

**InterRidge Steering Committee Meeting 2005
Appendices**

**APPENDIX I
InterRidge Chairs and Coordinators – Past and Present**

InterRi

dge Chairs

Colin Devey (Germany)	2004 - present
Kensaku Tamaki (Japan)	2000 - 2003
Mathilde Cannat (France)	1997 - 1999
Roger Searle (UK)	1994 - 1996
John Delaney, co-chair (USA)	1991 - 1993
H. David Needham, co-chair (France)	1991 – 1993

InterRidge Coordinators

Katja Freitag	March 2004 – present
Kristen Kusek (E&O)	March 2004 - present
Agnieszka Adamczewska	Nov 1999 – March 2004
Cara Wilson	March 1997 – Nov. 1999
Ruth Williams (acting)	Oct. 1996 - March 1997
Heather Sloan	Oct. 1993 - Oct. 1996
Trileigh Stroh	1989 -Oct.1993

InterRidge Steering Committee Members - Past and Present

Canada

Steve Scott	2004 - present
S. Kim Juniper	1998 - 2004

China

John Chen	2004 - present
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France

Javier Escartin, <i>ad hoc</i>	2002 - 2004
Jérôme Dymont	2001 - present
Françoise Gaill, <i>ad hoc</i>	1998 - 2004
Mathilde Cannat	1997 - 2000
Catherine Mével	1997 - 2003
Daniel Desbryères, <i>ad hoc</i>	1991 - 1997
Jean Francheteau	1991 - 1998
H. David Needham	1991 - 1994

Germany

Colin Devey	1999 - present
Peter M. Herzig	1996 - 2000
Roland Rihm	1995 - 1998

India

K. V. Kamesh Raju	2005 - present
Abhay V Mudholkar	2002 - 2005
Ranadhir Mukhopadhyay	2000 – 2001

Italy

Enrico Bonatti	1998 - 2004
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Japan

Nobi Seama	2005 - present
Masataka Kinoshita	2002 - present
Toshitaka Gamo	2001 - 2005
Kantaro Fujioka	1999 - 2001
Hiromi Fujimoto	1997 - 2000
Tetsuro Urabe	1995 - 1998
Kensaku Tamaki	1992 - 1997
Kensaku Tamaki	2000 - 2004

Korea

Sang - Mook Lee	2001 - present
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Norway

Rolf Pedersen	2001 - present
Eirik Sundvor	1996 - 2000

Portugal

Fernando Barriga	2001 - present
Ricardo Santos, <i>ad hoc</i>	2002 - 2004
Miguel Miranda	1996 - 2000

Spain

Miquel Canals	1995 - 1998
Juan José Dañoibeita	1995 - 1998

UK

Tim Henstock	2004 - present
Paul Dando	1999 - present
Christopher R. German	1997 - 2002
Philippe Blondel, <i>ad hoc</i>	1997 - 2002
Lindsay Parson, <i>ad hoc</i>	1996 - 1998
Roger C. Searle	1994 - 1998
Martin Sinha	1991 - 1996

USA

Donna Blackman	2005 - present
Charles Fisher	2002 – present
Deborah Smith	2003 - 2005
Spahr C. Webb, <i>ad hoc</i>	2001 - 2004
Jian Lin, <i>ad hoc</i>	1999 - 2004
Christopher G. Fox, <i>ad hoc</i>	1998 - 2001
David Kadko	1998 - 2001
Alan Chave, <i>ad hoc</i>	1997 - 2001
Dave Christie	1997 - 2001
Karen Von Damm	1996 - 1998
Lauren Mullineaux, <i>ad hoc</i>	1996 - 2000
Robert S. Detrick	1992 - 1995
John Delaney	1991 - 1994
P. Jeff Fox	1991 - 1994
Charles H. Langmuir	1991 - 1996

InterRidge National Correspondents - current

Principal Members:

France – Jérôme Dymont (confirmed)
 Germany - Colin Devey (confirmed)
 Japan – Kyoko Okino (confirmed)

UK – Tim Henstock (confirmed)
USA - Charles Fisher (confirmed)

Associate Members:

Canada - S. Scott (confirmed)
China – J. Chen
India – K. A. Kamesh Raju (confirmed)
Korea - Sang-Mook Lee (confirmed)
Norway - Rolf Pedersen (confirmed)
Portugal - Fernando Barriga

Corresponding Members:

Australia – Dietmar Müller (confirmed but looking for alternative within Australia)
Austria - Monika Bright (confirmed)
Brazil - Suzanna Sichel (confirmed)
Denmark - ? (John R. Hopper moved to Germany)
Iceland - Karl Grönvold
Mauritius - Daniel P. E. Marie
Mexico - ? (J. Eduardo Aguayo-Camargo emails bounce back)
Morocco - Jamal Auajjar
New Zealand - Ian Wright (confirmed)
Philippines - Graciano P. Yumul, Jr. (confirmed)
Russia - Sergei A. Silantsev (confirmed)
South Africa - Anton le Roex (confirmed but may become Petrus Le Roux if he moves to RSA)
Spain - Juan José Dañobeitia
Sweden - Nils G. Holm
Switzerland - Gretchen Früh-Green (confirmed)
SOPAC - Russell Howort (confirmed)

APPENDIX II

Alternative ideas from the IR office on how to approach the problem of sourcing funds

Apart from receiving yearly membership fees that support the running of the office as well as some funding for IR workshops and student awards, InterRidge needs to become inventive about sourcing other funds. This will enable IR to financially assist member nations to develop their ridge communities by assisting with travel support for scientists to take part in IR activities, students to take part in cruises etc. As ridge research calls for expensive equipment, the logical place to try and source funds is from equipment manufacturers – it should be in these companies’ interest to keep ridge research thriving! There are also government agencies (e.g. ISA, IOC-intergovernmental oceanography commission) that may be willing to contribute funds to specific IR activities given a suitable InterRidge membership structure.

The idea is to approach agencies/organizations/companies directly with specific IR activities that they could fund (Table 1).

Table 1. Activities that fund providers could support.

InterRidge workshop general (workshop conveners can decide where they need the money)
InterRidge workshop specific (travel for participants, a meal, abstract volume, etc)
InterRidge working group meeting (only for WG members to enable these to get together)
Sponsor a student to take part in a cruise, a workshop, a conference
Fellowship for a young scientist (developing nation) to do research at an institute of a nation with a strong ridge program
Education and outreach activity (student journalist at sea funding, funding for IR member to give a talk at a school, etc)
IR field trip or course
IR News (printing costs, color pages etc)

In order to include a fund provider in InterRidge, IR should consider having another “category” of membership if a company/organization etc would like to pay annual dues, call this something like “sponsoring member”. This category could have a non-voting steering committee member, and logos would be placed on the IR website (not the home page necessarily, but not hidden either).

If sponsorship is for a specific activity, this would be acknowledged, but InterRidge would have no “obligations” for including a representative on the steering committee.

Possible sources of external funding:

Intergovernmental agencies/organizations: ECOD, ESAC, ISA, SCOR

Companies: Placer Dome, Nautilus, Mitsubishi, any software companies?, fuel companies (Shell, BP, etc.), Bluefin

**APPENDIX III-1
InterRidge Office Expenditure 2004 (January 2004 – January 2005)**

	Amount in \$	Amount in €	Costs not from IR budget	Other info
Salaries				
Salary KF (Bremen)		€ 13.251,51		March-May
Salary KF (1/2 SP1144)		€ 15.594,89	€ 15.594,89	June-December
Salary KK 1		€ 15.447,43		\$18666,67 / trimester
Salary KK 2		€ 15.572,43		
Salary KK 3		€ 15.295,53		
Salary 1 student worker			€ 4.070,00	10 months
Travel				
Travel Korea (Katja)		€ 1.891,98		
Travel Korea (Colin, ticket only)		€ 732,48		
Travel Korea (Colin, approx. other)			€ 1.891,98	IFM-GEOMAR
Travel Venice (Katja)		€ 700,00		
Travel Venice (Colin)			€ 700,00	IFM-GEOMAR
IR Workshops				
IRR2K workshop Korea	\$3.000,00	€ 2.491,15		
IR biology workshop Bremen 2004		€ 5.000,00		
AGU educators session	\$200,00			In Kristen's invoice
AGU biogeochem wg meeting	\$250,00		€ 191,69	NieB got funding
Indian Ocean Ridge meeting (Jan05)	\$3.000,00	€ 2.209,29		
IR Student Awards				
Student award Korea IRR2K	\$700,00	€ 567,35		
Computer-related expenses				
Filemaker Pro 7 software		€ 102,00		
CD/DVD Hellweg Centrum		€ 53,71		
Software Kauf Devey (comsolutions)	\$150,00	€ 122,86		
Internet Domain 1&1		€ 17,88		
IR computer		€ 1.042,84		
Office2000, photoshop		€ 229,00		
Stationary etc (e.g DVDs, magnetic paper)		€ 42,94		
Database consultant work		€ 307,40		
IR NEWS, website				
IR News (September)		€ 4.142,95		total cost
IR logo		€ 574,20		total cost
IR flier		€ 362,01		total cost
Postage		€ 4.852,83		
Labels, envelopes etc IR News		€ 308,24		
Registration fees for conferences etc				
Kristen ODP		€ 1.600,00		
IODP Quittung Kfreitag		€ 50,00		
Kristen AGU	\$1.807,40	€ 1.355,55		
Visits Kristen				
Apartment April Kusek		€ 420,00		
April trip Kusek		€ 382,20		
January trip - Hotel		€ 296,00		
Work Kusek		€ 1.189,00		
TOTAL spent		€ 106.205,65		
Money in (actual)		€ 94.622,47		
Balance		-€ 11.583,18		
Money used from other sources			€ 22.448,56	

**Appendix III-2
Expected InterRidge Office Expenditure 2005 (February 2005 – January 2006)**

	Amount in \$	Amount in €	Costs not from IR budget	Other info
Salaries				
Salary KF (1/2 SP1144)		€ 25.815,14	€ 25.815,14	per year
Salary KK	\$61.500,00	€ 47.724,00		\$15375/quarter
Salary 1 HIWI			€ 4.884,00	per year
Travel				
Travel Goa (Katja)		€ 1.240,87		
Travel Goa (Kristen)	\$3.081,43	€ 2.391,19		
Travel Goa (Colin)			€ 1.240,87	IFM-GEOMAR
Travel Portugal (Katja)		€ 800,00		
Travel Portugal (Colin)		€ 800,00		
Travel Cyprus (Katja)		€ 800,00		
Travel Russia (Katja)		€ 1.000,00		
Travel EGU (Kristen)	\$1.300,00	€ 1.008,80		
Travel California (Kristen)		€ 1.000,00		
IR Workshops				
IR workshop MOMAR	\$3.000,00	€ 2.300,26		
IR workshop VENT and SEEP	\$3.000,00	€ 2.300,26		
Ridge2000-IR Cyprus field trip	\$3.000,00	€ 2.300,26		
Indian Ocean Ridge meeting (Jan05)				paid in 2004
IR Steering Committee meeting				
		€ 1.000,00		
IR Student Awards				
Student award Vent and Seep	\$700,00	€ 526,50		
Student award India	\$700,00	€ 526,50		
Office and Computer-related expenses				
Internet Domain 1&1		€ 17,88		
Software		€ 400,00		
Stationary (e.g. magnetic paper etc)		€ 200,00		
Thank you gifts		€ 150,00		
Website				
website work		€ 800,00		
database work (eg biology db with ChEss)		€ 1.000,00		
IR NEWS				
IR News (September)		€ 3.000,00		
IR flier		€ 400,00		
Postage		€ 5.000,00		
Labels, envelopes etc IR News		€ 300,00		
IR working group folders		€ 3.000,00		
Education and Outreach				
Networking and outreach travel		€ 6.000,00		
Visits Kristen				
Apartment Kusek (3 months estimated)		€ 1.260,00		
Expenses Kusek (2 visits)		€ 1.000,00		
Flights (2 visits)		€ 3.000,00		
TOTAL expected				
		€ 117.061,66		
Money in		€ 134.006,33		
Balance		€ 16.944,67		
Money used from other sources			€ 31.940,01	

**APPENDIX IV
National Updates**

Appendix IV-1 Germany DeRidge

C. Devey

In October 2003 the Senate of the German Research Council (DFG) started supporting the priority program "From Mantle to Ocean: Energy-, Material- and Life cycles at Spreading Axes". The project is currently planned to run for six years with the objective being to quantify the processes at mid-ocean ridges by undertaking detailed tectonic, geophysical, volcanological, geochemical, fluid-chemical and biological investigations. In order to attain a globally-relevant description and quantification of ridge processes it is necessary to carry out an intensive, multi-year, multi-disciplinary project at various time scales and at clearly-defined, representative regions along the mid-ocean ridge.

During the first phase (2003-2005) of the priority program, the DFG funded 20 projects. A list of these funded project are available on the SPP1144 web site, located at IFM-GEOMAR and accessible under www.deridge.de. Continuation and/or new proposals for the next two year funding period (1.10.05-30.9.07) were submitted to the DFG on March, 31th, 2005.

Summary of Meteor cruise M62/5

The R/V METEOR cruise M62/5 took place from 7 November – 29 December 2004, and was the second German research cruise to the South Atlantic Ridge between 7° and 11°S after cruise M62/4.

aim - determine the volcanological and tectonic nature of the seafloor in a portion of the South-Atlantic Ridge (MAR) between 7-11°S using the British TOBI device.

Main results:

(1) Four second-order ridge segments explored south of the Ascension fracture zone, over a distance of 1000 km along-axis. Approximately 6000 km² of seafloor with an average depth of 3100 m imaged with TOBI.

(2) Two extensive sheet-flows identified at the northern-central end of Segment 2.

(3) A hydrothermal plume with methane concentrations of up to 115 nmol/l and a maximum turbidity of 0.1331 V was found in 2700 m water depth at the border between segment A1 and A2.

(4) A temperature anomaly of 0.14°C found during a ROV dive on a plateau at the western flank of "Cheating Bay" is clearly related to an increase in heat transfer from a hydrothermal system below the surface. The occurrence of intense alteration of rocks and sediments around this so-called "Nibelungen field" also supports this conclusion.

(5) Most sampled microcrystalline basaltic rocks in the "Cheating Bay" area are covered by Mn-oxide.

