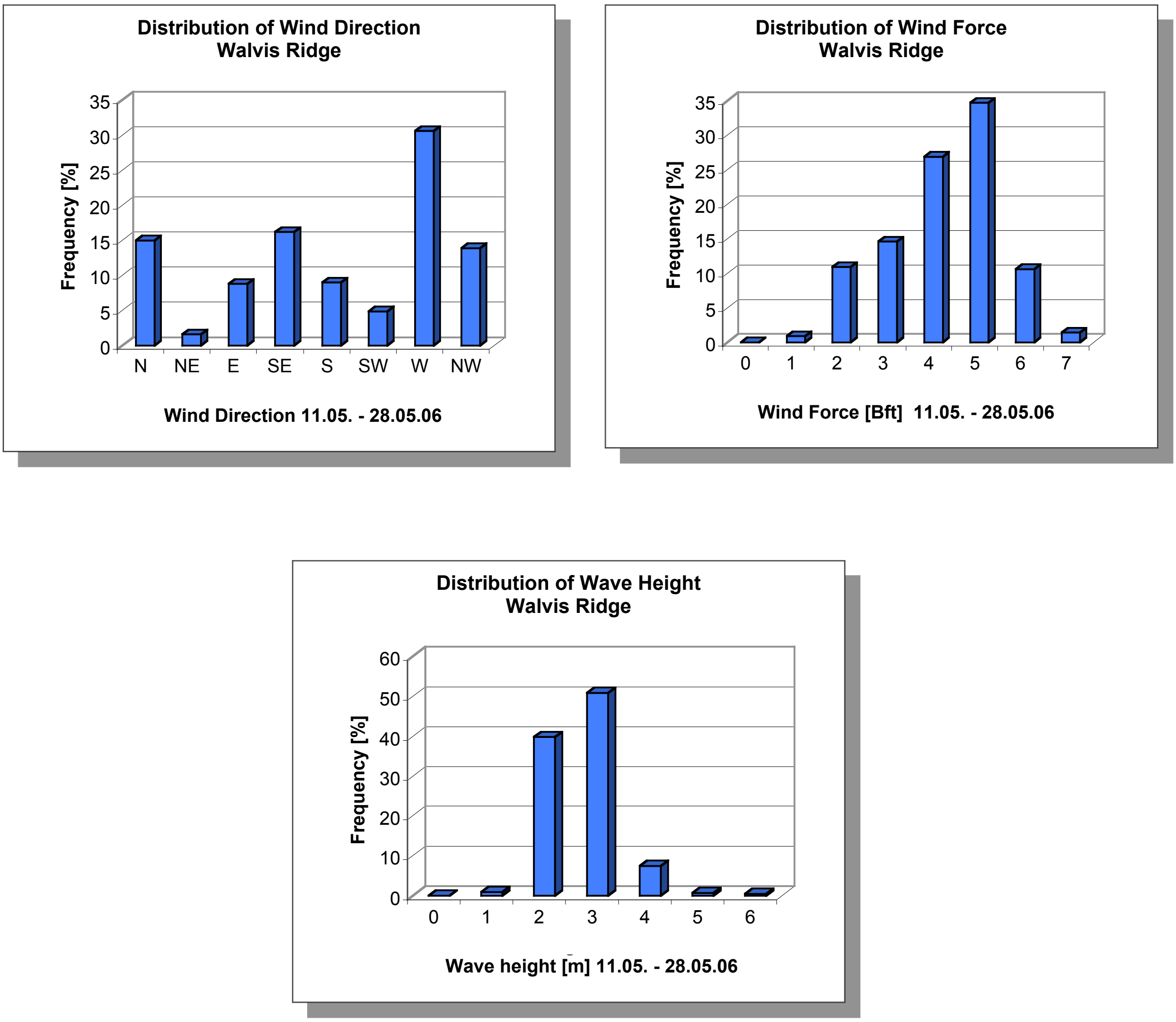
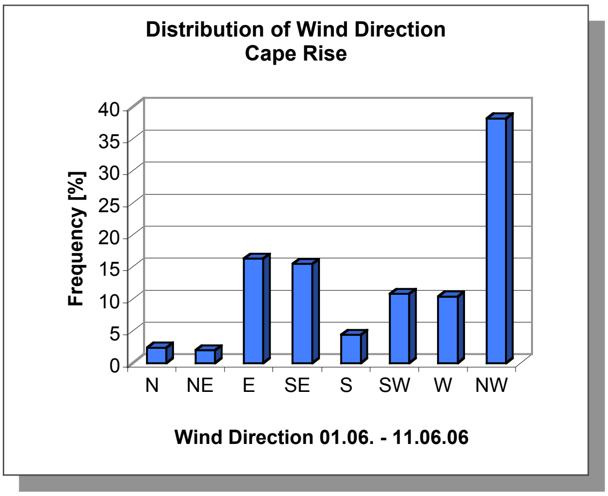
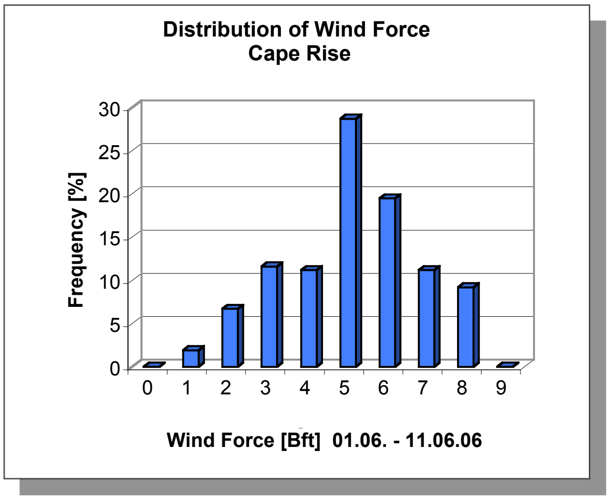

Distribution of Wind Direction
Walvis Ridge
Frequency [%]
35
30
25
20
15
10
5
0
N
NE
E
SE
S
SW
W
NW
Wind Direction 11.05. - 28.05.06
Distribution of Wind Force
Walvis Ridge
Frequency [%]
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
7
Wind Force [Bft] 11.05. - 28.05.06
Distribution of Wave Height
Walvis Ridge
Frequency [%]
60
50
40
30
20
10
0
0
1
2
3
4
5
6
Wave height [m] 11.05. - 28.05.06

Fig. 2.11 a - c


Distribution of Wind Direction
Cape Rise
Frequency [%]
0
5
10
15
20
25
30
35
40
N
NE
E
SE
S
SW
W
NW
Wind Direction 01.06. - 11.06.06


Distribution of Wind Force
Cape Rise
Frequency [%]
0
5
10
15
20
25
30
0
1
2
3
4
5
6
7
8
9
Wind Force [Bft] 01.06. - 11.06.06

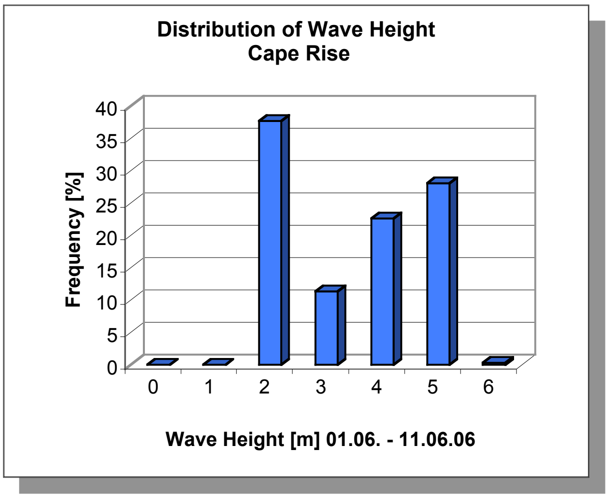

Distribution of Wave Height
Cape Rise
Frequency [%]
0
5
10
15
20
25
30
35
40
0
1
2
3
4
5
6
Wave Height [m] 01.06. - 11.06.06

Fig. 2.12 a - c

3. BATHYMETRIC INVESTIGATIONS

Ralf Krocker, Jana Schneider, Jan-Hendrik Lott
Alfred-Wegener-Institut

Objectives

The main task of the bathymetric group was to maintain the multi-beam system Hydrosweep DS2, and to guarantee the smooth data acquisition. The measured data have been processed to charts, which were used as basics for other scientific groups. Furthermore, the data will be a contribution to the global bathymetric dataset, which still contains sparse data within the main working areas of cruise ANT-XXIII/5.

Work at sea

Multibeam operation

Immediately after leaving Punta Arenas on 13 April 2006, the multi-beam system was switched on, whereupon the default setting of soft beam modus had to be changed to hard beams. The data storage was started on 14 April at 15:00 UTC, and was stopped on arrival in Cape Town at 06:00 UTC of 12 June 2006.

Contrary to previous experiences, the Hydrosweep system did not work that properly, which may have been caused by the system update to soft beams. The system failure had several reasons, which took different ways to solve. In various time intervals, lasting from three to five minutes, the SURVEY STATE DISPLAY indicated an error of DS2, neglecting data acquisition and data storage for that period of time. For the most part, the system was able to restore its functionality. When unsuccessful, however, the operator had to interrupt the data storing by stopping and restarting the data acquisition. Sometimes, the software Hydromap Online had to be rebooted additionally. Three times the system crashed this way. Only a hardware reset could restore the functionality. The resulting data show gaps of approximately one hour each time.

Checking navigational data, jumps in the positions were found. It is assumed to have been caused by the MINS (marine inertial navigational system), since incoming positions showed a continuous course, as can be seen in figure 3.1. Two procedures were used to correct the coordinates. On the one hand, the original smooth GPS positions had been corrected by installation offset related to ship's (coordinate origin)?, and were used without any further adjustments. On the other hand, wrong coordinates, which were still used in bathymetric raw data, had been replaced by original GPS coordinates. These GPS data were additionally adjusted by information on the ship's movement (roll, pitch and heave) of the MINS, and were centered in accordance with the Hydrosweep transmitter unit.

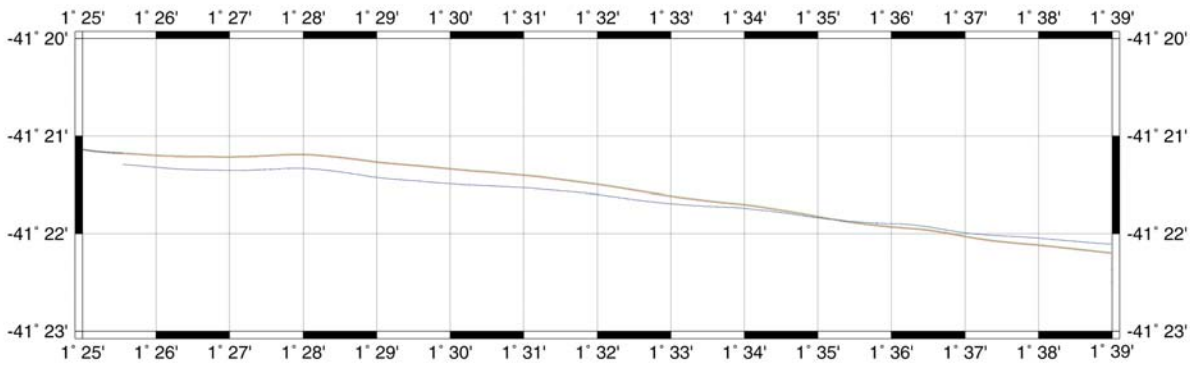


Fig. 3.1: At 1°25.5'E the MINS position (blue line) jumps approximately 200 meters to the south, and does not match the Trimble1 and Trimble2 GPS positions any longer.

The petrologists made three observations concerning the online visualization of Hydromap Online. First, the calibration signal should additionally be displayed, e.g. for a better interpretation of morphology, while looking for dredge locations. Second, the type of visualisation is very simple and could be processed e.g. as a shaded relief using a larger colour table. Third, the visualisation of previous measured data should stay longer on the screen, before changing to a simpler presentation.

Data processing and statistics

During 60 days of data acquisition a distance of 10,641 nm had been sampled. 457,150 swaths comprising 59 pre-formed beams each covered an area of nearly 126,000 square kilometres (inclusive redundancies). Sampling three files per day, 178 files with a complete size of 2.9 gigabyte have been stored in ATLAS SURF format.

The bathymetric raw data are influenced by random and systematic errors. Using Caris HIPS, approximately 6 % of pre-formed beams have been marked manually to be incorrect (minimum 0.3 %, maximum 96 %, median 3 % per file), and were suspended from further processing. During the night of the 4 to the 5 of May 2006, a storm distorted the data quality, resulting in a 96 % data loss. The sea state affected the data acquisition permanently. In one of the worst cases, the swath width of valid beams was reduced to half, as shown in figure 3.2.

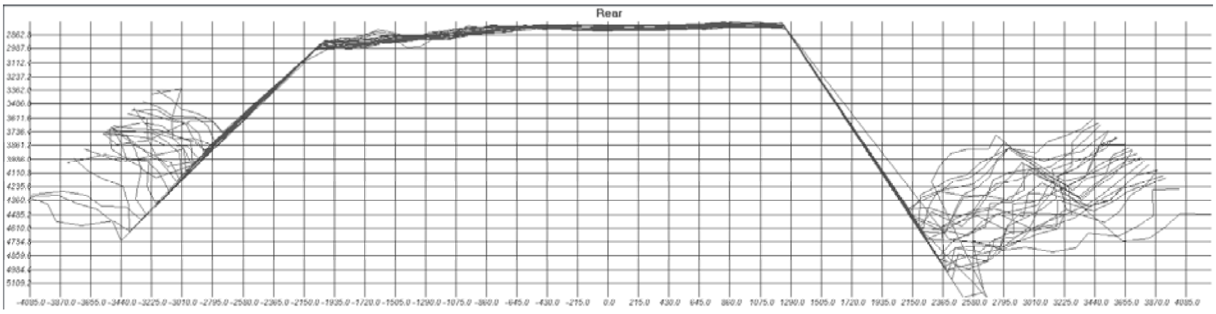


Fig. 3.2: Bad signal/noise ratio biased the outer beams

The bathymetric data have been edited and converted for further processing and archiving. Furthermore, they have been used for track planning. Avoiding data gaps and generous overlapping of neighbouring tracks, new waypoints have been planned in relation to the water depth. The result of this task can be seen in figures 3.3 to 3.5, showing examples of six parallel tracks. These tracks, crossing the Agulhas Ridge, have been the only systematic survey pattern on this cruise. Furthermore, more than fifteen charts of dredge locations have been created using GMT (Generic Mapping Tool) to support the petrological programme.

Examples of grey shaded digital terrain models

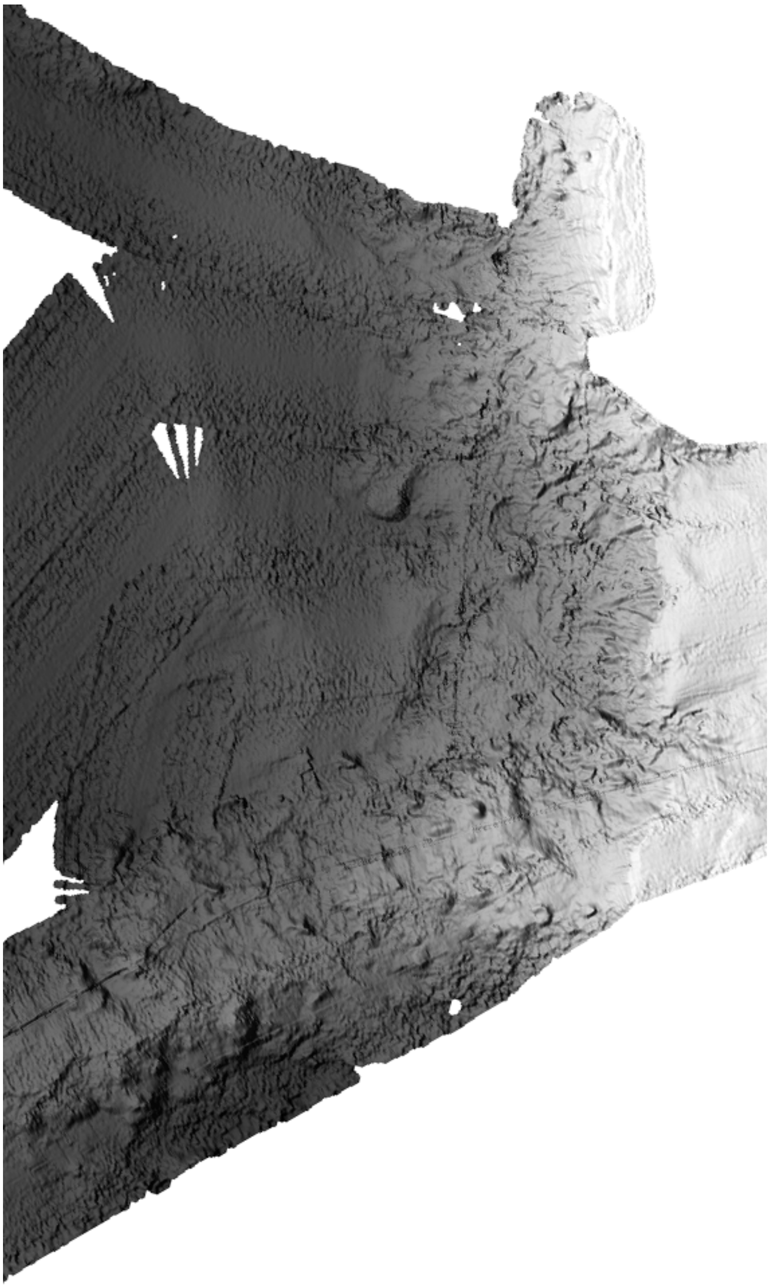


Fig.3.3: North-western slope of the Agulhas Ridge

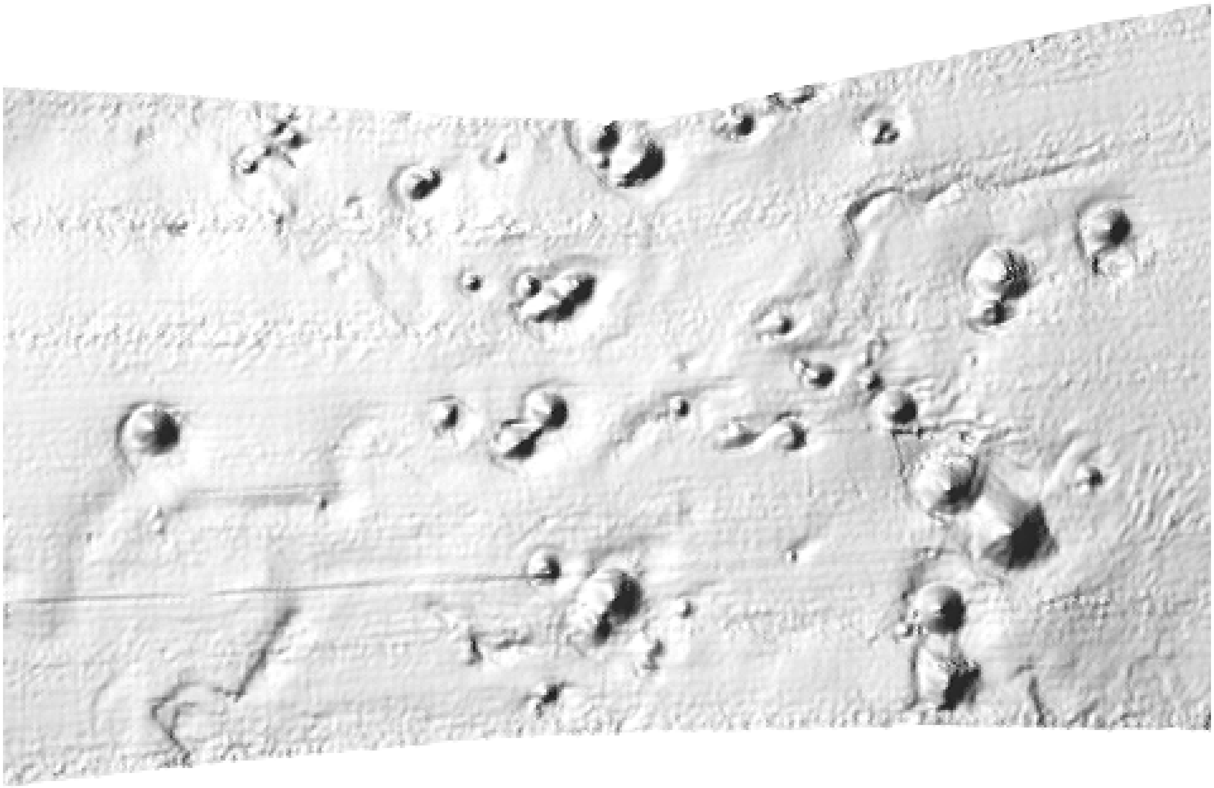


Fig. 3.4: Volcano peaks on the central Agulhas Ridge

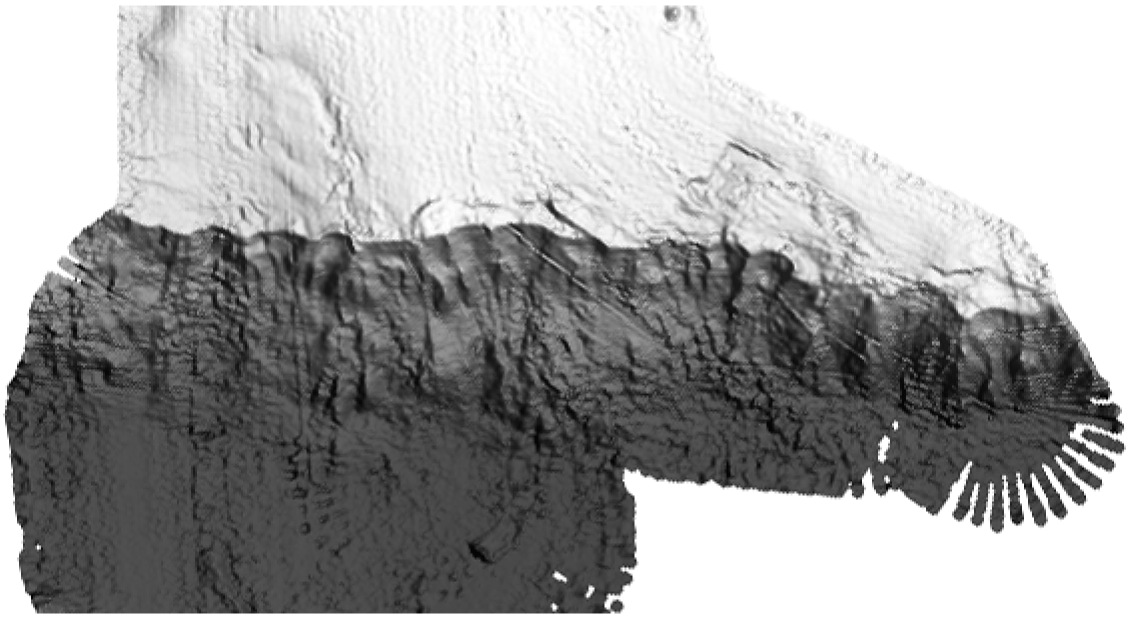


Fig. 3.5: South-eastern slope of Agulhas Ridge

Sound velocity profiles – CTD measurements

The sea floor depth is calculated by the travel time of an acoustic signal moving from the ship to the seafloor and back. The needed sound velocity in water changes according to water conditions, and therefore has to be determined for an accurate depth calculation. The sonar system, Hydrosweep DS2, has the ability to calculate the mean sound velocity, accomplishing a cross fan calibration. To achieve the most accurate depth values, four CTD measurements have been carried out in addition. When sampling the entire water column, we use the temperature, salinity and pressure values to calculate the exact sound velocity. The data variation is ample in shallow water, and almost linear in deep water. Therefore, CTD data had been sampled up to a maximum depth of 2,500 metres only, using a Seabird 911-Plus instrument, which sent data online by cable to the receiver unit in the winch control room. Table 3.1 provides an overview on the measurements; figure 3.6 graphically shows the sound velocities as a function of depth.

Tab. 3.1: Overview of measured CTD profiles

No.	Date / Time	Position	Depth
1	25.04.2006 / 16:40	51° 35' S - 001° 50' W	2,000 m
2	03.05.2006 / 21:00	43° 15' S - 010° 00' E	2,500 m
3	15.05.2006 / 07:15	35° 24' S - 003° 45' W	2,500 m
4	02.06.2006 / 08:45	40° 55' S - 015° 01' E	2,112 m

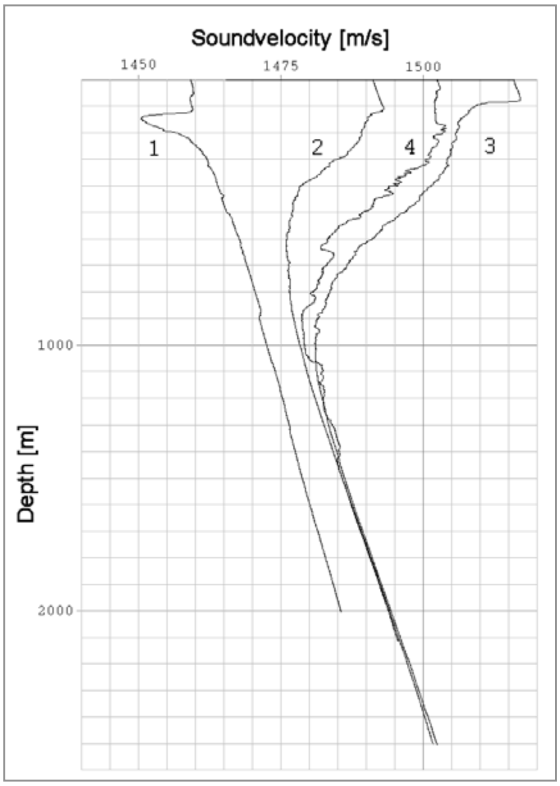


Fig. 3.6: Sound velocity profiles:
1) 25.04.2006;
2) 03.05.2006;
3) 15.05.2006;
4) 02.06.2006

4. BIODIVERSITY AND ECOLOGY OF DEEP-SEA COPEPODS

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Background and Objectives

The DFG funded project "Biodiversity and ecology of deep-sea copepods in polar seas – speciation processes and ecological niches in the homogeneous environment of the pelagic realm" focuses on the biodiversity and feeding ecology of dominant deep-sea copepods in the Antarctic and Arctic Oceans.

The two copepod families *Euchaetidae* and *Aetideidae* are important components of zooplankton communities throughout the World Oceans, especially in deep oceanic waters and polar regions. Most of these species inhabit meso- and bathypelagic depths, while some are epi- or benthopelagic. *Euchaetidae* contribute significantly to the zooplankton biomass in both polar regions, while *Aetideidae* are characteristic inhabitants of the Antarctic and Arctic deep-sea. The genus *Paraeuchaeta* is carnivorous, and includes major predators of other mesozooplankton. Aetideid copepods are generally referred to as omnivorous. Species of both families can be responsible for one to two thirds of the total energy flow throughout the carnivorous trophic level, and may consume nearly half of the vertical carbon flux. Thus, these meso- and bathypelagic copepods substantially affect pelago-benthic coupling processes and, hence, may have a significant impact on carbon and energy fluxes in polar systems.

A characteristic, but still enigmatic feature of *Euchaetidae* and *Aetideidae,* is the co-occurrence of several- to many closely related species in pelagic deep-sea habitats of the Antarctic and Arctic. For instance, 14 species of the genus *Paraeuchaeta* coexist in waters around the South Georgia archipelago in the Southern Ocean. Since the pelagic deep-sea is an almost homogeneous environment without physical barriers, the sympatric co-occurrences of such closely related species raises the questions of how the biodiversity of these deep-sea species evolved, and what mechanisms effectively minimize inter-specific competition, which would otherwise lead to the extinction of less fit competitors.

Most deep-sea ecosystems depend on primary production in the thin euphotic surface layer of the ocean, and on the sedimentation of organic matter to deeper strata. Therefore, resource limitation presumably represents an important factor in the evolution of meso- and bathypelagic species. Our project focuses on differences in vertical distribution, life-cycle strategies, diet spectra and feeding behaviour of different co-occurring deep-sea copepods in order to characterise their distinct ecological niches in the deep-sea pelagic realm. Thus, our project contributes, in general, to an improved understanding of deep-sea biodiversity and evolutionary patterns, particularly of the reasons and mechanisms sustaining a relatively rich meso- and bathypelagic fauna with a comparatively high biodiversity in polar seas despite the limited food supply and the absence of physical barriers. With these objectives, our project actively contributes to international marine biodiversity initiatives, such as Census of Marine Zooplankton (CMarZ).

Concentrating on important families of deep-sea copepods and applying state-of-the-art molecular genetic and biochemical methods, the project addresses the following questions:

1) How do closely related species (or even congeners) find individual niches in the almost homogeneous environment of the deep-sea pelagial?
2) Are there any differences in the vertical distribution of sympatric species?
3) How do feeding behaviour and diet composition vary among co-occurring species in order to minimise or avoid inter-specific competition?
4) When, how and why did the spread of aetideid and euchaetid copepods occur, leading to the high biodiversity of these deep-sea inhabitants?
5) What are the speciation mechanisms in the almost homogeneous environment of the deep-sea pelagial?
6) What are the reasons and mechanisms sustaining a relatively rich meso- and bathypelagic fauna with a comparatively high biodiversity in polar seas despite the limited food supply and in the absence of physical barriers?

