

DRAFT MINUTES

SEDIMENTS AND OCEAN HISTORY PANEL

Ocean Research Institute  
University of Tokyo  
August 31, September 1 and 2, 1987

Members Present:

A. Droxler (Rice U.)	P. Meyers (U. of Michigan)
P. Frohlich (L-DGO)	W. Normark (USGS)
R. Garrison (UCSC)	T. Saito (Yamagata, Japan)
M. Goldhaber (USGS)	A. Schaaf (GIS, France)
D. Kent (L-DGO)	N. Shackleton (Cambridge, England)
L. Mayer (Dalhousie, Chairman)	I. Premoli Silva (Milan, Italy)
	R. Stein (Giessen, FRG)

In Attendance:

P. Ciesielski (SOP)	V. von Rad (PCOM)
J. Ingle (WPAC)	C. Sancetta (CEPAC)
H. Okada (ARP)	A. Taira (PCOM)

Absent:

W. Berger (SIO)  
R. Embley (USGS)  
R. Sarg (Exxon)

1. Opening Remarks and Approval of Previous Minutes:

- 1.1 The meeting began at 8:45 with introduction of new members and welcome from Japanese ODP office.
- 1.2 The absence of a TAMU representative was noted with dismay, especially considering the upcoming discussion of the TAMU-proposed sediment classification scheme.
- 1.3 The minutes of 9 - 11 March meeting were accepted.

2. PCOM Report: (von Rad)

- 2.1 Brief report on Formation Microscanner was presented. SOHP comments: The tool is potentially extremely useful particularly in delta/deep-sea fan environments and for black shale studies. Questions raised included:

1. What is resolution on heaving ship?
2. How well can true subbottom depth be determined?
3. Appears to only work in indurated sediments which excludes important parts of the section
4. What are the costs associated with processing?

The SOHP is enthusiastic about the potential of the Formation Microscanner but requires further information on it.

- 2.2 Indian Ocean program reviewed - of note to SOHP was revised Exmouth/Argo program (see Indian Ocean discussion)
- 2.3 WPAC - first year finalized; PCOM questions to SOHP regarding Banda, Nankai and N.E. Australian Margin raised (see WPAC discussion)
- 2.4 CEPAC: PCOM requests that SOHP rank six top-priority programs within CEPAC prospectus (see CEPAC discussion)
- 2.5 PCOM directives re: new panel structure presented
- 2.6 Publication policy was discussed:

The SOHP endorsed the recommendations of the IHP as presented in the minutes of their 3 - 6 August meeting.

It was brought to the attention of the SOHP that samples for the paleontological reference collection have stopped coming to the Japanese center. We request that the IHP and TAMU look into this.

- 2.7 Prydz Bay: The Chairman presented a brief review of the events surrounding the Prydz Bay program.

The SOHP applauds PCOM's courage in deciding to retain this high-priority scientific program despite the severe budgetary constraints imposed.

### 3. Technology Issues: (in lieu of TAMU Report)

- 3.1 P. Cieselski reported that significant time was saved on Leg 114 by dropping sinker bars directly after core barrel (30 min/core).

The SOHP urges that TAMU adopt this technique as routine procedure or justify why it cannot.

- 3.2 Navidrill still has problems.

The SOHP emphasizes that the ability to recover material in alternating lithologies is critical for the Kerguelan program and urges that every effort be made to perfect this technique.

- 3.3 Severe problems with magnetized core barrels and the core orienting device were encountered on Leg 115.

The magnetic signal provides one of our most critical stratigraphic tools. The SOHP has repeatedly, and continues to, urge TAMU to resolve problems associated with acquiring a reliable magnetic record.

- 3.4 Our ESF representative reported that ESF scientists have been frustrated by the rigidity of the shipboard sampling policy and poor conditions in the paleontology lab. The SOHP has continually urged TAMU to adopt a flexible sampling policy and encourages offended scientists to document their complaints and forward them to our Panel and to TAMU.

4. Sediment Classification Scheme:

Having finally received the requested input, the SOHP hoped to conclude discussion of the sediment classification scheme. Unfortunately, in the absence of a TAMU representative, the discussion was rather one-sided. As stated in our detailed comments on the scheme (SOHP minutes of 20, 21 October meeting, Appendix A), the Panel applauds the development of this comprehensive yet reasonable approach. TAMU has responded to the 10 points raised by SOHP and the Panel accepts their responses with the following exceptions:

1. Replace the term "neritic" with "shallow water carbonate"
2. Add the terms "chert" and "limestone"
3. Replace "terrigenous" with "siliciclastic"
4. Replace "marly" with "mixed"

Without a TAMU representative, a "final negotiated resolution" was impossible. The chairman will report these results to TAMU and if they cannot resolve the differences, a conference call between appropriate TAMU and SOHP representatives will be established.

5. Atlantic Regional Panel Report: (Okada, Meyers)

Five workshops have been proposed for the next two years.

6. Southern Ocean Panel Report: (Meyers, Ciesielski)

Ciesielski requested a strong statement from SOHP with regard to the need for drilling the S.E. Pacific. The Panel is sympathetic with need for work in this region, but in the absence of any proposals has very little to work with.

