



What's New at RIDGE

- Office moves to OSU
- Plans for the next Millennium
- RIDGE 2000 Meeting

# RIDGE EVENTS

## RIDGE INTER-DISCIPLINARY GLOBAL EXPERIMENTS

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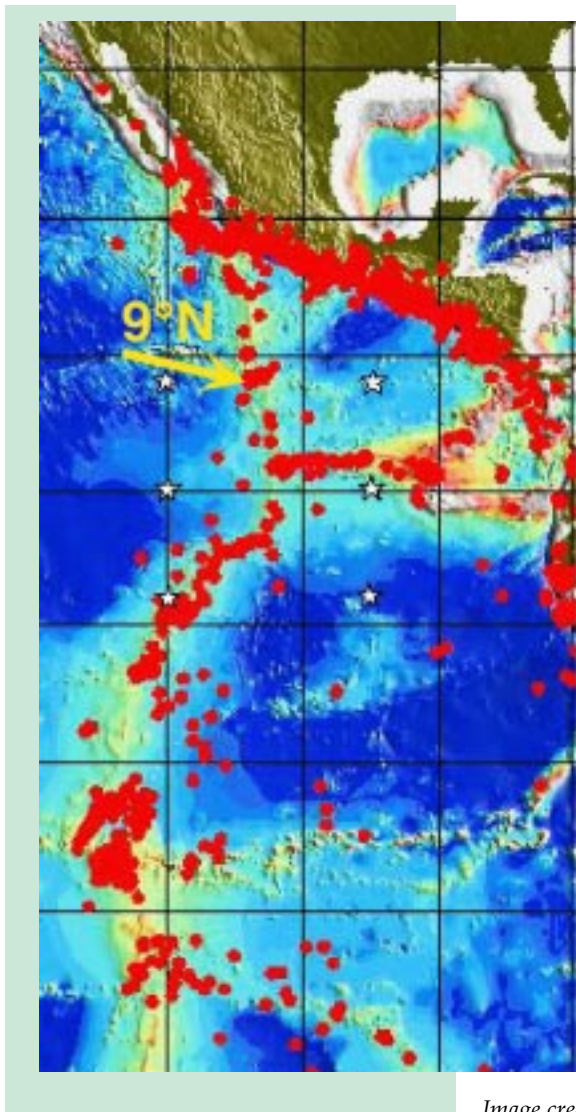


Image credit: NOAA/VENTS group

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## A Message from the Chair...

NASA has its New Millennium Program, the NOAA Vents folk have their New Millennium Observatory, so in order to assert RIDGE's leadership role, I hereby proclaim myself as New Millennium Chair of the RIDGE Program. In keeping with this high honor, this letter is a little long-winded. I promise not to do it again.

But, before we leap ahead, we should look back a little and thank Karen Von Damm, Chris Keeley and Laureen Caddick for a job well done. They took over the RIDGE program with very short notice when Jeff Fox, who was then Chair Apparent, (or perhaps chaise-lounge) gave up on trying to fill Bob Detrick's shoes and fled south to the easier task of managing the Ocean Drilling Program. Our transition has been much easier. Karen et al. took over a mature program that had passed beyond the initial enthusiasm of the ramp-up stage and was faced with the transition to reality — "routine" operation at a funding level well below what was envisioned in the initial science plans. They did an excellent job, keeping the program on course, setting up a variety of communications, encouraging and initiating new initiatives including several Event Response cruises, the RIDGE field schools and a very successful new line of "results" workshops. They deserve our most sincere thanks.

It is in the nature of millennia to encourage introspection, grand plans and pompous resolutions. Equally, it is the nature of our society to jump the gun and not wait placidly for 2001 to arrive. RIDGE is not immune to these pressures, and their impact on the program is discussed at some length below. First, however, I want to indulge in a little personal introspection.

A lot of people have asked me why I would want this job and there is, of course, no simple answer. Partly, it is an interesting job — more so than I ever realized before I started. Our program involves innumerable talented people doing innumerable interesting things. The more I learn, the greater my enthusiasm for the breadth and depth of science that RIDGE encompasses. A bigger part of the answer lies in my feeling that it is time to give something back in return for the incredible privilege to be able to work on the geographic and scientific frontiers of Ocean Science. Having grown up elsewhere, I am especially aware of the ease with which so many of us are able to pursue our interests, even in these relatively troubled times. It is not like this in other countries, except, perhaps, for a privileged few. The great strength of U.S. science lies in the ability of investigators of all ages and stages to obtain funding for good ideas and to involve themselves in the planning and

management of their science.

Yes, times are tough, or at least tougher. Here it seems to me lies the biggest threat, not only to RIDGE, but to our science in general. It seems to me that there is a tendency in tough times to withdraw oneself — to reduce one's involvement in the community, to hoard one's ideas and to be defensive, or even offensive, rather than constructive in criticizing the work of others. If this is true, even tougher times lie ahead. If we cannot get together and express the excitement and the future of our science, even to ourselves, then surely we cannot compete for public and political interest and, hence, for funding. It should be easy — our science speaks for us — the deep ocean has a fascination comparable to that of space, yet our political and financial presence is paltry by comparison. Now, as NSF and the other agencies are formulating their plans for the millennium, we need to be there with a clear strong message. We need to provide our managers with the material they need to pursue our interests for us.

*"We must all hang together or assuredly we will all hang separately". Benjamin Franklin at the signing of the Declaration of Independence*

### What is RIDGE?

Everybody knows what RIDGE is — right? I am not so sure. RIDGE is a chameleon. It clearly means different things to different people. For example, in the last couple of weeks I have heard RIDGE criticized, on the one hand for being too successful and (if I understand correctly) for distorting the "proper" balance in Ocean Science, and on the other hand as being a total failure. In both cases, the critics are prominent and influential ocean scientists.