Work at Sea

During the expedition ANT-XXIII/5, deep-sea copepods were collected at a total of 16 stations by stratified multiple opening/closing net hauls (Hydro-Bios Multi-Net, 200 µm mesh size). Sampling concentrated on two transects from West to East (Table 4.1); the first one at latitude 51°30'S across the Atlantic sector of the Southern Ocean from 53°54'W to 2°05'W, and a second one at approximately 38°S from 2°26'W to 9°45'E (Table 4.1). Standard depth intervals (2,000-1,500-1,000-500-200-100-50-0 m) were sampled in order to study differences in the vertical and regional distribution of copepod species in relation to hydrographic regimes. Since only five discrete depth strata could be sampled in one haul of the multi-net, two successive hauls (one to 2,000 m depth and another one to 200 m) were conducted at each station in order to combine deep sampling with a higher vertical resolution of the upper water layers.

Tab. 4.1: Sampling stations

Station	Date	Time (UTC)	Bottom depth (m)	Surface temp. (°C)	Salinity (psu)	Position longitude	Position latitude	max. Sampling Depth (m)
341	14.04.2006	18:10	101	8,9	33,2	52°41´S	66°11´W	92
342	16.04.2006	14:45	2097	7,0	33,9	52°18´S	53°54´W	2000
343	17.04.2006	12:08	2526	5,2	33,8	51°51´S	47°45´W	2000
344	18.04.2006	11:59	3561	4,4	33,7	51°30´S	40°57´W	2000
345	19.04.2006	11:00	4841	5,5	33,8	51°30´S	34°59´W	2000
346	20.04.2006	11:03	3988	4,2	33,8	51°29´S	29°00´W	2000
347	21.04.2006	11:01	4456	5,6	33,8	51°30´S	23°50´W	2000

Station	Date	Time (UTC)	Bottom depth (m)	Surface temp. (°C)	Salinity (psu)	Position longitude	Position latitude	max. Sampling Depth (m)
348	22.04.2006	12:31	4448	5,5	33,8	51°30´S	19°08´W	2000
349	23.04.2006	10:01	4094	3,9	33,8	51°30´S	13°47´W	2000
350	24.04.2006	9:00	2818	2,5	33,6	51°32´S	7°58´W	2000
351	25.04.2006	8:56	2884	2,3	33,7	51°33´S	2°05´W	2000
361	01.05.2006	9:22	4428	10,8	34,3	43°23´S	3°26´E	500
439-2/3	28.05.2006	11:44	2695	16,6	35,1	37°30´S	2°26´W	2000
441	29.05.2006	8:59	5116	15,5	34,9	37°47´S	0°47´E	2000
442	30.05.2006	9:05	5140	14,9	35,2	38°17´S	5°43´E	2000
443	31.05.2006	9:02	5032	16,6	35,5	38°41´S	9°45´E	2000

Zooplankton samples were analysed in a cold-room container (0 - 4°C) immediately after the catch. Deep-sea copepods of the families *Euchaetidae* and *Aetideidae* (and other dominant species) were sorted, recorded and either used for experiments on board or deep-frozen at -80° C for molecular genetic and biochemical analyses (diet composition via fatty acid trophic biomarkers and stable isotopes) at the home laboratory in Bremen. The rest of the net samples were preserved either in formalin or in ethanol for genetic studies. In addition, zooplankton material (krill, amphipods and chaetognaths) was collected for other projects conducted by co-operating partners at the Alfred Wegener Institute and Bremen University.

Since food availability, feeding behaviour and diet composition are crucial factors in determining the ecological niches of deep-sea animals, feeding experiments were carried out onboard. During quantitative feeding experiments, we determined ingestion rates at ambient conditions (darkness and *in-situ* temperature of 0°C) with *Paraeuchaeta* species. Predators and prey were incubated for three or more days. After the termination of the experiments, the remaining prey organisms were counted and both, predators and prey were deep-frozen for body-mass determination in the home laboratory.

A total of 45 measurements of oxygen consumption were conducted to establish metabolic rates and energy requirements of deep-sea copepods. The experiments included females, males and copepodids C5 of the most dominant euchaetid and aetideid species, i.e. *Paraeuchaeta antarctica*, *P. biloba*, *P. farrani* and *P. rasa* as well as *Gaetanus brevispinus*, *G. tenuispinus*, *G. antarcticus* and *Pseudochirella* species. One to four individuals were incubated for three or more days at *in-situ* conditions in closed glass bottles filled with oxygen-saturated seawater. Oxygen concentrations were determined by Winkler titration and corrected for microbial respiration in comparison to animal-free controls. In order to calculate mass-specific respiration rates, individuals for body-mass determination were frozen for later analysis in the home laboratory.

Preliminary Results

A total of more than 900 deep-frozen samples were collected, including 7 species of *Euchaetid* and 14 species of *Aetideid* copepods at different developmental stages.

For several more species, final confirmation is still pending. *Paraeuchaeta antarctica* was the most abundant Euchaetid copepod in the southern part of the investigation area, while the dominant Aetideids *Gaetanus tenuispinus* and *G. brevispinus* occurred at all stations.

Considerable differences in the abundance and vertical distribution of epi- to mesopelagic species were observed in relation to the Antarctic Convergence, which extended far northward across the eastern section of the first transect. Particularly for *P. antarctica*, maximum abundances were recorded at stations 348 and 349 under strong influence of Antarctic water masses.

Closely related or congeneric species were usually confined to discrete depth ranges resulting in a multi-layered vertical distribution pattern and partitioning of the water column. However, certain congeners shared the same depth layers or had overlapping depth ranges. In some cases, an ontogenetic zonation was observed with younger stages usually inhabiting shallower water layers. Thus, vertical partitioning contributes to an avoidance of inter-specific competition, but additional mechanisms are required to explain the cases of co-existence.

The successful combination of fieldwork and experimental approaches during ANT-XXIII/5 as well as molecular genetic and biochemical analyses in the home laboratory will expand our knowledge about life-cycle strategies and biodiversity of meso- and bathypelagic zooplankton and help to elucidate speciation processes in the deep-sea environment.

5. GEOPHYSICAL INVESTIGATIONS ACROSS POTENTIAL HOTSPOT TRAILS IN THE SOUTH ATLANTIC

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Objectives

The South Atlantic has been facing several pulses of marine magmatism during its geological history since the middle Mesozoic. The most prominent feature is the Walvis Ridge/Rio Grande Rise, which is believed to be a consequence of a long-living thermal anomaly (hotspot?) in the earth's mantle. Another hotspot trail might have been created along the old and young Shona ridges. The youngest expressions of submarine volcanism beside the mid-ocean ridge are the Discovery Seamounts, which are located between the Shona and Walvis ridges.

Along and across the seamounts extensive geophysical investigations were conducted to unravel key parameters like crustal thickness for these features.

While one of the petrological objectives is to understand if and how these volcanic events were connected, the geophysical work will concentrate on retrieving basic parameters on crustal thickness and evolution. Seismological, magnetic and gravimetric measurements were conducted as well.

In detail we would like to contribute to the following problems/questions:

- What is the amount of volcanic material of the Discovery Seamounts? For this, we would like to investigate the crustal structure and mantle composition beneath the seamounts.
- Did the seamount erupt at the axis of the mid-ocean ridge or off-axis? This will be investigated by means of a detailed magnetic helicopter survey to map the magnetic signature of the Discovery Seamounts.
-

The southern Walvis Ridge has a much narrower topographic signature than its northern part. If the mantle anomaly is more diffuse in that area, we might also find oceanic crust, which is thicker than normal. This will be investigated through a deep seismic sounding experiment. Further lines along the Walvis Ridge towards the north will be conducted, if we cannot reach one of our primary targets (Young Shona Ridge).

Similar experiments were conducted across the Old Shona Seamounts/Cape Rise Seamounts and Agulhas Ridge on the way to CapeTown.

Work at Sea

To achieve the most complete geophysical data set, we performed the following experiments (Fig. 5.1; Tables 5.1 -5.9):

- Three deep seismic sounding profiles across the Discovery Seamounts, the southern Walvis Ridge and the Cape Rise Seamounts/Agulhas Ridge, respectively. On each profile 8 - 10 oceanbottom seismometers with a mean spacing of 25 - 30 km were deployed.
- To test the specifications of some newly built long-term oceanbottom seismometers, these instruments were left twice for up to 12 days on the seafloor to record tele-seismic events.
- Multichannel seismic data acquisition across the Discovery Seamounts, the old Shona Seamounts and the southern Walvis Ridge, respectively, was conducted parallel to the deep seismic sounding experiments (Table 5.1). This resulted in a low-resolution image of these structures. The purpose of these lines was to provide structural information on the sediment distribution to support the wide-angle modelling.
- Two multichannel seismic data sets across the Walvis Ridge were acquired for IODP site survey purposes.
- Continuous acquisition of gravity data with a KSS31 gravimeter.
- Continuous acquisition of vector magnetic data with a fixed installed system on board RV *Polarstern*. Information about the calibration circles see table 5.8.
- Magnetic data were acquired with a helicopter borne system (Helimag).

The wide-angle data were downloaded from the recorders, and a quick quality check was performed. The seismic reflection data were standard processed to a brute stack for quality check purposes. The magnetic data acquired with the helicopter system were corrected by standard methods. No diurnal corrections were applied, since no magnetic base station was available in a reasonable distance. The potential field data (gravity, magnetic) gathered with the fixed-mounted systems were not processed on the vessel.

Fig. 5.1: The grey lines indicate the ship track. Magnetic isochrones are labelled 5-33R. The black lines with the magnetic flight pattern (dense grey lines) indicate the locations of the seismic refraction and reflection profiles across the Discovery and southernmost Cape Rise seamounts, as well as across the southern Walvis and Agulhas ridges.

Helicopter-borne Magnetic Data

Airborne magnetic data were acquired in all four survey areas. This magnetic survey was the first systematic approach in this area to investigate the magnetic signatures of the seamounts and ridges in order to compare the results with existing data from magnetometers, which had been towed along ship tracks. A major target was to identify spreading anomalies near fracture zones, where anomalies of different ages were identified.

The PICODAS HELIMAG acquisition system was used for obtaining the magnetic data. The flight planning was also done with the PICODAS computer. The Caesium sensor was towed 30 m beneath the helicopter and recorded data with 10 Hz. For all survey blocks 100 m flight altitude, measured by the radar-altimeter, and a helicopter speed of 80 kts (~40 m/s) was planned. In addition, 10 km line spacing was used for all flight-line plans. At the end of each line, the pilots made a 270° turn and crossed the lines in order to get intersections of survey lines and cross lines. This leads to an improvement for data levelling. All relevant information about the UTM zones used for the blocks can be found in table 5.8, and details about the projects can be found in the project files on the PICODAS computer. The acquired data file names, duration of flights and flown kilometres are listed for each single flight in table 5.8 in the appendix.

All acquired data were sampled to 1 Hz due to the sampling rate of the GPS data and IGRF corrected using the IGRF2005 model. Afterwards the flights were split into long survey lines and short cross lines as well as all turns were trimmed away. Spikes in magnetic and GPS data occurred sometimes along a line due to the use of radio and in the turns. All spikes were edited by linear interpolation.

Young Shona:
The flight lines were planned within a block bounded by the following corner points and with a line heading of 48°.

1. 006°E 51.5°S
2. 012°E 48.0°S
3. 010°E 46.0°S
4. 004°E 49.0°S

The block-corners were transformed to UTM coordinates and a central meridian of 009°E was used. In three days 8 flights with at total length of 3,232 km were conducted. The first flight acquired data along the four southern lines. The eight lines in the north expand over two major spreading anomalies and cover also three successful dredging positions. The data reveal a magnetic pattern of different signatures for the seamounts and spreading anomaly 33 can be clearly confirmed figure 5.2.

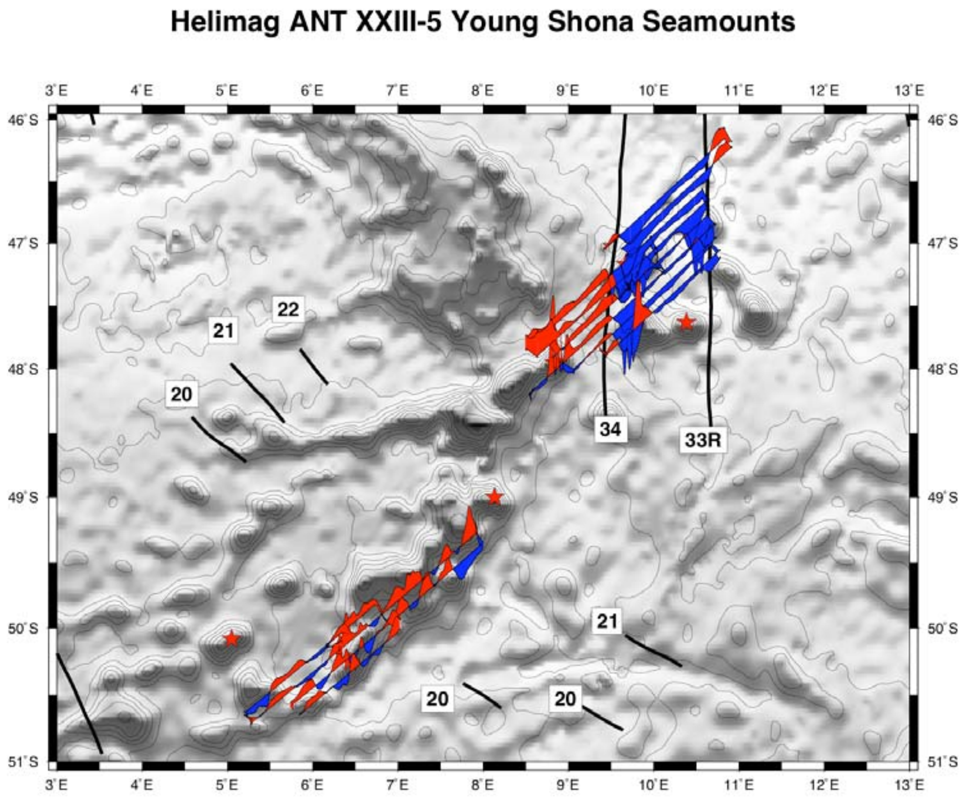

Fig. 5.2: Magnetic flight tracks across the Young Shona seamounts. Dark grey: negative anomalies; black: positive polarity. Previously identified magnetic isochrones are labelled. Satellite bathymetry is provided as backround information.

Discovery Seamounts

Within five days and during 11 flights aeromagnetic data were recorded along 4,123 km east and west of seismic profile 20060500 (Fig. 5.3). Bad weather conditions grounded the helicopter for three days, which resulted in gaps within the flight pattern. Across the major seamount, the anomalies have greater variations, and inverse magnetic signals were recorded across other seamounts, where dredging was also being performed. Spreading anomaly 31 again could clearly be confirmed with minor location shifts to older identifications.

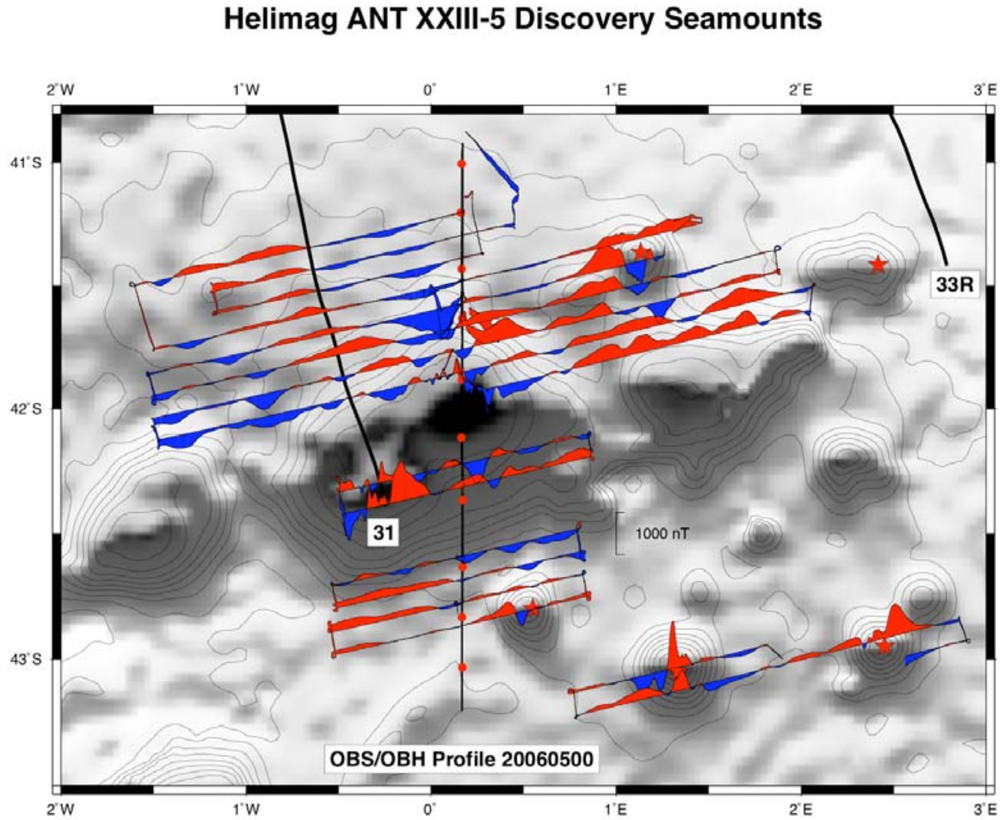

Fig. 5.3: Magnetic flight tracks across the Discovery seamounts. Dark grey: negative anomalies; black: positive polarity. The location of the seismic refraction profile and the positions of the OBS (dots) are indicated. Previously identified magnetic isochrones are labelled. Satellite bathymetry is provided as backround information.

Walvis Ridge

The major HELIMAG project was located across the Walvis Ridge. The main goals were, first the coverage between the younger and older spreading anomalies east of seismic profile 20060600 in order to get an insight of this fault zone. Long traverse lines were planned to detected unmarked spreading anomalies. In the northern part of this survey block, between seismic profile 20060650 and 20060660, full coverage of the area was prevented due to bad weather conditions (Fig. 5.4). In total, 15,417 km were flown within 14 days and during 35 flights. The entire grid provides a good basis for further investigations in this area. Spreading anomaly 32 can be identified, and seamounts appear with strong, but not reversed, magnetic signals.

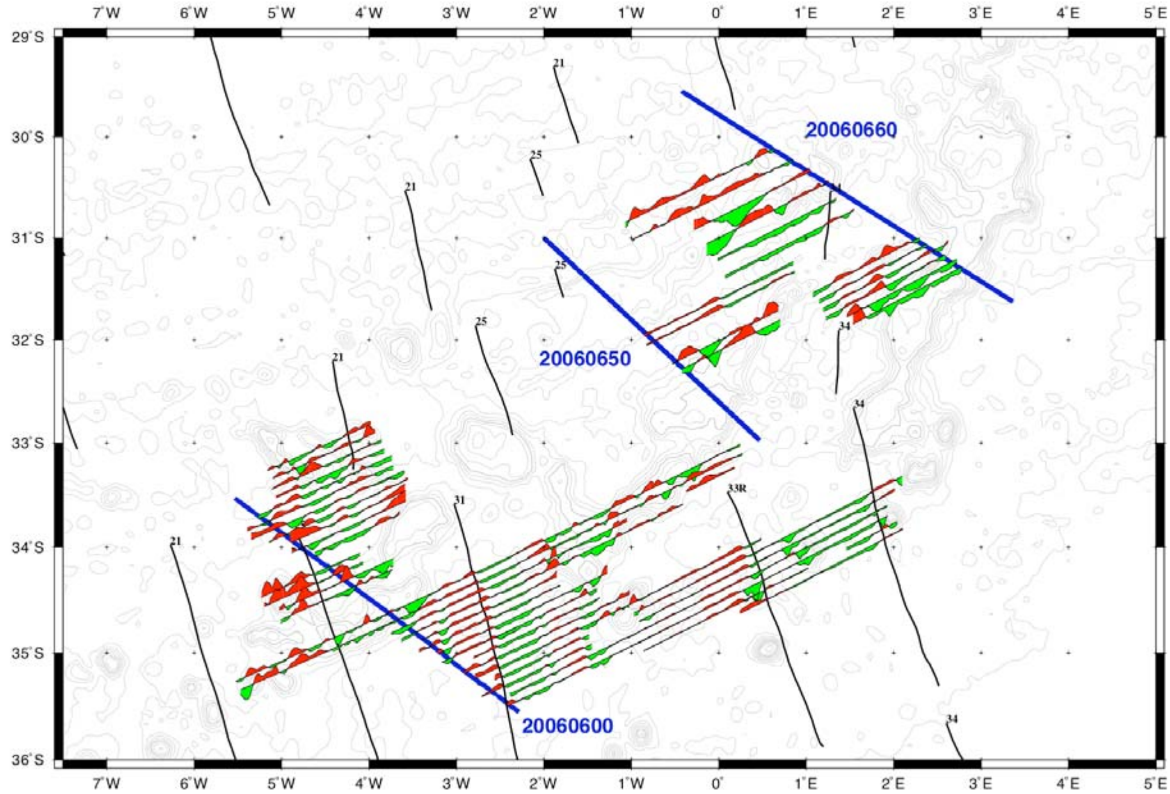

Fig. 5.4: Magnetic flight tracks across the southern Walvis Ridge. Dark grey: negative anomalies; black: positive polarity. The location of the seismic refraction profile 20060600)and two seismic reflection profiles (20060650, 20060660) are indicated. Previously identified magnetic isochrones are labelled. Satellite bathymetry is provided as backround information.

Agulhas Ridge

It is still being debated, whether the northeast end of the Agulhas Ridge is a volcanic or a tectonic feature. To get a better insight of the magnetic anomalies a full grid was flown east and west along the seismic profiles crossing the plateau of the Agulhas Ridge. In two days and four flights 1,683 line kilometres were flown, extending 30 to 40 miles perpendicular to the seismic profiles.

Gravity measurements

For gravity measurements, an on-board installed Bodenseewerke KSS31 gravimeter was used. Positioning information was taken from the scientific navigation platform MINS. During the entire cruise gravity data were recorded continuously every 10 seconds. No major gap of data occurred during the cruise. Minor gaps occurred only on transects between the different survey areas but not online of seismic profiles.

On-land measurements prior to and after the cruise allow a calibration of the relative gravity values recorded on the ship with respect to absolute gravity values. For this purpose recordings were taken with a LaCoste & Romberg gravimeter. The first calibration measurement was taken prior to departure on 13 April 2006 at the Bunkerpier in Punta Arenas as shown in figure 5.5. The absolute value for this point is 981295.81 mGal. Between 5:41 pm and 6:02 pm UTC 14 measurements were taken. The measured scale units and the resulting values in mGal are shown in table 5.9. The average value of the KSS 31 for this period was 1030.63 mGal. The calibration measurements in Cape Town were acquired on 12 June 2006, between 9:53 am and 10:34 am UTC near bollard 94 and 97, respectively. Bollard 97 was right next to the gangway to RV *Polarstern*. The distance to Bollard 94 is approx. 100 m and the absolute value is 979657.9042 mGal. A strong temperature decrease of the gravimeter forced us to heat up the equipment again. During the acquisition lots of traffic was going on. Therefore, we measured on both bollards. Most of the readings were taken manually due to a failure of the feedback system. Thus, the first three measurements were not used for the conversion to mGal (Table 5.9).

The overall average value in Punta Arenas is 4941.229 mGal, at bollard 97 in Cape Town 3307.474 mGal and 3280.630 mGal at bollard 94.

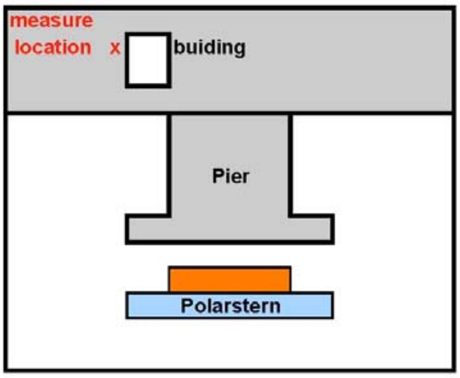

Fig. 5.5: Location of the harbour measurements in Punta Arenas

Preliminary results

The geophysical programme was focussed on retrieving initial information on the crustal structure from the Discovery Seamounts, the Walvis Ridge and the Old Shona/Cape Rise seamounts/Agulhas Ridge. All three deep seismic transects could be performed as planned. Most of the ocean-bottom instruments showed reasonable signal ranges (Table 5.6) to observe phases from the crust/mantle boundary.

The line across the Discovery Seamounts was located at the centre of the largest volcanic construction. The MCS data show that the top of the oceanic basement is located at different depth levels north and south of this mountain. Interpreting this as a subsidence effect one can speculate that the northern seafloor has a slightly different age than the southern one. If the subsequent analysis confirms this interpretation, the seamounts may be located on a major zone of weakness, or transform zone.

A similar observation was made along the lines of the Walvis Ridge. However, here this fact is supported by the interpretation of the existing magnetic data. These clearly show that the ocean floor north of the ridge is younger than the southern floor. The new magnetic data show clear seafloor anomalies around the deep seismic transect. According to these data almost all westernmost seamounts belonging to this ridge have the same age as the seafloor. Bad weather conditions did not allow the gathering magnetic data with the same density along the northern boundary of the ridge. Here, we hope that follow-up surveys will be able to close these gaps. The two northern MCS lines were acquired for IODP site survey purposes. The lines indicate that the ridge is covered by 500 m of sediments at maximum. Several promising sites for proposing a deep drill hole were identified.

The deep seismic lines from the Cape Rise Seamounts towards the Agulhas Ridge should indicate any crustal relationships between these two volcanic structures. For example, is the oceanic crust between both structures thicker than normal, indicating some magmatic influence from a former thermal mantle anomaly in this region? Furthermore, some investigators speculate on the continental origin of parts of the Agulhas Ridge. Though, the ocean-bottom instruments were spaced approximately 30 km apart, the data indicate that the general crustal structure can be retrieved, and further constrained by shipboard gravity data. In addition, a systematic magnetic survey with a line spacing of 10 km was flown in the strike of the ridge to retrieve its magnetic signature.

From the existing satellite-estimated bathymetry the topography of the ridge was expected to be more or less flat. The new seismic and bathymetric data indicate that this is mostly true. However, there are some small-scale bathymetric features, 500 m high and 1,500 - 2,000 m in diameter, which can be found in the middle of the ridge. The MCS data indicate that these features represent the peaks of larger, sediment-buried mountains. They are mostly likely of volcanic origin.

In conclusion, the cruise has retrieved the planned geophysical data from the main Cenozoic and Mesozoic magmatic structures in the eastern South Atlantic. We feel confident that the combination of petrological and geophysical data will provide new insights into the geological history of these structures.

