

---

# InterRidge

---

**Steering Committee Meeting Report, 2000**

**Woods Hole, MA, USA  
2-3 June 2000**

**Chair:  
Kensaku Tamaki**

**Published October 2000**

**Editor, Agnieszka Adamczewska,**  
InterRidge Office  
Ocean Research Institute,  
University of Tokyo  
1-15-1 Minamidai, Nakano,  
Tokyo 164-8639, Japan  
intridge@ori.u-tokyo.ac.jp  
<http://www.intridge.org>

# Table of Contents

<b>List of participants .....</b>	<b>1</b>
<b>Agenda.....</b>	<b>3</b>
<b>Introduction .....</b>	<b>4</b>
<b>Matters Arising.....</b>	<b>4</b>
<b>National Updates .....</b>	<b>5</b>
<i>France - DORSALES (Mével).....</i>	<i>5</i>
<i>Japan - InterRidge-Japan (H. Fujimoto).....</i>	<i>7</i>
<i>UK – BRIDGE (C. German).....</i>	<i>7</i>
<i>USA - RIDGE (D. Christie).....</i>	<i>8</i>
<i>USA-DEOS (A. Chave).....</i>	<i>8</i>
<i>Canada-CANRIDGE (K. Juniper).....</i>	<i>9</i>
<i>India – INRIDGE (R.K.Drolia).....</i>	<i>10</i>
<i>Norway (E. Sundvor).....</i>	<i>12</i>
<b>InterRidge Projects .....</b>	<b>13</b>
<i>Global Studies:</i>	
<i>Arctic Oceans Working Group .....</i>	<i>13</i>
<i>Global Digital Bathymetry Working Group .....</i>	<i>13</i>
<i>Global Distribution of Hydrothermal Activity Working Group.....</i>	<i>16</i>
<i>SWIR (Southwest Indian Ridge) Working Group.....</i>	<i>17</i>
<i>Meso-scale Studies:</i>	
<i>4-D Architecture Working Group.....</i>	<i>18</i>
<i>Back-Arc Basin Working Group.....</i>	<i>19</i>
<i>Active Processes:</i>	
<i>Biology Working Group.....</i>	<i>20</i>
<i>Undersea Technology Working Group.....</i>	<i>21</i>
<i>Event Detection and Response/Observatories .....</i>	<i>22</i>
<i>MOMAR.....</i>	<i>24</i>
<b>Actions List .....</b>	<b>26</b>
<b>Coordinator Update .....</b>	<b>28</b>
<i>InterRidge Membership .....</i>	<i>28</i>
<i>InterRidge Meetings, Workshops and Cruises.....</i>	<i>28</i>
<i>InterRidge WWW Pages .....</i>	<i>31</i>
<i>InterRidge Publications.....</i>	<i>32</i>
<i>InterRidge Budget.....</i>	<i>35</i>

<i>"To Do" items from the 1999 Steering Committee Meeting</i> .....	37
<b>InterRidge contacts with other programs</b> .....	<b>38</b>
<i>ILP (International Lithosphere Program)</i> .....	38
<i>SCOR (Scientific Committee on Oceanic Research)</i> .....	38
<i>ODP/IODP (International Ocean Drilling Program)</i> .....	39
<i>ISA (International Seabed Authority )</i> .....	39
<b>Calendar of MOR research related events</b> .....	<b>40</b>
<b>InterRidge Steering Committee (2000)</b> .....	<b>42</b>
<b>InterRidge National Correspondents</b> .....	<b>42</b>
<b>InterRidge People , Past and Present</b> .....	<b>43</b>
<i>Steering Committee Members</i> .....	43
<i>InterRidge Chairs</i> .....	43
<i>InterRidge Coordinators</i> .....	43
<b>InterRidge Mailing List, May 2000</b> .....	<b>44</b>

## List of participants

1. **Kensaku Tamaki** (Chair 2000)  
Ocean Research Institute  
University of Tokyo  
1-15-1 Minamidai, Nakano  
Tokyo 164-8639  
JAPAN  
Tel: +81 3 5351 6443  
Fax: +81 3 5351 6445  
tamaki@ori.u-tokyo.ac.jp
2. **Agnieszka Adamczewska**, Coordinator (1999)  
InterRidge Office  
Ocean Research Institute  
University of Tokyo  
1-15-1 Minamidai, Nakano  
Tokyo 164-8639  
JAPAN  
Tel: +81 3 5351 6820  
Fax: +81 3 5351 6530  
intridge@ori.u-tokyo.ac.jp
3. **Mathilde Cannat**, (1997)  
Laboratoire de Pétrologie  
Université Pierre et Marie Curie (Paris 6)  
4 place Jussieu  
F-75252 Paris Cédex 05  
FRANCE  
Tel: +33 1 44 27 51 92  
Fax: +33 1 44 27 39 11  
cannat@ccr.jussieu.fr
4. **Alan D. Chave**, *ad hoc* (1997)  
Department of Geology & Geophysics  
Woods Hole Oceanographic Institution  
Woods Hole, MA 02543  
USA  
Tel: +1 508 289 2833  
Fax: +1 508 457 2150  
alan@faraday.whoi.edu
5. **Paul R. Dando** (1999)  
School of Ocean Sciences  
University of Wales - Bangor,  
Menai Bridge  
Anglesey, LL59 5EY  
UK  
Tel: +44 1248 382 904  
Fax: +44 1248 382 620  
oss109@bangor.ac.uk
6. **Rajendra Kumar Drolia** (2000)  
National Geophysical Research Institute  
Uppal Road, Hyderabad  
Andhra Pradesh 500 007  
INDIA  
Tel: + 91 40 717 0141 extn.2316  
Fax: + 91 40 717 1564  
postmast@ngri.uunet.in
7. **Dave M. Christie** (1997)  
RIDGE Chair  
College of Oceanic & Atmospheric Sciences  
Oregon State University  
104 Oceanography Administration Building  
Corvallis OR 97331-5503  
USA  
Tel: +1 541 737 5204  
Fax: +1 541 737 2064  
dchristie@oce.orst.edu
8. **Christopher G. Fox** (1998)  
NOAA/PMEL/VENTS Program  
S.E. OSU Drive  
Newport OR 97365  
USA  
Tel: +1 541 867 0276  
Fax: +1 541 867 3970  
fox@pmel.noaa.gov
9. **Hiromi Fujimoto** (1997)  
Ocean Research Institute  
University of Tokyo  
1-15-1 Minamidai  
Nakano-ku, Tokyo 164  
JAPAN  
Tel: +81 3 5351 6429  
Fax: +81 3 5351 6429  
fujimoto@ori.u-tokyo.ac.jp
10. **Françoise Gaill** *at hoc* (1988)  
Laboratoire de Biologie Marine  
CNRS UPR 7622  
Université Pierre et Marie Curie (Paris 6)  
7 Quai Saint-Bernard  
F-75252 Paris Cédex 05  
FRANCE  
Tel: +33 1 44 27 30 63  
Fax: +33 1 44 27 52 50  
francoise.gaill@snv.jussieu.fr

11. **Christopher R. German** (1997)  
 Challenger Division for Seafloor Processes  
 Southampton Oceanography Centre  
 European Way, Empress Dock  
 Southampton, SO14 3ZH  
 UK  
 Tel: +44 1703 596 542  
 Fax: +44 1703 596 554  
 cge@soc.soton.ac.uk
12. **S. Kim Juniper**, (1998)  
 GEOTOP, Université du Québec à Montréal,  
 P.O. Box 8888, succursale Centre Ville,  
 Montreal, PQ H3C 3P8  
 Canada  
 Tel: +1 514 987 3000 ext 6603  
 Fax: +1 514 987 4647  
 juniper.kim@uqam.ca
13. **Catherine Mével**, *ad hoc* (1997)  
 Laboratoire de Pétrologie  
 CNRS-URA 736  
 Université Pierre et Marie Curie, case 110  
 4 place Jussieu  
 F-75252 Paris Cédex 05  
 FRANCE  
 Tel: +33 1 44 27 51 93  
 Fax: +33 1 44 27 39 11  
 mevel@ccr.jussieu.fr
14. **Jian Lin**, *ad hoc* (1999)  
 Department of Geology & Geophysics  
 Woods Hole Oceanographic Institution  
 Woods Hole, MA 02543-1541  
 USA  
 Tel: +1 508 289 2576  
 Fax: +1 508 457 2187  
 jian@galileo.who.edu
15. **Lauren S. Mullineaux**, *ad hoc* (1995)  
 Biology Department  
 Woods Hole Oceanographic Institution  
 Mail Stop 34  
 Woods Hole, MA 02543  
 USA  
 Tel: +1 508 289 2898  
 Fax: +1 508 457 2134  
 lmullineaux@whoi.edu
16. **Eirik Sundvor** (1996)  
 Institute of Solid Earth Physics  
 University of Bergen  
 Allegaten 41  
 N-5007 Bergen,  
 NORWAY  
 Tel: +47 55 58 3401  
 Fax: +47 55 58 9669  
 eirik.sundvor@ifjf.uib.no

**Absent Steering Committee Members:**

**Philippe Blondel**, *ad hoc* 1997 (UK)  
**Enrico Bonatti**, 1998 (Italy)  
**Colin Devey**, 1999 (Germany)  
**Kantaro Fujioka**, 1999 (Japan)  
**Peter M. Herzig**, 1996 (Germany)  
**David Kadko**, 1998 (USA)  
**Miguel A. Miranda**, 1996 (Portugal)

## Agenda

- Introduction and Welcome (Tamaki)
- General Organization of meeting (Adamczewska)
- Agreement on meeting agenda
- Accept the Minutes of 1999 meeting
- Coordinator Report (Adamczewska)
- National Updates and discussion
  - Canada (Juniper)
  - DORSALES (Mével)
  - India - InRidge (Droliia)
  - InterRidge-Japan (Fujimoto)
  - Norway (Sundvor)
  - UK (German)
  - USA - RIDGE (Christie)
  - USA - DEOS (Chave)
- InterRidge Projects
  - Biological Studies (Mullineaux, Chair)
  - EDR/Observatories & MOMAR workshop summary (Fox, Chair)
  - Development of MORMAR project (Cannat)
  - 4-D Architecture of the Oceanic Lithosphere (Lin, Chair)
  - Global Distribution of Hydrothermal Fluxes (German, Chair)
  - Back-Arc Basins (Fujimoto, Chair)
  - Global Digital Database (Blondel/Tamaki)
  - Arctic Ridges (Tamaki)
  - SWIR Project (Mével)
  - SWIR and Arctic – Indian participation (Droliia)
  - Proposal for new IR project: Carlsberg – Central Indian Ridge (Droliia)
- Evaluation/discussion of the working group structure
- The next decade – plan for the future (Tamaki)
- InterRidge liaisons with other programs
  - ISA (German/Juniper)
  - SEAS – Science of Eastern Asia Seas (Tamaki)
  - ILP (Tamaki)
  - SOPAC
  - SCOR (Wilson)
  - ODP/IODP (Tamaki)
- InterRidge Budget (Adamczewska)
- Future InterRidge Meetings
- Determine date and location of next Steering Committee Meeting
- InterRidge National Correspondents
- InterRidge Steering Committee members
- Summary of Actions for 2000
- Review 2000/2001 Calendar

## Introduction

The chair welcomed everyone to the meeting and introduced those participants who were new steering committee members. A round table was conducted to identify all participants.

K. Tamaki presented the vision of the InterRidge Tokyo office. Besides the usual office activities, the Office will make a special effort to:

- I) strengthen the interdisciplinary aspect of the program,
- II) increase participation of Asian countries in InterRidge,
- III) continue the enhancement of internet homepage resources, and
- IV) organise the "Next Decade Programme".

As part of the action to increase involvement of the Asian countries, Tamaki has organised a SEAS - InterRidge joint meeting at the Western Pacific Geophysics Meeting in Tokyo (June 27-30, 2000). In the meeting InterRidge activity will be demonstrated to Asian marine scientists. Tamaki also has a plan to invite Chinese, Taiwanese and Korean scientists to participate in the InterRidge cruise to the Knipovich Ridge. Additionally, Tamaki will visit Beijing in October 2000 to discuss the possibility of China upgrading their InterRidge membership.

The office has restructured the InterRidge website with a completely new design of the homepage. The recent issue of InterRidge News has been published as a PDF file available through the IR homepage. The office will further enhance the homepage resources through organizing a portal page for the Global Digital Database and further updating and publicising other IR databases. The office will make focused efforts toward planning the next decade ridge research programs beyond the current term of InterRidge (1992-2003).

## Matters Arising

### The future of InterRidge – the next decade

A new InterRidge Project plan, for the next decade will need to be established during this three year term of the InterRidge Office. It was agreed that a Working Group will be formed before the next Steering Committee meeting in 2001. The members of the working group will be the representatives from Principal and Associate Member countries. The working group will most likely meet during the Steering Committee meeting in 2001 to plan a workshop in the first half of 2002, during which the new InterRidge Project plan will be devised.



## National Updates

### France - DORSALES (Mével)

For the year 2000 the project has an operational budget of 800 kF (100 000 \$US). This limited budget is used to fund workshops and a few scientific proposals. In 2000, the call for proposals targeted:

- biogeochemical interactions
- physical and chemical mantle heterogeneities.

Dorsales is in the 3<sup>rd</sup> year of its 4 year funding scheme. Discussion about the future will be carried out at the next Dorsales meeting (September 2000).

The year before last Dorsales funded the building of a pressure container. The IPOCAMP pressure container is equipped with a video system and was successfully used on the Atalante in 1999. Similar containers are now being built through an EC program. The next step will be to build a system that allows collection of samples and maintains the *in-situ* pressure from the seafloor to the container on board.

#### Workshops

- Biogeochemical Interactions

A Biogeochemistry workshop was held at Roscoff, Jan 2000 (organiser P.M. Sarradin) to discuss possible experiments - the main focus was biomineralisation and the origin of life (through the formation of prebiotic molecules). A few proposals suggested as a result of the workshop will be funded.

- Biological sample preservation

F. Lallier will organize a small workshop, planned for September 2000, to collect and summarise basic methods used for specimen preservation. The aim of the workshop is to produce a technical manual that can be available on all cruises and it will help to standardise the protocols for preserving biosamples.

The report could be written in English and distributed through InterRidge

- As the result of the call for proposals, a small workshop on hotspot-ridge interactions will be organized. The aim is a better coordination of the studies based on the data collected around the EPR (Foundation hotspot), the MAR (Azores hotspot) and the CIR (Reunion hotspot). It is obvious that in the near future, hotspot-ridge interaction will become a major research theme for the French community.

#### Research Vessels/equipment

A major problem for the French community is the lack of a suitable vessel to operate the submersibles : Nautile (manned) and ROV Victor (unmanned). The Nadir will stop operating in the near future and the Atalante can support the Nautile but the Victor which requires a dynamic positioning. There is a strong possibility that a new research vessel will be build to replace the Nadir and thus a second vessel would be available to carry the ROV.

The R/V Marion Dufresne will be used 230 for scientific cruises instead of 130 previously. This opens up 100 additional days for science on a ship equipped with a multibeam system.

The academic French community presently does not have access to OBSs to work on mid-ocean ridges. There is a new project to purchase 25 OBS units in France.

#### Journées Dorsales 2000

The Dorsales Committee is organizing a workshop on ridges, in Roscoff, 20-22/9/2000. One hundred and twenty people are expected to attend, and 80 oral communications and posters will be presented.

This will be an opportunity to present recent works on mid-ocean ridges, and to discuss the future of the Dorsales program.