In fact, about the toughest job I have encountered since taking over the RIDGE chair has been to come up with a concise answer to the question "what is RIDGE, anyway?". My answer continues to evolve, but, by now, I can sometimes get to the end of it before the questioner's eyes glaze over:

- RIDGE is a "special program" within the Ocean Sciences division at NSF. It is actually one of the smaller ones. It is important to note that all the growth in Ocean Sciences funding in the last decade has been in special programs and that this situation is not likely to change in the near future. As far as I can tell, RIDGE has been unique among these special programs in its emphasis on communication and in

## *What's New in the RIDGE Office?*

its broadly focused objectives (see below).

- RIDGE is a pot of money – about \$9 million per year, of which almost \$5 million is used for science grants in Marine Geology and Geophysics and <\$1 million in Biological Oceanography. Most of the remainder is for direct funding of ship operations. In MGG, about 50% of all grants (and 50% of all proposals) are for mid-ocean ridge research. RIDGE dollars fund about half of these.
- RIDGE is a science plan that seeks to focus and to foster inter-disciplinary mid-ocean ridge research. The science plan does not, however, dictate where or how individual scientists should operate. In particular, it does not determine which proposals are funded – this is entirely the province of peer and panel review and of the program managers. “Relevance” to the science plan does, however, determine which of the funded projects from a given panel are assigned to RIDGE funding.
- RIDGE is a vehicle for education and communication. To date, most of this activity has been directed to the (potential) RIDGE scientific community, through Theoretical Institutes, through a myriad of workshops, through the newsletter and the web site. During the coming triennium, RIDGE will be expanding its educational and outreach activities to the broader community.
- RIDGE is an office that seeks to manage and facilitate all the above activities.

But beyond all these things:

- RIDGE has become a large, diverse, creative and ultimately successful community of scientists. More than the science plan or any of its other formal activities, this is undoubtedly the program's greatest success. This success can only continue as long as the community as a whole remains enthusiastic, open to change, committed to growth, receptive to, and productive of, new ideas. The program can only continue as long as individuals continue to volunteer their ideas, their talents, their enthusiasm and their time to make it all happen. And last, but by no means least, it can only continue if our program managers at NSF continue to receive our support in their efforts to promote and support our science.

To this effect, a RIDGE 2000 conference will be held in September 1999, to review the achievements of the RIDGE program to date, and to set its course for the next decade. (see separate RIDGE 2000 article on page 15)

On September 1, 1998, the RIDGE Office moved to the College of Oceanic and Atmospheric Sciences at Oregon State University. David Christie is the Chair of the RIDGE Steering Committee. Randy Keller and Carol Chin are the RIDGE Science Coordinators, and Ellen O'Shea is the RIDGE Office Manager. We are all looking forward to an exciting and fulfilling three years, and since this is our first newsletter, we want to take a moment to tell everyone our plans for the RIDGE Office at OSU. But first, we wish to thank Karen, Chris, and Lauren for leaving us with some large shoes to fill. They hand over a popular, vital program, and we intend to keep it that way.

With completion of the 9°N Workshop, the RIDGE Office handover was complete. We are now handling all RIDGE business at OSU. The fact that the Coordinator position is split between two people at this RIDGE Office should be transparent to most of you. To avoid confusion, the split will be along project lines. Only one of us will be responsible for a particular task, such as a newsletter or meeting. Carol's specialties are hydrothermal vents and water-column work, so she will be handling projects in those areas. Randy's background is in geology and geophysics, so he will be handling tasks in those areas. From our perspective, the major advantage to splitting this position is that it allows both of us more time to devote to our own research projects.

Over the next several months, we are going to add an education and outreach section to the RIDGE website (<http://ridge.oce.orst.edu>). This will be designed for a general audience, and contain highly accessible descriptions of RIDGE (and ridge) scientific results, future studies, and links to other sites. If a student, teacher, friend, journalist, or politician asks you about RIDGE, this will be the place to send them. We encourage you to contribute to this web effort by providing cruise or submersible photos, URLs of your favorite mid-ocean ridge-related web pages, or anything else that you think might be at home in this arm of our website. This will be a flexible, open-ended project with plenty of time and room for your input. Feel free to contact one of us if you have any suggestions.

All of us at the RIDGE Office are keenly interested in education and outreach. We will be working hard to raise RIDGE's profile among the general public, NSF, and political representatives. We welcome any suggestions along those lines. You can reach any or all of us at [ridge@oce.orst.edu](mailto:ridge@oce.orst.edu).

Cheers, David, Carol, Randy, Ellen

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## RIDGE STCOM Subcommittees — Members and Functions

At the October 1998 RIDGE Steering Committee meeting it was agreed that certain STCOM activities could be conducted more efficiently by focused subcommittees. STCOM then created four subcommittees: Database/Synthesis, Event Detection and Response/Observatory, Education and Outreach, and Meetings. The rationale, objectives, and members (\* = subcommittee chair) of each subcommittee are described below:

### **Database/Synthesis** (\**Spiegelman, Fisher, Lonsdale, Toomey*)

The Database/Synthesis Subcommittee's purpose is to foster and coordinate efforts for the development of community wide, multi-disciplinary databases as well as the tools for analysis and integration with theoretical models.

Current RIDGE sponsored data initiatives include the multi-beam synthesis and the soon-to-be-released Petrological Database but we hope to enlarge the scope of RIDGE-related data products and tools.

Some issues upon which we hope to generate discussion:

- Technological issues: Data/MetaData collection/management
- Policy issues: quality control/data sharing
- Community tools for interaction/analysis/collection
- Interactions with computer science

We expect that much of this discussion will arise through a series of workshops. Some possible topics for workshops that have already been discussed are:

- New tools for new science: Understanding the state of the art in data collection/management/synthesis
- Workshops for development of regional databases such as Juan de Fuca, 9°N, MAR, MELT region.

If you are interested in any of these issues or would like to contribute new ideas please contact any of the members of the sub-committee with a cc: to Marc Spiegelman (mspieg@ldeo.columbia.edu).

### **Event Detection and Response/Observatory** (\**Chadwick, Baross, Duennebier, Kadko, Zumberge*)

The main tasks of this subcommittee are to oversee and encourage RIDGE EDR (Event Detection and Response) and observatory activities, to coordinate relevant meetings and cruise plans, and to make this information available via the RIDGE web page. NSF has supported "event response" activities in the past on an ad hoc basis with whatever resources happen to be available at the time, but there is an increasing reluctance to continue in this mode.

