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The Expedition of the Research Vessel "Polarstern"
to the Antarctic in 2013 (ANT-XXIX/5)

Edited by
Wilfried Jokat
with contributions of the participants



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ANT-XXIX/5

18 April - 29 May 2013

Port Stanley - Saldanha

**Chief scientist
Wilfried Jokat**

**Coordinator
Rainer Knust**

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1. ZUSAMMENFASSUNG UND FAHRTVERLAUF

Wilfried Jokat
AWI

Die *Polarstern* Expedition ANT-XIX/5 begann am 18. April 2013 in Port Stanley (Falkland-Inseln) und endete am 29. Mai 2013 in Saldanha, Südafrika. Die geophysikalischen Programme zielten darauf ab, neue Kenntnisse über die geologische Entwicklung des Falkland Plateaus zu gewinnen. Hierfür wurden alle relevanten Datensätze, wie Tiefenseismik, Gravimetrie und Magnetik erhoben, um durch eine kombinierte Interpretation dieser Datensätze ein verlässliches Krustenmodell zu erstellen. Von der Geologie der Falkland-Inseln ist bekannt, dass diese aus sehr alter präkambrischer, kontinentaler Kruste bestehen. Aber wie weit die Inseln unter dem Meeresboden nach Osten unter dem Falkland Plateau ausdehnt sind, ist unbekannt. Für plattentektonische Rekonstruktionen (Abb. 1.1) ist genau diese Frage von großer Bedeutung. Geologisch betrachtet sind die Gesteinsformationen auf den Falkland-Inseln denen sehr ähnlich, wie man sie in der Nähe von Kapstadt findet. Vor der Bildung des Südatlantiks vor ca. 130 Millionen Jahren lagen beide Gesteinsformationen nicht weit voneinander entfernt. Zu erkunden, wo genau die wahrscheinlichste Position der Falkland-Inseln relativ zu Südafrika lag, war eines der Hauptziele dieser Expedition. Hierfür legte das Schiff insgesamt 7.589 NM (ca. 14.054 km) von Port Stanley nach Saldanha zurück (Abb. 1.2).

Wichtigster Programmteil im geophysikalischen Fahrtprogramm war die Vermessung eines tiefenseismischen Profils, das an der Ostküste der Falkland-Inseln begann und im Georgia-Becken endete. Insgesamt wurden an 76 Positionen Ozeanbodenseismometer aufgestellt, um die Luftpulser Signale aufzuzeichnen, die auf *Polarstern* generiert wurden. Die OBS Aufstellung wurde um 6 Landstationen ergänzt, die auf den Falkland-Inseln aufgestellt wurden, um seismische Informationen über die Krustenstruktur der Insel selbst zu erfassen. Damit betrug die Gesamtlänge des Profils 1.452 km. Seismische Signale wurden nur auf einem Teilstück von 1.300 km angeregt. Die seismische Vermessung mit dem Airgun Array endete 74 km vor der Ostküste der Falkland-Inseln bei einer Wassertiefe von 350 m, da für flachere Wassertiefen keine Genehmigung von den Fischereibehörden erteilt wurde. Für das tiefenseismische Profil standen insgesamt 40 OBS zur Verfügung, die in einem Abstand von ca. 16 km ausgesetzt wurden. Das erste Profilstück (614 km) begann am 20. April 2013 um 12:00 (LT) und endete nach 12 Tagen (1. Mai) mit der Bergung aller Geräte. Schlechtes Wetter hatte uns gezwungen, das Aussetzen der OBS für 2 Tage (21.-23. April) zu unterbrechen.

Ohne Unterbrechung wurden am 1. Mai die geborgenen 40 Geräte erneut für das zweite Profilstück ausgelegt. Am 2. Mai wurden diese Arbeiten unterbrochen, um ein Gerät (OBS 44) vom ersten Profilstück zu bergen. Es tauchte zur programmierten Auftauchzeit auf. Hierfür musste jeweils 483 km gedampft

werden. Am 6. Mai waren alle restlichen OBS ausgelegt. Seismische Energie wurde vom 6. Mai (05:30 LT) bis zum 9. Mai (22:00 LT) mit dem Airgun Array erzeugt. Das zweite Profilstück überlappt auf dem zentralen Falkland Plateau um 117 km mit dem ersten Teil und hat daher eine Länge von 783 km. Die OBS Bergungsarbeiten wurden vom 12.-14. Mai (morgens) erneut unterbrochen, um ein Gerät zu bergen, das nur zur programmierten automatischen Auftauchzeit auftauchen würde. Hierfür wurde jeweils 303 km gedampft. Die restlichen 11 Geräte wurden bis zum 15. Mai (23:30 LT) geborgen. Hier führte wiederum schlechtes Wetter dazu, dass für diese Arbeiten mehr Zeit als geplant benötigt wurde. Insgesamt mussten am 15. Mai vier Geräte erneut angefahren werden, da diese auf unsere Auftauchbefehle nicht reagierten. Alle Instrumente tauchten zur programmierten Zeit auf. Eine erste Sichtung der Daten bestätigt die Vermutung, dass das Plateau von ausgedünnter Kruste unterlagert ist. Ob dies aber bereits ozeanische Kruste ist, müssen zukünftige Analysen der Daten zeigen.

Parallel zu den seismischen Messungen wurden kontinuierlich Gravimetrie, Magnetik, Fächersonar und Sedimentecholotdaten (Parasound) erhoben. Damit eine gewisse Streifenbreite für die Bathymetrie vermessen werden konnte, wurden die Fahrtstrecken versetzt. Somit konnte auf dem Falkland Plateau insgesamt eine Fläche von 40.046 km² erstmalig hochauflösend vermessen werden. Parallel zur Schiffsmagnetik wurden mit den Bordhelikoptern ebenfalls magnetische Daten erhoben, die frei vom Schiffseinfluss sind. Das größte Problem bei diesem Telexperiment war das schlechte Wetter bei zu hohem Seegang. Insgesamt konnten im Rahmen von 67 Flugstunden 5.777 Profilkilometer magnetischer Daten gesammelt werden. Die Gewinnung aller drei Datensätze (Gravimetrie, Magnetik, Fächersonar/Parasound) stellt den ersten Versuch dar, das Falkland Plateau mit moderner Sensorik systematisch zu untersuchen.

Das biologische Programm zielte darauf ab, die Verteilung von Diatomeen auf dem Falkland Plateau und auf einem Teil des Transit zu erfassen. Zunächst wurden an jeder der OBS-Stationen Informationen mit Handnetzen (77) gesammelt. Diese Informationen wurde durch 20 Multinetze (bis 300 m Wassertiefe) auf dem Falkland Plateau und 9 Multinetzen, ebenfalls bis maximal 300 m Wassertiefe, auf dem Transit bis etwa 40°20'S - 004°00'W ergänzt.

Aufgrund der variablen Wettersituation wurden die geophysikalischen Arbeiten auf dem Falkland Plateau am 16. Mai beendet und der Transit Richtung Saldanha begonnen. Vom 22.-25. Mai wurde im zentralen Südatlantik eine magnetische Vermessung, ebenfalls für die Verfeinerung von kinematischen Modellen, durchgeführt.

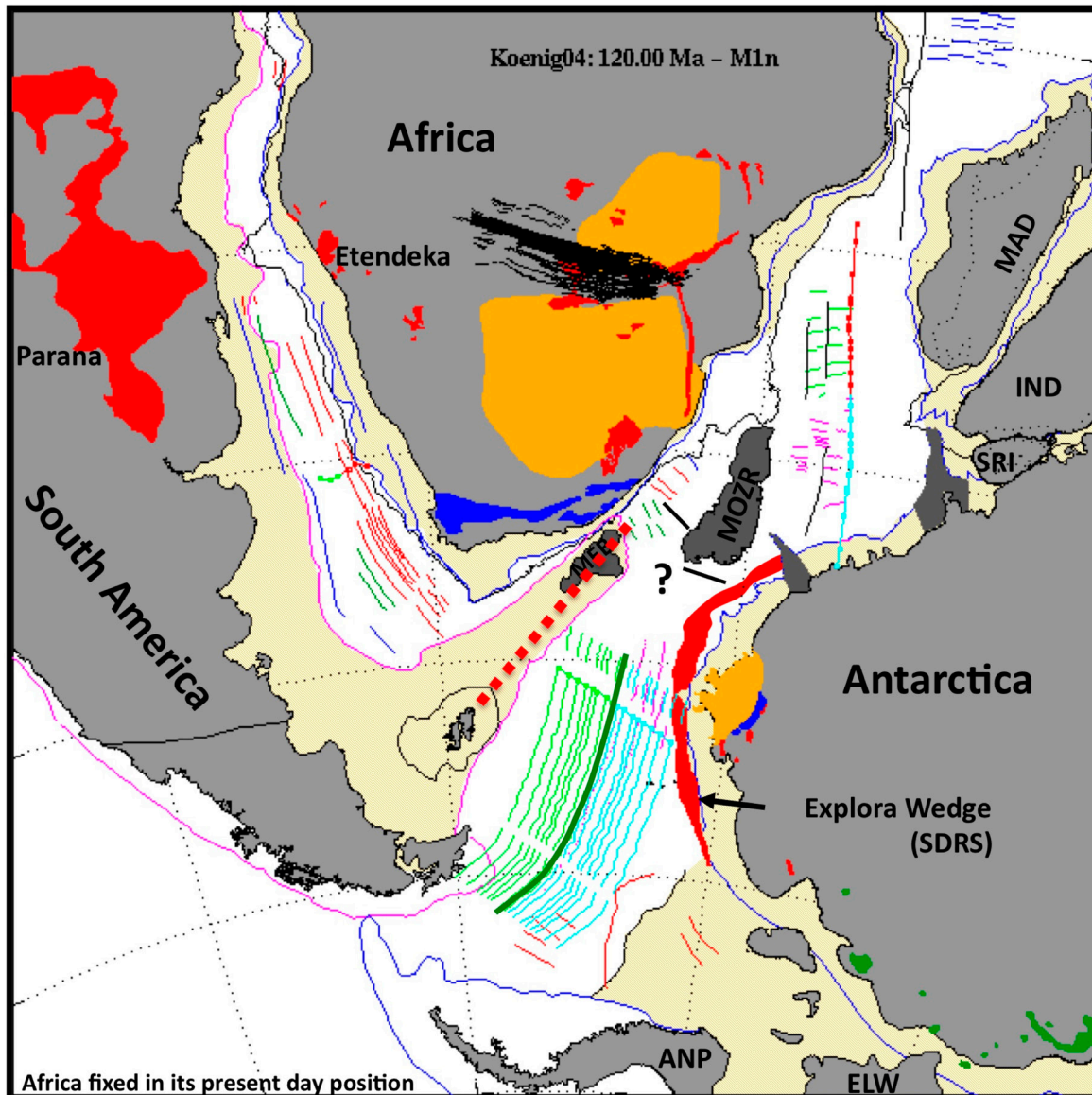


Abb. 1.1: Position der südlichen Kontinente vor etwa 120 Ma (König und Jokat, 2006). Die rote gepunktete Linie zeigt die Position der tiefen seismischen Linie entlang des Falkland Plateaus.

Rote Flächen bezeichnen mit Basalt bedeckte Regionen. Abkürzungen: ANP: Antarctic Peninsula, ELW: Ellsworth Whitmore Mountains, IND: India; MAD: Madagascar, MEB: Maurice Ewing Bank, MOZR: Mozambique Ridge, SRI: Sri Lanka.

Fig. 1.1: Position of southern continents some 120 Ma (König and Jokat, 2006). The red dotted line indicates the position of our deep seismic line along the Falkland Plateau.

Red labelled areas: Regions, which are covered by basalts. Abbreviations: ANP: Antarctic Peninsula, ELW: Ellsworth Whitmore Mountains, IND: India; MAD: Madagascar, MEB: Maurice Ewing Bank, MOZR: Mozambique Ridge, SRI: Sri Lanka.

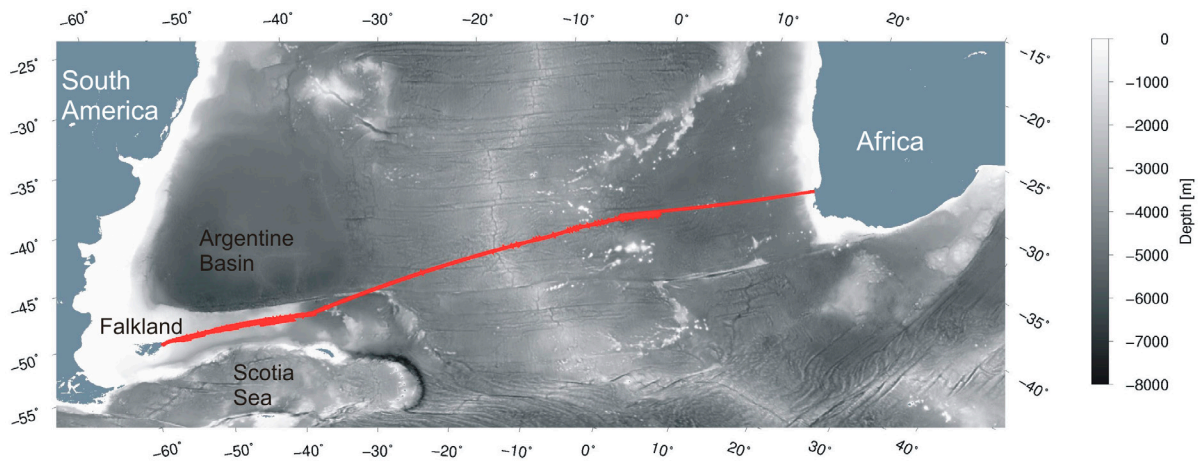


Abb. 1.2: Fahrtverlauf während ANT XXIX/5

Fig. 1.2: General cruise track of ANT-XIX/5

ITINERARY AND SUMMARY

The *Polarstern* expedition ANT-XIX/5 started on April 18, 2013 in Port Stanley (Falkland Islands), and terminated on May 29, 2013 in Saldanha (Rep. South Africa). The geophysical program aimed to retrieve new geophysical information on the geological evolution of the Falkland Plateau. To investigate this problem all relevant methods like deep seismic sounding, gravity and magnetic data were acquired to set up later on a sound crustal velocity/density model for the area. From the geology of the Falkland Islands it is known that they consist of very old Precambrian continental rocks. How far the basement rocks of the islands stretch towards the east underneath the Falkland Plateau is completely unknown. For plate tectonic reconstructions (Fig. 1.1), however, is this question of great relevance. Comparing the geology of the islands with those of the mountains around Cape Town it is obvious that they are very similar. Before the opening of the South Atlantic some 130 Million years ago both rock formations were located close together. To find constraints on the most likely position of the Falkland Islands relative to South Africa was one of the main objectives of the geophysical investigations. For this purpose the ship sailed in total 7,589 nm (approx. 14,054 km) from Port Stanley to Saldanha (Fig. 1.2).

To achieve the goals the most important part of the geophysical experiment was to acquire a deep seismic sounding profile, which starts at the east coast of the Falkland Islands and terminates in the Georgia Basin, east of the Maurice Ewing Bank. We deployed in total 38 ocean-bottom seismometers (OBS) at 76 locations to record the airgun shots generated on *Polarstern*. The OBS deployment was supplemented by 6 land stations, which were installed on the Falkland Islands in the prolongation of the marine profile. By also recording the airgun shots these stations will allow to investigate the crustal fabric of the easternmost part of the island. The entire length of the crustal transect was 1,452 km. However, seismic

airguns were only operated along 1,300 km. The shooting had to be stopped 74 km off the Falkland Islands east coast at a water depth of 350 m, since the Fishery authorities granted a research permit only for shallow water areas. For the deep seismic sounding experiment in total 40 OBS were available, which were deployed at a spacing of 16 km. The work along the first part of the transect (614 km) started on April 20, 2013 and terminated after 12 days (May 1) with the recovery of all instruments but one. Furthermore, bad weather conditions forced us to interrupt the deployment of the instruments for two days (April 21 – 23).

After all instruments deployed along the first part of the transect were recovered (May 1), we started to re-deploy them for the second portion on the same day. This activity was interrupted on May 2 to recover one remaining instrument (OBS 44) from the previous part. The instrument surfaced at the pre-programmed automatic release time. However, for the recovery we had to sail 483 km, respectively. On May 6, all OBS were deployed. We started operating the airgun array on May 6 (05:30 LT) and terminated the measurements on May 9 (22:00 LT). The second part of the transect strongly overlaps with the first one by 117 km. Thus, the second part of the transect has a total length of 783 km. The recovery of the OBS were interrupted again from May 12 – 14 (morning) to recover one OBS at its automatic release time. We had to stream 303 km to its position, respectively. Afterwards the remaining 11 instruments were recovered until May 15 (23:30 LT). Again bad weather conditions were responsible that we needed more time than planned for the recovery of the instruments. During May 15 we approached in total 4 OBS twice, because the instruments did not respond to our release commands. However, all OBS surfaced at their programmed automatic release time. A first preview of the seismic data confirms the assumption that the Falkland Plateau is underlain by thin crust. However, is the crust is of oceanic or continental origin needs careful analysis of all OBS recordings back in the lab.

Parallel to the seismic investigations gravity, magnetic, swath bathymetry and sediment echosounder (Parasound) data were acquired along all tracks. To achieve a certain swath width for the bathymetry we regularly offset the ship track while approaching the OBS positions. Finally, for the first time, we mapped an area of 40,046 km² on the Falkland Plateau with a high resolution swath system. Also parallel to the ship track and its fixed mounted fluxgate magnetometers, helicopters were used to acquire magnetic data offset to the ship tracks, which were undisturbed by the ship's field. The major constraints for the airborne operations were bad weather and a high swell. In total we acquired within 67 flight hours 5,777 km of additional magnetic data. All three data sets (Gravity, magnetic, swath bathymetry/Parasound) represent the first attempt to investigate the Falkland Plateau with modern sensors/equipment.

The biological program aimed to study the abundance and distribution of diatoms across the Falkland Plateau and also along portions of the transition back to Saldanha. At first, hand nets (77) were taken at each of the OBS locations. This information was supplemented by 20 multinet stations down to 300 m water depth across the Falkland Plateau, and 9 multinet station along our transit route up to 40°20'S - 004°00'W.

Because of the variable weather conditions we terminated the geophysical program on the Falkland Plateau on Mai 16 and sailed towards Saldanha. The transit was interrupted from May 22 to 25 in the central part of the South Atlantic for a small magnetic survey to test a kinematic model for the area.

2. WEATHER CONDITIONS DURING ANT-XXIX/5

Max Miller, Juliane Hempelt

DWD

On Saturday, April 20, 2013 (09:00 am), *Polarstern* left Port Stanley for the campaign ANT-XXIX/5. North-westerly winds at Bft 4, fog and 6° C were registered, caused by a high northeast of the Falkland Islands.

On Sunday (April 21) a storm formed at Antarctic Peninsula and intensified. As violent storm it moved northeast and affected *Polarstern*. To avoid heavy winds and waves we stopped travelling east. On Monday morning (April 22) we observed wind force 9 and a swell up to 6 metres. From Tuesday on we followed the eastwards moving storm at Bft 7. During the night to Thursday (April 25) westerly winds finally abated while *Polarstern* sailed west again.

On Saturday (April 27) *Polarstern* reached a position 80 km east of East Falkland. Scientific equipment had to be picked up at the islands by helicopter. In the morning hours a weak frontal zone moving north crossed our area. Winds at Bft 4 veered south. Therefore, air dried and some existing fog patches lifted. On Sunday we got under the influence of a weak ridge with good flight conditions, too.

From Monday (April 29) on a low at Antarctic Peninsula expanded north a bit and moved east across Weddell Sea. *Polarstern* operated at its northern edge. During the entire week westerly winds didn't exceed Bft 6.

On Monday (May 06) another low formed near South Sandwich Islands and moved east. During the following days secondary lows at its northern end caused a rapid change of wind force. But only for short times westerly winds freshened up to Bft 8 and swell didn't exceed 4 metres.

On Sunday (May 12) a new low over Drake Passage expanded towards South Georgia. Until Wednesday (May 15) *Polarstern* sailed the northern edge of this complex low at westerly to north-westerly winds Bft 7. But small secondary lows caused a temporary increase of wind speed. On Monday afternoon (May 13) and on Wednesday morning we observed a maximum wind force 10 and a swell of 6 metres. Later on the low moved southeast. Until Saturday (May 18) westerly to south-westerly winds at Bft 6 to 7 and some showers were prevailing.

At Whitsun we crossed an area of only weak pressure gradient. But a forming low at 28°S 17°W moved southeast and intensified. On Tuesday (May 21) it affected *Polarstern* while sailing southwest of Gough Island. On Tuesday evening south-easterly winds increased up to Bft 8 at a swell of 5 metres. But already on Wednesday winds veered west and abated.

From Thursday (May 23rd) on a new low west of Gough Island got the dominant feature. Mostly stationary at first it moved east later on and weakened gradually. *Polarstern* more or less sailed within its area of strong westerly winds but only for short times they peaked to Bft 8. Approaching South Africa winds abated.

On Wednesday morning, May 29, 2013, RV *Polarstern* reached Saldanha Bay at northerly winds Bft 4 to 5. The weather statistics are summarized in Figures 2.1 to 2.4.

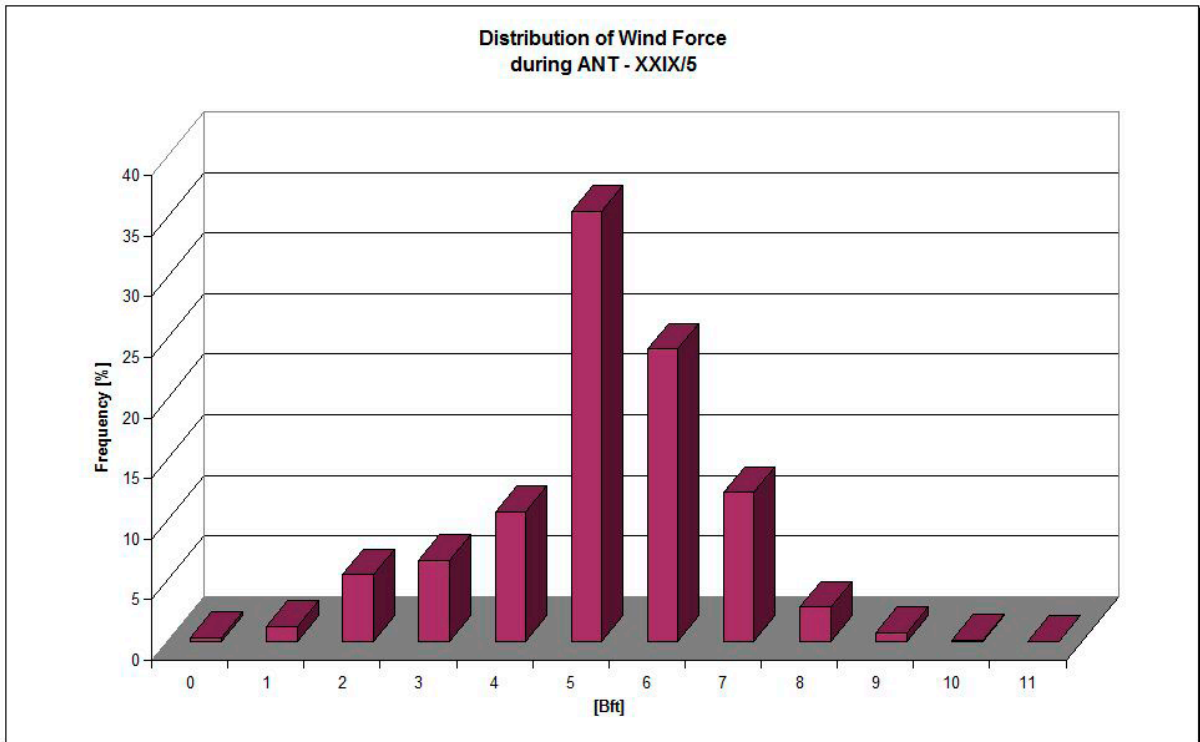


Fig. 2.1: Wind force distribution during the expedition ANT-XXIX/5

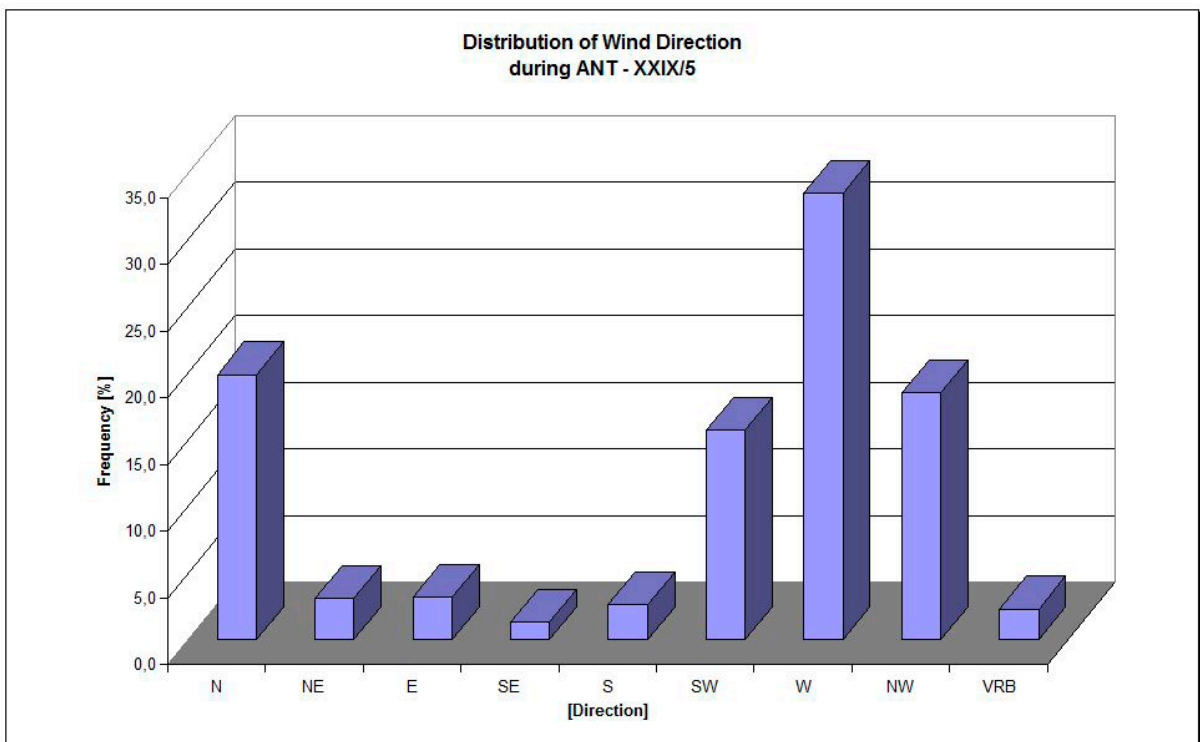


Fig. 2.2: Wind direction distribution during the expedition ANT-XXIX/5

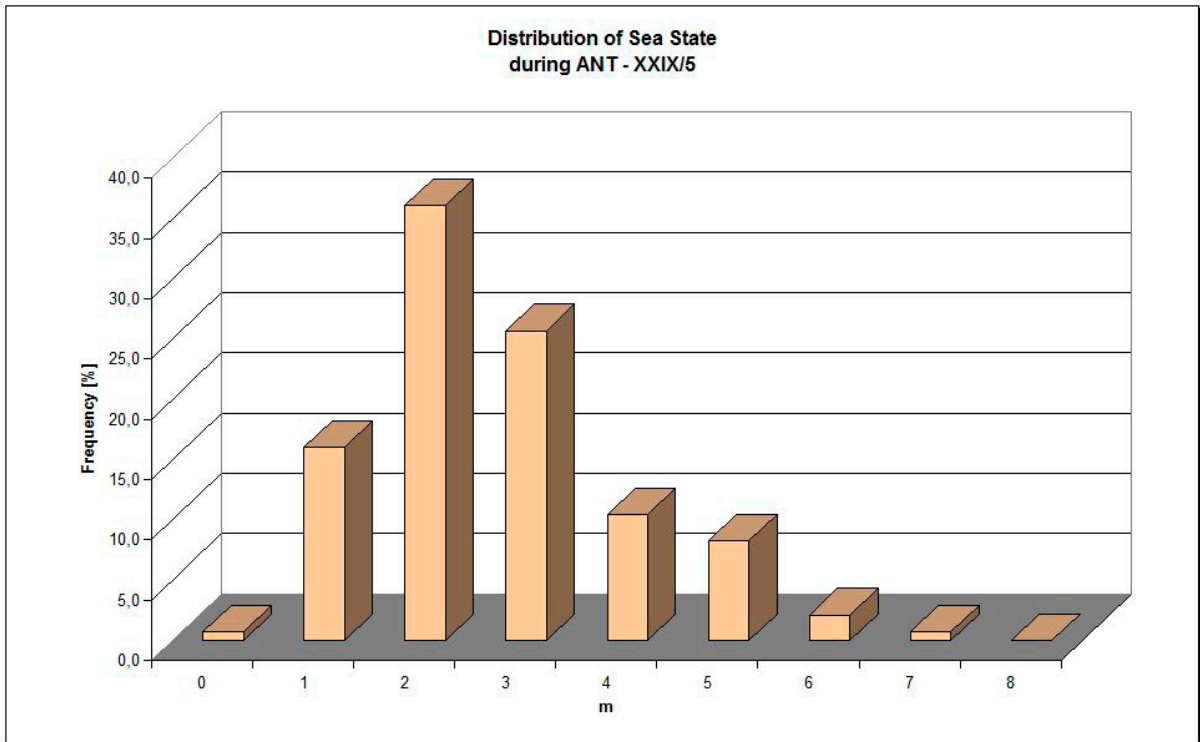


Fig. 2.3: Sea state distribution during the expedition ANT-XXIX/5

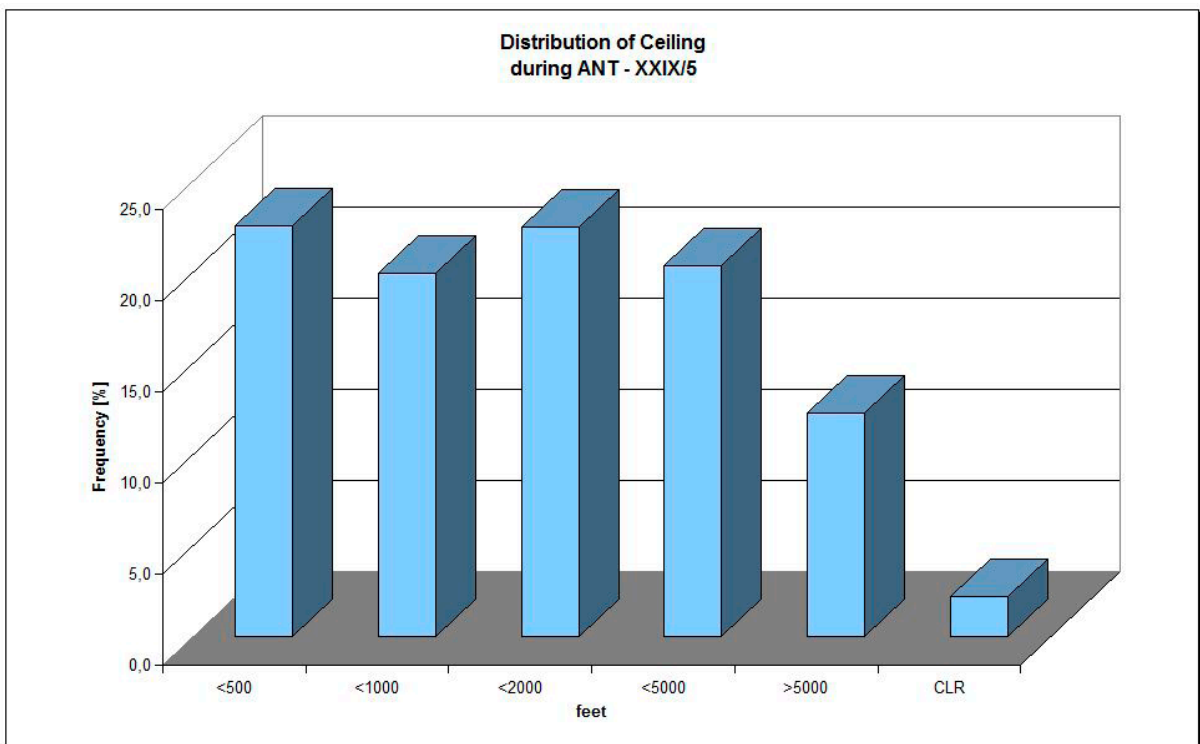


Fig. 2.4: Ceiling distribution during the expedition ANT-XXIX/5

3. MARINE GEOPHYSICS

Wilfried Jokat¹, Tabea Altenbernd¹, Jude Castelino, Markus Fink², Steven Franke¹, Tanja Fromm¹, Laura Gassner¹, Anne Hegewald¹, Henning Kirk¹, Norbert Lensch¹, Gunther Lüttschwager¹, Dietmar Penshorn¹, Antje Schlömer¹, Bernhard Schmitz¹

¹AWI

²Geomar

Objectives

The Falkland Plateau is today more than 1,500 km long, and stretches from the Falkland Islands eastwards to the Georgia Basin. Some 170 Ma as part of the Gondwana supercontinent the plateau had according to geodynamic models a different shape. The E-W extension was smaller, and the islands were located off southern Africa. From the current geoscientific data base only rough estimates can be made about the amount of stretching, which the Falkland Plateau underwent during the rifting and break-up of Gondwana. One of the most important parameter for any enhanced geodynamic model is the crustal thickness and structure along the entire plateau. Thus, we intend to gather a more than 1,500 km long seismic refraction line by using 40 ocean-bottom seismometers, which will be deployed twice. Helicopter borne magnetic data will be gathered along the line to identify especially in the Georgia Basin marine seafloor spreading anomalies in greater detail. We used ocean bottom seismometers twice and airguns to conduct this active experiment, and, thus, test the existing models.

- What is the nature of the crust between the Falkland Islands and the Maurice Ewing Band (MEB)?
- If the crust in between is oceanic, how does the continent-ocean transition look like?
- Are there any evidences for a HVLB underneath the plateau? This would indicate the presence of much more volcanic material in the region than previously known.
- How does the transition from the MEB to the oceanic Georgia Basin look like? Is the MEB a volcanic structure or extended continental crust?
- What kind of β factor (stretching) can be calculated to constrain the maximum extension of the plateau?
- Are the seafloor spreading anomalies symmetric to the conjugate Natal Basin? Which age model is supported by the new magnetic investigations?

The new data will provide a reliable crustal model for the Falkland Plateau, and will put strong constraints on any future geodynamic interpretation in this area.

Work at sea

The major part of our research area was located on the Falkland Plateau. To gather information on the crustal fabric between the Falkland Islands and the oceanic crust east of the Maurice Ewing Bank we installed 6 land stations in the prolongation of the marine profile. Offshore, we deployed 38 ocean bottom seismometers twice, because of the length of the entire line. The OBS spacing is 16 km. The seismic signals produced with 8 G-Guns (in total 64 ltr) were recorded up to 200 km onshore. The quality of the OBS data is highly variable. However, a more complete processing will be done in the lab, because of a failure of the processing computer during the expedition. Finally, no OBS got lost. However, some instruments (6) could only be recovered at their programmed automatic release time. The reasons for communication failure between the ship and OBS remain unknown.

In detail the geophysical team gathered the following data sets:

- One deep seismic line (20130010) starting east of the Falkland Islands and terminating in the Georgia Basin. The length of the line is 1,452 km. In total 76 OBS have been deployed with a spacing of 16 km (9 NM).
- Helicopter borne magnetic data are acquired with a minimum offset of 10 km north and south of the ship track to support the structural interpretation of the seismic data.
- Magnetic data are acquired by two fluxgate magnetometers fixed installed on *Polarstern*. For correcting the data on the magnetic influence of the vessel several magnetic calibration circles have been measured.
- Gravity data are measured along the entire ship track. Harbour values are gathered in Port Stanley and Saldanha (RSA).
- Swath bathymetry and Parasound sediment echosounder data are gathered along the entire track. Along the deep seismic sounding line the tracks are partly offset by several kilometres to enlarge the swath for retrieving new bathymetric data on this poorly charted region.

The following chapters will concentrate on the description of the technical details/problems of the different methods. The objectives remain the same for these different methods.

Preliminary (expected) results

The following results are expected:

- The deep seismic data (Fig. 3.0.1) show that the crust in general is around 18-20 km thick in the centre of the Falkland Plateau. This has been suggested before from gravity modelling. However, future analyses will show how the crustal fabric changes between the islands and the easternmost part of the Falkland Plateau.
- To provide an answer on the nature of the crust (continental vs oceanic) the OBS data have to be modelled in detail. Thus, the data do not allow any

3.1 Deployment of land stations on the Falkland Islands

statements on the existence of detailed features (High velocity lower crustal body) below the plateau and the position of the onset of oceanic crust east of the Maurice Ewing Bank (MEB).

- Seafloor spreading anomalies were found east of the MEB in the deep part of the Georgia Basin as expected. However, how far towards the west more Mesozoic anomalies might be identified can only be answered together with the structural seismic interpretation for the area of the MEB.