Tab. 5.1: Location and acquisition parameters of the deep seismic sounding and seismic reflection profiles

Date/Time Beg.		Profil	Latitude (Start)	Longitude (Start)	Date/Time Term.		Latitude (End)	Longitude (End)	Delay	Shots	Length (km)	Recording Stations	Airgun
02.05.2006	17:30:00	20060500	-40,9204	0,1701	03.05.2006	19:50:00	-43,2075	0,1669	30 ms	1580	277,031	Streamer	8x8,5 + 32
12.05.2006	4:15:00	20060600 I	-35,0075	-3,1675	12.05.2006	15:10:00	-35,5538	-2,2893	30 ms	656	106,218	Streamer	8x8,5
13.05.2006	23:10:00	20060600 II	-35,5335	-5,5304	15.05.2006	5:59:00	-34,9654	-3,2294	30 ms	1712	266,820	Streamer	8x8,5 + 32
16.05.2006	19:45:00	20060650	-32,9721	0,4652	18.05.2006	6:05:00	-31,0022	-1,9971	0 ms	8271	320,064	Streamer	4x8,5
18.05.2006	19:17:00	20060660	-29,5456	-0,4185	20.05.2006	20:25:00	-31,7013	3,5072	0 ms	11485	447,916	Streamer	4x8,5
02.06.2006	16:30:00	20060700	-41,1985	15,2087	04.06.2006	8:00:00	-38,5826	12,6035	30 ms	2342	368,191	Streamer	8x8,5 + 32
08.06.2006	13:12:00	20060750	-40,7399	14,8112	08.06.2006	20:11:00	-40,2611	14,3274	0 ms	1666	67315,0	Streamer	4x8,5

Tab. 5.2: Position of the OBS/OBH instruments along the deep seismic sounding profiles

Profil	Station		Typ	Lat	Long	Tiefe [m]	Ausbringen [UT]	Einholen [UT]	Reg. o.k.	Sig.range [km]	Bemerkung
20060500	OBS	501	LOBSTER	43° 1,99' S	0° 10,06' E	4213	02.05.2006, 00:55	07.05.06, 16:47	nein		Rekorder defekt
	OBS	502	LOBSTER	42° 50,00' S	0° 10,03' E	4114,9	02.05.2006, 02:13	07.05.06, 21:00	ja	20/15	
	OBH	503		42° 38,02' S	0° 10,26' E	3772,2	02.05.2006, 03:34	08.05.06, 01:01	ja	45/20	
	OBH	504		42° 22,05' S	0° 10,26' E	980	02.05.2006, 05:14	08.05.06, 03:51	ja	25/15	
	OBH	505		42° 6,92' S	0° 9,83' E	552,4	02.05.2006, 06:47	08.05.06, 06:06	ja	10/29	
	OBH	506	AWI-OBH	41° 52,94' S	0° 9,98' E	662,8	02.05.2006, 08:25	08.05.06, 08:20	ja	37/45	
	OBH	507		41° 38,08' S	0° 10,12' E	3242,1	02.05.2006, 10:08	08.05.06, 13:04	ja	30/34	
	OBS	508	LOBSTER	41° 26,00' S	0° 9,95' E	4665,5	02.05.2006, 11:27	08.05.06, 16:42	ja	22/11	
	OBS	509	LOBSTER	41° 12,03' S	0° 10,04' E	4649,4	02.05.2006, 12:53	08.05.06, 20:31			s2x - wandlung nicht möglich
	OBS	510	LOBSTER	41° 0,03' S	0° 10,04' E	4641,9	02.05.2006, 14:15	09.05.06, 00:29	ja	8/34	
20060600	OBS	601	LOBSTER	35° 30,04' S	2° 22,32' W	4209,4	11.05.2006, 21:07	12.05.06, 18:49	ja	35/9,5	
	OBS	602	LOBSTER	35° 21,05' S	2° 36,90' W	4359,8	11.05.2006, 22:48	12.05.06, 22:02	nein		s2x - wandlung nicht möglich
	OBS	603	LOBSTER	35° 11,99' S	2° 51,98' W	4246,1	12.05.2006, 00:53	13.05.06, 00:46	ja	25/33	
	OBS	604	LOBSTER	35° 3,03' S	3° 6,03' W	4209,6	12.05.2006, 02:22	13.05.06, 03:26	ja	7/41	
	OBS	605	LOBSTER	34° 53,92' S	3° 19,76' W	4266,5	13.05.2006, 03:26	24.05.06, 06:03	ja	63/28	
	OBH	606		34° 44,81' S	3° 35,10' W	4022,5	13.05.2006, 06:31	24.05.06, 10:00	ja	65/35	
	OBH	607		34° 35,90' S	3° 48,92' W	1224	13.05.2006, 07:58	24.05.06,	ja	52/34	
	OBH	608	AWI-OBH	34° 26,90' S	4° 3,89' W	1835,7	13.05.2006, 09:44	24.05.06,	ja	43/40	
	OBH	609		34° 18,04' S	4° 17,93' W	2570,1	13.05.2006, 11:13	24.05.06, 21:20	ja	34/26	

Profil	Station		Typ	Lat	Long	Tiefe [m]	Ausbringen [UT]	Einholen [UT]	Reg. o.k.	Sig.range [km]	Bemerkung
	OBH	610		34° 9,00' S	4° 32,03' W	3833,6	13.05.2006, 12:43	25.05.06, 00:45	nein		Batteriestecker defekt
	OBS	611	LOBSTER	34° 0,02' S	4° 46,97' W	3908,4	13.05.2006, 14:47	25.05.06, 03:56	ja	55/44	
	OBS	612	LOBSTER	33° 50,87' S	5° 0,89' W	3963,1	13.05.2006, 16:25	25.05.06, 07:06	ja	31/62	
	OBS	613	LOBSTER	33° 42,02' S	5° 15,93' W	3858,4	13.05.2006, 17:59	25.05.06, 10:32	ja	3/57	
	SONOBOJE	614		35° 36,032' S	2° 13,582' W	0	12.05.2006, 08:32	12.05.06, 16:50	ja	37	
	SONOBOJE	615		33° 33,00' S	5° 29,97' W	0	13.05.2006, 21:33	14.05.06, 10:05	ja	36	
20060700	OBH	701		39° 0,01' S	13° 0,00' E	4848	01.06.2006, 15:21	07.06.06, ??			Probleme beim Auslesen
	OBH	702		39° 15,31' S	13° 15,01' E	4852	01.06.2006, 17:28	06.06.06, 21:08	ja	50/34	
	OBS	703	LOBSTER	39° 35,42' S	13° 34,95' E	4618	01.06.2006, 20:03	06.06.06, 16:32	ja	30/54	
	OBS	704	LOBSTER	39° 48,44' S	13° 48,10' E	4897	01.06.2006, 22:13	06.06.06, 11:59	ja		hat gemessen, signale der seismometer-komponenten kaum zu er-kennen, hydro-phon sehr schwach
	OBH	705		40° 06,87' S	14° 09,94' E	4005	02.06.2006, 01:23	05.06.06, 16:50	ja	80/45	
	OBH	706		40° 23,88' S	14° 23,01' E	1922	02.06.2006, 04:01	05.06.06, 12:54	ja	58/47	
	OBS	708	LOBSTER	40° 38,71' S	14° 38,21' E	1918	02.06.2006, 06:20	05.06.06, 10:04	ja	43/76	2003,406 ms abweichung beim skew
	OBS	709	LOBSTER	40° 52,93' S	14° 53,85' E	4481	02.06.2006, 08:23	05.06.06, 05:17	ja	37/90	

Tab. 5.3: Quality control on the OBS recordings. The comparison is done for each instruments along all profiles. H-hydrophone, X,Y,Z-Geophone components

MCS SN	Station	H	X	Y	Z	skew [ms]	Daten [MB]	Bemerkungen
050928	501	ok	unbrauch-bar	unbrauch-bar	unbrauch-bar	-	28.6	nur 20h aufgezeichnet, Recorder kaputt
050929	502	ok	schlecht	ok	ok	3.7	293.5	
	601	ok	schlecht	schlecht	ok	1	48.9	
	605	ok	stark verrauscht	ok	ok	-	638.8	kein skew (Bedienungsfehler), abgebrochen bei Konvertierung *.raw zu *.s2x
	708	ok	-	-	-	2003.4	363.5	gelbe Box Akku zu schwach -> kein GPS-Signal beim ersten skew
050920	508	ok	ok	ok	ok	13.4	214.8	
	602	ok	ok	ok	ok	0.4	65.2	abgebrochen bei Konvertierung *.raw zu *.s2x
	611	ok	ok	z.T. stark verrauscht	ok	6.7	754.3	
	704	leicht verrauscht	schlecht	schlecht	schlecht	5	525.1	Hydrophon nur Wasserwelle, Seismometerdaten nicht zu erkennen
050902	509	ok	verrauscht	verrauscht	verrauscht	1.6	159.9	abgebrochen bei Konvertierung *.raw zu *.s2x
	603	ok	ok	ok	ok	0.03	62.3	Recorder-Reset ebi Programmierung
	612	ok	verrauscht	verrauscht	verrauscht	6	727.6	Firewire-Baustein defekt, verkehrt aufgetaucht
	703	ok	-	-	-	1006.4	332.5	Umwandlung von *.s2x zu *.segy für su komisch, verschiedene Anzahl Spuren, Wasserwelle zu verschiedenen Zeiten
050921	510	ok	ok	ok	ok	-5.9	211.9	
	604	ok	ok	ok	ok	0.5	65.6	
	613	leicht verrauscht	stark verrauscht	leicht verrauscht	stark verrauscht	2.4	699.9	
	709	leicht verrauscht	stark verrauscht	stark verrauscht	stark verrauscht	0.9	192.7	

Tab. 5.3 continued: Quality control on the OBH recordings. The comparison is done for each instruments along all profiles. H-hydrophone.

MCS SN	Station	H	skew [ms]	Daten [MB]	Bemerkungen
000614	503 610 701	ok - -	-47 - -43	102.5 - 103.6	 defekter Batteriestecker, keine Daten aufgezeichnet Messunge konnten nicht vernünftig beendet werden, Daten gerettet, aber nicht umwandelbar
020504	504	ok	34	119.1	
	609	leicht verrauscht	63	201.5	
	702	stark verrauscht	31	95.6	
010701	505	stark verrauscht	-94	125.5	
	607	verrauscht	-171	221.2	
	706	verrauscht	-53	70.5	
001008/	506	stark verrauscht	-39	120.9	kopiert durch „cat“, Medium konnte nicht gemountet werden
010709	608	verrauscht	28	133.7	nur über „cat“ oder Windows auslesbar
001006	507	ok	-22	104.5	
	606	verrauscht	-44	154.8	
	705	stark verrauscht	-15	68	Druckrohr Schlag bei Abbau durch Seegang

Tab. 5.4: Locations and acquisition parameters of the deep seismic sounding profiles

Date/Time Beg.		Profil	Latitude (Start)	Longitude (Start)	Date/Time Term.		Latitude (End)	Longitude (End)	Delay	Shots	Length (km)	Recording Stations	Airgun
02.05.2006	17:30:00	20060500	-40,92035	0,17011	03.05.2006	19:50:00	- 43,20755	0,16692	15 ms	1581	277,031	5xOBS 5xOBH	8x8,5 + 32
12.05.2006	4:15:00	20060600 I	- 35,00749	- 3.16753	12.05.2006	15:10:00	- 35.55376	- 2,28935	15 ms	656	106,218	4xOBS	8x8,5
13.05.2006	23:10:00	20060600 II	- 33,53346	- 5,53040	15.0.5.2006	5:59:00	- 35,05767	-3,09168	15 ms	1712	266,820	4xOBS 5xOBH	8x8,5 + 32
02.06.2006	16:30:00	20060700	-41,19850	15,20870	04.06.2006	8:00:00	-38,5826	12,6035	15 ms	2342	368,191	4xOBS 4xOBH	8x8,5 +32

Tab. 5.5: Quality information for the Oceanbottom Seismometers

MCS SN	Station	H	X	Y	Z	skew [ms]	Daten [MB]	Bemerkungen
050928	501	ok	unbrauch-bar	unbrauch-bar	unbrauch-bar	-	28.6	nur 20h aufgezeichnet, Recorder kaputt
050929	502	ok	schlecht	ok	ok	3.7	293.5	
	601	ok	schlecht	schlecht	ok	1	48.9	
	605	ok	stark verrauscht	ok	ok	-	638.8	kein skew (Bedienungsfehler), abgebrochen bei Konvertierung *.raw zu *.s2x
	708	ok	-	-	-	2003.4	363.5	gelbe Box Akku zu schwach -> kein GPS-Signal beim ersten skew
050920	508	ok	ok	ok	ok	13.4	214.8	
	602	ok	ok	ok	ok	0.4	65.2	abgebrochen bei Konvertierung *.raw zu *.s2x
	611	ok	ok	z.T. stark verrauscht	ok	6.7	754.3	

MCS SN	Station	H	X	Y	Z	skew [ms]	Daten [MB]	Bemerkungen
	704	leicht verrauscht	schlecht	schlecht	schlecht	5	525.1	Hydrophon nur Wasserwelle, Seismometerdaten nicht zu erkennen
050902	509	ok	verrauscht	verrauscht	verrauscht	1.6	159.9	abgebrochen bei Konvertierung *.raw zu *.s2x
	603	ok	ok	ok	ok	0.03	62.3	Recorder-Reset ebi Programmierung
	612	ok	verrauscht	verrauscht	verrauscht	6	727.6	Firewire-Baustein defekt, verkehrt aufgetaucht
	703	ok	-	-	-	1006.4	332.5	Umwandlung von *.s2x zu *.segy für su komisch, verschiedene Anzahl Spuren, Wasserwelle zu verschiedenen Zeiten
050921	510	ok	ok	ok	ok	-5.9	211.9	
	604	ok	ok	ok	ok	0.5	65.6	
	613	leicht verrauscht	stark verrauscht	leicht verrauscht	stark verrauscht	2.4	699.9	
	709	leicht verrauscht	stark verrauscht	stark verrauscht	stark verrauscht	0.9	192.7	

Quality information for the Oceanbottom Hydrophones

MCS SN	Station	H	skew [ms]	Daten [MB]	Bemerkungen
000614	503	ok	-47	102.5	
	610	-	-	-	defekter Batteriestecker, keine Daten aufgezeichnet
	701	-	-43	103.6	Messunge konnten nicht vernünftig beendet werden, Daten gerettet, aber nicht umwandelbar
020504	504	ok	34	119.1	
	609	leicht verrauscht	63	201.5	
	702	stark verrauscht	31	95.6	
010701	505	stark verrauscht	-94	125.5	
	607	verrauscht	-171	221.2	
	706	verrauscht	-53	70.5	

MCS SN	Station	H	skew [ms]	Daten [MB]	Bemerkungen
001008/	506	stark verrauscht	-39	120.9	kopiert durch „cat“, Medium konnte nicht gemountet werden
010709	608	verrauscht	28	133.7	nur über „cat“ oder Windows auslesbar
001006	507	ok	-22	104.5	
	606	verrauscht	-44	154.8	
	705	stark verrauscht	-15	68	Druckrohr Schlag bei Abbau durch Seegang

Tab. 5.7: Location of the calibration circles for the fixed mounted vector magnetometers

Calibration circles

Nr.	Date	Lon	Lat	Type
1	13.05.2006	33° 41,84' S	5° 15,94' W	1 circle cw
	Ende	33° 41,40' S	5° 15,71' W	
2	13.05.2006	33° 41,28' S	5° 15,65' W	1 circle ccw
	Ende	33° 41,20' S	5° 15,51' W	
3	25.05.2006	33° 41,09' S	5° 16,14' W	1 circle cw
	Ende	33° 40,84' S	5° 15,96' W	
4	10.06.2006	36° 58,61' S	17° 32,98' E	1 circle ccw
	Ende	36° 58,37' S	17° 33,43' E	

Tab. 5.8.: Project relevant details of each block of the HELIMAG survey.

Area	Project	Information			
		project file	UTM-zone	central meridian	heading
Young Shona	SDW9	sdw9.nms	32	9° E	48°
Discovery Seamounts	DSM31	dsm31.nms	31	3° E	75°
Walvis Ridge	WAL30	wal30.nms	30	3° W	65°
Agulhas Ridge	AGU	agu.nms	33	15° E	50°

Tab. 5.9: Habour values in Punta Arenas and CapeTown

On-land calibration measurements			**Punta Arenas, Bunkerpier**	
13. Apr 06				
K. Daniel, B.-M. Ehlers, A. Ferk, C. Hagen, J. Schinkel, M.Voß				
without plate	T=51°C			
UTC	**Scale**	**Feedback (V)**	**mGal**	**KSS**
17:41	4833,940	-6,06	4941,297	1027,85
17:44	4833,000	-5,12	4941,273	1030,88
17:47	4832,000	-4,112	4941,257	1030,73
17:49	4831,000	-3,092	4941,252	1030,99
17:51	4828,000	-0,064	4941,207	1031,45
17:52	4827,000	0,943	4941,188	1031,44
17:54	4826,000	1,94	4941,161	1031,38
17:55	4825,000	2,948	4941,145	1031,22
17:56	4826,000	1,954	4941,175	1030,64
17:58	4827,000	0,962	4941,208	1031,20
17:59	4828,000	-0,034	4941,236	1030,18
18:00	4829,000	-1,036	4941,259	1029,35
18:01	4830,000	-2,048	4941,271	1030,40
18:02	4831,000	-3,064	4941,280	1031,15
		average:	**4941,229**	**1030,63**

On-land calibration measurements			**Cape Town**	**Bollard 97**
12. Jun 06				
B.-M. Ehlers, W. Jokat, M.Voß				
with plate	T=51°C	high activity	strong temperature decrease	
UTC	**Scale**	**Feedback (V)**	**mGal**	**KSS**
9:53	3284,000	-0,17	not used	-637,43
9:54	3285,000	-9,22	not used	-636,63
9:55	3283,000	-0,002	not used	-636,55
10:00	3240,775	not used	3315,214	-636,90
10:07	3225,658	not used	3299,734	-636,99
		average:	**3307,474**	**-636,95**

On-land calibration measurements			**Cape Town**	**Bollard 94**
12. Jun 06				
M.Voß, B.-M. Ehlers, W. Jokat				
with plate	T=51°C	high activity	heated up	
UTC	**Scale**	**Feedback (V)**	**mGal**	**KSS**
10:23	3208,333	not used	3281,993	-636,81
10:25	3207,109	not used	3280,740	-637,22
10:29	3206,545	not used	3280,162	-636,45
10:32	3206,216	not used	3279,825	-636,14
		average:	**3280,680**	**-636,66**
10:33	3206,000	0,942	3280,546	-637,54
10:34	3205,000	1,935	3280,515	-636,00
		average:	**3280,531**	**-636,77**
		total average:	**3280,630**	**-636,69**

6. PETROGENESIS OF S. ATLANTIC SEAMOUNTS AND ASEISMIC RIDGES

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Objectives

The main petrological objective of the RV *Polarstern* expedition was a systematic dredge sampling of the effectively un-sampled Discovery, Shona, Meteor, Agulhas and Cape Rise lines of seamounts and ridges. Age and compositional data for dredge samples will reveal the long-term temporal, spatial and geochemical development of these major bathymetric anomalies.Their possible origin through excess volcanism linked to hotspot melting anomalies is hypothesised to have formed above deep upwelling mantle plumes.

Hotspot volcanism in the South Atlantic

The South Atlantic is a key area for addressing important questions to the wider scientific community: the existence and possible fixity of mantle plume and the origin of extreme geochemical mantle components postulated to occur in the sub-lithospheric oceanic mantle. With regard to the first, the reliable measurement of the distribution, history and migration rates of volcanism along hotspot-generated seamount chains and aseismic ridges is the key to testing whether mantle plume exist, establishing their possible role in continental rifting, and determining whether they provide a viable reference frame for tectonic plate reconstructions. The PS69 expedition has been motivated in part by recent evidence that the distribution and migration rates of volcanism along the St. Helena and Walvis hotspot trails are not well constrained. With regard to the second scientific question, the sub-South Atlantic mantle is unique in hosting a number of what are widely held to be compositionally extreme end-member mantle components (EM-I, DUPAL and LOMU) inferred from the limited rock samples available from the Tristan-Gough-Walvis Ridge lineament and the Mid-Atlantic Ridge.

Testing the mantle plume hypothesis

For more than 30 years, "hotspots," i.e., melting anomalies that create linear, age-progressive seamount chains and aseismic ridges in the direction of plate motion, have been attributed to mantle plume. However, the mantle plume paradigm is now being widely debated because for so many years it had been accepted without question rather than having been rigorously tested as a working hypothesis. One of the basic tests of the mantle plume model is still lacking: understanding the initital observation that led to the birth of the hypothesis in the first place, the existence of long, parallel age-progressive seamount chains and aseismic ridges. Nevertheless, the plume hypothesis remains the only viable explanation for age-progressive volcanic lineaments linked to active hotspot melting anomalies such as Tristan da Cunha and Hawaii.

On the basis of unusual geochemical signatures along the southern MAR and plate reconstruction models, the existence of the Shona plume was proposed, and a model of complex plume-ridge-fracture zone dynamics was developed as a possible cause of the unusual zig-zag plume track including the Meteor Rise, Agulhas Ridge and Cape Rise seamounts (Figs. 6.1 and 6.2). However, the only samples recovered from this potential plume track (ODP Leg 117 Site 703 on the Meteor Rise) have been shown to have compositions different from the Shona 'plume' in that they show a continental affinity, suggesting that the Meteor Rise might represent a rifted continental fragment, perhaps more similar to the Agulhas Plateau. Likewise, there is only one dredge sample from the Discovery Tablemount, yet a number of major conceptual models are based on these features representing a long-lived major mantle plume. A mantle plume origin for the Shona and Discovery bathymetric anomalies can be tested through a combination of high precision 40Ar/39Ar ages, geochemical data, seismology and seafloor magnetic anomaly ages.

Mantle geochemical components

A number of geochemical studies have shown that the South Atlantic hosts some of the more extreme of what are postulated to be 'mantle end-member components' (EM-I – Walvis Ridge; DUPAL – Tristan/Gough and Discovery hotspots; LOMU – southern MAR). The origin of these geochemical components is poorly constrained and proposals range from constructional heterogeneities established at the time of Earth formation and recycled ancient pelagic sediment to delaminated sub-continental lithosphere.

To resolve these alternatives, detailed sample suites are required from along the relevant seamount chains/aseismic ridges to evaluate the degree of temporal and spatial heterogeneity of these anomalies. Furthermore, it needs to be determined whether they are comparatively shallow-level, passive features, located nowadays within the convecting oceanic mantle, or deep-seated (lower mantle??) anomalies brought to the surface by upwelling plumes. With the exception of EM-I, these anomalies are unique to the Gondwana ocean basin systems, and the South Atlantic provides an ideal location for their study.

Work at Sea

West Shona Ridge and Seamounts

After a long transit from Punta Arenas we finally arrived at Shona Ridge – a major unsampled topographic anomaly in the Southern S. Atlantic (Fig. 6.1). Using a combination of satellite based topography and on-board Hydrosweep acoustic mapping we surveyed suitable seamount slopes for dredge sampling. Combined Hydrosweep and predicted bathymetry maps for all successful dredge stations can be found in Appendix 'Dredge Maps'. The station log for PS69 dredge stations is available in the Appendix. On Wednesday, 26 April, we recovered the first rock samples from Shona Ridge. Surveying and sampling of Shona Ridge continued until around noon on Saturday 29 April, when an approaching storm forced us to escape northwards to our next working area - Discovery ridges and seamounts. Despite challenging weather conditions we recovered basalt from 6 seamount/ridge locations

(Fig. 6.1). In the course of our dredging operations, we also recovered some dropstones. With suitable rock samples in hand the petrologists can acquire the first geochemical and age information from along the Shona volcanic lineament after the cruise and, hence, test how well it fits the predictions of the mantle plume hypothesis.

Another expedition objective is establishing the relationship between Shona Ridge and Meteor Rise, a major ridge extending northwards from the eastern end of Shona Ridge (Fig. 6.1). As already mentioned, the Meteor Rise has been identified on the basis of ODP 703 drilling as being a possibly continental fragment. Thus, we wish to establish, whether hotspot and non-hotspot processes might explain the unusual ‘zig-zag’ bathymetry of Shona Ridge and Meteor Rise. However, while evading the major storm approaching the Shona working area the RV *Polarstern* had to detour around Meteor Rise during the northward transit to our next working area, Discovery Ridge and Seamounts. The planned dredge stations on Meteor Rise, therefore, had to be cancelled. Fortunately, basement rock recovered during ODP drilling on Meteor Rise in 1987 is available for comparison with the PS69 samples from the Shona Lineament.

Discovery Ridges and Seamounts

As in the case of the Shona working area, dredge sampling was overall a success, despite loosing time due to poor weather conditions, and facing the challenge of dredging old manganese coated volcanic ridges in rough seas. The main sampling targets were seamounts clustered to the south of the Discovery Tablemount and others flanking it to the North (Fig. 6.1). In total we sampled basalt from 5 seamounts. Once again, dropstones were also recovered in some of our dredges. These are the first dredge samples from the Discovery volcanic structures with the exception of a sample from the top of the Discovery Tablemount. The petrologists will be able to obtain geochemical and age information after the cruise from along both the Discovery and Shona volcanic chains. This information in conjunction with geophysical data acquired during the expedition will establish for the first time how well these two apparent hotspot trails fit the predictions of the mantle plume hypotheses.

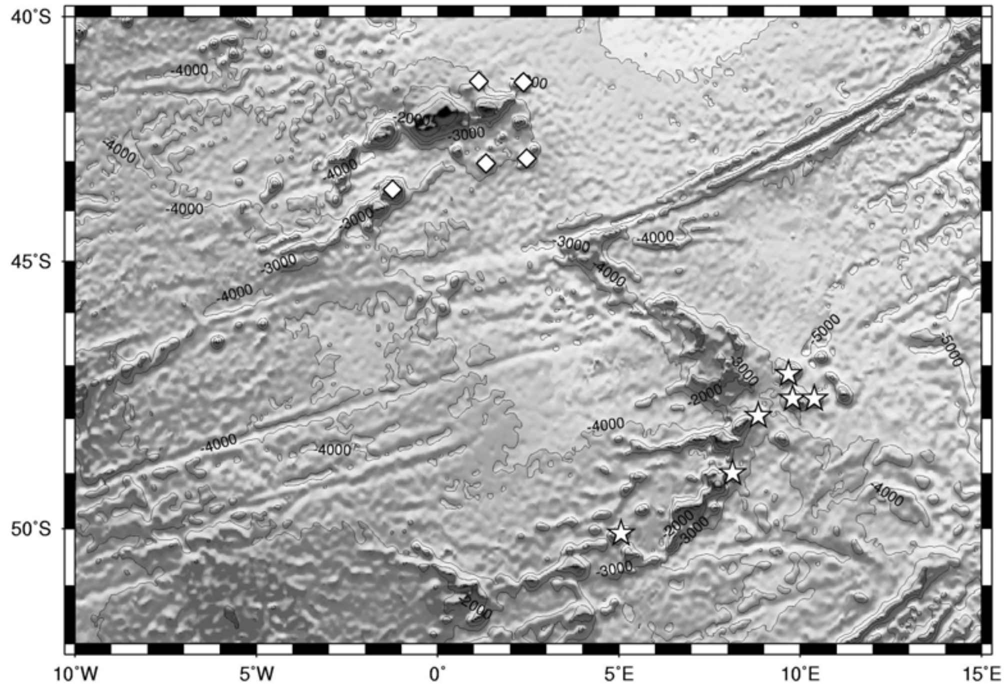


Fig. 6.1: Dredge location along the Shona seamounts (white stars) and the Discovery seamounts (white diamond). Satellite bathymetry is shown as backround information. The depth in labelled every 1,000 m.

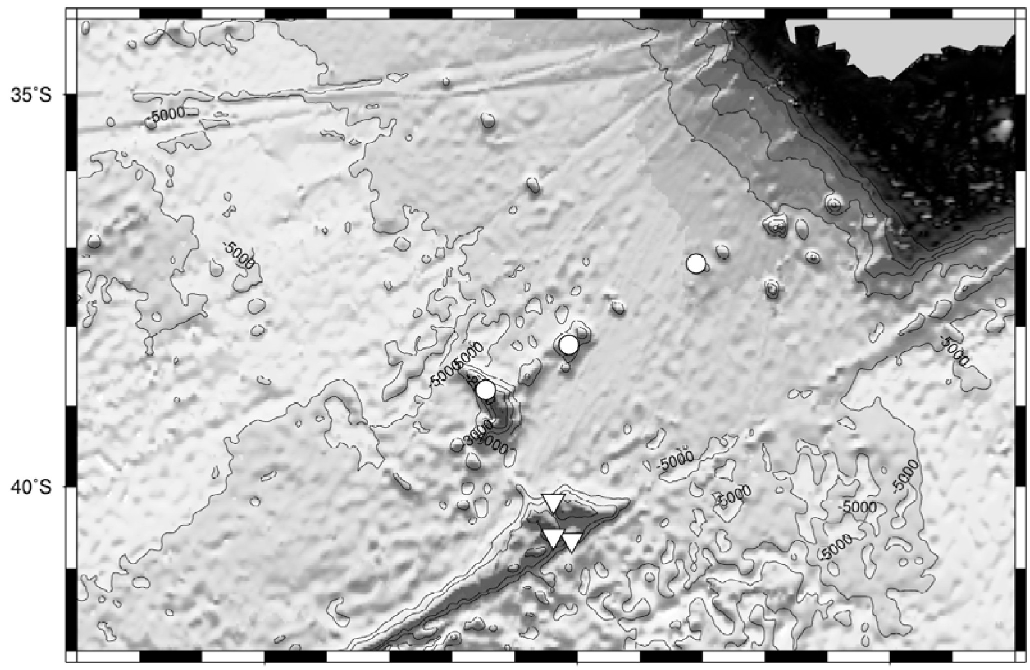


Fig. 6.2: Dredge location along the Cape Rise seamounts (white circles) and the Agulhas Ridge (white triangles). Satellite bathymetry is shown as backround information. The depth in labelled every 1,000 m.

Walvis Ridge and Guyots

This expedition was extended during the pre-cruise planning stage in order to collect seismic data from Walvis Ridge. However, some limited dredging was possible during transit between seismic profiles. Although the Walvis Ridge consists primarily of a massive aseismic ridge, a line of guyots flanks it to the south. We began sampling where this line of seamounts intersects the Walvis Ridge, and continued our sampling southward. Sampling was again successful and we recovered basalt from 9 seamounts and aseismic ridge locations (Fig. 6.3).

