



**ZENTRUM FÜR MARINE UMWELTWISSENSCHAFTEN
UNIVERSITÄT BREMEN**

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und weitere NEBROC-Wissenschaftler

Bremen, im Februar 2009

Abschlussbericht für das BMBF-Projekt:

**NEBROC II - Kooperation in den Meereswissenschaften zwischen dem
Royal Netherlands Institute for Sea Research (Royal NIOZ) und den
meeresforschenden Einrichtungen im Land Bremen**

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1. EINFÜHRUNG

Die Idee für NEBROC – die Kooperation in den Meereswissenschaften zwischen dem Royal Netherlands Institute for Sea Research (Royal NIOZ) und vier meeresforschenden Instituten im Land Bremen (Alfred-Wegener-Institut für Polar- und Meeresforschung, Universität Bremen, Max-Planck-Institut für marine Mikrobiologie und Zentrum für Marine Tropenökologie, die alle im Zentrum für Marine Umweltwissenschaften (MARUM) zusammengeschlossen sind) – entstand bei Gesprächen zwischen Minister Dr. Ritzén, Bundesminister Dr. Rüttgers und Frau Senatorin Kahrs im Frühjahr 1996. Auf deren Initiative trafen sich deutsche und niederländische Wissenschaftler und erarbeiteten einen gemeinsamen Antrag, mit dem Ziel über eine enge Kooperation zwischen dem Royal NIOZ und dem MARUM langfristig ein nordwesteuropäisches Center of Excellence zu etablieren. Dieser Antrag, mit ausgewiesenen Kooperationsfeldern in den Bereichen Klimageschichte, Ozeanischer Kohlenstoffkreislauf, Küsten- und Kontinentalhangforschung, Meeresforschungstechnologie und Doktorandenausbildung im Rahmen des "European Graduate College for Marine Sciences" (ECOLMAS) wurde ab dem 1.2.1998 von der NWO und vom BMBF zu gleichen Teilen gefördert. Einer Förderunterbrechung von 2003 bis 2005 schloss sich Deutschland eine weitere Förderphase von 2005 bis 2008 an. In den Niederlanden wird diese Phase noch bis 2010 gefördert.

Seit Beginn der Förderung hat sich NEBROC zu einem aktiven Forschungsnetzwerk entwickelt. Eines der vorrangigsten Ziele von NEBROC ist es, die Entwicklung gemeinsamer Forschungsprogramme zu stimulieren und zu unterstützen. Dabei konnten bereits beachtliche Erfolge beim Einwerben externer Fördermittel, z.B. von der EU, errungen werden. In wenigen Jahren wurden bereits deutliche und substantielle synergetische Effekte durch die Kooperation zwischen dem Royal NIOZ und den im MARUM vereinigten Instituten im Rahmen von NEBROC erzielt.

NEBROC hat sich dabei zu einem Forschungsverbund entwickelt, der durch die Fördermittel von der NWO und vom BMBF strategisch unterstützt wurde. Diese Unterstützung umfasst Personal- und einige Reisekosten, wohingegen die realen Forschungsarbeiten über externe Forschungsprojekte finanziert werden. Dabei spielen die über NEBROC finanzierten Personalstellen eine Schlüsselrolle, indem sie im Rahmen einer engen Kooperation neue Forschungsansätze und

Forschungsprojekte entwickeln und dadurch weitere Mittel für die Forschung eingeworben haben.

Auch in der jetzt abgeschlossenen Förderphase lag der Schwerpunkt der Aktivitäten von NEBROC auf dem Ausbau eines Centers of Excellence für Meereswissenschaften in NW-Europa, die durch „seed funding“ für NEBROC unterstützt wurden.

Die Förderphase, über die hier abschließend berichtet wird, begann am 1.9.2005 und pünktlich zu diesem Termin konnten auf Bremer Seite alle Personalstellen besetzt werden. Für die einzelnen Forschungsfelder sind die folgenden Personen eingestellt worden, die bereits im Antrag namentlich genannt worden sind:

Forschungsfeld A: Dr. Mario Hoppema (0,5 TVL 13)
Ozeanische Kohlenstoffflüsse & Biologische Rückkoppelungen

Forschungsfeld B: Dr. Ingrid Zondervan (1,0 TVL 13)
Neue Proxies und ihre Validierung

Forschungsfeld C: Dr. Jan-Berend Stuut (1,0 TVL 13)
Variabilität des Klimas und Paläoklimas

Forschungsfeld D: Dr. Christian Winter (1,0 TVL 13)
Kontinentalrandprozesse

Forschungsfeld E: Dr. Nils Volkenborn (0,5 TVL 13)
Funktionale Diversität und die Schlüsselrolle einzelner Arten

Die Zusammensetzung der NEBROC-Wissenschaftler, 3 von 5 der in Bremen/Bremerhaven beschäftigten kamen/kommen aus den Niederlanden und 2 der 5 am NIOZ beschäftigten kommen aus Deutschland, zeigt, dass auf dieser Ebene die Deutsch-Niederländische Kooperation und der Austausch bereits fest verankert sind. Frau Dr. Zondervan hat zum 1.1. 2007 eine neue Stelle übernommen. Das Forschungsfeld B wurde seit dem von Frau Dr. Claudia Sprengel vertreten.

