ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

698
2016

Berichte
zur Polar- und Meeresforschung

Reports on Polar and Marine Research

The Expedition SO246 of the Research Vessel SONNE to the Chatham Rise in 2016

Edited by

Karsten Gohl and Reinhard Werner

with contributions of the participants

HELMHOLTZ GEMEINSCHAFT

Die Berichte zur Polar- und Meeresforschung werden vom Alfred-Wegener-Institut, Helmholtz-Zentrum für Polar- und Meeresforschung (AWI) in Bremerhaven, Deutschland, in Fortsetzung der vormaligen Berichte zur Polarforschung herausgegeben. Sie erscheinen in unregelmäßiger Abfolge.

Die Berichte zur Polar- und Meeresforschung enthalten Darstellungen und Ergebnisse der vom AWI selbst oder mit seiner Unterstützung durchgeführten Forschungsarbeiten in den Polargebieten und in den Meeren.

Die Publikationen umfassen Expeditionsberichte der vom AWI betriebenen Schiffe, Flugzeuge und Stationen, Forschungsergebnisse (inkl. Dissertationen) des Instituts und des Archivs für deutsche Polarforschung, sowie Abstracts und Proceedings von nationalen und internationalen Tagungen und Workshops des AWI.

Die Beiträge geben nicht notwendigerweise die Auffassung des AWI wider.

Herausgeber
Dr. Horst Bornemann

Redaktionelle Bearbeitung und Layout
Birgit Reimann

Alfred-Wegener-Institut
Helmholtz-Zentrum für Polar- und Meeresforschung
Am Handeshafen 12
27570 Bremerhaven
Germany

www.awi.de
www.reports.awi.de

Der Erstautor bzw. herausgebende Autor eines Bandes der Berichte zur Polar- und Meeresforschung versichert, dass er über alle Rechte am Werk verfügt und überträgt sämtliche Rechte auch im Namen seiner Koautoren an das AWI. Ein einfaches Nutzungsrecht verbleibt, wenn nicht anders angegeben, beim Autor (bei den Autoren). Das AWI beansprucht die Publikation der eingereichten Manuskripte über sein Repositorium ePIC (electronic Publication Information Center, s. Innenseite am Rückdeckel) mit optionalem print-on-demand.

The Reports on Polar and Marine Research are issued by the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) in Bremerhaven, Germany, succeeding the former Reports on Polar Research. They are published at irregular intervals.

The Reports on Polar and Marine Research contain presentations and results of research activities in polar regions and in the seas either carried out by the AWI or with its support.

Publications comprise expedition reports of the ships, aircrafts, and stations operated by the AWI, research results (incl. dissertations) of the Institute and the Archiv für deutsche Polarforschung, as well as abstracts and proceedings of national and international conferences and workshops of the AWI.

The papers contained in the Reports do not necessarily reflect the opinion of the AWI.

Editor
Dr. Horst Bornemann

Editorial editing and layout
Birgit Reimann

Alfred-Wegener-Institut
Helmholtz-Zentrum für Polar- und Meeresforschung
Am Handeshafen 12
27570 Bremerhaven
Germany

www.awi.de
www.reports.awi.de

The first or editing author of an issue of Reports on Polar and Marine Research ensures that he possesses all rights of the opus, and transfers all rights to the AWI, inlcuding those associated with the co-authors. The non-exclusive right of use (einfaches Nutzungsrecht) remains with the author unless stated otherwise. The AWI reserves the right to publish the submitted articles in its repository ePIC (electronic Publication Information Center, see inside page of verso) with the option to "print-on-demand".

Titel: Sonne schleppt fünf verschiedene Systeme gleichzeitig: von Backbord nach Steuerbord sind diese das passive akustische Monitoring-System (PAM), die Steuerbord-Airguns, der seismische Streamer, die Backbord-Airguns und das Magnetometer (Foto K. Gohl/AWI).
Cover: Sonne tows five different systems in parallel: these are – from starboard to port – the passive acoustic monitoring system (PAM), the starboard airguns, the seismic streamer, the port airguns and the magnetometer (Photo K. Gohl/AWI).

The Expedition SO246 of the Research Vessel SONNE to the Chatham Rise in 2016

Edited by

Karsten Gohl and Reinhard Werner

with contributions of the participants

Please cite or link this publication using the identifiers
hdl:10013/epic.47961 or http://hdl.handle.net/10013/epic.47961 and
doi:10.2312/BzPM_0698_2016 or http://doi.org/10.2312/BzPM_0698_2016

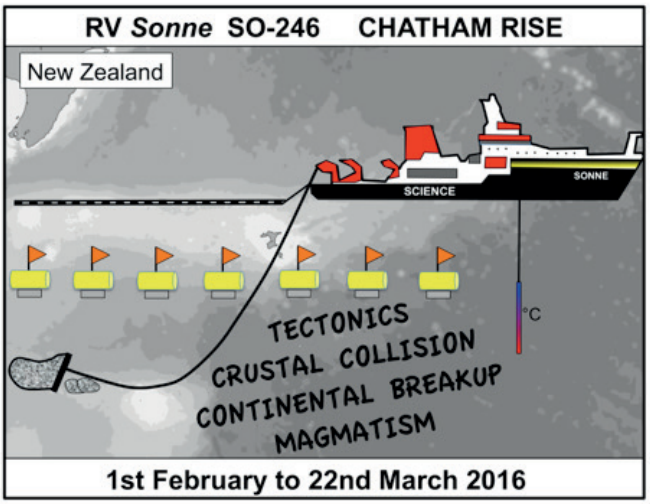
ISSN 1866-3192

RV *SONNE* SO246

RV SONNE SO246
Cruise Report / Fahrtbericht

Departure: Wellington, 01 February 2016
Arrival: Wellington, 21 March 2016

SO246 – CHATHAM RISE:
Chatham Rise (New Zealand): Compressional, extensional and breakup mechanisms of a submarine continental plateau



Karsten Gohl (Chief-Scientist)
Alfred-Wegener-Institut
Helmholtz-Zentrum für Polar- und Meeresforschung
Bremerhaven, Germany
&
Reinhard Werner
GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel
Kiel, Germany

Contents

1. ZUSAMMENFASSUNG / CRUISE SUMMARY

Der Fahrtabschnitt SO246 des FS *Sonne* hatte vordringlich das Ziel, die Prozesse des Zerfalls von Superkontinenten, die häufig mit dem Ende einer Subduktionstätigkeit und dem Wechsel von lithosphärischer Konvergenz zu Extension in Verbindung gebracht werden, zu analysieren. Der submarine Chatham-Rücken des östlichen Neuseelands lag an einer Schlüssellokation während des frühen Aufbruchs des östlichen Gondwana-Kontinents in der Spätkreide. Neuere Studien vom Chatham-Rücken zeigen, dass das kontinentale Rifting und der Aufbruch durch das Ende der Subduktion der proto-pazifischen Kruste an diesem Kontinentalrand als Folge der Kollision des Hikurangi-Plateaus – einer vulkanischen Großprovinz (LIP) – mit dem Chatham-Rücken, initiiert wurde. Dieser Fahrtabschnitt war ausgerichtet auf die Untersuchungen (a) der Rolle, die die Plateaukollision und -subduktion im Riftung- und Abbruchprozess gespielt hat, (b) der geodynamischen und magmatischen Prozesse, die das Rifting beleiteten, (c) der krustalen Charakteristik und Ausbreitung der kontinentalen Ausdünnung und Fragmentierung entlang des Plateaurandes des Chatham Rise, der konjugierend zum Kontinentalrand von Marie-Byrd-Land und der östlichen Amundsenmeer-Region der Westantarktis liegt, und (d) der Öffnung eines frühen ozeanischen Seeweges zwischen Neuseeland und der Antarktis. Die Aufnahme von refraktions- und weitwinkelseismischen Daten mit Hilfe von bis zu 40 Ozeanboden-Seismometern entlang von 4 langen Profilen wurde begleitend von mehrkanal-reflexionsseismischen Messungen, um die Strukturen und Eigenschaften der Sedimente, der Kruste und des obersten Mantels des östlichen Chatham-Rückens und seines Kontinentalrandes zu erkunden. Fächerecholot-, Sedimentecholot- und gravimetrische Aufnahmen wurden nahezu während der gesamten Fahrt registriert. Ein geschlepptes Magnetometer setzten wir in Regionen mit lückenhafter Abdeckung von magnetischen Anomaliedaten ein, um den Kontinent-Ozean-Übergang, magmatische Intrusionen und Störungszonen im Grundgebirge zu identifizieren. Eine Temperatursonde wurde an mehreren Stationen zur Bestimmung des geothermischen Wärmestroms eingesetzt. Wir sammelten zahlreiche Hartgesteinsproben mit Hilfe einer Dredge von den Flanken von 13 vulkanischen Seebergen (seamounts) am südöstlichen Rand des Chatham-Rückens, um vulkanologische, geochemische und geochronologische Untersuchungen in Hinblick auf magmatische Prozesse und die Entstehung der Seeberge durchzuführen. Eine kleine biologischen Komponente des Fahrtabschnitts widmete sich der Identifizierung und Verteilung von Organismen an den Flanken dieser tiefliegenden Seeberge. Die Analysen der Proben und Daten dieses Fahrtabschnitts werden zu einem verbesserten Verständnis der geodynamischen, tektonischen und magmatischen Prozesse beitragen, die den Aufbruch von Neuseeland und der Antarktis sowie die Formation ihrer passiven Kontinentalrändern und ihrer Kontinent-Ozean-Übergangskruste kontrolliert und begleitet haben. Wir erwarten, dass die Ergebnisse auch für das allgemeine Verständnis der Entstehung von Erzlagerstätten sowie für regionale paläoklimatische Untersuchungen verwertbar sein werden.

The main objective of RV *Sonne* cruise SO246 was to address the processes of disintegrating supercontinents that is often associated with the end of subduction activity and the change from lithospheric convergence to extension. The submarine Chatham Rise of eastern New Zealand was a key location at the early continental breakup of eastern Gondwana in the Late Cretaceous. Recent studies of the Chatham Rise indicate that the continental rifting and breakup had been initialized by the end of the Proto-Pacific crustal subduction along this Gondwana margin, following the collision of Hikurangi Plateau – a large igneous province (LIP) – with the Chatham Rise. This cruise was aimed to investigate (a) the role that this LIP collision and subduction played in the continental rifting and breakup process, (b) the geodynamic and magmatic processes accompanying the rifting, (c) the nature, characteristics and

extent of continental thinning and fragmentation at the south-eastern plateau margin of Chatham Rise, which is conjugate to the continental margins of eastern Marie Byrd Land and the Amundsen Sea Embayment of West Antarctica, and (d) the opening of an early oceanic pathway between New Zealand and Antarctica. The collection of seismic refraction/wide-angle reflection data by using up to 40 ocean-bottom seismometers along 4 long profiles was accompanied by multichannel seismic reflection recordings to image sedimentary, crustal and uppermost mantle structures and characteristics across eastern Chatham Rise and its margin. Multi-beam bathymetric, sediment-echosounding and gravimetric recordings were collected along most of the ship-track. A magnetometer was towed in areas of major gaps in magnetic anomaly coverage to help identify the continent-ocean transition, magmatic intrusions and basement offsets by faulting. We deployed a temperature probe for testing the geothermal heat-flow. Numerous hardrock samples were dredged from the flanks of 13 volcanic seamounts along the south-eastern Chatham Rise margin for volcanological, geochemical and geochronological studies on the causes and processes of magmatic activities and the formation of these seamounts. A small biological component of this cruise aimed at the identification and distribution of life organisms on the flanks of deep-seated seamounts. The analyses of samples and data collected during this cruise will contribute to an improved understanding of the geodynamic, tectonic and magmatic processes controlling and accompanying the disassembly of New Zealand and Antarctica, the formation of their passive continental margins and the extent and characteristics of their continent-ocean transitional crusts. We expect that the outcome will also have benefits for the general understanding of ore deposit generation and for regional paleoclimate studies.

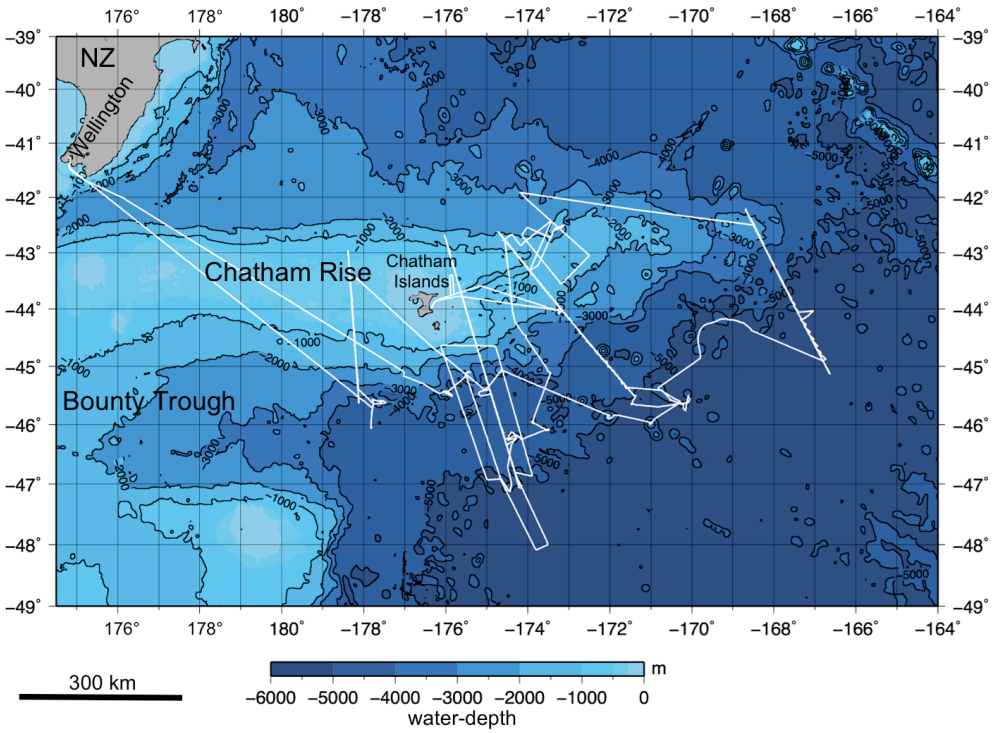


Fig. 1.1. Ship-track of RV *Sonne* cruise SO246

2. PARTICIPANTS

Fig. 2.1. Scientific cruise participants of SO246.

2.1 Principal investigators for CHATHAM RISE

Gohl, Karsten	AWI (project coordinator)
Hoernle, Kaj	GEOMAR
Werner, Reinhard	GEOMAR

2.2 Scientific party

Anders, Maria	Student, Geology	GEOMAR
Barrett, Rachel	Student, Geophysics	UniW
Bihler, Viola	Student, Geophysics	AWI
Brotzer, Andreas	Student, Geophysics	AWI
Crespo-Sanchidrián, Rosa	Student, Geodesy	AWI
Davy, Bryan	Senior Scientist, Geophysics	GNS
Dreutter, Simon	Student, Geodesy	AWI
Duguid, Gareth	Marine Mammal Observer	Gardline
Dziadek, Ricarda	Student, Geophysics	UniB & AWI
Eggers, Thorsten	Technician, Geophysics	Excitech
Eisermann, Hannes	Student, Geophysics	AWI
Furchheim, Nina	Student, Biology	MfN
Gades, Till Niels	Technician, Geophysics	KUM
Gohl, Karsten (Chief Scientist)	Senior Scientist, Geophysics	AWI
Hagemann, Katlina	Student, Geology	GEOMAR
Heinrich, Mirja	Student, Geology	GEOMAR
Hochmuth, Katharina	Scientist, Geophysics	AWI
Homrighausen, Stephan	Scientist, Geology	GEOMAR
Joeressen, Lukas	Technician, Geophysics	KUM

Kimmel, Bastian	Student, Geophysics	AWI
Koch, Steffen	Student, Geology	GEOMAR
Labahn, Erik	Technician, Geophysics	KUM
Moser, Manuel	Student, Geophysics	AWI
Münzner, Florentina	Student, Geodesy	AWI
Petersen, Florian	Student, Geophysics	AWI
Price, Richard	Marine Mammal Observer	Gardline
Rankmore, Krista	Marine Mammal Observer	Gardline
Riefstahl, Florian	Student, Geophysics	AWI
Riggin, Jessica (from 23 Feb)	Marine Mammal Observer	Gardline
Steinmann, René	Student, Geophysics	AWI
Stoll, Nicolas	Student, Geophysics	AWI
Waru, Mary-Jane (until 23 Feb)	Marine Mammal Observer	Gardline
Wellschmidt, Gesine	Student, Geology	GEOMAR
Werner, Reinhard	Senior Scientist, Geology	GEOMAR

Organisations:

AWI	Alfred Wegener Institute Helmholtz-Centre for Polar and Marine Research, Section of Geophysics, Am Alten Hafen 26, 27568 Bremerhaven, Germany (http://www.awi.de)
Excitech	Excitech GmbH, Branterei 33, 26419 Schortens, Germany (http://www.excitech.de)
Gardline	Gardline Environmental (New Zealand) Ltd., HP Tower, Level 15, 171 Featherston Street, Wellington 6011, New Zealand (http://www.gardlinemarinesciences.com)
GEOMAR	Helmholtz-Centre for Ocean Research Kiel (GEOMAR), Wischhofstr. 1-3, 24148 Kiel, Germany (http://www.geomar.de)
GNS	GNS Science, 1 Fairway Drive, Avalon, Lower Hutt 5010, New Zealand (http://www.gns.cri.nz)
KUM	K.U.M. Umwelt- und Meerestechnik GmbH, Wischhofstr. 1-3, 24148 Kiel, Germany (http://www.kum-kiel.de)
MfN	Museum of Natural History Berlin, Leibniz-Institute for Evolution and Biodiversity Science, Invalidenstr. 43, 10115 Berlin, Germany (http://www.naturkundemuseum.berlin)
UniB	University of Bremen, Dept. of Geosciences, Klagenfurter Str., 28359 Bremen, Germany (http://www.geo.uni-bremen.de)
UniW	Victoria University of Wellington, Institute of Geophysics, Salamanca Road, Wellington 6140, New Zealand (http://www.vuw.ac.nz)

2.3 Ship's crew

Meyer, Oliver	Master
Sossna, Yves	Chief Mate
Hoffsommer, Lars	2nd Officer
Henning, Tim	2nd Officer
Hermesmeyer, Dieter	Chief Engineer
Heikens, Karsten	2nd Engineer
Horsel, Roman	2nd Engineer
Dr. Walther, Anke	Medical Doktor
Grossmann, Matthias	Chief Electronician
Meinecke, Stefan	Electronician

Borchert, Wolfgang	System Manager IT
Plöger, Miriam	System Manager IT
Beyer, Thomas	Electrician
Schmidt, Hendrik	Electrician
Hoffmann, Georg	Motorman
Münch, Lothar	Motorman
Talpai, Matyas	Motorman
Tiemann, Frank	Chief Cook
Spieler, Andreas	2nd Cook
Pohl, Andreas	1st Steward
Kluge, Sylvia	2nd Stewardess
Kröger, Sven	2nd Steward
Royo, Luis	2nd Steward
Schrage, Frank	Boatswain
Blohm, Volker	Fitter
Burzlaff, Stefan	A.B.
Eidam, Oliver	A.B.
Fricke, Ingo	A.B.
Koch, Stefan	A.B.
Kraft, Jürgen	A.B.
Papke, René	A.B.
Vogel, Dennis	A.B.

3. AIMS OF THE CRUISE

The disintegration of supercontinents, such as Gondwana, is often associated with the end of subduction activity and the change from lithospheric convergence to extension. The crustal and mantle dynamic processes are hardly understood. What drives the change of mode from lithospheric collision to extension and breakup in a relatively short geological period? What are the underlying and accompanying mantle processes?

The submarine Chatham Rise of eastern Zealandia was at a key location at the early continental breakup of eastern Gondwana in the Late Cretaceous (Fig. 3.1). Recent studies of the Chatham Rise indicate that the continental rifting and breakup has been initialized by the end of the Proto-Pacific crustal subduction along this Gondwana margin, following the collision of Hikurangi Plateau – a large igneous province (LIP) – with Chatham Rise (e.g. Davy et al., 2008; Davy, 2014). This cruise SO246 and its associated project are aimed to investigate (a) the role that this LIP collision and subduction played in the continental rifting and breakup process, (b) the geodynamic and magmatic processes accompanying the rifting, (c) the nature, characteristics and extent of continental thinning and fragmentation at the south-eastern plateau margin of Chatham Rise, which is conjugate to the continental margins of eastern Marie Byrd Land and the Amundsen Sea Embayment of West Antarctica, and (d) the opening of an early oceanic pathway between New Zealand and Antarctica.

By utilizing deep crustal seismic profiling, magnetic, gravimetric, multi-beam bathymetric, sediment-echosounding recordings, geothermal heat-flow probing as well as volcanological, geochemical and geochronological analyses of dredge samples, this project contributes to an improved understanding of the processes controlling the disassembly of supercontinents and the formation of passive continental margins and their continent-ocean transitional crust. The outcome will also have benefits for the

understanding of the generation of ore deposits as well as for paleoclimate studies. A biological component of this cruise aims to reveal the identification and distribution of life organisms on the flanks of deep-seated seamounts.

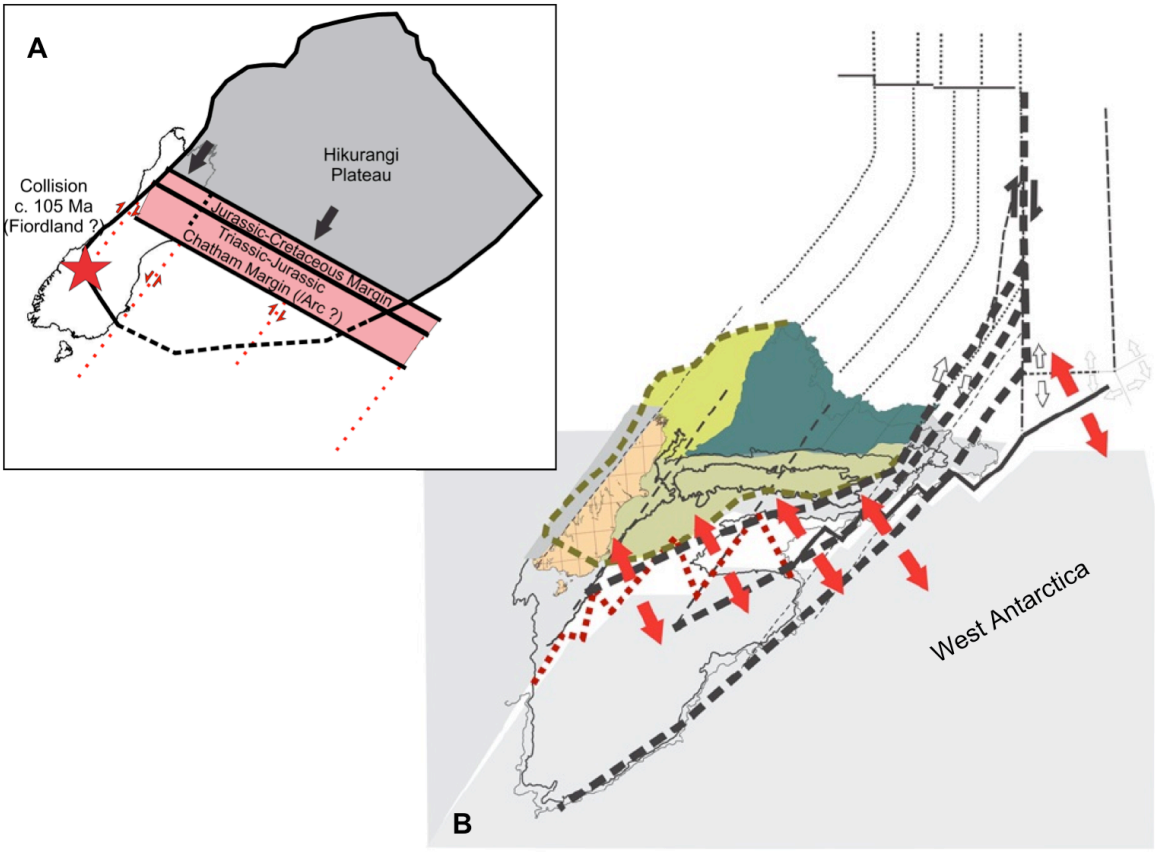


Fig. 3.1. Sketches illustrating (A) the collision of Hikurangi Plateau with the former Gondwana subduction margin of Zealandia at about 105 Ma and (B) the break-up of New Zealand from West Antarctica at about 90-85 Ma. Both sketches are from Davy (2014).

4. SETTING OF THE WORK AREA

The work area of cruise SO246 is located on the eastern Chatham Rise which is the easternmost region of the continental submarine plateaus and rises of greater New Zealand, or Zealandia as often referred to in the geoscientific literature (Fig. 4.1). Chatham Rise reaches its highest points, and supposedly thickest crust, at the Chatham Islands and slopes down to deep-sea levels of more than 4000 m along its southeastern margins. Having been at the former Gondwana active subduction margin in the Mesozoic and until the middle Cretaceous, Chatham Rise was than affected by the collision of the Hikurangi Plateau, an 130 Ma old oceanic large-igneous province (LIP), which jammed into the northern Chatham Rise margin at about 105 Ma, leading to cessation of the subduction process along this part of the Gondwana margin (e.g. Davy et al., 2008; Davy, 2014). Shortly after the collision event, Chatham Rise and, slightly later, Campbell Plateau broke apart from West Antarctica between 90 and 83 Ma as part of the larger Gondwana disintegration (e.g. Eagles et al., 2004; Wobbe et al., 2012).

As known from analyses of previously sampled basaltic rocks from seamounts, magmatic and volcanic events accompanied the collisional and extensional processes, but also occurred at younger times when these tectonic deformations were completed.

As both the collisional or compressional, as well as the extensional and break-up features are the main objectives of this project, we placed our geophysical profiles across most of the eastern Chatham from its former Gondwana margin and collision zone to the southeastern continental margin into the oceanic crust of the Pacific plate (Fig. 4.2). The rock sampling sites were selected on volcanic seamounts in the areas of the co-called Southeastern Chatham Terrace, an area of supposedly mixed oceanic and continental crustal affinity, and east of it close to the ocean-continent transition zone of southeastern Chatham Rise.

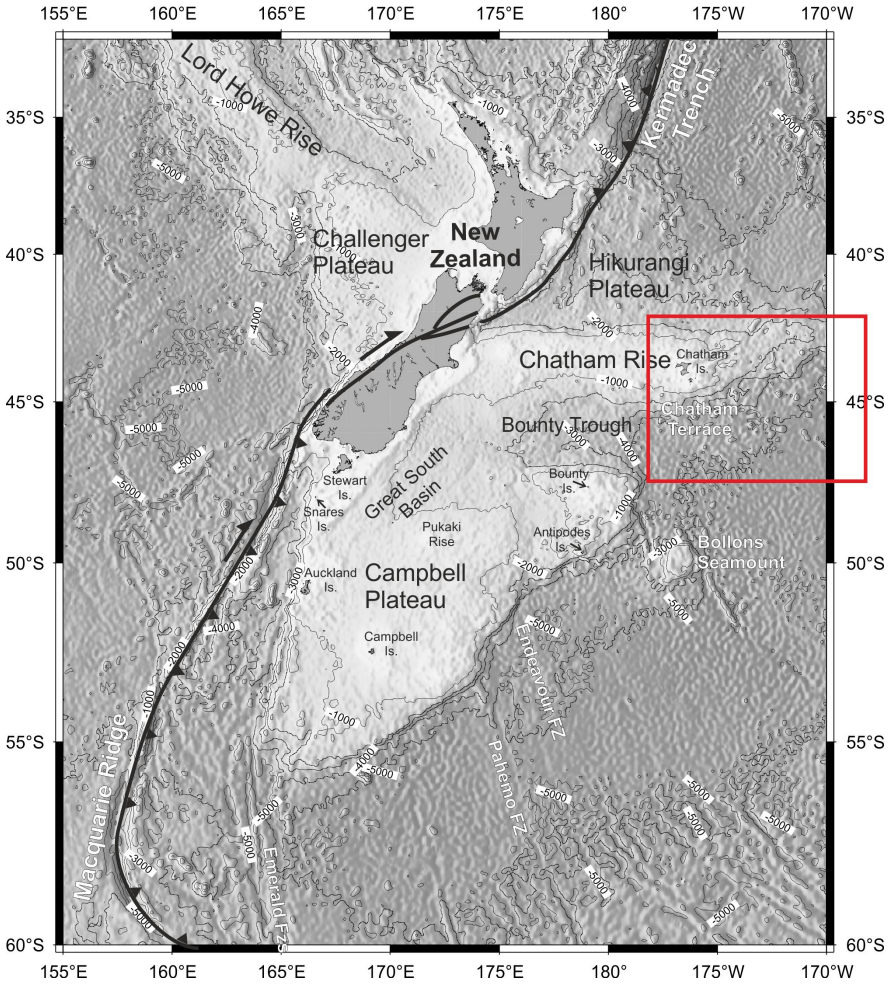


Fig. 4.1. Overview map of greater New Zealand (Zealandia) with its North and South Islands, the Pacific-Australian plate boundary and the submarine plateaus. Red box marks work area of SO246 on central-eastern Chatham Rise and its southern rise margin incl. Chatham Terrace.

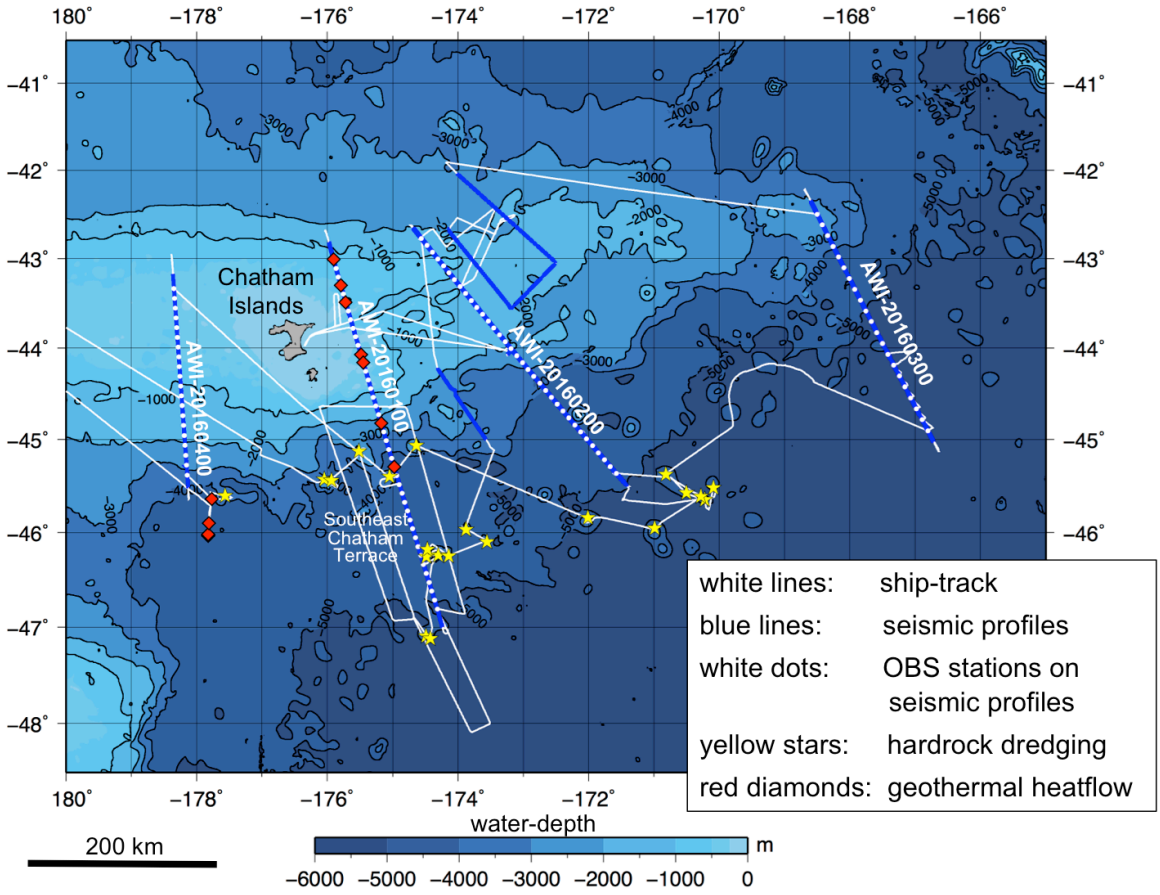


Fig. 4.2. Work area of central and eastern Chatham Rise during RV Sonne cruise SO246. Names of seismic refraction (OBS) profiles are annotated. Geothermal heat-flow stations are annotated in Fig. 6.6.1. Dredge stations are annotated in Figs. 6.7.1 and 6.7.15.

5. CRUISE ITINERARY

Day	**Date (2016)**	**Board time ca.** (UTC is -13 h)	**Science activities and events**	**Weather, seastate**
Sa	30.01.	09:30	Scientific advance team to ship;	n/a
Su	31.01.	10:00 12:30	Embarkment of scientific participants; Unpacking and assemblage of equipment;	n/a
Mo	01.02.	19:00	Unpacking and assemblage of equipment; **Departure from Wellington;** Transit to work area;	Fine

Day	**Date (2016)**	**Board time ca.** (UTC is -13 h)	**Science activities and events**	**Weather, seastate**
Tu	02.02.	 02:00 07:00 15:30	Continue transit to work area; Start of EM122 multibeam bathymetry (continuous during cruise); CTD station for EM122 calibration; Start of Parasound sediment-echosound recording (continuous during cruise); Deployment of magnetometer and start recording; Assemblage/installation of equipment;	Fine, low swell
We	03.02.	 11:00 11:45 19:00	Continue transit to work area; End magnetic recording; OBS releaser test; Start bathymetric survey & dredging	Cloudy, low swell
Th	04.02.	 13:00 15:00 15:15	Continue dredging; CTD station with ocean-bottom seismometer (OBS) releaser test and geothermal thermistor calibration; Start magnetic & bathymetric profiling (South Chatham Terrace); Test of Passive Acoustic Monitoring (PAM) system; Continue magnetic & bathymetric profiling;	Cloudy, low swell
Fr	05.02.		Continue magnetic & bathymetric profiling;	low to medium swell
Sa	06.02.	08:15 08:30 09:30 13:00	End magnetic profiling; Airgun safety instructions; Airgun test operation; Start OBS deployment Profile AWI-20160100 (40 OBS systems);	Partly cloudy, medium to high swell
Su	07.02.	17:00 20:00 22:00	End OBS deployment Profile AWI-20160100; Deployment of PAM, seismic streamer, airguns and magnetometer; Start shooting seismic refraction Profile AWI-20160100;	Partly cloudy, medium to low swell
Mo	08.02.		Continue shooting Profile AWI-20160100;	Cloudy, low swell
Tu	09.02.		Continue shooting Profile AWI-20160100;	Cloudy, low swell
We	10.02.	02:30 06:00	End shooting Profile AWI-20160100 then ship turning loop; Start shooting seismic reflection Profile AWI-20160001;	Fine, low swell
Th	11.02.		Continue shooting Profile AWI-20160001;	Fine, medium to low swell
Fr	12.02.	08:00 12:00 15:00	End shooting Profile AWI-20160001; Retrieval of seismic streamer, airguns and magnetometer; CTD and geothermal heatflow (HF) station; Start OBS retrieval Profile AWI-20160100; Geothermal heatflow stations;	Fine, low swell
Sa	13.02.	 19:30	Continue OBS retrieval Profile AWI-20160100; Geothermal heatflow stations; CTD station;	Cloudy, low swell

Day	**Date (2016)**	**Board time ca.** (UTC is -13 h)	**Science activities and events**	**Weather, seastate**
Su	14.02.		Continue OBS retrieval Profile AWI-20160100; Geothermal heatflow station; Bathymetric survey of seamount;	Fine, low swell
Mo	15.02.	 11:15 11:30 17:30	Continue OBS retrieval Profile AWI-20160100; Bathymetric survey of seamount; End OBS retrieval Profile AWI-20160100; CTD station; Start magnetic & bathymetric profiling (south of South Chatham Terrace);	Fine, low swell
Tu	16.02.	10:30 11:00	End of magnetic & bathymetric profiling; Start bathymetric surveying & dredging;	Fine, low swell
We	17.02.		Continue dredging;	Fine, low swell
Th	18.02.	14:00 19:30 22:30	End of dredging; magnetic & bathymetric profiling; CTD station; Deployment of PAM, streamer, airguns and magnetometer;	Increasing wind, medium swell & waves
Fr	19.02.	00:40 13:20	Start shooting seismic reflection Profile AWI-20160002; End shooting seismic reflection Profile AWI-20160002 due to severe weather; Transit to Profile AWI-20160200;	Strong winds, high waves
Sa	20.02.	10:30	Start OBS deployment Profile AWI-20160200 (35 OBS systems);	Medium wind & waves
Su	21.02.	10:45 11:00 13:00	End OBS deployment Profile AWI-20160200; Deployment of PAM and airguns (no streamer); Start shooting seismic refraction Profile AWI-20160200 (1st part);	Cloudy, low swell
Mo	22.02.	 12:00 13:00	Continue shooting Profile AWI-20160200; End shooting Profile AWI-20160200 (1st part) and retrieval of airguns and PAM due to weather; Start of magnetic and bathymetric survey on central Chatham Rise;	Cloudy, increasing wind and waves
Tu	23.02.	01:00 05:15 05:30 07:30 16:00 16:20 18:00	End of magnetic and bathymetric profile; 1st approach to Owenga (Chatham Island); Person exchange (1 person disembarking); Magnetic and bathymetric survey; 2nd approach to Owenga (Chatham Island); Person exchange (1 person embarking); Magnetic and bathymetric survey;	Partly cloudy, low swell
We	24.02.	07:00 09:00	Deployment of PAM and airguns (no streamer); Re-Start shooting seismic refraction Profile AWI-20160200 (2nd part);	Cloudy, medium winds and swell
Th	25.02.	07:30 08:00 10:00	End shooting Profile AWI-20160200; Deployment of streamer and magnetometer; Start shooting seismic reflection Profile AWI-20160003 (along AWI-20160200);	Cloudy, medium winds and swell
Fr	26.02.		Continue shooting Profile AWI-20160003;	Cloudy, medium winds and swell
Sa	27.02.	06:00 08:30 11:00	End shooting Profile AWI-20160003; Retrieval of magnetometer, airguns, PAM and streamer; CTD station; Start bathymetric surveying & dredging;	Partly cloudy, medium winds and swell

Day	**Date (2016)**	**Board time ca.** (UTC is -13 h)	**Science activities and events**	**Weather, seastate**
Su	28.02.	10:30 14:30	End dredging; Bathymetric survey to OBS profile; Start OBS retrieval Profile AWI-20160200;	Partly cloudy, medium winds; increasing swell
Mo	29.02.		Continue OBS retrieval;	Cloudy, increasing wind and waves
Tu	01.03.	 16:00 18:00	Continue OBS retrieval; End OBS retrieval Profile AWI-20160200; CTD station; Start of magnetic and bathymetric survey on northeastern Chatham Rise;	Partly cloudy, strong wind and waves
We	02.03.	 21:30	Continue magnetic and bathymetric survey; End magnetic and bathymetric survey due to stormy seas;	Cloudy, stormy, high waves
Th	03.03.	12:30 13:00 15:00	End magnetic and bathymetric survey; Deployment of PAM, streamer, airguns and magnetometer; Start shooting seismic reflection Profiles AWI-20160004 to -0006;	Winds decreasing, high to medium swell
Fr	04.03.		Continue shooting seismic reflection Profiles AWI-20160004 to -0006;	Cloudy, medium to low swell
Sa	05.03.	06:00 09:00 22:00	End shooting seismic reflection Profiles AWI-20160004 to -0006; Start magnetic and bathymetric profiling; Transit to next seismic refraction profile;	Partly cloudy, low swell
Su	06.03.	09:30	Start OBS deployment Profile AWI-20160300 (21 OBS systems);	Cloudy, low swell
Mo	07.03.	03:10 05:50	Deployment of PAM, streamer, airguns and magnetometer; Start shooting seismic refraction Profile AWI-20160300;	Cloudy, medium swell
Tu	08.03.	 18:00 22:20	Continue shooting Profile AWI-20160300; End shooting seismic Profile AWI-20160300; Retrieval of magnetometer, airguns, PAM and streamer; Start OBS retrieval Profile AWI-20160300;	Partly cloudy, medium swell
We	09.03.	 19:00	Continue OBS retrieval; Interrupt OBS retrieval at night time due to storm;	Partly cloudy, strong swell and waves
Th	10.03.	06:00 18:30	Continue OBS retrieval; End OBS retrieval Profile AWI-20160300;	Cloudy, strong swell and waves
Fr	11.03.		Slow transit to next dredge area by riding out a storm;	Cloudy, strong swell and waves
Sa	12.03.	 22:30	Down-time due to seastate; Start dredging program;	Partly cloudy, strong swell and waves; decreasing winds;
Su	13.03.		Continue bathymetric surveying & dredging;	Partly cloudy, low swell/waves

Day	Date (2016)	Board time ca. (UTC is -13 h)	Science activities and events	Weather, seastate
Mo	14.03.	22:00	Continue bathymetric surveying & dredging; Transit and bathymetric survey to last OBS profile;	Fine, low swell/waves
Tu	15.03.	13:30	Start OBS deployment Profile AWI-20160400 (20 OBS systems);	Fine, low swell/waves
We	16.03.	01:30 03:00 05:15	End OBS deployment Profile AWI-20160400; Deployment of PAM, streamer, airguns and magnetometer; Start shooting seismic refraction Profile AWI-20160400;	Rainy, partly cloudy, medium swell/waves
Th	17.03.	11:00 16:00	End of seismic Profile AWI-20160400; Retrieval of magnetometer, airguns, PAM and streamer; Start OBS retrieval Profile AWI-20160400;	Partly cloudy, low swell/waves
Fr	18.03.	12:00 14:30 20:00 20:30	End OBS retrieval Profile AWI-20160400; Bathymetric transit to next dredge station; Start bathymetric surveying and dredge program; End of dredging; Start bathymetric and Parasound surveying for geothermal heat-flow stations;	Cloudy, low swell/waves
Sa	19.03.	01:00 16:20 16:30	Start of geothermal heat-flow station profile; End of heat-flow station profile; Start transit to Wellington; Disassembling and packing of equipment;	Cloudy, low swell/waves; stronger wind
Su	20.03.		Continue transit to Wellington; Disassembling and packing of equipment;	Fine, medium swell/waves
Mo	21.03.	09:45	**Arrival in Wellington;** Disassembling and packing of equipment; Container packing and unloading;	Partly cloudy, low waves
Tu	22.03.		Container packing and unloading;	n/a
We	23.03.	10:00	Disembarkment of scientific participants;	n/a

6. WORK DETAILS AND FIRST RESULTS

6.1 Seismic refraction/wide-angle reflection profiling

Florian Riefstahl[1], Viola Bihler[1], Hannes Eisermann[1], Till Gades[2], Karsten Gohl[1], Katlina Hagemann[3], Lukas Joeressen[2], Bastian Kimmel[1], Manuel Moser[1], Florian Petersen[1,3], Rene Steinmann[1]

[1]AWI
[2]KUM GmbH
[3]GEOMAR

6.1.1 Objectives

The deep-crustal seismic profiling program of cruise SO246 with the deployment of ocean-bottom seismometers (OBS) was designed to reveal – for the first time – the structure and composition of the upper and lower crustal units, the crust-mantle boundary (Moho discontinuity) and the uppermost mantle beneath the Chatham Rise and its southeastern plateau margin. The OBS profiles are mapped in Fig. 4.2. We planned the first OBS profile AWI-20160100 such that it covers the central Chatham Rise from its presumably thickest crust close to the Chatham Islands to the south

across the plateau margin and into the so-called Southeastern Chatham Terrace. Profile AWI-20160200 extends from the eastern-central Chatham Rise across the southern plateau margin into ocean crust. The easternmost OBS profile AWI-20160300 was aimed to image the thin Chatham Rise crust and its boundary to oceanic crust at a location where the initial breakup between Zealandia and Marie Byrd Land of West Antarctica occurred (e.g. Eagles et al., 2004; Wobbe et al., 2012). Towards the end of the cruise, we collected data from the last OBS profile AWI-20160400 from the central Chatham Rise across the plateau margin into the eastern Bounty Trough. The aim here is to image the subducted slab of the Hikurangi Plateau beneath Chatham Rise (e.g. Davy et al., 2008).

6.1.2 Method and Equipment

The application of deep crustal seismic methods was one of the primary operational objectives of SO246 in order to reveal the deep structure and seismic velocity distribution of the crust and the crust-mantle boundary and the uppermost mantle of the Chatham Rise and its southeastern plateau margin. We used seismic refraction and wide-angle reflection techniques to obtain the distribution of seismic P- and S-wave velocity fields from recordings of large-offset and deeply penetrating refracted and reflected waves at wide angles using ocean-bottom seismometer or hydrophone systems (OBS or OBH). In addition, we used the standard multi-channel seismic reflection (MCS) technique to image the outline and reflectivity characteristics of the sedimentary layers and the structure of the sub-sedimentary basement and lower crust by recording the returning near-vertical wavefield. Figure 6.1 illustrates the principles of both techniques.

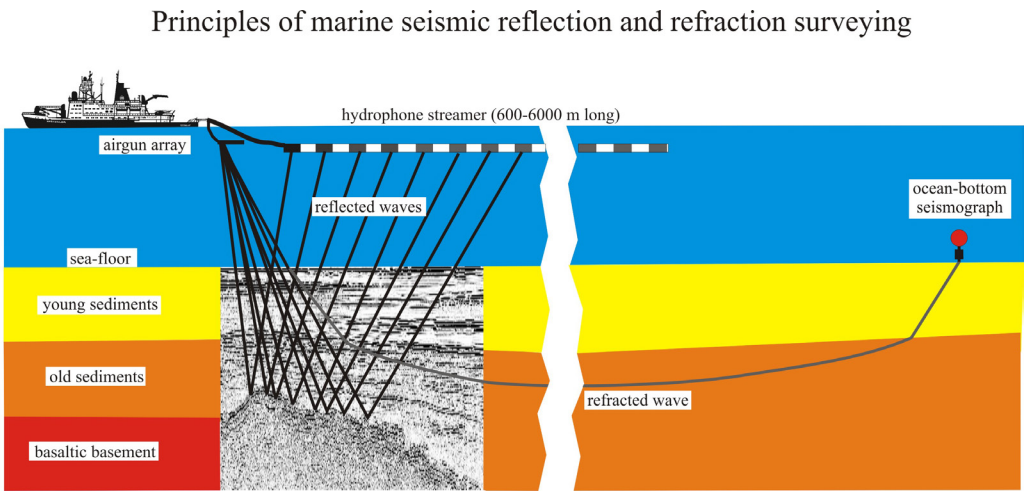


Fig. 6.1. Principles of marine seismic reflection and refraction surveying.

We used various types of OBS and OBH systems:

- 12 LOBSTER systems (OBS and OBH) of the AWI-owned DEPAS pool - *German Instrument Pool for Amphibian Seismology* (http://www.awi.de/en/science/geosciences/geophysics/equipment/ocean-bottom-seismometer/depas.html)
- 30 OBS and OBH systems owned by GEOMAR (http://www.geomar.de/en/research/fb4/fb4-gdy/infrastructure/obsobh-systems/)
- 1 prototype OBS (NAMMU) owned by K.U.M. GmbH (http://www.kum-kiel.de/en/home/)

All OBS and OBH systems consist in general of syntactic foam floats mounted on a steel frame or rod together with the data logger and batteries in a pressure cylinder, an acoustic release, a seismometer (for OBS), a hydrophone, a radio beacon, a xenon or LED flash light and a flag (Fig. 6.2). The OBS systems are tightly connected to an anchor frame via the acoustic releaser. The GEOMAR OBH systems are anchored with a heavy steel bar connected to the release unit by a steel rope. The pressure cylinders of all systems contain the seismic data loggers (MBS, MCS, 6D6 or GEOLOG-type), manufactured by SEND GmbH, K.U.M. GmbH or GEOMAR, and packs of alkali batteries. The acoustic/time release units of type KUMQuat or IXSEA are attached to the frame with the corresponding clamp and to the anchor frame hook through a hook and the releaser latch of the OBS/OBH systems. The OBS systems are installed with 3-component (4.5 s natural period) seismometers which are mounted to the frame. A clamp bolt is screwed tightly against the seismometer to achieve a good coupling to the anchor frame. The hydrophones of both OBS and OBH systems are of type HighTech (HTI) or E-2PD by OAS and are attached to the steel frame. The acoustic releaser types KUMQuat communicate via a K/MT 8011M deck transducer unit. The ship-owned transducer is mounted on the sub-hull extension beam of the ship (“Spargel”) which is lowered beneath the hull during acoustic transmission. The advantage of this system is that it can be operated while the ship is in motion. The configuration and components of some OBS or OBH systems varied slightly from the general description above.

Fig. 6.2. Photos of the deployed OBS and OBH systems: (A) GEOMAR OBH, (B) GEOMAR OBS, (C) LOBSTER of AWI DEPAS pool, and (D) NAMMU prototype OBS of K.U.M. GmbH after first successful test.

The recording parameters are set via the Java program *sendcom2* which also controls the time synchronisation of the internal recorder clock with an external GPS clock. For both deep crustal profiles, the sampling frequency on all channels was set to 250 Hz

for all recorders. The gain settings are listed in Appendices A.1 to A.4. The data were stored on 1 or 2 GB MicroDrive PCMCIA cards, or internal hard-drives or flash cards of the recorders. OBS/OBH deployments and recoveries of both profiles were conducted without major problems with the exception of an old GEOMAR OBH system, which suffered from a progressive reduction in buoyancy. However, all deployed systems were recovered.

The seismic source for the OBS/OBH recordings consisted of an array of 8 G-Guns with 8.5 liters (520 in^3) volume each (total of 68 l = 4160 in^3), towed in 4 x 2 clusters at 10 m water-depth and fired at 205 bar every full minute. Trigger time was given by a Meinberg GPS clock. The shots were also recorded by the multichannel seismic (MCS) equipment (see Chapter 6.2). The airgun configuration for dedicated MCS recordings is described in chapter 6.2.2.1.

6.1.3 Processing of seismic refraction/wide-angle data

The OBS/OBH data were processed during the cruise for quality control and to allow for an initial assessment of the crustal structures encountered along the four profiles. The main processing steps carried out include:

1. Download of navigation data from DSHIP
2. Download of the seismic raw data
3. Conversion of the raw data to SEGY format and quality control
4. Relocalization of the OBS/OBH seafloor positions
5. Data archiving

Download of navigation data and time adjustment of triggered shots

Navigation data were downloaded from the onboard DSHIP data acquisition system and transferred to a table according to format requirements by the *send2x* program of SEND GmbH (see *send2x* manual). These tables contain the GPS time, position (longitude and latitude) and water depth (from EM-122 multibeam or Parasound records).

Download of the seismic raw data

After recovery of the OBS/OBH systems, the cylinders were opened and the drift (skew) of the recorder clock was measured by comparison with the time signal of the GPS clock, using the *sendcom2* program. A linear clock drift is assumed. The data on the recorder storage devices were copied to a LINUX computer together with the recorder parameter files.

Conversion to SEGY format and quality control

Initial SEGY files were created on the LINUX computer using the software *send2x* (SEND GmbH). The software demultiplexes the raw data and corrects for the drift of the OBS clock. Four SEGY files are obtained for each OBS and one for each OBH (only hydrophone). The four OBS files correspond to the four channels of the instrument:

Channel 1 - hydrophone h
Channel 2 - horizontal geophone component x
Channel 3 - horizontal geophone component y
Channel 4 - vertical geophone component z

The output file names are generic names created by the software and contain information on the instrument, channel and recording time. Shot and station positions are recorded in the SEGY headers in arc seconds. The record length is nominally 60 seconds with start-of-shot time given by a shot list with the recorded correct trigger-time.

For further processing, we used shell scripts as well as the software packages Seismic Unix (SU) and Generic Mapping Tool (GMT) installed on the LINUX computer. The conversion to SEGY format, readable by SU, was done via the *send2x* program SEGYWRITE. Initial shot-receiver offsets were added to the SEGY headers by a shell script.

Relocalization of OBS/OBH positions

The OBS/OBH position at the seafloor differs from the deployment position of the instrument, which is related to currents while the OBS is sinking to the seafloor. Hence, the initial offsets calculated from the deployment position of the OBS have to be re-calculated. To obtain the minimum offset instrument position with respect to the recorded shot traces, the arrival times of the direct water wave in both directions were displayed at large scale, and a Δx (offset difference) was picked. This Δx was then added to or subtracted from the previous offset. These new offsets were written to the SEGY headers.

Data archiving

For each folder for an OBS/OBH station, a number of data sets were archived:

1. The raw data retrieved from the flash cards (in native SEND format).
2. The initial SEGY files obtained from the *send2x software.*
3. Set of initial SEGY files that can be read by Seismic Unix on PC/Linux machines (little endian). This data set for PC/Linux has the offsets added to the headers that were calculated from the OBS/OBH deployment position (*filename*.segy.offsets).
4. Set of SEGY files with the re-calculated OBS/OBH positions and offsets in the headers (*filename*.segy.offsets.reloc).

The data files together with navigation and plotted record files were stored on external USB hard disks.

6.1.4 Preliminary results of refraction/wide-angle OBS data

The OBS/OBH data were displayed and plotted during the cruise mainly for data quality control. Any modelling for crustal structure and composition will be performed at AWI after the cruise as part of a doctoral project. In the following, we only show some data examples and preliminary travel-time phase identification.

6.1.4.1 Profile AWI-20160100

We deployed 40 OBS/OBH systems across the central Chatham Rise (Fig. 4.2) with a nominal station interval of 11.0 km. Of the deployed systems, four systems (at stations 01, 03, 07 and 22) did not record on any channels due to malfunction of the MBS recorders. The data quality of the other systems ranges from very good to satisfying in the recording of P-wave phases, which can be observed at up to 120 km source-receiver offsets in the best records. In most cases, the hydrophone channel has the best signal-to-noise ratio even for S-wave phases (converted to P-waves on the seafloor). Many of the seismometer recordings have a profound ringing in their data after the first-arrivals. The record examples in Figs. 6.3 and 6.4 clearly show refracted first-arrival phases from the sediments (P_s) to the crust (P_c) and uppermost mantle (P_n) as well as high-amplitude reflections from the crust-mantle boundary (P_mP). Similar observations can be made from many of the other station records. A qualitative overview of the data quality of this profile is summarized in Appendix A.1.

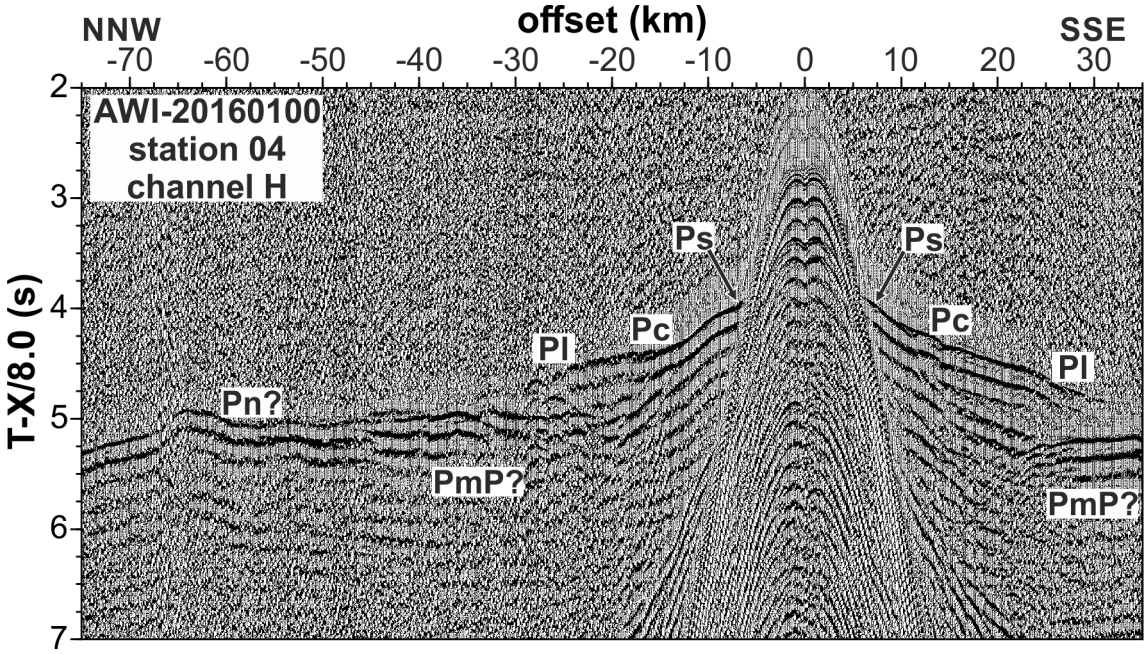


Fig. 6.3. Example of OBS record (hydrophone channel) from OBS station 04 of line AWI-20160100. Dominant P-wave travel-time phases include refractions from the sedimentary cover (P_s), upper and lower crust (P_c,P_l), as well as Moho reflections (P_mP) and uppermost mantle refractions (P_n).

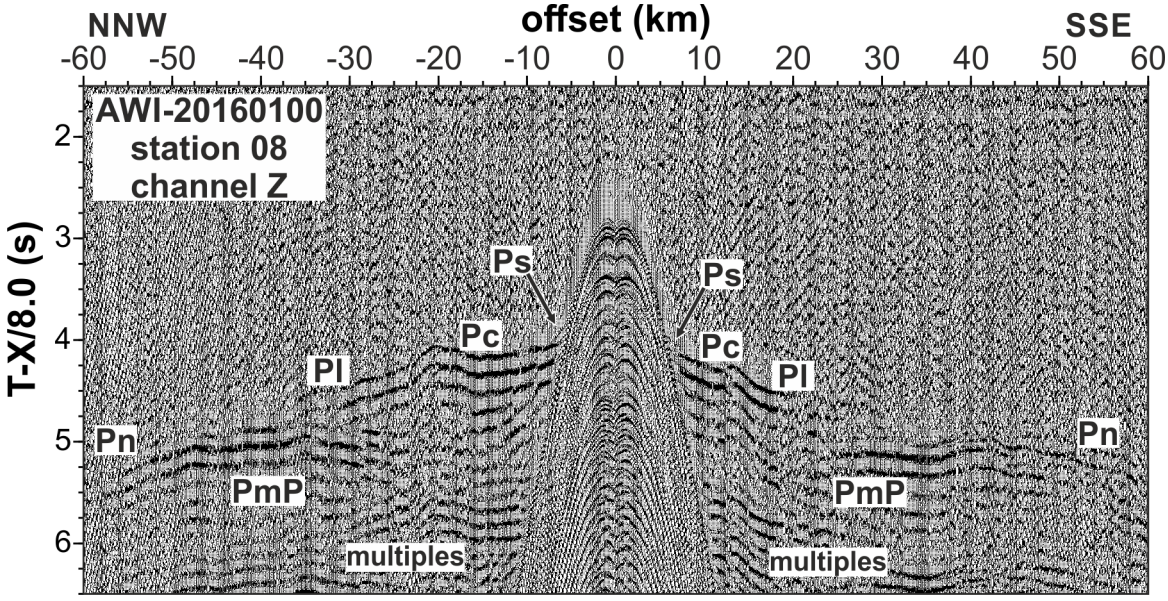


Fig. 6.4. Example of OBS record (vertical component) from OBS station 08 of line AWI-20160100. P-wave travel-time phases include refractions from the sedimentary cover (P_s), upper and lower crust (P_c,P_l), as well as Moho reflections (P_mP) and uppermost mantle refractions (P_n).

6.1.4.2 Profile AWI-20160200

We deployed 35 OBS/OBH systems across the eastern-central Chatham Rise (Fig. 4.2) with a nominal station interval from 11.0 km. All systems recorded data, although not always on all channels. The data quality of the other systems ranges from excellent to good in the recording of P-wave phases, which can be observed at up to 180 km source-receiver offsets in the best records. Medium-quality S-wave phases (converted to P-waves on the seafloor) were recorded by a large number of the systems. Some of the seismometer recordings have a profound ringing in their data after the first-arrivals. The record examples in Fig. 6.5 and 6.6 clearly show refracted first-arrival phases from the sediments (P_s) to the upper and lower crust (P_c and P_l) and uppermost mantle (P_n) as well as high-amplitude reflections from the crust-mantle boundary (P_mP). Similar observations can be made from many of the other station records. Some records show high-amplitude mid-crustal wide-angle reflections. S-wave records – primarily from the horizontal components of channels 2 and 3 – contain phases from the sedimentary cover (S_s), upper and lower crustal refractions (S_c and S_i), internal crustal reflections (S_iS) and Moho reflections (S_mS). A qualitative overview of the data quality of this profile is summarized in Appendix A.2.

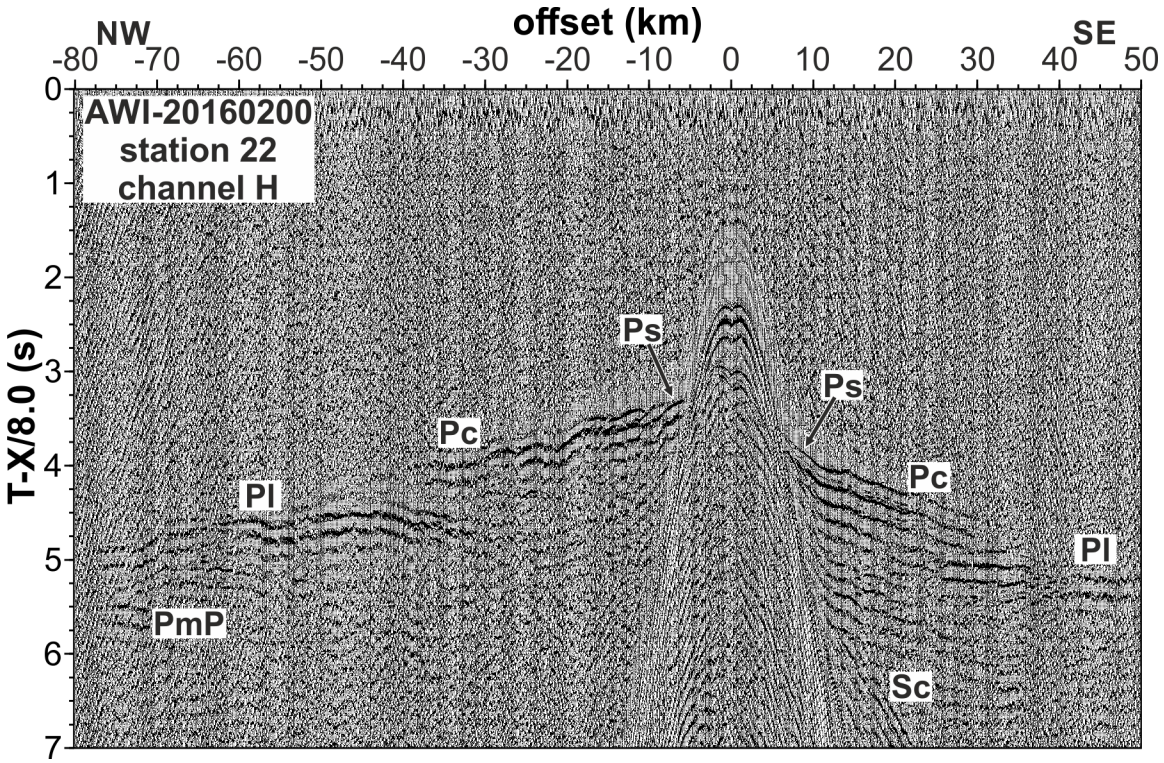


Fig. 6.5. Example of OBS record (hydrophone channel) from OBS station 22 of line AWI-20160200. Dominant P-wave travel-time phases include refractions from the sedimentary cover (P_s), upper crust (P_c), lower crust (P_l) and reflections from the Moho (P_mP). S-wave refractions from the upper crust (S_c) are also recorded.

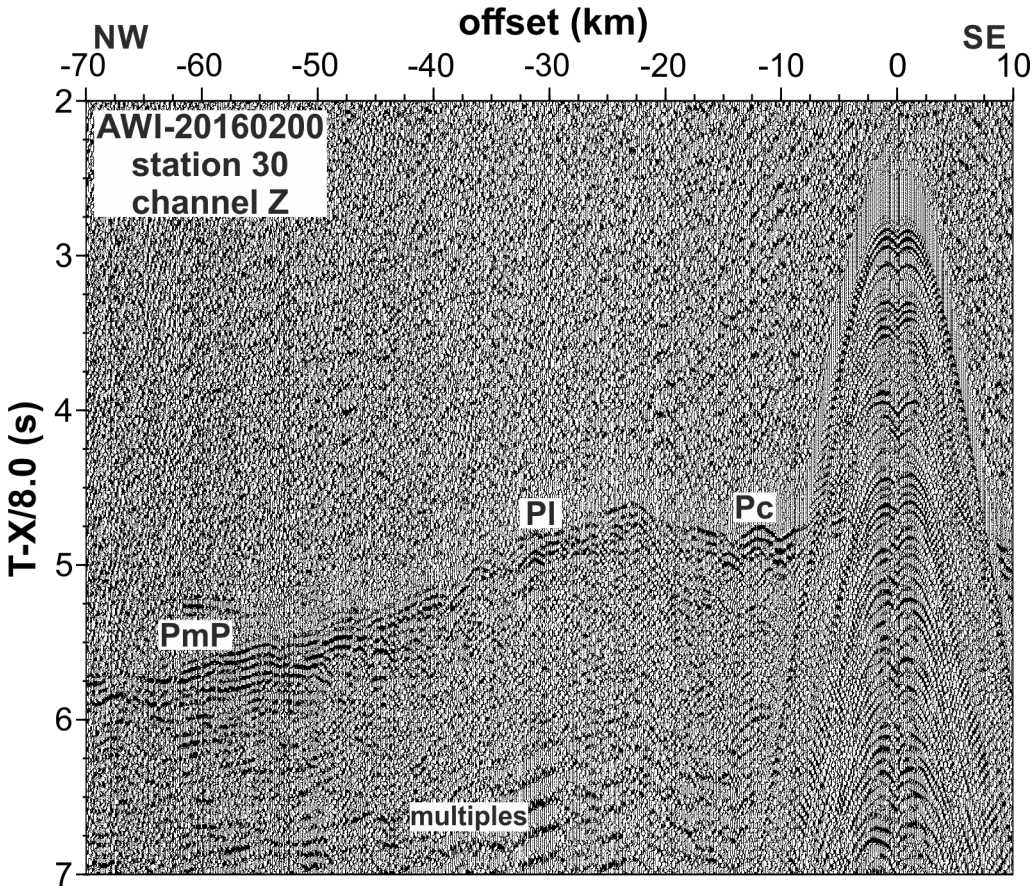


Fig. 6.6. Example of OBS record (vertical component) from OBS station 30 of line AWI-20160200. P-wave travel-time phases include refractions from the upper and lower crust (P_c,P_l) and Moho reflections (P_mP).

6.1.4.3 Profile AWI-20160300

We deployed 21 OBS/OBH systems across the eastern-central Chatham Rise (Fig. 4.2) with a nominal station interval from 15.0 km. All systems recorded data, although not always on all channels. The data quality of the other systems ranges from excellent to good in the recording of P-wave phases, which can be observed at up to 180 km source-receiver offsets in the best records. Medium-quality S-wave phases (converted to P-waves on the seafloor) were recorded by a large number of the systems. Some of the seismometer recordings have a profound ringing in their data after the first-arrivals. The record examples in Fig. 6.7 and 6.8 clearly show refracted first-arrival phases from the sediments (P_s) to the upper and lower crust (P_c and P_l) and uppermost mantle (P_n) as well as high-amplitude reflections from the crust-mantle boundary (P_mP). Similar observations can be made from many of the other station records. Some records show high-amplitude mid-crustal wide-angle reflections. S-wave records – primarily from the horizontal components of channels 2 and 3 – contain phases from the sedimentary cover (S_s), upper and lower crustal refractions (S_c and S_i), internal crustal reflections (S_iS) and Moho reflections (S_mS). A qualitative overview of the data quality of this profile is summarized in Appendix A.3.

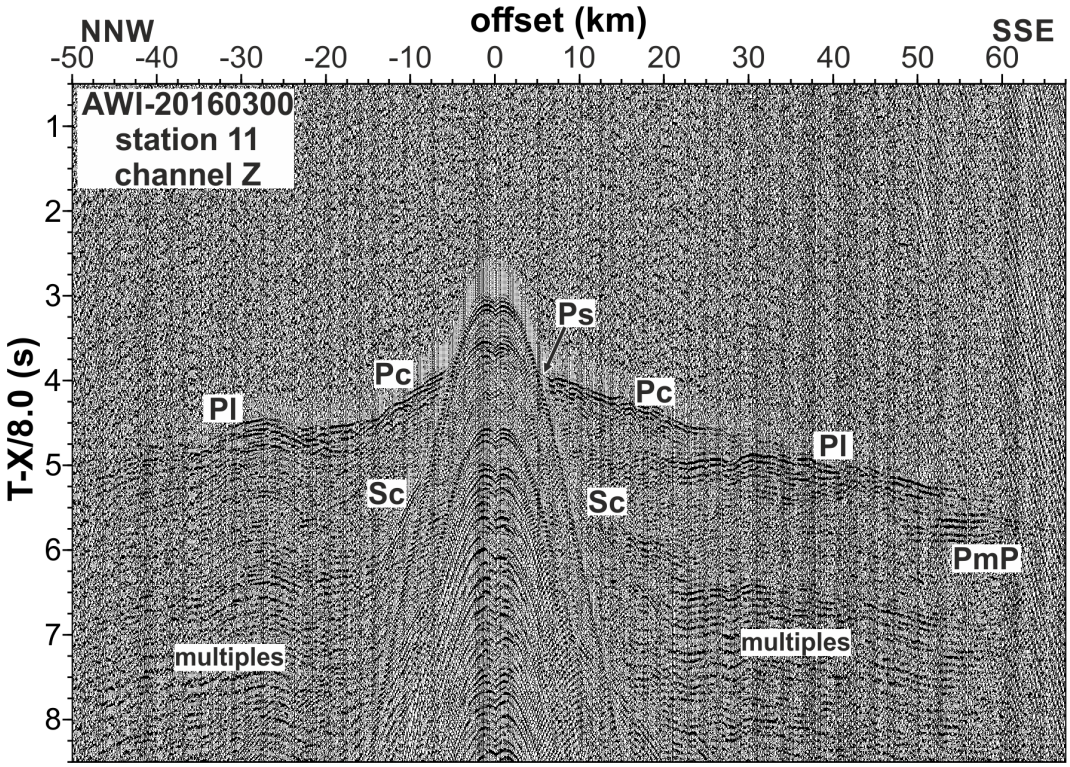


Fig. 6.7. Example of OBS record (vertical component) from OBS station 11 of line AWI-20160300. Dominant P-wave travel-time phases include refractions from the sedimentary cover (P_s), upper crust (P_c), lower crust (P_l) and reflections from the Moho (P_mP). S-wave refractions from the upper crust (S_c) are also recorded.