"Dorsales" Cruises

**2000**

ALAUFI (PI : B. Pelletier and Y. Lagabrielle)

Mapping of the North Fidji fracture zone - discovery of an active ridge : Futuna ridge

MANAUT (PI : J.M. Auzende)

Nautile dives in the Manus basin - hydrothermal fields

*The biology leg was cancelled (the authorizations for working in Papua New Guinea were not obtained)*

GIMNAUT (PI : J. Dyment)

Nautile dives on the CIR

Intercalibration of magnetic and radiogenic dating

ENCENS-SHEBA (PI: S Leray)

Mapping of the East Sheba Ridge and the gulf of Aden.

**2001**

*Scheduled cruises*

SWIFT (PI : E. Humler)

Mapping and sampling the SWIR between 35 and 49°E

Tentatively scheduled Jan 2001, Marion Dufresne

IRIS (PI : Y. Fouquet)

ROV Victor dives on Rainbow hydrothermal field - joined cruise investigating biology and geosciences.

ATOS (PI : P.M. Sarradin)

ROV Victor dives - biology

Partly EC funded cruise to the MAR, Lucky strike and Rainbow

*Well evaluated, but not yet scheduled*

TOM-SWIR (PI : D. Sauter)

Seismic tomography beneath the Jourdannes mountains segment (eastern portion of the SWIR - joint cruise with Japan and Germany)

PACANTACTIC II (PI : L. Dosso and H. Ondréas)

Sampling the Pacific Antarctic Ridge between 39° and 52°S

*Beyond - proposed projects*

LUCKY STAR (PI : S. Singh)

Internal structure of the Jussieu plateau (south of Açores) ; seismic line across Lucky Strike

DYNAMO (PI : V. Ballu and J. Escartín)

The Azores observatory; detailed mapping of a possible site - crustal deformation, possible collaboration with D. Smith : DSL120 + ABE

CARLOW (PI : E. Humler and C. Rommveaux-Jestin)

Sampling of the Central Indian Ridge : northern limit of DUPAL anomaly

PHARE (PI : F. Gaill and N. Le Bris)

Biogeochemical interactions; EPR 13°N

GESYSPE (PI : F. Lallier and D. Jollivet)

Genetics and symbiosis; EPR Galapagos to Easter microplate

HISOM (PI : R. Cosson)

Biogeochemical interactions; EPR 9°N

## Japan - InterRidge-Japan (H. Fujimoto)

Japanese ridge scientists will continue to maintain, or even raise the level of ridge-related research activities in the future. They will initiate new programs and carry out several cruises in this fiscal year (see report in InterRidge News 9.1). The InterRidge Office in ORI is now fully operational. An InterRidge cruise involving Japanese-Russian-US research cruise to Knipovich Ridge near the Arctic Sea will take place in September. Norwegian and Asian scientists will also join the cruise.

The R/V Hakuho-maru will visit the Gulf of Aden around the beginning of the 21st century. JAMSTEC plans to carry out five diving cruises in the Mariana Trough, Okinawa Trough, near the Rodriguez triple junction, and on the Atlantis II Bank in the SWIR. Archaean Park Project is a major, five-year program (2000-2004), which focuses on investigating the interactions between subsurface vent biosphere and the geo-environment.

Marine scientists from Asian countries established SEAS (Science of East Asian Seas) office in Tokai University to promote coordination of back-arc basin studies. JAMSTEC has started building a new riser drilling vessel, and continues to develop a new AUV which can cruise long distances.

## UK – BRIDGE (C. German)

The BRIDGE program has officially finished and the final celebrations took place in November 1999. The program was a success and was well received by new NERC Chief Executive. UK Principal Membership for InterRidge has been secured for 2000 & 2001. Unless a new programme is initiated, the UK will most likely downgrade its InterRidge membership to an Associate Member in 2002.

### Vessels

Funding (£4.5M/3 years) has been approved for the construction of a new 6500m ROV. The construction will be carried out from 2000-2003 and the ROV is expected to be on-line in 2004 and it will be movable to any ship capable of supporting ROV's.

One more ship, the James Clark Ross, is now available for research 70 days per year. The Discovery, Challenger and Darwin will stay online for 5 more years. Currently plans are being drawn up for a new ship to come online in 2005.

Programmes currently underway:

- EC - FPV Programme:

“Ventox” (D.Dixon, SOC)- Life in toxic environments

- EASS3:

TOBI, BRIDGET and SHRIMP, deep tow camera, (D.Masson, SOC) – will be made available to anybody in the EC and if the PI is European these instruments can also be taken to carry out research in any ocean.

### Future Work:

Indian Ocean: - due late 2001 (or early 2002)

a) CIR (TOBI - Ridge/Hotspot Interactions)

b) RTJ Area (Plume Biogeochemistry). PI. is P. Tyler, water column survey to follow up continental plume material to zoom in on hydrothermal sites.

Revisit the East Scotia Ridge hydrothermal fields with the new ROV: British Antarctic Survey, winter 2003/2004

### UK - DEOS:

Relocatable Observatories

Feasibility Study (Kvaerner & SOC) – funded May 2000

I) Reykjanes Ridge,

II) East Scotia Ridge, in review summer 2000

III) UK component of MOMAR

## USA - RIDGE (D. Christie)

The RIDGE Program is also nearing the end of its 10 year term. Plans for a replacement program have been initiated, and a science plan for a proposed new "RIDGE 2000 Program" will be submitted to NSF by Jan 1, 2001. The science plan will be based on community input from three meetings. The RIDGE 2000 meeting in Newport, OR in September 1999, set the broad outlines of a new plan consisting of an "Integrated Studies" theme and an "Exploratory and Time Dependent Studies" (ETD) theme. An Integrated Studies planning workshop was held in DeKalb Illinois in May, 2000; a draft report is available from the RIDGE website. An ETD planning workshop will be held in Nashville Tennessee in October 2000.

RIDGE 2000 Integrated Studies will focus on intensive multi-disciplinary studies at six sites over a decade. Site selection, based on Site Proposals from the community (not to be confused with normal NSF science proposals) will be carried out by community vote and monitored by a special panel. The ETD part of the program will encompass both exploratory-type studies, such as biogeography, and dispersal as well as rapid response and other time-critical studies at active sites that cannot be carried out in the spatially restricted Integrated Study sites.

The new program will combine a structure that facilitates integrative, multi-disciplinary studies while continuing to foster the strong, national and international, interdisciplinary communications that have been one of the biggest successes of the current RIDGE Program.

## USA-DEOS (A. Chave)

DEOS - Dynamics of Earth and Ocean Systems, started as an umbrella programme for permanent observatories on the sea floor with two components, buoys and cables.

Buoy observatories can be either moored or they can be moved around. The buoys are tethered to the sea floor and linked to a junction box. The buoy provides a power source a satellite link, which is the most difficult part of setting up these long term observatories.

Initially when the project started (3-4 years ago) there was talk of new-satellite systems *eg.* Iridium - a new generation in communication systems that would be widely available and that could provide links from anywhere on the earth. However, the market place for this communications system has vanished as a result of the world wide explosion in the cellular phone use. Other systems, such as LEO (low earth orbiting) are under construction but they have yet to come to fruition in a marketplace that is nowhere near as strong as originally anticipated. Without a satellite system, communication will be a limitation in the development of these observatories.

The speed of transmission is a major limitation. INMARSAT can transmit data at 100 000 Bits/s but data transmission in the order of Megabits per second is required. With the currently available communications system it is possible to monitor the health of instruments and obtain data transmission at low rates from the instruments. However, video or other sophisticated data transmission is not possible.

Thirty seafloor nodes were distributed around the Juan de Fuca plate. Each node provides power (2 KW/node, compared with 100W/buoy) and communications (1 G Bit/s) at a much higher rate than a buoy could.

The feasibility project was a wide scale oriented programme and ridges covered one of the eight categories investigated, the remaining categories involved subduction zones.

NePTUNE feasibility report is available on <http://www.neptune.washington.edu>

30 seafloor node requirements:

- spacing of 100 km
- aggregate data of 1 G Bit/s, for all the instruments added together
- fibre optic link with Ethernet system
- a parallel power system

NSF has funded \$ 1.5 million to do the communications engineering for the system, with partial matching funds from WHOI and Cisco Systems

DEOS - a 'major research equipment' proposal has been submitted to NSF for \$120 million and feed back is expected in the fall 2000.

The plan is to set up buoy observatories and build a system which surpasses current requirements for data transmission right now (*ie.* 1 G Bit/s) by at least ten fold.

Canada and Germany have expressed interest in NePTUNE as there is a strong drive for development of instrumentation and long term scientific monitoring.

### Research Vessels

AUVs (Autonomous Underwater Vehicles)

There is a lot of activity and new developments in the underwater vehicles around the world.

AUV's will increasingly be used for scientific studies and will serve the function of short term (~ 1 day) observatories.

- JASON - upgrade of the vehicle has been funded to JASON 2, which will have much greater capabilities and is expected to be build by 2001
- MBARI - ROV is now operational and forms a part of an ambitious sea going programme
- ABE - is operational and while theoretically could operate for several days, it has been used for approximately 1 day at a time. The vehicle was successfully used for science last year and will be used more extensively for scientific studies from this year onwards.
- ABE 2- has been funded and this vehicle will have operational duration of more than 2 days
- There has been some discussion about merging ALVIN and Sea Cliff. While this is unlikely to happen it is possible that the deeper Sea Cliff sphere (6000 m) will go into Alvin someday.
- JAMSTEC has a new AUV with a 300 km range. It is a very large vehicle, 10 m and 7 tons. Initial testing was carried out this year on a tether.

The US ship fleet is getting old. Half of the fleet is expected to be out of service in approximately 10 years time. WHOI and Scripps have set up committees to start planning and make recommendations for the building of new ships. Historically ships were build by the US navy but this might not be the case in the future.

## **Canada-CANRIDGE (K. Juniper)**

Ridge crest research in Canada has received a 4 year NSERC Collaborative Research Opportunities grant as a result of an effort by 10 university researchers led by K. Juniper (Université du Québec à Montréal) to write a collaborative grant proposal. The proposal envisions seafloor sampling and experimental work will use ROPOS, remotely-operated vehicle, in collaborative cruises with NOAA and the University of Washington.

The first major field season will be in summer 2001, with planned cruises to both, the Axial Volcano and the Endeavour Vents. Studies will focus on sulphide deposition, mineralisation, biology and the interaction of mineralisation processes and formation of sulphides. Experiments will include time series observations and looking at colonisation in relation to chemistry of sulphide edifices.

Two post-docs will be employed to investigate wet microbial weathering at high temperatures and pressures as well as some exotic aspects of plumes, such as viruses and photosynthetic bacteria that utilise light from black body radiation.

The PIs will hold annual mini workshops to coordinate ideas and discuss issues to ensure that this is a truly cooperative project. The team will be also working together with Fisheries and Oceans on the EMPA project to get direct feedback on the development of a management plan for the site.

NePTUNE feasibility study was carried out last year and the first science workshop was held in March 2000. The report from the workshop is available at <http://www.neptune.washington.edu>

There was a high level of interest among the Canadian scientists, as well as government and industry in participating in a joint project. The aim is to develop unique research themes for the Canadian participation in NePTUNE which reflect Canadian interests rather than simply buying into a share of USA planned programs. One third of the Juan de Fuca plate is within Canadian Jurisdiction but the requested funding is only 20% compared with NePTUNE.

The emphasis of the program will be on three main themes:

- I) climate *vs* ocean productivity,

- II) seismicity and related hazards and  
 III) biodiversity and perturbations of the sea floor

### New deep-water winch and cable for ROPOS

Infrastructure funding from the Canadian government Western Diversification Fund, the Canada Foundation for Innovation, and four Canadian universities (Victoria, Toronto, UQAM, New Brunswick) will enable an upgrade of the fibre optic cable and winch for ROPOS to increase diving capabilities down to 5500m and increase data transmission capacity.

## **India – INRIDGE (R.K.Drolia)**

Indian Ridge researchers have been visiting the Indian Ocean Ridge System (IORS) sporadically, leading to individually driven studies governed by the subject expertise of the concerned Scientist(s) rather than as a part of an integrated and well thought out plan.

The geological survey of India has collected data on the Annular BAB but this data is not freely available. MB data collected to date is still being analysed.

'InRidge' was envisioned in 1994 by Drolia and Mukhopadhyay with an objective to map petrologically and tectonically the gaps in IORS. With their efforts 'InRidge' was formed in 1997. The Indian scientific community having interest in ridge research, has extended their helping hand to develop this embryonic initiative into an effective scientific body to set plan, give direction, coordinate and monitor high quality multi-disciplinary integrated scientific research. This has led India to become Associate member of InterRidge in 2000.

India has one multipurpose Research Vessel equipped with geological, geophysical, multibeam swath bathymetric survey, biological and climatological equipment. For six months of the year, the ship is involved in monsoon research. This vessel is also used for continental margin research and geo-survey which results in very limited ship-time for Ridge research in any one year. To date, the ship-time for ridge-related research on this vessel was approximately 35 days per cruise (port to port) and 3 cruises have been completed. We have also used other vessels, which do not have multi-beam and gravimeter facility. We hope to get ship-time on the multi-purpose vessel during 2000 and 2001.

Current Status: Under umbrella of 'InRidge' at present six projects - two each on the Carlsberg and Central Indian Ridge, as well as one on the Andaman Arc Basin and on the IORS are in progress. The projects are funded by different funding agencies.

Ridge research is beginning to take recognition in India and it is hoped that India's association with InterRidge as an Associate member will further enhance the research possibilities for Indian scientists. Currently, 15-20 researchers and 3 graduate students are involved in Ridge related studies.

### *Objectives:*

- To study accretionary processes at CR and CIR; tectonic constraint on spreading kinematics and its relationship with Hydrothermal activity and address the issues through multi-disciplinary approach.
- To decipher the geo-physical, geological, morphological and geochemical signatures of Ridge-Hotspot/Plume interaction at present Ridge-axes.
- To understand mantle dynamics and mantle upwelling in relation to structural segmentation of the ridge

Some results from the Carlsberg Ridge, the Central Indian Ridge and the Andaman Back-Arc are presented below

Software: Chakraborty and Kodagali have developed two software Packages: PROBASI and INBASI for processing backscatter signals and estimating the roughness parameter (see InRidge update in IR news 9.1).

### Carlsberg - Central Indian Ocean Ridge: A Case for InterRidge Research Project

The Indian Ocean Ridge System is conspicuous for more than one reason. The ridge axis melt beneath the Indian ridge axis is isotopically distinct from the melt present in the other oceans. Mixing of ridge and hotspot melts, formation of axial seamounts and segmentation of ridge axis are other interesting aspects of this Ridge system.

Tremendous effort has recently been focused on the study of the IORS e.g. South Indian Ridge System (Cochran *et al.*, 1997; Sempere *et al.*, 1997; Christie *et al.*, 1998 and many others) and the South West Indian Ridge system is being studied by the International SWIR Working Group (InterRidge News 3-9, Mével *et al.*, 1997, 1998; Marine Geophy. Res. Spl. issue, Dec.1997, ODP 118 and many others). In contrast, the Carlsberg - Central Indian Ridge system has been poorly studied providing scanty but encouraging results (ODP leg 115; Chaubey *et al.*, 1990; Parson *et al.*, 1993; Ramana *et al.*, 1993;

Mukhopadhyay and Iyer, 1993; Briais, 1995; Kamesh Raju *et al.*, 1994, 1997; Dymant *et al.*, 1999; Drobia *et al.*, 2000). The uneven segmentation of the CR-CIR, drastic changes in spreading rate and direction, geophysical, morphological and geochemical evidences of observed off-axis volcanism, interaction of mantle plume / hotspot with spreading centre and underlying mantle, intersection of Wide Deformation Zone in 8-10°S provide the first field evidence of Over-Print Magnetization in VEMA Region. The mass/force balance at the Carlsberg Ridge accreting boundary makes CR-CIR an attractive Target to investigate this arm of the IORS.

