

JOIDES TECTONICS PANEL MEETING
MARCH 23-25, 1992
LAS VEGAS, NEVADA

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DRAFT EXECUTIVE SUMMARY

Ans'd.....

1. PRIORITIZATION OF SHORT LIST OF DESIRED NON-ENGINEERING EQUIPMENT

1. Fluid sampling strategy: pore pressure, permeability, and fluid sampling.
2. New Computer System--hardware and software (items 14 & 15 on March 3 list).
3. A. Downhole and shipboard equipment to enhance core-log integration,
 B. Hard-rock side-corer,
 C. Micropaleontology reference slide set(s)

2. CO-CHIEF SCIENTIST NOMINATIONS

Leg 152 (NARM 1): TECP nominates the following persons: Non-U.S.: Hans-Christian Larsen;
U.S: R. A. Duncan, Emily Klein

3. OFFSET DRILLING

TECP is concerned that apparently members of the OD-WG: 1. find TECP's expectations for site survey information and pre-drilling analysis to be too stringent or impossible to attain; 2. feel that TECP does not appreciate the importance of small-scale structures that may be recovered by drilling long sections of individual rock units. Also TECP notes with concern the shift from offset drilling as originally conceived to an emphasis on drilling "long sections" of various rock units apparently with little regard for tectonic setting. These concerns are discussed in more detail in the minutes.

3. DEEP DRILLING

TECP reaffirms its support for deep drilling (October 1991 minutes) and for the need for efforts to increase the efficiency of drilling, enhance core recovery, and increase the ultimate likelihood of success as deep sites such as those proposed for the North Atlantic Rifted Margins. ODP already has an on-going experiment in deep drilling--Hole 504B, now at 2000 m after 7 legs and roughly \$40 M. The panel expressed the general opinion that the way to explore the feasibility of deep drilling is to try it. Deep drilling on conjugate rifted margins remains a high priority objective of TECP

4. WATCHDOG REPORTS

Watchdog reports and their subjects included: Transform Margins--Alastair Robertson, Plate history, sea-level change, magnetic questions--Tanya Atwater, Young Rifted Margins--Dale Sawyer, Old Rifted Margins--Hans-Christian Larsen, Mid-ocean Ridges--Jeff Karson, Marginal Basins--Yujiro Ogawa, Convergent Margins--Casey Moore, Collisional Margins--Phil Symonds, and Stress and Mid-Plate Deformation--Mark Zoback. TECP finds these reports are highly useful in updating the panel and focusing its discussions.

5. GLOBAL RANKINGS

1	NARM-DPG Non-volcanic Leg 2	7.18
2	346 African Equatorial Margin	5.31
3	NARM-DPG Volcanic leg 2	4.64
4	Alboran Sea (Comas/Watts combin)	4.46
5	265 W. Woodlark Basin	3.77
6.	410 Deepening Hole 504B	3.31
7.	400 Costa Rica Accretionary Prism	3.00
8.	Mediterranean Ridges I (shallow)	2.54
9.	414 Barbados Accretionary Prism	2.23
10.	369 MARK	2.17

11.	Mediterranean Ridge II (deep)	2.08
12.	333 Cayman Trough	1.92
13.	NARM-DPG Non-volcanic leg 3	1.91
14	411/415 Caribbean Basalt/K/T boundary combined	1.77
15	375 Hess Deep Leg 2 (tectonic)	1.54
16	376 Vema Fracture Zone	1.46
17	Chile Triple Junction, leg 2	1.38
18	363 Grand Banks, Newfoundland	1.31
19	361 TAG	1.08
20	403 Rev K/T Boundary, Alvarez	0.92
21	368 Return to Hole 801C	0.77

6. MEMBERSHIP

The Tectonics Panel currently is short one U.S. member, and two other U.S. members, Dale Sawyer, Mike Purdy, and Hans-Christian Larsen are rotating off. The Panel is concerned about maintaining proper balance, particularly in view of the loss of its expertise in rifted margins, in seismology, and the onset of drilling activity in the Atlantic Ocean and possibly offset drilling. Recommendations for new Panel members are in the Minutes

7. NEXT MEETING

Tentatively -Iceland, Hans-Christian Larsen will arrange for field trip and host(s)

Tentative Date: September 22-27

TECP members are fully aware of the need for economizing to the extent possible.

8. RECORDING AND ARCHIVING OF STRUCTURAL DATA ON *JOIDES RESOLUTION*

TECP believes that it is important that structural information on cores be collected as an integral part of routine core description, as appropriate. Accordingly TECP recommends: 1. that standardization of the shipboard structural VCD form and spreadsheet should be carried out immediately; 2. that integration of the spreadsheet data with the computer database should not be difficult and should be effected as soon as possible; and 3. that development of a Macintosh-based "structural barrel sheet" application, modeled after the "VCD" application currently in development, should be carried out as soon as possible.

9. POSSIBLE RED SEA ACTIVITY

There was general agreement that any Red Sea Working Group or rfp should include Tectonics Panel representation

**JOIDES TECTONICS PANEL MEETING
MARCH 23-25, 1992
LAS VEGAS, NEVADA**

DRAFT MINUTES

- PRESENT:** Eldridge Moores, UCD, Chair
Tanya Atwater, UCSB
Jeff Karson, Duke U
Hans-Christian Larsen, Denmark
Casey Moore, UCSC
Yujiro Ogawa, Japan
Mike Purdy, WHOI
Jean-Pierre Rehault, France (substitute for J. Bourgois)
Tim Reston, Germany (substitute for R. Von Huene)
Alastair Robertson, U.K.
Dale Sawyer, Rice U.
Phil Symonds, Australia
Mark Zoback, Stanford U.
- LIAISONS** Beth Ambos, NSF
Brian Tucholke, PCOM
Bob Musgrave, ODP-TAMU
- APOLOGIES** Steve Cande, Lamont-Doherty
- AGENDA** Introduction
Report of Liaisons:
PCOM-Brian Tucholke
NSF-Beth Ambos
TAMU-Bob Musgrave
SGPP/OHP-Alastair Robertson
LITHP-Jeff Karson
Report from Offset Drilling Working Group-Dale Sawyer
Re-examination of deep-drilling, time for rfp?
Ranking of new proposals
Prioritization of short list of desired non-engineering
equipment
Nominations of Co-Chief Scientists for legs 151 (NAAG) and 152
(NARM 1)
Reports of Watchdogs
Global Rankings
Panel Membership
Field Trip Comments
ECOD Meeting
Structural data collection on *JOIDES Resolution*
Thanks to departing members

INTRODUCTION

The meeting opened with self-introductions. The Panel formally expressed its thanks to Tanya Atwater, official host, for arranging the meeting and the field trip, and also to Eric Frost, field trip leader, for his magnificent exposition of the secrets of continental rifting

exposed in the Colorado River Corridor. Moores reminded watchdogs of their identities and their responsibilities for the reports as listed in the agenda.