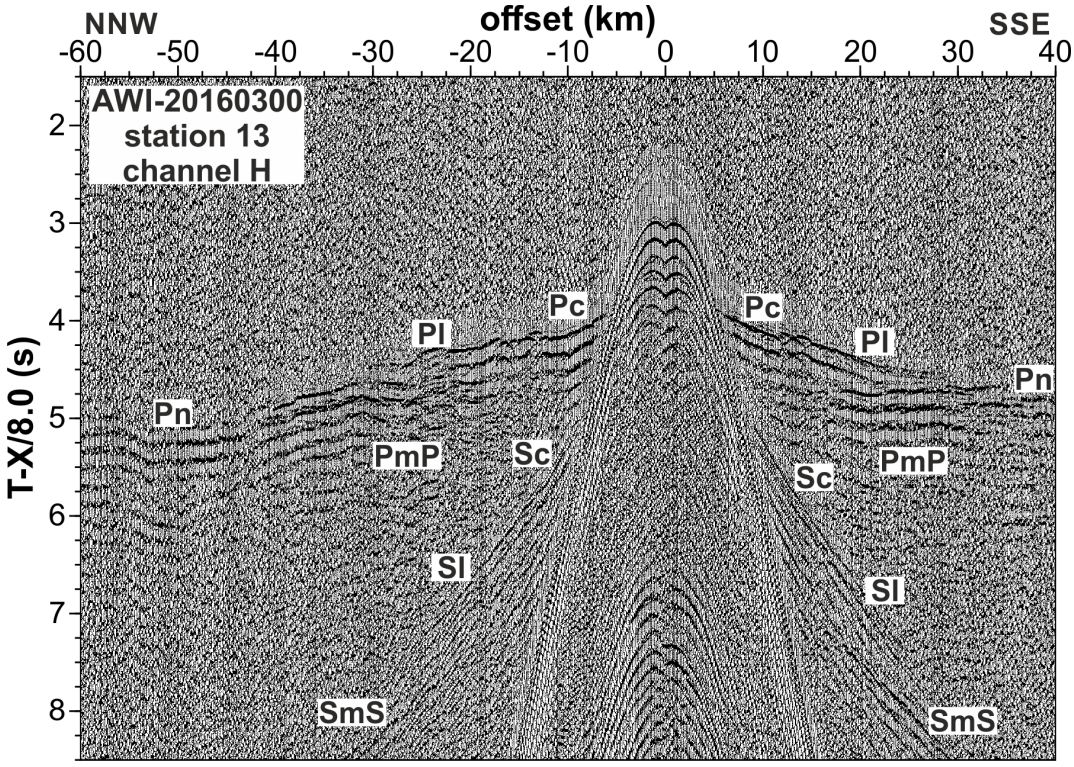


Fig. 6.8. Example of OBS record (hydrophone channel) from OBS station 13 of line AWI-20160300. Dominant P-wave travel-time phases include refractions from the upper crust (P_c), lower crust (P_l), uppermost mantle and reflections from the Moho (P_mP). S-wave refractions from the upper and lower crust (S_c, S_l) and the Moho (S_mS) are also recorded.

6.1.4.4 Profile AWI-20160400

We deployed 20 OBS/OBH systems across the eastern-central Chatham Rise (Fig. 4.2) with a nominal station interval from 12.0 km. 19 systems recorded data, although not always on all channels at the same quality. The data quality of the other systems ranges from excellent to good in the recording of P-wave phases, which can be observed at up to 120 km source-receiver offsets in the best records. Medium-quality S-wave phases (converted to P-waves on the seafloor) were recorded by a number of the systems. Some of the seismometer recordings have a profound ringing in their data after the first-arrivals. The record example in Fig. 6.9 shows refracted first-arrival phases from the sediments (P_s) to the upper and lower crust (P_c and P_l) and uppermost mantle (P_n). Similar observations can be made from many of the other station records. Some records show high-amplitude mid-crustal wide-angle reflections. S-wave records – primarily from the horizontal components of channels 2 and 3 – contain phases from the sedimentary cover (S_s), and some upper and lower crustal refractions (S_c and S_i), internal crustal reflections (S_iS) as well a few Moho reflections (S_mS). A qualitative overview of the data quality of this profile is summarized in Appendix A.4.

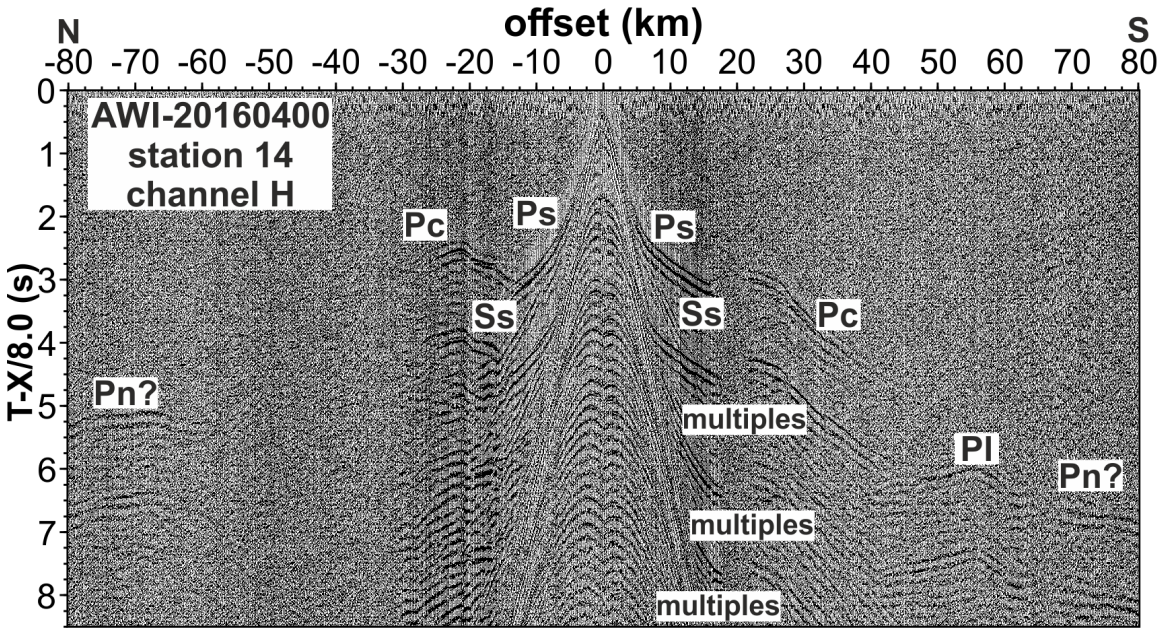


Fig. 6.9. Example of OBS record (hydrophone channel) from OBS station 14 of line AWI-20160400. Dominant P-wave travel-time phases include refractions from the sedimentary cover (P_s), upper crust (P_c), lower crust (P_l) and uppermost mantle (P_n). S-wave refractions from the sedimentary cover (S_s) are also recorded.

6.2 Seismic reflection profiling

Katharina Hochmuth[1], Andreas Brotzer[1], Ricarda Dziadek[1,2], Thorsten Eggers[3], Karsten Gohl[1], Erik Labahn[4], Nicolas Stoll[1]

[1]AWI
[2]Univ. Bremen
[3]Excitech GmbH
[4]KUM GmbH

6.2.1 Methods

Seismic data acquisition was one of the main objectives in order to obtain more information on the sediments distribution and tectonic set-up of the Chatham Rise and the junction between the Wishbone Ridge and the Chatham Rise. The information on the sedimentary thickness is also crucial for the modeling of the refraction/wide-angle

reflection seismic data. We used a standard multichannel seismic reflection technique to image the outline and reflectivity character of the sedimentary layers as well as the structure of the basement.

6.2.2 Seismic equipment

6.2.2.1 Seismic sources, triggering and timing

We used two clusters of 4 G-Guns as source for the refraction/wide-angle seismic reflection profiles which were also recorded as low-fold seismic reflection records with the streamer. The description of this configuration is included in chapter 6.1.2. For pure seismic reflection profiling, we used different airgun configurations due to changing capacity of the ship's compressors. Most profiles were acquired with 6 G-Guns (51 l / 3120 in^3) and profile AWI-20160002 was acquired with 4 G-Guns (34 l / 2080 in^3) due to the failure of pressure hoses of the portside array. The towing depth was adjusted to 6 m for the reflection seismic data acquisition, and shots were fired at 200 bar every 20 s. A summary of the profile parameters is in Appendix A.5.

Seismic data acquisition requires a very precise timing system, because seismic sources and recordings systems must by synchronized. A combined electric trigger-clock system was in operation to provide the firing signal for the electric airgun valves, and to provide the time-control of the seismic data recording. A *Meinberg* GPS clock was used with an antenna mounted on the upper deck. The clock provides UTC date and time (minute and second) pulses.

In compliance with the regulation for the protection of marine mammals, we gradually increased the number of airguns firing over a minimum of 21 minutes (soft start) at the beginning of every profile and after shot gaps due to the presence of marine mammals.

6.2.2.2 Multi-channel seismic recording system

We used a digital solid seismic streamer and recording system during the acquisition of the multi-channel seismic reflection data. The system (*SERCEL Sentinel*™ and *SEAL*™) is a high-resolution marine seismic data acquisition system, integrating both onboard and in-sea equipment.

The streamer is a 240-channel hydrophone array of 3000 m length with 12.5 m group interval and 8 hydrophones per group. This streamer is connected to the onboard recording system via a fiber optic tow leader and a deck lead. The data collected by the streamer hydrophones are converted from an analogue to a digital signal via an A/D-converter and then converted to a 24-bit complement format at 0.25 ms sample rate by a DSP. The data is routed to a Line Acquisition Unit Marine (LAUM) at this point, one of these being located every five Acquisition Line Sections (every 750 m). The LAUM decimates, filters and compresses the data before routing them through the tow leader and deck lead to the on-board equipment. The coupling of the streamer with the Control Module (CMXL) is made via the Deck Cable Crossing Unit (DCXU), which also acts as a LAUM for the first 60 channels of the streamer. The CMXL decompresses, demultiplexes and performs IEEE 32-bit conversion to the data. The data are collected via a network switch and converted to SEG-D format by the PRM, a processor software module on a *SUN Blade 2500* computer used for formatting data to the hard drives, cartridge drives and a NAS, and to the quality control system *eSQC*™, which runs on a separate computer. All system parameters are controlled by the *SEAL* software on the *Sun Blade 2500* computer and can be set manually. The software displays includes system activity such as log files and control graphics.

12 *DigiBirds*™, Model 5010, adjust the depth of the streamer. They are mounted in 300 m intervals. The current depths of the *DigiBird*™ as well as their wing angles can be monitored and controlled by the *DigiCourse*™ software.

Length of section	150 m
Channels of section	12
Hydrophones per group	16
Group length	12.5 m
Sensitivity	20 V/Bar open ended
Capacity	256 µf

Tab. 6.2.1. Specifications of each of the 20 active sections (Acquisition Line Section - ALS) of the SENTINEL™ solid streamer system.

Fig. 6.2.1. G-Gun array and winch with streamer system on deck of RV Sonne. Seismic reflection team during airgun repairs and on watch in the seismic lab.

6.2.3 Primary results

In total, we collected seismic reflection data along all 4 seismic refraction/wide-angle reflection profiles and acquired 6 additional MCS across the Chatham Rise, its conjunction with the Wishbone Ridge and the adjacent ocean basin (Fig. 6.2.2 and Appendix A.5). This equals to a total of 2895 km of seismic reflection data. During the time of acquisition, 40881 shots were fired by the G-Gun array.

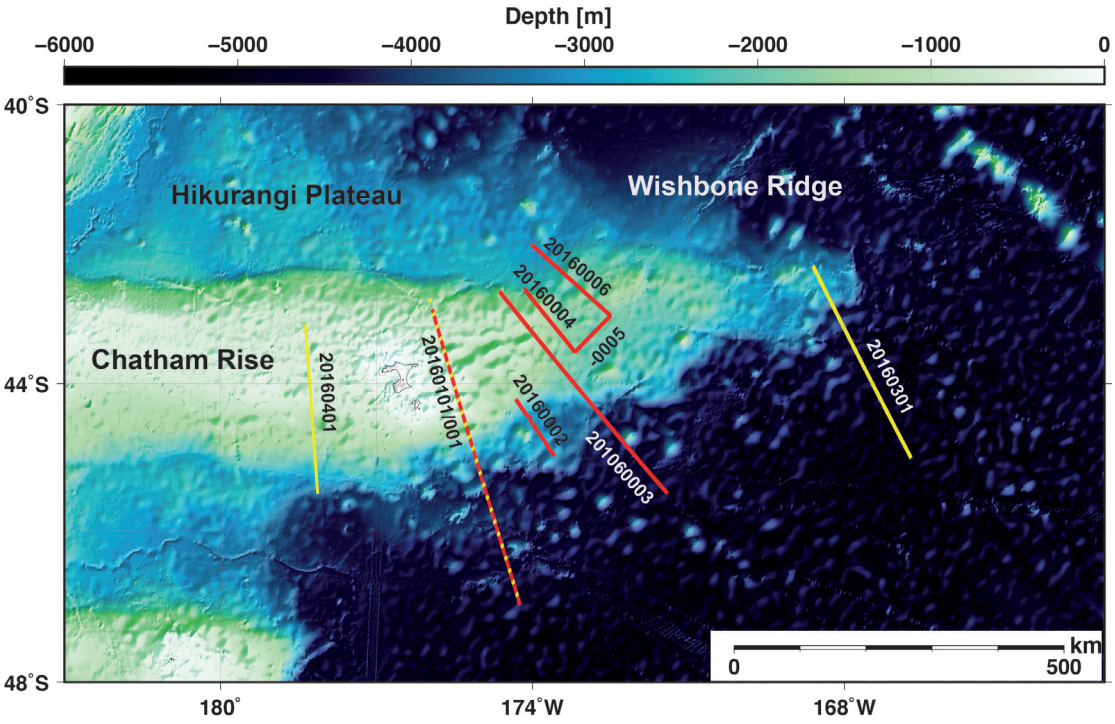


Fig. 6.2.2. Locations of the newly acquired seismic reflection data.

The area of the Chatham Rise is characterized by a constant sedimentary cover, which varies in thickness (from a few ms to about 1s TWT). The newly acquired data show deep reaching fault systems, which can be related to the two main tectonic phases of the Chatham Rise, the collision of the Hikurangi Plateau and the separation between Zealandia and West Antarctica. Relatively recent volcanic activity can be seen at the northern Chatham Rise. In this area, a half-graben system (Fig. 6.2.3) presumably represents the Gondwana margin before the breakup between Zealandia and West Antarctica.

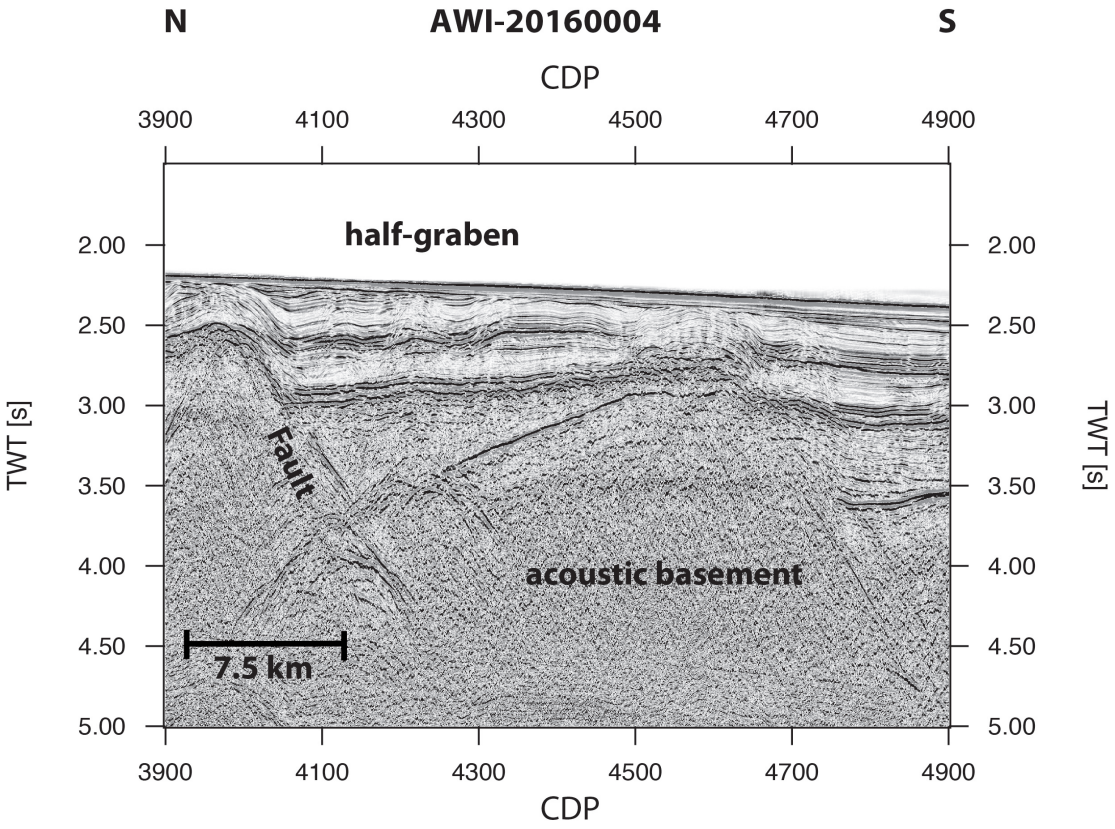


Fig. 6.2.3. Brute stack of part of seismic profile AWI-20160004, illustrating the deep reaching faults of the northern Chatham Rise. This section was stacked with a preliminary velocity analysis, and treated with a mute and an AGC of 500 ms.

The changeover between continental (Chatham Rise) and oceanic crust of the Pacific plate can be seen in the easternmost profiles. All profiles will, along with the deep-crustal velocity-depth models derived from the seismic refraction data, allow to pinpoint areas of stretched continental crust and the transition to oceanic crust.

At the lower slope of the Chatham Rise, sediment drifts are observed (Fig. 6.2.4). These contourites were deposited most likely by the strong Deep Western Boundary Current of the southwestern Pacific (e.g. Carter et al., 1994; Elderfield et al., 2009). A further analysis of this sedimentary system will help reconstruct the position of this bottom current through different time periods.

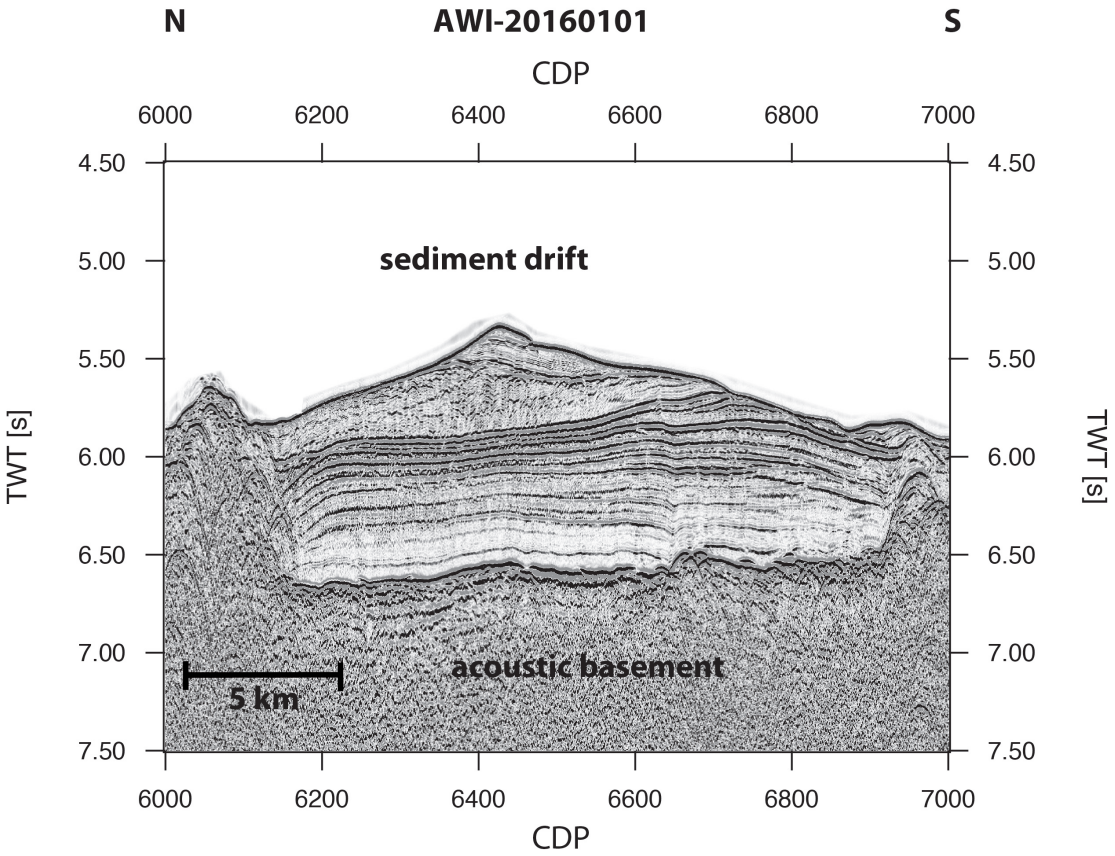


Fig. 6.2.4. Brute stack of part of seismic profile AWI-20160101, illustrating sedimentary deposits and a contourite drift at the foot of the Chatham Rise southwestern slope. This section has been stacked with a preliminary velocity analysis, and treated with a mute and an AGC of 500 ms.

6.3 Magnetic and gravimetric surveying

Bryan Davy[1], Rachel Barrett[2]

[1]GNS Science
[2]Univ. Wellington

6.3.1 Magnetics

The marine magnetometer has been deployed for all seismic reflection lines and most of the transits. The table of activity is in Tab. 6.3.1.

Magnetic line name	Start time	End time
Transit 1	2016/02/02, 02:59	2016/02/02, 21:56
Box 1	2016/02/04, 02:14	2016/02/05, 19:14
Line 20160101	2016/02/07, 09:26	2016/02/09, 12:32
Line 20160100	2016/02/09, 16:31	2016/02/11, 18:49
Box 2	2016/02/15, 04:30	2016/02/15, 21:25
Transit to 20160200	2016/02/18, 01:20	2016/02/18, 06:52
Line 20160200	2016/02/18, 11:53	2016/02/19, 00:20
Transit to Chatham Isl.	2016/02/22, 01:30	2016/02/22, 12:16
Near Chatham	2016/02/22, 18:45	2016/02/22, 23:20
Transit from Chatham Isl.	2016/02/23, 05:25	2016/02/23, 17:23
Line 20160300	2016/02/24, 21:30	2016/02/26, 16:43
Box 3	2016/03/01, 05:01	2016/03/02, 22:54
Lines 20160400 and -500	2016/03/03, 02:50	2016/03/03, 22:58

Magnetic line name	Start time	End time
Line 20160600	2016/03/03, 22:58	2016/03/04, 16:53
Transit 4	2016/03/04, 20:12	2016/03/05, 08:43
Line 20160301	2016/03/06, 17:14	2016/03/08, 04:44
Line 20160401	2016/03/15, 16:36	2016/03/16, 21:57

Tab. 6.3.1. Time periods of magnetic anomaly data collection. All dates and times are in UTC.

After unpacking the tow cable, freshly delivered to GNS Science just four days before scheduled sailing, it was with alarm that we discovered it was terminated by a plug at only one end. A replacement plug from GNS Science was delivered that afternoon before sailing and successfully soldered on by the ships electrical officer.

The magnetometer was initially towed at 12 knots but after some, mostly superficial damage of unknown cause to the leading edge of the magnetometer, the magnetometer was subsequently towed at a precautionary maximum 10 knots. The depth gauge ceased to work early in the survey, but the magnetometer has been successfully used without the gauge as tow depths are expected to be less than 10 m sub-sea-surface at speeds at or above 5 knots. Magnetometer deployment/retrieval time, by the crew, varied between 10 and 15 minutes. Mostly the magnetometer was deployed from a pulley suspended beneath the crane arm out the port side of the vessel although in some transits it was deployed directly off the port stern. The magnetometer was typically towed 350 m behind the stern of *Sonne*.

Data, including a GPS navigation and time feed, was recorded at a 0.5 s intervals but later decimated to a 10 s interval for anomaly calculation undertaken by subtracting the International Geomagnetic Reference Field. The magnetometer used was a SeaSpy magnetometer from Marine Magnetics, which uses the Overhauser effect to derive a very high precision and stable reading.

Fig. 6.3.1. The magnetometer cable was fitted to a mobile R/V Sonne winch for deployment off the port-side crane arm.

Fig. 6.3.2. The GNS Science Seaspy magnetometer sensor.

Fig. 6.3.3. Magnetic anomaly tracks from the SO246 survey plotted over bathymetry.

6.3.2 Gravity measurements

The LaCoste & Romberg S80/Ultrasys marine gravity meter was installed in the dedicated gravity meter room on Level 2 the day before the vessel sailed. Access to the gravity meter room for the meter was excellent with wide doors opening off the main deck and a lift available to close to the gravity meter room. The gravity meter was deployed in its new aero-frame which had recently proven successful during flights over the Ross Sea, Antarctica.

The S-80 is a dynamic marine/airborne gravity meter with a gyro-stabilised platform and a constantly moving, and monitored, spring at its core. The gravity meter was installed by bolting two points on the base directly into deck sockets. The other side was strapped via tie-downs to two further fitting points in the deck. This configuration has proven highly stable. The gravity meter was checked every two hours during operations.

A gravity base reading of 10600.2 meter units and spring tension of 10600.1 meter units was made at the Aotea Quay in Wellington at 01:22:50 on the 1st February 2016 (UTC). The corresponding wharf-side position was 174.786731° E and 41.268205° S +/- 5 m. Sea-level was 3.22 m below wharf-level and the R/V *Sonne* plimsol line at sea-level read 6.40 m. The gravity meter operated almost non-stop throughout the voyage, except for the two periods of storm extreme;

2016/02/19, 05:40 – 2016/02/20, 23:55 and
2016/03/09, 04:10 – 2016/03/12, 23:12

when the instrument was turned off and secured to protect the gravity meter spring. The spring tension reading on the sensor was typically 0.2-0.3 units lower than the digital reading on the laptop and the recorded time on the laptop within 2 seconds of GPS UTC time. This range was slightly exceeded following the second restart and the time and spring tension were reset. A second base station reading was obtained at the completion of the survey and later tied to the regional onshore New Zealand gravity network. Gravity reduction will be performed subsequent to the survey.

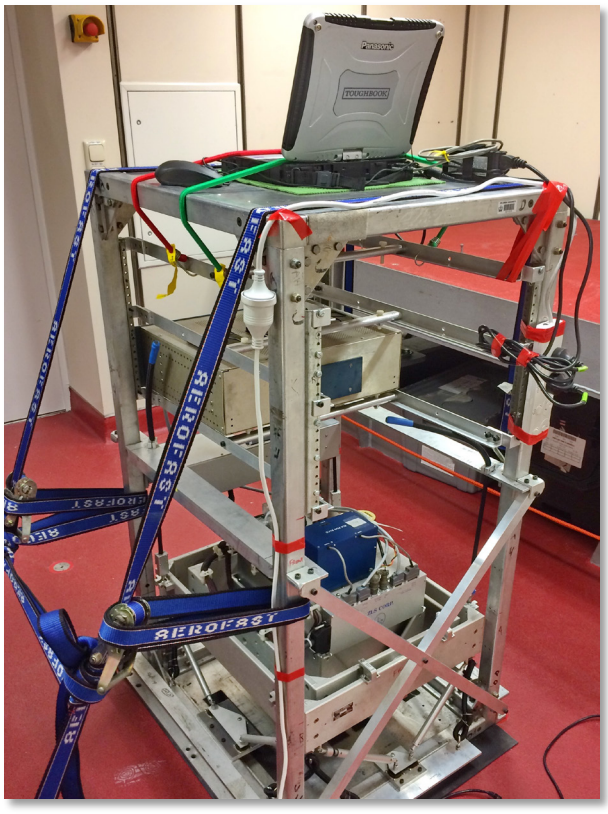


Fig. 6.3.4. The LaCoste & Romberg/Ultrasys marine gravity meter. The blue fibre-optic gyro unit sits atop the gravity sensor contained within the gyro-stabilised platform which remains level despite sea motions.

6.4 Parasound sediment-echosounding

Simon Dreutter[1], Ricarda Dziadek[1,2], Karsten Gohl[1], Florian Riefstahl[1]

[1]AWI
[2]Univ. Bremen

6.4.1 Method

The hull-mounted Parasound system generates two primary frequencies, of which the lower frequency is selectable between 18 and 23.5 kHz transmitting in a narrow beam of 4° at high power. As a result of the non-linear acoustic behaviour of water, the so-called “Parametric Effect”, two secondary harmonic frequencies are generated of which one is the difference (e.g. 4 kHz) and the other the sum (e.g. 40 kHz) of the two primary frequencies, respectively. As a result of the longer wavelength, the difference parametric frequency allows sub-bottom penetration of up to 100 m in the South Pacific Ocean (depending on sediment conditions) with a vertical resolution of about 30 cm. The primary advantage of parametric echosounders is based on the fact that the sediment-penetrating pulse is generated within the narrow beam of the primary frequencies, thereby providing a very high lateral resolution compared to conventional 4 kHz-systems. This capability, however, limits good survey results on sea-floor slopes, which are inclined to more than 4° relative to horizontal. The reason is that the energy reflected from the small inclined footprint on the seafloor is out of the lateral range of the receiving transducers in the hull of the vessel.

Settings	**Selected options**	**Selected ranges**
mode of operation	P-SBP/SBES	PHF, (SHF), SLF
frequency	PHF, SHF, SLF	20 kHz, (44 kHz), 4 kHz
pulse length	no. of period length	2, 0.5 ms
transmission source level	transmission power, transmission voltage	100%, 159 V
beam steering	none	
mode of transmisson	single pulse, quasi-equidistant pulse train	automatic according to water depth, interval 400-1200 ms
pulse type	continuous wave	
pulse shape	rectangular	
receiver band width	output sample rate (OSR), band width (% of OSR)	6.1 kHz, 66%
reception shading	none	
system depth source	fix min/max depth limit or variable min/max depth	manual other (Atlas Hydrosweep), Atlas Parastore
water velocity	C-mean, C-keel	manual 1500 m/s, system C-keel
data recording	PHF, SLF	full profile, full profile

Tab. 6.4.1. Settings of ATLAS HYDROMAP CONTROL for operating Parasound during cruise SO246.

Parasound DS III-P70 is controlled by two different operator software packages plus server software running in the background. These processes run simultaneously on a PC under Windows: (i) ATLAS HYDROMAP CONTROL is used to run the system by an operator. The selected modes of operation, sounding options and ranges used during the cruise are summarized in Tab. 6.4.1. (ii) ATLAS PARASTORE-3 is used by the operator for on-line visualization (processing) of received data on PC screen, for data storage and printing. It can also be used for replaying of recorded data, post-processing and further data storage in different output formats (PS3 and/or SEG-Y).

For any further details, the reader is referred to the operator manuals of ATLAS HYDROMAP CONTROL and ATLAS PARASTORE.

During SO246, digital data acquisition and storage were switched on during transect from Wellington to the first waypoint on the Chatham Rise on February 01 at 18:04 UTC and was switched off on March 20 at 13:58 UTC on the transect back to Wellington. Acquisition included PHF and SLF data during the entire cruise. Both PHF and SLF traces were visualized as online profiles on monitors.

6.4.2. Data examples

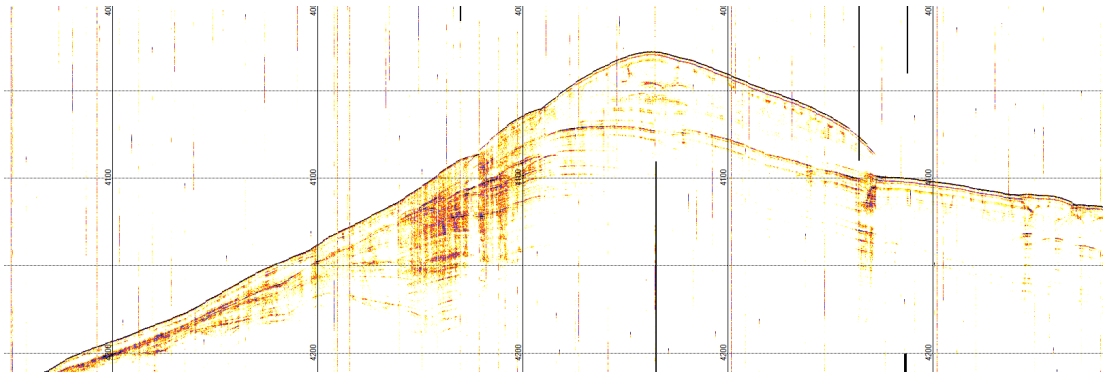


Fig. 6.4.1. Example of Parasound record shows contourite drift at the foot of the southeastern Chatham Rise slope at about 4100 m water-depth. Horizontal lines mark depth interval of 50 m.

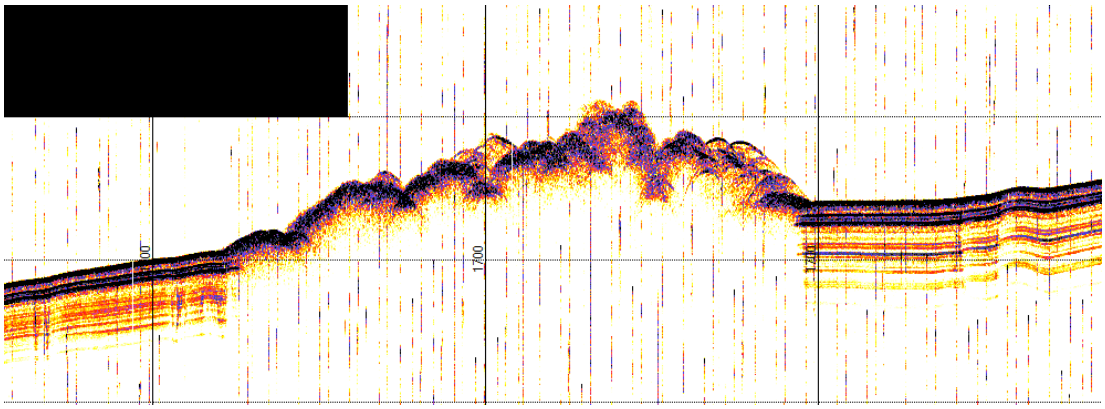


Fig. 6.4.2. Example of Parasound record shows young basalt flows from flanks of a volcanic seamount on the central-eastern Chatham Rise at about 1700 m water-depth. Horizontal lines mark depth interval of 50 m.

6.4.3. Data management

For the entire period of data acquisition, five different types of data files were stored on hard disc:

- PHF data in ASD format
- PHF data in PS3 format
- SLF data in ASD format
- SLF data in PS3 format

All ASD data are automatically packed into “cabinet files” by the Atlas software. The files are named according to date and time of recording (containing 10 minutes of acquired data per file). The data were sorted by the operator into folders according to data type and recording dates (0 to 24 hours UTC), copied to the storage PC via LAN and checked for completeness and readability (ATLAS PARASTORE-3 in replay mode, selectively only). Data with a total volume of 538 GB were transferred. The data was ordered for final storage in the AWI database (to be linked through PANGAEA) as illustrated in the following link:
(https://spaces.awi.de/confluence/display/PSdevices/Sedimentecholot).

For most of the Parasound data acquisition, the system ran on automatic control (automatic delay setting).

List of Abbreviations:

ASD	Atlas sounding data
PHF	primary high frequency
P-SBP	parametric sub-bottom profiling
PS3	export format of Parasound data
SBES	single-beam echo-sounder
SHF	secondary high frequency
SLF	secondary low frequency

6.5 Bathymetric surveying

Simon Dreutter[1], Rosa Crespo-Sanchidrian[1], Florentina Münzner[1]

[1]AWI

6.5.1 Introduction

Most research components conducted on SO246 required detailed bathymetric mapping for station planning purposes and characterization of the seafloor. Some bathymetry data from previous research cruises were available and used for additional cruise planning.

The bathymetry group operated the hull-mounted multibeam echosounder (MBES) Kongsberg Simrad EM122, including calibration and correction of the data for environmental circumstances (sound velocity, systematic errors in bottom detection, etc.), as well as the post processing and cleaning of the data for instant map generation.

6.5.2 Technical description

During SO246, the bathymetric surveys were conducted with the MBES Kongsberg Simrad EM122. The hull-mounted EM122 is a full ocean-depth system and was continuously operated during the entire cruise.

In addition, a hull-mounted EM710 was available to conduct surveys with higher vertical resolution in depth up to approximately 1500 m. Unfortunately, the acoustic frequency of the EM710 (~70 kHz) and the acoustic harmonics of the parametric sub-

bottom profiler Atlas Parasound P70 create strong interference on both systems, so that the EM710 was not used during the cruise.

The EM122 operates on a frequency of 12 kHz ranging from 10.5 to 13 kHz within the three different transmit sectors. On RV *Sonne*, the transducer arrays are arranged in a hull-mounted Mills cross configuration of 16 m (transmit unit) by 8 m (receive unit) to achieve an angular beam accuracy of 0.5° (transmit) by 1° (receive). The combined motion, position and time data comes from a Kongsberg Seapath system and the signal goes directly into the processing unit (PU) of the MBES to do real time motion compensation in pitch, roll and yaw in the range of +/-10°. With a combination of phase and amplitude detection algorithms, the PU computes the water depth from the returning backscatter signal.

The system was mostly operated on a 65° opening angle to both sides (130° in total) to obtain a wide field of surveyed area without the need of cutting the outer beams due to bad sounding quality. This gave an approximate swath width of 4.4 times the water depth. With the high angular accuracy, the 432 soundings in 288 equidistant beams per swath, the dual swath mode and the approximate vertical accuracy of 0.2% of the water depth, the system produces an overall accuracy and sounding density that is very usable for high resolution mapping in the research area of SO246 with depths to 5500 m. Especially during bad weather periods the data was surprisingly good compared to other systems.

6.5.3 Data acquisition

Data acquisition started on 1 February 2016 at 09:23 UTC just outside the Territorial Sea of New Zealand and ended on 20 March 2016 at 13:58 UTC before entering back into the Territorial Sea of NZ. The acquisition was carried out throughout the entire cruise with the exceptions of OBS recovery of the seismic refraction profiles and a short time within the Territorial Sea close to Chatham Islands. The MBES was switched off during OBS recovery to avoid interference with the pingers for the acoustic release.

Bathymetry was in particular important for explorative surveys of seamounts to search for suitable dredge locations.

6.5.4 Sound velocity profiles (SVP)

Echosounders compute the water depth from the travel time of the acoustic signal from the transducer to the seafloor and back. Therefore it is very important to know the exact sound velocity in the water column. It is influenced by the density and compressibility. These two parameters depend on the pressure, the temperature and the salinity. The mean water sound velocity is 1500 m/s. Due to regional and local variations of the physical parameters, the sound velocity can vary strongly depending on the area.

During the cruise, 11 SVP/CTD stations were conducted to calibrate the MBES for the sound velocity within the layers of the water column. CTD stands for Conductivity, Temperature and Depth. It is a device to measure these physical parameters, which are used to determine the sound velocity in the water column. Luckily the sound velocity in the research area of SO246 was quite stable (Fig. 6.5.1). Some differences can be seen in the data between the southern and the northern CTDs due to tropical currents influencing water properties in the north and Antarctic currents influencing water properties in the south of the area.

For acoustic modeling purposes, one CTD was sent down to 5000 m water-depth to obtain a complete profile of the water column. Since this is a very time consuming process, following CTDs were only send to 2500 m water-depths or less. This did not pose a problem, because sound velocities, while being mostly depending on the temperature in the upper water column, become more dependent on pressure at depth, and therefore a stable curve that can be modeled very accurately from previous data.

In the area of SO246, the transition between temperature effect and pressure effect is at a depth of 1500-2000 m, so with 2500 m we were on the safe side to obtain a usable SVP.

Three different devices were used to acquire the sound velocity of the water column. The full sized oceanographic Seabird CTD with water sampling bottles (those were not used), the smaller OceanScience Underway CTD to obtain SVPs underway, as well as disposable Sippican XSV that measure sound velocities directly with a piezoelectric pinger.

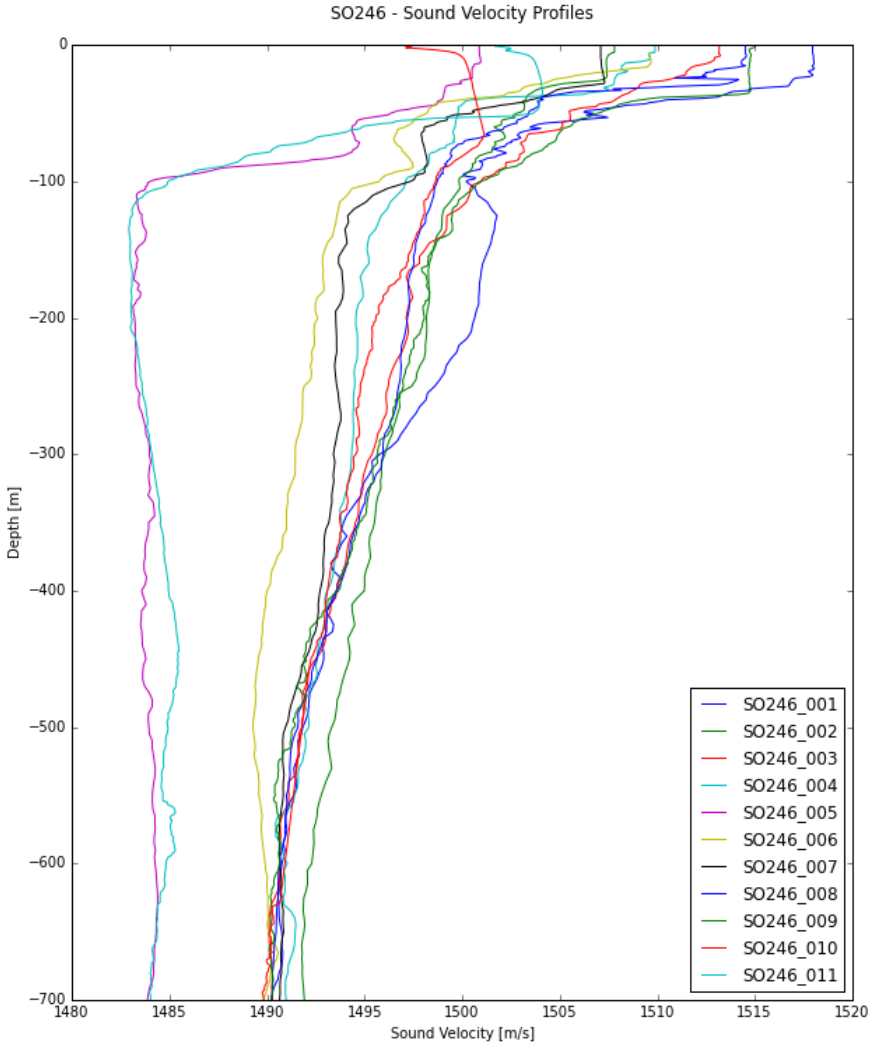


Fig. 6.5.1. Compiled sound velocity profiles (SVP) of SO246.

6.5.5 Data Processing and Usage

The bathymetric data was processed and cleaned with Caris HIPS to have a clean dataset at any time. This dataset was used to create overview maps and printouts of areas of interest for the various scientific groups and to export the data in different formats for further usage in various software. Therefore, it could be used directly for the cruise and station planning as well as for visualization of seafloor features during scientific presentations by cruise members.

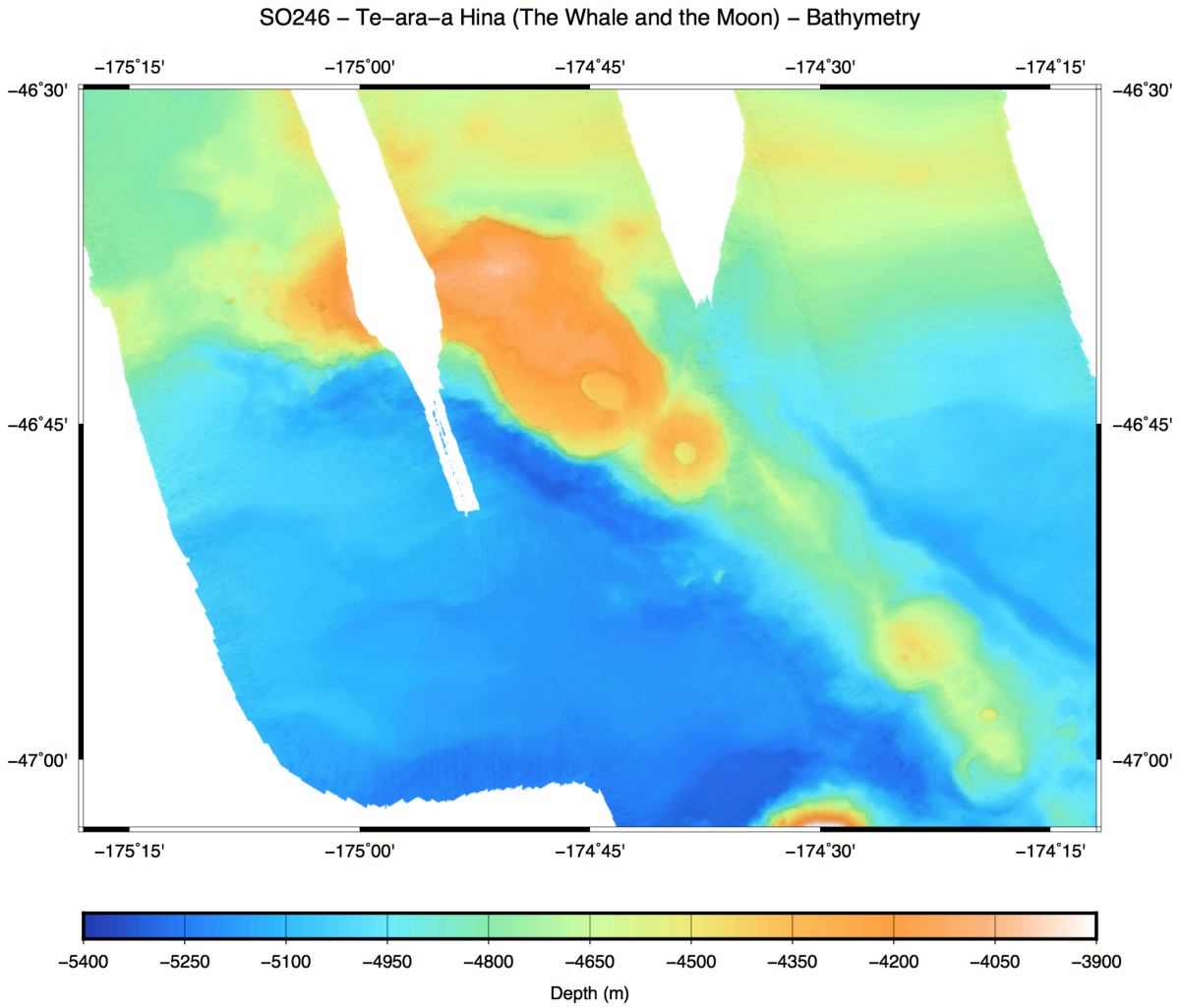


Fig. 6.5.2. Bathymetry of the seamount Te-ara-ā Hina (Maori for The Whale and the Moon), named with respect to its overall shape and appearance.

6.5.6 Preliminary results

By the end of the cruise, all EM122 data of the main research area were processed. During 49 days of survey, a track length of around 11,500 km was surveyed with 383,333,986 measured depths, covering an area of 255,931 km² (transit included). The raw data volume of the EM122 data is 61.5 GB with more than 900 separate files. The water depths range between a minimum of 69 m on the Chatham Rise (seamount) to a maximum of 5451 m in the southern deep-sea area of the research area (Fig. 6.5.3).

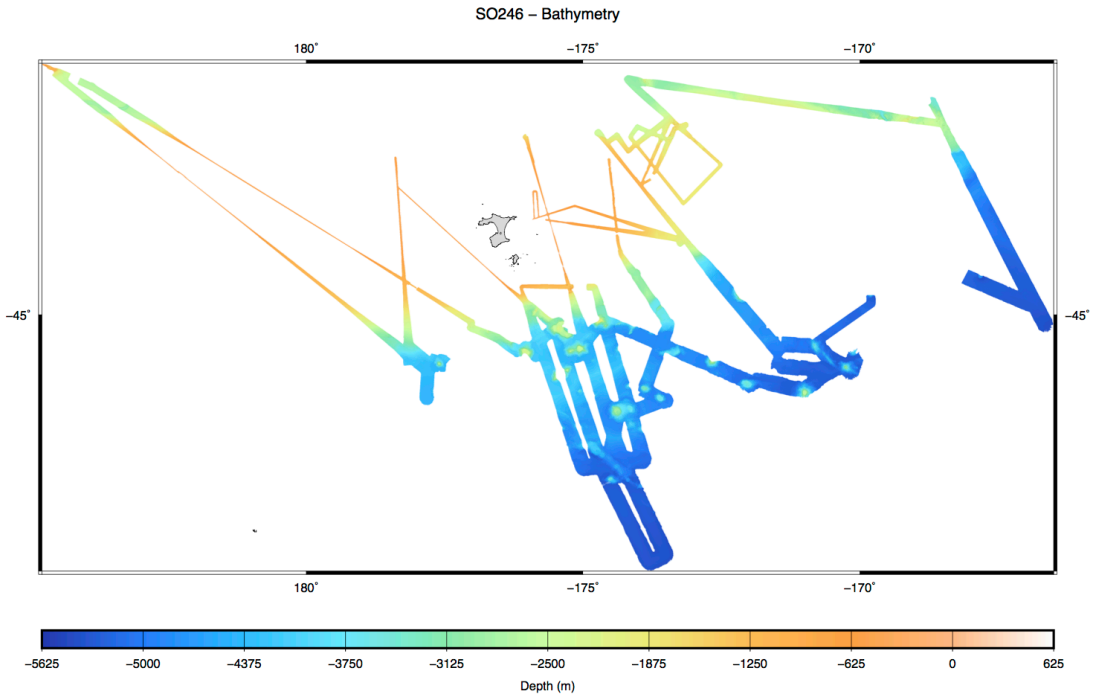


Fig. 6.5.3. Overview of all bathymetric surveys during SO246.

6.6 Geothermal gradients and heat-flow estimates

Ricarda Dziadek[1,2], Katharina Hochmuth[1], Karsten Gohl[1]

[1]AWI
[2]Univ. Bremen

6.6.1 Objectives

Marine heat-flow observations provide fundamental constraints on physical, chemical and biological processes occurring near and below the seafloor. Processes that influence and are influenced by heat transport within seafloor sediments and basement rocks include: (1) the thermal evolution of the oceanic crust and lithosphere; (2) the geodynamics of plate boundaries and mantle convection; (3) fluid circulation and associated impacts on water-rock interactions, seismicity, tectonics, and magmatism. Understanding these processes involves the quantification of energy and fluid fluxes, requiring knowledge of the thermal state deduced from observations that include heat flow, sub-bottom temperature, and thermo-physical sediment properties.

The objective of the temperature measurements during SO246 was an assessment of the thermal structure across the Chatham Rise to aid the differentiation between oceanic and continental crust. On a broader perspective, it is aimed to compare the thermal state of the crust in this region with the conjugating margin located in the Amundsen Sea Embayment of West Antarctica to study the break-up history of the Pacific Gondwana margin.

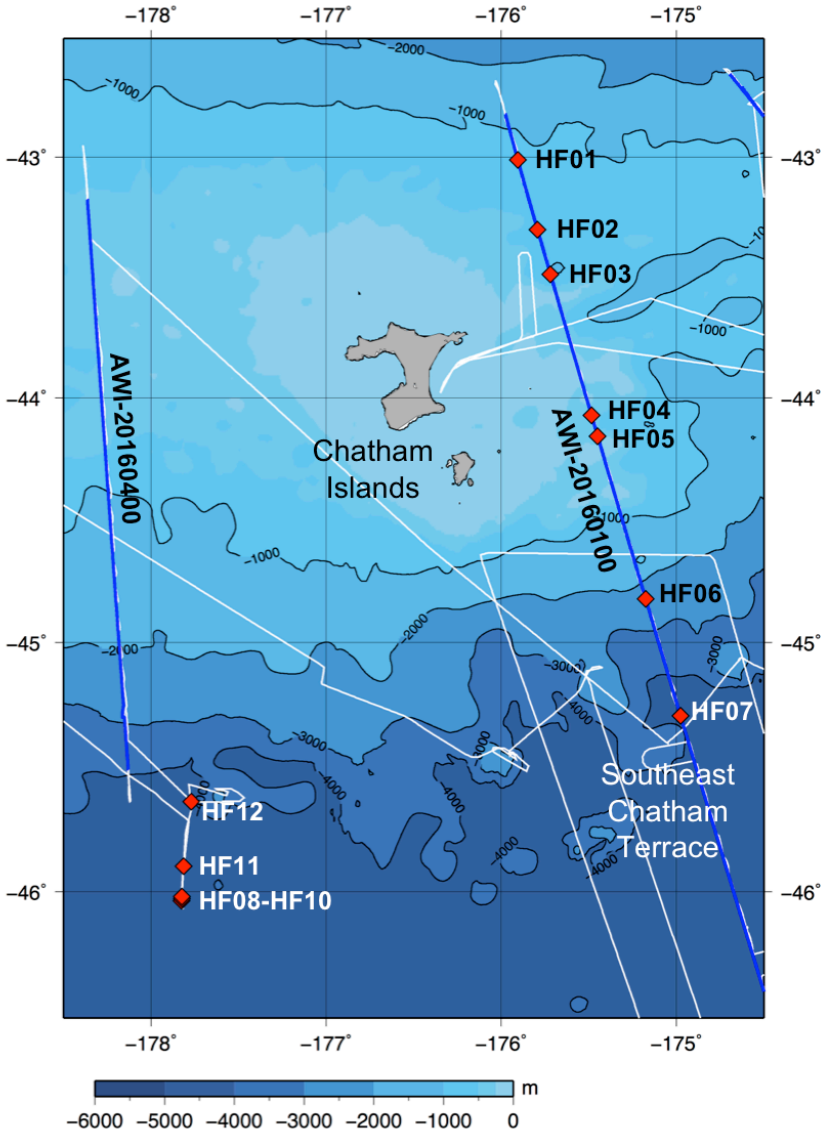


Fig. 6.6.1. Map with all geothermal heat-flow stations (red diamonds) of SO246. Blue lines are seismic refraction (OBS) profiles. White lines mark the ship-track.

6.6.2 Method

We used Miniaturized Temperature Loggers (MTL) that are autonomously operating precision thermometers for deep sea application. The housing is designed for an operation depth of up to 6000 m and sediment penetration. The sampling rate can be adjusted between 1 s and several minutes, yielding a registration time of 1 hour to 6 months. The MTL are constructed for 0.001 K resolution and 0.1 K precision (Pfender and Villinger, 2002) and were equidistantly mounted on a 4 m sensor rod. The standard procedure includes a calibration deployment of the MTL mounted on a CTD at the beginning of the cruise. Schematically represented in Fig. 6.6.2 are the MTLs details and the probe geometry, where six MTL are mounted below the weight with a distance of 0.7 m, and an additional water sensor above the weight. The instrumented probe is lowered with 1 m/s to 100 m above the sea floor, then winch speed is reduced to 0.6 m/s and penetrates the sediment by the force of its own weight. The probe typically sits in the sediment for 8-10 minutes (steady time) for any frictional heat to decay and guarantee undisturbed measurement of in–situ sediment temperatures. After recovery, the data can be obtained by a read-out unit without opening the loggers casing.

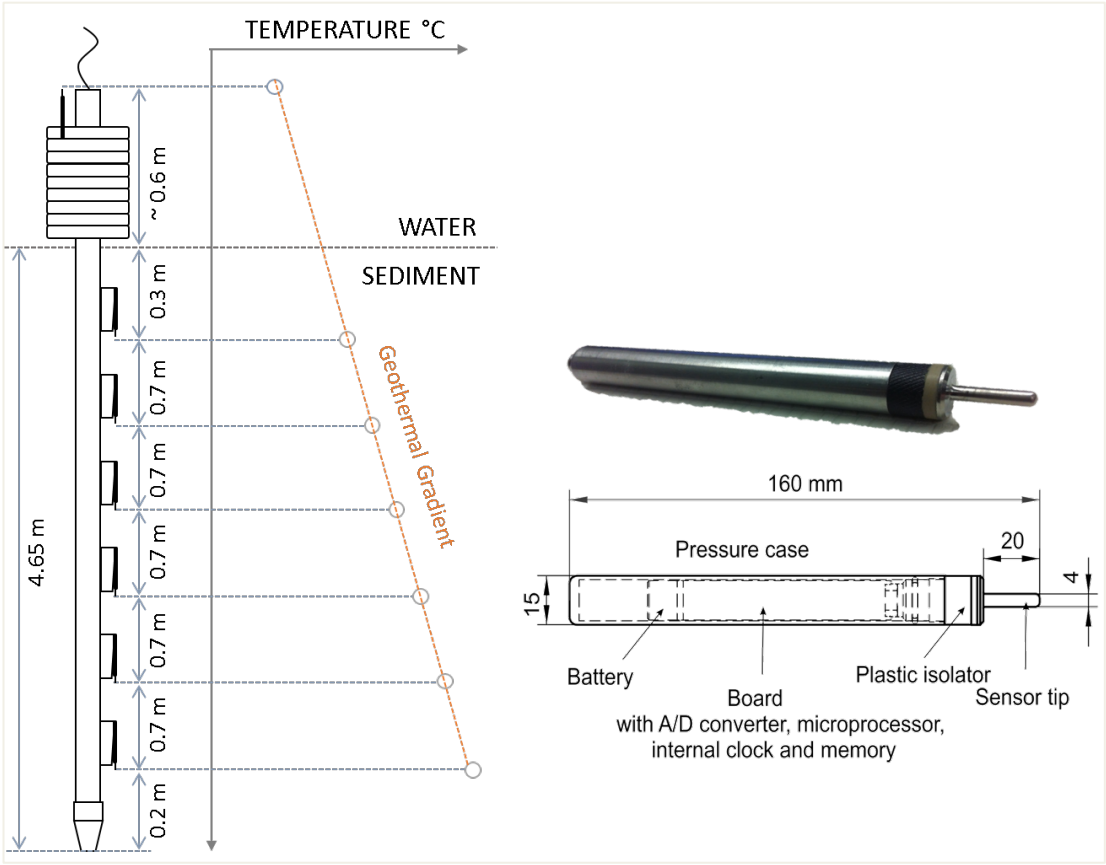


Fig. 6.6.2. Schematic representation of the equidistant mounting geometry along the probe of 6 MTLs and an additional water sensor above the weight. MTLs measure temperatures individually at different depths for deriving geothermal gradients and heat fluxes. Shown on the right are construction details of the deployed MTL.

6.6.3 Work at sea

Along OBS profile AWI-20160100 across the Chatham Rise, seven stations (HF01-HF07) for measuring temperature gradients were conducted (for details see Tab. 6.6.1). Two successful stations were HF01 and HF02 on the top of Chatham Rise. Downslope towards higher water depths the sediments were probably too hard and/or sandy for the probe to penetrate the sea-floor. As a result, the probe fell over, which could be inferred from changes in rope tension. Towards higher water depths, the rope tension signal is more difficult to read due to the increased tension that comes with a longer cable. Stations HF08-HF12 in the eastern part of the working area were conducted successfully with maximum penetration depths. The bottom-water temperature (0.8°C) is probably more stable in this region compared to the western profile, leading to less disturbed sub-seafloor temperature gradients.

Date (UTC)	Time (UTC)	HF/CTD station	Latitude (S)	Longitude (W)	Steady time	Depth [m]	Cable [m]	Comments
04.02.16	00:30	CTD2	45°08.09’	175°31.06’	-	2500		calibration
12.02.16	00:10	HF01	43°00.70’	175°54.25’	8 min	736	750	
12.02.16	00:21	HF02	43°18.13’	175°47.53’	8 min	536	550	
12.02.16	08:32	HF03	43°29.35’	175°43.16’	8 min	444	455	not successful

Date (UTC)	Time (UTC)	HF/CTD station	Latitude (S)	Longitude (W)	Steady time	Depth [m]	Cable [m]	Comments
13.02.16	05:25	HF04	44°04.31’	175°29.07’	7 min	426	438	MTL350 lost, low pen. depth
13.02.16	05:39	HF05	44°09.46’	175°26.97’	8 min	406	415	not successful
13.02.16	04:16	HF06	44°49.31’	175°10.51’	8 min	2331	2345	not successful
13.02.16		CTD3			-			calibration
13.02.16	02:25	HF07	45°17.76’	174°58.56’	11 min	4058	4080	not successful
19.03.16	-	HF08	46°02.19’	177°49.58’	8 min	4450	-	
19.03.16	-	HF09	46°01.69’	177°49.54’	8 min	4450	-	
19.03.16	-	HF10	46°01.19’	177°49.50’	8 min	4450	-	
19.03.16	-	HF11	45°53.92’	177°48.89’	8 min	4400	-	
19.03.16	-	HF12	45°38.43’	177°46.29’	8 min	4250	-	

Tab. 6.6.1. Station log of geothermal temperature probe deployments during SO246.

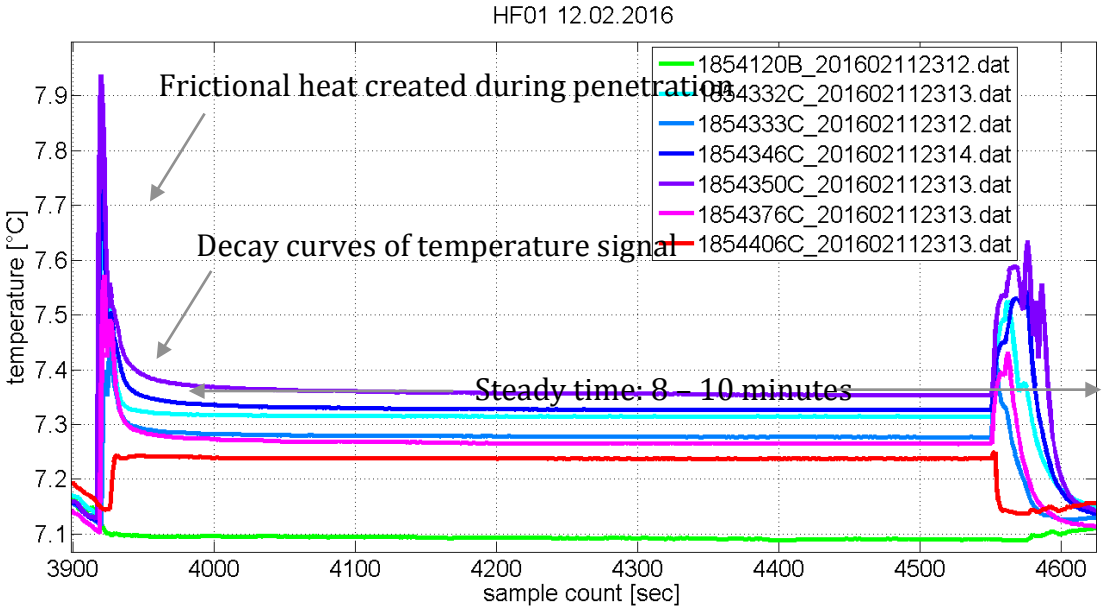


Fig. 6.6.3. Data example of deployment during Station HF01. The temperature recorded by each MTL is marked in a different colour and identified in the legend. The peak seen in almost all curves at 3920 seconds is created by frictional heat during penetration of the probe into the sediment. After 8-10 minutes, the artificial temperature signal is decayed and in-situ temperatures are used for further calculations.

6.6.4 Preliminary results

The preliminary data analyses included plotting of temperature versus time for all loggers. This is shown for Station HF01 exemplarily. The temperature recorded by the individual MTLs is marked in a different colour and identified in the legend. The green curve (MTL1854120B) shows least changes in the curves, because it is measuring water temperatures above the weight stand. The uppermost sediment logger

MTL1854406C probably did not penetrate the sediment, which can be inferred from the amount of frictional heat represented by the first temperature peak at 3920 seconds. After 8-10 minutes steady time, the friction-related temperature signal is decayed and in-situ sediment temperatures are taken for further calculations.

Fig. 6.6.4 shows a crude temperature-depth gradient at the stations HF01 and HF02. The vertical resolution is limited by the distance of the sensor mounting. The three lowermost temperatures we taken to fit a linear regression line. Up to a depth of 1.5 m the measured temperatures deviate from a linear fit. Reasons are probably unstable bottom water temperatures, which can be inferred from CTD data. The inferred gradient at station HF02 (83°C/km) is almost twice as high as for station HF01 (43°C/km).

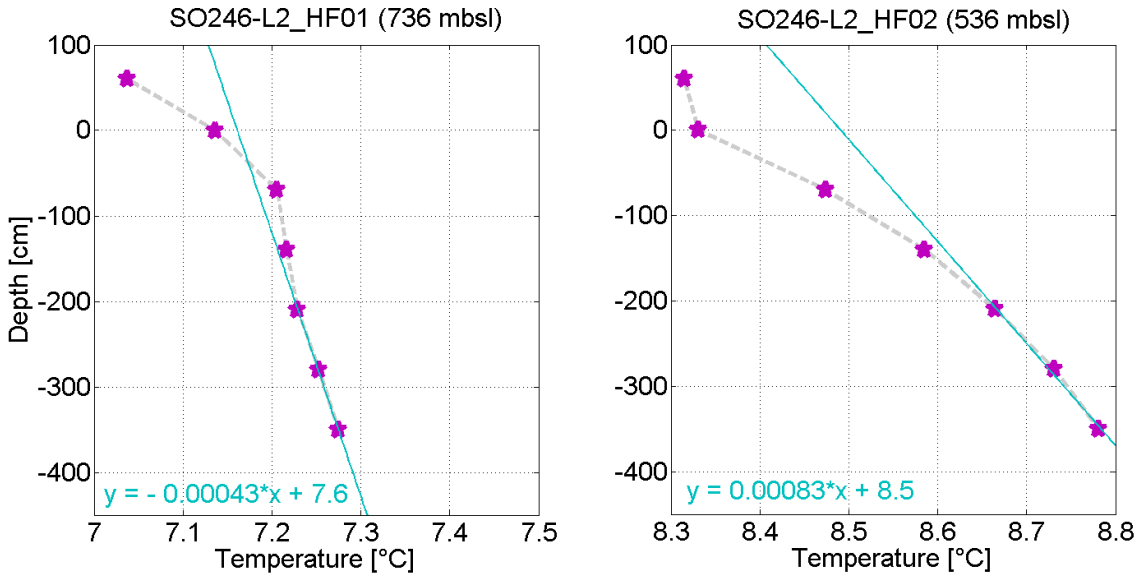


Fig. 6.6.4. Temperature gradients of heat-flow station HF01 and HF02 at shallow water depths located at the Chatham Rise. Upper sensors deviate from linear trend of temperature increase with depth. This might be caused unstable bottom water temperatures that imprint a different temperature signal within the upper two meters of the sub-seafloor.

6.7 Petrological sampling

Reinhard Werner[1], Maria Anders[1], Mirja Heinrich[1], Katlina Hagemann[1], Stephan Homrighausen[1], Nina Furchheim[2], Steffen Koch[1], Gesine Wellschmidt[1]

[1]GEOMAR
[2]Museum für Naturkunde

6.7.1 Methods

6.7.1.1 Dredging and site selection of dredge sites

Rock sampling on SO246 was carried out using rectangular chain bag dredges. A chain bag dredge consists of a massive steel frame with a chain bag attached to its bottom and steel teeth at its openings, which is dragged along the ocean floor by the ship´s winch.

General station areas were chosen on the basis of a number of existing datasets. These mainly included predicted bathymetry, derived from gravity data and ship depth soundings (ETOPO by Smith and Sandwell, 1997, and "The GEBCO_2014 Grid,

version 20150318", http://www.gebco.net), multi-beam bathymetry recorded on former cruises (courtesy B. Davy) and published data, maps, and profiles.

The final selection of dredge sites was critically dependent on detailed multi-beam echo-sounding surveys carried out at each site before dredging. Final positioning of the vessel over the dredge station was based on the bathymetric data gained on these surveys and, if available, seismic data recorded previously in these areas, as well as allowing for wind, swell, and drift conditions. Dredge tracks were usually located - depending on the morphology of the structures - on steep slopes, at plateau edges, at scarps, canyon walls, and on the flanks of cones and larger seamounts. This was mainly done to avoid areas of thick sediment cover.

6.7.1.2 Shipboard procedure

Once onboard, all rocks collected with the dredge were first scanned for encrusting benthic invertebrates (see chapter 6.7.3). Additionally, samples of disturbed sediment were collected for meiofauna studies from the four sediment trap tubes being fixed in the corners of the dredge. Afterwards a selection of the rocks were cleaned and cut using a rock saw. They were then examined with a hand lens and microscope, and grouped according to their lithologies and degree of submarine weathering. The immediate aim was to determine whether material suitable for geochemistry and radiometric age dating had been recovered. Best suitable samples have an unweathered and unaltered groundmass, empty vesicles, glassy rims (ideally), and any phenocrysts are fresh. If suitable samples were present, the ship moved to the next station. If they were not, then the importance of obtaining samples from the station was weighted against the available time.

Fresh blocks of representative samples were then cut for post-cruise thin section and microprobe preparation, geochemistry and further procedures to remove manganese and alteration products and/or to extract glass (if applicable). Each of these sub-samples, together with any remaining bulk sample, was described, labeled, and finally sealed in plastic bags for transportation to GEOMAR or cooperating institutions.

Non-magmatic rocks and Mn-Fe oxides yielded by dredging have also been collected and documented. Those samples can be transferred to co-operating specialists for further shore-based analyses. The biological samples (benthic invertebrates and disturbed sediment) were fixed on board and will be further processed and archived at the Museum für Naturkunde Berlin.

6.7.1.3 Shore-based analyses

Magmatic rocks sampled by RV *Sonne* from the ocean floor will be analyzed using a variety of different geochemical methods. The ages of whole rocks and minerals will be determined by $^{40}Ar/^{39}Ar$ laser dating. Major element geochemistry by X-ray fluorescence (XRF) and electron microprobe (EMP) will constrain magma chamber processes within the crust, and also yield information on the average depth of melting, temperature and source composition to a first approximation. Phenocryst assemblages and compositions will be used to quantify magma evolution, e.g. differentiation, accumulation and wall rock assimilation. Petrologic studies of the volcanic rocks will also help to constrain the conditions under which the melts formed (e.g., melting depths and temperatures). Further analytical effort will concentrate on methods that constrain deep-seated mantle processes. For example, trace element data measured by inductively coupled plasma mass spectrometry (ICP-MS) will help to define the degree of mantle melting and help to characterize the chemical composition of the source. Long-lived radiogenic isotopic ratios obtained by Thermal Ionization Mass Spectrometry (TIMS) and Multi-Collector ICP-MS such as $^{87}Sr/^{86}Sr$, $^{143}Nd/^{144}Nd$, $^{206}Pb/^{204}Pb$, $^{207}Pb/^{204}Pb$, $^{208}Pb/^{204}Pb$, and $^{176}Hf/^{177}Hf$ are independent of the melting process and reflect the long term evolution of a source region and thus serve as tracers to identify mantle and recycled crustal sources. Additionally, morphological studies and

volcanological analyses of the dredged rocks will be used to constrain eruption processes, eruption environment and evolution of the volcanoes. Through integration of the various geochemical parameters, the morphological and volcanological data and the age data, the origin and evolution of the sampled structures can be reconstructed.

