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# InterRidge

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## Steering Committee Meeting 1995 Report

GEOMAR  
Kiel, Germany  
11 & 12 September, 1995

Chair:  
Roger Searle

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## **InterRidge Steering Committee AGENDA**

**Introduction and Welcome** (Chairman)

**Apologies for Absence**

**Minutes of 1994 meetings**

To accept the minutes of the 1994 meetings (**Documents A & B**, previously circulated).  
Matters Arising.

**New Membership**

Endorsement of Spain as a new Principal Member Nation and of Spain's representatives on the Steering Committee.

Endorsement of Germany and Portugal as new Associate Member Nations and of Germany's representative on the Steering Committee.

**General Organisation of meeting and agreement on meeting agenda**

**Report of the Co-ordinator**

To receive the report of the co-ordinator on activities completed during the year to date (**Document C**). Discussion.

**InterRidge Program Plan Addendum 1994**

To ratify the InterRidge Program Plan Addendum 1994 (**Document D**, previously circulated).

**InterRidge Phase 2 Projects**

To review progress made during the last year and agree direction and action for the upcoming year.

To discuss project management (**Document E**).

To receive report of the Biological Studies *Ad Hoc* Committee

(Desbryères)

To receive project reports:-

- SWIR Project (Langmuir)
- Arctic Oceans Mapping (Rihm)
- Quantification of Fluxes Experiment (Sinha)
- 4-D Architecture of the Oceanic Lithosphere Experiment (Detrick, Searle)
- Back-arc Basin Database (Sloan)
- Event Detection and Response (To be arranged)
- Global digital database. (Detrick)

Discussion.

**Interaction with other organisations and programs**

To discuss SCOR Affiliation status.

To receive reports on contacts with other organisations and programmes as follows:

- SCOR working group 99 (Sinha)
- ODP (Fox)
- FARA/MAR 1996 Symposium (Needham, Langmuir)

Discussion.

**InterRidge Budget**

To receive a financial report from the Co-ordinator (**Document F**).

To discuss the possibility of funding for workshop participants.

To discuss invoicing procedure and currency.

**InterRidge Office Transfer**

To discuss and confirm the end of the Durham mandate. To discuss and establish a calendar and procedures for calls for tender, their processing, Co-Ordinator's salary, and associated budget issues.

**InterRidge representation, National Correspondents and membership of committees:**

To discuss and decide on any suggestions for possible additions and changes concerning

- (i) InterRidge liaison people to other programmes
- (ii) National Correspondents
- (iii) membership of the Steering Committee
- (iv) membership of the Working Groups

**Calendar for 1996**

To receive and if necessary update the provisional calendar presented as **Document G**.

**Any Other Business**

**Summary of Principal Conclusions**

**InterRidge Steering Committee**  
**Kiel, 11-12 September 1995**  
**Report**

**1.0 Introduction and Welcome**

R. Searle, as Chair, welcomed members and observers to the 1995 meeting of the InterRidge Steering Committee and initiated the proceeding by ceding the floor to H. Schmincke, the meeting host at GEOMAR.

H. Schmincke welcomed the Steering Committee to GEOMAR and expressed his enthusiasm for Germany's continued participation in InterRidge. With the addition of state funds to the GEOMAR budget, Germany will become a Principal Member in 1996. The co-ordination and leadership of DeRidge has been turned over to R. Rihm. The DeRidge Community currently numbers approximately 300 members working in the fields of paleo-oceanography, paleo-geography, environmental geology, sediment chemistry and volcanic petrology. GEOMAR is undergoing a period of growth, extending its facilities and constructing a new building to house them.

**2.0 Apologies for Absence**

Apologies were received from J. Cann who was invited to attend in his capacity as Active Processes Working Group Chair.

**3.0 Minutes of 1994 Meetings**

The minutes of the 1994 InterRidge Steering Committee Meetings were tabled and accepted.

**3.1 Matters Arising**

*SOSUS array operating status*

In the Atlantic, the Bermuda array has been shut down but the Iceland array is still running. A recent study revealed that tracking channel changes were not recorded making identification of arrays impossible and major time shift sources are unknown. A report for the study has been made to the Naval Research Laboratories (NRL) but it may not be made available to the public. It is estimated that corrections to the system could be made within 6 months to a year but that archived data is unrecoverable.

The Northeast Pacific array is still maintained and operating. One section of the array has broken down and the US Navy is committed to repair it.

*IRSC representation for ridge crest biologists*

R. Lutz was nominated as a possible representative in October 1994. This nomination did not receive unanimous approval from the Steering Committee and additional recommendations were called for. The following three nominations were made and are listed in order of preference:

- L. Mullineaux US
- D. Dixon UK
- K. Stetter Germany

**ACTION:**

The InterRidge Office will issue sequential invitations to the nominees until a positive response is received.