In order to promote better planning and advance preparation for event response activities, NSF and RIDGE issued proposal guidelines in January 1998 for event response proposals. To date, only one such proposal has been received and funded. Proposals are encouraged for advance activities, such as building instrumentation and to put funds in place that can be quickly made available when an event occurs.

In an on-going effort to coordinate both proposed and funded activities at the RIDGE observatory sites on the Juan de Fuca Ridge, an Observatory Coordinating meeting will be held during the 1998 AGU Fall Meeting in San Francisco at 5:30PM Monday December 7<sup>th</sup> at the Cathedral Hill Hotel. All those involved in Juan de Fuca field programs and related activities are encouraged to share information, future plans and opportunities for increased cooperation and collaboration.

### **Education and Outreach** (\**Manahan, Chin, Holloway, Karsten, Keller*)

The purpose of the RIDGE Education and Outreach Subcommittee is to enhance educational activities regarding all aspects of RIDGE programs and to provide outreach to professional scientists, to students, to science managers and to the general public. The subcommittee currently has three main tasks:

- To serve as the point-of-contact for the RIDGE postdoctoral fellowships within the RIDGE Steering Committee. The application criteria for the RIDGE postdoctoral fellowships are currently under review by the Steering Committee which is looking at ways to simplify the application process and to encourage a wider range of applicants, while still maintaining a strong focus on interdisciplinary research.
- To enhance educational outreach by arranging for speakers in different disciplines to visit undergraduate universities and present lectures on RIDGE (or ridge) activities and to inform them of current activities of RIDGE scientists. It is expected that up to six such presentations will be arranged within the US each year.
- To enhance community outreach by assisting and advising the RIDGE office on web-based design and content.

*Continued on page 7*

# RIDGE Meetings: Strategy and Purpose

The NSF RIDGE Program is deeply committed to a wide range of educational and outreach activities to enhance and disseminate understanding of the geological, geophysical, biological and geochemical processes related to the formation and evolution of axial ridge systems. In recognition of the highly interdisciplinary nature of ridge-science, together with awareness of the rapid pace of recent discovery in this field, the RIDGE Program has worked hard to establish a wide range of meeting formats (Theoretical Institutes, Workshops, Symposia, and Short Courses) that enhance communication and contribute to a better understanding of ridge-related science by students and professionals alike. The RIDGE Program encourages the broadest possible participation in its sponsored meetings. Individuals interested in *participating* in or *initiating* ridge-related meetings should contact the RIDGE Office at Oregon State University.

The attached information sheets provide criteria, definitions and an organizational hierarchy of RIDGE meetings. This hierarchy is intended to guide individuals in proposing or designing new meetings, but not to inhibit innovative new ideas. Each type of meeting is designed with a slightly different purpose depending upon the objectives of the convenors. The flow chart (Fig. 1) shows an idealized sequence of meetings that might flow from results of a RIDGE Theoretical Institute (RTI). Ideas and concepts advanced through the RTI may help to generate planning workshops, individual research projects, AGU thematic sessions, and Results Symposium Workshops, where the elements of new RTI on a new topic may come into focus. Key issues and leading questions derived from the RIDGE Science Plan can also result in a number of different types of RIDGE-sponsored workshops and symposia.

