

ODP TECTONICS PANEL MEETING

NICOSIA, CYPRUS

OCTOBER 9-11, 1991

EXECUTIVE SUMMARY

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Ans'd.....

1. OPCOM MONEY:

OPCOM has recommended feasibility studies for deep drilling, and TECP places very high priority on deep drilling on rifted continental margins. Therefore TECP requests that specific attention be directed toward drilling improvements that would increase the efficiency of drilling, enhance core recovery, and increase the ultimate likelihood of success at deep sites such as those proposed for North Atlantic rifted margins.

2. SUPPLEMENTAL DRILLING PROPOSALS

A. HOLE 801C: TECP places high priority on the logging of hole 801C. TECP's main interest in legs 143 and 144 is in questions of plate kinematics. These involve the preservation of a latitudinal spread of basement penetrations. TECP believes that the time allotted to Atolls and Guyots is generous. If something must be cut, however, TECP recommends that basement penetration be sacrificed in mid-latitude sites, preserving the maximum latitudinal spread of basement samples.

B. S-3--Drilling of hole OSN-2. Establishment of the global seismic net is extremely important for the long-term objectives of TECP, of ODP, and, indeed, of the global geoscience community. We strongly support the drilling of OSN-2.

Concerning what should be dropped from leg 145 to make time, we offer the following. Tectonic objectives are secondary on leg 145, but TECP does have interests in obtaining basement ages at the ocean floor sites and age and paleolatitude information at the seamount sites. If necessary, we would give up any time that might have been devoted to these objectives. However, we do feel that some of the potential tectonic objectives are more important than others, so TECP lists the following priorities, from lowest to highest:

Lowest: Information from seamount site PM1 and sea floor sites NW1A and NW4A are least likely to produce tectonically significant results.

Intermediate: Basement information from NW3A is likely to produce tectonically significant results for models of North Pacific plate evolution (Chinook plate hypothesis) so it is of medium priority.

Highest: On Detroit seamount (DS sites) significant basement penetration supplying paleolatitude and age information is very important for models of Pacific plate motions, as well as for global questions concerning true polar wander and fixity of hotspots. Thus these sites are of high priority to TECP.

3. PROPOSAL/ PROSPECTUS REVIEW.

TECP reviewed all 26 new proposals and re-reviewed appropriate proposals in the North Atlantic Prospectus. In keeping with PCOM's requirements, proponents were absent from the room during discussion and grading of proposals. Then TECP discussed

the NARM DPG report from the tectonic point of view. Both Co-Chairs of the DPG were absent from this discussion.

4. TECP RANKING OF NORTH ATLANTIC PROSPECTUS LEGS

RANK	PROPOSAL	SCORE
1	NARM NON-VOLCANIC FIRST LEG (IAP 4, 2, and 3A, and GAL 1)	7.4
2	NARM VOLCANIC FIRST LEG (EG 63-1 and 63-2)	6.1
3	346 Rev 2 Transform Margin (Ivory Coast-Ghana Margin)	5.7
4.	323 Rev Alboran Sea (Comas et al)	4.8
5.	403 K/t boundary, in the Gulf of Mexico, Alvarez et al /	4.0
6.	376 Layer 2/3 boundary, Vema F.Z.	3.2
7	369 Rev MARK Area	2.5
8	399 Alboran Sea (Watts)	2.3

5. LETTERS OF INTENT.

TECP suggests that the present "Letter of Intent" process should be strengthened and somewhat formalized. We suggest that letters of intent should be encouraged (e.g. by advertisement in JOIDES Journal, or publications with broader readership, such as EOS, GSA Today, or Terra Nova), all thematic panels should receive the letters, and the authors should receive a written response. This latter could include suggestions for additional proponents, experts to be consulted, and/or details of data sources. Encouragement from thematic panels at the critical stage may also help with funding of related site surveys, etc.

6. OFFSET DRILLING

TECP recommends that either a Detailed Planning Group be formed or that the Working Group be charged with the task of coming up with a coherent, balanced proposal for Atlantic offset drilling. This proposal should include an integration of tectonic and lithospheric themes, and it should include all the site survey and geological setting information outlined in the Offset Drilling Working Group minutes.

7. WATCHDOGS

Stimulating exciting tectonics drilling objectives is one of the TECP's main concerns. To foster this, TECP's watchdogs on various thematic issues are starting to take a more active role in enhancing communication between the panel and proposal proponents.

**JOIDES TECTONICS PANEL MEETING, OCTOBER 9-11,
1991
NICOSIA, CYPRUS**

MINUTES

PRESENT: Eldridge Moores, UCD Chairman
Tanya Atwater, UCSB
Steve Cande, Lamont-Dougherty
Jeff Karson, Duke U
Hans-Christian Larsen
Alain Mauffret, France (substitute for J. Bourgois)
Casey Moore, UCSC
Yujiro Ogawa, Japan
Mike Purdy, WHOI
Tim Reston, GEOMAR (substitute for K. Hinz/J. Behrman)
Alistair Robertson, UK
Dale Sawyer, Rice U
Phil Symonds, Australia
Mark Zoback, Stanford U.