The discovery and exploration phase of biological and hydrothermal research on CR-CIR is in its infancy stage. It requires in-depth investigations in the geological and volcanological context. The CR-CIR arm of IORS is the gap area in global characterization of global mid-ocean ridge system. Important deformational features including transform faults and a variety of non-transform discontinuities are unevenly distributed along the axis, which is also characterized by spreading asymmetries. Reported occurrence of Calyptogena (INDOYO cruise) is the first evidence of *in situ* biological communities associated with hydrothermal activity along CR-CIR, which suggests the propagation route via MOR connecting SEIR and East Pacific Rise. We have to resolve how these features impact the distribution of stress and strain in the lithosphere. How do they affect lithospheric composition and material properties? What may be the geometry of melt production region and the relationship of temporal variation with melt delivery system? How do they affect magma supply, hydrothermal circulation, the nature and distribution of biological communities? It requires a strongly focussed scientific program to investigate a spectrum of concepts ranging from the crustal accretion covering dynamics of underlying mantle to the physiology of the sub-seafloor microbe populations, and from the formation of melt and magma to chemical exchanges between seafloor hydrothermal systems and the ocean. We would have to focus on integrated studies utilizing broad range of tools and approaches to concentrate on crustal growth, mantle dynamics, hydrothermal studies and macro- & micro- biology.

During the last decade, InterRidge has played a pivotal role in bringing International ridge researchers together through various workshops, working groups, symposia and field programmes, which led to an accumulation of knowledge about gross-scale features of MAR, EPR, SWIR, SEIR and Back-arc basins. However, CR-CIR arm of IORS remained unexplored.

I urge the Steering Committee that a Working Group on CR-CIR may kindly be formed to study this arm of unexplored MOR. The Working group would examine the outstanding problems of the CR-CIR arm of IORS, the approaches to be adopted and availability of logistic support to carry out the experiments. It could focus on integrated studies utilizing broad range of tools and multi-disciplinary approaches to concentrate on accretionary processes at CR-CIR and evolutionary processes in oceanic communities, to delineate tectonic constraints on spreading-kinematics, its relationship with hydrothermal activity, to decipher geophysical, geomorphological and geochemical signatures of Ridge-Hotspot /Plume interaction.

I submit to this august body a request to examine the viability of CR-CIR project and to form a Working Group to formulate a research plan and modalities to execute it.

### Carlsberg Ridge:

Our results from Carlsberg ridge (south of 4° North) show that the axial valley is sedimented and we have identified a new Ridge axial discontinuity / non-transform discontinuity and this section shows symmetric spreading against the asymmetric spreading of the northern segment of Carlsberg Ridge. Dredge samples recovered mantle rocks such as lherzolite, gabbros and serpentinites from the inner rift valley wall, suggesting a shallow depth of the mantle. The large phenocrysts in lherzolites of clinopyroxenes and bastites suggest hydration alteration. Occurrence of pteropods below the aragonite compensation depth (2000-5000), and their good preservation indicate the presence of possible hydrothermal activity, through increase in alkalinity in seabed sediments.

### Central Indian Ridge:

Our recent results from Vema region of CIR (7-12°S) suggest that northern part of CIR is morphologically segmented with spacing of 30-80 km, coupled with several second order discontinuities. We have identified magnetic anomalies up to chron 5 and data show the symmetric spreading across the ridge. The differential half-spreading rate (0.3-0.4cm/year) north and south of Vema Transform suggest the evolution of CIR in two distinct units: the northern CIR merging with the Carlsberg ridge and forming the slow spreading accretionary boundary of the Indian plate, while the southern CIR is evolving as intermediate spreading western boundary of the Australian plate. They converge between 6-9°S region of the CIR, where the Wide Boundary Zone separating the Indian and Australian plates, intersects it; suggesting that the region is probably evolving as a triple junction.

The significant contribution of the study is 'Overprint Magnetization Hypothesis' wherein we show the first field evidence of demagnetization of rocks near Vema Fracture zone due to thermal anomaly associated with the adjacent ridge segment and remagnetised when the rocks cooled again below their Curie temperature. The geochemical and isotopic data suggest discrete magmatic provinces. The depth, pressure and extent of melting of magma in this area differ from the characteristic

ridge systems of other oceans. Manganese nodules recovered from Vityaz fracture zone are Hydrogenic ( $Mn/Fe \leq 1$ ) show a significant influence of hydrothermal component.

Our results from southern CIR suggest asymmetrical spreading during Brunhes and Matuyama period although a good correspondence between conjugate magnetic features is observed. The deep tow magnetic and surface magnetic profiles show a good correlation between both major anomalies and tiny wiggles on conjugate flanks. The bathymetric coverage show alignment of volcanic edifices parallel to the newly discovered 50 km long, 700m high Gasitov ridge on the 3.5-3.0 MY old crust. The 300-500 m high, 3-5 km wide abyssal hills and discontinuity characteristics, along with elongated ridges observed on the western flank of the CIR confirm that the area is underlain by anomalously hot mantle. The absence of conjugate features on the Australian plate (eastern flank of the CIR) suggest an off-axis formation. The proximity of the axis implies some relationship, yet to be determined. The shallow bathymetry and mantle bouguer anomaly minimum reflects a density anomaly under the study area which might result from either a thicker crust or a higher mantle temperature or both. Probably it reflects hotspot-spreading ridge interaction, the geometry of which remains to be characterised.

Our petrological data suggest eruption of N-MORB depleted in large ion lithophile (LIL) elements along the ridge axis whereas the sites further away from the ridge axis, at a transform fault and in NVZ show characteristics of transition (T) type basalts. The correlation between depth, pressure and extent of melting suggest mixing of foreign material with the N-MORB melt at the transform fault site while enrichment with NVZ rocks is probably due to input from circulating hydrothermal fluids. Our results suggest that Intercolumn melting is not the dominant process. It is probably characterized by melting of multiple domains that differ in initial and final melting pressure within segments fed by buoyant focussed mantle flow.

#### *Andaman Back-Arc:*

Within the complex morphotectonic fabric of the Andaman Back-arc basin, a spreading ridge, cratered volcanic seamounts and apparently active faults were identified. The north-south trending 80 km long spreading ridge is active in the south. The axial valley and the seamount crater seem to contain broken parts of a chimney structure, along with disseminated and vein type metal sulphides. The Nicobar rift valley, the deepest in the region, has recently been studied in detail. Late release of stress through this faulted rift valley seems to have adjusted the basement, which is overburdened with huge piles of sediment in the form of hour-glass structure, oriented normal to the principal strain axis. The present configuration of the basin seems to be a result of a continuous dilational stress, with younger tensional structures reorienting the geomorphic regime. Studies on pteropod assemblage in the surrounding area successfully drew the boundary between the top warmer Holocene and cooler Pleistocene at a depth of 90-110 cm.

## **Norway (E. Sundvor)**

New heat flow map of the Norwegian-Greenland Sea is published in Geological Society, London Special Publ., 167, 397-410

A new Subsurface Biology/Geology Program started in 1999 with field work at the Kolbeinsey Ridge north of Iceland using the new University of Bergen ROV (Remotely Operated Vehicle) with 2000 m cable which has the capacity to do photography, taking rock and sediment samples, doing CTD measurements and with Miskin bottles for water sampling. Further field work on the Mohns Ridges area is scheduled for August/September this year.

Plans together with the Marine Instituttet (Fishery Research) for building a new research vessel equipped for marine geophysical and geological investigation hopefully with a multibeam echosounder. University ship time will be 60-80 days/year.



## InterRidge Projects

The three InterRidge themes: Global Studies, Meso-Scale Studies and Active Processes are subdivided into ten InterRidge projects.

### Global Studies:

#### Arctic Oceans Working Group

*Arctic Oceans:* Colin W. Devey (Germany), Chair

*Bernard J. Coakley (USA)*

*Kathleen Crane (USA)*

*Olivier Dauteuil (France)*

*Vladimir Glebowsky (Russia)*

*Karl Gronvold (Iceland)*

*H. Ruth Jackson (Canada)*

*Wilfried Jokat (Germany)*

*Yngve Kristoffersen (Norway)*

*Peter J. Michael (USA)*

*Neil C. Mitchell (UK)*

*Roland Rihm (Germany),*

*Has Albert Roseau (Germany)*

*Hideki Shimamura (Japan)*

*Cindy Lee Van Dover (USA)*

The great SCICEX bathymetric and gravity data presented at AGU in SF were a giant step forward in terms of secure planning of the Polarstern expedition in 2001.

Last year a NSF proposal was submitted by P. Michael, C. Langmuir and H. Dick to cover their science but also to find funds for a second ship which is definitely needed for that expedition. He wrote. The proposal received favourable reviews and was expected to be recommended for funding in 2001. The proposal was consistent with the planning document that resulted from the 1998 meeting that was held in Hannover. The proposal focused mostly on sample recovery and igneous petrology, and was designed to be part of a multidisciplinary effort to study Gakkel Ridge.

Because, all along, the plan was for a two-ship cruise, the proposed cruise coincided exactly with Polarstern's cruise ARK-XVII/2. A positive funding decision by NSF for this international program makes it highly likely that they will work diligently to schedule an icebreaker, most likely USCGC Healy, for this project in August-October 2001. A 47 day cruise including 36 days of work was proposed on the ridge and 11 days of transit from Tromsø to Tromsø. However, based on discussions carried out in January, it was proposed that the cruise should be 50 days from Longyearbyen to Longyearbyen or 53 - 54 days from Tromsø to Tromsø. USCGC Healy's schedule is not yet fixed, and it will be very important to coordinate the dates closely so that the two cruises are compatible with one another.

The scheduling of Polarstern for 2001 is still in good shape and will be driven by the second ship.

Based on this information a German group submitted, in early January, a proposal to their funding agency including the following science:

- petrology, geology (hydrothermal sediments), seismic reflection, seismic
- refraction, magnetic, bathymetry, magnetotelluric, heatflow.

#### Global Digital Bathymetry Working Group

*Global Digital Database:* Philippe Blondel (UK), Chair

*Christine Deplus (France)*

*Jose Diaz (Spain)*

*Martin Jakobsson (Sweden)*

*Kazuo Kobayashi (Japan)*

*William Ryan (USA)*

*Marco Ligi (Italy)*

*Ron McNab (Canada)*

*Wilhelm Weinrebe (Germany)*

The last InterRidge Steering Committee meeting was in June 1999. I resigned from the Southampton Oceanography Centre in August 1999 and started work at the University of Bath in September 1999. Because of constraints associated with the new work, and because I was at sea last month, I regret not being able to join the IR-SC meeting in Woods Hole, and I regret that I did not have time to contact all members of the Working Group. Here are the latest developments:

Canada – Representative: Ron Macnab, Geological Survey (Atlantic)

Ron was ready at the last meeting to provide Canadian data of interest and Arctic ridges bathymetry, but was waiting for approval by the Canadian administration before proceeding further.

Arctic ridge bathymetry has now been released, with a 2.5-km resolution. The International Bathymetric Chart of the Arctic Ocean (IBCAO) is available at <http://www.ngdc.noaa.gov/mgg/bathymetry/arctic/arctic.html> in free, Cartesian format.

Finer resolution data will later be made available through the British Oceanographic Data Centre (BODC, UK) (expected date: end 2000).

Martin Jakobson and Ron Macnab published an article with other authors in EOS: Trans. AGU, vol. 81, no. 9 ( 2000) presenting the whole dataset.

France – Representative: Christine Deplus, IGP Paris

The synthesis of French data is under way and progressing. As mentioned at the previous meeting, the WWW site is located at SISMER, which already archives IFREMER data.

The SISMER representative in charge of data archiving is: Eric Moussat

*TMSI/IDM/SISMER ; Centre IFREMER de Brest BP 70*

*29280 PLOUZANE; FRANCE Eric.Moussat@ifremer.fr*

Accessible databases are listed at <http://www.ifremer.fr/sismer/catal/base/> (but no digital data seems to be readily downloadable).

An all-purpose dataset covering the whole world is available in MGD-77 format.

A specific bathymetry dataset contains EM-12D and SeaBeam data, in GMT and ASCII formats, and covers the zones: (cf. last WG report, in 1999).

1:	70-75N	5W-5E
2:	10S-40N	55-5W
3:	0-40S	125-90W
4:	70-50S	180-130W
5:	0-40S	40-80E
6:	10-30N	30-50E
7:	35-10S	165E-170W.

Centre-beam data from 340 cruises (inc. 87 ATALANTE cruises) is available in ASCII, MGD-77 or binary format.

Germany – Representative: Wilhelm Weinrebe, GEOMAR Kiel

The WWW server at [http://www.geomar.de/sci\\_dpmt/geodyn/](http://www.geomar.de/sci_dpmt/geodyn/) has been recently updated, and a list of cruises, with metadata and hyperlinks, is available at:

[http://www.geomar.de/sci\\_dpmt/geodyn/Blue\\_poster\\_bathy/index.html](http://www.geomar.de/sci_dpmt/geodyn/Blue_poster_bathy/index.html)

I do not have recent news from Germany, but I am going there in October/November and I will discuss with Wilhelm Weinrebe and other scientists involved with multibeam bathymetry. Many of them are at sea now and could not be contacted.

India – MB data on IORS was collected by the Indian researchers on Board 'Sagar

Kanya "covering one degree each on Carlsberg(4-3 degree N) and Central Indian

Ridge (7-8 degree South). KR Drolia will discuss with the Indian Administration the accessibility status of the MB data and report to the InterRidge office.

Italy – Representative: Marco Ligi, U. Bologna

WWW server is being established for Antarctica data (including Bouvet Triple Junction and Scotia Arc). Other data will also be archived.

No recent news received (but I have not asked for any).

Japan – .

The status at the last IR-SC meeting was that there was no central mechanism of exchange. MAR data was managed by Toshiya Fujiwara (Jamstec), Indian Ocean data by Kensaku Tamaki (ORI, Tokyo) and deep-sea trenches (no ridge data) by Kazuo Kobayashi (Jamstec). Kyoko Okino is compiling a database for MB data in Japan by organizing several Japanese institutions, the site is still under construction but a link to it will be made as soon as the portal page to world MB data is created by the InterRidge Office.

Korea – No representative  
No Korean ridge data.

Norway – No representative  
The SeaMARC-II data from the Arctic should be available through the IBCAO (see above for details).

Portugal – No representative  
No Portuguese ridge data.

Russia – No representative  
Mid-ocean ridge data is scattered in several institutions. No apparent progress there.

Spain – Representative: Jordi Sorribas, CSIC Barcelona  
The Spanish ship, the *Hesperides*, has a multibeam system and collects MB data on all cruises. Meta-data is available on the Internet at <http://hesperides-bd.icm.csic.es/Hesperides/campanyas>, and digital data should be available upon request to the PIs. An English version of the Web pages exists.