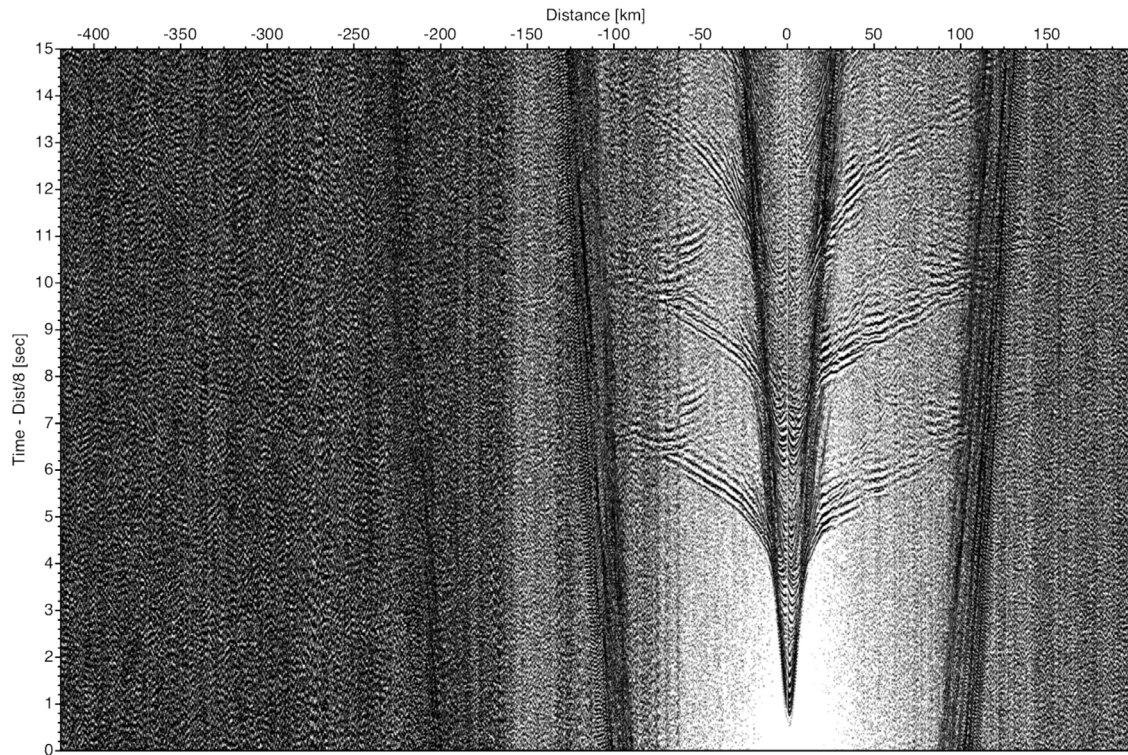


Fig. 3.0.1: Data example from the central Falkland Plateau (OBS 44). The travel time is reduced with 8 km/s.

Data management

All geophysical data recorded during this *Polarstern* expedition will be stored by the AWI geophysical department for post-processing and interpretation. Copies of the data will be provided to British/Falkland authorities according to the research permit. Data requests should be sent to the AWI geophysical department.

3.1 Deployment of land stations on the Falkland Islands

Anne Hegewald, Tabea Altenbernd, Tanja Fromm, Wilfried Jokat, Henning Kirk, Antje Schlömer
AWI

Objectives

The marine seismometer deployments were supplemented by land stations, which were installed on the Falkland Islands in the prolongation of the marine profile. By recording also the airgun shots these stations will allow to investigate the crustal fabric of the easternmost part of the island.

Work ashore

At the western end of the seismic refraction profile (Fig. 3.1.1) six REF TEK land stations were deployed (Figs. 3.1.1, 3.1.2) with an average distance of 12 km. They were equipped with a different number of 4.5 Hz-geophone chains (Table 3.1.1), to improve the signal-to-noise ratio of the recordings. The stations recorded continuously with a sample rate of 100 Hz and the gain was set to 32. Whenever possible, the geophones were installed in bedrock fissures to get the best possible coupling to the ground. Additionally, the geophones as well as the cables were covered with soil or stones to reduce the noise produced by wind. The internal clock is controlled by continuous GPS signal.

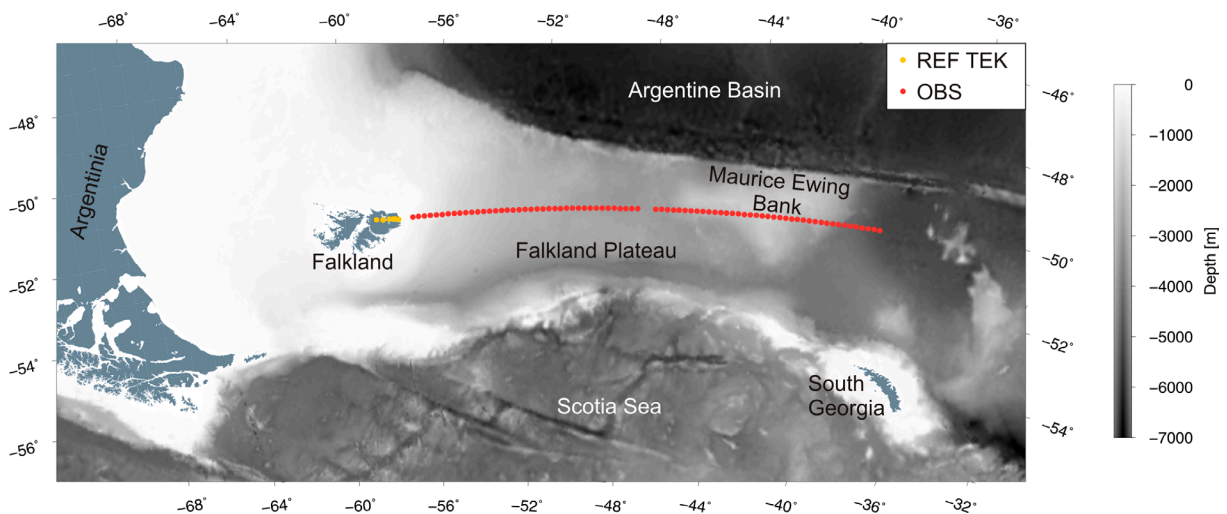


Fig. 3.1.1: Seismic refraction profile consisting of six land stations (yellow) and 78 OBS/OBH stations (red)

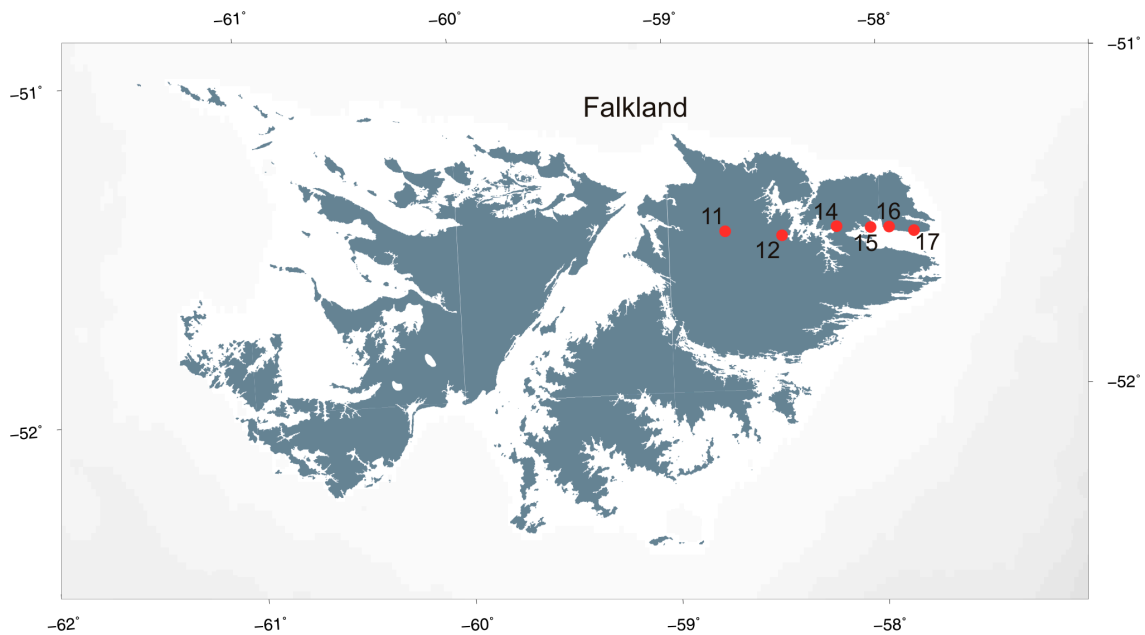


Fig. 3.1.2: Positions of the six land stations on East Falkland. The station numbers are abbreviated to the last two digits of the original station numbers.

3.1 Deployment of land stations on the Falkland Islands

Tab. 3.1.1: Configurations and positions of the six REF TEK land stations on East Falkland

Station No.	Longitude	Latitude	Channels	Channels x Chains
20130011	W 58° 43,744	S 51° 31,728	3	3 x 3 chains
20130012	W 58° 27,706	S 51° 32,770	2	2 x 3 chains
20130014	W 58° 12,202	S 51° 31,426	2	2 x 2 chains
20130015	W 58° 02,573	S 51° 31,769	3	3 x 3 chains
20130016	W 57° 57,241	S 51° 31,776	3	3 x 4 chains
20130017	W 57° 50,280	S 51° 32,507	3	2 x 4 chains 1 x 3 chains

Land station deployment

Two days before the ANT-XXIX/5 expedition started, three of the six REF TEK land stations were deployed by car. The stations 20130011, 20130012 and 20130014 are located next to the road and were installed with geophone chains and REF TEK equipment as well as GPS antenna. On the first day of the cruise, the other three REF TEK land stations were deployed by helicopter, including geophone chains, REF TEK equipment, GPS antenna and two 12 V batteries for each land station. The prior deployed land stations were also equipped with two 12 V batteries each and the acquisition was turned on (Table 3.1.2).

The stations 20130011 and 20130014 (Figs. 3.1.3a, c) were installed on a hill and next to the coast, respectively. The geophones of both stations were put into the ground between grass and small lichens. The ground mostly consists of small stones and hard soil.

Land station 20130015 (Fig. 3.1.3d) was built up on grass land with many sheep. For the geophones we made small holes of 10 cm to 20 cm depth through the upper peat unit, to put the geophones into harder ground. The cables were placed below the grass.

Stations 20130012, 20130016 and 20130017 (Figs. 3.1.3b, e, f) were installed along hill slopes into bedrock. However, the noise level was higher compared with the other stations because of strong wind blowing along the hill slopes.

Tab. 3.1.2: Times of recording for the six REF TEK land stations on East Falkland

Station No.	Start of recording (GMT)	End of recording (GMT)
20130011	19.04.2013 - 13:38	27.04.2013 - 13:00
20130012	19.04.2013 - 14:49	27.04.2013 - 13:46
20130014	19.04.2013 - 15:40	27.04.2013 - 14:30
20130015	19.04.2013 - 17:11	27.04.2013 - 17:15
20130016	18.04.2013 - 19:12	27.04.2013 - 17:53
20130017	18.04.2013 - 16:29	27.04.2013 - 16:18

3. Marine Geophysics



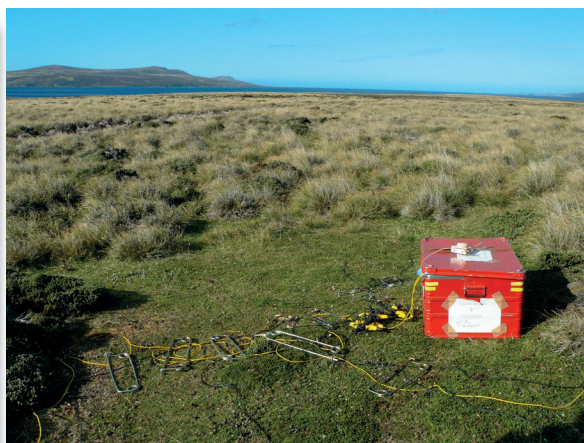
a) Station 20130011



b) Station 20130012



c) Station 20130014



d) Station 20130015



e) Station 20130016



f) Station 20130017

Fig. 3.1.3: Photographs of the six REF TEK land stations (photos by Anne Hegewald)

3.1 Deployment of land stations on the Falkland Islands

Land station recovery

After about 8 days (Table 3.1.2), when the first part of the OBS/OBH seismic refraction profile was finished with shooting, the six REF TEK land stations were recovered by helicopter. In total, three flights were necessary. The first flight recovered the land stations 20130011, 20130012 and 20130014.

After landing, the recording was stopped using the handheld. The retrieval time, the battery voltage and the disc usage were written down (Table 3.1.3). Furthermore, the power was turned off and all cables were disconnected. The geophone strings were recovered and the whole equipment was packed into the helicopter.

The same procedure was done with a second helicopter flight for the land stations 20130015 and 20130016. Based on fast changing weather conditions, the second helicopter recovered, in parallel to the second flight of the first helicopter, land station 20130017. However, we only had one handheld for terminating the acquisition. Hence, the data acquisition of land station 20130017 was stopped by turning the power off.

Tab. 3.1.3: Recorded parameters for the six REF TEK land stations on East Falkland

Station No.	Disk usage [Mb]	Minimum offset [km]	Max. identified shot offset, from raw data
20130011	370	135	high noise level
20130012	332	115	190 km
20130014	312	100	185 km
20130015	2558	90	175 km
20130016	497	85	high noise level, strong drift
20130017	476	80	180 km

Raw data quality check

After recovering of the land stations, the raw data were copied from SD-cards to computer, excluding land station 20130015. Based on an older REF TEK system, the raw data from land station 20130015 were stored on a DAT tape. Afterwards, these data were copied from the DAT tape to computer. All raw data are of Pascal format. Using the software package RTQT-View, from REF TEK, the data quality could be checked and the maximum identified offsets between air gun shots and land stations were calculated using the shot list. Regarding land station 20130016, a high noise level as well as a strong drift in the raw data (Fig. 3.1.4) made it impossible to assess the minimum offset. The raw data from land station 20130011 also show a high noise level. Furthermore, the minimum distance between the air gun shots and this land station is 135 km. In general, further data processing is necessary for all land stations to identify refraction waves based on larger offsets compared with the listed offsets in table 3.1.3.

Preliminary results

Data examples

Three raw data examples show: (1) a large drift as well as a high noise level from land station 20130017 (Fig. 3.1.4), (2) recorded air gun shots every 60 seconds from land station 20130012 (Fig. 3.1.5) within offsets between 184 km and 194 km, and (3) recorded air gun shots every 60 seconds from land station 20130014 (Fig. 3.1.6) with a high signal-to-noise ratio and within offsets between 127 km and 117 km.

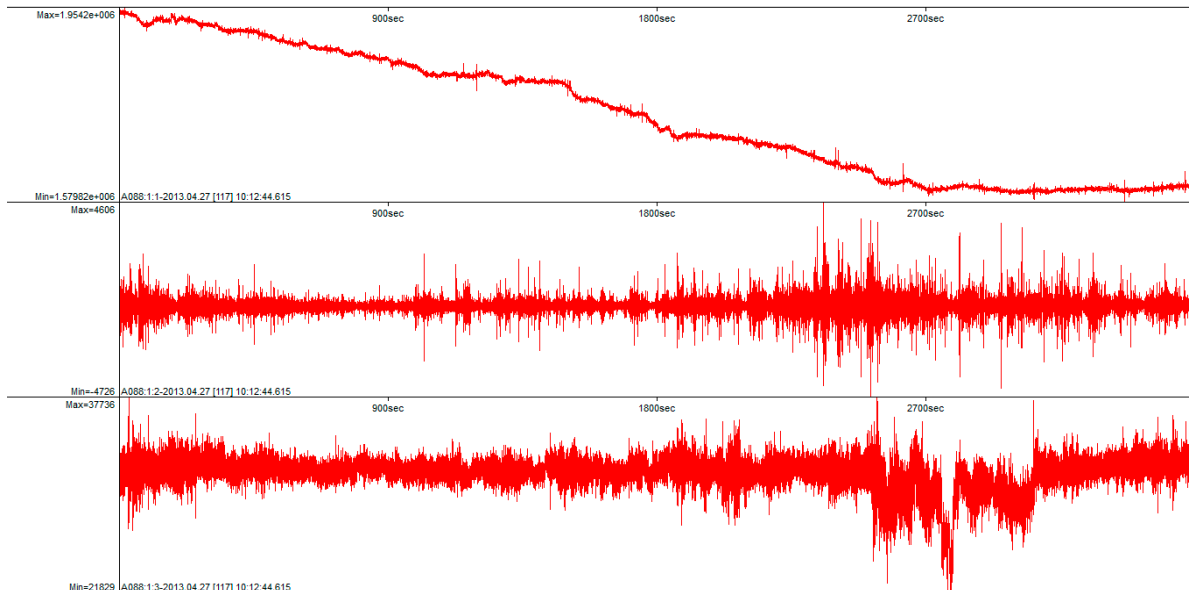


Fig. 3.1.4: Strong drift and high noise level on the three channels from land station 20130017, recorded on April 27, 2013 between 10:12 and 11:12 (GMT). The offsets between ship and the land station are 88 km to 78 km, respectively.

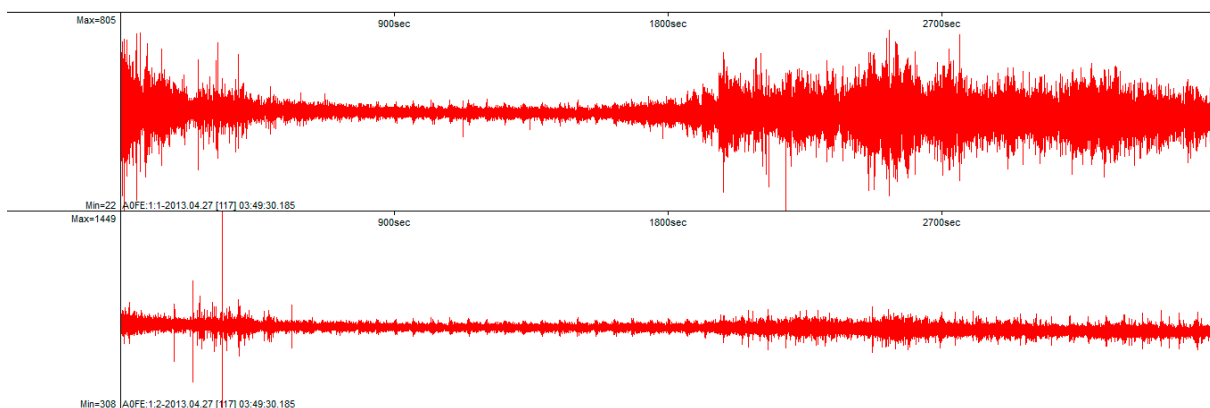


Fig. 3.1.5: Raw data showing the two channels from land station 20130012, recorded on April 27, 2013 between 03:49 and 04:49 (GMT). The offsets between ship and the land station are 194 km to 184 km, respectively. The raw data show the recorded air gun shots every 60 seconds, excluding the areas with high noise level.

3.2 Deployment of ocean-bottom seismometers along profile 20130010

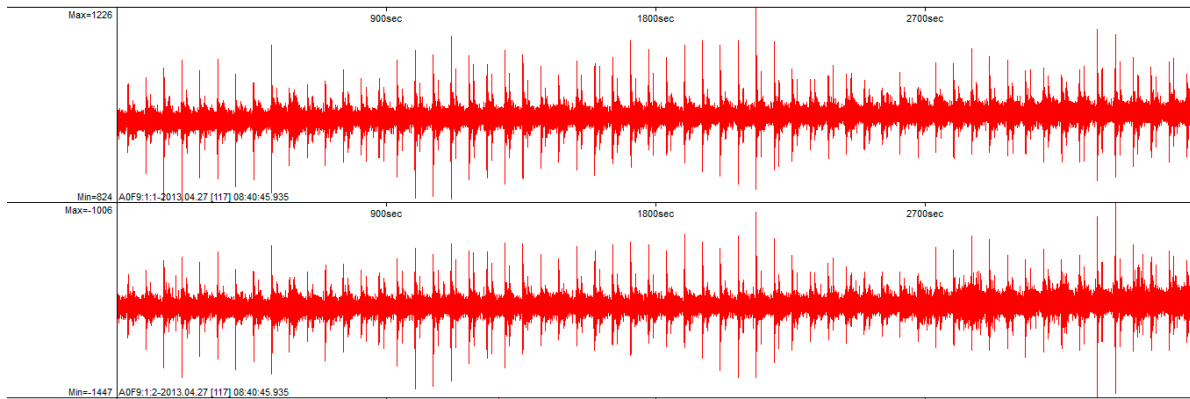


Fig. 3.1.6: Raw data showing the two channels from land station 20130014, recorded on April 27, 2013 between 08:40 and 09:40 (GMT). The offsets between ship and the land station are 127 km to 117 km, respectively. The raw data show the recorded air gun shots every 60 seconds.

Data management

Please refer to the beginning of chapter 3 on page 12.

3.2 Deployment of ocean-bottom seismometers along profile 20130010

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Objectives

To retrieve information about the tectonic evolution of the Falkland Plateau and its deeper crust we deployed 66 OBS (**o**cean-**b**ottom **s**eismometers) and 12 OBH (**o**cean-**b**ottom **h**ydrophones) along a profile spanning from the east of the Falkland Islands 1397 km to the west. The profile was divided in 2 parts. 38 OBS/OBH were deployed and recovered along each section.

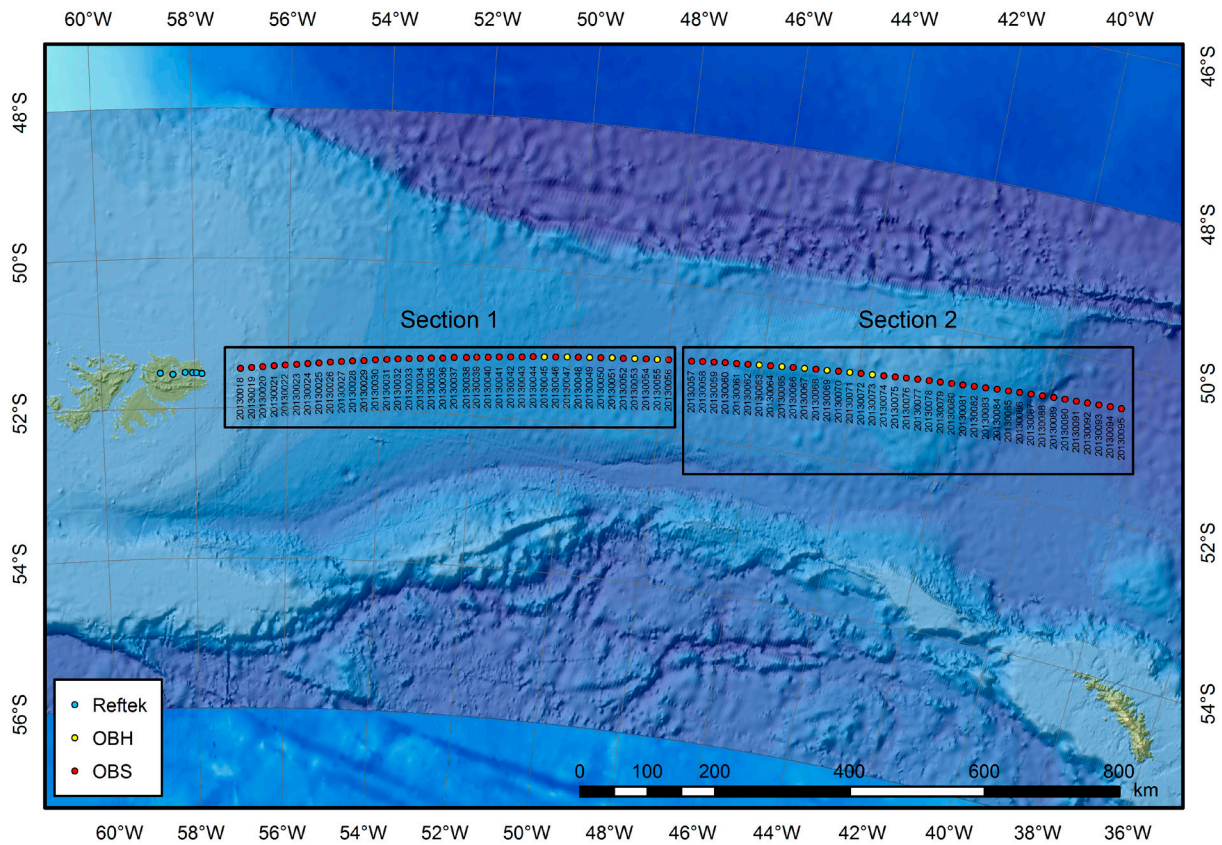


Fig. 3.2.1: OBS/OBH-profile 20120010 (ANT-XXIX/5)

Work at sea

Itinerary of deployment and recovery

We started deploying the first OBS (20130018) on 20 April at 51° 28.551' S and 57° 01.162' W (Fig. 3.2.2). The subsequent OBS were deployed at a distance of 9 miles. After wind forced up to 10 Beaufort and waves reached heights of more than 6 m, the deployment of the first section was stopped (after OBS 20130038) for two days. We finished the deployment of this part of the transect (OBS 20130056) on the 24 of April at 51° 00,661' S and 47° 57,028' W.

The recovery of the first part started on 27 April after 3 days of shooting with air guns and terminated on 1 May. All instruments could be recovered without any problems except one (OBS 20130044), which did not react to our release command for several times. Thus, we started in the evening of the 1st May to deploy instruments for the second part with OBS 20130057 at 50° 59,471' S and 47° 28,334' W and went back to station 20130044 on 2 May. The OBS appeared 40 minutes after the programmed release time on surface and could be recovered. The reason for the releaser unit failure of OBS 20130044 was that the main batteries suffered a short circuit. Fortunately, the battery of the automatic time release was not affected. We continued the regular deployment and finished with OBS station 20130078 on 6 May at 50° 31,568' S and 38° 30,099' W.

3.2 Deployment of ocean-bottom seismometers along profile 20130010

The recovery of the second section started on 10 of May and ended on 16 of May. A failure occurred within the release unit of OBS 20130052. It appeared already at the surface before we reached the point of deployment and before we send any release signal. The reason for that was that water had penetrated the releaser unit. Because OBS 20130068 couldn't be released, we went back to its deployment position on 13 of May. It was showed after the programmed release-time. Due to stormy weather conditions, 4 OBS (20130091, 20130093, 20130094 and 20130095) couldn't be released. Rough sea could be a reason for acoustic problems communicating with the instruments. Finally, we recovered the missing OBS (20130091, 20130093 and 20130095) at their programmed release-time. After the programmed release time of OBS 20130094 neither the antenna signal nor the flash light was discovered at the surface. Thus, we decided to continue and to recover the last OBS. After the successful recovering we went back to OBS 20130094. Several miles east its deployment position its radio signal was received by the ship's receiver unit. Finally, we recovered all deployed OBS.



Fig. 3.2.2: Deployment of an OBS

Instruments

The whole equipment is owned by the GEOMAR. We worked with different types of Ocean Bottom Seismometers: 4 LOBSTER (**L**ongterm **O**cean **B**ottom **S**eismometers for **T**sunami and **E**arthquake **R**esearch), 9 cube-designed OBS and 20 2002-designed OBS. Every OBS system (Fig. 3.2.3) consists of a frame with 2 or 4 flotation units, one titanium pressure cylinder, a 3-component seismometer (4,5 Hz), a hydrophone (HTI 01-PCA), an acoustic release unit, a flash light, a

radio beacon, a swimming line with a small floatation ball and an anchor weight. The pressure cylinder contains the data logger and a power supply. Different types of acoustic release units (KUMQuat and IXSea (formerly MORS/OCEANO)) were in use. Each releaser unit needs a different type of programming. The KUMQuat has its own specific programming unit, whereas some of the MORS/IXSea has to be programmed by special software or the release time has to be set manually on a switch board by a small screw driver within the releaser unit. All releasers communicate via the K/MT 8011M deck unit. Also, we used different types of data loggers (MLS: **M**arine **L**ongtime **R**ecorder, MTS: **M**arine **T**sunami **S**eismocorder and MBS: **M**arine **B**roadband **S**eismic Recorder), manufactured by SEND GmbH, which were all programmed by the SENDCOM software using a connected laptop.

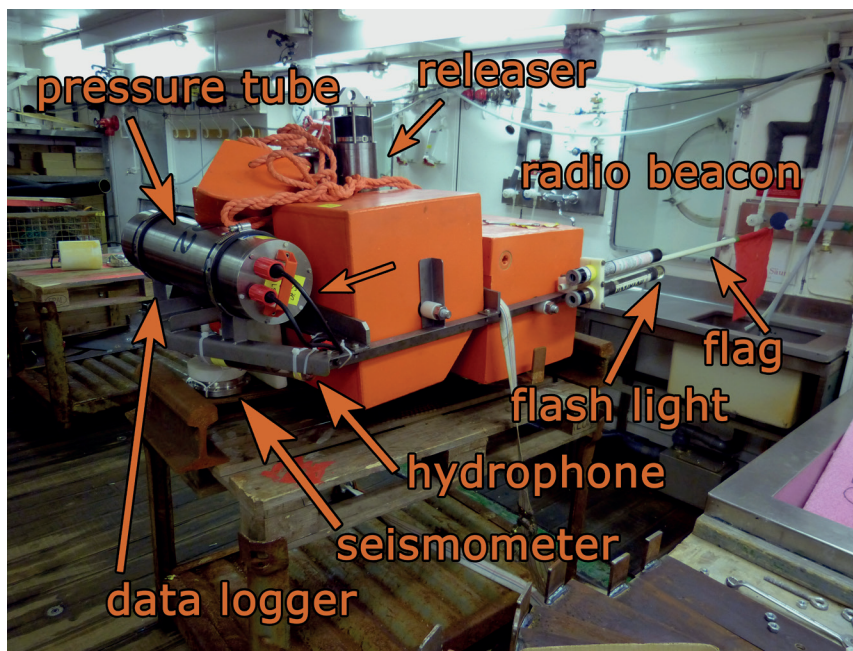


Fig. 3.2.3: Ocean-bottom-seismometer. The main instrument components are indicated.

The OBH (Figs. 3.2.4 and 3.2.5) is a steel tube with a buoyancy body on the top. A flash light, radio beacon and a flag are attached to the buoyant body (Fig. 3.2.4). Below the buoyant body are gadgets for the titanium pressure cylinder and the acoustic release unit. The hydrophone (OAS E-2PD) is also mounted here. Pieces of Railway tracks (about 40 kg) are used for anchors, which are suspended 2 m below the instrument by the release unit.

3.2 Deployment of ocean-bottom seismometers along profile 20130010

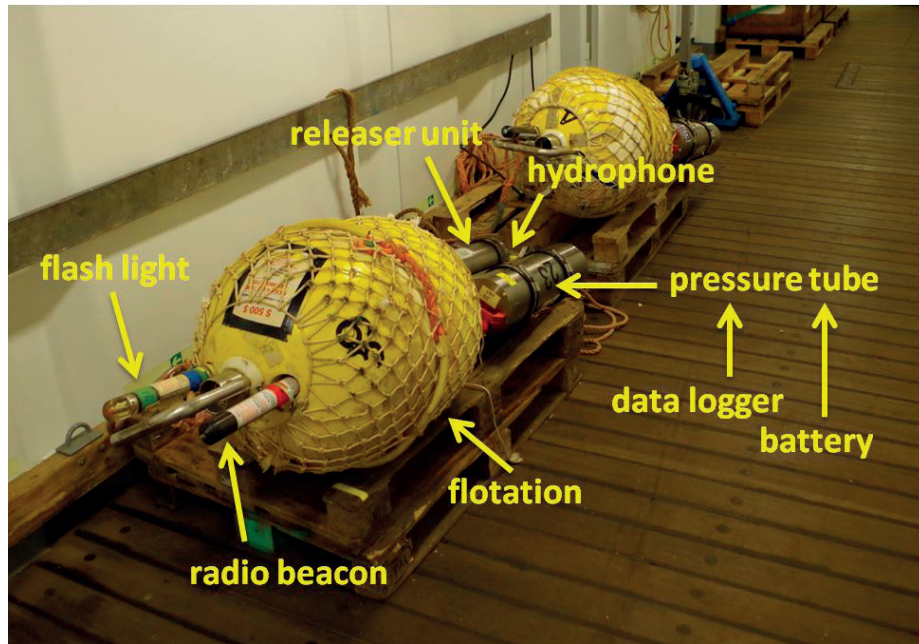


Fig. 3.2.4: Ocean-bottom-hydrophone. The main instrument components are indicated.

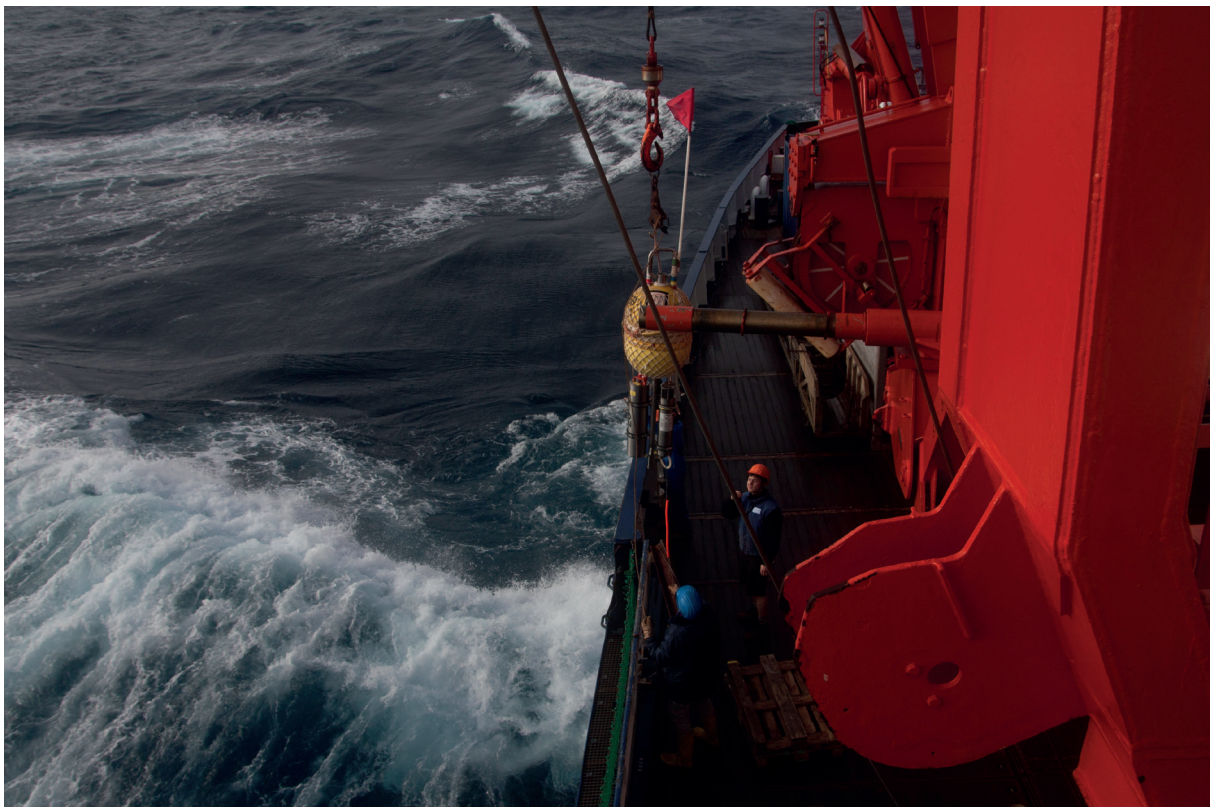


Fig. 3.2.5: Deployment of an ocean-bottom-hydrophon

Deployment

A few steps were necessary before one of the OBS or OBH were ready for deployment: At first the release unit had to be programmed with a release time. Secondly, it had to be installed to the OBS/OBH-frame so that the closed hook of the releaser holds the anchor of the system. The data logger had to be programmed. We activated all channels and set a sample rate of 200 Hz. The data loggers were equipped with 2 flashcards (3 GB PCMCIA cards) and synchronized by GPS time (DCF-77 format). Additionally the functionality to the sensor components (seismometer, hydrophone) had to be tested. A rechargeable unit or a battery pack with 48 alkaline power cells granted the electric power supply for the recorder. The tube was installed to the frame and the hydrophone and the sensitive seismometer were connected to it. The sensitive seismometer had to be installed between the frame and the anchor. This arrangement ensured a good seafloor coupling.

For the recovery of the OBS/OBH in darkness or in bad weather conditions like dense fog or high swell, it is very important to install a radio beacon, a flash light, which are activated by lower pressure at the surface. Before deployment the radio beacon was checked with the radio receiver on the bridge.

The silicon paste in the radio beacons and flash lights were replaced by ballistol oil to ensure that these items were able to work well at low temperatures.