7. Indian Ocean Panel Report: (von Rad, Droxler)

Exmouth Plateau (Leg 122): The Mutter and Larson proposal to reposition Site EP2 to EP12 was reviewed. While the SOHP is intrigued with the question of examining the differences between thin-skinned, detachment style deformation and thick-skinned block rotations, we prefer to defer discussion of the relative merits of the crustal objectives of the Mutter, Larson proposal to the Tectonics and Lithosphere Panels.

From a SOHP standpoint, we are very supportive of the proposed change. EP12 provides the opportunity to examine several sites with different tectonic settings, but with the same depositional/sea level history and therefore presents the opportunity to sort out the roles of sea level and tectonism in sequence development. EP12 also serves as a correlative site to EP7, our highest priority site in the area, as well as forming a cross-plateau transect with EP6 and EP7.

The proponents have revised their drilling-time estimates and presented a new proposed prospectus for Leg 122 (von Rad memo of 18 August).

The SOHP strongly endorses the program proposed by the Leg 122 proponents. We differ only in that we rank Site 10A of higher priority than Site 12. Site 10A is ranked above 12 because it provides the best opportunity to sample Triassic pre- and syn-rift sediments and the break-up unconformity. We urge that all four sites EP7, EP12, EP10A, and EP6 be drilled and that TAMU explore the feasibility of using Port Hedland as a port stop and thus save significant transit time.

The SOHP would like to complement the Exmouth Plateau proponents for their careful documentation of their program and for their sincere efforts to produce a manageable leg that will meet many of our primary objectives.

Argo Abyssal Plain (Leg 123): SOHP supports PCOM's recommendation for Leg 123 to consist of AAPIB and EP9. If basement drilling at AAPIB is unsuccessful, we urge that the time be directed toward AAP2.

8. Western Pacific Panel: (J. Ingle)

N.B. The WPAC third prospectus did not include priorities from our March 1987 meeting. These are:

1. N.E. Australian Margin
2. Japan Sea
3. South China Sea (Basin)
4. Sulu Sea
5. South China Sea Margin
6. Bonin - Site 6

J. Ingle, on behalf of WPAC, asked SOHP to reconsider the S. China Sea Margin Transect proposal pointing out that the S. China Sea Site adopted in the PCOM first year program was a basin site. The SOHP is supportive of the S. China Sea Margin Transect. In conjunction with the basin sites, this program could provide a complete sedimentary history of the basin (the deep basin sites only sample post-Oligocene). In addition, the transect should provide insight into intermediate water mass history and sea level fluctuations on a relatively young passive margin (see minutes of March 9, 10, 11 SOHP meeting for detailed discussion).

After discussing the program, the SOHP voted unanimously to leave priorities for WPAC drilling as listed above. The Panel emphasizes that these six programs are ranked above numerous other WPAC programs and thus all address first priority SOHP objectives.

Banda-Sulu-South China Sea Basins:

Noting PCOM's directive to TECT and LITH Panels to consider single leg program for this transect, the SOHP expressed concern over the potential loss of paleoceanographic objectives with the cut back of the program. The SOHP viewed this transect as a potential to evaluate the oceanic response of a set of basins with a spectrum of tectonic environments and is concerned that one site in each basin may not be enough to define critical parameters. If only one site is possible in each basin, the SOHP recommends the following sites.

Sulu Sea: two sites preferred here (margin and basin) to evaluate sill control. If only one site possible SOHP priority is Sulu 4 in order to evaluate history of anoxic waters.

Banda Sea: SOHP priority B1 (thicker section)

South China Sea Basin: SOHP priority S5 (thicker section)

### Nankai:

The SOHP has been asked to examine sites along the Nankai Transect for a possible geohydrology program.

The SOHP was extremely concerned by this directive. As far as we know there is no proposal in the system to do this work. If there is, the SOHP has not received it. SOHP has received no proposals for the Nankai area (they have been directed to other panels). This appears to be quite a turnaround by PCOM. On the one hand, we are constantly told that we can only respond to proposals, and now we are asked to comment on a program for which we've received no information.

The SOHP defers discussion of this program until we receive a proposal or the appropriate background material.

The directive brought up the more general question of the SOHP's attitude toward problems of hydrogeology. Inasmuch as it does loosely appear to fall within our mandate, the SOHP will seek opportunities to incorporate geohydrology objectives into legs and sites. Recent Legs along plate margins have discovered complex patterns of pore fluid movement which appear to be of fundamental significance to tectonism, diagenesis and global chemical fluxes. Accordingly, we urge strongly that special consideration be given, in planning and staffing future legs (such as Nankai I), to exploiting these exciting geohydrological developments. This should include provision of adequate time and equipment for appropriate in situ measurements and sampling (e.g. temperature, fluids, gases) as well as selection of scientific staff with requisite geochemical skills; critical also is the allotment of sufficient technical help (technicians) for shipboard measurements.

We are concerned, however, that the SOHP has limited expertise in this field and feel that the science would be better addressed within the framework of a separate geochemistry working group.

With regard to the Nankai area, the Panel wondered if the Oregon margin might not be a better place to address these problems.

### N.E. Australian Margin:

The chairman related the proponent's (Davies) strong concern over the comments of the Site Survey Panel re the N.E. Australian margin program. The problem seemed to stem from a communication lapse (the Site Survey Panel did not know that detailed site surveys were forthcoming) and appears to be resolved.