LIAISONS Shirley Dreiss SGPP
James Allen, ODP
John Mutter, PCOM
S. Cloetingh, LITHP Liaison (present during joint meeting)

VISITORS Fred Vine, Chair Offset drilling W. G.
Mike Storms, ODP

APOLOGIES: K. Klitgord, USGS

LIAISON REPORTS

SGPP Shirley Dreiss discussed the recent SGPP meeting. Considerable frustration was expressed about the status of tool development, especially permeability and pore pressure measuring devices, as well as with the mechanics of choice of Co-Chief Scientists.

TEDCOM Moores reported on the TEDCOM meeting he attended in the stead of Dale Sawyer. He reported that TEDCOM was very interested in pore pressure information in sites such as the model deep-drilling sites presented by TECP (CASCADIA, BARBADOS, and NEWFOUNDLAND BASIN). Casey Moore and Dale Sawyer will provide pore fluid pressure information to Moores on convergent and rifted continental margins, respectively, for forwarding to TEDCOM.

OPCOM Moores reported on the OPCOM meeting, emphasizing the list of proposed items to concentrate on. After considerable discussion, mainly concerning the desirability of Deep Drilling, TECP unanimously passed the following recommendation to forward to PCOM

OPCOM has recommended feasibility studies for deep drilling, and TECP places very high priority on deep drilling on rifted continental

margins. Therefore TECP requests that specific attention be directed toward drilling improvements that would increase the efficiency of drilling, enhance core recovery, and increase the ultimate likelihood of success at deep sites such as those proposed for North Atlantic rifted margins.

LITHP Jeff Karson reported that there had been no meeting of the Lithosphere Panel since the Davis TECP meeting.

OTHER LIAISONS TECP discussed the desirability of liaisons with other panels.

OHP Alastair Robertson and Tanya Atwater agreed to serve as liaisons to European and North American meetings, respectively.

TEDCOM Dale Sawyer is TECP liaison.

DMP Casey Moore? Mark Zoback? agreed to serve as official liaison

SUPPLEMENTAL DRILLING SITES

S-2. Logging of Hole 801C

TECP unanimously passed the following motion:

TECP places high priority on the logging of hole 801C. TECP's main interest in legs 143 and 144 is in questions of plate kinematics. These involve the preservation of a latitudinal spread of basement penetrations. TECP believes that the time allotted to Atolls and Guyots is generous. If something must be cut, however, TECP recommends that basement penetration be sacrificed in mid-latitude sites, preserving the maximum latitudinal spread of basement samples.

S-3. Drilling of hole OSN-2.

After discussion of the issues, TECP unanimously passed the following motion:

Establishment of the global seismic net is extremely important for the long-term objectives of TECP, of ODP, and, indeed, of the global geoscience community. We strongly support the drilling of OSN-2.

Concerning what should be dropped from leg 145 to make time, we offer the following. Tectonic objectives are secondary on leg 145, but TECP does have interests in obtaining basement ages at the ocean floor sites and age and paleolatitude information at the seamount sites. If necessary, we would give up any time that might have been devoted to these objectives. However, we do feel that some of the potential tectonic objectives are more important than others, so TECP lists the following priorities, from lowest to highest:

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REVIEW OF NEW PROPOSALS.

Proposal review began with a discussion of "conflict of interest" questions as outlined by John Mutter in the PCOM report. It was felt that members who were on the panel because of their expertise should not be "gagged". The idea of a quorum was questioned, as these panels are not a legalistic body. The opinion was expressed that it was the American contingent imposing its paranoia on the rest. Concern was expressed that these restrictions are turning thematic panels into an NSF-like proposal review agency, rather than an advisory body.

Despite these reservations about the process, TECP in its discussion and voting of new proposals scrupulously followed the instructions from PCOM. Specifically, proponents were not in the room during discussion or voting on their proposal. DPG chairs also were not in the room during discussion of the DPG report from the tectonic point of view.

253-Rev Paleooceanographic controls on the deposition of organic carbon-rich strata in the ancestral Pacific

This proposal primarily addresses paleooceanographic objectives in its emphasis on the origins of Pacific C_{org} -rich sediments. However, the postulated superplume, the origins of oceanic plateaus, and the Cretaceous magnetic quiet period are all of vital interest to TECP. The likelihood that the proposed drilling will establish the temporal relationships among these events and of them to other oceanographic and climatologic changes is extremely exciting. We note that the success of the proposed work is entirely dependent upon great improvements in coring and recovery in the cherty Cretaceous sediments and upon dependable penetration to and into basement volcanic rocks. It should not be attempted until these drill technological improvements are proven and routine. Hopefully they will be by the time that the drill ship returns to the Pacific. We look forward to continued updating of this proposal. If the proponents would like to discuss TECP's reactions further, we invite them to contact the appropriate "watchdogs", namely Steve Cande and Tanya Atwater.