Tab. 3.2.1: Deployment parameters of OBS/OBH along the first section (20130018 – 20130056)

station	date(UTC)	time (UTC)	latitude (S)	longitude (W)	water depth [m]
20130018	20.04.2013	15:11	51° 31,734'	57° 01,162'	131
20130019	20.04.2013	16:12	51° 31,735'	56° 46,737'	450
20130020	20.04.2013	18:13	51° 31,736'	56° 32,415'	526
20130021	20.04.2013	19:26	51° 31,737'	56° 17,842'	695
20130022	20.04.2013	20:51	51° 31,738'	56° 03,685'	833
20130023	20.04.2013	22:23	51° 31,739'	55° 49,018'	1005
20130024	20.04.2013	23:44	51° 31,740'	55° 34,858'	1086
20130025	21.04.2013	01:05	51° 31,741'	55° 20,617'	1222
20130026	21.04.2013	02:24	51° 31,742'	55° 06,144'	1260
20130027	21.04.2013	03:52	51° 31,743'	54° 51,806'	1365
20130028	21.04.2013	06:24	51° 31,744'	54° 37,462'	1470
20130029	21.04.2013	07:49	51° 31,745'	54° 22,946'	1557
20130030	21.04.2013	09:16	51° 31,746'	54° 08,624'	1652
20130031	21.04.2013	10:42	51° 31,747'	53° 54,138'	1733
20130032	21.04.2013	12:06	51° 31,748'	53° 39,970'	1803
20130033	21.04.2013	13:34	51° 31,749'	53° 25,678'	1849
20130034	21.04.2013	14:58	51° 31,750'	53° 11,366'	1901
20130035	21.04.2013	16:18	51° 31,751'	52° 57,162'	1941

3.2 Deployment of ocean-bottom seismometers along profile 20130010

station	date(UTC)	time (UTC)	latitude (S)	longitude (W)	water depth [m]
20130036	21.04.2013	19:05	51° 31,752'	52° 42,744'	2005
20130037	21.04.2013	20:28	51° 31,753'	52° 28,406'	2034
20130038	21.04.2013	21:49	51° 31,754'	52° 12,886'	2046
20130039	23.04.2013	14:45	51° 31,755'	51° 59,800'	2102
20130040	23.04.2013	16:33	51° 31,756'	51° 45,361'	2142
20130041	23.04.2013	18:09	51° 31,757'	51° 31,040'	2186
20130042	23.04.2013	19:46	51° 31,758'	51° 16,677'	2279
20130043	23.04.2013	21:22	51° 31,759'	51° 02,260'	2403
20130044	23.04.2013	22:50	51° 31,760'	50° 48,075'	2445
20130045	24.04.2013	00:23	51° 31,761'	50° 33,930'	2535
20130046	24.04.2013	01:51	51° 31,762'	50° 19,748'	2512
20130047	24.04.2013	03:23	51° 31,763'	50° 05,232'	2490
20130048	24.04.2013	05:01	51° 31,764'	49° 51,122'	2503
20130049	24.04.2013	07:01	51° 31,765'	49° 36,747'	2597
20130050	24.04.2013	08:24	51° 31,766'	49° 22,547'	2622
20130051	24.04.2013	09:56	51° 31,767'	49° 08,358'	2673
20130052	24.04.2013	11:35	51° 31,768'	48° 54,101'	2726
20130053	24.04.2013	13:08	51° 31,769'	48° 39,902'	2715
20130054	24.04.2013	15:01	51° 31,770'	48° 25,559'	2701
20130055	24.04.2013	16:28	51° 31,771'	48° 11,204'	2680
20130056	24.04.2013	17:59	51° 31,772'	47° 57,028'	2677

Tab. 3.2.2: Deployment parameters of OBS/OBH along the second section (20130057 – 20130095)

station	date(UTC)	time(UTC)	latitude (S)	longitude (W)	water depth [m]
20130057	01.05.2013	19:35	51° 31,773'	47° 28,334'	2649
20130058	01.05.2013	20:55	51° 31,774'	47° 14,204'	2643
20130059	01.05.2013	22:14	51° 31,775'	46° 59,890'	2530
20130060	02.05.2013	00:06	51° 31,776'	46° 45,843'	2576
20130061	02.05.2013	01:30	51° 31,777'	46° 31,504'	2236
20130062	02.05.2013	02:57	51° 31,778'	46° 17,310'	2059
20130063	02.05.2013	04:24	51° 31,779'	46° 03,060'	1981
20130064	02.05.2013	06:26	51° 31,780'	45° 48,890'	1961
20130065	02.05.2013	07:52	51° 31,781'	45° 34,604'	1903
20130066	02.05.2013	09:11	51° 31,782'	45° 20,368'	1852

3. Marine Geophysics

station	date(UTC)	time(UTC)	latitude (S)	longitude (W)	water depth [m]
20130067	02.05.2013	10:32	51° 31,783'	45° 06,340'	1820
20130068	02.05.2013	12:26	51° 31,784'	44° 51,968'	1809
20130069	02.05.2013	15:39	51° 31,785'	44° 37,840'	1757
20130070	02.05.2013	17:02	51° 31,786'	44° 23,619'	1698
20130071	02.05.2013	18:23	51° 31,787'	44° 09,415'	1647
20130072	02.05.2013	20:11	51° 31,788'	43° 55,316'	1584
20130073	04.05.2013	19:04	51° 31,789'	43° 41,185'	1499
20130074	04.05.2013	20:18	51° 31,790'	43° 26,857'	1407
20130075	04.05.2013	21:26	51° 31,791'	43° 12,598'	1296
20130076	04.05.2013	23:13	51° 31,792'	42° 58,628'	1386
20130077	05.05.2013	00:25	51° 31,793'	42° 44,308'	1444
20130078	05.05.2013	01:35	51° 31,794'	42° 30,249'	1501
20130079	05.05.2013	2:49	51° 31,795'	42° 16,110'	1606
20130080	05.05.2013	4:43	51° 31,796'	42° 01,997'	1788
20130081	05.05.2013	6:02	51° 31,797'	41° 47,869'	2000
20130082	05.05.2013	7:17	51° 31,798'	41° 33,618'	2129
20130083	05.05.2013	8:36	51° 31,799'	41° 19,455'	2120
20130084	05.05.2013	11:30	51° 31,800'	41° 05,264'	2043
20130085	05.05.2013	12:40	51° 31,801'	40° 51,192'	2167
20130086	05.05.2013	14:00	51° 31,802'	40° 37,087'	2498
20130087	05.05.2013	15:13	51° 31,803'	40° 22,979'	3008
20130088	05.05.2013	17:04	51° 31,804'	40° 08,851'	3009
20130089	05.05.2013	20:01	51° 31,805'	39° 54,606'	3764
20130090	05.05.2013	21:26	51° 31,806'	39° 40,482'	4015
20130091	05.05.2013	22:53	51° 31,807'	39° 26,446'	4174
20130092	06.05.2013	0:58	51° 31,808'	39° 12,429'	4355
20130093	06.05.2013	2:25	51° 31,809'	38° 58,283'	4549
20130094	06.05.2013	3:56	51° 31,810'	38° 44,195'	4706
20130095	06.05.2013	5:28	51° 31,811'	38° 30,099'	4835

Preliminary results

Recovery of the instruments

We stopped in a short distance of each deployment location and send a hydro-acoustic signal (12 kHz) to the OBS by the KUM acoustic release unit. Ideally, the release hook opened after receiving the signal and the OBS surfaced. In most

3.2 Deployment of ocean-bottom seismometers along profile 20130010

cases the radio beacon and flash light worked very well during the second part of the profile. At the end of the profile, the following OBS were released 4 miles before we reached the deployment position. In many cases we received no signal of the releaser unit after sending a release signal.

After recovering the OBS on deck, we connected the data loggers to the laptop, stopped the recording, synchronized the time and read out the data and stored important parameters like the skew-time, amount of data, etc.

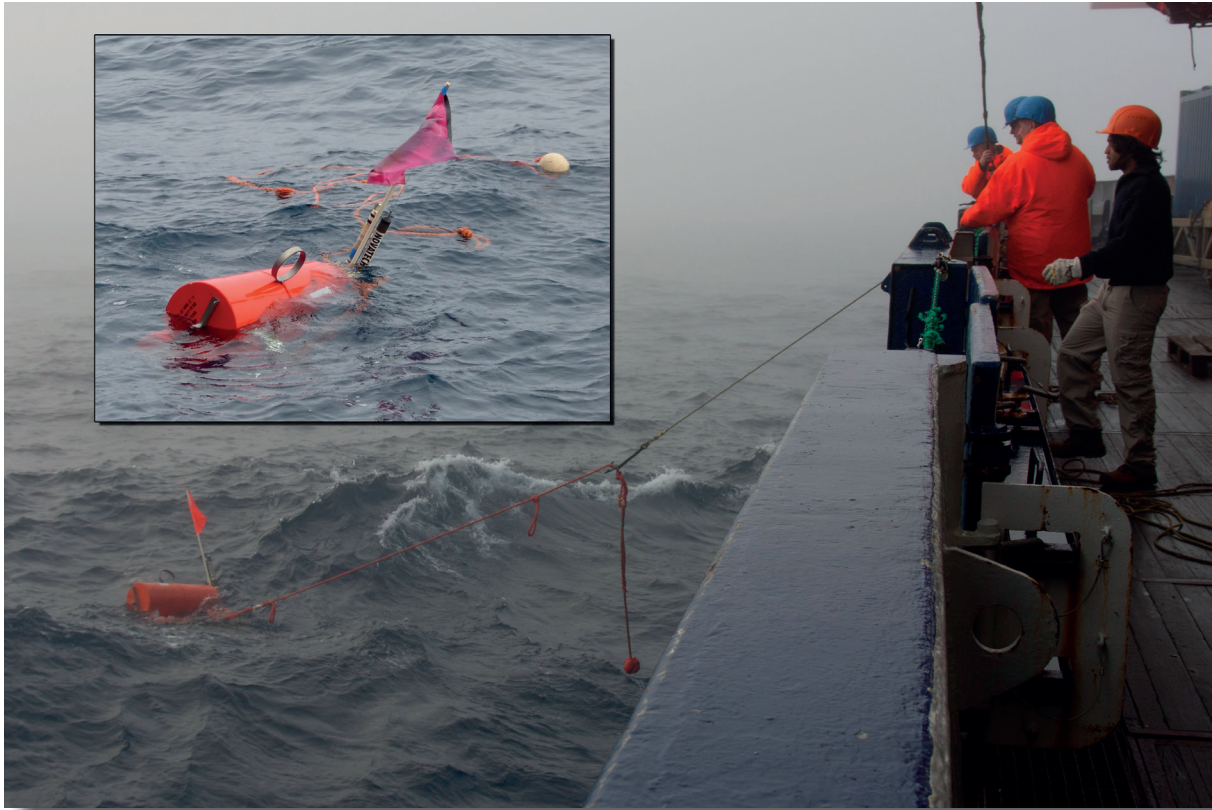


Fig. 3.2.6: Recovery of an ocean-bottom-seismometer

Tab. 3.2.3: Recovery parameters of OBS/OBH along the first part of line 20130010 (20130018 – 20130056)

station	first release		on surface		on deck		coordinates		water depth [m]
	date(UTC)	time(UTC)	date(UTC)	time(UTC)	date(UTC)	time(UTC)	latitude (S)	longitude (W)	
20130018	27.04.2013	17:49:00	27.04.2013	17:53	27.04.2013	18:06	51° 28,280'	57° 01,330'	315
20130019	27.04.2013	13:00:00	27.04.2013	13:10	27.04.2013	13:15	51° 27,841'	56° 46,737'	450
20130020	27.04.2013	14:19:00	27.04.2013	14:30	27.04.2013	14:38	51° 26,985'	56° 32,370'	523
20130021	27.04.2013	22:00:00	27.04.2013	22:09	27.04.2013	22:19	51° 26,171'	56° 17,842'	698
20130022	27.04.2013	23:38:00	27.04.2013	23:50	28.04.2013	00:05	51° 25,270'	56° 03,711'	826
20130023	28.04.2013	01:46:00	28.04.2013	02:02	28.04.2013	02:23	51° 25,060'	55° 49,018'	1005
20130024	28.04.2013	03:48:00	28.04.2013	04:06	28.04.2013	04:17	51° 24,246'	55° 34,849'	1082
20130025	28.04.2013	06:09:00	28.04.2013	06:26	28.04.2013	06:38	51° 23,406'	55° 20,644'	1218
20130026	28.04.2013	08:00:00	28.04.2013	08:21	28.04.2013	08:30	51° 22,541'	55° 06,118'	1254
20130027	28.04.2013	10:23:00	28.04.2013	10:40	28.04.2013	10:53	51° 21,869'	54° 51,859'	1359
20130028	28.04.2013	12:12:00	28.04.2013	12:31	28.04.2013	12:41	51° 21,073'	54° 37,283'	1454
20130029	28.04.2013	17:11:00	28.04.2013	17:35	28.04.2013	17:49	51° 20,313'	54° 22,619'	1542
20130030	28.04.2013	19:21:00	28.04.2013	19:47	28.04.2013	20:08	51° 19,252'	54° 07,851'	1643
20130031	28.04.2013	21:50:00	28.04.2013	22:20	28.04.2013	22:37	51° 18,225'	53° 53,757'	1730
20130032	28.04.2013	03:52:00	29.04.2013	04:17	29.04.2013	04:37	51° 18,219'	53° 39,768'	1797
20130033	29.04.2013	02:01:00	29.04.2013	02:27	29.04.2013	02:36	51° 17,838'	53° 25,637'	1846
20130034	29.04.2013	04:03:00	29.04.2013	04:29	29.04.2013	04:47	51° 17,320'	53° 11,360'	1891
20130035	29.04.2013	06:57:00	29.04.2013	07:24	29.04.2013	07:40	51° 16,185'	52° 57,255'	1938
20130036	29.04.2013	08:57:00	29.04.2013	09:36	29.04.2013	09:45	51° 15,263'	52° 42,548'	2014
20130037	29.04.2013	11:05:00	29.04.2013	12:17	29.04.2013	12:54	51° 13,777'	52° 28,567'	2055
20130038	29.04.2013	14:20:00	29.04.2013	14:55	29.04.2013	15:27	51° 12,615'	52° 13,836'	2048
20130039	29.04.2013	16:57:00	29.04.2013	17:28	29.04.2013	17:48	51° 12,390'	51° 59,649'	2090
20130040	29.04.2013	19:15:00	29.04.2013	19:53	29.04.2013	20:19	51° 13,187'	51° 44,116'	2149
20130041	29.04.2013	21:45:00	29.04.2013	23:05	29.04.2013	23:42	51° 13,022'	51° 29,748'	2197
20130042	30.04.2013	01:08:00	30.04.2013	01:43	30.04.2013	02:09	51° 11,766'	51° 15,969'	2275
20130043	30.04.2013	04:12:00	30.04.2013	04:43	30.04.2013	05:09	51° 10,357'	51° 01,779'	2366
20130044	03.05.2013	19:30:00*	03.05.2013	20:10	03.05.2013	20:30	51° 08,919'	50° 47,959'	2441
20130045	30.04.2013	09:27:00	30.04.2013	10:20	30.04.2013	10:33	51° 08,690'	50° 34,426'	2527
20130046	30.04.2013	11:57:00	30.04.2013	12:37	30.04.2013	12:52	51° 07,908'	50° 19,851'	2567
20130047	30.04.2013	14:12:00	30.04.2013	14:55	30.04.2013	15:09	51° 07,206'	50° 05,414'	2497
20130048	30.04.2013	16:35:00	30.04.2013	17:15	30.04.2013	17:41	51° 06,164'	49° 51,357'	2508
20130049	30.04.2013	19:07:00	30.04.2013	20:10	30.04.2013	20:47	51° 05,469'	49° 38,145'	2585
20130050	30.04.2013	22:10:00	30.04.2013	22:55	30.04.2013	23:12	51° 04,733'	49° 23,899'	2624
20130051	01.05.2013	02:03:00	01.05.2013	02:40	01.05.2013	03:10	51° 03,640'	49° 10,045'	2677
20130052	n. r.	n. r.	01.05.2013	00:55	01.05.2013	01:22	51° 00,692'	49° 09,100'	2710
20130053	01.05.2013	05:41:00	01.05.2013	06:39	01.05.2013	07:14	51° 02,279'	48° 42,217'	2722
20130054	01.05.2013	08:42:00	01.05.2013	09:25	01.05.2013	09:55	51° 01,903'	48° 27,289'	2703
20130055	01.05.2013	11:20:00	01.05.2013	11:59	01.05.2013	12:18	51° 01,095'	48° 12,307'	2685
20130056	01.05.2013	13:43:00	01.05.2013	14:25	01.05.2013	14:45	51° 00,179'	47° 57,683'	2679

3.2 Deployment of ocean-bottom seismometers along profile 20130010

Tab. 3.2.4: Recovery parameters of OBS/OBH along the second part of line 20130010 (20130057 – 20130095)

station	first release		on surface		on deck		coordinates		water depth [m]
	date(UTC)	time(UTC)	date(UTC)	time(UTC)	date(UTC)	time(UTC)	latitude (S)	longitude (W)	
20130057	10.05.2013	09:30:00	10.05.2013	10:05	10.05.2013	10:25	50° 59,398'	47° 29,083'	2651
20130058	10.05.2013	11:46:00	10.05.2013	12:20	10.05.2013	12:35	50° 58,579'	47° 14,539'	2639
20130059	10.05.2013	13:57:00	10.05.2013	14:30	10.05.2013	14:45	50° 57,900'	47° 00,240'	2527
20130060	10.05.2013	18:00:00	10.05.2013	18:34	10.05.2013	18:52	50° 57,130'	46° 45,920'	2570
20130061	10.05.2013	20:14:00	10.05.2013	20:44	10.05.2013	20:59	50° 56,295'	46° 31,558'	2228
20130062	10.05.2013	22:19:00	10.05.2013	22:47	10.05.2013	23:01	50° 55,602'	46° 17,208'	2057
20130063	11.05.2013	00:21:00	11.05.2013	00:46	11.05.2013	00:55	50° 55,005'	46° 02,989'	1982
20130064	11.05.2013	02:17:00	11.05.2013	02:44	11.05.2013	02:56	50° 54,304'	45° 49,189'	1965
20130065	11.05.2013	04:36:00	11.05.2013	05:13	11.05.2013	05:36	50° 53,510'	45° 34,759'	1906
20130066	11.05.2013	06:57:00	11.05.2013	07:24	11.05.2013	07:36	50° 52,763'	45° 20,336'	1856
20130067	11.05.2013	08:56:00	11.05.2013	09:40	11.05.2013	09:55	50° 52,140'	45° 06,230'	1828
20130068	13.05.2013	17:30:00*	13.05.2013	17:56	13.05.2013	18:05	50° 51,460'	44° 51,610'	1815
20130069	11.05.2013	17:32:00	11.05.2013	18:05	11.05.2013	18:15	50° 50,562'	44° 37,840'	1757
20130070	11.05.2013	19:30:00	11.05.2013	19:57	11.05.2013	20:16	50° 49,320'	44° 24,016'	1688
20130071	11.05.2013	01:38:00	11.05.2013	22:07	11.05.2013	22:17	50° 48,871'	44° 09,414'	1645
20130072	11.05.2013	23:29:00	11.05.2013	23:54	12.05.2013	00:07	50° 48,156'	43° 54,990'	1584
20130073	12.05.2013	01:18:00	12.05.2013	02:33	12.05.2013	02:49	50° 47,805'	43° 40,755'	1498
20130074	12.05.2013	04:15:00	12.05.2013	04:43	12.05.2013	05:00	50° 47,175'	43° 25,974'	1403
20130075	12.05.2013	06:17:00	12.05.2013	06:36	12.05.2013	06:44	50° 46,330'	43° 12,102'	1300
20130076	12.05.2013	07:56:00	12.05.2013	08:19	12.05.2013	08:30	50° 45,352'	42° 58,031'	1389
20130077	12.05.2013	09:46:00	12.05.2013	10:13	12.05.2013	10:26	50° 44,270'	42° 43,600'	1444
20130078	12.05.2013	11:43:00	12.05.2013	12:07	12.05.2013	12:17	50° 43,719'	42° 30,039'	1493
20130079	12.05.2013	13:25:00	12.05.2013	13:55	12.05.2013	14:07	50° 42,920'	42° 16,160'	1599
20130080	12.05.2013	15:41:00	12.05.2013	16:04	12.05.2013	16:20	50° 42,410'	42° 02,350'	1778
20130081	12.05.2013	17:36:00	12.05.2013	unknown	12.05.2013	18:36	50° 42,130'	41° 48,400'	1997
20130082	12.05.2013	19:56:00	12.05.2013	20:23	12.05.2013	20:37	50° 41,220'	41° 33,500'	2134
20130083	12.05.2013	22:00:00	12.05.2013	22:22	12.05.2013	22:48	50° 40,280'	41° 18,900'	2133
20130084	12.05.2013	23:57:00	13.05.2013	00:24	13.05.2013	00:42	50° 39,446'	41° 04,336'	2052
20130085	14.05.2013	08:20:00	14.05.2013	08:51	14.05.2013	09:10	50° 38,279'	40° 50,300'	2204
20130086	14.05.2013	10:27:00	14.05.2013	11:08	14.05.2013	11:28	50° 37,270'	40° 36,032'	2508
20130087	14.05.2013	12:51:00	14.05.2013	14:40	14.05.2013	15:00	50° 36,460'	40° 21,570'	2998
20130088	14.05.2013	15:06:00	14.05.2013	16:26	14.05.2013	17:03	50° 34,770'	40° 07,170'	2968
20130089	14.05.2013	17:09:00	14.05.2013	18:06	14.05.2013	18:45	50° 35,300'	39° 54,560'	3786
20130090	14.05.2013	19:00:00	14.05.2013	20:03	14.05.2013	20:38	50° 35,995'	39° 40,670'	4023
20130091	15.05.2013	18:00:00*	15.05.2013	19:00	15.05.2013	19:15	50° 34,980'	39° 26,570'	4188
20130092	15.05.2013	02:03:00	15.05.2013	03:15	15.05.2013	03:51	50° 34,348'	39° 12,726'	4368
20130093	15.05.2013	21:00:00*	15.05.2013	22:27	15.05.2013	22:49	50° 32,554'	38° 59,100'	4563
20130094	15.05.2013	22:30:00*	16.05.2013	02:45	16.05.2013	03:18	50° 29,953'	38° 44,519'	4741
20130095	16.05.2013	00:01:00*	16.05.2013	01:17	16.05.2013	02:05	50° 29,445'	38° 32,096'	4855

Tab. 3.2.5: Recording parameters of OBS/OBH along the first part of line 20130010 (20130018 – 20130056)

station	releaser unit		start synchronisation		end synchronisation		recorder SN	file size	skew (ms)
	typ	serial number	date	time	date	time			
20130018	KUM	060290	20.04.2013	14:29:00	27.04.2013	18:22:55	991240	539200	5
20130019	KUM	0703162	20.04.2013	15:24:00	27.04.2013	13:27:37	110707	490000	18
20130020	KUM	0703166	20.04.2013	17:56:00	27.04.2013	14:59:48	991241	537920	14
20130021	KUM	0703165	20.04.2013	18:19:00	27.04.2013	22:34:02	000708	528576	-79
20130022	KUM	0804171	20.04.2013	19:48:00	28.04.2013	00:27:46	010401	519264	-3
20130023	KUM	0703159	20.04.2013	22:01:00	28.04.2013	02:40:08	040807	499168	40
20130024	KUM	0807188	20.04.2013	22:58:00	28.04.2013	04:31:00	050817	516226	18
20130025	KUM	041126	21.04.2013	00:38:00	28.04.2013	06:45:00	050809	518761	43
20130026	KUM	051162	21.04.2013	01:43:00	28.04.2013	08:52:17	991260	524704	6
20130027	KUM	051139	20.04.2013	21:38:00	28.04.2013	11:24:41	991257	536896	26
20130028	KUM	0606112	21.04.2013	03:40:00	28.04.2013	12:59:50	020601	538432	26
20130029	IXSEA	298	21.04.2013	03:27:00	28.04.2013	18:00:00	020801	574666	-7
20130030	KUM	060283	21.04.2013	04:15:00	28.04.2013	20:25:59	991242	537664	-10
20130031	KUM	040718	21.04.2013	08:21:00	28.04.2013	22:56:41	081201	535023	4
20130032	KUM	040719	21.04.2013	09:08:00	29.04.2013	01:02:35	000706	539000	26
20130033	KUM	051273	21.04.2013	09:46:00	29.04.2013	03:01:00	991252	546560	-74
20130034	KUM	041124	21.04.2013	11:30:00	29.04.2013	05:00:00	041101	532007	51
20130035	KUM	040308	21.04.2013	13:42:00	29.04.2013	07:58:00	991258	654752	64
20130036	KUM	051142	21.04.2013	15:32:00	29.04.2013	10:10:52	040304	553280	-9
20130037	KUM	040712	21.04.2013	15:54:00	29.04.2013	13:17:00	991251	565120	-8
20130038	KUM	051169	21.04.2013	16:12:00	29.04.2013	15:15:00	000709	1052046	-24
20130039	KUM	0606104	21.04.2013	19:15:00	29.04.2013	18:01:55	061204	709671	69
20130040	IXSEA	299	22.04.2013	12:34:00	29.04.2013	20:41:07	061201	533024	15
20130041	IXSEA	227	22.04.2013	13:44:00	30.04.2013	00:42:00	991247	709376	10
20130042	IXSEA	307	22.04.2013	14:38:00	30.04.2013	02:47:00	040101	550080	-6
20130043	KUM	040716	22.04.2013	14:19:00	30.04.2013	05:21:00	040102	711808	-16
20130044	KUM	0703163	22.04.2013	15:44:00	03.05.2013	20:50:00	991255	835680	-64
20130045	IXSEA	308	22.04.2013	16:16:00	30.04.2013	error	001006	error	error
20130046	IXSEA	303	22.04.2013	16:05:00	30.04.2013	13:31:02	991248	638688	1
20130047	IXSEA	238	22.04.2013	16:46:00	30.04.2013	17:05:51	001005	2104128	28
20130048	IXSEA	237	22.04.2013	16:33:00	30.04.2013	18:11:00	000712	723233	8
20130049	IXSEA	466	22.04.2013	14:48:00	30.04.2013	21:31:10	050810	165600	101
20130050	IXSEA	471	22.04.2013	19:21:00	01.05.2013	00:02:58	050811	696576	54
20130051	IXSEA	470	23.04.2013	15:31:00	01.05.2013	03:22:00	991250	168737	39
20130052	IXSEA	462	23.04.2013	14:20:00	01.05.2013	02:03:29	081002	644512	-11
20130053	IXSEA	226	23.04.2013	15:55:00	01.05.2013	07:30:26	110101	138656	25
20130054	IXSEA	467	22.04.2013	20:05:00	01.05.2013	10:19:18	041104	755584	37
20130055	IXSEA	309	23.04.2013	16:09:00	01.05.2013	12:43:00	061202	196512	12
20130056	IXSEA	469	22.04.2013	20:23:00	01.05.2013	15:05:00	041103	794764	-20

3.2 Deployment of ocean-bottom seismometers along profile 20130010

Tab. 3.2.6: Recording parameters of OBS/OBH along the second part of line 20130010 (20130057 – 20130095)

station	releaser unit		start synchronisation		end synchronisation		recorder SN	file size	skew (ms)
	typ	serial number	date	time	date	time			
20130057	KUM	0703162	01.05.2013	17:00:00	10.05.2013	10:50:00	991240	656000	11
20130058	KUM	0703166	01.05.2013	17:46:00	10.05.2013	12:56:00	110707	620000	31
20130059	KUM	0602290	01.05.2013	18:26:00	10.05.2013	15:17:00	991241	697037	-23
20130060	KUM	0703165	01.05.2013	21:16:00	10.05.2013	19:09:00	000708	677219	-9
20130061	KUM	0804171	01.05.2013	21:34:57	10.05.2013	21:32:00	010401	670016	79
20130062	KUM	0703159	01.05.2013	23:40:00	10.05.2013	23:23:00	040807	668608	-4
20130063	IXSEA	469	01.05.2013	23:02:00	11.05.2013	01:22:06	050817	9504	-79
20130064	IXSEA	227	02.05.2013	01:15:00	11.05.2013	03:26:00	050809	678912	48
20130065	IXSEA	308	02.05.2013	04:52:00	11.05.2013	06:03:31	991260	356128	-47
20130066	IXSEA	470	02.05.2013	05:37:00	11.05.2013	08:00:00	991257	691648	-12
20130067	IXSEA	467	02.05.2013	05:11:00	11.05.2013	10:12:00	020601	166000	35
20130068	IXSEA	237	02.05.2013	07:14:00	13.05.2013	18:21:00	020801	853464	80
20130069	IXSEA	298	02.05.2013	14:06:00	11.05.2013	18:20:00	991242	227392	52
20130070	IXSEA	303	02.05.2013	08:37:00	11.05.2013	20:36:00	081201	687552	11
20130071	IXSEA	307	02.05.2013	14:38:00	11.05.2013	22:32:32	000706	364448	-24
20130072	IXSEA	299	02.05.2013	12:26:00	12.05.2013	00:38:00	991252	724288	23
20130073	IXSEA	309	04.05.2013	14:33:00	12.05.2013	03:20:00	041101	172128	70
20130074	IXSEA	463	04.05.2013	15:25:00	12.05.2013	05:51:00	991258	unknown	-23
20130075	IXSEA	302	04.05.2013	15:39:00	12.05.2013	07:35:00	40304	591744	-7
20130076	IXSEA	471	04.05.2013	15:58:00	12.05.2013	09:02:00	991251	605671	28
20130077	IXSEA	226	04.05.2013	16:19:00	12.05.2013	11:03:00	000709	596384	-44
20130078	IXSEA	300	04.05.2013	16:43:00	12.05.2013	13:07:00	061204	618217	-8
20130079	IXSEA	238	04.05.2013	17:00:38	12.05.2013	14:41:00	061201	627776	49
20130080	KUM	051142	04.05.2013	17:34:00	12.05.2013	19:07:00	991247	605382	-87
20130081	KUM	040718	04.05.2013	17:57:00	12.05.2013	19:23:00	040101	624647	25
20130082	KUM	041124	04.05.2013	21:46:00	12.05.2013	21:01:00	040102	610848	9
20130083	KUM	040308	04.05.2013	22:15:00	12.05.2013	23:13:00	991255	602272	-14
20130084	KUM	051169	04.05.2013	22:43:00	13.05.2013	01:02:00	001006	645024	1
20130085	KUM	051162	04.05.2013	23:51:00	14.05.2013	09:29:00	991248	746400	-5
20130086	KUM	041126	05.05.2013	00:10:00	14.05.2013	11:53:00	001005	858624	67
20130087	KUM	040712	05.05.2013	01:03:00	14.05.2013	19:26:00	000712	736960	2
20130088	KUM	040719	05.05.2013	03:47:00	14.05.2013	19:38:00	050810	773885	1
20130089	KUM	040716	05.05.2013	04:15:00	14.05.2013	19:47:00	050811	736416	143
20130090	KUM	051139	05.05.2013	05:08:00	14.05.2013	20:55:00	991250	901184	-12
20130091	KUM	060283	05.05.2013	11:15:00	15.05.2013	19:43:00	081002	734848	66
20130092	KUM	0606112	05.05.2013	17:27:00	15.05.2013	04:27:00	110101	679168	16
20130093	KUM	0606104	05.05.2013	13:45:00	15.05.2013	23:20:00	041104	727000	23
20130094	KUM	0807188	05.05.2013	14:16:00	16.05.2013	unknown	061202	761696	unknown
20130095	KUM	051273	05.05.2013	18:07:00	16.05.2013	02:25:00	041103	803040	16

Data management

Please refer to the beginning of chapter 3 on page 12.

3.3 Helicopter magnetic measurements and fix installed fluxgate instruments on the vessel

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AWI

Objectives

Magnetic surveying was conducted during the acquisition of the seismic profile using the ships magnetometer and a helicopter borne industrial magnetometer system.

The fix-installed system on *Polarstern* consists of two orthogonal three-component digital fluxgate sensors mounted mid-ships in the crows nest (Fig. 3.3.1), which acquired continuous data throughout the whole cruise. Please refer to König [2006] „Processing of shipborne magnetometer data and revision of the timing and geometry of the Mesozoic break-up of Gondwana“ (PhD-Thesis) for a detailed system description.

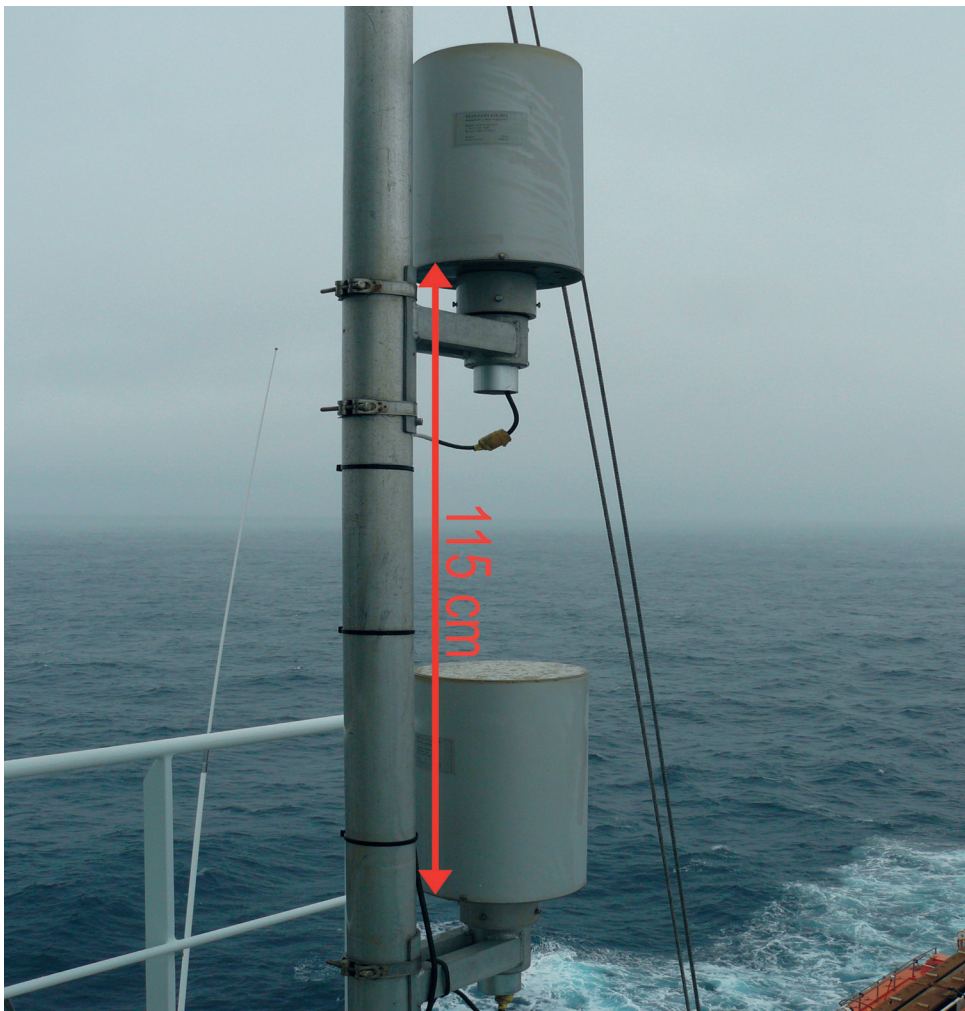


Fig. 3.3.1: Fluxgate magnetometer system (two sensors) installed on *Polarstern*

3.3 Helicopter magnetic measurements and fix installed fluxgate instruments

For the helicopter operations we used the airborne geophysical information system (AGIS) manufactured by PICO ENVIRONTEC INC. It consists of a high precision Scintrex CS3 Cesium vapor magnetometer towed in an amagnetic bird 30 m underneath the *Polarstern* helicopter D-HAAO, a magnetometer processor (MMS-4) and a computer (AGIS-XP) for data display, acquisition control and navigation. Positioning information was acquired via a Hemisphere Crescent R100 GPS receiver with the antenna placed on the helicopter's dashboard in front of the co-pilot. A pilot guidance unit (PGU) presented navigation information for the pilot.

Work at sea

Magnetic surveying was done during acquisition of the seismic survey parallel to the profile. All OBS locations were passed three times, first when deploying, second for airgun shooting and third for recovery. This gave more flight opportunities and chances to fill 'bad weather holes' in later passes. Ship tracks were parallel to each other with an offset around 5 km suitable for the multi beam sonar to retrieve a continuous dataset of bathymetric data.

Helicopter profiles were flown with 10 km cross line distance to the seismic profile. Whenever weather conditions allowed, additional profiles with 20 and 5 km offsets were flown when passing an area, which had already been surveyed.

Nominal cruise speed of the helicopter was 80 kn (~150 km/h or ~40 m/s) over ground at an altitude of 300 ft (100 m). Magnetometer data were sampled with 10Hz, GPS with 5Hz. Flight altitude was controlled with the Helicopter's radar altimeter, but had to be switched to GPS altitudes after flight F11 due to technical issues with the MMS-4. Flights were planned with the Pico software PEIConvert using strait lines in UTM projection.

Helicopter operations were mostly limited by weather conditions (fog, low clouds, swell or wind). Especially the first week of the cruise gave few opportunities for survey flights, which lead to missing data at the most western part of the profile up to OBS 23 (Fig. 3.3.2). After finishing the first part of the seismic profile a big gap between OBS 35 and 50 remained. 'Fortunately' OBS 44 could not be picked up with manual release, so *Polarstern* came back for the programmed auto-release time. Luckily weather conditions were good and an extra fuel tank allowed us to extend our flying range up to 90nm and close the data gap.

The second part of the profile started with moderately good weather. Even though visibility was varying during the day, we were able to get a least one flight a day.

A longer period with marginal weather conditions kept the helicopter on board and left a ~50 km gap between OBS 61 and 64.

Altogether aero- and shipborne magnetic data provide a good, systematic magnetic data coverage for the Falkland Plateau (Fig. 3.3.2).