6.7.2 Rock sampling report and preliminary results

The dredge program of the SO246 cruise is partly based on investigations conducted on cruise SO168 ZEALANDIA, which included reconnaissance mapping and sampling at a few seamounts south of the far eastern Chatham Rise (e.g. Hoernle et al., 2003). These studies revealed, that the volcanic seamounts sampled on SO168 began to form shortly after the breakup of the Chatham Rise from West Antarctica and therefore can provide information on mantle processes, which took place during the breakup. Some seamounts, however, also show evidence for late-stage volcanic activity. Based on the preliminary results of SO-168 and other studies, our working hypothesis is that a mantle plume existed beneath Zealandia and West Antarctica and that a slab window formed as a consequence of the collision of the Hikurangi Plateau with the Chatham Rise, allowing rise of plume material between the Campbell Plateau and the Chatham Rise, which may have caused rifting. Reconnaissance mapping and sampling conducted on SO168, however, neither allow to verify this hypothesis nor to reconstruct the sequence of events, which occurred in the upper mantle in course of and after the breakup.

The predicted bathymetry and multi-beam mapping conducted on SO168 (Hoernle et al., 2003) and on other former cruises (data by courtesy B. Davy) reveal that the area south of the eastern Chatham Rise (Fig. 4.2), is characterized by numerous seamounts which appear to be mainly volcanic in origin. In order to complete the SO168 data set and to reconstruct the spatial evolution of the magmatism in that area, the dredge program of SO246 aimed to achieve a set of magmatic rock samples, which spatially covers the Southeast Chatham Terrace and adjacent areas such as the lowermost part of the southern Chatham Rise margin and the abyssal plain directly south of the terrace. The second major goal of SO246 rock sampling was to sample different geomorphological units at individual seamounts and volcanic features, which appear to be of different age based on morphological observations. This approach aims to identify different phases of volcanic activity in order to reconstruct the temporal evolution of the magmatism in that area.

Rock sampling during SO246 was accompanied by a minor biological program to investigate benthic animals found on the dredged rocks and meiofauna recovered by sediment traps in our dredges. The biological studies focus on the biodiversity and biogeography of benthic meio- and macrofaunal key groups such as brachiopoda, kinorhyncha, loricifera, porifera, and bryozoa. These investigations complement results of the previous expeditions as, for example, SO168.

The following section gives background information and short summaries of the features sampled and/or mapped on SO246 and on the rocks obtained by dredging but also presents some preliminary interpretations of bathymetric data and rock assemblages. Refer to Appendix 6.7.A and 6.7.B for exact latitude, longitude, and depth of dredge sites and more detailed rock descriptions. An overview map with all SO246 dredge sites is shown in Fig. 4.2. Distances, dimensions and heights given in this chapter are approximate and are only included to give a rough idea of dimensions of morphological features. Distances between seamounts are given between the seamount tops. To our knowledge, none of the studied seamounts have been named by earlier surveys. All names mentioned in this chapter are working names assigned by SO246 and SO168. All photos shown in this chapter are taken by GEOMAR.

6.7.2.1 Southern Chatham Rise margin (DR04-DR06, DR74 and DR75)

According to the predicted bathymetry, at least 11 large seamounts are scattered on and adjacent to the southern base of the Chatham Rise between 173° and 177°W (Fig. 6.7.1). Eight of them have been completely or partly mapped by SO246, SO168, and other cruises. Multi-beam mapping revealed that five of them, all located west of 174°30´W, show a guyot-like edifice characterized by steep flank and a flat top. Guyots usually represent volcanoes that once formed ocean islands. After the volcano becomes extinct, the waves erode the island to sea level, forming a flat top on the volcano. As the crust beneath the volcano cools, the guyot subsides and its former wave cut top sinks beneath sea level. As it is typical for guyots, the top plateaus are never completely flat, but form gentle domes. This inward shoaling of the plateaus is consistent with subsidence occurring contemporaneously with erosion at sea level to form the plateaus.

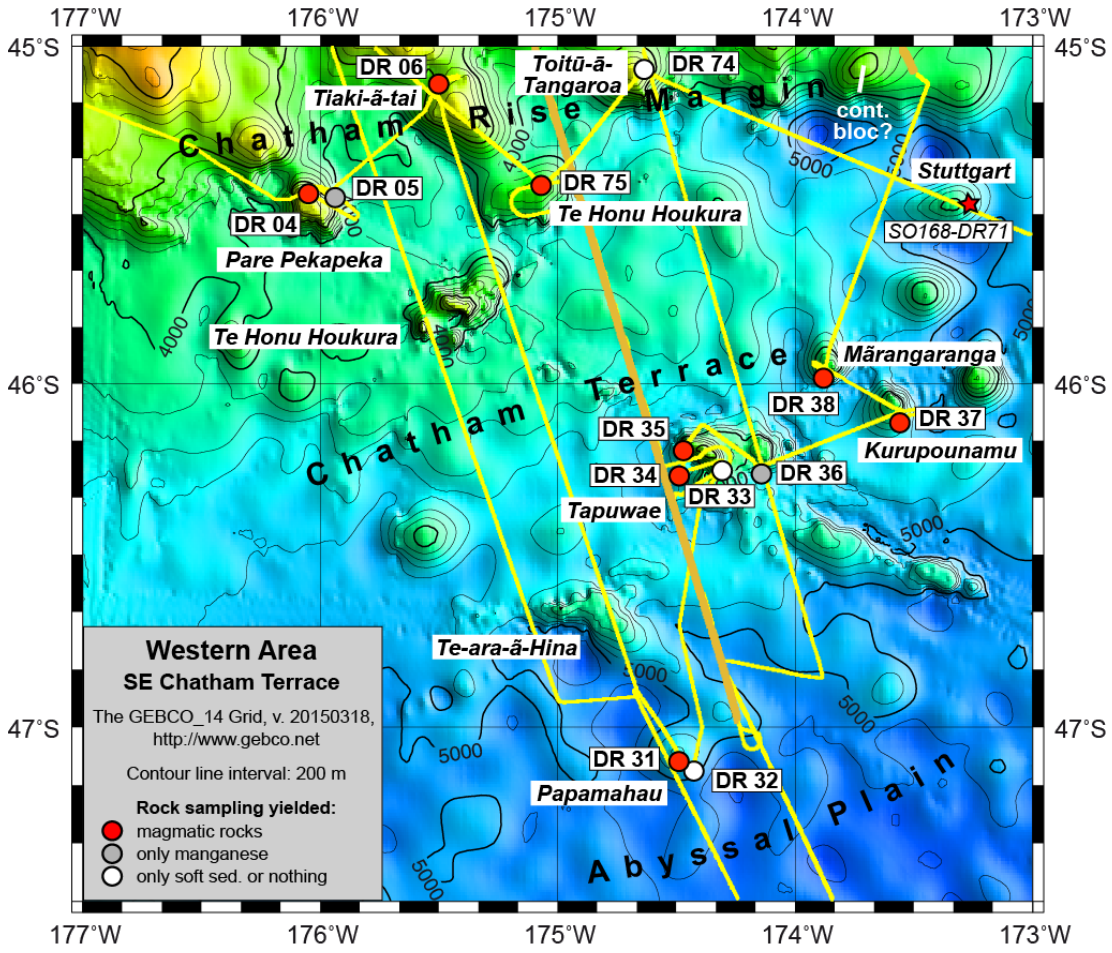


Fig. 6.7.1. Overview map showing the western part of the Chatham Terrace bounded by the southern base of the Chatham Rise to the north and the abyssal plain to the south (bathymetry based on "The GEBCO_2014 Grid, version 20150318", http://www.gebco.net). Dots mark SO246 dredge stations, and yellow lines annotate the SO246 ship´s track. Seismic profiles recorded on SO246 are marked by thick, darker lines. All seamount names in italics are informal working names assigned by cruise participants.

Three seamounts, located east of 174°30´W at the base of the Chatham Rise, do not show any evidence for a volcanic origin. Stuttgart seamount (Fig. 6.7.1), which has been mapped, sampled and named on cruise SO168, is an asymmetric ridge with a crestline above a steep, southern slope and a gentle northern slope. It turned out that

Stuttgart represents a tilted continental bloc (e.g., Hoernle et al., 2003, Mortimer et al., 2006). Approximately 29 nm northwest of Stuttgart, a similar asymmetric structure appears at the base of the Chatham Rise slope (Fig. 6.7.1). This seamount is also marked by a very steep (up to > 40°), c. 1700 m high southern and a gentle northern slope. We assume that it is also a N-tilted horst of continental material. Approximately 14 nm farther west, a SSW-NNE-striking ridge-like feature emanates from the base of the Chatham Rise (Fig. 6.7.2). This ridge shows different inclinations of its western and eastern slopes, sharp crests, and may be another continental sliver. Taken together, several continental fragments appear to be scattered at the base of the Chatham Rise margin between 130°30´W and 174°00´W.

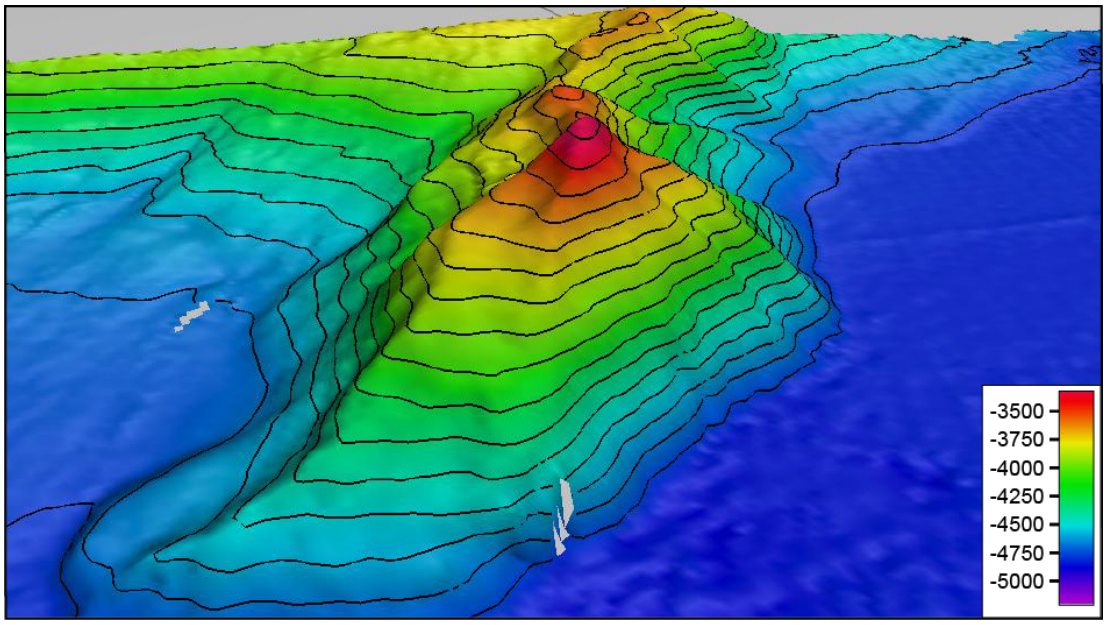


Fig. 6.7.2. Ridge-like structure on at the southern base of the Chatham Rise, which may represent a continental sliver (view from SSW to NNE). Note the different inclinations of the western and the eastern slope. The map is based on EM122 multi-beam data recorded on SO246 (exaggeration: 2x; interval of contour lines: 100 m).

The first dredges (DR04 and DR05) of the cruise were carried out at Pare Pekapeka seamount, which is located on the Chatham Terrace right at the base of the Chatham Rise. Pare Pekapeka is a oval-shaped guyot with a base at ~3850 - 4150 m b.s.l., a flat plateau top at ~2250 - 2500 m b.s.l. and basal dimensions of ~27 x 22 km (Fig. 6.7.3). Volcanic ridges and cones are visible on its flanks, but none above the flat top, so it is not known if these cones represent pre- or post erosional eruptions. Dredge haul DR04 was on the upper northern slope of Pare Pekapeka from c. 2770 to 2350 m b.s.l. just beneath the plateau edge (Fig. 6.7.3). The dredge returned c. 30 small, angular lava fragments, volcaniclastic breccias, a few dropstones, and manganese crusts. The lava fragments comprise three different lithologies: (1) fairly fresh, almost aphyric to slightly porphyric lava with up to ~15% small feldspar phenocrysts (< 1 mm) in a fine-grained, dense to slightly vesicular matrix; (2) fresh to moderately altered porphyric lava consisting of up to ~30% feldspar phenocrysts (up to 10 mm) and a few altered olivines or pyroxenes in an almost dense, fine-grained matrix (Fig. 6.7.4); and (3) slightly to heavily altered, highly vesicular (up to 35%) lava with <10% mostly altered feldspar phenocrysts (< 3 mm) (Fig. 6.7.5). The vesicles are mostly up to 2 - 3 mm in diameter (rarely up to 10 mm Ø) and partly filled with whitish and greenish material. The volcaniclastics consist of angular fragments of the lavas described above in a medium to fine-grained, brownish to black matrix.

The second dredge attempt (DR05) at Pare Pekapeka has been conducted at its lower northeastern slope from 3540 to 3240 m b.s.l. (Fig. 6.7.3) and aimed to sample rocks of the initial stage of this seamount. The dredge, however, returned only one fine-grained, yellowish altered sedimentary rock (altered tuff?), which is not useful for geochemical analysis.

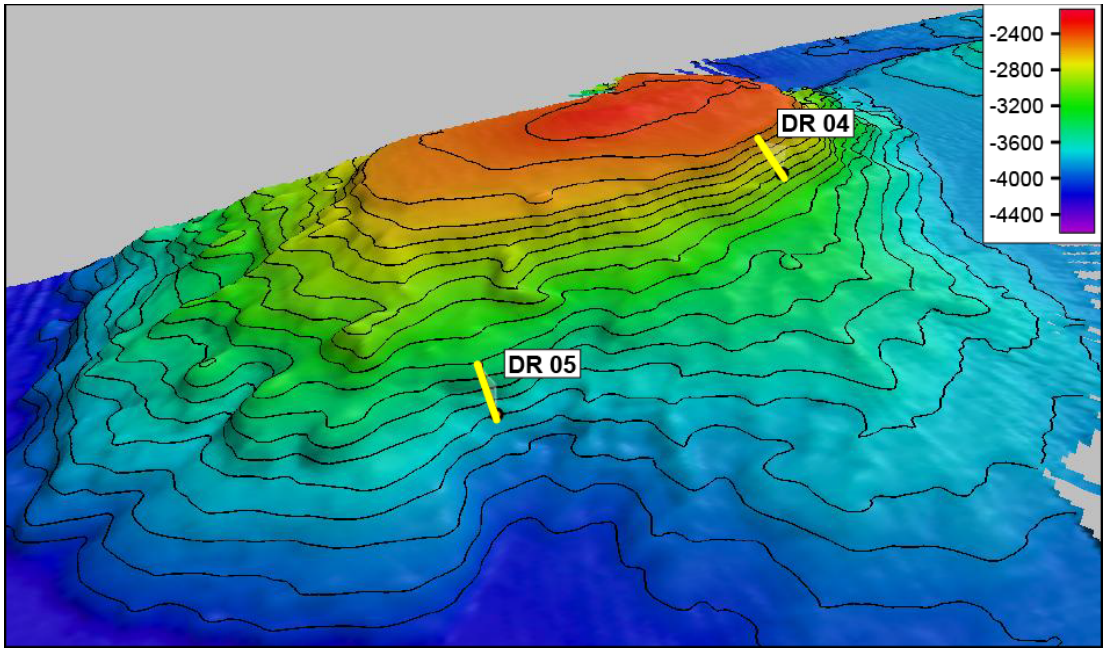


Fig. 6.7.3. 3D-map of Pare Pekapeka guyot with dredge tracks DR04 and DR05 (view from NE to SW). Exaggeration, contours, and data sources as in Fig. 6.7.2.

Fig. 6.7.4. Lithology 2 of DR04 at Pare Pekapeka guyot: a fairly fresh, dense, feldspar-phyric lava.

Fig. 6.7.5. Lithology 3 of DR04 at Pare Pekapeka guyot: highly vesicular lava with altered feldspar phenocrysts.

The next target of the SO246 dredging program was Tiaki-ã-tai seamount located c. 30 nm northeast of Pare Pekapeka in the transition zone between the Chatham Rise margin and the Chatham Terrace (Fig. 6.7.6). Tiaki-ã-tai is a subcircular guyot, which rises from 3100 m b.s.l. in the north (Chatham Rise slope) and 4250 m b.s.l. in the south (Chatham Terrace), respectively, to a top plateau at 2250 - 2600 m b.s.l. Its basal diameter can only be estimated to approximately 30 km due to incomplete mapping. Like Pare Pekapeka, Tiaki-ã-tai also does not show any clear evidence for

post-erosional volcanic activity. Dredge haul DR06 has been made at its northern flank from the base to the plateau edge between 2910 and 2630 m b.s.l. (Fig. 6.7.6). This dredge haul yielded, aside from a few dropstones and manganese crusts, surprisingly fresh, homogeneous lava fragments and some volcaniclastic rocks. The slightly prophyric lava contains up to 20% sub-mm sized feldspar needles and rarely small dark minerals (pyroxene?) in a very fine-grained, homogeneous matrix. Most lava fragments are almost dense but some show up to 25% vesicles (mostly <1 mm) in their outer parts. The volcaniclastic rocks consist of angular lava fragments in a fine-grained, brownish matrix. The clasts vary in color, degree of alteration, texture, and vesicularity, suggesting an epiclastic origin of this breccia.

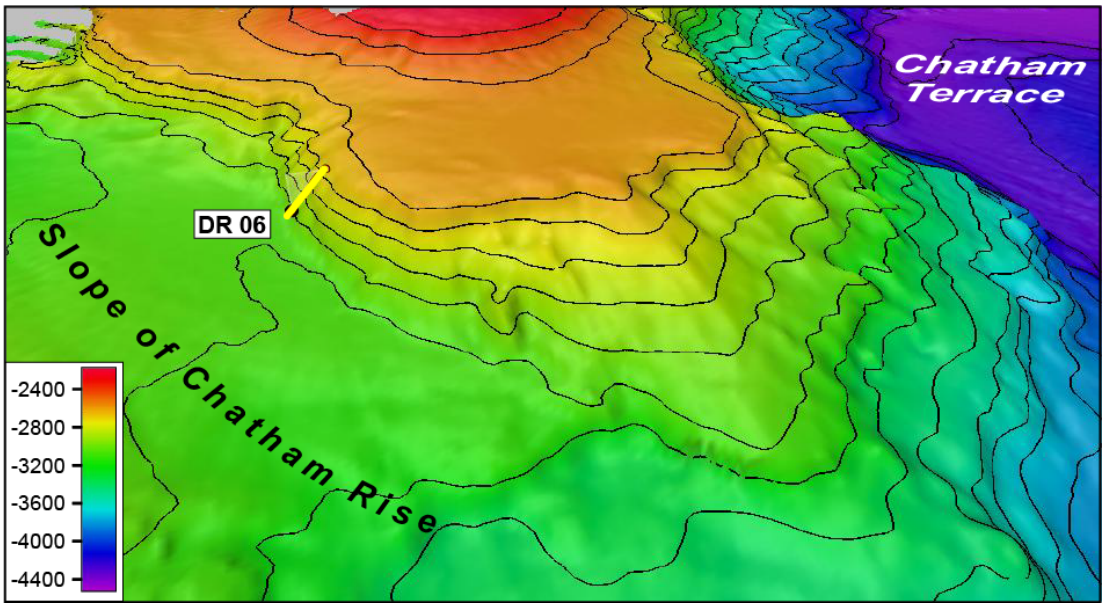


Fig. 6.7.6. 3D perspective map of Tiaki-ã-Tai guyot with dredge track DR06 (view from WNW to ESE). Tiaki-ã-Tai is directly located on the transition from southern slope of the Chatham Rise to the Chatham Terrace. Exaggeration, contours, and data sources are as in Fig. 6.7.2.

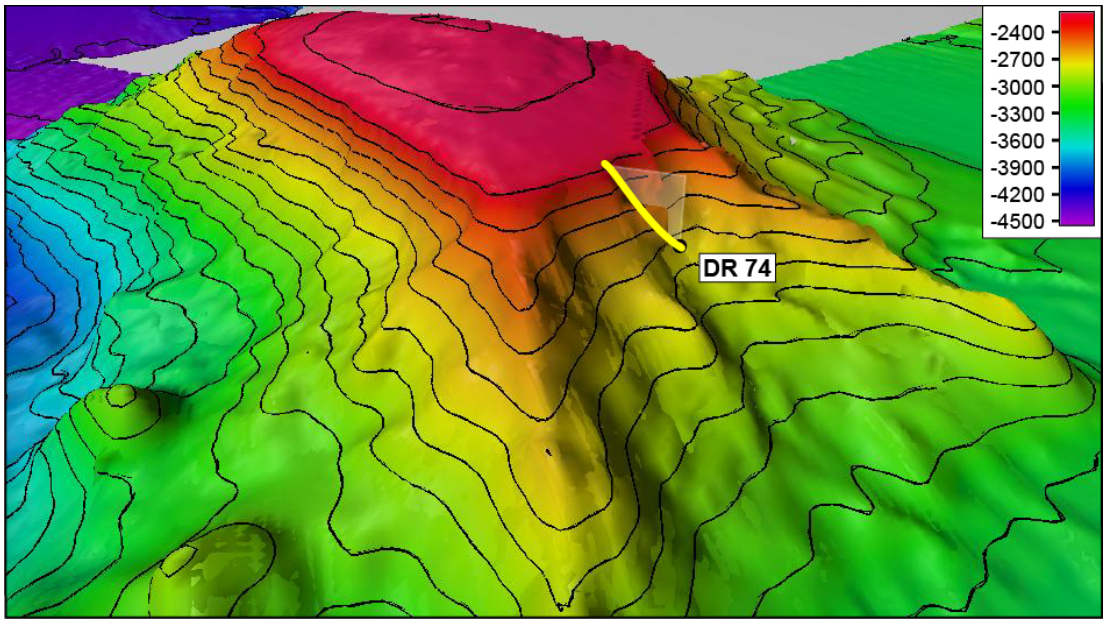


Fig. 6.7.7. 3D-perspective map of Toitū-ā-Tangaroa with dredge track DR74 (view from ESE to WNW). Exaggeration, contours, and data sources are as in Fig. 6.7.2.

On its way to the last seismic profile of the cruise, RV *Sonne* passed again the lower southern slope of Chatham Rise ESE of the Chatham Islands. On this occasion, we dredged two more of the large guyots, which dominate this area. Toitū-ā-Tangaroa guyot is located on the transition zone between the Chatham Rise and the Chatham Terrace (Figs. 7.6.1 and 7.6.7). Its basal dimensions can only be estimated to approximately 25 x 20 km due to incomplete mapping. Toitū-ā-Tangaroa rises from 3300 m b.s.l. at its northern base on the Chatham Rise slope and from 4500 m b.s.l. at its southern base, respectively, to a top plateau at 2200 - 2000 m b.s.l. Remarkable features of Toitū-ā-Tangaroa are short, up to 5 km long volcanic ridges emanating from the main edifice in various directions and numerous, some 100 m high volcanic cones, which are scattered on and adjacent to the flanks of the volcano (Fig. 6.7.7). Dredge track DR74 was located on the upper eastern flank of Toitū-ā-Tangaroa between two of ridges at 2500 m water depth. The dredge, however, got stuck and returned only one tiny volcanic rock of unclear origin.

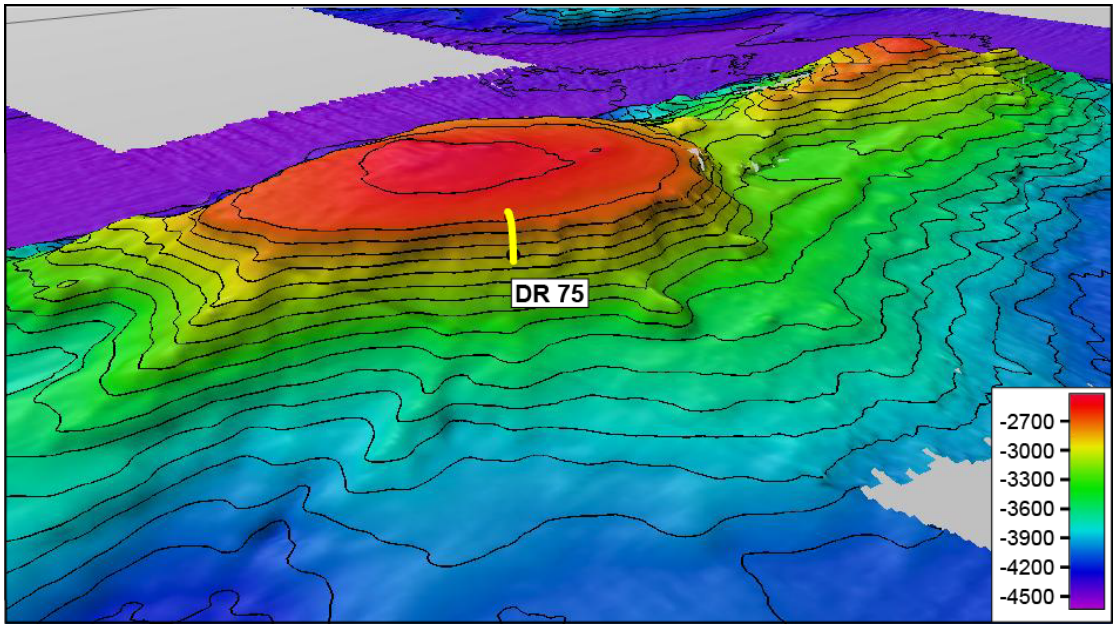


Fig. 6.7.8. 3D-perspective map of Te Honu Houkura twin seamount with dredge track DR75 (view from NNE to SSW). Exaggeration, contours, and data sources as in Fig. 6.7.2.

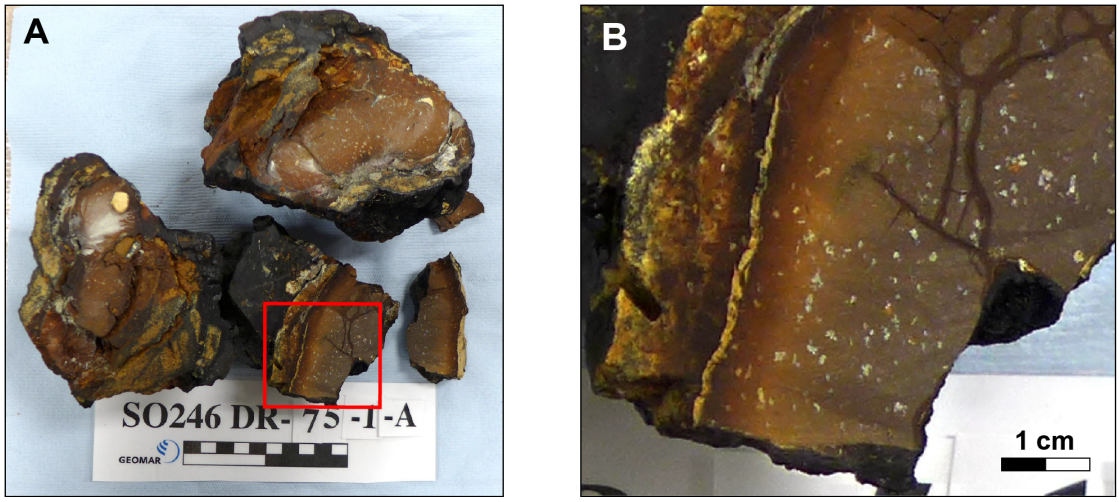


Fig. 6.7.9. Heavily altered volcanic breccia dredged at Te Honu Houkura seamount. An enlargement of the red-framed section in A is shown in B. Clearly visible are the palaognized glassy margin of the lava fragment and numerous feldspar phenocrysts which appear to be fresh in places.

Te Honu Houkura is a huge, E-W trending twin seamount (Fig. 4.7.8), which measures c. 37 x 25 km at its base in c. 4400 m water depth. Its eastern portion is an oval-shaped guyot with a top plateau at c. 2600 - 2450 m b.s.l. An E-W striking volcanic ridge forms the western part of Te Honu Houkura. The highest point of that ridge reaches 2550 m b.s.l. and obviously once extended to just about the water surface as indicted by a small top plateau (2 x 1.5 km). Some volcanic ridges and cones are visible on the flanks of Te Honu Houkura, but none on the top plateau. Dredge haul DR75 was conducted on the uppermost northeastern flank right beneath the plateau edge of the guyot from 2730 to 2550 m b.s.l. (Fig. 6.7.8). The dredge yielded a fragment of Mn-encrusted volcanic breccia (Fig. 6.7.9) and a lapilli tuff. The breccia consists of heavily altered, cm- to dm-sized brownish pillow fragments, palagonized glass fragments, and fragments of an altered, coarse-grained tuff in a fine-grained whitish-yellow to black matrix. Notably the lava fragments contain numerous feldspar phenocrysts, which appear to be fresh in places and may be useful for geochemical analytics and possibly also for age dating. The lapilli tuff is formed by angular, mm- to cm-sized palagonized glass fragments in a fine-grained dark matrix (altered ash?). It may be worth to check this rock for spots of fresh glass.

6.7.2.2 Western Chatham Terrace (DR33 - DR38)

A prominent group of six large seamounts and several smaller structures are located on the western Chatham Terrace between c. 173°00´W and 174°30´W (Fig. 6.7.1). The oval-shaped, E-W-striking Tapuwae seamount (Fig. 6.7.10) is by far the largest of these structures.

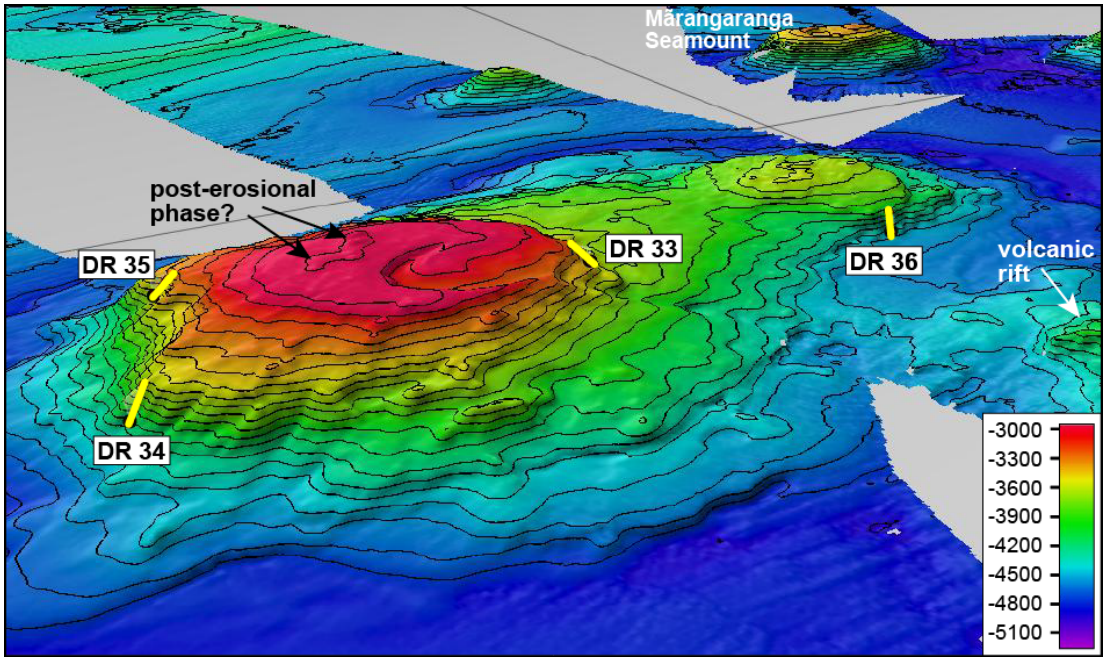


Fig. 6.7.10. 3D-perspective map of Tapuwae seamount with dredge tracks DR33 through DR36; Mărangaranga seamount is visible in the background (view from SW to NE). Note the three morphological units of Tapuwae: (1) Flat basal structure with (2) an steep-sided guyot on top in the foreground and (3) a "pan-cake"-like flat volcano attached to the eastern end of the basal structure. Exaggeration, contours, and data sources are as in Fig. 6.7.2.

Tapuwae measures ~40 x 25 km at its base in ~4800 m water depth and appears to consist of three different geomorphological units: (1). a sub-circular, flat-topped basal structure with basal dimensions of 30 x 28 km and a high of ~1000 m, (2) a circular, flat-topped "pancake"-like volcano measuring ~10 km in diameter and 1000 m in high, which is attached to the eastern tip of the basal structure and (2) a steep-sided, sub-circular edifice on top of the western part of the basal structure (Fig. 6.7.10). The steep-sided edifice exhibits a distinct erosional plateau in ~2800 - 3000 m water depth. Some small volcanic cones are visible on its flank and, notably, at least five cone-like features with gentle slopes, being up to 1 km in diameter and up to 100 m high, are situated on the erosional plateau. These features could be small, sediment covered volcanic cones, which would indicate a post-erosional phase of volcanic activity (Fig. 6.7.10). A chain of elongated flat volcanic structures emanates from the southern base of Tapuwei in ESE-direction (Fig. 6.7.1). This chain, most likely representing a fracture zone, was not mapped and sampled by SO246. However, multi-beam data recorded on former cruises and the predicted bathymetry suggest it may be approximately 100 km long.

Altogether, four dredge hauls have been conducted at Tapuwae in an attempt to sample all three geomorphological units. Due to westerly wind directions, dredge DR33 has been carried out from 3420 to 3130 m b.s.l. along the eastern, relatively gentle flank of the guyot, which is not very suitable for dredging (Fig. 6.7.10). Accordingly this dredge haul failed to return any rocks. Afterwards a change in wind direction enabled us to conduct two dredges at the steeper western flank of Tapuwae (Fig. 6.7.10). DR34 was made at the western slope of the basal structure from 3930 to 3510 m b.s.l. and recovered surprisingly fresh to moderately altered pillow fragments (Fig. 6.7.11a), altered volcaniclastics and some manganese crusts. The aphyric to slightly feldspar-phyric, vesicular pillow lava has a fine-grained matrix with sub-mm sized groundmass feldspar and contains up to 30% round (<5 mm) and elongated (<5 cm) vesicles. A minor variety of this lava contains up to 10% fresh feldspar phenocrysts (sub-mm to

6 mm in size), which appear suitable for dating (e.g. sample DR34-5). The volcaniclastic rocks consist of clasts of the lava described above, feldspar crystals and palagonized glass fragments in a fine-grained, dark matrix (Fig. 6.7.11b). These rocks should be carefully checked for datable feldspar and remnants of fresh glass.

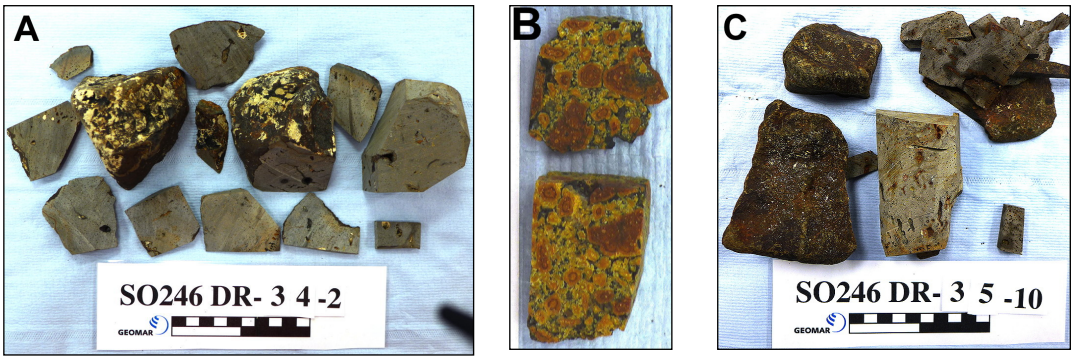


Fig. 6.7.11. Selection of rock samples dredged at Tapuwae seamount. A: Fairly fresh aphyric, vesicular pillow lava. B: Volcaniclastic rock fragments (sample DR34-11VC) consisting of palagonized glass fragments in a fine-grained dark, feldspar-bearing matrix (size of the clasts is 2 x 2 and 2 x 3 cm, respectively). C: Moderately altered, vesicular pillow lava; note the bright glassy surface of the lower left fragment, which is only slightly palagonized or hydrated.

Dredge DR35 was conducted upslopeDR 34 from 3570 to 3270 m beneath the margin of the top plateau and yielded again relatively fresh to moderately altered pillow fragments (Fig. 6.7.11c) besides the inevitable manganese crusts. The feldspar-phyric lavas are highly vesicular with up to 50% mm-sized vesicles in a fine-grained, homogeneous matrix. The sub-mm to 5 mm-sized feldspar phenocrysts (<15%) are fresh in places and seem to be appropriate for Ar/Ar dating in some samples (e.g. DR35-3). Notably the glassy rims of the pillows are only slightly palagonized or hydrated and may still contain fresh glass. The last dredge at Tapuwae, DR36, attempted to sample the flat "pan-cake"-like volcano in its eastern part (Fig. 6.7.10). The dredge track was set along its southern slope from 4300 to 3970 m b.s.l. but the dredge recovered only some hundred small manganese nodules (5 - 7 cm in diameter). Taken together, dredging at Tapuwae failed at the eastern "pan-cake"-like feature but yielded fresh samples, being useful for geochemical analyses and probably also for dating, from the upper guyot and the basal structure (although we cannot exclude at this stage that the rocks sampled there are debris from the guyot).

The following two dredge hauls targeted sampling two neighboring, medium-sized seamounts located c. 30 - 40 km ENE of Tapuwae on the Chatham Terrace (Fig. 6.7.1). Kurupounamu is an oval-shaped, steep-sided guyot-type volcano measuring 19 x 13 km at its base, elongated in a WNW-ESE direction (Fig. 6.7.12). It rises from the Chatham Terrace at ~4900 m b.s.l. to a flattish top between 3,850 - 3550 m b.s.l. Interestingly the margin of the erosional plateau of Kurupounamu is ~850 m deeper than that of the nearby Tapuwae guyot. A few volcanic cones are visible on its flanks and several small, up to 100 m high cone-like structures with gentle slopes (5 - 15°) are scattered on the top plateau (Fig. 6.7.12). These features may be sediment-covered volcanic cones formed by post-erosional volcanism. Dredge haul DR37 returned a large amount of manganese encrusted pillow fragments, volcanic breccia, and manganese nodules from the southeastern slope of Kurupounamu between c. 4,360 and 3800 m b.s.l. The pillow lava fragments are feldspar-phyric (5 - 25%) with fairly fresh to slightly altered 1 to 5 mm-sized feldspar phenocrysts. The groundmass is fine-

grained with up to 25% vesicles (sub-mm – 3 mm) and is variably altered ranging from dark grey to brownish. Notably, spots of fresh glass may be preserved in the palagonized glassy pillow rims beneath the manganese. The breccia consists of fragments of the pillow lava in a fine- to medium-grained, yellowish to brownish matrix (altered lapilli tuff?).

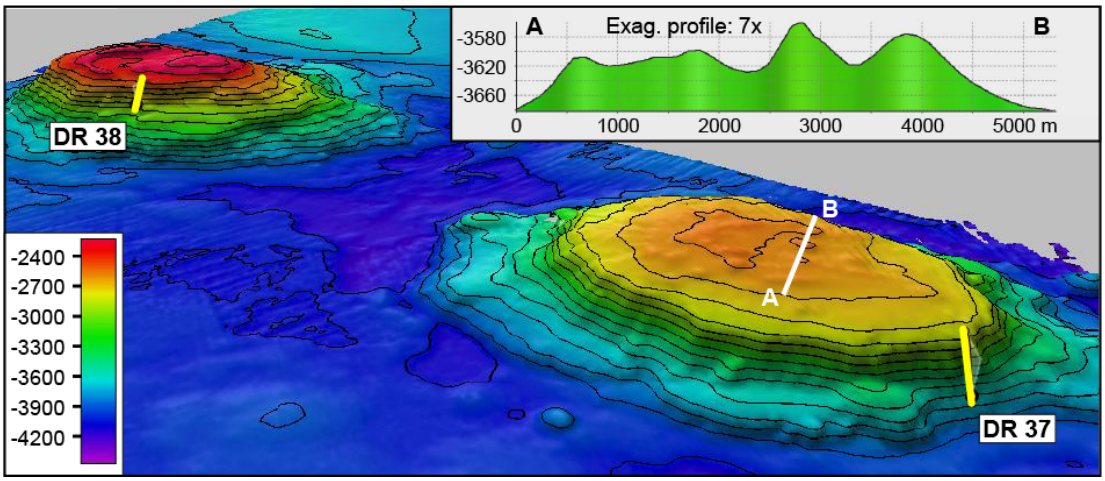


Fig. 6.7.12. 3D-perspective map of Kurupounamu (right) and Mãrangaranga (left) seamounts with dredge tracks DR37 and DR38 (view from SSE to NNW). The profile across the top plateau of Kurupounamu shows the cone-like structures with gentle slopes being scattered on the plateau (note the large exaggeration of the profile). Exaggeration, contours, and data sources of the 3D-map are as in Fig. 6.7.2.

Mãrangaranga seamount is located 13 nm WNW of Kurupounamu guyot (Fig. 6.7.12) and exhibits an oval-shaped, E-W striking edifice measuring c. 17 x 14 km at its base in 4800 m water depth with a relatively flat top in 3200 - 3500 m b.s.l. By contrast to typical guyot-type volcanoes, its top plateau shows a rough surface with a semicircular ridge-like feature in its western part and a dome-like structure in the east (Fig. 6.7.12). It remains unclear, if this plateau has been formed by erosion at the water surface or by volcanic and syn-volcanic events (e.g. collapse of the summit) in a submarine environment. Dredge track DR38 was set at the upper southern flank of Mãrangaranga right beneath the flat top from 3760 to 3410 m b.s.l. The dredge returned lava fragments, a few dropstones, and of course manganese crusts and nodules. The lava is moderately to strongly altered and exhibits up to 30% sub-mm-sized feldspar needles, small pyroxene and heavily altered olivine in a fine-grained grey to reddish-brown matrix. Clasts are vesicular with up to 15%, 1 - 7 mm-sized vesicles which are partly with whitish, orange, and greenish material.

6.7.2.3 Abyssal plain to the south of Chatham Terrace (DR31+32, DR54-56, and DR70-73)

The seamounts located further to the south on the abyssal plain south of Chatham Terrace exhibit a surprisingly broad variety in morphology and size. Apart from guyots, multi-beam mapping of SO246 and former cruises revealed, among others, large volcanoes without distinct top plateau, SE-striking ridge-like structures, a structure which appears to be formed of merged volcanic cones, and circular or elongated flat-topped, partly cratered volcanoes ("pancakes" and "donuts", Fig. 6.7.13).

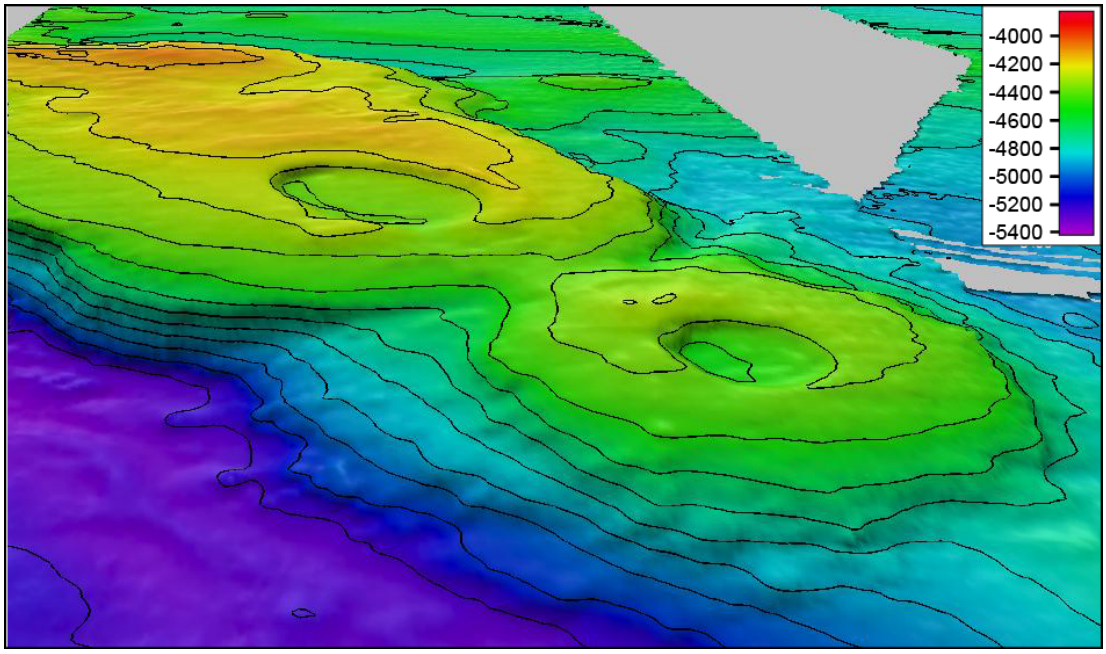


Fig. 6.7.13. 3D-perspective map of Te-ara-ã-Hina volcanoes on the transition of the Chatham Terrace to the abyssal plain (view from S to N). They are characterized by a flat, cratered summit plateaus. The diameter of the circular, donut-like structure in the foreground is c. 10 km at its base, its central depression measures c. 2.5 km in diameter and is c. 150 m deep. The map is based on multi-beam data recorded on SO246 (exaggeration: 2x; interval of contour lines: 100 m). Exaggeration, contours, and data sources are as in Fig. 6.7.2.

Dredging in this area focused on six of the larger volcanoes. Unfortunately the small, flat-topped structures exhibit a smooth morphology with relatively gentle slopes, which are most likely covered by sediments. This is also indicated by dredge attempts at slopes with similar inclinations at larger seamounts, which yielded nothing or just manganese nodules. Moreover, dredge hauls at these small volcanic structures are very time consuming since their base is generally located in water depths of more than 5000 m. Accordingly we decided to refrain from any dredge attempts at these small structures and to concentrate on more promising structures.

Approximately 45 nm south of Tapuwae volcano, the predicted bathymetry shows a medium-sized cone-like feature. Originally it was not planed to dredge this structure but magnetic and multi-beam surveys revealed an interesting, complex morphology of its edifice (Fig. 6.7.14). Therefore we decided to sample this volcano and named it Papamahau. Its oval-shaped, roughly NNE - SSW striking lower part measures ~20 x 14 km at its base, elevates ~900 m from the surrounding abyssal plain at ~5200 m, has a flat top, and is morphologically similar to the flat volcanic structures which occur frequently in this area (cf. Fig. 6.7.13). On the western portion of this basal structure sits an oval-shaped, steep-sided volcanic edifice which strikes E - W, measures ~8 x 6 km at its base, and elevates ~900 m high from the basal structure. Notably the plateau-like top of this feature is marked by a sub-circular dome, measuring ~3.2 km in diameter and ~250 m in high, and circular depressions in its center (1.2 km in diameter, 200 m deep) and at its southern margin (1.6 km in diameter, 300 m deep) (Fig. 6.7.14). A possible scenario for the formation of the central depression is the collapse of the cooled, solidified roof of a drained lava lake whereas the marginal depression most likely represents a landslide scarp. The central depression is bordered at its eastern und northern side by a shallow curved ridge, which could be a remnant of a larger dome- or cone-like structure, which once formed the top of this volcano. Although this volcanic edifice has a relatively flat, plateau-like top, its morphological features indicate that its top region has not been formed by erosion at sea level but by constructive and

destructive volcanic and syn-volcanic processes. Notably at least two phases of volcanic activity appear to have occurred at Papamahau. We assume that an initial phase formed the flat basal structure and a later phase the steep-sided edifice on top of the basal edifice.

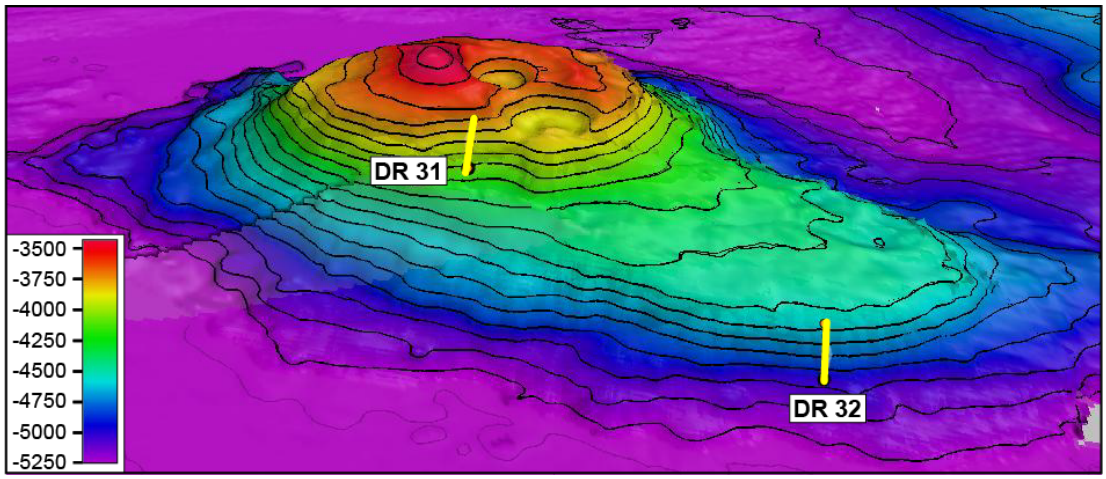


Fig. 6.7.14. 3D-perspective map of Papamahau seamount with dredge tracks DR31 and DR32 (view from SSE to NNW). Exaggeration, contours and data sources as in Fig. 6.7.2.

Dredge haul DR31 has been carried out between 4000 and 3550 m b.s.l. at the southern slope of the upper, steep-sided structure of Papamahau (Fig. 6.7.14). The dredge returned lots of moderately to heavily altered, manganese encrusted lava fragments, a few volcaniclastic rocks, manganese nodules and some dropstones of continental origin. The majority of lava fragments is aphyric, fine-grained and vesicular (5 - 20%). The vesicles measure up to 7 mm in diameter and are mostly filled with manganese or brownish material. Some fragments contain a few altered feldspars (<2%, <2 mm) and pyroxenes. Very fine-grained, homogeneous, and absolutely dense rock fragments represent a second, minor lithology of this dredge. Thin section evaluation is required to verify if these rocks represent lava or lithified sediment. The volcaniclastic rocks mainly consist of sub-rounded lava clasts and altered (palagonized) glass fragments. A few glass fragments, however, appear to be only very slightly altered. Therefore this rock should be carefully checked for fresh glass at GEOMAR. Dredge DR32 aimed to sample the basal structure of Papamahau at its southern slope from 4780 to 4470 m b.s.l. (Fig. 6.7.14) but yielded nothing.

Approximately 120 nm further northeast of Papamahau a group of seamounts exists on the abyssal plain south of the Chatham Terrace between c. 169°00´W and 172°30´W. Dredging in this area started at Te Kakaru seamount. Te Kakaru has not been completely mapped but seems to be an E-W striking, oval-shaped and steep-sided volcano with a relatively flat top (Fig. 6.7.16). This volcano extends 17 km in E-W direction at its base and rises from the abyssal plain at almost 5300 m b.s.l. to at least 3700 m b.s.l. The flat top of Te Kakaru is most likely not an erosional plateau but appears to be formed by two gentle dome-like structures. Dredge haul DR54 was made at the central southern slope of Te Kakaru between 4720 and 4320 m b.s.l. (Fig. 6.7.16). The dredge recovered a huge amount of MN-crusts and nodules. Amongst the manganese we discovered two small, moderately to heavily altered lava fragments. The lava is porphyric with up to 25% mostly altered, up to 3 mm-sized feldspar phenocrysts in a non-vesicular, fine-grained matrix. This rock is most likely not suitable for geochemical analyses because of its strong alteration.

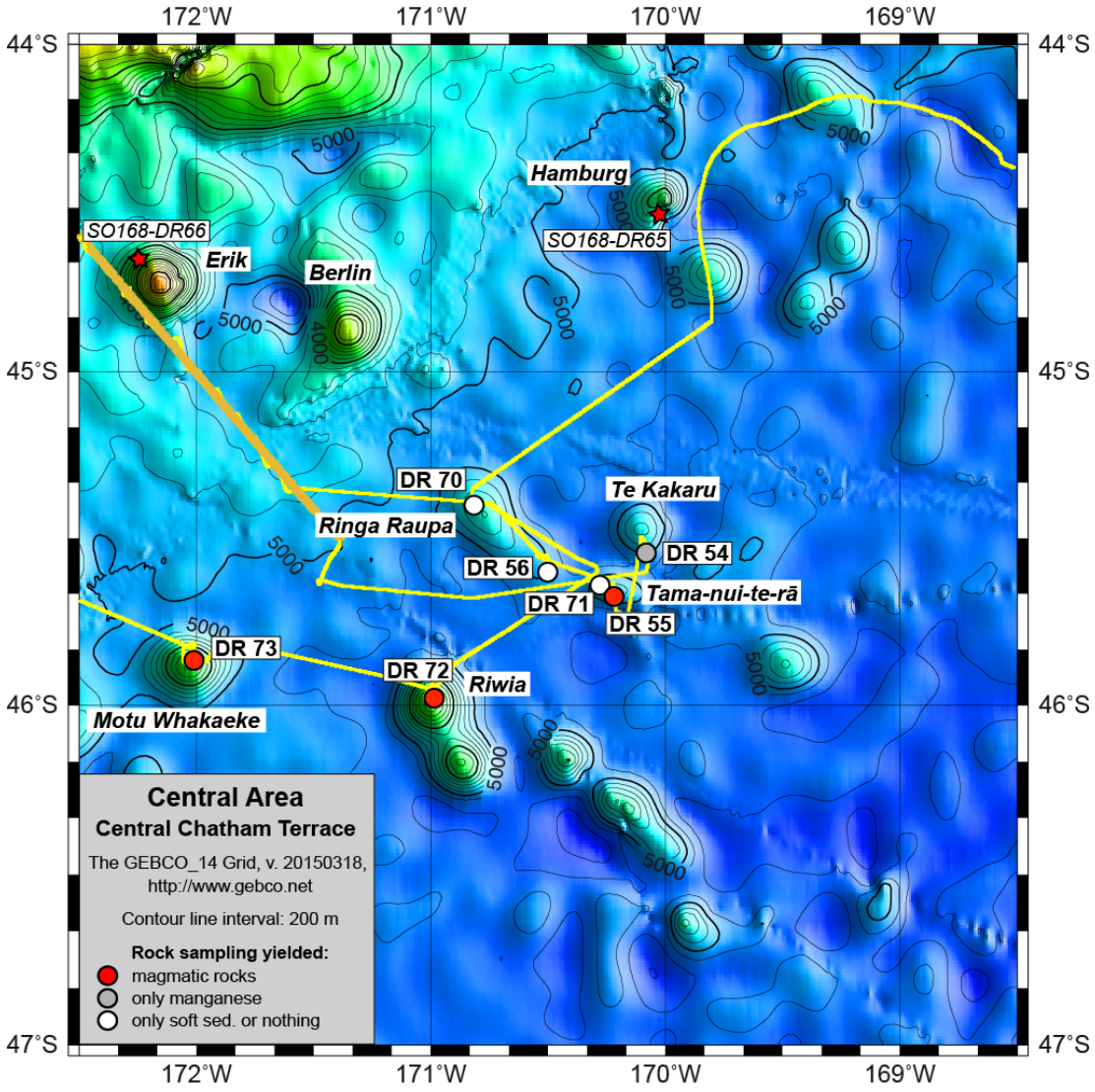


Fig. 6.7.15. Overview map showing the seamount group between c. 169°00´W and 172°30´W on the abyssal plain south of the Chatham Terrace as well as some seamounts (guyots) to the north, which have been investigated by cruise SO168 (bathymetry based on "The GEBCO_2014 Grid, version 20150318", http://www.gebco.net). Dots mark SO246 dredge stations, and yellow lines the SO246 ship´s track. Seismic profiles recorded on SO246 are marked by thick, darker lines. All seamount names in italic are informal working names assigned by cruise participants.

A few miles southwest of Te Kakaru, the predicted bathymetry exhibits a small, indistinct feature which turned out to be a large, c. 2400 m high seamount (Fig. 6.7.17; named Tama-nui-te-rā by the cruise participants). Remarkably, Tama-nui-te-rā has a WNW-ESE-striking, nearly rectangular base, measuring c. 19 x 15 km in 5250 m water depth. This basal structure passes at ~4000 m b.s.l. into a circular, flat-topped edifice. The plateau-like top has a diameter of 4.5 km and shows a rough surface with curved ridges, cones and dome-like structures, indicting that it is not an erosional plateau but has been formed by volcanic and syn-volcanic processes. The volcanic nature of at least parts of Tama-nui-te-rā is also indicated by volcanic ridges and satellite cones emanating up to 15 km from the SE-, NE-, and NW-corners of the rectangular base. It is, however, difficult to imagine how the rectangular base of Tama-nui-te-rā could be formed by volcanic processes. Therefore, we speculated that Tama-nui-te-rā is a volcanically overprinted continental bloc and attempted to verify this hypotheses by dredging.

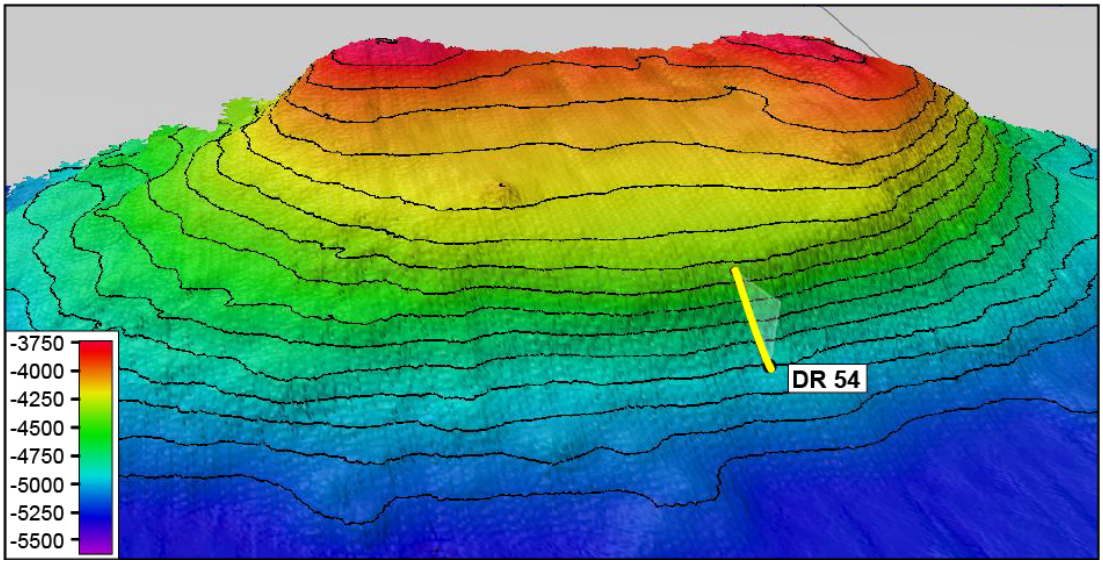


Fig. 6.7.16. 3D-perspective map of Te Kakaru seamount with dredge track DR54 (view from S to N). Exaggeration, contours, and data sources are as in Fig. 6.7.2.

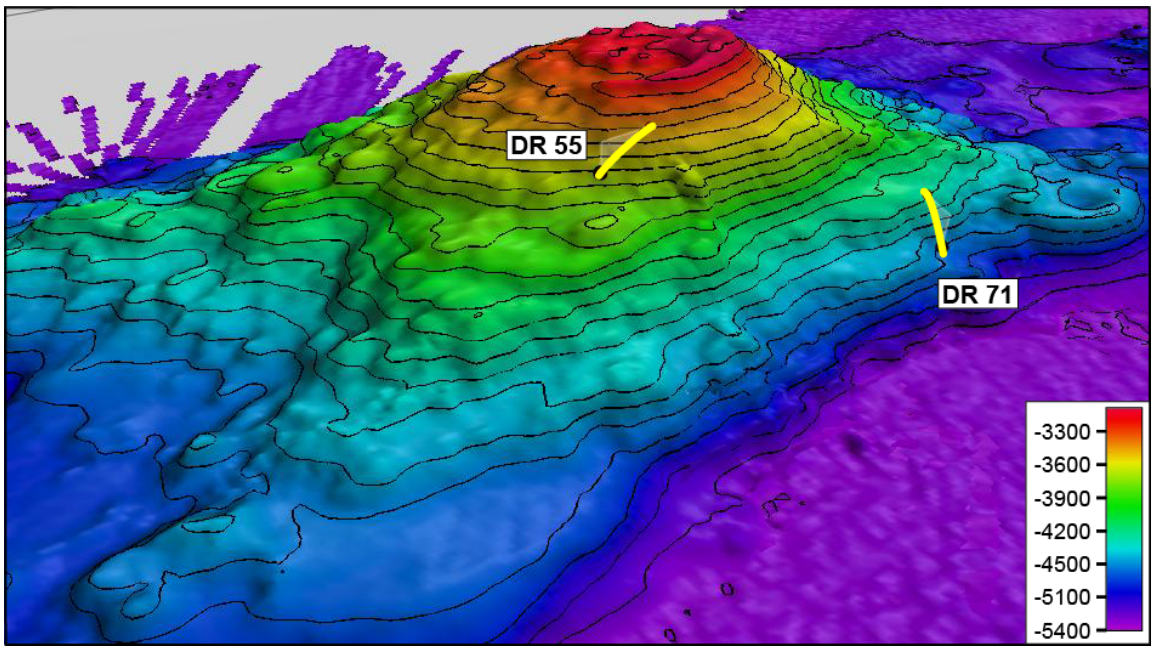


Fig. 6.7.17. 3D-perspective map of Tama-nui-te-rā seamount with dredge tracks DR54 and DR71 (view from NE to SW). Note the almost rectangular base of this structure which passes into a circular top. Exaggeration, contours, and data sources as in Fig. 6.7.2.

Dredge haul DR55 was carried out between 3550 m and 3280 m b.s.l. at the northwestern flank of the upper, circular portion of Tama-nui-te-rā (Fig. 6.7.17). The dredge recovered pillow lava and volcaniclastic rocks, confirming that the upper part of Tama-nui-te-rā is volcanic in origin. The pillow lava is relatively fresh to moderately altered, has a fine-grained, vesicular (10-30%) matrix with mm- to cm-sized, partly filled vesicles, and occurs as an aphyric and feldspar-phyric (20%, up to 5 mm) varieties. The feldspar phenocrysts appear to be fresh in places and may be suitable for age dating. The volcaniclastic rocks consist of cm-sized heavily altered lava clasts and mm-sized palagonized glass fragments in a whitish fine-grained matrix. Due to weather and scheduling constraints, RV *Sonne* headed towards another structure after this dredge. In a later stage of the cruise, however,

we returned to Tama-nui-te-rā and attempted to sample the rectangular base in order to decipher its nature (volcanic or continental?). Dredge DR71 was conducted at the lower northern slope of Tama-nui-te-rā between 4680 and 4380 m b.s.l. (Fig. 6.7.17) but unfortunately returned only a few tiny, rounded rock fragments of unclear origin so that the nature of this uncommon basal structure remains unclear.

Fig. 6.7.18. Pillow dredged at Tama-nui-te-rā (left), consisting of highly feldspar-phyric, relatively fresh lava (right).

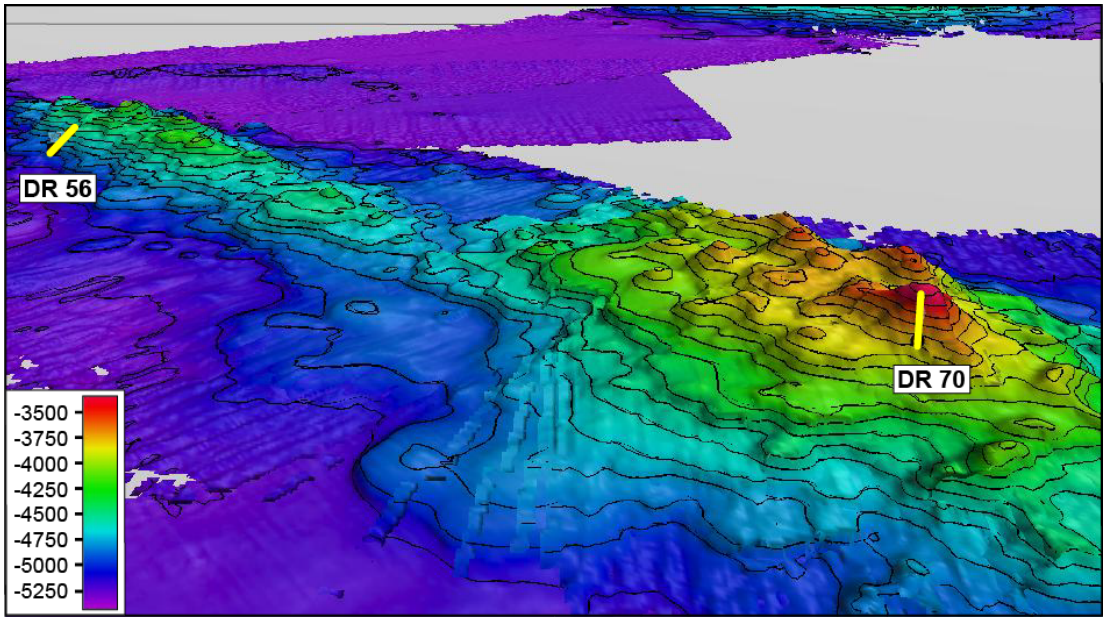


Fig. 6.7.19. 3D-perspective map of Ringa Raupa seamount with dredge track DR70 and the volcanic ridge emanating from its base in SE-direction with dredge track DR56 (view from N to S). Exaggeration, contours, and data sources are as in Fig. 6.7.2.

Northwest of Tama-nui-te-rā, multi-beam mapping revealed a completely different volcanic complex. Ringa Raupa seamount has a oval-shaped, NW-SE-trending base, which measures some 24 x 13 km and elevates 1000 - 1300 m from the surrounding abyssal plain at ~5100 m b.s.l. Notably, numerous volcanic cones are scattered on the

relatively flat top and the flanks of the basal structure (Fig. 6.7.19). The diameter of the circular cones are up to 2.5 km and their height is up to 600 m. A dredge attempt (DR70) has been made along the northeastern flank of the largest cone between 3600 and 3250 m b.s.l. (Fig. 6.7.19) but the dredge returned empty. A ~29 km long ridge, which appears to be formed of merged volcanic cones, emanating from the southeastern base of Ringa Raupa in SE-direction (Fig. 6.7.19). The ridge represents most likely a fracture zone. Its highest peaks extend up to 1000 m above the abyssal plain. Dredge haul DR56 was located along a small "nose" at the southeastern base of the ridge from 4730 to 4470 m b.s.l. (Fig. 6.7.19) but also failed to return rocks.

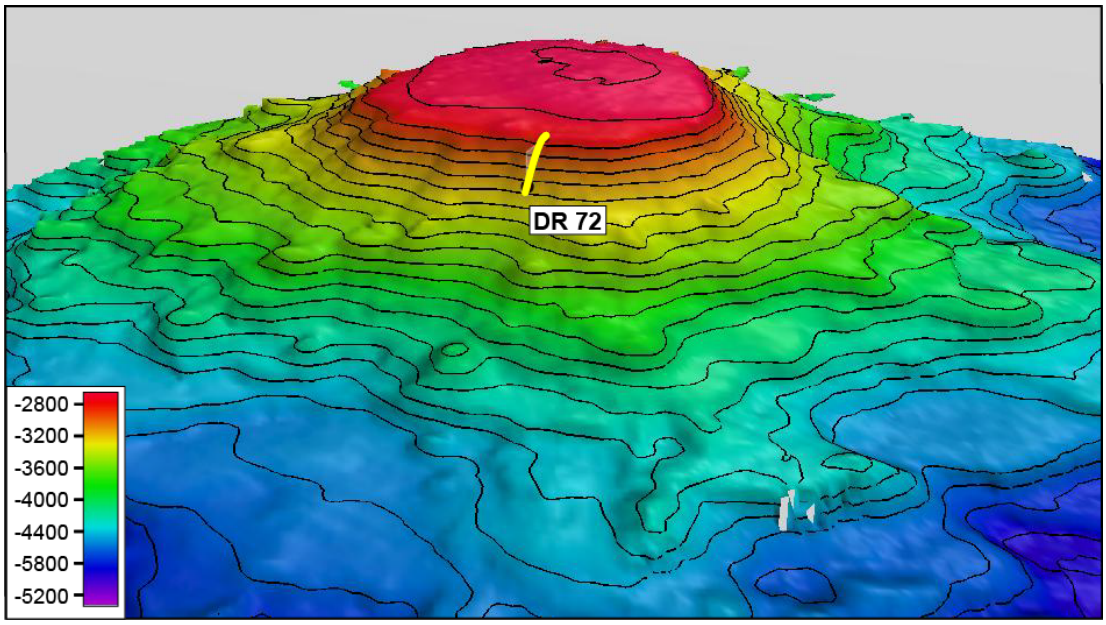


Fig. 6.7.20. 3D-perspective map of Riwia guyot with dredge track DR72 (view from N to S). Exaggeration, contours, and data sources are as in Fig. 6.7.2.

Fig. 6.7.21. Relatively fresh, dense pillow lava dredged at Riwia guyot.

Fig. 6.7.22. Pillow breccia dredged at Motu Whakaeke volcano.

Riwia seamount is located ~32 nm southeast of Ringa Raupa. Riwia was only partly surveyed but appear to be a classic, symmetrical guyot with abyssal plain at 5150 m b.s.l., a domed top plateau at c. 2750 - 2580 m b.s.l. and a basal diameter of ~25 km (Fig. 6.7.20). Dredge track DR72 was located at the upper northern slope of Riwia between 2970 m b.s.l. and the plateau edge at 2770 m b.s.l. (Fig. 6.7.20). The dredge recovered fresh to moderately altered pillow fragments, volcaniclastic rocks, and Mn-crusts and nodules. The slightly porphyric lava contains up to 10%, mm-sized feldspar phenocrysts in a dense to slightly vesicular (10%), fine-grained matrix (Fig. 6.7.21). Most of the sub-mm-sized vesicles are unfilled and the feldspar appears to be fresh in places.

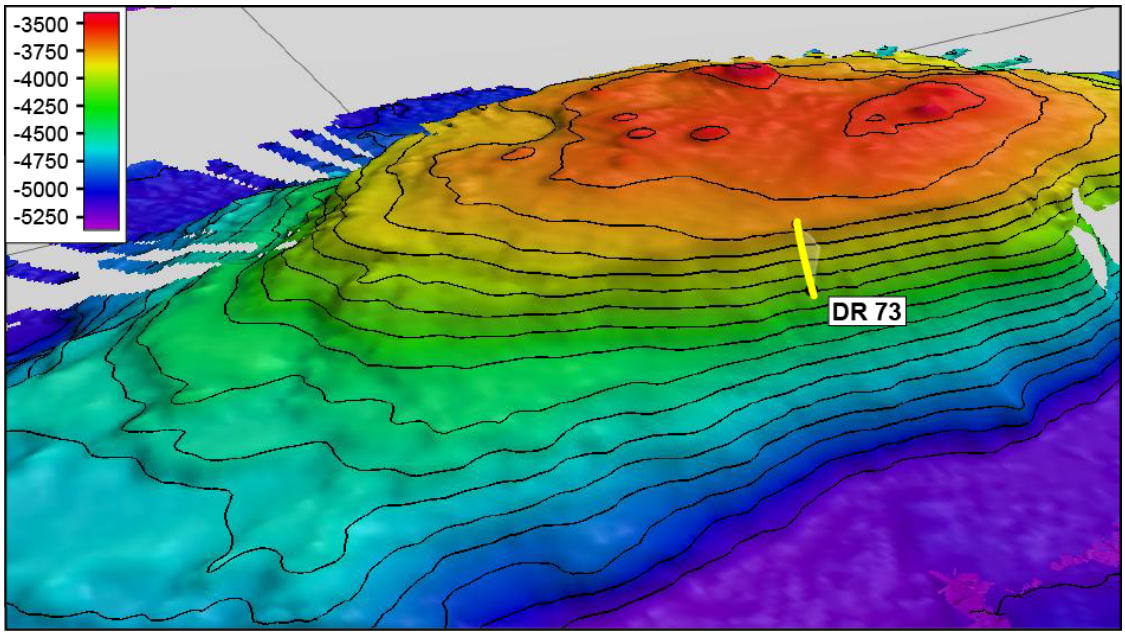


Fig. 6.7.23. 3D-perspective of Motu Whakaeke seamount with dredge track DR73 (view from NE to SW). Exaggeration, contours, and data sources are as in Fig. 6.7.2.