SPP 1144 data management

The project web page moved from Bremen to Kiel (<http://www.deridge.de>). Some changes occurred with regard to the temporary presentation of non-project data. These data, previously available via the project homepage, are now on the data web page (<http://www.pangaea.de/Projects/SPP1144/>). These data will successively get transferred to the WDC-MARE/PANGAEA archive.

Data from Meteor cruise M60/3 were the first data provided for transfer to the SPP1144 archive at WDC-MARE/PANGAEA. Data include CTD measurements, chemical analyses of fluids and rocks, temperature measurements and seafloor images (these include: i - thumbnails representing the original images, ii - track plot (PDF file) and iii - list (ASCII text) of image name, latitude and longitude) and maps. Each document or image can be visualized and downloaded in the original size. In order to access the SPP database, please contact K. Lackschewitz to apply for a password.

The next step in data management beside continuing the transfer of M60/3 data, is to start to inspect and prepare the new data from cruise M62/5.

Upcoming events

Meteor cruise M64/1

Meteor cruise M64/1 will start on April 2, 2005 from Mindelo, Cape Verdes and end in Fortaleza, Brasil on May 3. Chief scientist is K. Haase, Univ. of Kiel. The main objectives of the cruise are to find and sample active hydrothermal vents and to study recent volcanic processes on the Mid-Atlantic Ridge between 8 and 11°S. Both fluid chemical and biological/microbiological studies are planned at hydrothermal vents

Meteor cruise M64/2

M64/2 will start on May 6, 2005 from Fortaleza (Brasil) and end in Dakar (Senegal) on June 6. Chief scientist is K. S. Lackschewitz (IFM-GEOMAR Kiel). The overall goal of the cruise is to increase the understanding of the geochemistry, biology and microbiology of the Logatchev Hydrothermal Field (15°N at

the MAR). The studies will put special emphasis on the temporal variability of fluid emanations, fluid chemistry, microbial activities and associated fauna at selected vent sites in comparison to results obtained in previous Meteor-cruises to this hydrothermal field.

Schedule and main objectives of planned Meteor and Merian cruises 2006

The M.S. Merian cruise HYDROMAR III to the Logatchev Hydrothermal Field at 15°N is currently scheduled to depart on 25 January, 2006 and end on 21 February, 2006 (coordinator is C. Borowski, MPI Bremen). The investigations of this cruise are a continuation of the program started at 15°N on the Mid-Atlantic Ridge in 2004 (cruise M60/3; HYDROMAR I followed by cruise M64/2; HYDROMAR II). The emphasis of this cruise is to study the temporal variability of fluid emanations, fluid temperature and chemistry, microbial activities and associated fauna at selected hydrothermal vent sites.

A second M.S. Merian cruise to the Logatchev Field is presently scheduled for 23 February to 15 March 2006 (coordinator is T. Kuhn, IFM-GEOMAR Kiel). This HYDROMAR IV project proposes to drill 15 m long boreholes into the ultramafic-hosted active vent sites of the Logatchev-1 hydrothermal field. The drilling device that will be used is the newly built Rockdrill 2 owned by the British Geological Survey in Edinburgh (UK). The major scientific objectives include the investigation of depth zonations of mineralization and alteration, their age relationships and the establishment of the variability of the subsurface biosphere.

Meteor cruise M68/1 is scheduled to depart from Barbados on 25 April, 2006 and end in Recife on 2 May, 2006 (coordinator is A. Koschinsky, International University Bremen). The overall goals of the investigation are (1) to investigate the petrology and geochemistry of source rocks and the geochemistry and fluxes of the respective hydrothermal fluids, temporal variations of hydrothermal activity, hydrothermal alteration of volcanic rocks, and geo-bio interactions between fluids and hydrothermal biotopes at the slow-spreading Mid-Atlantic Ridge (MAR between 7 and 11°S) and (2) to focus on the biogeographic role of the southern MAR with respect to the distribution of hydrothermal fauna and the differences between hydrothermal systems at the northern and the southern MAR.

The proposals of all three cruises are presented as pdfs on the SPP1144 web site.

2nd SPP1144-Workshop in Etelsen, 28.-30.6.05

A 2nd SPP1144 workshop to present the results of Meteor cruises M62/4, 62/5, 64/1 and 64/2 and the preliminary results of the funded SPP1144 DFG-projects will take place in June 05. Future research activities at the Mid-Atlantic ridge segments and hydrothermal vent fields in the selected areas at 15°N and between 7 and 11°S will also be coordinated during this meeting. This workshop brings together scientists and graduate students from all disciplines interested in both areas.

Appendix IV-2 InterRidge France

J. Dymont (updated for IR News Vol 14)

Despite the end of the National Program of CNRS and IFREMER "Dorsales", ridge activities continue in France in three ways:

- Development of the MOMAR project, with the creation of a "MOMAR-France Steering Committee" in charge of coordinating the French activities in MOMAR
- Participation in InterRidge, with the creation of a "Bureau InterRidge France"
- Individual cruise proposals and submission of projects through other programs

1) MOMAR activities

The MOMAR-France Steering Committee, led by Mathilde Cannat, organized a national MOMAR workshop in late October 2004 to discuss future actions. Although the focus was initially on Lucky Strike, attending members found out that the interest was both on Lucky Strike and Rainbow, the former being the most favorable place for a permanent observatory whereas the latter would be the focus for repeated observations. Resubmission to IODP of a drilling proposal at Rainbow was strongly encouraged. The acquisition of earthquake epicenter locations in the MOMAR area through hydrophones moored in the SOFAR channel was also supported.

Cruises planned, pre-scheduled, or submitted as part of the MOMAR France effort are as follows:

- Two cruises will take place in 2005: *SISMOMAR*, an OBS experiment at Lucky Strike (P.I. Wayne Crawford), and *EXOMAR*, a biological cruise to various hydrothermal sites of the MAR including MOMAR sites (P.I. Anne Godfroy).

- Two cruises are pre-scheduled for 2006: *GRAVILUCK*, a deep-sea gravity and geodesy experiment at Lucky Strike (P.I. Valérie Ballu), and *MOMARETO*, a technological cruise to test devices developed as part of the EU-funded EXOCET/D program.
- As decided during the MOMAR-France workshop, two cruise proposals have been submitted for 2007. *MOMARTHINI* intends to “initiate the implementation of an integrated deep sea observatory in the Lucky Strike hydrothermal vent field” by gathering geological and biological data as part of a “zero-state” of the field (P.I. Javier Escartin). *MOMAR-DREAM* goals are to study the role of iron in the geological, hydrological, and biological processes, and to systematically characterize the site to prepare for IODP drilling (P.I. Jérôme Dymont & Françoise Gaill).
- Finally, a revised proposal for drilling at Rainbow was submitted by Yves Fouquet to IODP on March 31st.

The French interest for the MOMAR area was confirmed by the large French attendance at the 3rd International MOMAR implementation Workshop held in Lisbon in April 2005.

2) Bureau InterRidge France

The goals of the bureau are

- to be the correspondent of InterRidge in France, in order
 - to disseminate information from InterRidge to the relevant French programs or individual scientists and help the French Ridge community to benefit from InterRidge and the Ridge programs of other countries;
 - to pass information from the relevant French programs or individual scientists to InterRidge and improve the international visibility of the French Ridge community
- to disseminate information among the French Ridge community and support initiatives at the national level (workshops, meeting sessions) in order to maintain a community spirit among what was the “Dorsales” community.

Members of the Bureau are Jérôme Dymont, Françoise Gaill, Pascal Gente, and Yves Fouquet.

The budget in 2004 was 10 k Euro, it is 7 k Euro in 2005. This low budget, entirely paid by CNRS (together with the InterRidge contribution of 20 k\$ - recently increased to 25 k\$) is just sufficient to pay for the French attendance at InterRidge Steering Committee meetings and to support a limited number of participants at InterRidge workshops.

3) Cruises

The following is a list of ridge-relevant cruise proposals that the bureau InterRidge France is aware of. Cruises relevant to the MOMAR project are in italic.

Cruise name	Area	Chief scientist(s)	Remarks
<u>Completed in 2004</u>			
BioSpeedo	EPR	D. Jollivet	
<u>Completed or scheduled in 2005</u>			
Pacantarctic II	PAR	L. Dosso, H. Ondreas	Dec 04 - Jan 05, R/V L'Atalante
<i>Sismomar</i>	<i>MOMAR</i>	<i>W. Crawford S. Singh</i>	<i>Jun 05, R/V L'Atalante</i>
<i>Exomar</i>	<i>MAR</i>	<i>A. Godfroy</i>	<i>Summer 05, R/V Pourquoi Pas</i>
<u>Submitted for 2006 and 2007</u>			
Gala	Lau basin	E. Ruellan	
<i>Graviluck</i>	<i>MOMAR</i>	<i>V. Ballu</i>	<i>(prescheduled 2005, postponed)</i>
Pluriel	SEIR	M. Maia, C. Hémond	(prescheduled 2005, postponed)
<i>Momareto</i>	<i>MOMAR</i>	<i>P.M. Sarradin</i>	
<i>Momarthini</i>	<i>MOMAR</i>	<i>J. Escartin</i>	
<i>Momar-Dream</i>	<i>MOMAR</i>	<i>J. Dymont, F. Gaill</i>	
Serpentine	MAR	Y. Fouquet	
Parisub	EPR	P. Gente	(scheduled 2004, cancelled)
GeiSeir	SEIR	C. Hémond	
Mozaic	EPR	N. Le Bris	
Symbihot	EPR	F. Lallier	
AOC	Sheba R.	M. Fournier	

This does not take into account the quite large French participation in IODP legs on ridges, including the recent Legs 304-305 to the oceanic core complex at Atlantis Massif, on the Mid-Atlantic Ridge.

4) Scientific fleet

The new IFREMER ship, R/V Pourquoi Pas?, is near completion. Tests are scheduled for May to July 2005. The first cruise will be EXOMAR, a biological cruise to the mid-Atlantic Ridge. The ~100 m-long vessel can carry both deep sea submersible Nautile and ROV Victor, offers spacious laboratories and accommodation for ~40 scientists, and will have excellent survey capabilities. Details about the new ship can be found at <http://www.ifremer.fr/flotte/projets/nep/> and recent news at <http://www.ifremer.fr/flotte/projets/nep/nouvelles/index.htm>

Appendix IV-3 InterRidge Japan

K. Okino (updated for IR News Vol 14)

Japanese ridge scientists are continuing their activities with several seagoing research plans. The InterRidge-Japan program sponsored by JSPS (PI: K. Tamaki), which has supported the annual contribution to InterRidge, attendance at steering committees and workshops, as well as participation of Japanese scientists in international cruises, will end at the end of FY2005. We are trying to establish a new framework to maintain the community and to promote ridge-related studies in Japan.

Diving cruises near the Rodriguez Triple Junction

The *Shinkai6500* diving cruise (PIs: K. Takai and H. Kumagai) is scheduled at the southernmost Central Indian Ridge in January to February, 2006. The area includes two completely different types of hydrothermal fields, the Kairei and the Edmond. The Kairei field is known for its extraordinarily high concentration of hydrogen in hydrothermal solutions and for its chemolithoautotrophic ecosystem, that has not been observed at the Edmond site. The unique chemistry and ecosystem are interpreted to be due to the serpentinization of ultramafic rocks at high temperature. The hyperthermophilic, lithoautotrophic subsurface microbial system is an important key as it could be a last universal common ancestral community of life. The submersible dives by geologists, geochemists and biologists at these two sites and the adjacent ridge crests including a small oceanic detachment aim to reveal the tectonic setting of the area, the details of the ecosystems, and the interaction between them. A total of 30 dives are assigned.

Backarc Basin studies

Backarc basin studies by the Japanese community mainly target the Mariana arc. A submersible diving cruise to the southern Mariana Trough (PI: H. Masuda) was conducted from July to August, 2005 in order to understand the temporal and spatial variations of hydrothermally associated microbiological activities. A long magnetotelluric transect is planned in collaboration with U.S and Australia to provide a comprehensive structural image of the central Mariana subduction system that extends from the subducting Pacific Plate across to the Mariana Trough backarc basin,. An *R/V Kairei* cruise (PI: N. Seama) is scheduled in December, 2005 to deploy ocean bottom electro-magnetometers at 42 sites. In the extinct Parece Vela backarc basin, the *R/V Hakuho-maru* cruise was carried out from June to July, 2005 (PIs: K. Okino and Y. Ohara) and the intensive geophysical mapping of the southern tip of the basin and the dredging along the extinct rift system revealed the complicated evolution process of the area.

New outreach video "Direct approach to Sub-vent Biosphere, the origin of life on the Earth"

The Archean Park Project (PI: T. Urabe), an interdisciplinary research project on the interaction between the sub-vent biosphere and the geo-environment, supported by MEXT ended successfully at FY2004 (The summary papers of the project appeared in *Oceanography in Japan*, Vol. 14 No. 2, 2005 as a special issue of the Archean Park Project). The research team has recently released an outreach video, which summarizes their research highlights. The video is a good introduction to deep-sea hydrothermal systems and is suitable for introductory lecture courses. The file can be freely downloaded from <http://www.lib.kobe-u.ac.jp/products/seimei/e-index.html>

Riser drilling vessel "Chikyu" progress

The new riser drilling vessel *Chikyu* is continuing a series of basic operational tests and navigation training cruises around Japan this year. An open house for the general public is planned in September.

Appendix IV-4 CanRidge

S. Scott (updated for IR News Vol 14)

NEPTUNE Canada

The NEPTUNE cabled observatory for the Canadian portion of the Juan de Fuca plate, funded at \$C62.4 million (~\$US51 million) by the Canadian Foundation for Innovation and the British Columbia Knowledge Fund, is well along in its planning to be "wet" in 2007. An RPF for the Stage I Subsea Electro-Optical Cable Observatory System received responses from three highly qualified industrial teams. Many of the team members had made public presentations at a meeting organized by the Canadian Consulate in Los Angeles at the 2004 Fall meeting of AGU. The proponents liaised with institutions involved in the design of the US portion of the overall system to assure that the design for the Canadian Stage I will be capable of extension to complete the two-stage bi-national cabled observatory. The proposals have been evaluated and a final contract is expected to be in place in summer 2005.