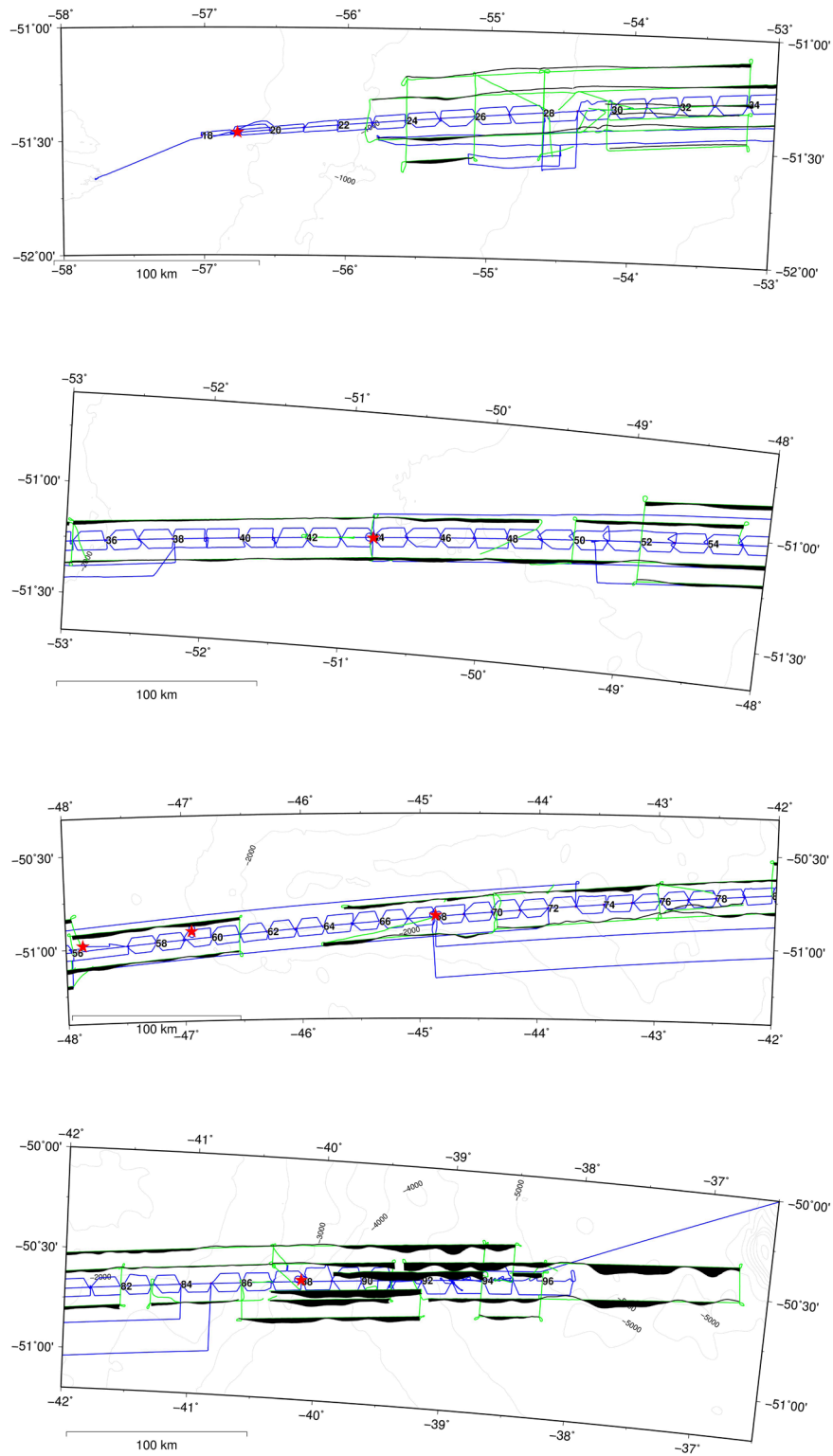


Fig. 3.3.2: Acquired magnetic profiles in relation to the seismic profile. Complete flight tracks (green lines), magnetic anomalies (black wiggles), ship track (blue lines), OBS stations (red dots) and calibration sites (stars) are shown. Map projection: UTM.

3.3 Helicopter magnetic measurements and fix installed fluxgate instruments

Tab. 3.3.1: Summary of flights: acquired data and surveyed area. Surveyed area is given in relation to OBS station, e.g.: 23-29 10NS means a flight 10 km north and south between OBS 23 and 29

Flight	Date	File	Area (in relation to OBS stations)	Comment
F1	25.04.2013	B3042519.P13	42-43	Testflight along shiptrack
F2	26.04.2013	B3042614.P01		Aborted d/t low clouds
F3	26.04.2013	B3042615.P24	23-29 10NS	
F4	26.04.2013	B3042617.P50	29-35 10NS	
F5	28.04.2013	B3042813.P03	24-28 20NS	Tie lines
F6	28.04.2013	B3042816.P11	28-34 20S	
F7	28.04.2013	B3042818.P57	30-34 20S	
F8	01.05.2013	B3050112.P21	50-56(55) 10NS	
F9	01.05.2013	B3050114.P29	56-61 10NS	
F10	01.05.2013	B3050117.P03	52-56 20NS	
F11	02.05.2013	B3050212.P38	65-68 10N	
F12	03.05.2013	B3050312.P57	44-49(50) 10NS	
F13	03.05.2013	B3050316.P20	35-44 10NS	
F14	04.05.2013	B3050416.P37	70-(72)76 10NS	abbreviated d/t fog
F15	05.05.2013	B3050513.P46	83-86 10S,	aborted d/t fog
F16	05.05.2013	B3050516.P46	86-90 10NS	
F17	06.05.2013	B3050612.P30	96-102 10NS	
F18	06.05.2013	B3050615.P03	91(92)-96 10NS	abbreviated d/t sunset
F19	06.05.2013	B3050617.P23	94-95(96) 20NS	aborted d/t sunset
F20	11.05.2013	B3051114.P05	64-70 10S	
F21	12.05.2013	B3051211.P18	76-82 10NS	
F22	12.05.2013	B3051216.P07	79-87 20/10N	
F23	14.05.2013	B3051413.P12	86-92 20/5S	
F24	14.05.2013	B3051416.P00	87-94 20/5N	

Preliminary results

Aeromagnetic data were stored in binary format on the AGIS-XP and converted to plain ASCII by PEIview. Line files were cut using FIDs noted during the flights. To obtain crustal anomalies the IGRF (International Geomagnetic Reference Field) was subtracted with GEOsoft Oasis Montaj. No correction for daily variation was applied. First results are shown in Fig. 3.3.2.

Data from ships magnetometers and motion reference unit (MINS) were exported from DShip data acquisition and management system at the end of the cruise. Seven calibration circles were sailed at several different locations for later compensation of the ships magnetic field (see Table 3.3.2 and Fig. 3.3.2 for locations).

In general, the Falkland Plateau has a very smooth magnetic field. Only east of the Falkland Islands we found a pronounced magnetic anomaly most likely marking a major structural change in the crustal fabric. If this anomaly is part of extended continental crust or mark a transition to a more oceanic domain is subject of future analyses. However, in the Georgia Basin, west of the Maurice Ewing Bank, clear spreading anomalies could be identified. The youngest of the anomalies detected is M2.

Tab. 3.3.2: Summary of calibration circles for compensating ships magnetic field

Date	Start time	End time	Longitude	Latitude
2013/04/20	16:22:00	17:09:00	56° 46.14' W	51° 27.67' S
2013/05/01	17:10:00	17:55:00	47° 51.48' W	50° 58.96' S
2013/05/03	17:23:00	18:55:59	50° 48.27' W	51° 9.68' S
2013/05/05	17:10:00	18:41:59	40° 9.00' W	50° 36.25' S
2013/05/10	15:24:00	16:59:59	46° 56.00' W	50° 55.17' S
2013/05/11	14:11:00	15:48:59	44° 52.20' W	50° 50.86' S
2013/05/16	12:00:00	13:43:59	36° 22.62' W	49° 58.26' S

Data management

Please refer to the beginning of chapter 3 on page 12.

3.4 Gravity measurements

Henning Kirk, Boris Dorschel, Wilfried AWI
Jokat, Gunther Lüttschwager, Bernhard
Schmitz

Objectives

During the entire cruise the onboard sea gravitometer, type KKS-31 manufactured by Bodenseewerke, was in operation and measured the relative gravity along the entire track. To gain absolute gravity values and to determine the instruments drift, two onshore tie measurements at the very beginning in Port Stanley and at the end in South Africa were planned. Here, we like to describe the harbour measurements and their locations.

Work at sea

Harbour value – Port Stanley

Due to shallow waters, *Polarstern* was not able to enter the harbour of Port Stanley, but had to anchor in the fjords roughly 1 nm offshore. Thus, no measurement next to the ship could be performed.

3.4 Gravity measurements

An absolute gravity base station description in Port Stanley was provided by McGibbon (1988). It was installed in the entrance area of the former BAS building next to the public jetty as part of the IGSN71 network. Its absolute gravity was determined to be 981226.75 mgal. However, the described location could not be found, since the old BAS building did no longer exist in its old shape. However, the original description was good enough to locate the point in the entrance of the visitor centre. Therefore, the measurements described below are an attempt to re-establish the old reference point in Port Stanley, as close by as possible to the former one, easy to find and to access and weather protected.

The new location is approximately less than 10 meters away from the old one, still at the same building, which accommodates nowadays „The Jetty Visitor Centre“. Its coordinates (WGS84), measured with a GPS handheld, are 51°41.534' S and 57°51,385' W with an accuracy of 3 m. The altitude (4.2 m) of the new gravity point could not be verified, and was taken over from McGibbon (1988). The following pictures (Figs. 3.4.1-3) illustrate the location of the gravity point:



Fig. 3.4.1: The Jetty Visitor Centre seen from the west end of the Ross Road. The public jetty is left hand side, Philomel St. starts to the right. The very left, lower part of the white building is the sheltered entrance area, containing the gravity spot.

Fig. 3.4.2: The entrance area of the Jetty Visitor Centre as seen from the public jetty (right side). The point is located tight in the right rear corner of the canopy.





Fig. 3.4.3: The red arrows mark the new gravity point.

Preliminary results

The Measurements in Port Stanley

Instruments : 1 gravity, LaCoste & Romberg, Model G, S/N 1031, with feedback
 1 GPS Garmin 450t
 Location : 51°41.534' S , 57°51,385' W, 4.2 m a.s.l
 Date : 17.04.2013
 conditions : Almost no trafic, tiny waves

The measurements were done with the feedback unit and on the plate. The temperature inside the instrument varied from 53.4° C (beginning) to 52.9° C (end).

Table 3.4.1: Gravity measurements in Port Stanley. The average value is 4892.51 mgal. For transfer from scale units (scu) to mgal, the basic value from the calibration list was 4803.41 mgal and the scaling factor 1.02260.

UTC	reading [scu]	reading [mgal]	feedback [mgal]	rel. gravity [mgal]
00:18	4784,0	4889,308	+3,150	4892,46
00:20	4785,0	4890,331	+2,156	4892,49
00:21	4786,0	4891,35	+1,144	4892,50
00:23	4787,0	4892,376	+0,145	4892,52
00:25	4788,0	4893,40	-0,888	4892,51
00:28	4789,0	4894,42	-1,838	4892,58
00:30	4790,0	4895,444	-2,906	4892,54

3.4 Gravity measurements

The averaged relative gravity will be used in combination with two older values (Tab. 3.4.2) measured with the G-1031 at IGSN71 base stations, namely in Bremerhaven, Germany, in the AWI D-building and in Cape Town, South Africa, at the Clock Tower, Waterfront (IGSN71-No: BM2) relevant for our experiment.

Table 3.4.2: Base reading of absolute gravity points in Germany and South Africa

Date	Location	abs. gravity [mgal]	G-1031 rel. gravity [mgal]	Difference [mgal]
25.10.2012	AWI D -build.	981356.72	5019.72	+127.21
27.11.2012	Clock Tower	979638.63	3302.78	-1589.73
30.05.2013	Clock Tower	979638.63	3302.04	-1590.47

Using these base reading we calculate the following absolute gravity at the selected location in Port Stanley:

$$\text{Abs. Gravity (Pt. Stanley – Bremerhaven)} = 981229.51 \text{ mgal}$$

$$\text{Abs. Gravity (Pt. Stanley – Cape Town-2012)} = 981228.36 \text{ mgal}$$

$$\text{Abs. Gravity (Pt. Stanley – Cape Town-2013)} = 981229.10 \text{ mgal}$$

The error for each the measurements are estimated to be 1 mgal, mainly caused by instrumental drift, transport and changes in the environmental conditions. This provides finally

$$\text{Abs. Gravity (Pt. Stanley)} = 981229 \pm 1.2 \text{ mgal}$$

which is roughly 2 mgal higher than the absolute gravity value published by McGibbon (1988) for the old location.



Fig. 3.4.4: Gravity harbour measurements in Saldanha, RSA at the starboard side of Polarstern

Harbour values in Saldanha Bay and Cape Town, South Africa

Instrumentation : 1 land gravimeter, LaCoste & Romberg, Model G, S/N 1031,
with feedback1 GPS Garmin 450t
Location : 33°01.085' S , 17°59,247' E, +-17m, H.a.s.l.: Not determined.
Date : 29.05.2013, 07:23 - 07:33 UTC
conditions : Moderate harbour activities, no significant vibrancy

The measurements were done with the feedback unit and on the plate. The inside temperature remained at 53.5° C.

Table 3.4.4: Base reading of absolute gravity points Saldanha, South Africa

UTC	reading [scu]	reading [mgal]	feedback [mgal]	rel. gravity [mgal]
07:23	3157.0	3225.68	-1.821	3223.86
07:25	3156.0	3224.66	-0.801	3223.85
07:26	3155.0	3223.63	+0.223	3223.85
07:28	3154.0	3222.61	+1.251	3223.86
07:30	3153.0	3221.59	+2.283	3223.87
07:32	3152.0	3220.57	+3.311	3223.88
07:33	3151.0	3219.54	+4.336	3223.88

The average gravity value is 3223.86 mgal. We applied a scale fix of 3167.41.41 mgal and the scaling factor was 1.02224.

The reading of sea gravity meter during this period was -780.57 mgal as the averaged raw gravity. With the spring constant of 0.901 we get

$$G_{\text{rel}} (\text{Saldanha}) = -703.29 \text{ mgal.}$$

The vertical distance Δh of the two instruments at 07:30 UTC is 3.0 m.



Fig. 3.4.5: Gravity measurements at the Clock Tower in Cape Town, RSA. The point is located at the western side of the building underneath the more northern edge of the window.

3.3 Helicopter magnetic measurements and fix installed fluxgate instruments

Instrumentation: 1 land gravimeter, LaCoste & Romberg, Model G, S/N 1031, with feedback
 Location: 33°54.22' S , 18°25,23' E, H.a.s.l.: 4.0 m
 IGSN71 Station BM2,
 Abs. Gravity: 979638.63 mgal
 Date : 30.05.2013, 17:05 - 17:12 UTC
 conditions : Very calm, no wind, almost no people around

The measurements were done with the feedback unit and on the plate. The inside temperature remained at 53.4° C.

Table 3.4.5: Base reading of absolute gravity points Clock Tower, Cape Town, South Africa

UTC	reading [scu]	reading [mgal]	feedback [mgal]	rel. gravity [mgal]
17:05	3236.0	3306.43	-4.409	3302.02
17:06	3235.0	3305.41	-3.382	3302.03
17:08	3234.0	3304.39	-2.352	3302.04
17:09	3233.0	3303.37	-1.327	3302.04
17:10	3232.0	3302.34	-0.299	3302.04
17:11	3231.0	3301.32	+0.726	3302.05
17:12	3230.0	3300.30	+1.750	3302.05

The average relative gravity value was 3302.04 mgal. The scale fix was 3269.63 mgal and the scaling factor 1.02229.

This leads to

$$\begin{aligned}
 \mathbf{G_{abs} (Saldanha)} &= G_{abs}(\text{Capetown}) + (G_{rel}(\text{Saldanha}) - G_{rel}(\text{Capetown})) + \Delta h * \\
 &0.3086 \text{ mgal/m} \\
 &= 979638.63 \text{ mgal} - 78.18 \text{ mgal} + 0.93 \text{ mgal} \\
 &= \mathbf{979561.4 \text{ mgal} = -703.29 \text{ mgal}}
 \end{aligned}$$

with again an estimated error of ~ +- 1 mgal.

Data management

Please refer to the beginning of chapter 3 on page 12.

3.5 Bathymetry and sediment echosounding

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AWI

Objectives

If you are going somewhere and you do not want to get lost – you need a map.

Accurate knowledge of the seafloor topography, hence high-resolution bathymetry data, is key, basic information, necessary to understand many marine processes in a spatial context. Bathymetric models of this area are often derived from satellite altimetry verified against a limited number of direct sounding measurements. Consequently, the main task of the bathymetry group during ANT-XXIX/5 was to collect high-resolution seabed and sub-bottom data from the Falkland Plateau in parallel to seismic refraction work. The detailed seabed maps provide information on the general and local topographic setting of the area. The simultaneously recorded sub-bottom data provide information on the sedimentary architecture of the surveyed area.

Work at sea

During ANT-XXIX/5, multi beam data were recorded with the Atlas Hydrographic® Hydrosweep DS3 multi beam echosounder permanently installed on *Polarstern*. The Hydrosweep DS3 was operated with the following optimised relevant parameter settings: Swath width portside 250 %, swath width starboard 250 %, beam pattern 'equal footprint', desired number of beams 920, the pulse type was frequency modulated (chirped), C-Keel source 'System C-keel', transmission sequence 'equidistant transmission'. More detailed information on set-up and settings can be extracted from the sensor parameter set 'ANT29-5_neu' which was applied during ANT-XXIX/5, and only adjusted for changes in water depths. The Hydrosweep DS3 operation software was 'Atlas Hydromap Control' version 2.3.1.0. Multi beam data were recorded with the Atlas Parastore software version 3.3.13.0 in *.asd format and with the Hypack® software package version 13.0.0.6 in *.hsx/raw format. In Hypack®, the data sets were stored in 30 min blocks. For further data processing, the *.hsx/raw files were imported in CARIS HIPS and SIPS®. In CARIS HIPS and SIPS®, water column sound velocity profiles were applied to the multi beam data. The necessary data sets were recorded with a Valeport Ltd, MIDAS SVP. In total 9 sound velocity profiles were used for sound velocity corrections (see Table 3.5.1 and Fig. 3.5.1).

Tab. 3.5.1: Sound velocity profiles for multi beam data correction

Number	Date (UTC)	Time (UTC)	Latitude	Longitude	Depth [m]
1	21.04.2013	16:17	51°16.09' S	52°57.10' W	1880
2	22.04.2013	13:16	51°28.18' S	55°47.05' W	870
3	01.05.2013	14:21	51°00.02' S	47°57.29' W	980
4	02.05.2013	12:24	50°51.17' S	44°51.29' W	980

3.5 Bathymetry and sediment echosounding

Number	Date (UTC)	Time (UTC)	Latitude	Longitude	Depth [m]
5	04.05.2013	17:48	50°47.46' S	43°40.48' W	1450
6	05.05.2013	08:36	50°40.19' S	41°19.23' W	1200
7	06.05.2013	08:51	50°30.10'S	38°01.89'W	2000
8	10.05.2013	00:41	51°05.04'S	49°14.04'W	1500
9	16.05.2013	14.45	49°57.22'S	36°24.28'W	4800

For data access, station planning and further use, the multi beam data were included in an ArcINFO® based GIS Project. Multi beam water column data were not recorded with the Hydrosweep DS3 during ANT-XXIX/5. Sub-bottom data were recorded with the Atlas PARASOUND sub-bottom echosounder permanently installed on *Polarstern*. The Atlas PARASOUND sub-bottom echosounder was operated with the following optimised relevant parameter settings: Transmission on request, desired primary high frequency 20kHz, desired secondary low frequency 4kHz, for all sampled frequencies was the output sample rate 12.2kHz with a band width of 33 % of the output sample rate. More detailed information on the PARASOUND set-up and settings can be extracted from the sensor parameter set 'ANT29-5_deep' which was applied during ANT-XXIX/5, and only adjusted for changes in water depths. The PARASOUND operation software was 'Atlas Hydromap Control' version 2.2.8.0. Sediment echosounder data were recorded with the Atlas Parastore software version 3.3.13.0 in *.asd, *.ps3 and *.sgy file formats for the primary high frequency and the secondary low frequency. For later post-processing, the full profiles including the water column data were recorded. For a more detailed description of the PARASOUND system, operation, data storage and management see Jokat (2009).

To minimize interferences between the two acoustic systems, the PARASOUND sub-bottom echosounder was operated in a triggered mode, receiving the trigger from the multi beam echosounder.

In the study area, the Hydrosweep DS3 multi beam echosounder and PARASOUND sub-bottom echosounder were operated fully supervised in 24h shift mode. The systems were operated alternatively from the bridge or the Bathymetry laboratory. On the bridge, the Ultra VNC® win32 remote desktop software provided access to the acquisition computers in the bathymetry lab. An overlap of parallel multi beam tracks of at least 20% was envisaged and almost always achieved. During transit, data recording continued until entering the Exclusive Economic Zone of South Africa.

Preliminary results

In the study area, approximately 40,046 km² (15,461nm² respectively) of seabed were mapped (Fig. 3.5.1).

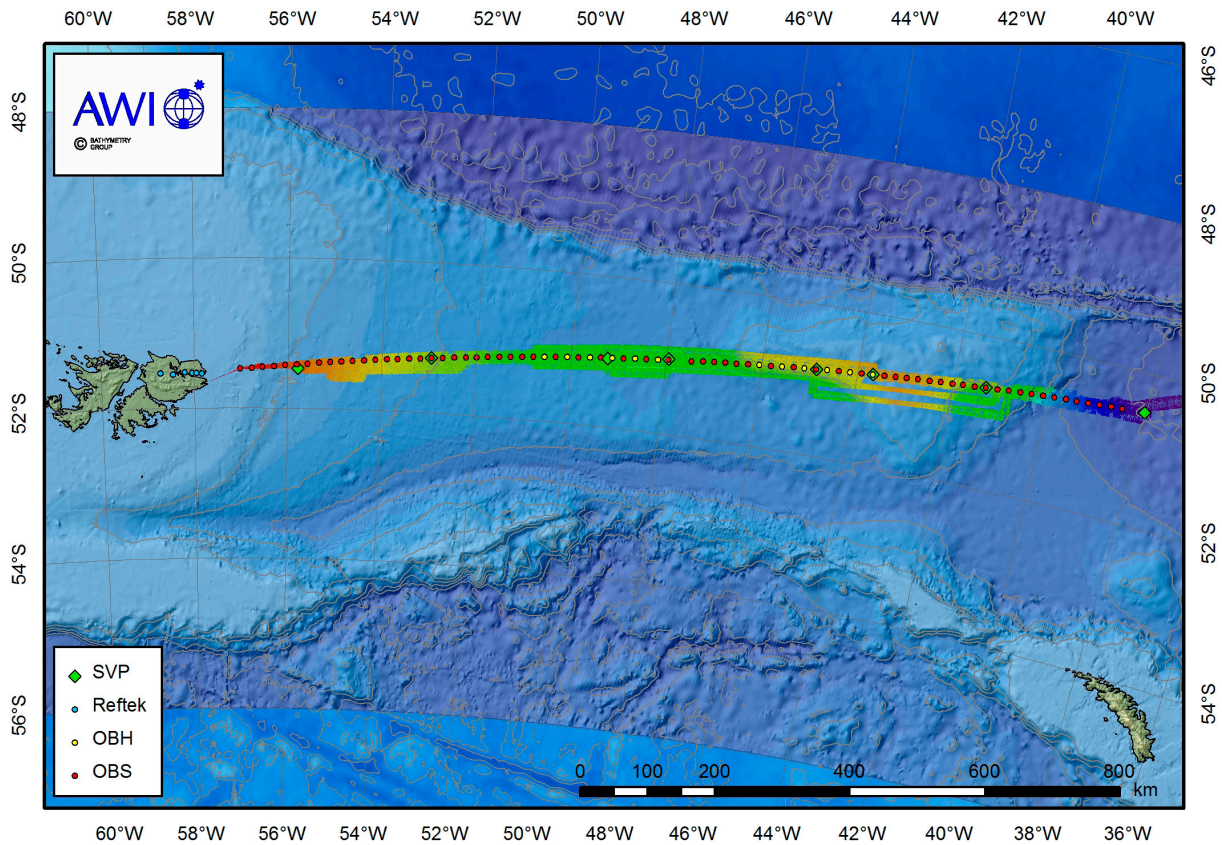


Fig. 3.5.1: Overview map of the study area (excluding parts of the transit to South Africa) showing the multi beam data coverage

The high resolution multi beam data provide detailed seabed information along a transect from the Falkland Island and across the Falkland Plateau including the Maurice Ewing Bank. The sediment echosounder data provide first information on the shallow sedimentary architecture of the Falkland Plateau that changes significantly from the Falkland Islands in the west to the Maurice Ewing Bank in the east (Figure 3.5.2a-c). As can be seen from Fig. 3.5.2, the penetration depth of the sediment echosounder varies widely from hardly any penetration in the central Falkland Plateau to more than 100 m penetration in parts of the Maurice Ewing Bank. In the data sets, wavy and sub-parallel sediment successions can be distinguished on the western Falkland Plateau (Figure 3.5.2a). In the central part of the Falkland Plateau, the seabed is highly reflective and only subtle sedimentary structures are displayed. Best results were achieved on the Maurice Ewing Bank. Here, the echosounder data display various discordant sediment sequences and erosional unconformities. In total, 8,400 km (4,530 nm respectively) of PARASOUND profile were recorded in the study area during ANT-XXIX/5.

Finally, multi beam and PARASOUND data were recorded during the transit to South Africa.

3.5 Bathymetry and sediment echosounding

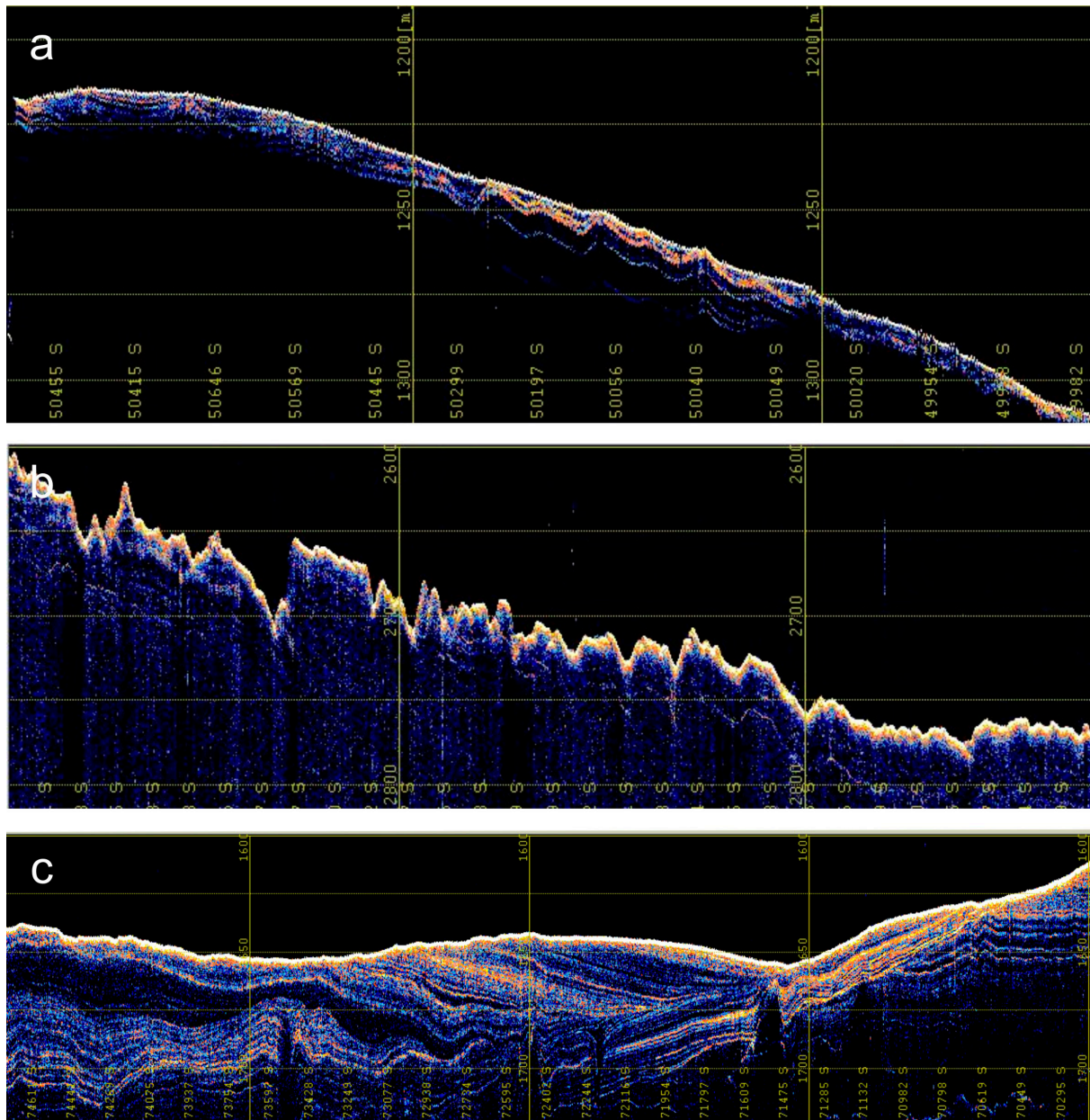


Fig. 3.5.2: Examples of sediment echosounder data from (a) the western (b) the central Falkland Plateau and (c) the Maurice Ewing Bank. The sediment echosounder data are plotted against time and are thus vertically exaggerated. Consequently, the sloping of the seabed does not represent the true seabed inclination.

Data management

All multi beam data recorded during this *Polarstern* expedition will be stored by the AWI bathymetry group for post-processing. The processed data will be included in the PANGAEA data base. Data requests should be sent to the AWI bathymetry group. Bathymetry data recorded during ANT-XXIX/5 will be provided to bathymetric compilation projects e.g. GEBCO (General Bathymetric Chart of the Ocean).

References

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4. MOLECULAR TAXONOMY AND BIOGEOGRAPHY OF SOUTHERN OCEAN PLANKTONIC DIATOMS

Bánk Beszteri, Friedel Hinz, Stefan Pinkernell

AWI

Objectives

Diatoms are the main primary producers in the Southern Ocean, fuelling food webs of the region. Through their sinking they contribute substantially to silicate and carbon export at depth, thereby influencing the biogeochemical cycling of these elements on a global scale. This diatom flora is in many ways peculiar, with numerous "endemics" and, presumably, special adaptations of its taxa to the unique conditions of this habitat (mostly abundant macronutrient supply; strong seasonality; trace element limitation; periodically strong grazing pressure). The team of the Hustedt Diatom Study Centre complements other AWI lines of phytoplankton research by studying the biogeography, taxonomy, systematics and evolution of pelagic diatom taxa of this region. The samples obtained during this cruise are being used within the frame of three research projects: molecular taxonomy; biogeography; and population genomics.

The first project aims at collating taxonomic, morphological and molecular information on pelagic diatom taxa of the Southern Ocean into a digital flora. Besides presenting an electronic identification aid, the main aim of the development of this flora is to provide a data basis to link identifications using different methodological approaches (live cell microscopy, light and electron microscopy of cleaned frustules, and molecular marker sequences), thereby contributing to enabling synthetic analyses of taxon observations collected using different methods. A crucial requirement for this undertaking is the availability of culture strains for a wide range of taxa. The main aim of the current cruise for this project was accordingly to collect cultures for an as wide as possible selection of diatom species encountered.

In the second project, we are studying the geographic distribution of individual pelagic diatom species of the Southern Ocean in the context of its abiotic determinants. We use species distribution modelling methods for an ecologically meaningful interpolation of the – at such geographic scales, necessarily scarce – occurrence records and for forecasting possible effects of climate change upon distribution ranges. For this, we are continuously extending the accessions of the diatom collection of the Hustedt Diatom Study Centre by new samples from thus far under-sampled regions and / or seasons of the Southern Ocean. To this end, on the current cruise, we were collecting net diatom samples which will supplement our currently available set of samples. Both the Falkland Plateau and the austral autumn are rather under-sampled in currently publicly available taxon occurrence records as well as among the accessions of the Hustedt diatom collection.

Our third project at this cruise aims at laying the foundations for a population genomic investigation of the main silica sinker of the region, the strongly silicified diatom species *Fragilariopsis kerguelensis*. This species occurs south of the Subantarctic Front, and often dominates phytoplankton communities mainly in the Polar Frontal Zone, but also occurs further south, in many places practically all the way to the Antarctic continent. The frustules of this species are the main constituents of the circum-Antarctic siliceous sediment layer also known as the opal belt. Through its often high abundances and its huge continuous circum-Antarctic distribution range, this species is expected to have uniquely large intraspecific genetic diversity even for a phytoplankton species. The extent and spatial and temporal turnover of this diversity has, however, not been investigated to date. We have recently finished first tests of a high throughput genotyping-by-sequencing method based on next generation sequencing of genomic DNA fragments on a handful of isolates of *F. kerguelensis*. At this cruise, we aimed at sampling autumn populations of this species which will be genotyped using the thus established methods to gain first insights into the amount and into the genomic and spatio-temporal distribution of genetic variation in this species.

Work at sea

The bulk of our sampling activities was sampling with plankton nets along the Falkland Plateau transect, and in the Southern part of our transit to South Africa (Figure 4.1. for an overview). Samples have been collected using a hand net from 0-15 m depth at 77 stations, at a high spatial resolution (~ 9 nm apart) along the Falkland Plateau transect. Phytoplankton samples were collected at approximately every longitude during the same transect from different depths from the upper 300 m of the water column using a multiple net (totalling 20 multiple net samples). On two occasions, the multiple net was used to sample from 1,000 m depth, in order to collect zooplankton samples for AWI collaborations. Further 9 multiple net samples were taken during the transit from the Falkland Plateau to South Africa, one within each latitude degree. Parts of the samples taken were fixed with hexamine-buffered formaldehyde and, in case of the zooplankton samples, with ethanol, for further processing in the home laboratory. We also continuously monitored assemblage composition using samples filtered upon a 20 μ m mesh size plankton net from the on-board seawater supply system and on some occasions, we used these samples for the isolation of cultures as well.

Parts of the fresh surface-near net samples were processed alive and used for isolation of clonal diatom cultures. After successive dilution, individual diatom cells were picked under an inverted microscope or a stereomicroscope, and either washed in single drops of sterile F/2 phytoplankton culture medium on triple-depression slides, or transferred into 12-well cell culture plates. Culture plates were observed 1-14 days after initial inoculation for growth and contamination before transferring promisingly growing and clean cultures into 15 ml Falcon tubes or 25 ml culture flasks for further growth. All cultures were kept at a 12:12 hour light:dark periodicity at 4-8 °C in a cold container with cool fluorescent illumination during the cruise. Fresh live samples were also used for microscopic imagery in order to document the live morphology of the range of taxa encountered, because appearance of live cells freshly obtained from the environment is often different from that of cells growing in cultures. The first cultures have grown so far that during our transit, we could start imaging them as well.

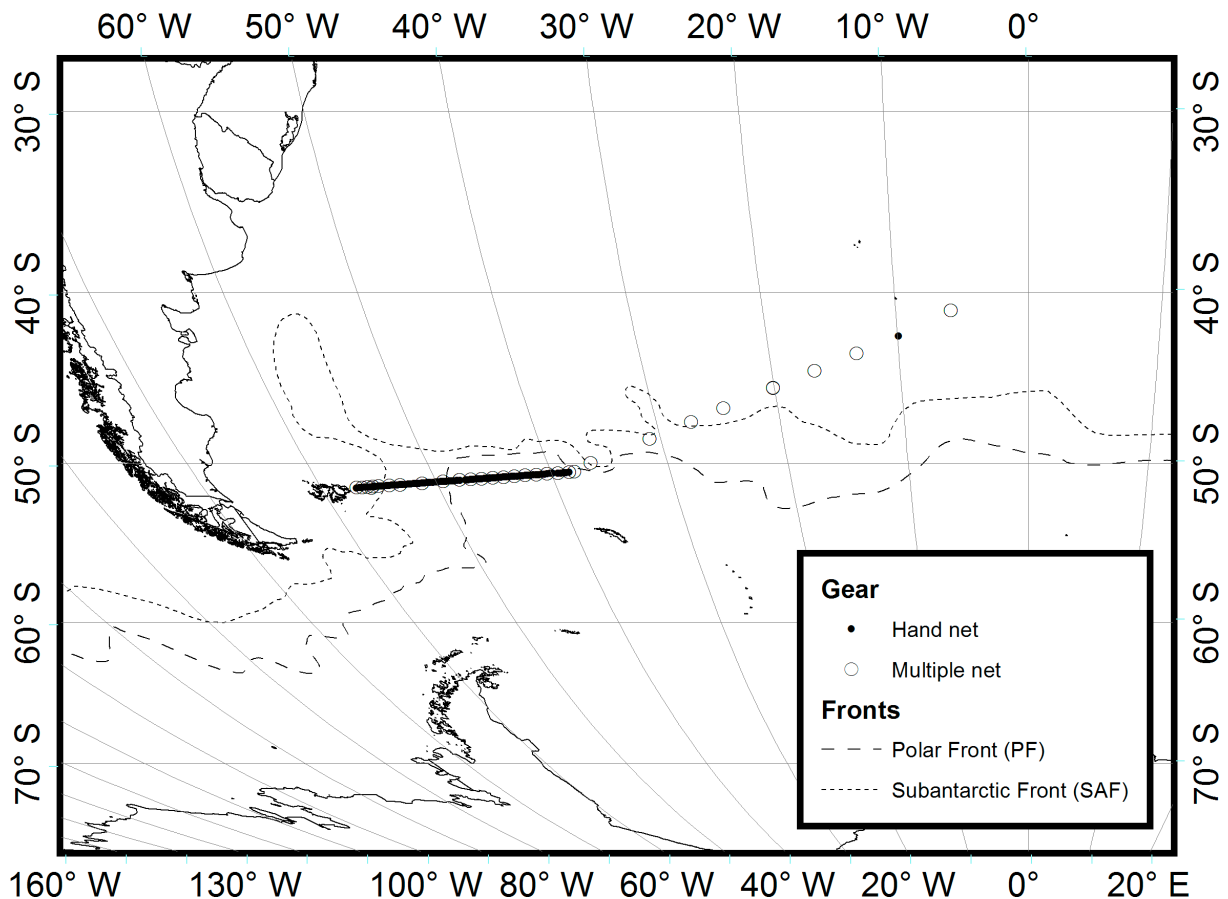


Fig. 4.1: Geographic overview of the net phytoplankton samples collected during ANT-XXIX/5 in the Southern Atlantic, in relation to the average position of the Subantarctic Front and the Antarctic Polar Front.

Preliminary (expected) results

In spite of the relatively small geographic extent of the main target area of the cruise (a 1,400 km long profile on the Falkland Plateau), we were lucky to encounter a variety of water masses with diverse diatom assemblages. Our anchor position in the Stanley harbour was home to an almost subtropical diatom community, but our Eastward profile quickly crossed the here Northward running Subtropical, and not much later the Polar Front, where we encountered typical Southern Ocean water masses and diatom assemblages. We found a pronounced spatial and temporal heterogeneity in assemblage composition and species dominances, as well as in zooplankton abundances. At some localities (especially during the final transit segment), we encountered heavily grazed communities where zooplankton abundance in the net samples was almost comparable with phytoplankton even in terms of numbers of individuals, whereas at other places, we found healthily growing and hardly grazed diatom assemblages (although never in bloom proportions). Altogether, we isolated over 600 clonal cultures from these samples (Fig. 4.2). Although an unknown proportion of these might not survive until arrival in the home laboratory, and an exact number of species captured can also only be given after a detailed morphological and molecular biological analysis in Bremerhaven, at this point it seems that we have been able to sample the majority of taxa encountered during our cruise. These culture strains will be documented in detail at the home laboratory using a variety of techniques. We will document live cell morphology using light microscopy of living cells (we already started this on board); frustule

4. Molecular taxonomy and biogeography of planktonic diatoms

morphology and ultrastructure using light and scanning electron microscopy of standard acid cleaned frustule preparations; and we will sequence a number of commonly used molecular marker genes for the strains.