Box checked: 4

330-Add2 Mediterranean Ridge: an accretionary prism in a collisional context

The Mediterranean ridge constitutes a lithologically unique accretionary prism in a collisional setting. A viable drilling program across the Mediterranean ridge needs to be supported by multichannel seismic data both to geologically constrain the sites and address safety issues. The present proposal mentions many topics of current interest in the study of accretionary prisms, including structural history and fluid evolution. For the Mediterranean ridge proposal to be competitive, the topical significance of these objectives must be developed and closely integrated from site to site. Essentially the proposed drilling program needs to be more coherent than it is currently.

We understand that the Mediterranean Ridge will be the subject of a multichannel seismic study led by Jean Mascle and Jean-Pierre Rehault. The proponents of this proposal should contact the French group to integrate more MCS data into any forthcoming Mediterranean Ridge drilling proposal. For further information about TECP's reaction to this proposal, please contact Phil Symonds or Casey Moore, TECP's watchdogs in this topic.

Box checked: 4

346-Add Complementary information on data status on proposal for drilling in the Atlantic transform margin.

This addendum is also included in proposal 346-Rev. TECP considers; proposal 346-Rev to be mature and ready to be drilled. It addresses high priority TECP objectives. We suggest that drilling time estimates (using the ODP guidelines) be assembled and that the proposal divided into legs and prioritized. Continue the processing efforts that you describe in the proposal.

Box checked: 5

346 Rev 2 Transform (translational) margin: The Ivory Coast-Ghana transform margin.

In its review, TECP reaffirmed its strong interest in the tectonic objectives of this proposed leg and continues to believe that this area is the best location to carry out a study of transform margins. The panel noted with approval the international effort being made to obtain additional geophysical and submersible (site survey) data. Some concern was expressed at the delay in providing the improved processed seismic refraction data, and it is hoped that this could be speeded up. Major concern was expressed that the proposal includes deep drilling objectives amounting to 2-3 legs. We suggest that drilling time estimates (using the ODP guidelines) be assembled and that the proposal divided into legs and prioritized. Continue the processing efforts that you describe in the proposal.

Box checked: 5

348 Add Upper Paleogene to Neogene depositional sequences on the U.S. Middle Atlantic margin: the Mid-Atlantic transect.

This is an excellent proposal, with much new data. It should produce a definitive study of relative sea level changes on a passive margin. Unfortunately, as the proposal is formulated, there is no theme of interest to the tectonic panel.

Box checked: 1

356 Rev Oceanographic and climatic changes caused by subsidence of large crustal areas in the Denmark straits, Jan Mayen Ridge, and Iceland-Faeroe Ridge area.

This proposal is mainly targeted at OHP interest. There is, however, a mention of vertical crustal movements of the prominent aseismic ridges and highs in the northeastern Atlantic, structures that exert very important oceanographic (and paleoceanographic) control. The hypothesized rapid vertical crustal movements of these features and the possible connection to intra-plate stress changes is briefly addressed as a potential tectonic objective. TECP appreciates the potential of this hypothesis, but in doing so, does not see this theme developed or substantiated enough that we can classify the proposal as addressing (*sensu stricto*) a high-priority tectonic objective. Part of the proposed study area is very close to highly-ranked volcanic margin drilling, and TECP accordingly would like to be informed if sites of this proposal are scheduled for drilling. If so, TECP would consider the need for deepening of some of the sites to include volcanic basement, especially on the Iceland-Greenland Ridge.

Box checked: 2

361 Rev A proposal for drilling an active hydrothermal system on a slow-spreading ridge: MAR 26° N (TAG)

TECP continues to be very interested in the potential for drilling into fault rocks during the deeper penetrations planned for this site. The muting of magnetic anomalies is important to the panel for several reasons elaborated in the proposal, but particularly because alteration is likely to be closely tied to faulting. TECP is disappointed, however, at the omission of any discussion of structural questions in this revised proposal, particularly as the Panels previous comments were essentially ignored. The mere mention of a relationship between the mineralization and structure does not constitute taking structural questions into account. No consideration of the structural environment was made in discussion of the objectives of the drilling. TECP notes that if this proposal is drilled without adequate structural expertise in the scientific party, a great opportunity will be lost. For further information about TECP's reaction to this proposal, please contact Jeff Karson, TECP's watchdog on this topic, or the panel Chair.

Box checked 3.

365 Add Geothermal measurements along the Newfoundland and Iberia conjugate passive margin transects.

TECP strongly endorses the importance of heat flow and heat production measurements in the NARM drill holes (should they be drilled). However, there are severe problems with this proposal. The panel was unconvinced by the data and modelling presented that the basic premise of the proposal was valid. High heat flow data points along the Goban Spur were somewhat arbitrarily discounted and for both profiles the crust was interpreted to be radiogenically depleted, which undermines the basic premise of the modelling. Perhaps more serious is the problem that simple shear models were never discussed and contrasted with pure-shear models, so that it was not clear if distinctions between these models could be determined from heat flow data.

The panel does support the proposal to deepen NB1-A to basement, nor does it explicitly support the recommendations for HPC or WSTP runs. Instead the panel hopes that careful oversight by DMP would assure that the goals of accurate heat flow and heat production measurements would be met..