PCOM's concerns over this program were related to the SOHP. The SOHP continues to consider the N.E. Australian Margin program as its highest priority program in WPAC. In light of PCOM's concerns, the SOHP will issue a special document dedicated to N.E. Australian Margin drilling.

Mississippi Valley Type Mineralization: (MVT)

The SOHP (particularly the Chairman) has received considerable input with regard to our previous comments about the MVT program. We discussed the new proposal for this work in great detail and conclude that while the host environment of the MVT ore deposits and that of the N.E. Australian Margin are indeed similar, the lack of a hydrostatic or tectonic mechanism to drive mineralized fluids through the system weakens the analogy to the point that we cannot argue for sites in addition to those designed to address our primary N.E. Australian Margin objectives. We do, however, strongly support the notion of evaluating the pre-mineralization host environment and urge that the N.E. Australian Margin program be designed to accommodate the geochemical and diagenetic measurements at the primary sites (N.E. Australian 1 and N.E. Australian 12).

The detailed rationale for this is presented in Appendix B.

SOHP recommendation: (12 for, 1 abstain)

1. MVT proposal does not provide sufficient justification for additional N.E. Australian Margin sites.
2. SOHP strongly encourages accommodation of MVT proposal objectives at existing N.E. Australian sites.

9. CEPAC: (Sancetta)

At our previous (March '87) meeting in Menlo Park, the SOHP devoted an entire day to CEPAC discussions. We began with a presentation of the CEPAC preliminary prospectus, noted gaps and then used these discussions to develop focused, CEPAC-oriented themes. Based on these discussions, the SOHP developed the following prioritized themes to guide CEPAC planning.

1. Pacific Neogene Paleoenvironment:  
High resolution surface and bottom water Neogene history of the Pacific and its relationship to paleoclimate, sea level, and tectonic events.  
Example programs: Eq Pacific Paleoenvironments (221E);  
O.J. Depth Transect (142E)

2. Mesozoic-Paleogene Pacific Paleoceanography:  
Evolution of late Mesozoic through Paleogene paleoclimates in high and low latitudes.  
Example programs: Souder Ridge-Unmak Plateau (195E, 182E); Atolls (some N. Pacific Gyre sites)
3. Old Pacific Crust:  
A look at Cretaceous open ocean.  
Example program: Mariana/Nauru Basin (261E)
4. Anoxic Events:  
Time stratigraphy, distribution and significance of oceanic carbon in low latitude open ocean settings. Correlation with other Cretaceous anoxic events, role of black shales in global carbon cycles; importance of carbon preservation vs productivity; effect of volcanism and role of bathymetry and climate in developing upwelling.  
Example program: Shatsky Rise (253E)
5. Atolls and Guyots:  
Drowning history, sea level and subsidence curves; continuous pre-Neogene paleoclimatic record from low latitudes; early Cretaceous to Recent shallow water biota; diagenesis as function of sea level history and volcanic episodicity.  
Example program: (Ogasawara (260D), Marshalls, Pacific Guyots, 202E, 203E)
6. Fans and Sedimentary Processes:  
Modern analogs to ancient deposits; test models for fan development; relationship of turbidite deposition to tectonic and sea level history.  
Example programs: Navy Fan (250E), Zodiak Fan (241E), Monterey Fan

The rationale for this ranking can be found in the discussions of individual programs. The SOHP emphasizes that these are its highest ranked themes for CEPAC drilling and that we would like to see each of these issues addressed in the Pacific. We are very concerned about the time constraints placed on the Pacific program and ask PCOM to seriously consider the time allotted to Pacific drilling.

Detailed discussions of the individual programs mentioned as examples above can be found in the CEPAC section of our March minutes (Appendix A).



C. Sancetta, CEPAC liaison (for Bill Sliter), presented the most recent CEPAC prospectus consisting of ten programs, many of which incorporate the SOHP primary themes. The most glaring exception is the Equatorial Pacific Paleoenvironments, but CEPAC will be reconsidering this program at their next meeting.

Given the most recent PCOM directive regarding new guidelines for the planning and proposal review process, and given the fact that a number of new proposals have come in since our last meeting, the SOHP decided to individually review each proposal that has been submitted to the panel, evaluate how well they fit into our previously established themes, and then use this discussion to examine our themes and see if they need amending.

As of our Tokyo meeting, the SOHP had received 33 CEPAC proposals.

At our March meeting, we reviewed the following proposals: 142, 182, 195, 199, 202, 203, 221, 222, 247, 250, 260, 257 (see Appendix A for specific comments). These were briefly discussed in Tokyo and attention then turned to new proposals.

1. Meiji Tongue and Detroit Seamount (259/E):
  - history of deep temperature
  - locale of deep water formation
  - ice-rafting history
  - deep current history
  - high-latitude

Extremely important to SOHP in that it provides one of the best chances to recover a carbonate-rich sequence from the N. Pacific SOHP Theme 1: Only two sites proposed--can be added to N. Pacific Gyre program.

2. Geisha Seamounts (280E)
  - ages of seamounts along pre-Emperor hotspot path

Only minor SOHP interest because most seamounts have less than 100 m sediment. Occasional opportunities. Some overlap with Winterer guyots proposal (203/E), but Winterer program needs wide geographic separation to address global sea level questions.