UK – Representative: Philippe Blondel, U. of Bath  
(formerly at Southampton Oceanography Centre)  
Although I moved to Bath in September 1999, I supervised two ITS students working in SOC with Chris German. They finished work in December 1999, and we held the last BRIDGE Data Management meeting in Southampton on February 14, 2000.

**The BRIDGE Database is now ready.** All British mid-ocean ridge data is stored on ~130 CDs. I have not received the final product of our endeavour (yet), but bathymetry data should be on less than 10 CDs. The BRIDGE WWW server is ready since late Spring 1999, and includes ship tracks and metadata. It is accessible on the Internet at <http://www.soc.soton.ac.uk/bridge>.

Now that the BRIDGE programme has ended, the database has passed under the stewardship of the NERC-SEADOG database, also based at Southampton Oceanography Centre. Distribution of data will be on a case-by-case basis, and more details will be given at this meeting by Chris German.

USA – Representative: Bill Ryan ??  
The RIDGE programme already has a WWW server, from which data can be downloaded, and CD-ROMs are already available. It was agreed at the last IR meeting that the future of the Lamont database would be discussed between RIDGE scientists. In particular, the access to data from the most recent cruises would be discussed.

Arctic Ridges – Representative: Martin Jakobson (U. Stockholm)  
Martin Jakobson published the article mentioned above, written with Ron Macnab and colleagues. Arctic Ridge bathymetry is now online. See above for details.

Summary  
In conclusion, the different national initiatives are progressing well. The US database is accessible through Lamont-Doherty, but the status of recent cruises is less clear. The French database is currently being implemented, and some data is already available on Internet but the web site is still under construction. The British database is complete and available. And Arctic ridge bathymetry is available as well. I am missing information for some countries (but not the ones with the most bathymetry), but I hope to address that in time for the next issue of InterRidge News.

## Global Distribution of Hydrothermal Activity Working Group

**Membership:** The membership of the working group was enlarged to include both macro - and micro-biologists and to increase the geographical representation within the working group (new members in bold).

**Global Distribution of Hydrothermal Activity:** Chris German (UK), Chair

*Ed Baker (USA)*

*John Chen (USA)*

***Don Cowan (UK)***

*Toshi Gamo (Japan)*

*Eulalia Gracia (Spain)*

*Peter Halbach (Germany)*

*Sang-Mook Lee (Korea)*

***Gary Massoth (New Zealand)***

*Joel Radford-Knoery (France)*

***Anna-Louise Reysenbach (USA)***

*Dan Scheirer (USA)*

*Steve Scott (Canada)*

*Kevin Speer (USA)*

*Carol Stein (USA)*

*Verena Tunnicliffe (Canada)*

*Cindy Van Dover (USA)*

The GDHA Working Group strives to identify priority areas for new hydrothermal research. The search for new active hydrothermal vent sites through detection of hydrothermal plumes and chemical signatures is not only steered by theoretical geophysicists but also by biologists. Predictions about the existence of hydrothermal sites in a particular ocean or site, until very recently were largely based on geological settings in the area, such as spreading rate and ridge - hotspot interactions. However, scientific questions originating from the biogeography of organisms are becoming an increasingly important driving force in the search for new hydrothermal vent sites in various places around the world.

### Vents Data-Base:

<http://www.intridge.org/vent.htm>

The global database with hydrothermal vent sites around the world is now functional on the IR website. It contains 208-entries as well as a global summary map. Confirmed and suspected hydrothermal vent sites are classified into one of the four categories: Active Sites; Inactive Sites; Manganese crusts or Sediments; and Hydrothermal Plumes. The aim is to have every known hydrothermal site in the world's oceans in this database.

The database is not only a source of knowledge about the hydrothermal vents but it is an important tool in identifying gaps in our knowledge. We still do not know anything about the possible existence of hydrothermal vents, and the fauna associated with them in an area equivalent to half of the planet.

At the time this Working Group was formed, two years ago, there was almost no information at all about the hydrothermal activity in the Indian nor the Arctic and southern oceans.

Researchers are extending outside of their traditional working areas. Recent discoveries include the East Scotia Ridge (UK), Bransfield Strait (USA) and Havre Trough Back-Arc, as a result of USA-NZ collaboration.

### Future Work:

A number of scheduled cruises in the near future will hopefully lead to the discovery of new hydrothermal sites and the organisms that colonise these sites. Currently the key research areas (both, from the geological and biogeographical perspectives) are well covered and require no further action right now.

#### **Indian Ocean Cruises:**

- a) Japan (Hashimoto), ROV Kaiko - RTJ area – summer 2000
- b) USA (ROV Jason, Argo, DSL 120 - RTJ Area) – spring 2001
- c) UK (TOBI, BRIDGET - CIR & RTJ Area) – 2001/2002

While the Arctic Working group was the main driving force behind the increase in research effort in the Arctic ocean, the GDHA Working Group helped to ensure that a significant hydrothermal component became a part of the planned geological and mapping investigations.

#### **Arctic Ocean Cruises:**

- a) Norway (Pedersen) ± Germany, Portugal, UK
- b) InterRidge: Japan (Tamaki), Russia (Cherkashov), USA, UK -Knipovich Ridge

- c) Germany (Devey), USA (Langmuir), UK - Gakkel Ridge area. A two ship programme extending the research area north from Spitzbergen into the high Arctic, summer 2001.

Iceland is a hotspot barrier with no deep sea connection between the North Atlantic and the Arctic. One current hypothesis is that the ordinary biomass normally living in the surface ocean is such an aggressive predator that there is no opportunity to establish communities which are vent specific so there is no connection in vent fauna from south of Iceland to north of Iceland. Therefore this is a key area for discovery of hydrothermal vents and investigations of the associated biology.

Other key areas that still need to be investigated over the next couple of years include the circum-Antarctic ridges and the southern Mid-Atlantic Ridge.

## SWIR (Southwest Indian Ridge) Working Group

**SWIR:** Catherine Mével (France), Chair

*Miquel Canals (Spain)*

*Chris German (UK)*

*Nancy Grindlay (USA)*

*Charlie Langmuir (USA)*

*Anton le Roex (South Africa)*

*Chris MacLeod (UK)*

*Jonathan Snow (Germany)*

*Kensaku Tamaki (Japan)*

*Cindy Lee Van Dover (USA)*

*What has been accomplished ?*

With two cruises scheduled, complete mapping of the SWIR axis should be accomplished by 2001

A systematic sampling along axis will be completed by 2001

Segment scale investigations: TOBI, UK magnetic/tectonic interactions and Shinkai dives

Detailed geological investigation of one specific area, Atlantis bank. A precise map of the sea floor provides information on depths. A lot of data is available on this area with a new proposals to continue drilling to look at lateral viability of the sea floor. It is an international: Japan, Canada and UK but independent research effort

*What is still to do?*

We have not located an active hydrothermal field but evidences for hydrothermal activity in the area was collected during the FUJI cruise 1997:

- nephelometry anomalies
- dead chimneys

Water column sampling is required to better constrain the possible location of an active site. Biology is still completely unknown in this area. Sampling programmes need to be organised.

Some evidence exists for hydrothermal activity on the southern bank of the CIR and a search should be concentrated in this area.

Crustal structure and lithosphere thickness also require investigation. A cruise has been proposed to carry out this work but it has not yet been scheduled.

*Proposed cruises*

Detailed studies at segment scale to better understand the processes of magma delivery in a very slow spreading and cold environment.

- seafloor observations and sampling: ROV, submersible

- off-axis studies (temporal variation). Available data show dissymmetry and variations between the two flanks of the ridge.

### What is happening on the SWIR ?

*Scheduled/approved cruises*

- water sampling and observations at the Rodrigues Triple Junction, looking for hydrothermal plumes/fields. R/V Kaire and ROV Kaiko, (Japan) PI : Jun Hashimoto,

August 2000,

- Geology and sampling of Atlantis II Bank. R/V Kaire + ROV Kaiko – PI : E. Kikawa (Japan) and H. Dick (USA)

September 2000,

- mapping and sampling the SWIR from 9 to 22° E. MAPRs . Additional proposal to deploy OBSs to be recovered one year later. December 2000 - January 2001 - PI : H. Dick and J. Lin (USA)

Cape Town 9<sup>th</sup> Dec. and returns 29<sup>th</sup> Jan to Durban

- SWIFT : mapping and sampling of the western portion of SWIR from 49° to 35°E

Marion Dufresne - PI : E. Humler (France + Denmark)

January 2001

- Detailed plume biogeochemical prospecting at the Rodrigues Triple Junction (and possible extension to the easternmost portion of the SWIR), approved but not yet scheduled.

PI : C. German and P. Tyler (UK)

likely in 2001

#### *Proposed cruises*

- seismic tomography of a segment : the Jourdannes mountain

TOM SWIR. PI : Daniel Sauter (France)

*Well evaluated, not scheduled yet*

France + Germany + Japan

- deployment an array of OBH/OBS in the region of oblique SWIR spreading

at 10°-15°E area. PI : Rob Sohn (USA)

By January 2001 a lot more data will be available and a workshop is proposed to synthesise current knowledge, identify areas both, disciplinary and geographically that require investigation and decide on future direction of research in this area. Additionally, the potential of deployment of instruments on the SWIR should be explored through consultation with C. Fox.

## **Meso-Scale Studies:**

### **4-D Architecture Working Group**

**4-D Architecture of the Oceanic Lithosphere:** Jian Lin (USA), Chair

*Simon Allerton (UK)*

*Donna K. Blackman (USA)*

*Mathilde Cannat (France)*

*Jérôme Dymont (France)*

*Pascal Gente (France)*

*Kathryn M. Gillis (Canada)*

*Eulália Grácia (Spain)*

*Peter B. Kelemen (USA)*

*Lindsay M. Parson (UK)*

*Nobukazu Seama (Japan)*

*Martin C. Sinha (UK)*

*Maya Tolstoy (USA)*

Goal of the working group was to understand the evolution of oceanic crust in spatial and geological time. In the early 90's substantial amount of funding in a number of nations resulted in a great increase in our understanding of the structure of segmentation at ridges with different spreading rates. A very impressive length of the global ridge system has now been mapped in detail by multibeam bathymetry and surface ship gravity and magnetics. Some bottom geological data were also collected at spotted locations on ridges of various spreading rates. Seismic refraction and reflection data were also collected on a very limited number of ridge segments. There is continuous interest in the community to use submersibles and ROVs to obtain geological data. With the help of the ODP Program Planning Group (PPG) on "Architecture of Oceanic Lithosphere", several drilling proposals were submitted to the ODP to drill oceanic crust in the Atlantic (both, in the 15°20'N area and sites of "megamullion" detachment faults), the "deep hole" site in the Pacific, and deep drilling near the 735B hole in the SW Indian Ridge. A couple of these proposals are likely to be scheduled for drilling before the current phase of ODP ends in 2003. The ODP PPG on "Architecture of Oceanic Lithosphere" has achieved its goal and was recently dissolved.

There is a strongly increasing momentum in the international community for looking at hotspot-ridge interactions and while the role of spreading rate is now well documented, due to the efforts in the early 90's, spreading rate is only one of the geological variables in this process. Variable magma supply is very important and hotspot-ridge interactions focus on one aspect of the magma supply issue. This is a relatively new problem that is attracting strong interests in the community and

requires an increase in information exchange at international level, coordination of funded proposals, and planning of new programs. Of the 48 major hotspots in the world 18 of them are present right on, or very close to the ridge axis.

The InterRidge database on “hotspot-ridge interactions” is up and running and, currently, it is the only such database available to the international community. The database contains over 250 references and contributions as well as the use of the database will be strongly encouraged.

US activities include RIDGE workshop on “Physical and Chemical Effects of Mantle Plume-Spreading Ridge Interactions” June 26-28, Troutdale, Oregon and recent seismic/petrology cruises at the Galapagos. France, UK and India all have funded projects scheduled for the near future.

InterRidge should serve as a contact point between the PIs of national projects.

InterRidge Theoretical Institute on “Thermal Regime of Ocean Ridges and the Dynamics of Hydrothermal Circulation” is planned for either Spring or Fall of 2002, Italy. The planning committee consists of C. German (SOC, UK), J. Lin (WHOI, USA), M. Cannat (CNRS, France), A. Fisher (UC, Santa Cruz, USA), R. Tribuzia (Univ Pavia, Italy), and A. Adamczewska (InterRidge, Japan). R. Tribuzia offered to run the field trip associated with the IRTI.

Sine the formation of the 4-D Architecture Working Group in 1994 the aims outlined in the 4-D Architecture Workshop Report (Boston, MA, USA) have been largely addressed and as a result of the outlined research plan our understanding in this area has greatly improved. Consequently it was proposed that this working group has achieved its goals and will now be dissolved. Planning the 2002 InterRidge Theoretical Institute on “Thermal Regime of Ocean Ridges and the Dynamics of Hydrothermal Circulation”, together with the InterRidge GDHA WG, will be the last action item of the 4-D Architecture WG.

A new working group “Hotspot-Ridge Interactions Working Group” will be formed with Jian Lin as the chair and a new research plan will be formulated to assist and direct global research in understanding these new and much less known aspects of ridge interactions.

## Back-Arc Basin Working Group

**Back-Arc Basin Database:** Hiromi Fujimoto and Jean-Marie Auzende, Co-Chairs

*Philippe Bouchet (France)*

*Jean-Luc Charlou (France)*

*Katsunori Fujikura (Japan)*

*Eulália Grácia (Spain)*

*Peter M. Herzig (Germany)*

*Roy A. Livermore (UK)*

*Steve D. Scott (Canada)*

*Robert J. Stern (USA)*

*Brian Taylor (USA)*

Considering that many research cruises have been carried out independently in back-arc basins, the WG planned to begin compilation of cruise information and topographic data. The co-chairs sent a letter to key scientists asking for collaboration in compilation work but received limited response, probably because the goal was not clear. There should be some standard model. Thus, ORI has recently listed up about 30 cruises carried out by Japanese vessels and started compilation of a database following the format of the home page of the RIDGE (USA) program. This is a contribution to the InterRidge Global Database WG as well as to the BAB WG; about half of the cruises were in the back-arc basins. The database will consist of 4 classes of data: cruise information, track chart, topographic map, and digital data. The proto-type of the database will be completed soon and will be shown on the InterRidge home page. Then the BAB WG can ask related scientists again for collaboration.

InterRidge Theoretical Institute on BAB was proposed by the BAB WG co-chairs and the possibility was discussed during the IR-STCOM. However, because so many InterRidge-related symposia and workshops are planned in the near future, the plan will be examined again at the next IR-STCOM. Considering that H. Fujimoto, a BAB WG co-chair, will rotate off the steering committee as a member from Japan, the InterRidge chair proposed Dr. Masataka Kinoshita, Tokai University, Japan, as the new co-chair, and this proposal was accepted by the STCOM. M. Kinoshita is the chair of the SEAS office, and will be a good person to be in charge of coordination of research programs in the western Pacific.

A joint meeting with SEAS group on studies of the western Pacific BAB was carried out in late June during the WPGM 2000 in Tokyo. About 30 scientists joined the meeting and contributed their opinions on some 10 presentations. Heated discussions were focused on the junction between Taiwan and the Okinawa Trough. InterRidge chair, coordinator, and BAB WG co-chair introduced InterRidge activities.