REPORT OF LIAISONS

PCOM Brian Tucholke reported highlights of the December meeting. The NSF budget has been increased by 11.2%. The program renewal until 1998 is in review. NSF has just completed the peer review of the 4-year program, and it will be reviewed by the National Academy of Sciences. Regarding deep drilling, the problem is one of definition, which variously is > 1 leg (TAMU), or 2-4 km deep hole in the oceanic crust (LITHP). The *JOIDES Resolution* currently is capable of drilling 2500 m. Hole 504B is presently at 2000.4 m, and deepening of 200-300 m is viable. OCS 2 proposal occasioned considerable debate but was declined although the science was highly rated, because (1) the results from OCS 1 are not yet known and (2) the negative impact on the tightly scheduled leg 145 was considerable. FY 92 and 93 drilling schedules will be modified in view of experience with DCS 2 engineering leg (142) just completed. It is not yet clear what went wrong with the system on leg 142. Leg 148-engineering may be something other than MARK, perhaps 504B or EPR or unlithified Bahamas carbonates, or even TAG, although the latter is not a good object for an engineering study because drilling a hole changes the hydrogeologic situation.

NSF Beth Ambos outlined the renewal process and the current status. There is considerable support to broaden the JOIDES charge to include more than the *JOIDES Resolution*, and to "internationalize" ODP and JOIDES offices and operations. Field (site-survey) programs included the Vema Fracture Zone, Woodlark Basin, and Cascadia.

TAMU-ODP Bob Musgrave reported that TAMU was undertaking a self-analysis and reorganization, including restructuring of the marine techs or specialists' positions, addition of computer specialists and rewriting the policy of marine tech positions, hoping to improve morale. TAMU is looking to replace Audrey Meyer, a difficult task. Many other positions are open, leaving the entire staff overloaded. Regarding individual legs, Leg 140 ended just below 2000 m. Downhole seismics are very good. Petrologists reported gabbro clots, changes in grain size and trace element composition suggesting that the hole is within 10's of m of the 2C/3 boundary. Leg 141 (Chile T. J.) was hampered by two medical evacuations, but had good success in drilling 5 holes--3 on the Plio-Pleistocene accretionary prism just north of the collision zone (sites 859, 860, 861), one over the subducted ridge (863) and one on the Taitau ridge (862), suspected to be an obducted ophiolite. Penetration was slow in unconsolidated silts, densities and velocities high, temperature gradient in 863 unexpectedly normal. They drilled through the BSR but didn't find it. No sign of subduction erosion was found north of the collision, incipient tectonic erosion is present in 863 and the sandstones were cemented. Site 862 had poor recovery of rhyodacites and tholeiites, thought to be younger than the underlying seafloor. Leg 142 was a test of the Diamond Coring System (DCS). The secondary heave compensator apparently failed to operate properly, leading to marked fluctuation on bit weight, milling and smashing of bit, and essentially no core recovery (6 m total of chips). The mini hardrock guidebase worked well, however. Prospects of current and future legs were discussed. The final location of Leg 145 is not known.

Considerable discussion ensued about information handling system, logging of structural information, and need for review of results of past high priority legs.

SGPP Alastair Robertson reported on meetings in Zürich and Miami. There was considerable concern about the DCS system and SGPP's needs for it. The panel considered being more proactive, particularly for a gas hydrate leg, and non-Atlantic legs.

OHP as well as SGPP are interested in the Red Sea, and TECP might be interested in a joint effort. There was concern about the pressure core barrel operating effectively in the absence of an engineer. It might be time again for a joint meeting with SGPP. Several TECP members averred that such meetings should be accompanied by a field trip to be successful, in order to afford the opportunity for individual panel members to become acquainted in an informal setting. The last meeting with LITHP was considered a great success for that reason.

LITHP Jeff Karson reported on a telephone conversation with Susan Humphris about the just-completed meeting. LITHP strongly supports continued development of the DCS, wishes to de-emphasize drilling of zero-age oceanic crust for the time being, supports continuation of Hess Deep drilling and drilling in other long sections of lower oceanic crust. LITHP wants to initiate RFP's, especially concerning the Red Sea, hotspots, convergent margins, plateaus, and a crustal characterization suite of holes.

OFFSET DRILLING

Dale Sawyer reported from the second meeting of the Offset Drilling Working Group (OD-WG). The Group received reports from LITHP, SSP, TECP, and PCOM. The SSP and TECP reports stressed the common concern for the lack of understanding of the need for a three-dimensional view of the stratigraphy and structure of a given site. The Group has diverged from TECP's understanding of the nature of offset drilling--to develop the stratigraphic sequence in one place where the nature of the various components can be constrained. The Group apparently has abandoned this single site approach and is now arguing for 12 legs over 6-7 years focusing on a strategy of definition of the "global" nature of oceanic crustal structure.

Following this report, it seems necessary to clarify TECP's position on a few points related to this initiative. At the outset, TECP wishes to emphasize that it feels strongly that offset drilling is the best available means of sampling the compositional and structural variations of the oceanic lithosphere. The OD-WG has done a fine job of identifying the problems to be investigated. TECP is concerned, however, about several points: first, apparently members of the OD-WG find TECP's expectations for site survey information and pre-drilling analysis to be too stringent or impossible to attain; second, several members of the OD-WG apparently believe that TECP does not appreciate the importance of small-scale structures that may be recovered by drilling long sections of individual rock units, and third, TECP notes with concern the shift from offset drilling as originally conceived to an emphasis on drilling "long sections" of various rock units apparently with little regard for tectonic setting.

TECP wishes to emphasize that its interest is not in limiting offset drilling to structural and tectonic objectives, but rather in suggesting approaches that will help to extract the greatest possible amount of information from the selected drill sites. We note that all sites under consideration exist because of apparently unusual tectonic activity; thus structural and tectonic information is integral to any offset drilling. In addition, we recognize that the process of construction of oceanic lithosphere, in whatever setting, is one in which tectonic, petrologic, and hydrogeologic processes are inextricably linked.

TECP also recognizes that the objectives of Offset Drilling are substantially different from many other types of ODP targets. The scale of lateral heterogeneities in composition and structure, for example, the size of coherent blocks between major faults, is often much smaller than that associated with drilling into a stratigraphic section of a large undeformed basin. The scale is not very different, however, from drilling into other active

tectonic regims, such as accretionary prisms. TECP feels that similar regional and local scale geological constraints should be available in all such settings prior to drilling.

The OD-WG has apparently focused on the issue of balanced (restorable) cross sections in potential target areas as an unrealistic requirement. TECP fully recognizes that a balanced cross section of any geologic structure is a hypothesis, that is, an evolving concept that may change with the acquisition of additional data, and that it may not be attainable in all instances. Still it is a worthy goal to be attempted in most, or even all, cases, because it rigorously tests the quality of data and viability of three-dimensional models. Certainly drilling data can provide very important constraints on the construction of viable hypotheses of geologic structures represented by such cross sections. TECP feels strongly that cross sections must be produced for all potential offset drilling target areas or areas of potential long-section drilling. Cartoons or schematic sections that cannot be restored to a reasonable pre-deformational configuration can be very misleading and can lead to costly errors in hole siting. TECP fully appreciates that it may not be possible to produce a unique cross section for a given area with the available information, and several models may be equally viable. In some such cases, drilling may be the only means of testing these hypotheses. If so, proponents should address the question of how drilling will help eliminate or confirm the range of possible structures in addition to other objectives. TECP feels that most of the available offset drilling target areas are in this category.

