JOIDES PLANNING COMMITTEE MEETING
27-30 November 1989
Woods Hole, Massachusetts

AGENDA

Page Number
Salmon

Monday 27, November 1989 (9:00 AM)

Tuesday, 28 November 1989 (8:30 AM)

Wednesday, 29 November 1989 (8:30 AM)

Thursday, 30 November 1989 (8:30 AM)

Page Number
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Additional Attachments

JOIDES MEETING SCHEDULE (11/10/89)

Date	Place	Committee/Panel
16-17 November*	Palisades, NY	CEPDPG
26 November	Woods Hole, MA	Panel Chairmen
27-30 November	Woods Hole, MA	PCOM
14-16 January, 1990*	Santa Cruz, CA	SGPP
23-24 January, 1990*	College Station, TX	DMP
24-25 January, 1990	Hilo, Hawaii	USSAC
13-14 February, 1990*	US West Coast	PPSP
13-14 February, 1990*	Salt Lake City, UT	TEDCOM
1st Week March, 1990*	New Orleans, LA	LITHP
1st Week March, 1990*	New Orleans, LA	TECP
6-8 March, 1990	Washington, DC	BCOM
6-7 March, 1990*	College Station, TX	SMP
7-9 March, 1990*	College Station, TX	IHP
16 March, 1990	College Station, TX	Annual Co-Chief Mtg.
29-31 March, 1990*	Hawaii	OHP
9-11 April, 1990*	Menlo Park, CA	SSP
24-26 April, 1990	France	PCOM
30-31 May, 1990	Palisades, NY	USSAC
20-22 June, 1990	Washington, DC	EXCOM & ODP Council
7-9 August, 1990*	LaJolla, CA	PCOM
8-9 August, 1990	LaJolla, CA	USSAC
2-4 October, 1990	France	EXCOM
25 November, 1990*	Hawaii	Panel Chairmen
26-29 November, 1990*	Hawaii	PCOM
April, 1991*	Austin, TX	PCOM
August, 1991*	FRG	PCOM
ex-IOP & Co-Chiefs**		

* Tentative meeting; not yet formally requested and/or approved.

** This important meeting to be approved if and when requested.

JOIDES RESOLUTION OPERATIONS SCHEDULE

LEGS 127 - 135

		DEPARTURE		ARRIVAL			
LEG	AREA	LOCATION	DATE	LOCATION	DATE	IN PORT	DAYS AT SEA*
127	Japan Sea I	Tokyo	06/24/89	Pusan	08/21/89	08/21 - 08/25	58
128	Japan Sea II	Pusan	08/26/89	Pusan	10/16/89	10/16 - 10/17	51
	Transit & Dry Dock	Pusan	10/18/89	Singapore	10/27/89	10/27 - 11/11	09
	Transit	Singapore	11/12/89	Guam	11/22/89	11/22 - 11/23	10
129	Old Pacific Crust	Guam	11/24/89	Guam	01/19/90	01/19 - 01/23	56
130	Ontong Java	Guam	01/24/90	Guam	03/27/90	03/27 - 03/31	62
131	Nankai	Guam	04/01/90	Pusan	06/02/90	06/02 - 06/06	62
132	Engineering II	Pusan	06/07/90	Guam	08/01/90	08/01 - 08/05	55
	Transit	Guam	08/06/90	Port Moresby	08/13/90	08/13 - 08/14	07
133	N.E. Australia	Port Moresby	08/15/90	Brisbane	10/10/90	10/10 - 10/14	56?
134	Vanuatu	Brisbane	10/15/90	Suva	12/10/90	12/10 - 12/14	56?
135	Lau Basin	Suva	12/15/90	?	02/09/91	?	56?

revised 08/07/89

*Schedule subject to change pending detailed planning after Leg 131.

PCOM Annual Meeting

Woods Hole Oceanographic Institution
27-30 November 1989

Agenda Notes

0900 Monday 27 November 1989

Item A
Introduction

1. Welcome, and comments about meeting logistics (B. Tucholke).

2. Introduction of PCOM members, panel chairmen, liaisons, and guests.

Item B.
Approval of Minutes of 22-24 August 1989 Seattle Meeting.