For further information about TECP's reaction to this proposal, please contact Dale Sawyer or Hans-Christian Larsen, TECP's watchdogs on this topic,

Box checked: 4

369 Add MK2: a deep hole in the oceanic upper mantle at slow spreading ridge

This proposal is a further elaboration of 369Rev. The proposal for a long hole in peridotite is presumably in response to the Offset Drilling W. G. preliminary report. TECP questions what the hole will add, particularly in view of the fact that site 670, leg 109 drilled 100 m of peridotite only a few miles away, and the proposed hole has not been placed within a suitable site-survey framework. The theme of magnetic properties of peridotite is of considerable interest, however.

Box checked: 3

369 Rev Generation of oceanic crust at slow-spreading centers: drilling in the western wall of the MARK area

This proposal is of appreciable interest to TECP, but is very immature and highly deficient. The drilling of hole MK-1 and its relation to detachment faulting is an important tectonic goal. However, the location of the fault (or other faults) is not shown on the maps, and the overall structural relations to be tested are not presented at all. Considering the appreciable amount of information available for this area, the PT's have not yet taken the opportunity to develop the case for drilling. Errors, such as the fact that MK-1 is not located at the same place on the map and cross-section, indicate that the proposal was hurriedly prepared. We realize that such was the case, in order to meet the PCOM deadline after the Offset Drilling W. G. meeting. We recommend that the proposal be extensively revised and resubmitted, taking advantage of the additional geological and geophysical data available for this region. For further information about TECP's reaction to this proposal, please contact Jeff Karson, TECP's watchdog on this topic, or E. Moores, Panel Chair.

Box checked: 4

376 Rev Drilling and the VEMA F. Z. (MAR): layer 2/3 boundary and vertical tectonics.

TECP recognizes the addition of some tectonic considerations in this revision. The proponents should consult the panels guidelines (JOIDES Journal, V. XVII, No. 2, June 1991, p. 58), particularly with respect to the interpretation(s) of the proposed drill sites. The proponents should consider other permissible interpretative cross-sections and the implications for drilling targets. It is recognized that drilling may be the best or only way to constrain this structure.

The panel is very interest in the origin of transverse ridges. We recognize these as fundamentally important components of the oceanic lithosphere that remain very poorly explained. While the proposal lists many current hypotheses, the proponents do not explain how the data acquired from subsidence history or other data would test or eliminate any of these hypotheses.

This proposal has the potential to be one of the highest-ranked oceanic drilling projects for TECP. For further information about TECP's reaction to this proposal, please contact Jeff Karson, TECP's watchdog on this topic, or E. Moores, Panel Chair.

Box checked: 4

380 Rev 2 Drilling into the clastic apron of Gran Canaria; Evolution of a coupled system volcanic ocean island-sedimentary basin

As with the previous version of this proposal, TECP recognised this to be an excellent study of an oceanic mid-plate volcano. It addresses two issues of tectonic interest: the lithosphere subsidence, loading, re-heating question; and the early history/reconstruction of the central Atlantic Ocean. The drilling program has obviously been designed aimed primarily at unravelling the important story contained in the volcanoclastic apron around Gran Canaria, and in this it seems an excellent plan. Although the issues of lithosphere subsidence/loading/reheating are described in the proposal, no adequate explanation or description is provided, however, of specifically how the drilling results will be used to answer these problems. And no account is provided of how the very difficult separation between the effects of horizontal stresses and vertical loading will be made.

The one hole in the Madeira Abyssal plain has potential tectonic interest because of its potential to provide a basement date within the Cretaceous magnetic quiet zone and thus help in early reconstructions of the Atlantic. But it is located within a fracture zone trough, and the offset on that fracture zone is necessarily unknown (because there are no identifiable magnetic anomalies), so any dating will have some inherent uncertainty. The hole thus will be of limited utility.

Box checked: 3

388 Add Addendum to: A proposal to Advance Piston Core the Ceara Rise, western Equatorial Atlantic: Neogene history of deep circulation and chemistry.

This proposal is to address problems of Neogene circulation. As its proposed sites have been selected to be as tectonically stable as possible, there is no objective of tectonic interest addressed.

Box checked: 1.

391 Add Depositional history and environmental development during the formation of sapropels in the eastern Mediterranean.

The objectives of this proposal are mostly paleoceanographic. There is little of interest to TECP.

Box checked: 1

397 Mantle plume interaction with melting during lithosphere extension--multiple rifting in the Tertiary North Atlantic region

The tectonics panel considered this proposal of interested in defining the history of magmatism and rifting associated with plume evolution. Members noted the need to obtain geochemical data from this area. The panel believed that early history of rifting might be better defined elsewhere. Some expressed interest in the rifting of the Jan Mayen ridge as a process of microcontinent formation. Overall the proposal was ranked below other North Atlantic rifted margin programs. For further information about TECP's reaction to this proposal, please contact Hans-Christian Larsen, TECP's watchdog on this topic,

Box checked: 4

398 Proposal for ODP investigation of Quaternary Paleoceanography...Gulf Stream and Labrador Current off the Grand Banks of Newfoundland.