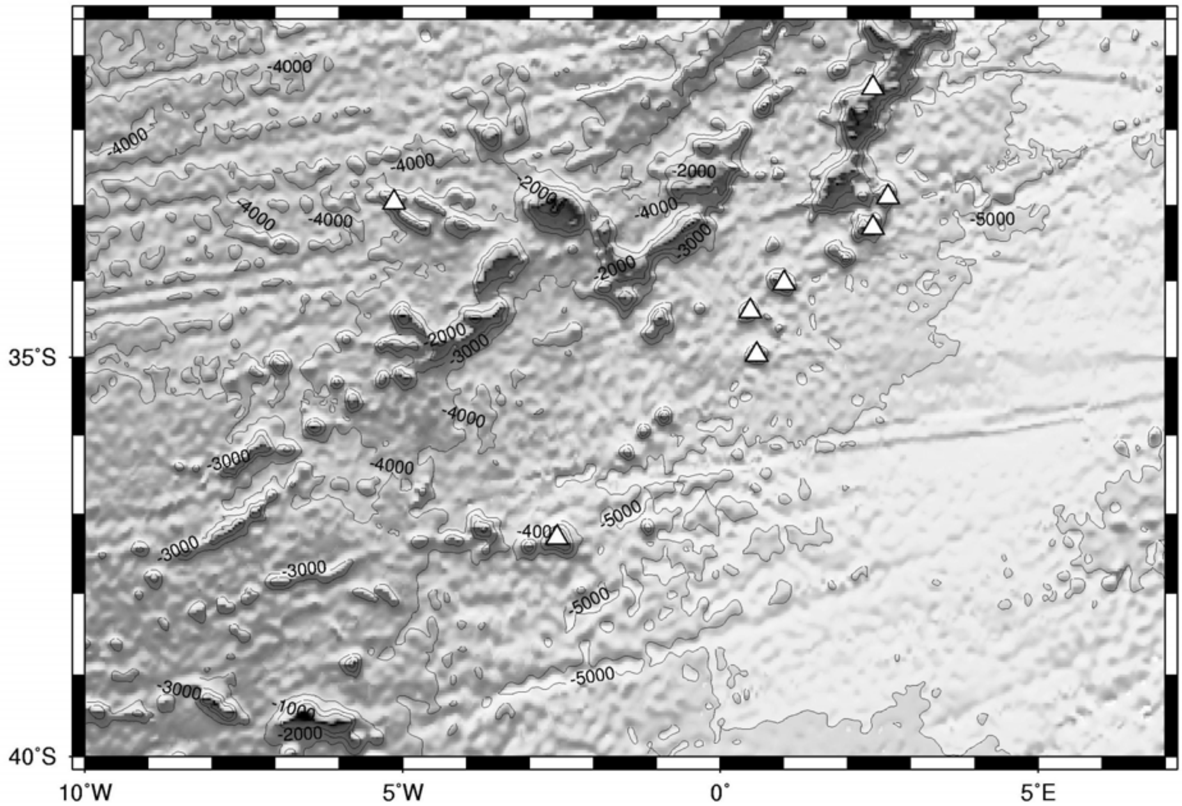


Fig. 6.3: : Dredge location along the southern Walvis Ridge (white triangles). Satellite bathymetry is shown as backround information. The depth in labelled every 1,000 m.

Another PS69 sampling objective on Walvis Ridge was searching for active volcanism. Evidence of explosive volcanic activity at the seafloor from the Walvis Ridge was detected by hydrophones moored in the North Atlantic Ocean. They recorded a sequence of explosive, volcano-acoustic signals originated at the Walvis Ridge beginning 24 November 2001, and continuing through March 2002. The largest swarm took place on 19 December, on the northern flank of an unnamed seamount (32.96°S; 5.22°W). Given the significance of finding active volcanism along Walvis Ridge this far from the very young islands of Tristan da Cunha and Gough, we complemented the seismic experiments by dredge sampling for evidence of active volcanism at the site of proposed active volcanism. Although we recovered basalts from the flanks and top of the seamount, we found no evidence for recent volcanism.

Cape Rise-Agulhas Ridge
The Cape Rise Seamounts (Fig. 6.2), extending about 400 km seaward of the Cape Town region, are widely considered to be the older part of the Shona seamounts and ridges that we sampled earlier in the expedition (Fig. 6.1). The Agulhas Ridge to the south is an enigmatic feature that has been linked to the same hotspot-mantle plume proposed to explain the Cape Rise Seamounts and more recent West Shona Seamounts. Alternatively, it could be a continental fragment. We dredge-sampled basalt from three locations along the Cape Rise Seamounts and from an additional three on Agulhas Ridge in order to distinguish between these different alternatives, and to establish whether a Shona hotspot-mantle-plume created the Cape Rise Seamounts and later the West Shona seamounts and ridges.

Preliminary Results
We successfully sampled our key objectives with the exception of Meteor Rise. Fortunately, ODP drilling of Meteor Rise basement (Site 703) provided suitable alternative material. The samples will allow us to address the following key questions:

- Are South Atlantic bathymetric anomalies initiated/maintained by deep plume or shallow sources in the mantle or a combination of both?
- In case of the former - how well do South Atlantic hotspot trails fit the predictions of the fixed Mantle Plume hypothesis?
- Can the distinct DUPAL and LOMU signature in the South Atlantic be related to shallow detached continental material?

APPENDIX

A.1 PARTICIPATING INSTITUTIONS

A.2 CRUISE PARTICIPANTS

A.3 SHIP'S CREW

A.4 STATION LIST

A.5 DREDGE MAPS

A.1 PARTICIPATING INSTITUTIONS

	Adresse /Address
AWI	Alfred-Wegener-Institut für Polar- und Meeresforschung in der Helmholtz-Gemeinschaft Postfach 12 01 61 27515 Bremerhaven / Germany
DWD	Deutscher Wetterdienst Seewetterdienst Bernhard-Nocht Str. 76 20359 Hamburg / Germany
HeliTransair	HeliTransair GmbH Flugplatz 63329 Egelsbach / Germany
KUM Kiel	K.U.M. Umwelt- und Meerestechnik Kiel GmbH Wischhofstraße 1-3, Geb.D5 D-24148 Kiel / Germany
LDEO	LDEO Lamont-Doherty Earth Observatory 61 Rt 9W P.O. Box 1000 Palisades, NY 10964-1000 / USA
University Amsterdam	Department of Isotope Geochemistry Vrije Universiteit De Boelelaan 1085, 1081 HV Amsterdam / The Netherlands
University Bremen	Marine Zoologie Universität Bremen Postfach 33 04 40 28334 Bremen / Germany
University Cape Town	Department of Geological Sciences University of Cape Town Rondebosch 7701 South Africa

A.2 CRUISE PARTICIPANTS

Name	Vorname/ First Name	Institut/ Institute	Beruf / Profession
Auel	Holger	University Bremen	Biologist
Barraza	Julio C. Castro		Observer (Chile)
Büchner	Jürgen	HeliTransair	Pilot
Daniel	Kristin	AWI	Geologist
Ehlers	Birte-Marie	AWI	Geophysicist
Ferk	Annika	AWI	Student, Geophysics
Franz	Karl	Heli Transair	Inspector
Hagen	Claudia	University Kiel	Student, Geophysics
Hanley	Jean	LDEO	Technician
Hering-Zieringer	Reinhard	DWD	Meteorologist
Jokat	Wilfried	AWI	Geophysicist
Krocker	Ralf	AWI	Engineer
Laakmann	Silke	University Bremen	Biologist
Lensch	Norbert	AWI	Technician
Le Roux	Petrus	University Cape Town	Geologist
Long	David James	University Cape Town	Student, Geology
Lott	Jan-Hendrik	AWI	Stud. Bathymetry
Martens	Hartmut	AWI	Technician
Nakashole	Albertina	University Cape Town	Stud. Geology
O'Connor	John	University Amsterdam	Geologist
Reta	Raul		Oberserver (Arg)
Schinkel	Julia	AWI	Student, Geo.
Schneider	Jana	AWI	Stud. Bathymetry
Schwenk	Arne	KUM Kiel	Physicist
Sonnabend	Hartmut	DWD	Technician
Stimac	Michael	HeliTransair	Mechanic
Stumpp	Meike	University Bremen	Student, Biology
Tinguely	Christel	University Cape Town	Student, Geology
Voß	Max	AWI	Geophysicist
Zeidler	Martin	HeliTransair	Mechanic

A.3 SHIP'S CREW

No.	Name	Rank
1	Schwarze, Stefan	Master
2	Spielke, Steffen	1.Offc.
3	Farysch, Bernd	Ch.Eng.
4	Fallei, Holger	2. Offc.
5	Peine, Lutz	2.Offc.
6	Niehusen, Frank	3.Offc.
7	Geisler, Stephanie	Doctor
8	Hecht, Andreas	R.Offc.
9	Minzlaff, Hans-Ulrich	1.Eng.
10	Westphal, Henning	3.Eng.
11	Sümnicht, Stefan	3.Eng.
12	Scholz, Manfred	ElecEng.
13	Nasis, Ilias	ELO
14	Verhoeven, Roger	ELO
15	Muhle, Helmut	ELO
16	Himmel, Frank	ELO
17	Loidl, Reiner	Boatsw.
18	Reise, Lutz	Carpenter
19	Vehlow, Ringo	A.B.
20	Lamm, Gerd	A.B.
21	Winkler, Michael	A.B.
22	Guse, Hartmut	A.B.
23	Hagemann, Manfred	A.B.
24	Schmit, Uwe	A.B.
25	Bäcker, Andreas	A.B.
26	Wende, Uwe	A.B.
27	Preußner, Jörg	Storek.
28	Ipsen, Michael	Mot-man
	Kusch, Thomas	Mot-man
29	Voy, Bernd	Mot-man
30	Elsner, Klaus	Mot-man
31	Hartmann, Ernst-Uwe	Mot-man
32	Grafe, Jens	Mot-man
33	Müller-Homburg, Ralf-Dieter	Cook
34	Silinski, Frank	Cooksmate

No.	Name	Rank
35	Völske, Thomas	Cooksmate
36	Jürgens, Monika	1.Stwdess
37	Wöckener, Martina	Stwdss/Kr
38	Czyborra, Bärbel	2.Stwdess
39	Silinski, Carmen	2.Steward
40	Gaude, Hans-Jürgen	2.Steward
41	Möller, Wolfgang	2.Stwdess
42	Huang, Wu-Mei	2.Steward
43	Yu, Kwok Yuen	Laundrym.
44	Felsenstein, Thomas	Apprent.

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/340-1	14.04.06	08:20	52° 27,29' S	68° 42,41' W	60,7	Magnetic Turn Circle	Start-Magnetik-drehkreise	Bb. Drehkreis
PS69/340-1	14.04.06	09:13	52° 27,47' S	68° 41,59' W	64,4	Magnetic Turn Circle	Information	Ende Bb. Drehkreis, Beginn Stb. Drehkreis
PS69/340-1	14.04.06	10:02	52° 27,38' S	68° 41,28' W	65,2	Magnetic Turn Circle	*Ende-Magnetik-drehkreise*	
PS69/341-1	14.04.06	18:13	52° 40,49' S	66° 10,90' W	99,9	Multiple net	zu Wasser	
PS69/341-1	14.04.06	18:19	52° 40,50' S	66° 10,81' W	99,0	Multiple net	auf Tiefe	92m
PS69/341-1	14.04.06	18:20	52° 40,50' S	66° 10,79' W	98,0	Multiple net	Hieven	
PS69/341-1	14.04.06	18:25	52° 40,53' S	66° 10,75' W	99,0	Multiple net	an Deck	
PS69/342-1	16.04.06	13:34	52° 18,35' S	53° 53,91' W	2090,5	Multiple net	zu Wasser	
PS69/342-1	16.04.06	14:42	52° 17,75' S	53° 53,73' W	2097,0	Multiple net	auf Tiefe	EL 30 2047meter
PS69/342-1	16.04.06	14:45	52° 17,73' S	53° 53,73' W	2095,8	Multiple net	Hieven	
PS69/342-1	16.04.06	15:53	52° 17,41' S	53° 53,62' W	2079,9	Multiple net	an Deck	
PS69/342-2	16.04.06	16:03	52° 17,31' S	53° 53,58' W	2075,7	Multiple net	zu Wasser	
PS69/342-2	16.04.06	16:10	52° 17,22' S	53° 53,47' W	2074,0	Multiple net	auf Tiefe	200m
PS69/342-2	16.04.06	16:11	52° 17,21' S	53° 53,48' W	2074,1	Multiple net	Hieven	
PS69/342-2	16.04.06	16:19	52° 17,12' S	53° 53,45' W	2073,9	Multiple net	an Deck	
PS69/343-1	17.04.06	12:07	51° 51,42' S	47° 44,75' W	2525,3	Multiple net	zu Wasser	
PS69/343-1	17.04.06	13:16	51° 51,39' S	47° 43,78' W	2501,4	Multiple net	auf Tiefe	EL30 2004meter
PS69/343-1	17.04.06	13:16	51° 51,39' S	47° 43,78' W	2501,4	Multiple net	Hieven	
PS69/343-1	17.04.06	14:22	51° 51,60' S	47° 43,04' W	2501,6	Multiple net	an Deck	
PS69/343-2	17.04.06	14:28	51° 51,63' S	47° 42,97' W	2499,2	Multiple net	zu Wasser	
PS69/343-2	17.04.06	14:36	51° 51,66' S	47° 42,88' W	2497,8	Multiple net	auf Tiefe	EL30 211 meter
PS69/343-2	17.04.06	14:36	51° 51,66' S	47° 42,88' W	2497,8	Multiple net	Hieven	
PS69/343-2	17.04.06	14:43	51° 51,69' S	47° 42,78' W	2500,2	Multiple net	an Deck	
PS69/344-1	18.04.06	11:57	51° 29,64' S	40° 56,93' W	3561,8	Multiple net	zu Wasser	
PS69/344-1	18.04.06	13:04	51° 28,91' S	40° 56,11' W	3559,4	Multiple net	auf Tiefe	EL 30 2028 meter
PS69/344-1	18.04.06	13:05	51° 28,90' S	40° 56,10' W	3557,9	Multiple net	Hieven	
PS69/344-1	18.04.06	14:12	51° 28,30' S	40° 55,30' W	3565,6	Multiple net	an Deck	
PS69/344-1	18.04.06	14:19	51° 28,24' S	40° 55,19' W	3566,4	Multiple net	zu Wasser	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/344-1	18.04.06	14:27	51° 28,19' S	40° 55,08' W	3566,1	Multiple net	auf Tiefe	EL30 209meter
PS69/344-1	18.04.06	14:27	51° 28,19' S	40° 55,08' W	3566,1	Multiple net	Hieven	
PS69/344-1	18.04.06	14:35	51° 28,13' S	40° 54,97' W	3566,2	Multiple net	an Deck	
PS69/345-1	19.04.06	11:00	51° 29,74' S	34° 58,72' W	4841,2	Multiple net	zu Wasser	
PS69/345-1	19.04.06	12:04	51° 29,98' S	34° 58,27' W	4838,4	Multiple net	auf Tiefe	EL30 2093meter
PS69/345-1	19.04.06	12:09	51° 29,99' S	34° 58,26' W	4837,9	Multiple net	Hieven	
PS69/345-1	19.04.06	13:19	51° 30,12' S	34° 58,52' W	4837,1	Multiple net	an Deck	
PS69/345-2	19.04.06	13:27	51° 30,12' S	34° 58,57' W	4837,9	Multiple net	zu Wasser	
PS69/345-2	19.04.06	13:35	51° 30,13' S	34° 58,61' W	4838,0	Multiple net	auf Tiefe	EL30 200meter
PS69/345-2	19.04.06	13:35	51° 30,13' S	34° 58,61' W	4838,0	Multiple net	Hieven	
PS69/345-2	19.04.06	13:43	51° 30,14' S	34° 58,65' W	4839,5	Multiple net	an Deck	
PS69/346-1	20.04.06	11:02	51° 29,36' S	28° 59,66' W	3990,0	Multiple net	zu Wasser	
PS69/346-1	20.04.06	12:08	51° 29,58' S	28° 59,90' W	3970,9	Multiple net	auf Tiefe	EL30 2114meter
PS69/346-1	20.04.06	12:10	51° 29,58' S	28° 59,89' W	3970,1	Multiple net	Hieven	
PS69/346-1	20.04.06	13:20	51° 29,66' S	28° 59,96' W	3959,0	Multiple net	an Deck	
PS69/346-2	20.04.06	13:26	51° 29,65' S	28° 59,97' W	3959,8	Multiple net	zu Wasser	
PS69/346-2	20.04.06	13:34	51° 29,65' S	28° 59,96' W	3961,1	Multiple net	auf Tiefe	EL30 210meter
PS69/346-2	20.04.06	13:34	51° 29,65' S	28° 59,96' W	3961,1	Multiple net	Hieven	
PS69/346-2	20.04.06	13:42	51° 29,64' S	28° 59,94' W	3963,4	Multiple net	an Deck	
PS69/347-1	21.04.06	11:01	51° 29,70' S	23° 50,36' W	4455,5	Multiple net	zu Wasser	
PS69/347-1	21.04.06	12:07	51° 29,94' S	23° 50,17' W	4455,4	Multiple net	auf Tiefe	EL30 2088meter
PS69/347-1	21.04.06	12:10	51° 29,95' S	23° 50,17' W	4455,2	Multiple net	Hieven	
PS69/347-1	21.04.06	13:22	51° 30,26' S	23° 50,15' W	4449,6	Multiple net	an Deck	
PS69/347-2	21.04.06	17:01	51° 30,33' S	23° 50,07' W	4451,7	Multiple net	zu Wasser	
PS69/347-2	21.04.06	17:09	51° 30,34' S	23° 50,05' W	4451,5	Multiple net	auf Tiefe	223m
PS69/347-2	21.04.06	17:10	51° 30,34' S	23° 50,07' W	4450,1	Multiple net	Hieven	
PS69/347-2	21.04.06	17:18	51° 30,37' S	23° 50,05' W	4448,3	Multiple net	an Deck	
PS69/348-1	22.04.06	12:30	51° 30,10' S	19° 7,54' W	4447,4	Multiple net	zu Wasser	
PS69/348-1	22.04.06	13:42	51° 30,42' S	19° 8,15' W	4444,1	Multiple net	auf Tiefe	2122m

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/348-1	22.04.06	13:42	51° 30,42' S	19° 8,15' W	4444,1	Multiple net	Hieven	
PS69/348-1	22.04.06	14:51	51° 30,51' S	19° 8,58' W	4443,5	Multiple net	an Deck	
PS69/348-2	22.04.06	14:56	51° 30,50' S	19° 8,59' W	4443,2	Multiple net	zu Wasser	
PS69/348-2	22.04.06	15:03	51° 30,52' S	19° 8,62' W	4443,5	Multiple net	auf Tiefe	211m
PS69/348-2	22.04.06	15:04	51° 30,52' S	19° 8,62' W	4444,3	Multiple net	Hieven	
PS69/348-2	22.04.06	15:11	51° 30,56' S	19° 8,62' W	4442,9	Multiple net	an Deck	
PS69/349-1	23.04.06	10:00	51° 30,36' S	13° 47,26' W	4105,2	Multiple net	zu Wasser	
PS69/349-1	23.04.06	11:06	51° 30,23' S	13° 47,33' W	4065,8	Multiple net	auf Tiefe	EL30 2098meter
PS69/349-1	23.04.06	11:10	51° 30,21' S	13° 47,33' W	4037,4	Multiple net	Hieven	
PS69/349-1	23.04.06	12:17	51° 30,17' S	13° 47,15' W	4071,7	Multiple net	an Deck	
PS69/349-2	23.04.06	12:26	51° 30,18' S	13° 47,11' W	4075,9	Multiple net	zu Wasser	
PS69/349-2	23.04.06	12:33	51° 30,19' S	13° 47,07' W	4102,6	Multiple net	auf Tiefe	EL30 211meter
PS69/349-2	23.04.06	12:34	51° 30,19' S	13° 47,07' W	4097,5	Multiple net	Hieven	
PS69/349-2	23.04.06	12:45	51° 30,14' S	13° 47,05' W	4090,8	Multiple net	an Deck	
PS69/350-1	24.04.06	08:59	51° 32,16' S	7° 57,81' W	2818,2	Multiple net	zu Wasser	
PS69/350-1	24.04.06	10:11	51° 32,35' S	7° 57,34' W	2816,7	Multiple net	auf Tiefe	EL30 2109meter
PS69/350-1	24.04.06	10:11	51° 32,35' S	7° 57,34' W	2816,7	Multiple net	Hieven	
PS69/350-1	24.04.06	11:20	51° 32,36' S	7° 56,77' W	2816,0	Multiple net	an Deck	
PS69/350-2	24.04.06	11:26	51° 32,36' S	7° 56,69' W	2814,8	Multiple net	zu Wasser	
PS69/350-2	24.04.06	11:34	51° 32,37' S	7° 56,62' W	2814,2	Multiple net	auf Tiefe	EL30 224meter
PS69/350-2	24.04.06	11:34	51° 32,37' S	7° 56,62' W	2814,2	Multiple net	Hieven	
PS69/350-2	24.04.06	11:43	51° 32,38' S	7° 56,54' W	2815,2	Multiple net	an Deck	
PS69/351-1	25.04.06	08:55	51° 33,99' S	2° 4,52' W	2876,9	Multiple net	zu Wasser	
PS69/351-1	25.04.06	10:08	51° 33,64' S	2° 5,07' W	2885,7	Multiple net	auf Tiefe	EL30 2141meter
PS69/351-1	25.04.06	10:09	51° 33,64' S	2° 5,09' W	2885,6	Multiple net	Hieven	
PS69/351-1	25.04.06	11:20	51° 33,42' S	2° 5,46' W	2870,6	Multiple net	an Deck	
PS69/351-1	25.04.06	11:28	51° 33,38' S	2° 5,55' W	2866,4	Multiple net	zu Wasser	
PS69/351-1	25.04.06	11:35	51° 33,36' S	2° 5,67' W	2862,0	Multiple net	auf Tiefe	EL30 209meter
PS69/351-1	25.04.06	11:35	51° 33,36' S	2° 5,67' W	2862,0	Multiple net	Hieven	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/351-1	25.04.06	11:43	51° 33,35' S	2° 5,78' W	2858,9	Multiple net	an Deck	
PS69/352-1	25.04.06	14:45	51° 33,49' S	1° 49,36' W	2772,8	CTD	zu Wasser	
PS69/352-1	25.04.06	15:28	51° 33,70' S	1° 49,77' W	2776,9	CTD	auf Tiefe	2000m
PS69/352-1	25.04.06	15:56	51° 33,79' S	1° 50,14' W	2780,0	CTD	an Deck	
PS69/353-1	26.04.06	02:41	51° 0,14' S	0° 59,61' E	1411,3	HydroSweep /ParaSound profile	Beginn Track	
PS69/353-1	26.04.06	03:48	50° 50,33' S	1° 7,75' E	3518,0	HydroSweep /ParaSound profile	Profil Ende	
PS69/354-1	26.04.06	22:57	50° 0,24' S	5° 6,43' E	1790,1	Dredge, geol.	zu Wasser	
PS69/354-1	26.04.06	23:29	50° 0,31' S	5° 7,04' E	1769,7	Dredge, geol.	auf Grund	
PS69/354-1	26.04.06	23:42	50° 0,44' S	5° 6,59' E	1598,5	Dredge, geol.	auf Tiefe	FN62.1 2500meter
PS69/354-1	27.04.06	00:36	50° 0,72' S	5° 5,69' E	1460,8	Dredge, geol.	dredge ende	
PS69/354-1	27.04.06	00:37	50° 0,73' S	5° 5,67' E	1500,8	Dredge, geol.	hieven	
PS69/354-1	27.04.06	01:09	50° 0,63' S	5° 5,61' E	1521,0	Dredge, geol.	hieven	mit 1m/s - vom Grund
PS69/354-1	27.04.06	01:33	50° 0,71' S	5° 5,21' E	1475,5	Dredge, geol.	an Deck	
PS69/355-1	27.04.06	11:06	50° 10,67' S	6° 20,34' E	2497,1	Dredge, geol.	zu Wasser	
PS69/355-1	27.04.06	11:50	50° 11,45' S	6° 21,08' E	1873,9	Dredge, geol.	auf Grund	
PS69/355-1	27.04.06	12:06	50° 11,91' S	6° 21,50' E	1965,5	Dredge, geol.	auf Tiefe	3500m
PS69/355-1	27.04.06	12:09	50° 11,97' S	6° 21,56' E	1940,3	Dredge, geol.	hieven	mit 0,5 m/s
PS69/355-1	27.04.06	13:37	50° 11,37' S	6° 21,03' E	1957,0	Dredge, geol.	dredge ende	vom Grund
PS69/355-1	27.04.06	14:09	50° 11,78' S	6° 21,48' E	2007,8	Dredge, geol.	an Deck	Dredge verloren
PS69/356-1	28.04.06	01:38	48° 59,08' S	8° 8,89' E	1830,9	Dredge, geol.	zu Wasser	
PS69/356-1	28.04.06	02:11	48° 59,25' S	8° 8,45' E	1666,0	Dredge, geol.	auf Grund	1801m
PS69/356-1	28.04.06	02:11	48° 59,25' S	8° 8,45' E	1666,0	Dredge, geol.	dredge beginn	
PS69/356-1	28.04.06	02:50	48° 59,63' S	8° 7,78' E	1086,3	Dredge, geol.	hieven	
PS69/356-1	28.04.06	03:10	48° 59,36' S	8° 8,05' E	0,0	Dredge, geol.	dredge ende	vom Grund
PS69/356-1	28.04.06	03:33	48° 59,74' S	8° 7,79' E	1089,1	Dredge, geol.	an Deck	
PS69/357-1	28.04.06	11:28	47° 54,94' S	8° 53,82' E	1781,8	Dredge, geol.	zu Wasser	
PS69/357-1	28.04.06	12:04	47° 54,96' S	8° 53,81' E	1767,6	Dredge, geol.	auf Grund	
PS69/357-1	28.04.06	13:35	47° 54,96' S	8° 53,51' E	1554,6	Dredge, geol.	dredge ende	vom Grund

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/357-1	28.04.06	13:59	47° 55,42' S	8° 53,30' E	1219,7	Dredge, geol.	an Deck	
PS69/358-1	28.04.06	18:00	47° 36,48' S	9° 51,41' E	1998,4	Dredge, geol.	zu Wasser	
PS69/358-1	28.04.06	18:36	47° 36,59' S	9° 51,01' E	1847,2	Dredge, geol.	auf Grund	
PS69/358-1	28.04.06	18:58	47° 36,89' S	9° 50,35' E	1363,4	Dredge, geol.	hieven	mit 0,5 max 2150 m
PS69/358-1	28.04.06	19:21	47° 36,59' S	9° 50,44' E	1550,7	Dredge, geol.	dredge ende	vom Grund
PS69/358-1	28.04.06	19:43	47° 36,59' S	9° 50,04' E	1418,2	Dredge, geol.	an Deck	
PS69/358-2	28.04.06	20:39	47° 36,74' S	9° 50,76' E	1651,2	Dredge, geol.	zu Wasser	
PS69/358-2	28.04.06	21:07	47° 36,87' S	9° 50,29' E	1378,3	Dredge, geol.	auf Grund	FN62.1 1600meter
PS69/358-2	28.04.06	21:12	47° 36,94' S	9° 50,19' E	1312,7	Dredge, geol.	dredge beginn	FN62.1 1700meter
PS69/358-2	28.04.06	21:27	47° 37,08' S	9° 49,95' E	1060,0	Dredge, geol.	hieven	
PS69/358-2	28.04.06	22:33	47° 37,20' S	9° 49,80' E	958,0	Dredge, geol.	hieven	von Grund
PS69/358-2	28.04.06	22:51	47° 37,23' S	9° 49,79' E	930,1	Dredge, geol.	an Deck	
PS69/359-1	29.04.06	01:33	47° 36,98' S	10° 24,99' E	1861,1	Dredge, geol.	zu Wasser	
PS69/359-1	29.04.06	02:09	47° 37,04' S	10° 24,73' E	1781,2	Dredge, geol.	auf Grund	
PS69/359-1	29.04.06	02:36	47° 37,43' S	10° 24,00' E	1371,8	Dredge, geol.	hieven	
PS69/359-1	29.04.06	04:10	47° 37,11' S	10° 24,53' E	1708,0	Dredge, geol.	dredge ende	travesieren nach Stb.
PS69/359-1	29.04.06	04:15	47° 37,08' S	10° 24,50' E	1722,8	Dredge, geol.	dredge ende	frei vom Grund
PS69/359-1	29.04.06	04:41	47° 37,05' S	10° 24,47' E	1756,2	Dredge, geol.	an Deck	
PS69/360-1	29.04.06	09:44	47° 2,41' S	9° 48,13' E	1787,0	Dredge, geol.	zu Wasser	
PS69/360-1	29.04.06	10:17	47° 2,45' S	9° 47,91' E	1671,1	Dredge, geol.	auf Grund	FN62.1
PS69/360-1	29.04.06	10:17	47° 2,45' S	9° 47,91' E	1671,1	Dredge, geol.	auf Tiefe	FN62.1 2000meter
PS69/360-1	29.04.06	10:33	47° 2,56' S	9° 47,68' E	1500,9	Dredge, geol.	hieven	mit 0,5
PS69/360-1	29.04.06	11:29	47° 2,47' S	9° 47,47' E	1452,9	Dredge, geol.	hieven	frei vom Grund
PS69/360-1	29.04.06	11:54	47° 2,43' S	9° 47,43' E	1467,5	Dredge, geol.	an Deck	
PS69/361-1	01.05.06	09:23	43° 22,83' S	3° 26,50' E	4424,2	Multiple net	zu Wasser	
PS69/361-1	01.05.06	09:40	43° 22,81' S	3° 26,42' E	4423,7	Multiple net	auf Tiefe	EL30 525meter
PS69/361-1	01.05.06	09:41	43° 22,81' S	3° 26,42' E	4423,9	Multiple net	Hieven	
PS69/361-1	01.05.06	10:00	43° 22,79' S	3° 26,48' E	4426,9	Multiple net	an Deck	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/362-1	02.05.06	00:55	43° 1,99' S	0° 10,05' E	4213,0	Ocean bottom seismometer	zu Wasser	501-4
PS69/363-1	02.05.06	02:13	42° 50,00' S	0° 10,03' E	4114,9	Ocean bottom seismometer	zu Wasser	
PS69/364-1	02.05.06	03:34	42° 38,02' S	0° 10,24' E	3772,2	Ocean bottom hydrophone	zu Wasser	
PS69/365-1	02.05.06	05:14	42° 22,05' S	0° 10,26' E	980,0	Ocean bottom hydrophone	zu Wasser	5041
PS69/366-1	02.05.06	06:47	42° 6,92' S	0° 9,83' E	552,4	Ocean bottom hydrophone	zu Wasser	5051
PS69/367-1	02.05.06	08:25	41° 52,94' S	0° 9,98' E	662,8	Ocean bottom hydrophone	zu Wasser	5061
PS69/368-1	02.05.06	10:08	41° 38,08' S	0° 10,09' E	3242,1	Ocean bottom hydrophone	zu Wasser	
PS69/369-1	02.05.06	11:27	41° 26,00' S	0° 9,95' E	4665,5	Ocean bottom seismometer	zu Wasser	5084
PS69/370-1	02.05.06	12:53	41° 12,03' S	0° 10,04' E	4649,4	Ocean bottom seismometer	zu Wasser	
PS69/371-1	02.05.06	14:15	41° 0,03' S	0° 10,04' E	4641,9	Ocean bottom seismometer	zu Wasser	
PS69/372-1	02.05.06	15:44	40° 48,78' S	0° 9,38' E	4759,4	Seismic reflection profile	Streamer zu Wasser	
PS69/372-1	02.05.06	17:04	40° 53,23' S	0° 10,26' E	4722,0	Seismic reflection profile	Bemerkung	Dicke Berta stb zu Wasser
PS69/372-1	02.05.06	17:08	40° 53,40' S	0° 10,27' E	4722,3	Seismic reflection profile	Kanonen zu Wasser	
PS69/372-1	02.05.06	18:25	40° 59,93' S	0° 10,04' E	4639,2	Seismic reflection profile	Bemerkung	Position OBS 5104 überlaufen
PS69/372-1	02.05.06	20:56	41° 11,87' S	0° 10,03' E	4650,9	Seismic reflection profile	Bemerkung	OBS 5094 überlaufen
PS69/372-1	02.05.06	23:36	41° 25,82' S	0° 9,95' E	4666,3	Seismic reflection profile	Bemerkung	OBS 5084 überlaufen