**4.0 New Membership**

The Steering Committee endorsed Spain as a new Principal Member Nation and welcomed Spain's representatives, M. Canals and J.J. Dañoibeitia, to the Steering Committee.

The Steering Committee endorsed Germany and Portugal as new Associate Member Nations and welcomed Germany's representative, R. Rihm, to the Steering Committee. No nomination for Portuguese representation has yet been made.

**4.1 Spain**

M. Canals and J.J. Dañoibeitia expressed their thanks and presented a brief summary of ridge crest research being carried out in Spain.

The Spanish ridge crest studies program originated with the launching of the RV *Hesperides*, which is capable of deep multi-channel and single channel seismic surveys with a 300 m streamer, an 85 m long streamer, and 2 compressors. It also has SIMRAD EM12 Expanded and EM-1000 swath mapping systems with side-scan sonar capabilities, gravimeter and magnetometer and the capacity to process data. Its most recent survey was a multi-channel seismic study of deep crustal structure of the area around Easter Island (See *InterRidge News*, vol. 4, no. 1). The objective of this project was to examine the nature of the boundaries and interaction between the Easter Microplate, the hot spot and volcanism by integrating interpretations of the seismic data with swath mapping.

The Spanish ridge studies program has been active since 1992, primarily focusing on work in the Antarctic region particularly the Scotia Sea and Bransfield Basin. This work has largely consisted of multibeam bathymetry mapping, seismic reflection, magnetics, gravity and the long-term deployment of thermistor chains. Future plans include a joint funded project with Woods Hole Oceanographic Institution (WHOI) to carry out a geophysics reconnaissance survey around the Galapagos Islands in 1996. Another project is planned to survey the Gulf of California where the Tamayo Fracture Zone intersects the trench to determine the interaction of the two plate boundaries and the effect of the subduction of the Rivera Plate. This project will be carried out using land stations, the RV *Hesperides* and, provisionally, two Mexican ships to shoot seismic lines.

Antarctica remains a scheduling priority for the RV *Hesperides* for at least 2 months a year. This leaves it free for up to 8 months of scientific work and its transits to and from the Antarctic make it available for work in the southern oceans. In view of this, Spain may be able to contribute 1 or 2 legs aboard the RV *Hesperides* to the SWIR Project.

#### **4.2 Germany**

R. Rihm thanked the Steering Committee and gave the following summary of the DeRidge agenda. Five thematic workshops are planned for 1996: North Atlantic and Arctic Ridge Studies - H.-J. Wallrabe-Adams; Indian Ocean Ridges - M. van Greven and P. Halbach; East Pacific Rise - G.A. Dehghani; The Red Sea - R. Rihm; Back-Arc Basins - P. Herzig. Further details were given in presentations made during the InterRidge/DeRidge Science Day held on Wednesday 13th September (see program; Appendix A). The first issue of the DeRidge Newsletter, published in English and devoted to documentation of current and recent ridge-related research in Germany, appeared in September 1995.

#### **5.0 Report of the Co-Ordinator**

The Steering Committee received the written report of the Co-Ordinator on activities completed during the year to date. Points specifically touched upon during the report presentation were: current InterRidge membership, *InterRidge News*, InterRidge Office administration, recent development of the InterRidge World Wide Web (WWW) home page, and the possibility of InterRidge acting as a 'broker' for piggy-back projects.

#### **5.1 InterRidge Membership**

InterRidge Membership in 1995 consists of 5 Principal Members, 2 Associate Members, and 11 Corresponding members. Among the 18 member nations, 5 are new or upgraded since the last Steering Committee Meeting. Spain upgraded from Corresponding to Principal Member, Germany and Portugal upgraded from Corresponding to Associate Members. India and Switzerland became new Corresponding Members.

#### **ACTION:**

It was decided that invitations to Australia and Canada to become Associated Members should be reiterated for 1996 and new contacts should be made with Taiwan. In addition, the Spanish contingent on the InterRidge membership database should be updated.

#### **5.2 InterRidge News**

As of September 1995, the circulation of *InterRidge News* was 1777. There is an increasing interest in *InterRidge News* within the international community evidenced by numerous new requests to be added to the circulation list and by increasing numbers of unsolicited articles received by the Office. This has enabled us to produce a more informative publication with a larger scientific content. It has, however, had a negative effect on the budget as the increasing length of the newsletter has corresponded to increased printing and postage costs. One solution would be to strictly



enforce limits on the manuscript length and number of figures for articles. Another suggestion for altering the structure of the newsletter is to create feature columns for each of the Phase 2 projects. One such feature has already been initiated on the Indian Ocean.

**ACTION:**

It was agreed that articles should be limited to about 4 manuscript pages and no more than 3 figures. They should focus on recent or preliminary results and the content should not have been published elsewhere.