The objectives of this proposal are not within the TECP mandate. We suggest that the proponents of 398 provide evidence that the proponents of 363A and 359A agree to the movement of their site.

Box checked: 1

399. Tectonic evolution of the Alboran Sea.

This succinct and well-focused proposal to examine the development of intracontinental extensional basins in a collisional tectonic setting addresses the general TECP theme of understanding deformation processes at convergent plate boundaries. Although the global significance of this type of basin development is covered to some extent within the proposal, TECP considers that this question deserves further emphasis and clarification.

The case for drilling in the Alboran Sea and the general questions that can be answered by drilling are clearly argued in the proposal. TECP feels, however, that because the significance of the extensional process comes from their position within a collisional system, effort needs to be made to expand the regional geology component of the proposal to include information on the nature and age of structures within the surrounding thrust belts. TECP believes that it is the link between collision and extension that needs to be emphasized, and not just the nature of extensional processes within the basins of the Alboran Sea. We ask that the following specific suggestions be borne in mind during any further planning and/or revision of the proposal:

1. The proposal needs some review of other data in the region relevant to understanding the development of the Alboran Sea, such as the near-shore exploration wells and the large network of seismic data. For example, the proposal would benefit from the addition of subsidence curves from these wells, particularly those in the Miocene grabens; these would give an indication of the extent to which drilling will be able to constrain the subsidence history of the grabens.
2. The proposal needs a clear structural element map of the Alboran Sea. Structure contour and isopach maps showing the distribution of "megasequences" between the proposed sites would also be helpful.
3. The proposal needs a simple "schematic" section illustrating the general setting and structural style of the Alboran Sea basins, and their relationship to the surrounding thrust belts. Presentation of larger segments of seismic data (compressed scale sections) across the whole Alboran province would also help better to locate the proposed sites within the regional setting.
4. Is there a better site for penetrating the full syn-rift section, thus constraining the initiation of extension?
5. Some re-think of the site seismic interpretations and their ambiguities is required. For example, will sites A₂, A₄, and A₅ really intersect basement? There appears to be significant reflectors below the proposed TD's at these sites, particularly cutting across the multiple at site A₂. Also, some of the seismic data, particularly at sites A₄ and A₅, requires migration to reduce interpretation ambiguity.

6. Can basement be dredged on the scarps in the vicinity of sites A4 and A5, perhaps negating the need for basement penetration?

It is clear that important collisional tectonic objectives can be addressed in the Alboran Sea. TECP believes that timely progression to a mature drilling proposal for the region can most efficiently proceed by the proponents collaborating with those of the original Alboran Sea proposal (323 Rev, Comas and others), which has already been reviewed several times by TECP.

TECP is interested in your response to this review, and invites you to consult with our "watchdog" for collisional margins: Phil Symonds (Bureau of Mineral Resources, GPO Box 378, Canberra, A.C.T. 2601 Australia; Tel: 06-2499490; fax 06-2576041).

Box checked: 4

400 Proposal...for determination of mass balance and deformation mechanisms of the Middle America Trench and accretionary prism

TECP agrees that determination of the mass balance in accretionary prisms is of fundamental tectonic significance. The Costa Rican convergent margin is probably the best place to carry out this experiment because of the lack of a trench wedge (suggesting uniform input) and a continuous slope cover (preventing loss of prism by erosion).

The Panel raised several issues that could be addressed in a revision of the proposal:

1. What is known about the Cocos-Caribbean plate kinematics over the expected duration of accretion (0-20 Ma)?
2. Does the magmatic arc in Costa Rica show any evidence of sedimentary input to the magmas?
3. Does the localized uplift of the Nicoya peninsula reflect the subduction of some irregularity that could have been associated with a substantial variation of sediment input to the prism?

The seismic data is of high quality and constrains prism geometry and structure well. The proposed objectives of deformation mechanisms and the effects of fluids on prism deformation would be well-supported by measurements of surface heatflow to test for fluid flow around out-of-sequence thrusts, the frontal thrust, and the mud volcano. Examination of geochemical gradients in piston cores might also help constrain fluid movement. There is probably too much drilling proposed, and choices will have to be made.

If you have any questions regarding this review, please contact Casey Moore, the Tectonics panel watchdog in this area.

Box checked: 4.

401. Evolution of a Jurassic seaway, southeastern Gulf of Mexico

TECP members were impressed by the exemplary presentation and illustration of this interesting proposal. Members agreed that the study of transform rifted margins

involves fundamental processes that are currently poorly understood and thus of considerable general interest. The proposed area is already well-studied with readily available site survey data. TECP was concerned, however, about several aspects of the proposal:

1. The area is extremely complex and the transtensional setting of the proposed drill area could be model-dependent. How certain are we that transtensional tectonics were operating?
2. It is unclear that this area is necessarily the best suited for the study of fundamental processes of transtensional rifting. Potential results might, therefore, be significant mainly in the regional Caribbean context.
3. All six proposed sites require more than 1,500 m of penetration and amount to four months' drilling time. This commitment may exceed the likely benefits of the leg's stated objectives.