Im Verlauf dieser Förderphase hat sich das Scientific Steering Committee von NEBROC insgesamt dreimal (plus einmal Anfang 2009) in Groningen zu seinen regelmäßigen Sitzungen getroffen. Da Groningen auf halben Weg zwischen Bremen/Bremerhaven und Texel liegt, hat sich die Universität Groningen im Verlauf der letzten Jahre als bevorzugter Sitzungsort erwiesen. Im Verlauf dieser Sitzungen wurden jeweils alle wichtigen NEBROC-relevanten Punkte besprochen. Die Einzelheiten dazu sind den beigefügten Protokollen der Sitzungen zu entnehmen. Bei diesen Protokollen, wie auch bei den weiteren Berichtsdokumenten, handelt es

sich im Rahmen von NEBROC konsequenterweise um bilaterale Papiere, die dementsprechend in English verfasst sind. Nach dem ebenfalls noch in Deutsch verfassten Erfolgskontrollbericht sind dann noch die folgenden Dokumente (in Englisch) beigefügt:

Part 1 – Übersicht über NEBROC Projekte und Aktivitäten

Part 2 – Protokolle der Scientific Steering Committee Meetings

Part 3 – Übersicht über das ECOLMAS Kursprogramm

Part 4 – Übersicht über begutachtete NEBROC-relevante Veröffentlichungen

Part 1

Overview of NEBROC Projects and Activities

- Joint Projects since 2002
- Joint Expeditions (2005-2008)
- NEBROC-Meetings/Workshops (2007-2008)

Overview of NEBROC Projects and Activities: Joint Projects since 2002

Project Acronym	Project Name	Duration	Funding through	NIOZ partner	Bremen partner
6C	Carbonate Chemistry, Carbon Cycle and Climate Change, a multidisciplinary view	2002-2006	EU 5 th FRP	G.J. Brummer S. Schouten	J. Bijma
CARBONATE	Mid latitude carbonate systems: complete sequences from cold-water coral carbonate mounds in the northeast Atlantic	2007-2011	ESF-Eurocores Euromarc	Tj. Van Weering	D. Hebbeln
Carbo-Ocean	Ocean sources and sinks of CO ₂	2005-2009	EU 6 th FRP, Integrated Project	H. de Baar	M. Hoppema D. Wolf-Gladrow C. Waldmann M. Diepenbroek
EPOCA	European Project on Ocean Acidification	2008-	EU 7 th FRP	Hein de Baar	Jelle Bijma
ESONET	European Seafloor Observatory Network	2007-2011	EU 6 th FRP	Tj. Van Weering	C. Waldmann M. Diepenbroek
EurOpA (proposed)	EuroCore Program on Ocean Acidification	2009-	EuroCore	G.J. Reichart	J. Bijma
HERMES	Hotspot Ecosystem Research on the margins of the European Seas	2005-2009	EU 6 th FRP, Integrated Project	Tj. Van Weering	D. Hebbeln, H. Grobe
HERMIONE	Hotspot Ecosystem Research and Man's Impact on European Seas	2009-2012	EU 7 th FRP, Integrated Project	Tj. Van Weering	D. Hebbeln, A. Boetius
IronAges	Iron resources and ocean nutrients: Advancement of global environmental simulations	1999-2003		H. de Baar	D. Wolf-Gladrow
MARBEF	Marine Biodiversity and Ecosystem Functioning	2005-2009	EU Network of Excellence	All Biologists	All Biologists
Mediflux	Fluid seepage at the Nile deep-sea fan	2002-2007	ESF-Eurocores Euromargins	J. Sinninghe-Damsté	A. Boetius
Microsystems	Microbial Diversity and Functionality in Cold-Water Coral Reef Ecosystems	2007-	ESF-Eurocores Eurodiversity	Tj. Van Weering J. Sinninghe-Damsté	A. Boetius
Moundforce	Forcing of carbonate mounds and deep water coral reefs along the NW European continental margin	2002-2007	ESF-Eurocores Euromargins	Tj. Van Weering	D. Hebbeln
PALEOSALT	New proxies for palaeosalinity reconstructions	2006-2009	ESF-Euroclimate	G.J. Brummer S. Schouten	J. Bijma
POLMAR	Graduate school, which collaborates closely with GLOMAR at the Univ of Bremen	2008-	Helmholtz	Various Dutch partners involved in teaching	J. Bijma
Proxycal	Development and validation of elemental ratio proxies in foraminifera and corals	2002-2006	DFG NWO	G.J. Brummer	J. Bijma I. Zondervan
Proxycal follow up	Development and validation of elemental ratio proxies in foraminifera, corals, alkenones	2007-2010	DFG NWO	G.J. Brummer P. v. Cappellen M. Wolthers	H. Arlinghaus A. Benthien J. Bijma G. Nehrke
Polarstern-pCO ₂	Underway pCO ₂ Polarstern	2007-	NIOZ-AWI	H. Zemmeling H. de Baar	M. Hoppema