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/372-1	03.05.06	01:48	41° 38,03' S	0° 10,08' E	3185,2	Seismic reflection profile	Bemerkung	OBH 307-1 passiert
PS69/372-1	03.05.06	04:31	41° 52,91' S	0° 9,99' E	647,0	Seismic reflection profile	Bemerkung	OBH 506-1 passiert
PS69/372-1	03.05.06	07:10	42° 6,84' S	0° 9,79' E	543,5	Seismic reflection profile	Bemerkung	OBH 505-1
PS69/372-1	03.05.06	10:13	42° 21,95' S	0° 10,26' E	1988,4	Seismic reflection profile	Bemerkung	OBH 5041 überlaufen
PS69/372-1	03.05.06	13:27	42° 37,97' S	0° 10,25' E	3777,0	Seismic reflection profile	Bemerkung	OBH-503-1 pass.
PS69/372-1	03.05.06	15:42	42° 49,90' S	0° 10,03' E	4115,3	Seismic reflection profile	Bemerkung	OBS 502-4 passiert
PS69/372-1	03.05.06	17:56	43° 1,96' S	0° 10,05' E	4209,2	Seismic reflection profile	Bemerkung	OBS 501-4
PS69/372-1	03.05.06	19:49	43° 12,36' S	0° 10,01' E	4294,2	Seismic reflection profile	Profile Ende	Streamer über Endposition
PS69/372-1	03.05.06	20:11	43° 13,85' S	0° 10,06' E	4320,9	Seismic reflection profile	Kanonen an Deck	
PS69/372-1	03.05.06	20:25	43° 14,64' S	0° 10,12' E	4309,9	Seismic reflection profile	Bemerkung	beginn hieven streamer
PS69/372-1	03.05.06	20:46	43° 15,72' S	0° 10,25' E	4342,7	Seismic reflection profile	Streamer an Deck	
PS69/373-1	03.05.06	20:57	43° 15,95' S	0° 10,26' E	4352,4	CTD	zu Wasser	
PS69/373-1	03.05.06	21:36	43° 16,10' S	0° 10,39' E	4363,7	CTD	auf Tiefe	EL31 2500meter
PS69/373-1	03.05.06	22:09	43° 16,16' S	0° 10,59' E	4381,2	CTD	an Deck	
PS69/374-1	04.05.06	03:27	43° 2,24' S	1° 27,16' E	1765,8	Dredge, geol.	zu Wasser	
PS69/374-1	04.05.06	04:02	43° 2,49' S	1° 26,66' E	1594,4	Dredge, geol.	auf Grund	
PS69/374-1	04.05.06	04:53	43° 2,44' S	1° 25,65' E	1031,2	Dredge, geol.	hieven	max 1950 m, nach Haker ca. max Zug 8,2 t
PS69/374-1	04.05.06	05:50	43° 2,36' S	1° 26,30' E	1445,4	Dredge, geol.	dredge ende	frei vom Grund
PS69/374-1	04.05.06	06:10	43° 2,40' S	1° 26,26' E	1416,7	Dredge, geol.	an Deck	
PS69/375-1	04.05.06	10:46	42° 58,43' S	2° 30,29' E	1757,3	Dredge, geol.	zu Wasser	
PS69/375-1	04.05.06	11:16	42° 58,29' S	2° 30,08' E	1612,3	Dredge, geol.	auf Grund	FN62.1 1750meter
PS69/375-1	04.05.06	11:37	42° 58,19' S	2° 29,58' E	1400,3	Dredge, geol.	auf Tiefe	FN62.1 2300meter
PS69/375-1	04.05.06	11:38	42° 58,19' S	2° 29,57' E	1395,8	Dredge, geol.	hieven	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/375-1	04.05.06	13:09	42° 58,58' S	2° 29,30' E	1417,4	Dredge, geol.	dredge ende	vom Grund
PS69/375-1	04.05.06	13:34	42° 58,50' S	2° 29,30' E	1394,1	Dredge, geol.	an Deck	
PS69/376-1	05.05.06	17:15	42° 47,69' S	0° 33,69' E	1757,8	Dredge, geol.	zu Wasser	
PS69/376-1	05.05.06	17:53	42° 47,80' S	0° 33,22' E	1445,4	Dredge, geol.	auf Grund	
PS69/376-1	05.05.06	18:09	42° 47,93' S	0° 32,82' E	1253,4	Dredge, geol.	hieven	max. 2200 m ausgesteckt
PS69/376-1	05.05.06	19:37	42° 47,68' S	0° 33,11' E	1307,1	Dredge, geol.	dredge ende	vom Grund Max Last 9,7 t
PS69/376-1	05.05.06	20:03	42° 47,87' S	0° 32,85' E	1256,1	Dredge, geol.	an Deck	
PS69/377-1	06.05.06	07:24	43° 26,64' S	1° 8,61' W	1844,3	Dredge, geol.	zu Wasser	
PS69/377-1	06.05.06	08:01	43° 27,12' S	1° 9,23' W	1588,2	Dredge, geol.	auf Grund	
PS69/377-1	06.05.06	08:03	43° 27,12' S	1° 9,26' W	1597,3	Dredge, geol.	auf Tiefe	FN62.1 2100meter
PS69/377-1	06.05.06	08:24	43° 27,33' S	1° 9,62' W	1205,1	Dredge, geol.	hieven	
PS69/377-1	06.05.06	08:24	43° 27,33' S	1° 9,62' W	1205,1	Dredge, geol.	dredge beginn	
PS69/377-1	06.05.06	09:15	43° 26,97' S	1° 8,77' W	1780,6	Dredge, geol.	dredge ende	von Grund
PS69/377-1	06.05.06	09:44	43° 26,75' S	1° 9,20' W	1627,1	Dredge, geol.	an Deck	
PS69/378-1	06.05.06	12:33	43° 46,70' S	1° 4,18' W	1649,0	Dredge, geol.	zu Wasser	
PS69/378-1	06.05.06	13:09	43° 46,51' S	1° 4,13' W	1602,9	Dredge, geol.	auf Grund	
PS69/378-1	06.05.06	13:19	43° 46,39' S	1° 4,31' W	1486,1	Dredge, geol.	dredge beginn	2050m gesteckt
PS69/378-1	06.05.06	14:42	43° 46,71' S	1° 4,15' W	1741,3	Dredge, geol.	dredge ende	vom Grund
PS69/378-1	06.05.06	14:43	43° 46,71' S	1° 4,16' W	1680,4	Dredge, geol.	hieven	
PS69/378-1	06.05.06	15:06	43° 46,28' S	1° 4,01' W	1559,4	Dredge, geol.	an Deck	
PS69/379-1	06.05.06	16:01	43° 47,86' S	1° 1,55' W	2468,9	Dredge, geol.	zu Wasser	
PS69/379-1	06.05.06	16:48	43° 47,60' S	1° 1,99' W	2402,0	Dredge, geol.	auf Grund	
PS69/379-1	06.05.06	18:01	43° 47,23' S	1° 2,12' W	2186,5	Dredge, geol.	dredge ende	vom Grund, max 2800 m, max Zug 7,2 t
PS69/379-1	06.05.06	18:25	43° 47,02' S	1° 2,25' W	2037,4	Dredge, geol.	an Deck	
PS69/380-1	07.05.06	15:03	43° 1,90' S	0° 10,35' E	4205,6	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/380-1	07.05.06	15:07	43° 1,84' S	0° 10,38' E	4202,7	Ocean bottom seismometer	ausgelöst	OBS 501-4

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/380-1	07.05.06	15:25	43° 1,59' S	0° 10,53' E	4214,2	Ocean bottom seismometer	Hydrophon an Deck	Hydrophon ein, Verholen wegen starker Abdrift
PS69/380-1	07.05.06	15:52	43° 2,37' S	0° 9,99' E	4298,3	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/380-1	07.05.06	15:55	43° 2,33' S	0° 9,99' E	4252,2	Ocean bottom seismometer	ausgelöst	
PS69/380-1	07.05.06	16:07	43° 2,13' S	0° 9,98' E	4222,5	Ocean bottom seismometer	Hydrophon an Deck	
PS69/380-1	07.05.06	16:15	43° 2,04' S	0° 10,04' E	4213,8	Ocean bottom seismometer	Information	UKW Signal empfangen
PS69/380-1	07.05.06	16:18	43° 2,07' S	0° 10,10' E	4218,2	Ocean bottom seismometer	aufgetaucht	stb querab
PS69/380-1	07.05.06	16:47	43° 1,41' S	0° 10,37' E	4221,7	Ocean bottom seismometer	an Deck	
PS69/381-1	07.05.06	19:13	42° 50,01' S	0° 9,91' E	4116,9	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/381-1	07.05.06	19:14	42° 50,00' S	0° 9,91' E	4118,1	Ocean bottom seismometer	ausgelöst	OBS 502-4 Station 363
PS69/381-1	07.05.06	19:25	42° 49,94' S	0° 9,94' E	4115,5	Ocean bottom seismometer	Hydrophon an Deck	
PS69/381-1	07.05.06	20:19	42° 50,12' S	0° 9,70' E	4123,7	Ocean bottom seismometer	aufgetaucht	
PS69/381-1	07.05.06	21:00	42° 49,51' S	0° 9,98' E	4113,7	Ocean bottom seismometer	an Deck	
PS69/382-1	07.05.06	23:29	42° 38,03' S	0° 10,02' E	3781,3	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/382-1	07.05.06	23:30	42° 38,03' S	0° 10,02' E	3781,5	Ocean bottom hydrophone	ausgelöst	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/382-1	07.05.06	23:36	42° 38,03' S	0° 10,03' E	3781,4	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/382-1	08.05.06	00:34	42° 38,14' S	0° 10,17' E	3771,6	Ocean bottom hydrophone	aufgetaucht	
PS69/382-1	08.05.06	01:01	42° 37,80' S	0° 10,70' E	3811,8	Ocean bottom hydrophone	an Deck	
PS69/383-1	08.05.06	03:21	42° 22,46' S	0° 9,00' E	1004,4	Ocean bottom hydrophone	Hydrophon zu Wasser	OBH 504-1
PS69/383-1	08.05.06	03:25	42° 22,45' S	0° 9,10' E	1015,0	Ocean bottom hydrophone	ausgelöst	
PS69/383-1	08.05.06	03:29	42° 22,45' S	0° 9,21' E	1001,6	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/383-1	08.05.06	03:37	42° 22,18' S	0° 10,19' E	999,5	Ocean bottom hydrophone	aufgetaucht	
PS69/383-1	08.05.06	03:51	42° 21,91' S	0° 10,58' E	997,6	Ocean bottom hydrophone	an Deck	
PS69/384-1	08.05.06	05:45	42° 7,02' S	0° 9,48' E	558,5	Ocean bottom hydrophone	Hydrophon zu Wasser	OBH 505-1
PS69/384-1	08.05.06	05:47	42° 7,00' S	0° 9,53' E	564,1	Ocean bottom hydrophone	ausgelöst	
PS69/384-1	08.05.06	05:51	42° 6,99' S	0° 9,63' E	560,3	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/384-1	08.05.06	05:54	42° 6,98' S	0° 9,69' E	558,9	Ocean bottom hydrophone	aufgetaucht	
PS69/384-1	08.05.06	06:06	42° 6,91' S	0° 10,12' E	549,7	Ocean bottom hydrophone	an Deck	
PS69/385-1	08.05.06	07:50	41° 53,14' S	0° 9,38' E	661,9	Ocean bottom hydrophone	ausgelöst	mit Posidonia

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/385-1	08.05.06	07:58	41° 52,97' S	0° 9,53' E	669,8	Ocean bottom hydrophone	aufgetaucht	
PS69/385-1	08.05.06	08:20	41° 53,02' S	0° 10,24' E	1246,8	Ocean bottom hydrophone	an Deck	
PS69/386-1	08.05.06	10:35	41° 38,11' S	0° 9,99' E	3232,4	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/386-1	08.05.06	10:37	41° 38,09' S	0° 9,98' E	3226,1	Ocean bottom hydrophone	ausgelöst	
PS69/386-1	08.05.06	10:38	41° 38,09' S	0° 9,97' E	3233,3	Ocean bottom hydrophone	Information	10x ausgelöst
PS69/386-1	08.05.06	10:42	41° 38,10' S	0° 9,97' E	3219,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/386-1	08.05.06	11:31	41° 38,18' S	0° 9,98' E	0,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/386-1	08.05.06	11:33	41° 38,17' S	0° 9,97' E	5425,8	Ocean bottom hydrophone	ausgelöst	
PS69/386-1	08.05.06	11:38	41° 38,13' S	0° 9,94' E	3186,2	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/386-1	08.05.06	11:58	41° 38,19' S	0° 9,88' E	4400,2	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/386-1	08.05.06	12:36	41° 38,04' S	0° 10,14' E	3243,7	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/386-1	08.05.06	12:50	41° 38,04' S	0° 10,19' E	3266,7	Ocean bottom hydrophone	aufgetaucht	
PS69/386-1	08.05.06	13:04	41° 37,91' S	0° 9,89' E	3118,5	Ocean bottom hydrophone	an Deck	
PS69/387-1	08.05.06	15:12	41° 25,99' S	0° 7,32' E	4643,1	Ocean bottom seismometer	Hydrophon zu Wasser	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/387-1	08.05.06	15:13	41° 25,98' S	0° 7,33' E	4643,4	Ocean bottom seismometer	ausgelöst	
PS69/387-1	08.05.06	15:21	41° 25,91' S	0° 7,37' E	4643,9	Ocean bottom seismometer	Hydrophon an Deck	
PS69/387-1	08.05.06	16:15	41° 25,95' S	0° 10,07' E	4666,0	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/387-1	08.05.06	16:16	41° 25,96' S	0° 10,07' E	4665,5	Ocean bottom seismometer	ausgelöst	
PS69/387-1	08.05.06	16:22	41° 25,99' S	0° 10,06' E	4664,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/387-1	08.05.06	16:30	41° 25,95' S	0° 10,05' E	4665,6	Ocean bottom seismometer	aufgetaucht	
PS69/387-1	08.05.06	16:42	41° 26,07' S	0° 10,04' E	4664,2	Ocean bottom seismometer	an Deck	
PS69/388-1	08.05.06	18:59	41° 12,35' S	0° 9,77' E	4657,3	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/388-1	08.05.06	19:02	41° 12,35' S	0° 9,75' E	4659,4	Ocean bottom hydrophone	ausgelöst	mit Antwort
PS69/388-1	08.05.06	19:07	41° 12,35' S	0° 9,71' E	4662,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/388-1	08.05.06	20:12	41° 12,12' S	0° 9,76' E	4651,6	Ocean bottom hydrophone	aufgetaucht	
PS69/388-1	08.05.06	20:31	41° 12,27' S	0° 9,70' E	4658,9	Ocean bottom hydrophone	an Deck	
PS69/389-1	08.05.06	22:48	41° 0,03' S	0° 9,75' E	4636,9	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/389-1	08.05.06	22:49	41° 0,03' S	0° 9,75' E	4637,1	Ocean bottom seismometer	ausgelöst	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/389-1	08.05.06	22:52	41° 0,04' S	0° 9,77' E	4636,8	Ocean bottom seismometer	Information	10x ausgelöst
PS69/389-1	08.05.06	22:55	41° 0,02' S	0° 9,77' E	0,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/389-1	09.05.06	00:05	40° 59,92' S	0° 10,09' E	0,0	Ocean bottom seismometer	aufgetaucht	
PS69/389-1	09.05.06	00:29	41° 0,28' S	0° 9,94' E	4644,0	Ocean bottom seismometer	an Deck	
PS69/390-1	09.05.06	06:19	41° 19,39' S	1° 17,14' E	2702,3	Dredge, geol.	zu Wasser	
PS69/390-1	09.05.06	07:10	41° 19,50' S	1° 16,75' E	2466,9	Dredge, geol.	auf Grund	
PS69/390-1	09.05.06	07:21	41° 19,59' S	1° 16,51' E	2355,9	Dredge, geol.	hieven	max 2950 m ausgelegt
PS69/390-1	09.05.06	08:44	41° 19,56' S	1° 16,32' E	2340,5	Dredge, geol.	hieven	von Grund
PS69/390-1	09.05.06	09:19	41° 19,66' S	1° 15,90' E	2125,8	Dredge, geol.	an Deck	
PS69/391-1	09.05.06	09:27	41° 19,68' S	1° 15,81' E	2092,4	Dredge, geol.	zu Wasser	
PS69/391-1	09.05.06	10:07	41° 19,72' S	1° 15,49' E	1841,0	Dredge, geol.	auf Grund	
PS69/391-1	09.05.06	10:17	41° 19,79' S	1° 15,31' E	1729,8	Dredge, geol.	auf Tiefe	FN62.1 2450meter
PS69/391-1	09.05.06	10:17	41° 19,79' S	1° 15,31' E	1729,8	Dredge, geol.	hieven	
PS69/391-1	09.05.06	11:52	41° 19,48' S	1° 15,82' E	2210,5	Dredge, geol.	hieven	von Grund
PS69/391-1	09.05.06	12:21	41° 19,27' S	1° 16,25' E	2417,3	Dredge, geol.	an Deck	
PS69/392-1	09.05.06	18:06	41° 22,39' S	2° 21,85' E	2776,7	Dredge, geol.	zu Wasser	
PS69/392-1	09.05.06	18:55	41° 22,89' S	2° 21,68' E	2442,7	Dredge, geol.	auf Grund	
PS69/392-1	09.05.06	19:08	41° 23,13' S	2° 21,69' E	2317,6	Dredge, geol.	hieven	max 3100 m ausgesteckt
PS69/392-1	09.05.06	20:30	41° 23,56' S	2° 21,51' E	1905,3	Dredge, geol.	hieven	von Grund
PS69/392-1	09.05.06	20:56	41° 23,68' S	2° 21,52' E	1839,1	Dredge, geol.	an Deck	
PS69/393-1	11.05.06	10:34	35° 47,60' S	0° 51,74' W	2645,7	Dredge, geol.	zu Wasser	
PS69/393-1	11.05.06	11:21	35° 47,51' S	0° 51,98' W	2509,2	Dredge, geol.	auf Grund	FN62.1 2650meter
PS69/393-1	11.05.06	11:32	35° 47,41' S	0° 52,19' W	2366,6	Dredge, geol.	auf Tiefe	FN62.1 2950meter
PS69/393-1	11.05.06	11:32	35° 47,41' S	0° 52,19' W	2366,6	Dredge, geol.	hieven	
PS69/393-1	11.05.06	12:36	35° 46,79' S	0° 52,35' W	1877,1	Dredge, geol.	dredge ende	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/393-1	11.05.06	13:15	35° 46,33' S	0° 52,60' W	1805,7	Dredge, geol.	an Deck	
PS69/394-1	11.05.06	21:07	35° 30,04' S	2° 22,32' W	4209,4	Ocean bottom seismometer	zu Wasser	obs 601
PS69/395-1	11.05.06	22:48	35° 21,05' S	2° 36,90' W	4359,8	Ocean bottom seismometer	zu Wasser	obs 602
PS69/396-1	12.05.06	00:53	35° 11,99' S	2° 51,98' W	4246,1	Ocean bottom seismometer	zu Wasser	
PS69/397-1	12.05.06	02:22	35° 3,03' S	3° 6,03' W	4209,6	Ocean bottom seismometer	zu Wasser	OBS 604
PS69/398-1	12.05.06	03:16	34° 58,09' S	3° 13,79' W	4231,2	Seismic reflection profile	Streamer zu Wasser	
PS69/398-1	12.05.06	04:00	34° 59,79' S	3° 11,05' W	4190,3	Seismic reflection profile	Kanonen zu Wasser	
PS69/398-1	12.05.06	04:15	35° 0,46' S	3° 10,04' W	4182,8	Seismic reflection profile	Profil Beginn	
PS69/398-1	12.05.06	04:59	35° 2,96' S	3° 6,07' W	4202,0	Seismic reflection profile	Bemerkung	obs 604 überlaufen
PS69/398-1	12.05.06	07:52	35° 12,00' S	2° 51,97' W	4245,9	Seismic reflection profile	Bemerkung	obs 603 überfahren
PS69/398-1	12.05.06	10:56	35° 21,03' S	2° 36,97' W	4357,3	Seismic reflection profile	Bemerkung	obs602 überlaufen
PS69/398-1	12.05.06	15:10	35° 33,24' S	2° 17,35' W	4498,5	Seismic reflection profile	Bemerkung	letzter Schuß
PS69/398-1	12.05.06	15:10	35° 33,24' S	2° 17,35' W	4498,5	Seismic reflection profile	Bemerkung	Kanonen aus dem Wasser
PS69/398-1	12.05.06	15:20	35° 33,43' S	2° 16,95' W	4495,8	Seismic reflection profile	Kanonen an Deck	
PS69/398-1	12.05.06	15:53	35° 34,01' S	2° 16,86' W	4474,4	Seismic reflection profile	Streamer an Deck	
PS69/399-1	12.05.06	16:53	35° 29,78' S	2° 23,09' W	4480,6	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/399-1	12.05.06	16:59	35° 29,78' S	2° 23,16' W	4479,7	Ocean bottom seismometer	ausgelöst	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/399-1	12.05.06	17:05	35° 29,78' S	2° 23,15' W	4479,2	Ocean bottom seismometer	Hydrophon an Deck	Start Releaser Test
PS69/399-1	12.05.06	18:05	35° 29,86' S	2° 22,79' W	4468,9	Ocean bottom seismometer	aufgetaucht	
PS69/399-1	12.05.06	18:49	35° 29,91' S	2° 22,14' W	4470,8	Ocean bottom seismometer	an Deck	
PS69/400-1	12.05.06	20:03	35° 23,93' S	2° 32,46' W	4248,9	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/400-1	12.05.06	20:04	35° 23,92' S	2° 32,47' W	4228,2	Ocean bottom seismometer	ausgelöst	
PS69/400-1	12.05.06	20:11	35° 23,87' S	2° 32,43' W	4244,4	Ocean bottom seismometer	Hydrophon an Deck	
PS69/400-1	12.05.06	20:53	35° 20,90' S	2° 36,87' W	4363,8	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/400-1	12.05.06	20:55	35° 20,89' S	2° 36,83' W	4365,4	Ocean bottom seismometer	ausgelöst	
PS69/400-1	12.05.06	21:00	35° 20,92' S	2° 36,76' W	4371,9	Ocean bottom seismometer	Hydrophon an Deck	
PS69/400-1	12.05.06	21:40	35° 20,98' S	2° 36,84' W	4365,5	Ocean bottom seismometer	aufgetaucht	
PS69/400-1	12.05.06	22:02	35° 21,00' S	2° 36,81' W	4367,0	Ocean bottom seismometer	an Deck	
PS69/401-1	12.05.06	23:16	35° 14,96' S	2° 47,09' W	4266,6	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/401-1	12.05.06	23:16	35° 14,96' S	2° 47,09' W	4266,6	Ocean bottom seismometer	ausgelöst	
PS69/401-1	12.05.06	23:21	35° 14,92' S	2° 47,06' W	4271,9	Ocean bottom seismometer	Hydrophon an Deck	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/401-1	13.05.06	00:19	35° 11,85' S	2° 51,88' W	4242,8	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/401-1	13.05.06	00:25	35° 11,83' S	2° 51,88' W	4244,5	Ocean bottom seismometer	aufgetaucht	
PS69/401-1	13.05.06	00:46	35° 11,96' S	2° 51,95' W	4245,5	Ocean bottom seismometer	an Deck	
PS69/402-1	13.05.06	01:57	35° 5,94' S	3° 1,52' W	4235,1	Ocean bottom seismometer	Hydrophon zu Wasser	OBS 604
PS69/402-1	13.05.06	01:58	35° 5,94' S	3° 1,53' W	4236,5	Ocean bottom seismometer	ausgelöst	
PS69/402-1	13.05.06	02:05	35° 5,89' S	3° 1,49' W	4235,6	Ocean bottom seismometer	Hydrophon an Deck	
PS69/402-1	13.05.06	03:04	35° 2,88' S	3° 5,89' W	4210,5	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/402-1	13.05.06	03:06	35° 2,90' S	3° 5,90' W	4208,7	Ocean bottom seismometer	aufgetaucht	
PS69/402-1	13.05.06	03:08	35° 2,89' S	3° 5,90' W	4208,5	Ocean bottom seismometer	Hydrophon an Deck	
PS69/402-1	13.05.06	03:26	35° 3,07' S	3° 6,14' W	4206,1	Ocean bottom seismometer	an Deck	
PS69/403-1	13.05.06	04:57	34° 53,92' S	3° 19,76' W	4266,5	Ocean bottom seismometer	zu Wasser	OBS 605
PS69/404-1	13.05.06	06:31	34° 44,81' S	3° 35,10' W	4022,5	Ocean bottom hydrophone	zu Wasser	OBH 606
PS69/405-1	13.05.06	07:58	34° 35,90' S	3° 48,92' W	0,0	Ocean bottom hydrophone	zu Wasser	obh 607
PS69/406-1	13.05.06	09:44	34° 26,90' S	4° 3,89' W	1835,7	Ocean bottom hydrophone	zu Wasser	obh 608

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/407-1	13.05.06	11:13	34° 18,04' S	4° 17,93' W	2570,1	Ocean bottom hydrophone	zu Wasser	
PS69/408-1	13.05.06	12:43	34° 9,00' S	4° 32,03' W	3833,6	Ocean bottom hydrophone	zu Wasser	OBH 610
PS69/409-1	13.05.06	14:47	34° 0,02' S	4° 46,97' W	3908,4	Ocean bottom seismometer	zu Wasser	OBS 611
PS69/410-1	13.05.06	16:25	33° 50,87' S	5° 0,89' W	3963,1	Ocean bottom seismometer	zu Wasser	OBS 612
PS69/411-1	13.05.06	17:59	33° 42,02' S	5° 15,93' W	3858,4	Ocean bottom seismometer	zu Wasser	OBS 613
PS69/412-1	13.05.06	18:04	33° 41,84' S	5° 15,94' W	3855,9	Magnetic Turn Circle	Start-Magnetikdrehkreise	stb Kreis
PS69/412-1	13.05.06	18:58	33° 41,40' S	5° 15,71' W	3835,7	Magnetic Turn Circle	Ende-Magnetikdrehkreise	stb
PS69/412-1	13.05.06	18:59	33° 41,28' S	5° 15,65' W	3830,3	Magnetic Turn Circle	Start-Magnetikdrehkreise	Bb drehkreis
PS69/412-1	13.05.06	19:50	33° 41,20' S	5° 15,51' W	3823,2	Magnetic Turn Circle	Ende-Magnetikdrehkreise	
PS69/413-1	13.05.06	21:33	33° 33,01' S	5° 29,97' W	4210,0	Sonarboje	zu Wasser	
PS69/414-1	13.05.06	22:21	33° 29,97' S	5° 34,93' W	4096,4	Seismic reflection profile	Streamer zu Wasser	
PS69/414-1	13.05.06	22:38	33° 30,78' S	5° 33,57' W	4160,3	Seismic reflection profile	Bemerkung	streamer ausgebracht
PS69/414-1	13.05.06	23:00	33° 31,50' S	5° 32,67' W	4219,2	Seismic reflection profile	Kanonen zu Wasser	
PS69/414-1	13.05.06	23:04	33° 31,65' S	5° 32,42' W	4220,5	Seismic reflection profile	Profil Beginn	
PS69/414-1	14.05.06	05:10	33° 51,08' S	5° 1,07' W	3962,9	Seismic reflection profile	Bemerkung	OBS 612
PS69/414-1	14.05.06	08:00	33° 60,00' S	4° 47,00' W	3907,6	Seismic reflection profile	Bemerkung	obs 611 überlaufen
PS69/414-1	14.05.06	18:05	34° 26,83' S	4° 4,03' W	1905,9	Seismic reflection profile	Bemerkung	OBS 608
PS69/414-1	14.05.06	21:00	34° 35,92' S	3° 48,92' W	0,0	Seismic reflection profile	Bemerkung	obs607 überlaufen