**Active Processes:**

**Biology Working Group**

*Biological Studies at the Ridge Crest:* Lauren Mullineaux (USA), Chair

*Paul R. Dando (UK)*

*John R. Delaney (USA)*

*Daniel Desbruyères (France)*

*David R. Dixon (UK)*

*Sergei S. Drachev (Germany)*

*Aline Fiala-Médioni (France)*

*Charles R. Fisher (USA)*

*Has Fricke (Germany)*

*Françoise Gaill (France)*

*Jun Hashimoto (Japan)*

*S. Kim Juniper (Canada)*

*Richard A. Lutz (USA)*

*Douglas C. Nelson (USA)*

*Suguru Ohta (Japan)*

*Anna-Louise Reysenbach (USA)*

*Karl O. Stetter (Germany)*

*Verena Tunnicliffe (Canada)*

Summary of progress of Biology Working Group Objectives from the 1995 Rutgers Workshop

International sample exchange agreement - despite continued encouragement by the InterRidge office for submission of sample collections to be posted on the InterRidge web site this initiative has not been very successful and very few researchers have contributed their collections.

Ridge crest biology directory was merged with the main directory

Bio-Box: While Craig Carry got some funding for the US and Verena Tunnicliffe agreed to take on the project internationally, InterRidge has no means to facilitate nor fund this project. Despite the lack of oversight, however, biological specimens have been collected from recent exploratory cruises. Furthermore, the vent fauna handbook has been widely distributed on research vessels and is available for users.

The International vent biology symposium in Madeira, Portugal (1997) was very successful. The proceedings were published in Cahiers De Biologie Marine Vol. 39:3-4.

The 'Species identification manual' for deep-sea hydrothermal vent fauna has also been a great success and has been widely used by scientists on cruises.

Demarcation of sanctuaries and collection areas. Substantial amount of time has been invested in setting up web pages on the InterRidge web site to create an easily accessible source of information about long term monitoring and collection sites. There is no way of enforcing or protecting individual scientists' study sites but it does provide a centralised place where long term experiments can be posted and thus facilitate awareness.

One by product of this incentive was the EOS article about the value of sanctuaries, continued research and sustainable use of these unique habitats. Additionally, it was an effort to encourage coordination of international efforts in multi-use working areas; another outgrowth of this project is the Vent Ecosystem Management Workshop this Fall.

An initiative for international calibration of techniques and experimental protocols has been revived and a workshop is planned for later this year (see Dorsales update).

Coordinate collaborative efforts to maximize efficient use of international resources. This issue has been addressed indirectly by including the world cruise schedule for planned and scheduled ridge related cruises in the IR news and now on the IR web site to assist in exchange of information.

IR office continues to maintain databases of international ridge-crest efforts, including international listing of seagoing capabilities and standardized national biological databases.

Vent ecosystem management

The Mir dives at the Rainbow vent site in Fall 1999 sparked a flurry of activity within the international community of vent biologists because they had been advertised in tourist trade magazines and web sites as part of a 'tourist' cruise organized by Zegrahm Tours. Many (perhaps all) of the tourist participants were members of the "Explorers Club" which was started by Sir Edmond Hilary. The Tour operators were unwilling to give specific information on proposed dive activities (in fact, they provided misinformation to InterRidge and US Ridge representatives). Our information on the cruises came from the Expedition Leader (Anatoly Sagalevitch) and one of the 'Explorers' who contacted Daniel Desbruyeres for scientific information on the Rainbow site. From the Explorers Club member we learned that scientific sampling was carried out at the sites during the dives. However, unlike what was thought initially, the pilot (and two observers) dived with a collecting



protocol generated by scientists on board the Akademik Keldysh (*check spelling*). It appears that the activities during dives were not much different than those during standard Russian scientific expeditions. The tour group involved appeared to have little influence over what happened during the dives.

### Meetings

The awareness that the ocean bottom is becoming more accessible to human exploitation has lead InterRidge to take on an active role in becoming involved in examining the management and protection issues and problems that will need to be addressed in the future. The InterRidge Vent Ecosystem Management Workshop – Victoria, Vancouver Is. Canada (September 2000) will bring together Scientists and policy makers to address these issues.

The International Seabed Authority (ISA) is in the process of developing regulations for mining operations in international waters of sulphide deposits, gas hydrates and cobalt crusts. InterRidge representatives K. Juniper and C. German were present at the information gathering workshop, in Jamaica, June 2000 to increase awareness within the mining community about the unique biology present at hydrothermal vent sites and future needs for protection and management of these unique ecosystems.

The second International Deep-hydrothermal Vent Biology symposium will be held in Brest, France, October 2001.

### New Biology Working Group objectives

L. Mullineaux finished her term as Biology Working Group Chair. The Steering Committee selected K. Juniper and F. Gaill as the new Biology Working Group co-chairs from a list of nominees suggested by the Biology Working Group members.

Issues raised that should be included in the future mandate:

- I) Ownership rights - microbiology samples taken from water within one nation's jurisdiction and developed commercially by another nation. Biotechnology funding.
- II) STCOM responsibility to direct research - WG role to promote/direct research
- III) Proposal driven not necessarily the best as it represents individual interests. National representatives need to co-direct global interests
- IV) WG broaden to include a subsurface biosphere component (instead of simply microbiology to foster interdisciplinary research), include a representative from the field of flow chemistry.
- V) Global biogeography - problems that cant be solved at a national level - include bioeography of microbes within this field
- VI) Vent ecosystems management and conservation issues

## **Undersea Technology Working Group**

***Undersea Cables:*** Alan Chave (USA), Chair

Alan Chave (USA), Chair  
 John R. Delaney (USA)  
 Hiroyasu Momma (Japan)

M. Kinoshita (Japan)  
 Adam Schultz (UK)  
 Debra S. Stakes (USA)

Pascal Tarits (France)  
 H. Villinger (Germany)

There was some discussion about merging the Undersea Technology and the Event Detection and Response/Observatories WG but while there is some overlap in the two WG, the objectives of the two groups were deemed sufficiently different that the status quo will be maintained. See the DEOS update for information regarding recent advances in ROVs and AUVs.

## Event Detection and Response/Observatories Update

*Event Detection and Response and Observatories*: Chris Fox (USA), Chair

*Kyohiko Mitsuzawa (Japan)*

### VENTS Program

A collection of 12 papers presenting results from the 1998 Axial Volcano eruption has been published in two successive issues of *Geophysical Research Letters*, vol. 26, no. 23 and 24.

### SOSUS

U.S. Navy SOSUS continues to operate in the Pacific and the signals are routinely monitored by NOAA/PMEL for ridge activity on the Northeast Pacific spreading centres. An earthquake swarm from the Endeavour Segment of the Juan de Fuca Ridge was recorded from June 8-13, 1999 consisting of over 2600 recorded events. Sensors at the nearby hydrothermal vent field recorded significant increases in temperature and post-event water sampling showed significant changes in fluid chemistry. Results are in press in *Nature*.

The Atlantic SOSUS arrays are not currently being monitored for scientific studies, and several attempts to obtain funding to do this have failed. Another attempt has been submitted to the National Ocean Partnership Program.

### Autonomous Hydrophones

NOAA/PMEL continues to monitor the East Pacific Rise and Galapagos Ridge with 6 hydrophones from 8°N to 8°S. Instruments were upgraded in October 1999 to allow once-a-year servicing. An additional hydrophone will be added at 12°N 95°W in October 2000.

A six-mooring hydrophone array was deployed in the Gulf of Alaska in October 1999 for marine mammal acoustic studies. This array will provide increased accuracy in epicentre locations derived for the Juan de Fuca Ridge.

Discussions between C. Fox and various French scientists concerning putting a hydrophone array north of the Azores took place in Brest in late June, 1999. A plan was sketched out combining ocean hydrophones with coastal seismometers to measure t-waves in a manner similar to that done in French Polynesia by Jacques Talandier. No further activity.

### NOAA Acoustics Initiative

An initiative is being promoted within the U.S. National Oceanic and Atmospheric Administration (NOAA) to deploy a global scale acoustic monitoring system to evaluate ambient noise in the ocean and its effect on marine life. As part of this effort, submarine seismic and volcanic activity would be monitored on a global basis. Funding is being proposed to begin in October, 2001.

### New Millennium Observatory

The New Millennium Observatory (NeMO) at Axial Volcano on the central Juan de Fuca Ridge continues to be a major focus of the NOAA Vents Program. It is intended to be a multi-year investigation with many academic and Canadian collaborators. The goal of NeMO is to map the distribution of geo/hydro/bio environments and document perturbations to hydrological and biological systems caused by volcanic events. Real-time event detection from SOSUS will queue on-site AUV response and field investigations.

An experimental system to provide real-time video images from the seafloor to the internet via acoustic modem and satellite (NeMO-Net) was tested in 1999. Improvements are planned for 2000. Web site is available at: <http://newport.pmel.noaa.gov/nemo/realtime/>

2000 Cruises - The third year of NeMO observations at Axial Volcano

RON BROWN: June 29-July 18; ROPOS; NeMO-Net (Bob Embley, PMEL)

RON BROWN: July 20 - August 4; Water column surveys and sampling (CTD); recovery and deployment of moorings (Ed Baker, PMEL)

An educational outreach program is being conducted during the field investigations with a NeMO Web Page at: <http://newport.pmel.noaa.gov/nemo/>

## USA RIDGE

RIDGE2000 planning is underway including a large-scale integrated experiment. (To be discussed by US RIDGE representative).

The autonomous hydrophone array deployed in the North Atlantic between 15°N and 35°N in March 1999 (in collaboration with NOAA/PMEL) was serviced in March 2000 by the R/V Knorr. All six instruments had 100% data recovery. Analysis has begun at NOAA/PMEL to derive earthquake epicentres and search for volcanic seismicity. A web site has been established at: [http://newport.pmel.noaa.gov/geophysics/mar\\_seis.html](http://newport.pmel.noaa.gov/geophysics/mar_seis.html)

An NSF/RIDGE-funded expedition (D. Fornari, Chief Scientist) to ground-truth possible eruption sites on the EPR detected by the PMEL hydrophone array sailed in April-May 2000 on the Melville. Although fresh lavas were observed at the sites, their relation to recorded earthquake swarms could not be definitively determined. Further examination of the data may reveal more. A web site is posted at: <http://www.divediscover.whoi.edu/>

The USA RIDGE Program supports two observatory sites along the Juan de Fuca Ridge, one at Cleft Segment and the other at Endeavour Segment. Complete documentation of these efforts is available at: <http://ridge.oce.orst.edu/observatory/observatory.html>

A Juan de Fuca Results Symposium was held on November 7-9, 1999 in Seattle, USA to discuss the results of the past decade of research in the northeast Pacific. Conveners were Ed Baker, John Baross, Jill Karston, Bob Dziak.

## U.S. National Academy of Sciences

An Ocean Studies Board workshop entitled "Symposium on Seafloor Observatories: Challenges and Opportunities" was held in Islamorada, Florida January 10-12, 2000. The resulting report will provide "a broad assessment of US scientific interest in seafloor observatories for earth and marine sciences in the next century." A complete write up can be found through the NAS web site at: <http://www4.nationalacademies.org/cger/osb.nsf>

## NePTUNE

The NOPP-sponsored NEPTUNE project is near issuing a final report on deploying a plate-scale cabled observatory in the northeast Pacific. The details of the project can be viewed at: <http://www.ocean.washington.edu/neptune/>

## Ocean Drilling Program

The ODP Long-Term Observatories Program Planning Group, co-chaired by Keir Becker and Kiyoshi Suyehiro, has submitted its final report and been disbanded by JOIDES.

The final report is available at: <http://vertigo.rsmas.miami.edu/ltoppg.html>

## MOMAR

The Monitoring the Mid-Atlantic Ridge (MOMAR) program is underway, with a follow up workshop planned for 2001. See the MoRMAR update.

## Japanese activities

JAMSTEC is operating three cabled seafloor observatories offshore Japan to monitor for tsunamis, seismics, heat flow, acoustics, video, ocean currents and hydrography. Sites include the Nankai Trough, Sagami Trough, and the Kurile Trench. JAMSTEC web site is located at: <http://www.jamstec.go.jp>

A Buoyed Satellite Seafloor Observatory is deployed across the Nankai Trough (on the down-going slab) to monitor tsunamis, seismics, heat flow, video, currents and hydrography. The observatory is augmented with ocean bottom seismometers. Data is delivered using pop-up telemetry buoys to INMARSAT-C.

The VENUS Project uses decommissioned submarine cables to establish observatory sites between Japan and Guam. An instrumented site exists at the Ryuku Trench near Okinawa with two additional sites planned between Okinawa and Guam. An OBS site is operational off the Izu Peninsula of Honshu.

## MOMAR

**MOMAR: Mathilde Cannat (France)**, Chair till 2nd workshop

*Pascal Tarits (France)*

*Pierre M. Sarradin (France)*

*Miguel Miranda (Portugal)*

*HIP representative (Portugal)*

*Ricardo Santos (Portugal)*

*David Chadwell (USA)*

*Alan Chave (USA)*

*Charlie Langmuir (USA)*

*Chris Fox or Maya Tolstoy (USA)*

*David Dixon (UK)*

*Adam Schultz (UK)*

*Peter Halbach (Germany)*

*Kim Juniper (Canada)*

*Masataka Kinoshita (Japan)*

The project is taking some time to develop. Regional and local characterization of the observatory sites is making progress, particularly in the field of biology. Geophysically-oriented observatory proposals, however, have not yet been funded. An electromagnetic survey of Lucky Strike volcano was, however, carried out during the winter of 1999 (PI : M. Sinha).

Following is an update on the status of the various MOMAR-related proposals:

MAGIA: EEC proposal submitted in 1999 to:

I) survey seismicity in the Azores and

II) deploy seismometers to study the deep structure of the Azores hotspot. The proposal was not funded but will be resubmitted in 2000.

VENTOX: Life in toxic environments. Funded in 1999. Not directly related to monitoring but will provide important background information about the biology in the ridge vents that can be used as foundations for future monitoring studies as part of the MOMAR project. Important for the future of biological monitoring in the area is the funding of a land based laboratory near the vent sites, at Horta (Azores). Also important is the funding of tool development: *in situ* analysis of physio-chemical parameters and pressure chambers for *in vivo* biological studies.

The ATOS diving cruise (Nautille, most probably scheduled in 2001) is part of the VENTOX project

IRIS: ROV (Victor) cruise to Rainbow site and southern extremity of the Lucky Strike segment. Most probably scheduled in 2001.

Lucky STAR: seismic reflection-refraction study of Lucky Strike segment and 'Jussieu Plateau'. Not funded in 1999 but will be resubmitted in 2000. This project is not directly related to monitoring but rather to increasing the general knowledge of the area.

DYNAMO: geodesy and deformation monitoring and Lucky Strike segment. Not funded in 1998. This proposal was to do fine scale bathymetry and simple imaging use the data to install platforms on which to deploy geodesy instruments. Technological solutions to be re-evaluated. Finding the appropriate tools to carry out this work is difficult because the spreading rate is slow.

NSF proposal, PI : C. Langmuir: petrological sampling of Lucky Strike and FAMOUS segments. Not funded in 1998 but has been resubmitted in 2000 and the decision is pending.

Also to be noted:

- 2 new research vessels soon to be operated by Portuguese navy
- JIFF proposal for seafloor monitoring platforms (UK)
- the second MOMAR workshop to be held in Fall 2001, Azores to reassess the situation

Summary of National representatives in the IR Working Groups

In accordance with the InterRidge Science Plan the working groups maintain a spectrum of representatives from the member nations and from different disciplines. The number of representatives in each of the Working Groups are summarised in Table 1.