Overview of NEBROC Projects and Activities: Joint Expeditions (2005-2008)

2008) Bremen expedition to the Gulf of Cadiz with Pelagia

Bremen: Dierk Hebbeln et al.,

NIOZ: Ruud Groenewegen, Lorenz Boom

2008) Expedition to the Irish continental margin with Celtic Explorer

NIOZ: Henk de Haas

Bremen: Claudia Wienberg

2008) GEOTRACES expedition to the Southern Ocean with Polarstern (ANT-XXIV/3; 6 Feb - 17 April)

Bremerhaven: Dieter Wolf-Gladrow, Uta Passow, Michiel Rutgers.v.d.Loef,ff,

NIOZ: Hein de Baar,

overall circa 30 GEOTRACES shipboard scientists, about half of NIOZ and half of Germany

2007) GEOTRACES expedition to the Arctic Ocean with Polarstern (ARK XXII/2; 27 July-13 October)

Bremerhaven: Michiel Rutgers.v.d.Loef,ff,

NOZ: Hein de Baar,

overall 15 GEOTRACES shipboard scientists, about half of NIOZ and half of Germany

2007) Pelagia expedition 64PE275 along AR7E section (Ireland-Greenland; 31 Aug - 27 Sep) for geochemistry, ocean physics and invasion of transient tracers CO₂ and chlorofluorocarbons;

NIOZ: Geert Jan Brummer, Hendrik van Aken, Hein de Baar,

Bremen: Monika Rhein

2007) Barter arrangement with University of Bremen, Germany: Pelagia expedition 64PE278 (26 Oct - 18 Nov) from Galway, Ireland to Funchal, Madeira; invasion of transient tracers CO₂ and chlorofluorocarbons,

Bremen: Monika Rhein,

NIOZ: Hein de Baar

2007) Expedition to the Irish Margin with Pelagia

NIOZ: Henk de Haas,

Bremen: Hiske Fink

2005) Expedition to the Gulf of Cadiz with Pelagia

NIOZ: Henk de Haas, Bremen: Claudia Wienberg

2005) Expedition to the Indonesian Margin with Sonne (SO184)

Bremen: Dierk Hebbeln,

NIOZ: Jurian Scholten, Charlotte Spliethoff

Overview of NEBROC Projects and Activities: NEBROC-Meetings/Workshops (2007-2008)

Date: 03.09.-09.09.2007
Place: Torquay, UK (IMOG Meeting)
Topic: NEBROC / Paleoclimate / New Proxies
Participants: Isla Castaneda (NIOZ), Enno Schefuß (MARUM)
Overview: Discussion on a joint project focusing on the Bremen sediment core GeoB-7702-3

Date: 28.09.-15.10.2007
Place: onboard RV Pelagia
Topic: NEBROC / Continental Margin Research / Paleoclimate
Participants: Henk de Haas et al. (NIOZ), Hiske Fink (MARUM)
Overview: Joint work during this expedition, which contributes to the CARBONATE project, an ESF-Eurocores-Euromarc funded project in which both, NIOZ and MARUM, participate.

Date: 16.10.2007
Place: Bremen
Topic: NEBROC / Paleoclimate
Participants: Isla Castaneda, Stefan Schouten (all NIOZ), Enno Schefuss, Stefan Mulitza (all MARUM)
Overview: Discussion on a joint project focusing on the Bremen sediment core GeoB-9528-3

Date: 23.10.2007
Place: Groningen
Topic: NEBROC / Continental Margin Research / Paleoclimate
Participants: Tjeerd van Weering (NIOZ), Dierk Hebbeln (MARUM)
Overview: Plans have been developed to apply for funding for a Hanse Conference at the Hanse Institute for Advanced Studies in Delmenhorst. The topic of this international conference will be on "Marine Carbonates".

Date: 05.-15.11.2007
Place: Bremerhaven
Topic: NEBROC / Paleoclimate
Participants: Geert-Jan Brummer (NIOZ), Jelle Bijma (AWI)
Overview: G.-J. Brummer spent 10 days as a guest scientist at AWI to discuss ongoing cooperation in the field of new proxy development.

Date: 13.-16.11.2007
Place: Bremen
Topic: NEBROC / Paleoclimate
Participants: Isla Castaneda, Stefan Schouten (all NIOZ), Lydie Dupont, Holger Kuhlmann, Stefan Mulitza, Jürgen Pätzold, Enno Schefuß, Jan-Berend Stuut (all MARUM)
Overview: Several discussion along the workshop on abrupt climate change in Africa held in Bremen.