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/414-1	14.05.06	23:43	34° 44,80' S	3° 35,14' W	4016,5	Seismic reflection profile	Bemerkung	obs 606 überlaufen
PS69/414-1	15.05.06	05:59	35° 3,46' S	3° 5,50' W	4221,6	Seismic reflection profile	Profile Ende	
PS69/414-1	15.05.06	06:14	35° 3,82' S	3° 4,86' W	4236,9	Seismic reflection profile	Kanonen an Deck	
PS69/414-1	15.05.06	06:49	35° 4,91' S	3° 2,96' W	4222,7	Seismic reflection profile	Streamer an Deck	
PS69/415-1	15.05.06	07:11	35° 4,49' S	3° 4,26' W	4237,2	CTD	zu Wasser	
PS69/415-1	15.05.06	07:57	35° 4,69' S	3° 4,32' W	4239,8	CTD	auf Tiefe	2500
PS69/415-1	15.05.06	08:30	35° 4,88' S	3° 4,41' W	4239,5	CTD	an Deck	
PS69/416-1	16.05.06	06:50	33° 42,94' S	1° 4,61' W	3254,0	Dredge, geol.	zu Wasser	Franzosen Dredge
PS69/416-1	16.05.06	07:49	33° 42,78' S	1° 4,79' W	0,0	Dredge, geol.	auf Grund	
PS69/416-1	16.05.06	08:00	33° 42,75' S	1° 4,96' W	0,0	Dredge, geol.	auf Tiefe	FN 61.2 3650meter
PS69/416-1	16.05.06	08:01	33° 42,75' S	1° 4,98' W	3104,2	Dredge, geol.	dredge beginn	
PS69/416-1	16.05.06	08:31	33° 42,53' S	1° 5,45' W	2791,2	Dredge, geol.	hieven	
PS69/416-1	16.05.06	09:58	33° 42,13' S	1° 5,67' W	2414,8	Dredge, geol.	dredge ende	von Grund
PS69/416-1	16.05.06	10:30	33° 41,97' S	1° 5,72' W	2367,6	Dredge, geol.	an Deck	
PS69/417-1	16.05.06	19:06	32° 59,95' S	0° 29,76' E	4505,6	Seismic reflection profile	Streamer zu Wasser	
PS69/417-1	16.05.06	19:38	32° 58,60' S	0° 28,22' E	0,0	Seismic reflection profile	Kanonen zu Wasser	
PS69/417-1	18.05.06	06:05	31° 0,13' S	1° 59,82' W	4485,6	Seismic reflection profile	Profile Ende	
PS69/417-1	18.05.06	06:13	30° 59,76' S	2° 0,22' W	4528,4	Seismic reflection profile	Kanonen an Deck	
PS69/417-1	18.05.06	06:48	30° 58,27' S	1° 59,30' W	4390,0	Seismic reflection profile	Streamer an Deck	
PS69/418-1	18.05.06	17:59	29° 30,10' S	0° 30,04' W	4199,0	Seismic reflection profile	Streamer zu Wasser	
PS69/418-1	18.05.06	19:10	29° 32,52' S	0° 25,50' W	4654,0	Seismic reflection profile	Kanonen zu Wasser	
PS69/418-1	20.05.06	00:28	30° 50,06' S	1° 54,92' E	4347,0	Seismic reflection profile	Kursänderung	Gegenkurs - Kanonenreparatur
PS69/418-1	20.05.06	00:50	30° 49,67' S	1° 53,37' E	4353,0	Seismic reflection profile	Kursänderung	123°

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/418-1	20.05.06	00:58	30° 49,30' S	1° 53,57' E	4350,0	Seismic reflection profile	Bemerkung	zurück auf Kurs & es ballert wieder
PS69/418-1	20.05.06	20:25	31° 42,08' S	3° 30,43' E	4685,0	Seismic reflection profile	Profile Ende	
PS69/418-1	20.05.06	20:33	31° 42,28' S	3° 30,85' E	4767,0	Seismic reflection profile	Kanonen an Deck	
PS69/418-1	20.05.06	21:03	31° 43,11' S	3° 32,61' E	4674,0	Seismic reflection profile	Streamer an Deck	
PS69/419-1	21.05.06	04:42	31° 31,23' S	2° 1,18' E	2761,0	Dredge, geol.	zu Wasser	big one
PS69/419-1	21.05.06	05:29	31° 31,58' S	2° 1,09' E	2600,0	Dredge, geol.	auf Grund	
PS69/419-1	21.05.06	05:42	31° 31,79' S	2° 1,01' E	2485,0	Dredge, geol.	dredge beginn	max 3000m gesteckt
PS69/419-1	21.05.06	08:30	31° 32,08' S	2° 0,70' E	2238,0	Dredge, geol.	dredge ende	von Grund
PS69/419-1	21.05.06	09:02	31° 31,88' S	2° 0,72' E	2380,0	Dredge, geol.	an Deck	
PS69/420-1	21.05.06	17:54	32° 46,97' S	2° 32,12' E	2756,0	Dredge, geol.	zu Wasser	The big One
PS69/420-1	21.05.06	18:39	32° 47,21' S	2° 32,58' E	2515,0	Dredge, geol.	auf Grund	
PS69/420-1	21.05.06	18:51	32° 47,32' S	2° 32,78' E	2339,0	Dredge, geol.	dredge beginn	3000 m gefiert
PS69/420-1	21.05.06	19:12	32° 47,67' S	2° 32,93' E	2059,0	Dredge, geol.	hieven	
PS69/420-1	21.05.06	19:55	32° 47,82' S	2° 33,03' E	1920,0	Dredge, geol.	dredge ende	vom Grund
PS69/420-1	21.05.06	20:23	32° 47,91' S	2° 33,17' E	1760,0	Dredge, geol.	an Deck	
PS69/421-1	22.05.06	01:13	33° 20,82' S	2° 6,56' E	2552,0	Dredge, geol.	zu Wasser	
PS69/421-1	22.05.06	01:57	33° 20,99' S	2° 6,54' E	2472,0	Dredge, geol.	auf Grund	
PS69/421-1	22.05.06	01:59	33° 21,02' S	2° 6,57' E	2443,0	Dredge, geol.	dredge beginn	2600m gesteckt
PS69/421-1	22.05.06	03:47	33° 20,66' S	2° 6,88' E	2474,0	Dredge, geol.	hieven	vom Grund
PS69/421-1	22.05.06	04:18	33° 21,01' S	2° 7,15' E	2121,0	Dredge, geol.	an Deck	
PS69/421-2	22.05.06	04:33	33° 21,06' S	2° 7,16' E	2081,0	Dredge, geol.	zu Wasser	
PS69/421-2	22.05.06	05:09	33° 21,12' S	2° 7,27' E	1968,0	Dredge, geol.	auf Grund	
PS69/421-2	22.05.06	05:19	33° 21,21' S	2° 7,47' E	1786,0	Dredge, geol.	dredge beginn	2350 m gefiert
PS69/421-2	22.05.06	07:26	33° 21,34' S	2° 7,51' E	1661,0	Dredge, geol.	dredge ende	vom Grund
PS69/421-2	22.05.06	07:48	33° 21,25' S	2° 7,25' E	1861,0	Dredge, geol.	an Deck	
PS69/422-1	22.05.06	16:53	34° 0,23' S	0° 58,28' E	2374,0	Dredge, geol.	zu Wasser	
PS69/422-1	22.05.06	17:32	34° 0,60' S	0° 57,68' E	2040,0	Dredge, geol.	auf Grund	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/422-1	22.05.06	17:38	34° 0,67' S	0° 57,60' E	1987,0	Dredge, geol.	dredge beginn	2400 m gefiert
PS69/422-1	22.05.06	19:37	34° 0,72' S	0° 56,97' E	1940,0	Dredge, geol.	dredge ende	vom Grund
PS69/422-1	22.05.06	20:04	34° 0,51' S	0° 56,86' E	2073,0	Dredge, geol.	an Deck	
PS69/423-1	23.05.06	02:06	34° 55,31' S	0° 33,48' E	2272,0	Dredge, geol.	zu Wasser	
PS69/423-1	23.05.06	02:50	34° 55,43' S	0° 32,92' E	2075,0	Dredge, geol.	auf Grund	
PS69/423-1	23.05.06	02:53	34° 55,48' S	0° 32,89' E	2041,0	Dredge, geol.	dredge beginn	
PS69/423-1	23.05.06	05:36	34° 55,33' S	0° 32,02' E	1898,0	Dredge, geol.	dredge ende	vom Grund
PS69/423-1	23.05.06	06:02	34° 55,00' S	0° 31,98' E	2045,0	Dredge, geol.	an Deck	
PS69/424-1	23.05.06	09:39	34° 24,95' S	0° 29,79' E	2288,0	Dredge, geol.	zu Wasser	
PS69/424-1	23.05.06	10:18	34° 25,06' S	0° 29,37' E	2119,0	Dredge, geol.	auf Grund	FN 62.1 2200meter
PS69/424-1	23.05.06	10:27	34° 25,13' S	0° 29,20' E	2030,0	Dredge, geol.	auf Tiefe	FN 62.1 2500meter
PS69/424-1	23.05.06	10:28	34° 25,14' S	0° 29,18' E	2020,0	Dredge, geol.	dredge beginn	
PS69/424-1	23.05.06	12:31	34° 25,35' S	0° 28,94' E	1795,0	Dredge, geol.	dredge ende	vom Grunde
PS69/424-1	23.05.06	13:00	34° 25,25' S	0° 29,66' E	2085,0	Dredge, geol.	an Deck	
PS69/425-1	24.05.06	04:13	34° 55,62' S	3° 14,47' W	4236,0	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/425-1	24.05.06	04:15	34° 55,62' S	3° 14,49' W	4239,0	Ocean bottom seismometer	ausgelöst	
PS69/425-1	24.05.06	05:23	34° 54,04' S	3° 19,55' W	4273,0	Ocean bottom seismometer	aufgetaucht	
PS69/425-1	24.05.06	06:02	34° 54,53' S	3° 20,26' W	4281,0	Ocean bottom seismometer	an Deck	
PS69/426-1	24.05.06	08:42	34° 41,25' S	3° 30,98' W	3902,0	Ocean bottom hydrophone	ausgelöst	obh 606 ausgelöst per posidonia
PS69/426-1	24.05.06	09:21	34° 45,09' S	3° 35,03' W	4048,0	Ocean bottom hydrophone	ausgelöst	0,3 kbl
PS69/426-1	24.05.06	09:42	34° 45,12' S	3° 35,11' W	4052,0	Ocean bottom hydrophone	aufgetaucht	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/426-1	24.05.06	09:57	34° 45,00' S	3° 35,16' W	4037,0	Ocean bottom hydrophone	an Deck	
PS69/427-1	24.05.06	11:53	34° 36,74' S	3° 45,71' W	1288,0	Ocean bottom hydrophone	ausgelöst	OBH 607
PS69/427-1	24.05.06	12:41	34° 36,14' S	3° 48,97' W	1242,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/427-1	24.05.06	12:42	34° 36,14' S	3° 48,96' W	1241,0	Ocean bottom hydrophone	ausgelöst	
PS69/427-1	24.05.06	12:52	34° 36,13' S	3° 48,89' W	1243,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/427-1	24.05.06	13:02	34° 36,10' S	3° 48,90' W	1240,0	Ocean bottom hydrophone	aufgetaucht	
PS69/427-1	24.05.06	14:06	34° 36,57' S	3° 49,33' W	1259,0	Ocean bottom hydrophone	an Deck	
PS69/428-1	24.05.06	15:53	34° 26,40' S	4° 1,89' W	1345,0	Ocean bottom hydrophone	ausgelöst	OBH 608
PS69/428-1	24.05.06	16:46	34° 27,09' S	4° 3,59' W	1821,0	Ocean bottom hydrophone	ausgelöst	
PS69/428-1	24.05.06	17:34	34° 27,15' S	4° 3,80' W	1893,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/428-1	24.05.06	17:37	34° 27,17' S	4° 3,77' W	1897,0	Ocean bottom hydrophone	ausgelöst	
PS69/428-1	24.05.06	17:43	34° 27,20' S	4° 3,74' W	1905,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/428-1	24.05.06	17:55	34° 27,13' S	4° 3,78' W	1865,0	Ocean bottom hydrophone	aufgetaucht	
PS69/428-1	24.05.06	18:07	34° 27,05' S	4° 3,79' W	1853,0	Ocean bottom hydrophone	an Deck	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/429-1	24.05.06	19:30	34° 17,58' S	4° 13,12' W	3136,0	Ocean bottom hydrophone	ausgelöst	
PS69/429-1	24.05.06	19:45	34° 16,37' S	4° 15,83' W	3105,0	Ocean bottom hydrophone	ausgelöst	
PS69/429-1	24.05.06	20:00	34° 18,45' S	4° 17,58' W	2557,0	Ocean bottom hydrophone	ausgelöst	
PS69/429-1	24.05.06	20:16	34° 18,35' S	4° 17,75' W	2636,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/429-1	24.05.06	20:19	34° 18,38' S	4° 17,76' W	2638,0	Ocean bottom hydrophone	ausgelöst	
PS69/429-1	24.05.06	20:23	34° 18,43' S	4° 17,77' W	2636,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/429-1	24.05.06	20:40	34° 18,41' S	4° 17,86' W	2651,0	Ocean bottom hydrophone	ausgelöst	per Posidonia
PS69/429-1	24.05.06	20:53	34° 18,39' S	4° 17,79' W	2640,0	Ocean bottom hydrophone	aufgetaucht	
PS69/429-1	24.05.06	21:15	34° 17,85' S	4° 17,84' W	2548,0	Ocean bottom hydrophone	an Deck	
PS69/430-1	24.05.06	22:59	34° 8,32' S	4° 30,81' W	3853,0	Ocean bottom hydrophone	ausgelöst	OBH 610 per Posidonia
PS69/430-1	24.05.06	23:11	34° 9,21' S	4° 31,91' W	3846,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/430-1	24.05.06	23:12	34° 9,20' S	4° 31,92' W	3846,0	Ocean bottom hydrophone	ausgelöst	
PS69/430-1	24.05.06	23:17	34° 9,18' S	4° 31,92' W	3846,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/430-1	24.05.06	23:20	34° 9,15' S	4° 31,93' W	3852,0	Ocean bottom hydrophone	ausgelöst	per Posidonia

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/430-1	25.05.06	00:21	34° 9,00' S	4° 31,74' W	3849,0	Ocean bottom hydrophone	aufgetaucht	
PS69/430-1	25.05.06	00:46	34° 8,49' S	4° 32,03' W	3850,0	Ocean bottom hydrophone	an Deck	
PS69/431-1	25.05.06	02:30	33° 57,75' S	4° 44,06' W	3915,0	Ocean bottom seismometer	Hydrophon zu Wasser	OBS 611
PS69/431-1	25.05.06	02:33	33° 57,82' S	4° 44,04' W	3919,0	Ocean bottom seismometer	ausgelöst	
PS69/431-1	25.05.06	02:37	33° 57,87' S	4° 43,99' W	3914,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/431-1	25.05.06	03:19	34° 0,03' S	4° 46,70' W	3919,0	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/431-1	25.05.06	03:22	34° 0,03' S	4° 46,72' W	3917,0	Ocean bottom seismometer	ausgelöst	
PS69/431-1	25.05.06	03:23	34° 0,03' S	4° 46,72' W	3918,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/431-1	25.05.06	03:37	34° 0,04' S	4° 46,76' W	3919,0	Ocean bottom seismometer	aufgetaucht	
PS69/431-1	25.05.06	03:57	33° 59,88' S	4° 47,23' W	3920,0	Ocean bottom seismometer	an Deck	
PS69/432-1	25.05.06	05:39	33° 48,10' S	4° 57,13' W	3962,0	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/432-1	25.05.06	05:40	33° 48,10' S	4° 57,13' W	3962,0	Ocean bottom seismometer	ausgelöst	
PS69/432-1	25.05.06	05:44	33° 48,14' S	4° 57,16' W	3963,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/432-1	25.05.06	06:26	33° 50,98' S	5° 0,57' W	3973,0	Ocean bottom seismometer	Hydrophon zu Wasser	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/432-1	25.05.06	06:28	33° 51,00' S	5° 0,59' W	3972,0	Ocean bottom seismometer	ausgelöst	
PS69/432-1	25.05.06	06:34	33° 51,02' S	5° 0,59' W	3974,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/432-1	25.05.06	06:38	33° 51,02' S	5° 0,56' W	3973,0	Ocean bottom seismometer	aufgetaucht	
PS69/432-1	25.05.06	07:09	33° 50,88' S	5° 1,09' W	3971,0	Ocean bottom seismometer	an Deck	
PS69/433-1	25.05.06	09:13	33° 42,29' S	5° 15,72' W	3879,0	Ocean bottom seismometer	Hydrophon zu Wasser	OBS 613
PS69/433-1	25.05.06	09:14	33° 42,29' S	5° 15,72' W	3881,0	Ocean bottom seismometer	ausgelöst	
PS69/433-1	25.05.06	09:21	33° 42,29' S	5° 15,67' W	3877,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/433-1	25.05.06	10:16	33° 42,22' S	5° 15,52' W	3869,0	Ocean bottom seismometer	aufgetaucht	
PS69/433-1	25.05.06	10:31	33° 41,85' S	5° 15,59' W	3848,0	Ocean bottom seismometer	an Deck	
PS69/434-1	25.05.06	11:48	33° 41,09' S	5° 16,14' W	3834,0	Magnetic Turn Circle	Start-Magnetikdrehkreise	stb
PS69/434-1	25.05.06	13:25	33° 40,84' S	5° 15,96' W	3832,0	Magnetic Turn Circle	Ende-Magnetikdrehkreise	
PS69/435-1	25.05.06	22:55	32° 53,36' S	5° 8,75' W	2590,0	Dredge, geol.	zu Wasser	big one
PS69/435-1	25.05.06	23:41	32° 53,55' S	5° 8,87' W	2408,0	Dredge, geol.	auf Grund	
PS69/435-1	25.05.06	23:51	32° 53,71' S	5° 8,96' W	2275,0	Dredge, geol.	dredge beginn	2800 m
PS69/435-1	26.05.06	00:08	32° 53,99' S	5° 8,93' W	1995,0	Dredge, geol.	hieven	
PS69/435-1	26.05.06	01:27	32° 53,66' S	5° 8,93' W	2294,0	Dredge, geol.	dredge ende	vom Grund
PS69/435-1	26.05.06	01:59	32° 53,24' S	5° 8,45' W	2717,0	Dredge, geol.	an Deck	
PS69/436-1	26.05.06	02:32	32° 55,82' S	5° 8,84' W	1681,0	Dredge, geol.	zu Wasser	
PS69/436-1	26.05.06	03:12	32° 55,83' S	5° 8,81' W	1624,4	Dredge, geol.	auf Grund	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/436-1	26.05.06	03:29	32° 56,17' S	5° 8,89' W	1565,1	Dredge, geol.	dredge beginn	
PS69/436-1	26.05.06	03:52	32° 56,60' S	5° 9,09' W	1568,9	Dredge, geol.	hieven	
PS69/436-1	26.05.06	04:38	32° 56,88' S	5° 9,08' W	0,0	Dredge, geol.	an Deck	
PS69/437-1	26.05.06	05:42	32° 59,47' S	5° 8,72' W	1483,1	Dredge, geol.	zu Wasser	
PS69/437-1	26.05.06	06:18	32° 59,19' S	5° 8,89' W	1481,6	Dredge, geol.	auf Grund	
PS69/437-1	26.05.06	06:39	32° 59,06' S	5° 9,32' W	1482,3	Dredge, geol.	dredge beginn	FN62.1 2100 m ausgesteckt
PS69/437-1	26.05.06	08:33	32° 59,12' S	5° 8,96' W	1479,1	Dredge, geol.	dredge ende	frei vom Grund
PS69/437-1	26.05.06	09:01	32° 59,22' S	5° 8,45' W	1499,8	Dredge, geol.	an Deck	
PS69/438-1	27.05.06	07:34	34° 26,15' S	1° 1,53' W	2281,8	Dredge, geol.	zu Wasser	
PS69/438-1	27.05.06	08:15	34° 26,24' S	1° 1,38' W	2138,3	Dredge, geol.	auf Grund	
PS69/438-1	27.05.06	09:50	34° 25,86' S	1° 1,32' W	2171,6	Dredge, geol.	dredge ende	vom Grund
PS69/438-1	27.05.06	10:20	34° 25,74' S	1° 1,79' W	2586,9	Dredge, geol.	an Deck	
PS69/439-1	28.05.06	08:05	37° 30,00' S	2° 25,43' W	2599,0	Dredge, geol.	zu Wasser	
PS69/439-1	28.05.06	08:56	37° 29,68' S	2° 25,42' W	2455,9	Dredge, geol.	auf Grund	
PS69/439-1	28.05.06	09:10	37° 29,48' S	2° 25,42' W	2329,1	Dredge, geol.	dredge beginn	Winde stopp bei 3000 m
PS69/439-1	28.05.06	10:51	37° 29,90' S	2° 25,60' W	2562,8	Dredge, geol.	dredge ende	frei vom Grund
PS69/439-1	28.05.06	11:26	37° 30,05' S	2° 25,73' W	2617,2	Dredge, geol.	an Deck	
PS69/439-2	28.05.06	11:43	37° 30,01' S	2° 25,59' W	2615,0	Multiple net	zu Wasser	
PS69/439-2	28.05.06	12:54	37° 29,95' S	2° 24,94' W	2611,0	Multiple net	auf Tiefe	2.125m
PS69/439-2	28.05.06	12:57	37° 29,98' S	2° 24,91' W	2589,1	Multiple net	Hieven	
PS69/439-2	28.05.06	14:07	37° 29,94' S	2° 24,33' W	2530,6	Multiple net	an Deck	
PS69/439-3	28.05.06	14:13	37° 29,94' S	2° 24,15' W	2664,9	Multiple net	zu Wasser	
PS69/439-3	28.05.06	14:22	37° 29,89' S	2° 24,04' W	2675,5	Multiple net	auf Tiefe	209m
PS69/439-3	28.05.06	14:22	37° 29,89' S	2° 24,04' W	2675,5	Multiple net	Hieven	
PS69/439-3	28.05.06	14:30	37° 29,82' S	2° 23,99' W	2563,5	Multiple net	an Deck	
PS69/440-1	28.05.06	15:56	37° 29,03' S	2° 25,66' W	2102,1	Dredge, geol.	zu Wasser	
PS69/440-1	28.05.06	16:36	37° 28,76' S	2° 25,56' W	1894,2	Dredge, geol.	auf Grund	
PS69/440-1	28.05.06	16:41	37° 28,70' S	2° 25,57' W	1819,7	Dredge, geol.	dredge beginn	FN62.1 2350m ausgesteckt

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/440-1	28.05.06	18:22	37° 28,25' S	2° 25,78' W	1391,9	Dredge, geol.	dredge ende	vom Grund
PS69/440-1	28.05.06	18:41	37° 28,16' S	2° 25,96' W	1332,5	Dredge, geol.	an Deck	
PS69/441-1	29.05.06	08:58	37° 47,05' S	0° 47,03' E	5114,1	Multiple net	zu Wasser	
PS69/441-1	29.05.06	10:10	37° 47,07' S	0° 47,38' E	5121,9	Multiple net	auf Tiefe	2100
PS69/441-1	29.05.06	11:19	37° 46,99' S	0° 47,74' E	5132,8	Multiple net	an Deck	
PS69/441-2	29.05.06	11:29	37° 46,98' S	0° 47,74' E	5128,8	Multiple net	zu Wasser	
PS69/441-2	29.05.06	11:36	37° 46,97' S	0° 47,73' E	5132,7	Multiple net	auf Tiefe	215 m
PS69/441-2	29.05.06	11:51	37° 46,77' S	0° 47,79' E	5128,0	Multiple net	an Deck	
PS69/442-1	30.05.06	09:11	38° 16,81' S	5° 43,40' E	5144,0	Multiple net	zu Wasser	
PS69/442-1	30.05.06	10:32	38° 18,13' S	5° 42,22' E	5128,0	Multiple net	auf Tiefe	2463 m EL 30
PS69/442-1	30.05.06	11:54	38° 18,90' S	5° 41,56' E	5063,0	Multiple net	an Deck	
PS69/442-2	30.05.06	12:02	38° 18,98' S	5° 41,76' E	5059,0	Multiple net	zu Wasser	
PS69/442-2	30.05.06	12:11	38° 19,10' S	5° 41,78' E	5058,0	Multiple net	auf Tiefe	218m
PS69/442-2	30.05.06	12:20	38° 19,23' S	5° 41,77' E	5061,0	Multiple net	an Deck	
PS69/442-3	30.05.06	12:37	38° 19,29' S	5° 41,89' E	5057,0	Releaser Test	zu Wasser	
PS69/442-3	30.05.06	13:53	38° 20,09' S	5° 41,82' E	5075,0	Releaser Test	auf Tiefe	
PS69/442-3	30.05.06	13:57	38° 20,08' S	5° 41,77' E	5074,0	Releaser Test	ausgelöst	
PS69/442-3	30.05.06	14:53	38° 20,46' S	5° 41,52' E	5074,0	Releaser Test	an Deck	
PS69/443-1	31.05.06	09:04	38° 40,61' S	9° 45,02' E	5032,0	Multiple net	zu Wasser	
PS69/443-1	31.05.06	10:14	38° 41,25' S	9° 45,60' E	4996,0	Multiple net	auf Tiefe	2118 m EL 30
PS69/443-1	31.05.06	11:26	38° 41,95' S	9° 46,04' E	4984,0	Multiple net	an Deck	
PS69/443-2	31.05.06	11:31	38° 41,98' S	9° 46,22' E	4981,0	Multiple net	zu Wasser	
PS69/443-2	31.05.06	11:42	38° 42,14' S	9° 46,45' E	4981,0	Multiple net	auf Tiefe	210 m EL 30
PS69/443-2	31.05.06	11:49	38° 42,19' S	9° 46,55' E	4982,0	Multiple net	an Deck	
PS69/444-1	01.06.06	15:20	39° 0,01' S	13° 0,00' E	4852,0	Ocean bottom hydrophone	zu Wasser	OBH 701
PS69/445-1	01.06.06	17:27	39° 15,29' S	13° 15,01' E	4850,0	Ocean bottom hydrophone	zu Wasser	OBH 702

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/446-1	01.06.06	20:02	39° 35,42' S	13° 34,96' E	4613,0	Ocean bottom seismometer	zu Wasser	OBS 703
PS69/447-1	01.06.06	22:13	39° 48,89' S	13° 48,09' E	4891,0	Ocean bottom seismometer	zu Wasser	704
PS69/448-1	02.06.06	01:22	40° 6,88' S	14° 9,94' E	4003,0	Ocean bottom hydrophone	zu Wasser	OBH-705
PS69/449-1	02.06.06	04:01	40° 23,89' S	14° 23,00' E	1921,0	Ocean bottom hydrophone	zu Wasser	OBH-706
PS69/450-1	02.06.06	06:20	40° 38,70' S	14° 38,17' E	1917,0	Ocean bottom seismometer	zu Wasser	OBS 708
PS69/451-1	02.06.06	08:22	40° 52,85' S	14° 53,72' E	4481,0	Ocean bottom seismometer	zu Wasser	
PS69/452-1	02.06.06	08:39	40° 53,60' S	14° 54,99' E	4507,0	CTD	zu Wasser	
PS69/452-1	02.06.06	09:40	40° 53,52' S	14° 58,30' E	4416,0	CTD	auf Tiefe	EL31 3300meter
PS69/452-1	02.06.06	10:20	40° 53,63' S	15° 0,20' E	4428,0	CTD	an Deck	
PS69/453-1	02.06.06	13:59	41° 16,53' S	15° 16,41' E	4628,0	Seismic reflection profile	Streamer zu Wasser	
PS69/453-1	02.06.06	15:50	41° 13,39' S	15° 15,11' E	4736,0	Seismic reflection profile	Kanonen zu Wasser	Dicke Berta
PS69/453-1	02.06.06	16:09	41° 12,76' S	15° 14,13' E	4968,0	Seismic reflection profile	Kanonen an Deck	Dicke Berta out of order
PS69/453-1	02.06.06	16:14	41° 12,60' S	15° 13,84' E	4971,0	Seismic reflection profile	Kanonen zu Wasser	Array
PS69/453-1	02.06.06	19:40	40° 59,12' S	14° 59,61' E	4861,0	Seismic reflection profile	Bemerkung	profil unterbrochen
PS69/453-1	02.06.06	20:01	40° 58,08' S	14° 59,13' E	4632,0	Seismic reflection profile	Bemerkung	profil weiterführung
PS69/453-1	03.06.06	04:41	40° 23,90' S	14° 23,02' E	1920,0	Seismic reflection profile	Bemerkung	OBH 706
PS69/453-1	03.06.06	16:43	39° 35,44' S	13° 34,99' E	4618,0	Seismic reflection profile	Bemerkung	OBH 703
PS69/453-1	03.06.06	21:59	39° 15,32' S	13° 15,01' E	4851,0	Seismic reflection profile	Bemerkung	obh 702