The NEPTUNE Canada project includes funds for instruments for community science experiments. NEPTUNE Canada held three workshops in 2004 for the purpose of facilitating the formation of experimental teams and the development of ideas for experiments. A total of 17 proposals were received by the January 18, 2005 deadline. The 6-member international review committee met at the University of Victoria on April 1-2 to rank proposals and recommend funding levels.

A prototype data management system for NEPTUNE and VENUS is being developed by Benoît Pirene, who was appointed in 2004 as Assistant Director for Data Management.

The University of Victoria has acquired a cable landing station in Port Alberni, British Columbia, where the first phase of NEPTUNE will be coming ashore.

ROPOS Upgrade

The Canadian ROPOS ROV (5000m capability) is undergoing a major upgrade to its handling and data transmission systems funded by two grants from the Canadian Foundation for Innovation and the British Columbia Knowledge Fund (Ross Chapman and Verena Tunnicliffe, PIs, University of Victoria). When completed, ROPOS will be capable of transmitting live data ashore via a satellite link, will have fly-away capability for mid-depth dives without its deep water cage and winch, and will have a Kraft arm that will enhance its manipulative ability.

NSERC Major Facilities Access Grants

The Natural Sciences and Engineering Research Council of Canada made two grants to ridge-related science through its Major Facilities Access program.

Canada IODP (K. Gillis, PI, University of Victoria) \$C200,000 per year for 3 years to pay Canada's portion of its membership in ECORD.

Canadian Scientific Submersible Facility (S. D. Scott, PI, University of Toronto) \$C400,000 per year for 3 years to subsidize Canadian users of ROPOS. This is the third successful 3-year MFA grant for ROPOS and is a \$50,000 per year increase over the previous two grants.

Endeavour Marine Protected Area

The implementation committee set up by Fisheries and Oceans Canada continues to develop a plan for regulating and monitoring scientific use of the Endeavour MPA.

A rapid response team investigated an earthquake swarm detected in the MPA by a SOSUS acoustic array.

Ridge-related Cruises

Canadians participated on the following ridge-related cruises:

Pacific Ring of Fire (NOAA, R. Embly, Chief Scientist) using ROPOS to investigate hydrothermalism in the Marianna-Bonin arc.

Keck (University of Washington, J. Delaney, PI) to the Endeavour MPA. Canadian participant was Elitsa Hrischeva, University of Toronto. CanRidge contributed two ROPOS dives.

Easter microplate to investigate hydrothermalism and vent biology. Canadian participant was Dan Layton-Matthews, University of Toronto.

Movements of CanRidge People

Kim Juniper and Brian Bornhold were appointed co-chief scientists of NEPTUNE in 2004.

Mark Hannington has moved from the Geological Survey of Canada to Ottawa University where he holds an endowed chair.

Steve Scott stepped down as Chair of the Department of Geology at the University of Toronto on June 30, 2005.

Appendix IV-5 Korea

S-M. Lee

Since the end of Daeyang Program, scientists in Korea have been trying to renew exploration of active spreading backarc basins in the western Pacific. This year (2005) a new program, tentatively called "Deep-Sea Hydrothermal Environmental Exploration Program (DSHEEP)," was launched by Korea Ocean Research and Development Institute (KORDI) in collaboration with other institutes, including Seoul National University. While the final approval for long-term funding is pending, a 10-day reconnaissance survey will be conducted in the Bismarck Sea, Papua New Guinea later this year, probably in September-October using R/V Onnuri. We have asked for a 10 year funding divided into three phases. The first phase (2005-2008) will focus on the geological and oceanographical characterization of the Bismarck Sea and vicinity through extensive mapping and surveys. Depending on the results of the first phase, we hope to select a number to integrated study areas and conduct near-bottom observations using remotely operated vehicles and submersibles in the second phase (2009-2011). The scientific objective for the final phase (2012-2015) is still in discussion. Understanding various processes within hydrothermal vent fields and their relationship to tectonic and magmatic controls is an important goal of this program, but is not the only goal. The coastal regions of western Bismarck Sea are vulnerable to seismic hazards. Our efforts to map this part (New Guinea Basin) and conduct geophysical survey will provide information which will help the local government to better assess the risk of earthquakes and tsunamis. Another important difference between this new program and other Korean programs in western Pacific is in its scope and approach. The new program will look beyond hydrothermal vent fields as possible mineral or biological resources and take across-the-board approach. Also like the previous Daeyang Program, we expect the new program to foster wide-ranging international collaborations, following the scientific tradition of InterRidge.

Appendix IV-6 New Zealand

I. Wright (updated for IR News Vol 14)

Although having a long hiatus in reporting, InterRIDGE science projects in the New Zealand region have continued apace since the last national news contribution, with continued work focusing on the hydrothermalism, mineralization, vent biology, magma petrogenesis, and chemical flux of the Tonga – Kermadec volcanic arc.

The major project has been EM300 multibeam mapping and hydrothermal surveying of the arc front between 30°S and 25°S during a RV *Tangaroa* voyage in October 2004. This third voyage has now completed volcano and hydrothermal plume mapping for the entire Kermadec arc. Combined with similar studies by German and Australian colleagues along the Tonga arc, it now forms a ~2500 km long inventory of volcano spacing and distribution, and frequency and intensity of venting along the entire Tonga – Kermadec arc front. The northern Kermadec arc is dominated by silicic caldera volcanism, with seven of nine larger edifices being calderas. Typically the calderas are 5-10 km in diameter, with some showing at least four phases of caldera-forming volcanism. The largest is the Monowai caldera, with the previously known and mapped Monowai cone forming a late-stage satellite construction on the southern caldera rim. The advent of near pervasive silicic caldera volcanism along the northern Kermadec arc differs from the southern Kermadec arc (where there is a mix of silicic and basaltic volcanism), and may provide insight into the temporal evolution of arc and the requisite thermal presaging and thickening of arc crust prior to generation of silicic melts.

Of the northern Kermadec arc, seven of eight volcanoes surveyed are actively venting from at least 13 different sites. The most active is Monowai caldera, where a large hydrothermal field occurs.

This recent work has included a 6-month deployment of a current meter array around the Brothers hydrothermal site as part of an experiment to establish chemical flux and process of plume dispersion from the caldera. Plume chemical intensity and size at Brothers are the greatest of the presently discovered Kermadec arc vent sites and should provide an upper limit to flux rates. The array was recovered in May 2005.

Also late in 2004 a joint Japanese – NZ project completed the first submersible dives along the Kermadec – Havre arc – back-arc system, using the *Shinkai 6500* from RV *Yokosuka*. Four dives were completed at the Brothers caldera hydrothermal sites – two on the northwest caldera wall with extensive high-temperature black smoker venting and two on the resurgent dome site where fluids with lower-temperature but higher volatile content were collected. GNS and NIWA are involved with fluid chemistry and vent biology studies with Japanese colleagues from JAMSTEC and Chiba, Kyushu, and Tokyo Universities.

A recent major thrust of the Kermadec work was a 17 submersible dive programme using the *PISCES IV and V manned submersibles* and the RV *Ka'imikai-o-Kanaloa* in April - May 2005. The programme is a joint NZ / US project with funding from NOAA Ocean Exploration, GNS, and NIWA. Eight volcanoes were the target sites between 25°48'S and 36°21'S that cover a range of water-depths, types of volcanoes, and vent chemistries. The major thrusts of the work are to understand the variability of hydrothermal vent chemistry, volcanic and vent field geology, and both macro- and microfaunal vent biological studies. A follow-up dive programme using *Pisces* by colleagues from the University of Mississippi, but also involving New Zealand scientists, conducted a further 6 dives on the southern Kermadec volcanoes, whilst researchers from the University of Kiel (Germany) dived on volcanoes along the southern Tonga arc.

Appendix IV-7 Switzerland

G. Früh-Green (Updated for IR News Vol 14)

In Switzerland, research on ridge-related processes has traditionally involved comparative field, geochemical and petrologic studies of ophiolites and marine sediments with their modern analogues. Two major universities, the ETH Zürich and the University of Bern, are particularly involved in studies of the modern oceanic crust and ridge-related processes. Being a landlocked country, Switzerland has no formal oceanographic program and thus active participation in oceanographic research and cruises depends entirely on international collaborations. In addition, Switzerland has traditionally been a strong proponent of the Ocean Drilling Program and its successor IODP. Many research groups are also indirectly involved in ridge-related research through field, experimental, and analytical studies of processes at ocean/continent transition zones and in subduction zone settings. The following summarizes the activities of three groups that are working directly on InterRidge-related projects.

Mid-Ocean Ridge Hydrothermal Systems

Together with students and colleagues at the ETH-Zurich, Gretchen Früh-Green is involved in studies of hydrothermal alteration and geochemical fluxes in the oceanic lithosphere. These studies can be summarized in three main areas of research:

- (1) Controls and consequences of serpentinization in different tectonic environments and understanding serpentinite-driven hydrothermal systems;
- (2) Methane and hydrogen formation in mid-ocean ridge hydrothermal systems; and
- (3) Fluid flow and geochemical fluxes during hydrothermal alteration.

These projects combine petrological, geochemical and stable isotope methods with microstructural and fluid inclusions studies and involve strong international collaboration.

Swiss Involvement in studies of Lost City:

Most recent studies of the ETH-group focus on understanding the peridotite-hosted Lost City hydrothermal system (LCHF) and are part of the larger international, multidisciplinary investigation of the LCHF, led by Deborah Kelley (School of Oceanography, Univ. of Washington, Seattle) and funded by the RIDGE oceanographic program of the US NSF. Two research projects funded by the ETH-Zurich and the Swiss National Science Foundation (SNF) support two Ph.D. students. G. Früh-Green and A. Delacour participated in the field campaign to Lost City in 2003. A. Delacour participated on IODP Expedition 305. Both G. Früh-Green and A. Delacour will also be involved (shore-based) in the July 2005 investigations of Lost City with co-PIs Debbie Kelley and Bob Ballard (funded by IFE, NOAA, and the Jason Foundation for Education). Public outreach of the Lost City program has been highly successful and has also received good media coverage in the Swiss press and radio. In particular, Lost City was one of the highlights in an Exposition "Worlds of Knowledge", in celebration of 150 years ETH, which took place in Zurich from 22. April – 8. May, 2005.

Hydrothermal process modeling

Christoph Heinrich and part of his group at the ETH are active in modeling hydrothermal processes. Based on developments by S. Matthai (now at Imperial College), two PhD students, S. Geiger and D. Coumou, have extended a Finite Element / Finite Volume C++ code "CSP" to model the flow of coexisting fluid phases such as low density vapour and high density brine at high temperatures, pressures and overall salinities. CSP allows the simulation of fluid processes with "realistic" geometrical detail by efficiently handling mesh resolutions varying over several orders of magnitude in a single model geometry. Similarly, fluid and rock properties varying over orders of magnitude can accurately be treated.

Transition from 'amagmatic' rifting to (ultra-) slow sea-floor spreading

Othmar Müntener and his group at the University of Bern are investigating gabbro and peridotite samples from ODP Leg 210 (Site 1277) from the Newfoundland margin, the conjugate margin of Iberia. Their studies combine petrological and microstructural studies with the aim to reconstruct the crystallization and thermal history of peridotites and gabbros. They are also conducting major and trace element studies on samples from the Galicia Margin (ODP Legs 149 and 173). The data will be used to characterize 2D-spatial compositional variations of peridotite in magma-poor passive margins to address the fundamental question whether there is a correlation between peridotite composition and increasing distance to the continent. Key questions to be solved are the importance of melt migration processes and its relations to the composition of migrating liquids during formation of 'non-volcanic' passive margins, and how 'amagmatic' rifting evolves into (ultra-) slow spreading. The combination of data from the Alps and from Iberia will ultimately show how constraints from both ancient and present-day settings can be used to extract relevant data for crust-forming processes at ridges. O. Müntener has received a special Swiss SNF professorial grant, which includes funding for students to conduct this study.

Storage of light elements (B, Be, Cl, Li) in serpentinized oceanic lithosphere

A second project of Othmar Müntener's group, in collaboration with A. Kalt (Univ. of Neuchâtel), is a systematic study of the abundance, partitioning and mobility of B, Li, Be, Cl, F, and the B isotope fractionation in rock-forming minerals from hydrothermally altered oceanic mantle from ODP Leg 209. This group is using in-situ methods and mass spectrometry to provide new mineral partitioning and isotope data to constrain the enrichment of light elements in the oceanic mantle during hydrothermal alteration and ultimately to quantify the potential input from the partially hydrated ultramafic part of the oceanic lithosphere into the subduction factory.

APPENDIX V

InterRidge Deep-Earth Sampling Working Group

WG Members

Benoît ILDEFONSE (chair)	CNRS	Montpellier, France
Wolfgang BACH	WHOI	Woods Hole, USA
Mathilde CANNAT	CNRS	Paris, France
Henry J.B. DICK	WHOI	Woods Hole, USA
Kathryn GILLIS	University of Victoria	Victoria, Canada
Peter B. KELEMEN	Columbia University	Palisades, USA
Christopher J. MACLEOD	Cardiff University	Cardiff, UK
Jay MILLER	IODP	College Station, USA
Yasuhiko OHARA	HODJ	Tokyo, Japan
Damon TEAGLE	SOC	Southampton, UK
Douglas R. TOOMEY	University of Oregon	Eugene, USA
Susumu UMINO	University of Shizuoka	Shizuoka, Japan

Associated Scientists (not directly involved in the group in this initial phase)

Donna BLACKMANN	SCRIPPS	San Diego, USA
David CHRISTIE	OSU	Corvallis, USA
Kyoko OKINO	ORI	Tokyo, Japan

Introduction. WG focus and main issues

The proposed 'Deep Earth Sampling' (DES) Working Group is an interdisciplinary group comprising petrologists, structural geologists, petrophysicists, geochemists and geophysicists. It aims to plan a global strategy, oversee monitor and guide the passed or ongoing drilling (IODP, ICDP) projects, and incite/support/develop new projects. It may be viewed as a logical follow-up to the work achieved by the ODP "Architecture of the Oceanic Lithosphere" PPG (see report in the DES working group page at www.interridge.org). In summary, our mandate is, quoting the Interridge Steering Committee, "to determine where to drill with regard to mid-oceanic ridges, and then come out with proposals that will feed in to other initiatives such as IODP".