Initiation of Phase 2 project columns was seen as a positive development in keeping with the evolution of the InterRidge Program. An effort will be made to include these new feature columns as a function of available material in the upcoming Fall/Winter issue.

Tables of contents of newsletters published by various national programs will be included in the 'Updates' section.

As the above changes are unlikely to reduce the length of the newsletter, the Co-Ordinator will look into using thinner, lighter weight paper to bring printing and postage costs down.

### **5.3 Office Administration**

With a view towards more efficient operation of the present Office and an easy transfer at the end of the Durham term, a major effort is being made to standardise, expand and update the maillist database and electronic directories; standardise workshop organisation procedure and report production.

### **5.4 WWW**

Since the last Meeting of the Steering Committee, the InterRidge Home Page has been created and is accessible on the WWW. Its features include information about InterRidge and its member nations; the InterRidge Researcher Electronic and Ridge Crest Biologist Directories; the Back-Arc Basin database index, geochemical database and geophysical database; links to other sites concerned with ridge studies and ship information; and a mirror of some of the ship information and scheduling contained on the University of Delaware Oceanic site.

**ACTION:**

In addition to the existing features, *InterRidge News* will be posted on the WWW.

### **5.5 Piggyback Project Brokerage Proposal**

The InterRidge Office could act as a broker matching potential piggy-back projects with investigators whose funded and scheduled cruises have the time and space to carry them out. Proposed projects and announcements of open ship time could be posted on the WWW and advertised in *InterRidge News*.

**ACTION:**

The Steering Committee approved of the proposal to provide this service to the international community. A call for piggy-back projects and open ship time will go out in the Fall/Winter 1995 issue of *InterRidge News* and over the e-maillist.

## **6.0 InterRidge Program Plan Addendum 1994**

The InterRidge Program Plan Addendum 1994 was tabled and accepted.

### **6.1 Matters Arising**

#### ***Yearly Indian Ocean Meeting***

It was decided not to schedule yearly Indian Ocean Meetings as was recommended by the participants of the Indian Ocean Meeting in Baltimore 6 April 1994. Meetings will be held as the need for planning or presentation of results demands.

#### ***Arctic Ocean data archive***

This project would create a publicly accessible archive of data from the Arctic Oceans. Data is currently concentrated in Germany, Lamont, Canada and Russia. Steps are being taken to secure the release of this data. Mark Langseth at Lamont is working with the Canadians who in turn are working with the Russians. In Germany, R. Rihm is encouraging contributions to the archive.

#### **ACTION:**

Further promotion of this archive would result from establishing a liaison with the Nansen Arctic Drilling Project and by creating an Arctic Oceans feature column in *InterRidge News*.

#### *The White Sub*

Although presentations of InterRidge endorsement was made at the end of 1994, the report containing the decision to either go ahead with conversion of the US Navy nuclear submarine or scrap the project is still unavailable. At this point, it is doubtful that the project will go ahead.

### **7.0 InterRidge Phase 2 Projects**

#### **7.1 SWIR Project Plan - C. Langmuir**

*(A summary outline of the report is presented here. Further details can be found in the draft report distributed at the meeting.)*

The Southwest Indian Ridge (SWIR) was chosen as a focus for the Global Studies Program because it has an essentially constant, super-slow spreading rate along its entire length and exhibits two contrasting types of morphology. While this makes the area tectonically interesting, there remain some problems associated with this zone. High southern latitudes make shipboard work difficult in this area. As yet no regional hydrothermal surveys have been carried out and hence no biological data is available. The logistical problems associated with work in high latitudes has, in the past, led to an unco-ordinated approach of investigation through individual cruises. The logistical difficulties could be more effectively coped with through co-ordinated collaboration.

#### **Characteristics of the Southwest Indian Ridge:**

- (A) Morphology and segmentation
- (B) Regional geophysics
- (C) Crustal structure and crustal thickness
- (D) Petrology and geochemistry
- (E) Distribution and characteristics of hydrothermal sites and associated biology

#### **Scientific Problems to be Investigated**

(A) How do the various aspects of crustal accretion respond as the spreading rate becomes very slow? Do models based on faster spreading rates adequately describe phenomena at super-slow ridges? The following aspects should be considered:

- (i) Crustal structure and geophysics
- (ii) Crustal composition
- (iii) Hydrothermal activity
- (iv) Biology

(B) What are the effects of variation in magmatic budget at constant spreading rate? How do such effects vary as a function of spreading rate?

(C) What are the characteristics and scale of the geographical boundaries for crustal composition, and biogeographic provinces between the Atlantic and Indian Oceans?