Approximately 45 nm farther west, RV *Sonne* surveyed an oval-shaped, E-W striking seamount, named Motu Whakaeke by the cruise participants (Fig. 6.7.23). Motu Whakaeke measures 25 x 17 km at its base in c. 5130 m water depth, elevates c. 1700 m above the abyssal plain, is extremely steep-sided, and has a domed plateau-like top. The top plateau, however, differs from those of the classic guyots in that area (e.g., Riwia guyot) by its uneven surface, which is characterized by shallow, up to 150 m high circular or oval elevations with gentle slopes and small depressions in between (Fig. 6.7.23). Therefore it is difficult to say if this plateau has been formed by erosion at the water surface or by other processes in a submarine environment. Dredge DR73 has been conducted at the upper northern flank of Motu Whakaeke between 3940 and 3620 m b.s.l. The dredge haul yielded fresh to moderately altered pillow fragments, volcaniclastica, and manganese crusts. The lava is porphyric with up to 20% fresh to slightly altered, mm-sized feldspars in a fine-grained, homogeneous matrix. The vesicularity of these rocks is up to 20%, the mm-sized, unfilled vesicles are partly arranged in layers parallel to the rock surface. Some pillow fragments show palagonized glassy rims. The volcaniclastic rocks are pillow breccias consisting of cm-sized clasts of the pillow lava described above, sheared glassy pillow rims, and mm-sized glassy lapilli in an altered, yellowish ash matrix (Fig. 6.7.22). Spots of fresh glass may be preserved in this breccia. Material similar to the yellowish matrix of the breccia was attached to several of the pillow fragments out of this dredge. Therefore we presume that DR73 sampled a top breccia of pillow complex.

6.7.2.4. Fracture zones and abyssal plain southeast of Chatham Rise

Originally it was planned to map and sample fracture zones (e.g. Udintsev Fracture Zone) and seamounts in the area to the southeast of the eastern tip of Chatham Rise. Upon arrival in that region, however, the weather conditions hindered us in carrying out any investigations and the weather-forecast predicted similar conditions for the next days. In order to be able to finish our mapping and sampling program in the area of the Chatham Terrace we decided to cancel the studies of the fracture zones and adjacent structures and headed westward.

6.7.2.5. Te Pū Wharehuna guyot at the central southern base of Chatham Rise

At the end of the cruise we got the opportunity to sample one more seamount as seismic profiling proceeded faster than expected. Te Pū Wharehuna is located at c. 45°35´S and 177°35´W off the base of the central portion of the Chatham Rise and represents the westernmost seamount of the seamount province south of the Chatham Rise. Multi-beam mapping revealed a classic steep-sided, sub-circular guyot measuring ~12.5 km at its base (Fig. 7.6.24). Like many other guyots at the southern Chatham Rise margin, it is located directly on the transition between the lower slope of the rise and the abyssal plain. Its edifice rises from 4400 m b.s.l (southern base) and 4150 m b.s.l. (northern base), respectively, to a top plateau at 2950 - 2830 m b.s.l. Dredge haul DR81 was carried out between 3680 m and 3220 m b.s.l. at the lower northern flank of Te Pū Wharehuna. The dredge recovered lots of dm-sized pillow fragments and Mn-encrusted pillow breccias. The rocks appear relatively fresh but have not been processed on board since the petrological laboratory was cleared before this dredge haul due to time constraints.

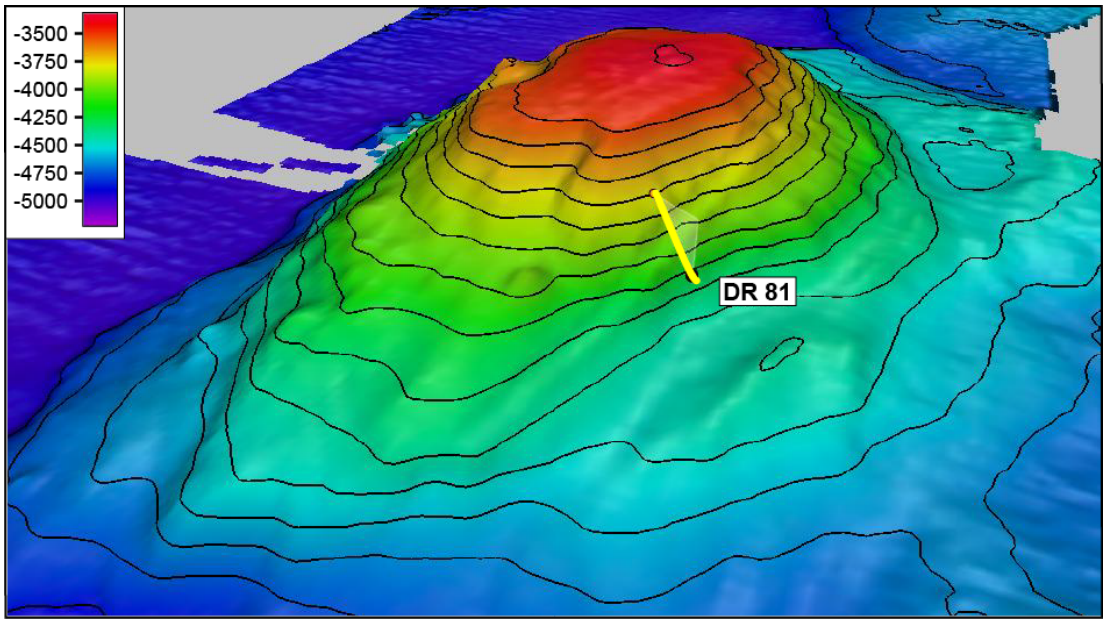


Fig. 6.7.24. 3D-perspective map of Te Pū Wharehuna guyot with dredge track DR81 (view from NE to SW). Te Pū Wharehuna is situated on the transition between the lower slope of the Chatham Rise (right) and the abyssal plain (left). Exaggeration, contours, and data sources are as in Fig. 6.7.2.

6.7.2.6. Rock sampling summary

RV *Sonne* cruise SO246 has achieved the major goal of its dredge program, i.e. a representative hard rock sampling of the seamount province south of the Chatham Rise. Altogether 14 seamounts have been investigated by SO246, and 13 of them were

successfully sampled. Including multiple dredge stations at selected seamounts, 21 dredges were carried out in only 7 working days in an average water depth of ~3800 m. Twelve of these dredges recovered lava fragments, nine volcaniclastics, and 12 Mn-Fe oxides. Combined with the samples yielded at six additional six seamounts that area on cruise SO168, our sample set represents by far the most detailed marine sampling of this seamount province to date. Aphyric and feldspar-bearing pillow lavas dominate among the dredged rocks, but various types of volcaniclastic rocks are also very common, some of them show textures or structures which may point to subaerial or shallow water volcanic activity and/or deposition. Plutonic rocks, sub-volcanic intrusiva and sedimentary rocks have not been discovered on SO246. We note, that dredging was in particular successful at the upper portions or slopes of large volcanoes. By contrast, most attempts to sample the base of the volcanoes and thus the shield phase, which represents the initial phase of activity, failed probably due to thick manganese crusts or sediment cover. The overall degree of alteration of the recovered rocks varies from heavily altered to surprisingly fresh, even fresh glass rims and glassy lapilli may be preserved in a few samples. Although alteration is a well-known problem for geochemical analysis and dating of magmatic rocks due to their extended exposure in a submarine environment over several tens of millions of years, we are confident that SO246 yielded a comprehensive set of samples being suitable for shore-based analyses including advanced methods like Sr-Nd-Pb-Hf isotope analyses and Ar/Ar dating.

Multi-beam mapping revealed a surprisingly broad variety of volcanic edifices within the working area. Some preliminary conclusions can be drawn from the new maps and 3D-perspectives. Several seamounts consists of different morphological units such as a broad, relatively flat basal structure and a circular, steep-sided and flat-topped volcano on top of the basal structure (e.g. Papamahau, Tapuwae). Those volcanic complexes are most likely formed by at least two phases of magmatic activity.

The majority of the guyots at the southern Chatham Rise margin sit exactly on the transition zone between the lower slope of the rise and the adjacent abyssal plain, suggesting that this suture is a zone of weakness, which allowed magma to rise to the surface or that they have formed in a very early stage of rifting. The latter would be consistent the 82 Ma age of Kakapo Seamount (sampled on cruise SO168, Hoernle et al., 2003). Volcanic ridges and cones are visible on the flanks of most surveyed guyots at the Chatham rise margin, but none above the flat top, so it is not known if these cones represent pre- or post erosional eruptions. With one exception, the margins of the erosion platforms and the base of the guyots in that area are located in relatively uniform water depths of c. 2600 - 2900 m below sea level (b.s.l.) and 4100 - 4500 m b.s.l., respectively, indicating similar ages and a similar subsidence history of these structures. Only Toitū-ā-Tangaroa guyot exhibits a top-plateau at 2200 - 2000 m b.s.l. and therefore may be less subsided and/or somewhat younger as the adjacent guyots.

Many flat-topped volcanoes were mapped further south on the Chatham Terrace and on the abyssal plain south of the terrace. However, in some cases the top plateaus show a rough surface with domes, depressions, and curved ridges, indicating they were probably not formed by erosion at sea level but by constructive and destructive volcanic and syn-volcanic processes. Six of the mapped volcanoes in that area are, however, distinct classic guyots. The two northernmost of them exhibit plateau margins in 2400 m b.s.l., which may suggest that they are younger than the guyots at the Chatham rise margin. The plateau edges of three guyots located further south are in ~2800 - 3000 m b.s.l. and of one in 3800 m b.s.l. It appears that the depth of the erosional platforms and of the base of the volcanoes increases systematically toward south, which is consistent with greater subsidence of the oceanic crust in the south. Interestingly, the depth of the top plateau margins of the neighboring Tapuwae and Kurupounamu guyots, located only 16 nm from each other, differ by ~1000 m (~2900 m

and ~3900 m b.s.l., respectively). This observation suggests different ages for these volcanoes and/or that this area has been affected by major tectonic events after erosion of the volcanoes. Two of the southern guyots show smooth, cone-like feature features on their erosional plateaus which could represent post-erosional volcanic activity.

Two directions dominate among the oval or elongated volcanic structures in the working area. The large, oval-shaped volcanic complexes on the Chatham Terrace (e.g. Tapuwae, Te Honu Houkura) extend from east to west, whereas most of the volcanic chains and ridges emanating from larger volcanoes as well as some of the medium-sized oval volcanic edifices strike in NW-SE direction. We presume that the chains and ridges are located on fractures zones of the ocean crust.

Taken together, morphological observations point to a complex, multi-stage tectonic and magmatic history of the area south of the Chatham Rise. However, more detailed studies of the multi-beam data and integration of the geochemical and age data with the morphological observations are required to verify these hypotheses.

6.7.3 Biological sub-project

Most biological samples were collected by the geological chain-bag dredge. The collected boulders and rocks were carefully checked for benthic invertebrates. Additionally, we were able to collect some samples at two OBS-stations, where the OBS stayed in the water for more than 48 hours, and were used as hard substrate from different animals.

The collected animals were directly fixed in 100% pure ethanol, 4% formaldehyde or in 4% Paraformaldehyde. The specimens are voucher specimens for the Museum of Natural History in Berlin and can be used for morphological, histological and immunohistochemical investigations. The samples fixed in ethanol can be also used for molecular research.

The samples of the chain-bag dredge lead to the assumption that the biodiversity in this region is low. Half of the dredges contained biological material; all of the collected species were small in size and found in low number. This might be an indication that the deep waters south of the Chatham Rise are sparsely populated by benthic invertebrates, which is in contrast to the high biodiversity on the Chatham Rise, which has been revealed by previous cruises (e.g. SO168). One reason for the low biodiversity on the sampled rocks might be the great depth of most dredge stations.

At two stations close to the Chatham Rise, it was possible to find brachiopods, which will be used for molecular investigations. Beside the fixation in ethanol, different species have been fixed in paraformaldehyde to investigate them by immunohistochemistry. That method can for example be used to investigate the potential abundance of light-sensitive proteins in deep-sea organisms.

6.8 Marine mammal observation

Gareth Duguid[1], Krista Rankmore[1], Richard Price[1], Mary-Jane Waru[1], Jessica Riggins[1]

[1]Gardline Ltd

6.8.1 Introduction

Sound is conducted through water approximately 4.5 times faster than through air and is the most important sense for many marine organisms. This is especially true for marine mammals, which use sound to communicate, navigate, forage and for predator avoidance (Richardson et al., 1995). The functional frequency range used by marine mammals varies between 7 Hz and 180 kHz, with the large baleen whales using the

lower frequencies while smaller toothed whales use higher frequencies (Southall et al., 2007)

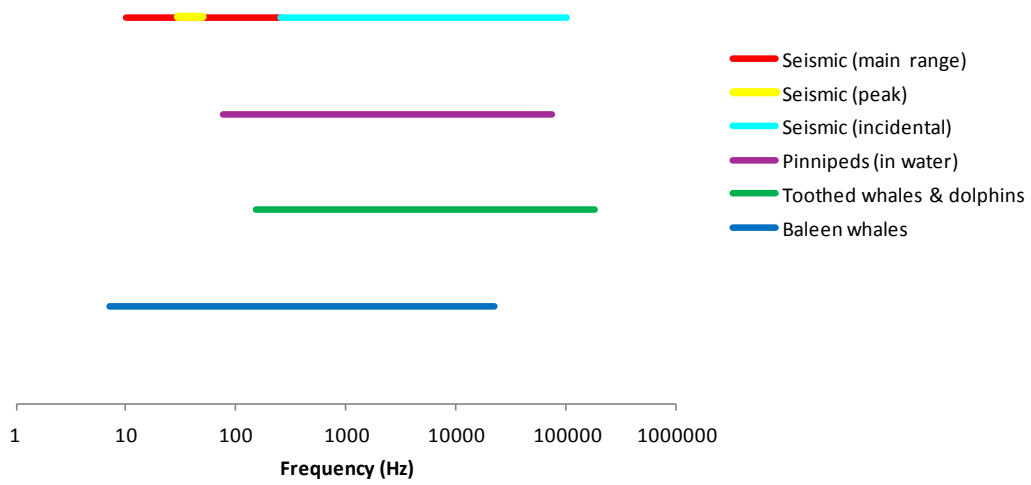


Fig. 6.8.1. Auditory frequencies used by marine mammals and the main frequency range of seismic activity (based on Gotz et al., 2009, and Southall et al., 2007).

The *2013 Code of Conduct for Minimising Acoustic Disturbance to Marine Mammals from Seismic Survey Operations* (hereafter referred to as the Code) was developed by the New Zealand Department of Conservation (DOC) under the mandate of Section 3A of the Marine Mammals Protection Act (MMPA) 1978. The Code came into effect on 29 November 2013 and applies to New Zealand territorial waters, exclusive economic zone (EEZ) and continental waters (beyond the outer limits of the EEZ but over the continental shelf). The current survey was conducted using the RV *Sonne*, and as a foreign state vessel, it was exempt from the MMPA. Despite the exemptions in place, AWI with GNS Science's assistance wished to voluntarily adopt provisions of the Code in order to protect marine mammals in the survey area.

A key part of the planning process for seismic surveys is for the operator to determine the lowest practicable power levels of the acoustic source and the preparation of a Marine Mammal Impact Assessment (MMIA). This process leads to the development of an appropriate marine mammal mitigation plan (MMMP) and the definition of the operational area, outside of which the acoustic source will not be activated.

The objective of the Marine Mammal Observation (MMO) team onboard was to ensure the Code and MMMP was followed as much as practically possible, recording any marine mammal sightings or acoustic detections, and to ensure seismic operations were shutdown or delayed in the presence of certain species of concern.

6.8.2 Methods

During the survey, two qualified MMO's carried out dedicated watches for marine mammals during daylight hours. At least one MMO was on watch during all daylight hours, and two MMO's were on watch during vessel transits above 12 knots. Watches were carried out from the observation room and outdoor wings or from the bridge, 20 m and 18.4 m above sea level, respectively. The primary observation technique used to detect marine mammals was to scan the visible area of sea using the naked eye, and scanning areas of interest with rangefinder (reticule) or regular binoculars. This technique gave both a wide field of view and the ability to have a sufficient range of 5-

10 km in ideal conditions. MMO's also had digital SLR cameras with 280-300 mm zoom lenses to take photographs that can assist species identification. MMOs were provided with equipment including a GPS, sextant, reticule binoculars, compass, range finder stick and angle boards in order to determine distances, bearings and plot the position of marine mammals throughout the duration of sightings.

Acoustic monitoring for whales and dolphins was performed by a Passive Acoustic Monitoring System (PAM) operator at all times, while the acoustic source was in the water, during daylight and the hours of darkness when conditions allowed for the deployment of the hydrophone array. During a detection, information on the vessels position, depth, course and acoustic activity was recorded. In addition, for each marine mammal sighted; the species, position, distance and bearing to the vessel and source were also recorded where possible. The PAM system was comprised of a four-element towed hydrophone array connected to a data processing system, enabling the acquired sound to be inspected both aurally and visually. The hydrophones were connected to dry-end hardware, which digitised the analogue signal allowing it to then be read by a computer. The system utilised one medium frequency and three high frequency hydrophones in order to cover the frequency range of vocalising marine mammals from 5 Hz to 180 kHz. The signal received by the hydrophones was then monitored in real-time by the dedicated software PAMGuard, which through the use of click detectors, whistles and moan detectors, and filters allows the automatic detection of the presence of marine mammal to assist the operator.

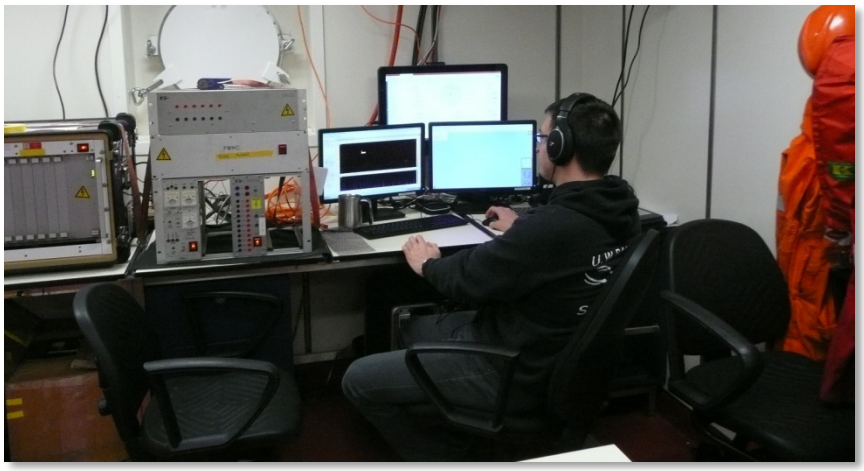


Fig. 6.8.2. PAM system operator at work in the seismic lab.

6.8.3 Effort and sightings

Between 1st February and 21st March 2016, a total of 678 hours and 19 minutes of dedicated marine mammal watches were carried out by the MMOs. In addition, a total of 338 hours and 5 minutes of dedicated marine mammal acoustic monitoring was carried out by the PAM system operators. Throughout the 20-day seismic survey a total of 22 hours and 40 minutes of pre-start visual watches was conducted by the MMOs, and 24 hours and 5 minutes of pre-start acoustic monitoring was conducted by the PAM system operators. Full pre-start visual monitoring was conducted prior to all soft starts and tests. Full pre-start acoustic monitoring was conducted immediately preceding all soft starts and tests.

During the survey, there were no delays to the activation of the acoustic source due to marine mammal encounters. However, there were three shutdowns of the acoustic source due to marine mammal encounters, and all of these shutdowns were for groups of pilot whales, one of which was a mixed species group with bottlenose dolphins. Further details of these encounters can be found below in Tab. 6.8.1.

There were a total of 13 soft starts during the survey; two of which were during good sightings conditions, six during poor conditions and five during hours of darkness. There were 11 soft starts that occurred were between 20 and 40 minutes in duration, and two did not comply with the Code. One soft start was short, as it was only 19 minutes long. Another soft start was too long due to airgun technical problems.

There were four other non-compliances in regard to the Code during the survey. One was due to the PAM system array being damaged and therefore recovered/swapped for a new cable, but seismic operations were allowed to continue even though it was dark. Three non-compliances were for starting operations in darkness in a new location without following the correct pre-start monitoring requirements.

Throughout the duration of the survey, there were a total of 35 On-Survey sightings and 11 Off-Survey sightings of marine mammals. In total there were 22 sightings of Species of Concern comprising of bottlenose dolphin, false killer whale, killer whale, long-finned pilot whale, sperm whale and unidentifiable large whales (Figs. 6.8.3 and 6.8.4). Of the marine mammal acoustic detections, there were a total of seven On-Survey detections and no Off-Survey detections. These detections included three identified species; long-finned pilot whales, sperm whales and bottlenose dolphins (Fig. 6.8.5).

ON SURVEY							
Species	SoC	Date	No. of animals (no. of calves)	Latitude	Longitude	ID certainty	Mitigation action
Bottlenose dolphin *Tursiops truncatus*	Yes	09/02/16	20 (0)	45° 12.44' S	174° 57.00' W	Certain	Shutdown
Common dolphin *Delphiuis delphis*	No	12/02/16	5 (0)	43° 12.11' S	175° 49.82' W	Possible	None
		15/03/16	10 (0)	43° 24.04' S	178° 01.42' W	Certain	None
		15/03/16	5 (0)	43° 29.66' S	178° 15.33' W	Certain	None
		15/03/16	8 (0)	43° 52.71' S	178° 19.89' W	Certain	None
		15/03/16	8 (0)	44° 42.73' S	178° 17.62' W	Certain	None
		17/03/16	10 (0)	43° 14.40' S	178° 21.46' W	Certain	None
False killer whale *Psuedorca crassidens*	Yes	06/02/16	6 (0)	46° 26.54' S	174° 03.74' W	Certain	None
Killer whale *Orcinus orca*	Yes	12/02/16	6 (2)	42° 58.92' S	175° 54.17' W	Certain	None
Long-finned pilot whale *Globicephala melas*	Yes	03/02/16	35 (0)	44° 53.82' S	177° 28.03' W	Certain	None
		09/02/16	80 (0)	45° 04.66' S	174° 57.83' W	Certain	Shutdown
		18/02/16	13 (2)	45° 58.27' S	173° 52.58' W	Certain	None
		05/03/16	12 (0)	42° 02.20' S	173° 03.09' W	Certain	None
		06/03/16	25 (4)	42° 58.63' S	168° 10.41' W	Certain	None
		16/03/16	10 (0)	44° 42.73' S	178° 12.75' W	Certain	Shutdown
New Zealand fur seal *Arctocephalus forsteri*	No	08/02/16	1 (0)	44° 23.97 'S	175° 21.01' W	Certain	None
		09/02/16	1 (0)	45° 12.44' S	174° 57.00' W	Certain	None
		11/02/16	2 (0)	45° 00.70' S	175° 05.70' W	Certain	None
		11/02/16	1 (0)	44° 47.59' S	175° 11.24' W	Certain	None
		11/02/16	1 (0)	44° 34.66' S	175° 16.60' W	Certain	None
		11/02/16	1 (0)	44° 03.90' S	175° 29.20' W	Certain	None
		12/02/16	1 (0)	43° 06.42' S	175° 49.81' W	Certain	None
		13/02/16	1 (0)	44° 43.24' S	175° 12.62' W	Certain	None

		14/02/16	3 (0)	45° 29.41' S	174° 59.42' W	Certain	None
Sperm whale *Physeter microcephalus*	Yes	04/02/16	2 (0)	45° 05.67' S	175° 25.99' W	Certain	None
		05/02/16	1 (0)	44° 38.13' S	175° 59.78' W	Certain	None
		07/02/16	1 (0)	43° 18.28' S	175° 47.67' W	Certain	None
		07/02/16	1 (0)	42° 56.94' S	175° 55.68' W	Probable	None
		07/02/16	1 (0)	42° 54.50' S	175° 56.56' W	Certain	None
		13/02/16	2 (0)	44° 54.88' S	175° 08.18' W	Certain	None
		20/02/16	1 (0)	42° 50.95' S	174° 32.85' W	Certain	None
		23/02/16	1 (0)	43° 45.10' S	175° 50.85' W	Certain	None
Whale spp.	Yes	03/02/16	1 (0)	44° 53.82' S	177° 28.03' W	Probable	None
		21/02/16	1 (0)	45° 19.71' S	171° 37.36' W	Certain	None
		07/03/16	1 (0)	44° 06.71' S	167° 22.85' W	Certain	None
OFF SURVEY							
Species	SoC	Date	No. of animals (No. of calves)	Longitude	Latitude	ID certainty	Mitigation Action
Common dolphin *Delphiuis delphis*	No	01/02/16	2 (0)	41° 30.36' S	174° 52.07' E	Certain	None
		01/02/16	20 (0)	41° 53.26' S	174° 56.42' E	Certain	None
		21/03/16	100 (0)	41° 29.83' S	174° 53.24' E	Certain	None
		21/03/16	15 (2)	41° 24.35' S	174° 49.97' E	Certain	None
		21/03/16	30 (2)	41° 23.45' S	174° 49.78' E	Certain	None
		21/03/16	35 (0)	41° 19.77' S	174° 51.07' E	Certain	None
Dusky dolphin	No	20/03/16	200 (0)	43° 55.77' S	179° 03.18' E	Certain	None
New Zealand fur seal	No	02/02/16	1 (0)	42° 51.67' S	177° 59.17' E	Certain	None
		02/02/16	1 (0)	43° 06.98' S	178° 32.86' E	Certain	None
Sperm whale *Physeter macrocephalus*	Yes	01/02/16	1 (0)	41° 27.94' S	174° 49.12' E	Certain	None
		20/03/16	1 (0)	43° 26.60' S	178° 12.58' E	Certain	None

Tab. 6.8.1. Summary of marine mammal sightings during SO246 (SoC = Species of Concern).

Fig. 6.8.3. Dusky dolphin sighted on 20th February 2016 at 09:10 h during Off-Survey watches during SO246.

Fig. 6.8.4. Long-finned pilot whales sighted on 18th February 2016 at 09:54 h during On-Survey watches during SO246.

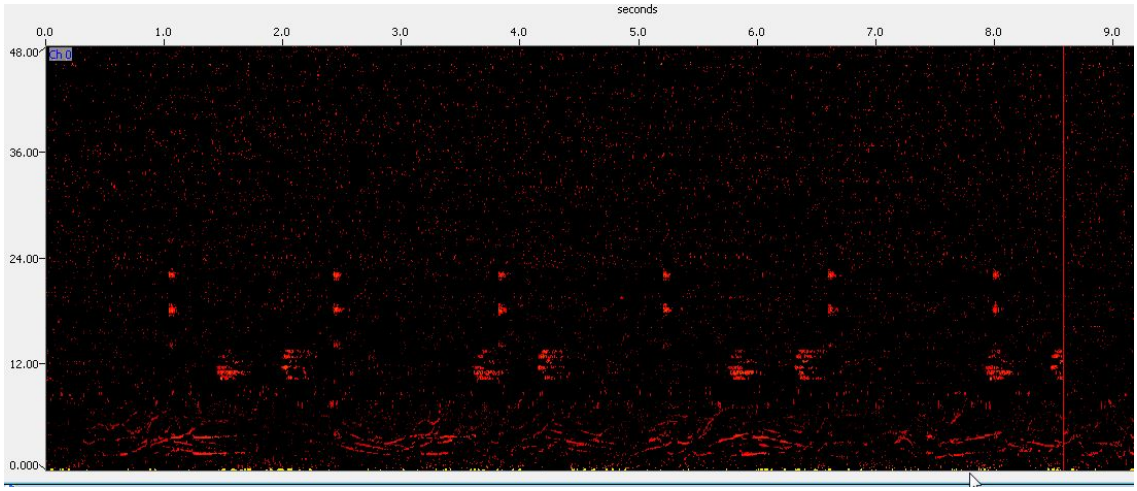


Fig. 6.8.5. Long-finned pilot whale whistles (2-6 kHz) detected on 16th February 2016 at 22:13 h during On-Survey watches during SO246 (frequencies in kHz on the Y-axis).

7. ACKNOWLEDGEMENTS

Our foremost, grateful acknowledgments go to the Master Oliver Meyer and his crew of the RV *Sonne*. Their high level of competence, expertise and their engagement in supporting the scientific teams to conduct their instrument and equipment operations contributed significantly to the success of this cruise. The pleasant work atmosphere on board made this cruise a wonderful experience for all participants.

We thank the New Zealand government for granting permission to perform our research in New Zealand's territorial waters. We gratefully acknowledge the support of the Germany Foreign Office and the German Embassy in Wellington.

Gratefully acknowledged are the help and support of a number of organisations and individuals to enable an unforeseen and yet smoothly operated person exchange at Chatham Islands on 23 Feb. The Maori community of Chatham Islands is being thanked in particular.

The project SO246–CHATHAM RISE is funded by the *Bundesministerium für Bildung und Forschung* (BMBF) through research grants 03G0246A to K. Gohl and 03G0246B to K. Hoernle and R. Werner. Additional funding was granted by GNS Science to support miscellaneous peripheral activities related to the SO246 cruise. We thank the *Leitstelle Deutscher Forschungsschiffe* (*German Control Center for German Research Vessels*) for operational support of this cruise and project. Also thanks to the AWI Logistics Department for their support of transport and travel logistics of the AWI groups. Greatly acknowledged is the contribution of 30 OBS/OBH systems by GEOMAR as well as the technical staff and OBS prototype contribution by the company KUM. 12 OBS/OBH systems were kindly supplied by the *German Instrument Pool for Amphibian Seismology* (DEPAS) based at the AWI.

The Chief Scientist would like to thank all scientific teams for their excellent work, great motivation and engagement, which were kept up at high spirit throughout the cruise.

8. REFERENCES

Carter, R.M., Carter, L. & Davy, B. (1994). Seismic stratigraphy of the Bounty Trough, south-west Pacific Ocean. *Marine Petrol. Geology*, 11, 79-93.

Davy, B. (2014). Rotation and offset of the Gondwana convergent margin in the New Zealand region following Cretaceous jamming of Hikurangi Plateau large igneous province subduction. *Tectonics*, 33, 1577-1595, doi:10.1002/2014TC003629.

Davy, B., Hoernle, K. & Werner, R. (2008). Hikurangi Plateau: Crustal structure, rifted formation, and Gondwana subduction history. *Geochemistry, Geophysics, Geosystems (G^3)*, 9, doi:10.1029/2007GC001855.

Eagles, G., Gohl, K. & Larter, R.D. (2004). High resolution animated tectonic reconstruction of the South Pacific and West Antarctic margin. *Geochemistry, Geophysics, Geosystems (G^3)*, v. 5, n. 7 doi:10.1029/2003GC000657.

Elderfield, H., Greaves, M., Barker, S., Hall, I.R., Tripati, A., Ferrati, P., Crowhurst, S., Booth, L. & Daunt, C. (2009). A record of bottom water temperature and seawater $\delta^{18}O$ for the Southern Ocean over the past 440 kyr based on Mg/Ca of benthic foraminimeral *Uvigerina* spp. *Quaternary Science Reviews*, doi:10.1016/j.quascirev.2009.07.013.

Gotz, T., Hastie, G., Hatch, L.T., Raustein, O., Southall, B.L. & Tasker, M. (2009). *Overview of the impacts of anthropogenic sound in the marine environment.* OSPAR Commission Biodiversity Series. Publication Number 441/2009. OSPAR Commission, UK.

Hoernle, K., Mortimer, N., Werner, R. & Hauff, F. (eds.) (2003). Fahrtbericht/Cruise Report SO-168 ZEALANDIA (Causes and effects of plume and rift-related cretaceous and cenocoic volcanism on Zealendia). *GEOMAR REPORT 133*, 127 pp.

Mortimer, N., Hoernle, K., Hauffm F., Palin, J.M., Dunlop, W.J., Werner, R. & Faure, K. (2006). New constraints on the age and evolution of the Wishbone Ridge, southwest Pacific Cretaceous microplates, and Zealandia-West Antarctica breakup. *Geology*, 34, 185-188.

Pfender, M. & Villinger, H. (2002). Miniaturized data loggers for deep sea sediment temperature gradient measurements. *Marine Geology*, 186, 557-570.

Richardson, W.J., Greene, Jr., C.R., Malme, C.I. & Thompson, D.H. (1995). *Marine Mammals and Noise*. Academic Press, San Diego, USA.

Smith, W.H.F. & Sandwell, D.T. (1997). Global seafloor topography from satellite altimetry and ship depth soundings. *Science*, 277, 1956-1962.

Southall, B.L., Bowles, A.E., Ellison, W.T., Finneran, J.J., Gentry, R.L., Greene, Jr., C.R., Kastak, D., Ketten, D.R., Miller, J.H., Nachtigall, P.E., Richardson, W.J., Thomas, J.A. & Tyack, P.L. (2007). Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations. *Aquatic Mammals*, 33 (7).

Wobbe, F., Gohl, K., Chambord, A., Sutherland, R. (2012). Structure and breakup history of the rifted margin of West Antarctica in relation to Cretaceous separation from Zealandia and Bellingshausen plate motion. *Geochemistry, Geophysics, Geosystems (G^3)*, 13, Q04W12, doi:10.1029/2011GC003742.

APPENDIX

Appendix A.1 OBS/OBH Deployment & Recovery Profile 20160100

Average station interval: 5.95 nm (6.0 km) Total profile length (between OBS-Station 01 and 40): 231.6 nm (429.0 km) Data quality: 1 = good, 2 = medium, 3 = low, 4 = no data
*no skew due to recorder crash

	Deployment				Recovery				Type	Rec.	Skew	Sen-	Gain level				Quality			
Stat	Latitude	Longitude	Depth	Date/Time	Latitude	Longitude	Depth	Date/Time				sors	C 1	C 2	C 3	C 4	C 1	C 2	C 3	C 4
No.	South	West	(m)	UTC	South	West	(m)	UTC		Type	(ms)		h	x	y	z	h	x	y	z
1	46°48.614’	174°18.795’	5037	06.02.16 / 00:01	46°48.446’	174°18.918’	5036	14.02.16 / 22:09	OBS (GEOMAR)	MBS	17	h,x,y, z	5	9	9	9	4	4	4	4
2	46°42.949’	174°21.397’	4951	06.02.16 / 00:47	46°42.924’	174°21.311’	4952	14.02.16 / 20:47	OBH (GEOMAR)	MBS	49	h	5	-	-	-	1	-	-	-
3	46°37.248’	174°23.926’	4728	06.02.16 / 01:29	46°37.086’	174°23.563’	4708	14.02.16 / 19:08	OBS (GEOMAR)	MBS	21	h,x,y, z	5	9	9	9	4	4	4	4
4	46°31.714’	174°26.434’	4637	06.02.16 / 02:12	46°31.763’	174°26.252’	4636	14.02.16 / 17:15	OBS (AWI)	MCS	30	h	4	-	-	-	1	-	-	-
5	46°25.978’	174°28.619’	4813	06.02.16 / 02:56	46°26.025’	174°28.619’	4773	14.02.16 / 16:25	OBS (GEOMAR)	MBS	-46	h,x,y, z,	5	9	9	9	1	2-3	3	2-3
6	46°20.264’	174°31.546’	4878	06.02.16 / 03:43	46°20.594’	174°30.828’	4886	14.02.16 / 14:59	OBH (GEOMAR)	MBS	-133	h	5	-	-	-	1	-	-	-
7	46°14.578’	174°34.003’	4840	06.02.16 / 04:28	46°14.716’	174°33.475’	4813	14.02.16 / 10:25	OBS (GEOMAR)	MBS	-*	h,x,y, z	5	9	9	9	4	4	4	4
8	46°08.937’	174°36.563’	4761	06.02.16 / 05:12	46°08.871’	174°35.811’	4773	14.02.16 / 08:58	OBS (AWI)	6D6	380	h,x,y, z	1	1	1	1	1	1-2	2	1-2
9	46°03.273’	174°38.977’	4598	06.02.16 / 05:55	46°03.294’	174°38.364’	4556	14.02.16 / 07:18	OBS (GEOMAR)	MBS	50	h,x,y, z	5	9	9	9	1	3	3	3
10	45°57.577’	174°41.492’	4409	06.02.16 / 06:35	45°57.830’	174°41.029’	4389	14.02.16 / 05:57	OBH (GEOMAR)	MBS	-27	h	5	-	-	-	1	-	-	-
11	45°51.841’	174°43.879’	4246	06.02.16 / 07:19	45°52.193’	174°43.107’	4258	14.02.16 / 04:32	OBS (GEOMAR)	MBS	12	h,x,y, z	5	9	9	9	1-2	3	3	3
12	45°46.143’	174°46.342’	4099	06.02.16 / 08:02	45°46.493’	174°45.870’	4079	14.02.16 / 03:09	OBS (AWI)	MCS	26	h	4	-	-	-	1	-	-	-
13	45°40.324’	174°48.683’	4271	06.02.16 / 08:43	45°40.736’	174°48.637’	4263	14.02.16 / 01:10	OBS (GEOMAR)	MBS	-461	h,x,y, z	5	9	9	9	1	2	2	2
14	45°34.746’	174°51.175’	4391	06.02.16 / 09:27	45°35.031’	174°51.201’	4316	13.02.16 / 23:51	OBS (AWI)	MCS	10	h	4	-	-	-	2	-	-	-
15	45°29.065’	174°53.637’	4183	06.02.16 / 10:12	45°29.224’	174°53.525’	4317	13.02.16 / 22:22	OBS (GEOMAR)	MBS	-327	h,x,y, z	5	9	9	9	1	2	2	2
16	45°23.475’	174°56.057’	3844	06.02.16 / 10:54	45°23.766’	174°56.236’	3868	13.02.16 / 18:05	OBH (GEOMAR)	MBS	-78	h	5	-	-	-	1	-	-	-
17	45°17.842’	174°58.513’	4056	06.02.16 / 11:36	45°17.970’	174°58.907’	4068	13.02.16 / 13:44	OBS (GEOMAR)	MBS	-109	h,x,y, z	5	9	9	9	1-2	2-3	2-3	2-3

	Deployment				Recovery				Type	Rec.	Skew	Sen-sors	Gain level				Quality			
Stat No.	Latitude South	Longitude West	Depth (m)	Date/Time UTC	Latitude South	Longitude West	Depth (m)	Date/Time UTC		Type	(ms)		C 1 h	C 2 x	C 3 y	C 4 z	C 1 h	C 2 x	C 3 y	C 4 z
18	45°12.147’	175°00.935’	4210	06.02.16 / 12:19	45°12.061’	175°01.558’	4211	13.02.16 / 12:24	OBS (AWI)	MCS	26	h	4	-	-	-	2-3	-	-	-
19	45°06.455’	175°03.204’	4054	06.02.16 / 13:01	45°06.439’	175°03.393’	4056	13.02.16 / 10:47	OBS (GEOMAR)	MBS	-97	h,x,y, z	5	9	9	9	2	3	3	3
20	45°00.775’	175°05.660’	4057	06.02.16 / 13:43	45°00.530’	175°05.714’	3249	13.02.16 / 09:35	OBS (AWI)	MCS	8	h,x,y, z	4	16	16	16	1	2-3	2	2-3
21	44°54.966’	175°07.908’	2765	06.02.16 / 14:28	44°54.887’	175°08.172’	2768	13.02.16 / 06:22	OBH (GEOMAR)	MBS	16	h	5	-	-	-	1-2	-	-	-
22	44°49.335’	175°10.586’	2340	06.02.16 / 15:09	44°49.227’	175°11.213’	2317	13.02.16 / 02:56	OBS (GEOMAR)	MBS	-238	h,x,y, z	5	9	9	9	4	4	4	4
23	44°43.594’	175°12.910’	1715	06.02.16 / 15:54	44°43.460’	175°12.810’	1685	13.02.16 / 01:42	OBS (AWI)	MCS	37	h	4	-	-	-	1	-	-	-
24	44°38.049’	175°15.258’	1336	06.02.16 / 16:37	44°38.117’	175°15.368’	1330	13.02.16 / 00:16	OBS (GEOMAR)	MBS	57	h,x,y, z	5	9	9	9	1-2	2-3	2-3	2-3
25	44°32.314’	175°17.700’	1044	06.02.16 / 17:21	44°32.430’	175°17.613’	1040	12.02.16 / 23:15	OBS (AWI)	MCS	-14	h	4	-	-	-	1-2	-	-	-
26	44°26.570’	175°19.946’	525	06.02.16 / 18:08	44°26.684’	175°19.891’	510	12.02.16 / 22:10	OBS (GEOMAR)	MBS	10	h,x,y, z	5	9	9	9	1	2-3	2-3	2-3
27	44°20.876’	175°22.351’	397	06.02.16 / 18:52	44°20.912’	175°22.425’	404	12.02.16 / 21:10	OBS (KUM prototype)	6D6	-180	h,x,y, z	1	1	1	1	1	2	2-3	2
28	44°15.194’	175°24.661’	412	06.02.16 / 19:41	44°15.091’	175°24.677’	407	12.02.16 / 20:00	OBS (GEOMAR)	MBS	-16	h,x,y, z	5	9	9	9	2-3	3	3	3
29	44°09.492’	175°26.961’	405	06.02.16 / 20:26	44°9.464’	175°26.979’	408	12.02.16 / 17:54	OBH (GEOMAR)	MBS	-9	h	5	-	-	-	2-3	-	-	-
30	44°03.761’	175°29.133’	391	06.02.16 / 21:06	44°04.294’	175°29.083’	425	12.02.16 / 16:06	OBS (GEOMAR)	MBS	20	h,x,y, z	5	9	9	9	1	2	2-3	2-3
31	43°58.155’	175°31.456’	315	06.02.16 / 21:50	43°58.366’	175°31.331’	336	12.02.16 / 15:00	OBS (AWI)	MCS	5	h,x,y, z	4	8	8	8	2	2-3	2-3	2-3
32	43°52.467’	175°33.790’	144	06.02.16 / 22:34	43°52.691’	175°33.560’	150	12.02.16 / 13:50	OBS (GEOMAR)	MBS	-154	h,x,y, z	5	9	9	9	2	3	3	3
33	43°46.712’	175°36.063’	327	06.02.16 / 23:12	43°46.814’	175°36.150’	322	12.02.16 / 12:40	OBH (GEOMAR)	MBS	18	h	5	-	-	-	2-3	-	-	-
34	43°41.090’	175°38.285’	356	07.02.16 / 00:01	43°40.814’	175°38.545’	353	12.02.16 / 11:18	OBS (GEOMAR)	MBS	-24	h,x,y, z	5	9	9	9	2	2-3	2-3	3
35	43°35.266’	175°40.709’	235	07.02.16 / 00:43	43°35.493’	175°40.379’	224	12.02.16 / 10:10	OBS (AWI)	MCS	11	h	4	-	-	-	3	-	-	-
36	43°29.565’	175°42.910’	443	07.02.16 / 01:25	43°29.397’	175°43.122’	443	12.02.16 / 08:03	OBS (GEOMAR)	MBS	1	h,x,y, z	5	9	9	9	2	3	3	3
37	43°23.983’	175°45.124’	461	07.02.16 / 02:01	43°23.945’	175°45.034’	465	12.02.16 / 07:00	OBS (AWI)	MCS	18	h	4	-	-	-	3	-	-	-

	Deployment				Recovery				Type	Rec.	Skew	Sen-sors	Gain level				Quality			
Stat No.	Latitude South	Longitude West	Depth (m)	Date/Time UTC	Latitude South	Longitude West	Depth (m)	Date/Time UTC		Type	(ms)		C 1 h	C 2 x	C 3 y	C 4 z	C 1 h	C 2 x	C 3 y	C 4 z
38	43°18.203’	175°47.470’	536	07.02.16 / 02:41	43°18.106’	175°47.537’	535	12.02.16 / 04:45	OBS (GEOMAR)	MBS	26	h,x,y,z	5	9	9	9	2	3	3	3
39	43°12.466’	175°49.791’	598	07.02.16 / 03:22	43°12.505’	175°49.787’	597	12.02.16 / 03:36	OBH (GEOMAR)	MBS	-37	h	5	-	-	-	2-3	-	-	-
40	43°06.728	175°52.132’	660	07.02.16 / 04:03	43°06.660’	175°52.030	647	12.02.16 / 02:24	OBS (GEOMAR)	MBS	-52	h,x,y,z	5	9	9	9	2-3	3	2-3	3

Appendix A.2 OBS/OBH Deployment & Recovery Profile 20160200

Average station interval: 5.95 nm (11.0 km) Total profile length (between OBS-Station 01 and 35): 202 nm (374.0 km) Data quality: 1 = good, 2 = medium, 3 = low, 4 = no data
*no skew due to recorder crash, **data will be later processed because of formatting issues

	Deployment				Recovery				Type	Rec.	Skew	Sen-sors	Gain level					Quality				
Stat No.	Latitude South	Longitude West	Depth (m)	Date/Time UTC	Latitude South	Longitude West	Depth (m)	Date/Time UTC		Type	(ms)		C 1 h	C 2 x	C 3 y	C 4 z	C5 h	C 1 h	C 2 x	C 3 y	C 4 z	C5 h
1	42°46.587’	174°33.516’	1540	19.02.2016 / 21:10	42°46.652’	174°33.285’	1558	01.03.2016 / 03:04	OBS (GEOMAR)	MBS	-35	h,x,y,z	5	9	9	9	-	1-2	1-2	2	1-2	-
2	42°51.058’	174°28.446’	1343	19.02.2016 / 22:03	42°51.082’	174°28.373’	1360	01.03.2016 / 01:53	OBS (GEOMAR)	MBS	-93	h,x,y,z	5	9	9	9	-	1	1-2	1-2	1-2	-
3	42°55.829’	174°23.475’	1263	19.02.2016 / 22:53	42°55.760’	174°23.485’	1268	01.03.2016 / 00:55	OBS (AWI)	MCS	+62	h	4	-	-	-	-	1	-	-	-	-
4	43°00.384’	174°18.383’	1166	19.02.2016 / 23:45	43°00.247’	174°18.451’	1175	01.03.2016 / 23:59	OBS (GEOMAR)	MBS	-65	h,x,y,z	5	9	9	9	-	2	2	2	2	-
5	43°04.981’	174°13.285’	1104	20.02.2016 / 00:37	43°04.865’	174°13.155’	1114	01.03.2016 / 22:57	OBS (GEOMAR)	Geolog	+0.1	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**
6	43°09.727’	174°08.214’	1057	20.02.2016 / 01:25	43°09.558’	174°08.333’	1064	01.03.2016 / 22:00	OBS (AWI)	6D6	-376	h,x,y,z	1	2	2	2	-	2	2	2	2	-
7	43°14.255’	174°02.943’	1078	20.02.2016 / 02:13	43°14.233’	174°03.063’	1084	01.03.2016 / 21:02	OBS (GEOMAR)	MBS	+43	h,x,y,z	5	9	9	9	-	1-2	2	2	2-3	-
8	43°18.794’	173°57.861	1113	20.02.2016 / 02:58	43°18.697’	173°58.118’	1114	01.03.2016 / 19:52	OBS (AWI)	MCS	+43	h	4	-	-	-	-	2	-	-	-	-
9	43°23.568’	173°52.742’	1293	20.02.2016 / 03:41	43°23.460’	173°52.659’	1321	01.03.2016 / 18:57	OBH (GEOMAR)	MBS	-18	h	5	-	-	-	-	1	-	-	-	-
10	43°28.027’	173°47.748’	1414	20.02.2016 / 04:20	43°28.087’	173°47.695’	1421	01.03.2016 / 16:19	OBS (GEOMAR)	MBS	+33	h,x,y,z	5	9	9	9	-	1	1	1-2	1-2	-
11	43°32.609’	173°42.551’	1519	20.02.2016 / 05:02	43°32.770’	173°42.672’	1524	01.03.2016 / 15:24	OBS (GEOMAR)	MBS	-107	h,x,y,z	5	9	9	9	-	2	2	2	2	-
12	43°37.359’	173°37.301’	1613	20.02.2016 / 05:43	43°37.509’	173°37.525’	1617	01.03.2016 / 14:24	OBS (AWI)	MCS	+16	h,x,y,z	4	16	16	16	-	1	1-2	1-2	2	-
13	43°41.960’	173°32.074’	1711	20.02.2016 / 06:22	43°42.119’	173°32.280’	1717	01.03.2016 / 13:23	OBS (GEOMAR)	MBS	-128	h,x,y,z	5	9	9	9	-	4	1-2	1-2	1-2	-
14	43°46.476’	173°27.012’	1794	20.02.2016 / 07:04	43°46.480’	173°27.799’	1795	01.03.2016 / 12:24	OBS (AWI)	MCS	-8	h	4	-	-	-	-	1-2	-	-	-	-
15	43°51.062’	173°21.711’	1878	20.02.2016 / 07:45	43°51.052’	173°22.008’	1881	01.03.2016 / 11:16	OBS (GEOMAR)	MBS	-*	h,x,y,z	5	9	9	9	-	1	1-2	1-2	1-2	-
16	43°55.571’	173°16.527’	1961	20.02.2016 / 08:26	43°55.551’	173°16.905’	1959	01.03.2016 / 10:10	OBH (GEOMAR)	MBS	-106	h	5	-	-	-	-	1-2	-	-	-	-
17	44°00.261’	173°11.317’	2049	20.02.2016 / 09:09	44°00.204’	173°11.759’	2048	01.03.2016 / 08:50	OBS (KUM prototype)	6D6	-334	h,x,y,z	1	1	1	1	-	1	1	1	1	-

	Deployment				Recovery				Type	Rec.	Skew	Sen-sors	Gain level					Quality				
Stat No.	Latitude South	Longitude West	Depth (m)	Date/Time UTC	Latitude South	Longitude West	Depth (m)	Date/Time UTC		Type	(ms)		C 1 h	C 2 x	C 3 y	C 4 z	C5 h	C 1 h	C 2 x	C 3 y	C 4 z	C5 h
18	44°04.794’	173°06.060’	2184	20.02.2016 / 09:50	44°04.734’	173°06.237’	2186	01.03.2016 / 07:28	OBS (GEOMAR)	Geolog	0	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**
19	44°09.288’	173°00.752’	2430	20.02.2016 / 10:30	44°09.191’	173°00.730’	2429	01.03.2016 / 05:55	OBS (AWI)	MCS	+46	h	4	-	-	-	-	2	-	-	-	-
20	44°13.950’	172°55.446’	2957	20.02.2016 / 11:13	44°13.858’	172°55.107’	2931	01.03.2016 / 04:58	OBS (GEOMAR)	MBS	-395	h,x,y,z	5	9	9	9	-	2	3	3	3	-
21	44°18.493’	172°50.069’	3709	20.02.2016 / 11:56	44°18.562’	172°50.008’	3714	01.03.2016 / 03:50	OBS (AWI)	MCS	+81	h	4	-	-	-	-	1	-	-	-	-
22	44°23.115’	172°44.750’	3961	20.02.2016 / 12:41	44°23.148’	172°44.222’	3988	01.03.2016 / 02:41	OBS (GEOMAR)	MBS	-14	h,x,y,z	5	9	9	9	-	1	2	2	2	-
23	44°27.709’	172°39.407’	4257	20.02.2016 / 13:24	44°27.718’	172°39.275’	4281	01.03.2016 / 01:24	OBS (GEOMAR)	MBS	+78	h,x,y,z	5	9	9	9	-	1	2-3	2-3	2	-
24	44°32.170’	172°34.190’	4493	20.02.2016 / 14:07	44°32.199’	172°34.124’	4502	01.03.2016 / 00:05	OBS (AWI)	MCS	-*	h	4	-	1-	-	-	1-2	-	-	-	-
25	44°36.731’	172°28.843’	4562	20.02.2016 / 14:51	44°36.869’	172°28.622’	4572	01.03.2016 / 22:33	OBS (GEOMAR)	MBS	-49	h,x,y,z	5	9	9	9	-	1-2	3	2-3	2-3	-
26	44°41.317’	172°23.443’	4593	20.02.2016 / 15:37	44°41.362’	172°23.500’	4612	01.03.2016 / 21:09	OBS (AWI)	MCS	-*	h	4	-	-	-	-	2	-	-	-	-
27	44°45.868’	172°18.071’	4550	20.02.2016 / 16:17	44°46.657’	172°17.646’	4565	01.03.2016 / 19:37	OBH (GEOMAR)	MBS	-34	h	5	-	-	-	-	1-2	-	-	-	-
28	44°50.407’	172°12.661’	4610	20.02.2016 / 16:58	44°50.488’	172°12.911’	4608	01.03.2016 / 15:01	OBS (GEOMAR)	MBS	-71	h,x,y,z	5	9	9	9	-	1-2	1-2	1-2	1-2	-
29	44°54.900’	172°07.261’	4636	20.02.2016 / 17:38	44°55.137’	172°07.690’	4676	01.03.2016 / 13:42	OBS (GEOMAR)	Geolog	-0.5	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**
30	44°59.437’	172°01.873’	4678	20.02.2016 / 18:21	44°59.480’	172°02.347’	4680	01.03.2016 / 11:52	OBS (AWI)	MCS	+7	h,x,y,z	4	16	16	16	-	1	2	2	1	-
31	45°03.940’	171°56.481’	4706	20.02.2016 / 19:05	45°04.069’	171°56.960’	4715	01.03.2016 / 10:25	OBS (GEOMAR)	MBS	+23	h,x,y,z	5	9	9	9	-	2	3	3	2	-
32	45°08.464’	171°51.004’	4760	20.02.2016 / 19:48	45°08.477’	171°51.411’	4768	01.03.2016 / 08:52	OBS (GEOMAR)	MBS	+35	h,x,y,z	5	9	9	9	-	1	2-3	2-3	2-3	-
33	45°12.966’	171°45.580’	4801	20.02.2016 / 20:33	45°13.136’	171°46.290’	4811	01.03.2016 / 07:22	OBS (AWI)	MCS	+30	h	4	-	-	-	-	3	-	-	-	-
34	45°17.492’	171°40.123’	4711	20.02.2016 / 21:15	45°17.886’	171°41.108’	1558	01.03.2016 / 05:43	OBS (GEOMAR)	MBS	+32	h,x,y,z	5	9	9	9	-	4	2-3	3	3	-
35	45°21.951’	171°34.697’	4888	20.02.2016 / 21:59	45°22.636’	171°36.091’	1360	01.03.2016 / 04:09	OBS (GEOMAR)	MBS	-72	h,x,y,z	5	9	9	9	-	2	2-3	2-3	2	-

Appendix A.3 OBS/OBH Deployment & Recovery Profile 20160300

Average station interval: 8.1 nm (15.0 km) Total profile length (between OBS-Station 01 and 21): 162.0 nm (300.0 km) Data quality: 1 = good, 2 = medium, 3 = low, 4 = no data
*no skew due to recorder crash, **data will be later processed because of formatting issues

	Deployment				Recovery				Type	Rec.	Skew	Sen-sors	Gain level					Quality				
Stat No.	Latitude South	Longitude West	Depth (m)	Date/Time UTC	Latitude South	Longitude West	Depth (m)	Date/Time UTC		Type	(ms)		C 1 h	C 2 x	C 3 y	C 4 z	C 5 h	C 1 h	C 2 x	C 3 y	C 4 z	C 5 h
1	42°29.935’	168°30.026’	2616	05.03.2016 / 20:28	42°29.943’	168°29.674’	2624	08.03.2016 / 09:48	OBS (GEOMAR)	MBS	0	h,x,y,z	5	9	9	9	-	1	2	2-3	2	-
2	42°37.105’	168°25.082’	2818	05.03.2016 / 21:17	42°37.125’	168°24.853’	2804	08.03.2016 / 11:03	OBS (AWI)	MCS	+24	h	4	-	-	-	-	2	-	-	-	-
3	42°44.424’	168°20.225’	2937	05.03.2016 / 22:07	42°44.567’	168°19.905’	2950	08.03.2016 / 12:11	OBS (GEOMAR)	Geolog	+0.5	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**
4	42°51.618’	168°15.107’	3291	05.03.2016 / 22:52	42°51.248’	168°15.252’	3331	08.03.2016 / 13:27	OBS (AWI)	MCS	+8	h	4	-	-	-	-	1-2	-	-	-	-
5	42°58.914’	168°10.290’	4303	05.03.2016/ 23:40	42°58.393’	168°10.347’	4304	08.03.2016 / 14:57	OBS (GEOMAR)	MBS	+5	h,x,y,z	5	9	9	9	-	1-2	3	3	2-3	-
6	43°06.146’	168°05.274’	4478	06.03.2016 / 00:31	43°05.816’	168°05.382’	4466	08.03.2016 / 16:24	OBS (AWI)	6D6	-0.2	h,x,y,z	1	2	2	2	-	2	3	3	2	-
7	43°13.350’	168°00.250’	4837	06.03.2016 / 01:21	43°13.131’	168°00.295’	4845	08.03.2016 / 17:47	OBS (GEOMAR)	MBS	+10	h,x,y,z	5	9	9	9	-	1-2	3	3	3	-
8	43°20.570’	167°55.241’	4840	06.03.2016 / 02:09	43°20.570’	167°55.241’	4858	08.03.2016 / 19:23	OBS (AWI)	MCS	-6	h	4	-	-	-	-	2-3	-	-	-	-
9	43°27.872’	167°50.274’	4874	06.03.2016 / 03:03	43°27.842’	167°50.220’	4871	08.03.2016 / 20:42	OBS (GEOMAR)	MBS	-48	h,x,y,z	5	9	9	9	-	1-2	3	3	3	-
10	43°35.105’	167°45.219’	5006	06.03.2016 / 03:51	43°35.160’	167°44.988’	5019	08.03.2016 / 22:15	OBS (GEOMAR)	Geolog	+0.3	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**
11	43°42.236’	167°40.053’	5035	06.03.2016 / 04:39	43°41.991’	167°39.708’	5042	08.03.2016 / 23:50	OBS (AWI)	MCS	-*	h,x,y,z	4	16	16	16	-	1	3	2-3	1-2	-
12	43°49.540’	167°35.132’	5040	06.03.2016 / 05:25	43°49.350’	167°35.070’	5055	09.03.2016 / 01:17	OBS (GEOMAR)	MBS	+38	h,x,y,z	5	9	9	9	-	2-3	3	3	2-3	-
13	43°56.724’	167°29.973’	4970	06.03.2016 / 06:12	43°56.483’	167°29.728’	5072	09.03.2016 / 02:49	OBS (GEOMAR)	MBS	-7	h,x,y,z	5	9	9	9	-	1	3	3	3	-
14	44°03.958’	167°24.804’	5086	06.03.2016/ 06:58	44°03.682’	167°24.419’	5095	09.03.2016/ 05:49	OBS (AWI)	MCS	+18	h	4	-	-	-	-	1	-	-	-	-
15	44°11.047’	167°19.528’	5173	06.03.2016 / 07:44	44°11.092’	167°19.315’	5175	09.03.2016 / 17:30	OBS (GEOMAR)	MBS	+10	h,x,y,z	5	9	9	9	-	1	2-3	2-3	2	-
16	44°18.282’	167°14.392’	5226	06.03.2016 / 08:32	44°18.247’	167°14.106’	5230	09.03.2016 / 19:03	OBS (AWI)	MCS	+7	h,x,y,z	4	16	16	16	-	1	2-3	2	1-2	-
17	44°25.433’	167°09.111’	5233	06.03.2016 / 09:23	44°25.331’	167°08.736’	5248	09.03.2016 / 20:44	OBS (GEOMAR)	Geolog	+0.1	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**

	Deployment				Recovery				Type	Rec.	Skew	Sen-sors	Gain level					Quality				
Stat No.	Latitude South	Longitude West	Depth (m)	Date/Time UTC	Latitude South	Longitude West	Depth (m)	Date/Time UTC		Type	(ms)		C 1 h	C 2 x	C 3 y	C 4 z	C 5 h	C 1 h	C 2 x	C 3 y	C 4 z	C 5 h
18	44°32.754’	167°04.019’	5258	06.03.2016 / 10:11	44°32.583’	167°03.881’	5269	09.03.2016 / 22:35	OBS (AWI)	MCS	+19	h	4	-	-	-	-	1	-	-	-	-
19	44°39.783’	166°58.764’	5256	06.03.2016 / 11:00	44°39.483’	166°58.612’	5275	10.03.2016 / 00:19	OBS (GEOMAR)	MBS	+10	h,x,y,z	5	9	9	9	-	1	2-3	2-3	2-3	-
20	44°46.997’	166°53.542’	5288	06.03.2016 / 11:52	44°46.643’	166°53.337’	5296	10.03.2016 / 03:20	OBS (KUM Prototype)	6D6	-152	h,x,y,z	2	1	1	1	-	1	2-3	2-3	2	-
21	44°54.160’	166°48.265’	5302	06.03.2016 / 12:46	44°53.706’	166°48.171’	5314	10.03.2016 / 05:21	OBS (GEOMAR)	MCS	-15	h,x,y,z	5	9	9	9	-	1	2-3	3	2-3	-

Appendix A.4 OBS/OBH Deployment & Recovery Profile 20160400

Average station interval: 6.5 nm (12.0 km) Total profile length (between OBS-Station 01 and 20): 123.1 nm (288.0 km) Data quality: 1 = good, 2 = medium, 3 = low, 4 = no data
*no skew due to recorder crash, **data will be later processed because of formatting issues

	Deploy-ment				Recovery				Type	Rec.	Skew	Sen-sors	Gain level					Quality				
Stat.	Latitude	Longitude	Depth	Date/Time	Latitude	Longitude	Depth	Date/Time					C 1	C 2	C 3	C 4	C 5	C 1	C 2	C 3	C 4	C 5
No.	South	West	(m)	UTC	South	West	(m)	UTC		Type	(ms)		h	x	y	z	h	h	x	y	z	h
1	43°20.405’	178°20.864’	395	15.03.2016 / 00:18	43°20.495’	178°20.839’	401	17.03.2016 / 03:23	OBS (GEOMAR)	MBS	3	h,x,y,z	5	9	9	9	-	2	2-3	3	3	-
2	43°26.770’	178°20.202’	437	15.03.2016 / 01:00	43°26.821’	178°20.210’	434	17.03.2016 / 04:18	OBS (AWI)	MCS	8	h	4	-	-	-	-	1	-	-	-	-
3	43°33.250’	178°19.582’	417	15.03.2016 / 01:40	43°33.346’	178°19.530’	417	17.03.2016 / 05:10	OBS (GEOMAR)	Geolog	0	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**
4	43°39.705’	178°18.983’	377	15.03.2016 / 02:18	43°39.781’	178°18.879’	382	17.03.2016 / 06:28	OBS (AWI)	MCS	-*	h	4	-	-	-	-	2-3	-	-	-	-
5	43°46.197’	178°18.200’	390	15.03.2016 / 02:56	43°46.159’	178°17.811	393	17.03.2016 / 07:24	OBS (GEOMAR)	MBS	6	h,x,y,z	5	9	9	9	-	2-3	2-3	2-3	2-3	-
6	43°52.719’	178°17.597’	430	15.03.2016 / 03:32	43°52.673’	178°17.270’	434	17.03.2016 / 08:21	OBS (AWI)	6D6	-51	h,x,y,z	1	2	2	2	-	1	1-2	1-2	2	-
7	43°59.063’	178°17.079’	448	15.03.2016 / 04:10	43°59.028’	178°16.811’	454	17.03.2016 / 09:15	OBS (GEOMAR)	MBS	-7	h,x,y,z	5	9	9	9	-	2	3	3	3	-
8	44°05.511’	178°16.368’	477	15.03.2016 / 04:48	44°05.372’	178°16.078’	482	17.03.2016 / 10:10	OBS (AWI)	MCS	5	h	4	-	-	-	-	1	-	-	-	-
9	44°12.013’	178°15.770’	506	15.03.2016 / 05:27	44°11.770’	178°15.690’	511	17.03.2016 / 11:10	OBS (GEOMAR)	MBS	-4	h,x,y,z	5	9	9	9	-	2	2-3	2-3	2-3	-
10	44°18.440’	178°15.088’	650	15.03.2016 / 06:09	44°18.283’	178°14.823’	648	17.03.2016 / 12:08	OBS (GEOMAR)	Geolog	0.1	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**
11	44°24.918’	178°14.506’	961	15.03.2016 / 06:46	44°24.470’	178°14.358’	944	17.03.2016 / 13.12	OBS (AWI)	MCS	4	h,x,y,z	4	16	16	16	-	1	2	2	1-2	-
12	44°31.268’	178°13.841’	1018	15.03.2016 / 07:26	44°31.684’	178°13.683’	1030	17.03.2016 / 14:14	OBS (GEOMAR)	MBS	7	h,x,y,z	5	9	9	9	-	1	1-2	1-2	2	-
13	44°37.764’	178°13.423’	1180	15.03.2016 / 08:06	44°38.012’	178°13.370’	1193	17.03.2016 / 15:19	OBS (GEOMAR)	MBS	20	h,x,y,z	5	9	9	9	-	1-2	3	3	3	-
14	44°44.219’	178°12.746’	1319	15.03.2016 / 08:45	44°44.651’	178°12.750’	1339	17.03.2016 / 16:25	OBS (AWI)	MCS	15	h	4	-	-	-	-	3	-	-	-	-
15	44°50.750’	178°12.073’	1519	15.03.2016 / 09:26	44°51.030’	178°12.172’	1568	17.03.2016 / 17:28	OBS (GEOMAR)	MBS	11	h,x,y,z	5	9	9	9	-	1-2	2	2-3	2-3	-
16	44°57.172’	178°11.347’	1845	15.03.2016 / 10:04	44°57.264’	178°11.243’	1851	17.03.2016 / 18:35	OBS (AWI)	MCS	1	h,x,y,z	4	16	16	16	-	1	1-2	1-2	2	-
17	45°03.681’	178°10.642’	2244	15.03.2016 / 10:41	44°04.056’	178°10.390’	2261	17.03.2016 / 19:16	OBS (GEOMAR)	Geolog	0.2	h,x,y,z,h	1	16	16	16	16	**	**	**	**	**
18	45°10.161’	178°09.943’	2443	15.03.2016 / 11:18	45°10.710’	178°09.282	2467	17.03.2016 / 20:51	OBS (AWI)	MCS	9	h	4	-	-	-	-	1	-	-	-	-

	Deploy-ment				Recovery				Type	Rec.	Skew	Sen-sors	Gain level					Quality				
Stat. No.	Latitude South	Longitude West	Depth (m)	Date/Time UTC	Latitude South	Longitude West	Depth (m)	Date/Time UTC		Type	(ms)		C 1 h	C 2 x	C 3 y	C 4 z	C 5 h	C 1 h	C 2 x	C 3 y	C 4 z	C 5 h
19	45°16.649’	178°09.258’	2781	15.03.2016 / 11:54	45°17.202’	178°08.381’	2820	17.03.2016 / 21:52	OBS (GEOMAR)	MBS	6	h,x,y, z	5	9	9	9	-	1-2	3	3	3	-
20	45°23.063’	178°08.624’	3223	15.03.2016 / 12:29	45°23.543’	178°07.949’	3286	17.03.2016 / 23:00	OBS (GEOMAR)	MBS	-25	h,x,y, z	5	9	9	9	-	4	4	4	4	-

Appendix A.5 Seismic reflection profile list

All profiles (except 20160200A/B): Seismic streamer SERCEL Sentinel 3000 m

PROFILE # AWI-	Start/ End	DATE (UTC)	TIME (UTC)	LATITUDE	LONGITUDE	SHOT #	RECORD LENGTH (s)	SAMPLE RATE (ms)	SHOT INTERVAL (s)	PROFILE LENGTH (km)	G-GUN ARRAY	Comment
20160101	start end	07/02/2016 09/02/2016	11:40:00 13:52:00	-43.01144 -46.99530	-175.90418 -174.24047	1 2985	10	1	60	462	8 x 520 in^3	OBS recording
20160102	start end	07/02/2016 07/02/2016	09:03:00 11:40:00	-42.82029 -42.99044	-175.97519 -175.91195	1 113	40	1	60	19	8 x 520 in^3	OBS recording
20160001	start end	09/02/2016 11/02/2016	16:28:00 19:04:00	-46.99043 -42.96710	-174.24231 -175.92074	1 9112	15	1	20	467	6 x 520 in^3	
20160002	start end	18/02/2016 19/02/2016	11:49:00 00:16:00	-44.99656 -44.22056	-175.57345 -174.31349	1 1655	15	1	20	106	4 x 520 in^3	
20160200A	start end	21/02/2016 21/02/2016 22/02/2016	00:16:00 17:46:00 00:00:00	-45.48293 -44.38055 -43.99632	-171.434938 -172.736839 -173.195937	1 1424	-	-	60	256	8 x 520 in^3 7 x 520 in^3	only OBS recording, no streamer
20120200B	start end	23/02/2016 24/02/2016	19:57:00 18:30:00	-44.06092 -42.64220	-173.237868 -174.683733	1 1353	-	-	60	225	8 x 520 in^3	only OBS recording, no streamer
20160003	start end	24/02/2016 26/02/2016	21:00:00 17:00:00	-42.70846 -45.50253	-174.62425 -171.40743	1 7027	15	1	20	404	6 x 520 in^3	
20160004	start end	03/03/2016 03/03/2016	01:38:04 14:47:00	-42.66278 -43.55154	-174.12964 -173.17140	1 2362	15	1	20	128	6 x 520 in^3	
20160005	start end	03/03/2016 03/03/2016	14:47:00 22:52:00	-43.55154 -43.05279	-173.17140 -172.50769	2363 3818	15	1	20	77	6 x 520 in^3	
20160006	start end	03/03/2016 04/03/2016	22:53:00 17:04:00	-43.05142 -42.04364	-172.50722 -174.00832	3819 7095	15	1	20	167	6 x 520 in^3	
20160301	start end	06/03/2016 08/03/2016	16:43:00 04:52:00	-45.02136 -42.35049	-166.72112 -168.60015	1 2170	15	1	60	334	8 x 520 in^3	OBS recording
20160401	start end	15.03.2016 16.03.2016	16:12:00 21:59:00	-45.51315 -43.17374	-178.13049 -178.36406	1 1784	15	1	60	261	8 x 520 in^3	OBS recording