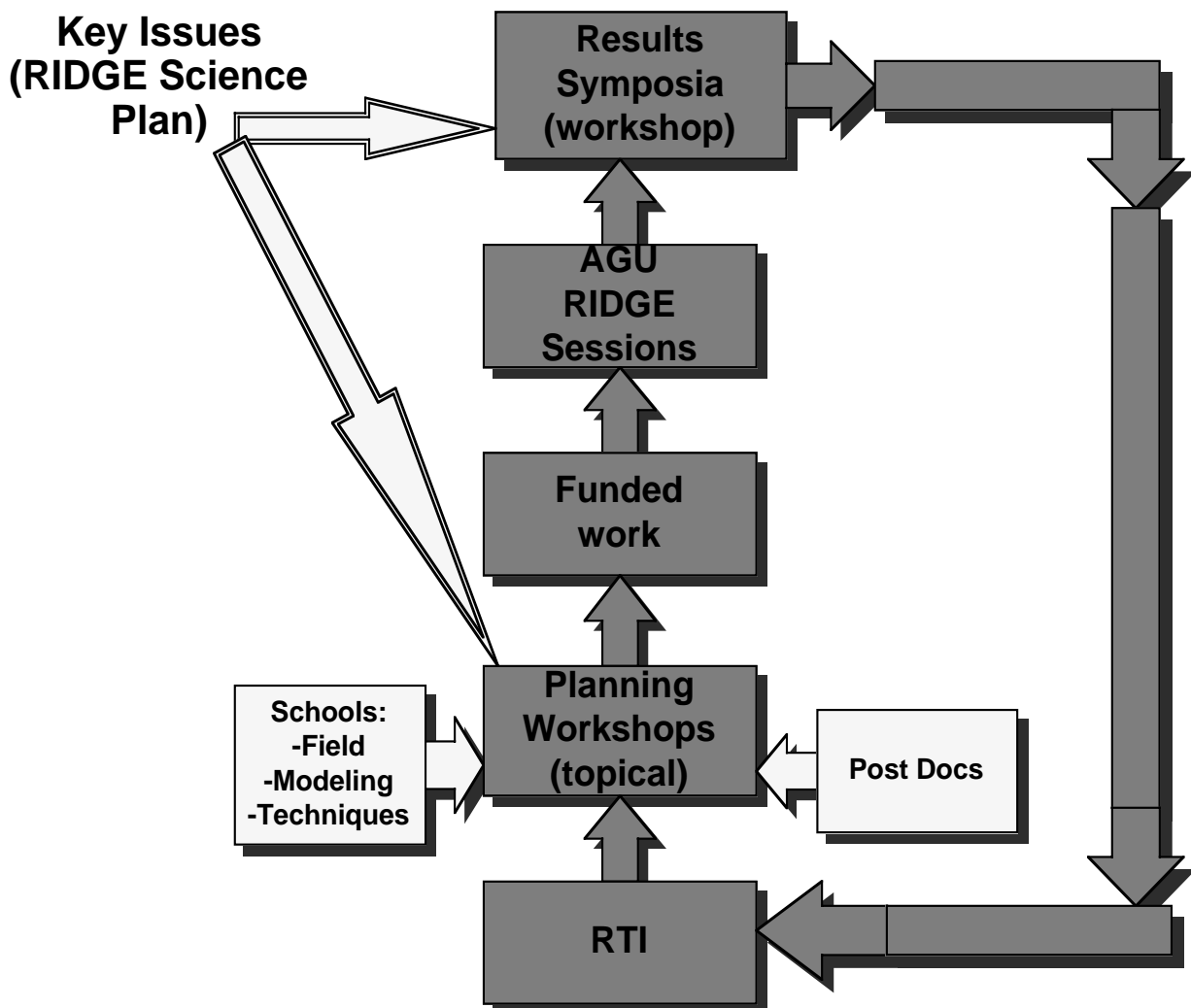


Figure 1- Flow Chart

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# RIDGE Meetings: Strategy and Purpose

## Criteria, Definitions, and Organization of RIDGE Meetings

### RTI — RIDGE Theoretical Institute

- Purpose:** Comprehensive presentation of mature studies on a topic that can be tied to a unifying theoretical underpinning.  
Open to a broad cross-section of the community (large meeting ~ 100 people).  
Strong interdisciplinary educational component.
- Product:** Published AGU monograph.  
The RTI is often conducted in association with pre- or post-meeting short courses, field trips and poster sessions.
- Funding:** Requires separate NSF RIDGE proposal after STCOM\* endorsement.  
12-18 month lead time
- Initiation:** Initiated and convened by RIDGE community scientists with guidance/solicitation from STCOM.
- Examples:** Mantle Flow, Melt Generation and Lithospheric Deformation at Mid-ocean Ridges (1990); Physical, Chemical, Biological and Geological Interactions Within Seafloor Hydrothermal Systems (1993);  
Magmatism and Faulting at Mid-Ocean Ridges (1995)

### Workshops

- Initiation and Funding:**  
Workshops are initiated and planned by individuals from the community and are funded through the RIDGE Office following STCOM approval of a short proposal.

#### Results Symposium Workshop

- Purpose:** Present results from a substantial amount of RIDGE research on a given topic or area.  
Foster interdisciplinary exchange, data sharing, interpretation, synthesis, etc.  
Primarily intended for workers with direct interests in the subject (~50 people)
- Product:** Workshop report (EOS, RIDGE Newsletter)  
Symposium volume (JGR special issue, etc.)  
Possible RTI
- Examples:** Mantle Flow and Melt Generation Beneath Mid-Ocean Ridges (MELT, 1997), Results Symposium on Field Studies on the East Pacific Rise, 9-10°N (1998).

#### Planning Workshop

- Purpose:** Bring together workers to explore and plan for a topic that may be appropriate for a focused RIDGE effort (20-30 people).  
Synthesize existing knowledge and produce a written plan for possible follow-up action.  
Recommend priorities and strategies for implementation.
- Product:** RIDGE planning document or Request for Proposals for a research program. Results may also generate Results workshop or AGU theme session.
- Examples:** MELT (1993) LARVE (1993), Subsurface Biosphere at Mid-ocean Ridges (1997), Surface Ocean Productivity (1998).



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## Organizational Workshop

- Purpose:** Bring together workers with active and/or pending proposals for work in a common area or with a common aim.  
Maximize use of resources and minimize overlap and or conflicts in logistics and scientific objectives.
- Product:** Web based database and information exchange.
- Examples:** Various Coordination meetings for observatory activities.

## Schools

- Purpose:** To educate graduate students and professional researchers through practical experience involving actual study of ridge-related materials. Can be field schools or short courses on topics such as modeling, data analysis, or techniques.
- Product:** To date, these have not produced a published product. Field guide or short course text published by RIDGE as a notebook would be great! Alternatively, publication can be in the form of EOS and RIDGE newsletter articles emphasizing the nature of the activities that occurred during the schools.
- Funding:** Requires a separate RIDGE proposal to NSF following STCOM endorsement.
- Initiation:** Initiated by RIDGE community scientists with guidance from STCOM.
- Examples:** Iceland Summer School on Active Processes at Mid-Ocean Ridges (1997). Oman Field School on Ridge Processes (1998).

\*STCOM = RIDGE Steering Committee

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*Meetings descriptions - continued from page 4*

### **Meetings** (\*Seyfried, Gillis, Karsten, Lin, Shanks)

The Meetings Subcommittee is a watchdog group, responsible for maintaining the breadth and balance of RIDGE-sponsored meetings. Where necessary, the subcommittee will identify topics or regions for which a dedicated meeting might be beneficial, either for planning and coordination purposes or for outreach. They may also identify possible convenors and encourage them to consider submitting a meeting proposal.

The Meetings subcommittee's first assignment, to describe the purpose and organization of a hierarchy of RIDGE-sponsored meetings, has been completed and is described elsewhere in this newsletter. Suggestions and meeting proposals are welcome from any member of the RIDGE community at any time. The process is very simple. Contact the RIDGE Office for initial guidance.

## COMING SOON ... ON THE RIDGE WEBSITE

- New RIDGE Interim Science Plan
- RIDGE 2000 Meeting Announcement

<http://ridge.oce.orst.edu>





# RIDGE Steering Comm

## **David M. Christie, Chair**

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David Christie is a petrologist who tries to understand the interplay between petrogenesis and regional and local tectonics along mid-ocean ridges. His primary interests center on phenomena associated with morphological transitions at intermediate spreading rates and around hotspots.

## **John Baross**

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John Baross specializes in the ecology, physiology and taxonomy of microorganisms from hydrothermal vent environments, as well as the use of biochemical and molecular methods to detect, quantify and classify the same. He has particular interests in the microbiology of extreme environments and in the significance of submarine hydrothermal vent environments for the origin and evolution of life and as a model for studying life on other volcanically active solar bodies.