Date: 12.12.2007
Place: Texel
Topic: NEBROC / Continental Margin Research / Paleoclimate
Participants: Marieke Rietveld, Jack Schilling, Henk de Haas et al. (all NIOZ), Dierk Hebbeln, Claudia Wienberg, Nico Nowald (all MARUM)

Overview: During this meeting the use of the Dutch RV Pelagia by the MARUM group in early 20087 has been discussed. As the vessel originally planned for this expedition, RV Merian, was in the shipyard at that time, the MARUM group got ship time on the Pelagia within the Barter exchange programme.

Date: 17.-18.01.2008
Place: Ghent, Belgium (COCARDE Workshop)
Topic: NEBROC / Continental Margin Research
Participants: Furu Mienis, (NIOZ), Dierk Hebbeln, Claudia Wienberg, (all MARUM)
Overview: Discussion for the planned Bremen-organised expedition with RV Pelagia to the Golf of Cadiz

Date: 27.-30.01.2008
Place: Gran Canaria, Spain (ESF Workshop on ocean acidification)
Topic: NEBROC / Ocean Carbon fluxes
Participants: Jan de Leeuw (NIOZ), Jelle Bijma (AWI)
Overview: General discussion of all ongoing NEBROC cooperations within the research area Ocean Carbon Fluxes

Date: 18.-19.03.2008
Place: Veldhoven, the Netherlands (Dutch Earth Scientists' meeting)
Topic: NEBROC / Ocean Carbon Fluxes
Participants: Jelle Bijma (AWI), Jan-Berend Stuu (MARUM), Tjeerd van Weering, Ulrike Fallet, Geert Jan Brummer (NIOZ)
Overview: General discussion of all ongoing NEBROC cooperations within the research areas Ocean Carbon Fluxes and Paleoclimate

Date: 28.3.-04.04.2008
Place: Faro (TRACES & HERMES Meetings)
Topic: NEBROC / Continental Margin Research
Participants: Tjeerd van Weering, Henk de Haas, Furu Mienis, (all NIOZ), Dierk Hebbeln, Claudia Wienberg, Markus Eisele, Hiske Fink (all MARUM)
Overview: Discussion of first results from the Bremen-organised joined expedition on RV Pelagia in Feb/Mar 2008

Date: 13.-18.04.2008
Place: Vienna (EGU Meeting)
Topic: NEBROC / New Proxies
Participants: Jaap Sinninghe Damste, Henk de Haas, Furu Mienis (NIOZ), Jelle Bijma (AWI), Jan-Berend Stuu (MARUM)
Overview: Various scientific discussions during EGU 2008

Date: 9.-13. 06.2008
Place: Nice, France (Epoca kick-off meeting)
Topic: NEBROC / Organic carbon fluxes, new proxies
Participants: Hein de Baar (NIOZ), Jelle Bijma (AWI)
Overview: General discussion of all ongoing NEBROC cooperations within the research areas Ocean Carbon Fluxes and new proxies

Date: 15.-17. 06.2008
Place: Angers, France (Paleosalt annual meeting)
Topic: NEBROC / Organic carbon fluxes, new proxies
Participants: Stefan Schouten, Marcel v/d Meer (NIOZ), Jelle Bijma (AWI)
Overview: General discussion of all ongoing NEBROC cooperations within the research areas Ocean Carbon Fluxes and new proxies

Date: 16.-18.07.2008
Place: Bremen
Topic: NEBROC / Paleoclimate
Participants: Isla Castañeda (NIOZ), Jürgen Pätzold, Enno Schefuß, Stefan Mulitza (MARUM)
Overview: Discussion on collaboration and sampling of sediment cores

Date: 05.-08.08.2008
Place: San Alessi, Italy (CABONATE Workshop)
Topic: NEBROC / Continental Margin Research
Participants: Henk de Haas (NIOZ), Dierk Hebbeln (MARUM)
Overview: Discussion on the joint MeBo-drilling expedition on RV Celtic Explorer

Date: 28.-29.8.2008
Place: Texel
Topic: NEBROC / Continental Margin Research
Participants: Tjeerd van Weering, Henk de Haas, Furu Mienis, Cees van der Land, Alina Stadnitskaya(all NIOZ), Dierk Hebbeln, Claudia Wienberg, Markus Eisele, Hiske Fink (all MARUM)
Overview: General discussion of all ongoing NEBROC cooperations within this research area

Date: 29.-30.9.2008
Place: Giens, France (Euroclimate final conference)
Topic: NEBROC / Organic Carbon fluxes, paleoclimate
Participants: Stefan Schouten, Marcel van de Meer (NIOZ), Regina da Rocha, Jelle Bijma (AWI)
Overview: General discussion of all ongoing NEBROC cooperations within these research areas

Date: 6.-9.9.2008
Place: Monaco (The ocean in a high-CO₂ world)
Topic: NEBROC / Organic Carbon fluxes
Participants: Hein de Baar (NIOZ), Jelle Bijma (AWI)
Overview: General discussion of all ongoing NEBROC cooperations within this research area

Date: 17.11.-18.11.2008
Place: Bremen (CARBONATE Meeting)
Topic: NEBROC / Continental Margin Research
Participants: Tjeerd van Weering (NIOZ), Dierk Hebbeln, Claudia Wienberg (MARUM)
Overview: Discussion of first results of the joint MeBo-drilling expedition on RV Celtic Explorer and development of further plans for the project.