Total shots: 34718 Total shot profile lengths: 2906 km

Appendix A.6 Rock sampling summary

Type	Stat.	Location	total volume	Rec. DR	Rock summary	on bottom lat °S	on bottom long °W	off bottom lat °S	off bottom long °W	depth (m) begin	depth (m) end	Mag. rock	VC	Sed	Mn
DR	4	Western Area, Pare Pekapeka Guyot	few rocks	1	lava fragments, volcaniclastics, few dropstones	45,431	176,048	45,437	176,048	2770	2350	1	1		
DR	5	Western Area, Pare Pekapeka Guyot	one rock	0	dropstone	45,442	175,936	45,448	175,940	3544	3239				
DR	6	Western Area, Tiaki-ā-tai Guyot	few rocks	1	lava fragments, volcaniclastics, Mn-crusts, few dropstones	45,129	175,518	45,135	175,518	2909	2633	1	1		1
DR	31	Western Area, Papamahau Smt.	half full	1	lava fragments, volcaniclastics, Mn-nodules, few dropstones	47,092	174,487	47,084	174,499	4004	4159	1	1		1
DR	32	Western Area, Papamahau Smt.	empty	0		47,120	174,424	47,113	174,424	4784	4900				
DR	33	Western Area, Tapuwae Smt.	empty	0		46,241	174,304	46,233	174,309	3416	3553				
DR	34	Western Area, Tapuwae Smt.	few rocks	1	lava fragments, volcaniclastics, Mn-crusts	46,256	174,485	46,250	174,478	3933	3508	1	1		1
DR	35	Western Area, Tapuwae Smt.	few rocks	1	lava fragments, Mn-crusts	46,182	174,467	46,179	174,459	3574	3705	1			1
DR	36	Western Area, Tapuwae Smt.	1/8 full	0	Mn-nodules	46,250	174,139	46,243	174,134	4303	3974				1
DR	37	Western Area, Kurupounamu Guyot	1/2 full	1	lava fragments, volcaniclastics, Mn-crusts+nodules	46,101	173,555	46,089	173,555	4537	3802	1	1		1
DR	38	Western Area, Mārangaranga Smt.	few rocks	1	lava fragments, Mn-crusts, few dropstones	45,970	173,877	45,963	173,877	3756	3407	1			1
DR	54	Central Area, Te Kakaru Smt.	1/2 full	0	2 small lava fragments, Mn-crusts+nodules	45,520	170,086	45,513	170,091	4723	4425			1	1
DR	55	Central Area, Tama-nui-te-rā Smt.	some rocks	1	lava fragments, volcaniclastics, Mn-crusts	45,650	170,223	45,651	170,235	3545	3284	1	1		1
DR	56	Central Area, Ringa Raupa Smt.	empty	0		45,577	170,504	45,578	170,514	4725	4469				
DR	70	Central Area, Ringa Raupa Smt.	empty	0		45,376	170,817	45,384	170,820	3592	3250				
DR	71	Central Area, Tama-nui-te-rā Smt.	empty	0	a few tiny dropstones and Mn-crumbs	45,616	170,282	45,623	170,286	4668	4360				
DR	72	Central Area, Riwia Smt.	1/4 full	1	pillow breccia, Mn crusts and nodules, 1 dropstone	45,955	170,987	45,962	170,990	2969	2740	1	1		1
DR	73	Central Area, Motu Whakaeke Smt.	1/4 full	1	pillow fragments, Mn-crusts	45,842	172,008	45,850	45,850	3940	3623	1			1
DR	74	Western Area, Toitū-ā-Tangaroa Smt.	empty	0	one tiny volcanic rock	45,065	174,640	45,066	174,637	2500	2458				
DR	75	Western Area, Te Honu Houkura Smt.	few rocks	1	volcanic breccia	45,401	175,046	45,407	175,048	2725	2554	1			
DR	81	Western Area, Te Pū Wharehuna Smt.	1/4 full	1	lava fragments, pillow breccia, Mn-crusts	45,608	177,563	45,616	177,568	3478	3080	1	1		1
			61,9%	**13**	**yielded magmatic rocks (suitable for analysis)**							**11**	**9**	**1**	**12**
Dredge Stations (DR): 21			**38,1%**	**8**	**returned empty or only soft sediment and / or Mn and / or dropstones**										

Appendix A.7 Rock description

SO246-DR-4

Description of Location and Structure: Southern margin of Chatham Rise, Pare Pekapeka guyot, upper northern slope, dredge track ends ~200m beneath plateau edge, seamount

Dredge on bottom UTC 03/02/16 8:48hrs, lat 45°25.83'S, long 176°02.88'W, depth 2770m

Dredge off bottom UTC 03/02/16 9:56hrs, lat 45°26.24'S, long 176°02.88'W, depth 2350m

total volume: few relatively small rocks (~40}

Comments: pillows, volcaniclastic rocks, continental rocks (dropstones) and Mn-crust (many samples of the lavas taken because of the small size of the rock fragments)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-4-1	1. Rock Type: volcanic, fresh 2. Size: 9x6x7cm 3. Shape / Angularity: angular to subrounded 4. Color of cut surface: grey, slightly brown 5. Texture / Vesicularity: aphyric, vesicular, v.:<1% 6. Phenocrysts: Plag, 10-15%, <1mm, fresh? 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating 10. Comment: relatively small sample, representative sample for lithology 1	X	X	5	Pl		1		
SO246-DR-4-2	1. Rock Type: volcanic, moderately fresh 2. Size: 12x8x9cm 3. Shape / Angularity: angular to subrounded 4. Color of cut surface: grey, light brown 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Plag, ~10%, up to 1mm, relatively small, moderately fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating 10. Comment: -	X	X	5	Pl		1		
SO246-DR-4-3	1. Rock Type: volcanic, moderately fresh 2. Size: 8x7x6cm 3. Shape / Angularity: angular to subrounded 4. Color of cut surface: grey, light brown 5. Texture / Vesicularity: aphyric, vesicular, v.:5%, up to 3mm in Ø, unfilled 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating 10. Comment: -	X	X				1		
SO246-DR-4-4	1. Rock Type: volcanic, partly altered 2. Size: 12x10x8cm 3. Shape / Angularity: angular - subrounded 4. Color of cut surface: grey, light brown 5. Texture / Vesicularity: aphyric, v.:5%, up to 5mm in Ø, mostly 1-2mm, unfilled 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating 10. Comment: alteration margin on edges of sample, there also red vesicle fillings (clay?)	X	X				1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-4-5	1. Rock Type: volcanic, altered 2. Size: 14x5x10cm 3. Shape / Angularity: angular 4. Color of cut surface: brown, sometimes grey 5. Texture / Vesicularity: aphyric, vesicular, v.:5%, average: <1mm Ø, sometimes up to 3mm Ø, mostly filled, filling green - whitish 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating 10. Comment: alteration stronger in center (red)	X	X				1		
SO246-DR-4-6	1. Rock Type: volcanic, fresh interior, altered rim 2. Size: 15x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: inside dark grey, outside brown 5. Texture / Vesicularity: aphyric, vesicular, v.:10%, ~1mm Ø in altered rim filled with white material 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: white material in vesicles 9. Encrustations: Mn-coating 10. Comment: try to use just fresh interior for GC (picking)	X	X				1		
SO246-DR-4-7	1. Rock Type: volcanic, moderately fresh, especially interior 2. Size: 8x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: inside grey, outside brownish 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: large Plag-phenocrysts, ~5%, up to 5mm, strongly altered, also altered Ol or Px? (<1mm, <1%) 7. Matrix: fine grained 8. Secondary Minerals: iddingsite? 9. Encrustations: Mn-coating 10. Comment: representative sample for second lithology	X		4	Pl		2		
SO246-DR-4-8	1. Rock Type: volcanic, moderately fresh, especially interior 2. Size: 7x6x3.5cm 3. Shape / Angularity: angular 4. Color of cut surface: inside grey, outside brownish 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: altered Plag, 3%, up to 3mm, elongated 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating 10. Comment: cracks, partly filled with?	X		4-5	Pl		2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-4-9	1. Rock Type: volcanic, moderately fresh, especially interior 2. Size: 5x5x4cm 3. Shape / Angularity: angular 4. Color of cut surface: inside grey, outside brownish 5. Texture / Vesicularity: slightly porphyric and vesicular, 1%, <1mm, mostly unfilled 6. Phenocrysts: altered Ol (iddingsite) or Px, <1%, <1mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite? 9. Encrustations: very thin Mn-coating 10. Comment: -	X					2		
SO246-DR-4-10	1. Rock Type: volcanic, moderately fresh 2. Size: 14x10x8cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Plag, 25%-30%, up to 5mm Ø, moderatly fresh; altered Px or iddingsite? (Ol), <1%, up to 1mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite? 9. Encrustations: thin Mn-coating 10. Comment: filled cracks, probably best sample for Ar/Ar dating	X	X	2	Pl		2		
SO246-DR-4-11	1. Rock Type: volcanic, moderately fresh 2. Size: 8x6x4.5cm 3. Shape / Angularity: angular to subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, slightly vesicular v.:3%, <1mm, unfilled 6. Phenocrysts: Plag, altered, 10%, up to 5mm, elongated, orientated 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: cracks filled with red/brown material	X	X	2	Pl		2		
SO246-DR-4-12	1. Rock Type: volcanic, moderately fresh 2. Size: 9x5.5x5 cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: 20% Plag up to 1cm, Ø 1mm, slightly altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: eventually former chilled margin visible?	X	X	2-3	Pl		2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-4-13	1. Rock Type: volcanic, moderately fresh 2. Size: 8x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, v.:1%, rarely up to 7mm, mostly unfilled 6. Phenocrysts: Plag, 30%, Ø 1mm, slightly altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: sediment on one side of sample 10. Comment: former chilled margin visible (up to 2mm), no GC but sediment was ± removed	X		2	Pl		2		
SO246-DR-4-14	1. Rock Type: volcanic, moderately fresh 2. Size: 7x7x5cm 3. Shape / Angularity: angular 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyric, v.:1%, rarely up to 2mm, poorlly filled (red) 6. Phenocrysts: Plag, 1%, 1mm, altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: cracks	X		4	Pl		2		
SO246-DR-4-15	1. Rock Type: volcanic, moderately fresh 2. Size: 9x8.5x3.5cm 3. Shape / Angularity: angular to subrounded 4. Color of cut surface: grey-brown 5. Texture / Vesicularity: porphyric, vesicular, v.:30%, mostly <0.5mm, red filling 6. Phenocrysts: Plag, 5%, max. 2mm, relatively fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: larger sample with GC, more altered than samples above	X	X	2	Pl		2		
SO246-DR-4-16	1. Rock Type: volcanic, moderately fresh 2. Size: 10x9x4cm 3. Shape / Angularity: angular 4. Color of cut surface: grey-brown 5. Texture / Vesicularity: porphyric, vesicular, v.:5%, max 0.5cm 6. Phenocrysts: Plag, 10%, fine grained, partly altered, 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: interior grey, brown at the margin	X	X	3	Pl		2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-4-17	1. Rock Type: volcanic, moderately altered 2. Size: 7x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown-grey 5. Texture / Vesicularity: porphyric, vesicular, v.:10%, up to 1mm, mostly white filling 6. Phenocrysts: Plag, 2%, <1mm, partly altered 7. Matrix: fine grained 8. Secondary Minerals: white vesicle filling 9. Encrustations: thin Mn-coating 10. Comment: brown-red at one side, greyish at the other and more vesicles	X		4	Pl		2		
SO246-DR-4-18	1. Rock Type: volcanic, moderately altered 2. Size: 8x6x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown-reddish 5. Texture / Vesicularity: porphyric, vesicular, v.:10%, up to 1mm, partly filled 6. Phenocrysts: Plag, ~10%, up to 1mm, very altered 7. Matrix: fine grained 8. Secondary Minerals: brown-red vesicle filling 9. Encrustations: thin Mn-coating 10. Comment: concentrical organized phenocrysts and vesicles	X		6	Pl		2		
SO246-DR-4-19	1. Rock Type: volcanic, moderately altered 2. Size: 7x6x3.5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey-yellow 5. Texture / Vesicularity: aphyric, vesicular, v.:~10%, up to 2mm, partly filled with brown-yellow material 6. Phenocrysts: Plag in matrix, ~5%, up to 1mm, very altered 7. Matrix: fine grained 8. Secondary Minerals: brown-yellow vesicle filling 9. Encrustations: thin Mn-coating 10. Comment: one side grey, one side yellow, only GC because sample size is quite large compared to other samples	X	X				2		
SO246-DR-4-20	1. Rock Type: volcanic, altered 2. Size: 9x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: red, brownish, grey 5. Texture / Vesicularity: aphyric, vesicular, v.:~2%, <1mm, partly filled 6. Phenocrysts: Plag in matrix, ~10%, <1mm, very altered 7. Matrix: fine grained 8. Secondary Minerals: brown-red vesicle filling 9. Encrustations: thin Mn-coating 10. Comment: Part of a pillow, grey in the interior, brown-red towards the margin, light grey at the out most rim which is in contact with the Mn-coating	X					2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-4-21	1. Rock Type: volcanic, moderately altered 2. Size: 9x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: brown-red, grey 5. Texture / Vesicularity: porphyric, vesicular, v.:~5%, <1mm, not filled 6. Phenocrysts: Ol rare, <1%, ~2mm, fresh; Plag, ~1%,~1mm, altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: red interior with light grey margin, little piece extra, maybe glass for thin section	X		6			2		
SO246-DR-4-22	1. Rock Type: volcanic, just slightly altered 2. Size: 8x5.5x5.5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to dark grey 5. Texture / Vesicularity: aphyric, highly vesicular, v.:~35%, up to 2mm, partly unfilled or white-transparent filling 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: vesicle filling? 9. Encrustations: thin Mn-coating 10. Comment: representative sample for lithology 3 (highly vesicular samples)	X	X				3		
SO246-DR-4-23	1. Rock Type: volcanic, slightly altered 2. Size: 5.5x5.5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, highly vesicular, v.:~35%, up to 2mm, partly filled with sediment 6. Phenocrysts: Plag, ~5%, ~2mm, very altered 7. Matrix: fine grained 8. Secondary Minerals: vesicle filling? 9. Encrustations: thin Mn-coating 10. Comment: -	X		5	Pl		3		
SO246-DR-4-24	1. Rock Type: volcanic, moderately altered 2. Size: 9x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to brown 5. Texture / Vesicularity: porphyric, vesicular, v.:~10%, up to 2mm, partly filled 6. Phenocrysts: Plag, ~10%, ~1mm, partly altered 7. Matrix: fine grained 8. Secondary Minerals: vesicle filling? 9. Encrustations: thin Mn-coating 10. Comment: different zones of more altered and more fresh matrix	X		3	Pl		2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-4-25-VC	1. Rock Type: volcaniclastic breccia, moderately fresh lava clasts as angular clasts 2. Size: 13x12x9cm 3. Shape / Angularity: angular lava clasts within subrounded rocksample 4. Color of cut surface: lava = brown grey; surrounding = light brown, grey to black 5. Texture / Vesicularity: lava clasts= porphyric, slightly vesicular, v.: < 1%, up to 1mm, sometimes filled 6. Phenocrysts: Plag, ~2%, up to 3mm, moderately fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating 10. Comment: many cracks, representative sample for lithology 4 (breccia)			3	Pl		4		
SO246-DR-4-26-VC	1. Rock Type: volcaniclastic breccia, moderately fresh lava clasts as angular clasts 2. Size: 10x10x8cm 3. Shape / Angularity: angular lava clasts within subrounded rocksample 4. Color of cut surface: lava = light grey; surrounding = light brown, grey - black 5. Texture / Vesicularity: lava clasts= porphyric, vesicular, v.: 7%, up to 3mm, mostly filled 6. Phenocrysts: Plag, ~10%, up to 1mm; evenutally Px 7. Matrix: fine grained or medium 8. Secondary Minerals: green, red vesicle fillings 9. Encrustations: thin Mn-coating, sediment 10. Comment: many cracks			5	Pl		4		
SO246-DR-4-27	1. Rock Type: volcanic, altered 2. Size: 7x5x3cm 3. Shape / Angularity: angular 4. Color of cut surface: red 5. Texture / Vesicularity: aphyric, vesicular, ~10%, ~0.5mm, with white filling 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: vesicle fillings 9. Encrustations: thin Mn-coating, sediment 10. Comment: zones of darker color, appear at the end of the list due to later discovery of samples in this dredge	X					2		
SO246-DR-4-28	1. Rock Type: volcanic, partly fresh 2. Size: 9x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, brown 5. Texture / Vesicularity: aphyric, vesicular, ~10%, up to 1mm, partly filled with brown material 6. Phenocrysts: - 7. Matrix: fine grained (Plag, very altered) 8. Secondary Minerals: vesicle fillings 9. Encrustations: thin Mn-coating, sediment 10. Comment: appear at the end of the list due to later discovery of samples in this dredge	X					2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-4-29	1. Rock Type: volcanic, fresh 2. Size: 5x4x3.5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicular, ~10%, up to 2mm, partly filled with white material 6. Phenocrysts: Plag, ~20%, ~2mm, slightly altered 7. Matrix: fine grained 8. Secondary Minerals: vesicle fillings 9. Encrustations: thin Mn-coating, sediment 10. Comment: cracks, very small sample, appear at the end of the list due to later discovery of samples in this dredge	X		3	Pl		2		

SO246-DR-5

Description of Location and Structure: Southern margin of Chatham Rise Margin, Pare Pekapeka guyot, lower northeastern slope

Dredge on bottom UTC 03/02/16 13:56hrs, lat 45°26.50'S, long 175°56.14'W, depth 3544m
Dredge off bottom UTC 03/02/16 15:08hrs, lat 45°26.90'S, long 175°56.38'W, depth 3239m
total volume: 1 rock
Comments: volcaniclastic rock

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-5-1-X	1. Rock Type: volcaniclastic rock 2. Size: 8x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: <1mm Mn-coating 10. Comment: just taken because it is only sample of dredge, not usefull for further analytics								

Appendix A.7 Rock description

SO246-DR-6

Description of Location and Structure: Southern margin of Chatham Rise margin, Tiaki-ā-tai guyot, ~25nm NE of DR-4+5 on lower Chatham Rise margin, upper step from top to bottom

Dredge on bottom UTC 03/02/16 21:21hrs, lat 45°07.72'S, long 175°31.10'W, depth 2909m

Dredge off bottom UTC 03/02/16 22:23hrs, lat 45°08.11'S, long 175°31.07'W, depth 2633m

total volume: few rocks

Comments: pillow lava, volcaniclastic rocks, few dropstones, Mn-crusts (many samples of the lavas taken because of the small size of most rock fragments)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-6-1	1. Rock Type: volcanic, moderately fresh 2. Size: 18x14x10cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey to light brown 5. Texture / Vesicularity: slightly porphyric, dense, v.: <1%, sub-mm, unfilled 6. Phenocrysts: Plag needles, 7-10%, sub-mm, fresh? 7. Matrix: very fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: very thin (sub-mm) Mn-coating 10. Comment: largest sample of dredge , fairly fresh and representativ for majority of dredge (samples 1-16)	X	X	5	Pl		1		
SO246-DR-6-2	1. Rock Type: volcanic, fresh 2. Size: 9x7x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey slightly brown in interior 5. Texture / Vesicularity: slightly porphyric, dense 6. Phenocrysts: Plag-needles, ~5%, <1mm, (similar to sample 1); Px ?; darker minerals visible (sub-mm, <5%) 7. Matrix: very fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: very thin (sub-mm) Mn-coating 10. Comment: -	X		5	Pl		1		
SO246-DR-6-3	1. Rock Type: volcanic, fresh 2. Size: 6x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black-grey (darker than sample 1+2) 5. Texture / Vesicularity: porphyric, vesicular, centre: v.:<1%, 1mm, outer parts v.: 20-25%, 1mm, unfilled 6. Phenocrysts: Plag, 20%, sub-mm, needles, moderatly fresh 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: - 10. Comment: -	X		4	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-6-4	1. Rock Type: volcanic, slightly altered 2. Size: 8x5x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown patches of alteration 5. Texture / Vesicularity: porphyric, vesicular, centre: v.:<1%, 1mm, outer parts v.: 20-25%, 1mm, unfilled 6. Phenocrysts: Plag, 20%, sub-mm, needles, moderatly fresh; Ol, sub-mm ? 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: - 10. Comment: cracks, sometimes filled with green-yellow sediment, very similar to sample 3						1		
SO246-DR-6-5	1. Rock Type: volcanic, moderatly altered 2. Size: 7x7x5cm 3. Shape / Angularity: angular 4. Color of cut surface: fresh part grey, altered part brown-red 5. Texture / Vesicularity: slightly porphyric, dense, v.: <1%, sub-mm, unfilled 6. Phenocrysts: Plag needles, 7-10%, sub-mm, fresh? 7. Matrix: very fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: - 10. Comment: cracks			5	Pl		1		
SO246-DR-6-6	1. Rock Type: volcanic, altered (espicially in center) 2. Size: 11x6x5cm 3. Shape / Angularity: angular to subrounded 4. Color of cut surface: grey rim, brown-grey interior 5. Texture / Vesicularity: slightly porphyric, dense, v.: <1%, sub-mm, unfilled 6. Phenocrysts: additional to Plag (see sample 1) mafic minerals (Px?), <5%, sub-mm 7. Matrix: very fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10.Comment: few cracks from edges to interior						1		
SO246-DR-6-7	1. Rock Type: volcanic, quite fresh 2. Size: 13x7x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, slightly reddish brown 5. Texture / Vesicularity: porphyric, slightly more vesicular than sample DR-6-1, centre: no vesicles 6. Phenocrysts: Plag see sample 1, fresh!; px? (mafic, dark), <5%, up to 1mm 7. Matrix: very fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: - 10. Comment: got number DR-6-7 by mistake (deserves better number due to freshness of sample and Plag!)	X	X	2	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-6-8	1. Rock Type: volcanic, fresh 2. Size: 9x8x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, slightly reddish brown 5. Texture / Vesicularity: porphyric, dense but outer areas show a few large empty vesicles from 1mm to 1cm Ø (3 vesicles found) 6. Phenocrysts: Plag see sample 1, <5%, sub-mm; Px? (sub-mm) 7. Matrix: very fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: no cracks			4-5	Pl		1		
SO246-DR-6-9	1. Rock Type: volcanic, partly altered 2. Size: 10x7x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, altered parts are reddish-brown 5. Texture / Vesicularity: porphyric, very dense, v.:1%, <1mm, unfilled 6. Phenocrysts: Plag (see sample 1), Px?, 5%, sub-mm 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: small cracks, unfilled			5	Pl		1		
SO246-DR-6-10	1. Rock Type: volcanic, moderatly altered 2. Size: 8x5.5x5cm 3. Shape / Angularity: angular 4. Color of cut surface: brown at the center, grey at the rim 5. Texture / Vesicularity: slightly porphyric, very dense, v.:1%, <1mm, unfilled 6. Phenocrysts: Plag, 10%, sub-mm needles, fresh? 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: -			4-5	Pl		1		
SO246-DR-6-11	1. Rock Type: volcanic, moderatly altered 2. Size: 7x7x4cm 3. Shape / Angularity: angular to subrounded 4. Color of cut surface: grey, altered parts slightly brown 5. Texture / Vesicularity: porphyric, dense, v.:1%, few vesicles up to 2mm in size 6. Phenocrysts: Plag, 5%, sub-mm needles; Ol?, up to 3mm large, heavily altered (iddingsite) 7. Matrix: fine grained 8. Secondary Minerals: iddingsite? 9. Encrustations: thin Mn-coating 10. Comment: -			5	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-6-12	1. Rock Type: volcanic, moderatly altered 2. Size: 10x8x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey at the rim, altered part in the center brown 5. Texture / Vesicularity: porphyric, dense, v.:3%, unfilled 6. Phenocrysts: Plag,10%, sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: iddingsite? 9. Encrustations: thin Mn-coating 10. Comment: -			5	Pl		1		
SO246-DR-6-13	1. Rock Type: volcanic, moderatly altered 2. Size: 10x8x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey at the rim, altered part in the center brown 5. Texture / Vesicularity: slightly porphyric, dense, no vesicles 6. Phenocrysts: Plag, <10%, sub-mm, orientated, needle shape; Px? (to small to be sure) 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: -						1		
SO246-DR-6-14	1. Rock Type: volcanic, very similar to sample 13 2. Size: 9x7x6 cm 3. Shape / Angularity: angular 4. Color of cut surface: grey at the rim, altered part in the center brown 5. Texture / Vesicularity: porphyric, dense, v.:3%, unfilled 6. Phenocrysts: Plag,10%, sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: Mn patches also in interior of rock						1		
SO246-DR-6-15	1. Rock Type: volcanic, moderatly fresh 2. Size: 8x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey to light brown 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: larger Plag up to 2mm, moderatly fresh, also sub-mm Plag (more abundant) <10%; Px as larger phenocrysts, up to 2mm, also smaller, fairly fresh, <10% 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: - 10. Comment: -			2-3	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-6-16	1. Rock Type: volcanic, moderatly altered 2. Size: 8x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: interior red/brown, rim grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Plag, <15%, up to 1mm, moderatly fresh; possibly Px?, <10%, sub-mm 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comment: -			2-3	Pl		1		
SO246-DR-6-17	1. Rock Type: volcanic, moderatly fresh 2. Size: 6x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, highly vesicular, v.:30%-40%, up to 5mm, vesicles unfilled, only at the rim white, brown and green fillings 6. Phenocrysts: Plag-needles, 5%, sub-mm, moderately fresh 7. Matrix: fine grained 8. Secondary Minerals: different vesicle fillings 9. Encrustations: thin Mn-coating 10. Comment: different lithology compared to the dense samples of DR6.	X		5	Pl		2		
SO246-DR-6-18	1. Rock Type: volcaniclastic breccia 2. Size: 32x22x11cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, red and brown clasts in a brown matrix 5. Texture / Vesicularity: breccia, vesicular v.: 1%-30%, up to 2mm, partly filled with white-green material / sediment 6. Phenocrysts: - 7. Matrix: fine grained matrix, clasts fine grained as well 8. Secondary Minerals: vesicle filling 9. Encrustations: Mn-coating / sediment ~3cm 10. Comment: clasts between 1mm and 3cm, representative of lithology 3						3		
SO246-DR-6-19	1. Rock Type: volcaniclastic breccia, similar to sample DR-6-18 2. Size: 11x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, red and brown clasts in a brown matrix 5. Texture / Vesicularity: breccia, vesicular v.: 1%, up to 1mm, partly filled 6. Phenocrysts: - 7. Matrix: fine grained matrix, clasts fine grained as well 8. Secondary Minerals: vesicle filling 9. Encrustations: Mn-coating / sediment ~3cm 10. Comment: clasts between 1mm and 2cm, variable in shape, alteration and vesicularity						3		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-6-20	1. Rock Type: volcaniclastic breccia 2. Size: 14x7x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, red and brown clasts in a brown matrix 5. Texture / Vesicularity: breccia, vesicular, v.: 1%, up to 2mm, within clasts 6. Phenocrysts: - 7. Matrix: fine grained matrix, clasts fine grained as well 8. Secondary Minerals: vesicle filling 9. Encrustations: large parts with Mn-coating / sediment 10. Comment: clasts between 1mm and 1cm, variable in shape and alteration, possibly epiclastic rock?						3		
SO246-DR-6-21-Mn	1. Rock Type: Mn-crust 2. Size: 12x9x4.5cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								

SO246-DR-31

Description of Location and Structure: Papamahau seamount, upper part of the southern slope, ± from base to top

Dredge on bottom UTC 16/02/16 00:49hrs, lat 47°05.50'S, long 174°29.20'W, depth 4004m

Dredge off bottom UTC 16/02/16 02:21hrs, lat 45°05.03'S, long 174°29.94'W, depth 3550m

total volume: half full

Comments: volcanic rocks Mn-coated (2-5 cm) volcanic rocks, plutonic dropstones (mostly rounded, few angular without coating)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-31-1	1. Rock Type: volcanic, moderately altered 2. Size: 6x4x4cm (with Mn: 9x9x10cm) 3. Shape / Angularity: angular 4. Color of cut surface: brown to grey 5. Texture / Vesicularity: aphyric, slightly vesicular v.:4%, up to 2mm Ø, all filled (edges: Mn filling, center light brown filling) 6. Phenocrysts: - 7. Matrix: very fine grained, homogeneous, alteration stronger on endges/ margin, Plag in matrix 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~3cm, interior of Mn nodule 10. Comments: Best sample because easy to extract Mn and relatively large, but not freshest sample of dredge. Defines lithology 1 (main lithology of dredge).	X	X				1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-31-2	1. Rock Type: volcanic, moderately fresh 2. Size: 7x6x4.5cm (with Mn: 11x9x8cm) 3. Shape / Angularity: subangular 4. Color of cut surface: grey, brown edges 5. Texture / Vesicularity: aphyric, vesicular v.:15%, in general sub-mm, some larger ones (3mm), sometimes filled with either Mn or light brown sediment 6. Phenocrysts: altered Plag? only few visible 7. Matrix: homogeneous, stronger altered rim, fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~4cm, interior of Mn nodule 10. Comments: fresher than sample DR-31-1 but more difficult to extract from Mn-crust, abundant cracks/ patches with Mn	X	X				1		
SO246-DR-31-3	1. Rock Type: volcanic, altered 2. Size: 10x9x8cm (with Mn: 14x13x13cm) 3. Shape / Angularity: angular to subrounded 4. Color of cut surface: light brown 5. Texture / Vesicularity: aphyric, vesicular v.:10%, variable in Ø: sub-mm but also up to 5mm, partly filled (light brown and Mn), trapped volcaniclastics now strongly altered as larger patches (up to 2cm) 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~4cm, interior of Mn nodule 10. Comments: larger sample than most others	X	X				1		
SO246-DR-31-4	1. Rock Type: volcanic, moderately fresh 2. Size: 7x5x4.5cm (with Mn: 10x9x9cm) 3. Shape / Angularity: subangular 4. Color of cut surface: brown-grey 5. Texture / Vesicularity: very slightly porphyric, vesicular v.: 10%, sub-mm up to 4mm, filled with Mn or light brown material but also many unfilled 6. Phenocrysts: altered Plag, inddingsite? / altered Px 7. Matrix: fine grained 8. Secondary Minerals: iddingsite? 9. Encrustations: Mn-crust ~3cm, interior of Mn nodule 10. Comments: abundant Mn patches and filled cracks	X	X				1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-31-5	1. Rock Type: volcanic, moderatly altered 2. Size: 5x4x3.5cm (with Mn: 9x8x7cm) 3. Shape / Angularity: angular 4. Color of cut surface: brown, rim darker brown 5. Texture / Vesicularity: aphyric (only <1% phenocrysts), slightly vesicular v.:1%, sub-mm, all filled with Mn or sediment 6. Phenocrysts: Plag, ~5%, up to 1mm, moderately altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~4cm, interior of Mn nodule 10. Comments: too few plag to use for analytics, abundant Mn patches within sample	X					1		
SO246-DR-31-6	1. Rock Type: volcanic, moderately altered 2. Size: 8x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to reddish 5. Texture / Vesicularity: aphyric, vesicular v.:15%, up to 3mm, in general unfilled 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~3cm, red alteration on one margin 10. Comments: -						1		
SO246-DR-31-7	1. Rock Type: volcanic, strongly altered 2. Size: 5x5x4cm (with Mn: 8x7x7cm) 3. Shape / Angularity: subangular 4. Color of cut surface: orange to brown 5. Texture / Vesicularity: porphyric, vesicular, v.:20%, up to 2mm, mostly unfilled (or with Mn) 6. Phenocrysts: Plag, ~5%, up to 1-2mm, altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~3cm, interior of Mn nodule 10. Comments: Sample taken, because Plag-phenocrysts visible and relatively large --> TS to check if further analytic is possible	X		?	Pl		1		
SO246-DR-31-8	1. Rock Type: volcanic, altered 2. Size: 6.5x6x5.5cm (with Mn: 11x11x11cm) 3. Shape / Angularity: angular 4. Color of cut surface: brown grey, orange margin 5. Texture / Vesicularity: aphyric, vesicular, v.:25%, sub-mm, unfilled or filled with Mn 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~5cm, interior of Mn nodule 10. Comments: Possible palagonite at red margin?, many cracks						1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-31-9	1. Rock Type: volcanic, altered 2. Size: 12x9x9cm (with 5cm Mn-crust) 3. Shape / Angularity: angular 4. Color of cut surface: brown yellow 5. Texture / Vesicularity: aphyric, vesicular, v.:20%, up to 1mm, almost all filled with Mn 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~5cm, interior of Mn nodule 10. Comments: Mn-filled vesicles dendritec around cracks or follwing alteration-horizons --> secondary? Vesicularity?						1		
SO246-DR-31-10	1. Rock Type: volcanic, altered 2. Size: 27x27x17cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish grey/ yellow, many colored alteration rims 5. Texture / Vesicularity: aphyric, vesicular, v.:20%, up to 1mm, almost all filled with Mn 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating 10. Comments: refer to reference letter G on photos						1		
SO246-DR-31-11	1. Rock Type: volcanic, altered 2. Size: 8x7x5cm (excl. 3cm Mn-crust) 3. Shape / Angularity: angular 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: slightly porphyric, vesicular v.:15%, Ø 1mm, up to 7mm, filled with Mn or unfilled 6. Phenocrysts: strongly altered Plag, ~1%, up to 1mm 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~3cm, interior of Mn nodule 10. Comments: similar to sample DR-31-9 and DR31-10-G many cracks and Mn dendrites						1		
SO246-DR-31-12	1. Rock Type: volcanic, altered 2. Size: 8x6x5cm (with 3cm Mn-crust) 3. Shape / Angularity: subangular 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: aphyric, vesicular, v.: 7%, mainly sub-mm, some up to 3mm, filled (Mn, whit-brown sediment) or unfilled 6. Phenocrysts: - 7. Matrix: fine grained, homogenous 8. Secondary Minerals: - 9. Encrustations: Mn-crust ~3cm, interior of Mn nodule 10. Comments: -						1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-31-13-VC (H)	1. Rock Type: volcaniclastic, lava+glass-fragments in interior, basalt altered 2. Size: 23x22x24cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey-brown lava, red palagonit margins, black glass?, green-white volcaniclastics surrounding the others 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: Mn-crust around entire rock 10. Comments: maybe fresh glass, hard to destinguish if glass or Mn, very fragile, everything taken to check later for glass	X			Gl?		2		
SO246-DR-31-14	1. Rock Type: volcanic, moderately altered 2. Size: 14x8x3cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey, patchy red alteration 5. Texture / Vesicularity: aphyric, vesicular, v.: 10%, up to 3mm, unfilled, sometimes vesicle-borders coated with white material 6. Phenocrysts: - 7. Matrix: fine grained, very homogenous 8. Secondary Minerals: white vesicle-coating 9. Encrustations: very thin Mn-coating 10. Comments: only sample (with DR31-15) without prominent Mn-crust (in situ?), represents lithology 3	X					3		
SO246-DR-31-15	1. Rock Type: volcanic, moderately fresh 2. Size: 9x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey, brown in interior 5. Texture / Vesicularity: aphyric, dense 6. Phenocrysts: fresh Plag visible in matrix but very fine grained 7. Matrix: fine grained, very homogenous 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: sse sample DR31-14, fresh Plag but too small for analytic?	X		?	Pl		3		
SO246-DR-31-16-Mn	1. Rock Type: Mn-nodule 2. Size: 9x7x7cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-31-17-Mn	1. Rock Type: Mn-nodule 2. Size: 8x8x8cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								
SO246-DR-31-18-Mn	1. Rock Type: Mn-nodule 2. Size: 11x9x7cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								
SO246-DR-31-19-Mn	1. Rock Type: Mn-nodule 2. Size: 7x7x7cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								

SO246-DR-32

Description of Location and Structure: Papamahau seamount, basal unit, southern slope, +- from base to top

Dredge on bottom UTC 16/02/16 06:41hrs, lat 47°07.17'S, long 174°25.42'W, depth 4784m

Dredge off bottom UTC 16/02/16 08:00hrs, lat 47°06.80'S, long 174°25.46'W, depth 4472m

total volume: nothing

Comments:

SO246-DR-33

Description of Location and Structure: Tapuwae seamount, eastern slope of upper, guyot-like structure, ± from base to top

Dredge on bottom UTC 16/02/16 15:44hrs, lat 46°14.44'S, long 174°18.26'W, depth 3416m

Dredge off bottom UTC 16/02/16 17:12hrs, lat 46°13.99'S, long 174°18.55'W, depth 3131m

total volume: nothing

Comments: dredge got caught up in the main wire

Appendix A.7 Rock description

SO246-DR-34

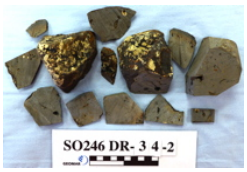
Description of Location and Structure: Tapuwae seamount, central western slope of basal unit (but could also be debris from the upper guyot-like strucuture), northern flank of a small valley

Dredge on bottom UTC 16/02/16 20:41hrs, lat 46°15.37'S, long 174°29.11'W, depth 3933m

Dredge off bottom UTC 16/02/16 22:04hrs, lat 46°14.98'S, long 174°28.68'W, depth 3508m

total volume: few rocks

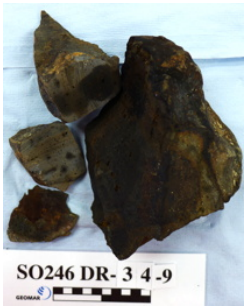
Comments: pillow fragments, lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-34-1	1. Rock Type: volcanic, fresh 2. Size: 9x7x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: aphyric, vesicular v.: 15%, sub-mm to 1mm Ø, homogeneously distributed, partly filled (yellow to red) 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin (sub-mm) Mn-coating 10. Comments: Sample representative for lithology 1, freshest, lesser vesicles than other samples	X	X				1		
SO246-DR-34-2	1. Rock Type: volcanic, fresh 2. Size: 14x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: aphyric, vesicular, v.: 20%, sub-mm to 5mm Ø, partly filled (yellow to red and white) 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: white vesicle filling 9. Encrustations: thin Mn-coating (1-5mm) 10. Comments: fresh pillow-lava fragment	X	X				1		
SO246-DR-34-3	1. Rock Type: volcanic, fresh 2. Size: 10x7x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: slightly porphyric, vesicular, v.: 20%, sub-mm to 8mm Ø, partly filled with white sediment or secondary minerals 6. Phenocrysts: Plag, ~10%, sub-mm, partly altered 7. Matrix: fine grained 8. Secondary Minerals: white vesicle filling 9. Encrustations: thin (sub-mm) Mn-coating 10. Comments: Plag possibly too small to separate	X	X				1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-34-4	1. Rock Type: volcanic, slightly altered 2. Size: 12x7x7cm 3. Shape / Angularity: rounded 4. Color of cut surface: light grey with patches of brown to orange 5. Texture / Vesicularity: aphyric, vesicular, v.: 20%, sub-mm to 4mm Ø, partly filled with white to red sediment or secondary minerals 6. Phenocrysts: 7. Matrix: fine grained 8. Secondary Minerals: white vesicle filling 9. Encrustations: Mn-coating 2-5 mm, interior of Mn-nodule 10. Comments:	X	X				1		
SO246-DR-34-5	1. Rock Type: volcanic, moderately altered 2. Size: 18x12x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey with brown to black patches 5. Texture / Vesicularity: porphyric, vesicular, v.: 25%, sub-mm to 1mm Ø, partly filled with sediment or secondary minerals 6. Phenocrysts: Plag, 10%, sub-mm to 6mm, fresh 7. Matrix: fine grained 8. Secondary Minerals: vesicle filling 9. Encrustations: thin Mn-coating ~1mm 10. Comments: Good, fresh, big Plag for further analysis		X	2	Pl		1		
SO246-DR-34-6	1. Rock Type: volcanic, moderately altered 2. Size: 17x16x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey with brown to orange patches 5. Texture / Vesicularity: aphyric, vesicular, v.: 25%, sub-mm to 5cm (elongated vesicles), partly filled with secondary minerals or yellow to red sediment 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: vesicle filling 9. Encrustations: thin Mn-coating (sub-mm to 2mm) 10. Comments: Large sample, but with large vesicles and altered patches, pillow lava fragment with distinct zones in color and vesicularity, representative for lithology 2		X				2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-34-7	1. Rock Type: volcanic, moderatly altered 2. Size: 7x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, brown, orange 5. Texture / Vesicularity: slightly porphyric, vesicular, v.: 25%, sub-mm to 1cm (elongated vesicles), partly filled with yellow to brown sediment and white/ transparent secondary minerals 6. Phenocrysts: Plag, rare, up to 1mm 7. Matrix: fine grained 8. Secondary Minerals: white to transparent vesicle filling 9. Encrustations: thin Mn-coating (~1mm) and sediment (~5mm) 10. Comments: pillow fragment with increasing vesicularity toward the rim; light grey with palagonite at the outmost rim (glass); light grey in the center, in between brown to orange		X		Gl		2		
SO246-DR-34-8	1. Rock Type: volcanic, moderately altered 2. Size: 11x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey to brown 5. Texture / Vesicularity: aphyric, vesicular, v.: 25%, sub-mm to 7mm (elongated vesicles), partly filled with brown-red sediment and white/ transparent secondary minerals 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: white to transparent vesicle filling 9. Encrustations: thin Mn-coating (sub-mm) 10. Comments: pillow fragment; similar to DR-34-6 and DR-34-7						2		
SO246-DR-34-9-R-X	1. Rock Type: volcanic, moderately altered 2. Size: 30x22x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to brown 5. Texture / Vesicularity: slightly porphyric, vesicular, v.: 30%, 1-5mm, homogeneously distributed, partly filled with orange and grey sediment 6. Phenocrysts: Plag, ~5%, small, altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating (1-3mm) 10. Comments: large sample with high vesicularity, reference sample for lithology 3, Plag probably not enough for separation, archive sample						3		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-34-10-N-X	1. Rock Type: volcanic, moderatly altered 2. Size: 21x20x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey-yellow, brown 5. Texture / Vesicularity: slightly porphyric, vesicular, v.: 40%, sub-mm to 2cm, partly filled with green, grey and red material 6. Phenocrysts: Plag, ~5%, small, altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: large sample with high vesicularity, lithology 3, Plag probably not enough for separation, archive sample						3		
SO246-DR-34-11-VC	1. Rock Type: volcaniclastic, highly altered 2. Size: 5x3,5x1,5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: yellow-brown clasts in Mn-coated-crystallin matrix 5. Texture / Vesicularity: unsorted angular clast (glass&lithology similar to DR34-1 but altered) in fine grained microcrystallin matrix 6. Phenocrysts: lithic clast similar to DR34-1, fresh crystals (Plag?/Qz?) 7. Matrix: fine grained 8. Secondary Minerals: altered glass to palagonite? 9. Encrustations: - 10. Comments: no more material, but check DR34-14-VC, check crystals in matrix, maybe suitable for Ar/Ar, represents lithology 4	X					4		
SO246-DR-34-12-VC	1. Rock Type: volcaniclastic, highly altered 2. Size: 7x4,5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: yellow-brown glass; grey lithic clasts 5. Texture / Vesicularity: unsorted angular clast (glass&lithology similar to DR34-1 but altered) 6. Phenocrysts: Plag?/Qz? 7. Matrix: fine grained 8. Secondary Minerals: altered glass to palagonite? 9. Encrustations: 10. Comments: similar to DR34-11-VC, but more lithic clasts						4		
SO246-DR-34-13-VC	1. Rock Type: volcaniclastic, highly altered 2. Size: 9x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: yellow-brown (former glass) to grey-red (lithic clasts) 5. Texture / Vesicularity: unsorted angular clast (glass&lithology similar to DR34-1 but altered) 6. Phenocrysts: Plag?/Qz? 7. Matrix: fine grained 8. Secondary Minerals: altered glass to palagonite? 9. Encrustations: Mn-crust (1-4cm) 10. Comments: similar to DR34-11-VC, less minerals in matrix						4		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-34-14-VC	1. Rock Type: volcaniclastic, highly altered 2. Size: 7x5x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: yellow-brown (former glass) to grey-red (lithic clasts) 5. Texture / Vesicularity: unsorted angular clast (glass&lithology similar to DR34-1 but altered) 6. Phenocrysts: Plag?/Qz? 7. Matrix: fine grained 8. Secondary Minerals: altered glass to palagonite? 9. Encrustations: Mn-crust (1-4cm) 10. Comments: similar to DR34-11-VC, best sample (biggest) for matrix & crystal seperation						4		
SO246-DR-34-15-Mn	1. Rock Type: Mn-crust 2. Size: 15x9x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								

SO246-DR-35

Description of Location and Structure: Tapuwae seamount, central western flank of guyot-like structure, upper slope beneath plateau margin

Dredge on bottom UTC 17/02/16 01:14hrs, lat 46°10.93'S, long 174°28.04'W, depth 3574m

Dredge off bottom UTC 17/02/16 02:33hrs, lat 46°10.76'S, long 174°27.50'W, depth 3272m

total volume: few rocks

Comments: pillow fragments

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-35-1	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 18x17x14cm 3. Shape / Angularity: subangular to subrounded 4. Color of cut surface: grey, brown around cracks 5. Texture / Vesicularity: slightly porphyric, vesicular, v.: 40%, Ø1mm, unfilled (exception when close to cracks) 6. Phenocrysts: some single Plag-crystals, up to 2mm 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white & brown vesicle-fillings 9. Encrustations: Mn-coating 10. Comments: large pillow-sample, apart from areas around cracks fresh, represents majority of this dredge and lithology 1, has thick glass/palagonite rim, seperated from rest and labelled as such (compare TS), Plag content probably too low for analytic?	X	X	3	Gl Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-35-2	1. Rock Type: volcanic, morderately fresh 2. Size: 40x37x27cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: light grey, brown patches 5. Texture / Vesicularity: porphyric, vesicular, v.:35%, up to 2mm, in general unfilled 6. Phenocrysts: Plag, 3%, up to 4mm, moderately fresh, some strongly altered 7. Matrix: fine grained, homogenous 8. Secondary Minerals: few brown-orange vesicle-fillings 9. Encrustations: Mn-crust on some parts (up to 5mm) 10. Comments: largest sample of dredge, refer to letter U, maybe Plag possible to analyze	X	X	3-4	Pl		1		
SO246-DR-35-3	1. Rock Type: volcanic, fresh 2. Size: 27x18x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicular, v.:50%, mm to sub-mm, outer margins: unfilled, inner part: filled 6. Phenocrysts: Plag, 15%, up to 5mm, fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white-light brown vesicle-fillings 9. Encrustations: thin Mn-coating 10. Comments: fresh sample but different from majority of this dredge (due to large Plag phenocrysts), probably best sample for Ar/Ar	X	X	1	Pl		1		
SO246-DR-35-4	1. Rock Type: volcanic, fresh 2. Size: 11x9x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, slightly light brown in some areas 5. Texture / Vesicularity: porphyric, vesicular, v.:30%, Ø1-2mm, in general unfilled 6. Phenocrysts: Plag, 3%, up to 3mm, relatively fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: red or orange-brown vesicle- 9. Encrustations: thin Mn-coating 10. Comments: fresh sample but smaller than sample 1-3, maybe useful for Ar/Ar	X	X	3	Pl		1		
SO246-DR-35-5	1. Rock Type: volcanic, moderately fresh 2. Size: 7x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, slightly light brown 5. Texture / Vesicularity: slightly porphyric, vesicular, v.:30%, up to 3mm, in general unfilled 6. Phenocrysts: single Plag-crystals, up to 1mm, moderately fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white or red vesicle-fillings 9. Encrustations: thin Mn-coating 10. Comments: small sample but relatinely fresh	X		4	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-35-6	1. Rock Type: volcanic, moderately fresh 2. Size: 10x8x5cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: greyish 5. Texture / Vesicularity: aphyric, vesicular, v.:30%, up to 2mm, in general unfilled (few fillings) 6. Phenocrysts: - 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white or red vesicle-fillings 9. Encrustations: thin Mn-coating 10. Comments: -	X					1		
SO246-DR-35-7	1. Rock Type: volcanic, moderately fresh 2. Size: 13x7x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to light brown 5. Texture / Vesicularity: slightly porphyric, vesicular, v.:30%, Ø 1mm, up to 2mm, in general unfilled (few fillings) 6. Phenocrysts: Plag, 1%-2%, up to 2mm, moderatly fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white or red vesicle-fillings 9. Encrustations: thin Mn-coating 10. Comments: contains not enough Plag for analytics	X		4	Pl		1		
SO246-DR-35-8	1. Rock Type: volcanic, fresh 2. Size: 8x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, brown margins 5. Texture / Vesicularity: porphyric, vesicular, v.:40%, sub-mm to mm (up to 4mm), in general unfilled 6. Phenocrysts: Plag, moderately altered, 2%, up to 4mm 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white or red vesicle-fillings 9. Encrustations: thin Mn-coating 10. Comments:Plag too altered and rare for analytic?	X		5	Pl		1		
SO246-DR-35-9	1. Rock Type: volcanic, moderately fresh 2. Size: 10x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly porphyric, vesicular, v.:30%-40%, sub-mm to mm (up to 4mm), in general unfilled 6. Phenocrysts: Plag, 1%, up to 1mm 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white or red vesicle-fillings 9. Encrustations: thin Mn-coating 10. Comments:Plag too rare for Ar/Ar?	X		5	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-35-10	1. Rock Type: volcanic, pillow fragment, partly altered 2. Size: 15x10x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, altered parts orange-brown 5. Texture / Vesicularity: almost aphyric, vesicular, v.: 40%, two groups of vesiculars: 1. sub-mm, in general unfilled; 2. 2mm - 5mm, vesicle borders coated with red material 6. Phenocrysts: possibly a few altered Plag-crystals 7. Matrix: fine grained, homogenous 8. Secondary Minerals: red vesicle-fillings, palagonite on one margin 9. Encrustations: very thin Mn-coating 10. Comments: representative of lithology 2, reminds to samples from DR-34, has palagonized chilled margin on one side, check for fresh glass	X	X	5	Pl Gl		2		
SO246-DR-35-11	1. Rock Type: Mn-crust with 1cm quite fresh glass + lava fragment attached 2. Size: 9x6x5cm (Mn: 2-5cm) 3. Shape / Angularity: subangular to subrounded 4. Color of cut surface: margin: red-grey-black 5. Texture / Vesicularity: porphyric, vesicular, v.: 20%, Ø sub-mm up to 3mm, in general unfilled 6. Phenocrysts: Plag, 1%, up to 4mm, quite fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white, red, brown vesicle fillings, palagonite 9. Encrustations: 2-5cm Mn-crust 10. Comments: only very small lava fragment on thick Mn-crust but possibly freshest glass from this dredge!	X			Gl Pl		1		
SO246-DR-35-12-Mn	1. Rock Type: Mn-crust 2. Size: 6cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: fragments of few small lava clasts								

Appendix A.7 Rock description

SO246-DR-36

Description of Location and Structure: round "pancake-like" extension from the eastern basal part of Tapuwae seamount, southern slope from base to top

Dredge on bottom UTC 17/02/16 07:15hrs, lat 46°15.02'S, long 174°08.31'W, depth 4303m

Dredge off bottom UTC 17/02/16 08:34hrs, lat 46°15.58'S, long 174°08.07'W, depth 3974m

total volume: 1/8 full

Comments: manganese knolls

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-36-1-Mn	1. Rock Type: Mn-nodules 2. Size: 5-7cm in diameter 3. Shape / Angularity: 4. Color of cut surface: 5. Texture / Vesicularity: 6. Phenocrysts: 7. Matrix: 8. Secondary Minerals: 9. Encrustations: 10. Comments: 10 samples taken; small altered volcaniclastica in center								

SO246-DR-37

Description of Location and Structure: medium-sized, guyot-like Kurupounamu seamount, upper part of SE slope

Dredge on bottom UTC 17/02/16 14:53hrs, lat 46°06.04'S, long 173°33.32'W, depth 4357m

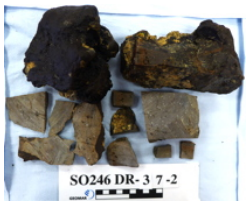
Dredge off bottom UTC 17/02/16 17:07hrs, lat 46°05.34'S, long 173°33.31'W, depth 3802m

total volume: half full

Comments: pillow lava fragments, Mn-crusts and nodules, sediments with clasts

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-37-1	1. Rock Type: volcanic, pillow fragment, relatively fresh 2. Size: 17x13x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey + orange-brown alteration margin 5. Texture / Vesicularity: porphyric, vesicular, v.:7%, sub-mm to 3mm Ø, in general unfilled (alteration margin: v.:15%, up to 3mm Ø, unfilled) 6. Phenocrysts: Plag, 10%, up to 5mm, slightly altered, some have needle shape 7. Matrix: fine grained, homogenous 8. Secondary Minerals: light brown-greenish vesicle fillings, palagonite 9. Encrustations: 2-3cm Mn-crust 10. Comments: possibly fresh glass? ➔extra sample with glass + Mn-crust taken (not seperated from each other), possibly Ar/Ar, representative for the majority of dredged samples (lithology 1)	X	X	3	Pl Gl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-37-2	1. Rock Type: breccia with volcanic fragments (some fresh) 2. Size: 24x21x15cm, 1-2cm Mn 3. Shape / Angularity: subangular Only one volcanic fragment is described in the following: 1. Rock Type: volcanic fragment 2. Size: 12x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey (fresh!) 5. Texture / Vesicularity: porphyric, vesicular, v.:18%, sub-mm unfilled 6. Phenocrysts: Plag, 10%, up to 5mm, in general needle-shaped, moderately fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: white fillings within cracks 9. Encrustations: 1-2cm Mn-crust, part of breccia 10. Comments: possibly suitable for Ar/Ar-dating, pillow fragment is part of breccia consisting of sediment / volcaniclastica and Mn; labels and numbers for TS, GC, Ar/Ar, minerals and lithology refer to pillow fragment not to the breccia, picture laballed with P	X	X	2-3	Pl		1		
SO246-DR-37-3	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 14x10x6cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey with light brown alteration in center 5. Texture / Vesicularity: porphyric, vesicular, v.:20%, sub-mm, mostly unfilled, some filled with Mn 6. Phenocrysts: Plag, 1%-2%, up to 2mm, slightly altered 7. Matrix: fine grained, homogenous 8. Secondary Minerals: 2-3% Mn-dendrites, red vesicle filling 9. Encrustations: Mn-coating 10. Comments: probably not enough Plag for Ar/Ar-dating?	X	X	3-4	Pl		1		
SO246-DR-37-4	1. Rock Type: volcanic, pillow fragment, moderatly altered 2. Size: 13x10x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey to brown 5. Texture / Vesicularity: porphyric, vesicular, v.:15%, sub-mm, partly filled 6. Phenocrysts: Plag, 12%, up to 3mm, some have needle shape, slightly altered 7. Matrix: fine grained, homogenous 8. Secondary Minerals: Mn-fillings within cracks and vesicels 9. Encrustations: Mn-coating 10. Comments: some cracks from rim to center, one Plag 7mm large, possibly Ar/Ar	X	X	2-3	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-37-5	1. Rock Type: volcanic, pillow fragment, relatively altered 2. Size: 17x11x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to brownish, alteration 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: 12%, sub-mm, partly filled 6. Phenocrysts: Plag, 7%, up to 2mm, slightly altered 7. Matrix: fine grained, homogenous 8. Secondary Minerals: vesicles & cracks filled with Mn 9. Encrustations: thin Mn-coating 10. Comments: several cracks	X	X	3-4	Pl		1		
SO246-DR-37-6	1. Rock Type: volcanic, pillow fragment, relatively fresh 2. Size: 19x13x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey with orange-brown alteration margin 5. Texture / Vesicularity: porphyric, vesicular, v.:25%, sub-mm up to 5mm, partly filled 6. Phenocrysts: Plag, 10%, up to 2mm, some have needle shape, relatively fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: vesicles & cracks partly filled with Mn or sediment 9. Encrustations: thin Mn-coating 10. Comments: several cracks, possibly fresh glas -> extra sample, possible Ar/Ar	X	X	2-3	Pl Gl		1		
SO246-DR-37-7	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 17x13x12cm, 0,2-0,5cm Mn-coating 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey to brownish, orange-brown alteration margin 5. Texture / Vesicularity: porphyric, vesicular, v.:25%, sub-mm up to 3mm, partly filled 6. Phenocrysts: Plag, 7%, up to 3mm, slightly altered 7. Matrix: fine grained, homogenous 8. Secondary Minerals: vesicles & cracks filled with Mn, Mn dendrites 9. Encrustations: 0,2-0,5cm Mn-coating 10. Comments: several cracks	X		3-4	Pl		1		
SO246-DR-37-8	1. Rock Type: volcanic, heavily altered 2. Size: 25x25x15cm, 2-7cm Mn-crust 3. Shape / Angularity: subangular 4. Color of cut surface: red-brownish 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: 3%, sub-mm, mostly unfilled 6. Phenocrysts: Plag??? Strange color, up to 1cm big white to grey colored minerals 7. Matrix: fine grained, homogenous 8. Secondary Minerals: some yellow filled vesicles 9. Encrustations: up to 5mm Mn-coting 10. Comments: altered minerals in altered matrix, extremely porphyric	X		?	?		2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-37-9-Q-X	1. Rock Type: volcanic fragment covered with Mn-crust, possibly pillow fragment 2. Size: 30x29x24cm incl. up to 5 cm Mn-crust, clast: 10x4x4cm [volcanic fragment described in the following] 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: 10%, sub-mm, mostly unfilled 6. Phenocrysts: Plag, 20%, up to 5mm, some have needle shape, relatively fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: single reddish fillings 9. Encrustations: Mn-crust 10. Comments: Mn-crust removed, good sample for Ar/Ar if needed, picture labelled with Q	X		1-2	Pl		1		
SO246-DR-37-10-X	1. Rock Type: volcanic pillow fragment in sedimetary breccia, moderately fresh 2. Size: 17x10x7cm incl. up to 6cm crust of breccia, clast: 12x8x5cm [volcanic fragment described in the following] 3. Shape / Angularity: angular 4. Color of cut surface: grey to light brown 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: 10%, sub-mm, mostly unfilled 6. Phenocrysts: Plag, 15%, up to 5mm, relatively fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: single reddish fillings, vesicles filled with Mn 9. Encrustations: clast within sedimentary and volcanic breccia with Mn-precipitation 10. Comments: more pillow fragments embedded in breccia	X		2-3	Pl		1		
SO246-DR-37-11-X	1. Rock Type: volcanic, pillow fragment, relatively fresh 2. Size: 14x11x8cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to light brown 5. Texture / Vesicularity: porphyric, vesicular, v.:25%, sub-mm up to 4mm, partly filled 6. Phenocrysts: Plag, 20%, up to 6mm, slightly altered, some have needle shape 7. Matrix: fine grained, homogenous 8. Secondary Minerals: single reddish fillings 9. Encrustations: Mn-coating 10. Comments: fragment has several cracks	X		3-4	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-37-12-X	1. Rock Type: volcanic, pillow fragment, relatively fresh 2. Size: 14x11x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey with orange brown margin 5. Texture / Vesicularity: porphyric, vesicular, v.:20%, sub-mm to 5mm, mostly unfilled 6. Phenocrysts: Plag, 15%, up to 6mm, moderately fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: palagonite? Single reddish fillings 9. Encrustations: Mn-coating 10. Comments: several cracks in fragment, some little ones in the chilled margin	X		2-3	Pl		1		
SO246-DR-37-13-X	1. Rock Type: volcanic, pillow fragment, slightly altered 2. Size: 17x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey with light brown margin 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: 10%, sub-mm, mostly unfilled 6. Phenocrysts: Plag, 5%, up to 5mm, moderately fresh 7. Matrix: fine grained, homogenous 8. Secondary Minerals: single reddish fillings 9. Encrustations: Mn-coating 10. Comments: cracks in fragment and large unfilled vesicles	X		3-4	Pl		1		
SO246-DR-37-14-Mn	1. Rock Type: Mn-crust 2. Size: 39x24x7cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								
SO246-DR-37-15-Mn	1. Rock Type: Mn-nodule with yellow sediment core 2. Size: 8x8x8cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-37-16-Mn	1. Rock Type: Mn-nodule 2. Size: 10x6x5cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								

SO246-DR-38

Description of Location and Structure: medium-sized, flat-topped Mārangaranga seamount, probably not a guyot, upper southern slope

Dredge on bottom UTC 17/02/16 22:16hrs, lat 45°58.21'S, long 173°52.63'W, depth 3756m

Dredge off bottom UTC 17/02/16 23:37hrs, lat 45°57.76'S, long 173°52.64'W, depth 3407m

total volume: few rocks

Comments: few very small altered pillow segments, many Mn-nodules and some dropstones

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-38-1	1. Rock Type: volcanic, moderately altered 2. Size: 9x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey in the center, reddish brown at the rim 5. Texture / Vesicularity: porphyric, vesicular, v.: 15%, between 1mm and 7mm diameter, larger vesicles partly filled with white and green material 6. Phenocrysts: Plag, 20 %, sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: some cracks, especially at the brown-reddish rim, Plag probably too little for Ar/Ar	X	X	3	Pl		1		
SO246-DR-38-2	1. Rock Type: volcanic, moderately altered 2. Size: 7x5x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, some parts are slightly brownish 5. Texture / Vesicularity: porphyric, vesicular, v.: 5%, sub-mm to 3mm, larger vesicles filled with white material 6. Phenocrysts: Plag, 30%, sub-mm; brownish mineral, altered Ol?, 20%, sub-mm 7. Matrix: fine grained 8. Secondary Minerals: Iddingsite (altered Ol)? 9. Encrustations: thin Mn-coating 10. Comments: highly crystalline volcanic rock	X	X	4	Pl		2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-38-3	1. Rock Type: volcanic, moderately altered 2. Size: 7x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey in the center, reddish brown at the rim 5. Texture / Vesicularity: porphyric, vesicular, v.: 15%, between 1mm and 7mm diameter, larger vesicles partly filled with white and green material 6. Phenocrysts: Plag, 20%, sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: sample is the same lithology as sample 1, but smaller in size and with a smaller brownish rim	X	X	4	Pl		1		
SO246-DR-38-4	1. Rock Type: volcanic, moderately altered 2. Size: 7x5x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicular, v.: 15%, 1mm-4mm, unfilled 6. Phenocrysts: Plag, 25%, sub-mm 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: very thin Mn-coating 10. Comments: sample too small for GC			4	Pl		1		
SO246-DR-38-5	1. Rock Type: volcanic, moderately altered 2. Size: 7x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey in the center, reddish brown at the rim 5. Texture / Vesicularity: porphyric, vesicular, v.: 15%, up to 5mm, larger vesicles partly filled with white and green material 6. Phenocrysts: Plag, 20%, sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: very thin Mn-coating 10. Comments: same lithology as sample 1, but slightly more altered			4	Pl		1		
SO246-DR-38-6	1. Rock Type: volcanic, moderately altered 2. Size: 7x5x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey with smaller brownish parts 5. Texture / Vesicularity: porphyric, vesicular, v.: 15%, up to 3mm, larger vesicles partly filled with white and green material 6. Phenocrysts: Plag, 20%, sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: same lithology as sample 1, but small sample with smaller vesicles			4	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-38-7	1. Rock Type: volcanic, altered 2. Size: 6x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey with large brownish parts 5. Texture / Vesicularity: porphyric, vesicular, v.: 15%, up to 4mm, partly filled 6. Phenocrysts: Plag, 15%, sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: same lithology as sample 1, but the most altered sample			4	Pl		1		
SO246-DR-38-8	1. Rock Type: subvolcanic or plutonic 2. Size: 7x6x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, slightly reddish-brown 5. Texture / Vesicularity: holocrystalline? 6. Phenocrysts: Plag, 40%, up to 4mm 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: sample is eventually a gabbro, maybe geochemistry is fitting to volcanic rocks of this dredge [note: this could also be a dropstone]			4	Pl		3		
SO246-DR-38-9-Mn	1. Rock Type: Mn-crust 2. Size: 26x24x19cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								
SO246-DR-38-10-Mn	1. Rock Type: Mn-nodules (4 pieces) 2. Size: between 6cm and 13cm diameter 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: -								

Appendix A.7 Rock description

SO246-DR-54

Description of Location and Structure: Te Kakaru seamount, lower southern slope of circular, flat-topped seamount (probably not a guyot)

Dredge on bottom UTC 27/02/16 05:29hrs, lat 45°31.17'S, long 170°05.14'W, depth 4723m

Dredge off bottom UTC 27/02/16 06:56hrs, lat 45°30.78'S, long 170°05.46'W, depth 4322m

total volume: half full

Comments: many Mn-nodules and Mn-crusts

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-54-1	1. Rock Type: volcanic, moderately altered 2. Size: 14x14x11cm incl. Mn, 7x4x4cm excl. Mn 3. Shape / Angularity: subangular excl. Mn 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, not vesicular, v.: <1% 6. Phenocrysts: Plag, 25%, up to 3mm 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust 1-6cm 10. Comments: Plag not fresh, but high amount, too small for GC, representative for LITH 1	X		4			1		
SO246-DR-54-2	1. Rock Type: volcanic, very altered 2. Size: 26x16x13cm incl. Mn, 6x6x4cm excl. Mn 3. Shape / Angularity: subangular excl. Mn 4. Color of cut surface: brown-red 5. Texture / Vesicularity: porphyric, not vesicular, v.: <1% 6. Phenocrysts: Plag, 25%, up to 3mm 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-crust 1-5cm 10. Comments: many cracks with a lot of Mn, same as LITH 1, but much more altered, too small for GC	X		4			1		
SO246-DR-54-3-Mn	1. Rock Type: Mn-nodule 2. Size: Ø 9cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: four pieces								
SO246-DR-54-4-X	1. Rock Type: solidified sediment 2. Size: 11x10x7cm 3. Shape / Angularity: rounded 4. Color of cut surface: green, brown 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: sediment, archive sample						2		

Appendix A.7 Rock description

SO246-DR-55

Description of Location and Structure: Tama-nui-te-rā seamount, exhibits rectangular base, which passes in a circular top, northern slopeof the circular top (dredge track extremely oblique to the slope due to weather conditions)

Dredge on bottom UTC 27/02/16 12:08hrs, lat 45°39.00'S, long 170°13.35'W, depth 3545m

Dredge off bottom UTC 27/02/16 13:47hrs, lat 45°39.03'S, long 170°14.11'W, depth 3284m

total volume: few rocks

Comments: pillow fragments

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-55-1	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 36x30x26cm incl. 5cm Mn 3. Shape / Angularity: rounded 4. Color of cut surface: dark grey, brown, yellow, light grey 5. Texture / Vesicularity: porphyric, vesicular, v.: 25%, up to 1,5cm, partly filled with sediment 6. Phenocrysts: Plag, 20%, up to 5mm, moderately fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: 5cm Mn-crust 10. Comments: large sample, representative for LITH 1, big partly resorbed Plag, refer to F in picture of uncrushed rock	X	X	2	Pl		1		
SO246-DR-55-2	1. Rock Type: volcanic, moderately fresh 2. Size: 24x15x12cm 3. Shape / Angularity: rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicular, v.: 25%, sub-mm to 2mm, homogenously distributed, partly filled with yellow sediment 6. Phenocrysts: Plag, 20%,sub-mm up to 2mm, moderately fresh; Ol? extremely altered-red 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: no Mn-crust, no pillow fragment, representative for LITH 2	X	X	2	Pl		2		
SO246-DR-55-3	1. Rock Type: volcanic, pillow fragment, moderately altered 2. Size: 10x10x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey to orange 5. Texture / Vesicularity: aphyric, vesicular, v.: 30%, sub-mm to 8mm, partly filled with sediment 6. Phenocrysts: 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating (1mm) 10. Comments: different vesicle layers, representative for LITH 3	X	X				3		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-55-4	1. Rock Type: volcanic, pillow fragment, slightly altered 2. Size: 18x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, vesicular, v.: 10%, sub-mm up to 5mm, partly filled with sediment 6. Phenocrysts: 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating (1mm) 10. Comments:	X	X				3		
SO246-DR-55-5	1. Rock Type: volcanic, moderately fresh 2. Size: 15x10x10cm incl. 1-3cm Mn-crust 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly porphyric, vesicular, v.:15%, sub-mm to 3mm, partly filled with sediment 6. Phenocrysts: Plag, <1%, 1mm in size and fine grained needles in matrix 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: 1-3cm Mn-crust 10. Comments: -	X					3		
SO246-DR-55-6	1. Rock Type: volcanic, pillow fragment, moderately altered 2. Size: 9x8x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to orange 5. Texture / Vesicularity: aphyric, vesicular, v.:15%, sub-mm to 1cm, elongated, partly filled with sediment, connecting cracks, one distinct vesicle layer 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: 0-5mm Mn-coating 10. Comments: -	X					3		
SO246-DR-55-7	1. Rock Type: volcanic, moderately fresh 2. Size: 8x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, vesicular, v.:30%, sub-mm to 5mm, partly filled with sediment 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: within the cracks transparent secondary minerals and other vesicle fillings 9. Encrustations: - 10. Comments: -	X					3		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-55-8	1. Rock Type: volcanic, moderately fresh 2. Size: 8x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, vesicular, v.:15%, sub-mm to 1mm, partly filled with sediment 6. Phenocrysts: - 7. Matrix: fine grained (Plag-needles) 8. Secondary Minerals: - 9. Encrustations: 5mm Mn-coating (Mn nodule interior) 10. Comments: -	X					3		
SO246-DR-55-9-VC	1. Rock Type: volcaniclastic, altered 2. Size: 8x8x4cm 3. Shape / Angularity: rounded 4. Color of cut surface: grey, orange, yellow, green 5. Texture / Vesicularity: porphyric, vesicular, v.: 10%, sub-mm to 5mm, partly filled with sediment 6. Phenocrysts: green, orange, yellow clasts, sub-mm up to 3mm 7. Matrix: fine-grained 8. Secondary Minerals: - 9. Encrustations: 1-5mm Mn-coating 10. Comments: VC						4		

SO246-DR-56

Description of Location and Structure: SE-trending volcanic ridge, emanating from Ringa Raupa seamount, small "nose" at NE-slope

Dredge on bottom UTC 27/02/16 18:22hrs, lat 45°34.62'S, long 170°30.26'W, depth 4725m

Dredge off bottom UTC 27/02/16 19:37hrs, lat 45°34.70'S, long 170°30.85'W, depth 4469m

total volume: empty

Comments:

SO246-DR-70

Description of Location and Structure: Ringa Raupa seamount, volcanic structure formed by several merged cones, northern slope of largest, northernmost cone

Dredge on bottom UTC 12/03/16 11:00hrs, lat 45°22.57'S, long 170°49.04'W, depth 3595m

Dredge off bottom UTC 12/03/16 12:22hrs, lat 45°23.04'S, long 170°49.19'W, depth 3250m

total volume: nothing

Comments:

SO246-DR-71

Description of Location and Structure: Tama-nui-te-rā seamount, lower northern slope, attempt to sample to rectangular base of this seamount

Dredge on bottom UTC 12/03/16 17:28hrs, lat 45°36.89'S, long 170°16.94'W, depth 4668m

Dredge off bottom UTC 12/03/16 18:52hrs, lat 45°37.37'S, long 170°17.13'W, depth 4360m

total volume: 2 very small rocks

Comments: unclear origin of the rocks, too small and altered for analytic, not taken as samples

Appendix A.7 Rock description

SO246-DR-72

Description of Location and Structure: Riwia guyot, upper northern slope right beneath plateau edge

Dredge on bottom UTC 13/03/16 1:10hrs, lat 45°57.30'S, long 170°59.22'W, depth 2969m

Dredge off bottom UTC 13/03/16 2:21hrs, lat 45°57.74'S, long 170°59.40'W, depth 2770m

total volume: 1/4 full

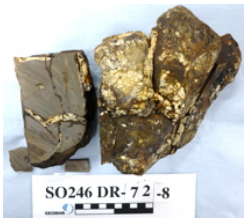
Comments: pillow fragements, volcaniclastica, Mn-crusts