## **William W. Chadwick**

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Bill Chadwick is a physical volcanologist with interests in the mechanics of magma intrusion, the structure and morphology of submarine eruption sites, and understanding the role of volcanic events as perturbations to hydrothermal and biological systems on mid-ocean ridges.

## **James Childress**

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Jim Childress is interested in ecological physiology of marine invertebrates and fishes, physiology of deep-sea animals,

physiology of hydrothermal vent and hydrocarbon seep animals, and animal/bacterial symbioses.

## **Fred K. Duennebie**

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Fred Duennebie's research focuses on marine seismology and instrumentation. He is involved with the Hawaii Undersea Geo-Observatory on Loihi volcano and the Hawaii-2 Observatory on a decommissioned telephone cable half way between Hawaii and California. The broad-band seismic system at H2O was built and is monitored at the University of Hawaii.

## **Andrew Fisher**

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Andy Fisher is a hydrogeologist with interests in the fluxes of heat, fluid, and solutes through oceanic crust. His research involves seafloor heat flow surveys, geotechnical testing of crustal samples, in-situ hydrogeologic testing, and coupled numerical modeling of hydrothermal systems.

## **Kathryn M. Gillis**

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Kathy Gillis is interested in the geochemical fluxes associated with oceanic hydrothermal systems and the nature of fluid-rock interaction near the magma-hydrothermal transition. Her research involves field mapping in ophiolites and tectonic exposures of modern oceanic crust, tracing the evolution of hydrothermal systems using geochemical and petrological data, and assessing how deformation and magmatism influence metamorphic processes.



# Committee- December 1998

## **John R. Holloway**

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John Holloway's major research interests are the role of volatiles in the evolution of igneous systems, the application of fluid phase thermodynamics to geologic problems, and the phase relations of the mantle of Mars. In the last two years he has spent most of his time developing laboratory-scale artificial seafloor hydrothermal systems. The aim of this work is to reproduce "black smoker" fluid chemistry, pressure and temperatures to allow investigation of abiotic synthesis of organics and eventually to culture hyperthermophiles under similar conditions to those found in vent systems.

## **David Kadko**

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Dave Kadko uses the distribution of radioisotopes in the ocean to understand the rates and timescales of various processes. He uses disequilibria among the naturally occurring radioactive decay series in hydrothermal vent fluids, associated mineral deposits, and the overlying effluent plume as geochemical tools to investigate the rates of processes occurring in submarine hydrothermal systems.

## **Jill Karsten**

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Jill Karsten's research interests are focused on combined tectonic and petrologic studies of intermediate spreading rate ridges. She has emphasized looking at "perturbed" ridge crest systems, such as hot spot-ridge-propagating rift interactions at the Juan de Fuca Ridge and the consequences of ridge subduction at the Southern Chile Ridge, with the belief that such settings provide complementary constraints on more normal ridge crest behavior. Most recently, she has begun an investigation (with Emily Klein) of the northern Chile Ridge, primarily to look at the thermal influence of offsets on spreading center processes. As a former Ph.D. student at the

University of Washington, she has watched the RIDGE program evolve from its pre-Salishan, "mote in Delaney's eye" days, to its current dominance in the MG&G community, and she hopes to take an active role in helping the community to maintain the RIDGE program's vitality and to steer it into a new era of exciting accomplishments in ridge-related research.

## **Marvin Lilley**

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Marv Lilley has been spending too much time at sea to prepare a biographical sketch, but you can find him at <http://www.discovery.com/stories/science/seavents/seavents.html>.

## **Jian Lin**

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Jian Lin's research focuses on the physics controlling structural segmentation of ocean ridges and mantle thermal regimes, ridge-hotspot interactions and melt fluxes, oceanic crust faulting mechanisms, margin rifting-spreading transition, and stress transfer and earthquake triggering in Southern California.

## **Peter Lonsdale**

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Peter Lonsdale specializes in deep-sea geomorphology. He has investigated the structural geomorphology of Pacific spreading centers since the late 1970s, principally by using the Deep Tow vehicle, submersibles, and multibeam sonars. He was involved in the initial discoveries of hydrothermal vents on mid-ocean rises, at sedimented near-shore spreading axes, on rise-flank seamounts, and in back-arc basins. Though his research interests extend beyond the geographic focus of the RIDGE program, risecrest studies remain a major component of his current work; his most recent cruise (October 1998) studied the northernmost segment of the East Pacific Rise, bisecting Alarcon Basin in the mouth of the Gulf of California.

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## *More Steering Committee...continued from page 9*

### **Donal Manahan**

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Donal Manahan's research interests are biology of larval forms, marine biochemistry and physiology, and animal life in extreme environments (Antarctica; hydrothermal vents).

### **William Seyfried Jr.**

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Bill Seyfried's research deals with experimental and theoretical constraints on hydrothermal alteration processes in subseafloor reaction zones at mid-ocean ridges. He is currently developing in-situ sensors for measurement and monitoring of pH and dissolved H<sub>2</sub> and H<sub>2</sub>S in aqueous fluids at elevated temperatures and pressures.

### **W.C. Pat Shanks**

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Pat Shanks' research has focused on the origin of submarine hydrothermal base-metal sulfide deposits and has included studies of the Red Sea geothermal brine deposits, East Pacific Rise and Juan de Fuca Ridge volcanic-hosted ridge-crest systems, and sediment-hosted systems at Guaymas Basin, Middle Valley, and Escanaba Trough. Studies of ancient analogs in the conterminous U.S., including the Turner-Albright Deposit in the Josephine Ophiolite complex in SW Oregon and the Elizabeth Deposit in the Vermont Cu Belt, have proceeded in concert with studies of the modern oceanic systems. Recently, studies have included the Ocean Drilling Program (Leg 169) delineation of a large sediment-hosted massive sulfide deposit at Bent Hill in Middle Valley (northern Juan de Fuca Ridge), seafloor oxidation of sulfides, acid mine drainage, and hot springs in Yellowstone Lake.