3. Deep drilling in the M-Series, West Pacific (287/E)
  - two sites to sample oldest Pacific crust and extend M sequence to about M-38
  - age and nature of mid-Cretaceous volcanic crust
  - age and paleoenvironment of Jurassic - 8 - Cretaceous sediment

With discouraging results of Nauru Basin site surveys, this proposal may represent the only chance to sample the open ocean record of the Cretaceous. As with the Nauru Basin proposal (262/E), this program depends on the ability of site surveys to demonstrate "windows" through the volcanic event and a drill string capable of withstanding the severe conditions imposed by the program. The SOHP will consider this program in the place of 262/E as its candidate for Old Pacific Crust drilling, a very high priority.

4. Queen Charlotte Transform Fault (256/E)
  - tectonic history and structure of very obliquely convergent margin

Proposal does not discuss SOHP considerations though there is some possibility of recovering a pre-Miocene sea level history through examination of turbidite history, but this is difficult to do. In general, little SOHP interest.

5. Hawaiian Hotspot (282/E)
  - date age of Hawaiian Ridge and get accurate estimate of Pacific Plate motion

SOHP had trouble with concept of "oceanic front" created by Hawaiian Swell--is there stratigraphic or physical oceanographic evidence for this? Also, the presence of "abyssal plain" fossiliferous clay--brown clay at the southwestern foot of Hawaiian Ridge needs further documentation. Finally, there needs to be better documentation of sediment column at proposed sites; the moat has been locus of much mass wasting.

6. Escanaba Trough (Gorda Ridge) (284/E; 224/E)
  - volcanic and geochemical processes in sediment dominated spreading center

Questions of diagenesis and mineral alteration are of interest to SOHP. Sediments in trough may have sea level signal (alternations between pelagic and turbidites) but will be difficult to separate from climatic signal.

7. Gulf of California (275/E)

The panel has taken proposal 275/E to supersede 257/E.

- early rifting in Manzanillo Rift
- geochemical studies in Farallon Basin
- hydrothermal systems in Guaymas Basin
- Neogene paleoceanography and depositional history

This is an unwieldy proposal with 33 proponents, 27 sites, and over 11 km of proposed drilling. The mixed objectives make it very difficult for a single panel to review. Of particular interest to SOHP are the five sites proposed for paleoceanography. These sites should provide a high-resolution Quaternary paleoclimate signal though the need for such studies was questioned until Leg 64 work is completed. Also of interest are studies of diagenesis and metallogenesis though these studies are poorly defined and require high temperature drilling. SOHP potentially has strong interest in a Gulf of California program, but this proposal must be broken down into realistic manageable components.

8. California Current Transect (271/E)
- history of California current (timing of initiation, spatial and temporal fluctuations in strength, and seasonality effects)
  - biostratigraphic, magnetostratigraphic and tephrostratigraphic reference sections
  - high-resolution climatic cycles
  - nature and timing of deep-sea unconformities

Scope of proposal is somewhat regional but objectives are extremely important in terms of global Neogene paleoenvironments theme. Not all sites critical, will be difficult to recover carbonate in some sites. Examination of onset of El-Nino is potentially very exciting.

9. Central California Coast (Monterey Fan) (212/E)
- history of Monterey Fan
  - paleo trench location and history
  - history of Salinian Block
  - change from subduction to transform motion

Of limited interest to SOHP. Proposal very immature. CEPAC representative reports proposal withdrawn.

10. California Transform Margin (245/E)
- basement composition of suspect terranes
  - age and inception of strike-slip faulting
  - sedimentological and tectonic aspects of deep-sea fans

Also of limited SOHP interest. Like Queen Charlotte Transform proposal, a difficult paleoceanographic problem to solve. Potential SOHP interest in diagenesis of diatomaceous sequences and unconformity dating but of more regional interest.

11. N. Gulf of Alaska (236/E)  
- origin and movement of allochthonous terranes  
- processes occurring at subduction zone

Well-documented proposal that is not directed towards SOHP interests but potentially important to SOHP if Souder Ridge sites are not possible. N. Gulf of Alaska sites present possibility of recovering a high-latitude paleoclimatic reference section. Also, possible diagenesis and pore water studies in subducted sediments.

12. Oregon Accretionary Complex (233/E)  
- delineation and quantification of fluid migration processes within an accretionary complex

Well-documented proposal with many tectonic objectives but a number of diagenetic and hydrogeologic objectives that are of interest to SOHP. Logging and in situ pore water sampling will be critical for this program. Of particular interest is diagenesis of authogenic carbonates. The SOHP wonders if these sites are not more appropriate for hydrogeology studies than Nankai.

13. Aleutian Subaerial Pyroclastic Flows (269/E)  
- drill pyroclastic flows within 50 km of Aleutian Calderas to examine effects of submarine environment or physical characteristics of flow.

Very narrow focus and apparently inappropriate use of drillship. Could be studied with vibracoring and subaerially in recent uplifted deposits.

14. Navy Fan (250/E)  
- evaluate applicability of commonly-used sedimentation models based on ancient turbidite systems to modern continental margin environments.  
- effects of sea level changes on supply of sediment to Fan  
- determine co-eval lithofacies associated with sub-environments of deposition (e.g. valley, overbank, lobe, etc.)  
- late Pleistocene stratigraphy of S. Clemente Basin to provide constraints on tectonic and paleoceanographic history of borderland.