Small-scale structures in cores drilled as part of offset drilling or any other program are of great interest to TECP. We refer the OD-WG to TECP's recommended checklist of features to be looked for in ODP sites and cores, published in the June, 1991 JOIDES Journal. Specifically, TECP appreciates the OD-WG's interest in the small-scale structures that may be sampled by drilling long sections of rock units such as gabbroic or serpentinized ultramafic rocks. However, all offset drilling target areas by definition occur in areas where tectonic activity has exposed a considerable cross section of the crust. These tectonic processes are likely to produce rotations and relative displacements of major crustal blocks. Without adequate structural constraints on the geologic setting of a drill site, it will be impossible to unambiguously restore small-scale structures to their pre-deformational orientations. The lack of such constraints would severely limit the usefulness of such structures in any interpretation of oceanic lithosphere construction processes. TECP strongly endorses the OD-WG's interest in drill-core scale structures as a means of determining important processes of deformation, magmatism, and metamorphism. TECP simply wishes to see that the maximum possible amount of relevant information is extracted from any site.

Drilling long sections of gabbroic and ultramafic rocks without adequate constraints on the structural setting of the drill site is of interest in that structural and compositional variations may be encountered. However, any such geologic variations or contacts drilled are of limited use if they cannot be reoriented to their typical attitude in oceanic lithosphere. For example, if deformation fabrics or igneous layers are intersected by the core, in what attitude did they form--vertical, horizontal, or inclined? TECP feels that it is crucial that these types of ambiguities be eliminated as much as possible.

Drilling of long sections in major rock units as a means of developing a "global composite section" seems like a long route to filling the matrix of objectives outlined by the OD-WG. It appears, alternatively, that several sites at which offset-drilling could produce a composite section in a single setting are available and ready to drill now, or could be ready very soon. These include Hess Deep, the MARK area, the Mid-Cayman spreading center, the Vema Transform fault, and possibly the TAG area. Drilling other environments could be built around existing holes, such as 735 B, as site survey data become available.

Finally, TECP is concerned by the paucity of hypotheses to be tested by offset drilling, and especially drilling of long sections. Although it is not formal policy, TECP is generally much more favorably impressed by proposals that seek to use drilling to test hypotheses, whether the main focus is structural/tectonic or not. Penetrating unknown areas of the Earth's crust with little regard for the local structural setting or the potential for contributing to the understanding of the tectonics of oceanic lithosphere is a concept that marine science and ODP have outgrown. In such endeavor there is a hypothesis being tested by default, which is that the oceanic crust is uniform world-wide with a simple horizontal layered structure. The last decade of progress in marine geology and study of on-land oceanic crustal analogues has demonstrated that this simplistic model is the least likely to of a myriad of hypotheses of oceanic crustal structure to be representative of the true situation.

DEEP DRILLING

TECP reaffirms its support for deep drilling (October 1991 minutes) and for the need for efforts to increase the efficiency of drilling, enhance core recovery, and increase the ultimate likelihood of success as deep sites such as those proposed for the North Atlantic Rifted Margins. ODP already has an on-going experiment in deep drilling--Hole 504B, now at 2000 m after 7 legs and roughly \$40 M. The panel expressed the general opinion that the way to explore the feasibility of deep drilling is to try it. Deep drilling on conjugate rifted margins remains a high priority objective of TECP

RANKING OF NEW PROPOSALS

059 Rev 3 Continental margin sediment instability: global sealevel history and basinal analysis through drilling abyssal plains

TECP maintains an interest in an understanding of the origin of turbidite-depositional signatures associated with sealevel changes.

Box checked: 2.

332 Rev 3 Florida Escarpment drilling transect

MCS seismic data should be presented to provide a context for considering potential fluid flow paths. Care should be taken to show that either there are no 3-dimensional effects on fluid flow or that they can be accounted for. The proponents should consider the possibility that much of the fluid flow through the carbonates could be channelized in a few fractures. If so, the proponents should indicate a strategy for intersecting these fractures in site FE-3.

Box checked: 2.

333-Add Update to : Tectonic and magmatic evolution of a pull-apart basin: a drilling transect across the Cayman trough, Caribbean Sea.

TECP continues to be enthusiastic about many aspects of this proposal. The panel is impressed by the effort of the proponents to augment the site survey data base for this area. The remaining lack of seismic refraction data is still a deficiency.

The proponents should be aware of two other ODP efforts that are related to the proposed work: 1. Other Caribbean and Gulf of Mexico proposals related to the Caribbean basalt

province (411) and K/T Boundary impact studies (403 and 415). Contact Tanya Atwater, TECP watchdog on this topic. Cayman trough tectonics could have had a significant effort on the rearrangement of relevant tectonic elements. 2. Hole CAY-3 is of potential interest to the Offset-Drilling Working Group (Fred Vine, Chair). Multiple holes in the median valley wall could address deep crustal objectives and possibly a detachment fault. Contact Jeff Karson, TECP watchdog on this topic.

Box checked: 4.

354 Rev "Neogene history of the Benguela current and Angola-Namibia upwelling system.

The proposal is concerned with Neogene-Recent paleoceanography, specifically the evolution of an upwelling margin, and has no identifiable or potential tectonics component

Box checked: 1

361 Add Site Survey, TAG hydrothermal field, MAR 26°N.

While the primary emphasis at this site is (appropriately) likely to remain the collection of hydrothermal products, TECP is particularly excited about the related topics that can be addressed by integration with the proposed site survey data. The relationship of the vents and stockworks to the local and regional fault structures will supply important insight into hydrothermal plumbing systems. The possible correlation of hydrothermal demagnetization effects from the cm scale of cores through meters to km scale of magnetic anomalies will be unique. We strongly endorse the site survey proposal and hope that it can be done soon. We anticipate strong TECP interest when these new data are integrated into the drilling plan. For further information, contact Jeff Karson, TECP watchdog on this topic.

Box checked: 5

403-Rev Revised proposal to drill the K/T boundary, Gulf of Mexico Basin.

TECP continues to be interested in the K/T impact structure at Chicxulub, although its relationship to our thematic objectives is not clear. The proponents have made a great deal of progress in complementary land studies--in fact it seems to us that dating of the structure may be accomplished on land, and not require ocean drilling. We acknowledge that core recovery has improved significantly since DSDP, and we agree that recovery of the key horizon is likely in one or more holes. The proponents seem to assume that the ejecta pattern may be determined from the land work, combined with the proposed sites. One TECP member suggested that ejecta patterns often are concentrated along one or a few radials, which would make determination of the pattern more problematical. Detailed siting should await the completion of the site survey. There are several proposals now under consideration that relate either thematically or regionally to this one (e.g. 333-Tectonic and magmatic evolution of a pull-apart basin: a drilling transect across the Cayman trough, Caribbean Sea; P. Mann et al; 411-The Caribbean basalt province,, an oceanic basalt plateau province; T. W. Donnelly et al, and 415-The Cretaceous/Tertiary boundary in the Caribbean sea; H. Sigurdsson, et al). You might find it worthwhile to cooperate in some way with one or more of these proponent groups.

Box checked; 3.

409 High resolution late Quaternary paleoclimatic and sedimentary record, Santa Barbara Basin, California,

This proposal contains nothing of TECP interest.