If you have any questions regarding this review, please contact Alastair Robertson, the Tectonics panel watchdog in this area (translational margins)

Box checked: 3

402 The geochemical anomaly in MAR basalts between 12° and 18°N.

The tectonics panel recognizes a number of potentially interesting aspects of the proposal that are not strongly emphasized. These include: 1) plate boundary reorganizations around a ridge-ridge-ridge triple junction; 2) fracture zone processes; and 3) spreading center-related extensional tectonics. Should additional site survey or other data indicate that these topics can be investigated in detail as part of the proposed drilling program, TECP could be more enthusiastic. Especially if peridotites are to be drilled, TECP urges that the structural and tectonic guidelines of the panel (JOIDES Journal, V. XVII, No. 2, June 1991, p. 58) be given serious consideration for the planning and execution of the proposed holes.

403 Proposal to drill the KT boundary in the Gulf of Mexico

TECP viewed this very interesting proposal as perhaps not in its White Paper, but perhaps it should be. The question of plume-generated eruptions vs impact as a triggering mechanism of plate motion has been raised in the case of the Indian Ocean, and the question is possibly of even more general importance. Everyone, even TECP, is interested in the nature of major extinction events. The journalistic importance of this proposal is extremely high, and the proposal could be the most important site that ODP can drill. Several questions were raised about the amount and location of the drilling sites, with the opinion expressed that perhaps one or two sites would be adequate.

Box checked: 5.

404 Late Neogene Paleoceanography from western North Atlantic

The proposal is entirely focused on late Neogene deep sea sediment sections and has no tectonically relevant themes.

Box checked: 1

405 Amazon deep-sea fan growth pattern: relationship to equatorial climate change, continental denudation, and sea-level fluctuations

This proposal is for a test of the Vail Exxon model of sea-level fluctuations, relating Amazon fan deposition to uplift of the Andes. As written there is no theme of interest to the Tectonics Panel.

Box checked: 1

406 North Atlantic climatic variability: sub-orbital, orbital, and super-orbital time scales:

This proposal for drilling a number of very shallow holes in regions of fast sedimentation rate has no theme of interest to the Tectonics Panel.

Box checked: 1.

407 Offset drilling in the North Atlantic shallow mantle at a geochemical anomaly

TECP has two areas of concern regarding this proposal--one related to developing TECP interest and the other related to the effect of tectonics on LITHP interests:

1. The tectonic interest in this proposal lies in the character of the detachment fault mentioned. We would like to see this subject developed. No cartoon or model was included to show possible orientations of this fault or its role in the exposure of the mantle rocks. TECP considers seismic data to be very important in placing drilling results into a regional context. We would also like to see a direct connection between the proposed penetration of the detachment and the solution of a significant tectonic problem, *i.e.*, just drilling through a fault doesn't mean that we will learn a great deal about tectonic processes. What would you observe or measure? We believe that TECP concerns can be addressed in this area, but they must be discussed in more detail to attract our interest.

2. Our second concern relates to the role of tectonic processes in exposing the mantle rocks. If the stratigraphic setting (in an offset ocean drilling sense) of the rocks to be drilled is not better established, we fear that the proposed sites will acquire little more than a bunch of rocks from somewhere in the mantle. The tectonics of the exposure should be better understood to provide this stratigraphic setting.

Questions or comments on our discussion can be addressed to our "watchdog" on mid-ocean ridge processes--Jeff Karson.

Box checked: 3

408 Northern Nicaragua rise drilling proposal: testing two new interpretations

This proposal is focused on the development of carbonate platforms and circulation systems in the northern Nicaraguan Rise area. Although the proposal recognizes significant tectonic and structural control on platform development, it does not attempt to address any high-priority TECP objectives. The tectonic development of the region is complex and still appears to be poorly constrained. Several TECP members were dubious about the relationship of the proposed extensional phase--suggested to have been

responsible for segmentation of the platform in the middle Miocene--to a change in the configuration of the Caribbean-North American plate boundary.

Box checked: 2.

RE-REVIEW OF PROPOSALS IN NORTH ATLANTIC PROSPECTUS

In keeping with the instructions from PCOM, TECP re-reviewed the proposals within its mandate in the North Atlantic Prospectus that had not been incorporated into the fore-going reviews.

323 Rev. The Alboran Basin and the Atlantic-Mediterranean gateway...

This proposal addresses the relationship between compressional events on land and extensional "collapse" in the Alboran Basin. They present great onshore data, involving timing and shortening. There is a great deal more data being collected now, including MCS, heat flow, seabeam, Gloria, paleomagnetism. The proposal would benefit greatly with being combined with 399. In addition the proposal proponents need to address the suggestions made by TECP during the last review. For further information about TECP's reaction to this proposal, please contact Phil Symonds, TECP's watchdog on this topic,

Ranking: 4

330 Mediterranean Ridge: An accretionary prism in a collisional context.

This proposal addresses a very important issue, in that every accretionary complex on land went through a stage like this one. Thus it provides an actualistic window into a process of great importance in geologic history, not just in terms of modern oceanic processes, even though the physical properties vary from one wedge to another. The proposal still is immature, though we are aware that writing and data acquisition goes on apace. We are aware of new Russian data around Cyprus and new French data on the ridge, itself. We recommend combining of the various groups and data sets to produce an outstanding proposal. Salt is a safety problem that needs to be addressed. For further information about TECP's reaction to this proposal, please contact Phil Symonds, TECP's watchdog on this topic.