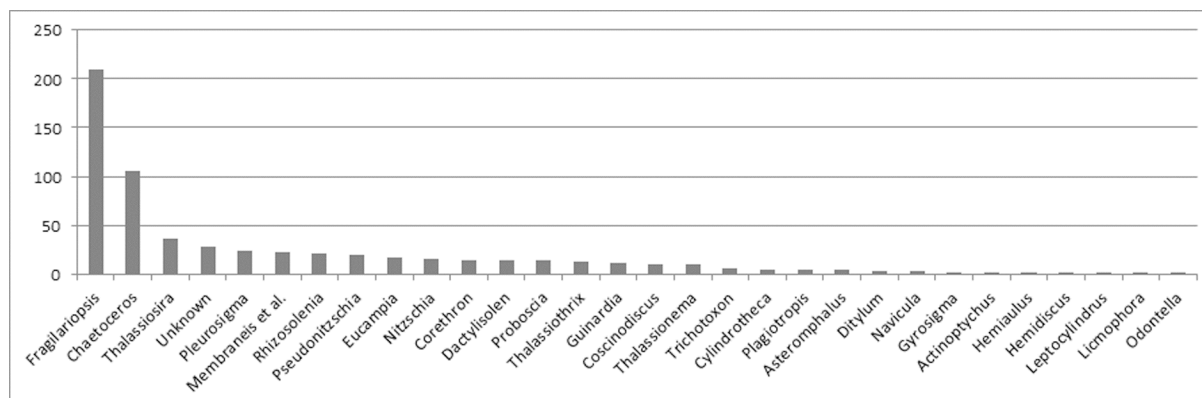


Fig. 4.2: Overview of the taxonomic distribution of the 623 cultures isolated during our cruise leg. All identifications are preliminary as they are only based on on-board microscopy of live cells.

The additional formaldehyde-fixed samples will allow us to assess our cultivation success by comparing the original diversity in the samples with the diversity of our cultures. Besides, they will be used to obtain geo-referenced taxon occurrence records which will be channelled into our distribution modelling workflow for biogeographic analyses.

During the expedition, we sampled four *Fragilariopsis kerguelensis* populations in depth, by isolating 20-40 clonal strains from each (altogether around 200 cultures of this species). Survival rate of these cultures until arrival in the home laboratory is a major unknown, but all these strains started dividing and seemed healthily growing while on board.

Data management

Fixed diatom samples that will be prepared for standard light and electron microscopic investigation of cleaned frustules in the home lab will become part of the publicly available diatom collection of the Hustedt Diatom Study Centre (herbarium code BRM). Sample metadata will be recorded and made publicly available for searching in the BRM collection database. The same applies to preparations to be obtained from the culture strains established. During the cruise, we tested the EarthCape biodiversity information platform for on-board metadata capture and in close e-mail contact with the EarthCape developer team, established a preliminary workflow for recording station and sample metadata directly on board which can be merged into our collection database back in Bremerhaven. We supplemented our live microscopic images with sampling-related and taxonomic metadata. Some of these images, along with further images to be produced in the home lab, will be used in our digital diatom flora of the Southern Ocean, and they will be published on-line under a Creative Commons license. The fixed diatom samples will be processed and taxon occurrences / relative abundances recorded in the home laboratory; this information will become publicly available upon publication of the scientific publications resulting from the data set. The molecular marker sequences to be obtained from culture strains established during the cruise will be made publicly available through Genbank. The isolated cultures will also be made available to interested researchers for experimental work on a collaborative basis.

5. MARINE MAMMAL OBSERVATION

Tabea Altenbernd¹, Jude Castelino¹, Markus Fink², Steven Franke¹, Tanja Fromm¹, Laura Gassner¹, Anne Hegewald¹, Wilfried Jokat¹, Henning Kirk¹, Norbert Lensch¹, Gunther Lüttschwager¹, Dietmar Penschorn¹, Stefan Pinkernell¹, Antje Schlömer¹, Bernhard Schmitz¹

¹AWI

²GEOMAR

Objectives

Marine Mammal Observation was conducted from 24.04.2013 to 28.05.2013. The aims of the observation were

- to get more data about the distribution of whale-species in the South Atlantic Ocean
- to protect marine mammals from underwater noise caused by seismic sources during the acquisition of seismic refraction data.

Work at sea

Operation

Observation was undertaken from the bridge of *Polarstern* during the hours of daylight. On the 18 m high bridge, a good and clear view of the sea surface around the ship is ensured. The observers used naked eye and binoculars (Fujinon 7-50 FTM/MT Field of view 7-300) to scan the sea surface. The reticle scale of the binoculars was used for distance estimation of detected marine mammals.

During airgun-operation, the observation was carried out by 2 observers, in times without airgun-operation, one observer was present. All observers were scientists trained by other scientists on the ship, who already had experiences in marine mammal observation.

Sightings of marine mammals were written down in protocols and were also recorded electronically with the software Walog2, version 1.3. The software writes log-files of the sightings, which include information like date and time of first sighting, GPS position, species, certainty and other parameters. Digital photography helped to identify species. Additionally, an infrared-camera manufactured by Rheinmetall, which uses the "First" (Fast Infrared Search and Track) system was used to detect the blow of whales in the area around the ship.

Preliminary results

Observation during airgun operation

In order to minimise the risk of disturbing marine mammals by seismic data acquisition, several actions were undertaken:

5. Marine Mammal Observation

A pre-shooting search was done by one of the observers on bridge before the beginning of the ramp up (Table 5.1). After a pre-shooting search of at least 60 min, the guns were ramped up, starting with one gun and adding the next gun until all guns were shooting and full acoustic power was reached. The ramp up took 29-65 min, the shot interval along the seismic refraction line was 60 sec.

It was decided to stop shooting immediately in case of sighting a marine mammal within a zone of 500 m distance to the seismic source (mitigation zone) during the pre-shooting search, ramp-up or airgun operation. After a 30 min delay from the time of the last sighting of the animal within the mitigation zone, shooting would have been started again with a ramp-up of the guns.

During the pre-shooting search, ramp up and acquisition of the two sections of the seismic refraction profiles, no marine mammals were sighted within the mitigation zone by the observers.

Tab. 5.1: Marine mammal observation before and during airgun operation

Date (UTC)	Time (UTC)	Date (shiptime)	Time (shiptime)	Operation	Sightings during operation?
24.04.13	16:05	24.04.13	13:05	start pre-shooting search	no
24.04.13	18:45	24.04.13	15:45	start ramp up	no
24.04.13	19:14	24.04.13	16:14	start seismic refraction profile, section 1	no
27.04.13	11:36	27.04.13	08:36	end of seismic refraction profile, section 1	no
06.05.13	10:00	06.05.13	07:00	start pre-shooting search	no
06.05.13	11:08	06.05.13	08:08	start ramp up	no
06.05.13	12:13	06.05.13	09:13	start seismic refraction profile, section 2	no
10.05.13	00:00	09.05.13	22:00	end of seismic refraction profile, section 2	no

Sightings

In total, 23 sightings of marine mammals, made by the observers on bridge, were noted (Table 5.2). All sightings of marine mammals occurred during the time of no airgun operation. The identified whale species were: long-finned pilot whale (Figure 5.1), orca, fin whale, hourglass dolphin (Figure 5.2) and sperm whale. Often, whales were only detected by their blow, therefore, their species could not be identified.



Fig. 5.1: Long-finned pilot whale

Tab. 5.2: Sightings of marine mammals during the cruise

Number	species	Date (ship/UTC)	time (ship time)	time (UTC)	Sighting position (position of ship)
1	seal	26.04.13	12:21	15:21	51°19.2979' S 53°59.2215' W
>20	long-finned pilot whale	27.04.13	08:59	11:59	51°27.8435' S 56°48.1349' W
>20	long-finned pilot whale	27.04.13	10:12	13:12	51°27.3633' S 56°46.8930' W
1	undefined large whale	28.04.13	12:09	15:09	51°35.8614' S 54°31.8167' W
1	orca	29.04.13	15:07	18:07	51°10.5886' S 51°58.3324' W
1	undefined whale	01.05.13	09:51	12:51	50°58.8212' S 48°07.7523' W
1	undefined large whale	01.05.13	14:43	17:43	50°58.1153' S 47°50.6213' W
1	fin whale	01.05.13	15:29	18:29	50°59.1051' S 47°42.2129' W
2	undefined whale	01.05.13	15:32	18:32	50°59.1102' S 47°41.4615' W
1	undefined whale	07.05.13	09:15	11:15	50°39.2837' S 40°59.5401' W
1	undefined whale	07.05.13	09:37	11:37	50°39.4372' S 41°02.4232' W
1	undefined large whale	13.05.13	15:54	17:54	50°51.4296' S 44°51.7038' W
1	undefined large whale	13.05.13	16:28	18:28	50°52.6744' S 44°53.3552' W

5. Marine Mammal Observation

Number	species	Date (ship/UTC)	time (ship time)	time (UTC)	Sighting position (position of ship)
>30	long-finned pilot whale	14.05.13	16:19	18:19	51°10.9569' S 44°51.1405' W
2	hourglass dolphin	14.05.13	16:19	18:19	51°10.9569' S 44°51.1405' W
>10	undefined whale	15.05.13	15:17	17:17	50°33.5191' S 39°07.8195' W
1	hourglass dolphin	18.05.13	08:28	09:28	48°23.6722' S 30°29.1057' W
2	undefined whale	19.05.13	09:51	10:51	45°30.0701' S 20°06.8178' W
2	undefined whale	20.05.13	08:04	09:04	45°00.6045' S 18°24.7603' W
1	undefined whale	20.05.13	09:43	10:43	45°00.6045' S 18°24.7603' W
1	seal	22.05.13	15:01	15:01	40°45.6443' S 04°57.8419' W
1	undefined whale	24.05.13	07:22	07:23	39°01.3324' S 00°41.5633' E
1	sperm whale	28.05.13	13:16	13:16	33°51.1029' S 15°44.8453' E



Fig. 5.2: Hourglass dolphin close to the ship, 18.05.13

Data management

Metadata of the marine mammal observation recorded with the software Walog2 will be accessible through the PANGAEA database.

APPENDIX

A.1 PARTICIPATING INSTITUTIONS

A.2 CRUISE PARTICIPANTS

A.3 SHIP'S CREW

A.4 STATION LIST

A.1 TEILNEHMENDE INSTITUTE / PARTICIPATING INSTITUTIONS

	Address
AWI	Alfred-Wegener-Institut Helmholtz Zentrum für Polar- und Meeresforschung Postfach 120161 27515 Bremerhaven Germany
DWD	Deutscher Wetterdienst Geschäftsbereich Wettervorhersage Seeschiffahrtsberatung Bernhard Nocht Str. 76 20359 Hamburg Germany
HELISERVICE	HeliService International GmbH SERVICE Am Luneort 15 27572 Bremerhaven Germany
GEOMAR	GEOMAR – Helmholtz Zentrum für Ozeanforschung Wischhofstr. 1-3, 24148 Kiel Germany

A.2 FAHRTTEILNEHMER / CRUISE PARTICIPANTS

Name/ Last name	Vorname/ First name	Institut/ Institute	Beruf/ Profession
Altenbernd	Tabea	AWI	Geophysicist
Beszteri	Bank	AWI	Biologist
Brauner	Jens	Heliservice	Technician
Busse	Kirsten	AWI	Student, geophys
Castelino	Jude	AWI	Geophysicist
Dorschel	Boris	AWI	Geologist
Fink	Markus	Geomar	Geophysicist
Franke	Steven	AWI	Student, geophys
Fromm	Tanja	AWI	Geophysicist
Gassner	Laura	AWI	Student, geophys
Gall	Fabian	Heliservice	Technician
Hegewald	Anne	AWI	Geophysicist
Hempelt	Juliane	DWD	Technician
Hinz	Friedel	AWI	Technician
Jokat	Wilfried	AWI	Geophysicist
Kirk	Henning	AWI	Technician
Lensch	Norbert	AWI	Technician
Lindner	Roland	Heliservice	Pilot
Lüttschwager	Gunther	AWI	Student, geophys
Miller	Max	DWD	Meteorologist
Penshorn	Dietmar	AWI	Technician
Pinkernell	Stefan	AWI	Biologist
Schlömer	Antje	AWI	Geophysicist
Schmitz	Bernhard	AWI	Student, geophys
Slabon	Patrizia	AWI	Student, geophys
Zepick	Burkhard	Heliservice	Pilot

A.3 SCHIFFSBESATZUNG / SHIP'S CREW

No.	Name	Rank
1	Schwarze, Stefan	Master
2	Grundmann, Uwe	1. Offc.
3	Farysch, Bernd	Ch. Eng.
4	Fallei, Holger	2. Offc.
5	Langhinrichs, Moritz	2. Offc.
6	Peine, Lutz G.	2. Offc.
7	Pohl, Klaus	Doctor
8	Hecht, Andreas	R. Offc.
9	Grafe, Jens	2. Eng.
10	Minzlaff, Hans-Ulrich	2. Eng.
11	Holst, Wolfgang	3. Eng.
12	Scholz, Manfred	Elec. Eng.
13	Himmel, Frank	ELO
14	Hüttebräucker, Olaf	ELO
15	Nasis, Ilias	ELO
16	Riess, Felix	ELO
17	Loidl, Rainer	Boatsw.
18	Reise, Lutz	Carpenter
19	Bäcker, Andreas	A.B.
20	Brickmann, Peter	A.B.
21	Gladow, Lothar	A.B.
22	Hagemann, Manfred	A.B.
23	Lamm, Gerd	A.B.
24	Scheel, Sebastian	A.B.
25	Schmidt, Uwe	A.B.
26	Wende, Uwe	A.B.
27	Winkler, Michael	A.B.
28	Preußner, Jörg	Storek.
29	Elsner, Klaus	Mot-man
30	Pinske, Lutz	Mot-man
31	Schütt, Norbert	Mot-man
32	Teichert, Uwe	Mot-man

33	Voy, Bernd	Mot-man
34	Müller-Homburg, R.D.	Cook
35	Martens, Michael	Cooksmate
36	Silinski, Frank	Cooksmate
37	Czyborra, Bärbel	1. Stwdess
38	Wöckener, Martina	Stwdess/N.
39	Arendt, Rene	2. Stwdess
40	Gaude, Hans-Jürgen	2. Steward
41	Möller, Wolfgang	2. Steward
42	Silinski, Carmen	2. Stwdess
43	Sun, Yong Sheng	2. Steward
44	Yu, Kwok Yuen	Laundrym.

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0290-1	20.04.13	15:11	OBS	in the water	51° 28,55' S	57° 1,17' W	14,0
PS81/0290-2	20.04.13	15:12	HN	in the water	51° 28,55' S	57° 1,16' W	5,0
PS81/0290-1	20.04.13	15:12	OBS	on ground/ max depth	51° 28,55' S	57° 1,16' W	5,0
PS81/0290-2	20.04.13	15:14	HN	on ground/ max depth	51° 28,56' S	57° 1,15' W	38,0
PS81/0290-2	20.04.13	15:15	HN	on deck	51° 28,55' S	57° 1,15' W	112,0
PS81/0291-1	20.04.13	16:12	OBS	in the water	51° 27,84' S	56° 46,73' W	9,0
PS81/0291-2	20.04.13	16:12	HN	in the water	51° 27,84' S	56° 46,73' W	9,0
PS81/0291-1	20.04.13	16:12	OBS	on ground/ max depth	51° 27,84' S	56° 46,73' W	9,0
PS81/0291-2	20.04.13	16:15	HN	on ground/ max depth	51° 27,85' S	56° 46,75' W	430,0
PS81/0291-2	20.04.13	16:15	HN	on deck	51° 27,85' S	56° 46,75' W	430,0
PS81/0292-1	20.04.13	16:22	MTC	profile start	51° 27,67' S	56° 46,14' W	435,1
PS81/0292-1	20.04.13	16:46	MTC	action	51° 27,66' S	56° 46,05' W	438,9
PS81/0292-1	20.04.13	17:09	MTC	profile end	51° 27,68' S	56° 46,00' W	437,3
PS81/0292-1	20.04.13	17:09	MTC	on ground/ max depth	51° 27,68' S	56° 46,00' W	437,3
PS81/0293-2	20.04.13	18:07	HN	in the water	51° 27,15' S	56° 32,41' W	525,8
PS81/0293-2	20.04.13	18:10	HN	on ground/ max depth	51° 27,12' S	56° 32,43' W	526,1
PS81/0293-2	20.04.13	18:11	HN	on deck	51° 27,12' S	56° 32,43' W	525,1
PS81/0293-1	20.04.13	18:12	OBS	in the water	51° 27,13' S	56° 32,42' W	525,9
PS81/0293-1	20.04.13	18:12	OBS	on ground/ max depth	51° 27,13' S	56° 32,42' W	525,9
PS81/0294-1	20.04.13	19:27	OBS	in the water	51° 26,34' S	56° 17,84' W	697,8
PS81/0294-1	20.04.13	19:27	OBS	on ground/ max depth	51° 26,34' S	56° 17,84' W	697,8
PS81/0294-2	20.04.13	19:28	HN	in the water	51° 26,34' S	56° 17,84' W	697,4
PS81/0294-2	20.04.13	19:29	HN	on ground/ max depth	51° 26,35' S	56° 17,85' W	696,9
PS81/0294-2	20.04.13	19:30	HN	on deck	51° 26,35' S	56° 17,85' W	697,5
PS81/0295-1	20.04.13	20:52	OBS	in the water	51° 25,59' S	56° 3,69' W	832,0
PS81/0295-2	20.04.13	20:53	HN	in the water	51° 25,59' S	56° 3,67' W	831,0
PS81/0295-2	20.04.13	20:53	HN	on ground/ max depth	51° 25,59' S	56° 3,67' W	831,0
PS81/0295-1	20.04.13	20:53	OBS	on ground/ max depth	51° 25,59' S	56° 3,67' W	831,0
PS81/0295-2	20.04.13	20:55	HN	on deck	51° 25,60' S	56° 3,66' W	832,7
PS81/0296-1	20.04.13	22:17	HN	in the water	51° 24,90' S	55° 49,12' W	1007,2
PS81/0296-1	20.04.13	22:17	HN	on ground/ max depth	51° 24,90' S	55° 49,12' W	1007,2
PS81/0296-1	20.04.13	22:20	HN	on deck	51° 24,89' S	55° 49,15' W	1006,3
PS81/0296-2	20.04.13	22:23	OBS	in the water	51° 24,92' S	55° 49,15' W	1005,8
PS81/0296-2	20.04.13	22:23	OBS	on ground/ max depth	51° 24,92' S	55° 49,15' W	1005,8

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0297-1	20.04.13	23:44	OBS	in the water	51° 24,18' S	55° 34,88' W	1085,9
PS81/0297-1	20.04.13	23:44	OBS	on ground/ max depth	51° 24,18' S	55° 34,88' W	1085,9
PS81/0297-2	20.04.13	23:46	HN	in the water	51° 24,19' S	55° 34,85' W	1085,7
PS81/0297-2	20.04.13	23:46	HN	on ground/ max depth	51° 24,19' S	55° 34,85' W	1085,7
PS81/0297-2	20.04.13	23:46	HN	on deck	51° 24,19' S	55° 34,85' W	1085,7
PS81/0298-1	21.04.13	1:05	OBS	in the water	51° 23,42' S	55° 20,64' W	1222,0
PS81/0298-1	21.04.13	1:05	OBS	on ground/ max depth	51° 23,42' S	55° 20,64' W	1222,0
PS81/0298-2	21.04.13	1:06	HN	in the water	51° 23,43' S	55° 20,62' W	1222,9
PS81/0298-2	21.04.13	1:07	HN	on ground/ max depth	51° 23,44' S	55° 20,60' W	1222,4
PS81/0298-2	21.04.13	1:07	HN	on deck	51° 23,44' S	55° 20,60' W	1222,4
PS81/0299-1	21.04.13	2:23	OBS	in the water	51° 22,69' S	55° 6,16' W	1259,8
PS81/0299-1	21.04.13	2:23	OBS	on ground/ max depth	51° 22,69' S	55° 6,16' W	1259,8
PS81/0299-2	21.04.13	2:25	HN	in the water	51° 22,70' S	55° 6,14' W	1260,4
PS81/0299-2	21.04.13	2:25	HN	on ground/ max depth	51° 22,70' S	55° 6,14' W	1260,4
PS81/0299-2	21.04.13	2:28	HN	on deck	51° 22,72' S	55° 6,14' W	1260,0
PS81/0300-1	21.04.13	3:52	OBS	on ground/ max depth	51° 21,99' S	54° 51,81' W	1364,8
PS81/0300-2	21.04.13	3:53	HN	in the water	51° 21,98' S	54° 51,81' W	1366,8
PS81/0300-2	21.04.13	3:54	HN	on ground/ max depth	51° 21,98' S	54° 51,80' W	1364,8
PS81/0300-2	21.04.13	3:56	HN	on deck	51° 21,98' S	54° 51,81' W	1366,3
PS81/0301-1	21.04.13	5:30	HN	in the water	51° 21,23' S	54° 37,44' W	1468,2
PS81/0301-1	21.04.13	5:31	HN	on ground/ max depth	51° 21,23' S	54° 37,44' W	1466,4
PS81/0301-1	21.04.13	5:34	HN	on deck	51° 21,23' S	54° 37,43' W	1466,0
PS81/0301-2	21.04.13	5:37	OBS	in the water	51° 21,24' S	54° 37,43' W	1467,7
PS81/0301-2	21.04.13	5:46	OBS	action	51° 21,31' S	54° 37,35' W	1471,7
PS81/0301-2	21.04.13	5:47	OBS	on deck	51° 21,32' S	54° 37,35' W	1471,4
PS81/0301-2	21.04.13	6:24	OBS	in the water	51° 21,29' S	54° 37,47' W	1466,8
PS81/0301-2	21.04.13	6:24	OBS	on ground/ max depth	51° 21,29' S	54° 37,47' W	1466,8
PS81/0302-1	21.04.13	7:31	OBS	action	51° 22,29' S	54° 23,48' W	1570,4
PS81/0302-1	21.04.13	7:49	OBS	in the water	51° 20,57' S	54° 22,96' W	1557,8
PS81/0302-1	21.04.13	7:49	OBS	on ground/ max depth	51° 20,57' S	54° 22,96' W	1557,8
PS81/0302-2	21.04.13	7:52	HN	in the water	51° 20,61' S	54° 22,89' W	1557,1
PS81/0302-2	21.04.13	7:53	HN	on ground/ max depth	51° 20,61' S	54° 22,89' W	1555,3
PS81/0302-2	21.04.13	7:53	HN	on deck	51° 20,61' S	54° 22,89' W	1555,3
PS81/0303-1	21.04.13	9:17	OBS	in the water	51° 19,73' S	54° 8,62' W	1650,3
PS81/0303-2	21.04.13	9:18	HN	in the water	51° 19,74' S	54° 8,62' W	1653,6
PS81/0303-1	21.04.13	9:18	OBS	on ground/ max depth	51° 19,74' S	54° 8,62' W	1653,6
PS81/0303-2	21.04.13	9:19	HN	on ground/ max depth	51° 19,74' S	54° 8,61' W	1651,9

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0303-2	21.04.13	9:20	HN	on deck	51° 19,75' S	54° 8,61' W	1653,2
PS81/0304-1	21.04.13	10:31	OBS	action	51° 19,93' S	53° 54,67' W	1735,7
PS81/0304-1	21.04.13	10:32	OBS	in the water	51° 19,78' S	53° 54,58' W	1732,6
PS81/0304-1	21.04.13	10:43	OBS	on ground/ max depth	51° 18,96' S	53° 54,14' W	1733,0
PS81/0304-2	21.04.13	10:44	HN	in the water	51° 18,95' S	53° 54,12' W	1733,9
PS81/0304-2	21.04.13	10:46	HN	on ground/ max depth	51° 18,95' S	53° 54,11' W	1729,6
PS81/0304-2	21.04.13	10:46	HN	on deck	51° 18,95' S	53° 54,11' W	1729,6
PS81/0305-1	21.04.13	12:06	OBS	in the water	51° 18,28' S	53° 39,97' W	1803,0
PS81/0305-1	21.04.13	12:06	OBS	on ground/ max depth	51° 18,28' S	53° 39,97' W	1803,0
PS81/0305-2	21.04.13	12:08	HN	in the water	51° 18,29' S	53° 39,99' W	1803,7
PS81/0305-2	21.04.13	12:09	HN	on ground/ max depth	51° 18,30' S	53° 40,02' W	1802,8
PS81/0305-2	21.04.13	12:10	HN	on deck	51° 18,30' S	53° 40,04' W	1802,0
PS81/0306-1	21.04.13	13:34	OBS	in the water	51° 17,58' S	53° 25,68' W	1850,7
PS81/0306-1	21.04.13	13:34	OBS	on ground/ max depth	51° 17,58' S	53° 25,68' W	1850,7
PS81/0306-2	21.04.13	13:36	HN	in the water	51° 17,63' S	53° 25,67' W	1848,7
PS81/0306-2	21.04.13	13:37	HN	on ground/ max depth	51° 17,64' S	53° 25,64' W	1846,8
PS81/0306-2	21.04.13	13:38	HN	on deck	51° 17,63' S	53° 25,61' W	1848,4
PS81/0307-1	21.04.13	14:58	OBS	in the water	51° 16,88' S	53° 11,37' W	1808,2
PS81/0307-1	21.04.13	14:58	OBS	on ground/ max depth	51° 16,88' S	53° 11,37' W	1808,2
PS81/0307-2	21.04.13	14:59	HN	in the water	51° 16,91' S	53° 11,36' W	1898,3
PS81/0307-2	21.04.13	15:01	HN	on ground/ max depth	51° 16,96' S	53° 11,37' W	1903,1
PS81/0307-2	21.04.13	15:02	HN	on deck	51° 16,98' S	53° 11,39' W	1904,3
PS81/0308-1	21.04.13	16:18	OBS	in the water	51° 16,15' S	52° 57,16' W	1942,8
PS81/0308-1	21.04.13	16:19	OBS	on ground/ max depth	51° 16,15' S	52° 57,16' W	1941,2
PS81/0308-2	21.04.13	16:20	HN	in the water	51° 16,15' S	52° 57,16' W	1939,7
PS81/0308-2	21.04.13	16:21	HN	on ground/ max depth	51° 16,14' S	52° 57,16' W	1943,3
PS81/0308-2	21.04.13	16:23	HN	on deck	51° 16,15' S	52° 57,16' W	1940,9
PS81/0308-3	21.04.13	16:28	SVP	in the water	51° 16,17' S	52° 57,14' W	1940,9
PS81/0308-3	21.04.13	17:05	SVP	on ground/ max depth	51° 16,10' S	52° 57,25' W	1948,2
PS81/0308-3	21.04.13	17:06	SVP	hoisting	51° 16,11' S	52° 57,26' W	1946,3
PS81/0308-3	21.04.13	17:42	SVP	on deck	51° 16,04' S	52° 57,35' W	1951,2
PS81/0309-1	21.04.13	19:05	OBS	in the water	51° 15,58' S	52° 42,74' W	2006,3
PS81/0309-1	21.04.13	19:05	OBS	on ground/ max depth	51° 15,58' S	52° 42,74' W	2006,3
PS81/0309-2	21.04.13	19:07	HN	in the water	51° 15,62' S	52° 42,74' W	2002,1
PS81/0309-2	21.04.13	19:08	HN	on ground/ max depth	51° 15,63' S	52° 42,73' W	2004,1
PS81/0309-2	21.04.13	19:10	HN	on deck	51° 15,63' S	52° 42,73' W	2002,8
PS81/0310-1	21.04.13	20:28	OBS	in the water	51° 14,75' S	52° 28,41' W	2035,8
PS81/0310-2	21.04.13	20:29	HN	in the water	51° 14,77' S	52° 28,40' W	2031,4

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0310-1	21.04.13	20:29	OBS	on ground/ max depth	51° 14,77' S	52° 28,40' W	2031,4
PS81/0310-2	21.04.13	20:30	HN	on ground/ max depth	51° 14,78' S	52° 28,41' W	2034,0
PS81/0310-2	21.04.13	20:31	HN	on deck	51° 14,78' S	52° 28,42' W	2034,2
PS81/0311-1	21.04.13	21:49	OBS	in the water	51° 14,02' S	52° 13,90' W	2050,3
PS81/0311-1	21.04.13	21:50	OBS	on ground/ max depth	51° 14,03' S	52° 13,88' W	2045,3
PS81/0311-2	21.04.13	21:52	HN	in the water	51° 14,05' S	52° 13,86' W	2045,7
PS81/0311-2	21.04.13	21:52	HN	on ground/ max depth	51° 14,05' S	52° 13,86' W	2045,7
PS81/0311-2	21.04.13	21:53	HN	on deck	51° 14,06' S	52° 13,88' W	2041,5
PS81/0312-1	22.04.13	13:07	MN	in the water	51° 28,59' S	55° 46,83' W	1020,2
PS81/0312-1	22.04.13	13:08	MN	on ground/ max depth	51° 28,56' S	55° 46,87' W	1016,7
PS81/0312-1	22.04.13	13:10	MN	on deck	51° 28,48' S	55° 46,98' W	1007,2
PS81/0312-2	22.04.13	13:32	SVP	in the water	51° 28,30' S	55° 47,09' W	1014,7
PS81/0312-2	22.04.13	13:54	SVP	on ground/ max depth	51° 28,39' S	55° 46,76' W	1011,5
PS81/0312-2	22.04.13	13:55	SVP	hoisting	51° 28,39' S	55° 46,71' W	1020,8
PS81/0312-2	22.04.13	13:56	SVP	action	51° 28,41' S	55° 46,69' W	1016,7
PS81/0312-2	22.04.13	14:12	SVP	on deck	51° 28,58' S	55° 46,31' W	1018,0
PS81/0313-1	23.04.13	14:45	OBS	in the water	51° 13,21' S	51° 59,83' W	2101,2
PS81/0313-1	23.04.13	14:45	OBS	on ground/ max depth	51° 13,21' S	51° 59,83' W	2101,2
PS81/0313-2	23.04.13	14:47	HN	in the water	51° 13,24' S	51° 59,77' W	2104,1
PS81/0313-2	23.04.13	14:47	HN	on ground/ max depth	51° 13,24' S	51° 59,77' W	2104,1
PS81/0313-2	23.04.13	14:49	HN	on deck	51° 13,27' S	51° 59,71' W	2103,7
PS81/0314-1	23.04.13	16:33	OBS	in the water	51° 12,51' S	51° 45,40' W	2145,0
PS81/0314-1	23.04.13	16:33	OBS	on ground/ max depth	51° 12,51' S	51° 45,40' W	2145,0
PS81/0314-2	23.04.13	16:36	HN	in the water	51° 12,52' S	51° 45,35' W	2147,6
PS81/0314-2	23.04.13	16:38	HN	on ground/ max depth	51° 12,53' S	51° 45,34' W	2148,6
PS81/0314-2	23.04.13	16:39	HN	on deck	51° 12,54' S	51° 45,32' W	2147,3
PS81/0315-1	23.04.13	18:08	OBS	in the water	51° 11,77' S	51° 31,05' W	2187,3
PS81/0315-1	23.04.13	18:08	OBS	on ground/ max depth	51° 11,77' S	51° 31,05' W	2187,3
PS81/0315-2	23.04.13	18:10	HN	in the water	51° 11,79' S	51° 31,02' W	2188,1
PS81/0315-2	23.04.13	18:11	HN	on ground/ max depth	51° 11,80' S	51° 31,01' W	2187,6
PS81/0315-2	23.04.13	18:13	HN	on deck	51° 11,82' S	51° 30,97' W	2191,5
PS81/0316-1	23.04.13	19:45	OBS	in the water	51° 10,99' S	51° 16,71' W	2279,9
PS81/0316-2	23.04.13	19:47	HN	in the water	51° 11,02' S	51° 16,67' W	2280,4
PS81/0316-1	23.04.13	19:47	OBS	on ground/ max depth	51° 11,02' S	51° 16,67' W	2280,4
PS81/0316-2	23.04.13	19:49	HN	on ground/ max depth	51° 11,06' S	51° 16,65' W	2281,2
PS81/0316-2	23.04.13	19:50	HN	on deck	51° 11,06' S	51° 16,67' W	2280,4
PS81/0317-1	23.04.13	21:22	OBS	on ground/ max depth	51° 10,24' S	51° 2,33' W	2398,0

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0317-2	23.04.13	21:24	HN	in the water	51° 10,22' S	51° 2,25' W	2402,2
PS81/0317-2	23.04.13	21:24	HN	on ground/ max depth	51° 10,22' S	51° 2,25' W	2402,2
PS81/0317-2	23.04.13	21:26	HN	on deck	51° 10,21' S	51° 2,26' W	2396,7
PS81/0318-1	23.04.13	22:48	OBS	in the water	51° 9,35' S	50° 48,19' W	2442,4
PS81/0318-1	23.04.13	22:52	OBS	on ground/ max depth	51° 9,35' S	50° 48,02' W	2442,2
PS81/0318-2	23.04.13	22:55	HN	in the water	51° 9,39' S	50° 47,94' W	2440,9
PS81/0318-2	23.04.13	22:55	HN	on ground/ max depth	51° 9,39' S	50° 47,94' W	2440,9
PS81/0318-2	23.04.13	22:57	HN	on deck	51° 9,38' S	50° 47,89' W	2443,4
PS81/0319-1	24.04.13	0:24	OBH	in the water	51° 8,72' S	50° 33,93' W	2535,0
PS81/0319-1	24.04.13	0:24	OBH	on ground/ max depth	51° 8,72' S	50° 33,93' W	2535,0
PS81/0319-2	24.04.13	0:26	HN	in the water	51° 8,73' S	50° 33,86' W	2538,1
PS81/0319-2	24.04.13	0:27	HN	on ground/ max depth	51° 8,73' S	50° 33,83' W	2534,4
PS81/0319-2	24.04.13	0:29	HN	on deck	51° 8,73' S	50° 33,76' W	2536,4
PS81/0320-1	24.04.13	1:50	OBS	in the water	51° 8,11' S	50° 19,79' W	2517,7
PS81/0320-1	24.04.13	1:50	OBS	on ground/ max depth	51° 8,11' S	50° 19,79' W	2517,7
PS81/0320-2	24.04.13	1:51	HN	in the water	51° 8,09' S	50° 19,76' W	2513,1
PS81/0320-2	24.04.13	1:53	HN	on ground/ max depth	51° 8,07' S	50° 19,69' W	2515,9
PS81/0320-2	24.04.13	1:57	HN	on deck	51° 8,08' S	50° 19,61' W	2518,4
PS81/0321-1	24.04.13	3:20	OBH	in the water	51° 7,29' S	50° 5,31' W	2495,0
PS81/0321-1	24.04.13	3:21	OBH	on ground/ max depth	51° 7,28' S	50° 5,29' W	2491,6
PS81/0321-2	24.04.13	3:22	HN	in the water	51° 7,28' S	50° 5,25' W	2490,1
PS81/0321-2	24.04.13	3:22	HN	on ground/ max depth	51° 7,28' S	50° 5,25' W	2490,1
PS81/0321-2	24.04.13	3:23	HN	on deck	51° 7,27' S	50° 5,23' W	2490,3
PS81/0322-1	24.04.13	5:04	OBS	in the water	51° 6,63' S	49° 51,09' W	2509,0
PS81/0322-1	24.04.13	5:10	OBS	on ground/ max depth	51° 6,57' S	49° 50,90' W	2506,8
PS81/0322-2	24.04.13	5:13	HN	in the water	51° 6,52' S	49° 50,77' W	2507,3
PS81/0322-2	24.04.13	5:14	HN	on ground/ max depth	51° 6,52' S	49° 50,77' W	2505,2
PS81/0322-2	24.04.13	5:15	HN	on deck	51° 6,52' S	49° 50,76' W	2508,8
PS81/0323-1	24.04.13	6:58	OBH	in the water	51° 5,81' S	49° 36,79' W	2595,0
PS81/0323-1	24.04.13	6:59	OBH	on ground/ max depth	51° 5,81' S	49° 36,78' W	2591,3
PS81/0323-2	24.04.13	7:00	HN	in the water	51° 5,81' S	49° 36,76' W	2596,8
PS81/0323-2	24.04.13	7:00	HN	on ground/ max depth	51° 5,81' S	49° 36,76' W	2596,8
PS81/0323-2	24.04.13	7:01	HN	on deck	51° 5,81' S	49° 36,76' W	2592,9
PS81/0324-1	24.04.13	8:24	OBS	in the water	51° 5,10' S	49° 22,60' W	2622,9
PS81/0324-1	24.04.13	8:25	OBS	on ground/ max depth	51° 5,10' S	49° 22,57' W	2620,0
PS81/0324-2	24.04.13	8:26	HN	in the water	51° 5,10' S	49° 22,55' W	2622,1
PS81/0324-2	24.04.13	8:27	HN	on ground/ max depth	51° 5,10' S	49° 22,55' W	2621,6