There are currently (November 2004) 126 active pre-proposals and proposals residing in the IODP SAS (<http://www.iodp-mi-sapporo.org/active.html>). 18 of these (including 2 Atlantic rifted margins projects) have objectives relevant to the InterRidge Science Plan (see appendix 1). Most of these projects were initiated during the end of the ODP, and all of them are thought as conventional, non-riser operations. Design of new

integrated, multi-platform projects, as outlined in the Science Plan for Mission Specific Platforms (<http://www.bgr.de/ecord/index.html>) for example, should be encouraged by the DES Working Group.

Rationale

excerpted from the InterRidge Science Plan, 2004-2013 :

InterRidge should seek to promote interdisciplinary investigations of the 4-D architecture of the ancient and modern ocean crust and shallow mantle at all scales, and explore the extent and diversity of the sub surface biosphere of the oceanic lithosphere. This would be best achieved by the formation of an InterRidge Working Group with a focus on promoting the development and use of different drilling platforms ranging from over-the-side rock drills to riser drilling, and land-based platforms. It would be instrumental in formulating a new international drilling project that will seek to achieve total penetrations of in situ ocean crust in the Atlantic and Pacific within 20 years, and partial sections of crust and mantle in different tectonic settings. Drilling of active hydrothermal systems and young ocean crust and mantle at the ridge axis and in tectonic windows would be a high priority for the working group. These holes should also be used as laboratories in themselves allowing, for example, experiments with, and long term monitoring of, hydrologic systems within the crust. Recognizing the value of ophiolite studies to understand the ocean lithosphere, the working group should promote onland drilling to acquire long sections of the ocean crust and shallow mantle in well understood ophiolite complexes thought to represent key end-members for mid-ocean and arc environments.

More specifically, the working group should focus on the following items (see InterRidge Science Plan for more details, www.interridge.org).

1. Drilling of Active Hydrothermal Systems
2. Zero-age Ocean Crust and Axial Mantle
3. The Deep Biosphere
4. Drilling in Ophiolites
5. An International Crustal Penetration Drilling Project

Drilling the whole ocean crust has been an objective of the marine geoscience community since the late 1950's. This objective started with the Mohole project (Phase 1 drilled in 1961), and was followed in 1968 by DSDP/ODP. To date, the deepest hole in the ocean crust is ODP Hole 504B, at the depth of 2111m. Achieving a complete coring of the oceanic crust remains one of the priority objectives in the IODP initial science plan (http://www.iodp.org/downloads/IODP_Init_Sci_Plan.pdf) with the 21st century Mohole initiative.

excerpted from the InterRidge Science Plan, 2004-2013 :

Understanding global geochemical fluxes from the Earth's interior to the crust, oceans and atmosphere, the relationship between the seismic structure of the ocean crust and its stratigraphy, as well as the economic potential of the oceans requires a full knowledge of the composition and structure of the ocean crust and shallow mantle. This goal can only be achieved by drilling representative end-member crustal types formed in a variety of tectonic settings. Drilling in one ocean basin or one type of ocean crust alone cannot achieve this objective. This drilling must include total penetrations into the mantle at both fast and slow-spreading ridges, as well as drilling long partial sections in tectonic windows representing the diversity of oceanic environments. This, then, rather than a single deep drill hole is the goal of an International Crustal Penetration drilling project that the working group will promote through IODP.

Implementation

The DES working group will lead/conduct discussions, and take actions on the following items

1. Use and development of existing rock-drill technology
2. Effective use of multiple platforms
3. Nurturing of IODP proposals
4. Guide/focus future IODP proposals to target specific items (see these under Rationale)
5. Promoting/organizing InterRidge-IODP workshop
6. Providing an official liaison to IODP

A workshop on the evolution of oceanic lithosphere (see appendix 2) is currently proposed to USSSP, InterRidge and Ridge 2K by David Christie (Oregon State university, Corvallis). It is planned for Fall 2005. In particular, the workshop aims to "identify aspects of oceanic crustal accretion that can be addressed with

current technology, and will begin the process of community prioritization for tackling these via ocean drilling. A particular focus will be on ways in which IODP can partner with InterRidge and with national mid-ocean ridge science programs to achieve common objectives". This workshop falls completely into the InterRidge DES Working Group objectives, and we welcome the opportunity to use it as the starting point of our work.

Appendix 1

List of currently active IODP proposals (<http://www.iodp-mi-sapporo.org/active.html>) related to InterRidge (Nov 2004)

Proposal #	Short Title	Proponent
522-Full3	Superfast Spreading Crust	Alt
531-Pre2	Max Spreading Rate Core Complex	Snow
532-Full	Kane Megamullion	Tucholke
535-Full4 *	735B Deep	Dick
545-Full3	Juan de Fuca Flank Hydrogeology	Fisher
547-Full4	Oceanic Subsurface Biosphere	Fisk
551-Full	Hess Deep	Gillis
570-Full	East Pacific Rise	Haymon
574-Full	Rainbow Hydrothermal Field	Fouquet
584-Full2	TAG II Hydrothermal	Rona
591-Full3 *	Conical/Desmos Hyd., PNG	Herzig
632-Pre	Lamont Seamount	Lundstrom
640-Pre	Godzilla Mullion	Ohara
646-Full *	Iceland Hotspot	Murton
655-Pre *	Juan de Fuca Observatories	Davis
657-Pre *	Galicia Rifted Margin	Sawyer
659-Full *	Newfoundland Rifted Margin	Tucholke
662-Full *	South Pacific Gyre Microbiology	D'Hondt

* : submitted Oct 1st, 2004

Appendix 2

Proposal for a USSSP – InterRidge – Ridge2000 Joint Workshop

Evolution of Oceanic Lithosphere

(excerpted from the original proposal by Dave Christie)

Conveners and Correspondents:

David Christie (coordinator):	dchristie@coas.oregonstate.edu
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We propose to convene an international workshop to enunciate and prioritize the key scientific problems concerning the formation and evolution of the oceanic lithosphere that can be achieved by IODP using available technology. Agreements are in place for the workshop to be jointly sponsored by USSSP, InterRidge and by Ridge2000. If USSSP supports this proposal, we intend to approach other national and regional IODP sciencefunding entities and national "ridge" programs. Several of the latter have informally expressed interest in co-sponsorship.

Because we are in the process of building international collaboration, we have deliberately not finalized some of the decisions requested in the JOI/USSSP proposal guide. In particular, we have not identified all members of the organizing committee, contacted key participants or specified the timing and location. These issues are, however, discussed in general terms in the proposal text and we are continuing to work on them. The problem is circular - international participation is, in effect, dependent on whether USSSP funding becomes available, as the workshop is unlikely to proceed without it. Until USSSP funding is in place, final decisions from some partners may not be possible.

Introduction and Rationale

The potential for IODP to contribute to an improved understanding of the composition, structure, and evolution of the ocean lithosphere is enormous and has been enunciated in planning documents since ocean drilling began. Yet, the number of active "ocean crust" proposals in the IODP system at the present time is very small, and the great majority of these are focused on a single class of problem -- seafloor exposure of gabbroic and peridotite sections that form where extensional tectonics dominates accretionary style rather than magmatic intrusion/extrusion. The reasons for this limited community engagement in IODP are unclear, but it may partially reflect a perception that IODP contributions would come mainly from two end-member objectives that are not immediately achievable -- so-called "zero-age" drilling and drilling to the Moho. This workshop will identify aspects of oceanic crustal accretion that can be addressed with current technology, and will begin the process of community prioritization for tackling these via ocean drilling. A particular focus will be on ways in which IODP can partner with InterRidge and with national mid-ocean ridge science programs to achieve common objectives.

The formation and evolution of the oceanic lithosphere is a dominant process in the chemical differentiation of our planet. It encompasses the transfer and transformation of material and energy from the mantle to the crust and from the crust to the oceans (and eventually to the atmosphere). From its time of formation until it returns by subduction to the mantle, the oceanic lithosphere interacts with seawater, continuously recycling surface materials, especially water, back into the mantle. This evolution must be documented and quantified before a realistic understanding of the ongoing transfer of energy and materials among the major Earth reservoirs can be achieved. To develop such an understanding, well integrated, multi-disciplinary studies encompassing many branches of the earth and biological sciences are essential. Aspects of such studies include documentation of geophysical, geochemical, and biological properties and quantitative modeling studies: of deep earth structure and material flow; of magma formation and magmatic evolution; of volcanic and tectonic construction of oceanic crust; of fluid circulation and fluid-rock interactions within the oceanic lithosphere; of fluid behavior and chemical interactions near the seafloor, and within the overlying water column. Wherever fluid-solid interactions occur, at water-rock interfaces or at deposition sites in veins and at seafloor vents, broad-ranging ecological and biological studies are required. At these sites, microbial ecosystems that exploit and/or mediate a wide variety of chemical reactions form the bases of complex food chains, independent of the sunlight that supports the vast majority of life forms elsewhere on our planet.

Many of the most effective tools for direct scientific sampling and measurement in the remote and hostile environments of the deep seafloor are those provided by IODP. Deep-sea drilling is the only tool for direct sampling of hard rock, consolidated sediment and fluids at significant depth below the seafloor, and the resulting drillholes also provide a valuable access for short- and long-term sub-seafloor monitoring. IODP tools can and should be effectively combined with those available from conventional surface ships and from submersible vehicles. Deep-sea vehicles, while limited to materials exposed at the seafloor (or in some cases to very short cores) can provide spatial and temporal context to the largely one-dimensional environments of deep drill holes. Multi-kilometer scale structure of the seafloor and subsurface can be obtained from shipboard geophysical mapping and on-bottom instrument arrays of, for example, ocean bottom seismographs or electro-magnetic sensors. Effective use of drilling, shipboard, and instrumentation resources is required to maximize the scientific return-- true advances in understanding of the suite of processes involved and the interdependence of the various physical, chemical, and biological aspects.

Why another workshop? -- Relationship to the IODP Science Planning

The goal of drilling a complete section through the oceanic crust and into the upper mantle has been reiterated throughout the history of ocean drilling and is embedded in the IODP Initial Science Plan as the "21st Century Mohole". Inherent in this goal, is the tripartite need for: a clearly defined scientific strategy; for parallel development of essential operational experience; and for phased development of the essential improved technologies, all of which are essential for it to be fully realized. Despite this clear mandate for a broad range of crustal drilling projects, the community response in terms of proposals has not been forthcoming. The reasons for this lack of response are unclear. But they may lie in part in disillusionment with the endmembers of ocean-crustal drilling and in part in a lack of recognition that there is compelling science

in the middle ground. At one extreme, attempts to penetrate “zero-age” crust along the East Pacific Rise under ODP were not successful and this important, but elusive, goal continues to require substantial technological development. At the other extreme, the ultimate “Mohole” through the entire ocean crust also requires technological development and it seems unlikely to be achieved in the next decade. Between these extremes, however, there is a wealth of critical scientific problems. The fundamental goal of this workshop is to enunciate these problems and to energize and empower the community to become active in their solution.

A seemingly mandatory component of community-based science plans, such as those for IODP and the various national and international “ridge” and “margins” programs is an expression of the need to synchronize and leverage efforts among the different programs. In reality, true synergy between or among such programs is very rare. A second goal of this workshop will be to identify opportunities for true collaboration of IODP with InterRidge and its constituent national programs.

The studies of the formation and evolution of oceanic lithosphere required to meet this goal are inherently integrative and interdisciplinary. Both operationally and scientifically, they depend on contributions from many disciplines and from many facets of the science planning documents that guide IODP. Here we point out some of the links to key planning documents, but no attempt is made to reproduce the detailed materials that those documents contain.

The IODP Initial Science Plan

The scientific scope of this workshop brings together aspects of two of the three broad research themes enunciated in the IODP Initial Science Plan – “The deep biosphere and the sub-seafloor ocean” and “solid Earth Cycles and dynamics”. Within these themes, integrated studies of the oceanic lithosphere will expand upon key aspects of two of the eight initiatives – “Deep Biosphere” and “21st Century Mohole”.

Opportunities in Geochemistry for Post-2003 Ocean Drilling

This JOI/USSSP workshop report provides much of the broad scientific rationale for this proposal. In a section entitled “Road to the MOHO” it merges disparate parts of the initial science plan to lay out a rationale for a well-integrated, multi-year study of the ocean lithosphere, that would ultimately define both scientific context and lead to site identification for the ultimate Mohole objective, penetration through the full thickness of the ocean crust.

The key questions are summarized below, and the relevant text from the workshop report is appended to this proposal.

Lithosphere Structure and Aging.

- How extensively do fluids penetrate and react with ocean crust and mantle?
- Is seismic Layer 2a equivalent to the pillow lava section of the ocean crust? Does the relationship change as seafloor age increases away from the spreading axis?
- What is the petrological nature of the Mohorovicic seismic discontinuity and are there mechanical and petrologic changes in this boundary as the lithosphere ages?
- Does the Moho deepen as fluids transform fresh peridotite to serpentinite?

Lithosphere Magnetization.

- How is the source of seafloor magnetic anomaly “stripes” distributed through the crust and mantle?
- How is the source partitioned between tiny grains of primary titanomagnetite in basalts and secondary magnetite in altered gabbro and serpentinite?

Hydrothermal Exchanges.

- How deeply do seawater-derived fluids penetrate into the oceanic lithosphere and what are the thermal consequences of this hydrothermalism?
- What are the nature and extent of geochemical reactions that transform wall rock and fluid compositions along fluid pathways?
- How does fluid circulation evolve as porosity, tectonic stress and sediment burial change as the lithosphere moves away from the spreading axis?
- How do the magnitudes of thermal, and chemical exchange between the ocean and older seafloor evolve as the lithosphere ages? (Two-thirds of all heat loss from the oceanic lithosphere occurs through seafloor older than 1 million years.)

Deep Biosphere.

- How do the species compositions and abundances of microbial communities evolve as porosity and thermal structure changes laterally and with depth?
- What are the thermal and physiochemical boundaries to the distribution of individual microbes and communities?