Box checked: 1

410 A proposal for deepening hole 504B to core and log the dike/gabbro layer 2/3 boundary.

Successful drilling and coring through the seismic layer 2/3 boundary, coupled with downhole seismic and VSP data, represents an extremely important objective of TECP. The proponents of this proposal have not made the case that this boundary is within several hundred meters of the current depth of the hole (2000.4 m). The petrologic arguments are not convincing that the dike/gabbro contact lies just below the depth of the hole. The arguments based on the VSP data are equally unconvincing. Nevertheless, surface seismic data indicates the seismic 2/3 boundary is at 2 km +/- several 100 m. Thus TECP believes that the hole should be deepened, so long as the seismic data (multichannel seismic and VSP data) are collected to make it possible to tie the hole to both local and general ocean crustal models based on seismics. In this way, even if the dike/gabbro contact is not reached in the next drilling leg, it will still help to test the standard geophysical-ophiolite ocean crustal model.

Box checked: 4

411 Proposal for drilling the Caribbean basalt province-an oceanic basalt plateau

TECP has a secondary interest in the proposal as it stands. General improvements and stronger emphasis on the more tectonically oriented parts of the proposal potentially could make it of primary interest to TECP. These improvements might include: 1. a better justification for this locality as a suitable place for Large Igneous Provinces (LIPS) studies, including references to the LIPS workshop recommendations, and better discussion and documentation of the plate kinematic history of the Caribbean plate (a subject that is itself of interest to TECP); 2. a better definition of the model to be tested ("blob-tail" model); 3 a more detailed discussion of the "bimodal" nature of basement (B smooth-B rough), the possible "B-smooth": over "B-rough" structure (as discussed in proposal 343-Window of Cretaceous volcanic formation, Caribbean Zone, by A. Mauffret et al) and the possibility of "B-rough" representing original oceanic basement (as suggested in proposal 343); 4. an improved seismic database (perhaps by collaborating with the proponents of proposal 343) and a better seismic stratigraphic interpretation to provide constraints on the gross structure and stratigraphy of the plateau (Dipping reflectors at depth provide potential opportunities, untaken in this proposal, to explore lateral younging or aging of the plateau). Other themes that would be of particular interest to TECP include plate kinematic history of the Caribbean plate, the age and position constraints on the CCBP in relation to other mid-Cretaceous LIPS (e.g. Ontong Java Plateau) and the South Atlantic opening/J-Anomaly ridge event, and the structure of this province as an example of a LIP.

Box checked: 3

412 The Bahamas transect: Neogene/Quaternary sea-level fluctuations and fluid flow in a carbonate platform

This is a thorough drilling proposal based on exceptionally high-quality seismic data. However, its objectives are not of primary interest to TECP. The issue of identifying and

quantifying tectonic subsidence of the carbonate bank is not adequately addressed by the proposal. TECP is interested in knowledge of global sealevel change because of the potential of using this signal to study the subsidence of passive margins and/or rates of sea floor spreading. The linkage of this proposal to these grand long-term goals is tenuous, however.

Box checked: 2.

413 Magmatic and tectonic evolution of oceanic crust: the Reykjanes Ridge

TECP appreciates the importance of this proposal to mid-ocean ridge volcanology and the construction of slow-spreading oceanic crust. The study would enhance NARM objectives related to the evolution of the Icelandic hotspot. The primary deficiencies noted by the panel include a lack of integration of geological data from Iceland, uncertainties regarding dating of lavas, and lack of specific hydrothermal objectives. The velocity structure of the crust is not discussed, but in such highly vesicular material, practical drilling problems may arise. Regarding stress measurements, the proposed holes are not deep enough to obtain the necessary stress levels for break-outs in basaltic rock in an extensional environment. Finally the depth of basement penetration planned may not be sufficient to sample geochemical variations related to magmatic pulses. For additional comments or clarification, please contact Jeff Karson, TECP watchdog on this topic.

414 Rates, effects, and episodicity of structural and fluid processes, northern Barbados ridge accretionary prism.

This proposal is a high priority of TECP. While it is very similar to planned work on the Cascadia margin, it is clearly necessary to characterize fluids in more than one accretionary prism. Returning to the site of Leg 110 is a good idea, as it builds on existing knowledge, and the 3-D seismic survey will make the planned VSP's quite useful.

The deficiencies of this proposal are principally related to the fact that its success will depend on how well the borehole seal technique will work, which is completely unknown at this time. Thus this proposal is somewhat premature and hard to evaluate until it is clear how well borehole seal technology works at Cascadia. Drilling and casing problems may exist in this water depth.

There were several minor problems with this proposal (what are migrating dilatational waves? how could pore pressure be determined as a function of depth? how will one do a pulse permeability test with a submersible?) but these do not detract from the high importance we place on the overall proposal.

Box checked 4

415 Proposal for drilling the Cretaceous/Tertiary boundary in the Caribbean sea.

This very interesting and well-written proposal builds on new geochemical studies of glass spherules at the K/T boundary in Haiti, which provide evidence of a major bolide impact on continental terrane overlain by evaporite-rich sediments in the Caribbean region. Six drilling sites are proposed in the Caribbean and Yucatan Basin to evaluate the Chicxulub impact structure on the Yucatan Peninsula a very interesting as the source of Haiti K/T impact glasses, and to examine the distribution of K/T boundary impact ejecta, the nature of the depositional mechanism of the impact layer, and climatic and other environmental effects at the K/T boundary.

Clearly the nature of the K/T boundary is an important question that can be examined by ODP as identified in COSOD II and the Long Range Plan. Although TECP has a general interest in the problem, such questions are not specifically within its mandate. The proposal mentions that the sites proposed serve to address multiple scientific objectives including the study of the Caribbean Cretaceous Basalt province--ODP proposal 411 by Donnelly et al. This latter proposal definitely falls within TECP's mandate.

TECP members raised questions about knowledge of the post-bolide tectonic dispersal of various features within the study region, and its impact on understanding the distribution of impact ejecta within the region. No figure is presented in the proposal illustrating the proposed drill sites in their paleogeographic location. Some objectives of this proposal are similar to those in proposal 403-Rev by Alvarez and others, and TECP felt that at some stage it may be beneficial if the various proponents collaborate in proposing ODP drilling to examine the K/T boundary in the Caribbean.

Box checked 3

Letter of Intent:

Letter from K. J. Hsü.

TECP noted with interest Hsü's hypothesis of a southward rather than northward dipping subduction zone south of Cyprus and would like to see this incorporated into a Mediterranean drilling proposal, if possible. Alastair Robertson briefly summarized the status of Mediterranean drilling. Following a February meeting chaired by Maria Citta-Seroni, it was agreed that 1) the two Alboran Sea proposals (323-Comas/399-Watts) would be combined and resubmitted as a single new proposal; 2) a second new proposal (to be submitted by 1 August, 1992) would focus on shallow drilling sites (largely using existing site survey data), principally the Mediterranean Ridge and the Eratosthenes Seamount. Sites chosen would also be suitable to recover sapropels, of interest to SGPP. The main tectonic theme would be incipient collisional processes, involving evaporite-bearing sequences (also of interest to SGPP).

PRIORITIZATION OF SHORT LIST OF DESIRED NON-ENGINEERING EQUIPMENT

After extensive discussion, TECP voted on the priority of non-engineering equipment, utilizing the list "Non-engineering wish list-nonprioritized", prepared 3 March 1992 by S. Humphris for discussion at Panel Meetings, with one or two added items. TECP's recommendations are divided in two groups--first priority and second priority (but highly desirable), as follows:

First Priority Fluid sampling strategy: pore pressure, permeability, and fluid sampling.