#### **General Strategy**

The general objectives that should be accomplished by the program are:

- To provide the long wavelength perspective in terms of depth and basalt chemistry.
- To provide the critical data set for a super-slow ridge that can be compared to faster spreading ridges: for the range of axial depth and segmentation style, we need, for multiple segments, multibeam bathymetry, gravity and magnetics surveys, seismic experiments that provide crustal structure information, closely spaced rock sampling, and an assessment of the hydrothermal budget.
- To locate specific hydrothermal sites, preferably in regions with different styles of segmentation, and lead to sampling of water and the associated biological community.

The primary emphasis of the program in terms of hydrothermal prospecting and detailed experiments should be on the northeastern portion of the SWIR.

### **Elaboration of specific program components**

Three different regions, representative of the range in magmatic budget and segmentation characteristics, would be selected for intensive study on the segment scale, with the ultimate aims of investigating and understanding the range in styles of crustal accretion at super-slow spreading rate and of identifying, observing and sampling hydrothermal sites and associated life.

- (A) Regional high resolution bathymetry with underway geophysics
- (B) Regional hydrothermal surveys
- (C) Investigation of 3-D crustal structure
- (D) Regional sampling and detailed sampling of individual segments
- (E) Detailed hydrothermal and biological studies

### **Specific Project Design**

- (A) One leg of multibeam bathymetry and underway geophysics.
- (B) One leg of petrological sampling.
- (C) One or two legs of a deep towed instrument package that would provide side-scan and hydrothermal sniffing.
- (D) A seismic experiment to evaluate crustal structure in the three regions.
- (E) An ROV leg with the aim of locating and photographing two active hydrothermal sites preferably in two of the three regions.
- (F) A submersible leg to dive on the two hydrothermal sites and sample water, sulfides and animals.

Two additional legs would be needed to investigate the southwestern portion of the ridge, for regional bathymetry, geophysics and sampling. These legs will be necessary to answer questions about the SWIR as a gateway between the Indian and Atlantic Oceans, and for comparison of geological, geophysical and petrological characteristics of the two ends of the ridge.

### ***Discussion and Comments***

A Draft of the Project Plan and a proposed cover letter to be signed by R. Searle was distributed with the thought that the way in which the various national committees are approached concerning the project is very important and deserves some consideration. Steering Committee Members were asked for their input in drafting the cover letter so as to achieve the maximum positive effect in their own countries.

It was decided to address the letter to the InterRidge National Correspondents asking them to bring it to the attention of the national program. There will be a need for comments and endorsement of the project and input on the calendar and how their country might contribute to the project.

Comments on the wording of the cover letter were made and noted. It was thought more advisable in the case of Japan to send the cover letter and Project Plan to JAMSTEC rather than ORI. The BRIDGE geographic exclusion should be addressed in the letter to the UK Correspondent. A copy will be sent to all Administrative Correspondents.

### ***Time frame:***

The number of legs required may have been underestimated and a longer time frame may have to be considered. Funding of individual legs and their sequence may depend on demonstrating that the foundation work has been successfully completed.

### ***Data distribution:***

A co-ordinated strategy will be required at the national level for data to be passed on to the next cruise to work in the area.

### ***Distribution of the Project Plan Document:***

The widely varying funding structures in different nations complicates a large scale collaborative project such as this one. The leverage of national ridge studies programs endorsement and commitment will make individual proposals stronger. Individual surveys must be shown to be part of an integrated collaborative international project plan to which InterRidge and its member nations are committed.

The finalised SWIR Project Plan document should be distributed to funding administrators and ship operators and managers so that the people who control ships, ROVs, submersibles, etc. will

be aware of what equipment will be required when and where. This will increase the likelihood that the equipment will be in the Indian Ocean in the right time framework.

*Ships and submersible which may be available:*

The RV Hesperides is capable of towing TOBI and has an EM12 Extended swath bathymetry mapping system that covers 3.5 times the water depth. A demand has been made to modify the A-frame so that it could be capable of deploying a submersible.

The RV Sonne now has a GD deep tow with a fiber optic cable. A recent call for expressions of interest to work with the Sonne in the Indian Ocean has had some response which will probably lead to work being carried out there.

Shinkai 6500 has been invited to make 10 dives in the Indian Ocean in 1998. In order for these dives to be approved site surveys must be completed.

**Action:**

The InterRidge Office will circulate the SWIR Project Plan to all national Correspondents requesting the endorsement of their national program and an expression of interest and commitment. They will also be asked to solicit proposals from the community in their country and to give an idea of what resources might be contributed. A cover letter written by C. Langmuir will accompany the Project Plan outlining the data sharing protocol, calendars, etc. The document should be circulated in time for it to be presented and discussed at the RIDGE and Dorsales meetings to be held in November.

The InterRidge Office will request that individual investigators for Indian Ocean legs notify the InterRidge Office of submitted proposal, funding decisions, scheduling, etc. This information will be used to aid InterRidge in its co-ordinating role for this project.