Relationship To InterRidge, Ridge 2000 and Margins Objectives

One way to maximize the scientific return from major national and international programs is to identify priority scientific problems that match or intersect the goals of two or more programs and to encourage scientifically compelling proposals to address those problems. For example, the US Ridge 2000 program has targeted three "Integrated Studies Sites" -- areas within which multiple, tightly focused, multi-disciplinary projects will be focused in order to develop a whole-system "mantle-to-microbe" understanding of crustal accretion. Many of key questions concerning the evolution of oceanic lithosphere can potentially benefit from the accumulated knowledge at such sites. The more knowledge we have of the spreading center at the present time, the better we will be able to design experiments and develop our understanding of crustal evolution on progressively older seafloor. Similar correspondences can and should be found with emerging European interest in a Mid-Atlantic Ridge (MOMAR) observatory site and with Korean, Japanese, Ridge2000 and national and international "Margins" program interests in the back-arc basins of the western Pacific. A key component of these, and of Margins' Subduction Factory theme, is an improved characterization of the chemistry and structure of oceanic lithosphere.

Workshop Partnership

The US Ridge 2000 Program has agreed to contribute \$20,000 to support US participants attending the proposed workshop.

InterRidge has also agreed to endorse the workshop and to contribute \$2-3,000 from its very limited budget.

In personal discussion, representatives from Japan and Korea have been supportive in principle and copies of this proposal have been forwarded to key individuals in these countries and in Europe. Discussions will continue as this proposal is reviewed by USSSP. Responsibility for final negotiations may be passed to or shared with JOI/USSSP when funding is in place.

Workshop Particulars

We envisage a 2.5-day workshop for 60 (ideal) to 80 (max.) participants. We have budgeted on the basis of 50 US participants. We anticipate that overseas attendance would be 10-30 people, funded from their own national resources. The exact numbers and national representations will depend on funding levels approved by the various entities.

We have avoided specifying dates and venues, as these details should be dealt with in cooperation with the other international participants. The most cost effective venue will be readily accessible from Europe and Asia, possibly in southern California or Seattle WA.

Because InterRidge and Ridge2000 are already well into their current 10 year programs, there is some urgency to this workshop, given a minimum 2-3 year time lag between the workshop and drilling of even the most compelling proposals arising from it. We propose to hold the workshop at the earliest reasonable date, most likely in fall 2005. We will advertise the workshop in EOS, but primarily through the email lists and websites of JOI/USSSP, IODP, Ridge 2000 and InterRidge. The various national organizations will likely advertise to their constituents through their own resources.

APPENDIX VI

Proposal for a workshop on Arctic Mid-Ocean Ridges to be held in early 2006

Jonathan E. Snow, Max-Planck Institut für Chemie, Mainz, Germany
Henry J. B. Dick, Woods Hole Oceanographic Institution

Executive Summary

Recent years have seen an explosion of interest and work on mid-ocean ridges in the arctic domain, and related ridges worldwide. This is because of their key role in questions relating to the formation of mid-ocean ridge basaltic melts, the breakup of continents, the evolution of life on Earth, ocean circulation and climate. We propose to convene a major workshop to study the ultraslow spreading arctic ridges. Our aims are 1)

identifying the first-order questions for the disciplines of geophysics, geochemistry, biology, petrology, and microbiology, and at the interfaces between disciplines. 2) The workshop would also formulate a strategy to identify the resources to achieve its goals. 3) Coordinate ongoing activities for the upcoming International Polar Year. We expect attendance of 100-200 scientists, including representatives from all the polar nations, in particular Europe, Russia, China and Japan. We solicit the support of InterRidge logistically and financially in the **Arctic Ridges**.

The Arctic Ridge system extends north from Iceland three thousand kilometers (Kolbeinsey, Mohns, Knipovitch Ridges) through the Fram Strait via Lena Trough and as Gakkel Ridge across the floor of the Arctic Ocean onto the Siberian Margin. Together these ridges show the wide extent of ultraslow spreading ridge types. Long sections of these ridges are heavily sedimented, providing obvious advantages for heat flow and seismic studies, while others are little sedimented – an obvious advantage for sampling and observational studies. In addition, the Lena Trough provides a direct look at the early stages of continental breakup and ocean formation, with the continental margins less than 100-km from the active ridge. Following, and largely because of the InterRidge workshop "Mapping and Sampling Arctic Ridges" in 1998 there has been a huge explosion in mid-ocean ridge-based research centered on the Arctic region and analogous ridges in other regions.

Scope of the conference

Petrology

Ultraslow spreading ridges are a key region for the study of the formation of mid-ocean ridge basalt because degrees of partial melting are suppressed beneath a thick lithospheric cap. The Arctic ridges however show a strong along-strike variation of crustal construction and magmatic sources that cannot be accounted for simply by variations in spreading rate or ridge geometry. Therefore the polar ridges, and arctic ridges in particular provide an unparalleled opportunity to use basalts as fine-scale probes of underlying mantle compositions and melt formation processes at extremely low melting degrees.

Geophysics/Tectonics

Ultraslow spreading ridges are comparatively difficult to study with geophysical methods due to their rough topography and complex structure. Many physical aspects of ultraslow spreading ridges diverge from accepted models of crustal accretion at mid-ocean ridges, and provide an insight into the underlying mechanisms of crustal accretion and rifting globally. Of particular interest is the

Biology

Of particular importance to ecology and biodiversity are the numerous hot springs for which there is strong evidence along the Arctic ridges. As a mediterranean sea, located between the Atlantic and Pacific Oceans, the role of hydrothermal activity on Gakkel Ridge in the development of biodiversity along the entire ocean ridge system is of particular interest. Are there vent communities along Gakkel Ridge? If so, are they similar to Atlantic fauna or Pacific fauna, or both or neither? Moreover, with long stretches where only mantle peridotite is emplaced to the seafloor, it is a potential laboratory for studying the origin of life on the planet.

Climate

Just as it is today, in the geologic past, the Arctic as a region has been one of the most important keys to the Earth's climate. The arctic is a major regulating factor for global thermohaline circulation, primarily via albedo changes, the formation and storage of fresh water in the form of ice, and the export of cold saline deep water to other ocean basins. Major climatic changes, including the cooling in the middle Miocene coincide with the opening and closing of the Arctic basin to global thermohaline circulation. However, the major gateways in the Arctic (Fram Strait and Bering Strait) have been far less well studied than have the more equatorial gateways.

Aims of the conference

- Interdisciplinary exchange of recent results
- Formulation of first-order questions
- Identification of resources/technology for exploration
- Formation of interdisciplinary projects
- Coordination of ridge related IPY projects.
-

Products:

White paper: The Future of Polar Ridge Research
IPY WG report: Ridge Activities in the IPY 2007/2008

Participants

Based on attendance at related symposia at recent meetings we expect around 200 attendees, though the number will depend to a large extent on the financing and the venue.

Steering Committee

J Snow MPI, Germany (Co-chair)

H Dick, WHOI, USA (Co-chair)

O Müntener Switzerland

T Reston, Germany

Y Ohara, Japan

Working Plan

By the end of 2004 we will finalize the steering committee. We particularly still need members representing life sciences and Russia. At the beginning of 2005 we will seek additional support through the European Science Foundation. The venue selection process will be somewhat dependent on additional funding from Europe: if we can generate significant funding from European sources we will endeavor to hold the conference in Europe. If not we will hold the conference in the USA, as participant funding from the Ridge2000 program has already been approved.

Schedule

Venue selection	Spring 2005
Logistics Organisers visit Venue	Summer 2005
Call for papers	Fall 2005
Conference	Spring 2006
Field Trip	Week after conference

Preliminary Budget:

Based on similar conferences in the past, the budget will consist of travel costs plus about EU100/participant for abstracts, venue, coffee and organization. A non-travel budget of about EU 22,500 is thus expected. The planned field trip will cost additionally for transportation and lodging.

Summary/Outlook

The Arctic Ridge system provides new and remarkable opportunities for research into the slowest end-member for seafloor spreading and ridge biogeography . For these reasons we believe that it is a critical area for future ridge research. With the upcoming International polar year, now is a critical juncture for beginning to plan the program of ridge-related exploration during that time. With the advent of the US Icebreaker USCGC Healy, the success of the European-led ACEX expedition and renewal of international ocean drilling, there are now unprecedented new resources potentially available for mid-ocean ridge research in the Arctic. This conference will provide new opportunities for our community to potentially benefit from these new resources for ridge research on which our community should capitalize.

APPENDIX VII-1

InterRidge Working Group - Biogeochemical Interactions at Deep-Sea Vents

Update for IR News Vol 14

The working group's first meeting was held in December 2004 at the AGU fall meeting in San Francisco where the working group activities were presented in the R2K poster session. The working group's focus is on multidisciplinary research aimed at understanding the interactions between the biotic and abiotic components of different mid-oceanic ridge and back arc basin environments ([http://www.interridge.org/Working Groups presentation](http://www.interridge.org/Working%20Groups%20presentation)). Our primary goals are to strengthen and favour interdisciplinary and international exchange on these topics and, especially, to foster collaboration in field studies and the development of underwater instrumentation.

The first year of activity was one of intense communication within the ridge research community as well as with scientists involved in other emerging fields of biogeosciences related to reduced environments in the deep ocean. A wide range of contributions to international conferences were provided. A session entitled "Methods, tools and strategies for biogeochemical investigation of chemosynthetic deep water systems" was organised by working group members as part of the Biogeosciences programme of the 2005 EGU General Assembly held from 24-29 April in Vienna, Austria (www.copernicus.org/EGU/ga/egu05). A second session was organised at the ASLO summer meeting entitled "Plate Tectonics and Chemotrophy at Deep-sea Vents". This focussed on new interdisciplinary cutting-edge research in microbial geochemistry of mid-ocean ridges

and back-arc basins (<http://aslo.org/meetings/santiago2005>). Contributions will also be provided at the Geochemistry and Biogeochemistry session of the 3rd International Symposium on Hydrothermal Vent and Seep Biology, September 2005 at the Scripps Institution of Oceanography (SIO), La Jolla, California.

Working group members additionally supported the MoMAR International Workshop that was held in April 2005 in Lisbon by being part of the organising committee and participating in the workshop sessions. This meeting was an initiative of the Monitoring and Observatories working group. In 2005, working group efforts were also directed towards outreach activities, through participation at a press conference at the EGU 2005 General Assembly and through education outreach contributions to the InterRidge web site.

The preparation and search for funding for a workshop and IR-Theoretical Institute to be held in 2007 will be the working group's top priority next year. These activities were discussed at the 2005 IR Steering Committee meeting in April, and received approval by the Steering Committee members.

Update on First meeting, 14/12/04, San Francisco

Attendants :

Antje Boetius (Member) MPI for Marine Microbiology, Bremen, Germany, aboetius@mpi-bremen.de
Jean-Luc Charlou (Member) Ifremer, Brest, France, charlou@ifremer.fr
Kang Ding (Associated member) U. of Minnesota, Minneapolis, USA, mlcd@umn.edu
Françoise Gaill (Chair of the IR WG 'Mid-Ocean Ridge Ecosystems' / MOMAR-France Committee) CNRS-UMR SAE, Paris, France, fgaill@snv.jussieu.fr
Chris German (Member) SOC, Southampton, UK, cge@soc.soton.ac.uk
Grant Ferris (Member) U. of Toronto, Toronto, Canada, grant.ferris@utoronto.ca
Chuck Fisher (Chair of Ridge 2000 / IR Steering Committee), Penn State U., University Park, USA, cfisher@psu.edu
Daniele Fortin (Member) U. of Ottawa, Ottawa, Canada, dfortin@uottawa.ca
Benoit Ildefonse (Chair of the IR WG 'Deep-earth Interior' / chair of IODP-France) U. Montpellier 2, Montpellier, France, benoit@dstu.univ-montp2.fr
Kristen Kusek (InterRidge office / Coordinator of the program for Education and Outreach) Kiel, Germany, Kristenkusek@aol.com
Nadine Le Bris (Chair) Ifremer, Brest, France, nlebris@ifremer.fr
Bill Seyfried (Member) University of Minnesota, Minneapolis, USA, wes@umn.edu
Ken Takai (Member) JAMSTEC, Yokosuka, Japan, kent@jamstec.go.jp

Invited but were not able to attend

John Baross (Member) University of Washington, jbaross@u.washington.edu
Colin Devey (InterRidge Chair) GEOMAR, Kiel, Germany. cdevey@ifm-geomar.de
Javier Escartin (Chair of the IR Working Group 'Monitoring and Observatories') IPGP, Paris, France, escartin@ipgp.jussieu.fr
George Luther (Member) University of Delaware, Lewes, USA, luther@udel.edu
Meg Tivey (Member) WHOI, Woods Hole, USA mktivey@whoi.edu
Frank Wenzhöfer (Member) MPI-MM, Bremen, Germany. fwenzhoe@mpi-bremen.de

Meeting programme

1. Presentation of participants affiliation, fields of competence and interests
2. Message from the InterRidge Office (K. Kusek)
3. Overview of the Working Group objectives (N. Le Bris)
4. 2005 conferences dedicated sessions and meeting
5. Prospective actions; special issue and IR-Theoretical Institute
6. Complementary issues

1. Participants

8 of 12 WG members could attend the meeting. Unfortunately, we missed a few of us. The 5 full member countries of InterRidge (US, France, Germany, UK, Japan) and one associated member country (Canada) were represented.

We had the chance to welcome Chuck Fisher (R2K and IR Steering Committee), Françoise Gaill (chair of the Mid Oceanic Ridge Ecosystems WG and member of MoMAR-France Committee). Benoit Ildefonse (chair of the Deep-Earth Interior WG and chair of IODP-France) also joined us at the end of the meeting.

Members of the Working Group provided a brief presentation of their field of interest, illustrating the multidisciplinary and complementary focus of the activities covered by WG members.

2. Message from K. Kusek /InterRidge Office

Kristen is in charge of the Education and Outreach coordination at the InterRidge office. She presented us a supporting message from the IR office and greatly encourage us to contribute to the IR web site. (<http://interridge.org/>)

3. Overview of the Working Group objectives (N. Le Bris)

In the past decade, deep-sea hydrothermal vents research has raised major questions concerning:

- the fluxes of elements from geosphere to hydrosphere,
- the importance and diversity of the deep biosphere,
- the origin and evolution of life,
- biodiversity and adaptation to extreme environments.