Funds should be allocated to further develop tools for measurement of fluid pressure and permeability and for fluid sampling. In addition a **strategy** should be developed to conduct fluid measurements in boreholes in tectonically active environments. The **Geoprops** tool should be tested, modified as necessary, and utilized. An adequate number of **Borehole Seals** should be made available; the instrumentation for the Borehole Seal should be expanded for longer term monitoring and for measurement of borehole characteristics in addition to fluid pressure and temperature.

Second Priority New Computer System--hardware and software (items 14 & 15 on March 3 list).

Extensive and disparate data sets are collected, processed, and stored on board *JOIDES Resolution*. The substantial difficulties experienced in analyzing and integrating these data sets in a timely manner on board the *Resolution* are hampering early understanding of the significance of the results. In particular core-log integration (defined below) is considered vital in terms of optimising the the onboard scientific outcomes, locating boundaries/changes in the drill hole and promoting interaction between the various scientific groups. TECP feels that improvements in this area is a high priority and will maximize onboard utilization of the *JOIDES Resolution* data base.

Third Priority (listed alphabetically)

A. Downhole and shipboard equipment to enhance core-log integration,

In this context, core-log integration is defined as " the means of precisely positioning, orienting, and correlating core material with the hole, particularly where recovery is limited, through the use of downhole measurements, sonic core monitors, and shipboard measurements". For interpretation of structural observations made onboard the *Resolution* and later it would be extremely valuable to know precisely where in a core interval a piece of core came from.

B. Hard-rock side-corer

In recent years, commercially available sidewall coring systems have been successfully used in continental scientific drill holes. Such coring was quite successful--both the German KTB (gneiss and amphibolite) and Long Valley drillholes (tuff). The capabilities, technical requirements, potential availability and costs of these tools should be investigated for possible application in ODP holes.

C. Micropaleontology reference slide set(s)

TECP felt that such a reference collection would be very valuable, particularly in view of the pressure shipboard paleontologists are under to produce immediate dates. Being able to study actual specimens is clearly ideal, as this is a vast undertaking (and maintenance could also be demanding) alternative/additional methods of storing information could be considered, including a consolidated collection of relevant reprints, video displays, or photographs.

CO-CHIEF SCIENTIST NOMINATIONS

Leg 152 (NARM 1)

TECP nominates the following persons:

Non-U.S.: Hans-Christian Larsen

U.S.: R. A. Duncan
Emily Klein

TECP will routinely suggest Co-Chiefs for our high-priority legs as soon as scheduled, or when highly ranked.

WATCHDOG REPORTS

1. Transform Margins-Alastair Robertson

The main rationale for translational margin drilling is that this fundamental continental margin setting remains virtually unexplored by drilling despite global significance and importance for interpretation of continental orogenic belts (e.g. Alps, Oman, etc.) Three proposals are active:

1. 401 Evolution of a Jurassic seaway, S. E. Gulf of Mexico (Buffler et al). This proposal aims to investigate strike-slip rifting to form a small ocean basin in the Caribbean. The proposal was reviewed and the proponents are preparing a revised proposal with criticisms in mind.

2. 386 Rev Paleooceanography and deformation, California margin (Lyle et al). A new proposal has been submitted and will be reviewed at the September, 1992 TECP meeting. While largely paleoenvironmental in objective, the proposal will also consider tectonic processes along the California borderland (e.g. microplate interaction, triple junction migration). Tanya Atwater has agreed to contact the proponents to see if the relevant tectonics components can be enlarged prior to review by TECP.

3. 346-Rev2 Ivory Coast-Ghana transform margin (Masclé et al). At each of three TECP reviews, this proposal has been highly rated. The Equatorial African transform is agreed to be an excellent location for this study and an impressive array of French and international data have now been assembled. New MCS seismic reflection and refraction (as well as other) data are being processed, and TECP looks forward to receipt of the (final) revised proposal, which should be based on a practicable one-leg drilling program.

Other areas in this tectonic setting potentially include the Red Sea (Gulf of Aden, Gulf of Aqaba(?)), western Australian margin, southeast Australia margin, the British Columbia transform margin, and the San Andreas-California system. The latter has safety problems related to hydrocarbon potential, but there are good basement objectives related to extensional tectonics in a transform setting.

2. Plate history, sea-level change, magnetic questions-Tanya Atwater

Our knowledge of the post-Pangaeian kinematic histories of the world's plates has become increasingly refined, substantially aided by ocean drilling, both directly from local drill core information and indirectly by basement dating for the magnetic reversal time scale. A few, relatively intractable problems remain, some generic and some regional, as follows:

A. Early Rifting Histories

The pace of the acceleration of relative plate motion, from incipient continental rifting to true, steady, sea floor spreading is poorly known, leaving this last step in any continental reconstruction much less well-constrained than the rest. The time span involved appears to be very highly variable from one margin to another. The proposed NARM legs will characterize fast (volcanic) breakup and slower (non-volcanic) rifting. The Australian margins (and especially the south Australian margin) represent very slow, very diffuse non-volcanic rifting and may be important sites for investigation of this aspect. A tectonic proposal for south Australia is expected soon, and the N.W. Australia proposal (340: Tectonic, climatic, oceanographic change, N. Australian margin--Symonds et al) will be revised. The possible future work in the Red Sea offers another likely very fast breakup site.

B. Final Closure Histories

An important contribution of present-day active plate studies is the analogy they offer for ancient systems. On close examination, most ancient continental collisions seem to have stray pieces embedded within them. Thus the Mediterranean and S. W. Pacific regions, with their numerous small plates and plate boundaries, may be typical of collisional systems, lending them global importance in addition to their very high regional interest. In the Mediterranean, the expected Alboran Basin and Mediterranean Ridge revisions are thus of great interest, and Aegean extensional system studies should also be encouraged. In the S. W. Pacific, only the Woodlark Basin is presently proposed, but other projects should be encouraged (such as the N. Australia collisional margin).

C. Plate motion histories-Pacific Basin

The relative and absolute motion histories for the Atlantic and Indian ocean plates are reasonably well-known for the Mesozoic and Cenozoic. Plate motions in the Pacific basin are much less well-constrained, especially for the Mesozoic, and drilling results may supply the strongest constraints for this important problem. For the Pacific plate, strong paleolatitude information is anticipated from the upcoming Atolls and Guyots legs (143 & 144), because of the sensitivity of coral reef development to latitude, and possibly from the North Pacific Transect (leg 145). The continuation of work in the Jurassic-crust hole 801C is of great interest to TECP. Proposal 253 (Sliter et al--Pacific black shales) might also supply latitudinal controls.

For other Mesozoic Pacific Basin plates, almost nothing is known. Captured pieces of these plates are believed to reside in the Bering and Caribbean Seas, so that study of these seas may answer problems of oceanic scope. The Caribbean basaltic province may have originated in the Pacific, and it should yield information about its paleolatitude history, its affinities to Pacific geochemical/hotspot anomalies, and (perhaps) its location with respect to the Yucutan Chicxulub crater (proposed K/T impact site).

D. Cretaceous Quiet Zone Histories

Sea floor spreading histories generally must be interpolated over the 30 to 40 million year span of the Cretaceous Quiet Zone. When this is done, a global fast-spreading episode seems to have occurred, a surprising result with profound implications if true. Some basement ages obtained in the quiet zones of each ocean would provide a disproportionately large payoff toward the verification or refinement of these rates. While TECP does not advocate at this time holes simply for the collection of basement ages, any hole drilled for whatever purpose in a quiet zone location should be continued to basement.