**Table 1.** National representation on the InterRidge working groups.

	Arctic	SWIR	GDD	GDHA	4D	BAB	Biology	Tech.	EDR/Obs	Total
France	1	1	1	2	3	3	3	1		15
Germany	4	1	1	1		1	3	1		12
Japan	1	1	1	1	1	2	2	2	1	11
UK	1	2	1	2	3	1	2	1		13
USA	4	3	1	5	4	2	6	3	1	29
Canada	1		1	2	1	1	2			8
Italy			1							1
Norway										
Portugal										
Iceland	1									1
India										1
Korea				1						1
New Zealand				1						1
Norway	1									1
Russia	1									1
South Africa		1								1
Spain		1	1	1	1	1				5
Sweden			1							1
Total:	15	10	9	16	13	11	18	8	2	100
Nations:	9	7	9	9	6	7	6	5	2	

## Actions List

The Steering Committee has identified the following key issues that need to be addressed.

### IR Office

- Organise next decade planning group (with communication with ST committee members) before the next STCOM.
- Get alias for IR homepage
- Produce IR pamphlet for distribution

In accordance with the InterRidge Programme Plan that “... No individual member, whether a National Correspondent or otherwise, may serve more than four consecutive years. ....”, a number of new representatives to the STCOM are expected to be selected for next year from several Member Nations.

- One new National representative for France will be appointed before the next STCOM meeting.
- Since no representatives were present from, either Germany nor Portugal it was not possible to discuss future representation for either of these nations. P. Dando and F. Gaill will both be visiting Portugal and will take up the issue of National representative on the IR Steering Committee with the Portuguese Ridge scientists. The IR Office will contact the Portuguese and German representatives and ask for new members to be nominated before the next Steering Committee meeting.
- Tamaki/Adamczewska will attend the WPGM meeting (June 27-30, 2000, Tokyo) to meet with Taiwanese scientists and discuss increasing the mailing list subscription from Taiwan and Taiwanese membership with IR.
- Tamaki/Adamczewska will discuss with Korean scientists the possibility of Associate membership during the WPGM meeting (June 27 –30, 2000, Tokyo).
- Tamaki will visit China in late October, 2000 to meet with Wang Zhihong, the Chinese National Correspondent and other Chinese Scientists, to discuss the possibility of China becoming an Associate or Principal member .
- Adamczewska participate in the DeRidge annual meeting (6-7 July, 2000, Germany) to discuss Germanys membership and representation at the Steering Committee.
- Adamczewska will contact Dave Christie about attending the SCOR meeting (12-15 October, 2000, Washington DC) to present IR activities
- Ridge scientists from China, Korea and Taiwan will be invited to join the InterRidge cruise to the Knipovich ridge in September this year

### Dorsales,

- A new French representative will be select to sit on the Steering Committee from 2001

### USA-DEOS

- Chave will assist in enhancing the WG homepage with the updated information for ROVs and AUVs under development.
- Chave will provide info to the “Vessel and Vehicle” database with the links to relevant projects (NEPTUNE, DEOS, etc.)

### Global Digital Database WG

- The IR Office will design and construct a ‘portal’ page for the GDD WG to provide links to the MB data from different countries, through consultation with the WG Chair

### Global Distribution of Hydrothermal Activity WG

- InterRidge Office will create an interactive map so that entries in the Hydrothermal Vents database can be accessed by clicking on different areas of the world map.
- C. German will co-organise the “Thermal Regime of Ocean Ridges and the Dynamics of Hydrothermal Circulation” Theoretical Institute in 2002.

### SWIR WG

- C. Mével will start organising a SWIR workshop – tentatively scheduled for spring 2002
- R.K. Drolia will provide name of Indian member for the SWIR WG
- R.K Drolia will provide an article to next IR news to stimulate interest in CIR and Carlsberg Ridge

### 4-D Architecture WG

- At the STCOM meeting it was decided that this Working group has fulfilled its objectives and will now be dissolved. The members of the 4-D Architecture WG will be thanked for their involvement. As InterRidge Chair, K. Tamaki will send a formal letter of appreciation to each member of the dissolved 4-D Architecture WG. J. Lin will assist K. Tamaki in drafting the thank-you letter.
- K. Tamaki and J. Lin will invite representatives from member nations to become members of the new “Hotspot-Ridge Interactions Working Group”. The Steering Committee suggested the following members for the new working group: Graham (USA), Ito (USA), Lin (USA, Chair), Cannat (France), Dymont (France), Bourdon (France), MacGregor (UK), Seama (Japan), Hoernle (Germany), Drolia (India), Gracia (Spain), Freire Luis (Portugal).
- J. Lin, as the chair of the new Hotspot-Ridge Interactions Working Group, will formulate a research plan with help from the new WG members.
- J. Lin will co-organise the “Thermal Regime of Ocean Ridges and the Dynamics of Hydrothermal Circulation” Theoretical Institute in 2002.

### Back Arc Basins WG

- IR Chair will invite Masataka Kinoshita from the Tokai University, Japan to become the new co-chair for the BAB WG
- Fujimoto will help to coordinate restructuring of the membership of the WG with the Chairmen (M. Kinoshita and J –M Auzende).
- Continue to improve the “Hotspot-Ridge Interactions” web page, making it a user-friendly information centre through links to meetings, cruise schedules, cruise reports, submitted and published papers etc.

### Biology WG

- The new co-chairs (K. Juniper and F. Gaill) will renew the membership of the WG
- K. Juniper and F. Gaill, will write a draft document for expectations of the new WG
- K. Juniper and C. German will attend ISA Workshop (June 27, 2000, Jamaica). IR office will prepare IR Pamphlets before the workshop
- IR office will continue to encourage submissions to the international sample exchange data base
- Include a flag in the next IR news to encourage submissions for sanctuaries.
- The new Biology Working Group should hold a workshop, probably during the 2<sup>nd</sup> Hydrothermal Vent Symposium in Brest, 2001 to formulate new directions and visions for biological research

### Undersea Technology

- IR Office will provide assistance in updating the homepage
- Increase the membership of the working group to include a representative from IFRAMER

### Event Detection and Response/Observatories WG

- M. Cannat and C. Fox will jointly organise EDR/Observatory WG and MOMAR committee, and organize the 2<sup>nd</sup> MOMAR Workshop (2<sup>nd</sup> half of 2001, Azores, Portugal)
- Increase the membership of the working group to include representatives from *e.g.* France, India, Portugal and UK

### MOMAR

- Encourage lobbying by European scientists from different countries, particularly Portugal to increase awareness about the importance of MOMAR.
- Obtain support for MOMAR from outside of Europe (C. Fox)
- Organize the 2<sup>nd</sup> MOMAR Workshop (Autumn of 2001 Azores, Portugal)

## Coordinator Update

### InterRidge Membership

India has upgraded its membership to an Associate Member of InterRidge in 2000. The Indian representative at the Steering Committee is Ranadhir Mukhopadhyay and the national correspondents for India are Sridhar D Iyer and Abhay V Mudholkar. China and the Philippines have joined as Corresponding members from 2000. Wang Zhihong is the National correspondent for China and Graciano P. Yumul, Jr is the national correspondent for the Philippines.

Currently there are 26 countries associated with InterRidge: 5 principal members (France, Germany<sup>1</sup>, Japan, UK and USA ), 5 associate members (Canada, India, Italy, Portugal and Norway) and 16 corresponding members (Australia, Brazil, China, Denmark, Iceland, Korea, Mexico, Morocco, New Zealand, Philippines, Russia, Spain, South Africa, Sweden, Switzerland and SOPAC).

M. A. Miranda, P. M. Herzig, M. Cannat, H. Fujimoto, L. Mullineaux and E. Sundvor have all finished their term as representatives on the InterRidge Steering Committee. Thank you all for your input, time and effort.

The new representative for Norway from 2001 will be Rolf Pedersen.

### InterRidge Meetings, Workshops and Cruises

#### Recent and Upcoming meetings

- InterRidge Steering Committee Meeting,  
*Woods Hole, MA, USA. 2-3 June, 2000.*
- InterRidge-Seas Joint business meeting at the Western Pacific Geophysics Meeting,  
*Tokyo, Japan. 28<sup>th</sup> June 2000,*
- Joint GSL/GSA/InterRidge Meeting: The Nature and Tectonic Significance of Fault Zone Weakening  
*Geological Society, Burlington House, London, UK, 8-9 March, 2000*
- InterRidge Workshop: Management and Conservation of Hydrothermal Vent Ecosystems  
*Institute of Ocean Sciences, Victoria, B.C., Canada, 28 - 30 September, 2000*
- The 2nd International Symposium on Deep-sea Hydrothermal Vent Biology  
*Le Quartz, Brest, France, 8-12 October 2001,*

#### *InterRidge Workshop: Management and Conservation of Hydrothermal Vent Ecosystems*

The initiative to hold the workshop was sparked by the announcement of tourist dive cruises to the Rainbow vent site in April 1999. Discussion initiated by the proposed vent tourism brought up the problem of how to manage multiple users and competing interests at an individual vent site. Since 80 % of vent fauna are known from only 1 site and over-exploitation by scientists or mining can cause a great loss in biodiversity of organisms which have adapted to conditions normally considered to be highly toxic. The workshop is designed to discuss and publicise the issue and to try to develop a code of ethics, or code of responsibilities that could be used to help resolve potential conflicts as well as to consider potential management solutions for the future.

The InterRidge Office is handling administrative matters and logistical organisation of the Workshop at IOS, Canada. The organisers of the workshop are Paul Dando and Kim Juniper.

The organising committee for the workshop was created with representatives from marine policy, and conservation agencies as well as having a good national balance.

---

<sup>1</sup> Due to changes in the funding situation, Germany will be unable to pay the Principal membership in 2000. However, Germany continues to be interested in being a full member of InterRidge and expects to pay the full Principal contribution next year.



**Organising committee:** Paul Dando (UK); Kim Juniper (Canada), Craig Allen (USA), Doug Andrie (Canada), Kevin Conley (Canada), Daniel Desbruyeres (France), Mauro Fabiano (Italy), Yves Fouquet (France), Lyle Glowka (Germany), Lauren Mullineaux (USA), Ricardo Serrao Santos (Portugal), Andrew Solow (USA), David Vousden (USA)

**Objectives of the meeting:**

1. To discuss the effects of various uses of vent ecosystems - i.e., what damage occurs?
2. To establish the rationale for why it is important to preserve vent ecosystems
3. To identify specific, uniquely sensitive, sites
4. To develop general recommendations for management
5. To draft specific recommendations for specific sites at risk
6. To make recommendations for conservation research (modelling? exploration?)

*The 2nd International Symposium on Deep-sea Hydrothermal Vent Biology*

With the escalating increase in biological research carried out on deep sea hydrothermal vents an international meeting to facilitate exchange of information has been proposed by Daniel Desbruyeres.

The organizing committee, chaired by Daniel Desbruyeres will include, D. Prieur (Brest France), F. Lallier (Roscoff, France), Agnieszka Adamczewska (InterRidge Japan), M. Biscoito (Madeira, Portugal) and S. Kim Juniper (Montreal Canada). The scientific committee will be chaired by Prof. V. Tunnicliffe (Canada) a provisional list of the following members has been suggested: Paul Dando (U.K.), Françoise Gaill (France), Suguru Ohta (Japan), Didier Jollivet (France), Lauren Mullineaux (U.S.A.), Adele Pile (Australia), Anna-Marie Reysenbach (U.S.A.), KT Scott (U.S.A.), Michael Tuerkay (Germany Allemagne),

**The following session topics have been proposed:**

- Ecology, micro-distribution, temporal evolution,
- Interactions of organisms/habitat,
- Physiology - Adaptation,
- Microbiology of symbioses and free-living bacteria,
- Biogeography, evolution, genetics and taxonomy,
- Cold seeps communities

Future meetings, in the planning stages

- IR Steering Committee meeting 2001  
*Kobe, Japan 1-2 June 2001*
- InterRidge MOMAR Workshop 2001  
*Azores, Portugal, 2001*
- InterRidge Theoretical Institute: Thermal Regime of Ocean Ridges and the Dynamics of Hydrothermal Circulation  
*Pavia, Italy, 2002*

*InterRidge Steering Committee meeting*

The next Steering Committee meeting will be held at the Department of Earth & Planetary Sciences, Kobe University, Kobe, Japan. The meeting will be hosted by Dr. Nobukazu Seama in Kobe, Japan, Friday 1<sup>st</sup> – Saturday 2<sup>nd</sup> June. An extra day will be set aside to provide an opportunity for the new Working Group to meet to start formulating the InterRidge project plan for the next decade.

*InterRidge MOMAR Workshop 2001*

The EEC proposal written to fund part of the first MOMAR workshop also includes support for a second workshop. The contract has a duration of 36 months, meaning that the 2<sup>nd</sup> workshop will need to take place before Nov. 2001, in the Azores, Portugal. The organisation of the workshop is underway.

*IRTI : Thermal Regime of Ocean Ridges and the Dynamics of Hydrothermal Circulation*

To be held in Pavia, Northern Italy,

Proposed Dates: April-May or September 2002

**Organizing Committee:**

Chris German, Southampton Oceanographic Center, UK

Jian Lin, Woods Hole Oceanographic Institution, USA

Mathilde Cannat, Univ Pierre et Marie Curie, France

Andy Fisher, Univ California, Santa Cruz, USA

Riccardo Tribuzio, Univ Pavia, Italy

Agnieszka Adamczewska, InterRidge Office, Japan

The proposed structure for the IRTI is two days of short courses and one and a half days devoted to a workshop, followed by a fieldtrip to the northern Apennine ophiolites.

The topics covered during the short course section of the IRTI will be:

- Geophysical Constraints
- Morphology & Rheology
- Modelling the Thermal State of Ocean Crust
- Petrological (hard-rock) Constraints
- Constraints from Vent-Fluid Compositions
- Constraints from Vent-Field Distributions
- Modeling Hydrothermal Circulation in the Crust
- Petrological (Hydrothermal Alteration) Constraint
- Thermal Observations

The outline for the workshop will be worked out in the near future.

## InterRidge WWW Pages

In this age of technology the Internet has become an important means for 'instantaneous' information transfer to all corners of the world. The InterRidge office maintains a web site containing several hundreds of pages.

All the web pages have been transferred to the Tokyo server and we have redesigned the InterRidge home page. The basic menu structure has been retained but the menus are now grouped into three main categories: Information, Activities and Databases. There a number of new features on our website, including

- the latest Cruise schedule, listing ridge related cruises.
- a short introduction to InterRidge itself in the 'About us' menu
- two new databases that should be of interest to everybody:
  - I) a database containing the locations of hydrothermal vent sites along ocean ridges around the world and
  - II) a "reference search" database containing close to 1000 references concerned with all aspects of Ocean Ridges.
- A brief summary of the features found on the InterRidge website can be found in the 'News' section

The statistics for the monthly visitation to the InterRidge web site are shown in Figures 1 and 2. The counter used in Tokyo is provides the total number of pages requested, rather than just access of the front homepage. Since a large proportion of the URLs provided bypass the IR homepage, the total access of pages provides a more informative way to assess the usage of the IR web site. For comparison, the total number of pages accessed in January and February will be directly comparable to the access rate in the previous months. In March 2000 the new homepage went live and was announced via a broadcast to the IR electronic mailing list. As a result the access rate for the IR web site almost doubled during that month. From April the IR web site access decreased but remained above that prior to the announcement of the new IR homepage.

As usual the national, working group and IR Office updates published in *InterRidge News* are also posted on the web site, as are all the InterRidge reports. Additionally, the entire InterRidge News 9.1 issue is now available as a set of 3 downloadable PDF files using AcrobatReader 4.0.