Date: 26.11.2008
Place: Bremen
Topic: NEBROC / Paleoclimate
Participants: Stefan Schouten, Jung-Hyun Kim (NIOZ), Carola Ott, Rebecca Rendle-Bühring (MARUM)
Overview: Discussion on collaboration possibilities on organic geochemical proxies.

Date: 28.11.2008
Place: Utrecht, the Netherlands (15th annual NSG meeting & 8th annual EUROPROX meeting)
Topic: NEBROC / Paleoclimate, Organic Carbon Fluxes
Participants: Gert Jan Reichart (UU), Jan-Berend Stuut (MARUM) Jelle Bijma (AWI)
Overview: General discussion of all ongoing NEBROC cooperations within this research area.

Date: 12.12.2008
Place: NIOZ
Topic: NEBROC / Paleoclimate
Participants: Marcel van de Meer (NIOZ), Albert Benthien (AWI)
Overview: Discussion on quality control and measuring techniques in organic geochemistry

Part 2

Minutes of the NEBROC Scientific Steering Committee Meetings

- 2005 Meeting: 15.12.2005
- 2006 Meeting: 17.01.2007
- 2007 Meeting: 21.11.2007
- 2008 Meeting: 14.01.2009

Die Sitzungsprotokolle sind nicht für die Veröffentlichung vorgesehen, sie dienen lediglich zur vertraulichen Information des Bundesministeriums für Bildung und Forschung (BMBF).

Part 3

ECOLMAS Courses

- ECOLMAS (and GLOMAR) Courses (2002-2009)

ECOLMAS (and GLOMAR) Courses (2002-2009)

Date, Location	Subject	Teacher	Participants/Country
May 01 - 03, 2002, Utrecht	Astronomical timescales. Construction, application, and comparison with Ar/Ar chronology	F.J. Hilgen, J. Wijbrans	28 (12 BRE, 12 NL, 1 BE, 2 CH, 1 SWE)
May 27 - 30, 2002, Bremen	Early diagenesis in marine sediments	M. Zabel, S. Kasten	16 (12 BRE, 2 D, 1 NL, 2 PT, 1 AR)
Sep 09 - 13, 2002, Bremen	Organism-based proxies in paleoceanography	G. Versteegh, J. Bijma	24 (15 BRE, 2 D, 1 B, 2 I, 2 NL, 1 AR)
Oct 07 - 18, 2002, Texel	Introductory Course in Marine Sciences	W. van Raaphorst, T. Bickert	20 (12 BRE, 7 NL, 1AR)
Nov 04 - 06, 2002, Utrecht	Paleoclimatology	William Hay	30 (13 BRE, 2CH, 13 NL, 2 NO, 2 GB)
Nov 26 - 29, 2002, Bremen	Sedimentological and geochemical proxies in paleoceanography	R. Henrich, M. Zabel	21 (13 BRE, 1 D, 5 NL, 1 GB, 1 CHI)
Apr 15 - 17, 2003, Bremen	Statistical data analysis in earth sciences	T. von Dobeneck, D. Heslop	23 (19 BRE, 3 NL, 1 SE)
July 07 - 09, 2003, Bremen	Paleoceanography of Cretaceous to Cenozoic oceans	T. Bickert, J. Kuss, R. Speijer	14 (10 BRE, 1 D, 3 NL)
July 10 - 11, 2003, Bremen	Time-series analysis of paleoclimatic data	M. Schulz	25 (13 BRE, 6 D, 5 NL, 1 CH)
Sep 29 - Oct 01, 2003, Amsterdam	Chemical paleoceanography	M. Frank	18 (6 BRE, 12 NL)
Nov 03 - 14, 2003, Bremen	Introductory Course in Marine Sciences	T. Bickert, J. de Leeuw	14 (9 BRE, 1 F, 2 I, 2 PT)
Nov 25 - 28, 2003, Bremen	Ocean carbonates and their budgets	R. Henrich, G. Ganssen	12 (12 BRE)
Dec 01 - 04, 2003, Bremen	Dinoflagellates - biological characteristics, ecology and their use for paleoclimate reconstruction	C. Zonneveld, H. Brinkhuis, H. Willems	17 (13 BRE, 1 NL, 1 NO, 1 PT, 1 RU)
Jan 14 - 16, 2004, Bremen	Seismic imaging of sedimentary structures	V. Spiess et al.	17 (10 BRE, 4 D, 1 DK, 2 PT)
Jan 19 - 20; Feb 09 - 10, 2004, Bremen	Scientific writing	R. Rendle	17 (17 BRE)
Feb 13 - 15, 2004, Bremen	Introduction to climate modeling	A. Paul et al.	15 (9 BRE, 1 D, 3 NL, 1 B, 1 PT)
May 10 - 14, 2004, Utrecht	Isotope methods in marine (bio)geochemistry	M. Alperin, Univ. North Carolina	21 (7 BRE, 14 NL)
May 26 - 28, 2004, Bremen	Biogenic silica in the ocean	O. Romero et al.	19 (13 BRE, 2 DK, 3 GB, 1 E)
June 03 - 11, 2004, Amsterdam / Texel / Bremen	Proxies in Paleoceanography: Basics and new developments	S. Jung et al.	30 (1 BRE, 2 NL, 4 D, 2 CH, 1 CL, 1 E, 3 F, 2 I, 1 HUN, 1 NO, 1 LAT, 1 PT, 3 TR, 7 SLO)
Nov 07 - 13, 2004, Barcelona (PROPER)	Preservation potential of climate signals	S. Jung et al.	26 (3 BRE, 1 D, 1 AR, 9 E, 1 F, 1 FIN, 1 IRL, 1 I, 1 HUN, 1 PL, 1 PT, 2 SLO, 1 TR, 2 GB)
Nov 11 - 12, 2004, Bremen	Greenhouse Climate and Carbon Cycle Dynamics	J. Zachos, Santa Cruz	14 (12 BRE, 1 NL, 1 I)
Nov 15 - 26, 2004, Texel	Introductory Course in Marine Sciences	F. Jansen et al.	16 (1 BRE, 14 NL, 1 E)
Apr 01 - 06, 2005, Southampton (PROPER)	Paleoclimate I: Integrating modern processes, data evaluation, and models	E. Rohling, A. Roberts, S. Jung	27 (2 BRE, 1 AUT, 3 D, 1 DK, 9 E, 3 F, 3 FIN, 1 HUN, 1 IRL, 1 I, 1 PL, 1 PT, 1 TK, 2 GB, 2 SLO)
July 11-13, 2005, Bremen	Organism-based proxies in paleoceanography	H. Filipsson, M. Mothadi	15 (13 BRE, 2 D)