3. Young Rifted Margins--Dale Sawyer

There are many sites with many interesting possibilities.

A. The western Woodlark Basin is an exciting area that will explore extensional propagation into a collisional area. The proponents are on the right track in preliminary proposals and reports of new site-survey experiments funded or pending.

B. The Cayman trough is also an area with exciting potential, with much new data collected, and a new drillable proposal.

C. The Aegean Sea is another area that is the subject of only a preliminary proposal. There is a problem of access that continues to exist, related to current political uncertainties in the region.

D. Other sites include the Tyrrhenian Sea, which has interesting LITHP, as well as TECP objectives, and the Red Sea, which may represent an ideal site from which to study the early tectonics of rifting of continents.

There was general agreement that any Red Sea Working Group should include Tectonics Panel representation.

4. Old Rifted Margins-Hans-Christian Larsen

There are many relevant proposals in this category: (326-Morocco-NW Africa--Hinz, 327--Argentine continental rise--Hinz, 328-E. Greenland continental margin (missing in the JOIDES list), 363-Plume volcanism and rift/drift-Grand Banks-Iberia-Tucholke et al, 392--mantle plume origin, north Atlantic volcanic margins--Larsen et al, 394--pre/syn extensional basins on passive margins, Kiørboe, et al, 395--compressional tectonics on a passive margin--Boldreel, et al, , 397--mantle plume and multiple rifting, North Atlantic--Gudlaugsson, et al, and the NARM-DPG report (representing proposals 310, 358, 393, 396, 334, and 365). The main activity in this area since the last meeting was the presentation to PCOM of the NARM-DPG report and the scheduling of the first two legs of MARM drilling for 1993. One proposal (397) arrived too late to be processed by the NARM-DPG and is so far the only "post-NARM-DPG" rifted margin proposal. It potentially could have changed some of the later proposed drilling of NARM-DPG, but not the fundamental NARM concept. TECP's comments on proposals not included in the NARM-DPG are as follows:

326--not highly ranked because it lacks sufficient thematic approach

327--highly interesting area, but fairly thick sediments prevent it from being an ideal place for a major margin transect

328--was not included in the NARM-DPG proposal because it lacked a close conjugate position with the Vøring margin and sufficient data. It is a hostile environment for more systematic studies (NE Greenland, pack-ice).

363--not included in NARM-DPG proposal because it is only of secondary interest to rifted margin formation as it stands. As a "plume-study", it ranked lower than the "Icelandic plume" study (NARM volcanic rifted margins legs)

392--was ranked highly by TECP, but declared immature. NARM-DPG also felt it was immature by itself and partly also with regards to the drilling strategy proposed. It could be of high interest at a later date if revised.

394--ranked highly by TECP, but immature. Potentially very interesting correlation possibilities between volcanic rifted margin formation (seaward dipping reflector sequence[SDRS]) and adjacent marginal basins, but the relationship needs to be better demonstrated. A revised and improved proposal could be of high interest.

395--ranked lowly by TECP because it is a rather local/regional proposal as it stands

397--ranked highly by TECP as a proposal and study area with interesting complexities. The latter led to its avoidance by NARM-DPG, but the complexities might be a fruitful subject for future drilling after the first phase of NARM drilling has been digested.

5. Mid-ocean Ridges--Jeff Karson

TECP is eager to support proposals to drill old oceanic crust, as well as all of active processes along spreading centers. To be supportable, however, these proposals must attempt to place these holes in the context both of regional and local tectonic settings. In addition TECP expects careful attention to the origin and significance of relatively fine-scale structures expected on the scale of the drill cores and holes. Extensional tectonics in well-studied settings clearly show a marked diversity of structures ranging from simple to exceedingly complex. The orientations of oceanic crustal structures formed at spreading centers, therefore, cannot be assumed. Proposals that integrate the geometry and kinematics of various deformation structures in the framework of testable hypotheses are most likely to receive strong TECP support.

Despite the obvious importance of mechanical extension to the creation and evolution of oceanic lithosphere, proposals reaching the TECP still generally are woefully deficient in attention to the processes and structures related to extension. TECP regards a proposal simply for drilling a deep hole into, say, gabbro or serpentized peridotite as weak because the orientation of the hole and any structures in it or in the drill core may not be constrained. Thus these structures cannot be adequately used to evaluate models of sea floor spreading.

TECP has recently reviewed many proposals that potentially could address fundamental problems in mid-ocean ridge extensional tectonics and transform faulting. The panel would like to encourage the following types of proposals to this end (the list is not prioritized):

1. Systematic drilling of active and inactive oceanic detachment faults that appear to be fundamental components of slow-spreading ridges;
2. Drilling of major geophysical horizons and geologic contacts within range of ODP capabilities. For example, the seismic layer 2/3 boundary, reflection and refraction MOHO's, sheeted dike/gabbro transition, and mafic/ultramafic transitions should be prime targets.
3. Drilling into areas of active processes such as hydrothermal outflow and persistent microseismic activity.
4. Areas related to major strike-slip faulting in transform faults to define the deformation/metamorphism histories of these shear zones and the state of stress in their vicinities.
5. So-called "transverse ridges" along fracture zones.

We stress that proposals that use drilling to test significant structural/tectonic hypotheses are most likely to receive TECP support.

At present there are 20 active proposals considered in this area. Major programs include those developed by (1) the EPR DPG report; (2) the Sedimented Ridges DPG Report, and (3) the Offset-Drilling Working Group (see Table). These were ranked by TECP at the Spring 1992 meeting. Of these, only two reached the top 10 ranked proposals

(410-deepening hole 504B, ranked # 6, and 369-drilling gabbros and serpentinites exposed by detachment faulting in the MARK area, ranked # 10;). Both proposals were also ranked highly by LITHP.

ACTIVE SPREADING CENTERS

No	Title
325	Endeavor Ridge, Hi-T. hydrothermal site
333	Mid-Cayman spreading center (site CAY 3)
361	TAG Hydrothermal field
369	MARK western median valley wall (gabbro + serpentinite)
402	Geochemical anomaly at 12°-18°N on mid-Atlantic ridge
407	15°N on MAR-shallow mantle geochemical anomaly
413	Magmatic-tectonic evolution of Reykjanes Ridge EPR-DPG--EPR II (beyond leg 142) Sed. Ridges DPG-Sedimented ridges II (beyond leg 139)

TRANSFORMS AND RIDGE-TRANSFORM INTERSECTIONS (RTI'S)

319	East Galapagos-Inca Transform extinct hydrothermal site
333	Cayman trough
374	Mantle heterogeneity at Oceanographer Fracture Zone
376	Layer 2/3 boundary, Vema Transform fault

OTHER SITES

331	Aegir Ridge
352	Mathematicians Ridge
368	Return to hole 801C
370	Mid Atlantic Ridge magmatic processes and natural tracers
373	Stress measurement at hole 505
375	Hess Deep (beyond leg 147)
410	Deepen Hole 504 B

Sedimented Ridges The first holes in this program were drilled during Leg 139. They were very successful in recovering massive sulfides and a variety of altered and fresh sediments and igneous host rocks. Several faults were apparently drilled. A second leg must await the development of high-temperature drilling capabilities. This leg was not ranked among the top 20 by TECP, because it lacks attention to tectonic objectives that obviously must exist in the area.