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-72-1	1. Rock Type: volcanic, pillow fragment, relatively fresh 2. Size: 17x13x9cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey, some areas slightly orange 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: 7%, sub-mm, mostly unfilled 6. Phenocrysts: Plag, 5%, up to 5mm, moderately fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: represents majority of the dredge, representative for LITH 1, some cracks filled with sediment	X	x	3	Pl		1		
SO246-DR-72-2	1. Rock Type: volcanic, pillow fragment, relatively fresh 2. Size: 12x9x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, interior slightly brown to grey 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: 2-3%, sub-mm, unfilled 6. Phenocrysts: Plag, 7%, up to 1cm, moderately fresh, Px? 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: Plag is larger as in sample 1, maybe useful for Ar/Ar, fine cracks filled with sediment/ manganese	X	X	2	Pl		1		
SO246-DR-72-3	1. Rock Type: volcanic, pillow fragment, relatively fresh 2. Size: 13x5x5cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey to grey 5. Texture / Vesicularity: porphyric, non vesicular 6. Phenocrysts: Plag, 2%, up to 3mm, relatively fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: no high content of Plag but relatively fresh --> Ar/Ar	X		2	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-72-4	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 12x5x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to light orange brown, darker grey rim 5. Texture / Vesicularity: porphyric, slightly vesicular, v.:1-2%, sub-mm, unfilled 6. Phenocrysts: Plag, 5%, up to 3mm, relatively fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: maybe some glass in the rim --> extra TS; some cracks unfilled	X	X	1-2	Pl Gl		1		
SO246-DR-72-5	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 11x9x9cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, inner part orange-brown 5. Texture / Vesicularity: porphyric, vesicular, v.:~10%, sub-mm, unfilled 6. Phenocrysts: Plag, 3%, up to 2mm, moderately fresh, some have needle shape 7. Matrix: fine grained 8. Secondary Minerals: some Mn dendrites 9. Encrustations: thin Mn-coating 10. Comments: stronger orange part in the interior compared to other samples before	X	X	3	Pl		1		
SO246-DR-72-6	1. Rock Type: volcanic, pillow fragment, relatively altered 2. Size: 9x6x5cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: grey, big inner part orange-brown 5. Texture / Vesicularity: porphyric, nearly non-vesicular, v.:1%, sub-mm, unfilled 6. Phenocrysts: Plag, 3%, up to 3mm, relatively altered; Ol, up to 2mm 7. Matrix: fine grained 8. Secondary Minerals: some Mn dendrites 9. Encrustations: thin Mn-coating 10. Comments: alteration core similar to sample 5, TS with Ol-mineral, several small cracks, another TS with big non-defined mineral	X		4	Pl Ol		1		
SO246-DR-72-7	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 22x21x10cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, big inner part orange-brown 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: 3%, sub-mm, mostly unfilled 6. Phenocrysts: Plag, 5%, up to 2mm, moderately fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: several small pillow fragments surrounded with sediment, big fragment with several smaller parts hold together with sediment and Mn--> One half of the sample is complete	X		3	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-72-8	1. Rock Type: volcanic, pillow fragment, relatively fresh 2. Size: 21x16x9cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicular, v.:7%, sub-mm, unfilled 6. Phenocrysts: Plag, 5%, up to 3mm, moderately fresh 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: sediment filling between smaller parts and in cracks, similar to sample 7	X					1		
SO246-DR-72-9	1. Rock Type: volcanic, pillow fragment, relatively altered 2. Size: 21x12x12cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: orange-brown to light grey 5. Texture / Vesicularity: porphyric, non vesicular 6. Phenocrysts: Plag, 7%, up to 3mm, moderately fresh, maybe Px? up to 2mm 7. Matrix: fine grained 8. Secondary Minerals: Mn dendrites 9. Encrustations: thin Mn-coating 10. Comments: a bit more altered than the samples before, enough material for GC if needed	X		2-3	Pl Px?		1		
SO246-DR-72-10	1. Rock Type: volcanic, pillow fragment, relatively altered 2. Size: 13x13x7cm 3. Shape / Angularity: angular 4. Color of cut surface: orange-brown 5. Texture / Vesicularity: porphyric, non vesicular 6. Phenocrysts: Plag, 7-10%, up to 5mm, relatively altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: cracks filled with Mn, maybe some glass preserved in the rim --> TS; sample big enough for GC sample if needed	X		3-4	Pl Gl?		1		
SO246-DR-72-11	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 9x8x5cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: grey to brown 5. Texture / Vesicularity: porphyric, non vesicular 6. Phenocrysts: Plag, 3%, up to 2mm, relatively altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: several small cracks filled with Mn, some red fillings in former mineral shape	X		3	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-72-12	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 11x9x6cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: light grey to slightly orange in the inner part 5. Texture / Vesicularity: porphyric, slightly vesicular, v.:1-2%, sub-mm, unfilled 6. Phenocrysts: Plag, 5%, up to 3mm, relatively altered 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: maybe glass preserved in the rim, but no extra TS, some alteration zones in the interior, cracks filled with sediment	X		3-4	Pl		1		
SO246-DR-72-13	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 11x6x6cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, slightly vesicular, v.:1-2%, sub-mm, unfilled 6. Phenocrysts: Plag, 3%, up to 3mm, relatively altered; maybe Px? up to 1mm 7. Matrix: fine grained 8. Secondary Minerals: Mn dendrites 9. Encrustations: - 10. Comments: some small cracks	X		3-4	Pl Px?		1		
SO246-DR-72-14	1. Rock Type: volcanic, pillow fragment, relatively altered 2. Size: 10x10x5cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: grey, orange parts in the interior 5. Texture / Vesicularity: porphyric, slightly vesicular, v.:~2%, sub-mm, unfilled 6. Phenocrysts: Plag, 5%, up to 2mm, relatively altered 7. Matrix: fine grained 8. Secondary Minerals: Mn dendrites 9. Encrustations: thin Mn-coating 10. Comments:	X		3-4	Pl		1		
SO246-DR-72-15-X	1. Rock Type: volcanic, volcanic-breccia, altered 2. Size: 33x20x15cm 3. Shape / Angularity: angular 4. Color of cut surface: orange-brown, green 5. Texture / Vesicularity: porphyric, slightly vesicular, v.:1%, sub-mm, unfilled 6. Phenocrysts: Plag, 3%, up to 1mm, relatively altered, some have needle shape 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: Mn-coating up to 1cm 10. Comments: archive sample, many orange fragments together with green altered glass (palagonite?) and Mn; cracks filled with sediment and Mn	X					2		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-72-16-Mn	1. Rock Type: Mn-nodule 2. Size: 18x10x7cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: Mn sample								
SO246-DR-72-17-Mn	1. Rock Type: Mn-crust 2. Size: 25x16x8cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: Mn sample								

SO246-DR-73

Description of Location and Structure: Motu Whakaeke seamount, flat-topped structure but probably not a guyot, upper nort eastern slope right beneath top

Dredge on bottom UTC 13/03/16 9:44hrs, lat 45°50.50'S, long 172°00.48'W, depth 3940m

Dredge off bottom UTC 13/03/16 11:07hrs, lat 45°50.98'S, long 172°00.61'W, depth 3623m

total volume: 1/4 full

Comments: pillow fragements, volcaniclastica, Mn-crust

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-73-1	1. Rock Type: volcanic, pillow fragment, fresh 2. Size: 10x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, slightly vesicular, v.: ~10%, up to 1mm, Ø<1mm, mostly filled (white-brown material) 6. Phenocrysts: Plag, 5%, 1mm, moderately fresh 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: iddingsite (1-2%) or red vesicle filling 9. Encrustations: thin Mn-coating, cracks mainly filled with Mn 10. Comments: freshest sample from dredge, but others have more (+fresher) Plag, represents DR73 the best sample and is relatively large, representative fpr LITH 1	X	X	3	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-73-2	1. Rock Type: volcanic, pillow fragment, fresh 2. Size: 9x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly porphyric, slightly vesicular, v.: 5%, up to 1mm in interior, partly >1mm at margins, filled in interior (white-yellowish), unfilled at margins 6. Phenocrysts: Plag, 10%, Ø 1mm, few larger ones, moderately fresh, sometimes needle-shaped 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: vesicle fillings and in some cracks 9. Encrustations: thin Mn-coating 10. Comments: similar to sample 1 but smaller with less Plag	X	X	3-4	Pl		1		
SO246-DR-73-3	1. Rock Type: volcanic, partly altered pillow fragment, moderately fresh 2. Size: 9x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, one margin (former chilled margin) red-brown 5. Texture / Vesicularity: porphyric, vesicular, v.: 10%, sub-mm (unfilled) in grey part, towards/ within brown 3cm thick margin up to 5mm, unfilled 6. Phenocrysts: Plag, 12%, up to 4mm, relatively fresh 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: iddingsite (?) or red vesicle fillings, volcaniclastic material within larger cracks 9. Encrustations: - 10. Comments: maybe one of the best samples for Ar/Ar dating	X	x	2	Pl		1		
SO246-DR-73-4	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 10x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to brown 5. Texture / Vesicularity: slightly porphyric, vesicular, v.: 20%, in grey interior: 1mm, half of it filled (white material); within red/brown margin (~1cm thick) vesicles up to 7mm, unfilled, shows a highly vesicular layer parallel to the rim 6. Phenocrysts: Plag, 5%, up to 4mm, Ø mm-size, fresh 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: 1mm Mn-cover, volcaniclastic palagonite 10. Comments: relatively fresh Plag but too little available?	X	X	3	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-73-5	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 9x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey-brown 5. Texture / Vesicularity: slightly porphyric, vesicular, 1cm below former chilled margin vesicular layer, v.: 20%, unfilled, up to 7mm; interior, v.:3%, mm to sub-mm, mostly filled (white-brown material) 6. Phenocrysts: Plag, 1%, sub-mm in size, moderately altered 7. Matrix: fine grained, homogeneous within layers (vesicular layer compared to former chilled margin and interior of pillow fragment) 8. Secondary Minerals: vesicle fillings 9. Encrustations: thin Mn-coating 10. Comments: some cracks	X	X	5	Pl		1		
SO246-DR-73-6	1. Rock Type: volcanic, pillow fragment, moderately fresh 2. Size: 9x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey interior, brown alteration horizons, red former chilled margin 5. Texture / Vesicularity: slightly porphyric, vesicular, v.: 12%, mm-size up to 5mm, mainly within brown alteration-margin, partly filled with white-yellow clay? 6. Phenocrysts: Plag, 2%, up to 1mm in size, very sparse 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: -	X	X	5	Pl		1		
SO246-DR-73-7	1. Rock Type: volcanic, pillow fragment, strongly altered 2. Size: 20x8x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: red-brown, former chilled margin surrounds entire sample (crosssection of pillow) 5. Texture / Vesicularity: porphyric, vesicular, within alteration horizon v.: 12%, up to 7mm, unfilled; interior, 5%, sub-mm to mm, unfilled 6. Phenocrysts: Plag, 20%, up to 3mm in size, altered but 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: 9. Encrustations: thin Mn-coating, volcaniclastic 10. Comments: some cracks, TS taken to check how fresh Plag is (due to its abundance)	X		5	Pl		1		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-73-8	1. Rock Type: volcanic, pillow fragment, attached to volcaniclastic material (see sample 9-X), pillow moderately altered, volcaniclastica altered to palagonite, dark orange-red former chilled margin + glassy fragments (also orange-red) within volcaniclastica 2. Size: 12x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface : lava: red-brown-grey lava, volcaniclastica: yelloish- green 5. Texture / Vesicularity: porphyric, vesicular, v.: 10%, up to 5mm, partly filled with white clay 6. Phenocrysts: Plag, 1-2%, up to 2mm in size, altered 7. Matrix: fine grained, homogeneous 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: many cracks, TS could be taken from transition between lava and volcaniclastic palagonite, because it represents possibly most of all other lava samples which might all have been embedded within volcaniclastic material						1		
SO246-DR-73-9-X	1. Rock Type: volcaniclastica, altered (palagonite) with possible "fresh" glass fragments? 2. Size: 48x30x15cm 3. Shape / Angularity: rounded 4. Color of cut surface: green-yellow 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: 6cm Mn crust 10. Comments: glassy fragments, sub-cm, 5-10%, red to black in color, sample taken because it represents the largest sample of this dredge, all pillow fragments shwo remnants of this material at their margins. Check if glass-separation is possible. Refer to picture M						1		
SO246-DR-73-10-X	1. Rock Type: volcanic pillow fragment out of sample 9, fresh but too small 2. Size: 8x7x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly porphyric to almost aphyric, vesicular, v.:7%, 1-2mm, unfilled 6. Phenocrysts: Plag, >1%, sub-mm, altered 7. Matrix: fine grained and very homogeneous 8. Secondary Minerals: - 9. Encrustations: volcanic palagonite 10. Comments: thin cracks, only almost aphyric sample out of this dredge, but too small for GC --> check if sample can still be used for further analytics, TS made!	X					2?		

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-73-11-X	1. Rock Type: volcanic pillow fragment, moderately altered 2. Size: 8x7x5cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: similar to sample 1						1		
SO246-DR-73-12-X	1. Rock Type: volcanic pillow fragment, moderately altered 2. Size: 8x7x4cm 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: iddingsite? 9. Encrustations: - 10. Comments: similar to sample 1						1		
SO246-DR-73-13-Mn	1. Rock Type: Mn-crust 2. Size: 13x14x7cm (7cm thickness) 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: crust shows remnants of volcaniclastica like sample 9-X								

SO246-DR-74

Description of Location and Structure: Toitū-ā-Tangaroa guyot, upper NE-slope right beneath plateau margin, between two ridges emanating from the main edifice

Dredge on bottom UTC 13/03/16 23:25hrs, lat 45°03.89'S, long 174°38.40'W, depth 2500m

Dredge off bottom UTC 14/03/16 2:40hrs, lat 45°03.93'S, long 174°38.20'W, depth 2458m

total volume: one rock

Comments: stucked at 2684m and 8t, after third try to release it handed over to the bridge, vessel moved backwards to release dredge

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-74-1	1. Rock Type: volcanic 2. Size: 6.5x4.5x4cm 3. Shape / Angularity: angular 4. Color of cut surface: light and dark grey, yellow and 5. Texture / Vesicularity: aphyric, vesicular, v.: 30-40%, 6. Phenocrysts: - 7. Matrix: fine grained 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: lava sample, too small for GC, only rock	X					1		

Appendix A.7 Rock description

SO246-DR-75

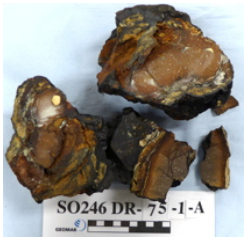
Description of Location and Structure: Te Honu Houkura guyot, upper northern slope beneathl plateau edge

Dredge on bottom UTC 14/03/16 6:38hrs, lat 45°24.03'S, long 175°02.76'W, depth 2725m

Dredge off bottom UTC 14/03/16 7:48hrs, lat 45°24.38'S, long 175°02.87'W, depth 2538m

total volume: two rocks

Comments: volcanic breccia in Mn-crust

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-75-1-A	1. Rock Type: highly altered volcaniclastic rock (pillow breccia) 2. Size: 1A+B: 30x20x9cm 3. Shape / Angularity: rock: angular: clasts: angular 4. Color of cut surface: matrix: whitsh-yellow to black, fragments: reddisch to brown 5. Texture / Vesicularity: porphyric; slightly vesicular, v: 3%, sub-mm vesicles, partly filled with whitish material 6. Phenocrysts: 10% feldspar, up to 3 mm, needles up to 1 mm, fresh in places 7. Matrix: lapilli tuff consisting of angular palagonized glass fragments and lava clasts in an fine-grained matrix (probably altered ash) 8. Secondary Minerals: clay, whitish minerals 9. Encrustations: 5-10cm Mn-crusts, Mn has pentrated to the rock 10. Comments: Sample 1A and B are pieces from the same block; lava clasts show partly altered glassy rims; brownish lava clasts have been sepeprated from most of the Matrix and Mn; in general lava is too altered for geochemical analyses, but feldspar may be suitable for age dating and geochemistry if carefully separated; Preliminary interpretation: This rock represents most likely a top breccia of a submarine (pillow) lava flow						1		
SO246-DR-75-1-B	1. Rock Type: highly altered volcaniclastic rock (pillow breccia) 2. Size: see sample 1A 3. Shape / Angularity: see sample 1A 4. Color of cut surface: see sample 1A, additionally yellowish to grey and greyish clasts 5. Texture / Vesicularity: Lava clasts and matrix see sample 1A, yellowish to grey coarse-grained clasts 6. Phenocrysts: see sample 1A 7. Matrix: see sample 1A 8. Secondary Minerals: see sample 1A 9. Encrustations: see sample 1A 10. Comments: see sample 1A, but this rock contains also clastic fragment (most likely representing an altered coarse-grained tuff) and only modarate altered cm-sized lava fragments (probably too small for geochemisty)								

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-75-2	1. Rock Type: lapilli tuff 2. Size: 14x10x7cm 3. Shape / Angularity: rock: subrounded, lapilli: angular 4. Color of cut surface: orange-brownish-black 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: fine-grained dark material (altered ash?) 8. Secondary Minerals: - 9. Encrustations: up to 5cm thick Mn-crust 10. Comments: most lapilli are palagonized or completely altered (to clay) glass fragments, check rock for spots of fresh glass which could be suitable for microprobe etc., Mn penetrated the rock								

SO246-DR-81

Description of Location and Structure: Te Pū Wharehuna seamount, medium-sized sub-circular guyot, lower northern slope

Dredge on bottom UTC 18/03/16 4:51hrs, lat 45°36.47'S, long 177°33.79'W, depth 3478m

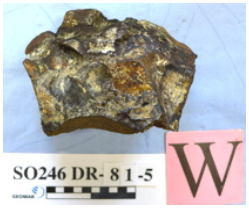
Dredge off bottom UTC 14/03/16 7:48hrs, lat 45°24.38'S, long 175°28.77'W, depth 2538m

total volume: 1/3 full

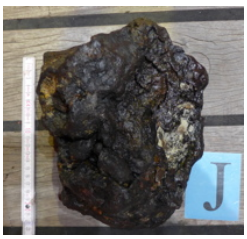
Comments: pillow fragments, manganese crusts

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-81-1	1. Rock Type: volcanic 2. Size: 17x16x6cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric (Plag, Px, Ol?) 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: not prepared on board, probably good for analyses, picture O								
SO246-DR-81-2	1. Rock Type: volcanic, pillow fragment 2. Size: 20x18x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey-brown 5. Texture / Vesicularity: porphyric (Plag, Px, Ol?) 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: not prepared on board, probably good for analyses, picture Z								
SO246-DR-81-3	1. Rock Type: volcanic, pillow fragment 2. Size: 21x18x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey-yellow 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: not prepared on board, probably good for analyses, picture F								

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-81-4	1. Rock Type: volcanic, pillow fragment 2. Size: 21x13x11cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to brown 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: not prepared on board, probably good for analyses, picture M								
SO246-DR-81-5	1. Rock Type: volcanic, pillow fragment 2. Size: 15x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: thin Mn-coating 10. Comments: not prepared on board, probably good for analyses, picture W								
SO246-DR-81-6	1. Rock Type: volcanic 2. Size: 22x15x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: Mn-coating and Mn in cracks 10. Comments: not prepared on board, probably good for analyses, picture L								
SO246-DR-81-7	1. Rock Type: volcanic 2. Size: 17x15x9cm 3. Shape / Angularity: angular 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: not prepared on board, probably good for analyses, picture E								

Appendix A.7 Rock description

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	LITH	NOTES	PICTURE
SO246-DR-81-8	1. Rock Type: volcanic 2. Size: 14x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: not prepared on board, probably good for analyses, picture T								
SO246-DR-81-9 to -17	1. Rock Type: volcanic, pillow fragments 2. Size: 7 to 17cm in diameter 3. Shape / Angularity: - 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: not prepared on board, archive samples								no pictures
SO246-DR-81-18-Mn-X	1. Rock Type: Mn crust with clasts 2. Size: 22x18x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: not prepared on board, archive sample, picture J								
SO246-DR-81-19-X	1. Rock Type: Mn crust with volcanic breccia 2. Size: 25x24x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: not prepared on board, archive sample								no picture
SO246-DR-81-20-Mn	1. Rock Type: Mn crust 2. Size: 20x15x10cm 3. Shape / Angularity: rounded 4. Color of cut surface: - 5. Texture / Vesicularity: - 6. Phenocrysts: - 7. Matrix: - 8. Secondary Minerals: - 9. Encrustations: - 10. Comments: not prepared on board, picture U								

Abkürzungen / Abbreviation

z.W	zu Wasser / into water
a.D.	an Deck / on deck
Slmax	(maximale) Seillänge / max. rope-length
LT	Lottiefe nach EM 122 / Depth of EM 122
W ...	eingesetzte Winde / Winch used
nm	Seemeilen / nautical miles
EM/PS	SIMRAD Multibeam / Parasound
rwk / COG:	Rechtweisender Kurs / true course
d:	Distanz / distance
v:	Geschwindigkeit in Knoten / SOG in knots
SL:	Seillänge / rope-length
SZ:	Seilzug / rope tension

Eingesetzte Geräte / Equiopment used

CTD	8
Dredge	21
Magnetometer	16
2D- Seismik-Profil	10
PAMs	8
Wärmestromsonde	10
Releasertest	1
OBS	8
EM 122-Profil	2
Σ	84

Einsätze / tasks

Geräteverluste / lost Equipment: keine

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_1-1	016/02/01 13:16:35,00	CTD	CTD	station start				f	42° 0,153' S	176° 6,938' E	2669,9	0,3	33,3	3,1	179,9
246_1-1	01.02.2016 13:18:56	CTD	CTD	in the water			EL2	f	42° 0,158' S	176° 6,935' E	2666,4	0,1	30,7	2,5	333,7
246_1-1	01.02.2016 14:25:04	CTD	CTD	max depth/on ground			SLmax: 2500 m	f	42° 0,157' S	176° 6,930' E	2668,3	0,4	49,4	3	8,5
246_1-1	01.02.2016 15:16:03	CTD	CTD	on deck				f	42° 0,157' S	176° 6,937' E	2664,5	0,2	NaN	NaN	169,1
246_2-1	02.02.2016 02:31:31	Magnetometer	MAG	station start				f	43° 10,005' S	178° 39,545' E	405,4	5,9	342,7	1,4	116,2
246_2-1	02.02.2016 02:38:45	Magnetometer	MAG	in the water				f	43° 10,451' S	178° 40,522' E	429,9	8,4	260,5	1,6	125,5
246_2-1	02.02.2016 02:46:17	Magnetometer	MAG	profile start			SLmax: 350 m	f	43° 10,986' S	178° 41,684' E	411,3	8,3	0,2	1,6	124,8
246_2-1	02.02.2016 22:02:16	Magnetometer	MAG	information			Beginn hieven	f	45° 6,002' S	177° 0,723' W	2249,7	7,2	115,1	2,5	178,9
246_2-1	02.02.2016 22:25:29	Magnetometer	MAG	profile end			Magnetometer an Deck	f	45° 9,010' S	177° 1,330' W	2486,2	7,3	118,3	1,5	191,7
246_2-1	02.02.2016 22:25:58	Magnetometer	MAG	station end				f	45° 9,070' S	177° 1,346' W	2349,1	7,6	125,3	2,1	188,2
246_3-1	02.02.2016 22:37:20	Multi Corer	MUC	station start			Beginn Releaser Test	f	45° 9,530' S	177° 1,518' W	2349,7	0,5	123,1	3,5	125,8
246_3-1	02.02.2016 22:37:54	Multi Corer	MUC	in the water			FW1 / SPW1	f	45° 9,531' S	177° 1,518' W	2351,5	0,3	142,1	2,8	311,3
246_3-1	02.02.2016 23:33:24	Multi Corer	MUC	max depth/on ground			SLmax: 2200 m	f	45° 9,532' S	177° 1,519' W	0	0,3	59,6	1,5	152,2
246_3-1	02.02.2016 23:34:47	Multi Corer	MUC	in the water			Transducer	f	45° 9,531' S	177° 1,518' W	0	0	103,3	1,4	318,3
246_3-1	03.02.2016 01:04:34	Multi Corer	MUC	on deck			Transducer	f	45° 9,529' S	177° 1,527' W	0	0,5	188	1,6	257,8
246_3-1	03.02.2016 01:06:48	Multi Corer	MUC	hoisting				f	45° 9,531' S	177° 1,529' W	0	0,4	205,4	3,6	196,3
246_3-1	03.02.2016 02:01:12	Multi Corer	MUC	on deck				f	45° 9,537' S	177° 1,521' W	2344,3	0,3	199	1	160
246_3-1	03.02.2016 02:02:19	Multi Corer	MUC	station end				f	45° 9,539' S	177° 1,521' W	2350,5	0,3	232,3	1,2	61,9
246_4-1	03.02.2016 05:39:09	Dredge	DRG	station start				f	45° 27,661' S	176° 10,696' W	3569,2	9,2	242,3	5,7	103
246_4-1	03.02.2016 05:39:49	Dredge	DRG	alter course			auf 090° rw	f	45° 27,675' S	176° 10,553' W	3603,1	9,3	237,4	5,2	92,8
246_4-1	03.02.2016 05:51:59	Dredge	DRG	alter course			auf 065° rw	f	45° 27,668' S	176° 7,783' W	3087,1	10,1	237,4	5,1	94,4
246_4-1	03.02.2016 06:25:50	Dredge	DRG	alter course			auf 110° rw	f	45° 25,311' S	176° 0,409' W	3284,9	10,2	265,1	5,2	72,7
246_4-1	03.02.2016 06:37:23	Dredge	DRG	alter course			auf 130° rw	f	45° 25,832' S	175° 57,894' W	3436,4	9,8	251,5	5	110,5
246_4-1	03.02.2016 06:57:39	Dredge	DRG	alter course			auf 300° rw	f	45° 27,881' S	175° 54,406' W	3505,6	9,2	261,3	5,9	149,8
246_4-1	03.02.2016 07:56:01	Dredge	DRG	in the water			FW1 / SPW1	f	45° 25,812' S	176° 2,873' W	2789,9	0,9	277,7	5,6	207,7
246_4-1	03.02.2016 08:41:21	Dredge	DRG	max depth/on ground			SL: 2838 m	f	45° 25,827' S	176° 2,874' W	2773,8	0,8	299,3	6,8	266,2
246_4-1	03.02.2016 08:48:17	Dredge	DRG	information			Auslegen: KüG: 180°; d:770 m	f	45° 25,824' S	176° 2,879' W	2766,7	0,4	282,3	6,3	158,2
246_4-1	03.02.2016 09:15:18	Dredge	DRG	max depth/on ground			SLmax: 3150 m	f	45° 26,239' S	176° 2,879' W	2353,2	0,6	290,2	5,6	48,9
246_4-1	03.02.2016 09:16:00	Dredge	DRG	hoisting			Beginn dredgen	f	45° 26,240' S	176° 2,876' W	2351,1	1,2	290,6	4,5	79,8
246_4-1	03.02.2016 09:56:46	Dredge	DRG	information			frei vom Grund: SL: 2345 m	f	45° 26,240' S	176° 2,886' W	2352,1	0,1	261,7	4,7	52,7
246_4-1	03.02.2016 10:48:03	Dredge	DRG	on deck				f	45° 26,241' S	176° 2,891' W	2351,9	0,4	262,4	4,4	120,9
246_4-1	03.02.2016 11:00:28	Dredge	DRG	station end				f	45° 26,242' S	176° 2,891' W	0	0,4	268,4	2	293,9
246_5-1	03.02.2016 12:46:13	Dredge	DRG	station start				f	45° 26,511' S	175° 56,078' W	3633,2	0,3	305,8	2,9	46,9

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_5-1	03.02.2016 12:48:39	Dredge	DRG	in the water			FW1 / SPW1	f	45° 26,511' S	175° 56,077' W	3383,2	1,2	291,9	3,5	180
246_5-1	03.02.2016 13:55:53	Dredge	DRG	information			Beginn Ausstecken KüG 201°	f	45° 26,496' S	175° 56,146' W	3532,8	0,6	299,9	5,4	305,3
246_5-1	03.02.2016 14:25:49	Dredge	DRG	max depth/on ground			SLmax: 3950 m	f	45° 26,893' S	175° 56,379' W	3238,4	1	312,8	5,3	163,9
246_5-1	03.02.2016 14:25:59	Dredge	DRG	hoisting				f	45° 26,893' S	175° 56,380' W	3241,9	0,3	323	5,4	138,4
246_5-1	03.02.2016 16:14:30	Dredge	DRG	on deck				f	45° 26,899' S	175° 56,380' W	3236,5	0,5	324,6	6	154,7
246_5-1	03.02.2016 16:21:27	Dredge	DRG	station end				f	45° 26,898' S	175° 56,376' W	3237,9	0,2	319,8	8,4	334,3
246_6-1	03.02.2016 20:13:44	Dredge	DRG	station start				f	45° 7,713' S	175° 31,100' W	2896,8	0,5	320,3	4,9	160,5
246_6-1	03.02.2016 20:21:39	Dredge	DRG	in the water			FW1 / SPW1	f	45° 7,708' S	175° 31,099' W	2924,1	0,6	327,2	6,9	124,3
246_6-1	03.02.2016 21:20:51	Dredge	DRG	max depth/on ground			Bodenkontakt, SL: 3024m	f	45° 7,714' S	175° 31,098' W	2918,8	0,2	339,3	8,2	281,5
246_6-1	03.02.2016 21:21:14	Dredge	DRG	information			Auslegen: KüG: 176°, d: 730m	f	45° 7,714' S	175° 31,098' W	2910,4	0,2	338,4	7,2	179,1
246_6-1	03.02.2016 21:46:18	Dredge	DRG	hoisting			SLmax: 3330m	f	45° 8,097' S	175° 31,062' W	2637,1	0,3	337,6	5,9	218,7
246_6-1	03.02.2016 22:23:39	Dredge	DRG	information			Frei vom Grund: SL: 2633m	f	45° 8,107' S	175° 31,062' W	2635,9	0,6	346,4	6,2	80,5
246_6-1	03.02.2016 23:17:28	Dredge	DRG	on deck				f	45° 8,105' S	175° 31,056' W	2636,3	0,4	348	9,7	226,7
246_6-1	03.02.2016 23:35:44	Dredge	DRG	station end				f	45° 8,107' S	175° 31,058' W	2968,6	0,2	1,6	7,5	267,9
246_7-1	03.02.2016 23:44:20	CTD	CTD	station start				f	45° 8,101' S	175° 31,062' W	2657,6	0,2	352,1	9,1	149,6
246_7-1	03.02.2016 23:47:01	CTD	CTD	in the water			EL2	f	45° 8,098' S	175° 31,062' W	2666,8	0,2	351,6	8,6	191,2
246_7-1	04.02.2016 00:52:20	CTD	CTD	max depth/on ground			SLmax: 2500 m	f	45° 8,091' S	175° 31,064' W	0	0,7	339,9	6,9	70
246_7-1	04.02.2016 00:53:51	CTD	CTD	in the water			Transducer	f	45° 8,092' S	175° 31,064' W	0	0,5	343,1	8,5	89,8
246_7-1	04.02.2016 00:57:07	CTD	CTD	on deck			Transducer	f	45° 8,093' S	175° 31,064' W	0	0,1	333,2	7,7	141
246_7-1	04.02.2016 00:57:42	CTD	CTD	hoisting				f	45° 8,093' S	175° 31,062' W	0	0,1	335,6	8,4	146,7
246_7-1	04.02.2016 01:47:37	CTD	CTD	on deck				f	45° 8,094' S	175° 31,059' W	2677,2	0,4	334,2	7	51,8
246_7-1	04.02.2016 01:49:09	CTD	CTD	station end				f	45° 8,093' S	175° 31,060' W	2681,8	0,3	337,8	6,9	110,1
246_8-1	04.02.2016 01:57:32	Magnetometer	MAG	station start				f	45° 8,079' S	175° 30,824' W	2635	3,5	339,7	3,2	146,5
246_8-1	04.02.2016 01:57:40	Magnetometer	MAG	in the water			SLmax: 350	f	45° 8,086' S	175° 30,817' W	2635	3,5	316	4,2	138,8
246_8-1	04.02.2016 02:14:05	Magnetometer	MAG	information			PAM zu Wasser	f	45° 9,199' S	175° 30,046' W	2535,3	4,9	340,3	8,1	154,3
246_8-1	04.02.2016 02:30:23	Magnetometer	MAG	information			PAM an Deck	f	45° 10,338' S	175° 29,379' W	2483,6	4,6	338,4	6,5	149,9
246_8-1	04.02.2016 12:28:38	Magnetometer	MAG	alter course			KüG 266° ; d: 14nm	f	46° 54,023' S	174° 40,044' W	5234,4	10,8	325,7	11,8	176,1
246_8-1	04.02.2016 13:41:46	Magnetometer	MAG	alter course			KüG 341° ; d: 146nm	f	46° 55,907' S	174° 58,173' W	5103,9	10,4	337,5	14,6	266,7
246_8-1	05.02.2016 02:10:23	Magnetometer	MAG	alter course			KüG: 091° ; d: 57nm	f	44° 38,911' S	176° 7,130' W	923	11,7	315,2	14	2,1
246_8-1	05.02.2016 07:04:53	Magnetometer	MAG	alter course			KüG: 164°, d: 125nm	f	44° 38,755' S	174° 47,771' W	2080	11,8	326,5	11,5	113,7
246_8-1	05.02.2016 19:16:25	Magnetometer	MAG	information			Beginn hieven	f	46° 49,883' S	173° 53,924' W	5113,7	5,3	288,4	11,9	162,4
246_8-1	05.02.2016 19:27:23	Magnetometer	MAG	information			Magnetometer an Deck	f	46° 50,780' S	173° 53,578' W	5120,4	5,8	278,8	14,7	149,8
246_8-1	05.02.2016 19:27:36	Magnetometer	MAG	station end				f	46° 50,797' S	173° 53,569' W	5121,5	5	284,1	13,5	166,6
246_9-1	05.02.2016 18:16:00	Passive Acustic Monitoring Systen	PAM	in the water			PAM z/W	f	46° 45,120' S	173° 56,020' W	5103,2	5	295,6	12,2	160,8
246_9-1	05.02.2016 18:24:00	Passive Acustic Monitoring Systen	PAM	information			PAM 200m ausgesteckt	f	46° 45,771' S	173° 55,740' W	5099,8	5	282,9	11,5	166,4
246_9-1	05.02.2016 22:32:48	Passive Acustic Monitoring Systen	PAM	on deck			PAM an Deck	f	46° 50,380' S	174° 4,647' W	5338,3	1,4	279,2	10,3	341,8
246_9-1	05.02.2016 22:32:54	Passive Acustic Monitoring Systen	PAM	station end				f	46° 50,380' S	174° 4,649' W	5338,3	0,7	273,7	9,7	233,8
246_10-1	05.02.2016 20:06:58	Seismic Source	SEISSRC	station start			Beginn Test der Airguns	f	46° 51,411' S	173° 56,947' W	5105,1	3,9	271,2	12,6	275
246_10-1	05.02.2016 20:19:05	Seismic Source	SEISSRC	Airgun in water			Stb. Airgun zu Wasser	f	46° 51,397' S	173° 57,422' W	5106,4	1,4	279,8	11,2	259,7
246_10-1	05.02.2016 20:38:22	Seismic Source	SEISSRC	information			Beginn schießen	f	46° 51,274' S	173° 58,600' W	5076,3	2,3	273,9	11,3	285,4
246_10-1	05.02.2016 20:44:45	Seismic Source	SEISSRC	information			Stop schießen	f	46° 51,251' S	173° 58,939' W	5070,7	2,9	276,3	10,8	305,8
246_10-1	05.02.2016 21:15:40	Seismic Source	SEISSRC	information			Stb. Airgun an Deck	f	46° 51,008' S	174° 0,629' W	5062,1	2,5	282,7	9,9	272,2
246_10-1	05.02.2016 21:48:26	Seismic Source	SEISSRC	Airgun in water			Bb. Airgun zu Wasser	f	46° 50,738' S	174° 2,192' W	5325,6	3	269	11,8	284,2
246_10-1	05.02.2016 21:49:07	Seismic Source	SEISSRC	information			Beginn schießen	f	46° 50,731' S	174° 2,247' W	5085,1	4	278,1	11,6	282,1
246_10-1	05.02.2016 21:52:42	Seismic Source	SEISSRC	information			Stop schießen	f	46° 50,681' S	174° 2,597' W	5097,2	4,8	275,2	12	278,1
246_10-1	05.02.2016 22:21:06	Seismic Source	SEISSRC	information			Bb. Airgun an Deck	f	46° 50,477' S	174° 3,994' W	5093	2,3	273,7	11,9	287,8
246_10-1	05.02.2016 22:21:26	Seismic Source	SEISSRC	station end				f	46° 50,473' S	174° 4,015' W	5094,1	2,9	276,4	13,2	288,2
246_11-1	06.02.2016 00:00:38	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 48,630' S	174° 18,777' W	5039,1	1,8	269	15,1	323,6
246_11-1	06.02.2016 00:00:51	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 1	f	46° 45,394' S	174° 19,869' W	5023,2	10,1	278,8	18,5	347,4

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_11-2	06.02.2016 00:44:28	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 43,001' S	174° 21,406' W	4965	2	270,4	13,8	343,8
246_11-2	06.02.2016 00:46:34	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 2	f	46° 42,950' S	174° 21,402' W	4954,5	1	269,7	13,3	24,9
246_11-3	06.02.2016 01:28:03	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 37,293' S	174° 23,882' W	4728,2	2,8	256,8	11,2	313,6
246_11-3	06.02.2016 01:29:49	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 3	f	46° 37,250' S	174° 23,927' W	4731	1,1	259	10,5	19,3
246_11-4	06.02.2016 02:11:30	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 31,740' S	174° 26,404' W	4642,8	1,7	247,2	11,2	262,8
246_11-4	06.02.2016 02:12:50	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 4	f	46° 31,712' S	174° 26,434' W	4639	1,2	255,3	10	315,4
246_11-5	06.02.2016 02:55:22	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 26,004' S	174° 28,936' W	4799,2	2,4	234,3	12,1	340,1
246_11-5	06.02.2016 02:55:45	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 5	f	46° 25,995' S	174° 28,940' W	4798,8	0,5	227,3	11,9	330,9
246_11-6	06.02.2016 03:41:36	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 20,260' S	174° 31,527' W	4873,9	1,2	235	12,1	246,7
246_11-6	06.02.2016 03:42:13	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 6	f	46° 20,264' S	174° 31,539' W	4874	1,1	234,4	11,9	330,5
246_11-7	06.02.2016 04:26:10	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 14,543' S	174° 34,033' W	4882,1	0,6	244,7	10,4	203,2
246_11-7	06.02.2016 04:28:33	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 7	f	46° 14,589' S	174° 33,998' W	4839,7	1,3	232,3	8,8	147,3
246_11-8	06.02.2016 05:11:34	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 8,939' S	174° 36,541' W	4762,5	1,7	218,7	9	265,8
246_11-8	06.02.2016 05:12:49	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 8	f	46° 8,936' S	174° 36,578' W	4761	1,1	232,9	9	229,9
246_11-9	06.02.2016 05:54:14	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 3,281' S	174° 38,937' W	4600,4	2,9	222,4	12,9	309,9
246_11-9	06.02.2016 05:55:37	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 9	f	46° 3,258' S	174° 39,001' W	4598,3	2,3	223,7	10,6	318,1
246_11-10	06.02.2016 06:34:58	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 57,584' S	174° 41,458' W	4408,9	2,7	220,2	10,7	298,6
246_11-10	06.02.2016 06:36:03	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 10	f	45° 57,566' S	174° 41,510' W	4412,2	1,2	220,5	11,9	297,3
246_11-11	06.02.2016 07:17:53	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 51,848' S	174° 43,879' W	4228,4	0,2	202	13,1	320,1
246_11-11	06.02.2016 07:18:54	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 11	f	45° 51,822' S	174° 43,876' W	4228,7	2,9	207,9	10,6	20,2
246_11-12	06.02.2016 08:01:16	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 46,156' S	174° 46,325' W	4098,4	1,3	212,8	11,3	316,8
246_11-12	06.02.2016 08:02:18	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 12	f	45° 46,138' S	174° 46,345' W	4098,8	2,2	209	11,4	324
246_11-13	06.02.2016 08:43:26	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 40,513' S	174° 48,676' W	4269,7	1,6	228,9	10,9	213,3
246_11-13	06.02.2016 08:43:59	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 13	f	45° 40,524' S	174° 48,681' W	4271,2	1,4	220,9	13	239,4
246_11-14	06.02.2016 09:26:24	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 34,769' S	174° 51,175' W	4493,1	1,7	212,9	11,4	323,6
246_11-14	06.02.2016 09:27:21	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 14	f	45° 34,746' S	174° 51,176' W	4390,9	1,9	201,6	14	13,5
246_11-15	06.02.2016 10:11:27	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 29,078' S	174° 53,635' W	4178,1	1,9	205,7	13,7	344,2
246_11-15	06.02.2016 10:11:59	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 15	f	45° 29,065' S	174° 53,637' W	4182,7	3,4	205,2	10	7,4
246_11-16	06.02.2016 10:53:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 23,492' S	174° 56,035' W	3861,1	1,3	193,1	12,2	326,3
246_11-16	06.02.2016 10:54:02	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 16	f	45° 23,474' S	174° 56,056' W	3843,5	1,5	195,9	11,3	323,8
246_11-17	06.02.2016 11:35:16	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 17,856' S	174° 58,492' W	4063	2,6	188,5	9,4	335,5
246_11-17	06.02.2016 11:36:33	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 17	f	45° 17,830' S	174° 58,525' W	4060,5	2,5	199	10,9	0,1
246_11-18	06.02.2016 12:19:16	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 12,154' S	175° 0,923' W	4212,5	1,7	207,9	13,8	294,9
246_11-18	06.02.2016 12:20:13	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 18	f	45° 12,131' S	175° 0,947' W	4454	1,3	210,4	13,1	337,8
246_11-19	06.02.2016 13:00:15	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 6,491' S	175° 3,106' W	4063,1	3,4	182,4	8,2	322,5
246_11-19	06.02.2016 13:01:43	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 19	f	45° 6,462' S	175° 3,180' W	4059,5	1,9	186,7	9	295,4
246_11-20	06.02.2016 13:43:26	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 0,784' S	175° 5,625' W	3259,6	1,6	171	10,9	307,7
246_11-20	06.02.2016 13:44:06	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OSB 20	f	45° 0,776' S	175° 5,650' W	4057,3	1	180,8	13,5	268,1
246_11-21	06.02.2016 14:27:06	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 54,993' S	175° 7,855' W	2769,2	1,4	186,4	9	283,9
246_11-21	06.02.2016 14:29:14	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 21	f	44° 54,955' S	175° 7,914' W	2767,9	0,7	197,6	14,2	288,8
246_11-22	06.02.2016 15:08:27	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 49,336' S	175° 10,556' W	2342,3	2,2	192,9	10,4	248,9
246_11-22	06.02.2016 15:10:06	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 22	f	44° 49,334' S	175° 10,618' W	2341,7	2,1	195	8,9	284,5
246_11-23	06.02.2016 15:53:22	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 43,595' S	175° 12,895' W	1709,7	2,3	179,9	7,2	279,5
246_11-23	06.02.2016 15:54:34	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 23	f	44° 43,590' S	175° 12,932' W	1714,5	0,3	182	8,6	312
246_11-24	06.02.2016 16:36:43	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 38,050' S	175° 15,259' W	1334,1	0,7	187,6	5,1	233,4
246_11-24	06.02.2016 16:37:30	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 24	f	44° 38,049' S	175° 15,271' W	1349,4	1,6	205,8	6,5	265,1
246_11-25	06.02.2016 17:20:55	Seismic Ocean Bottom Receiver	SEISOBR	information				f	44° 32,309' S	175° 17,698' W	1051,3	1,8	NaN	NaN	206,4
246_11-25	06.02.2016 17:22:11	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 25	f	44° 32,324' S	175° 17,717' W	1054,5	2,2	195,6	6,8	251,2
246_11-26	06.02.2016 18:07:27	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 26,568' S	175° 19,924' W	525,7	2	164	8,5	230,7

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_11-26	06.02.2016 18:08:50	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 26	f	44° 26,574' S	175° 19,962' W	1045,1	0,3	173,8	11,6	209,4
246_11-27	06.02.2016 18:51:59	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 20,877' S	175° 22,348' W	399,4	1,6	169,5	8,6	216,8
246_11-27	06.02.2016 18:52:53	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 27	f	44° 20,890' S	175° 22,371' W	398,5	0,8	171,8	8	208,8
246_11-28	06.02.2016 19:40:14	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 15,195' S	175° 24,657' W	414,5	0,8	178,6	7,6	199,5
246_11-28	06.02.2016 19:41:14	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 28	f	44° 15,193' S	175° 24,661' W	414,6	0,7	183	9,1	1,7
246_11-29	06.02.2016 20:25:07	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 9,504' S	175° 26,959' W	405,7	0,6	173	7,5	302,4
246_11-29	06.02.2016 20:26:11	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 29	f	44° 9,494' S	175° 26,961' W	1225,6	0,7	182,3	8,3	221,4
246_11-30	06.02.2016 21:06:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 3,771' S	175° 29,121' W	1296,1	1,1	150,8	9,6	309,8
246_11-30	06.02.2016 21:06:49	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 30	f	44° 3,761' S	175° 29,131' W	1251,5	1,6	158,9	10	328,3
246_11-31	06.02.2016 21:49:28	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 58,159' S	175° 31,450' W	315,4	1,1	145,6	7,4	307,1
246_11-31	06.02.2016 21:50:34	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 31	f	43° 58,155' S	175° 31,456' W	315	0,7	151,5	6,4	288,8
246_11-32	06.02.2016 22:33:41	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 52,470' S	175° 33,785' W	144	0,5	155,9	8,4	277,1
246_11-32	06.02.2016 22:34:29	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 32	f	43° 52,465' S	175° 33,792' W	143,7	0,3	164,6	8,9	255,7
246_11-33	06.02.2016 23:17:19	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 46,704' S	175° 36,004' W	325,8	1,9	151,4	7	259,7
246_11-33	06.02.2016 23:18:04	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 33	f	43° 46,709' S	175° 36,035' W	326,2	2	157	7,8	268,2
246_11-34	07.02.2016 00:00:49	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 41,085' S	175° 38,257' W	356,9	1,6	151,7	7,1	279,6
246_11-34	07.02.2016 00:01:11	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 34	f	43° 41,087' S	175° 38,270' W	355,8	1,1	151,7	7,8	254,1
246_11-35	07.02.2016 00:43:11	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 35,272' S	175° 40,660' W	235,5	1,8	150,3	7,2	267,1
246_11-35	07.02.2016 00:44:30	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 35	f	43° 35,265' S	175° 40,709' W	235,7	1,6	136,7	7,4	282,1
246_11-36	07.02.2016 01:23:56	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 29,565' S	175° 42,899' W	443,8	1,4	142,7	6,8	286,4
246_11-36	07.02.2016 01:25:16	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 36	f	43° 29,560' S	175° 42,940' W	442,1	1,4	127,7	8,5	276,1
246_11-37	07.02.2016 02:00:44	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 23,962' S	175° 45,071' W	461,1	2,4	139,2	6,6	241,3
246_11-37	07.02.2016 02:02:23	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 37	f	43° 23,992' S	175° 45,136' W	463,1	1,7	140,6	6,1	231
246_11-38	07.02.2016 02:41:04	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 18,193' S	175° 47,432' W	533,7	2,6	126	5,2	234,4
246_11-38	07.02.2016 02:42:13	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 38	f	43° 18,208' S	175° 47,477' W	535,2	2	134	6,4	251,1
246_11-39	07.02.2016 03:22:06	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 12,466' S	175° 49,789' W	598,5	1,7	150,7	6,8	239,9
246_11-39	07.02.2016 03:23:03	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 39	f	43° 12,474' S	175° 49,818' W	598,2	1,6	155,3	7,6	216,7
246_11-40	07.02.2016 04:03:02	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 6,724' S	175° 52,111' W	655,4	1,6	142,7	7,5	224,9
246_11-40	07.02.2016 04:04:25	Seismic Ocean Bottom Receiver	SEISOBR	OBS deployed			OBS 40	f	43° 6,731' S	175° 52,147' W	654,8	0,9	137,7	7,7	266,7
246_12-1	07.02.2016 06:45:07	Passive Acustic Monitoring Systen	PAM	in the water			PAM z/W	f	42° 40,947' S	176° 1,659' W	1576	5,4	132,6	8,1	180,1
246_12-1	07.02.2016 06:51:25	Passive Acustic Monitoring Systen	PAM	information			PAM 200 m ausgesteckt	f	42° 41,436' S	176° 1,429' W	1541,7	5,3	130,1	8,2	167,1
246_12-1	08.02.2016 09:06:45	Passive Acustic Monitoring Systen	PAM	information			PAM defekt, wird eingeholt	f	44° 42,620' S	175° 13,304' W	1345,8	4,9	89,2	3,2	157,4
246_12-1	08.02.2016 09:25:41	Passive Acustic Monitoring Systen	PAM	information			PAM wird wieder ausgesteckt	f	44° 44,127' S	175° 12,683' W	1787,6	4,7	64,2	4,4	170,3
246_12-1	08.02.2016 09:28:40	Passive Acustic Monitoring Systen	PAM	information			PAM wird wegen Kabelbruch ganz ei	f	44° 44,367' S	175° 12,586' W	1847	5	35,4	3,7	161,2
246_12-1	08.02.2016 09:29:57	Passive Acustic Monitoring Systen	PAM	on deck			PAM an Deck	f	44° 44,469' S	175° 12,541' W	1869,7	5	36,9	3,1	164
246_12-1	08.02.2016 09:47:31	Passive Acustic Monitoring Systen	PAM	information			PAM wurde ausgetauscht und wir wieder a	f	44° 45,877' S	175° 11,950' W	2071	5,3	57,1	4,9	150,1
246_12-1	08.02.2016 10:22:26	Passive Acustic Monitoring Systen	PAM	in the water			PAM ausgesteckt	f	44° 48,629' S	175° 10,801' W	2315,8	4,4	54,2	4,5	162,9
246_12-1	09.02.2016 13:55:07	Passive Acustic Monitoring Systen	PAM	profile end			Profilende Seismik	f	46° 59,960' S	174° 14,324' W	4902,7	4,7	300,3	6,8	162,2
246_12-1	11.02.2016 20:05:44	Passive Acustic Monitoring Systen	PAM	station end			PAM an Deck	f	42° 54,782' S	175° 56,484' W	854,2	3,7	347,4	3,4	342,9
246_13-1	07.02.2016 06:54:51	Seismic Towed Receiver	SEISTR	station start			Endboje z/W	f	42° 41,666' S	176° 1,338' W	1524,7	2,7	121,8	7,2	169,8
246_13-1	07.02.2016 08:32:00	Seismic Towed Receiver	SEISTR	MCS in water				f	42° 47,066' S	175° 59,313' W	1190,4	3,1	127,3	5,1	165,7
246_13-1	07.02.2016 08:48:12	Seismic Towed Receiver	SEISTR	information			Stb. Airgun zu Wasser	f	42° 47,921' S	175° 59,003' W	1145,1	3,2	125,6	5,8	156,4
246_13-1	07.02.2016 09:02:08	Seismic Towed Receiver	SEISTR	information			Bb. Airgun zu Wasser	f	42° 48,636' S	175° 58,731' W	1109,2	3,3	151,6	6,9	159,2
246_13-1	07.02.2016 09:05:16	Seismic Towed Receiver	SEISTR	profile start			Beginn schießen, rwK: 165°	f	42° 48,786' S	175° 58,675' W	1101,1	3,1	125,4	6,1	140,7
246_13-1	08.02.2016 17:01:17	Seismic Towed Receiver	SEISTR	information			Kanonen wegen Walen abgestellt, Unterbr	f	45° 20,314' S	174° 57,480' W	4302,8	4,8	345,1	5,6	165,9
246_13-1	08.02.2016 17:32:02	Seismic Towed Receiver	SEISTR	information			Beginn Softstart, Ende Unterbrech	f	45° 22,770' S	174° 56,421' W	3877,5	5,1	339,4	5,3	174,3
246_13-1	08.02.2016 17:55:13	Seismic Towed Receiver	SEISTR	information			Kanonen wieder volle Leistung	f	45° 24,634' S	174° 55,637' W	3968,8	4,8	17,5	5,4	165,8
246_13-1	09.02.2016 13:51:28	Seismic Towed Receiver	SEISTR	profile end				f	46° 59,674' S	174° 14,445' W	4898,9	5,2	323,6	9,7	155,9
246_13-1	09.02.2016 13:55:41	Seismic Towed Receiver	SEISTR	station end				f	47° 0,004' S	174° 14,300' W	4902,5	5	317,2	9,4	157,7

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_14-1	07.02.2016 09:08:05	Magnetometer	MAG	station start				f	42° 48,927' S	175° 58,623' W	1095,1	3,3	127,7	7	156,6
246_14-1	07.02.2016 09:22:43	Magnetometer	MAG	in the water			SL: 350 m	f	42° 49,872' S	175° 58,263' W	1046,1	4,9	125,9	6	166,4
246_14-1	09.02.2016 05:11:32	Magnetometer	MAG	information			Beginn Einholen, techn. Defek	f	46° 18,375' S	174° 32,364' W	4854,6	4,9	1,9	7,3	150,5
246_14-1	09.02.2016 05:23:54	Magnetometer	MAG	information			a/D	f	46° 19,356' S	174° 31,940' W	4886,2	5,3	15,6	7,5	156,2
246_14-1	09.02.2016 05:26:00	Magnetometer	MAG	information			geht wieder Z/W, soweit ok	f	46° 19,524' S	174° 31,866' W	4892,2	5,4	336,4	4,1	167,5
246_14-1	09.02.2016 05:43:25	Magnetometer	MAG	in the water			300m wieder z/W	f	46° 20,904' S	174° 31,251' W	4844,6	4,9	353,1	4,5	160,9
246_14-1	09.02.2016 12:37:16	Magnetometer	MAG	information			Einholen wegen Defekt am Ger	f	46° 53,779' S	174° 16,831' W	5038,1	4,8	332,3	8,2	159
246_14-1	09.02.2016 12:58:26	Magnetometer	MAG	information			an Deck	f	46° 55,437' S	174° 16,161' W	4990,6	5	323,4	7,8	163,6
246_14-1	09.02.2016 13:00:36	Magnetometer	MAG	station end				f	46° 55,607' S	174° 16,093' W	4983,7	4,8	339,6	8,3	163,9
246_15-1	09.02.2016 16:08:43	Magnetometer	MAG	station start			geht z/W	f	47° 0,989' S	174° 13,927' W	5008,5	4,9	207,3	8,7	340,7
246_15-1	09.02.2016 16:29:55	Magnetometer	MAG	profile start			300m ausgesteckt	f	46° 59,273' S	174° 14,597' W	4901,7	5	209,8	9,5	340,5
246_15-1	10.02.2016 03:44:41	Magnetometer	MAG	information			Einholen wegen techn. Defekt, Austausch Pro	f	46° 5,763' S	174° 37,896' W	4667,9	5	182,9	2	342,1
246_15-1	10.02.2016 03:56:06	Magnetometer	MAG	information			a/D	f	46° 4,861' S	174° 38,300' W	4634,8	4,9	177,2	1,5	347,6
246_15-1	10.02.2016 04:07:35	Magnetometer	MAG	information			Ersatz z/W	f	46° 3,957' S	174° 38,692' W	4620,9	4,9	157,9	1,3	342,8
246_15-1	10.02.2016 04:20:18	Magnetometer	MAG	information			300m ausgesteckt, Fortsetzung Pr	f	46° 2,927' S	174° 39,133' W	4587,1	4,9	201,8	1,9	336,1
246_15-1	11.02.2016 18:54:14	Magnetometer	MAG	profile end			Beginn Einholen	f	42° 58,790' S	175° 54,967' W	770,7	5,1	295,8	4,4	346,9
246_15-1	11.02.2016 19:05:32	Magnetometer	MAG	station end			Magnetomeer an Deck	f	42° 57,910' S	175° 55,289' W	785,8	5	303,4	4,1	356,4
246_16-1	09.02.2016 16:25:52	Seismic Source	SEISSRC	station start				f	46° 59,599' S	174° 14,468' W	4919,2	5,3	208,6	7,6	349,3
246_16-1	09.02.2016 16:25:59	Seismic Source	SEISSRC	profile start			Softstart	f	46° 59,590' S	174° 14,472' W	4921	5,3	205,1	6,5	344
246_16-1	11.02.2016 19:06:39	Seismic Source	SEISSRC	profile end				f	42° 57,822' S	175° 55,320' W	789,1	5	295,3	4	353,5
246_16-1	11.02.2016 19:24:17	Seismic Source	SEISSRC	information			Bb. Airgun an Deck	f	42° 56,825' S	175° 55,698' W	813,5	3	280,9	4,7	354
246_16-1	11.02.2016 19:57:02	Seismic Source	SEISSRC	information			Stb. Airgun an Deck	f	42° 55,278' S	175° 56,270' W	842,5	2,8	319,3	2,5	348,1
246_16-1	11.02.2016 20:08:00	Seismic Source	SEISSRC	information			Beginn Einholen Streamer	f	42° 54,641' S	175° 56,541' W	0	4,1	0,8	3,6	348,4
246_16-1	11.02.2016 21:40:29	Seismic Source	SEISSRC	on deck				f	42° 50,273' S	175° 58,583' W	1033,7	2,8	312,5	3,6	349,9
246_16-1	11.02.2016 21:40:39	Seismic Source	SEISSRC	station end				f	42° 50,265' S	175° 58,586' W	1032,4	3,3	312	3,4	354,1
246_17-1	11.02.2016 23:04:31	CTD	CTD	station start				f	43° 0,679' S	175° 54,246' W	737,4	0,5	312,1	3,2	237,1
246_17-1	11.02.2016 23:06:05	CTD	CTD	in the water				f	43° 0,682' S	175° 54,250' W	737,2	0,4	322,7	2,9	165,5
246_17-1	11.02.2016 23:27:23	CTD	CTD	max depth/on ground			SLmax: 700m	f	43° 0,682' S	175° 54,246' W	737,4	0,2	333,2	3,7	49,9
246_17-1	11.02.2016 23:44:25	CTD	CTD	on deck				f	43° 0,687' S	175° 54,254' W	739,2	0,4	314,2	4,9	339,6
246_17-1	11.02.2016 23:44:55	CTD	CTD	station end				f	43° 0,687' S	175° 54,254' W	737,1	0,2	323,8	4,2	358,2
246_18-1	11.02.2016 23:53:14	Heat-Flow probe	HF	station start				f	43° 0,693' S	175° 54,253' W	0	0,6	308,8	5,1	242,6
246_18-1	11.02.2016 23:56:37	Heat-Flow probe	HF	in the water			FW1/SPW1	f	43° 0,687' S	175° 54,243' W	0	0,1	324,1	5,4	123,5
246_18-1	12.02.2016 00:19:59	Heat-Flow probe	HF	max depth/on ground			SLmax: 750m	f	43° 0,677' S	175° 54,254' W	737,6	0,7	310	4,3	210,7
246_18-1	12.02.2016 00:29:26	Heat-Flow probe	HF	hoisting			SZmax: 17kn	f	43° 0,685' S	175° 54,251' W	735,8	0,3	310,3	3,9	148,4
246_18-1	12.02.2016 00:53:41	Heat-Flow probe	HF	on deck				f	43° 0,689' S	175° 54,254' W	736,8	0,3	329,2	4,2	271,2
246_18-1	12.02.2016 00:55:49	Heat-Flow probe	HF	station end				f	43° 0,691' S	175° 54,259' W	737,5	0,1	326,8	4,7	14,6
246_19-1	12.02.2016 00:59:51	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 40	f	43° 0,688' S	175° 54,260' W	0	0,4	343,6	5,5	29,3
246_19-1	12.02.2016 01:00:04	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon zu Wasser	f	43° 0,688' S	175° 54,260' W	0	0,6	342,5	5,3	34
246_19-1	12.02.2016 01:07:32	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon an Deck	f	43° 0,694' S	175° 54,250' W	0	0,2	339,9	4,7	349,9
246_19-1	12.02.2016 02:07:33	Seismic Ocean Bottom Receiver	SEISOBR	released				f	43° 6,399' S	175° 52,128' W	0	3,5	312,7	6,2	196,4
246_19-1	12.02.2016 02:17:13	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 6,660' S	175° 52,047' W	0	0,4	325,8	5,5	149,7
246_19-1	12.02.2016 02:24:47	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 6,917' S	175° 52,065' W	654	1,5	322,2	5,4	181,3
246_19-1	12.02.2016 02:25:10	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 6,927' S	175° 52,064' W	654,4	1,7	322,1	5,7	179,2
246_19-2	12.02.2016 03:04:30	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 12,067' S	175° 49,818' W	603,7	1,8	312,9	3,4	156
246_19-2	12.02.2016 03:04:36	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 39	f	43° 12,070' S	175° 49,817' W	603,1	1,7	317,4	3,7	185,3
246_19-2	12.02.2016 03:28:33	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 12,082' S	175° 49,935' W	592,6	0,8	309,6	1,6	286,1
246_19-2	12.02.2016 03:36:26	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 12,491' S	175° 49,792' W	597,2	0,7	307,2	4,5	163,6
246_19-2	12.02.2016 03:38:16	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 12,532' S	175° 49,776' W	597,5	1,9	314,4	2,9	150,1
246_19-3	12.02.2016 04:25:51	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 17,725' S	175° 47,694' W	531,5	1,4	311,9	2,7	157,9

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_19-3	12.02.2016 04:26:00	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 38	f	43° 17,728' S	175° 47,692' W	531,5	1,1	317,6	3,3	138
246_19-3	12.02.2016 04:33:11	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 17,725' S	175° 47,714' W	539,1	0,1	300,1	2,4	150,6
246_19-3	12.02.2016 04:43:53	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 18,044' S	175° 47,550' W	536,1	1,7	311,1	2,9	278,9
246_19-3	12.02.2016 04:45:40	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 18,065' S	175° 47,555' W	535,6	2,9	316,5	3,9	183,5
246_20-1	12.02.2016 05:06:07	Heat-Flow probe	HF	station start				f	43° 18,137' S	175° 47,515' W	535,2	1,1	321,7	3,7	255,6
246_20-1	12.02.2016 05:07:28	Heat-Flow probe	HF	in the water			FW1/SPW1	f	43° 18,141' S	175° 47,540' W	535,8	0,4	318,1	3,9	102,4
246_20-1	12.02.2016 05:21:54	Heat-Flow probe	HF	max depth/on ground			SLmax: 550 m	f	43° 18,134' S	175° 47,524' W	536,5	0,4	321	4,1	34,9
246_20-1	12.02.2016 05:29:54	Heat-Flow probe	HF	hoisting			SZ max: 14,1 kN	f	43° 18,135' S	175° 47,521' W	536,5	0,2	318,7	3,3	188,6
246_20-1	12.02.2016 05:49:18	Heat-Flow probe	HF	on deck				f	43° 18,132' S	175° 47,520' W	536	0,3	318,9	3,9	130,9
246_20-1	12.02.2016 05:50:30	Heat-Flow probe	HF	station end				f	43° 18,133' S	175° 47,520' W	536,7	0,2	315,5	3,7	119,6
246_19-4	12.02.2016 06:37:52	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 23,294' S	175° 45,433' W	463,4	5,4	325,5	4,2	155,5
246_19-4	12.02.2016 06:37:58	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 37	f	43° 23,303' S	175° 45,430' W	463,4	5,2	328,5	4,3	167,2
246_19-4	12.02.2016 06:38:17	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 23,328' S	175° 45,418' W	463,4	5,2	329	4,1	156,8
246_19-4	12.02.2016 07:01:16	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 23,944' S	175° 45,035' W	463,6	0,9	314,4	3,6	93,1
246_19-4	12.02.2016 07:01:38	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 23,945' S	175° 45,034' W	464,8	1,3	328,2	3,7	251,9
246_19-5	12.02.2016 07:47:48	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 28,853' S	175° 43,248' W	433,7	2,3	303,2	3,2	174
246_19-5	12.02.2016 07:48:01	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 36	f	43° 28,860' S	175° 43,245' W	436,6	2,1	337,2	1,6	170,5
246_19-5	12.02.2016 07:53:20	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 28,926' S	175° 43,221' W	444,6	0,1	321	2,9	244,9
246_19-5	12.02.2016 08:06:09	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 29,406' S	175° 43,164' W	442,7	0,2	326,4	2,8	198,4
246_19-5	12.02.2016 08:06:25	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 29,408' S	175° 43,165' W	442,4	0,5	313,3	3,5	80,4
246_21-1	12.02.2016 08:12:43	Heat-Flow probe	HF	station start				f	43° 29,346' S	175° 43,165' W	443,8	0,7	320,3	4,3	334,8
246_21-1	12.02.2016 08:20:46	Heat-Flow probe	HF	in the water			FW1/SPW1	f	43° 29,349' S	175° 43,160' W	443,5	0,4	325,9	5,3	319
246_21-1	12.02.2016 08:31:42	Heat-Flow probe	HF	max depth/on ground			SLmax: 456 m	f	43° 29,350' S	175° 43,161' W	446,9	0,1	325,4	4,4	87,9
246_21-1	12.02.2016 08:40:45	Heat-Flow probe	HF	hoisting			SZmax: 7,2 kN	f	43° 29,350' S	175° 43,162' W	446,8	0,1	320,8	4,4	330,3
246_21-1	12.02.2016 08:54:43	Heat-Flow probe	HF	on deck				f	43° 29,352' S	175° 43,154' W	447,8	0,1	329,8	4,4	333,9
246_21-1	12.02.2016 08:57:33	Heat-Flow probe	HF	station end				f	43° 29,351' S	175° 43,155' W	442,8	0,3	322,3	4	215,7
246_19-6	12.02.2016 09:48:17	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 34,639' S	175° 40,801' W	253,7	2,7	316,1	5,6	156,2
246_19-6	12.02.2016 09:48:27	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 35	f	43° 34,645' S	175° 40,797' W	253,7	2,5	332,3	5	155,2
246_19-6	12.02.2016 09:54:40	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 34,748' S	175° 40,702' W	253,3	0,5	47,2	1,4	91,9
246_19-6	12.02.2016 10:13:37	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 35,539' S	175° 40,347' W	221,1	2,8	326,5	6,3	165,5
246_19-6	12.02.2016 10:13:43	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 35,544' S	175° 40,345' W	220,5	2,7	325,2	5,4	166,8
246_19-7	12.02.2016 10:53:48	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 40,193' S	175° 38,349' W	341,5	4,5	311,2	5	155,3
246_19-7	12.02.2016 10:53:53	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 34	f	43° 40,198' S	175° 38,345' W	341,5	4,5	319	4,6	161
246_19-7	12.02.2016 10:58:39	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 40,418' S	175° 38,241' W	354,4	1,7	322,8	5,2	148,9
246_19-7	12.02.2016 11:21:11	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 40,796' S	175° 38,561' W	352,6	0,4	333,7	5,7	12,2
246_19-7	12.02.2016 11:21:36	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 40,792' S	175° 38,565' W	352,4	0,4	329	4,9	76,2
246_19-8	12.02.2016 12:14:21	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 45,936' S	175° 36,008' W	0	3,8	314,8	3,7	159,8
246_19-8	12.02.2016 12:16:19	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 33	f	43° 46,050' S	175° 35,974' W	0	3	306,4	3,8	168,2
246_19-8	12.02.2016 12:21:30	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 46,298' S	175° 35,908' W	0	2,2	322	3,8	168,4
246_19-8	12.02.2016 12:40:16	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 46,820' S	175° 36,148' W	0	0,3	327	5,2	215,9
246_19-8	12.02.2016 12:40:27	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 46,822' S	175° 36,148' W	0	0,6	324,5	4,5	159,7
246_19-9	12.02.2016 13:28:43	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 51,776' S	175° 33,908' W	156,6	5,3	331,8	6,1	223
246_19-9	12.02.2016 13:30:52	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 32	f	43° 51,921' S	175° 34,126' W	150,1	6,4	325,1	6,6	225,6
246_19-9	12.02.2016 13:39:33	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 52,418' S	175° 33,944' W	0	3,9	334,2	4	135,2
246_19-9	12.02.2016 13:50:00	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 52,680' S	175° 33,574' W	0	0,9	333,4	4,6	127,9
246_19-9	12.02.2016 13:50:18	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 52,685' S	175° 33,569' W	0	1	337,7	4,4	136,4
246_19-10	12.02.2016 14:28:21	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 57,127' S	175° 32,299' W	263,7	7,2	305,3	5	174,1
246_19-10	12.02.2016 14:32:39	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 31	f	43° 57,582' S	175° 32,283' W	266	4,6	317,6	4,9	177,6
246_19-10	12.02.2016 14:37:48	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 57,874' S	175° 32,203' W	295,4	2,4	326,3	2,1	135,8