To address these questions now requires to elucidate basic underlying mechanisms, and particularly those driving the interactions between the biotic and abiotic components of the systems, which play a major role in microbial turnover of C, S, N, Fe, minerals formation and alteration, or vent ecosystems function.

Advances in these fields necessitate to develop complementary approaches across spatial and temporal scales, including field observation and acquisition of numerical data, *in situ* and laboratory experimentation, geochemical and biogeochemical modeling. The need for an increased disciplinary convergence at the interface of biosciences and geosciences is particularly underlined.

To promote these studies in the context of the InterRidge new decade plan, the main objectives of the Working Group 'Biogeochemical interaction at Deep-Sea vents' are:

- *to enhance scientific exchange and collaboration among the fields of chemistry, geochemistry, biogeochemistry and microbial ecology,*
- *to link our knowledge and research strategies with that of scientists of neighboring disciplines, i.e. vent biologists, ecologists and geologists,*
- *to foster development of underwater instrumentation, particularly for quantitative in situ measurements of chemical and biological fluxes, sensing and sampling at various scales.*

4. 2005 international conferences and meeting

In 2005, the working group activity will focus on the organization of dedicated sessions in international conferences:

- **EGU 2005** – General Assembly - april 24-29 – Vienna, Austria

BG6.08 "Methods, tools and strategies for biogeochemical investigation of chemosynthetic deep water systems". Conveners: N. Le Bris , C. R. German, A. Boetius.

Dead-line for abstract submission January 21

www.copernicus.org/EGU/ga/egu05/index.htm

- **ASLO 2005** - Summer Meeting - June 19-24 - Santiago de Compostella, Spain
SS34 Plate tectonics and chemoautotrophy at deep-sea vents. Conveners : D. Fortin, F. G. Ferris.
Dead-line for abstract submission February 1rst
<http://www.aslo.org/santiago2005>

- **3rd International Symposium on Hydrothermal Vent and Seep Biology** - September 12-16 San Diego, Cal. Biogeochemical Interactions, environmental patterns. Conveners and programme to be finalized. Deadline 30 april.

Several WG members will also participate to the R2K-InterRidge International MoMAR Implementation Workshop. Lisbon, Portugal, 7-9 April 2005 (www.momar.org)

5. Prospective actions

Potential actions of the Working Group in the future were discussed. It focussed on the publication a special issue in Biogeosciences and the organization of a Theoretical Institute together with the publication of an IRTI Monograph.

Special issue in Biogeosciences

It was suggested that a special issue could be proposed to Biogeosciences (<http://www.copernicus.org/EGU/bg/bg.html>) gathering papers from communications at the three 2005 dedicated sessions. Contact will be taken by N. Le Bris and A. Boetius (Editorial Board member) with Jean-Pierre Gattuso Editor to get more precise information on the time schedule, number of papers...

Theoretical Institute

The organization of a Theoretical Institute was confirmed as a main objective of the Working Group. Precision on the general organization of a Theoretical Institute was given by Chuck Fisher. The courses are expected to be especially valuable for PhD students.

The possibility to plan an IR-TI 'Biogeochemical interactions at deep-sea vents' by 2006 was discussed. End of 2006- beginning of 2007 would enable to get funding from the German Ridge program. InterRidge should be able to provide 3000 Euros for organization and travel fundings.

Chuck Fisher indicated that R2K uses to provide 5000 to 10000 USD for joined RTI/IR-TI. However, financial support will be prioritized in 2006 to a RTI on 'Modeling'. Individual support for US participant travel should still be available from R2K.

Additional funding opportunities could be obtain through ESF (European Science Foundation). ESF can provide financial support to European residents if the TI takes place in Europe. If ESF funding is obtained, complementary national funding should be available through the institutions (Ifremer, CNRS,...) and programs.

It was decided to update the draft project that was included to the first WG proposal and submit it to the IR steering committee for its next spring meeting.

IR TI Monograph edition

The project of editing a monograph from this TI as received a great interest. Chris German underlined that it requires 3 years to be completed, arguing for an early IR-TI planning. Chris proposed to provide his recent experience of AGU monograph edition to this new project. As shown for previous IR-TI and R-TI, AGU publications has proved to provide a good support for this.

6. Complementary issues

Cooperation

The Working Group should further enlarge its focus through cooperation in the fields of:

- technological developments particularly with engineers involved in these developments
- IODP drilling project proposals particularly with geoscientists
- astrobiology

Associated members

Many ridge scientists were interested to take part to this WG. At that time, it is decided to keep the number of member limited to 12, but the possibility for a group enlargement or member turnover could be considered in the future. An associated member list will be created, including:

Wolfgang Bach WHOI US

Max Coleman UK

Chris Daughney NGS New Zeland

Kang Ding U. of Minesotta US

Katrina Edwards WHOI US

Yves Fouquet Ifremer France

Andrea Koschinski International University Bremen Germany

Richard Leveillé Canada

Karsten Pedersen Gothenberg, Sweden

Brad Tebo SIO US

Uli Wortman U. of Toronto Canada

This list is to be completed.

Web site

It is proposed:

- to provide Katja Freitag and [Kristen Kusek](#) at the InterRidge Office a short presentation of the WG and illustrations to supply the WG page,
- to complement the IR Directory list with all WG members,
 - to provide information on the cruises planned with participation of the WG members in order that they could be identified in the IR cruise list.

APPENDIX VII-2

InterRidge Working Group – Mid Ocean Ridge Ecosystems

(Updated for IR News Vol 14)

The focus of the MORE working group is to increase international collaboration in hydrothermal biological studies and to work on integrating ridge crest biological and geological studies. This working group is the continuation of the Biology working group. It started with a first meeting in Bremen, Germany on 19 and 20 January 2004.

The first working group activity was to follow the program started out by the Biology working group and chose the time and location for the next vent symposium. This « Third international vent and seep biology meeting » takes place this September in San Diego. A draft was put together to evaluate the most exciting results obtained in the decade and identify which new questions are of interest in the future. From this information, a symposium program was developed.

The second working group activity is a major one and concerns the writing of a code of conduct for research at hydrothermal vent sites. Vent ecologists recognized this problem right from the start of InterRidge. The overall goal is to provide a structure for self policing at heavily frequented vent sites. Kim Juniper prepared a draft code which was accepted by the working group after some minor modifications. This draft code was proposed to the InterRidge Steering Committee however the discussion is still open. Urgency is needed as the World Wildlife Fund (WWF) has put together a proposal to make the Rainbow hydrothermal vent field a marine protected area (MPA). The working group will discuss this during the San Diego symposium in order to put together a final draft that is acceptable to the InterRidge Steering Committee members.

Close relationships exist between our working group and ChEss (Biogeography of deep-water chemosynthetic ecosystems). Data exchange started a year ago and discussion between the two groups is frequent.

Additional interaction and exchanges regarding interdisciplinary interests exist with other InterRidge working groups: Deep earth sampling, Monitoring and observatories, Back arc spreading systems/Back arc basins and Biogeochemical interactions at deep sea vents.

APPENDIX VII-3

InterRidge Working Group – Hotspot-Ridge Interactions

(Updated for IR News Vol 14)

The September 2003 Workshop in Brest, France, was a major activity of the Ridge-Hotspot Interactions working group. The details of the workshop are posted on the InterRidge web site. Elements of the workshop report were written and will be put into a final report shortly.

As a direct result of the above workshop, a group of international scientists led by Bram Murton submitted a major proposal (IODP proposal 646 Full) to the IODP program in October 2004, to drill and investigate the origin of the “V-shaped” ridges at the Reykjanes Ridge. The reviews of the proposal by the IODP SSEP were favorable and the panel recommended immediate acquisition of site-survey geophysical data of the proposed drill sites. A parallel proposal was submitted earlier to the US NSF for doing just that. Because of the current financial constraints of the US NSF seagoing programs, it is not yet clear when the site-survey cruise will be conducted. However, there is clearly a very strong international interest in this drilling program.

Other initiatives related to ridge-hotspot interactions have been developed in different InterRidge member countries. As a German initiative, a recent workshop on plume-ridge interactions took place in Hamburg (<http://www.toughcone.de/WORKSHOP/finalprogWS05.pdf>) and was mostly dedicated to Iceland. German and UK scientists recently completed several cruises on the MAR near Ascension Island, in a ridge-hotspot environment. Similarly, the French and Portuguese cruises in the MOMAR area may help explain the interaction of the MAR with the Azores hotspot. French research groups have a strong interest in the Indian Ocean hotspots (continuation of current work on CIR-Reunion interaction; cruise proposals for SEIR-

Amsterdam interaction). This interest is shared by Japanese scientists, who have planned a two-leg cruise for 2007 along the Rodrigues segments of the CIR and are involving French, British, and US scientists.

We are in the process of compiling a list of active or planned research projects on ridge-hotspot interactions in the different InterRidge countries. Plans are also being developed to summarize the recent efforts of individual scientists/countries in meeting sessions and to promote closer international collaboration and research activities on ridge-hotspot interactions.

APPENDIX VIII
InterRidge Workshop
“Tectonic and Oceanic Processes along the Indian Ridge System”
19 – 21 January 2005, N.I.O., Goa

Summary

InterRidge Workshop on “Tectonic and Oceanic Processes along the Indian Ridge System” was held at the National Institute of Oceanography, Dona Paula, Goa, India from 19 to 21 January, 2005. The workshop was well attended with participants from 8 countries and covered all aspects related to the ridge research in eight technical sessions. There were 10 special talks, 24 oral presentations and 18 poster presentations. Besides, a special interactive talk was devoted to the recent seismic event, off Sumatra, that generated a tsunami. On the second day of the workshop a film on “Volcanoes of the deep sea” was screened. Panel discussions were held during the concluding session of the workshop, which brought out opportunities for forging collaboration among the ridge researchers across the world.

The workshop was organized with financial help from the Council of Scientific and Industrial Research, InterRidge and Ridge 2000 Program, USA.

Background

The Council of Scientific & Industrial Research (CSIR), India, in association with the Department of Ocean Development, Government of India, initiated a Network Programme “Tectonic and oceanic processes along the Indian Ridge system and Back Arc Basins”, to investigate the mid-ocean ridge system and the backarc basin in the Indian Ocean. The National Institute of Oceanography, Dona Paula, Goa and National Geophysical Research Institute, Hyderabad, both constituent laboratories of the CSIR, are implementing this interdisciplinary programme. India, an associate member of the InterRidge proposed to organize a workshop on “Tectonic & Oceanic Processes along the Indian Ridge System” to provide a forum for the ridge researchers world over to exchange ideas and results and foster collaborations. The proposal was considered during the InterRidge Steering Committee meeting held at Tokyo, Japan, in 2003. It was decided that an InterRidge Workshop entitled “Tectonic and oceanic processes along the Indian Ridge system and back arc basins” would be hosted by NIO, at Goa, India, from 19-21 January 2005.

Workshop objectives

To focus on the geological, geophysical, physical, chemical and biological processes at the Indian Ocean spreading centers

To provide a forum for exchange of ideas and results

To encourage international collaboration in exploration of Indian Ocean ridge research using latest tools and techniques.

Workshop themes

Scientific contributions were solicited under the following themes:

Ridge segmentation

Outcropping mantle and mullion tectonics

Ridge-hotspot interaction and mantle dynamics

Hydrothermal processes and ridge biology

Back arc basins

Emerging technologies

Participants

This was one of the well-attended workshops of the InterRidge. A total of 80 participants from 10 countries attended the workshop. Following is the country wise breakup of participation.

France – 5	Japan – 3	Russia – 1	United States of America – 10
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Germany – 2	Korea – 1	Spain - 1	
India – 55	Portugal - 1	United Kingdom – 2	

Inauguration



The inaugural ceremony of the workshop was held in the impressive NIO auditorium named “Cardium” on 19 January 2005 at 9.30 hrs. Dr. Satish Shetye, Director, NIO, in his welcome address underlined the importance of understanding the earth system process and the need to enhance the efforts to study the Indian Ocean. Dr. Colin Devey, InterRidge Chair and Chair of Scientific Organizing Committee of the workshop briefed the future goals of the InterRidge. Dr. Jerome Dymont, Co-chair of the Scientific Organizing Committee explained the objectives of the workshop. Dr. KA Kamesh Raju, National Coordinator of the Indian Ridge programme presented a sketch of Indian Ridge initiative, its past activities and future goals. Dr. H.K. Gupta, Secretary, Department of Ocean Development, Govt. of India, inaugurated the workshop by lighting the traditional lamp. In his inaugural address Dr. Gupta enumerated various initiatives of the Department of Ocean Development and reiterated the support of the Government for oceanographic research. He also mentioned the impact of the recent tsunami that devastated the coasts of Southeast Asian countries, including India, and the plans set in motion to establish capabilities for predicting future events.

Poster display



Dr. Chuck Fisher, Chair, Ridge2000, inaugurated the poster display. A total of 18 posters were presented, which were grouped as per the scientific themes of the workshop. Few posters with wider scope were

displayed as general interest posters. To provide ample opportunity for the participants to interact with the authors, arrangements were made for the display of posters on all the three days of the workshop.

Technical sessions

The schedule of the workshop consisted of 8 technical sessions besides inauguration and concluding sessions (Annexure –1). Each technical session contained at least one special talk followed by oral presentations. A total of 24 scientific presentations and 10 special talks were given during the workshop.

Session I – Ridge segmentation: Jerome Dymant initiated scientific presentations with an introductory talk on “Past and present Indian Ocean ridges: exciting targets for mid-ocean ridge studies”. He observed that unlike the Pacific and Atlantic oceans, the Indian Ocean presents a variety of spreading center types, from the ultra-slow Southwest Indian Ridge (SWIR) to the slow Carlsberg (CR) and Central Indian (CIR) ridges to the intermediate Southeast Indian Ridge (SEIR) and geochemically, the Indian ridges represent a window to a distinctive mantle province, emphasized by the Dupal anomaly. He further added that many exciting opportunities await ridge researchers in the Indian Ocean and urged not to miss them!