Date, Location	Subject	Teacher	Participants/Country
Aug 29 - Sep 03, 2005, Field trip Alpine Mountains	Mass wasting on continental margins: Comparing modern and ancient settings	R. Henrich, T. Hanebuth, S. Krastel	6 (5 BRE, 1 CH)
Oct 07 - 14, 2005, Bratislava (PROPER)	Paleoclimate II: Orbital forcing: data and models	D. Rehakova et al.	(not available)
Oct 24 - Nov 04, 2005, Bremen	Introductory Course in Marine Sciences	T. Bickert, et al.	26 (20 BRE, 3 D, 1 E, 2 NL)
Dec 13 - 16, 2005, Bremen	Sedimentological and geochemical proxies in paleoceanography	R. Henrich, M. Zabel	23 (16 BRE, 2 D, 1 E, 1 B, 1 NL, 2 PT)
Feb 28 - March 03, 2006, Bremen	Geochemistry of marine porewater and sediment	S. Kasten, H. D. Schulz, M. Zabel	15 (12 BRE, 3 NL)
March 20 - 21, 2006, Bremen	Signal and time series analysis	D. Heslop	25 (15 BRE, 3 D, 6 NL, 1 PT)
May 09 - 12, 2006, Amsterdam	Laser ablation isotope analysis	S. Eggins, P. Mason	(not available)
May 29 - June 02, 2006, Texel	Advanced organic biogeochemistry	S. Schouten, J. Sinninghe-Damste	27 (13 BRE, 1 AUS, 1 CH, 7 D, 2 GR, 1 NL, 1 SE, 1 UK)
July 17 - 19, 2006, Bremen	Law of the Sea	A. Kirchner	12 (BRE 12)
Nov 06 - 17, 2006, Texel	Introductory Course in Marine Sciences	F. Jansen, T. Bickert	29 (11 BRE, 15 NL, 1 ESP, 1 F, 1 UK)
Nov 28 - Dec 01, 2006, Bremen	Ocean carbonates and their budgets	R. Henrich, G. Ganssen	19 (15 BRE, 1 D, 3 NL)
January 29 - February 01, 2007, Bremen	Dinoflagellates - biological characteristics, ecology and their use for paleoclimate reconstruction	K. Zonneveld, G. Versteegh	20 (5 BRE, 3 D, 2 BE, 1 F, 4 NL, 1 PT, 3 UK, 1 CND)
February 08 - 09, 2007, Amsterdam	Shelf margins and the generation of turbidites	A. Petter, C. Olariu, R. Steel	(not available)
March 12 - 16, 2007, Bremen	Terrestrial climate signals in deep-sea sediments	J.-B. Stuut, L. Dupont	18 (13 BRE, 2 BE, 3 IRL)
July 16 - 19, 2007, Bremen	Statistical methods	D. Heslop, M.I Schulz	20 (20 BRE)
July 16 - 20, 2007, Bremen	International Marine Environmental Law	A. Kirchner	12 (12 BRE)
August 13-24, 2007, Bremen	ECORD Summer school on Paleocyanography	G. Wefer et al.	24 (10 BRE, 2 D, 2 CH, 1 ESP, 1 FIN, 1 IRL, 3 NO, 2 UK, 1 CHN, 1 USA)
September 08 - 14, 2007, Wadden Sea Station Sylt	Tidal flat ecology: Experimental design and statistical analysis	K. Reise, N. Volkenborn, J. van der Meer	24 (16 BRE, 5 D, 2 NL, 1 F)
September 24 - 25, 2007, Bremen	Climate Change 2007: The Physical Science Basis (WG 1, IPCC)	P. Lemke	21 (20 BRE)
September 26 - 28, 2007, Bremen	The Global Carbon Cycle: Past, Present, and Future	D. Wolf-Gladrow	21 (19 BRE, 1 D)
September 24 - 25, 2007, Bremen	Organic facies modelling - modern oceanic systems and ancient source rocks	M. Inthorn	25 (24 BRE, 1 UK)
September 26-28, 2007, Bremen	The global carbon cycle: past, present & future	D. Wolf-Gladrow et al.	21 (19 BRE, 1 D, 1 MRC)
October 8-11, 2007, Bremen	Coastal morphodynamic modelling	C. Winter et al.	16 (10 BRE, 4 D, 2 PT)
October 15-19, 2007, Bremen	Socio-Economic and Institutional dimensions of global change in the marine realm	Ingo Heidbrink et al.	17 (17 BRE)
November 27-30, 2007, Bremen	Multivariate analyses of ecological data	A. Ramette	25 (16 BRE, 2 D, 2 F, 3 NL, 2 PT)
Februar 11- 22, 2008, Bremen	Introductory Course in Marine Sciences	Torsten Bickert, et al.	17 (17 BRE)
March 17 - 18., 2008 Bremen	Multivariate statistics methods	Dave Heslop	20 (18 BRE, 2 D)