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_19-10	12.02.2016 15:00:39	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	43° 58,366' S	175° 31,331' W	336,1	1,7	314,3	5,2	182,8
246_19-10	12.02.2016 15:00:43	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 58,368' S	175° 31,332' W	334,9	1,6	317,9	5	204,1
246_19-11	12.02.2016 15:29:01	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 1,809' S	175° 30,039' W	399,2	7,9	301,4	6,1	163,7
246_19-11	12.02.2016 15:29:03	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 30	f	44° 1,813' S	175° 30,038' W	399,2	8,3	293,8	6,3	167,7
246_19-11	12.02.2016 15:34:55	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 2,607' S	175° 29,724' W	415,4	8,9	285	6,6	164,3
246_19-11	12.02.2016 16:05:53	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	44° 4,283' S	175° 29,086' W	425,9	0,8	292,9	4,7	170,8
246_19-11	12.02.2016 16:06:23	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 4,291' S	175° 29,085' W	426,9	0,8	291,5	5	153
246_22-1	12.02.2016 16:09:16	Heat-Flow probe	HF	station start				f	44° 4,325' S	175° 29,068' W	425	1	294,3	4,5	235,4
246_22-1	12.02.2016 16:13:46	Heat-Flow probe	HF	in the water			FW1/SPW1	f	44° 4,311' S	175° 29,076' W	425,9	0,2	288,4	5	215
246_22-1	12.02.2016 16:28:00	Heat-Flow probe	HF	max depth/on ground			SLmax: 437 m	f	44° 4,317' S	175° 29,086' W	425,4	0,3	291,3	3,2	68,7
246_22-1	12.02.2016 16:33:39	Heat-Flow probe	HF	hoisting			SZ max: 8,8 kN	f	44° 4,316' S	175° 29,084' W	425,4	1	300,2	4,4	291,3
246_22-1	12.02.2016 16:50:10	Heat-Flow probe	HF	on deck				f	44° 4,316' S	175° 29,084' W	425,5	0,1	307	3,8	18,1
246_22-1	12.02.2016 16:52:49	Heat-Flow probe	HF	station end				f	44° 4,318' S	175° 29,085' W	425,5	0,3	307,1	3,7	217,2
246_19-12	12.02.2016 17:29:29	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 8,143' S	175° 27,498' W	401,3	7,6	298,5	3,2	163,5
246_19-12	12.02.2016 17:31:04	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 29	f	44° 8,346' S	175° 27,427' W	390,8	7,5	299,8	3	161,5
246_19-12	12.02.2016 17:42:29	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 9,136' S	175° 27,091' W	390,8	2,8	284,9	4,1	341,2
246_19-12	12.02.2016 17:55:45	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	44° 9,463' S	175° 26,977' W	407,9	0,7	297	3,5	97
246_19-12	12.02.2016 17:55:50	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 9,464' S	175° 26,977' W	408,1	0,6	294,5	4,3	258,9
246_23-1	12.02.2016 17:56:47	Heat-Flow probe	HF	station start				f	44° 9,463' S	175° 26,978' W	407,1	0,1	296,8	3,3	355,7
246_23-1	12.02.2016 18:01:32	Heat-Flow probe	HF	in the water			FW1/SPW1	f	44° 9,464' S	175° 26,978' W	405,4	0,2	303,3	3,7	278,7
246_23-1	12.02.2016 18:13:51	Heat-Flow probe	HF	max depth/on ground			SLmax: 410 m	f	44° 9,457' S	175° 26,984' W	407,4	0,5	310,8	3,9	77,6
246_23-1	12.02.2016 18:14:03	Heat-Flow probe	HF	information			Lanze umgekippt, kommt a/D zur Ko	f	44° 9,457' S	175° 26,984' W	405,7	0,3	309,9	3,6	338
246_23-1	12.02.2016 18:24:37	Heat-Flow probe	HF	in the water			erneut z/W; FW1 / SPW1	f	44° 9,462' S	175° 26,985' W	404,6	0,1	306,8	3,5	250,7
246_23-1	12.02.2016 18:39:12	Heat-Flow probe	HF	max depth/on ground			SLmax: 415 m	f	44° 9,457' S	175° 26,984' W	406,5	0,5	297,7	3,5	123
246_23-1	12.02.2016 18:47:32	Heat-Flow probe	HF	hoisting			SZ max 7,2 kN	f	44° 9,464' S	175° 26,984' W	407	0,3	282,8	4,1	112,9
246_23-1	12.02.2016 19:00:03	Heat-Flow probe	HF	on deck				f	44° 9,460' S	175° 26,973' W	407,4	0,3	275,2	3,9	334,2
246_23-1	12.02.2016 19:01:03	Heat-Flow probe	HF	station end				f	44° 9,460' S	175° 26,975' W	407,1	0,4	276,5	3,6	308,5
246_19-13	12.02.2016 19:47:06	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 28 ausgelöst	f	44° 14,618' S	175° 24,539' W	340,2	5,3	309,9	2,4	171,2
246_19-13	12.02.2016 19:53:44	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 14,893' S	175° 24,652' W	392,5	1	332,3	2,3	241,5
246_19-13	12.02.2016 20:02:46	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	44° 15,078' S	175° 24,676' W	405,9	0,6	314,7	2,1	27,3
246_19-14	12.02.2016 20:51:23	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 27 ausgelöst	f	44° 20,201' S	175° 21,998' W	438,3	6	244,9	3,2	179,3
246_19-14	12.02.2016 20:59:08	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 20,571' S	175° 22,018' W	401,4	1,2	235,1	3,6	130,8
246_19-14	12.02.2016 21:12:37	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	44° 20,894' S	175° 22,450' W	408,5	1,5	NaN	NaN	293
246_19-15	12.02.2016 21:53:58	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 26 ausgelöst	f	44° 25,540' S	175° 19,890' W	493,6	7,3	258,6	3	162,3
246_19-15	12.02.2016 22:01:31	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 26,120' S	175° 19,777' W	529,1	2,6	222,5	2,6	190,7
246_19-15	12.02.2016 22:12:02	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	44° 26,706' S	175° 19,896' W	505,1	2,1	175,8	2,2	181,1
246_19-16	12.02.2016 22:40:57	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 25 ausgelöst	f	44° 30,330' S	175° 18,147' W	859,3	8	229,2	4	162,6
246_19-16	12.02.2016 22:56:27	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 31,849' S	175° 17,445' W	1025,4	2,1	248,6	3	159,6
246_19-16	12.02.2016 23:12:30	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	44° 32,605' S	175° 17,527' W	1075,4	0,6	224,5	2,9	167
246_19-16	12.02.2016 23:12:39	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 32,608' S	175° 17,527' W	1077,6	0,9	221,1	2,6	151,9
246_19-17	12.02.2016 23:45:04	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 35,996' S	175° 15,671' W	1279,7	7,2	208	3,6	163,9
246_19-17	12.02.2016 23:45:12	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 24	f	44° 36,010' S	175° 15,664' W	1279,7	7,1	218,1	3,2	164
246_19-17	13.02.2016 00:05:51	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 37,694' S	175° 15,110' W	1341,7	4,5	212,6	1,8	180,7
246_19-17	13.02.2016 00:17:20	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	44° 38,111' S	175° 15,399' W	1332,6	1,2	179,4	2,2	293,4
246_19-17	13.02.2016 00:17:55	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 38,108' S	175° 15,414' W	1334,9	1,5	176,5	3,9	224,2
246_19-18	13.02.2016 00:55:10	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 41,760' S	175° 13,690' W	0	6,8	214,1	4,7	151,1
246_19-18	13.02.2016 00:55:17	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 23	f	44° 41,771' S	175° 13,681' W	0	6,7	217,4	4,9	159,8
246_19-18	13.02.2016 01:21:30	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 43,379' S	175° 12,534' W	1714,5	0,4	218,3	4,5	231,9
246_19-18	13.02.2016 01:40:03	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	44° 43,641' S	175° 13,266' W	1698	0,7	203,4	3,9	307,5

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_19-18	13.02.2016 01:40:12	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 43,640' S	175° 13,268' W	1691,3	0,9	200,7	3,8	310,7
246_19-19	13.02.2016 02:02:09	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 45,343' S	175° 12,503' W	1960,8	6,8	220,7	6,3	157,3
246_19-19	13.02.2016 02:02:17	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 22	f	44° 45,356' S	175° 12,495' W	1963	7	221,3	6,5	160,2
246_19-19	13.02.2016 02:34:09	Seismic Ocean Bottom Receiver	SEISOBR	information			geischtet	f	44° 48,617' S	175° 10,285' W	2331,6	5,1	235,4	5,1	159,2
246_19-19	13.02.2016 02:54:00	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	44° 49,254' S	175° 11,165' W	2315,6	1,1	219,8	5	315,8
246_19-19	13.02.2016 02:54:07	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 49,253' S	175° 11,168' W	2319,6	1,4	220,4	3,3	334,1
246_24-1	13.02.2016 03:17:12	Heat-Flow probe	HF	station start				f	44° 49,285' S	175° 10,527' W	2330,2	0,1	199,4	4,1	261,9
246_24-1	13.02.2016 03:19:56	Heat-Flow probe	HF	in the water			+ Pinger 100m über Gerät	f	44° 49,291' S	175° 10,519' W	2330,7	0,7	195,6	4,1	189,1
246_24-1	13.02.2016 04:16:56	Heat-Flow probe	HF	max depth/on ground			SLmax: 2343 m; SPW 1	f	44° 49,309' S	175° 10,519' W	2331,6	0,6	220,8	3,6	88,7
246_24-1	13.02.2016 04:23:38	Heat-Flow probe	HF	hoisting			SZ max: 26,1 kN	f	44° 49,307' S	175° 10,532' W	2331,4	0,3	180,3	4,5	120,6
246_24-1	13.02.2016 05:19:04	Heat-Flow probe	HF	on deck				f	44° 49,316' S	175° 10,526' W	0	0,1	207,3	3,4	141,1
246_24-1	13.02.2016 05:19:08	Heat-Flow probe	HF	station end				f	44° 49,316' S	175° 10,526' W	0	0,3	208,5	3	63,2
246_19-20	13.02.2016 05:23:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 49,316' S	175° 10,519' W	0	0,1	219	4,3	250,8
246_19-20	13.02.2016 05:23:13	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 21	f	44° 49,316' S	175° 10,519' W	0	0,3	208,4	3,7	136,5
246_19-20	13.02.2016 06:14:19	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 54,614' S	175° 7,880' W	2738	5,8	217,2	3,7	198,7
246_19-20	13.02.2016 06:25:53	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	44° 54,882' S	175° 8,180' W	2768,5	0,3	194,2	2,7	238,2
246_19-20	13.02.2016 06:26:00	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 54,883' S	175° 8,180' W	2767,4	0,5	190,1	3,1	175,6
246_25-1	13.02.2016 06:29:07	CTD	CTD	station start				f	44° 54,923' S	175° 8,172' W	2768,1	1,1	217,8	5,7	164,2
246_25-1	13.02.2016 06:32:14	CTD	CTD	in the water			EL2	f	44° 54,927' S	175° 8,176' W	2765,2	0,1	224,4	4	117
246_25-1	13.02.2016 07:43:47	CTD	CTD	max depth/on ground			SLmax: 2700 m	f	44° 54,930' S	175° 8,178' W	2763,1	0,2	231,2	1,7	249,8
246_25-1	13.02.2016 07:44:33	CTD	CTD	hoisting				f	44° 54,931' S	175° 8,177' W	2770,7	0,6	212,7	1,7	127,5
246_25-1	13.02.2016 08:39:08	CTD	CTD	on deck				f	44° 54,927' S	175° 8,173' W	0	0,4	119,8	1,2	298,8
246_25-1	13.02.2016 08:40:15	CTD	CTD	station end				f	44° 54,928' S	175° 8,175' W	0	0,2	133,8	1,5	206,8
246_19-21	13.02.2016 09:00:37	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 20 ausgelöst	f	44° 56,860' S	175° 7,209' W	0	7,5	203,7	2,8	160,8
246_19-21	13.02.2016 09:25:19	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 59,838' S	175° 5,668' W	3125	6,3	174,9	4,7	183,5
246_19-21	13.02.2016 09:38:02	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	45° 0,547' S	175° 5,717' W	3247,1	0,6	175,1	3,9	148,4
246_19-22	13.02.2016 09:41:18	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 19 ausgelöst	f	45° 0,784' S	175° 5,636' W	3235,1	7,6	181,5	5,2	159,4
246_19-22	13.02.2016 10:37:54	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 6,031' S	175° 3,537' W	4005,6	0,9	156,9	6,5	225,6
246_19-22	13.02.2016 10:48:21	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	45° 6,442' S	175° 3,396' W	4062,5	0,8	147,7	5	228,9
246_19-23	13.02.2016 10:51:41	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 18 ausgelöst	f	45° 6,502' S	175° 3,445' W	1259	2	148,1	4	177,9
246_19-23	13.02.2016 12:00:50	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 11,820' S	175° 0,563' W	4217,9	0,2	164,8	3,5	8,8
246_19-23	13.02.2016 12:25:13	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	45° 12,058' S	175° 1,586' W	4212,1	0,9	162,1	4,9	266,6
246_19-23	13.02.2016 12:25:20	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	45° 12,058' S	175° 1,588' W	4210,5	0,6	160,7	4,8	244,6
246_19-24	13.02.2016 12:34:01	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 12,642' S	175° 1,458' W	0	6,6	173,9	3,4	151,2
246_19-24	13.02.2016 12:34:08	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 17	f	45° 12,654' S	175° 1,450' W	0	6,8	171,4	4,8	159,1
246_19-24	13.02.2016 13:24:14	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 17,098' S	174° 58,240' W	4060,1	3,7	181,7	3,6	137
246_19-24	13.02.2016 13:43:19	Seismic Ocean Bottom Receiver	SEISOBR	released				f	45° 17,958' S	174° 58,868' W	4057	1,3	167,7	4,9	247,7
246_19-24	13.02.2016 13:43:26	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	45° 17,959' S	174° 58,870' W	4059,4	1,4	172,2	4,4	261,8
246_26-1	13.02.2016 14:00:02	Heat-Flow probe	HF	station start				f	45° 17,797' S	174° 58,822' W	4058,3	2	193,7	4,4	95,4
246_26-1	13.02.2016 14:08:46	Heat-Flow probe	HF	in the water			FW1/SPW1	f	45° 17,798' S	174° 58,704' W	4051,3	0,7	188,6	4,3	33,9
246_26-1	13.02.2016 15:26:08	Heat-Flow probe	HF	max depth/on ground			SLmax: 4068 m	f	45° 17,768' S	174° 58,563' W	4052	0,3	167,5	3,7	164,1
246_26-1	13.02.2016 15:37:16	Heat-Flow probe	HF	hoisting			SZ max: 45,7 kN	f	45° 17,772' S	174° 58,567' W	4050,9	0,4	175,2	4,3	84
246_26-1	13.02.2016 17:04:47	Heat-Flow probe	HF	on deck				f	45° 17,769' S	174° 58,563' W	0	0,1	136,6	3,5	47,8
246_26-1	13.02.2016 17:04:53	Heat-Flow probe	HF	station end				f	45° 17,770' S	174° 58,563' W	0	0,2	143,9	3,6	146,7
246_19-25	13.02.2016 16:51:16	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 17,768' S	174° 58,566' W	4055,9	0,1	161,1	3,7	200,5
246_19-25	13.02.2016 16:56:41	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 16	f	45° 17,767' S	174° 58,563' W	0	0,2	163,2	3,4	213
246_19-25	13.02.2016 17:51:26	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 22,701' S	174° 56,452' W	3895,6	7,8	134,8	3	166,7
246_19-25	13.02.2016 18:05:13	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	45° 23,707' S	174° 56,238' W	3873,6	1,2	144,1	3,9	188,4
246_19-25	13.02.2016 18:05:28	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	45° 23,712' S	174° 56,239' W	3846	1,2	166	3,5	196,6

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_27-1	13.02.2016 18:10:33	KONGSBERG EM122	EM122	station start				f	45° 23,982' S	174° 56,335' W	3706,2	6,2	159,8	6,2	240,5
246_27-1	13.02.2016 18:10:39	KONGSBERG EM122	EM122	profile start			rwK: 260°	f	45° 23,987' S	174° 56,348' W	3743	6,6	162,2	5,1	244,3
246_27-1	13.02.2016 19:19:49	KONGSBERG EM122	EM122	alter course			rwK: 080°	f	45° 25,661' S	175° 8,890' W	3319,9	7,7	130,9	5,3	254,6
246_27-1	13.02.2016 21:07:03	KONGSBERG EM122	EM122	station end				f	45° 29,292' S	174° 58,643' W	3830,3	8	114,6	5	77,2
246_19-26	13.02.2016 21:11:17	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 15 ausgelöst	f	45° 29,170' S	174° 57,853' W	0	8,1	131,5	4,7	80,2
246_19-26	13.02.2016 22:10:48	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 28,923' S	174° 53,971' W	4146	0,1	98,5	3,7	212,2
246_19-26	13.02.2016 22:22:22	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	45° 29,245' S	174° 53,508' W	4289,3	1,3	73,4	4,6	187,5
246_19-27	13.02.2016 22:25:42	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 14 ausgelöst	f	45° 29,489' S	174° 53,366' W	4301,4	8,1	100,6	5,2	155,9
246_19-27	13.02.2016 23:40:51	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 34,695' S	174° 51,227' W	4348,9	3,1	76,3	3,5	164,5
246_19-27	13.02.2016 23:51:51	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	45° 35,029' S	174° 51,199' W	4316,5	0,3	91,5	3,2	144,5
246_19-27	13.02.2016 23:51:57	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	45° 35,029' S	174° 51,200' W	4316,5	0,8	89,7	2,6	241,8
246_19-28	14.02.2016 00:04:23	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 36,010' S	174° 50,794' W	4357,6	5,9	89	4,2	161,5
246_19-28	14.02.2016 00:04:31	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 13	f	45° 36,022' S	174° 50,787' W	4357,6	6,2	86,8	4,7	158,1
246_19-28	14.02.2016 00:54:45	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 40,163' S	174° 48,827' W	4275,2	0,2	101,3	4	12,3
246_19-28	14.02.2016 01:10:32	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	45° 40,740' S	174° 48,637' W	4260,5	1	109,7	5,1	196,1
246_19-28	14.02.2016 01:10:39	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	45° 40,741' S	174° 48,637' W	4260,5	0,8	113,9	5,8	143,1
246_19-29	14.02.2016 01:48:03	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 41,911' S	174° 48,158' W	4206,6	4,9	106,6	2,7	158,8
246_19-29	14.02.2016 01:48:13	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 12	f	45° 41,924' S	174° 48,152' W	4206,6	4,8	89,4	2,4	164,1
246_19-29	14.02.2016 02:57:51	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 45,894' S	174° 46,262' W	4053,1	0,3	90,9	2,1	79,9
246_19-29	14.02.2016 03:09:35	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	45° 46,439' S	174° 45,928' W	4102,5	1,4	60,2	2,2	143
246_19-29	14.02.2016 03:09:42	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	45° 46,442' S	174° 45,926' W	4098,1	1,4	66,9	1,9	146,1
246_19-30	14.02.2016 03:11:57	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 46,498' S	174° 45,873' W	4078,6	1,8	49,5	1,4	155,3
246_19-30	14.02.2016 03:12:02	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 11	f	45° 46,501' S	174° 45,871' W	4078,6	1,9	49,6	1,7	148,7
246_19-30	14.02.2016 04:12:52	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 51,547' S	174° 44,052' W	4224,1	0,5	62,9	2,5	104,6
246_19-30	14.02.2016 04:33:30	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	45° 52,219' S	174° 43,072' W	4236,8	2	92,9	3	128,4
246_19-31	14.02.2016 04:34:19	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 10 ausgelöst	f	45° 52,236' S	174° 43,045' W	4243,9	1,9	74,8	3,5	126,3
246_19-31	14.02.2016 05:45:10	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 57,196' S	174° 41,452' W	4397,9	0,2	49,7	3,4	189,6
246_19-31	14.02.2016 05:56:00	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	45° 57,695' S	174° 41,105' W	4390,1	1,7	63,6	4	145,3
246_19-32	14.02.2016 05:59:17	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 9 ausgelöst	f	45° 57,862' S	174° 41,022' W	4388,9	4,3	69,5	2,8	171,3
246_19-32	14.02.2016 07:02:48	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 2,432' S	174° 39,242' W	4569	5,2	77,5	4	164,1
246_19-32	14.02.2016 07:23:37	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	46° 3,352' S	174° 38,315' W	4595,4	2,3	74,9	3,7	152,9
246_19-32	14.02.2016 07:24:23	Seismic Ocean Bottom Receiver	SEISOBR	information				f	46° 3,385' S	174° 38,298' W	4577,2	3,2	77	4,1	161,8
246_19-33	14.02.2016 07:25:41	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 8 ausgelöst	f	46° 3,462' S	174° 38,258' W	4577,2	4,2	75,5	3,1	160,4
246_19-33	14.02.2016 08:46:52	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 8,328' S	174° 35,649' W	4755,9	1,2	74,3	3	40,2
246_19-33	14.02.2016 09:00:32	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	46° 8,868' S	174° 35,818' W	4772,1	0,5	55,7	1,8	349,1
246_19-34	14.02.2016 09:03:43	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 7 ausgelöst	f	46° 8,853' S	174° 35,841' W	4766,2	0,7	109,8	1,1	215,1
246_19-34	14.02.2016 10:13:42	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 14,176' S	174° 33,887' W	4835,8	1	69,4	4,1	133,8
246_19-34	14.02.2016 10:27:19	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	46° 14,737' S	174° 33,477' W	4811,8	1,3	NaN	NaN	189,2
246_28-1	14.02.2016 10:29:05	KONGSBERG EM122	EM122	station start			rwK: 075°	f	46° 14,782' S	174° 33,476' W	4810,9	1,8	68,7	4,4	142,2
246_28-1	14.02.2016 11:44:58	KONGSBERG EM122	EM122	alter course			rwK: 250°	f	46° 11,503' S	174° 20,706' W	3058,5	7,9	37,7	4,3	73,8
246_28-1	14.02.2016 13:21:40	KONGSBERG EM122	EM122	profile end				f	46° 18,054' S	174° 25,166' W	4066,5	6,5	18,8	5,8	240
246_19-35	14.02.2016 13:30:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	46° 18,297' S	174° 25,729' W	4177,4	1,3	23	4,4	215
246_19-35	14.02.2016 13:31:03	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon zu Wasser	f	46° 18,309' S	174° 25,749' W	4134,5	0,9	28,3	4,8	219,8
246_19-35	14.02.2016 13:39:55	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 6	f	46° 18,391' S	174° 25,756' W	0	1,4	19	4,3	193,8
246_19-35	14.02.2016 13:44:28	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon an Deck	f	46° 18,437' S	174° 25,741' W	0	1,5	28,6	4,8	191,9
246_19-35	14.02.2016 14:31:19	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 19,612' S	174° 29,748' W	0	4,7	19	5,3	295,1
246_19-35	14.02.2016 15:00:04	Seismic Ocean Bottom Receiver	SEISOBR	recovered				f	46° 20,593' S	174° 30,833' W	4866,9	0,5	6,1	0,5	117
246_19-35	14.02.2016 15:00:09	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	46° 20,593' S	174° 30,832' W	4866,9	0,9	356,4	0,7	119,9
246_19-36	14.02.2016 15:04:12	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 5 ausgelöst	f	46° 20,696' S	174° 30,799' W	4866,4	3,1	2,6	2,1	183,4

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_19-36	14.02.2016 16:15:15	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 25,592' S	174° 28,910' W	4795,9	1,8	352,2	1,6	162,3
246_19-36	14.02.2016 16:25:26	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	46° 26,016' S	174° 28,630' W	4790,1	0,7	16,2	3,2	118,1
246_19-37	14.02.2016 16:36:46	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 4 ausgelöst	f	46° 26,629' S	174° 28,334' W	0	4,5	20,1	3,8	172,4
246_19-37	14.02.2016 17:40:54	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 31,290' S	174° 26,480' W	4653,4	0,6	28,4	4,2	154,2
246_19-37	14.02.2016 17:50:09	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	46° 31,740' S	174° 26,269' W	4636	1,8	21,1	5,4	161,1
246_19-38	14.02.2016 17:52:10	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 3 ausgelöst	f	46° 31,835' S	174° 26,218' W	4636	3,6	23,4	5,9	160,6
246_19-38	14.02.2016 18:59:31	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 37,089' S	174° 24,090' W	4716,6	1,9	18,4	6,3	111,5
246_19-38	14.02.2016 19:10:40	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	46° 37,084' S	174° 23,525' W	4708	1,3	358,3	6,3	92,5
246_19-39	14.02.2016 19:15:33	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 2 ausgelöst	f	46° 37,162' S	174° 23,289' W	5921,6	3,7	9,8	4,6	146,6
246_19-39	14.02.2016 20:39:06	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 42,873' S	174° 20,979' W	4961,9	1	9,7	4,4	215,7
246_19-39	14.02.2016 20:49:45	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	46° 42,926' S	174° 21,326' W	4948,6	1,1	24,6	7	258
246_19-40	14.02.2016 21:12:50	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 1 ausgelöst	f	46° 44,765' S	174° 20,548' W	0	6,2	17,4	6,9	160,8
246_19-40	14.02.2016 21:58:43	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	46° 47,721' S	174° 19,102' W	5044,2	6,7	26,5	7,5	163,2
246_19-40	14.02.2016 22:11:27	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	46° 48,454' S	174° 18,922' W	5037,8	0,2	8,6	6,2	109,8
246_29-1	14.02.2016 22:22:22	CTD	CTD	station start				f	46° 48,452' S	174° 18,926' W	5038,6	0,2	7,3	7,3	34
246_29-1	14.02.2016 22:24:21	CTD	CTD	in the water			EL 2	f	46° 48,452' S	174° 18,927' W	5039,2	0,2	14,1	8,1	347,5
246_29-1	15.02.2016 00:40:26	CTD	CTD	max depth/on ground			SLmax: 5000 m	f	46° 48,451' S	174° 18,925' W	5034,2	0,2	20	8,2	152,9
246_29-1	15.02.2016 03:58:39	CTD	CTD	on deck				f	46° 48,449' S	174° 18,917' W	5033,4	0,2	19,3	6,8	119,6
246_29-1	15.02.2016 03:59:30	CTD	CTD	station end				f	46° 48,450' S	174° 18,918' W	5031,7	0,3	28,2	6,2	217,8
246_30-1	15.02.2016 04:15:21	Magnetometer	MAG	station start			Beginn Aussetzen	f	46° 48,406' S	174° 19,200' W	5024,6	6	13,6	6,2	150,8
246_30-1	15.02.2016 04:28:24	Magnetometer	MAG	information			300m ausgesteckt	f	46° 49,450' S	174° 18,720' W	5054,7	5,5	11,3	5,6	171,5
246_30-1	15.02.2016 12:15:49	Magnetometer	MAG	alter course			rwK: 245°; d: 13 nm	f	47° 59,487' S	173° 30,354' W	5356,4	10,2	330,8	5,4	159,2
246_30-1	15.02.2016 13:32:49	Magnetometer	MAG	alter course			rwK: 333°; d: 79 nm	f	48° 5,246' S	173° 47,003' W	5327,1	9,9	2,5	11,6	253,7
246_30-1	15.02.2016 21:30:00	Magnetometer	MAG	profile end			Beginn einholen des Magnetomet	f	46° 55,094' S	174° 40,078' W	5182,4	6,3	15,2	9	334,4
246_30-1	15.02.2016 21:41:54	Magnetometer	MAG	station end				f	46° 54,206' S	174° 40,713' W	5194,7	4,9	9,8	7,1	331,4
246_31-1	15.02.2016 23:23:08	Dredge	DRG	station start				f	47° 5,534' S	174° 29,889' W	4007,8	0,2	6	7	59
246_31-1	15.02.2016 23:24:55	Dredge	DRG	in the water			FW1/SPW1	f	47° 5,534' S	174° 29,884' W	4045,6	0,4	3,5	7,3	11,3
246_31-1	16.02.2016 00:49:00	Dredge	DRG	max depth/on ground			SL: 4159 m	f	47° 5,500' S	174° 29,920' W	4004	0,5	348	6,7	288,5
246_31-1	16.02.2016 00:49:12	Dredge	DRG	profile start			rwK: 359°; d: 780 m	f	47° 5,500' S	174° 29,920' W	4002,8	0,3	347,8	7,7	262,4
246_31-1	16.02.2016 01:23:13	Dredge	DRG	profile end			SLmax: 4550 m	f	47° 5,032' S	174° 29,945' W	3548,5	0,2	352,7	5,9	333,3
246_31-1	16.02.2016 01:23:36	Dredge	DRG	hoisting				f	47° 5,031' S	174° 29,946' W	3547,2	0,2	348,2	7	83,6
246_31-1	16.02.2016 02:28:33	Dredge	DRG	information			Frei vom Grund; SZmax: 49 kN	f	47° 5,026' S	174° 29,934' W	3551,7	0,3	357	6,7	27,4
246_31-1	16.02.2016 03:43:29	Dredge	DRG	on deck				f	47° 5,026' S	174° 29,940' W	3546,1	0,4	2,1	5,8	71,1
246_31-1	16.02.2016 03:57:06	Dredge	DRG	station end				f	47° 5,028' S	174° 29,939' W	3550,3	0,2	1,4	6,8	260,4
246_32-1	16.02.2016 05:08:18	Dredge	DRG	station start				f	47° 7,327' S	174° 25,436' W	4812,9	0,1	357	6,1	325,8
246_32-1	16.02.2016 05:10:25	Dredge	DRG	in the water			FW1/SPW1	f	47° 7,314' S	174° 25,417' W	4800,2	0,8	3,1	6	58,6
246_32-1	16.02.2016 06:41:12	Dredge	DRG	max depth/on ground			SL: 4901 m	f	47° 7,308' S	174° 25,408' W	4784,2	0,1	13,1	6,1	204,7
246_32-1	16.02.2016 06:41:40	Dredge	DRG	profile start			rwK: 356°; d: 810 m	f	47° 7,308' S	174° 25,407' W	4779,2	0,5	9,3	5,4	237
246_32-1	16.02.2016 07:13:19	Dredge	DRG	profile end			SLmax: 5300 m	f	47° 6,804' S	174° 25,465' W	4474,1	0,3	10,9	5,8	52,8
246_32-1	16.02.2016 07:13:36	Dredge	DRG	hoisting				f	47° 6,804' S	174° 25,464' W	4473,7	0,3	8,6	6,9	337,7
246_32-1	16.02.2016 08:00:00	Dredge	DRG	information			Frei vom Grund; SZmax: 60 kN	f	47° 6,799' S	174° 25,461' W	4472,1	0,1	9,5	4,7	241,5
246_32-1	16.02.2016 09:35:35	Dredge	DRG	on deck				f	47° 6,801' S	174° 25,470' W	0	0,4	14	5,6	202,4
246_32-1	16.02.2016 09:41:48	Dredge	DRG	station end				f	47° 6,801' S	174° 25,470' W	4479,8	0,3	13,6	5,9	17,6
246_33-1	16.02.2016 14:37:01	Dredge	DRG	station start				f	46° 14,477' S	174° 18,256' W	3444,1	0,3	11,1	5,1	318
246_33-1	16.02.2016 14:38:00	Dredge	DRG	in the water			FW1/SPW1	f	46° 14,476' S	174° 18,251' W	3476,5	0,2	18,4	4,6	156,5
246_33-1	16.02.2016 15:44:46	Dredge	DRG	max depth/on ground			SL: 3416 m	f	46° 14,437' S	174° 18,260' W	3411,7	0,2	18,5	4,8	20,1
246_33-1	16.02.2016 15:47:07	Dredge	DRG	profile start			rwK: 336°; d: 870 m	f	46° 14,434' S	174° 18,264' W	3401,3	1,4	19,9	4,8	325,6
246_33-1	16.02.2016 16:16:21	Dredge	DRG	profile end			Slmax: 3950 m	f	46° 13,990' S	174° 18,550' W	3146	0,7	11	4,8	322,8
246_33-1	16.02.2016 16:16:54	Dredge	DRG	hoisting				f	46° 13,988' S	174° 18,554' W	3143,6	0,4	11,3	4,1	237,3

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_33-1	16.02.2016 17:12:30	Dredge	DRG	information			Frei vom Grund; SZmax: 39,3 k	f	46° 13,989' S	174° 18,554' W	3131,2	0,2	23,9	5,7	274,6
246_33-1	16.02.2016 18:11:38	Dredge	DRG	on deck				f	46° 13,985' S	174° 18,550' W	3166,2	0,6	24,3	4,7	82,3
246_33-1	16.02.2016 18:14:30	Dredge	DRG	station end				f	46° 13,983' S	174° 18,551' W	3167,5	0,7	15,5	4	260,7
246_34-1	16.02.2016 19:14:23	Dredge	DRG	station start				f	46° 15,360' S	174° 29,122' W	4081,1	0,8	29,3	4,3	40,9
246_34-1	16.02.2016 19:17:25	Dredge	DRG	in the water			FW1/SPW1	f	46° 15,359' S	174° 29,120' W	4010,5	0,1	20,6	4,4	339,4
246_34-1	16.02.2016 20:41:19	Dredge	DRG	max depth/on ground			SL: 4133 m	f	46° 15,366' S	174° 29,113' W	3933,8	0,2	11,9	6,4	41,4
246_34-1	16.02.2016 21:13:00	Dredge	DRG	information			Eingeparkt, Beginn dredgen, SLmax:	f	46° 14,982' S	174° 28,686' W	3507,1	0,6	19,1	6,8	103,6
246_34-1	16.02.2016 22:09:54	Dredge	DRG	hoisting			Frei vom Grund, SL: 3500 m, SZmax:	f	46° 14,977' S	174° 28,677' W	3549,2	0,2	356,3	6,2	156,6
246_34-1	16.02.2016 23:21:45	Dredge	DRG	on deck				f	46° 14,977' S	174° 28,683' W	3516,5	0,4	356,3	5,1	12
246_34-1	16.02.2016 23:28:49	Dredge	DRG	station end				f	46° 14,989' S	174° 28,627' W	3508,8	0,9	357,6	4,9	103
246_35-1	17.02.2016 00:00:14	Dredge	DRG	station start				f	46° 11,013' S	174° 28,020' W	3655,1	2,9	15,2	5,1	350,8
246_35-1	17.02.2016 00:03:58	Dredge	DRG	in the water			FW1/SPW1	f	46° 10,936' S	174° 27,999' W	3588,5	0,6	17,9	4,8	72,7
246_35-1	17.02.2016 01:13:17	Dredge	DRG	max depth/on ground			SL: 3705 m	f	46° 10,940' S	174° 28,042' W	3607,5	0,4	7,7	5,9	49,1
246_35-1	17.02.2016 01:18:33	Dredge	DRG	profile start			rwK: 067°; d: 710 m	f	46° 10,941' S	174° 28,023' W	3528,8	0,7	2,9	4,6	108,3
246_35-1	17.02.2016 01:45:46	Dredge	DRG	profile end			SLmax: 4100 m	f	46° 10,773' S	174° 27,491' W	3263,5	0,3	359,4	7	334,6
246_35-1	17.02.2016 01:45:55	Dredge	DRG	hoisting				f	46° 10,773' S	174° 27,493' W	3263,5	0,3	354,5	6	278,2
246_35-1	17.02.2016 02:37:48	Dredge	DRG	information			Frei vom Grund; SZmax: 71 kN	f	46° 10,763' S	174° 27,500' W	3271,6	0,3	355,5	6,9	355,3
246_35-1	17.02.2016 03:43:55	Dredge	DRG	on deck				f	46° 10,765' S	174° 27,513' W	3275,2	0,6	5,9	5,8	97,7
246_35-1	17.02.2016 03:51:27	Dredge	DRG	station end				f	46° 10,766' S	174° 27,513' W	3275,2	0,5	3	5,1	117,1
246_36-1	17.02.2016 05:51:09	Dredge	DRG	station start				f	46° 15,060' S	174° 8,264' W	4304,8	0,4	355,8	6,7	26,8
246_36-1	17.02.2016 05:54:17	Dredge	DRG	in the water			FW1/SPW1	f	46° 15,032' S	174° 8,279' W	4326,4	0,6	357,2	6,4	287,6
246_36-1	17.02.2016 07:14:37	Dredge	DRG	max depth/on ground			SL: 4418 m	f	46° 15,020' S	174° 8,311' W	4290	0,2	352,3	7,5	274,6
246_36-1	17.02.2016 07:16:00	Dredge	DRG	profile start			rwK: 020°; d: 800 m	f	46° 15,019' S	174° 8,310' W	4286,1	0,4	352,5	7,8	47,9
246_36-1	17.02.2016 07:46:21	Dredge	DRG	hoisting			SLmax: 4850 m	f	46° 14,578' S	174° 8,073' W	3972,5	0,2	3,1	6,9	178,3
246_36-1	17.02.2016 08:34:10	Dredge	DRG	information			Frei vom Grund; SL: 3965 m; SZmax:	f	46° 14,582' S	174° 8,067' W	3974,2	0,2	358,5	8,2	74,3
246_36-1	17.02.2016 09:55:25	Dredge	DRG	on deck				f	46° 14,574' S	174° 8,073' W	3973,7	0,1	352,4	8,4	18,3
246_36-1	17.02.2016 10:06:06	Dredge	DRG	station end				f	46° 14,573' S	174° 8,074' W	3974,7	0,3	352,3	8,4	62,5
246_37-1	17.02.2016 13:28:40	Dredge	DRG	station start				f	46° 6,054' S	173° 33,257' W	4342,5	0,5	0,5	8	120,5
246_37-1	17.02.2016 13:29:30	Dredge	DRG	in the water			FW1/SPW1	f	46° 6,056' S	173° 33,258' W	4294	0,4	4,5	9	229,9
246_37-1	17.02.2016 14:53:00	Dredge	DRG	max depth/on ground			SL: 4453 m	f	46° 6,037' S	173° 33,318' W	4356,7	0,6	20,2	9,4	104,8
246_37-1	17.02.2016 14:53:03	Dredge	DRG	profile start			rwK: 360°; d: 840 m	f	46° 6,037' S	173° 33,318' W	4356,7	0,2	23,4	9,2	317,4
246_37-1	17.02.2016 15:47:39	Dredge	DRG	profile end			SLmax: 5000 m	f	46° 5,344' S	173° 33,312' W	3813	0,4	351,5	12	67,9
246_37-1	17.02.2016 15:48:11	Dredge	DRG	hoisting				f	46° 5,341' S	173° 33,314' W	3801,1	0,3	0,8	11	48,2
246_37-1	17.02.2016 16:37:51	Dredge	DRG	information			Frei vom Grund; SZmax: 80,8 k	f	46° 5,335' S	173° 33,314' W	3813,8	0,3	357,7	10,7	257,9
246_37-1	17.02.2016 18:25:44	Dredge	DRG	on deck				f	46° 5,338' S	173° 33,322' W	3813,6	0,3	2,3	10,6	235
246_37-1	17.02.2016 18:38:04	Dredge	DRG	station end				f	46° 5,340' S	173° 33,329' W	3812	0	13,8	11	276
246_38-1	17.02.2016 21:00:00	Dredge	DRG	station start				f	45° 58,194' S	173° 52,629' W	3775,5	0,3	12,8	10,2	141,7
246_38-1	17.02.2016 21:03:26	Dredge	DRG	in the water			FW1 / SPW1	f	45° 58,208' S	173° 52,624' W	3755,4	0,3	13,1	9,7	183,2
246_38-1	17.02.2016 22:15:33	Dredge	DRG	max depth/on ground			SL: 3872 m	f	45° 58,213' S	173° 52,635' W	3754,6	0,2	11,3	11,4	78,1
246_38-1	17.02.2016 22:18:00	Dredge	DRG	profile start			rwK: 359°; d: 760 m	f	45° 58,210' S	173° 52,636' W	3751,7	0,7	17,8	11,8	34,3
246_38-1	17.02.2016 22:45:45	Dredge	DRG	hoisting			SLmax: 4300 m	f	45° 57,759' S	173° 52,642' W	3409,1	0,1	5,4	11,3	24,8
246_38-1	17.02.2016 23:37:06	Dredge	DRG	information			Frei vom Grund; SZmax: 75 kN	f	45° 57,757' S	173° 52,641' W	3404,3	0,4	8,2	12,1	292,9
246_38-1	18.02.2016 00:48:00	Dredge	DRG	on deck				f	45° 57,752' S	173° 52,649' W	3435,8	0,3	24,7	13,5	12,9
246_38-1	18.02.2016 00:48:09	Dredge	DRG	station end				f	45° 57,752' S	173° 52,649' W	3420,2	0,4	30,3	13,2	32,6
246_39-1	18.02.2016 01:02:52	Magnetometer	MAG	station start				f	45° 57,227' S	173° 52,624' W	3350,2	5,1	14,6	13	16,2
246_39-1	18.02.2016 01:04:03	Magnetometer	MAG	information			Magnetometer zu Wasser	f	45° 57,132' S	173° 52,590' W	3340,1	4,9	13,3	11,3	14,9
246_39-1	18.02.2016 01:24:55	Magnetometer	MAG	profile start				f	45° 54,387' S	173° 51,756' W	3772	9,5	20,7	13,2	11,7
246_39-1	18.02.2016 01:50:43	Magnetometer	MAG	information			Einholen Magnetometer	f	45° 51,010' S	173° 50,084' W	4610,1	5,5	10,8	12,4	22,1
246_39-1	18.02.2016 02:02:17	Magnetometer	MAG	information			Magnetometer an Deck; Profilunterbr	f	45° 50,048' S	173° 49,568' W	4534,7	5,1	10,2	13,6	15,4

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_39-1	18.02.2016 02:10:38	Magnetometer	MAG	in the water				f	45° 49,344' S	173° 49,212' W	4549,9	5,5	13,3	14,3	19,6
246_39-1	18.02.2016 02:25:32	Magnetometer	MAG	information			Magetometer auf 350 m austgeste	f	45° 47,752' S	173° 48,389' W	4600,7	9,4	11	11,4	16,9
246_39-1	18.02.2016 06:56:38	Magnetometer	MAG	profile end			Beginn Einholen	f	45° 7,830' S	173° 27,271' W	3940,3	4,6	4,8	12,8	23,5
246_39-1	18.02.2016 07:06:24	Magnetometer	MAG	station end			Magnetometer an Deck	f	45° 7,125' S	173° 26,915' W	3895,9	4,8	1,2	11,3	15,6
246_40-1	18.02.2016 07:18:08	CTD	CTD	station start				f	45° 7,009' S	173° 26,878' W	3891,3	0,3	19,7	13,6	71,5
246_40-1	18.02.2016 07:19:31	CTD	CTD	in the water			EL 1	f	45° 7,009' S	173° 26,875' W	3891	0,3	26,7	11,1	120,1
246_40-1	18.02.2016 08:25:57	CTD	CTD	max depth/on ground			SLmax: 2500 m	f	45° 7,007' S	173° 26,876' W	3890,9	0,7	9	10,8	78,6
246_40-1	18.02.2016 09:15:15	CTD	CTD	on deck				f	45° 7,006' S	173° 26,870' W	3895,8	0,5	6,8	12,2	31
246_40-1	18.02.2016 09:16:02	CTD	CTD	station end				f	45° 7,003' S	173° 26,869' W	3894,1	0,6	2,5	12,4	107
246_41-1	18.02.2016 09:25:58	Passive Acustic Monitoring Systen	PAM	station start				f	45° 6,541' S	173° 27,447' W	3817,1	3,5	15,4	16,4	305,4
246_41-1	18.02.2016 09:26:19	Passive Acustic Monitoring Systen	PAM	in the water				f	45° 6,533' S	173° 27,467' W	3816,7	3,1	15,4	15	301,4
246_41-1	18.02.2016 09:32:36	Passive Acustic Monitoring Systen	PAM	information			PAM ausgesteckt	f	45° 6,370' S	173° 27,855' W	3803,9	3,4	13,8	13,7	305,2
246_41-1	19.02.2016 00:33:43	Passive Acustic Monitoring Systen	PAM	profile end				f	44° 12,221' S	174° 19,156' W	1598,2	3,8	351,4	17,3	344,5
246_41-1	19.02.2016 00:42:42	Passive Acustic Monitoring Systen	PAM	on deck				f	44° 11,688' S	174° 19,315' W	3166,3	4,2	357	17,9	344,1
246_41-1	19.02.2016 00:42:55	Passive Acustic Monitoring Systen	PAM	station end				f	44° 11,673' S	174° 19,321' W	3155,8	3,3	7	17,5	341,6
246_42-1	18.02.2016 09:34:34	Seismic Towed Receiver	SEISTR	station start				f	45° 6,306' S	173° 27,977' W	3794,6	2,7	12,4	13,1	300,6
246_42-1	18.02.2016 09:34:48	Seismic Towed Receiver	SEISTR	information			Endboje zu Wasser, Beginn auslegen S	f	45° 6,299' S	173° 27,990' W	3776,7	2,7	10,1	12,7	309,7
246_42-1	18.02.2016 10:54:59	Seismic Towed Receiver	SEISTR	information			Streamer ausgelegt	f	45° 2,550' S	173° 31,873' W	3642,2	3,3	11,9	13,4	336,4
246_42-1	18.02.2016 11:11:22	Seismic Towed Receiver	SEISTR	information			StB Airgun zu Wasser	f	45° 1,792' S	173° 32,498' W	3640	3	9,4	13,8	330
246_42-1	18.02.2016 11:26:35	Seismic Towed Receiver	SEISTR	information			Bb Airgun zu Wasser	f	45° 1,080' S	173° 33,195' W	3651,4	3,4	13	15,5	323,8
246_42-1	18.02.2016 11:51:21	Seismic Towed Receiver	SEISTR	information			Beginn Softstart; Erster Schuss	f	44° 59,638' S	173° 34,558' W	3586,1	5,1	18,2	16,1	324,2
246_42-1	18.02.2016 11:51:46	Seismic Towed Receiver	SEISTR	profile start			rwK: 326°	f	44° 59,608' S	173° 34,588' W	3590,6	5,1	8,4	14,6	324,2
246_42-1	18.02.2016 12:31:45	Seismic Towed Receiver	SEISTR	information			Ende Softstart	f	44° 56,890' S	173° 37,214' W	3623,9	4,4	17,5	14,5	323,3
246_42-1	18.02.2016 19:22:54	Seismic Towed Receiver	SEISTR	information			Stb. Airgun wird eingeholt	f	44° 30,654' S	174° 2,394' W	2899,5	3,7	15,6	15,9	321,8
246_42-1	18.02.2016 19:38:08	Seismic Towed Receiver	SEISTR	information		Stb. Airgun am Heck vorgehievt, neuer Auftriebskörper wird befesti		f	44° 29,884' S	174° 2,513' W	2926,8	3	1	12,9	348,4
246_42-1	18.02.2016 19:45:21	Seismic Towed Receiver	SEISTR	information			Stb. Airgun voll ausgesteckt	f	44° 29,460' S	174° 2,431' W	2949,6	3,9	2,6	14,2	354,1
246_42-1	18.02.2016 19:47:58	Seismic Towed Receiver	SEISTR	information			Bb. Airgun wird eingeholt	f	44° 29,322' S	174° 2,387' W	2949,2	2,8	357,9	16,9	13
246_42-1	18.02.2016 19:50:40	Seismic Towed Receiver	SEISTR	information			Stb. Airgun schießt wieder (Softst	f	44° 29,165' S	174° 2,345' W	2950,8	4,2	2,8	13,5	7
246_42-1	18.02.2016 20:02:04	Seismic Towed Receiver	SEISTR	information			Bb. Airgun an Deck	f	44° 28,532' S	174° 2,159' W	2958,1	2,6	356,2	11,3	17,8
246_42-1	19.02.2016 00:17:12	Seismic Towed Receiver	SEISTR	profile end			Profilabbruch wegen des Wetters; Letzt	f	44° 13,170' S	174° 18,841' W	1665,3	3,2	2,2	18,4	322,2
246_42-1	19.02.2016 00:26:35	Seismic Towed Receiver	SEISTR	on deck			StB Airgun	f	44° 12,645' S	174° 19,039' W	1625	4,8	1,7	16,1	345,9
246_42-1	19.02.2016 02:47:42	Seismic Towed Receiver	SEISTR	on deck			Streamer	f	44° 4,617' S	174° 21,652' W	1267,6	2,8	8,6	15,3	11,8
246_42-1	19.02.2016 02:47:55	Seismic Towed Receiver	SEISTR	station end				f	44° 4,607' S	174° 21,654' W	1266,3	2,1	6,7	16,1	352,8
246_43-1	18.02.2016 11:34:39	Magnetometer	MAG	station start				f	45° 0,674' S	173° 33,578' W	3653,5	2,4	11,3	13,1	318
246_43-1	18.02.2016 11:42:36	Magnetometer	MAG	in the water				f	45° 0,207' S	173° 34,009' W	3645	5,2	9,8	14,4	318,6
246_43-1	19.02.2016 00:43:46	Magnetometer	MAG	profile end				f	44° 11,623' S	174° 19,338' W	3164,5	3,6	356	15,8	356,9
246_43-1	19.02.2016 00:58:51	Magnetometer	MAG	information			Magnetometer an Deck	f	44° 10,801' S	174° 19,577' W	1530,3	2,8	2,4	13,1	337,8
246_43-1	19.02.2016 00:58:55	Magnetometer	MAG	station end				f	44° 10,798' S	174° 19,578' W	1531,6	3,4	2,4	15,3	352,7
246_44-1	19.02.2016 21:09:40	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 46,600' S	174° 33,492' W	1604,9	1,9	299,6	6,2	283,1
246_44-1	19.02.2016 21:11:12	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 1	f	42° 46,579' S	174° 33,528' W	1131,5	1,2	296,4	5,9	279,4
246_44-2	19.02.2016 22:02:28	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 51,070' S	174° 28,415' W	1343,3	1,8	303,5	4,5	286,6
246_44-2	19.02.2016 22:03:52	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 2	f	42° 51,057' S	174° 28,453' W	1345,4	1,1	302,9	8	307,5
246_44-3	19.02.2016 22:51:19	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 55,827' S	174° 23,435' W	1261,4	2,4	310	4,7	261,8
246_44-3	19.02.2016 22:52:19	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 3	f	42° 55,830' S	174° 23,486' W	1263,4	1,4	307,8	4,5	279,9
246_44-4	19.02.2016 23:44:35	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 0,380' S	174° 18,361' W	1165,5	1,5	309,7	5,1	243
246_44-4	19.02.2016 23:45:57	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 4	f	43° 0,389' S	174° 18,389' W	1166,4	0,7	308,9	5	222,2
246_44-5	20.02.2016 00:35:52	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 4,975' S	174° 13,275' W	1102,7	1	315,3	4,1	255,8
246_44-5	20.02.2016 00:36:46	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 5	f	43° 4,981' S	174° 13,293' W	1102,7	2,2	310,5	4,9	233,5
246_44-6	20.02.2016 01:25:05	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 9,721' S	174° 8,204' W	1056,5	0,8	299,9	4,6	256,8

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_44-6	20.02.2016 01:26:13	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 6	f	43° 9,735' S	174° 8,220' W	1058	0,7	300,9	4,4	208,6
246_44-7	20.02.2016 02:12:31	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 14,252' S	174° 2,935' W	1077,9	0,4	280	2,8	339,1
246_44-7	20.02.2016 02:13:51	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 7	f	43° 14,265' S	174° 2,953' W	1078,6	0,6	280,1	5,3	227,8
246_44-8	20.02.2016 02:57:37	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 18,797' S	173° 57,853' W	1113	2,4	279,3	4,8	349,2
246_44-8	20.02.2016 02:58:31	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 8	f	43° 18,775' S	173° 57,873' W	1114,2	1,2	276	4,9	347,7
246_44-9	20.02.2016 03:42:10	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 23,594' S	173° 52,726' W	1311	1,6	297,1	3,2	146
246_44-9	20.02.2016 03:44:38	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 9	f	43° 23,717' S	173° 52,660' W	1308,2	5,5	287,9	3,8	151,9
246_44-10	20.02.2016 04:18:58	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 28,011' S	173° 47,759' W	1414,6	2,1	307,1	3,9	155,1
246_44-10	20.02.2016 04:20:22	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 10	f	43° 28,041' S	173° 47,740' W	1413,9	1,6	297,2	3,9	155,3
246_44-11	20.02.2016 05:00:27	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 32,564' S	173° 42,553' W	1518,3	3,7	293,2	4,5	178,8
246_44-11	20.02.2016 05:02:35	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 11	f	43° 32,629' S	173° 42,550' W	1517,2	1,2	306,8	3,4	192
246_44-12	20.02.2016 05:43:26	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 37,339' S	173° 37,314' W	1613,6	2,6	311,1	2,9	155,3
246_44-12	20.02.2016 05:44:06	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 12	f	43° 37,361' S	173° 37,302' W	1616,3	1,6	308,6	3,2	152,4
246_44-13	20.02.2016 06:21:45	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 41,947' S	173° 32,079' W	1711,1	2,4	313,6	3,3	184,3
246_44-13	20.02.2016 06:23:18	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 13	f	43° 41,988' S	173° 32,059' W	1712,8	1,5	320,2	3,4	166,9
246_44-14	20.02.2016 07:04:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 46,421' S	173° 27,006' W	1790,9	2,8	315,6	2,4	176,6
246_44-14	20.02.2016 07:05:16	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 14	f	43° 46,472' S	173° 27,012' W	1793	2,4	312,8	3,1	172,4
246_44-15	20.02.2016 07:45:50	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 51,048' S	173° 21,719' W	1877,3	1,1	343,1	2	134,1
246_44-15	20.02.2016 07:46:12	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 15	f	43° 51,056' S	173° 21,715' W	1877,9	1,4	318,5	1,2	127,2
246_44-16	20.02.2016 08:24:56	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 55,543' S	173° 16,574' W	1960,1	2	312,3	1,4	139,6
246_44-16	20.02.2016 08:27:25	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 16	f	43° 55,591' S	173° 16,495' W	1965,9	1,2	319,8	3,9	116,3
246_44-17	20.02.2016 09:07:43	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 0,204' S	173° 11,372' W	2043,1	2,5	340,5	2,6	145,9
246_44-17	20.02.2016 09:09:12	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 17	f	44° 0,246' S	173° 11,337' W	2048	2	345,8	4,1	149,5
246_44-18	20.02.2016 09:49:53	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 4,779' S	173° 6,071' W	2184,3	2,4	323,7	3,1	158
246_44-18	20.02.2016 09:51:00	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 18	f	44° 4,807' S	173° 6,054' W	2181,4	1,5	320,4	1,5	173
246_44-19	20.02.2016 10:30:21	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 9,253' S	173° 0,774' W	2421,7	3,1	346	3,6	160,4
246_44-19	20.02.2016 10:31:17	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 19	f	44° 9,291' S	173° 0,752' W	2432,8	2,2	357,9	3,3	137,7
246_44-20	20.02.2016 11:12:51	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 13,933' S	172° 55,465' W	2955,9	1,8	342,7	4	143,3
246_44-20	20.02.2016 11:13:59	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 20	f	44° 13,956' S	172° 55,440' W	2958,3	1,6	327,1	2,2	109,8
246_44-21	20.02.2016 11:55:50	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 18,483' S	172° 50,095' W	3709,9	2,6	341,2	5,5	115,4
246_44-21	20.02.2016 11:56:54	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 21	f	44° 18,502' S	172° 50,049' W	3708,8	2	342,5	5,6	98,6
246_44-22	20.02.2016 12:40:07	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 23,107' S	172° 44,773' W	3959,5	1,3	285,6	2,9	128,3
246_44-22	20.02.2016 12:41:21	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 22	f	44° 23,117' S	172° 44,747' W	3962,2	1,2	303,4	1,5	103,7
246_44-23	20.02.2016 13:23:53	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 27,698' S	172° 39,440' W	4273,5	1,8	300,6	2,6	137,4
246_44-23	20.02.2016 13:25:30	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 23	f	44° 27,721' S	172° 39,386' W	4276,8	1,5	327,1	5,9	99,1
246_44-24	20.02.2016 14:07:24	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 32,178' S	172° 34,199' W	4491,1	1,6	334,5	4,4	127
246_44-24	20.02.2016 14:08:35	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 24	f	44° 32,192' S	172° 34,168' W	4490,1	0,8	329,7	6,9	79,6
246_44-25	20.02.2016 14:51:27	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 36,727' S	172° 28,861' W	4563,3	1,8	328,8	7,5	115,8
246_44-25	20.02.2016 14:53:08	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 25	f	44° 36,737' S	172° 28,809' W	4561,6	1,1	325,3	6,7	90,9
246_44-26	20.02.2016 15:37:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 41,308' S	172° 23,453' W	5554,3	2	292,2	4,8	172,1
246_44-26	20.02.2016 15:38:35	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 26	f	44° 41,333' S	172° 23,427' W	4603,8	1	308,8	3,6	156,2
246_44-27	20.02.2016 16:17:13	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 45,865' S	172° 18,081' W	5453,8	1,7	322,9	4,8	134,4
246_44-27	20.02.2016 16:18:34	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 27	f	44° 45,879' S	172° 18,059' W	4520,4	0,7	314,7	5,6	166,3
246_44-28	20.02.2016 16:58:30	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 50,396' S	172° 12,676' W	4599,8	1,8	304,9	5,1	132,5
246_44-28	20.02.2016 17:00:29	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 28	f	44° 50,408' S	172° 12,647' W	4613	0,9	295,4	7	103,4
246_44-29	20.02.2016 17:39:31	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 54,896' S	172° 7,271' W	4666,4	1,9	280	5,3	137,1
246_44-29	20.02.2016 17:40:54	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 29	f	44° 54,911' S	172° 7,244' W	4624,4	0,2	291,7	5,6	19,7
246_44-30	20.02.2016 18:20:54	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 59,431' S	172° 1,882' W	4679,7	2	277,4	7	162,7
246_44-30	20.02.2016 18:21:16	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 30	f	44° 59,439' S	172° 1,874' W	5517,4	1,4	279,6	7,5	146,4

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_44-31	20.02.2016 19:04:46	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 3,911' S	171° 56,495' W	4701,9	1,7	308,4	6,3	161,1
246_44-31	20.02.2016 19:05:56	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 31	f	45° 3,938' S	171° 56,480' W	4705,3	1,4	312,5	5,2	156,4
246_44-32	20.02.2016 19:48:05	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 8,440' S	171° 51,040' W	4756,6	1,8	320,4	1,6	132,9
246_44-32	20.02.2016 19:49:02	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 32	f	45° 8,458' S	171° 51,012' W	4768,2	1,8	320,9	5,1	101,4
246_44-33	20.02.2016 20:32:12	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 12,950' S	171° 45,602' W	4803,6	2,4	327,9	5,7	129,6
246_44-33	20.02.2016 20:33:33	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 33	f	45° 12,974' S	171° 45,573' W	4801,1	0,8	308,6	6,3	142,9
246_44-34	20.02.2016 21:15:08	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 17,480' S	171° 40,137' W	4709,1	1,4	329	6,7	169,2
246_44-34	20.02.2016 21:16:14	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 34	f	45° 17,503' S	171° 40,115' W	4708,8	1,5	321,7	7,4	141,8
246_44-35	20.02.2016 21:56:09	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 21,926' S	171° 34,714' W	4890,2	2,1	286,3	8,7	151,5
246_44-35	20.02.2016 21:57:16	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 35	f	45° 21,955' S	171° 34,697' W	4902,4	1,6	293,7	7,3	164,8
246_45-1	20.02.2016 22:00:00	Passive Acustic Monitoring Systen	PAM	station start				f	45° 22,036' S	171° 34,682' W	4911	2,4	293,1	8,1	157,7
246_45-1	20.02.2016 22:09:22	Passive Acustic Monitoring Systen	PAM	in the water			wird ausgesteckt	f	45° 22,485' S	171° 34,204' W	4902,5	3,9	287,6	7,7	131,9
246_45-1	20.02.2016 22:14:02	Passive Acustic Monitoring Systen	PAM	information			PAM ist ausgesteckt	f	45° 22,708' S	171° 33,896' W	4929,1	3,9	291,1	6,6	134,4
246_45-1	22.02.2016 00:45:48	Passive Acustic Monitoring Systen	PAM	profile end				f	44° 0,079' S	173° 15,052' W	2011	2	214,7	13,2	242,2
246_45-1	22.02.2016 00:54:46	Passive Acustic Monitoring Systen	PAM	on deck				f	44° 0,267' S	173° 15,455' W	1999,8	1,5	213,9	13,9	210,9
246_45-1	22.02.2016 00:54:51	Passive Acustic Monitoring Systen	PAM	station end				f	44° 0,268' S	173° 15,457' W	1999,8	1,1	216,2	11,3	262,4
246_46-1	20.02.2016 23:35:31	Seismic Towed Receiver	SEISTR	station start				f	45° 30,273' S	171° 23,151' W	5007	4,1	295,4	8	299,4
246_46-1	20.02.2016 23:38:38	Seismic Towed Receiver	SEISTR	in the water			Stb Airgun	f	45° 30,186' S	171° 23,355' W	5012,7	2,9	304,2	6,5	293,1
246_46-1	20.02.2016 23:46:13	Seismic Towed Receiver	SEISTR	on deck			Wechsel Drahtstander der Auftrie	f	45° 29,998' S	171° 23,866' W	5000	3,7	306,3	7,4	292,8
246_46-1	20.02.2016 23:57:33	Seismic Towed Receiver	SEISTR	in the water			Stb Airgun	f	45° 29,677' S	171° 24,750' W	4993,8	4,3	300,5	8,5	298,8
246_46-1	21.02.2016 00:12:47	Seismic Towed Receiver	SEISTR	in the water			Bb Airgun	f	45° 29,054' S	171° 25,792' W	4980,1	3,7	273,7	8,4	316,1
246_46-1	21.02.2016 00:16:04	Seismic Towed Receiver	SEISTR	information			1 Schuss, Softstart	f	45° 28,911' S	171° 25,985' W	4966	3,7	272,5	8,9	318,4
246_46-1	21.02.2016 00:16:31	Seismic Towed Receiver	SEISTR	profile start			rwK: 320°	f	45° 28,891' S	171° 26,009' W	4965	3,7	272,6	8,1	324,2
246_46-1	21.02.2016 00:38:49	Seismic Towed Receiver	SEISTR	information			Ende Softstart	f	45° 27,717' S	171° 27,463' W	4939,8	4,8	260,1	9,5	317,2
246_46-1	22.02.2016 00:00:34	Seismic Towed Receiver	SEISTR	profile end				f	43° 59,704' S	173° 11,891' W	2037,4	5,8	208,4	13,9	322,8
246_46-1	22.02.2016 00:04:00	Seismic Towed Receiver	SEISTR	information			Letzter Schuss	f	43° 59,515' S	173° 12,184' W	2027,5	4,3	218,2	18,4	294,9
246_46-1	22.02.2016 00:22:26	Seismic Towed Receiver	SEISTR	on deck			Stb Airgun	f	43° 59,553' S	173° 13,827' W	2021,8	3,9	213,8	13,7	234,9
246_46-1	22.02.2016 00:44:24	Seismic Towed Receiver	SEISTR	on deck			Bb Airgun	f	44° 0,060' S	173° 15,013' W	2007,4	1,1	223,9	12,9	210,9
246_46-1	22.02.2016 00:44:38	Seismic Towed Receiver	SEISTR	station end				f	44° 0,063' S	173° 15,019' W	2007,9	1	216,2	11,6	219,8
246_47-1	22.02.2016 00:56:35	Magnetometer	MAG	station start				f	44° 0,322' S	173° 15,545' W	1996,7	3,3	205,7	16,1	240,1
246_47-1	22.02.2016 01:00:53	Magnetometer	MAG	in the water				f	44° 0,412' S	173° 15,743' W	1991,4	2,7	224,4	16,2	228,9
246_47-1	22.02.2016 01:17:40	Magnetometer	MAG	profile start			rwK: 278°	f	44° 1,187' S	173° 16,884' W	2002,3	4,3	213,2	15,4	232,1
246_47-1	22.02.2016 12:21:47	Magnetometer	MAG	profile end			Beginn Einholen	f	43° 46,652' S	175° 37,508' W	308,2	5,2	231,8	8,8	275,2
246_47-1	22.02.2016 12:36:04	Magnetometer	MAG	information			Magnetometer an Deck	f	43° 46,489' S	175° 39,137' W	298,1	5,7	245,7	8,3	280,3
246_47-1	22.02.2016 12:36:25	Magnetometer	MAG	station end				f	43° 46,484' S	175° 39,181' W	299	5,4	243,5	7,9	278,7
246_48-1	22.02.2016 18:30:07	Magnetometer	MAG	station start				f	43° 46,029' S	175° 54,954' W	161	7,7	249,7	8,3	73,3
246_48-1	22.02.2016 18:32:42	Magnetometer	MAG	in the water				f	43° 45,938' S	175° 54,588' W	164,1	5,7	274,8	3,3	68
246_48-1	22.02.2016 18:40:51	Magnetometer	MAG	information			350 m ausgesteckt	f	43° 45,718' S	175° 53,708' W	170,9	5	234,1	4,7	70,2
246_48-1	22.02.2016 18:47:08	Magnetometer	MAG	profile start			rwK: 358°	f	43° 45,365' S	175° 52,765' W	187,2	9,5	252,5	10,1	15,2
246_48-1	22.02.2016 20:55:47	Magnetometer	MAG	alter course			rwK: 090°; d: 3 nm	f	43° 24,223' S	175° 54,019' W	415,9	9,7	240,1	9,6	1,3
246_48-1	22.02.2016 21:14:14	Magnetometer	MAG	alter course			rwK: 175°; d:22 nm	f	43° 23,904' S	175° 50,391' W	439,4	9,4	246,7	8,2	103,9
246_48-1	22.02.2016 23:21:03	Magnetometer	MAG	profile end				f	43° 44,176' S	175° 47,888' W	263,6	6,2	265,7	7,8	194,1
246_48-1	22.02.2016 23:39:00	Magnetometer	MAG	information			Magnetometer an Deck	f	43° 44,938' S	175° 49,933' W	230,8	5,8	260,9	6,5	262,1
246_48-1	22.02.2016 23:39:20	Magnetometer	MAG	station end				f	43° 44,946' S	175° 49,977' W	231,2	6,1	255,2	7,4	251,6
246_49-1	23.02.2016 05:11:10	Magnetometer	MAG	station start				f	43° 46,100' S	175° 54,973' W	159	7	265	7	70,4
246_49-1	23.02.2016 05:24:28	Magnetometer	MAG	in the water			315 m ausgesteckt	f	43° 45,694' S	175° 53,536' W	174,6	5,9	262,3	6	66,5
246_49-1	23.02.2016 05:24:30	Magnetometer	MAG	profile start				f	43° 45,692' S	175° 53,532' W	174,2	5,9	253,2	5,8	63,4
246_49-1	23.02.2016 09:31:00	Magnetometer	MAG	alter course			rwK: 108; d: 91 nm	f	43° 35,398' S	175° 8,985' W	577,2	9,5	275,3	6,4	72,5
246_49-1	23.02.2016 17:27:41	Magnetometer	MAG	profile end			Beginn Einholen	f	43° 58,380' S	173° 29,824' W	1836,9	5,2	276,8	4,3	110,7

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_49-1	23.02.2016 17:40:38	Magnetometer	MAG	station end			Magnetometer an Deck	f	43° 58,701' S	173° 28,439' W	1858,8	4,5	284,4	7,5	109,9
246_50-1	23.02.2016 17:47:03	Passive Acustic Monitoring Systen	PAM	station start			Beginn Auslegen	f	43° 58,874' S	173° 27,683' W	1866,9	5,6	299,2	5,8	108,3
246_50-1	23.02.2016 17:53:13	Passive Acustic Monitoring Systen	PAM	in the water			200m ausgesteckt	f	43° 59,047' S	173° 26,927' W	1882,5	5,5	282,6	5,3	105,2
246_50-1	26.02.2016 17:36:57	Passive Acustic Monitoring Systen	PAM	profile end			Beginn Einholen	f	45° 32,444' S	171° 23,449' W	5062,2	3,8	343,8	10,5	195
246_50-1	26.02.2016 17:42:22	Passive Acustic Monitoring Systen	PAM	station end			PAM an Deck	f	45° 32,762' S	171° 23,689' W	5075,6	3,7	341,1	9,7	209
246_51-1	23.02.2016 19:10:04	Seismic Towed Receiver	SEISTR	station start				f	44° 3,139' S	173° 12,132' W	2154,9	7,2	298,8	12,3	226,3
246_51-1	23.02.2016 19:14:40	Seismic Towed Receiver	SEISTR	information			Stb. Airgun zu Wasser	f	44° 3,345' S	173° 12,414' W	2118,7	2,3	304,1	9,4	226,1
246_51-1	23.02.2016 19:30:16	Seismic Towed Receiver	SEISTR	information			Beginn auslegen Bb. Airgun	f	44° 4,102' S	173° 13,464' W	2169	4,4	298,4	10,7	233,9
246_51-1	23.02.2016 19:38:05	Seismic Towed Receiver	SEISTR	information			Bb. Airgun zu Wasser	f	44° 4,489' S	173° 13,991' W	2167,1	4,5	287,3	10,6	213,3
246_51-1	23.02.2016 19:59:24	Seismic Towed Receiver	SEISTR	information			Beginn Softstart	f	44° 3,618' S	173° 14,238' W	2125,3	6,3	280,3	9,2	41,1
246_51-1	23.02.2016 20:19:31	Seismic Towed Receiver	SEISTR	information			Beginn schießen mit voller Krat	f	44° 2,349' S	173° 12,501' W	2063,1	4,5	267,6	6,8	44
246_51-1	23.02.2016 20:45:26	Seismic Towed Receiver	SEISTR	profile start			rwK: 320°	f	44° 0,707' S	173° 10,837' W	2054	5,4	269,1	5,5	340,6
246_51-1	24.02.2016 18:30:36	Seismic Towed Receiver	SEISTR	profile end				f	42° 38,924' S	174° 41,800' W	2377,8	4,9	322,1	10,8	322
246_51-1	24.02.2016 19:00:04	Seismic Towed Receiver	SEISTR	on deck			Airguns an Deck	f	42° 37,923' S	174° 43,425' W	2421,1	4,6	327	11,1	315,1
246_51-1	24.02.2016 19:00:05	Seismic Towed Receiver	SEISTR	station end				f	42° 37,922' S	174° 43,426' W	2421,1	4,4	317,3	10,2	313,3
246_52-1	24.02.2016 19:07:12	Seismic Towed Receiver	SEISTR	station start				f	42° 37,530' S	174° 43,000' W	2424,8	6	325	5,9	126,9
246_52-1	24.02.2016 19:08:48	Seismic Towed Receiver	SEISTR	information			Beginn auslegen Streamer, Endboje zu	f	42° 37,631' S	174° 42,859' W	2416,8	5,1	319,7	6,9	128,9
246_52-1	24.02.2016 20:42:37	Seismic Towed Receiver	SEISTR	information			Streamer ausgelegt	f	42° 41,747' S	174° 38,212' W	1663,6	3,4	318,7	3,2	141,9
246_52-1	24.02.2016 20:47:44	Seismic Towed Receiver	SEISTR	information			Beginn aussetzen Stb. Airgun	f	42° 41,969' S	174° 37,990' W	1680,2	3,1	301,5	9,9	135,2
246_52-1	24.02.2016 20:54:42	Seismic Towed Receiver	SEISTR	information			Stb. Airgun zu Wasser	f	42° 42,266' S	174° 37,686' W	1679,7	3,4	317,9	7	154,2
246_52-1	24.02.2016 21:00:12	Seismic Towed Receiver	SEISTR	information			Beginn Softstart	f	42° 42,516' S	174° 37,447' W	1677,7	3,4	322,4	9,5	140,9
246_52-1	24.02.2016 21:03:47	Seismic Towed Receiver	SEISTR	information			Beginn aussetzen Bb. Airguns	f	42° 42,680' S	174° 37,282' W	1673,6	3,3	348,9	2,8	135,8
246_52-1	24.02.2016 21:11:04	Seismic Towed Receiver	SEISTR	information			Bb. Airguns zu Wasser	f	42° 42,999' S	174° 36,950' W	1669	3,2	333,6	4,5	138,9
246_52-1	24.02.2016 21:18:15	Seismic Towed Receiver	SEISTR	information			Magnetometer geht zu Wasse	f	42° 43,307' S	174° 36,637' W	1666	3,6	306,2	3,9	149,2
246_52-1	24.02.2016 21:25:03	Seismic Towed Receiver	SEISTR	information			Beginn schießen mit voller Krat	f	42° 43,633' S	174° 36,294' W	1658,1	3,6	333	7,1	131,8
246_52-1	24.02.2016 21:30:00	Seismic Towed Receiver	SEISTR	information			Magnetometer ausgesteckt	f	42° 43,875' S	174° 36,043' W	1653,1	3,8	310,5	7,2	138,6
246_52-1	24.02.2016 22:12:25	Seismic Towed Receiver	SEISTR	profile start			rwK: 141°	f	42° 46,523' S	174° 33,521' W	1555,3	4,6	339,6	6,1	144,9
246_52-1	26.02.2016 16:51:23	Seismic Towed Receiver	SEISTR	information			Beginn Einholen Magnetomete	f	45° 29,551' S	171° 25,205' W	4996,3	5	342,2	8,3	134,9
246_52-1	26.02.2016 17:00:18	Seismic Towed Receiver	SEISTR	profile end			Airguns aus	f	45° 30,172' S	171° 24,421' W	4999,1	5,9	337,2	7,3	147,7
246_52-1	26.02.2016 17:07:08	Seismic Towed Receiver	SEISTR	information			Magnetometer an Deck	f	45° 30,646' S	171° 23,826' W	5013,6	5,3	350,7	9,1	130,4
246_52-1	26.02.2016 17:13:31	Seismic Towed Receiver	SEISTR	information			Beginn Einholen Stb. Airguns	f	45° 31,105' S	171° 23,299' W	5029,2	4,7	338,2	5,5	153,6
246_52-1	26.02.2016 17:21:19	Seismic Towed Receiver	SEISTR	information			Stb. Airguns an Deck	f	45° 31,571' S	171° 23,099' W	5046,3	3,5	333,8	8,2	145,1
246_52-1	26.02.2016 17:24:04	Seismic Towed Receiver	SEISTR	information			Beginn Einholen Bb. Airguns	f	45° 31,716' S	171° 23,094' W	5034,4	4	332,5	9,1	187,6
246_52-1	26.02.2016 17:33:57	Seismic Towed Receiver	SEISTR	information			Bb. Airguns an Deck	f	45° 32,270' S	171° 23,324' W	5061,6	4,1	344,2	11,5	197,2
246_52-1	26.02.2016 17:45:19	Seismic Towed Receiver	SEISTR	information			Beginn Einholen Streamer	f	45° 32,928' S	171° 23,806' W	5092,4	3,7	347,5	11,1	222,8
246_52-1	26.02.2016 19:19:56	Seismic Towed Receiver	SEISTR	station end			Streamer an Deck	f	45° 39,000' S	171° 28,096' W	5126,9	3,8	348,6	11,4	201,4
246_52-1	26.02.2016 19:21:38	Seismic Towed Receiver	SEISTR	station end				f	45° 39,106' S	171° 28,145' W	5124,5	3,8	349,8	10,8	198,8
246_53-1	26.02.2016 19:34:07	CTD	CTD	station start			Test vom WTD des XSV	f	45° 39,176' S	171° 28,561' W	5139,8	0,8	346,4	12,1	133,3
246_53-1	26.02.2016 19:39:21	CTD	CTD	information			XSV zu Wasser	f	45° 39,164' S	171° 28,555' W	5136,3	0,7	342,7	10,7	84
246_53-1	26.02.2016 19:46:32	CTD	CTD	information			Ende Test, Gerät (XSV) ist bei 1000m a	f	45° 39,176' S	171° 28,639' W	5142,9	0,7	337,5	12,2	277,9
246_53-1	26.02.2016 19:50:57	CTD	CTD	in the water			EL 1	f	45° 39,170' S	171° 28,635' W	5124,8	0,9	330,7	13,4	73,6
246_53-1	26.02.2016 20:55:42	CTD	CTD	max depth/on ground			SLmax: 2500 m	f	45° 39,173' S	171° 28,644' W	5128	0,9	324,2	11,3	59,5
246_53-1	26.02.2016 20:56:49	CTD	CTD	hoisting				f	45° 39,173' S	171° 28,646' W	5139,3	0,2	323,9	11,9	23,1
246_53-1	26.02.2016 21:43:49	CTD	CTD	on deck				f	45° 39,169' S	171° 28,641' W	5143	0,7	313,1	10,6	210,1
246_53-1	26.02.2016 21:46:02	CTD	CTD	station end				f	45° 39,150' S	171° 28,634' W	5143,8	1,8	318,4	10,8	13,8
246_54-1	27.02.2016 03:58:16	Dredge	DRG	station start				f	45° 31,177' S	170° 5,116' W	4749,3	0,5	335,7	10,9	62,4
246_54-1	27.02.2016 04:00:55	Dredge	DRG	in the water			FW1/SPW1	f	45° 31,172' S	170° 5,146' W	4729,8	0,5	329,2	10	192,6
246_54-1	27.02.2016 05:29:00	Dredge	DRG	max depth/on ground			SL: 4902 m	f	45° 31,174' S	170° 5,143' W	4736,6	0,3	311	10,2	262,7
246_54-1	27.02.2016 05:29:20	Dredge	DRG	profile start			rwK: 331°; d: 770 m	f	45° 31,174' S	170° 5,143' W	4735,7	0,1	310,7	8,7	349,8