**7.2 Arctic Mapping Global Studies Project - R. Rihm**

The workshop, held in November 1994, was attended by about 50 people from 8 countries.

The objectives of the workshop were:

- To make known existing geological, geophysical and biological data sets from the Arctic to researchers interested in this region through a series of presentations which also served to identify major gaps in data coverage;
- To correlate different data types in key regions as a first step in the compilation of a data synthesis which will lead to an integrated interpretation;
- To define approaches and implementation plans as part of co-ordinated international strategies to overcome logistical challenges and extend data coverage.

A lot of data was unearthed whose existence had previously been unknown. It was noted that a significant amount of data held by the military is currently inaccessible to the public. It was agreed by workshop participants that links with the Nansen Drilling Program would be more appropriate than with the Ocean Drilling Program for work in the Arctic. It is felt that the workshop presentations and discussion served to focus the interest of the international community on mapping in the Arctic Oceans and that this interest will persist as the report is published and work continues.

**ACTION:**

The InterRidge Office will publish the workshop report in conjunction with the Alfred Wegener Institute, R. Rihm acting as liaison. The report will be distributed through both organisations.

**7.3 Quantification of Fluxes at the Mid-Ocean Ridge - M. Sinha**

Out of the two InterRidge workshops held on fluxes at the mid-ocean ridge, one in Durham in September 1993 and the other in Cambridge in June 1995, a coherent body of work has arisen aimed at the investigation of heat, energy, chemical and mass fluxes involved in the accretionary process. This investigation is based on the concept of a "box" experiment on the axial segment length scale and extending from the upper mantle to the water column. Its object is to measure all fluxes across all boundaries and certain fluxes within the box itself.

Fluxes to be measured are:

- Magmatic - within the mantle, mantle to crust and intercrustal
- Hydrothermal - within the crust, to water column, recycling, chemical export
- Thermal - energy
- Chemical - alterations of crustal (and mantle) rocks
- Biological - productivity and gene flow

Isolated consideration of fluxes is not possible, therefore, this experiment must be integrated with the InterRidge Phase 2 Projects and other experiments. This can best be accomplished by coordinating appropriate parts of different projects and by carrying out these experiments at the same site.

Major linkages exist with:

- Mantle fluxes - MELT
- Crustal magma fluxes - 4-D Architecture of the Oceanic Lithosphere
- Chemical history - Ocean Drilling Program
- Vent scale fluxes - Observatories

### **Experimental approach**

The approach to quantification of fluxes in a box experiment can be summed up by the following equation.

$$\text{flux into the box} - \text{flux out of the box} = \text{vent input}$$

This is best carried out at a 'bathtub' segment, one which has a deep axial valley and is closed off at least one end. The 29°N segment was selected as the preferred site because it meets these criteria. Its northern end is closed and its southern end, while being open, can be easily instrumented with current meters and sediment traps to measure the flux through the gap, at and below plume level. Other sites taken into consideration were TAG, Snake Pit and Rainbow. The 29°N segment was selected because of its 'bathtub'-like morphology and because it is a known site of hydrothermal venting. Although the hydrothermal activity at the 29°N Broken Spur site is limited, signals of additional venting have been detected within the segment.

Discussion at the Cambridge workshop pointed out some of the difficulties in the site selection process. For example, was there correct and proportional representation of InterRidge nations at the workshop? What is the extent of InterRidge's influence in directing individual investigators towards a given site?

### ***Discussion and Comments***

A 'bathtub' experiment is only valid if one assumes that venting is steady state. For this reason, slow-spreading ridges, because of their complexity and exaggerated temporal and spatial heterogeneity, are probably not the best place to site such an experiment. It would be more practical to suit the site to the experiment.

It might be best to gain further understanding of the processes involved in hydrothermal venting rather than allow the planning to lead the science.

### ***7.4 4-D Architecture of the Oceanic Lithosphere - R. Detrick***

Two major workshops have addressed the problems involved in determining the 4-D architecture of the oceanic lithosphere, the Durham workshop (Sept. 1993) focusing on axial segmentation and the workshop held in Boston (Sept. 1994). The major scientific objectives have been identified as the following:

- What is the 3-D nature of the magmatic plumbing system of a spreading segment?
- What is the 3-D nature of hydrothermal circulation?
- How is extension partitioned between faulting and magmatism?
- What are the fundamental causes of segmentation and what controls temporal variability in spreading segments?

The recommendations of the 4-D workshop fall into two categories:

- Type One (#1) - Those requiring full multi-national participation (instrumentation, ships, etc.)

- Type Two (#2) - Those that can successfully be completed by individual investigators or nations but would benefit from co-ordination or integration provided by InterRidge. Other ways in which InterRidge could contribute to this effort are through facilitation of communication (*InterRidge News*, on-line information and bulletin boards) and data exchange (on-line databases).