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0324-2	24.04.13	8:27	HN	on deck	51° 5,10' S	49° 22,55' W	2621,6
PS81/0325-1	24.04.13	9:55	OBS	action	51° 4,34' S	49° 8,37' W	2671,6
PS81/0325-1	24.04.13	9:56	OBS	in the water	51° 4,34' S	49° 8,36' W	2672,2
PS81/0325-1	24.04.13	9:56	OBS	on ground/ max depth	51° 4,34' S	49° 8,36' W	2672,2
PS81/0325-2	24.04.13	9:57	HN	in the water	51° 4,34' S	49° 8,35' W	2671,6
PS81/0325-2	24.04.13	9:57	HN	on ground/ max depth	51° 4,34' S	49° 8,35' W	2671,6
PS81/0325-2	24.04.13	10:00	HN	on deck	51° 4,35' S	49° 8,32' W	2672,4
PS81/0326-1	24.04.13	11:35	OBS	in the water	51° 3,73' S	48° 54,12' W	2727,1
PS81/0326-1	24.04.13	11:35	OBS	on ground/ max depth	51° 3,73' S	48° 54,12' W	2727,1
PS81/0326-2	24.04.13	11:38	HN	in the water	51° 3,72' S	48° 54,12' W	2728,4
PS81/0326-2	24.04.13	11:38	HN	on ground/ max depth	51° 3,72' S	48° 54,12' W	2728,4
PS81/0326-2	24.04.13	11:41	HN	on deck	51° 3,72' S	48° 54,11' W	2726,2
PS81/0327-1	24.04.13	13:07	OBH	in the water	51° 2,99' S	48° 39,92' W	2716,8
PS81/0327-1	24.04.13	13:08	OBH	on ground/ max depth	51° 2,99' S	48° 39,91' W	2713,8
PS81/0327-2	24.04.13	13:10	HN	in the water	51° 3,07' S	48° 39,91' W	2712,0
PS81/0327-2	24.04.13	13:11	HN	on ground/ max depth	51° 3,09' S	48° 39,93' W	2713,2
PS81/0327-2	24.04.13	13:13	HN	on deck	51° 3,11' S	48° 39,95' W	2705,1
PS81/0328-1	24.04.13	15:00	OBS	in the water	51° 2,12' S	48° 25,59' W	2699,1
PS81/0328-1	24.04.13	15:01	OBS	on ground/ max depth	51° 2,12' S	48° 25,57' W	2700,6
PS81/0328-2	24.04.13	15:04	HN	in the water	51° 2,17' S	48° 25,58' W	2700,6
PS81/0328-2	24.04.13	15:05	HN	on ground/ max depth	51° 2,16' S	48° 25,58' W	2698,3
PS81/0328-2	24.04.13	15:06	HN	on deck	51° 2,16' S	48° 25,57' W	2699,0
PS81/0329-1	24.04.13	16:30	OBH	in the water	51° 1,44' S	48° 11,28' W	2680,4
PS81/0329-1	24.04.13	16:30	OBH	on ground/ max depth	51° 1,44' S	48° 11,28' W	2680,4
PS81/0329-2	24.04.13	16:31	HN	in the water	51° 1,43' S	48° 11,26' W	2678,0
PS81/0329-2	24.04.13	16:32	HN	on ground/ max depth	51° 1,43' S	48° 11,27' W	2680,3
PS81/0329-2	24.04.13	16:33	HN	on deck	51° 1,43' S	48° 11,27' W	2678,9
PS81/0330-1	24.04.13	17:59	OBS	in the water	51° 0,68' S	47° 57,03' W	2677,4
PS81/0330-1	24.04.13	17:59	OBS	on ground/ max depth	51° 0,68' S	47° 57,03' W	2677,4
PS81/0330-2	24.04.13	18:01	HN	in the water	51° 0,64' S	47° 57,01' W	2676,0
PS81/0330-2	24.04.13	18:02	HN	on ground/ max depth	51° 0,62' S	47° 57,00' W	2675,2
PS81/0330-2	24.04.13	18:03	HN	on deck	51° 0,61' S	47° 56,99' W	2673,6
PS81/0331-1	24.04.13	18:25	SEISREFR	in the water	51° 0,64' S	47° 55,36' W	2667,9
PS81/0331-1	24.04.13	18:27	SEISREFR	in the water	51° 0,66' S	47° 55,48' W	2665,8
PS81/0331-1	24.04.13	18:39	SEISREFR	in the water	51° 0,72' S	47° 56,18' W	2666,1
PS81/0331-1	24.04.13	18:43	SEISREFR	in the water	51° 0,73' S	47° 56,41' W	2668,6
PS81/0331-1	24.04.13	18:45	SEISREFR	action	51° 0,74' S	47° 56,54' W	2669,6
PS81/0331-1	24.04.13	19:14	SEISREFR	profile start	51° 0,88' S	47° 59,08' W	2675,3
PS81/0331-1	27.04.13	11:36	SEISREFR	profile end	51° 27,79' S	56° 46,58' W	432,0

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0331-1	27.04.13	11:40	SEISREFR	hoisting	51° 27,81' S	56° 47,09' W	429,3
PS81/0331-1	27.04.13	11:52	SEISREFR	on deck	51° 27,83' S	56° 47,84' W	419,6
PS81/0331-1	27.04.13	12:06	SEISREFR	on deck	51° 27,86' S	56° 48,50' W	415,8
PS81/0332-1	27.04.13	12:42	OBS	in the water	51° 27,67' S	56° 46,59' W	432,4
PS81/0332-1	27.04.13	12:42	OBS	on ground/ max depth	51° 27,67' S	56° 46,59' W	432,4
PS81/0332-1	27.04.13	12:45	OBS	information	51° 27,65' S	56° 46,59' W	432,5
PS81/0332-1	27.04.13	12:53	OBS	information	51° 27,59' S	56° 46,59' W	432,2
PS81/0332-1	27.04.13	12:54	OBS	at surface	51° 27,58' S	56° 46,59' W	433,1
PS81/0332-1	27.04.13	12:54	OBS	on deck	51° 27,58' S	56° 46,59' W	433,1
PS81/0333-1	27.04.13	14:18	OBS	in the water	51° 26,88' S	56° 32,44' W	522,7
PS81/0333-1	27.04.13	14:18	OBS	on ground/ max depth	51° 26,88' S	56° 32,44' W	522,7
PS81/0333-1	27.04.13	14:19	OBS	information	51° 26,87' S	56° 32,45' W	523,3
PS81/0333-1	27.04.13	14:25	OBS	at surface	51° 26,86' S	56° 32,44' W	522,9
PS81/0333-1	27.04.13	14:27	OBS	on deck	51° 26,84' S	56° 32,44' W	522,9
PS81/0333-1	27.04.13	14:38	OBS	on deck	51° 26,92' S	56° 32,38' W	522,8
PS81/0333-2	27.04.13	14:47	MN	in the water	51° 26,81' S	56° 32,31' W	523,6
PS81/0333-2	27.04.13	14:59	MN	on ground/ max depth	51° 26,74' S	56° 32,15' W	524,7
PS81/0333-2	27.04.13	14:59	MN	hoisting	51° 26,74' S	56° 32,15' W	524,7
PS81/0333-2	27.04.13	15:16	MN	on deck	51° 26,75' S	56° 32,09' W	523,7
PS81/0334-1	27.04.13	17:48	OBS	on ground/ max depth	51° 28,45' S	57° 1,36' W	316,1
PS81/0334-1	27.04.13	17:48	OBS	in the water	51° 28,45' S	57° 1,36' W	316,1
PS81/0334-1	27.04.13	17:49	OBS	action	51° 28,44' S	57° 1,37' W	316,3
PS81/0334-1	27.04.13	17:49	OBS	on deck	51° 28,44' S	57° 1,37' W	316,3
PS81/0334-1	27.04.13	17:53	OBS	at surface	51° 28,38' S	57° 1,42' W	315,7
PS81/0334-1	27.04.13	18:05	OBS	action	51° 28,28' S	57° 1,33' W	315,4
PS81/0334-2	27.04.13	18:06	MN	in the water	51° 28,25' S	57° 1,35' W	314,6
PS81/0334-1	27.04.13	18:06	OBS	on deck	51° 28,25' S	57° 1,35' W	314,6
PS81/0334-2	27.04.13	18:21	MN	on ground/ max depth	51° 28,09' S	57° 1,35' W	313,1
PS81/0334-2	27.04.13	18:21	MN	hoisting	51° 28,09' S	57° 1,35' W	313,1
PS81/0334-2	27.04.13	18:36	MN	on deck	51° 27,95' S	57° 1,42' W	312,5
PS81/0335-1	27.04.13	21:59	OBS	in the water	51° 26,14' S	56° 17,82' W	696,0
PS81/0335-1	27.04.13	22:00	OBS	on ground/ max depth	51° 26,15' S	56° 17,82' W	697,8
PS81/0335-1	27.04.13	22:17	OBS	on deck	51° 26,19' S	56° 17,90' W	696,7
PS81/0336-1	27.04.13	23:37	OBS	in the water	51° 25,39' S	56° 3,86' W	826,3
PS81/0336-1	27.04.13	23:37	OBS	on ground/ max depth	51° 25,39' S	56° 3,86' W	826,3
PS81/0336-1	27.04.13	23:41	OBS	information	51° 25,38' S	56° 3,89' W	826,2
PS81/0336-1	27.04.13	23:49	OBS	on deck	51° 25,38' S	56° 3,88' W	825,8
PS81/0336-1	27.04.13	23:50	OBS	at surface	51° 25,38' S	56° 3,88' W	825,4
PS81/0336-1	28.04.13	0:05	OBS	on deck	51° 25,25' S	56° 3,70' W	823,0
PS81/0336-2	28.04.13	0:10	MN	in the water	51° 25,24' S	56° 3,72' W	823,0
PS81/0336-2	28.04.13	0:21	MN	on ground/ max depth	51° 25,17' S	56° 3,76' W	821,6
PS81/0336-2	28.04.13	0:21	MN	hoisting	51° 25,17' S	56° 3,76' W	821,6
PS81/0336-2	28.04.13	0:36	MN	on deck	51° 25,00' S	56° 3,86' W	818,1

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0337-1	28.04.13	1:45	OBS	in the water	51° 24,71' S	55° 49,59' W	1002,3
PS81/0337-1	28.04.13	1:46	OBS	on ground/ max depth	51° 24,70' S	55° 49,60' W	1002,9
PS81/0337-1	28.04.13	1:48	OBS	information	51° 24,69' S	55° 49,61' W	1001,8
PS81/0337-1	28.04.13	2:00	OBS	information	51° 24,67' S	55° 49,65' W	1001,8
PS81/0337-1	28.04.13	2:03	OBS	at surface	51° 24,68' S	55° 49,62' W	1002,2
PS81/0337-1	28.04.13	2:03	OBS	on deck	51° 24,68' S	55° 49,62' W	1002,2
PS81/0337-1	28.04.13	2:24	OBS	on deck	51° 25,07' S	55° 49,07' W	1005,4
PS81/0338-1	28.04.13	3:45	OBS	on ground/ max depth	51° 24,36' S	55° 34,86' W	1083,6
PS81/0338-1	28.04.13	3:47	OBS	in the water	51° 24,36' S	55° 34,85' W	1083,8
PS81/0338-1	28.04.13	3:49	OBS	action	51° 24,36' S	55° 34,84' W	1082,6
PS81/0338-1	28.04.13	3:56	OBS	on deck	51° 24,32' S	55° 34,84' W	1082,9
PS81/0338-1	28.04.13	4:02	OBS	at surface	51° 24,35' S	55° 34,81' W	1085,1
PS81/0338-1	28.04.13	4:15	OBS	action	51° 24,26' S	55° 34,86' W	1081,4
PS81/0338-1	28.04.13	4:17	OBS	on deck	51° 24,25' S	55° 34,85' W	1081,9
PS81/0338-2	28.04.13	4:22	MN	in the water	51° 24,24' S	55° 34,82' W	1083,5
PS81/0338-2	28.04.13	4:32	MN	on ground/ max depth	51° 24,29' S	55° 34,80' W	1081,7
PS81/0338-2	28.04.13	4:32	MN	hoisting	51° 24,29' S	55° 34,80' W	1081,7
PS81/0338-2	28.04.13	4:49	MN	on deck	51° 24,30' S	55° 34,83' W	1080,6
PS81/0339-1	28.04.13	6:08	OBS	on ground/ max depth	51° 23,60' S	55° 20,46' W	1217,9
PS81/0339-1	28.04.13	6:08	OBS	in the water	51° 23,60' S	55° 20,46' W	1217,9
PS81/0339-1	28.04.13	6:11	OBS	action	51° 23,61' S	55° 20,45' W	1217,7
PS81/0339-1	28.04.13	6:18	OBS	on deck	51° 23,62' S	55° 20,43' W	1217,7
PS81/0339-1	28.04.13	6:26	OBS	at surface	51° 23,55' S	55° 20,43' W	1217,7
PS81/0339-1	28.04.13	6:38	OBS	action	51° 23,41' S	55° 20,64' W	1218,4
PS81/0339-1	28.04.13	6:39	OBS	on deck	51° 23,40' S	55° 20,64' W	1218,8
PS81/0340-1	28.04.13	8:01	OBS	on ground/ max depth	51° 22,82' S	55° 5,90' W	1259,5
PS81/0340-1	28.04.13	8:01	OBS	action	51° 22,82' S	55° 5,90' W	1259,5
PS81/0340-1	28.04.13	8:19	OBS	at surface	51° 22,78' S	55° 5,99' W	1256,8
PS81/0340-1	28.04.13	8:34	OBS	on deck	51° 22,51' S	55° 6,12' W	1259,6
PS81/0340-2	28.04.13	8:38	MN	in the water	51° 22,50' S	55° 6,11' W	1259,3
PS81/0340-2	28.04.13	8:50	MN	on ground/ max depth	51° 22,49' S	55° 6,04' W	1260,5
PS81/0340-2	28.04.13	9:06	MN	on deck	51° 22,62' S	55° 6,05' W	1258,3
PS81/0341-1	28.04.13	10:22	OBS	on ground/ max depth	51° 22,11' S	54° 51,42' W	1357,9
PS81/0341-1	28.04.13	10:22	OBS	action	51° 22,11' S	54° 51,42' W	1357,9
PS81/0341-1	28.04.13	10:40	OBS	at surface	51° 22,04' S	54° 51,40' W	1359,5
PS81/0341-1	28.04.13	10:51	OBS	on deck	51° 21,86' S	54° 51,85' W	1358,0
PS81/0342-1	28.04.13	12:10	OBS	in the water	51° 21,46' S	54° 37,15' W	1455,2
PS81/0342-1	28.04.13	12:10	OBS	on ground/ max depth	51° 21,46' S	54° 37,15' W	1455,2
PS81/0342-1	28.04.13	12:12	OBS	information	51° 21,44' S	54° 37,16' W	1455,8
PS81/0342-1	28.04.13	12:18	OBS	on deck	51° 21,40' S	54° 37,18' W	0,0
PS81/0342-1	28.04.13	12:32	OBS	at surface	51° 21,39' S	54° 37,08' W	1457,3
PS81/0342-1	28.04.13	12:45	OBS	on deck	51° 21,07' S	54° 37,28' W	1454,7

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0343-1	28.04.13	17:06	OBS	on ground/ max depth	51° 20,84' S	54° 23,00' W	1546,9
PS81/0343-1	28.04.13	17:11	OBS	in the water	51° 20,82' S	54° 23,02' W	1547,0
PS81/0343-1	28.04.13	17:13	OBS	action	51° 20,80' S	54° 23,02' W	1549,2
PS81/0343-1	28.04.13	17:17	OBS	on deck	51° 20,80' S	54° 23,03' W	1549,2
PS81/0343-1	28.04.13	17:35	OBS	at surface	51° 20,79' S	54° 23,03' W	1549,4
PS81/0343-1	28.04.13	17:49	OBS	action	51° 20,32' S	54° 22,63' W	1540,9
PS81/0343-1	28.04.13	17:50	OBS	on deck	51° 20,31' S	54° 22,62' W	1541,4
PS81/0344-1	28.04.13	19:18	OBS	on ground/ max depth	51° 19,96' S	54° 8,60' W	1648,0
PS81/0344-1	28.04.13	19:20	OBS	action	51° 19,93' S	54° 8,56' W	1647,2
PS81/0344-1	28.04.13	19:47	OBS	at surface	51° 19,96' S	54° 8,52' W	1649,1
PS81/0344-1	28.04.13	20:06	OBS	on deck	51° 19,25' S	54° 7,84' W	1643,3
PS81/0344-2	28.04.13	20:12	MN	in the water	51° 19,23' S	54° 7,80' W	1640,7
PS81/0344-2	28.04.13	20:22	MN	on ground/ max depth	51° 19,14' S	54° 7,74' W	1641,3
PS81/0344-2	28.04.13	20:38	MN	on deck	51° 19,10' S	54° 7,63' W	1641,3
PS81/0345-1	28.04.13	21:49	OBS	on ground/ max depth	51° 18,97' S	53° 54,13' W	1725,1
PS81/0345-1	28.04.13	21:50	OBS	information	51° 18,97' S	53° 54,13' W	1723,2
PS81/0345-1	28.04.13	22:15	OBS	at surface	51° 19,04' S	53° 54,13' W	1724,2
PS81/0345-1	28.04.13	22:35	OBS	on deck	51° 18,23' S	53° 53,77' W	1730,6
PS81/0346-1	28.04.13	23:52	OBS	in the water	51° 18,53' S	53° 40,09' W	1782,3
PS81/0346-1	28.04.13	23:52	OBS	on ground/ max depth	51° 18,53' S	53° 40,09' W	1782,3
PS81/0346-1	28.04.13	23:53	OBS	information	51° 18,53' S	53° 40,07' W	1783,3
PS81/0346-1	29.04.13	0:02	OBS	on deck	51° 18,44' S	53° 40,10' W	1829,8
PS81/0346-1	29.04.13	0:17	OBS	at surface	51° 18,35' S	53° 40,13' W	1790,2
PS81/0346-1	29.04.13	0:37	OBS	on deck	51° 18,22' S	53° 39,76' W	1798,9
PS81/0347-1	29.04.13	2:00	OBS	in the water	51° 17,78' S	53° 25,78' W	1852,3
PS81/0347-1	29.04.13	2:00	OBS	on ground/ max depth	51° 17,78' S	53° 25,78' W	1852,3
PS81/0347-1	29.04.13	2:02	OBS	information	51° 17,79' S	53° 25,78' W	1848,2
PS81/0347-1	29.04.13	2:20	OBS	on deck	51° 17,79' S	53° 25,73' W	0,0
PS81/0347-1	29.04.13	2:27	OBS	at surface	51° 17,77' S	53° 25,74' W	1845,3
PS81/0347-1	29.04.13	2:35	OBS	on deck	51° 17,86' S	53° 25,61' W	1843,5
PS81/0348-1	29.04.13	4:03	OBS	on ground/ max depth	51° 17,12' S	53° 11,44' W	1894,3
PS81/0348-1	29.04.13	4:04	OBS	in the water	51° 17,13' S	53° 11,43' W	1895,2
PS81/0348-1	29.04.13	4:05	OBS	action	51° 17,14' S	53° 11,42' W	1894,4
PS81/0348-1	29.04.13	4:09	OBS	on deck	51° 17,18' S	53° 11,39' W	1894,1
PS81/0348-1	29.04.13	4:14	OBS	in the water	51° 17,17' S	53° 11,38' W	1892,6
PS81/0348-1	29.04.13	4:16	OBS	on deck	51° 17,17' S	53° 11,38' W	1893,0
PS81/0348-1	29.04.13	4:29	OBS	at surface	51° 17,09' S	53° 11,39' W	1895,2
PS81/0348-1	29.04.13	4:45	OBS	action	51° 17,29' S	53° 11,40' W	1891,6
PS81/0348-1	29.04.13	4:47	OBS	on deck	51° 17,31' S	53° 11,35' W	1890,0
PS81/0348-2	29.04.13	4:51	MN	in the water	51° 17,38' S	53° 11,31' W	1887,0
PS81/0348-2	29.04.13	5:00	MN	on ground/ max depth	51° 17,48' S	53° 11,28' W	1886,2
PS81/0348-2	29.04.13	5:01	MN	hoisting	51° 17,49' S	53° 11,28' W	1885,7
PS81/0348-2	29.04.13	5:18	MN	on deck	51° 17,73' S	53° 11,34' W	1893,2

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0349-1	29.04.13	6:56	OBS	on ground/ max depth	51° 16,41' S	52° 57,23' W	1942,4
PS81/0349-1	29.04.13	6:56	OBS	in the water	51° 16,41' S	52° 57,23' W	1942,4
PS81/0349-1	29.04.13	6:57	OBS	action	51° 16,42' S	52° 57,23' W	1943,2
PS81/0349-1	29.04.13	7:25	OBS	at surface	51° 16,27' S	52° 56,93' W	1942,8
PS81/0349-1	29.04.13	7:39	OBS	on deck	51° 16,19' S	52° 57,21' W	1938,7
PS81/0350-1	29.04.13	8:56	OBS	on ground/ max depth	51° 15,78' S	52° 42,99' W	1988,4
PS81/0350-1	29.04.13	9:29	OBS	at surface	51° 15,77' S	52° 42,82' W	1990,2
PS81/0350-1	29.04.13	9:46	OBS	on deck	51° 15,26' S	52° 42,54' W	2013,1
PS81/0351-1	29.04.13	11:04	OBS	in the water	51° 14,89' S	52° 28,42' W	2026,6
PS81/0351-1	29.04.13	11:04	OBS	on ground/ max depth	51° 14,89' S	52° 28,42' W	2026,6
PS81/0351-1	29.04.13	11:06	OBS	information	51° 14,88' S	52° 28,43' W	2027,5
PS81/0351-1	29.04.13	11:43	OBS	on deck	51° 14,86' S	52° 28,54' W	2028,3
PS81/0351-1	29.04.13	11:58	OBS	in the water	51° 14,86' S	52° 28,62' W	2029,9
PS81/0351-1	29.04.13	12:17	OBS	at surface	51° 14,89' S	52° 28,63' W	0,0
PS81/0351-1	29.04.13	12:17	OBS	on deck	51° 14,89' S	52° 28,63' W	0,0
PS81/0351-1	29.04.13	12:52	OBS	on deck	51° 13,75' S	52° 28,58' W	2053,2
PS81/0352-1	29.04.13	14:17	OBS	in the water	51° 14,05' S	52° 13,76' W	2037,7
PS81/0352-1	29.04.13	14:17	OBS	on ground/ max depth	51° 14,05' S	52° 13,76' W	2037,7
PS81/0352-1	29.04.13	14:21	OBS	information	51° 14,01' S	52° 13,83' W	2042,8
PS81/0352-1	29.04.13	14:27	OBS	on deck	51° 14,00' S	52° 13,85' W	2052,9
PS81/0352-1	29.04.13	14:52	OBS	at surface	51° 13,97' S	52° 13,69' W	2041,4
PS81/0352-1	29.04.13	15:23	OBS	action	51° 12,70' S	52° 13,85' W	2049,4
PS81/0352-1	29.04.13	15:28	OBS	on deck	51° 12,61' S	52° 13,83' W	2046,4
PS81/0353-1	29.04.13	16:54	OBS	on ground/ max depth	51° 13,49' S	51° 59,52' W	2108,9
PS81/0353-1	29.04.13	16:55	OBS	in the water	51° 13,46' S	51° 59,57' W	2111,1
PS81/0353-1	29.04.13	16:58	OBS	action	51° 13,44' S	51° 59,59' W	2110,6
PS81/0353-1	29.04.13	17:08	OBS	on deck	51° 13,46' S	51° 59,52' W	0,0
PS81/0353-1	29.04.13	17:28	OBS	at surface	51° 13,42' S	51° 59,60' W	2110,1
PS81/0353-1	29.04.13	17:46	OBS	action	51° 12,44' S	51° 59,64' W	2090,6
PS81/0353-1	29.04.13	17:48	OBS	on deck	51° 12,39' S	51° 59,65' W	2089,8
PS81/0354-1	29.04.13	19:16	OBS	on ground/ max depth	51° 12,55' S	51° 45,50' W	2149,8
PS81/0354-1	29.04.13	19:26	OBS	action	51° 12,55' S	51° 45,44' W	2147,7
PS81/0354-1	29.04.13	19:53	OBS	at surface	51° 12,69' S	51° 45,43' W	0,0
PS81/0354-1	29.04.13	20:19	OBS	on deck	51° 13,18' S	51° 44,12' W	2149,3
PS81/0355-1	29.04.13	21:46	OBS	on ground/ max depth	51° 11,87' S	51° 31,20' W	2184,8
PS81/0355-1	29.04.13	21:56	OBS	information	51° 11,89' S	51° 31,18' W	2183,7
PS81/0355-1	29.04.13	22:29	OBS	action	51° 12,01' S	51° 31,11' W	2186,3
PS81/0355-1	29.04.13	22:32	OBS	information	51° 12,04' S	51° 31,11' W	2188,1
PS81/0355-1	29.04.13	23:02	OBS	on deck	51° 12,20' S	51° 31,23' W	0,0
PS81/0355-1	29.04.13	23:05	OBS	at surface	51° 12,28' S	51° 31,40' W	0,0
PS81/0355-1	29.04.13	23:42	OBS	on deck	51° 13,10' S	51° 29,66' W	2197,7
PS81/0356-1	30.04.13	1:05	OBS	in the water	51° 11,10' S	51° 16,46' W	2277,8
PS81/0356-1	30.04.13	1:06	OBS	on ground/ max depth	51° 11,11' S	51° 16,48' W	2277,6

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0356-1	30.04.13	1:08	OBS	information	51° 11,13' S	51° 16,49' W	2277,6
PS81/0356-1	30.04.13	1:45	OBS	at surface	51° 11,14' S	51° 16,42' W	0,0
PS81/0356-1	30.04.13	1:45	OBS	on deck	51° 11,14' S	51° 16,42' W	0,0
PS81/0356-1	30.04.13	2:09	OBS	on deck	51° 11,78' S	51° 15,97' W	2280,3
PS81/0356-2	30.04.13	2:16	MN	in the water	51° 11,83' S	51° 15,99' W	2279,4
PS81/0356-2	30.04.13	2:27	MN	on ground/ max depth	51° 11,78' S	51° 16,12' W	2276,4
PS81/0356-2	30.04.13	2:27	MN	hoisting	51° 11,78' S	51° 16,12' W	2276,4
PS81/0356-2	30.04.13	2:44	MN	on deck	51° 11,75' S	51° 16,30' W	2273,8
PS81/0357-1	30.04.13	4:10	OBS	on ground/ max depth	51° 10,55' S	51° 2,50' W	2391,6
PS81/0357-1	30.04.13	4:10	OBS	in the water	51° 10,55' S	51° 2,50' W	2391,6
PS81/0357-1	30.04.13	4:12	OBS	action	51° 10,56' S	51° 2,54' W	2394,4
PS81/0357-1	30.04.13	4:20	OBS	on deck	51° 10,65' S	51° 2,59' W	2385,0
PS81/0357-1	30.04.13	4:43	OBS	at surface	51° 10,68' S	51° 2,47' W	2376,8
PS81/0357-1	30.04.13	5:08	OBS	action	51° 10,35' S	51° 1,80' W	2368,8
PS81/0357-1	30.04.13	5:10	OBS	on deck	51° 10,36' S	51° 1,77' W	2366,2
PS81/0358-1	30.04.13	6:29	OBS	on ground/ max depth	51° 9,58' S	50° 47,99' W	2441,6
PS81/0358-1	30.04.13	6:29	OBS	in the water	51° 9,58' S	50° 47,99' W	2441,6
PS81/0358-1	30.04.13	6:31	OBS	action	51° 9,58' S	50° 48,04' W	2441,6
PS81/0358-1	30.04.13	6:44	OBS	on deck	51° 9,68' S	50° 48,17' W	2439,6
PS81/0358-1	30.04.13	7:20	OBS	in the water	51° 9,52' S	50° 48,42' W	2436,6
PS81/0358-1	30.04.13	7:34	OBS	in the water	51° 9,50' S	50° 48,46' W	0,0
PS81/0358-1	30.04.13	7:47	OBS	in the water	51° 9,55' S	50° 48,47' W	0,0
PS81/0358-1	30.04.13	7:59	OBS	on ground/ max depth	51° 9,62' S	50° 48,34' W	2436,0
PS81/0359-1	30.04.13	9:27	OBS	on ground/ max depth	51° 8,95' S	50° 33,63' W	2531,4
PS81/0359-1	30.04.13	10:18	OBS	at surface	51° 8,92' S	50° 33,98' W	2527,6
PS81/0359-1	30.04.13	10:34	OBS	on deck	51° 8,66' S	50° 34,42' W	2527,2
PS81/0360-1	30.04.13	11:56	OBS	in the water	51° 8,18' S	50° 19,42' W	2518,1
PS81/0360-1	30.04.13	11:56	OBS	on ground/ max depth	51° 8,18' S	50° 19,42' W	2518,1
PS81/0360-1	30.04.13	11:57	OBS	information	51° 8,18' S	50° 19,43' W	2515,5
PS81/0360-1	30.04.13	12:36	OBS	on deck	51° 8,25' S	50° 19,64' W	0,0
PS81/0360-1	30.04.13	12:37	OBS	at surface	51° 8,25' S	50° 19,64' W	0,0
PS81/0360-1	30.04.13	12:51	OBS	on deck	51° 7,90' S	50° 19,85' W	2518,5
PS81/0361-1	30.04.13	14:11	OBH	in the water	51° 7,42' S	50° 5,01' W	2481,4
PS81/0361-1	30.04.13	14:12	OBH	on ground/ max depth	51° 7,42' S	50° 5,02' W	2480,5
PS81/0361-1	30.04.13	14:12	OBH	information	51° 7,42' S	50° 5,02' W	2480,5
PS81/0361-1	30.04.13	14:49	OBH	on deck	51° 7,40' S	50° 5,18' W	0,0
PS81/0361-1	30.04.13	14:55	OBH	at surface	51° 7,40' S	50° 5,16' W	2477,3
PS81/0361-1	30.04.13	15:06	OBH	action	51° 7,21' S	50° 5,42' W	2499,2
PS81/0361-1	30.04.13	15:07	OBH	on deck	51° 7,21' S	50° 5,42' W	2501,0
PS81/0362-1	30.04.13	16:33	OBS	on ground/ max depth	51° 6,80' S	49° 50,89' W	2495,5
PS81/0362-1	30.04.13	16:33	OBS	in the water	51° 6,80' S	49° 50,89' W	2495,5
PS81/0362-1	30.04.13	16:33	OBS	on ground/ max depth	51° 6,80' S	49° 50,89' W	2495,5

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0362-1	30.04.13	16:36	OBS	action	51° 6,79' S	49° 50,90' W	2501,6
PS81/0362-1	30.04.13	16:45	OBS	on deck	51° 6,78' S	49° 50,88' W	0,0
PS81/0362-1	30.04.13	16:47	OBS	in the water	51° 6,78' S	49° 50,90' W	0,0
PS81/0362-1	30.04.13	17:15	OBS	on deck	51° 6,80' S	49° 50,87' W	2501,8
PS81/0362-1	30.04.13	17:22	OBS	at surface	51° 6,79' S	49° 50,85' W	2502,4
PS81/0362-1	30.04.13	17:38	OBS	action	51° 6,20' S	49° 51,38' W	2507,7
PS81/0362-1	30.04.13	17:40	OBS	on deck	51° 6,17' S	49° 51,37' W	2507,3
				on ground/ max depth			
PS81/0363-1	30.04.13	19:05	OBH		51° 6,07' S	49° 36,73' W	2594,3
PS81/0363-1	30.04.13	19:06	OBH	action	51° 6,06' S	49° 36,76' W	2591,9
PS81/0363-1	30.04.13	20:45	OBH	on deck	51° 5,40' S	49° 38,24' W	2583,9
				on ground/ max depth			
PS81/0364-1	30.04.13	22:10	OBS		51° 5,20' S	49° 22,49' W	2622,5
PS81/0364-1	30.04.13	22:52	OBS	at surface	51° 5,31' S	49° 22,68' W	0,0
PS81/0364-1	30.04.13	23:13	OBS	on deck	51° 4,65' S	49° 23,96' W	2623,0
PS81/0364-2	30.04.13	23:19	MN	in the water	51° 4,52' S	49° 24,07' W	2627,7
				on ground/ max depth			
PS81/0364-2	30.04.13	23:30	MN		51° 4,48' S	49° 24,29' W	2629,7
PS81/0364-2	30.04.13	23:30	MN	hoisting	51° 4,48' S	49° 24,29' W	2629,7
PS81/0364-2	30.04.13	23:46	MN	on deck	51° 4,44' S	49° 24,65' W	2634,1
				on ground/ max depth			
PS81/0365-1	01.05.13	1:21	OBS		51° 0,71' S	49° 9,12' W	2710,3
PS81/0365-1	01.05.13	1:21	OBS	on deck	51° 0,71' S	49° 9,12' W	2710,3
PS81/0366-1	01.05.13	2:02	OBH	in the water	51° 4,41' S	49° 8,02' W	2671,7
				on ground/ max depth			
PS81/0366-1	01.05.13	2:02	OBH		51° 4,41' S	49° 8,02' W	2671,7
PS81/0366-1	01.05.13	2:03	OBH	information	51° 4,40' S	49° 8,06' W	2672,0
PS81/0366-1	01.05.13	2:07	OBH	on deck	51° 4,41' S	49° 8,16' W	2672,0
PS81/0366-1	01.05.13	2:42	OBH	at surface	51° 4,27' S	49° 8,16' W	2673,6
PS81/0366-1	01.05.13	3:07	OBH	action	51° 3,72' S	49° 10,05' W	2675,7
PS81/0366-1	01.05.13	3:08	OBH	on deck	51° 3,69' S	49° 10,05' W	2674,9
				on ground/ max depth			
PS81/0367-1	01.05.13	5:38	OBH		51° 3,01' S	48° 39,59' W	2722,8
PS81/0367-1	01.05.13	5:39	OBH	in the water	51° 3,01' S	48° 39,62' W	2720,7
PS81/0367-1	01.05.13	5:42	OBH	action	51° 3,01' S	48° 39,64' W	2720,4
PS81/0367-1	01.05.13	5:47	OBH	on deck	51° 3,02' S	48° 39,57' W	0,0
PS81/0367-1	01.05.13	6:10	OBH	in the water	51° 3,05' S	48° 39,54' W	2722,2
PS81/0367-1	01.05.13	6:13	OBH	on deck	51° 3,05' S	48° 39,49' W	2725,5
PS81/0367-1	01.05.13	6:39	OBH	at surface	51° 3,06' S	48° 39,63' W	2720,7
PS81/0367-1	01.05.13	7:12	OBH	on deck	51° 2,27' S	48° 42,23' W	2724,1
				on ground/ max depth			
PS81/0368-1	01.05.13	8:41	OBS		51° 2,26' S	48° 25,38' W	2699,6
PS81/0368-1	01.05.13	8:42	OBS	action	51° 2,27' S	48° 25,39' W	2699,6
PS81/0368-1	01.05.13	9:25	OBS	at surface	51° 2,46' S	48° 25,29' W	0,0
PS81/0368-1	01.05.13	9:56	OBS	on deck	51° 1,89' S	48° 27,28' W	2702,1
PS81/0369-1	01.05.13	11:19	OBH	in the water	51° 1,50' S	48° 10,86' W	2691,8
				on ground/ max depth			
PS81/0369-1	01.05.13	11:19	OBH		51° 1,50' S	48° 10,86' W	2691,8
PS81/0369-1	01.05.13	11:20	OBH	information	51° 1,51' S	48° 10,89' W	2691,4
PS81/0369-1	01.05.13	11:24	OBH	on deck	51° 1,53' S	48° 10,97' W	2689,3
PS81/0369-1	01.05.13	11:58	OBH	at surface	51° 1,59' S	48° 11,18' W	2679,9

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0369-1	01.05.13	12:18	OBH	on deck	51° 1,08' S	48° 12,32' W	2684,0
PS81/0370-1	01.05.13	13:42	OBS	in the water	51° 0,82' S	47° 56,59' W	2676,0
PS81/0370-1	01.05.13	13:42	OBS	on ground/ max depth	51° 0,82' S	47° 56,59' W	2676,0
PS81/0370-1	01.05.13	13:43	OBS	information	51° 0,82' S	47° 56,61' W	2675,5
PS81/0370-1	01.05.13	13:46	OBS	on deck	51° 0,84' S	47° 56,62' W	2676,4
PS81/0370-1	01.05.13	14:25	OBS	at surface	51° 0,84' S	47° 56,84' W	2679,6
PS81/0370-1	01.05.13	14:45	OBS	on deck	51° 0,15' S	47° 57,67' W	2679,0
PS81/0370-2	01.05.13	14:49	MN	in the water	51° 0,11' S	47° 57,65' W	2679,9
PS81/0370-2	01.05.13	14:58	MN	in the water	51° 0,09' S	47° 57,66' W	2679,3
PS81/0370-2	01.05.13	15:29	MN	on ground/ max depth	51° 0,03' S	47° 57,84' W	2681,5
PS81/0370-2	01.05.13	15:29	MN	hoisting	51° 0,03' S	47° 57,84' W	2681,5
PS81/0370-2	01.05.13	16:22	MN	on deck	51° 0,00' S	47° 58,37' W	2687,6
PS81/0370-2	01.05.13	16:25	MN	on deck	51° 0,00' S	47° 58,40' W	2687,9
PS81/0371-1	01.05.13	17:10	MTC	profile start	50° 58,96' S	47° 51,48' W	2675,6
PS81/0371-1	01.05.13	17:33	MTC	action	50° 58,96' S	47° 51,19' W	2675,5
PS81/0371-1	01.05.13	17:55	MTC	profile end	50° 58,96' S	47° 51,27' W	2674,6
PS81/0371-1	01.05.13	17:55	MTC	on ground/ max depth	50° 58,96' S	47° 51,27' W	2674,6
PS81/0372-1	01.05.13	19:35	OBS	in the water	50° 59,46' S	47° 28,35' W	2649,2
PS81/0372-1	01.05.13	19:35	OBS	on ground/ max depth	50° 59,46' S	47° 28,35' W	2649,2
PS81/0373-1	01.05.13	20:54	OBS	in the water	50° 58,60' S	47° 14,21' W	2641,8
PS81/0373-1	01.05.13	20:55	OBS	on ground/ max depth	50° 58,62' S	47° 14,21' W	2642,4
PS81/0374-1	01.05.13	22:14	OBS	in the water	50° 57,80' S	46° 59,90' W	2531,9
PS81/0374-1	01.05.13	22:14	OBS	on ground/ max depth	50° 57,80' S	46° 59,90' W	2531,9
PS81/0374-2	01.05.13	22:18	MN	in the water	50° 57,84' S	46° 59,79' W	2526,5
PS81/0374-2	01.05.13	22:29	MN	on ground/ max depth	50° 57,85' S	46° 59,64' W	2526,1
PS81/0374-2	01.05.13	22:41	MN	on deck	50° 57,85' S	46° 59,53' W	2525,0
PS81/0375-1	02.05.13	0:07	OBS	in the water	50° 57,07' S	46° 45,84' W	2577,4
PS81/0375-1	02.05.13	0:07	OBS	on ground/ max depth	50° 57,07' S	46° 45,84' W	2577,4
PS81/0376-1	02.05.13	1:30	OBS	in the water	50° 56,39' S	46° 31,52' W	2236,6
PS81/0376-1	02.05.13	1:30	OBS	on ground/ max depth	50° 56,39' S	46° 31,52' W	2236,6
PS81/0377-1	02.05.13	2:56	OBS	in the water	50° 55,67' S	46° 17,36' W	2057,7
PS81/0377-1	02.05.13	2:57	OBS	on ground/ max depth	50° 55,69' S	46° 17,35' W	2058,2
PS81/0378-1	02.05.13	4:26	OBH	in the water	50° 55,01' S	46° 3,05' W	1981,3
PS81/0378-1	02.05.13	4:26	OBH	on ground/ max depth	50° 55,01' S	46° 3,05' W	1981,3
PS81/0378-2	02.05.13	4:29	MN	in the water	50° 55,01' S	46° 3,06' W	1981,3
PS81/0378-2	02.05.13	4:39	MN	on ground/ max depth	50° 55,08' S	46° 3,06' W	1984,3
PS81/0378-2	02.05.13	4:40	MN	hoisting	50° 55,09' S	46° 3,06' W	1986,6
PS81/0378-2	02.05.13	4:58	MN	on deck	50° 55,12' S	46° 3,09' W	1985,7
PS81/0379-1	02.05.13	6:26	OBS	in the water	50° 54,26' S	45° 48,89' W	1958,9