Ranking: 4.

DISCUSSION OF NORTH ATLANTIC RIFTED MARGINS DPG

N.B. During this discussion both Co-Chairs of the NARM DPG were absent from the room.

TECP commenced its discussion of the North Atlantic Prospectus by a discussion of the tectonic aspects of the proposal of the North Atlantic Rifted Margins Detailed Planning Group. There was overall consensus that the proposed legs and priority order outlined by the DPG were acceptable for discussion and ranking purposes. The panel members generally felt that the volcanic rifted margins were more well-studied than non-volcanic rifted margins. The primary interest with volcanic rifted margins seems to be history and evolution of the plume and its interaction with crustal formation processes. The dating schemes proposed for the volcanic rocks seem questionable to some panel members. Regarding the non-volcanic rifted margins, the Iberian side seems especially well prepared and ready for drilling. There is some question about the readiness of legs 2 and 4 in the

Newfoundland basin. More data seems in the offing. There was a question why there was no palinspastic reconstruction, or no attempt to construct a balanced cross-section. It may not be possible, but one should at least try.

RANKING OF NORTH ATLANTIC PROSPECTUS PROGRAMS

Procedure: Proponents of proposals were permitted to be present during voting and to vote on all but their own proposals. Eight legs were selected by consensus by TECP for ranking. Each panel member voting ranked their choices in a list, giving 8 points to their first choice, and 1 to their last. Panel members with conflicts of interest so indicated on their paper ballot. The total for each leg was tallied and then divided by the number voting. Both Co-Chairs of the NARM-DPG elected not to participate in the voting.

TECP RANKING OF NORTH ATLANTIC PROSPECTUS LEGS

RANK	PROPOSAL	SCORE
1	NARM NON-VOLCANIC FIRST LEG (IAP 4, 2, and 3A, and GAL 1)	7.4
2	NARM VOLCANIC FIRST LEG (EG 63-1 and 63-2)	6.1
3	346 Rev 2 Transform Margin (Ivory Coast-Ghana Margin)	5.7
4.	323 Rev Alboran Sea (Comas et al)	4.8
5.	403 K/t boundary, in the Gulf of Mexico, Alvarez et al /	4.0
6.	376 Layer 2/3 boundary, Verna F.Z.	3.2
7	369 Rev MARK Area	2.5
8	399 Alboran Sea (Watts)	2.3

PANEL MEMBERSHIP

The panel discussed membership questions. Three U.S. members of the Tectonics panel are coming to the end of their terms. Ordinarily a panel member rotates off after 6 meetings, but the JOIDES Office has expressed the desire to regularize terms to end with the calendar year. U. S. Panel members who have completed their fifth meeting with this meeting are Kim Klitgord, Mike Purdy, and Dale Sawyer. Klitgord has expressed a desire to be replaced, and he has missed the last two meetings. On the other hand, Purdy and Sawyer have actively participated in all meetings, and are mainstays in our rifted margin contingent. Given the fact that the focus of ODP is moving towards rifted margins in the Atlantic, TECP requests that Purdy and Sawyer stay on the Panel for a sixth meeting. They both have expressed their willingness to do so. The panel nominates the following persons as panel members:

Rifted Margins

Priority	Name
1	Charlotte Keene
2.	Chris Beaumont
3.	Mike Steckler
4.	Gerard Bond

In addition the panel feels itself deficient in the following two areas and has nominated the appropriate persons listed for membership.

Physical Mechanisms of Deformation

- | | |
|----|---------------|
| 1. | Sue Agar |
| 2. | Carol Simpson |
| 3. | Jan Tullis |

Collisional-Small Ocean Basin (Caribbean-Mediterranean) questions

- | | |
|----|---------------|
| 1. | Leigh Royden |
| 2. | Neil Lundberg |
| 3. | J. Pindell |
| 4. | Paul Mann |
| 5. | Roy Kligfield |
| 6. | John Suppe |

LETTERS OF INTENT

Vanneste: H-C Larsen commented that the Thulean Plateau is a very interesting tectonically.

Hsü Considerable discussion ensued concerning this letter. The Panel agreed that there is a need to reinforce the mechanism for encouraging potential proponents to put forward exciting new ideas for drilling. Stimulating exciting tectonics drilling objectives is one of the panels main concerns. To achieve this TECP suggests that the present "Letter of Intent" process should be strengthened and somewhat formalized. We suggest that letters of intent should be encouraged (e.g. by advertisement in JOIDES Journal, or publications with broader readership, such as EOS, GSA Today, or Terra Nova), all thematic panels should receive the letters, and the authors should receive a written response. This latter could include suggestions for additional proponents, experts to be consulted, and/or details of data sources. Encouragement from thematic panels at the critical stage may also help with funding of related site surveys, etc.