1. The attached revised draft minutes include corrections received at the JOIDES Office through 8 November.

2. ☛ Call for additional corrections or additions; call for approval.

Item C
Approval of Agenda

1. Comments about the scheduling of the meeting and the organization of its agenda (R. Moberly).

The two main purposes for the Annual Meeting are <u>to exchange information</u> among the JOIDES panels, the different parts of the ODP organization, and the Planning Committee, and <u>to prepare the next one-year drilling plan</u>, in this case for fiscal year 1991. Two important but subordinate purposes are to discuss and decide matters related to the panel reports, and conduct routine PCOM business.

Reporters should stress the points that bear on future planning, answer questions that were asked by PCOM earlier, and raise issues that need to be resolved at this meeting. Details can be left to the panel minutes. Use of the overhead projector will help. The combined time for an oral report and its discussion should be about 30 minutes on Monday and 30 to 40 minutes on Tuesday.

a. Monday: Reports of a more general or background nature, by liaisons to PCOM, the service panels, and the technical and panel-chairmen committees.

b. Tuesday: Reports that bear more directly on FY91 planning, by the thematic panels and detailed-planning groups, and a report on the status of engineering and technical developments by the ODP subcontractors.

Because some chairmen may not stay beyond this day, PCOM will also on Tuesday consider certain issues of general concern in the JOIDES community where it will be useful to have the opinions of panel chairmen. Issues may have been identified well in advance (and are listed in **Item I**) or may have just been identified at Sunday's Panel Chairmen Meeting; some may arise during this meeting. We will try to schedule those with the broadest overall concern on Tuesday when all panel chairs and guests will still be present. Time restraints probably will force scheduling some of them later.

c. Wednesday: Preparation of the FY91 drilling plan. Continued consideration of major issues. Consideration of planning requirements for the Spring 1990 PCOM meeting. Panel chairmen and guests are urged to remain for at least the first part of this day, to be available as possible sources of information for the PCOM deliberations.

d. Thursday: Routine PCOM affairs, personnel decisions, and matters deferred from earlier in the week.

2. ☛ Call for additions to **Item I** of the Agenda; call for other additions or revisions; call for its approval.

Item D
ODP Status Reports

1. EXCOM (R. Moberly, liaison)

Results of the EXCOM meeting held 3-4 October in Amsterdam that are of interest to PCOM are summarized below:

• Conferences. PCOM's mandate calls for sponsoring and convening COSOD-type conferences at appropriate intervals. One plan had called for COSOD III in mid-1992. After discussion, EXCOM leaned toward both (a) a small series of international science-focused meetings in the summer or fall of 1991, partly retrospective ('distinguished past') and partly forward-looking ('exciting future'), with timing, venues, and organization largely decided by the country or countries for which these will be partly 'marketing exercises' for MOU renewal; and (b) COSOD III in perhaps 1993, with a focus on means of implementation of plans in the renewed program.

• Mandate changes. EXCOM accepted, and the JOI Board of Governors ratified, the changes we proposed about panel membership statements and reinstitution of working groups.

• Global geoscience initiatives. EXCOM accepted the JOI proposal (which PCOM had endorsed) of formal initiatives with international advisory bodies of large global geoscience programs. There were, however, considerable reservations about the direct contact once a year between the liaison groups and PCOM, because of the possibility of short-circuiting the JOIDES advisory panel structures. That reservation also led to the proviso that PCOM and EXCOM members shall not be members of the liaison groups.

• Budget Committee. J. Austin of PCOM was appointed to BCOM.

• Data Dissemination. PCOM is to recommend to JOI any action about dissemination of ODP data, including action concerning the group that prepared the CD-ROM of DSDP data. PCOM should take action after hearing the IHP report.

• Future Structure of PCOM. Our resolution about non-JOI membership on PCOM was passed from EXCOM to the JOI Board of Governors. Supposedly, the BOG will decide their course of action at their late winter meeting. (note: Tuesday afternoon James Baker, President of JOI, Inc., will discuss the issue of representation on PCOM for non-JOI institutions. Attached are letters received to date from persons in non-JOI institutions, in answer to our inquiry.)