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/453-1	04.06.06	08:00	38° 34,95' S	12° 36,22' E	5102,0	Seismic reflection profile	Profile Ende	
PS69/453-1	04.06.06	08:13	38° 33,95' S	12° 35,37' E	5098,0	Seismic reflection profile	Kanonen an Deck	
PS69/453-1	04.06.06	08:59	38° 31,15' S	12° 32,47' E	5107,0	Seismic reflection profile	Streamer an Deck	
PS69/454-1	05.06.06	03:44	40° 52,63' S	14° 53,52' E	4467,0	Ocean bottom seismometer	zu Wasser	709
PS69/454-1	05.06.06	03:46	40° 52,63' S	14° 53,56' E	4468,0	Ocean bottom seismometer	ausgelöst	
PS69/454-1	05.06.06	03:52	40° 52,62' S	14° 53,68' E	4464,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/454-1	05.06.06	04:52	40° 52,49' S	14° 54,62' E	4442,0	Ocean bottom seismometer	aufgetaucht	
PS69/454-1	05.06.06	05:17	40° 52,52' S	14° 54,45' E	4448,0	Ocean bottom seismometer	an Deck	
PS69/455-1	05.06.06	08:14	40° 37,82' S	14° 39,85' E	1863,0	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/455-1	05.06.06	08:16	40° 37,80' S	14° 39,87' E	1860,0	Ocean bottom seismometer	ausgelöst	
PS69/455-1	05.06.06	08:20	40° 37,80' S	14° 39,83' E	1863,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/455-1	05.06.06	08:43	40° 38,63' S	14° 38,57' E	1918,0	Ocean bottom seismometer	aufgetaucht	
PS69/455-1	05.06.06	09:05	40° 37,99' S	14° 39,03' E	1863,0	Ocean bottom seismometer	an Deck	
PS69/456-1	05.06.06	10:59	40° 26,45' S	14° 28,12' E	1731,0	Ocean bottom hydrophone	ausgelöst	10 mal Posidonia
PS69/456-1	05.06.06	11:43	40° 23,91' S	14° 23,07' E	1917,0	Ocean bottom hydrophone	Hydrophon zu Wasser	

Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/456-1	05.06.06	11:47	40° 23,88' S	14° 23,08' E	1918,0	Ocean bottom hydrophone	ausgelöst	
PS69/456-1	05.06.06	11:50	40° 23,87' S	14° 23,13' E	1917,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/456-1	05.06.06	12:10	40° 23,71' S	14° 23,51' E	1896,0	Ocean bottom hydrophone	aufgetaucht	
PS69/456-1	05.06.06	12:55	40° 22,86' S	14° 22,86' E	1898,0	Ocean bottom hydrophone	an Deck	
PS69/457-1	05.06.06	14:43	40° 7,20' S	14° 15,54' E	4297,0	Ocean bottom hydrophone	ausgelöst	OBH-705 / Posidonia - Auslösung
PS69/457-1	05.06.06	15:09	40° 5,89' S	14° 12,26' E	4333,0	Ocean bottom hydrophone	ausgelöst	
PS69/457-1	05.06.06	15:26	40° 6,78' S	14° 9,83' E	4001,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/457-1	05.06.06	15:29	40° 6,76' S	14° 9,77' E	3972,0	Ocean bottom hydrophone	ausgelöst	
PS69/457-1	05.06.06	15:35	40° 6,74' S	14° 9,60' E	3959,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/457-1	05.06.06	15:59	40° 6,76' S	14° 9,58' E	3966,0	Ocean bottom hydrophone	aufgetaucht	Ukw Signal
PS69/457-1	05.06.06	16:50	40° 5,15' S	14° 7,98' E	4129,0	Ocean bottom hydrophone	an Deck	
PS69/458-1	06.06.06	10:16	39° 50,07' S	13° 51,41' E	4803,0	Ocean bottom seismometer	Hydrophon zu Wasser	704
PS69/458-1	06.06.06	10:17	39° 50,07' S	13° 51,39' E	4801,0	Ocean bottom seismometer	ausgelöst	
PS69/458-1	06.06.06	10:22	39° 50,06' S	13° 51,36' E	4808,0	Ocean bottom seismometer	Hydrophon an Deck	

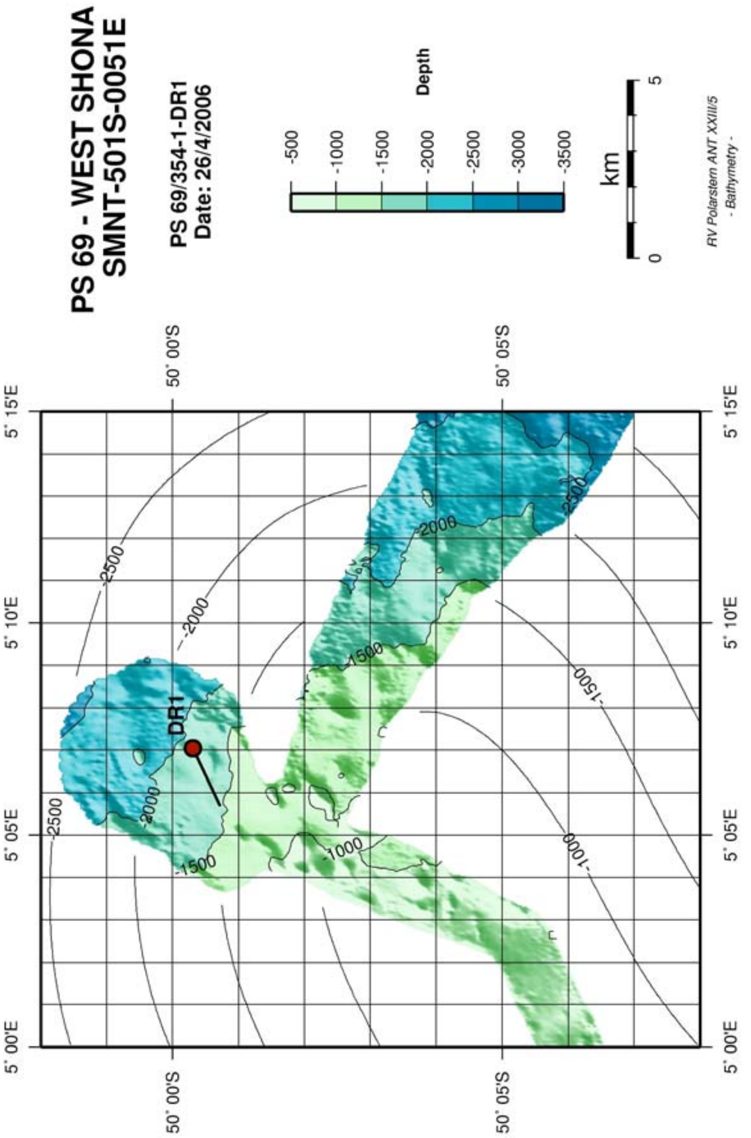
Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/458-1	06.06.06	10:43	39° 49,00' S	13° 48,15' E	4893,0	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/458-1	06.06.06	10:44	39° 48,99' S	13° 48,13' E	4894,0	Ocean bottom seismometer	ausgelöst	
PS69/458-1	06.06.06	10:51	39° 49,00' S	13° 48,09' E	4895,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/458-1	06.06.06	11:30	39° 49,22' S	13° 48,24' E	4836,0	Ocean bottom seismometer	aufgetaucht	
PS69/458-1	06.06.06	12:00	39° 48,44' S	13° 45,50' E	4919,0	Ocean bottom seismometer	an Deck	
PS69/459-1	06.06.06	14:04	39° 33,47' S	13° 37,93' E	4557,0	Ocean bottom seismometer	Hydrophon zu Wasser	OBS-703
PS69/459-1	06.06.06	14:05	39° 33,46' S	13° 37,89' E	4548,0	Ocean bottom seismometer	ausgelöst	
PS69/459-1	06.06.06	14:10	39° 33,41' S	13° 37,81' E	4543,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/459-1	06.06.06	14:37	39° 35,28' S	13° 34,93' E	4615,0	Ocean bottom seismometer	Hydrophon zu Wasser	
PS69/459-1	06.06.06	14:43	39° 35,20' S	13° 34,84' E	4613,0	Ocean bottom seismometer	ausgelöst	
PS69/459-1	06.06.06	14:43	39° 35,20' S	13° 34,84' E	4613,0	Ocean bottom seismometer	Hydrophon an Deck	
PS69/459-1	06.06.06	15:14	39° 34,91' S	13° 34,29' E	4585,0	Ocean bottom seismometer	aufgetaucht	
PS69/459-1	06.06.06	15:32	39° 34,94' S	13° 33,35' E	4459,0	Ocean bottom seismometer	an Deck	
PS69/460-1	06.06.06	18:08	39° 13,56' S	13° 18,28' E	4774,0	Ocean bottom hydrophone	ausgelöst	OBH 702

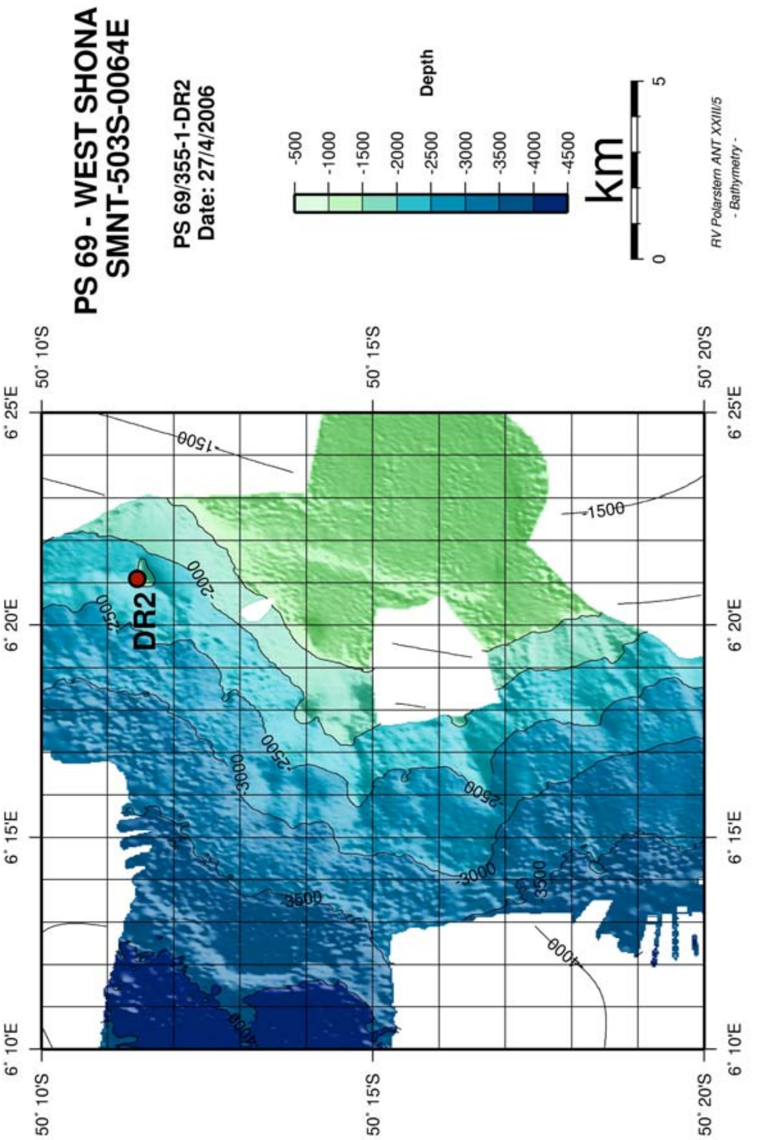
Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/460-1	06.06.06	18:28	39° 15,34' S	13° 15,32' E	4842,0	Ocean bottom hydrophone	ausgelöst	
PS69/460-1	06.06.06	18:34	39° 15,34' S	13° 15,09' E	4848,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/460-1	06.06.06	18:35	39° 15,33' S	13° 15,08' E	4848,0	Ocean bottom hydrophone	ausgelöst	per Hydrophone
PS69/460-1	06.06.06	18:38	39° 15,32' S	13° 15,07' E	4853,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/460-1	06.06.06	20:08	39° 14,56' S	13° 14,42' E	4851,0	Ocean bottom hydrophone	an Deck	
PS69/461-1	06.06.06	22:14	39° 0,30' S	13° 1,37' E	4852,0	Ocean bottom hydrophone	ausgelöst	
PS69/461-1	06.06.06	22:47	39° 0,03' S	12° 59,98' E	4845,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/461-1	06.06.06	22:48	39° 0,02' S	12° 59,97' E	4847,0	Ocean bottom hydrophone	ausgelöst	
PS69/461-1	06.06.06	22:53	39° 0,04' S	12° 59,96' E	4846,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/461-1	06.06.06	23:29	39° 0,21' S	12° 59,44' E	4842,0	Ocean bottom hydrophone	Hydrophon zu Wasser	
PS69/461-1	06.06.06	23:34	39° 0,23' S	12° 59,34' E	4845,0	Ocean bottom hydrophone	ausgelöst	
PS69/461-1	06.06.06	23:35	39° 0,24' S	12° 59,32' E	4846,0	Ocean bottom hydrophone	Hydrophon an Deck	
PS69/461-1	06.06.06	23:54	39° 0,34' S	12° 58,97' E	4838,0	Ocean bottom hydrophone	aufgetaucht	
PS69/461-1	07.06.06	00:17	38° 59,98' S	12° 59,11' E	4847,0	Ocean bottom hydrophone	an Deck	
PS69/462-1	07.06.06	03:50	38° 50,48' S	13° 24,81' E	3076,0	Dredge, geol.	zu Wasser	Big one

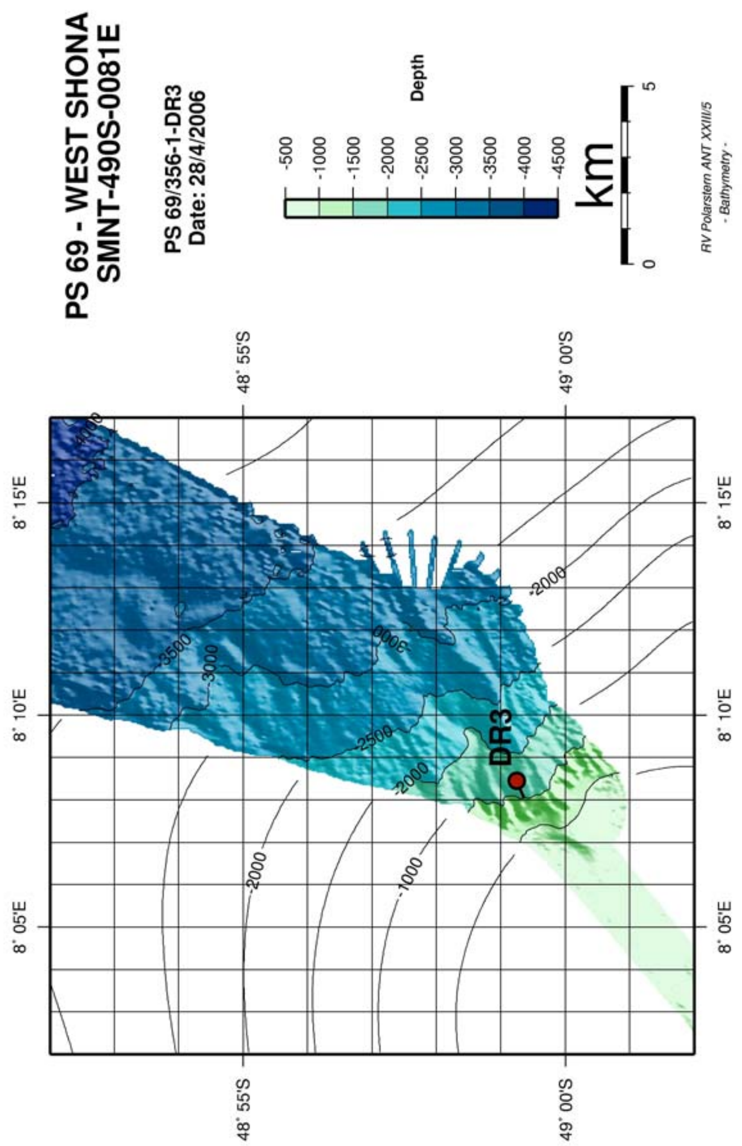
Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/462-1	07.06.06	04:45	38° 50,42' S	13° 26,07' E	2499,0	Dredge, geol.	auf Grund	
PS69/462-1	07.06.06	04:52	38° 50,41' S	13° 26,22' E	2407,0	Dredge, geol.	dredge beginn	3100 m ausgesteckt
PS69/462-1	07.06.06	05:04	38° 50,35' S	13° 26,40' E	2274,0	Dredge, geol.	hieven	
PS69/462-1	07.06.06	06:42	38° 50,12' S	13° 27,07' E	1785,0	Dredge, geol.	dredge ende	frei vom Grund
PS69/462-1	07.06.06	07:08	38° 50,15' S	13° 27,02' E	1788,0	Dredge, geol.	an Deck	
PS69/463-1	08.06.06	01:22	40° 39,49' S	14° 54,74' E	2872,0	Dredge, geol.	zu Wasser	
PS69/463-1	08.06.06	02:13	40° 39,42' S	14° 54,71' E	2852,0	Dredge, geol.	auf Grund	
PS69/463-1	08.06.06	02:26	40° 39,14' S	14° 54,79' E	2686,0	Dredge, geol.	dredge beginn	
PS69/463-1	08.06.06	05:00	40° 39,34' S	14° 54,83' E	2834,0	Dredge, geol.	dredge ende	frei vom Grund
PS69/463-1	08.06.06	05:40	40° 39,71' S	14° 54,52' E	2933,0	Dredge, geol.	an Deck	
PS69/463-1	08.06.06	07:43	40° 37,47' S	14° 37,59' E	1750,0	Dredge, geol.	zu Wasser	
PS69/463-1	08.06.06	07:52	40° 37,38' S	14° 37,46' E	1639,0	Dredge, geol.	an Deck	
PS69/463-1	08.06.06	08:10	40° 36,55' S	14° 36,74' E	1821,0	Dredge, geol.	zu Wasser	
PS69/463-1	08.06.06	08:50	40° 36,87' S	14° 36,90' E	1767,0	Dredge, geol.	auf Grund	
PS69/463-1	08.06.06	09:04	40° 37,09' S	14° 36,97' E	1565,0	Dredge, geol.	dredge beginn	FN62.1 2300meter
PS69/463-1	08.06.06	09:26	40° 37,31' S	14° 37,07' E	1341,0	Dredge, geol.	hieven	
PS69/463-1	08.06.06	10:09	40° 37,38' S	14° 37,14' E	1371,0	Dredge, geol.	dredge ende	von Grund
PS69/463-1	08.06.06	10:29	40° 37,43' S	14° 37,21' E	1448,0	Dredge, geol.	an Deck	
PS69/464-1	08.06.06	12:36	40° 46,75' S	14° 50,13' E	4612,0	Seismic reflection profile	Streamer zu Wasser	
PS69/464-1	08.06.06	13:07	40° 44,74' S	14° 48,93' E	3736,0	Seismic reflection profile	Kanonen zu Wasser	
PS69/464-1	08.06.06	13:09	40° 44,60' S	14° 48,87' E	3699,0	Seismic reflection profile	Bemerkung	1st shot
PS69/464-1	08.06.06	20:14	40° 15,45' S	14° 19,43' E	2926,0	Seismic reflection profile	Profile Ende	
PS69/464-1	08.06.06	20:19	40° 15,16' S	14° 19,16' E	3023,0	Seismic reflection profile	Kanonen an Deck	
PS69/464-1	08.06.06	20:49	40° 13,33' S	14° 17,33' E	3434,0	Seismic reflection profile	Streamer an Deck	
PS69/465-1	09.06.06	00:04	40° 10,42' S	14° 36,51' E	2594,0	Dredge, geol.	zu Wasser	
PS69/465-1	09.06.06	01:04	40° 10,85' S	14° 36,82' E	2360,0	Dredge, geol.	auf Grund	

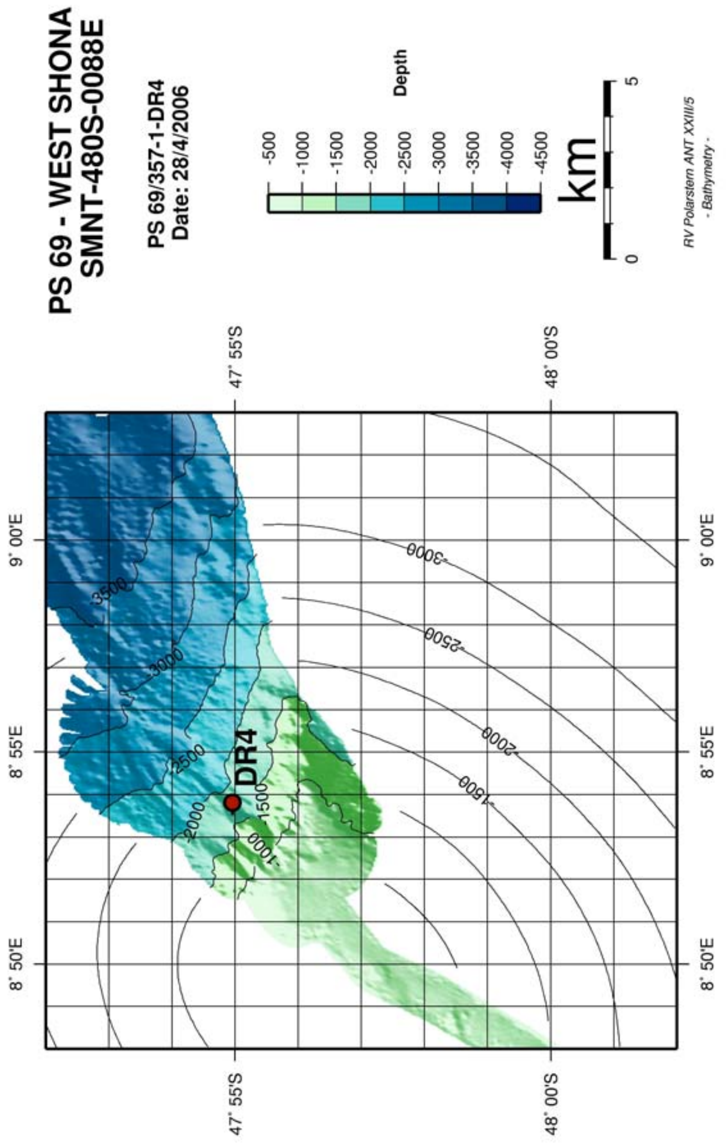
Station	Date	Time	PositionLat	PositionLon	Depth [m]	Gear	Action	Remarks
PS69/465-1	09.06.06	01:11	40° 10,97' S	14° 36,88' E	2284,0	Dredge, geol.	dredge beginn	
PS69/465-1	09.06.06	02:54	40° 10,49' S	14° 37,13' E	2507,0	Dredge, geol.	dredge ende	frei vom Grund
PS69/465-1	09.06.06	03:26	40° 10,61' S	14° 36,73' E	2474,0	Dredge, geol.	an Deck	
PS69/466-1	09.06.06	16:18	38° 11,54' S	14° 44,88' E	2398,0	Dredge, geol.	zu Wasser	
PS69/466-1	09.06.06	17:00	38° 11,81' S	14° 45,79' E	2078,0	Dredge, geol.	auf Grund	
PS69/466-1	09.06.06	17:09	38° 11,90' S	14° 45,99' E	1917,0	Dredge, geol.	dredge beginn	GE62.1 2600m ausgesteckt
PS69/466-1	09.06.06	18:57	38° 11,89' S	14° 46,19' E	1796,0	Dredge, geol.	dredge ende	von Grund
PS69/466-1	09.06.06	19:22	38° 11,75' S	14° 45,82' E	2033,0	Dredge, geol.	an Deck	
PS69/467-1	10.06.06	07:47	37° 12,60' S	16° 48,41' E	2574,0	Dredge, geol.	zu Wasser	
PS69/467-1	10.06.06	08:31	37° 12,46' S	16° 48,80' E	2353,0	Dredge, geol.	auf Grund	
PS69/467-1	10.06.06	08:39	37° 12,44' S	16° 48,95' E	2222,0	Dredge, geol.	dredge beginn	FN62.1 2650meter
PS69/467-1	10.06.06	08:59	37° 12,26' S	16° 49,40' E	2015,0	Dredge, geol.	hieven	
PS69/467-1	10.06.06	10:43	37° 12,28' S	16° 50,82' E	1474,0	Dredge, geol.	dredge ende	von Grund
PS69/467-1	10.06.06	11:03	37° 12,34' S	16° 51,06' E	1369,0	Dredge, geol.	an Deck	
PS69/468-1	10.06.06	14:25	36° 58,74' S	17° 32,39' E	4346,0	Magnetic Turn Circle	Start-Magnetikdrehkreise	
PS69/468-1	10.06.06	15:11	36° 58,61' S	17° 32,98' E	4346,0	Magnetic Turn Circle	Start-Magnetikdrehkreise	Bb.
PS69/468-1	10.06.06	15:59	36° 58,37' S	17° 33,43' E	4344,0	Magnetic Turn Circle	Ende-Magnetikdrehkreise	