EPR Drilling Despite great optimism, EPR Leg 142 (bare-rock drilling with DCS) was a major disappointment, as discussed above. A second leg apparently must await engineering progress on the DCS. TECP did not rank this leg among its top 20 proposals, because the DPG did not address the tectonic aspects of lithosphere generation.

Offset-Drilling Objectives The Offset Drilling Working Group is considering a number of potential sites (10) and a number of other target sites. All proposals are deficient in addressing TECP thematic interests, but the MARK proposal was considered the best and ranked # 10. Cayman Trough drilling, which includes a median valley hole, ranked # 12; Hess Deep #15, and Vema Fracture Zone #16. TECP notes that several of the "potential sites" have no active proposals and lack sufficient site surveys for near-term drilling.

6 Marginal Basins--Yujiro Ogawa

Convergent margins were the subject of several recent legs (125, 126, 127, 128). There are new proposals for back-arc/marginal basins except for the Caribbean. With regard to future planning, little is known about back arc or forearc settings. Models include active stretching and passive upwelling and active upwelling which causes stretching. These models need testing, possibly with deeper holes, coherent cross-sections, and oriented cores to get at dynamics of system. Back-arc basins are not equal to marginal basins. Entrapped basins such as the Bering Sea or south China Sea are not so interesting from the active tectonic point of view as back-arc basins.

7. Convergent Margins-Casey Moore

Active proposals for drilling in accretionary prisms extend from the Mediterranean through the Atlantic to the Eastern Pacific Ocean. The Mediterranean Ridge proposal is unique in involving salt tectonics in an incipient collisional setting. TECP looks forward to a more topically focused proposal(s) with structural control provided by soon-to-be-completed MCS studies. The drilling of leg 141 across the Chile Triple Junction only partially completed the proposed study of subduction erosion and subsequent accretion. An additional leg would be necessary to finalize this program, and should concentrate south of the ridge-trench contact. A proposal for drilling the Costa Rica accretionary prism would focus on constraining the process of sediment subduction. The seismic data is of high quality; a relatively well-known convergence history, coupled with an absence of surface erosion of the accretionary prism, suggests that the proposed drilling leg will really determine the mass balance of accretion and sediment subduction in this system. A rejuvenated Barbados proposal concentrates on analysis of fluid and fault dynamics along a hydrogeological flow line out of the accretionary prism. The program would test for the migration of fluid pulses along the decollement surface and tie these to MCS imaging of high amplitude seismic reflections. Consideration of the proposed second leg along the Cascadia margin was deferred, pending the outcome of Leg 146.

8 Collisional Margins--Phil Symonds

There are eight active proposals that fall within this theme--seven in the Mediterranean region and one on the north Australian margin. The status of these proposals is summarized in the following table:

No.	Title	Contact	TECP Rating	Review Maturity	RANKING	
					Global 3/91	N.Atl Pros 10/91.
323- rev	Alboran Basin & Atlantic-Med. gateway	Comas	4	I--im-mature	2	4
324	Malta Escarpment-Mediterranean tectonic evolution	Cita-Sironi	2	I		
330A dd2	Mediterranean Ridge--accretionary prism in collisional context	Cita-Sironi	4	I	3	
340	Collisional tectonism and foreland basin development--N. Austr. margin	Symonds	4	I	11/12	
364	Thrust units of continental basement-Sardinia-African strait	Torelli	2	I		
379	Scientific drilling in Medit. Sea	Masclé	3	I	2	

383	Extension & continent/continent collision--Aegean	Kastens		I	2
399	Tectonic evolution of Alboran Sea	Watts	4	I	8

Two of the above proposals (324, 364) were not highly rated by TECP and will not be discussed further in this report

Alboran Basin--Proposals 323-Rev and 399

In line with TECP's recommendations the proponents of these proposals have recently met to discuss a joint tectonics proposal for the Alboran Sea. Information received from the proponents indicates that they intend to submit an addendum referring to both proposals, and containing updated thematic, and site-specific geodynamic and tectonic objectives, a prioritized list of drill sites chosen from those submitted previously, and updated site survey forms. The Atlantic-Mediterranean gateway goals will be addressed in a separate addendum.

Other progress relates to site surveys in the area, as notified by Comas. In the past summer two multichannel seismic and seabeam cruises have been conducted in the Alboran Sea and Gulf of Cadiz on R/VHesperides. These data currently are being processed. A data package containing the seismic data presented in proposal 323 has been sent to the ODP Data Bank

This proposal is thought to be drillable within four years, and it should be considered also for 1994.

Mediterranean Ridge--Proposals 330Add2 and 379

A meeting was held in Milano on 2 March 1992 to discuss ODP proposals in this region. The main themes proposed for ODP drilling in the area are: accretionary complexes, continent-continent collision, salt deformation and dissolution, and fluid circulation. The consensus of the meeting was that a two-leg strategy should be adopted for drilling in the region:

Leg 1--shallow, post-Messinian objectives and mud diapirism. This is thought to be ready to go with the data available, and drillable in 1994. The proposed sites are 3 on a transect across the Sirte Abyssal plain deformation front, 2 sites on the crest of the central Mediterranean Ridge, and one site on the Eratosthenes seamount.

Leg 2--dep objectives, including evaporites and pre-Messinian formation. Requires additional site surveys already planned and partially funded.

Deep drilling on the Mediterranean ridge will be further discussed at the meeting "Focussing on scientific objectives on the Mediterranean sea" to be held in Trieste, 15 October, 1992. The proponents hope to lodge a site survey package for the shallow objectives before August 1992, and a revised drilling proposal will be submitted as soon as possible.

Northern Australian margin--Proposal 340

Data collection is continuing on the Australian side of the Timor foredeep, and several deep seismic transects of the foreland basin system will be collected in the near future by tying BIRPS and BMR surveys. Although in the next year it should be possible

to propose more definitive sites on the flexed Australian craton, the proposal would also benefit from site surveys over the foredeep and orogen, in Indonesia waters, thus allowing all parts of the collisional system to be examined by drilling. The preliminary proposal has been revised (but not yet formally re-submitted) following the original TECP review and the proponents have informally responded to TECP on matters raised in its review. These revisions and review comments will be incorporated into a revised proposal when appropriate seismic site data become available. It seems unlikely that the proposal will be ready for drilling within the next 4 years.

9. Stress and Mid-Plate Deformation--Mark Zoback

Determination of stress in boreholes requires a paradoxical combination of conditions--rocks that are lithified, but which are not too strong to withstand the applied stresses. As drill holes are essentially vertical, the stress of concern is the maximum horizontal stress. The maximum horizontal stress increases fastest with depth in areas of compressional deformation, and slowest in areas of extensional deformation, (such as mid-oceanic ridges). Thus stress measurement opportunities require an optimum combination of depth, tectonic regime, and rock strength.

Principal opportunities include the NARM deep holes, especially those in the Iberian Abyssal Plain and Newfoundland basin, and, if they are deep enough, the volcanic rifted margin holes. Investigation of the ridge-push force is interesting because it seems to be the dominant source of horizontal stress in North America and Europe. Stress determinations in accretionary prisms are complicated by the fact that generally the poorly consolidated rocks encountered are too weak to support elastic stresses. The Alboran basin presents exciting opportunities, and Cayman Trough holes 1 and 2 (east of the Cayman Spreading Center) look promising. Hole 504B is the most important site, the borehole breakouts there are surprising because they indicate strike-slip and reverse faulting, with a maximum horizontal stress of about 1 kilobar. Modeling suggests that earthquakes in young oceanic crust should be compressive because of cooling stresses.