• Future Structure of ODP. EXCOM will assist JOI in setting up and charging the next (third) Performance Evaluation Committee (PEC). The review is to include the broader structural aspects of the program as well as the performance of the subcontractors. EXCOM will advise JOI regarding procedures to select the post-1992 subcontractors.

• Miscellaneous. In a discussion related to performance evaluation, PCOM was cautioned that the JOIDES advisory panels must be independent; they must not become unduly influenced by organizations they are to monitor or evaluate. In a discussion of the Long Range Plan, comments were made about the Executive Summary, and the statement about a possible second vessel; JOI is to work the comments into a consensus statement. EXCOM reviewed ODP results in terms of COSOD I objectives. PCOM's motion that TAMU shall develop the capability to run the BRG's suite of logging tools at sites drilled with the DCS, led to discussion of the budgetary and time-delay implications of some of the possible methods.

2. NSF (B. Malfait, liaison)

• Resource issues and budget status

• Membership issues and status of planning for renewals

• Other information

3. JOI (T. Pyle, liaison)

• Budgetary and other current information that may affect the current 4-year FY89-92 Program, and the 1-year FY90 Program.

• Planning for the FY91 Program

• Interaction with scientific bodies for international global geoscience initiatives; mandate needed for liaison groups between JOIDES and other international groups. (see also Agenda Item **N-2**)

- Other information

(approximately 1015) Coffee Break

4. Science Operator (L. Garrison, liaison; not to include engineering and technical developments, Agenda Item **H**)

- Japan Sea legs, dry-docking, and present operations

- Operational status of FY90 drilling program: schedule, co-chiefs and other staffing, clearances, safety reviews, and related factors (preferably, Leg 132 should be deferred to Item **H**).

- Publications: schedule; anticipated costs and problems

- Personnel changes and other developments at ODP-TAMU

- Other comments

5. Wireline Logging (R. Anderson, liaison; not to include engineering and technical developments, Agenda Item **H**)

- Recent performance statistics and examples

- Developments at Lamont; other comments

☛ Before recess: Identification of action items from morning reports; take action or postpone as appropriate.

1200-1300 Lunch in the Carriage House

Item E
Annual Reports to JOIDES by its Service Panel Chairmen

1. DMP (P. Worthington)

2. IHP (T. Moore)
(Including IHP proposals about (a) Data Dissemination by CD-ROM and (b) Publications Policy, both of which may require PCOM action.)

3. PPSP (M. Ball)

4. SMP (K. Moran)
(Including comments about use of radioisotopes)

(approximately 1500) Coffee Break)

5. SSP (R. Kidd)

6. TEDCOM (C. Sparks)

Item .F
Panel Chairmen

The report of the Sunday 26 November meeting of the Panel Chairmen will be given by its *pro tem* chair, T. Moore.

☛ Before recess: Identification of action items from afternoon reports.

0830 Tuesday 28 November 1989

Item G
Annual Reports to JOIDES by its Thematic Panel Chairmen

1. LITHP (R. Batiza)

2. OHP (N. Shackleton)

(approximately 1000) Coffee break

3. SGPP (E. Suess)

4. TECP (I. Dalziel)

☛ Before recess: Identification of action items from morning reports.

1200-1300 Lunch in the Carriage House

Item H
Status of Engineering and Technical Developments

1. TAMU (B. Harding, assisted by L. Garrison and M. Storms)

• Status and forecast for engineering developments (update similar to M. Storms' 4 August 1989 report and tables)

• Status of second Engineering Leg (Leg 132)

• Transit and Engineering-operations Leg (third engineering leg, Leg 136). Projected operations at 504B and setting of guide-bases on the East Pacific Rise; additional tests.

• Preliminary comments about probable aims and time-frame of a fourth engineering leg. (FY91? FY92?)

2. LDGO (R. Jarrard)

• Status of near-term technological developments

• Slim-hole, high-temperature logging (assisted by T. Pyle, P. Worthington, and B. Harding; including initial report of CSDP-ODP meeting of 17 November)

☛ Before break: Identification of action items from early afternoon reports.