Fan drilling has been the subject of numerous discussions at the SOHP (see previous minutes). While some fan drilling addresses strictly regional problems, a carefully selected site and planned program can address questions important to SOHP global themes, in

particular the history of sea level and its role in generating continent margin and deep sea sedimentary sequences. Navy Fan, because it is young (hence thin deposits) somewhat isolated (thus relatively higher input of biogenic components) and closely analagous to many turbidite sequences preserved in the geologic record makes it the best candidate for fan drilling.

Having discussed or reviewed all proposals, the SOHP ranked these programs based on their relevance to existing themes or their potential relevance to themes that we have not yet addressed but should.

Thirty proposals were presented; the Escanaba Trough proposals (224 and 284), the Old Pacific proposals (261 and 285), and the Gulf of California proposals (257/275) were each treated as one program. Each member was given 15 votes of equal value and a vote taken in order to eliminate those proposals of limited interest to SOHP themes.

Using a cutoff value of eight votes, seventeen proposals were eliminated (212, 224, 225, 229, 233, 237, 241, 245, 247, 249, 256, 261, 269, 236, 280, 282, 284).

Completing this exercise and now having a more manageable number of proposals to deal with, the SOHP re-examined its previously established Pacific themes to see how the remaining proposals fit within them and what revisions, if any, were necessary.

Within the framework of each theme, the proposals were ranked with respect to their relative merits and relevance to that theme:

(1) Theme: Neogene Paleoenvironment

Relevant Proposals:

Rank

221/E	Eq. Pacific Paleoenvironments	1
142/E	Ontong Java Transect	1
195/E	Bering Sea/Umnak	3
271/E	California Current Transect	4
199, 259/E	North Pacific Gyre & Meiji Drift	5
257, 275/E	Gulf of California	5

(2) Theme: Mesozoic Paleocceanography (2)

Relevant Proposals:

		Rank
202, 203, 260	Atolls & Guyots (only those parts of each proposal dealing with sediment caps)	1
182, 195	Bering Sea	2
222	Ontong Java History	3
199	N. Pacific Gyre	3

(3) Theme: Sea Level: Atolls and Guyots (SLAG)

Relevant Proposals:

		Rank
202	Marshall drowned atolls	1
260	Ogawawara Plateau	2
203	Pacific Guyots	3

(4) Theme: Anoxic Events

Relevant Proposals:

		Rank
253	Shatsky Rise	1
275/257	Gulf of California	2
182	Bering Sea	3

(5) Theme: Old Pacific Crust

Relevant Proposals:

		Rank
285	Jurassic Quiet Zone (replacing 261)	1

(6) Theme: Metalogenesis and Diagenesis

Relevant Proposals:

		Rank
233	Oregon Accretionary Margin	1
284/224	Escanaba Trough	2
275/257	Gulf of California	3

(7) Theme: Fans and Sedimentary Processes

Relevant Proposals:

		Rank
250	Navy Fan	1
271	California Current	2
275	Gulf of California	3

The interest in the metallogenesis and diagenetic aspects of the Gulf of California proposal led to the discussion of the SOHP's attitude toward these issues. Once again we concluded that we would like to see a separate working group dealing with geochemical problems, but in the absence of such a group we cannot overlook these topics and include a seventh theme.

Each of these themes represents problems of key importance to the SOHP, and we would like to see all of them addressed in the course of Pacific Drilling. While we realize that this may not be possible, we believe that at this point in the CEPAC planning process, the themes we have presented along with the highest ranked proposals associated with them make up a viable starting point for CEPAC planning. Despite the large number of individual proposals represented in this list, logistical constraints, lack of adequate documentation, and the combination of proposals into logical packages will all serve to reduce the number of legs to a manageable level.

In forthcoming meetings SOHP, along with CEPAC will begin to select the highest priority aspects of the thematically-relevant proposals and begin to establish viable drilling packages.

10. Next meeting: 7, 8, 9 March in Houston, Texas.  
André Droxler, Rice University, Host.

Liaisons for upcoming meetings:

André Schaaf will go to CEPAC meeting in Paris.  
Phil Meyers will go to SOP meeting in Ohio.  
Isabella Premoli Silva will go to IOP meeting in Rome.

11. SOHP Discussion of ODP Planning Process:

We have seen on the SOHP over the past few years, an evolution of thought about the effectiveness of the present planning structure, beginning with total dissatisfaction in late 1985 (as evidenced by the Panel's unanimous endorsement of the Arthur/Leinen memo) to a position of general acceptance but far from enthusiastic support for the present scheme. Our feelings of frustration (that we were just 'spinning wheels') have been replaced (since the first PANCHM meeting and PCOM's guidelines with regard to planning flow and liaisons) with the uneasy feeling that the system appears to be working now, but can it continue to do so?