In the special talk, Charles DeMets described results from a new detailed study of Somalia-India-Australia motion since 20 m.y., based on more than 3000 magnetic anomaly and fracture zone crossings identified from original shipboard, airborne, and satellite data. Segmentation and tectonics of Carlsberg Ridge and the Central Indian Ridge were dealt by Chaubey et. al. and Kamesh Raju et. al. respectively. In another paper, Charles DeMets explained changes in Indian plate motion since 20 Ma and Carlsberg and northern Central Indian ridge spreading kinematics. Peter Rona et al. compared the morphology, petrology, and hydrothermal activity of sections of the Mid-Atlantic Ridge with that of the Carlsberg Ridge in the northwestern Indian Ocean extending from the Owen Fracture Zone (10°N) to the Vityaz Fracture Zone (5°S). Catherine Mével et. al. characterized the variations in thermal regime along the axis of the southwest Indian ridge between the Rodrigues Triple junction and the Andrew Bain fracture zone related to the local influence of hot spots.

Session II – Outcropping mantle and mullion tectonics: Robert S White delivered special talk on “Melt production rates under mid-ocean ridges”. He showed that the rate of melt production under mid-ocean ridges is controlled primarily by the temperature of the underlying mantle and by the rate of seafloor spreading. Independent methods of determining the thickness of melt produced can be derived from geophysical measurements of the igneous crustal thickness (wide-angle seismics and gravity) and from geochemical inferences from rare earth element (REE) concentrations in mid-ocean ridge basalts of the total amount of melt generated in the mantle. Both geophysical and geochemical methods give consistent results for the amount of melt generated from the mantle and frozen to form oceanic crust. He added that the Indian Ocean contains a wide range of both spreading rates and of mantle temperatures, including both abnormally hot and abnormally cold regions of mantle, which enables the dependence of melting on both mantle temperature and spreading rate to be investigated.

Abhay Mudholkar described the emplacement of mantle rocks along the Carlsberg Ridge with the help of seafloor topography and petrographic studies. Dwijesh Ray et al. brought out the influence of low temperature hydrothermal alteration during serpentinisation along the north Central Indian Ridge. RK Drolia showed the results of analysis of swath bathymetry from the northern Central Indian ridge. Satish Singh presented some thoughts on seismic imaging of moho, magma chambers and serpentinisation front along Indian Ocean Ridge systems from MAR and EPR experiences.

Session III – Ridge-hotspot interaction and mantle dynamics: Henry Dick gave the special talk of the session on the SW Indian Ridge. He observed that long sections of the SW Indian Ridge closely resemble slow-spreading ridges, consisting of linked magmatic segments, small non-transform offsets and transform faults, the crust is generally significantly thinner, and mantle peridotites are more abundant near ridge discontinuities. Elsewhere, long sections of the ultraslow spreading SW Indian Ridge consist of linked amagmatic and magmatic ridge segments without transform or non-transform offsets despite often-extreme ridge obliquity. He also found that in regions of low overall melt productivity, widely spaced volcanoes may erupt transitional or alkaline basalt at the ridge axis rather than N-MORB, though the actual volcanic edifices may be as large as or larger than those found at slow spreading ridges.

Tiwari et al. debated on the nature of isostatic compensation along the Deccan-Reunion hotspot track due to on-axis versus intra-plate volcanism. Christopher Hemond presented two papers – one on recycled Oceanic Crust and Pelagic Sediment, into the Indian Mantle. The Central Indian Ridge (18°-20°S) and the other dealing with Rodrigues Ridge and St Paul-Amsterdam Plateau as examples of ridge-hotspot interactions in the Indian Ocean. YJ Bhaskar Rao et al. presented evidence for northward extension of Indian Ocean - type mantle anomalies based on Sr and Nd isotopic systematics of Indian Ocean MORBs from Central Indian and Carlsberg ridges.

Special evening talk on the recent seismic event off Sumatra: The occurrence of severe sub-marine earthquake (M9.0) off Sumatra and the mega tsunami it generated caused devastation in the coastal areas of Southeast Asian countries is a matter of grave concern to the earth scientists. Satish C. Singh delivered a special talk of the event, its effects and post tsunami research that needs to be undertaken immediately. He also presented a plan of work, which solicits multi-nation and multi-institutional participation.

Session IV – Hydrothermal processes and ridge biology: In the special talk, John Lupton gave a detailed account of ^3He in the Indian Ocean. He explained that, in the Indian Ocean, the ^3He distribution is the result of a complex mix of sources, including input from a variety of hydrothermal sites, intrusion of Antarctic Bottom Water from the south, and a tongue of ^3He -rich Indonesian through flow water intruding from the east. While it might be expected that hydrothermal sources are distributed throughout the mid-ocean ridge system, only a portion of the Indian Ocean ridges have been explored. Based on the ^3He distribution, the principal hydrothermal sources appear to be in the Gulf of Aden, in the central Indian Ocean near the Rodriguez Triple Junction, and a source near the convergent margin in the far northeast.

Marvin Lilley et al. dealt with the chemistry of the Kairei and Edmond vent fields, Central Indian Ridge. They interpreted that fluids from both fields appear to have phase separated at supercritical conditions, and only fluids with chloride concentrations greater than local ambient seawater were found at both sites. The composition of the hydrothermal fluids from each of these sites is distinct. Bramley Murton et al., presented results of their cruise to Carlsberg Ridge, organized during August 2003, and detection of a mega-plume and insights into volcanic events and hydrothermal processes. The paper by Bibhuranjan Nayak dealt with Hydrothermal Mineralization at Mount Jourdanne, Southwest Indian Ridge (SWIR) and mineralogical associations that indicate different thermal episodes that range from conditions under which black smokers form to the ceasing of the hydrothermal activity through white smoker activity. BR Rao et al., showed recent field observation of methane anomalies over ridge segments along the Central Indian and Carlsberg Ridges and inferred that the source of the methane signal may be located in the vicinity of the southern segment.

Session V – Hydrothermal processes and ridge biology: Charles Fisher delivered special talk on “Adaptations of hydrothermal vent animals to their habitat, with special reference to the currently known fauna of the Central Indian Ocean Ridge”. He showed with examples that almost all of the animals found during dives to the Central Indian Ocean Ridge are new species. Many of these new species, like the abundant mussels and shrimp, are closely related to other well-studied species of mussels and shrimp found at other vent sites around the world.

PA Loka Bharathi reviewed the current status of microbiological studies of the Indian ridge systems. The recent work include the discovery of extremely active vent sites with biological communities close to the Rodriguez Triple Junction by Japanese scientists and microbiological studies at the Edmond deep-sea Hydrothermal vent field in CIR which is dominated by ϵ -proteobacteria comprising nearly 75 %. Baban Ingole presented a paper on “Biological communities of the Indian Ridge System”. Y. V. B. Sarma et al., discussed signals from Light Scattering Sensors (LSS) in conjunction with potential temperature anomaly ($\Delta\theta$) and methane (CH_4) and silicate (SiO_4) as physical and chemical proxies to identify deep sea hydrothermal activity over the Carlsberg Ridge (CR) and Central Indian Ridge (CIR) regions. They have shown encouraging signals in chemical proxies such as $\delta^3\text{He}$ and Fe in the Carlsberg ridge region. Geo-chemical aspects of the sediments from Carlsberg Ridge were dealt by AB Valsangkar.

Session VI –Back arc basins: In the special talk, Sang-Mook Lee elaborated on the diverse tectonic and magmatic interactions at backarc spreading centers with examples from the Bismarck Sea, western Pacific. He noted that an important aspect that distinguishes backarc spreading centers from mid-ocean ridges is the diversity of tectonics and magmatism which can be observed within short along-axis distance. Unlike mid-ocean ridges which are fixed relative to the underlying mantle, many backarc spreading centers are relatively young features which have undergone rapid deformation over the geological timescale, and therefore, the present-day backarc basins may well represent different snapshots of a few end members of a dynamical system.

B.N. Nath presented a paper by Siby Kurian et al. about the geochemical evidence of hydrothermal component in Andaman Backarc basin sediments. Their interpretation using geochemical data of the significant detrital component in the sediment cores is consistent with the published seismic data that shows sediment infilling in the northeastern part of the neotectonic spreading ridge. The large detrital component in these sediments may be diluting hydrothermal signatures.

Session VII –Special Talks: Charles Langmuir delivered special talk on “Mantle domain boundaries in the Indian Ocean and the nature of mantle heterogeneity.

Screening of film “Volcanoes of the Deep Sea” (courtesy Peter Rona): An excellent digital movie, which was produced using Hollywood's latest technology (IMAX) working closely with Woods Hole scientific team was screened. The movie was a visual delight of the deep sea and presented a good account of under water volcanism, hydrothermal venting and associated biological activity.

Session VIII –Emerging technologies: “Japanese expeditions on the Indian Ridges: the past achievements and future plans” was the special talk of the session which was delivered by K. Tamaki. He has presented the details of previous expeditions and plans of future cruises and the latest tools that are being used. He also explained the Japanese initiative under ODP to undertake drilling in the Indian Ocean and the possible scientific problems that can be addressed.

Jean-Yves Royer et al., presented a scheme for monitoring the Indian Ocean ridge seismicity with a hydrophone network. The objective was to monitor the low level seismic activity (magnitude < 2) associated with the Indian Ocean ridge system, using a network of 3 temporary hydrophones combined with the 3 permanent hydro-acoustic stations of the Comprehensive nuclear-Test-Ban Treaty Organization (CTBTO) deployed in the SOFAR channel of the Indian Ocean (Crozet Island, Diego Garcia Island and Cape Leeuwin) and the seismicity associated with the deformation of the Indo-Australian composite plate. Similar experiments have been successfully conducted in the Atlantic and Pacific oceans. Sanjeev Afzulpurkar reviewed the current status of instrumentation used for ridge studies and outlined future needs.

Panel discussion

The panel discussion was initiated by the InterRidge Chair, Dr. Colin Devey by giving an overview of the deliberations that took place during the technical presentations. The presentations covered all the segments of the Indian Ridge system, with the exception of South East Indian Ridge, due to the last minute cancellation of the participants. Outstanding aspects that required attention are the coverage along the Central Indian and Carlsberg Ridge segments, more dense sampling along the segments to characterize the geochemical signatures, emphasis on vent exploration and use of modern tools. Dr. Langmuir suggested use of the protocols followed in SWIR and in the Pacific for the Vent exploration, these deal with integration of tectonics with the water column signatures. Dr. Jerome Dymont stressed on the need for more exchanges to take place between the Indian Ridge scientists and the groups working in the Atlantic and Pacific. He opined that such exchanges facilitate sharing of expertise gained. Dr. Drolia suggested the need to form a CR-CIR working group on the lines of SWIR working group. In response to this, Dr. Dymont suggested that the interactions can be achieved through the existing working groups, and the present working groups are primarily process oriented rather than the geographical area. These working groups will have scope for wider interactions cutting across the geographical boundaries. The other point that came into focus is the biogeography of the benthic species in the Indian Ocean, highlighted by Dr. Ingole and others. Dr. Subrahmanyam suggested the need to have the off-axis coverage over the CIR segment to capture the signature of intra-plate deformation processes east of CIR, Dr. Drolia mentioned the need to look into the incipient triple junctions east of the CIR segment. Highlighting the immediate requirement of the Indian Ridge program to have modern tools such as deep-tow, ROV and in-situ sensors, Dr. Kamesh Raju solicited the participation of the Ridge researchers in the forthcoming second phase exploratory efforts of the Indian Ridge program along with modern tools and methods. He also indicated that exchange of technicians would be useful. Responding to the suggestions for the off-axis coverage along the CIR segments, Dr. Kamesh, indicated, this can be taken up as an activity of the future investigations of the CIR segment. Dr. Tamaki, offered berths for the Indian participants in the future Indian Ocean cruises of Japan using AUV. Dr. Chaubey suggested bringing out a special issue on “Tectonic and oceanic processes along the Indian Ridge system”. He also informed that the Marine Geophysical Researches, an international journal for the study of the earth beneath the sea, agreed to publish a special issue containing 10-12 good research papers. Dr. Colin Devey, InterRidge Chair and Chair of Scientific Organizing Committee of the workshop welcomed the suggestion and promised to provide support to this endeavor. There was a brief discussion on the IODP proposals in the Indian Ocean, Dr. Tamaki, who is closely involved with the IODP program coordination from Tokyo, clarified that proposals are welcome from the individuals or a group of scientists, membership in IODP is not a pre-requisite. Discussions ended with a recommendation to have more exchange of scientists, tools and expertise to explore the Indian Ocean ridge segments. The panel discussion concluded with a formal vote of thanks by Dr. C. Subrahmaniam.

Student awards

As per the tradition of the InterRidge to encourage young researchers and attract bright students towards ridge research, student awards were announced for best student poster presentation. In view of several meritorious posters from the students, the award was shared among three young researchers Mr. KV Anoop (Geophysics), Mr. Dwijesh Ray (Geology) and Ms. Sheryl Fernandez (Biology).



APPENDIX IX

Preliminary schedule for IR Steering Committee Meeting in 2006 at Moscow

Proposal from Sergei Silantyev

This has been discussed with Directors of Vernadsky Institute and Institute of Ore Deposits and Mineralogy (IGEM) (both of Russian Academy of Sciences).

They suggest following plan:

1) The meeting will be held at Moscow in Vernadsky Institute:

2) Duration is 3 days;

3) First 2 days - Vernadsky (IR Steering Com. Meeting)

4) Last day:

(a) few lectures (2-3 with Invited Lecture status) in Vernadsky or IGEM.

These talk's could be devoted to any scientific problem concerning IR interests;

(b) Discussion with top-level officials from Russian Academy of Sciences on perspective for Russia - IR Community Relationships.

Data for Meeting carrying out depend on your decision.

Russian Academy of Sciences can organize accommodation at a reduced rate.

APPENDIX X

InterRidge Workshop on Ridge Studies at the MAR joint with the Steering Committee Meeting - Rio de Janeiro - 2007 - Brazil

Objectives

(1) To publicise the international cooperation in ridge-crest studies through the InterRidge. Talks should present the goals of the international cooperation, including the role of working groups, interdisciplinary approaches and team efforts. Take the opportunity to make public ridge studies among the large Brazilian geological and geophysical community.

(2) To promote an InterRidge Workshop to discuss Ridge Studies for the next decade. The workshop will address to the major achievements on ridge studies in the last decade and will outline major challenges for the future, focusing on the geological, geophysical, chemical and biological processes at the Mid-Atlantic Ridge spreading centres. The workshop will also cover exploration using latest tools and techniques for better understanding of the ridge processes and hydrothermal vent system in the MAR.