Date, Location	Subject	Teacher	Participants/Country
April 01 - 04, 2008 Bremen	Introduction to climate modelling	André Paul et al.	17 (13 BRE, 2 D, 1 NL, 1 PT)
April 22 – 24, 2008 Bremen	Multibeam imaging	Verner B. Ernstsén & Tilmann Schwenk	19 (14 BRE, 2 D, 1 BE, 2 NL)
September 1-12, 2008 Bremen	ECORD Summer School 2008 "The Deep Subseafloor Biosphere"	Dierk Hebbeln, Kai Uwe Hinrichs & Ursula Röhl	28 (10 BRE, 3 D, 1 BE, 4 CH, 3 DK, 1 G, 4 I, 2 USA)
September 19 - 27, 2008 Bremen	Mass wasting on continental margins: Comparing modern and ancient settings	Rüdiger Henrich et al.	5 (5 BRE)
October 14-16, 2008, Bremen	Polar oceans and global change	W. Hagen et al.	16 (10 BRE, 5 D, 1 CH)
October 29-30, 2008, Bremen	Carbon burbs and hiccups: the global carbon cycle during the Cenozoic	H. Pälike	22 (13 BRE, 2 D, 7 NL)
November 17-21, 2008, Bremen	Socio-economic and institutional dimensions of global change in the marine realm	M. Flitner et al.	25 (23 BRE, 2 NL)
December 2-3, 2008, Bremen	Towards reconciling use and conservation at Sea-examples from fisheries policy and marine protected areas	A. Berghöfer	14 (9 BRE, 5 IND)
February 23-27, 2009 Bremen	Marine Sciences Part I: physical oceanography and climate	Torsten Bickert et al.	

Country Code of Participants

BRE Bremen (University, IUB, MPI, ZMT, AWI), D Germany, AUT Austria, B Belgium, CH Switzerland, DK Denmark, E Spain, F France, FIN Finland, GB Great Britain, HUN Hungary, I Italy, IND Indonesia, IRL Ireland, LAT Latvia, NL Netherlands, NO Norway, PL Poland, PT Portugal, RU Russia, SE Sweden, SLO Slovakia, TK Turkey, AR Argentina, CL Chile

Part 4

NEBROC-related peer-reviewed publications

NEBROC-related peer-reviewed publications

In press/Submitted/In prep.

Alt-Epping, U., Stuut, J-B W, Hebbeln, D. & Schneider, R. 'Variations in sediment provenance during the past 3000 years off the Tagus River, Portugal' *Marine Geology*, In press.