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0379-1	02.05.13	6:26	OBS	on ground/ max depth	50° 54,26' S	45° 48,89' W	1958,9
PS81/0380-1	02.05.13	7:51	OBH	in the water	50° 53,46' S	45° 34,62' W	1901,8
PS81/0380-1	02.05.13	7:51	OBH	on ground/ max depth	50° 53,46' S	45° 34,62' W	1901,8
PS81/0381-1	02.05.13	9:10	OBS	in the water	50° 52,69' S	45° 20,40' W	1851,2
PS81/0381-1	02.05.13	9:11	OBS	on ground/ max depth	50° 52,69' S	45° 20,37' W	1851,1
PS81/0382-1	02.05.13	10:32	OBH	in the water	50° 51,93' S	45° 6,34' W	1820,5
PS81/0382-1	02.05.13	10:32	OBH	on ground/ max depth	50° 51,93' S	45° 6,34' W	1820,5
PS81/0382-2	02.05.13	10:34	MN	in the water	50° 51,96' S	45° 6,35' W	1821,4
PS81/0382-2	02.05.13	10:41	MN	on ground/ max depth	50° 51,99' S	45° 6,33' W	1821,4
PS81/0382-2	02.05.13	11:02	MN	on deck	50° 51,98' S	45° 6,19' W	1823,2
PS81/0382-2	02.05.13	11:03	MN	on deck	50° 51,98' S	45° 6,19' W	1821,5
PS81/0383-1	02.05.13	12:27	OBS	in the water	50° 51,33' S	44° 51,96' W	1810,5
PS81/0383-1	02.05.13	12:27	OBS	on ground/ max depth	50° 51,33' S	44° 51,96' W	1810,5
PS81/0383-2	02.05.13	12:30	POS	in the water	50° 51,35' S	44° 51,83' W	1811,8
PS81/0383-2	02.05.13	12:59	POS	on ground/ max depth	50° 51,28' S	44° 51,49' W	1810,5
PS81/0383-2	02.05.13	12:59	POS	hoisting	50° 51,28' S	44° 51,49' W	1810,5
PS81/0383-2	02.05.13	13:17	POS	profile start	50° 51,24' S	44° 51,26' W	1809,9
PS81/0383-2	02.05.13	13:19	POS	profile end	50° 51,23' S	44° 51,28' W	1808,7
PS81/0383-2	02.05.13	13:19	POS	on deck	50° 51,23' S	44° 51,28' W	1808,7
PS81/0384-1	02.05.13	15:39	OBH	in the water	50° 50,56' S	44° 37,84' W	1756,2
PS81/0384-1	02.05.13	15:39	OBH	on ground/ max depth	50° 50,56' S	44° 37,84' W	1756,2
PS81/0385-1	02.05.13	17:01	OBS	in the water	50° 49,80' S	44° 23,63' W	1698,2
PS81/0385-1	02.05.13	17:01	OBS	on ground/ max depth	50° 49,80' S	44° 23,63' W	1698,2
PS81/0386-1	02.05.13	18:24	OBH	in the water	50° 49,05' S	44° 9,41' W	1646,7
PS81/0386-1	02.05.13	18:24	OBH	on ground/ max depth	50° 49,05' S	44° 9,41' W	1646,7
PS81/0386-2	02.05.13	18:27	MN	in the water	50° 49,07' S	44° 9,40' W	1646,3
PS81/0386-2	02.05.13	18:38	MN	on ground/ max depth	50° 49,08' S	44° 9,37' W	1647,2
PS81/0386-2	02.05.13	18:38	MN	hoisting	50° 49,08' S	44° 9,37' W	1647,2
PS81/0386-2	02.05.13	18:56	MN	on deck	50° 49,09' S	44° 9,30' W	1646,4
PS81/0387-1	02.05.13	20:11	OBS	in the water	50° 48,37' S	43° 55,33' W	1583,1
PS81/0387-1	02.05.13	20:11	OBS	on ground/ max depth	50° 48,37' S	43° 55,33' W	1583,1
PS81/0388-1	03.05.13	17:23	MTC	profile start	51° 9,68' S	50° 48,27' W	2442,1
PS81/0388-1	03.05.13	17:24	MTC	on ground/ max depth	51° 9,53' S	50° 48,27' W	2437,3
PS81/0388-1	03.05.13	18:08	MTC	action	51° 9,59' S	50° 48,32' W	2438,6
PS81/0388-1	03.05.13	18:55	MTC	profile end	51° 9,62' S	50° 48,32' W	2440,0
PS81/0389-1	03.05.13	19:46	OBS	on ground/ max depth	51° 9,56' S	50° 48,19' W	2437,2
PS81/0389-1	03.05.13	19:56	OBS	on deck	51° 9,55' S	50° 48,08' W	2440,0
PS81/0389-1	03.05.13	20:05	OBS	at surface	51° 9,59' S	50° 48,03' W	2441,7

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0389-1	03.05.13	20:26	OBS	on deck	51° 8,92' S	50° 47,93' W	2445,1
PS81/0390-1	04.05.13	17:54	SVP	in the water	50° 47,60' S	43° 41,11' W	1497,0
PS81/0390-1	04.05.13	17:55	SVP	in the water	50° 47,60' S	43° 41,10' W	1498,1
PS81/0390-1	04.05.13	18:27	SVP	on ground/ max depth	50° 47,76' S	43° 40,97' W	1499,8
PS81/0390-1	04.05.13	18:52	SVP	on deck	50° 47,81' S	43° 40,90' W	1499,3
PS81/0390-1	04.05.13	18:53	SVP	on deck	50° 47,82' S	43° 40,89' W	1500,4
PS81/0390-2	04.05.13	19:05	OBH	in the water	50° 47,64' S	43° 41,19' W	1498,9
PS81/0390-2	04.05.13	19:05	OBH	on ground/ max depth	50° 47,64' S	43° 41,19' W	1498,9
PS81/0391-1	04.05.13	20:18	OBS	in the water	50° 46,93' S	43° 26,88' W	1405,6
PS81/0391-1	04.05.13	20:19	OBS	on ground/ max depth	50° 46,95' S	43° 26,85' W	1404,9
PS81/0392-1	04.05.13	21:26	OBS	in the water	50° 46,24' S	43° 12,63' W	1295,2
PS81/0392-1	04.05.13	21:26	OBS	on ground/ max depth	50° 46,24' S	43° 12,63' W	1295,2
PS81/0392-2	04.05.13	21:30	MN	in the water	50° 46,21' S	43° 12,56' W	1295,0
PS81/0392-2	04.05.13	21:42	MN	on ground/ max depth	50° 46,19' S	43° 12,47' W	1295,9
PS81/0392-2	04.05.13	22:00	MN	on deck	50° 46,19' S	43° 12,33' W	1298,4
PS81/0393-1	04.05.13	23:11	OBS	in the water	50° 45,48' S	42° 58,64' W	1384,8
PS81/0393-1	04.05.13	23:12	OBS	on ground/ max depth	50° 45,48' S	42° 58,64' W	1384,3
PS81/0394-1	05.05.13	0:24	OBS	in the water	50° 44,67' S	42° 44,32' W	1444,3
PS81/0394-1	05.05.13	0:24	OBS	on ground/ max depth	50° 44,67' S	42° 44,32' W	1444,3
PS81/0395-1	05.05.13	1:34	OBS	in the water	50° 44,00' S	42° 30,24' W	1503,0
PS81/0395-1	05.05.13	1:34	OBS	on ground/ max depth	50° 44,00' S	42° 30,24' W	1503,0
PS81/0396-1	05.05.13	2:48	OBS	in the water	50° 43,22' S	42° 16,12' W	1605,5
PS81/0396-1	05.05.13	2:48	OBS	on ground/ max depth	50° 43,22' S	42° 16,12' W	1605,5
PS81/0396-2	05.05.13	2:54	MN	in the water	50° 43,17' S	42° 16,07' W	1605,5
PS81/0396-2	05.05.13	3:05	MN	on ground/ max depth	50° 43,11' S	42° 16,13' W	1603,2
PS81/0396-2	05.05.13	3:05	MN	hoisting	50° 43,11' S	42° 16,13' W	1603,2
PS81/0396-2	05.05.13	3:23	MN	on deck	50° 43,02' S	42° 16,23' W	1602,6
PS81/0397-1	05.05.13	4:43	OBS	in the water	50° 42,63' S	42° 2,00' W	1774,3
PS81/0397-1	05.05.13	4:43	OBS	on ground/ max depth	50° 42,63' S	42° 2,00' W	1774,3
PS81/0398-1	05.05.13	6:02	OBS	in the water	50° 41,83' S	41° 47,86' W	1999,7
PS81/0398-1	05.05.13	6:03	OBS	on ground/ max depth	50° 41,83' S	41° 47,87' W	2000,0
PS81/0399-1	05.05.13	7:18	OBS	in the water	50° 41,07' S	41° 33,61' W	2128,9
PS81/0399-1	05.05.13	7:18	OBS	on ground/ max depth	50° 41,07' S	41° 33,61' W	2128,9
PS81/0400-1	05.05.13	8:34	OBS	in the water	50° 40,28' S	41° 19,48' W	2117,6
PS81/0400-1	05.05.13	8:35	OBS	on ground/ max depth	50° 40,30' S	41° 19,46' W	2119,7
PS81/0400-2	05.05.13	8:38	MN	in the water	50° 40,31' S	41° 19,39' W	2119,5
PS81/0400-2	05.05.13	9:20	MN	on ground/ max depth	50° 40,09' S	41° 18,98' W	2142,1

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0400-2	05.05.13	10:23	MN	on deck	50° 39,78' S	41° 18,16' W	2095,9
PS81/0401-1	05.05.13	11:30	OBS	in the water	50° 39,57' S	41° 5,26' W	2044,2
PS81/0401-1	05.05.13	11:30	OBS	on ground/ max depth	50° 39,57' S	41° 5,26' W	2044,2
PS81/0402-1	05.05.13	12:39	OBS	in the water	50° 38,82' S	40° 51,21' W	2166,1
PS81/0402-1	05.05.13	12:39	OBS	on ground/ max depth	50° 38,82' S	40° 51,21' W	2166,1
PS81/0403-1	05.05.13	13:59	OBS	in the water	50° 38,08' S	40° 37,13' W	2498,7
PS81/0403-1	05.05.13	13:59	OBS	on ground/ max depth	50° 38,08' S	40° 37,13' W	2498,7
PS81/0404-1	05.05.13	15:12	OBS	action	50° 37,44' S	40° 22,97' W	3001,8
PS81/0404-1	05.05.13	15:13	OBS	on ground/ max depth	50° 37,44' S	40° 22,97' W	3010,7
PS81/0404-2	05.05.13	15:15	MN	in the water	50° 37,44' S	40° 22,98' W	3009,5
PS81/0404-2	05.05.13	15:25	MN	on ground/ max depth	50° 37,36' S	40° 22,95' W	3012,7
PS81/0404-2	05.05.13	15:26	MN	hoisting	50° 37,36' S	40° 22,94' W	3012,2
PS81/0404-2	05.05.13	15:43	MN	on deck	50° 37,27' S	40° 22,94' W	3008,6
PS81/0405-1	05.05.13	17:04	OBS	in the water	50° 36,70' S	40° 8,85' W	3010,0
PS81/0405-1	05.05.13	17:04	OBS	on ground/ max depth	50° 36,70' S	40° 8,85' W	3010,0
PS81/0406-1	05.05.13	17:10	MTC	profile start	50° 36,25' S	40° 9,00' W	2968,0
PS81/0406-1	05.05.13	17:11	MTC	on ground/ max depth	50° 36,10' S	40° 9,00' W	2946,9
PS81/0406-1	05.05.13	17:56	MTC	action	50° 36,18' S	40° 9,01' W	2964,5
PS81/0406-1	05.05.13	18:41	MTC	profile end	50° 36,25' S	40° 8,98' W	2970,6
PS81/0407-1	05.05.13	20:00	OBS	in the water	50° 35,88' S	39° 54,64' W	3763,7
PS81/0407-1	05.05.13	20:01	OBS	on ground/ max depth	50° 35,88' S	39° 54,62' W	3764,0
PS81/0408-1	05.05.13	21:25	OBS	in the water	50° 35,22' S	39° 40,51' W	4019,7
PS81/0408-1	05.05.13	21:26	OBS	on ground/ max depth	50° 35,23' S	39° 40,49' W	4019,9
PS81/0409-1	05.05.13	22:52	OBS	in the water	50° 34,52' S	39° 26,45' W	4174,0
PS81/0409-1	05.05.13	22:52	OBS	on ground/ max depth	50° 34,52' S	39° 26,45' W	4174,0
PS81/0409-2	05.05.13	22:58	MN	in the water	50° 34,59' S	39° 26,46' W	4173,8
PS81/0409-2	05.05.13	23:10	MN	on ground/ max depth	50° 34,62' S	39° 26,62' W	4169,0
PS81/0409-2	05.05.13	23:10	MN	hoisting	50° 34,62' S	39° 26,62' W	4169,0
PS81/0409-2	05.05.13	23:27	MN	on deck	50° 34,77' S	39° 26,82' W	4166,3
PS81/0410-1	06.05.13	0:57	OBS	in the water	50° 33,80' S	39° 12,42' W	4357,8
PS81/0410-1	06.05.13	0:57	OBS	on ground/ max depth	50° 33,80' S	39° 12,42' W	4357,8
PS81/0411-1	06.05.13	2:24	OBS	in the water	50° 33,07' S	38° 58,29' W	4547,4
PS81/0411-1	06.05.13	2:24	OBS	on ground/ max depth	50° 33,07' S	38° 58,29' W	4547,4
PS81/0412-1	06.05.13	3:56	OBS	in the water	50° 32,35' S	38° 44,19' W	4633,1
PS81/0412-1	06.05.13	3:56	OBS	on ground/ max depth	50° 32,35' S	38° 44,19' W	4633,1
PS81/0413-1	06.05.13	5:28	OBS	in the water	50° 31,57' S	38° 30,09' W	4835,7
PS81/0413-1	06.05.13	5:28	OBS	on ground/ max depth	50° 31,57' S	38° 30,09' W	4835,7

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0413-2	06.05.13	5:31	MN	in the water	50° 31,57' S	38° 30,11' W	4835,0
PS81/0413-2	06.05.13	5:42	MN	on ground/ max depth	50° 31,57' S	38° 30,18' W	4835,5
PS81/0413-2	06.05.13	5:42	MN	hoisting	50° 31,57' S	38° 30,18' W	4835,5
PS81/0413-2	06.05.13	5:58	MN	on deck	50° 31,56' S	38° 30,30' W	4834,1
PS81/0414-1	06.05.13	8:30	MN	in the water	50° 30,06' S	38° 1,81' W	4950,4
PS81/0414-1	06.05.13	8:42	MN	on ground/ max depth	50° 30,05' S	38° 1,87' W	4949,2
PS81/0414-1	06.05.13	8:59	MN	on deck	50° 30,00' S	38° 1,97' W	4949,6
PS81/0414-2	06.05.13	9:04	SVP	in the water	50° 30,02' S	38° 1,98' W	4952,5
PS81/0414-2	06.05.13	9:46	SVP	on ground/ max depth	50° 30,03' S	38° 1,95' W	4949,6
PS81/0414-2	06.05.13	10:15	SVP	on deck	50° 29,92' S	38° 1,99' W	4951,0
PS81/0414-2	06.05.13	10:27	SVP	on deck	50° 29,90' S	38° 2,00' W	4950,8
PS81/0415-1	06.05.13	10:40	SEISREFR	in the water	50° 29,87' S	38° 2,01' W	4950,7
PS81/0415-1	06.05.13	11:00	SEISREFR	in the water	50° 28,83' S	38° 2,42' W	4976,0
PS81/0415-1	06.05.13	11:08	SEISREFR	information	50° 28,34' S	38° 2,59' W	4977,6
PS81/0415-1	06.05.13	12:13	SEISREFR	profile start	50° 30,09' S	38° 1,39' W	4973,3
PS81/0415-1	10.05.13	0:00	SEISREFR	profile end	51° 4,56' S	49° 10,90' W	2658,4
PS81/0415-1	10.05.13	0:11	SEISREFR	on deck	51° 4,72' S	49° 12,09' W	2655,3
PS81/0415-1	10.05.13	0:20	SEISREFR	on deck	51° 4,86' S	49° 12,90' W	2658,6
PS81/0416-1	10.05.13	0:41	SVP	in the water	51° 5,06' S	49° 14,07' W	2653,4
PS81/0416-1	10.05.13	1:18	SVP	on ground/ max depth	51° 5,12' S	49° 14,56' W	2645,1
PS81/0416-1	10.05.13	1:18	SVP	hoisting	51° 5,12' S	49° 14,56' W	2645,1
PS81/0416-1	10.05.13	1:48	SVP	on deck	51° 5,14' S	49° 14,92' W	2642,1
PS81/0417-1	10.05.13	9:28	HN	in the water	50° 59,49' S	47° 28,25' W	2649,1
PS81/0417-1	10.05.13	9:28	HN	on ground/ max depth	50° 59,49' S	47° 28,25' W	2649,1
PS81/0417-1	10.05.13	9:29	HN	on deck	50° 59,49' S	47° 28,25' W	2649,3
PS81/0417-2	10.05.13	9:30	OBS	on ground/ max depth	50° 59,49' S	47° 28,25' W	2650,8
PS81/0417-2	10.05.13	9:31	OBS	information	50° 59,49' S	47° 28,24' W	2649,4
PS81/0417-2	10.05.13	10:05	OBS	at surface	50° 59,61' S	47° 28,16' W	0,0
PS81/0417-2	10.05.13	10:05	OBS	on deck	50° 59,61' S	47° 28,16' W	0,0
PS81/0417-2	10.05.13	10:23	OBS	on deck	50° 59,38' S	47° 29,12' W	2648,2
PS81/0418-1	10.05.13	11:41	HN	in the water	50° 58,64' S	47° 13,81' W	2642,9
PS81/0418-1	10.05.13	11:43	HN	on ground/ max depth	50° 58,66' S	47° 13,82' W	2639,7
PS81/0418-2	10.05.13	11:44	OBS	in the water	50° 58,66' S	47° 13,83' W	2639,7
PS81/0418-1	10.05.13	11:44	HN	on deck	50° 58,66' S	47° 13,83' W	2639,7
PS81/0418-2	10.05.13	11:45	OBS	on ground/ max depth	50° 58,67' S	47° 13,83' W	2639,7
PS81/0418-2	10.05.13	11:46	OBS	information	50° 58,68' S	47° 13,84' W	2639,7
PS81/0418-2	10.05.13	12:02	OBS	on deck	50° 58,66' S	47° 13,84' W	0,0
PS81/0418-2	10.05.13	12:19	OBS	at surface	50° 58,61' S	47° 13,93' W	2643,6
PS81/0418-2	10.05.13	12:33	OBS	on deck	50° 58,56' S	47° 14,54' W	2644,8
PS81/0419-1	10.05.13	13:51	HN	in the water	50° 57,91' S	46° 59,62' W	2563,7
PS81/0419-1	10.05.13	13:53	HN	on ground/ max depth	50° 57,91' S	46° 59,63' W	2530,9

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0419-2	10.05.13	13:54	OBS	on ground/ max depth	50° 57,92' S	46° 59,64' W	2531,8
PS81/0419-2	10.05.13	13:54	OBS	in the water	50° 57,92' S	46° 59,64' W	2531,8
PS81/0419-1	10.05.13	13:54	HN	on deck	50° 57,92' S	46° 59,64' W	2531,8
PS81/0419-2	10.05.13	13:56	OBS	action	50° 57,93' S	46° 59,65' W	2531,7
PS81/0419-2	10.05.13	14:04	OBS	on deck	50° 58,02' S	46° 59,67' W	2535,5
PS81/0419-2	10.05.13	14:30	OBS	at surface	50° 58,02' S	46° 59,77' W	2537,3
PS81/0419-2	10.05.13	14:45	OBS	action	50° 57,90' S	47° 0,24' W	2527,0
PS81/0419-2	10.05.13	14:52	OBS	on deck	50° 57,95' S	47° 0,17' W	2542,2
PS81/0420-1	10.05.13	15:24	MTC	profile start	50° 55,17' S	46° 56,00' W	2633,2
PS81/0420-1	10.05.13	15:28	MTC	on ground/ max depth	50° 55,29' S	46° 55,20' W	2623,9
PS81/0420-1	10.05.13	16:12	MTC	information	50° 55,14' S	46° 56,11' W	2633,9
PS81/0420-1	10.05.13	16:59	MTC	profile end	50° 55,16' S	46° 56,19' W	2634,8
PS81/0421-1	10.05.13	17:58	HN	in the water	50° 57,19' S	46° 45,89' W	2582,4
PS81/0421-2	10.05.13	17:58	OBS	on ground/ max depth	50° 57,19' S	46° 45,89' W	2582,4
PS81/0421-1	10.05.13	17:58	HN	on ground/ max depth	50° 57,19' S	46° 45,89' W	2582,4
PS81/0421-1	10.05.13	17:58	HN	on deck	50° 57,19' S	46° 45,89' W	2582,4
PS81/0421-2	10.05.13	18:01	OBS	action	50° 57,22' S	46° 45,86' W	2580,6
PS81/0421-2	10.05.13	18:34	OBS	at surface	50° 57,36' S	46° 45,78' W	2586,8
PS81/0421-2	10.05.13	18:51	OBS	on deck	50° 57,13' S	46° 45,92' W	2570,0
PS81/0422-1	10.05.13	20:10	HN	in the water	50° 56,38' S	46° 31,62' W	2236,3
PS81/0422-1	10.05.13	20:12	HN	on ground/ max depth	50° 56,38' S	46° 31,60' W	2236,5
PS81/0422-1	10.05.13	20:12	HN	on deck	50° 56,38' S	46° 31,60' W	2236,5
PS81/0422-2	10.05.13	20:13	OBS	on ground/ max depth	50° 56,38' S	46° 31,60' W	2236,9
PS81/0422-2	10.05.13	20:14	OBS	information	50° 56,39' S	46° 31,59' W	2235,8
PS81/0422-2	10.05.13	20:26	OBS	action	50° 56,38' S	46° 31,55' W	2237,0
PS81/0422-2	10.05.13	20:46	OBS	at surface	50° 56,56' S	46° 31,34' W	2246,6
PS81/0422-2	10.05.13	21:03	OBS	on deck	50° 56,30' S	46° 31,50' W	2227,6
PS81/0423-1	10.05.13	22:15	HN	in the water	50° 55,89' S	46° 17,34' W	2066,4
PS81/0423-1	10.05.13	22:16	HN	on ground/ max depth	50° 55,88' S	46° 17,33' W	2065,4
PS81/0423-2	10.05.13	22:18	OBS	in the water	50° 55,88' S	46° 17,32' W	2065,2
PS81/0423-1	10.05.13	22:18	HN	on deck	50° 55,88' S	46° 17,32' W	2065,2
PS81/0423-2	10.05.13	22:19	OBS	on ground/ max depth	50° 55,87' S	46° 17,31' W	2064,8
PS81/0423-2	10.05.13	22:19	OBS	information	50° 55,87' S	46° 17,31' W	2064,8
PS81/0423-2	10.05.13	22:26	OBS	on deck	50° 55,88' S	46° 17,31' W	2062,5
PS81/0423-2	10.05.13	22:46	OBS	at surface	50° 55,89' S	46° 17,27' W	2066,1
PS81/0423-2	10.05.13	23:02	OBS	on deck	50° 55,60' S	46° 17,21' W	2055,2
PS81/0424-1	11.05.13	0:17	HN	in the water	50° 55,22' S	46° 2,94' W	1990,3
PS81/0424-1	11.05.13	0:18	HN	on ground/ max depth	50° 55,21' S	46° 2,94' W	1991,1
PS81/0424-2	11.05.13	0:19	OBH	in the water	50° 55,21' S	46° 2,95' W	1991,7
PS81/0424-1	11.05.13	0:19	HN	on deck	50° 55,21' S	46° 2,95' W	1991,7
PS81/0424-2	11.05.13	0:20	OBH	on ground/ max depth	50° 55,20' S	46° 2,95' W	1990,0

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Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0424-2	11.05.13	0:20	OBH	information	50° 55,20' S	46° 2,95' W	1990,0
PS81/0424-2	11.05.13	0:30	OBH	on deck	50° 55,21' S	46° 3,01' W	1990,6
PS81/0424-2	11.05.13	0:45	OBH	at surface	50° 55,19' S	46° 3,10' W	1989,5
PS81/0424-2	11.05.13	0:55	OBH	on deck	50° 55,00' S	46° 3,01' W	1983,5
PS81/0425-1	11.05.13	2:12	HN	in the water	50° 54,42' S	45° 48,89' W	1968,0
PS81/0425-1	11.05.13	2:14	HN	on ground/ max depth	50° 54,42' S	45° 48,91' W	1970,6
PS81/0425-2	11.05.13	2:16	OBS	in the water	50° 54,43' S	45° 48,93' W	1970,1
PS81/0425-1	11.05.13	2:16	HN	on deck	50° 54,43' S	45° 48,93' W	1970,1
PS81/0425-2	11.05.13	2:17	OBS	on ground/ max depth	50° 54,44' S	45° 48,93' W	1970,2
PS81/0425-2	11.05.13	2:17	OBS	action	50° 54,44' S	45° 48,93' W	1970,2
PS81/0425-2	11.05.13	2:33	OBS	on deck	50° 54,47' S	45° 48,98' W	0,0
PS81/0425-2	11.05.13	2:45	OBS	at surface	50° 54,49' S	45° 49,01' W	1972,6
PS81/0425-2	11.05.13	2:56	OBS	action	50° 54,31' S	45° 49,17' W	1964,6
PS81/0425-2	11.05.13	2:56	OBS	on deck	50° 54,31' S	45° 49,17' W	1964,6
PS81/0426-1	11.05.13	4:30	HN	in the water	50° 53,69' S	45° 34,64' W	1912,2
PS81/0426-1	11.05.13	4:32	HN	on ground/ max depth	50° 53,68' S	45° 34,63' W	1913,2
PS81/0426-2	11.05.13	4:34	OBH	on ground/ max depth	50° 53,66' S	45° 34,63' W	1911,8
PS81/0426-2	11.05.13	4:34	OBH	in the water	50° 53,66' S	45° 34,63' W	1911,8
PS81/0426-1	11.05.13	4:34	HN	on deck	50° 53,66' S	45° 34,63' W	1911,8
PS81/0426-2	11.05.13	4:36	OBH	action	50° 53,66' S	45° 34,62' W	1913,0
PS81/0426-2	11.05.13	4:59	OBH	on deck	50° 53,61' S	45° 34,57' W	0,0
PS81/0426-2	11.05.13	5:11	OBH	at surface	50° 53,76' S	45° 34,46' W	1917,4
PS81/0426-2	11.05.13	5:34	OBH	action	50° 53,48' S	45° 34,76' W	1905,1
PS81/0426-2	11.05.13	5:37	OBH	on deck	50° 53,48' S	45° 34,72' W	1905,2
PS81/0427-1	11.05.13	6:46	HN	in the water	50° 52,33' S	45° 21,06' W	1839,2
PS81/0427-1	11.05.13	6:55	HN	on ground/ max depth	50° 52,81' S	45° 20,46' W	1859,5
PS81/0427-2	11.05.13	6:55	OBS	on ground/ max depth	50° 52,81' S	45° 20,46' W	1859,5
PS81/0427-1	11.05.13	6:55	HN	on deck	50° 52,81' S	45° 20,46' W	1859,5
PS81/0427-2	11.05.13	6:57	OBS	action	50° 52,82' S	45° 20,43' W	1860,0
PS81/0427-2	11.05.13	7:24	OBS	at surface	50° 52,86' S	45° 20,30' W	1862,2
PS81/0427-2	11.05.13	7:36	OBS	on deck	50° 52,76' S	45° 20,25' W	1859,7
PS81/0428-1	11.05.13	8:51	HN	in the water	50° 52,12' S	45° 6,30' W	1829,9
PS81/0428-1	11.05.13	8:51	HN	on ground/ max depth	50° 52,12' S	45° 6,30' W	1829,9
PS81/0428-2	11.05.13	8:55	OBH	on ground/ max depth	50° 52,13' S	45° 6,25' W	1830,8
PS81/0428-1	11.05.13	8:55	HN	on deck	50° 52,13' S	45° 6,25' W	1830,8
PS81/0428-2	11.05.13	8:59	OBH	action	50° 52,13' S	45° 6,24' W	1829,6
PS81/0428-2	11.05.13	9:40	OBH	at surface	50° 52,09' S	45° 6,10' W	1830,3
PS81/0428-2	11.05.13	9:48	OBH	on deck	50° 51,95' S	45° 6,14' W	1824,4
PS81/0429-1	11.05.13	11:04	HN	in the water	50° 51,36' S	44° 51,52' W	1814,7
PS81/0429-1	11.05.13	11:05	HN	on ground/ max depth	50° 51,37' S	44° 51,51' W	1815,6
PS81/0429-2	11.05.13	11:06	OBS	in the water	50° 51,38' S	44° 51,49' W	1816,1
PS81/0429-1	11.05.13	11:06	HN	on deck	50° 51,38' S	44° 51,49' W	1816,1

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0429-2	11.05.13	11:07	OBS	on ground/ max depth	50° 51,39' S	44° 51,48' W	1816,3
PS81/0429-2	11.05.13	11:09	OBS	information	50° 51,40' S	44° 51,46' W	1814,4
PS81/0429-2	11.05.13	11:38	OBS	on deck	50° 51,38' S	44° 51,43' W	0,0
PS81/0429-2	11.05.13	11:52	OBS	in the water	50° 51,34' S	44° 51,79' W	1813,6
PS81/0429-2	11.05.13	11:52	OBS	on ground/ max depth	50° 51,34' S	44° 51,79' W	1813,6
PS81/0429-2	11.05.13	11:57	OBS	information	50° 51,39' S	44° 51,76' W	1812,8
PS81/0429-2	11.05.13	12:01	OBS	information	50° 51,42' S	44° 51,73' W	1817,4
PS81/0429-2	11.05.13	12:15	OBS	on deck	50° 51,50' S	44° 51,43' W	0,0
PS81/0429-2	11.05.13	12:29	OBS	in the water	50° 51,43' S	44° 52,48' W	0,0
PS81/0429-2	11.05.13	12:29	OBS	on ground/ max depth	50° 51,43' S	44° 52,48' W	0,0
PS81/0429-2	11.05.13	12:35	OBS	information	50° 51,42' S	44° 52,31' W	0,0
PS81/0429-2	11.05.13	12:38	OBS	on deck	50° 51,44' S	44° 52,23' W	0,0
PS81/0429-2	11.05.13	12:46	OBS	in the water	50° 50,98' S	44° 52,17' W	0,0
PS81/0429-2	11.05.13	12:47	OBS	on ground/ max depth	50° 50,97' S	44° 52,16' W	0,0
PS81/0429-2	11.05.13	12:47	OBS	information	50° 50,97' S	44° 52,16' W	0,0
PS81/0429-2	11.05.13	12:50	OBS	on deck	50° 50,97' S	44° 52,10' W	0,0
PS81/0429-2	11.05.13	13:06	OBS	in the water	50° 51,32' S	44° 51,78' W	0,0
PS81/0429-2	11.05.13	13:07	OBS	on ground/ max depth	50° 51,33' S	44° 51,75' W	0,0
PS81/0429-2	11.05.13	13:07	OBS	information	50° 51,33' S	44° 51,75' W	0,0
PS81/0429-2	11.05.13	13:16	OBS	on deck	50° 51,38' S	44° 51,44' W	0,0
PS81/0429-2	11.05.13	13:52	OBS	in the water	50° 51,24' S	44° 51,40' W	0,0
PS81/0429-2	11.05.13	13:52	OBS	on ground/ max depth	50° 51,24' S	44° 51,40' W	0,0
PS81/0429-2	11.05.13	13:53	OBS	information	50° 51,24' S	44° 51,37' W	0,0
PS81/0429-2	11.05.13	13:57	OBS	on deck	50° 51,23' S	44° 51,22' W	0,0
PS81/0430-1	11.05.13	14:11	MTC	profile start	50° 50,86' S	44° 52,20' W	1796,5
PS81/0430-1	11.05.13	15:01	MTC	on ground/ max depth	50° 50,72' S	44° 52,23' W	1789,1
PS81/0430-1	11.05.13	15:48	MTC	profile end	50° 50,80' S	44° 52,23' W	1791,4
PS81/0431-1	11.05.13	17:22	HN	in the water	50° 50,42' S	44° 37,65' W	1753,8
PS81/0431-2	11.05.13	17:22	OBH	on ground/ max depth	50° 50,42' S	44° 37,65' W	1753,8
PS81/0431-1	11.05.13	17:23	HN	on ground/ max depth	50° 50,42' S	44° 37,65' W	1752,4
PS81/0431-1	11.05.13	17:24	HN	on deck	50° 50,41' S	44° 37,64' W	1753,4
PS81/0431-2	11.05.13	17:25	OBH	in the water	50° 50,42' S	44° 37,63' W	1754,5
PS81/0431-2	11.05.13	17:32	OBH	action	50° 50,40' S	44° 37,53' W	1754,1
PS81/0431-2	11.05.13	17:41	OBH	on deck	50° 50,40' S	44° 37,44' W	1752,7
PS81/0431-2	11.05.13	18:00	OBH	at surface	50° 50,44' S	44° 37,49' W	1753,9
PS81/0431-2	11.05.13	18:07	OBH	on deck	50° 50,41' S	44° 37,78' W	1754,7
PS81/0432-1	11.05.13	19:28	HN	in the water	50° 49,68' S	44° 23,53' W	1696,5
PS81/0432-1	11.05.13	19:28	HN	on ground/ max depth	50° 49,68' S	44° 23,53' W	1696,5
PS81/0432-2	11.05.13	19:29	OBS	on ground/ max depth	50° 49,67' S	44° 23,53' W	1696,4
PS81/0432-1	11.05.13	19:29	HN	on deck	50° 49,67' S	44° 23,53' W	1696,4