OFFSET DRILLING

TECP discussed the disappointing nature of the proposals for offset drilling. The suggestion was made that either a Detailed Planning Group be formed or that the Working Group be charged with the task of coming up with a coherent, balanced proposal for Atlantic offset drilling. This proposal should include an integration of tectonic and lithospheric themes, and it should include all the site survey and geological setting information outlined in the Offset Drilling Working Group minutes. If a DPG is formed, potential members with structural-tectonic expertise include Bob Varga, Jean M. Auzende, Brad Hacker, Perter Lonsdale, John Hildebrand, Doug Toomey, Jack Casey, Marty Kleinrock, Sue Agar.

WATCHDOG REPORTS

1. Transform Margins--Alastair Robertson

The request for proposals from the ODP office produced only two that are currently "active": 275-Rev (Gulf of California) and 386-Rev (California margin). Panel members expressed considerable interest in stimulating improved proposals in these cases, particularly to study continental-oceanic crust interaction problems, e.g. transform propagation into continental crust, modes of continental sliver detachment, i.e. terrane initiation, or fault coupling of transform/spreading ridge intersections in space in time. Concerning the California borderland, TECP wondered if safety requirements greatly

limited drilling potential. Finally TECP noted the complete absence of current proposals to study other transform settings, e.g. trench-trench transforms.

2. Plate history, sealevel change, magnetic questions-Tanya Atwater, Steve Cande

No action.

3. Young rifted margins--Dale Sawyer

No action, but see North Atlantic DPG report!

4. Old rifted margins--Hans-Christian Larsen.

The requested proposals received included ones for the Red Sea, the south Australian margin, the Antarctic margin, Bransfield Strait, and the Woodlark Basin. The Red Sea proposal is outdated and there are political problems. The Antarctic margin is heavily sedimented and the proposal is very immature. Bransfield Strait has similar problems. The South Australia margin site has real potential, as sediments are not thick. Woodlark basin is interesting because of its possible tie to ophiolites and the relationship between the continent-penetrating propagating rift and the on-land metamorphic core complex. We should encourage the proponents of the Woodlark and South Australia proposals to revise and update their proposals.

5. Mid-Oceanic Ridges--Jeff Karson

The Offset Drilling Working Group is reviewing all the appropriate proposals. Some areas need proposals. Some proposals need work. Stay tuned.

6. Marginal Basins--Yujiro Ogawa.

Convergent margins were the subject of several recent legs (125, 126, 127, 128). There are few outstanding proposals. With regard to future planning, little is known about back arc or forearc settings. Need deeper holes, coherent cross-sections, oriented cores to get at dynamics of system.

7. Convergent margins--Casey Moore.

There is concern about fluid measurements on the Cascadia leg. The CoChiefs are writing a response to the concerns in the prospectus. Barbados will come in again. Also Peru.

8. Collisional margins--Phil Symonds

There are eight active proposals--seven in the Mediterranean and one on the north Australian margin. The Mediterranean proposals include accretionary prism, back arc basin (Tyrrhenian Sea), and extensional basin (Alboran Sea) problems. We need to encourage proponents carefully to address exactly what drilling will do to resolve these problems. The north Australian margin is a good possibility for the future. It is probably the only place in the world where one can study an incipient foreland basin by ODP drilling. It will provide information on craton deformation in a convergent-collisional system. The foredeeps and basins produced by this deformation are an important class of basin, and they should be a part of the TECP white paper..

9. Stress and mid-plate deformation--Mark Zoback

There is a need for routine deployment of the borehole televiewer to get breakout information for stress determination. Probably most holes are not deep enough for meaningful measurements. The best is hole 504B, which surprisingly is in a highly compressive stress field.

The panel empowered the watchdogs to communicate on behalf of the panel to the various proponents of the promising proposals or areas and encourage them to update or improve their proposals. A model letter is as follows:

Dear _____

The Tectonics Panel of the Ocean Drilling Project has, in the course of its deliberations, reviewed your proposal for drilling in _____. The Panel is trying to encourage the preparation and submission of outstanding proposals in areas of its high priority themes. We believe that a well-formulated, mature proposal attacking the major questions in this region would address our high-priority theme of _____.

You should understand that the Tectonics Panel only makes recommendations to the Planning Committee, which schedules drilling. The process is very competitive, but we see real potential for eventual drilling in your area and would like to see it developed further. The following specific suggestions are intended to assist you in this process:

- 1.
 - 2.
 - 3.
- (etc.)

Sincerely yours,

TECP Watchdog for _____.

The Panel also decided to invite the proponents of proposals ranked 4 to communicate with the appropriate watchdog.

NEXT MEETING

Las Vegas (?) Nevada, after a 2-3 day field trip to look at continental rifting and detachment faulting. Tanya Atwater to host. Tentative date March 19-23, 1992