We believe that the fundamental problem facing the planning process has been the lack of a clear cut hierarchy between

the thematic and regional panels. It may sound glib coming from a thematic panel, but there can be no question that drilling must be thematically driven. Both COSOD I and II, in defining the fundamental questions to be addressed by scientific ocean drilling, have specified problems that are process or theme oriented rather than regional in nature. Once thematic objectives are defined, the specifics of site location must be addressed by the regional experts, but this must be done within the framework of the thematic objectives. In creating a non-hierarchical system, PCOM has generated a planning process that at its worst is a competitive free-for-all between regional and thematic objectives (with PCOM as the arbitrator) and, at its best, approaches the hierarchical system that we are requesting. We have seen that the system can work well, but only when everyone is reasonable and the liaisons are excellent. We are too cynical to expect that this will always be the case and would much rather see PCOM formalize a planning process that ensures a thematically driven program.

We believe that the role of the thematic panels should be to develop long-term, global (if necessary--most of SOHP's goals are) programs in response to meetings like COSOD I and II. These thematic aims should be debated and hopefully approved by PCOM and then become the basis for long-term logistical planning. SOHP has attempted this in the past with projects like the deep tests or the paleoupwelling program which called for a series of globally distributed sites, but the thematic ramifications of such programs and particularly the importance of 'the package' in terms of addressing the objectives seemed to never filter through the system. If such themes were PCOM directives, we believe that they would.

This call for formal recognition of major themes is not an effort to divert from a proposal-driven program. If ODP is to remain an open organization, we must always be receptive and responsive to proposals from the community. What we seek, is a compromise between a proposal-driven program and the coherent, long-term planning that can be achieved with a limited number of major themes. Perhaps this compromise could be called a 'proposal-responsive' system in which we operate under major thematic objectives (developed at forums like COSOD other workshops) and respond to individual proposals.

The mandate of the SOHP: We have long considered our mandate to be too broad and have supported several proposals for partitioning our duties. One possibility is to establish a series of working groups that are watchdogs for particular subdisciplines (i.e. physical properties, organic chemistry, etc.). These working groups would review all drilling prospectuses and evaluate the specific needs of particular legs for their subdiscipline. These working



groups may also want to solicit or submit specific proposals for areas of critical interest.

We are also concerned with the recent change to two meetings per year coupled with a rotation of one-third of the membership off each year. This has led to severe problems of continuity and much wasted time and duplicated effort (we have at least three new members every other meeting). Therefore, we ask PCOM in considering a new planning structure to attempt to design a system that provides for some long-term stability.

## APPENDIX A

### 9.3 · CEPAC:

The third day of the SOHP meeting was devoted entirely to discussions of CEPAC objectives and priorities. The discussion began with a review of SOHP's previously (and hastily) established themes for CEPAC drilling:

- 1 -PALEOSECS (high-to-low-latitude and depth transects)
- 2 -Old Pacific Crust
- 3 -Atolls and Guyots
- 4 -Episodicity of Volcanism
- 5 -Fans and Sedimentary Processes
- 6 -Fluid Circulation (hydrothermal processes, etc.)

It was apparent that some of these themes -- especially the top priority PALEOSECS theme -- were too broad and unfocussed to provide useful direction to the CEPAC Panel. A rather free-form discussion ensued with numerous Pacific-specific problems outlined. These included:

- silica uptake and deposition in the N. Pacific
- CCD history of the N. Pacific
- Gateways: Bering Sea, Atlantic and Indian Ocean connections
- organic matter - upwelling history
- evolution of biota in Pacific and relationship to in-place high latitude fauna
- low latitude temperature and bottom water history
- Eastern boundary currents and relationship to terrestrial climate

In order to focus our discussion, Bill Sliter was asked to present the CEPAC Panel's preliminary packages and ranking. We would respond to this, note any important gaps and oversights and then use this as a guide to formulate more focussed themes.

The CEPAC preliminary prospectus consisted of:

	CEPAC Rank
1) Juan de Fuca (232 E)	3
2) N. Pacific Gyre (199E)	2
3) Pacific Guyots (203E)	1
4) Ontong Java Plateau (222E)	2
5) EPR (76E)	3
6) Bering Sea (195E)	5
7) Shatsky (253E)	2
8) Marshalls (202E)	1
9) Old Pacific (262E)	4
10) Oregon Accretionary Prism (233E)	8

11)	N P Magnetic Quiet Zone (231E)	2
12)	Ontong Java Transect (142E)	2
13)	Hawaii Moat (31E)	6
14)	Vancouver Island (237E)	0

Those of direct SOHP interest are:

- 1) N. Pacific Gyre
- 2) Ontong Java Plateau
- 3) Bering Sea
- 4) Shatsky
- 5) Marshalls
- 6) Old Pacific

Of some interest are:

- 7) Pacific Guyots
- 8) Juan de Fuca
- 9) Oregon Accretionary Prism

The programs of interest to SOHP and included on the CEPAC program were discussed:

1. N. Pacific Gyre (199E)
  - evolution of siliceous sedimentation in N. Pacific
  - relationship to Antarctic glaciation (global silica budget)
  - Cenozoic history of aeolian sedimentation
  - paleoenvironment of N. Pacific - Milankovitch cycles over Neogene interval of global cooling
  - evolution/paleobiology of subarctic gyre species

The SOHP wonders if many of these questions can be addresses in Bering Sea. In many cases, sites further North would better address objectives (i.e. Sounder Ridge). Could any of these objectives be combined with NP MQZ program?