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0432-2	11.05.13	19:30	OBS	action	50° 49,67' S	44° 23,53' W	1696,5
PS81/0432-2	11.05.13	19:56	OBS	at surface	50° 49,77' S	44° 23,30' W	1696,8
PS81/0432-2	11.05.13	20:11	OBS	on deck	50° 49,51' S	44° 23,59' W	1692,1
PS81/0433-1	11.05.13	21:33	HN	in the water	50° 48,93' S	44° 9,19' W	1645,4
PS81/0433-1	11.05.13	21:34	HN	on ground/ max depth	50° 48,95' S	44° 9,19' W	1646,3
PS81/0433-1	11.05.13	21:35	HN	on deck	50° 48,95' S	44° 9,18' W	1647,8
PS81/0433-2	11.05.13	21:36	OBH	on ground/ max depth	50° 48,96' S	44° 9,16' W	1647,5
PS81/0433-2	11.05.13	21:37	OBH	action	50° 48,96' S	44° 9,15' W	1647,7
PS81/0433-2	11.05.13	22:07	OBH	at surface	50° 48,98' S	44° 9,14' W	1647,4
PS81/0433-2	11.05.13	22:16	OBH	on deck	50° 48,90' S	44° 9,42' W	1646,2
PS81/0434-1	11.05.13	23:27	HN	in the water	50° 48,24' S	43° 54,91' W	1583,0
PS81/0434-1	11.05.13	23:28	HN	on ground/ max depth	50° 48,25' S	43° 54,90' W	1583,2
PS81/0434-2	11.05.13	23:29	OBS	in the water	50° 48,26' S	43° 54,88' W	1584,3
PS81/0434-1	11.05.13	23:29	HN	on deck	50° 48,26' S	43° 54,88' W	1584,3
PS81/0434-2	11.05.13	23:30	OBS	on ground/ max depth	50° 48,26' S	43° 54,87' W	1582,8
PS81/0434-2	11.05.13	23:30	OBS	information	50° 48,26' S	43° 54,87' W	1582,8
PS81/0434-2	11.05.13	23:39	OBS	on deck	50° 48,31' S	43° 54,88' W	1584,8
PS81/0434-2	11.05.13	23:54	OBS	at surface	50° 48,37' S	43° 54,94' W	1585,1
PS81/0434-2	12.05.13	0:06	OBS	on deck	50° 48,17' S	43° 55,03' W	1581,9
PS81/0435-1	12.05.13	1:14	HN	in the water	50° 47,54' S	43° 40,80' W	1496,7
PS81/0435-1	12.05.13	1:15	HN	on ground/ max depth	50° 47,56' S	43° 40,82' W	1495,3
PS81/0435-2	12.05.13	1:17	OBH	in the water	50° 47,57' S	43° 40,80' W	1491,3
PS81/0435-1	12.05.13	1:17	HN	on deck	50° 47,57' S	43° 40,80' W	1491,3
PS81/0435-2	12.05.13	1:18	OBH	on ground/ max depth	50° 47,57' S	43° 40,79' W	1495,9
PS81/0435-2	12.05.13	1:18	OBH	information	50° 47,57' S	43° 40,79' W	1495,9
PS81/0435-2	12.05.13	1:24	OBH	on deck	50° 47,62' S	43° 40,83' W	1497,2
PS81/0435-2	12.05.13	1:56	OBH	in the water	50° 47,58' S	43° 40,84' W	1496,4
PS81/0435-2	12.05.13	2:00	OBH	information	50° 47,58' S	43° 40,86' W	1497,5
PS81/0435-2	12.05.13	2:26	OBH	on deck	50° 47,63' S	43° 40,34' W	0,0
PS81/0435-2	12.05.13	2:30	OBH	in the water	50° 47,56' S	43° 40,44' W	0,0
PS81/0435-2	12.05.13	2:34	OBH	at surface	50° 47,58' S	43° 40,41' W	0,0
PS81/0435-2	12.05.13	2:34	OBH	on deck	50° 47,58' S	43° 40,41' W	0,0
PS81/0435-2	12.05.13	2:48	OBH	action	50° 47,82' S	43° 40,76' W	1496,0
PS81/0435-2	12.05.13	2:50	OBH	on deck	50° 47,80' S	43° 40,73' W	1494,5
PS81/0436-1	12.05.13	4:11	HN	in the water	50° 46,82' S	43° 26,78' W	1407,6
PS81/0436-2	12.05.13	4:12	OBS	on ground/ max depth	50° 46,83' S	43° 26,74' W	1406,4
PS81/0436-1	12.05.13	4:13	HN	on ground/ max depth	50° 46,85' S	43° 26,74' W	1406,7
PS81/0436-1	12.05.13	4:13	HN	on deck	50° 46,85' S	43° 26,74' W	1406,7
PS81/0436-2	12.05.13	4:14	OBS	in the water	50° 46,86' S	43° 26,72' W	1405,2
PS81/0436-2	12.05.13	4:16	OBS	action	50° 46,88' S	43° 26,66' W	1405,3
PS81/0436-2	12.05.13	4:30	OBS	on deck	50° 47,00' S	43° 26,46' W	0,0
PS81/0436-2	12.05.13	4:41	OBS	at surface	50° 46,99' S	43° 26,41' W	1405,5
PS81/0436-2	12.05.13	4:58	OBS	action	50° 47,19' S	43° 26,04' W	1404,2

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0436-2	12.05.13	5:00	OBS	on deck	50° 47,18' S	43° 25,98' W	1400,9
PS81/0437-1	12.05.13	6:13	HN	in the water	50° 46,33' S	43° 12,39' W	1296,7
PS81/0437-1	12.05.13	6:14	HN	on ground/ max depth	50° 46,34' S	43° 12,38' W	1299,1
PS81/0437-2	12.05.13	6:15	OBS	on ground/ max depth	50° 46,35' S	43° 12,38' W	1298,4
PS81/0437-1	12.05.13	6:15	HN	on deck	50° 46,35' S	43° 12,38' W	1298,4
PS81/0437-2	12.05.13	6:17	OBS	action	50° 46,37' S	43° 12,37' W	1298,7
PS81/0437-2	12.05.13	6:38	OBS	at surface	50° 46,34' S	43° 12,27' W	1298,9
PS81/0437-2	12.05.13	6:43	OBS	on deck	50° 46,32' S	43° 12,10' W	1298,6
PS81/0438-1	12.05.13	7:53	HN	in the water	50° 45,57' S	42° 58,21' W	1387,7
PS81/0438-1	12.05.13	7:53	HN	on ground/ max depth	50° 45,57' S	42° 58,21' W	1387,7
PS81/0438-2	12.05.13	7:55	OBS	on ground/ max depth	50° 45,57' S	42° 58,19' W	1389,6
PS81/0438-1	12.05.13	7:55	HN	on deck	50° 45,57' S	42° 58,19' W	1389,6
PS81/0438-2	12.05.13	7:57	OBS	action	50° 45,56' S	42° 58,18' W	1390,4
PS81/0438-2	12.05.13	8:20	OBS	at surface	50° 45,43' S	42° 58,03' W	0,0
PS81/0438-2	12.05.13	8:30	OBS	on deck	50° 45,30' S	42° 58,00' W	1390,7
PS81/0439-1	12.05.13	9:43	HN	in the water	50° 44,81' S	42° 44,17' W	1443,9
PS81/0439-1	12.05.13	9:43	HN	on ground/ max depth	50° 44,81' S	42° 44,17' W	1443,9
PS81/0439-2	12.05.13	9:45	OBS	on ground/ max depth	50° 44,78' S	42° 44,15' W	1445,2
PS81/0439-1	12.05.13	9:45	HN	on deck	50° 44,78' S	42° 44,15' W	1445,2
PS81/0439-2	12.05.13	9:46	OBS	action	50° 44,77' S	42° 44,14' W	1443,9
PS81/0439-2	12.05.13	10:11	OBS	at surface	50° 44,66' S	42° 43,94' W	0,0
PS81/0439-2	12.05.13	10:11	OBS	on deck	50° 44,66' S	42° 43,94' W	0,0
PS81/0439-2	12.05.13	10:26	OBS	on deck	50° 44,27' S	42° 43,60' W	1444,9
PS81/0440-1	12.05.13	11:40	HN	in the water	50° 44,04' S	42° 29,85' W	1503,6
PS81/0440-1	12.05.13	11:41	HN	on ground/ max depth	50° 44,03' S	42° 29,86' W	1502,3
PS81/0440-2	12.05.13	11:43	OBS	in the water	50° 44,01' S	42° 29,88' W	1501,5
PS81/0440-1	12.05.13	11:43	HN	on deck	50° 44,01' S	42° 29,88' W	1501,5
PS81/0440-2	12.05.13	11:44	OBS	on ground/ max depth	50° 44,00' S	42° 29,88' W	1500,2
PS81/0440-2	12.05.13	11:44	OBS	information	50° 44,00' S	42° 29,88' W	1500,2
PS81/0440-2	12.05.13	11:51	OBS	on deck	50° 44,00' S	42° 29,87' W	1500,1
PS81/0440-2	12.05.13	12:06	OBS	at surface	50° 43,98' S	42° 29,83' W	1498,2
PS81/0440-2	12.05.13	12:16	OBS	on deck	50° 43,70' S	42° 30,03' W	1493,4
PS81/0441-1	12.05.13	13:21	HN	in the water	50° 43,30' S	42° 15,77' W	1609,3
PS81/0441-1	12.05.13	13:22	HN	on ground/ max depth	50° 43,30' S	42° 15,78' W	1609,2
PS81/0441-1	12.05.13	13:23	HN	on deck	50° 43,30' S	42° 15,79' W	1610,7
PS81/0441-2	12.05.13	13:24	OBS	in the water	50° 43,29' S	42° 15,80' W	1610,3
PS81/0441-2	12.05.13	13:24	OBS	on ground/ max depth	50° 43,29' S	42° 15,80' W	1610,3
PS81/0441-2	12.05.13	13:26	OBS	information	50° 43,28' S	42° 15,79' W	1608,6
PS81/0441-2	12.05.13	13:34	OBS	on deck	50° 43,26' S	42° 15,80' W	1607,8
PS81/0441-2	12.05.13	13:53	OBS	at surface	50° 43,26' S	42° 15,92' W	1607,3
PS81/0441-2	12.05.13	14:07	OBS	action	50° 42,92' S	42° 16,16' W	1599,7

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0441-2	12.05.13	14:08	OBS	on deck	50° 42,90' S	42° 16,17' W	1599,0
PS81/0442-1	12.05.13	15:36	HN	in the water	50° 42,59' S	42° 2,02' W	1782,8
PS81/0442-2	12.05.13	15:36	OBS	on ground/ max depth	50° 42,59' S	42° 2,02' W	1782,8
PS81/0442-1	12.05.13	15:37	HN	on ground/ max depth	50° 42,58' S	42° 2,02' W	1807,3
PS81/0442-2	12.05.13	15:39	OBS	in the water	50° 42,54' S	42° 2,04' W	1781,1
PS81/0442-1	12.05.13	15:39	HN	on deck	50° 42,54' S	42° 2,04' W	1781,1
PS81/0442-2	12.05.13	15:41	OBS	action	50° 42,51' S	42° 2,05' W	1781,9
PS81/0442-2	12.05.13	15:45	OBS	on deck	50° 42,45' S	42° 2,06' W	1780,3
PS81/0442-2	12.05.13	16:04	OBS	at surface	50° 42,74' S	42° 1,94' W	1789,6
PS81/0442-2	12.05.13	16:19	OBS	action	50° 42,41' S	42° 2,35' W	1776,4
PS81/0442-2	12.05.13	16:20	OBS	on deck	50° 42,40' S	42° 2,35' W	1778,7
PS81/0443-1	12.05.13	17:31	HN	in the water	50° 41,96' S	41° 47,85' W	2003,3
PS81/0443-2	12.05.13	17:31	OBS	on ground/ max depth	50° 41,96' S	41° 47,85' W	2003,3
PS81/0443-1	12.05.13	17:32	HN	on ground/ max depth	50° 41,95' S	41° 47,85' W	1941,6
PS81/0443-1	12.05.13	17:34	HN	on deck	50° 41,91' S	41° 47,86' W	2002,4
PS81/0443-2	12.05.13	17:35	OBS	in the water	50° 41,91' S	41° 47,87' W	2000,4
PS81/0443-2	12.05.13	17:36	OBS	action	50° 41,91' S	41° 47,87' W	2002,8
PS81/0443-2	12.05.13	17:43	OBS	on deck	50° 41,93' S	41° 47,88' W	2001,8
PS81/0443-2	12.05.13	18:36	OBS	on deck	50° 42,13' S	41° 48,40' W	1997,2
PS81/0444-1	12.05.13	19:54	HN	in the water	50° 41,19' S	41° 33,51' W	2132,1
PS81/0444-1	12.05.13	19:55	HN	on ground/ max depth	50° 41,19' S	41° 33,51' W	2133,1
PS81/0444-2	12.05.13	19:55	OBS	on ground/ max depth	50° 41,19' S	41° 33,51' W	2133,1
PS81/0444-1	12.05.13	19:55	HN	on deck	50° 41,19' S	41° 33,51' W	2133,1
PS81/0444-2	12.05.13	19:56	OBS	action	50° 41,19' S	41° 33,51' W	2131,9
PS81/0444-2	12.05.13	20:23	OBS	at surface	50° 41,21' S	41° 33,67' W	2132,7
PS81/0444-2	12.05.13	20:39	OBS	on deck	50° 41,22' S	41° 33,47' W	2135,6
PS81/0445-1	12.05.13	21:59	HN	in the water	50° 40,46' S	41° 19,49' W	2123,3
PS81/0445-1	12.05.13	21:59	HN	on ground/ max depth	50° 40,46' S	41° 19,49' W	2123,3
PS81/0445-2	12.05.13	22:00	OBS	in the water	50° 40,45' S	41° 19,49' W	2124,9
PS81/0445-1	12.05.13	22:00	HN	on deck	50° 40,45' S	41° 19,49' W	2124,9
PS81/0445-2	12.05.13	22:01	OBS	on ground/ max depth	50° 40,45' S	41° 19,50' W	2124,1
PS81/0445-2	12.05.13	22:02	OBS	information	50° 40,45' S	41° 19,50' W	2123,0
PS81/0445-2	12.05.13	22:07	OBS	on deck	50° 40,48' S	41° 19,50' W	2123,8
PS81/0445-2	12.05.13	22:29	OBS	at surface	50° 40,48' S	41° 19,55' W	2126,8
PS81/0445-2	12.05.13	22:47	OBS	on deck	50° 40,25' S	41° 19,10' W	2125,0
PS81/0446-1	12.05.13	23:54	HN	in the water	50° 39,81' S	41° 5,20' W	2104,1
PS81/0446-1	12.05.13	23:54	HN	on ground/ max depth	50° 39,81' S	41° 5,20' W	2104,1
PS81/0446-2	12.05.13	23:56	OBS	in the water	50° 39,79' S	41° 5,16' W	2049,8
PS81/0446-1	12.05.13	23:56	HN	on deck	50° 39,79' S	41° 5,16' W	2049,8
PS81/0446-2	12.05.13	23:57	OBS	on ground/ max depth	50° 39,77' S	41° 5,14' W	2048,8
PS81/0446-2	12.05.13	23:57	OBS	information	50° 39,77' S	41° 5,14' W	2048,8

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0446-2	13.05.13	0:05	OBS	on deck	50° 39,79' S	41° 5,14' W	2049,3
PS81/0446-2	13.05.13	0:24	OBS	at surface	50° 39,81' S	41° 5,16' W	2051,1
PS81/0446-2	13.05.13	0:41	OBS	on deck	50° 39,42' S	41° 4,44' W	2049,7
PS81/0447-1	13.05.13	17:00	OBS	on ground/ max depth	50° 51,48' S	44° 51,68' W	1818,5
PS81/0447-1	13.05.13	17:00	OBS	in the water	50° 51,48' S	44° 51,68' W	1818,5
PS81/0447-1	13.05.13	17:03	OBS	action	50° 51,47' S	44° 51,69' W	1818,2
PS81/0447-1	13.05.13	17:14	OBS	on deck	50° 51,53' S	44° 51,52' W	1819,7
PS81/0447-1	13.05.13	17:56	OBS	at surface	50° 51,46' S	44° 51,61' W	1815,8
PS81/0447-1	13.05.13	18:05	OBS	on deck	50° 51,30' S	44° 51,77' W	1813,3
PS81/0448-1	14.05.13	8:16	HN	in the water	50° 38,83' S	40° 50,99' W	2174,8
PS81/0448-1	14.05.13	8:16	HN	on ground/ max depth	50° 38,83' S	40° 50,99' W	2174,8
PS81/0448-2	14.05.13	8:18	OBS	on ground/ max depth	50° 38,81' S	40° 50,96' W	2175,4
PS81/0448-1	14.05.13	8:18	HN	on deck	50° 38,81' S	40° 50,96' W	2175,4
PS81/0448-2	14.05.13	8:19	OBS	action	50° 38,80' S	40° 50,94' W	2177,2
PS81/0448-2	14.05.13	8:20	OBS	at surface	50° 38,80' S	40° 50,92' W	2176,4
PS81/0448-2	14.05.13	9:06	OBS	on deck	50° 38,28' S	40° 50,30' W	2183,6
PS81/0449-1	14.05.13	10:20	HN	in the water	50° 38,18' S	40° 36,59' W	2527,9
PS81/0449-1	14.05.13	10:21	HN	on ground/ max depth	50° 38,17' S	40° 36,56' W	2532,0
PS81/0449-1	14.05.13	10:22	HN	on deck	50° 38,16' S	40° 36,54' W	2533,9
PS81/0449-2	14.05.13	10:23	OBS	in the water	50° 38,16' S	40° 36,54' W	2532,9
PS81/0449-2	14.05.13	10:24	OBS	on ground/ max depth	50° 38,15' S	40° 36,54' W	2531,5
PS81/0449-2	14.05.13	10:24	OBS	information	50° 38,15' S	40° 36,54' W	2531,5
PS81/0449-2	14.05.13	10:29	OBS	on deck	50° 38,15' S	40° 36,47' W	2531,4
PS81/0449-2	14.05.13	11:08	OBS	at surface	50° 38,09' S	40° 36,57' W	2529,6
PS81/0449-2	14.05.13	11:30	OBS	on deck	50° 37,20' S	40° 35,87' W	2507,4
PS81/0450-1	14.05.13	12:47	HN	in the water	50° 37,52' S	40° 22,69' W	3023,5
PS81/0450-1	14.05.13	12:48	HN	on ground/ max depth	50° 37,52' S	40° 22,68' W	3025,4
PS81/0450-2	14.05.13	12:50	OBS	in the water	50° 37,51' S	40° 22,64' W	3024,1
PS81/0450-1	14.05.13	12:50	HN	on deck	50° 37,51' S	40° 22,64' W	3024,1
PS81/0450-2	14.05.13	12:51	OBS	on ground/ max depth	50° 37,51' S	40° 22,62' W	3026,2
PS81/0450-2	14.05.13	12:51	OBS	information	50° 37,51' S	40° 22,62' W	3026,2
PS81/0450-2	14.05.13	12:55	OBS	on deck	50° 37,49' S	40° 22,52' W	3028,9
PS81/0450-2	14.05.13	13:47	OBS	in the water	50° 37,17' S	40° 22,21' W	3018,1
PS81/0450-2	14.05.13	14:02	OBS	action	50° 37,18' S	40° 21,93' W	3044,7
PS81/0450-2	14.05.13	14:10	OBS	on deck	50° 37,17' S	40° 21,82' W	3049,1
PS81/0450-2	14.05.13	14:40	OBS	at surface	50° 36,68' S	40° 21,84' W	3007,6
PS81/0450-2	14.05.13	15:00	OBS	on deck	50° 36,46' S	40° 21,57' W	2998,9
PS81/0451-1	14.05.13	15:03	OBS	on ground/ max depth	50° 36,43' S	40° 21,45' W	3003,6
PS81/0451-1	14.05.13	15:03	OBS	in the water	50° 36,43' S	40° 21,45' W	3003,6
PS81/0451-1	14.05.13	15:06	OBS	action	50° 36,40' S	40° 21,37' W	3000,0
PS81/0451-1	14.05.13	15:08	OBS	on deck	50° 36,37' S	40° 21,34' W	3000,7
PS81/0451-1	14.05.13	16:26	OBS	at surface	50° 33,65' S	40° 12,03' W	2983,0
PS81/0451-1	14.05.13	17:03	OBS	action	50° 34,77' S	40° 7,17' W	2968,2

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0451-2	14.05.13	17:05	HN	in the water	50° 34,71' S	40° 7,16' W	2960,8
PS81/0451-1	14.05.13	17:05	OBS	on deck	50° 34,71' S	40° 7,16' W	2960,8
PS81/0451-2	14.05.13	17:06	HN	on ground/ max depth	50° 34,69' S	40° 7,14' W	2959,8
PS81/0452-1	14.05.13	17:07	OBS	on ground/ max depth	50° 34,67' S	40° 7,14' W	2959,2
PS81/0452-1	14.05.13	17:07	OBS	in the water	50° 34,67' S	40° 7,14' W	2959,2
PS81/0451-2	14.05.13	17:07	HN	on deck	50° 34,67' S	40° 7,14' W	2959,2
PS81/0452-1	14.05.13	17:09	OBS	action	50° 34,63' S	40° 7,16' W	2951,9
PS81/0452-1	14.05.13	17:13	OBS	on deck	50° 34,59' S	40° 7,11' W	2951,7
PS81/0452-1	14.05.13	18:06	OBS	at surface	50° 30,96' S	39° 57,43' W	3558,0
PS81/0452-1	14.05.13	18:45	OBS	on deck	50° 35,30' S	39° 54,56' W	3786,8
PS81/0452-2	14.05.13	18:49	HN	in the water	50° 35,15' S	39° 54,48' W	3792,8
PS81/0452-2	14.05.13	18:49	HN	on ground/ max depth	50° 35,15' S	39° 54,48' W	3792,8
PS81/0452-2	14.05.13	18:51	HN	on deck	50° 35,13' S	39° 54,45' W	3795,3
PS81/0453-1	14.05.13	18:52	OBS	on ground/ max depth	50° 35,12' S	39° 54,44' W	3793,7
PS81/0453-1	14.05.13	18:57	OBS	action	50° 35,06' S	39° 54,32' W	3788,3
PS81/0453-1	14.05.13	19:55	OBS	at surface	50° 31,78' S	39° 42,51' W	3985,5
PS81/0453-1	14.05.13	20:34	OBS	on deck	50° 36,00' S	39° 40,75' W	4037,2
PS81/0453-2	14.05.13	20:37	NN	in the water	50° 36,00' S	39° 40,69' W	4033,5
PS81/0453-2	14.05.13	20:37	NN	on ground/ max depth	50° 36,00' S	39° 40,69' W	4033,5
PS81/0454-1	14.05.13	20:39	OBS	on ground/ max depth	50° 35,99' S	39° 40,67' W	4023,6
PS81/0453-2	14.05.13	20:39	NN	on deck	50° 35,99' S	39° 40,67' W	4023,6
PS81/0454-1	14.05.13	20:40	OBS	action	50° 35,99' S	39° 40,66' W	4034,6
PS81/0454-1	14.05.13	20:47	OBS	action	50° 35,99' S	39° 40,63' W	4033,4
PS81/0454-1	14.05.13	22:24	OBS	in the water	50° 34,77' S	39° 26,68' W	4169,2
PS81/0454-1	14.05.13	22:24	OBS	on ground/ max depth	50° 34,77' S	39° 26,68' W	4169,2
PS81/0454-1	14.05.13	22:25	OBS	information	50° 34,77' S	39° 26,68' W	4171,7
PS81/0454-1	14.05.13	22:35	OBS	on deck	50° 34,83' S	39° 26,69' W	0,0
PS81/0454-1	14.05.13	22:43	OBS	in the water	50° 34,86' S	39° 26,91' W	0,0
PS81/0454-1	14.05.13	22:45	OBS	information	50° 34,91' S	39° 26,93' W	0,0
PS81/0454-1	14.05.13	22:50	OBS	on deck	50° 35,04' S	39° 27,00' W	0,0
PS81/0454-2	14.05.13	23:06	HN	in the water	50° 35,44' S	39° 27,07' W	0,0
PS81/0454-2	14.05.13	23:06	HN	on ground/ max depth	50° 35,44' S	39° 27,07' W	0,0
PS81/0454-2	14.05.13	23:08	HN	on deck	50° 35,48' S	39° 27,09' W	0,0
PS81/0454-1	15.05.13	1:23	OBS	information	50° 35,61' S	39° 25,33' W	4192,6
PS81/0455-1	15.05.13	2:00	OBS	on ground/ max depth	50° 33,58' S	39° 17,84' W	4299,8
PS81/0455-1	15.05.13	2:02	OBS	in the water	50° 33,61' S	39° 17,83' W	4300,1
PS81/0455-1	15.05.13	2:03	OBS	action	50° 33,63' S	39° 17,82' W	4300,5
PS81/0455-1	15.05.13	2:13	OBS	on deck	50° 33,81' S	39° 17,74' W	4300,3
PS81/0455-1	15.05.13	3:14	OBS	in the water	50° 34,23' S	39° 12,24' W	4372,1
PS81/0455-1	15.05.13	3:16	OBS	action	50° 34,26' S	39° 12,22' W	0,0
PS81/0455-1	15.05.13	3:16	OBS	at surface	50° 34,26' S	39° 12,22' W	0,0
PS81/0455-1	15.05.13	3:17	OBS	on deck	50° 34,28' S	39° 12,21' W	0,0

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0455-2	15.05.13	3:17	HN	in the water	50° 34,28' S	39° 12,21' W	0,0
PS81/0455-2	15.05.13	3:19	HN	on ground/ max depth	50° 34,32' S	39° 12,19' W	0,0
PS81/0455-2	15.05.13	3:19	HN	on deck	50° 34,32' S	39° 12,19' W	0,0
PS81/0455-1	15.05.13	3:47	OBS	action	50° 34,23' S	39° 12,81' W	4368,2
PS81/0455-1	15.05.13	3:51	OBS	on deck	50° 34,34' S	39° 12,73' W	4369,6
PS81/0456-1	15.05.13	4:33	OBS	on ground/ max depth	50° 32,82' S	39° 3,67' W	4503,3
PS81/0456-1	15.05.13	4:35	OBS	in the water	50° 32,81' S	39° 3,70' W	4491,2
PS81/0456-1	15.05.13	4:36	OBS	action	50° 32,83' S	39° 3,70' W	4491,2
PS81/0456-1	15.05.13	4:46	OBS	on deck	50° 32,96' S	39° 3,69' W	0,0
PS81/0456-2	15.05.13	5:35	HN	in the water	50° 33,33' S	38° 58,10' W	4570,0
PS81/0456-2	15.05.13	5:36	HN	on ground/ max depth	50° 33,34' S	38° 58,11' W	4567,3
PS81/0456-1	15.05.13	5:37	OBS	in the water	50° 33,36' S	38° 58,09' W	4570,0
PS81/0456-2	15.05.13	5:37	HN	on deck	50° 33,36' S	38° 58,09' W	4570,0
PS81/0456-1	15.05.13	5:38	OBS	action	50° 33,38' S	38° 58,07' W	4567,8
PS81/0456-1	15.05.13	5:40	OBS	on deck	50° 33,44' S	38° 58,05' W	4555,3
PS81/0456-1	15.05.13	7:08	OBS	information	50° 31,88' S	39° 0,98' W	4535,9
PS81/0456-1	15.05.13	9:08	OBS	action	50° 33,04' S	38° 59,26' W	4558,7
PS81/0457-1	15.05.13	10:19	HN	in the water	50° 32,29' S	38° 43,69' W	4734,9
PS81/0457-1	15.05.13	10:20	HN	on ground/ max depth	50° 32,28' S	38° 43,70' W	4731,0
PS81/0457-1	15.05.13	10:21	HN	on deck	50° 32,27' S	38° 43,70' W	4714,0
PS81/0457-2	15.05.13	10:22	OBS	in the water	50° 32,26' S	38° 43,70' W	4730,9
PS81/0457-2	15.05.13	10:22	OBS	on ground/ max depth	50° 32,26' S	38° 43,70' W	4730,9
PS81/0457-2	15.05.13	10:23	OBS	information	50° 32,26' S	38° 43,69' W	4733,4
PS81/0457-2	15.05.13	12:03	OBS	on deck	50° 32,22' S	38° 43,84' W	4725,0
PS81/0458-1	15.05.13	12:47	OBS	in the water	50° 31,54' S	38° 35,96' W	4808,3
PS81/0458-1	15.05.13	12:47	OBS	on ground/ max depth	50° 31,54' S	38° 35,96' W	4808,3
PS81/0458-1	15.05.13	12:48	OBS	information	50° 31,52' S	38° 35,99' W	4804,4
PS81/0458-1	15.05.13	12:51	OBS	on deck	50° 31,48' S	38° 36,01' W	4805,4
PS81/0458-2	15.05.13	13:31	HN	in the water	50° 31,48' S	38° 29,79' W	4841,5
PS81/0458-2	15.05.13	13:32	HN	on ground/ max depth	50° 31,46' S	38° 29,79' W	4857,3
PS81/0458-2	15.05.13	13:33	HN	on deck	50° 31,45' S	38° 29,81' W	4853,6
PS81/0458-1	15.05.13	13:35	OBS	in the water	50° 31,43' S	38° 29,86' W	4857,4
PS81/0458-1	15.05.13	13:36	OBS	information	50° 31,42' S	38° 29,88' W	4853,0
PS81/0458-1	15.05.13	13:42	OBS	on deck	50° 31,36' S	38° 30,04' W	4856,3
PS81/0458-1	15.05.13	15:00	OBS	information	50° 30,73' S	38° 30,10' W	4860,9
PS81/0459-1	15.05.13	19:04	OBS	on ground/ max depth	50° 34,84' S	39° 26,10' W	4190,4
PS81/0459-1	15.05.13	19:05	OBS	at surface	50° 34,84' S	39° 26,11' W	4187,4
PS81/0459-1	15.05.13	19:15	OBS	on deck	50° 34,99' S	39° 26,59' W	4186,9
PS81/0460-1	15.05.13	21:11	OBS	on ground/ max depth	50° 33,22' S	38° 58,10' W	4566,2
PS81/0460-1	15.05.13	21:14	OBS	action	50° 33,22' S	38° 58,11' W	4564,5
PS81/0460-1	15.05.13	21:55	OBS	on deck	50° 33,26' S	38° 58,04' W	4573,0
PS81/0460-1	15.05.13	22:27	OBS	at surface	50° 33,13' S	38° 57,91' W	4570,2

A.4 STATIONSLISTE / STATION LIST PS 81

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0460-1	15.05.13	22:49	OBS	on deck	50° 32,56' S	38° 59,11' W	4560,7
PS81/0461-1	16.05.13	0:14	OBS	in the water	50° 32,30' S	38° 43,71' W	4727,5
PS81/0461-1	16.05.13	0:17	OBS	on deck	50° 32,29' S	38° 43,67' W	4730,9
PS81/0461-1	16.05.13	0:36	OBS	in the water	50° 31,97' S	38° 44,90' W	4721,6
PS81/0461-1	16.05.13	0:42	OBS	on ground/ max depth	50° 31,87' S	38° 44,87' W	0,0
PS81/0461-1	16.05.13	0:42	OBS	on deck	50° 31,87' S	38° 44,87' W	0,0
PS81/0462-1	16.05.13	1:13	OBS	at surface	50° 31,76' S	38° 38,63' W	4781,0
PS81/0462-1	16.05.13	2:05	OBS	on ground/ max depth	50° 29,47' S	38° 32,11' W	4854,1
PS81/0462-1	16.05.13	2:06	OBS	on deck	50° 29,45' S	38° 32,10' W	4855,4
PS81/0463-1	16.05.13	2:45	OBS	on ground/ max depth	50° 28,52' S	38° 40,80' W	4791,6
PS81/0463-1	16.05.13	2:45	OBS	at surface	50° 28,52' S	38° 40,80' W	4791,6
PS81/0463-1	16.05.13	3:16	OBS	action	50° 30,01' S	38° 44,54' W	4738,9
PS81/0463-1	16.05.13	3:19	OBS	on deck	50° 29,94' S	38° 44,52' W	4739,9
PS81/0464-1	16.05.13	12:00	MTC	profile start	49° 58,26' S	36° 22,62' W	4885,1
PS81/0464-1	16.05.13	12:51	MTC	on ground/ max depth	49° 58,26' S	36° 22,70' W	4882,6
PS81/0464-1	16.05.13	13:43	MTC	profile end	49° 58,26' S	36° 22,59' W	4885,1
PS81/0465-1	16.05.13	14:15	MN	in the water	49° 57,06' S	36° 24,80' W	4916,0
PS81/0465-1	16.05.13	14:25	MN	on ground/ max depth	49° 57,15' S	36° 24,64' W	4910,0
PS81/0465-1	16.05.13	14:26	MN	hoisting	49° 57,16' S	36° 24,62' W	4908,4
PS81/0465-1	16.05.13	14:43	MN	on deck	49° 57,30' S	36° 24,56' W	4907,6
PS81/0465-2	16.05.13	14:51	SVP	in the water	49° 57,36' S	36° 24,47' W	4909,5
PS81/0465-2	16.05.13	15:02	SVP	in the water	49° 57,47' S	36° 24,53' W	4909,0
PS81/0465-2	16.05.13	15:06	SVP	in the water	49° 57,49' S	36° 24,52' W	4907,2
PS81/0465-2	16.05.13	16:32	SVP	on ground/ max depth	49° 57,85' S	36° 24,78' W	4908,6
PS81/0465-2	16.05.13	16:37	SVP	hoisting	49° 57,90' S	36° 24,86' W	4909,5
PS81/0465-2	16.05.13	18:29	SVP	on deck	49° 58,58' S	36° 24,58' W	4897,0
PS81/0465-2	16.05.13	18:31	SVP	on deck	49° 58,60' S	36° 24,56' W	4899,3
PS81/0465-2	16.05.13	18:37	SVP	on deck	49° 58,65' S	36° 24,49' W	4899,0
PS81/0466-1	17.05.13	9:51	SEISREFR	in the water	48° 52,97' S	32° 16,43' W	3804,8
PS81/0466-1	17.05.13	9:54	SEISREFR	in the water	48° 52,99' S	32° 16,68' W	3760,6
PS81/0466-1	17.05.13	9:55	SEISREFR	profile start	48° 52,99' S	32° 16,76' W	3743,6
PS81/0466-1	17.05.13	11:44	SEISREFR	profile end	48° 50,38' S	32° 7,81' W	3417,1
PS81/0466-1	17.05.13	11:45	SEISREFR	hoisting	48° 50,44' S	32° 7,84' W	3477,1
PS81/0466-1	17.05.13	11:51	SEISREFR	on deck	48° 50,70' S	32° 7,96' W	3697,2
PS81/0467-1	17.05.13	16:44	MN	in the water	48° 30,97' S	30° 55,89' W	5140,4
PS81/0467-1	17.05.13	16:57	MN	on ground/ max depth	48° 30,98' S	30° 55,77' W	5139,0
PS81/0467-1	17.05.13	16:57	MN	hoisting	48° 30,98' S	30° 55,77' W	5139,0
PS81/0467-1	17.05.13	17:15	MN	on deck	48° 31,04' S	30° 55,73' W	5139,8
PS81/0468-1	18.05.13	6:39	MN	in the water	47° 30,07' S	27° 12,86' W	4710,3
PS81/0468-1	18.05.13	6:51	MN	on ground/ max depth	47° 30,04' S	27° 12,65' W	4713,4
PS81/0468-1	18.05.13	7:06	MN	on deck	47° 30,12' S	27° 12,48' W	4714,8
PS81/0469-1	18.05.13	18:03	MN	in the water	46° 42,22' S	24° 22,64' W	4356,5

Station	Date	Time	Gear	Action	Position Lat	Position Lon	Depth [m]
PS81/0469-1	18.05.13	18:14	MN	on ground/ max depth	46° 42,16' S	24° 22,50' W	4357,9
PS81/0469-1	18.05.13	18:32	MN	on deck	46° 42,10' S	24° 22,29' W	4362,7
PS81/0470-1	19.05.13	10:44	MN	in the water	45° 30,03' S	20° 6,83' W	3533,9
PS81/0470-1	19.05.13	10:54	MN	on ground/ max depth	45° 30,10' S	20° 6,79' W	3537,9
PS81/0470-1	19.05.13	10:54	MN	hoisting	45° 30,10' S	20° 6,79' W	3537,9
PS81/0470-1	19.05.13	11:11	MN	on deck	45° 30,13' S	20° 6,95' W	3531,3
PS81/0471-1	20.05.13	1:57	MN	in the water	44° 30,22' S	16° 40,18' W	3327,7
PS81/0471-1	20.05.13	2:08	MN	on ground/ max depth	44° 30,14' S	16° 40,16' W	3335,8
PS81/0471-1	20.05.13	2:08	MN	hoisting	44° 30,14' S	16° 40,16' W	3335,8
PS81/0471-1	20.05.13	2:27	MN	on deck	44° 30,01' S	16° 40,11' W	3351,7
PS81/0472-1	20.05.13	10:30	MTC	profile start	43° 59,91' S	14° 55,38' W	3226,7
PS81/0472-1	20.05.13	11:18	MTC	on ground/ max depth	43° 59,91' S	14° 55,30' W	3228,9
PS81/0472-1	20.05.13	12:08	MTC	profile end	43° 59,91' S	14° 54,97' W	3133,7
PS81/0473-1	20.05.13	19:26	MN	in the water	43° 30,00' S	13° 15,39' W	3652,4
PS81/0473-1	20.05.13	19:37	MN	on ground/ max depth	43° 29,84' S	13° 15,37' W	3653,0
PS81/0473-1	20.05.13	19:54	MN	on deck	43° 29,77' S	13° 15,34' W	3648,7
PS81/0474-1	21.05.13	11:05	HN	in the water	42° 30,09' S	9° 54,57' W	3829,5
PS81/0474-1	21.05.13	11:06	HN	on ground/ max depth	42° 30,09' S	9° 54,57' W	3829,0
PS81/0474-1	21.05.13	11:07	HN	on deck	42° 30,09' S	9° 54,56' W	3830,1
PS81/0475-1	22.05.13	10:02	MN	in the water	41° 1,60' S	5° 50,55' W	3272,8
PS81/0475-1	22.05.13	10:15	MN	on ground/ max depth	41° 1,54' S	5° 50,36' W	3316,3
PS81/0475-1	22.05.13	10:15	MN	hoisting	41° 1,54' S	5° 50,36' W	3316,3
PS81/0475-1	22.05.13	10:31	MN	on deck	41° 1,39' S	5° 50,22' W	3325,8
PS81/0476-1	23.05.13	12:35	MTC	profile start	39° 22,11' S	0° 3,25' W	4966,9
PS81/0476-1	23.05.13	13:00	MTC	on ground/ max depth	39° 21,48' S	0° 5,84' W	4901,0
PS81/0476-1	23.05.13	13:27	MTC	information	39° 22,00' S	0° 3,23' W	4971,4
PS81/0476-1	23.05.13	14:18	MTC	profile end	39° 21,85' S	0° 3,21' W	4969,0
PS81/0477-1	26.05.13	11:32	MTC	profile start	36° 52,99' S	6° 50,79' E	4873,1
PS81/0477-1	26.05.13	11:33	MTC	on ground/ max depth	36° 52,85' S	6° 50,81' E	4867,0
PS81/0477-1	26.05.13	12:22	MTC	action	36° 51,87' S	6° 48,34' E	4861,8
PS81/0477-1	26.05.13	13:12	MTC	profile end	36° 51,76' S	6° 48,32' E	4857,6

Gear abbreviations

HN	Hand Net
MN	Multi Net
MTC	Magnetic Turn Circle
OBH	Ocean-Bottom Hydrophone
OBS	Ocean-Bottom Seismometer
POS	Posidonia
SEISREFR	Seismic Refraction Profile
SVP	Sound Velocity Profiler

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