The scientific objectives above could be addressed by experiments carried out at a slow-spreading and at a fast-spreading ridge.

*Slow-spreading Ridge* - The strategy at a slow-spreading ridge would consist of a series of nested 'box' surveys with different scales of resolution. In addition, a near bottom experiment at a smaller scale would provide detailed 'ground truthing'. Coverage off-axis would extend to about 10 Ma old lithosphere and along-axis would include the adjacent segment. The sites considered for this experiment were MARK, TAG, 29°N and 35°N.

The types of studies to be included in this experiment are:

- 3-D geological and geophysical surface mapping out to 10 Ma (#1)
- Deep-towed, high resolution surveying and bottom experiments (#2)
- 3-D seismic investigation of crustal and upper mantle structure (active and passive tomographic experiments) (#1)
- Long-term\* monitoring of seafloor deformation using seismic and geodetic techniques (#1)
- Dredging, rock coring, submersible sampling of crustal and upper mantle rocks (#2)
- Drilling (#1)

\* 2-3 years initially

*Fast-spreading Ridge* - Since exposure of deep crustal and mantle rocks is not as readily available at fast-spreading ridges, site selection is limited to specific locations. The locations selected are 9°-11°N and 14°-18°S on the East Pacific Rise (EPR), and the north wall of Hess Deep. Strategy for this experiment would include structural and segment-scale active processes studies of the EPR and structural studies of the lower crust and upper mantle exposed in tectonic windows in Hess Deep.

The types of studies to be carried out at Hess Deep:

- Surface and near-bottom bathymetry and geophysical mapping (#2)
- Correlation of outcrop geology with geophysical structure (#2)
- Drilling and bore hole experiments (#1)

The types of studies to be carried out at the EPR;

- Repeat bathymetry and geophysical mapping (#2)
- Sampling and distribution of lava flows (#2)
- Vent distribution and faunal distribution (#2)
- Long-term\* monitoring of seafloor deformation using seismicity and geodetic techniques (#1 & #2)

\* 2-3 years initially

Points requiring Steering Committee discussion or InterRidge Office action:

- Site selection for MAR 4-D architecture experiment
- Appointment of project leaders and co-ordinating committees
- Establishment of Internet-accessible catalogues of recent and pending surveys
- Co-ordination of GIS database for site selected
- Development of a project plan for Type #1 experiments
- Co-ordination of ODP proposal submission

#### ***Discussion and Comments***

Since this is too large a project to be closely co-ordinated by InterRidge, individual investigators or nations should be encouraged to peruse those parts of the experiments which do not require multi-national participation. InterRidge should focus on co-ordinating type 2 aspects of the experiments.

Selection of 4-D Experiment fronts for InterRidge focus:

- ODP proposal co-ordination - A thorough understanding of the regional geology ('site survey') is required for proposal approval. It is possible, however, to submit a generic proposal for which the background work has not yet been completed. In parallel with generation of a generic proposal, field work to complete the site survey could be carried out. This may be the best approach since the technology for on-axis drilling will not be completed for another 2-3 years. Justification for ODP drilling exists in the fundamental differences in crustal structure reflected in the gravity signal at the ridge.
- Tomography experiment - active source crustal tomographic experiments could be mounted immediately. At the segment-scale this would definitely be a Type #1 experiment.

### **7.5 Event Detection and Response**

National Correspondents, Administrators, ship operators and scientists should be included on an electronic maillist concerned with event detection and response. Funding agencies might be coaxed into maintaining a reserve of money for event response.

### **7.6 Back-arc Basin Databases**

A demonstration of the Back-arc Basin Database on the WWW was made at the reception held on the evening of 11 September.

### **7.7 Global Digital Database - R. Detrick**

The Global Digital Atlas was discussed and approved at the Steering Committee Meeting in Tokyo in September 1994. One of the major contributors to the Atlas is the on-going RIDGE multi-beam data synthesis project.

The RIDGE multi-beam data synthesis project is a three year project which began in 1993 and whose funding terminates in June 1996. One of the objectives of this project was to move beyond the traditional paper atlas to an on-line database that is accessible on the Internet and to produce CD Roms both of which make the data more accessible and more useful to the community. The original scope of the project encompassed data from the Northeast Pacific, the EPR and MAR. Substantial progress has been made in all of those areas. The Northeast Pacific synthesis is completed and the data are available on CD Rom through the National Geophysical Data Center (NGDC) in Colorado. The EPR data are on-line and consist principally of the ODP data synthesis. Most of the US data collected on the MAR are currently on-line.

It has been a very successful project to date with approximately 10,000 logins per month via the WWW. It is widely accessed not only by our community but also by the general public. There are many different levels of data resolution available, all of which can be independently password-protected. Individual passwords can be controlled by PIs allowing a great deal of flexibility in terms of proprietorial protection. It could serve as a model for various InterRidge on-line databases.