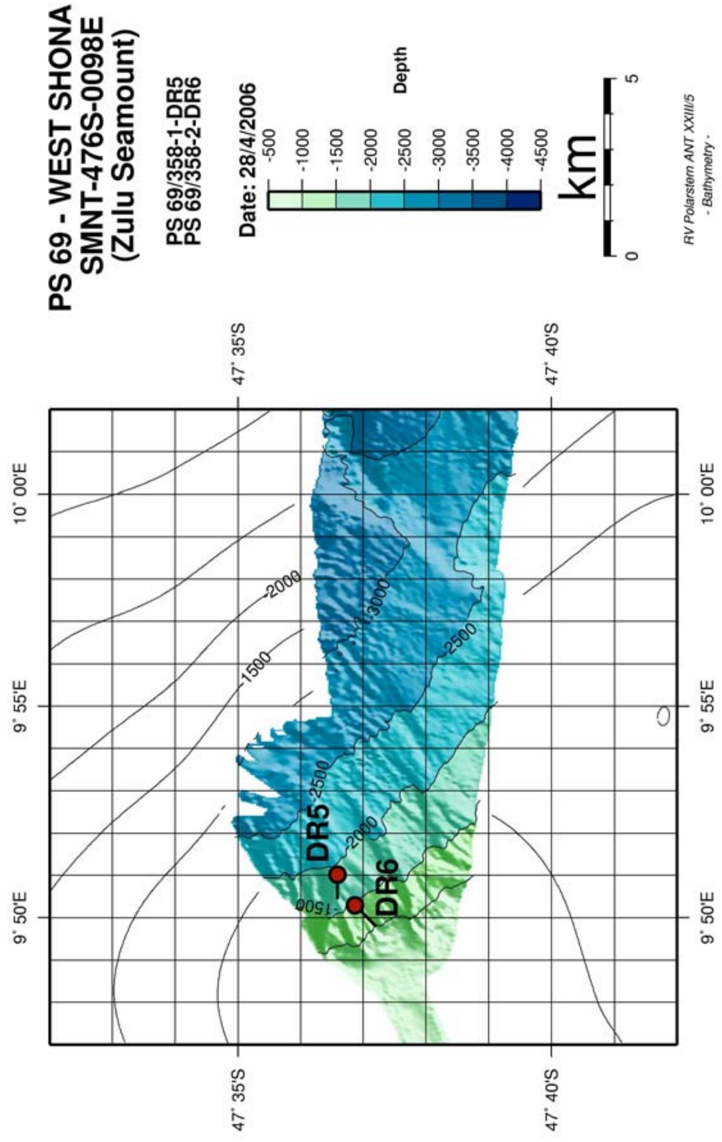
A.5 DREDGE MAPS

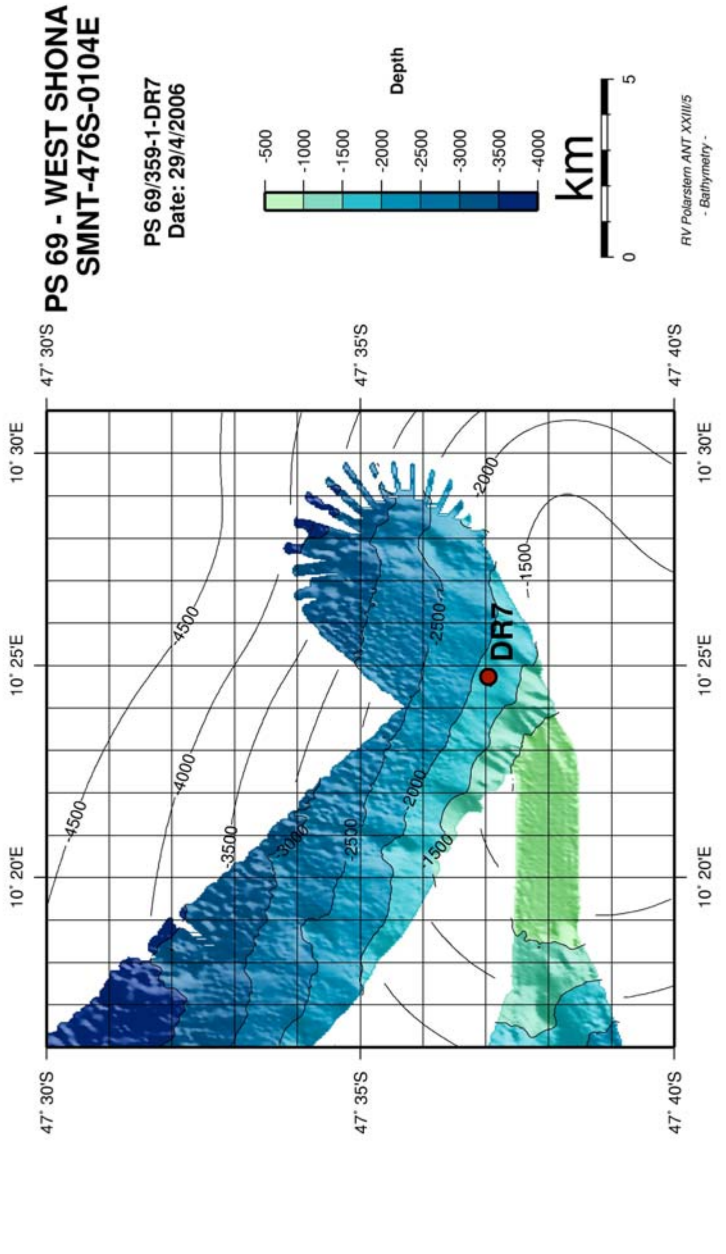


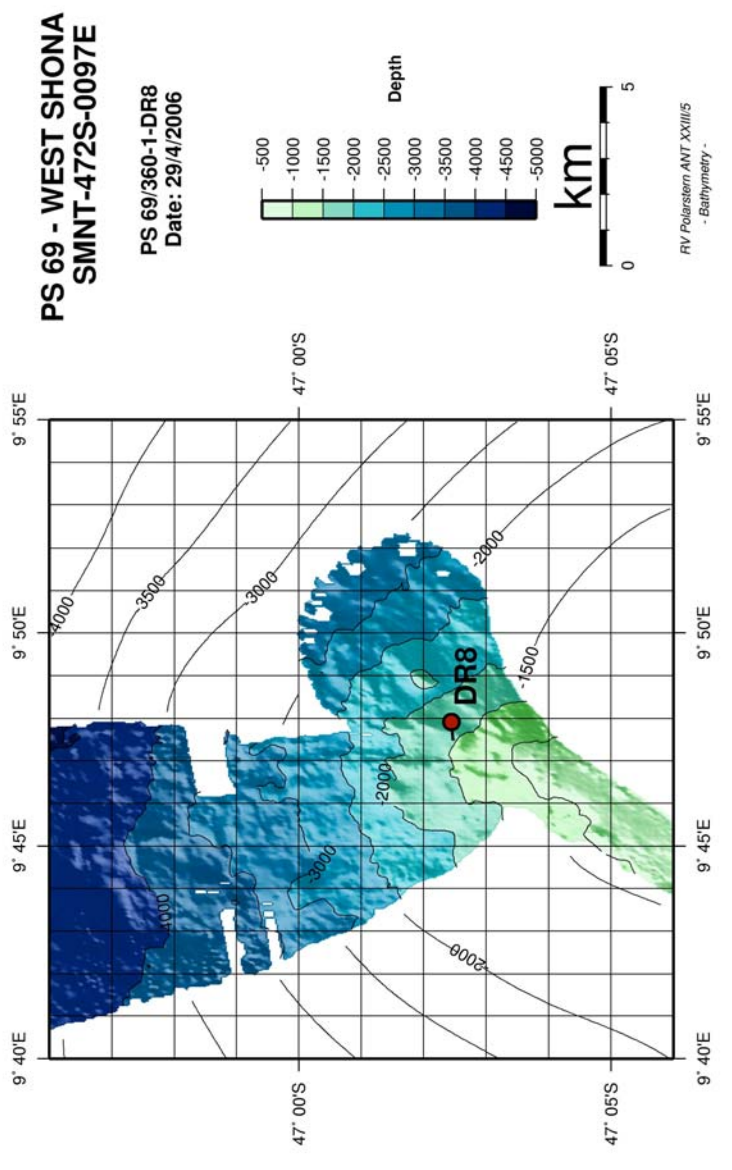

PS 69 - WEST SHONA
SMNT-503S-0064E
PS 69/355-1-DR2
Date: 27/4/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
0
5
km
RV Polarstern ANT XXIII/5
- Bathymetry -
DR2
50˚ 10'S
50˚ 15'S
50˚ 20'S
6˚ 10'E
6˚ 15'E
6˚ 20'E
6˚ 25'E

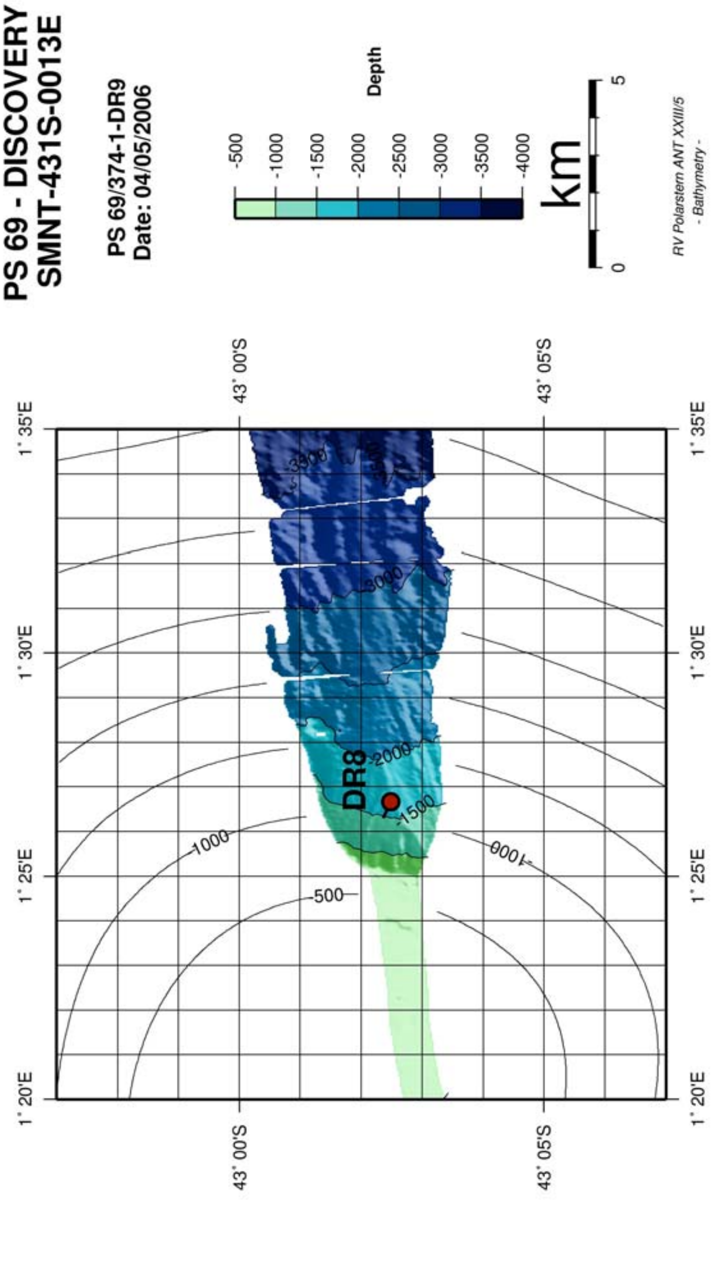

PS 69 - WEST SHONA
SMNT-490S-0081E
PS 69/356-1-DR3
Date: 28/4/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
48° 55'S
49° 00'S
8° 05'E
8° 10'E
8° 15'E
DR3
-1000
-2000
-2500
-3000
-3500
-4000

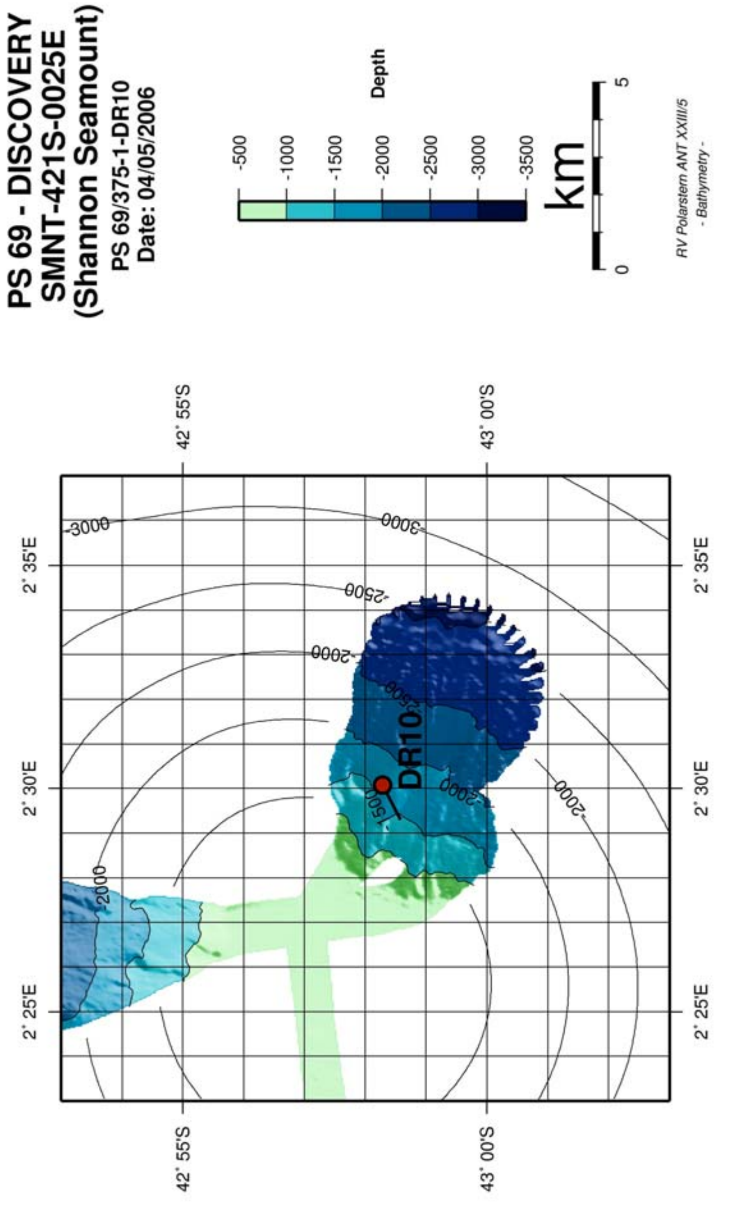

PS 69 - WEST SHONA
SMNT-480S-0088E
PS 69/357-1-DR4
Date: 28/4/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
0
5
km
RV Polarstern ANT XXIII/5
- Bathymetry -
DR4
47° 55'S
48° 00'S
8° 50'E
8° 55'E
9° 00'E

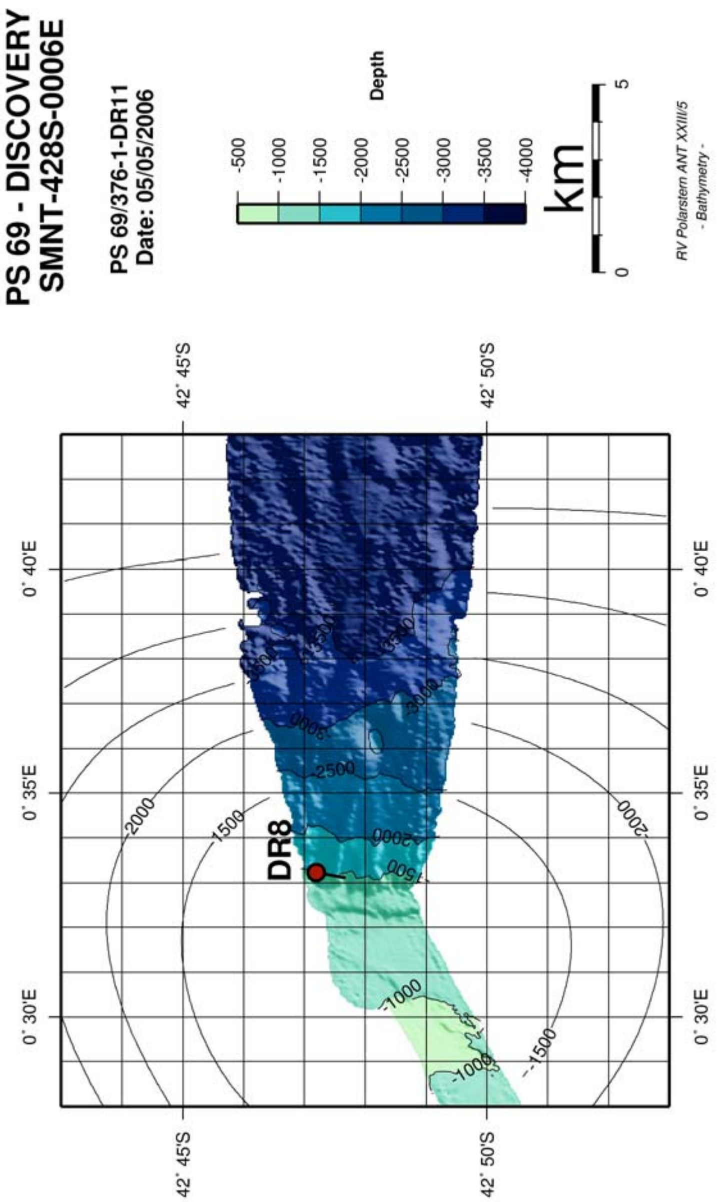

PS 69 - WEST SHONA
SMNT-476S-0098E
(Zulu Seamount)
PS 69/358-1-DR5
PS 69/358-2-DR6
Date: 28/4/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
47° 35'S
47° 40'S
9° 50'E
9° 55'E
10° 00'E
DR5
DR6
-1500
-2000
-2500
-3000

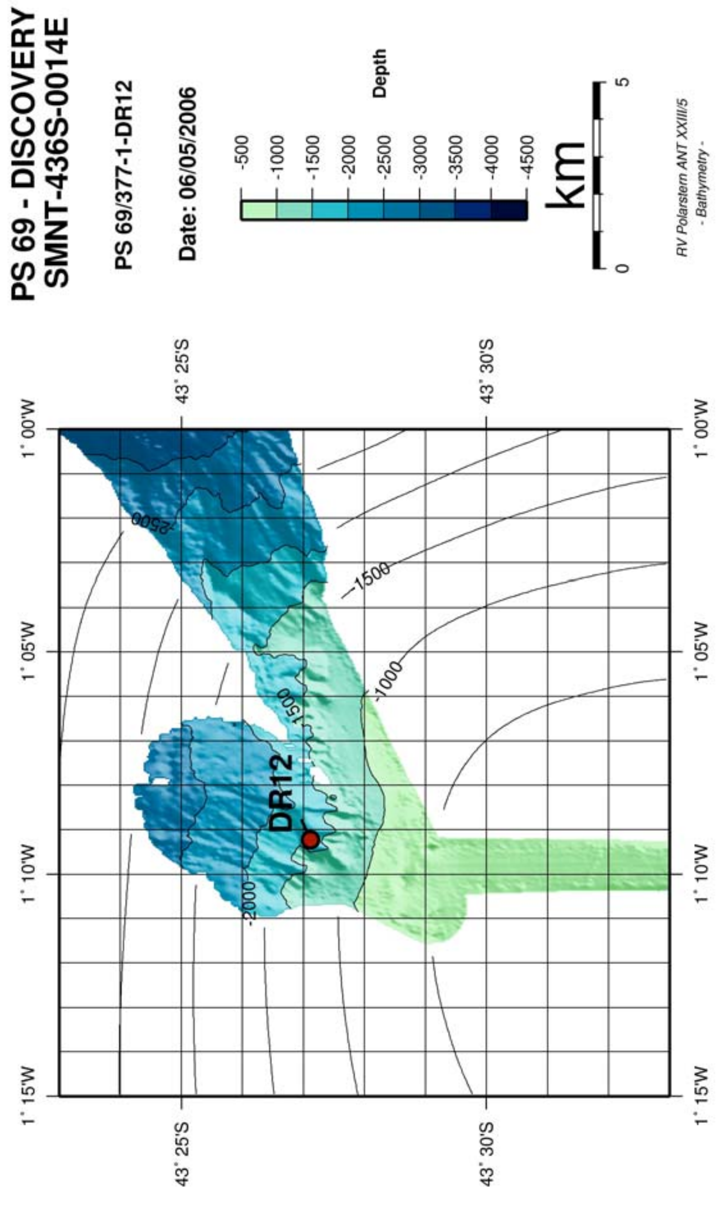

PS 69 - WEST SHONA
SMNT-476S-0104E
PS 69/359-1-DR7
Date: 29/4/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
DR7
47° 30'S
47° 35'S
47° 40'S
10° 20'E
10° 25'E
10° 30'E


PS 69 - WEST SHONA
SMNT-4725-0097E
PS 69/360-1-DR8
Date: 29/4/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
-5000
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
9° 40'E
9° 45'E
9° 50'E
9° 55'E
47° 00'S
47° 05'S
DR8
-4000
-3500
-3000
-2000
-1500

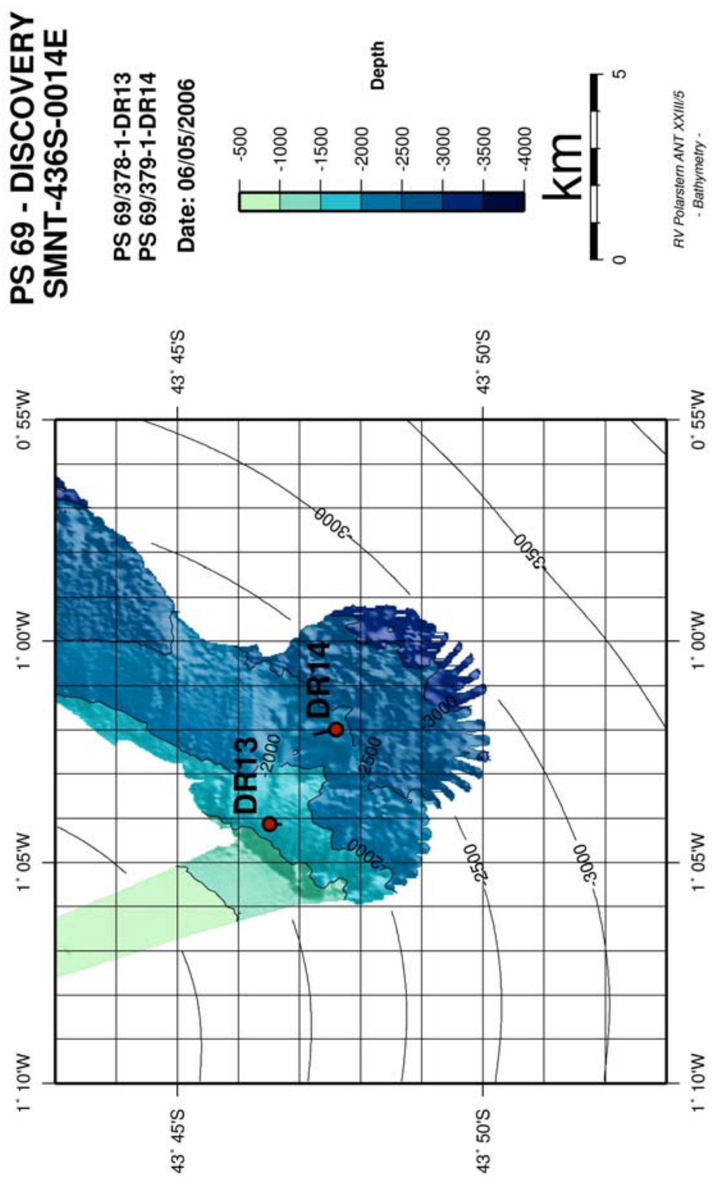

PS 69 - DISCOVERY
SMNT-431S-0013E
PS 69/374-1-DR9
Date: 04/05/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
43° 00'S
43° 05'S
1° 20'E
1° 25'E
1° 30'E
1° 35'E
DR8
-500
-1000
-1500
-2000
-3000

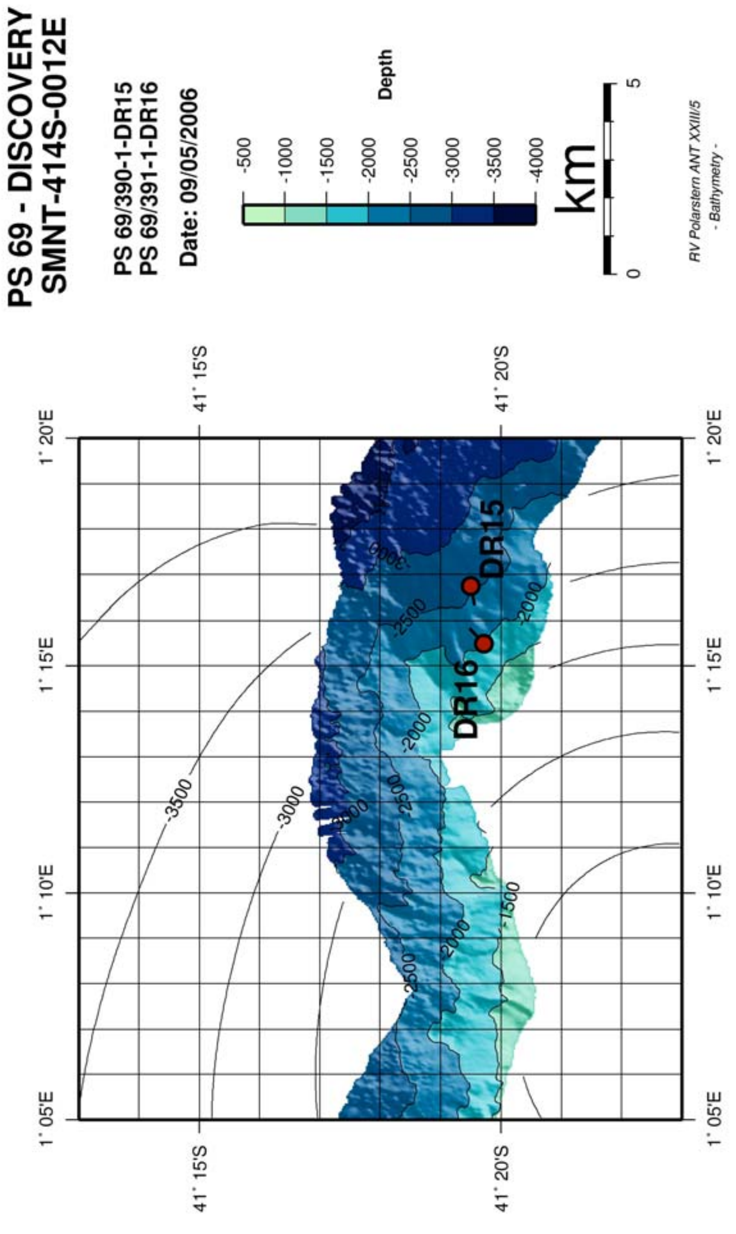

PS 69 - DISCOVERY
SMNT-421S-0025E
(Shannon Seamount)
PS 69/375-1-DR10
Date: 04/05/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
0
5
km
RV Polarstern ANT XXIII/5
- Bathymetry -
42° 55'S
43° 00'S
2° 25'E
2° 30'E
2° 35'E
DR10
-1500
-2000
-2500
-3000

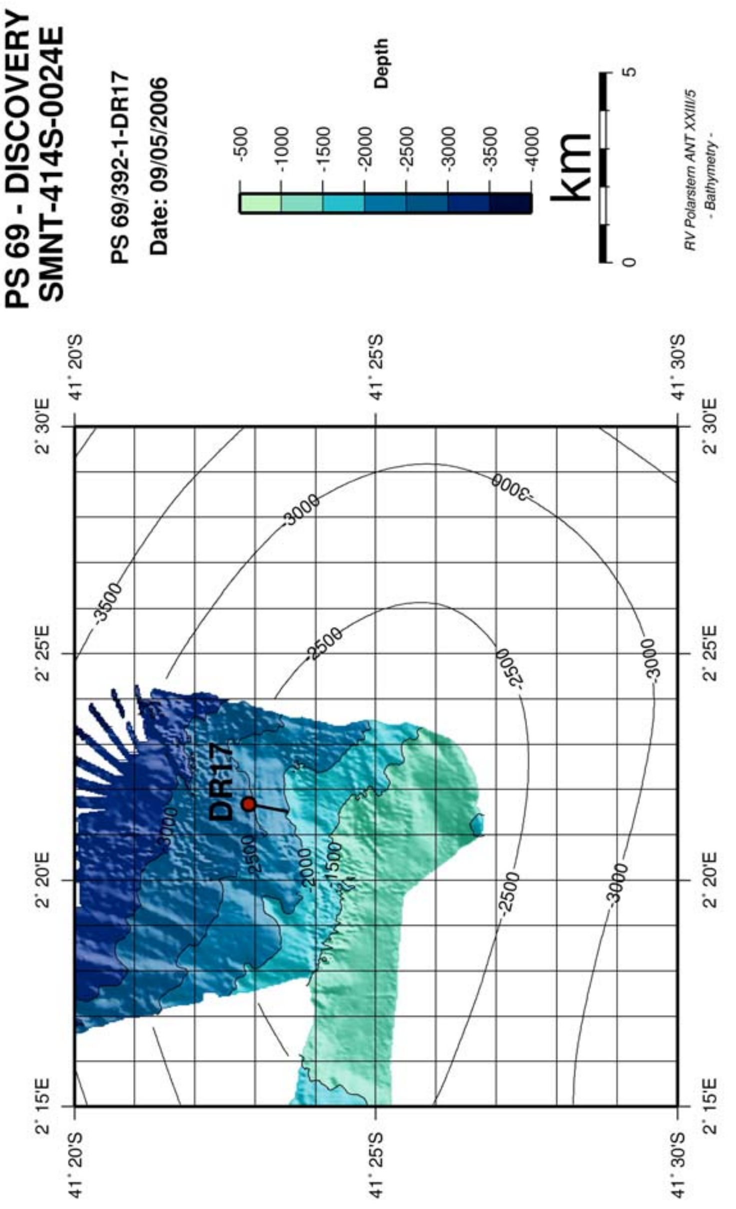

PS 69 - DISCOVERY
SMNT-428S-0006E
PS 69/376-1-DR11
Date: 05/05/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
0
5
km
RV Polarstern ANT XXIII/5
- Bathymetry -
42˚ 45'S
42˚ 50'S
0˚ 30'E
0˚ 35'E
0˚ 40'E
DR8



PS 69 - DISCOVERY
SMNT-436S-0014E
PS 69/377-1-DR12
Date: 06/05/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
DR12
-2500
-1500
-1000
1500
-2000
43° 25'S
43° 30'S
1° 00'W
1° 05'W
1° 10'W
1° 15'W


PS 69 - DISCOVERY
SMNT-436S-0014E
PS 69/378-1-DR13
PS 69/379-1-DR14
Date: 06/05/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
DR13
DR14
-2000
-2500
-3000
-3500
0° 55'W
1° 00'W
1° 05'W
1° 10'W
43° 45'S
43° 50'S


PS 69 - DISCOVERY
SMNT-414S-0012E
PS 69/390-1-DR15
PS 69/391-1-DR16
Date: 09/05/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
DR15
DR16
1° 05'E
1° 10'E
1° 15'E
1° 20'E
41° 15'S
41° 20'S


PS 69 - DISCOVERY
SMNT-414S-0024E
PS 69/392-1-DR17
Date: 09/05/2006
Depth
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
km
0
5
RV Polarstern ANT XXIII/5
- Bathymetry -
DR17
41° 20'S
41° 25'S
41° 30'S
2° 15'E
2° 20'E
2° 25'E
2° 30'E

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