Taking a proactive stance, areas that would be potentially interesting include the Vema Fracture zone, Equatorial Atlantic, Queen Charlotte-San Andreas transform systems, and the Gulf of California. Regarding strategy, the best tool is the borehole televiewer, and the next best the formation microscanner. TECP's aim should be to see that these continue to be routinely deployed.

GLOBAL RANKINGS

Voting procedure: TECP followed the procedure agreed upon at the December, 1991 Panel Chairs' meeting. A total of 33 drilling legs were identified from the Watchdog Reports and the "Active" ODP Proposal list which were achievable in the next 4 years. Each Panel Member voted for 10 in ranked order, with # 1 ranked receiving 10 points, #2 ranked 9 points, etc. Proponents, including NARM-DPG Chairs, were identified on their respective proposals. Voting was by paper ballot, with it agreed in advance that proponents, including NARM DPG Chairs could not vote on their own proposals. The total number of points for each drilling leg were totaled and normalized by the total permitted to vote. Rankings and scores are as follows:

Rank	Name	Score/10
1	NARM-DPG Non-volcanic Leg 2 (Deep Newfoundland Basin site)	7.18
2	346 African Equatorial Margin	5.31

3	NARM-DPG Volcanic leg 2 (completion of first priority transect (SE Greenland and deep site on Vøring Margin)	4.64
4	Alboran Sea (Comas/Watts combin)	4.46
5	265 W. Woodlark Basin	3.77
6.	410 Deepening Hole 504B	3.31
7.	400 Costa Rica Accretionary Prism	3.00
8.	Mediterranean Ridges I (shallow)	2.54
9.	414 Barbados Accretionary Prism	2.23
10.	369 MARK	2.17
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11.	Mediterranean Ridge II (deep)	2.08
12.	333 Cayman Trough	1.92
13.	NARM-DPG Non-volcanic leg 3	1.91
14	411/415 Caribbean Basalt/K/T boundary combined	1.77
15	375 Hess Deep Leg 2 (tectonic)	1.54
16	376 Vema Fracture Zone	1.46
17	Chile Triple Junction, leg 2	1.38
18	363 Grand Banks, Newfoundland	1.31
19	361 TAG	1.08
20	403 Rev K/T Boundary, Alvarez	0.92
21	368 Return to Hole 801C	0.77

MEMBERSHIP

The Tectonics Panel currently is short one U.S. member, and two other U.S. members, Dale Sawyer, Mike Purdy, and Hans-Christian Larsen are rotating off. The Panel is concerned about maintaining proper balance, particularly in view of the loss of its expertise in rifted margins, in seismology, and the onset of drilling activity in the Atlantic Ocean and possibly offset drilling. The following recommendations for membership are made with an eye to maintaining proper balance, to add needed expertise in modeling and small-scale structures, and to preserve a degree of ocean-going field experience within the Panel.

A. Seismology-generalist

1. Anne Trehu, OSU
2. Uri Ten Brink--USGS Woods Hole

B. Rifted Margins

1. Chris Beaumont, Dalhousie
2. Mike Steckler, Lamont
3. Debbie Hutchinson, USGS
4. Mike Coffin, UT Austin

C. Ocean Crust-Microstructures

1. Sue Agar Northwestern
2. Jill Karstens--U. Hawaii

NEXT MEETING

Location Iceland, Hans-Christian Larsen will arrange for field trip and host(s)
Date: September 22-27, per discussion with Jamie Austin, concerning
problem of information flow from SSP,

At the next meeting the Panel wishes to invite one or more of the Co-Chief Scientists from Leg 141 to assist the Panel in evaluation of the results of the leg and what further questions remain to be pursued. This will be the first evaluation of a series that the Panel plans to initiate for its highly prioritized legs that get drilled.

FIELD TRIPS

TECP wishes to record that the experience of participation in the two recent field trips (Cyprus, S. W. U.S. extensional corridor) have been of immense scientific and practical benefit and should be continued. The aim of these trips has been to gain experience with outstanding field examples of geologic phenomena that can be studied in three dimensions in detail and that also bear on topics of current high priority to ODP. Our feeling is that such trips are extremely important in providing panel members with direct hands-on experience with three-dimensional features that are usually only imaged in the oceans. This experiences greatly enhances the insights from which ODP proposals are evaluated. The informal atmosphere of field trips has also served to form bonds between members of the Tectonic Panel and, in the case of Cyprus, with LITHP members as well. As a result, each panel now has a better perspective of the priorities and interests of the other. TECP intends to continue this practice but also to evaluate it from time to time to assess its continued value in our deliberations.

RECORDING AND ARCHIVING OF STRUCTURAL DATA ON *JOIDES RESOLUTION*

In response to a request from Moores, Bob Musgrave reported on the status of routine archiving and recording of structural data on the *Joides Resolution*. Currently no formal structure exists for the initial recording of structural observations during core description, or for the database archiving of this information. Structural geologists have not been routinely included in staffing of ODP legs, and this is reflected in the lack of a standard structural "visual core description":(VCD) form, of the type used by shipboard sedimentologists and igneous petrologists and in the absence of detailed (and quantitative) structural information on "barrel sheets" Structural geologists on recent legs (e.g. Legs 131, 141) have constructed their own "structural VCD's" from MacDraw templates, on which they have hand-drawn and written structural observation. These paper forms are currently filed by the ODP database group and are available as photocopies on request, but there is no means at present to transfer these data to the computer database. Lithology, sedimentary structures, color, etc., which are recorded on the existing barrel sheets, are currently entered into the database at ODP; ODP is in the process of final development of a Macintosh-based barrel-sheet drafting program, which can be directly stored in the computerized database. A similar approach could be usefully applied to core-by-core summaries of the structural VCD data.

Leg 141 structural geologists also summarized attitudes (both in core-and corrected geographic-frames) of structural elements in an EXCEL spreadsheet, similar to the spreadsheet-based data-entry formats being developoed for the physical properties lab. At this stage, this structural information has not been incorporated into the database, but is available only through the "Initial Reports". A formalized version of this spreadsheet could be developed and routinely used and entered into the computer database.

TECP believes that it is important that structural information on cores be collected as an integral part of routine core description, as appropriate. Accordingly TECP recommends:

- 1. that standardization of the shipboard structural VCD form and spreadsheet should be carried out immediately;**
- 2. that integration of the spreadsheet data with the computer database should not be difficult and should be effected as soon as possible; and**
- 3. that development of a Macintosh-based "structural barrel sheet" application, modeled after the "VCD" application currently in development, should be carried out as soon as possible. This could be done as an extension of the existing barrel sheet, but it would probably be more easily constructed as a separate application. The output of the "structural barrel sheet" application could be merged with the lithographic barrel sheet in PICT form, as has been done with physical properties data. A Macintosh-based "structural barrel sheet" would allow complete integration of structural observations into the computer database.**

THANKS

The Tectonics Panel unanimously thanked its departing members, Hans-Christian Larsen, Dale Sawyer, and Mike Purdy, its departing PCOM liaison, Brian Tucholke, for their valuable contributions to the Panel's work over the past several years. The Panel also wishes to thank, belatedly, Shirley Dreiss, former SGPP Chair.