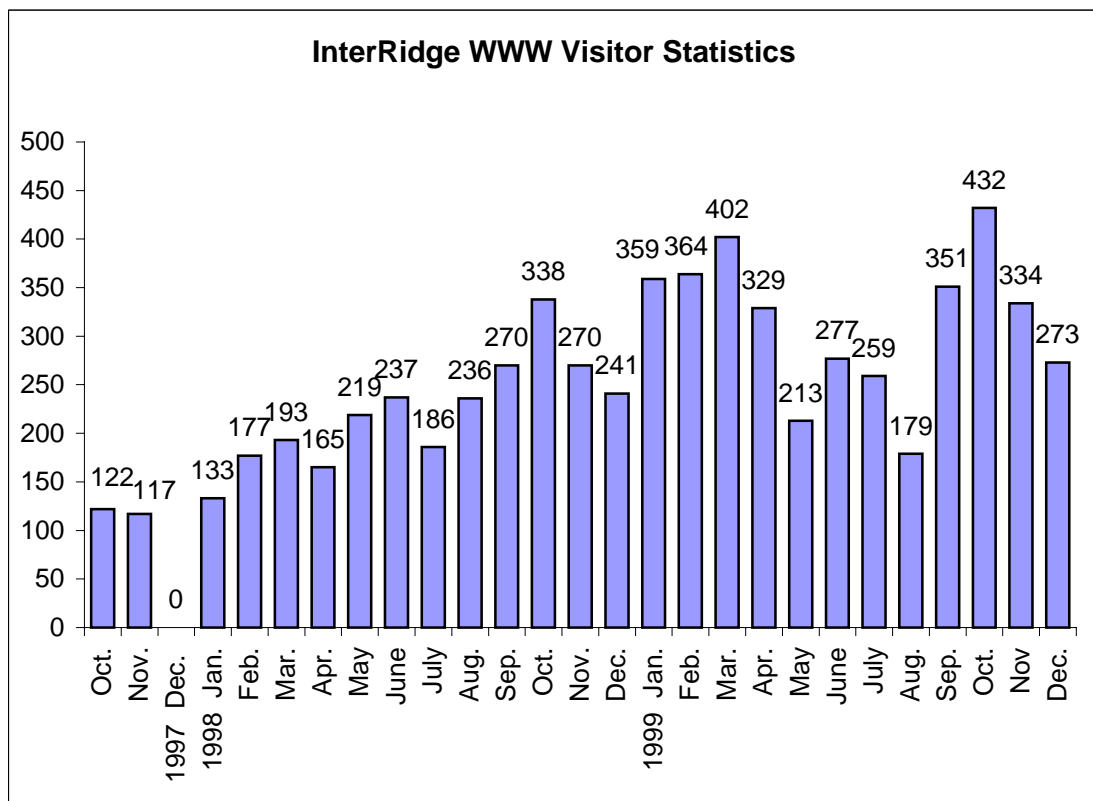
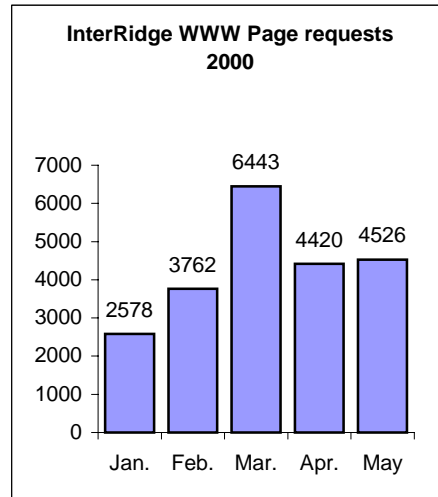


Figure 1. InterRidge WWW Visitor Statistics, October 1997- Dec 1999.



**Figure 2.** Total number of pages requested from the IR website, between January to May 2000.

## InterRidge Publications

### Summary of Publications in 2000

- Extra reprints (200 copies) of the Arctic Report: Mapping and Sampling the Arctic Ridges: A project Plan, Dec. 1998
- *InterRidge News*, vol. 9, no. 1, pp. 56, April, 2000
- InterRidge Pamphlet – (2000 glossy colour copies)
- Steering Committee Report – 2000

### *Publications planned for 2000*

- *InterRidge News*, vol. 9, no. 2
- Management and Conservation of Hydrothermal Vent Ecosystems Workshop report.

### InterRidge Pamphlet

In an attempt to boost awareness of InterRidge activities the InterRidge office designed a glossy colour pamphlet. The suggestions made by the Steering committee for improvement of the initial design were incorporated prior to printing. The IR pamphlet provides contact details for the IR office as well as information about general membership and information distributed via the InterRidge web pages. Copies of the pamphlet were distributed to the Steering committee members as well as the national correspondents.

### InterRidge News

The *InterRidge news* remains the primary means of communication with the Ridge Community. Currently over 2600 people receive this publication. The entire issue of IR News 9.1 (spring 2000) has been made available in downloadable PDF format on the IR web pages. Subsequent issues of *InterRidge news* and other InterRidge publications will, from now on, be made available as PDF files from the InterRidge website. While the costs of printing and postage of *InterRidge news* comprise over 12% of the budget, *InterRidge news* is an important means of providing the most recent and up to date research articles to scientists without easy access to the web. The general feed back is that the research articles but also the calendar of international meetings and cruises schedule are the most valuable information distributed via the *InterRidge news*. A breakdown of the subject and nationality of the articles and updates that have appeared in *InterRidge News* is given in Tables 2 and 3. A break-down of how many people receive *InterRidge News* on a national basis is provided in Table 4.

Articles published in *InterRidge News*

**Table 2.** Classification, by working group and nationality, of all the articles published to-date in *InterRidge News*.

	<i>InterRidge News</i> Year volume and issue															Total	% Total	
	'92	'93 v2		'94 v3		'95 v4		'96 v5		'97 v6		'98 v7		'98 v8				'00
	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2			1
<b>Working group</b>																		
Arctic	1	1		1				1	1	1			1	1	2		8	8
BAB	3	2				2		1			2		1	2	1	1	13	12
Biology				1	2	1	2	1	3	1	2	4	3	1	3	3	21	19
Cables																	0	-
EDR/Obs.						1				2		1		2			6	7
Global																	0	
Digital DB																		-
GDHA					1				1	1		1	1		1		5	5
SWIR				1	2	2	2	1	1		1	1	1	1			13	13
4D						2		2	1	5	3	2				2	15	14
Architecture																		
Miscellaneous	1	3		2	4	2	2		2				4	3	2		23	22
Articles per issue:	5	6	0	5	9	10	6	6	9	10	8	9	11	10	9	6	104	
<b>Country**</b>																		
France	1	1		2	3	2	1	3	4		2	2	3	1	1	1	25	27
Germany	1	1		1		3	1			1	2		1	2	3		13	13
Japan		1		1	3	1					1	1	2	1	1	2	11	11
UK				1	2		1					1	1	1		1	7	6
USA	2	2				1	3		3	7	1	3	2	3	2	1	24	23
Canada				1	1				1								3	3
Italy																	0	
Norway								1		1			1		1		3	3
Portugal													1		1		2	2
Australia	1	1															2	2
Brazil																	0	-
Denmark																	0	-
Iceland																	0	-
India					1					1		1					3	3
Korea											1						1	1
Mexico								1									1	1
New															1		0	-
Russia											1			1		1	2	2
South Africa							1										1	1
Spain						1				1							2	2
Sweden																	0	-
Switzerland																	0	-
Articles per issue:	5	6	0	5	9	10	6	6	9	10	8	9	10	10	9	6	104	

\* Classified by subject matter

\*\*According to affiliation of the first author

Updates published in *InterRidge News*

Table 3. Classification, by working group and nationality, of all the updates published to-date in *InterRidge News*.

	<i>InterRidge News, year, volume and issue</i>																Total	% Total	
	'92		'93 v2		'94 v3		'95 v4		'96 v5		'97 v6		'98 v7		'98 v8				'00
	1	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2			1
<b>Working group</b>																			
Arctic													1	1	1			3	10
BAB													1				1	2	7
Biology							1			1		2				1	2	7	25
Cables											1	1						2	7
EDR/Obs.												1	1					2	7
Global										1			1					2	
Digital DB																			7
GDHA							1						1		1			3	10
MOMAR													1	1	1			3	10
SWIR					1		1			1			1					4	14
4D Architecture															1			1	3
Updates per issue:	0	0	0	0	1	0	3	0	0	3	1	8	5	4	1	3		29	
<b>Country</b>																			
France	1				1	1	1	1		1	1	1	1	1	1	1		11	10
Germany		1			1	1	1	1	1	1	1	1	1				1	12	11
Japan	1	1			1		1	1			1		1		1	1		9	8
UK	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	15	14
USA		1			1	1	1	1	1	1	1	1	1	1	1	1	1	14	13
Canada		1			1	1	1	1		1	1	1	1	1	1	1	1	12	11
Italy													1					1	1
Norway											1							1	1
Portugal	1												1					2	2
Australia					1				1									2	2
Brazil											1							1	1
China																	1	1	1
Denmark															1			1	1
Iceland													1					1	1
India							1			1						1	1	4	4
Korea	1	1							1		1		1			1		6	5
Mexico		1							1									2	2
Morocco																1		1	1
New Zealand													1					1	1
Russia		1			1								1		1			4	4
South Africa										1								1	1
Spain	1						1				1							3	3
Sweden								1		1								2	2
Switzerland											1							1	1
Updates per issue:	6	8	0	4	7	6	8	9	4	8	10	11	6	6	8	7		108	

## InterRidge Budget

The InterRidge budget for 2000 is outlined below. Overall the costs for salaries, and office expenses are similar to those in Paris. The Coordinator salary is only 2% higher than in Paris. Germany is not expected to raise enough funds to pay full Principal membership fee this year and so despite the fact that India has joined InterRidge as an Associate member from this year, the annual budget is expected to decrease in 2000. As a result, of a decrease in the income for this year, the percentage of the budget devoted to the annual salaries increased from 68% in 1999 to 69% of the total budget in 2000. The post-doc salary, which had not been utilized while the office was hosted in Paris, will remain at Jussieu. The InterRidge accounts have not yet been finalised in Paris, but it appears that there is a surplus which will be transferred to the Tokyo office later this year.

The combined travel expenses, for the Chair and Coordinator went up by 65% from last year. From Tokyo the average cost per trip is 40% higher than those from Paris. Expenses associated with publishing and postage of the InterRidge News are very comparable to the costs in Paris. The general cost of printing in Tokyo is higher and the estimated costs for printing reports during 2000 is more than 2.5 times greater compared to last year. The estimated expenditure of the InterRidge Office for 2000 is close to the annual budget and overall is only 8% higher than in 1999.

### InterRidge Income : National Contributions 2000

	Yen	Dollars *
<b>PRINCIPAL MEMBERS</b>		
Japan	4,308,000	40,000
France	2,154,000	20,000
UK	2,154,000	20,000
USA	2,154,000	20,000
<b>ASSOCIATE MEMBERS</b>		
Canada	538,500	5,000
Germany	538,500	5,000
Italy	538,500	5,000
Norway	538,500	5,000
Portugal	538,500	5,000
India	538,500	5,000
<b>Total</b>	<b>14,001,000</b>	<b>130,000</b>

\* Assumed \$1.00 = 107.7 Yen (25<sup>th</sup> May, 2000)

**Estimated InterRidge Costs 2000**

	EXPENDITURE (Yen)	EXPENDITURE (Dollars)*	% change	NOTES
<b>Salaries</b>				
Coordinator	5,250,000	48,747		
Assistants	1,500,000	13,928		Assistants started work in April
Post-Doc	3,000,000	27,855		
Subtotal	<b>9,750,000</b>	<b>90,529</b>	-3%	
<b>Travel &amp; Expenses</b>				
Chair (Woods Hole)				Chairman's air ticket is supported by InterRidge Japan
Travel	0	0		
Expenses	60,000	557		
Coordinator (Canada, Woods Hole, Germany, Canada, Washington DC)				
Travel	420,000	3,900		
Expenses	450,000	4,178		
Subtotal	<b>930,000</b>	<b>8,635</b>	65%	
<b>Meeting</b>				
Vent Workshop	323,100	3,000		
Subtotal	<b>323,100</b>	<b>3,000</b>		
<b>Reports</b>				
IR Pamphlet	115,000	1,068		1500 color prints
Vent Workshop Abstracts	10,000	93		
Vent Workshop Report	130,000	1,207		36 pages/500 prints
St. Committee Report	18,000	167		
Subtotal	<b>273,000</b>	<b>2,535</b>	279%	
<b>Office Costs</b>				
Telecommunications	150,000	1,393		
Printing IR News (2 issues)	850,000	7,892		
Postage IR News (2 issues)	1,000,000	9,285		
Postage non IR News	250,000	2,321		
Supplies	150,000	1,393		
Softwares	100,000	929		
Equipment	300,000	2,786		Notebook PC
Overhead	1,500,000	13,928		
Subtotal	<b>4,300,000</b>	<b>39,926</b>	9%	
<b>Total</b>	<b>15,576,100</b>	<b>144,625</b>	8%	



## “To Do” items from the 1999 Steering Committee Meeting

As a result of the rotation of the InterRidge office, the following "To do" items from 1999 were reviewed and determined to be either no longer relevant or had already been dealt with.

- **Matters arising:**

- AMORES experiments at Rainbow - Prof. Sagalevitch  
Daniel Desbruyères / Chris German

- **IR Steering Committee Membership:**

- Peter Herzig and  
- Miguel Miranda

- **Future meetings:**

- MAGMA proposal about a possible InterRidge meeting. Alan Chave and Catherine Mével

- **SWIR**

- Water sampling cruises and deep crustal experiments at SWIR.  
- Invite a seismologist to join the working group.

- **Arctic Oceans:**

- Second ship to accompany the *Polarstern* in 2001.  
- A Russian SOSUS array in the Arctic. –

- **Global digital database**

- SOPAC and MB data from this area C. Wilson and Philippe – no success  
- NOAA site with MB data - Chris Fox - URL  
- Find a new Indian representative for the working group.

- **4-D Architecture of the Oceanic Lithosphere**

- ODP PPG - Can the InterRidge working group help.  
- InterRidge concerned change in policy for PPGs to ODP SCICOM.

- **Event Detection and Response and Observatories:**

- Putting in an array on the SWIR - SWIR WG collaboration  
- Give feedback to ODP on the final report from the Long-Term Observatories Program planning Group.  
- Establish a connection to the Japanese EDR efforts.

- **MOMAR**

- M. Cannat and P. Tarits will promote the MOMAR project by visiting the EC administration in Brussels.  
- Chris Fox or Maya Tolstoy member of the committee?  
- Contact Miguel Miranda for a nomination from the Hydrographic Institute of Portugal.

- **ODP (Ocean Drilling Program):**

- Lauren will write something up about a possible SCOR working group on hydrothermal vent conservation issues and give it to Mathilde before the meeting in October.  
- Kensaku Tamaki will look into getting a liaison between InterRidge and the ODP SCICOM.

## InterRidge contacts with other programs

### ILP (International Lithosphere Program)

Harry Elderfield is the liaison between ILP and InterRidge. ILP held a Workshop on the Hydrogeology of the Oceanic Lithosphere after the 1998 Fall AGU meeting. The workshop has held in Santa Cruz and organised by Keir Becker, Earl Davis, Harry Elderfield, and Jon Martin, with invaluable local support by Andy Fisher. The Workshop was co-sponsored by JOI/USSSP.