Compton, J. S., Caren Herbert, M. Timm Hoffman, Ralph Schneider & Jan-Berend Stuut. Soil erosion and escarpment retreat estimated from the Holocene Orange River terrigenous mud flux. The Holocene. Submitted

Dueñas-Bohórquez, A., J. Bijma, R. da Rocha, A. Kuroyanagi & G. J. Reichart, Effect of salinity and seawater calcite saturation state on Mg and Sr incorporation in planktonic foraminifera. In prep.

Dueñas-Bohórquez, A., J. Bijma, R. da Rocha, A. Kuroyanagi and G. J. Reichart. Ontogenic and Inter-individual variations of Mg/Ca ratio of planktonic foraminifera. In prep.

Dissard, D., Gert Jan Reichart and Jelle Bijma. Impact of seawater pCO₂ changes on calcification and on Mg/Ca and Sr/Ca in benthic foraminifera calcite (*Ammonia tepida*): results from culturing experiments. In prep.

Dissard, D., Gernot Nehrke, Gert Jan Reichart and Jelle Bijma. The impact of salinity on the Mg/Ca and Sr/Ca ratio in the benthic foraminifer *Ammonia tepida*: results from culturing experiments. *Biogeosciences Discussions*, Submitted

Hoppema, M., R. Middag, H.J.W. de Baar, E. Fahrbach, E.M. van Weerlee and H. Thomas. Whole season net community production in the Weddell Sea. *Polar Biology* in press

Jaeschke A., Abbas B., Zabel M., Hopmans E.C., Schouten S. and Sinninghe Damsté J.S. Anaerobic ammonium oxidation (anammox) in continental shelf and slope sediments off northwest Africa. In prep.

Kim J.-H., Huguet C., Zonneveld K.A.F., Versteegh G.J.M., Sinninghe Damsté J.S. and Schouten S. An experimental field study to test the stability of lipids used for TEX86 and UK37' palaeothermometry. *Geochim. Cosmochim. Acta.*, In press.

Liu, X., Hailiang Dong, Xiangdong Yang, Ulrike Herzschuh, Enlou Zhang, Jan-Berend W. Stuut & Yongbo Wang. Late Holocene forcing of the Asian winter and summer monsoon as evidenced by proxy records from the northern Qinghai-Tibetan Plateau: *Earth and Planetary Science Letters*. Submitted

McGregor, H.V., Lydie Dupont, Jan-Berend W. Stuut & Holger Kuhlmann. Vegetation shift in southern Morocco at 700 AD: culture (Islamisation) or climate change? *Quaternary Science Reviews*. Submitted

Mertens K.N., Foubert A., Vanneste H., Wienberg C., Stuut J-B.W., Baas M., Sinninghe Damsté J.S., Hebbeln D. & Louwye S. Tracking 40,000 years of Late Quaternary migrations of the Azores Front in the southern Gulf of Cadiz using nannofossils, biomarkers and sedimentological proxies. In prep.

Mollenhauer, G., Inthorn, M., Vogt, T., Zabel, M., Sinninghe Damsté, J.S., Eglinton, T.I. Aging of marine organic matter during cross-shelf lateral transport in the Benguela upwelling system revealed by compound-specific radiocarbon dating. *G-cubed*. In press.

Palmer, M.R., M.J. Cooper, S. Schouten, G.J. Brummer, G.J. Reichart, J.M. Yu, H. Elderfield, J. Bijma. Multi-proxy reconstruction of surface water pCO₂ in the northern Arabian Sea since 30 ka: Implications for the rise in atmospheric CO₂ during deglaciation. In prep.

Pittauerová, D., Stefan Mulitza, Bernd Hettwig, Wissam Chehade, Gesine Mollenhauer, Jan-Berend Stuut, Helmut W. Fischer. Application of self-absorption correction method in gamma spectroscopy for ²¹⁰Pb and ¹³⁷Cs sediment chronology on the continental slope off NW Africa. *Radioprotection*. In press

da Rocha, R., A. Dueñas-Bohórquez, G.-J. Reichart and J. Bijma. The impact of temperature and salinity on the incorporation of Mg in *G. sacculifer*. In prep.

da Rocha, R., A. Dueñas-Bohórquez, G.-J. Reichart and J. Bijma. The impact of pH/ CO₃²⁻ on the incorporation of Mg in *G. sacculifer*. In prep.

Seeberg-Elverfeldt, I.A., Pätzold, J. Arz, H. & Stuut, J-B W. 'Late Holocene climate variability in the northern Red Sea' Paleooceanography. Submitted

Sluijs, A., Röhl, U., Schouten, S., Brumsack, H-J., Sangiorgi, F., Sinninghe Damsté, J:S., Brinkhuis, H. Arctic late Paleocene – Early Eocene paleoenvironments with special emphasis on the Paleocene – Eocene thermal maximum (Lomonosov Ridge, IODP Expedition 302) Paleooceanography, resubmitted

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