From the beginning of the project there was the intent to incorporate as much non-US data as possible. Discussion at the Tokyo meeting added to the impetus to expand the RIDGE synthesis with the idea that it would provide a major component of the InterRidge Global Digital Atlas. Following that meeting steps were taken to expand the input of non-US data particularly for the EPR and MAR which are the focus for years 2 and 3 of the RIDGE project.

InterRidge National Correspondents were made aware of the InterRidge International Global Digital Atlas effort and the existence of the subcommittee established to oversee it. Their co-operation was encouraged. Contacts were made with the UK, Italy, Russia with some success and their data has been incorporated into the database. France was also encouraged to contribute its data which includes valuable data collected in the Atlantic. D. Needham was in contact with W. Ryan and an IFREMER engineer working with him visited Lamont, W. Ryan proposed possible exchange protocols and offered to help set up a data base at IFREMER. There is still no French data in the synthesis and this has caused some frustration in the US. A few weeks ago the discovery was made of a systematic login from several addresses in France to download all available data as well as attempts to hack into login-protected data files. This has led to blocking French access to the data in the Lamont bank until the situation can be resolved.

### *Discussion and Comments*

On-line data bases are becoming more prevalent and important and will require international good will and adoption of appropriate policies by the various nations to avoid the contribution of any one nation being unfairly exploited.

The identity of the person or people responsible for systematically downloading the data and attacking the logic-protected file is unknown to the French Steering Committee Members and inquiries will be needed to clarify the situation.

There is an interest in the French community in developing a database and contact was made by IFREMER with the Lamont group to discuss solutions to technical difficulties. Possible procedures for data exchange were proposed by Lamont. There is no ambiguity about the eventual contribution of French data although no calendar or schedule for the exchange has been agreed upon. Further discussion is required.

An internal policy has been established to insure that French data is available in France within a reasonable time but policy concerning distribution of French data outside of France is not clear. In addition, there is some question about contributing to the RIDGE synthesis which is perceived as a purely US product and not an InterRidge product. A statement addressed to IFREMER endorsing the RIDGE synthesis as an InterRidge project might be useful.

This question of the place of the US RIDGE project within the InterRidge project was raised by several members of the Committee (see 7.8 below)

#### **ACTION:**

R. Searle was asked to write to the president of IFREMER (with a copy to the Comité Dorsales) requesting that the ban on exportation of multi-beam data be lifted so that the French investigators can participate on equal footing within the international community. (D. Needham expressed reservation about that approach, pointing out that, although the situation was not clear, he didn't know of any formal written ban covering multi-beam data in general.)

RIDGE will make a request to Dorsales for French multi-beam data.

These letters would include a restatement of the original InterRidge project design which included database archives in multiple centers in various countries. Citation policy should be stressed in order to encourage contribution.

The InterRidge Global Digital Atlas Committee is charged with developing a citation protocol. There should be some clear policy for time limits for investigators from InterRidge nations to contribute their data to their national database.

#### **7.8 Global Digital Atlas Committee Report - K. Tamaki**

The Committee was charged with making an assessment of the level of commitment in each country to organising a system of database management. A letter was circulated to the National Correspondents and responses were received from France, the UK and the US, but little other action has been taken.

The committee was unaware that the RIDGE multi-beam synthesis was intended as an international effort and it welcomes this knowledge and the work done by the Lamont group. Maintaining and managing a database is very hard work. Some, but not all, countries will have the staff and funding to maintain their own. The availability of an international database to which countries that cannot support their own can contribute is a very practical solution.

Password technology is very useful since it means that immediately after a cruise tracklines can be made available to the community and the resolution of accessible data can be increased step by step. This will allow submission of data to the database before publication without raising proprietary issues.

A discussion of the rule governing data submission is required specifically as pertains to citation of contributors. The current databases at Lamont and the NGDC are anonymous. This may require some development if investigators are to be encouraged to freely contribute their data.



### *Discussion and Comments*

With the password protection the investigators at the University of Washington are carrying out all their research and data manipulation on the WWW.

At last year's Steering Committee Meeting in Tokyo, the understanding was that the RIDGE multi-beam synthesis would be a limited database and that each country would take responsibility for its own data or for limited geographic areas. For example, since the RIDGE project only covers the Northeast Pacific, the EPR and the MAR, it was thought that other countries might take responsibility for areas like the Indian Ocean or the Arctic using the software that has been developed and made freely available by the Lamont group. It was generally thought that the idea of geographically defined databases makes more sense than duplicating efforts for the same areas in each country. It was noted that sites can be developed and maintained by one country and mirrored by others to enhance accessibility.