#### Summary of Workshop Conclusions and Recommendations

- Significant advances have been made recently in approaching the overall goal of understanding the history of mass and heat transport through the oceanic crust.
- The most useful work has involved truly inter-disciplinary studies including geochemistry, geophysics, numerical modelling, and long-term observatories.
- Recent advances underscore both the pivotal role played by scientific ocean drilling in providing *in situ* samples and experimental capabilities as well as the emerging importance of including microbiology in crustal hydrogeological studies.
- Future work must be truly inter-disciplinary (i.e., spanning fields from microbiology to geophysics), and should generally focus on two approaches: (1) detailed studies at a few select sites to understand ocean crustal hydrogeological processes well, and (2) efficient reconnaissance surveys in "representative" but poorly understood settings, particularly in older ocean basin environments, to assess the levels of hydrologic activity and hence to improve quantitative estimates of global fluxes.
- The sampling and long-term sub-seafloor observatory capabilities represented in scientific ocean drilling are crucial to these future objectives. It is our hope that this report will be useful in planning hydrogeological drilling objectives in the ridge flank and ocean basin environments
- An electronic copy of the ILP Hydrogeology of the Oceanic Lithosphere Workshop Report can be obtained from the InterRidge Office on request.

### SCOR (Scientific Committee on Oceanic Research)

#### Report from the SCOR Steering Committee meeting in Goa, India

In October 1999, Cara Wilson, the previous InterRidge Coordinator, attended the SCOR steering committee meeting in Goa, India. While InterRidge has been affiliated with SCOR since 1997, the October 1999 meeting was the first time InterRidge was officially represented at a SCOR meeting. The venue of the meeting provided the opportunity to strengthen our connections with the Indian InterRidge community while simultaneously improving our contacts with SCOR.

One of the strengths of SCOR is their working groups to which they provide financial assistance to hold workshops. One of the motivations of attending the SCOR meeting was to find out more about their working groups to see if any of the issues that InterRidge is concerned with could be addressed through a SCOR working group. SCOR working groups are envisioned to deal, in a short time period, with a contemporary scientific problem and to produce a specific result - usually this has been a meeting or a book, although there has been a growing trend towards the result being a collection of white papers. The proposal for a new SCOR working group should include a realistic terms of reference covering the goals to be accomplished in a four year lifetime. The working groups should be comprised of a maximum of 10 people and should be well balanced internationally. Proposals dealing with hot new science will be favoured. The proposal deadline for new working groups is usually in July or August and decisions are made at the SCOR steering committee meeting in October.

In 1997 InterRidge submitted a proposal to SCOR for a new working group dealing with the issue of the exchange of biological samples. While they supported the concept they did not approve the working group as the problem was not truly scientific. Just prior to the SCOR meeting there was some discussion about whether the scientific issues underlying the upcoming InterRidge workshop on Vent Management would be appropriate for a SCOR working group. Cara Wilson talked informally about this idea to members of the SCOR steering committee. While the idea was not discouraged, it was thought

that the concept was partially outside of SCOR's agenda and that the proposal would be more likely to be accepted if it was financially co-sponsored by another organization.

As part of the SCOR meeting agenda Cara gave a brief presentation about InterRidge at the National Institute of Oceanography (NIO). She met with Ranadhir Mukhopadhyay and other ridge researchers at NIO to discuss the details of India joining InterRidge as an Associate member in 2000. It was agreed that India would have two national correspondents, one from each of their major oceanographic institutions - NIO and the Geological Survey of India. At the time of the meeting the Indian administration had already agreed to the financial responsibility of becoming an InterRidge Associate member and the agreement just had to be formalized. InterRidge's affiliation with SCOR required that the Indian National Science Academy (INSA) approve India's Associate membership with InterRidge<sup>ii</sup>. Both InterRidge and SCOR wrote letters to INSA supporting India's Associate membership with InterRidge.

## ODP/IODP (International Ocean Drilling Program)

Before the end of the ODP (September 2003), ridge related drilling legs will probably involve "Drilling Mantle Peridotite along the Mid-Atlantic Ridge from 14° to 16° N" proposed by P. Kelemen, J. Casey, and M. Cannat (proposal #525 that was highly ranked at the SCICOM in August 1999). Other ridge related active proposals are:

- "Quantifying the Processes of Oceanic Core Complex Formation" by D. Blackman, J. Karson, D. Kelley, K. Johnson (#512)
- "An *In Situ* Section of Oceanic Crust Spread at Superfast Rate" by D.S. Wilson, J.D. Alt, R.S. Detrick, P.A. Pezard (#522)
- "Exploring the Plutonic Crust at a Fast-Spreading Ridge: New Drilling at Hess Deep" by K.M. Gillis, R.B. Pedersen, J.H. Natland, P.B. Kelemen, H.J.B. Dick, B. Ildefonse, J. Miller, D.K. Smith (#551), and
- "735 Deep: The Nature of the Lower Crust and Shallow Mantle at a Slow-Spreading Ridge" by H.J.B. Dick, J.H. Natland, P.T. Robinson, E. Kikawa, J. Miller, C.J. MacLeod and R.A. Stephen (#535).

Currently the liaison activity between the ODP Science Committee and InterRidge is rather weak. K. Tamaki has made a request to the SCICOM chair to nominate a liaison member for InterRidge from SCICOM.

The Japanese riser drilling vessel is now under construction from 2000 and will be completed within 2002.

The IODP, which will succeed ODP, is scheduled to start in April 2003. The IODP is being shaped through the intensive efforts of STA (Science and Technology Agency of Japan) and NSF (National Science Foundation, USA). A Planning Sub-Committee (IPSC) for IODP, chaired by Ted Moore has been active since the end of 1998.

## ISA (International Seabed Authority)

The International Seabed Authority is an autonomous international organization established by the United Nations Convention on the Law of the Sea. It is located in Kingston, Jamaica, and is the organization through which States Parties to the Convention organize and control prospecting, exploration and mining activities in marine areas beyond the limits of national jurisdiction (the Area).

The International Seabed Authority will convene a workshop on mineral resources, other than polymetallic nodules of the Area, from 26-30 June 2000, Jamaica. This workshop is the third in a series of workshops convened by the Authority, and sequel to the workshop on environmental guidelines for the exploration for deep seabed polymetallic nodules in the Area. Kim Juniper and Chris German will participate in this workshop and to prepare and present a paper about the impacts of the development of polymetallic massive sulphides on the vent ecosystems. Describing the ecosystem, its flora and fauna and their role, uses and potential quantities.

<sup>ii</sup> This is the first time that our affiliation with SCOR has had a negative effect. The Japanese have said that InterRidge's affiliation with SCOR has made their InterRidge membership easier with their national administration

## Calendar of MOR research related events

More details about all of the following meetings can be found by following links from the "Meetings" menu on the InterRidge web site.

27-30 March, 2000	<b>Oceanology International 2000 Penrose Conference: Volcanic rifted margin.</b> Royal Holloway University of London, Egham Surrey, UK
17-20 April, 2000	<b>Geoscience 2000.</b> University of Manchester, UK
30 May - 3 June, 2000	<b>AGU 2000 Spring Meeting.</b> Washington, DC, USA.
16-19 April, 2000	<b>European Geophysical Society, XXV General Assembly.</b> Nice, France.
23-26 May, 2000	<b>UT '00: Underwater Technology 2000.</b> Tokyo, Japan.
5-9 June, 2000	<b>ASLO-2000.</b> Copenhagen, Denmark.
 2-3 June 2000	<b>InterRidge Steering Committee Meeting.</b> Woods Hole, MA, USA
26-28 June, 2000	<b>RIDGE Plume-Ridge Interaction Workshop.</b> Troutdale, Oregon, USA.
18-22 July, 2000	<b>IAVCEI.</b> Bali, Indonesia.
July 28 - August 1, 2000	<b>RIDGE Theoretical Institute: Subsurface Biosphere.</b> Big Sky, Montana, USA.
28 August- 2 Sept. 2000	<b>The XVIII th (New) International Congress of Zoology.</b> Athens, Greece.
6-17 August 2000	<b>31st International Geological Congress.</b> Rio de Janeiro, Brazil.
3-8 September, 2000	<b>Goldschmidt Conference.</b> Oxford, UK.
20-22 September, 2000	<b>Journees DORSALE 2000.</b> Paris, France.
 28-30 September, 2000	<b>IR workshop on Management of Hydrothermal Vent Ecosystems</b> Sidney, British Columbia, Canada.
15-19 December 2000	<b>AGU 2000 Fall Meeting.</b> San Francisco, CA, USA.
12-16 January 2001	<b>International Conference on the Geology of Oman</b> Muscat, Sultanate of Oman.
26-30 March 2001	<b>26th General Assembly of the EGS.</b> Nice, France.
 1-2 June 2000	<b>InterRidge Steering Committee Meeting.</b> Kobe, Japan.
10-15 June, 2001	<b>10th Water-Rock Interaction Symposium.</b> Sardinia, Italy.
18 - 24 August, 2001	<b>Second International Conference of Comparative Physiology &amp; Biochemistry in Africa.</b> Chobe National Park, Botswana.
 8-13 October, 2001	<b>2<sup>nd</sup> International Symposium on Deep-Sea Hydrothermal Vent Biology</b> Brest, France.

APPENDIX

## InterRidge Steering Committee (2000)

1. Mathilde Cannat	(France; 1997)	13. Peter M. Herzig	(Germany, 1996)
2. Philippe Blondel	(UK, <i>ad hoc</i> , 1997)	14. S. Kim Juniper	(Canada, 1998)
3. Enrico Bonatti	(Italy, NC, 1998)	15. David Kadko	(USA, 1999)
4. Alan Chave	(USA, <i>ad hoc</i> , 1997)	16. Jian Lin	(USA, <i>ad hoc</i> , 1999)
5. Dave Christie	(USA, 1997)	17. Catherine Mével	(France, 1997)
6. Paul Dando	(UK, 1999)	18. Miguel A. Miranda	(Portugal, 1996)
7. Colin Devey	(Germany, 1999)	19. Ranadhir Mukhopadhyay	(India, 2000)
8. Christopher G. Fox	(USA, <i>ad hoc</i> , 1998)	(Rajendra K. Drolia represented India in 2000)	
9. Kantaro Fujioka	(Japan, 1999)	20. Lauren Mullineaux	(USA, <i>ad hoc</i> , 1995)
10. Hiromi Fujimoto	(Japan, 1997)	21. Eirik Sundvor	(Norway, 1996)
11. Françoise Gaill	(France, <i>ad hoc</i> , 1998)	22. Kensaku Tamaki	(Japan; Chair 2000)
12. Chris R. German	(UK, 1997)		

## InterRidge National Correspondents

### *Principal Members:*

1. France - Dorsales - Catherine Mével
2. Germany - DeRidge - Colin Devey
3. Japan - InterRidge Japan - Nobuhiro Isezaki
4. UK - BRIDGE - Chris German
5. USA - RIDGE - David C. Christie

### *Associate Members:*

1. Canada - CanRidge - S. Kim Juniper, Kathryn M. Gillis
2. India - Sridhar D Iyer, Abhay V Mudholkar
3. Italy - Enrico Bonatti, Paola Tartarotti
4. Norway - Eirik Sundvor
5. Portugal - J. Miguel A. Miranda

### *Corresponding Members:*

1. Australia - Trevor J. Falloon
2. Brazil - Suzanna Sichel
3. China Wang Zhihong
4. Denmark - John R. Hopper
5. Iceland - Karl Grönvold
6. Korea - Sang-Mook Lee
7. Mexico - J. Eduardo Aguayo-Camargo
8. Morocco - Jamal Auajjar
9. New Zealand - Ian Wright
10. Philippines - Graciano P. Yumul, Jr.
11. Russia - Alexander V. Sobolev, Sergei Maschenkov
12. South Africa - Anton le Roex
13. Spain - Juan José Dañoibeita
14. Sweden - Nils G. Holm
15. Switzerland - Gretchen Früh-Green
16. SOPAC - Russell Howorth

Contact details for the Steering Committee members as well as all of the national correspondents can be found in the Member Directory on the InterRidge home site at <http://www.intridge.org/data2.html>

## InterRidge People , Past and Present

### Steering Committee Members

<b>Canada</b>		<b>Portugal</b>	
S. Kim Juniper	1998-	Miguel Miranda	1996-
<b>France</b>		<b>Spain</b>	
Françoise Gaill, <i>ad hoc</i>	1998-	Miquel Canals	1995-1998
Mathilde Cannat	1997-	Juan José Dañobeita	1995-1998
Catherine Mével	1997-		
Daniel Desbruyères, <i>ad hoc</i>	1991-1997	<b>UK</b>	
Jean Francheteau	1991-1998	Paul Dando	1999-
H. David Needham	1991-1994	Christopher R. German	1997-
		Philippe Blondel, <i>ad hoc</i>	1997-
<b>Germany</b>		Lindsay Parson, <i>ad hoc</i>	1996-1998
Colin Devey	1999-	Roger C. Searle	1994-1998
Peter M. Herzig	1996-2000	Martin Sinha	1991-1996
Roland Rihm	1995-1998		
		<b>USA</b>	
<b>India</b>		Jian Lin, <i>ad hoc</i>	1999-
Ranadhir Mukhopadhyay	2000-	Christopher G. Fox, <i>ad hoc</i>	1998-
		David Kadko	1998-
<b>Italy</b>		Alan Chave, <i>ad hoc</i>	1997-
Enrico Bonatti	1998-	David M. Christie	1997-
		Karen Von Damm	1996-1998
<b>Japan</b>		Lauren Mullineaux, <i>ad hoc</i>	1996-
Kantaro Fujioka	1999-	Robert S. Detrick	1992-1995
Hiromi Fujimoto	1997-	John Delaney	1991-1994
Tetsuro Urabe	1995-1998	P. Jeff Fox	1991-1994
Kensaku Tamaki	1992-1997	Charles H. Langmuir	1991-1996
Kensaku Tamaki	2000 -		
<b>Norway</b>			
Eirik Sundvor	1996-200		

### InterRidge Chairs

Kensaku Tamaki (Japan)	2000 -
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

Agnieszka Adamczewska	December 1999 -
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 Mailing List, May 2000

**Table 4.** The nationality of the InterRidge mailing list, classified first by membership (principal, associate, correspondent and then by alphabet.

Country	#	Country	#
France	295	Iceland	19
Germany	213	Indonesia	1
Japan	199	Iran	3
UK	234	Ireland	10
USA	1125	Israel	2
<b>Total</b>	<b>2066</b>	Korea	11
Canada	74	Mauritius	1
India	39	Mexico	5
Italy	24	Monaco	2
Norway	22	Morocco	1
Portugal	39	Netherlands	17
<b>Total</b>	<b>198</b>	New Caledonia	1
Argentina	2	New Zealand	7
Australia	23	Papua New Guinea	1
Austria	2	Philippines	2
Belgium	13	Poland	1
Brazil	3	Puerto Rico	1
Chile	3	Russia	111
China	19	Slovenia	1
Cuba	1	South Africa	3
Cyprus	1	Spain	40
Czech Republic	1	Sweden	14
Denmark	6	Switzerland	16
Ecuador	1	Taiwan	1
Fiji	5	Tonga	1
French Polynes	1	Turkey	3
Greece	3	Ukraine	1
Greenland	1	Venezuela	2
Hong Kong	1	<b>Total</b>	<b>364</b>
		<b>Total Mailing list</b>	<b>2628</b>