2. O. J. Plateau (depth transect) (142E)
  - vertical oceanic gradients and their linkage to climate parameters, bottom and intermediate water properties
  - high-resolution stratigraphic records across intervals of fundamental paleoceanographic change (global hiatuses)
  - nature and role of carbonate dissolution - CO<sub>2</sub> budgets
  - nature of deep-sea seismic signal and relationship to sea level signal
  - correlation with margin transects (basin-shelf fractionation) and global network of equatorial depth transects (basin-basin fractionation)

The SOHP strongly supports this program though they would like to see the proposal better documented. This program is very complementary to Eq Pacific Paleoenvironment program (221E) - see below.

3. Bering Sea (182E, 195E)
  - one of few sites available for Cretaceous-Paleogene high northern latitude pelagic record
  - water mass exchanges with Arctic Ocean through time
  - areal extent of Cretaceous black shales
  - nature of Cretaceous-Paleogene high latitude climate
  - evolution of faunal assemblages - radiation of species

The SOHP supports these programs and has listed the Souder Ridge as one of its highest priority Deep Stratigraphic Test sites. Our only concern is uncertainty of basement ages in region.

4. Shatsky
  - anoxic history in low latitude ocean basin
  - history of productivity, upwelling, volcanism
  - paleodepth of low oxygen water masses
  - paleomag studies, spreading rates, plate evolution
  - transitional ocean (early Jurassic) - major climate change

The SOHP strongly supports this program. Problem is technical one. Must be able to drill through mixed lithologies to address objectives.

5. Marshalls and Pacific Guyots:
  - Eocene-Cretaceous (?) reefs
  - volcanic history
  - subsidence patterns and sea level history
  - why atoll vs guyot
  - plate motions

The Panel believes that atoll and guyot drilling can be extremely important to SOHP objectives, particularly in terms of establishing sea level histories, in establishing continuous paleoclimatic record (pre Neogene) from low latitude (must be pieced together), examining diagenesis as a function of sea level fluctuations, volcanic episodicity and early Cretaceous to Recent shallow water biota. To address these problems, we urge that the sites drilled be:

- continuous pelagic sequences
- above CCD
- not too deeply buried

Examples: Harrie, Sylvania, Horizon,  
Ogasawara

6. Old Pacific Crust (261E)
  - age and nature of Mid Cretaceous volcanic crust
  - age and paleoenvironment of underlying (Jurassic-E. Cretaceous) sediment
  - calibration of Mesozoic magnetic lineation correlation

This program offers the only opportunity to look at an open ocean record for the Cretaceous and thus is of extreme importance to the SOHP. The success of this program depends on site surveys that show windows through the volcanic event and a drillstring capable of withstanding severe conditions imposed by the program.

The following gaps in the CEPAC program were identified and discussed:

- 1 Equatorial Pacific Late Paleoenvironments (221E)
  - focuses on equatorial current system and relationship to thermocline
  - examines several time scales - Milankovitch cycles and Neogene events
  - addresses questions of dissolution vs erosion vs productivity and relevance to global hiatuses, Isthmus of Panama closing
  - excellent complement to Peru Margin studies and O.J. Plateau transect (deep and intermediate water story)

Strong SOHP support for this program.

- 2 Ogasawara Plateau (260D)
  - comparisons between guyot and seamount development
  - development stages of reefal communities (Jurassic? - Cretaceous)
  - diagenesis studies
  - Paleogene carbonate sequences

General support but some questions of appropriateness of sites - section is thin.

- 3 Peru Margin - B. Garrison suggested a return to Peru Margin - problems to be addressed include:
    - upwelling history - longer than thought-land evidence shows Oligocene/Eocene events
    - Milankovitch/phosphorite cycles
    - brine story - implications for diagenesis
- SOHP very enthused about Leg 112 results and not opposed to further drilling but feels that it is necessary for Leg 112 results to have

public dissemination and for land studies to develop further before more serious consideration.

4 Gulf of California (257E)

- Cenozoic sediments and diagenesis with respect to heat flows

Guaymus Basin already examined (Site 498). Regional studies are necessary before further drilling. Problem might be better examined at Juan de Fuca Ridge.

5 California Margin Transects

- history of California Current system
- timing of onset of diatom deposition
- development of seasonality
- response of current system to N. hemisphere glaciation
- hiatus development
- improved paleomag and tephrachronology

Can be combined with tectonic (248E) and Navy Fan proposals. Potentially serious problems with paleomag. General support but needs careful identification of useful sites.

6 South Pacific

- South Pacific is important in terms of high latitude paleoceanography and as comparison to N. Pacific high latitude sites. We encourage proposals especially for pre-Neogene sections (Louisville Ridge?)

7 N.E. Pacific upwelling (247E)

- high latitude reference biostratigraphic studies
- paleoceanography of California Current
- N. Pacific bottom water history
- long term hydrothermal history
- history of aeolian sediments and hemipelagic deposition
- age, composition, history of seamount chains

This program is certainly relevant to SOHP interests but needs to be better focused and developed to demonstrate feasibility of fulfilling objectives.

8 Fans and Sedimentary Processes

- find modern analogs to important ancient deposits
- test models for fan development

- relationship of turbidite deposition to tectonic and sea level history

SOHP is generally supportive of efforts to see problems of fans addressed. Some technical difficulties exist and some debate among proponents about which fan is best to drill. A careful drilling strategy must be developed.