The workshop will cover the following themes:

Hydrothermal Vents & Biology

Tectonic & Volcanic Processes at the Mid-Atlantic Ridge

Mid-ocean ridges represent a window for the observation of mantle processes at various scales. Mantle beneath the ridge partially melts to form the oceanic crust. Mantle also sometimes outcrops at slow- or ultra-slow-spreading ridges.

We invite contributions on the structure and geochemistry of mid-ocean ridges, how such observations constrain the ridge dynamics, and on models of mid-ocean ridge processes.

Key issues to be addressed are:

1) What are the respective roles of spreading rate, hydrothermal cooling, or mantle temperature and geochemistry in the morphology and dynamics of the ridge?

2) How is the mantle signature altered (or filtered?) by the other parameters acting at the ridge axis?

3) Why are the geochemical characteristics of mid-ocean ridge basalts so homogeneous? The objective of the session is to compare and review observables and models, to better understand ridge processes and mantle dynamics.

Proposed Venue and Time frame

Rio de Janeiro Brazil

One week in September or October/2007 during the Congress of the Brazilian Geophysical Society

One day geological field trip to Cabo Frio and Búzios in the State of Rio de Janeiro

Proposed names for the local committee

Sidney L. M. Mello Lagemar/Universidade Federal Fluminense

Susanna E. Sichel - Lagemar/Universidade Federal Fluminense

Paulo Sumida Instituto Oceanográfico da Universidade de São Paulo IOUSP

Lucia Siqueira Campos Instituto de Biologia/Universidade Federal do Rio de Janeiro-UFRJ

Proposed names for the Scientific Committee

Colin Devey, IFM-Geomar, Germany

Marcia Maia, CNRS/UBO, France

Kensaku Tamaki, Dept. of Geosystem Engineering, Univ. of Tokyo, Japan

Anton P. le Roex, Dept. Geological Sciences, Univ. of Cape Town, South Africa

Paul Tyler, SOC, UK

Chris German, SOC, UK

Partial Funding Available from

Brazilian Geophysical Society
Secretaria da Comissão Interministerial para os Recursos do Mar - SECIRM
InterRidge

APPENDIX XI

InterRidge Biology Database Merge with ChEssBase – proposal for IR funding contribution for collaborative work with ChEss



Introduction

The ChEss program has assumed active leadership for questions regarding the biogeography of vent organisms and other deep-water reducing habitats such as cold seeps, large organic falls and areas of low oxygen. At the mid-ocean ridge ecosystems working group meeting in Bremen (18-19 Jan 2004), the group agreed that there was no point in InterRidge maintaining a separate data base of vent organism distribution since a more complete database on chemosynthetic habitats was being developed by ChEss. The ChEss database went online in the second half of 2004. To ensure up-to-date data from the InterRidge biology database is merged with the ChEss database, the IR data need to be interrogated for 1) overlap with data in the ChEss database and 2) outdated data. The cost to do this is estimated at 400 Euros. To indicate InterRidge's interest in having ChEssBase integrated into OBIS, and given budget allowances, a further 300 Euros is requested from InterRidge to contribute to the ChEssBase project. Therefore a total of Euro 700 would be invested in this deep-water chemosynthetic ecosystems species database.

Rationale

Rather than numerous organizations having their own databases, it is more efficient and effective to coordinate efforts that link or merge databases. Apart from ensuring that running databases are updated regularly and also to avoid duplication of work (building and especially maintaining a database is a long and demanding job), it would be more effective and efficient to centralize data collection by an organization in which, as in the case of ChEss, one of the major objectives is to develop and maintain a biological database. If such a database is recognized as a central source of information, and the host organization assumes the task to keep it up to date, other organizations/institutions/individuals can then feed in their data using established procedures.

Background

January 2004 - The IR mid-ocean ridge ecosystems working group agreed to merge the IR vent organism database with the one that ChEss was developing.

June 2004 - A first draft of the ChEss database (ChEssBase) was finished in Access, and a SOC database manager started work on a draft interface to make it searchable on the web.

August 2004 - Two bioinformatics MsC students from Madrid (Maria Blanco and Aida Arcas) started designing and programming the interface and web page to have ChEssBase available online. Maria Blanco has since been involved in further developments and improvements of the ChEss database structure and its web interface.

October 2004 - a first draft of the interface for ChEssBase was completed which ran locally on the SOC server for trials.

December 2004 – ChEssBase goes live on the ChEss web site:

www.soc.soton.ac.uk/chess/database/database.html.

January – April 2005 – ChEssBase is being regularly updated and its structure slightly modified to improve its searching capabilities and use of the data.

Spring 2005 – ChEssBase will be integrated with OBIS (Ocean Biogeographic Information System, www.iobis.org) during 2005.

Current status and work needed to merge the InterRidge database with ChEssBase

The InterRidge biological database has not been recently updated and therefore contains outdated information, such as invalid species names or missing data such as new species. In order to integrate the InterRidge database with the ChEss database, both a bioinformatics and a vent biologist are necessary to undertake a rigorous inventory of the InterRidge data, compare it to the ChEssBase data and thereby make sure that no incorrect or duplicated data is merged into the ChEss database.

Maria Blanco is currently developing further the ChEssBase search facility and might be available both to assume the work necessary to merge the two databases as well as to carry out the integration of ChEssBase with OBIS.

Budget

The cost of hiring a student to interrogate the InterRidge data (time 40 hours) is: Euro 400

The request is for 400 Euros from InterRidge to cover costs related to interrogating the InterRidge data prior to merging with ChEssBase. A further 300 Euros should be invested in the work associated with integrating ChEssBase with OBIS as this is of direct benefit to the InterRidge biology community. This would be honoured by ChEss by acknowledging InterRidge on their website.

Future

ChEss believes organizations maintaining databases should link and coordinate database efforts to avoid duplication of effort and to make the databases more powerful and useful. A major effort into coordination has been undertaken by OBIS, a web-based provider of global geo-referenced information on marine species. There are 39 current contributors to OBIS, which have their databases integrated with the OBIS system, providing a large-scale biogeographical search and modelling system for marine organisms. ChEssBase aims to be integrated in OBIS during 2005.

The main task that lies ahead is ensuring that ChEssBase is maintained and updated regularly. This can be achieved by making sure key people/groups are identified (through, for example, the IR and ChEss communities) and annually approached to encourage data submittal.

The ideal situation would be to have one international database that stays with one organization for an extended period/indefinitely, i.e. The limiting factors here are usually related to funds and expertise availability. Certain institutions (i.e. Ifremer, Daniel Desbruyères) have a long history of database development that has resulted in robust, large-scale databases with an indefinite life time. Ridge 2000 (Chuck Fisher & Suzanne Carbotte) is also developing a detailed database for biological, geological and chemical data obtained from R2K investigations of vent ecosystems. make sure the efforts are compatible so that data is easily transferable and PIs don't have to do anything twice. In the case of Ifremer and R2K, the funds and technical expertise are significant, but the data are limited to samples from Ifremer and R2K cruises and investigations. R2K agrees that it is critical that the databases are compatible so that data can be transferred easily and PI's don't have to do anything twice. The aim of ChEssBase once merged with the IR biological database would be to provide a centralize source of information to which any programme, institution or individual can provide their data on deep-water chemosynthetic ecosystems. Furthermore, to avoid duplication of efforts and maximize the available resources, ChEssBase aims at linking with other major databases (i.e. Biocean from Ifremer, R2K) both by providing direct links to such databases on the ChEssBase web site and by their integration with OBIS.

One of the major challenges for ChEssBase would be to ensure its continuity during and beyond the life-time of ChEss and the Census of Marine Life initiative (to end in 2010). Should this organization change its focus or lack the necessary funds to maintain and update the database, a call for bids to host the database should be made by the database hosting organization, and the complete database transferred to a suitable successor organization. Ideally, the hosting organization should identify the suitable successor organization with the help of data-contributing groups.

APPENDIX 1

What is ChEssBase?

ChEssBase is a dynamic relational database available online since the summer of 2004. The aim of ChEssBase is to provide taxonomical, biological, ecological and distributional data of all species described from deep-water chemosynthetic ecosystems, as well as images, bibliography and information on the habitats. These habitats include hydrothermal vents, cold seeps, whale carcasses, sunken wood and areas of minimum oxygen that intersect with the continental margin or seamounts.

About the data on ChEssBase

Since the discovery of hydrothermal vents in 1977 and of cold seep communities in 1984, over 500 species from vents and over 200 species from seeps have been described. New species are continuously being discovered and described, so ChEssBase is in active development and new data are being entered regularly.

The current database does not include data on specific samples from specific cruises, and still has not images available. This will be the next step forward for ChEssBase (2005-2007), when we hope to include information on sample collections, cruise information, scientific contacts and images of both species and habitats.

At the moment, ChEssBase includes data on 716 species from 74 chemosynthetic sites around the globe. These data contain information (when available) on the taxonomy, diagnosis, trophic level, reproduction, endemism and habitat types and distribution. There are now 949 papers in our reference database.

Database design

ChEssBase was developed as a species-based relational database in Microsoft Access. The database is now running in PHP/MySQL from the SOC's server.

The team

Eva Ramirez-Llodra at the Southampton Oceanography Centre (UK) is the ChEss coordinator and ChEssBase manager. The ChEssBase search facility and web interface were designed and created by María Blanco and Aida Arcas (Madrid, Spain).

APPENDIX XII

Education Outreach Initiatives - update

We have designed and undertaken two main E&O initiatives to help us achieve our goals: a Deep Ocean Video Series, and Science Writer-At-Sea program. Following is a brief update on our progress in Year 1.

1 Deep Ocean Video Series'

InterRidge has teamed up with Future Vision: Educational Media Programming (Robin Cooper; St. Petersburg, FL, USA) to produce and distribute internationally a deep ocean educational video series (6 videos). Collaborators include ChEss and Ridge2000. The series is prompted by the success of an educational video Future Vision produced in concert with "Volcanoes of the Deep Sea," a recently released IMAX film; the video engaged a significant teacher-student audience worldwide and became a model for the proposed video series.

The video series will:

_ use the cutting-edge story of the deep ocean as a springboard for learning about basic concepts in science, math, technology and the humanities

_ meet the needs of teachers worldwide by using a video format that has been received with enthusiasm by educators and scientists, and effectively engages a diverse student audience in today's challenging and dynamic educational environment

_ highlight the world's leading deep ocean science experts, especially women and minorities as role models for students

_ encourage an environmental ethic crucial to the management and survival of the Earth as an integrated, balanced system; and

_ stimulate and encourage cross-cultural, trans-Atlantic exchange among diverse learner groups

A "video package" will be offered. The package includes the 1/2 -hour video and supportive educational materials in the form of a downloadable Teacher's Guide and website. Videos will be available in three ways: via satellite, on the website, and for the best quality – purchased for a modest sum in DVD format.

In addition to the video package, we propose to host an international workshop that will be tagged onto an already existing InterRidge workshop. A core team of participants will be invited, including educators representing various aspects of ridge science, cultures and learning communities. The goal will two-fold: to further discuss ways to continually improve the video package and ensure that it meets the particular needs of all learning communities, and to provide a face-to-face forum for meaningful exchange between scientists and teachers.

Status: Proposal written; Budget around US \$1 million; Partners within US, Germany and other European countries secured; Enlisted help of marketing expert from Boston, MA; Presentation to Volkswagen Foundation in Germany first week of May 2005.

2. Science Writer-At-Sea

In order to improve the relationship between scientists and journalists – with the ultimate goal of boosting science literacy – programs are needed that bring the two camps together in meaningful ways. The Science Writer-At-Sea program will target graduate students in science/environmental journalism. Subject to berth availability, the goal is to invite at least 1-2 students to participate annually in research expeditions around the world. This cost-effective experience would be akin to a “J-school bootcamp,” and there are many benefits to the scientists and journalists involved.

Outcomes:

_ Students generate newsworthy articles for science websites / magazines / newspapers / educator’s guides / educational films; scientists satisfy their ‘outreach’ missions

_ Scientists and future journalists gain a better understanding of each other’s roles and responsibilities; future writers secure their first list of science contacts

_ The ‘lessons learned’ from student/scientist experiences would be used to develop science communication seminars / presentations at science and journalism meetings

_ Courses taught / Visiting lectures

_ Grow to become an international writing / cultural exchange program where graduate students from different countries work together on shipboard expeditions (exchange of media cultures, ideas for enhancing science coverage, etc.)

Status:

Pilot test: Rolf Pedersen, principal investigator for an InterRidge cruise in July 2005 (Norwegian cruise to slow-spreading deep ocean ridge in Arctic; subsurface biosphere / volcanics) has agreed to make berths available for Kusek and graduate student science writer to ‘pilot test’ the program.

Contact made with Columbia University Earth & Environmental Science Journalism, a dual master’s program (Kim Kastens); awaiting response for student (ideal student: summer before first year). Contact also made with USF Science Journalism Center.

IR will support travel expenses to/from Norway

Contact made with Peter Lord (Environmental writer, Providence Journal; co-director of Metcalf Institute for Marine and Environmental Reporting / University of Rhode Island)

WEBSITE under development (IR’s first cruise website); working with members from Society of Environmental Journalists to ensure site effectively uses multimedia (‘cutting-edge’ journalism)

Thinking ahead:

Link the deep ocean educational video series with the Science Writer-At-Sea program. Students could assist in writing for websites, educational guides, video scripts, etc.

Students would apply to be accepted.

Another potential market: film students (documentaries)

Funding: Sloan Foundation (?), National Science Foundation

_ Publications:

Kusek, K. 2004, *The Marine Scientist*, “InterRidge Moves to Northern Germany”

Kusek, K. 2005 (in peer review), *CURRENT: The Journal of Marine Education*, “Unleashing the Power of the Deepest Story on Earth”

_ Presentations:

March 2004, IODP, “InterRidge: Next Decade Plan”; Washington, DC

December 14, 2004, AGU, “InterRidge Reaches Outside the Box and Asks: What’s the Story?”; with Robin Cooper (Future Vision: Educational Media Programming); San Francisco, CA

Jan 12-14, 2005, NERC Deep Oceans Meeting, "Deep Ocean Education Outreach for Dummies"; Swindon, UK

_ Other Meetings:

April 23-25, 2005, EGU, Education session