### **Marc Spiegelman**

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Marc Spiegelman is a theorist whose principal research interests are the dynamics of coupled fluid/solid systems and

their observable consequences. Current work emphasizes dynamics of melt and solid flow in the mantle beneath ridges and the geochemical consequences of these processes. He is also working on generic reactive fluid-flow problems. Long term goals include integration of mantle and crustal models, a better theoretical foundation for flow in brittle media and the reunification of global geochemistry and geodynamics. He is also very interested in better integration of theory and observation and in the development of community-wide databases and data-analysis tools.

### **Douglas R. Toomey**

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Doug Toomey attempts to conduct oceanographic research in a department that is unaware of the ocean except on sunny weekends, which aren't too frequent in the Pacific NW! Much of Doug's research has been related to the goals of the RIDGE Program, in particular using and developing seismic imaging methods to understand magmatism at ridges.

### **Mark Zumberge**

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Mark Zumberge's research interests include absolute and relative measurements of gravity, development of geophysical sensors using optical fibers, and marine geodetic techniques for the detection of crustal deformation.

## **JdF RESULTS SYMPOSIUM** **Preliminary Announcement**

A RIDGE Results Symposium for the Juan de Fuca Ridge is in the planning stages for late October or early November 1999.

Watch the RIDGE website or the next newsletter for details.

## RIDGE Results Symposium: Field Studies Along the East Pacific Rise at 9°–10°N

### *Preliminary Summary of a Recent RIDGE Meeting:*

**Convenors:** Rachel Haymon (haymon@magic.geol.ucsb.edu), University of California, Santa Barbara  
Jim Childress (childres@lifesci.lscf.ucsb.edu), University of California, Santa Barba  
Douglas Toomey (drt@newberry.uoregon.edu) University of Oregon, Eugene  
Karen Von Damm (kvd@cisunix.unh.edu), University of New Hampshire, Durham

On September 24-26, 1998 over 80 researchers participated in a RIDGE workshop at the University of California, Santa Barbara, to discuss results and future challenges of research related to the East Pacific Rise (EPR) between 9°-10°N. The results oriented meeting brought together a full spectrum of inter-disciplinary researchers whose common interest is to further our understanding of this exceptionally well-studied section of EPR.

#### **The purpose of the meeting was:**

- To bring together researchers from different disciplines who have been studying the fast spreading East Pacific Rise (EPR) at 9°-10°N so that many different types of observations and findings coincident in space and time can be shared, discussed, and synthesized.
- To promote more effective interpretation of data and collaboration among investigators and students working at the EPR 9°-10°N.
- To identify important observations that should be made or experiments that should be done to address new questions arising from what has been learned thus far about ridge crest processes at the EPR 9-10°N.
- To discuss coordination of future data acquisition efforts, and possibilities for developing a multidisciplinary time series database of observations for the EPR 9°-10°N that will enhance the usefulness of this site as a natural seafloor laboratory for study of fast-spreading mid-ocean ridges.

The meeting was organized as a three-day workshop, consisting of a mix of invited and contributed talks with additional poster presentations during the evenings. An abstract volume was provided.

The interdisciplinary breadth of RIDGE supported research at 9°-10°N is well demonstrated by the range of topics discussed: regional tectonics and magnetics, seismic velocity structure, microseismicity, gravity, petrology and basalt geochemistry, fine-scale morphology, hydrothermal vent geology, hydrothermal fluid chemistry, hydrothermal mineralization, hydrothermal plumes, ecology of vent fauna, vent macrofauna function, vent zooplankton, vent microfauna, vent radiation measurements, 9°-10°N databases.

The meeting was a tremendous success. Discussions were lively and extremely educational as researchers from markedly different sub-disciplines of the RIDGE program summarized their most exciting findings (and outstanding questions!) at a level that was respectful to the breadth of the audience. Many at the meeting came away with a renewed appreciation of and excitement for how individual research efforts contribute to our overall understanding of ridge processes.

It is the goal of the convenors to submit a report summarizing recommendations raised in discussion during the workshop. This information will be placed in a future RIDGE newsletter.



*Image credit: David Christie*

## InterRidge Workshop Report: Mapping and Sampling the Arctic Ridges

Peter Michael, *The University of Tulsa, Tulsa, OK 74104*

An InterRidge workshop: Mapping and Sampling the Arctic Ridges was held in Hannover, Germany on October 16-17, 1998 to formulate plans for expeditions to the Arctic mid-ocean ridge (now formally named Gakkel Ridge). The workshop aimed to move forward from the 1994 InterRidge workshop in Kiel, in which current data were compiled and scientific goals were discussed for all of the Arctic ridges. The report from that workshop, published in 1997, identified Gakkel Ridge as having the highest priority for study. The 1800 km-long Gakkel Ridge is unique among the global spectrum of ridges. Its spreading rate is considerably lower than the other very-slow-spreading ridge, the SWIR. Ridge offsets are very small and/or sparse, and spreading is orthogonal. Preliminary indications from SCICEX bathymetry and gravity measurements are that Gakkel has an exceptionally deep rift valley, and the thinnest known crust for a normal ridge. Tiny basalt samples have been recovered from two locations on Gakkel Ridge, and suggest that the crust may have end member major and trace element characteristics as well. These distinctive physical and chemical properties mean that studies of Gakkel Ridge should provide fundamental insights into global crustal accretion and mantle processes unattainable from any other source. In addition, Gakkel Ridge could be host to unique hydrothermal vent communities because the Arctic Ocean basin is hydrographically isolated from the Atlantic and Pacific Ocean basins.

All of these factors combine to make Gakkel Ridge a unique and extremely attractive ridge for petrological, geophysical, hydrothermal and biological studies. But the huge logistical challenges of working in ice covered seas have prevented any type of sampling and many types of geophysical studies. For reasons of safety and efficiency, Arctic expeditions require two icebreakers working together. InterRidge was created to address such large undertakings.