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_54-1	27.02.2016 06:02:19	Dredge	DRG	profile end			SLmax: 5300 m	f	45° 30,785' S	170° 5,455' W	4342,8	0,2	302,3	12,7	267,3
246_54-1	27.02.2016 06:02:28	Dredge	DRG	hoisting				f	45° 30,784' S	170° 5,455' W	4342,8	0,3	301,2	10,6	111
246_54-1	27.02.2016 06:56:24	Dredge	DRG	information			frei vom Grund; SZmax: 61 kN	f	45° 30,783' S	170° 5,451' W	4343,8	0,5	300,3	11,6	80,6
246_54-1	27.02.2016 08:15:43	Dredge	DRG	on deck				f	45° 30,783' S	170° 5,457' W	4337,2	0,1	297,2	11,2	329
246_54-1	27.02.2016 08:25:19	Dredge	DRG	station end				f	45° 30,787' S	170° 5,461' W	4361,6	0,4	296,8	11,9	7,1
246_55-1	27.02.2016 11:09:28	Dredge	DRG	station start				f	45° 39,006' S	170° 13,281' W	3647,1	0,8	284,8	9,3	197,2
246_55-1	27.02.2016 11:10:17	Dredge	DRG	in the water			FW1/SPW1	f	45° 39,005' S	170° 13,281' W	3621,6	0,5	281,1	8,2	135,6
246_55-1	27.02.2016 12:07:38	Dredge	DRG	max depth/on ground			SL: 3654 m	f	45° 38,999' S	170° 13,344' W	3566,1	0,4	263,6	10,2	343,9
246_55-1	27.02.2016 12:07:47	Dredge	DRG	profile start			rwK: 269°	f	45° 38,999' S	170° 13,345' W	3566,1	1,6	261,9	9,8	355,9
246_55-1	27.02.2016 12:50:02	Dredge	DRG	profile end			SLmax: 4200 m	f	45° 39,034' S	170° 14,102' W	3288,9	0,6	250,4	10,5	4
246_55-1	27.02.2016 12:50:07	Dredge	DRG	hoisting				f	45° 39,034' S	170° 14,102' W	3288,9	0,2	244,4	10,3	215
246_55-1	27.02.2016 13:47:21	Dredge	DRG	max depth/on ground			SZmax: 52 kN	f	45° 39,027' S	170° 14,104' W	3289,2	0,5	233,5	9,5	194,3
246_55-1	27.02.2016 14:41:31	Dredge	DRG	on deck				f	45° 39,040' S	170° 14,111' W	3276,6	1	243,2	7,3	177,1
246_55-1	27.02.2016 15:00:00	Dredge	DRG	station end				f	45° 39,040' S	170° 14,101' W	3271,6	1,3	259,6	7,2	350,2
246_56-1	27.02.2016 17:04:51	Dredge	DRG	station start				f	45° 34,604' S	170° 30,242' W	4761,9	1,2	281,3	7,2	320,3
246_56-1	27.02.2016 17:06:04	Dredge	DRG	in the water			FW1/SPW1	f	45° 34,606' S	170° 30,250' W	4752,3	0,2	274,5	7,3	275,2
246_56-1	27.02.2016 18:21:51	Dredge	DRG	max depth/on ground			SL: 4903 m	f	45° 34,615' S	170° 30,260' W	4754,2	1,1	290,1	9,7	172,7
246_56-1	27.02.2016 18:24:11	Dredge	DRG	profile start			rwK: 257°; d: 730 m	f	45° 34,617' S	170° 30,262' W	4743,7	0,6	288,6	11	253,3
246_56-1	27.02.2016 18:51:59	Dredge	DRG	profile end			SLmax: 5250 m	f	45° 34,708' S	170° 30,857' W	4466,7	1,2	273,5	9,9	332,7
246_56-1	27.02.2016 18:52:14	Dredge	DRG	hoisting				f	45° 34,708' S	170° 30,859' W	4468,8	0,2	273,7	8,7	179,3
246_56-1	27.02.2016 19:36:33	Dredge	DRG	information			frei vom Grund; SZmax: 84,2 kN	f	45° 34,698' S	170° 30,853' W	4465,7	0,4	267,9	10	188,6
246_56-1	27.02.2016 21:03:38	Dredge	DRG	on deck				f	45° 34,705' S	170° 30,846' W	4477,8	1,2	238,9	13,5	40,6
246_56-1	27.02.2016 21:06:50	Dredge	DRG	station end				f	45° 34,703' S	170° 30,847' W	4479,3	0,5	232,5	14,4	209,4
246_57-1	28.02.2016 01:06:22	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	45° 22,482' S	171° 24,835' W	4882,2	7,8	223,5	7,8	272,9
246_57-1	28.02.2016 01:19:21	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 35	f	45° 22,355' S	171° 27,257' W	0	8,1	229,4	9,5	275
246_57-1	28.02.2016 03:53:56	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 22,436' S	171° 35,418' W	0	4,1	238,5	9	231,5
246_57-1	28.02.2016 04:10:10	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	45° 22,608' S	171° 36,114' W	0	1,2	230,4	10,7	227,7
246_57-1	28.02.2016 04:11:10	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	45° 22,590' S	171° 36,148' W	0	2,4	243,6	8,2	304,9
246_57-2	28.02.2016 04:14:03	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 34	f	45° 22,606' S	171° 36,394' W	0	6,1	230,3	10,5	273,8
246_57-2	28.02.2016 05:28:46	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 17,495' S	171° 39,993' W	0	5,1	231,2	7,4	254
246_57-2	28.02.2016 05:43:51	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	45° 17,883' S	171° 41,109' W	0	1,2	224,6	5,8	329,6
246_57-2	28.02.2016 05:50:01	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	45° 17,995' S	171° 41,423' W	0	3,4	232,9	5,9	232,7
246_57-3	28.02.2016 05:48:05	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 33	f	45° 17,927' S	171° 41,275' W	0	3,5	245,4	5,8	238,9
246_57-3	28.02.2016 07:02:56	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 12,810' S	171° 45,088' W	0	0,7	256,4	4,5	349,3
246_57-3	28.02.2016 07:24:10	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	45° 13,130' S	171° 46,302' W	0	0,9	249,8	4,1	302,5
246_57-4	28.02.2016 07:41:44	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 32	f	45° 11,696' S	171° 47,186' W	0	7,2	268,7	4,7	332,5
246_57-4	28.02.2016 08:33:47	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 8,349' S	171° 50,259' W	0	1,5	298,2	2,8	244,2
246_57-4	28.02.2016 08:54:27	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	45° 8,483' S	171° 51,467' W	0	1,8	308,4	2,5	244,8
246_57-5	28.02.2016 09:34:58	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 31	f	45° 4,853' S	171° 54,064' W	0	5,1	321,2	3,1	344,4
246_57-5	28.02.2016 10:09:33	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	45° 4,053' S	171° 55,633' W	0	2	340,9	6,7	301,4
246_57-5	28.02.2016 10:27:00	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	45° 4,064' S	171° 56,977' W	0	1	347,5	4,3	270,9
246_57-6	28.02.2016 10:30:27	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 30	f	45° 3,992' S	171° 57,109' W	0	4,3	335,9	5	322,4
246_57-6	28.02.2016 11:41:28	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 59,786' S	172° 2,339' W	0	2	341,5	6,9	41,9
246_57-6	28.02.2016 11:53:07	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 59,471' S	172° 2,353' W	4678,2	1,9	10,7	5,3	30,1
246_57-6	28.02.2016 11:53:24	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 59,469' S	172° 2,355' W	4677	0,9	8	5,2	24,4
246_57-7	28.02.2016 12:03:12	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 58,982' S	172° 3,178' W	0	6,2	3,8	6,3	314,1
246_57-7	28.02.2016 12:03:20	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 29	f	44° 58,971' S	172° 3,191' W	0	6,7	358,8	6,6	309,6
246_57-7	28.02.2016 13:16:29	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 55,178' S	172° 6,730' W	0	1,7	12	8,1	170,9
246_57-7	28.02.2016 13:42:36	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 55,136' S	172° 7,688' W	0	0,4	1	6,9	36,4

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_57-7	28.02.2016 13:42:46	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 55,135' S	172° 7,686' W	4649,8	0,6	7,2	7	34,2
246_57-8	28.02.2016 13:48:21	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 54,942' S	172° 7,767' W	0	4,9	17,2	7,9	337,6
246_57-8	28.02.2016 13:48:36	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 28	f	44° 54,924' S	172° 7,782' W	0	5,4	10,7	7,2	338,2
246_57-8	28.02.2016 14:52:43	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 50,674' S	172° 13,056' W	0	1	2,6	7,4	50
246_57-8	28.02.2016 15:01:55	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 50,463' S	172° 12,867' W	0	1,6	10,4	6,8	46,1
246_57-8	28.02.2016 15:03:39	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 50,414' S	172° 12,829' W	0	2,4	20,1	8,8	24,1
246_57-9	28.02.2016 15:09:46	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 27	f	44° 49,857' S	172° 12,823' W	0	7,7	16,6	8,4	305,8
246_57-9	28.02.2016 16:30:37	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon z/W, nochmal ausgek	f	44° 46,185' S	172° 18,000' W	0	0,2	17,2	10,9	33,7
246_57-9	28.02.2016 16:53:30	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon a/D	f	44° 46,180' S	172° 17,998' W	0	0,5	13,8	11	187,9
246_57-9	28.02.2016 17:08:15	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon z/W	f	44° 45,828' S	172° 18,095' W	0	0,9	8,9	12,7	160,5
246_57-9	28.02.2016 17:16:52	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon a/D	f	44° 45,869' S	172° 18,052' W	0	0,3	6,1	11,4	343,7
246_57-9	28.02.2016 19:00:00	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 46,514' S	172° 17,823' W	0	1,3	14,8	12,4	100,5
246_57-9	28.02.2016 19:38:52	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 46,679' S	172° 17,617' W	0	2,7	4,3	16,3	133,4
246_57-10	28.02.2016 19:45:15	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 26	f	44° 46,648' S	172° 17,510' W	0	4,2	17,6	15,6	296,6
246_57-10	28.02.2016 20:58:13	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 41,628' S	172° 23,248' W	0	0,6	359,3	11,5	268,5
246_57-10	28.02.2016 21:11:10	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 41,362' S	172° 23,446' W	0	2,4	347,6	13,8	104,6
246_57-11	28.02.2016 21:29:11	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 25	f	44° 40,509' S	172° 24,524' W	0	4,8	3,3	13	305,4
246_57-11	28.02.2016 22:15:32	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 37,379' S	172° 28,813' W	0	1,4	350,4	12,1	47,5
246_57-11	28.02.2016 22:34:06	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 36,885' S	172° 28,610' W	0	2,2	341,5	13,6	163,1
246_57-12	28.02.2016 22:36:25	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 24	f	44° 36,930' S	172° 28,514' W	0	2	337,3	14,8	91,5
246_57-12	28.02.2016 23:47:20	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 32,885' S	172° 34,515' W	0	3,7	352,4	10,3	19,6
246_57-12	29.02.2016 00:04:01	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 32,200' S	172° 34,130' W	4496,8	0,6	357,4	7,3	212,8
246_57-12	29.02.2016 00:04:14	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 32,199' S	172° 34,127' W	4495,6	0,9	341,7	8,7	221,9
246_57-13	29.02.2016 00:12:02	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 31,931' S	172° 34,544' W	0	6,6	349,7	10	309
246_57-13	29.02.2016 00:12:45	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 23	f	44° 31,878' S	172° 34,620' W	0	6,3	352,2	9,2	312,7
246_57-13	29.02.2016 01:11:27	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 27,979' S	172° 39,633' W	0	0,8	330,6	11,7	91,3
246_57-13	29.02.2016 01:24:25	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 27,716' S	172° 39,275' W	4285,3	1,6	321,9	11,6	58,2
246_57-13	29.02.2016 01:24:31	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 27,713' S	172° 39,271' W	4285,3	1	323,5	12,4	33
246_57-14	29.02.2016 01:30:01	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 27,542' S	172° 39,254' W	0	6,1	337,4	10,6	334,1
246_57-14	29.02.2016 01:30:06	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 22	f	44° 27,535' S	172° 39,259' W	0	5,5	NaN	NaN	316,1
246_57-14	29.02.2016 02:25:23	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 23,697' S	172° 44,776' W	0	2,5	296,3	14,3	12,9
246_57-14	29.02.2016 02:41:09	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 23,145' S	172° 44,148' W	0	1,8	307,5	13,1	102,1
246_57-14	29.02.2016 02:41:12	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 23,145' S	172° 44,146' W	0	1,7	307,1	11,3	90,3
246_57-15	29.02.2016 03:00:07	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 21,868' S	172° 45,423' W	0	7,2	283,9	12,4	307,7
246_57-15	29.02.2016 03:00:14	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 21	f	44° 21,860' S	172° 45,440' W	0	7,2	282,2	10,3	305,2
246_57-15	29.02.2016 03:40:34	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 18,883' S	172° 49,746' W	0	3,2	292	11,3	317,8
246_57-15	29.02.2016 03:51:33	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	44° 18,547' S	172° 49,975' W	3694,2	2,6	291,6	11,5	83
246_57-16	29.02.2016 03:52:04	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 20	f	44° 18,550' S	172° 49,956' W	3691,3	3,3	285,2	10,5	74,3
246_57-16	29.02.2016 04:28:22	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophone zu Wasser	f	44° 15,166' S	172° 54,085' W	0	1,8	276,2	11,9	4,3
246_57-16	29.02.2016 04:31:31	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophone a/D	f	44° 15,105' S	172° 54,058' W	0	2	NaN	NaN	39,7
246_57-16	29.02.2016 04:34:55	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 15,077' S	172° 53,991' W	0	0,9	277,6	13,1	73,8
246_57-16	29.02.2016 04:58:01	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	44° 13,855' S	172° 55,105' W	0	2,6	266,8	13,6	54,7
246_57-17	29.02.2016 05:00:34	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 19; Hydrophon z/W, ausgel	f	44° 13,819' S	172° 55,030' W	0	2,4	261,3	13,2	52,5
246_57-17	29.02.2016 05:06:59	Seismic Ocean Bottom Receiver	SEISOBR	information			Hydrophon a/D	f	44° 13,737' S	172° 54,881' W	0	2	270,2	11,8	31
246_57-17	29.02.2016 05:44:51	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 9,307' S	172° 59,899' W	0	4,6	251,1	13	286,1
246_57-17	29.02.2016 05:56:44	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	44° 9,140' S	173° 0,707' W	0	2,1	233,9	16,7	11,8
246_57-18	29.02.2016 06:42:27	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 4,588' S	173° 5,794' W	0	1,3	213,2	11,9	338,9
246_57-18	29.02.2016 06:47:28	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 18	f	44° 4,526' S	173° 5,744' W	0	0,3	220	11,9	340,3
246_57-18	29.02.2016 07:18:13	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 4,528' S	173° 5,747' W	0	0,2	229,7	15,6	240,5

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_57-18	29.02.2016 07:29:07	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 4,743' S	173° 6,232' W	0	1,6	205,8	19,2	318,2
246_57-19	29.02.2016 07:49:08	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 17	f	44° 2,398' S	173° 8,442' W	0	8	210,1	14,6	331,7
246_57-19	29.02.2016 08:27:12	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 0,007' S	173° 10,941' W	0	0,5	219,6	15,4	60,3
246_57-19	29.02.2016 08:53:46	Seismic Ocean Bottom Receiver	SEISOBR	information			an Deck	f	44° 0,121' S	173° 11,724' W	0	1,3	220,2	17,5	15,7
246_57-20	29.02.2016 09:13:34	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 16	f	43° 57,988' S	173° 13,884' W	0	7,2	215,4	15,7	334,6
246_57-20	29.02.2016 09:54:15	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 55,544' S	173° 15,988' W	0	3,5	229,9	13,5	256,3
246_57-20	29.02.2016 10:10:32	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 55,556' S	173° 16,902' W	0	1,4	225,8	15,7	293,9
246_57-21	29.02.2016 10:26:51	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 15	f	43° 53,648' S	173° 18,279' W	0	7,3	217,1	14,7	343,8
246_57-21	29.02.2016 10:53:29	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 50,656' S	173° 20,771' W	0	3,1	223,5	14,8	268,2
246_57-21	29.02.2016 11:15:54	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 51,055' S	173° 22,001' W	0	2,6	217,6	17,5	333,8
246_57-21	29.02.2016 11:15:59	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 51,053' S	173° 22,003' W	0	2,3	216,7	16,1	319,9
246_57-22	29.02.2016 11:34:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 48,762' S	173° 23,980' W	0	6,6	213	13,3	333,8
246_57-22	29.02.2016 11:34:05	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 14	f	43° 48,754' S	173° 23,986' W	0	6,5	224,6	16,7	326
246_57-22	29.02.2016 12:04:51	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 46,166' S	173° 26,530' W	0	0,8	241,7	13,1	219,2
246_57-22	29.02.2016 12:21:26	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 46,650' S	173° 27,334' W	0	1,6	223,2	18,3	292,1
246_57-22	29.02.2016 12:21:33	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 46,647' S	173° 27,337' W	0	1,8	219,1	20	275,2
246_57-23	29.02.2016 12:39:06	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 44,881' S	173° 28,925' W	0	5,2	213	11,4	335,3
246_57-23	29.02.2016 12:42:45	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 13	f	43° 44,564' S	173° 29,116' W	0	6,8	213,7	13,6	339,3
246_57-23	29.02.2016 13:06:29	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 41,700' S	173° 31,553' W	0	2,1	241,9	12,6	269,7
246_57-23	29.02.2016 13:22:36	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 42,129' S	173° 32,263' W	0	1,2	223	16,1	302,1
246_57-23	29.02.2016 13:22:42	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 42,127' S	173° 32,265' W	0	1,1	219,3	15,7	336,9
246_57-24	29.02.2016 13:44:43	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 39,898' S	173° 34,176' W	0	6,7	222,2	16,4	335,4
246_57-24	29.02.2016 13:44:49	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 12	f	43° 39,887' S	173° 34,180' W	0	7,1	221,2	14,7	347,8
246_57-24	29.02.2016 14:12:21	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 37,262' S	173° 36,859' W	0	5,1	241	13,3	230,1
246_57-24	29.02.2016 14:24:36	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 37,507' S	173° 37,532' W	0	1,8	237,9	11,2	273,4
246_57-24	29.02.2016 14:24:46	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 37,506' S	173° 37,537' W	0	1,6	244,2	10,3	284,3
246_57-25	29.02.2016 14:50:09	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 34,863' S	173° 39,666' W	0	5,7	218,7	16,2	356,2
246_57-25	29.02.2016 14:50:31	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 11	f	43° 34,832' S	173° 39,675' W	0	4,9	228,7	13	346,9
246_57-25	29.02.2016 15:11:43	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 32,491' S	173° 42,009' W	0	5,2	244,4	11	232,1
246_57-25	29.02.2016 15:23:59	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	43° 32,768' S	173° 42,639' W	0	0,7	229,5	13,3	282,1
246_57-26	29.02.2016 15:48:04	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 10	f	43° 30,025' S	173° 44,909' W	0	7,3	226,8	18,4	337,5
246_57-26	29.02.2016 16:06:10	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 27,846' S	173° 46,995' W	0	4,5	226,3	13,4	253,1
246_57-26	29.02.2016 16:19:11	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	43° 28,095' S	173° 47,701' W	0	1,3	227,6	14,6	10,5
246_57-27	29.02.2016 16:48:52	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 9	f	43° 24,893' S	173° 50,452' W	0	7,2	229,9	15,7	330,8
246_57-27	29.02.2016 17:29:19	Seismic Ocean Bottom Receiver	SEISOBR	information			OBS noch am Grund?	f	43° 23,523' S	173° 52,848' W	0	1,9	226,7	11,5	18,2
246_57-27	29.02.2016 18:04:58	Seismic Ocean Bottom Receiver	SEISOBR	information			ausgelöst mit richtigem Code	f	43° 23,604' S	173° 52,735' W	0	1,6	249,1	11,8	6,4
246_57-27	29.02.2016 18:34:56	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 23,443' S	173° 52,731' W	0	1,8	247,5	13,6	281,9
246_57-27	29.02.2016 19:00:03	Seismic Ocean Bottom Receiver	SEISOBR	station end			an Deck	f	43° 23,491' S	173° 52,664' W	0	1,9	250,7	14	227,7
246_57-28	29.02.2016 19:21:34	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 8	f	43° 21,152' S	173° 54,770' W	0	7,1	246,7	15,3	338,1
246_57-28	29.02.2016 19:41:11	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 18,695' S	173° 56,984' W	0	8,1	246,3	12,9	296,2
246_57-28	29.02.2016 19:53:14	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 18,683' S	173° 58,140' W	0	2,2	262,1	10,3	356,2
246_57-29	29.02.2016 20:38:33	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 7	f	43° 14,022' S	174° 2,323' W	0	1,7	260	13,3	264,9
246_57-29	29.02.2016 20:40:12	Seismic Ocean Bottom Receiver	SEISOBR	released				f	43° 14,037' S	174° 2,349' W	0	0,6	258,6	15,9	202,1
246_57-29	29.02.2016 20:56:05	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 14,217' S	174° 2,788' W	0	0,5	240,8	13,4	184,6
246_57-29	29.02.2016 21:04:03	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 14,231' S	174° 3,080' W	0	0,4	251,2	14,6	89,3
246_57-30	29.02.2016 21:33:41	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 6	f	43° 11,237' S	174° 5,282' W	0	7	251	16,9	332,2
246_57-30	29.02.2016 21:36:40	Seismic Ocean Bottom Receiver	SEISOBR	released				f	43° 10,919' S	174° 5,450' W	0	6,5	247,4	18,1	336,4
246_57-30	29.02.2016 21:52:59	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 9,498' S	174° 7,168' W	0	7,9	231,5	12	261,5
246_57-30	29.02.2016 22:03:11	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 9,520' S	174° 8,318' W	0	1,2	236,8	11,2	4,8

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_57-31	29.02.2016 22:27:02	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 5	f	43° 6,615' S	174° 10,349' W	0	7,4	247,5	14,7	344,4
246_57-31	29.02.2016 22:29:09	Seismic Ocean Bottom Receiver	SEISOBR	released				f	43° 6,388' S	174° 10,466' W	0	6,8	241,2	16,1	349,2
246_57-31	29.02.2016 22:43:51	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 4,891' S	174° 11,925' W	0	7,5	240,2	17	267,9
246_57-31	29.02.2016 22:57:11	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 4,864' S	174° 13,120' W	0	2	262,2	16,2	138,8
246_57-32	29.02.2016 23:24:17	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 4	f	43° 2,203' S	174° 15,625' W	0	6,9	240,8	17,7	333,7
246_57-32	29.02.2016 23:26:34	Seismic Ocean Bottom Receiver	SEISOBR	released				f	43° 1,945' S	174° 15,776' W	0	8,1	230,9	15,1	339,4
246_57-32	29.02.2016 23:48:12	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 0,103' S	174° 17,941' W	0	2,5	264,8	13,8	221,5
246_57-32	01.03.2016 00:00:02	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 0,220' S	174° 18,464' W	0	3,2	236,3	17	345,1
246_57-32	01.03.2016 00:00:08	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 0,218' S	174° 18,468' W	0	1,7	234,6	14,9	289,8
246_57-33	01.03.2016 00:20:47	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 3	f	42° 57,945' S	174° 20,850' W	0	8,3	252	16,7	332,5
246_57-33	01.03.2016 00:22:18	Seismic Ocean Bottom Receiver	SEISOBR	released				f	42° 57,767' S	174° 20,954' W	0	7,8	250,2	16,3	339,8
246_57-33	01.03.2016 00:42:30	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	42° 55,594' S	174° 22,790' W	0	1,9	259	11,5	246
246_57-33	01.03.2016 00:55:24	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	42° 55,759' S	174° 23,481' W	0	1,1	250,9	11,9	226,4
246_57-33	01.03.2016 00:55:35	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 55,756' S	174° 23,486' W	0	1,5	257,3	13,5	306,2
246_57-34	01.03.2016 01:21:07	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 2	f	42° 52,701' S	174° 25,977' W	0	5,4	254,5	17,7	343,1
246_57-34	01.03.2016 01:22:17	Seismic Ocean Bottom Receiver	SEISOBR	released				f	42° 52,597' S	174° 26,024' W	0	5,5	248,2	14	340
246_57-34	01.03.2016 01:42:51	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	42° 50,915' S	174° 27,812' W	0	4,7	251,1	11,7	247,9
246_57-34	01.03.2016 01:53:18	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	42° 51,084' S	174° 28,367' W	0	1,4	239	13,2	308,4
246_57-34	01.03.2016 01:53:28	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 51,081' S	174° 28,370' W	0	2,1	242,2	12,7	336,6
246_57-35	01.03.2016 02:20:56	Seismic Ocean Bottom Receiver	SEISOBR	station start			OBS 1	f	42° 48,240' S	174° 30,880' W	0	6,6	251,1	18,9	327,8
246_57-35	01.03.2016 02:22:01	Seismic Ocean Bottom Receiver	SEISOBR	released				f	42° 48,133' S	174° 30,938' W	0	6,6	248,4	16,9	334
246_57-35	01.03.2016 02:45:48	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	42° 46,314' S	174° 33,051' W	0	2,8	256,9	17,5	155,4
246_57-35	01.03.2016 03:06:41	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	42° 46,622' S	174° 33,286' W	1556,6	0,4	253	10,6	129,4
246_57-35	01.03.2016 03:06:53	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 46,619' S	174° 33,285' W	1556,4	0,7	245,3	11,5	216,4
246_58-1	01.03.2016 03:11:22	CTD	CTD	station start				f	42° 46,584' S	174° 33,279' W	1559,1	0,7	237,2	12,2	227,4
246_58-1	01.03.2016 03:23:06	CTD	CTD	in the water			EL1	f	42° 46,597' S	174° 33,285' W	1557	0,7	254,9	12,9	126,1
246_58-1	01.03.2016 04:02:19	CTD	CTD	max depth/on ground			SLmax: 1500 m	f	42° 46,593' S	174° 33,272' W	1556,8	0,9	258,6	12,1	123,7
246_58-1	01.03.2016 04:30:16	CTD	CTD	on deck				f	42° 46,594' S	174° 33,278' W	1558,5	0,3	247,7	12,3	251
246_58-1	01.03.2016 04:32:05	CTD	CTD	station end				f	42° 46,597' S	174° 33,286' W	1558	0,4	245,2	10,8	127,4
246_59-1	01.03.2016 04:43:51	Magnetometer	MAG	station start			Beginn auslegen Magnetomete	f	42° 46,748' S	174° 33,844' W	1536,7	3,9	248,8	14,8	254,8
246_59-1	01.03.2016 04:45:01	Magnetometer	MAG	in the water			Magnetometer an Bb.-Seite 350m au	f	42° 46,763' S	174° 33,918' W	1533,2	2,8	243,6	16,4	258,5
246_59-1	01.03.2016 06:17:32	Magnetometer	MAG	profile start			rwK: 144°; d: 60 nm	f	42° 40,811' S	174° 22,172' W	2108,8	9,9	263,3	15,6	141,4
246_59-1	01.03.2016 07:50:00	Magnetometer	MAG	alter course			rwK: 052°; d: 42 nm	f	42° 52,268' S	174° 10,280' W	1578,6	9,7	251,5	15	54,8
246_59-1	01.03.2016 12:20:41	Magnetometer	MAG	alter course			rwK: 204°; d: 58 nm	f	42° 26,001' S	173° 26,727' W	2218,6	8,6	262	9,8	55,6
246_59-1	02.03.2016 01:32:40	Magnetometer	MAG	alter course			rwK: 064°; d: 9 nm	f	43° 17,860' S	173° 56,589' W	1142,3	4,3	252,7	18	199,5
246_59-1	02.03.2016 02:26:58	Magnetometer	MAG	alter course			rwK: 024°; d: 51 nm	f	43° 14,247' S	173° 46,208' W	1301,1	9,6	243	6,3	57,3
246_59-1	02.03.2016 07:02:21	Magnetometer	MAG	alter course			rwK: 070°; d: 8 nm	f	42° 33,834' S	173° 20,501' W	1824,6	9,5	217,5	12,5	30,3
246_59-1	02.03.2016 08:06:29	Magnetometer	MAG	alter course			rwK: 210°	f	42° 30,461' S	173° 8,084' W	1983,2	7,4	219,6	19	112,8
246_59-1	02.03.2016 08:19:10	Magnetometer	MAG	information			Abbruch Profil wegen schlecht Wetter, Beginn einh	f	42° 31,108' S	173° 8,069' W	1998,5	1,9	227,6	8,6	210,9
246_59-1	02.03.2016 08:29:56	Magnetometer	MAG	station end			Magnetometer an Deck	f	42° 31,472' S	173° 8,453' W	2009,2	3,1	202,3	12,2	217,8
246_60-1	02.03.2016 18:56:00	Magnetometer	MAG	station start				f	42° 42,190' S	173° 25,343' W	2051,5	2,6	210,5	10,1	191,6
246_60-1	02.03.2016 19:06:47	Magnetometer	MAG	in the water			Magnetometer an Bb. Seite ausges	f	42° 42,699' S	173° 25,577' W	1961,3	5,3	199,1	11	199,7
246_60-1	02.03.2016 23:07:25	Magnetometer	MAG	profile end				f	42° 32,860' S	174° 1,213' W	2506,1	6	212	8,5	202,6
246_60-1	02.03.2016 23:19:19	Magnetometer	MAG	information			Magnetometer an Deck	f	42° 33,525' S	174° 1,801' W	2479,1	3,5	198,8	6,1	216,6
246_60-1	02.03.2016 23:19:48	Magnetometer	MAG	station end				f	42° 33,548' S	174° 1,823' W	2475,8	3,9	210,7	5,2	227
246_61-1	02.03.2016 23:22:37	Passive Acustic Monitoring Systen	PAM	station start				f	42° 33,703' S	174° 1,948' W	2476	4,2	218,3	8	209,2
246_61-1	02.03.2016 23:27:44	Passive Acustic Monitoring Systen	PAM	in the water				f	42° 33,980' S	174° 2,172' W	2475,7	4	199,3	4,3	238
246_61-1	04.03.2016 17:56:47	Passive Acustic Monitoring Systen	PAM	on deck				f	42° 0,581' S	174° 3,201' W	2934,1	4,1	320,1	10	315,1
246_61-1	04.03.2016 17:56:47	Passive Acustic Monitoring Systen	PAM	station end				f	42° 0,581' S	174° 3,201' W	2934,1	4,1	320,1	10	315,1

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_62-1	02.03.2016 23:30:53	Seismic Towed Receiver	SEISTR	station start				f	42° 34,111' S	174° 2,296' W	2638,7	1,9	186,4	7,4	210,5
246_62-1	02.03.2016 23:32:06	Seismic Towed Receiver	SEISTR	MCS in water			Endboje zu Wasser	f	42° 34,163' S	174° 2,345' W	2459,3	3,5	192,9	7,4	210,3
246_62-1	03.03.2016 01:23:38	Seismic Towed Receiver	SEISTR	information			Streamer zu Wasser	f	42° 39,181' S	174° 7,243' W	2291	3,3	203,5	4,3	218,1
246_62-1	03.03.2016 01:26:04	Seismic Towed Receiver	SEISTR	in the water			Stb Airgun zu Wasser	f	42° 39,292' S	174° 7,335' W	2280,9	3,8	189,7	6,6	211,9
246_62-1	03.03.2016 01:38:50	Seismic Towed Receiver	SEISTR	information			Beginn Softstart	f	42° 39,790' S	174° 7,801' W	2271,4	3,2	171,2	3,6	194,9
246_62-1	03.03.2016 01:41:41	Seismic Towed Receiver	SEISTR	in the water			Bb Airgun zu Wasser	f	42° 39,902' S	174° 7,903' W	2259,4	3	160,3	5,2	203,4
246_62-1	03.03.2016 01:44:51	Seismic Towed Receiver	SEISTR	on deck			Bb Airgun an Deck	f	42° 40,035' S	174° 8,024' W	2259,2	3,3	182,1	3,2	216
246_62-1	03.03.2016 02:12:06	Seismic Towed Receiver	SEISTR	profile start			rwK: 145°; d: 66 nm	f	42° 42,074' S	174° 7,515' W	2100,6	5,9	209,2	5,6	160,5
246_62-1	03.03.2016 02:22:58	Seismic Towed Receiver	SEISTR	in the water			Bb Airgun	f	42° 42,790' S	174° 6,780' W	2032,6	4,7	226,7	3,7	130,8
246_62-1	03.03.2016 14:27:38	Seismic Towed Receiver	SEISTR	alter course			rwK: 044°; d: 43 nm	f	43° 32,834' S	173° 12,238' W	1838,5	5,4	289,5	8,5	155,5
246_62-1	03.03.2016 22:45:38	Seismic Towed Receiver	SEISTR	alter course			rwK: 312°	f	43° 3,633' S	172° 30,856' W	1841,9	5	286,4	10,1	44,7
246_62-1	04.03.2016 17:00:00	Seismic Towed Receiver	SEISTR	profile end				f	42° 2,833' S	174° 0,199' W	2928,4	4,5	320,7	11	311,4
246_62-1	04.03.2016 17:04:00	Seismic Towed Receiver	SEISTR	information			Ende Schießen	f	42° 2,619' S	174° 0,498' W	2927,1	4,8	318,3	11,7	318,2
246_62-1	04.03.2016 17:23:00	Seismic Towed Receiver	SEISTR	information			Beginn Hieven Bb. gun	f	42° 1,897' S	174° 1,483' W	2926,5	3,4	322,8	11,4	311,6
246_62-1	04.03.2016 17:32:30	Seismic Towed Receiver	SEISTR	information			Bb. gun a/D	f	42° 1,588' S	174° 1,886' W	2937,8	2,1	316,5	10,4	315
246_62-1	04.03.2016 17:35:22	Seismic Towed Receiver	SEISTR	information			Beginn Hieven Stb. gun	f	42° 1,497' S	174° 1,996' W	2938,9	2,9	312,6	10,8	319,9
246_62-1	04.03.2016 17:45:00	Seismic Towed Receiver	SEISTR	information			Stb. gun a/D	f	42° 1,174' S	174° 2,398' W	2937,9	3	319,2	10,4	311,8
246_62-1	04.03.2016 17:54:20	Seismic Towed Receiver	SEISTR	information			Beginn Hieven streamer	f	42° 0,711' S	174° 3,022' W	2929,6	4,8	318,8	9,5	315,1
246_62-1	04.03.2016 19:51:55	Seismic Towed Receiver	SEISTR	on deck			streamer a/D	f	41° 54,759' S	174° 10,838' W	2962,1	4,7	311,9	9,4	311,3
246_62-1	04.03.2016 19:52:12	Seismic Towed Receiver	SEISTR	station end				f	41° 54,745' S	174° 10,859' W	2960,4	4,7	316,2	8,8	320,7
246_63-1	03.03.2016 02:31:17	Magnetometer	MAG	station start				f	42° 43,268' S	174° 6,263' W	1994,7	5,5	199,4	3,9	154,1
246_63-1	03.03.2016 02:37:23	Magnetometer	MAG	in the water				f	42° 43,731' S	174° 5,788' W	1946,7	5,8	235,9	3,6	150,9
246_63-1	03.03.2016 02:47:28	Magnetometer	MAG	profile start			SLmax: 350 m	f	42° 44,381' S	174° 5,086' W	1891,3	5,5	188,2	3,2	122,1
246_63-1	04.03.2016 17:00:00	Magnetometer	MAG	profile end				f	42° 2,833' S	174° 0,199' W	2928,4	4,5	320,7	11	311,4
246_63-1	04.03.2016 17:04:00	Magnetometer	MAG	information			Beginn hieven	f	42° 2,619' S	174° 0,498' W	2927,1	4,8	318,3	11,7	318,2
246_63-1	04.03.2016 17:15:33	Magnetometer	MAG	information			an Deck	f	42° 2,183' S	174° 1,088' W	2930,6	3	325,3	12,5	320,8
246_63-1	04.03.2016 17:15:38	Magnetometer	MAG	station end				f	42° 2,180' S	174° 1,092' W	2930,6	3,1	319	11,6	309,1
246_64-1	04.03.2016 20:00:31	Magnetometer	MAG	station start				f	41° 54,476' S	174° 10,591' W	2959,9	5,6	318	9,5	97,6
246_64-1	04.03.2016 20:01:23	Magnetometer	MAG	information			Magnetometer geht zu Wasser an Bb	f	41° 54,488' S	174° 10,486' W	2964,9	5,4	333	5,2	104,7
246_64-1	04.03.2016 20:10:57	Magnetometer	MAG	in the water			Komplett ausgesteckt	f	41° 54,510' S	174° 9,738' W	2963,2	3,3	309,7	11,5	77,3
246_64-1	05.03.2016 08:53:06	Magnetometer	MAG	profile end				f	42° 12,776' S	171° 28,093' W	2244,3	5,1	320,7	7,7	92,4
246_64-1	05.03.2016 08:54:00	Magnetometer	MAG	information			Beginn einholen Magnetometer	f	42° 12,785' S	171° 27,993' W	2244,8	5	306,2	7,8	89,3
246_64-1	05.03.2016 09:06:16	Magnetometer	MAG	station end			Magnetometer an Deck	f	42° 12,914' S	171° 26,720' W	2243,9	4,7	316,9	6,9	102,2
246_65-1	05.03.2016 20:27:09	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 29,918' S	168° 30,046' W	2615,9	1,4	317,1	8	182,1
246_65-1	05.03.2016 20:28:39	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 1	f	42° 29,934' S	168° 30,028' W	2615,5	1,1	328,5	7,5	137,6
246_65-1	05.03.2016 20:29:05	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 29,938' S	168° 30,023' W	2615,9	0,3	332,6	7,9	139,4
246_65-2	05.03.2016 21:16:45	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 37,095' S	168° 25,101' W	2816,2	1	333,4	8,6	189,5
246_65-2	05.03.2016 21:17:17	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 2	f	42° 37,101' S	168° 25,093' W	2818,8	1,2	336,9	8,8	116,7
246_65-2	05.03.2016 21:18:29	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 37,111' S	168° 25,072' W	2814,3	1,2	338,9	9,4	121
246_65-3	05.03.2016 22:06:04	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 44,414' S	168° 20,233' W	2936,6	1,2	338,9	9,8	148,6
246_65-3	05.03.2016 22:07:21	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 3	f	42° 44,436' S	168° 20,214' W	2935	1,4	329	9,2	145,1
246_65-3	05.03.2016 22:08:03	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 44,447' S	168° 20,200' W	2935,9	1,3	330,5	9	123
246_65-4	05.03.2016 22:51:53	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 51,603' S	168° 15,119' W	3291,7	1,6	327,3	12	151,6
246_65-4	05.03.2016 22:52:56	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 4	f	42° 51,627' S	168° 15,102' W	3294,9	1,7	315,3	12,5	150,7
246_65-4	05.03.2016 22:53:06	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 51,631' S	168° 15,099' W	3294,9	1,8	318	11,1	129,3
246_65-5	05.03.2016 23:40:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 58,894' S	168° 10,299' W	4303,2	2,2	322,8	12,3	187,9
246_65-5	05.03.2016 23:41:10	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 5	f	42° 58,922' S	168° 10,286' W	4302,6	1,1	333,4	11,8	178,1
246_65-5	05.03.2016 23:42:43	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 58,959' S	168° 10,279' W	4295,3	2,8	321,8	10,5	177,1
246_65-6	06.03.2016 00:31:22	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 6,141' S	168° 5,289' W	4449,8	1,6	318,4	10,2	129,4

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_65-6	06.03.2016 00:32:10	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 6	f	43° 6,150' S	168° 5,270' W	4477,5	1,8	316,1	9,7	110,8
246_65-6	06.03.2016 00:33:21	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 6,164' S	168° 5,243' W	4479	1,6	319,7	10,9	162,5
246_65-7	06.03.2016 01:20:32	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 13,335' S	168° 0,277' W	4837,6	2,6	310	9,5	203,3
246_65-7	06.03.2016 01:21:16	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 7	f	43° 13,357' S	168° 0,268' W	4835,6	1,8	318,6	9,8	173,8
246_65-7	06.03.2016 01:22:36	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 13,386' S	168° 0,249' W	4835,1	1,6	323,5	8,6	170,9
246_65-8	06.03.2016 02:09:35	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 20,561' S	167° 55,248' W	4840,7	1,3	313,4	10,7	180,9
246_65-8	06.03.2016 02:10:03	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 8	f	43° 20,572' S	167° 55,242' W	4845,3	1,6	326,4	8	152,4
246_65-8	06.03.2016 02:11:12	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 20,593' S	167° 55,226' W	4840,5	0,8	320,2	9,7	164
246_65-9	06.03.2016 03:00:02	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 27,765' S	167° 50,275' W	4862	3,2	321,2	10,4	182,2
246_65-9	06.03.2016 03:03:22	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 9	f	43° 27,884' S	167° 50,270' W	4863	0,2	320,4	10,8	100,9
246_65-9	06.03.2016 03:03:26	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 27,884' S	167° 50,269' W	4836,6	1	323,8	11	157,9
246_65-10	06.03.2016 03:50:23	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 35,091' S	167° 45,210' W	5010,8	3,3	320,7	10	192,2
246_65-10	06.03.2016 03:52:44	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 10	f	43° 35,152' S	167° 45,219' W	6796	1,3	314,8	12,7	169,2
246_65-10	06.03.2016 03:52:49	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 35,153' S	167° 45,219' W	6796	1,1	323	11,5	151,8
246_65-11	06.03.2016 04:39:06	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 42,229' S	167° 40,060' W	5034,7	1,8	316,3	10,6	165,2
246_65-11	06.03.2016 04:40:11	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 11	f	43° 42,253' S	167° 40,042' W	5033,3	1,1	320,6	12,7	151,7
246_65-11	06.03.2016 04:40:18	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 42,255' S	167° 40,039' W	5033,3	1,4	320,2	12	130,5
246_65-12	06.03.2016 05:24:07	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 49,514' S	167° 35,122' W	5043,8	2,8	312,5	13,1	204,1
246_65-12	06.03.2016 05:25:28	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 12	f	43° 49,556' S	167° 35,132' W	5038,2	1,3	322	13,1	154,6
246_65-12	06.03.2016 05:25:29	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 49,557' S	167° 35,132' W	5038,2	1,4	319,8	12,8	149,8
246_65-13	06.03.2016 06:10:47	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 56,707' S	167° 30,015' W	5280,3	2,7	0,6	2,3	119,4
246_65-13	06.03.2016 06:12:21	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 13	f	43° 56,731' S	167° 29,965' W	5053,4	1,1	308,4	4,9	89,5
246_65-13	06.03.2016 06:12:29	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 56,731' S	167° 29,962' W	5068,7	0,8	319,8	8,4	154,9
246_65-14	06.03.2016 06:58:12	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 3,919' S	167° 24,800' W	5084,4	2,7	316	14	203,4
246_65-14	06.03.2016 06:59:47	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 14	f	44° 3,962' S	167° 24,797' W	5096,6	1,4	320,1	13,1	143,6
246_65-14	06.03.2016 06:59:54	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 3,965' S	167° 24,796' W	5096,6	1,7	315,3	13,7	155,7
246_65-15	06.03.2016 07:44:06	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 11,025' S	167° 19,552' W	5146,3	1,6	311,1	15,4	153,8
246_65-15	06.03.2016 07:45:23	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 15	f	44° 11,056' S	167° 19,522' W	5181,2	2	313,6	12,3	148,4
246_65-15	06.03.2016 07:46:15	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 11,077' S	167° 19,498' W	5173	2,2	312,1	13,5	130,2
246_65-16	06.03.2016 08:31:38	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 18,259' S	167° 14,415' W	5207	1,7	313,6	14	145,9
246_65-16	06.03.2016 08:32:57	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 16	f	44° 18,284' S	167° 14,395' W	5218,3	1,4	317,9	14,1	168,3
246_65-16	06.03.2016 08:33:54	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 18,303' S	167° 14,368' W	5230,8	1,5	310,3	15,8	141,5
246_65-17	06.03.2016 09:20:36	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 25,377' S	167° 9,162' W	5239	1,7	307,4	15,3	163,4
246_65-17	06.03.2016 09:23:41	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 17	f	44° 25,450' S	167° 9,083' W	5236,9	1,9	318,6	13,1	124,2
246_65-17	06.03.2016 09:24:29	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 25,453' S	167° 9,078' W	5242,4	1,4	316,1	14,4	139,7
246_65-18	06.03.2016 10:10:21	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 32,750' S	167° 4,031' W	5267,7	2	312,2	12,5	142,2
246_65-18	06.03.2016 10:11:22	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 18	f	44° 32,758' S	167° 4,010' W	5253,5	1,2	313,2	13,7	143,6
246_65-18	06.03.2016 10:12:22	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 32,767' S	167° 3,982' W	5260,4	1,3	316,3	13,3	99,8
246_65-19	06.03.2016 10:58:28	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 39,765' S	166° 58,796' W	5252,7	1,2	311	13,5	141,3
246_65-19	06.03.2016 11:00:03	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 19	f	44° 39,791' S	166° 58,754' W	5272,1	1,1	312,5	13,8	124,8
246_65-19	06.03.2016 11:00:54	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 39,805' S	166° 58,730' W	5275,3	2,4	310,6	10,6	126,5
246_65-20	06.03.2016 11:51:50	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 46,981' S	166° 53,558' W	5283,2	2,6	312	12,6	129,4
246_65-20	06.03.2016 11:53:08	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 20	f	44° 47,011' S	166° 53,532' W	5288,6	2,2	307,9	14,4	134,2
246_65-20	06.03.2016 11:53:12	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 47,012' S	166° 53,530' W	5288,6	1,2	310,4	13,9	122,3
246_65-21	06.03.2016 12:45:55	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 54,136' S	166° 48,278' W	5316,5	1,8	317,5	14,6	161,2
246_65-21	06.03.2016 12:47:02	Seismic Ocean Bottom Receiver	SEISOBR	deployed			OBS 21	f	44° 54,172' S	166° 48,261' W	5298,5	2,5	313,5	12,9	146,9
246_65-21	06.03.2016 12:47:11	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 54,177' S	166° 48,258' W	5298,5	3	306,4	16,3	143,1
246_66-1	06.03.2016 14:17:02	Passive Acustic Monitoring Systen	PAM	station start				f	45° 7,884' S	166° 38,382' W	5363,9	2,7	294	14,5	311,2
246_66-1	06.03.2016 14:21:23	Passive Acustic Monitoring Systen	PAM	in the water			SLmax: 200 m	f	45° 7,661' S	166° 38,453' W	5379,1	2,8	290,8	14,8	349,6

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_66-1	06.03.2016 14:21:47	Passive Acustic Monitoring Systen	PAM	profile start			rwK: 333°	f	45° 7,641' S	166° 38,458' W	5371	3	293,5	15,7	338,5
246_66-1	08.03.2016 05:45:15	Passive Acustic Monitoring Systen	PAM	profile end				f	42° 18,457' S	168° 37,743' W	3058,3	3,2	317,6	14,9	331,2
246_66-1	08.03.2016 05:57:04	Passive Acustic Monitoring Systen	PAM	station end			an Deck	f	42° 17,866' S	168° 38,095' W	3155,6	3,7	326,1	18	334,9
246_67-1	06.03.2016 14:23:18	Seismic Towed Receiver	SEISTR	station start				f	45° 7,572' S	166° 38,478' W	5375,2	3,1	296,1	14,9	2,6
246_67-1	06.03.2016 14:24:32	Seismic Towed Receiver	SEISTR	MCS in water			Endboje zu Wasser	f	45° 7,517' S	166° 38,499' W	5387,4	3,1	295,4	14,1	0,5
246_67-1	06.03.2016 16:18:19	Seismic Towed Receiver	SEISTR	MCS in water			Streamer z/W	f	45° 2,480' S	166° 42,265' W	5356,6	3,1	289,7	14,6	337,2
246_67-1	06.03.2016 16:30:00	Seismic Towed Receiver	SEISTR	in the water			Stb. airguns z/W	f	45° 1,953' S	166° 42,659' W	5339,4	3,8	287	15,5	305,3
246_67-1	06.03.2016 16:42:40	Seismic Towed Receiver	SEISTR	in the water			Bb. airguns z/W	f	45° 1,300' S	166° 43,252' W	5352,9	3,6	286,2	13,2	332,4
246_67-1	06.03.2016 16:43:00	Seismic Towed Receiver	SEISTR	information			Softstart	f	45° 1,282' S	166° 43,267' W	5353,1	3,6	277,9	12,7	314,4
246_67-1	06.03.2016 17:18:41	Seismic Towed Receiver	SEISTR	profile start				f	44° 58,916' S	166° 44,890' W	5325,6	4,2	282,1	14,9	325,8
246_67-1	08.03.2016 04:53:00	Seismic Towed Receiver	SEISTR	profile end				f	42° 20,961' S	168° 36,057' W	2914	4,2	324,7	12,8	333,8
246_67-1	08.03.2016 05:19:56	Seismic Towed Receiver	SEISTR	on deck			Bb. airguns a/D	f	42° 19,649' S	168° 36,950' W	3002,2	3,6	333	15,1	330,8
246_67-1	08.03.2016 05:31:24	Seismic Towed Receiver	SEISTR	on deck			Stb. airguns a/D	f	42° 19,126' S	168° 37,296' W	3010,7	2,9	331,8	15,2	337,2
246_67-1	08.03.2016 05:33:57	Seismic Towed Receiver	SEISTR	information			Beginn Einholen Streamer	f	42° 19,005' S	168° 37,383' W	3008,2	4,3	327,7	12,9	336,1
246_67-1	08.03.2016 07:38:05	Seismic Towed Receiver	SEISTR	information			Endboje an Deck (Streamer an De	f	42° 13,258' S	168° 41,127' W	3376,3	2,3	322,7	14,4	329,6
246_67-1	08.03.2016 07:38:57	Seismic Towed Receiver	SEISTR	station end				f	42° 13,224' S	168° 41,151' W	3376,1	3,3	320	14,2	343,5
246_68-1	06.03.2016 17:14:46	Magnetometer	MAG	station start				f	44° 59,180' S	166° 44,700' W	5337,4	4,9	290,4	12,9	334,5
246_68-1	06.03.2016 17:14:47	Magnetometer	MAG	profile start				f	44° 59,179' S	166° 44,700' W	5337,4	4,9	292,6	14,9	328,3
246_68-1	06.03.2016 17:14:47	Magnetometer	MAG	in the water				f	44° 59,179' S	166° 44,700' W	5337,4	4,9	292,6	14,9	328,3
246_68-1	08.03.2016 04:53:00	Magnetometer	MAG	profile end			Beginn einholen Magnetomete	f	42° 20,961' S	168° 36,057' W	2914	4,2	324,7	12,8	333,8
246_68-1	08.03.2016 05:06:02	Magnetometer	MAG	station end			an Deck	f	42° 20,340' S	168° 36,491' W	3055,9	3,1	328,7	13,1	343,5
246_69-1	08.03.2016 08:48:43	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 23,652' S	168° 33,325' W	0	8,3	321,1	12,2	151
246_69-1	08.03.2016 08:51:16	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 1	f	42° 23,934' S	168° 33,101' W	0	7,5	318,1	11,9	150,1
246_69-1	08.03.2016 09:28:35	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	42° 30,186' S	168° 28,517' W	0	6,6	323,1	17,5	226,8
246_69-1	08.03.2016 09:48:59	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	42° 29,935' S	168° 29,654' W	0	1,6	311	16,3	65,3
246_69-1	08.03.2016 09:49:29	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 29,932' S	168° 29,638' W	0	1,6	313	15,7	75,9
246_69-2	08.03.2016 09:58:43	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 30,469' S	168° 28,536' W	0	7,5	314,9	10,3	141,2
246_69-2	08.03.2016 10:00:01	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 2	f	42° 30,608' S	168° 28,436' W	0	7,3	317	15,5	150,7
246_69-2	08.03.2016 10:48:07	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	42° 37,490' S	168° 24,567' W	0	0,5	316,7	12,6	202,8
246_69-2	08.03.2016 11:04:48	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	42° 37,105' S	168° 24,794' W	0	3,8	314,1	21,7	48,8
246_69-2	08.03.2016 11:04:54	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 37,102' S	168° 24,787' W	0	3,2	309,5	22,3	59,8
246_69-3	08.03.2016 11:10:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 40,805' S	168° 21,620' W	0	12	317,3	18	150,8
246_69-3	08.03.2016 11:10:09	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 3	f	42° 37,083' S	168° 24,226' W	0	5,8	301,5	16,2	110,3
246_69-3	08.03.2016 11:53:20	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	42° 44,073' S	168° 19,535' W	0	12,6	319,6	15,5	165,8
246_69-3	08.03.2016 12:12:14	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	42° 44,567' S	168° 19,906' W	0	1,9	321,2	17,2	32,9
246_69-3	08.03.2016 12:12:24	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 44,564' S	168° 19,905' W	0	2	315,4	16,7	64
246_69-4	08.03.2016 12:18:04	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 44,344' S	168° 19,749' W	0	7,2	326,9	16,7	104,8
246_69-4	08.03.2016 12:18:11	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 4	f	42° 44,346' S	168° 19,730' W	0	7	327,3	15,6	113,6
246_69-4	08.03.2016 13:08:04	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	42° 50,311' S	168° 15,312' W	0	7,2	216,4	17,2	160,4
246_69-4	08.03.2016 13:25:00	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	42° 51,340' S	168° 15,207' W	0	1,9	206,5	18,6	336,5
246_69-4	08.03.2016 13:25:18	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 51,331' S	168° 15,210' W	0	1,7	204	17,5	345,6
246_69-5	08.03.2016 13:32:00	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 51,376' S	168° 15,323' W	0	6,3	225,4	15,9	161,9
246_69-5	08.03.2016 13:32:05	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 5	f	42° 51,384' S	168° 15,322' W	0	6,2	227,6	14	179,9
246_69-5	08.03.2016 14:35:44	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	42° 58,781' S	168° 10,061' W	0	2,4	239,7	9,3	253,8
246_69-5	08.03.2016 14:56:06	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	42° 58,442' S	168° 10,352' W	0	3,4	232,2	9,9	32
246_69-5	08.03.2016 14:56:30	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	42° 58,430' S	168° 10,349' W	0	2,4	221,9	9,4	4,1
246_69-6	08.03.2016 15:04:17	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	42° 58,699' S	168° 10,745' W	0	8,3	241,4	9,9	166,3
246_69-6	08.03.2016 15:04:18	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 6	f	42° 58,701' S	168° 10,745' W	0	8	243,3	9,2	164,1
246_69-6	08.03.2016 16:13:58	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 5,824' S	168° 5,003' W	0	1,1	241	14,1	313,7

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_69-6	08.03.2016 16:24:25	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 5,810' S	168° 5,388' W	0	1	240,1	12	294
246_69-6	08.03.2016 16:24:29	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 5,810' S	168° 5,390' W	0	2,3	246,9	11,8	336,1
246_69-7	08.03.2016 16:28:40	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 5,884' S	168° 5,682' W	0	7	244,5	15,4	188,6
246_69-7	08.03.2016 16:29:06	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 7	f	43° 5,937' S	168° 5,684' W	0	7,4	244,9	13,8	172,3
246_69-7	08.03.2016 17:36:40	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 13,092' S	167° 59,978' W	0	0,4	239,9	13,8	343,6
246_69-7	08.03.2016 17:47:08	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 13,133' S	168° 0,298' W	0	2,2	238,2	14,7	14,6
246_69-7	08.03.2016 17:47:15	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 13,130' S	168° 0,297' W	0	1,3	237	14,8	359,7
246_69-8	08.03.2016 17:50:29	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 13,087' S	168° 0,426' W	0	3,4	237,3	13,7	240
246_69-8	08.03.2016 17:51:56	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 8	f	43° 13,135' S	168° 0,572' W	0	5,8	246,5	12,6	248,8
246_69-8	08.03.2016 19:11:36	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 20,373' S	167° 55,027' W	0	2	265,2	9,1	333,2
246_69-8	08.03.2016 19:23:20	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 20,527' S	167° 55,465' W	0	1,8	235,9	14,4	224,5
246_69-8	08.03.2016 19:23:38	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 20,521' S	167° 55,466' W	0	2,4	243,8	11,7	352,4
246_69-9	08.03.2016 19:27:08	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 20,376' S	167° 55,528' W	0	4,2	249,3	13,1	13,7
246_69-9	08.03.2016 19:32:51	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 9	f	43° 20,426' S	167° 55,049' W	0	5,9	249,9	20,9	140,1
246_69-9	08.03.2016 20:33:40	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 27,713' S	167° 49,765' W	0	1,2	249,5	14,8	204,1
246_69-9	08.03.2016 20:45:40	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 27,813' S	167° 50,220' W	0	1,2	241	15	359,4
246_69-9	08.03.2016 20:46:06	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 27,806' S	167° 50,216' W	0	1,1	237,8	13,2	19,1
246_69-10	08.03.2016 20:50:23	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 27,557' S	167° 50,159' W	0	6,4	256,2	7,7	67,8
246_69-10	08.03.2016 21:00:34	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 10	f	43° 28,449' S	167° 49,077' W	0	8,1	261,2	15,4	151,5
246_69-10	08.03.2016 22:00:14	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 34,750' S	167° 44,719' W	0	2,2	257	11,4	245,3
246_69-10	08.03.2016 22:17:36	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 35,135' S	167° 44,970' W	0	0,2	253,1	14,9	357,2
246_69-10	08.03.2016 22:17:40	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 35,134' S	167° 44,969' W	0	0,5	256,2	17,1	17,9
246_69-11	08.03.2016 22:19:13	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 35,102' S	167° 44,975' W	0	2,5	245,4	16,4	324,9
246_69-11	08.03.2016 22:22:09	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 11	f	43° 34,907' S	167° 44,894' W	0	5,7	270,1	9,4	76,2
246_69-11	08.03.2016 23:38:11	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 42,143' S	167° 39,655' W	0	0,3	246,3	15,4	350,3
246_69-11	08.03.2016 23:48:41	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 42,134' S	167° 39,652' W	0	2,6	233,1	17,7	51,7
246_69-11	08.03.2016 23:48:45	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 42,132' S	167° 39,650' W	0	1	231,8	20,2	48,5
246_69-12	08.03.2016 23:50:01	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 42,077' S	167° 39,641' W	0	4,5	255,3	22	352,4
246_69-12	08.03.2016 23:50:30	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 12	f	43° 42,050' S	167° 39,660' W	0	4	241,2	21,6	320,3
246_69-12	09.03.2016 01:01:07	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 49,331' S	167° 34,590' W	0	3,2	272	12	193,8
246_69-12	09.03.2016 01:10:21	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 49,341' S	167° 34,600' W	0	3,1	218	23,5	343,3
246_69-12	09.03.2016 01:10:36	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 49,330' S	167° 34,604' W	0	2,6	228,8	25,1	328,3
246_69-13	09.03.2016 01:30:09	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 50,248' S	167° 35,382' W	0	8,8	253,1	15,3	124,3
246_69-13	09.03.2016 01:30:14	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 13	f	43° 50,256' S	167° 35,373' W	0	7,7	256,5	16,1	151,6
246_69-13	09.03.2016 02:42:17	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	43° 56,494' S	167° 29,470' W	0	0,3	232,8	19,4	201,8
246_69-13	09.03.2016 02:49:51	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	43° 56,486' S	167° 29,730' W	0	3,8	240,4	14,9	235,2
246_69-13	09.03.2016 02:49:59	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	43° 56,489' S	167° 29,737' W	0	2,5	235,7	14,5	230
246_69-14	09.03.2016 02:54:07	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	43° 56,615' S	167° 29,963' W	0	2,8	241,3	10,8	250,6
246_69-14	09.03.2016 02:54:18	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 14	f	43° 56,620' S	167° 29,973' W	0	3,5	237,8	12,2	235,2
246_69-14	09.03.2016 04:18:49	Seismic Ocean Bottom Receiver	SEISOBR	released			2te Auslösung	f	44° 3,588' S	167° 24,195' W	0	1,9	247,1	12,8	271,1
246_69-14	09.03.2016 05:33:05	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 3,503' S	167° 24,224' W	0	1,4	262,5	15,6	66,5
246_69-14	09.03.2016 05:51:33	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 3,608' S	167° 24,436' W	0	0,8	255,4	15,5	277,7
246_69-14	09.03.2016 05:52:07	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 3,609' S	167° 24,452' W	0	1,3	249,4	16,2	252,7
246_69-15	09.03.2016 16:09:41	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 10,532' S	167° 17,953' W	0	0,7	269,6	12,4	330,2
246_69-15	09.03.2016 16:09:50	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 15	f	44° 10,534' S	167° 17,960' W	0	2,1	264	12,4	246,9
246_69-15	09.03.2016 17:21:59	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 11,100' S	167° 19,111' W	0	1,2	272,3	14,9	209,5
246_69-15	09.03.2016 17:30:40	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 11,088' S	167° 19,317' W	0	1	268,2	13,4	346,8
246_69-15	09.03.2016 17:30:44	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 11,088' S	167° 19,318' W	0	1,5	273,1	13,8	226,5
246_69-16	09.03.2016 17:33:08	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 11,094' S	167° 19,452' W	0	3,5	278	17,3	264,4

Station	Date / Time UTC	Device	Device Abbreviation	Action	Comment (Station)	Comment (Device Op)	Comment (Action)	Expedition Fixed	Latitude	Longitude	Depth (m)	Speed (kn)	Wind Dir	Wind speed (m/s)	Course
246_69-16	09.03.2016 17:33:11	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 16	f	44° 11,095' S	167° 19,457' W	0	4	279,1	14,7	246,5
246_69-16	09.03.2016 18:56:18	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 18,229' S	167° 14,010' W	0	2,3	296	15,9	37,7
246_69-16	09.03.2016 19:05:00	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 18,268' S	167° 14,036' W	0	1,6	294,7	14,1	121,2
246_69-16	09.03.2016 19:05:06	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 18,269' S	167° 14,034' W	0	0,8	300,6	14,8	116,6
246_69-17	09.03.2016 19:07:53	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 18,280' S	167° 14,095' W	0	2,4	300,5	14,4	264,7
246_69-17	09.03.2016 19:20:54	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 17	f	44° 18,527' S	167° 14,822' W	0	2,5	297,9	14,8	237,7
246_69-17	09.03.2016 20:27:22	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 25,270' S	167° 8,540' W	0	2,4	297,3	15,4	235,8
246_69-17	09.03.2016 20:44:59	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 25,312' S	167° 8,722' W	0	2,4	277,5	14,4	28,7
246_69-17	09.03.2016 20:45:03	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 25,311' S	167° 8,719' W	0	1,9	270,5	16,2	40,5
246_69-18	09.03.2016 20:49:14	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 25,213' S	167° 8,873' W	0	4,3	290,3	17,7	264,2
246_69-18	09.03.2016 21:00:13	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 18	f	44° 25,534' S	167° 9,636' W	0	4,1	289,6	17	228,6
246_69-18	09.03.2016 22:24:42	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 32,571' S	167° 3,348' W	0	2,5	292	20,2	249,2
246_69-18	09.03.2016 22:37:43	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 32,549' S	167° 3,828' W	0	3,4	285	16,4	33,8
246_69-18	09.03.2016 22:37:48	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 32,548' S	167° 3,825' W	0	1,9	273,1	16,4	65,8
246_69-19	09.03.2016 22:39:43	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 32,524' S	167° 3,753' W	0	2,4	269,1	20,9	59,6
246_69-19	09.03.2016 22:41:44	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 19	f	44° 32,468' S	167° 3,704' W	0	2,4	270,1	21,3	21,8
246_69-19	10.03.2016 00:07:04	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 39,456' S	166° 57,926' W	0	5,4	276,6	18	250,7
246_69-19	10.03.2016 00:19:14	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 39,478' S	166° 58,613' W	0	2,2	277,7	17,9	354
246_69-19	10.03.2016 00:19:30	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 39,474' S	166° 58,612' W	0	0,1	282,7	14,3	9,7
246_69-20	10.03.2016 00:20:15	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 39,466' S	166° 58,615' W	0	1,7	272,3	15,4	168,6
246_69-20	10.03.2016 00:20:35	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 20	f	44° 39,465' S	166° 58,617' W	0	0,8	281,7	18,5	332,7
246_69-20	10.03.2016 03:00:34	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 46,969' S	166° 53,197' W	0	2,9	278,4	11,4	263
246_69-20	10.03.2016 03:21:19	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 46,638' S	166° 53,341' W	0	2	263	12,1	224,3
246_69-20	10.03.2016 03:21:22	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 46,637' S	166° 53,343' W	0	2,4	276,7	11,4	323,4
246_69-21	10.03.2016 03:30:03	Seismic Ocean Bottom Receiver	SEISOBR	station start				f	44° 46,739' S	166° 54,329' W	0	4,5	262,1	12,9	240
246_69-21	10.03.2016 03:30:15	Seismic Ocean Bottom Receiver	SEISOBR	released			OBS 21	f	44° 46,742' S	166° 54,349' W	0	5,1	265,2	14,5	235,6
246_69-21	10.03.2016 05:04:44	Seismic Ocean Bottom Receiver	SEISOBR	information			gesichtet	f	44° 53,633' S	166° 47,064' W	0	3,2	255	12,6	254,8
246_69-21	10.03.2016 05:22:32	Seismic Ocean Bottom Receiver	SEISOBR	recovered			an Deck	f	44° 53,685' S	166° 48,210' W	0	3,2	252,5	12	240,9
246_69-21	10.03.2016 05:22:36	Seismic Ocean Bottom Receiver	SEISOBR	station end				f	44° 53,686' S	166° 48,215' W	0	2,4	257,4	11	257,9
246_70-1	12.03.2016 09:56:03	Dredge	DRG	station start				f	45° 22,560' S	170° 49,059' W	3588,1	0,8	202,9	8,3	321,9

Die **Berichte zur Polar- und Meeresforschung** (ISSN 1866-3192) werden beginnend mit dem Band 569 (2008) als Open-Access-Publikation herausgegeben. Ein Verzeichnis aller Bände einschließlich der Druckausgaben (ISSN 1618-3193, Band 377-568, von 2000 bis 2008) sowie der früheren **Berichte zur Polarforschung** (ISSN 0176-5027, Band 1-376, von 1981 bis 2000) befindet sich im electronic Publication Information Center **(ePIC)** des Alfred-Wegener-Instituts, Helmholtz-Zentrum für Polar- und Meeresforschung (AWI); see http://epic.awi.de. Durch Auswahl “Reports on Polar- and Marine Research“ (via “browse”/”type”) wird eine Liste der Publikationen, sortiert nach Bandnummer, innerhalb der absteigenden chronologischen Reihenfolge der Jahrgänge mit Verweis auf das jeweilige pdf-Symbol zum Herunterladen angezeigt.

The **Reports on Polar and Marine Research** (ISSN 1866-3192) are available as open access publications since 2008. A table of all volumes including the printed issues (ISSN 1618-3193, Vol. 377-568, from 2000 until 2008), as well as the earlier **Reports on Polar Research** (ISSN 0176-5027, Vol. 1-376, from 1981 until 2000) is provided by the electronic Publication Information Center **(ePIC)** of the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI); see URL http://epic.awi.de. To generate a list of all Reports, use the URL http://epic.awi.de and select “browse”/ ”type” to browse ”Reports on Polar and Marine Research”. A chronological list in declining order will be presented, and pdf-icons displayed for downloading.

Zuletzt erschienene Ausgaben:

Recently published issues:

698 (2016) The Expedition SO246 of the Research Vessel SONNE to the Chatham Rise in 2016, edited by Karsten Gohl and Reinhard Werner

697 (2016) Studies of Polygons in Siberia and Svalbard**,** edited by Lutz Schirrmeister, Liudmila Pestryakova, Andrea Schneider and Sebastian Wetterich

696 (2016) The Expedition PS88 of the Research Vessel POLARSTERN to the Atlantic Ocean in 2014, edited by Rainer Knust and Frank Niessen

695 (2016) The Expedition PS93.1 of the Research Vessel POLARSTERN to the Arctic Ocean in 2015, edited by Ruediger Stein

694 (2016) The Expedition PS92 of the Research Vessel POLARSTERN to the Arctic Ocean in 2015, edited by Ilka Peeken

693 (2015) The Expedition PS93.2 of the Research Vessel POLARSTERN to the Fram Strait in 2015, edited by Thomas Soltwedel

692 (2015) Antarctic Specific Features of the Greenhouse Effect: A Radiative Analysis Using Measurements and Models by Holger Schmithüsen

691 (2015) Krill in the Arctic and the Atlantic Climatic Variability and Adaptive Capacity by Lara Kim Hünerlage

690 (2015) High latitudes and high mountains: driver of or driven by global change? 26th Intern. Congress on Polar Research, 6 – 11 September 2015, Munich, Germany, German Society for Polar Research, edited by Eva-Maria Pfeiffer, Heidemarie Kassens, Christoph Mayer, Mirko Scheinert, Ralf Tiedemann and Members of the DGP Advisory Board

689 (2015) The Expedition PS89 of the Research Vessel POLARSTERN to the Weddell Sea in 2014/2015, edited by Olaf Boebel

ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR-
UND MEERESFORSCHUNG

BREMERHAVEN

Am Handelshafen 12
27570 Bremerhaven
Telefon 0471 4831-0
Telefax 0471 4831-1149
www.awi.de

HELMHOLTZ
GEMEINSCHAFT