Based on these discussions, SOHP ranked all discussed programs:

Rank	Votes	Theme
1	12	Equatorial Pacific
2	11	Bering Sea
3	10	Old Pacific
4	9	Ontong Java Plateau (Transect)
5	8	Shatsky Rise
6	7	Navy Fan
7	5	N. Pacific Gyre
8	4	Gulf of California (diagenesis)
	4	Oregon upwelling
10	3	Marshalls (atolls)
	3	California margin transect
	3	Ogasawara (seamount)
	3	Louisville Ridge (SW Pacific)
14	2	Pacific guyots
	2	Peru margin (oceanography)
16	1	Juan de Fuca (sedimented ridge)
	1	Oregon accretionary prism
	1	S. Pacific

And established a set of CEPAC-specific themes to guide future CEPAC planning (in order of priority)

1. Pacific Neogene Paleoenvironment:  
High resolution surface and bottom water Neogene history of the Pacific and its relationship to paleoclimate, sea level, and tectonic events -  
Example programs: - Eq Pacific Paleoenvironments (221E); O.J. Depth Transect (142E)
2. Mesozoic-Paleogene Pacific Paleooceanography:  
Evolution of late Mesozoic through Paleogene paleoclimates in high and low latitudes -  
Example programs: - Souder Ridge-Unmak Plateau (195E, 182E); Atolls (some N. Pacific Gyre sites)
3. Old Pacific Crust:  
A look at Cretaceous open ocean  
Example program: - Mariana/Nauru Basin (261E)

4. Anoxic events:

Time stratigraphy, distribution and significance of oceanic carbon in low latitude open ocean settings. Correlation with other Cretaceous anoxic events, role of black shales in global carbon cycles; importance of carbon preservation vs productivity; effect of volcanism and role of bathymetry and climate in developing upwelling. Example program: - Shatsky Rise (253E)

5. Atolls and Guyots:

Drowning history, sea level and subsidence curves; continuous pre-Neogene paleoclimatic record from low latitudes; early Cretaceous to Recent shallow water biota; diagenesis as function of sea level history and volcanic episodicity. Example program: - (Ogasawara (260D), Marshalls, Pacific Guyots, 202E, 203E)

6. Fans and Sedimentary Processes:

Modern analogs to ancient deposits; test models for fan development; relationship of turbidite deposition to tectonic and sea level history. Example programs: - Navy Fan (250E), Zodiak Fan (241E), Monterey Fan.

The rationale for this ranking can be found in the discussions of individual programs. The SOHP emphasizes that these are its highest ranked themes for CEPAC drilling and that we would like to see each of these issues addressed in the Pacific. We are very concerned about the time constraints placed on the Pacific program and ask PCOM to seriously consider the time allotted to Pacific drilling.



## APPENDIX B

### SOHP position in MVT drilling in N.E. Australia:

There is a reasonable geologic analogy between interpreted depositional environments of host beds of Mississippi Valley Type (MVT) Pb/Zn deposits of the southeast Missouri district and sediments of the northeast Coast of Australia. Both are characterized by fore reef, reef, and back reef carbonate facies as well as coarse clastic (potential aquifer) units. Both are adjacent to sedimentary basins which could represent the source of compaction driven ore forming fluids. There is, however, considerable reason to suspect that factors other than normal diagenetic evolution and fluid drive other than that expected from basin compaction are required to explain the origin of the Missouri MVT deposits. Recent fluid inclusion studies on regional distribution of salinity and filling temperatures in the mid-continent area, including data from N. Arkansas, Missouri, Kansas, and Oklahoma demonstrates a regional thermal event which was the cause of the precipitation of ubiquitous hydrothermal dolomite and trace sphalerite so characteristic of this area. This event heated the entire sedimentary section including late Cambrian to Pennsylvanian units to temperatures far above what they would have experienced based solely on their maximum burial depth. Much of the mid-continent region of the U.S. was bathed in warm and very saline fluids. Published calculations based on numerical modeling of regional fluid flow show that regional heating of this magnitude cannot be caused by fluids derived from compacting sedimentary basins, but instead requires heat transport only attainable in flow regimes driven by hydrostatic head differences. This constraint, coupled with the sketchy information on the timing of Pb/Zn mineralization, dating it as late Pennsylvanian or early Permian, suggests that the ores are related to continental scale tectonic events occurring at that time involving the assembling of the super continent Pangea. The measured fluid inclusion filling temperatures are consistent with this interpretation in that they increase systematically to the south towards the Arkoma Basin and Ouachita orogenic zone.

Even if local early diagenetic factors may not be ultimately responsible for MVT mineralization, early diagenesis nevertheless probably plays an important role in "host rock preparation" events such as defining porosity of potential aquifer units, and localized formation of H<sub>2</sub>S in reef units. This H<sub>2</sub>S might later act as trap for metals. Thus although we do not feel that the MVT - NE Australia analogy is sufficiently strong to resite the proposed ODP drilling which has already been designed to address a range of other geologic issues, there is strong motivation to make a concerted effort to obtain geochemical and diagenetic information relevant to MVT deposit formation on the planned holes. Before such measurements are planned, however, careful attention must be paid to the existing and planned ODP capabilities and the time associated with such measurements. It is also suggested that the Florida Escarpment may be a more suitable place for this experiment.