Recent developments have made shipboard studies of Gakkel Ridge more foreseeable, and precipitated the need for a planning workshop. The U.S. SCICEX program has provided the first high quality swath bathymetry and gravity data from Gakkel Ridge that complements the excellent aeromagnetic data from the U.S. Naval Research Laboratory. The Icebreaking Research Ship USCG HEALY (WAGB-20) is now built and will be routinely operational in about three years, with its primary mission as a world class high latitude research platform. The workshop resulted in a project plan, that is highlighted by several recommendations:

1. Where available, SCICEX bathymetric data are good enough to allow accurate sampling of the Gakkel spreading axis.
2. The European end of Gakkel Ridge, as opposed to the end close to the Laptev Sea shelf, should be seismically surveyed and sampled first because it is logistically easier, it lies in international waters, it has little or no sediment cover in the axis and it is relatively well surveyed bathymetrically.
3. The extreme slow spreading rate of the Laptev Sea end of the axis makes it nevertheless an extremely high priority, if much more challenging, sampling target.
4. Reasonable sampling and seismic survey strategies will involve two ships to deal with ice conditions. Both ships should have at least some science capabilities, but the scientific control of the mission must be clearly in the hands of one of the ships.
5. Planning windows exist in 2001 (Polarstern, Germany) and possibly in 2002? (Healy) to bring ice-capable research vessels to the Arctic near Gakkel; an international funding effort will be needed at least to fund a second ship since most expeditions require two ships.
6. Critical scientific objectives in the area of biogeography and hydrothermal processes should be advanced at the Knipovich Ridge concurrently with the geophysical and geochemical studies of the Gakkel Ridge; such studies can address critical biological and hydrothermal objectives for Arctic Ridge systems in general, while further defining specific objectives important for later studies at the Gakkel Ridge.
7. Although present technology can accomplish many of the sampling goals in the Arctic, refinement of this technology to deal with the special Arctic conditions, especially minimization of time in water, is necessary.

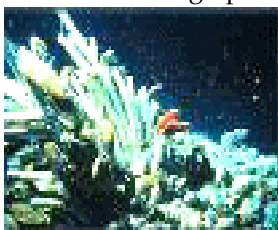


Image credit: Tim Shank, Rich Lutz & Bill Lange

# InterRidge Workshop Report: Long-Term MOnitoring of the Mid-Atlantic Ridge “MOMAR”

Maya Tolstoy, LDEO, Palisades, NY 10964

The MOMAR (MOnitoring the Mid Atlantic Ridge) workshop was hosted by Prof. Miranda and Prof. Mendes Victor of the University of Lisbon, at the Museu de Ciencia, in Lisbon, Portugal, from October 28th to 31st, 1998. The workshop was organized by InterRidge, and included 67 international participants - 20 from the US, 43 from Europe, 3 from Japan and 1 Canadian. Speakers, poster presenters and young scientists were supported by the European Community ‘TMR’ program and by the U.S. RIDGE & DEOS initiatives.

## The Purpose of the meeting was:

MOMAR was designed to bring together researchers from the international scientific community to plan the establishment of long term multi-disciplinary monitoring on the Mid-Atlantic Ridge near the Azores. The meeting had a technical emphasis, in order to focus on what can practically be done with current technology. With this in mind, the talks were divided up into 3 sections:

1. *Review of existing seafloor/Ridge Observatory/monitoring efforts.* Talks about existing, or planned, long-term monitoring efforts on the seafloor. This section provided an overview of on-going monitoring to clarify discussion on the possible scope of the what might be done on the MAR.
2. *Site Selection for the MOMAR experiment.* Talks focused on what is known about the MAR in the area of the Azores, and what site or sites would be the most interesting and practical for long-term observations.
3. *Monitoring Technology at the MOMAR Site:* Talks about existing technical capabilities of the community, both in terms of installation as well as actual monitoring equipment. This section provided input on possible experiments that might form part of the monitoring effort.

Following the talks, the meeting broke into three working groups to help focus and write up the ideas discussed in the talks and in accompanying poster sessions:

- *Focused multidisciplinary studies group* discussed possible sites and quickly realized that there was strong agreement that the Lucky Strike segment is most appropriate for both segment scale and vent field scale studies.
- *Event detection and response group* discussed how the soon to be emplaced hydroacoustic monitoring array for the MAR, along with expansion of the land seismic array, might be utilized to detect areas of possible magmatic activity on the MAR.
- *Regional/comparative studies group* discussed experiments that require a broader geographical view of monitoring, and /or learn from comparison of contrasting sites.

The MOMAR workshop provided a forum for discussion of both the scientific questions to be addressed on the MAR, as well as the technology available with which to address them. There was strong emphasis on international coordination of the efforts, in terms of science, technology and logistics, and particularly concerning environmental considerations. It is anticipated that an international steering committee will be set up to help direct the next steps toward implementing the ideas from MOMAR. The workshop report is anticipated by the end of the year.

**MOMAR Organizing Committee:** Pascal Tarits, Co-Chair, (tarits@univ-brest.fr); Maya Tolstoy, Co-chair, (tolstoy@ldeo.columbia.edu); Mathilde Cannat, (mac@ccr.jussieu.fr); Alan D. Chave, (alan@faraday.who.edu); Daniel Desbruyeres, (ddesbruy@ifremer.ft); Robert S. Detrick, (rdetrick@who.edu); Christopher G. Fox, (fox@pml.noaa.gov); Peter Halbach, (hbrumgeo@zedat.fu-berlin.de); Charles H. Langmuir, (langmuir@ldeo.columbia.edu); J. Miguel A. Miranda, (jmiranda@fc.ul.pt); Hiroyasu Momma, (mommah@jamstec.go.jp); Adam Schultz, (ada,@esc.cam.ac.uk); Luis A Mendes Victor, (lmvictor@fc.ul.pt).