A proposal has been submitted by the Lamont group to renew the funding and extend the US project. This would include maintenance and updating but probably not geographic expansion apart from perhaps the Indian Ocean. It was noted that in this case most of the MOR system would be covered by the Lamont group.

The RIDGE data base is a contribution to an international, freely-available InterRidge Global database. Initiative from other countries would be welcome and could be channelled through the InterRidge Global Digital Atlas Committee.

### **7.9 Biological Studies Ad Hoc Committee - D. Desbruyères**

The Biological *Ad Hoc* Committee held its first workshop at Rutgers University on 24 & 25 April 1995. The 25 participants included the members of the *Ad Hoc* Committee and various members of the ridge crest biologist community (15 +1 USA, 4 France, 2 Portugal, 2 UK, 1 Canada, + InterRidge Co-Ordinator). There were no German or Spanish participants. L. Mullineaux will be joining the committee from the US.

The objectives of the workshop were:

- To develop an implementation plan for integration of biological studies into the 3 principal InterRidge themes.
- To draft a formal international agreement to be endorsed by InterRidge to provide for exchange of data and samples.
- To develop approaches and methods to maximise the effectiveness of biological sampling and observations during "geological" cruises.

It is the opinion of the Biological *Ad Hoc* Committee that biological studies do not fall naturally within the framework of InterRidge. The scales on which the three principal themes operate are not those used by biologists. This may be the reason for the very limited participation of biologist in InterRidge workshops. However, Active Processes is the most natural theme for biological studies to fit into.

### **A Basic Framework for Biological Studies at the Ridge Crest**

#### **1 Origin and Evolution of Vent Taxa**

- Paleo tectonics
- Paleo-oceanography (need input from geosciences)
- Evolution
- Genetics
- Biogeography

#### **2 Community Structure and Species Persistence (Community Dynamics)**

- Cold sulfide deposits
- Temporal variation
- Monitoring (observatories link)
- Ridge fauna
- Dispersal and Reproduction
- Lifecycle
- Symbionts transmission
- Adaptation to extreme conditions

Hydrothermal vents are an unstable environment. Biological communities must persist within a segment and then disperse in lifecycles which help them to survive. Cold sulfide deposits are not being studied at present but may be the most important aspect of hydrothermal venting in terms of volume and their associated biological communities.

### 3 Biogeochemical Interaction

- Biological modification of vent fluid chemistry
- Biomineralisation
- Subsurface circulation system plumbing

These are fundamental processes occurring at hydrothermal vents, yet there is currently little or no work going on in these areas.

### 4 Biological Production

- Chemosynthetic production
- Symbiosis
- Ultrathermophily (limits of life)
- Exploration of OM from vents to ridge
- Cold biological production (psychophilic chemosynthetic production)

All of this is currently under discussion over the Internet and an implementation plan is being formulated which will eventually be ready for discussion at the Steering Committee level.

#### *International Sample Exchange Agreement and 'Bio-box'*

The bio-box is an American concept. It is a box containing all the supplies and information necessary for non-biologists to effectively and correctly sample and preserve hydrothermal vent biota. Optimally, all vessels carrying a bio-box would be in communication with a biologist.

The International Sample Exchange Agreement pertains to preserved and frozen samples. Its aim is to avoid duplication of sampling which is costly not only in monetary terms but also in terms of environmental impact. The Biological *Ad Hoc* Committee will request ratification of the Agreement which will have been endorsed by all the member nations of InterRidge. The Agreement excludes commercial use of any exchanged sample. Each nation will have a curatory clearing house kept by a national corresponding curator whose responsibility it will be to:

- keep a record of all samples collected by PIs from his or her country;
- respond to sample requests;
- keep a record of all exchanged samples; and
- curate bio-box samples.

Limitations of the Agreement will include:

- non-commercial use of samples;
- investigators must supply reports on work carried out;
- the life of the study must be agreed upon before exchange;
- citation must be agreed upon before exchange; and
- samples may never be redistributed by the requester.

#### *Ridge Crest Biologist Directory*

This directory is currently under development on the WWW.

#### *Data Exchange - BioOcean-H*

BioOcean-H is currently used as a format for data exchange in France for deep sea research data but not for hydrothermal vent fauna. This database is being extended as a project of the Biological *Ad Hoc* Committee to include vent fauna so that data may be exchanged on the WWW.

#### *International Vent Biology Symposium*

An international symposium is being planned by M. Biscuito (Portugal) and C. Cary (US) to be held in Madeira in the Spring of 1997. The proceedings will be published in a volume edited by D. Dixon (UK).

#### *Species Identification Manual*

A manual is currently being compiled which will be distributed to all cruises working at the ridge crest so that biological samples that arrive on deck can be identified and described by geologists in a way which can be understood by biologists. Contributions of manual pages are being made by numerous individuals within the community.