Image credit: Tim Shank, Rich Lutz & Bill Lange

## Contributors for the RIDGE Smoker at AGU

The RIDGE Office would like to thank the following institutions for their generous contributions to the 1998 RIDGE Smoker during the Fall AGU Meeting in San Francisco:



Chemistry Department, *Arizona State University*



College of Oceanic and Atmospheric Sciences, *Oregon State University*



Department of Geological Sciences, *University of Oregon*



Department of Geology and Geophysics, *University of Minnesota*



Department of Geology and Geophysics, *Woods Hole Oceanographic Institution*



Lamont-Doherty Earth Observatory, *Columbia University*



Rosenstiel School of Marine and Atmospheric Sciences, *University of Miami*



Scripps Institution of Oceanography, *UC San Diego*



School of Ocean and Earth Science and Technology, *University of Hawaii*  
(Contribution to the room rental fund)

### *In Memoriam: Holger W. Jannasch*

Holger W. Jannasch, one of the pioneers of marine microbiology, died of cancer on September 8, 1998. He was born in Holzminden, Germany, May 23, 1927, received his doctoral degree in biology from the University of Göttingen in 1955 and joined the Woods Hole staff in 1963. For more than 30 years at WHOI he contributed immensely to our understanding of the physiology and ecology of deep sea microorganisms and to the development of instruments and methods to isolate microorganisms or to measure their activity. Shortly after the discovery of submarine hydrothermal vents in 1977, Jannasch, with Dave Karl, Jon Tuttle and Carl Wirsen, began microbial studies at vents that would continue until a few months before his death. These studies helped establish that the primary producers at vents were chemolithotrophic bacteria that fixed carbon dioxide and utilized energy sources generated by hydrothermal processes. He was a coauthor, with Colleen Cavanaugh, John Waterbury and others of the seminal 1981 Science paper that first described the symbiotic association between the tube worm *Riftia pachyptila* and chemolithotrophic bacteria.

From the 1980s, Jannasch focused his research on hyperthermophiles from vent environments and, with Karl Stetter and others, isolated and described numerous new species. In recognition, a new hyperthermophilic methanogen was given the name *Methanococcus jannaschii*. It is notable that *M. jannaschii* was one of the first organisms to have its genome completely sequenced and, like its name-sake, it has yielded many surprises and important discoveries.

Holger Jannasch received many awards including the Fisher Scientific Award in Applied and Environmental Microbiology and the Cody Award in Ocean Sciences from the Scripps Institution of Oceanography. He was a Fellow of the American Association for the Advancement of Science, the American Academy of Arts and Sciences and the American Academy of Microbiology. In 1995 he was elected to the National Academy of Sciences. He (co)authored more than 200 publications.

Holger Jannasch will be remembered by the RIDGE community for his pivotal role in helping define the important role of microorganisms in hydrothermal vent environments and as a world ambassador for conveying the excitement of oceanography and microbial life in the deep sea to a diverse audience. *Contributed by John Baross.*



## RIDGE 2000

### *RIDGE into the Next Millennium*

*The millennium bug may have nothing to do with your computer. It seems to be manifesting itself as a rash of demands for review and planning activities. Immunity from this bug may not be an advantage. If we do not join in, we will assuredly be left out.*

In September 1999, RIDGE will convene a conference to review the program to date and, more particularly, to determine directions and priorities for RIDGE in the next decade. Details will be forthcoming early in 1999. Some of the reasons for this decision are discussed below:

The initial RIDGE Science Plan, released almost a decade ago, formally and elegantly expressed the critical need for multi-disciplinary collaboration in the study of mid-ocean ridge systems. It emphasized the need for integrated studies by focusing on the theme of energy transfer through the system, from the mantle through the crust to the water column. It also provided a structure involving broad experiments that are nested on spatial and temporal scales, from global to local, from millions of years to seconds.

The second Science Plan, released in 1993, focused its objectives around six themes or “program elements”, and later workshops further defined the types of experiments that were needed to fulfil the objectives of these elements. Throughout this process, and subsequently, there has been strong resistance to tightly focusing or prioritizing individual experiments – all proposals are free to compete for funding through the normal review process and, therefore, there is no direct connection between the science plan and the funding process.

The production of a third Science Plan preoccupied the RIDGE Steering Committee for almost two years. The reasons for this long gestation are numerous, but in my personal view, a key problem was how to prioritize without compromising the freedom of individuals to follow their own scientific initiative. Eventually, the committee agreed to focus on six “scientific questions” which would help to focus scientific endeavor on important, but potentially solvable problems, while leaving adequate latitude for individuals.

A draft of this plan was released for comment in August 1998 and the final plan will be available on the RIDGE website as an “Interim Science Plan” by the time this article is published.

The decision to relegate this plan to interim status was not an easy one. Nevertheless, I believe it is essential if the RIDGE Program is to remain viable for a second decade. There are several reasons for this:

- The draft plan received very little feedback from the community, but there is ample anecdotal evidence

that it was not greeted with very much enthusiasm.

- During a recent visit to NSF, it became very clear to me that RIDGE is highly regarded as a success story, but that it must evolve if it is to continue to compete successfully within NSF. Keywords are “focus”, “not possible within the normal core funding structure” and emphatically “not business as usual”.
- A key function of the Science Plan is to convey our scientific goals and priorities to NSF, the National Academy and others who are influential in guiding or controlling funding. It is essential that any plan be credible to this audience and that it be seen to have strong community support.

Therefore, a RIDGE 2000 conference will be held in September 1999, to review the achievements of the RIDGE program to date, and to set its course for the next decade.

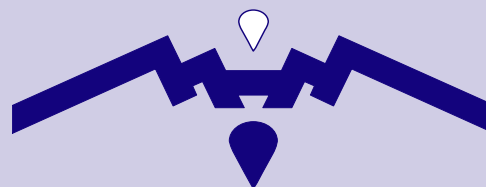
### GETTING INVOLVED IN RIDGE...

Anyone can get involved in RIDGE — you can:

- Write a meeting proposal
- Apply for a RIDGE postdoc
- Propose a RIDGE Experiment
- Suggest a topic for the ‘RIDGE 2000’ meeting in September 1999
- Apply to join the Steering Committee

Contact the RIDGE Office for further details on any of these options.

[ridge@oce.orst.edu](mailto:ridge@oce.orst.edu)



## *RIDGE Announcements*



A RIDGE Results Symposium for the Juan de Fuca Ridge is in the planning stages for late October or early November 1999. Watch the RIDGE website or the next newsletter for details.



Planning has begun for a conference on the future of RIDGE, to be held in September of 1999. Watch the RIDGE website for details.



The new RIDGE Interim Science Plan is about to be released on the RIDGE website.

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