(approximately 1445) Coffee Break

Item I
Issues Related to Community Concerns

Members of the JOIDES Community have raised the following issues with the JOIDES Office. In one form or another they have also been on the mind of the PCOM Chairman, who proposes that a part of the Annual Meeting be available for their discussion, and if necessary, action be taken to solve if possible those considered by PCOM and the Panel Chairmen to be serious problems. If not a specific action now, there might be an ad hoc committee formed to report its advice at a later meeting. The proposal is that these, and whatever other general problems may arise from the Panel Chairmen's Sunday meeting, be set into some ordered list by the wishes of those assembled, and discussed in turn. Please come prepared to the meeting to suggest which ones of these or other concerns should be brought before the whole group.

1. Planning for long-range technological developments. The Long Range Plan is divided into phases, to allow engineering developments in advance of drilling. At present a major effort aimed at better core recovery is maturing with the development and testing of the diamond coring system. Another major effort is evolving towards high-temperature drilling and logging. Deep drilling is planned for later phases of ODP. LITHP wants to penetrate to the mantle; TECP and SGPP want to learn about the deep parts of accretionary prisms; OHP wants deep stratigraphic tests near the margins of continents. Who or what group will begin the task of evaluating what needs to be done, and the timetable? Should there be special working groups? Should TAMU be charged with the scheduling? If so, from what parts of JOIDES will they receive advice? Should this wait for COSOD III?

2. Weight of PCOM decisions. Can there be a mechanism to make it more difficult for PCOM to change its decisions? Or, if a problem does exist, is it because decisions are made without careful consideration of the issues? During the days of DSDP, including IPOD, more than a bare majority was needed at PCOM for a decision. Admittedly, there were some procedural problems when members had to leave a meeting early if they did not leave a proxy with someone. Should PCOM follow the example of EXCOM, which "shall reach its decisions by the affirmative vote of at least two-thirds of all members, including members from at least three non-US members"? Will this, or some other way, ensure careful consideration of issues?

3. Mix of activities of DPGs and thematic panels. Thematic panels have the best view of the thematic importance of a particular program or leg. To what extent, if at all, should thematic panels be used for detailed site selection and calculation of drilling times? A DPG might be ideally constituted to judge proposals from from other areas on the same theme. To what extent should a DPG be used to evaluate proposals?

4. Final planning (or, cramming it all into a leg). Every group or person wants to be the last one to plan or comment about a leg. Thematic panels who had no earlier interest in a leg want to add

work after a leg is accepted. Thematic panels who did have earlier interests in a leg are unhappy when a DPG reaches a compromise that is less than all of the wishes of all of the panels. DMP and BRG are unhappy when all of their logging recommendations cannot be fit into the time available. PCOM wants to send liaisons to the pre-cruise meetings to ensure that its objectives are covered. Can we be kindler and gentler? Are we missing something in communications? Or is it the nature of a multi-million dollar project to bring out so much unhappiness when one's own project is not completed to the degree one had hoped?

During the earlier phase of DSDP (based on regional panels) and in the later IPOD phase (based on thematic panels), PCOM took the advice of its panels and of its liaison to DSDP, and PCOM planned the legs (which sites, what objectives, what transit times, and so on). PCOM then nominated Co-chief Scientists to carry out what they had planned. With rare exceptions it seemed to work.

5. JOIDES closed to peer review of new ideas. We have heard the expression that greatest obstacle to a continuation of ODP is neither a shortage of funding in the various countries nor non-JOI participation in high level decision-making. Rather, some have pointed to the lack of outside peer review of proposals. The case is presented that a small community of scientists on JOIDES panels leads conferences, writes white papers, receives proposals, and judges them against the themes they established. Further, this community, by virtue of nominating their successors, perpetuate their ideas (now, indeed, panels can write their own proposals!). The allegation has been made that it is exceptionally difficult to get a fair review of new scientific ideas. A single leg is more than a $3M project, counting all parts of its planning, operations, and data interpretation. Should not there be outside reviews of such expensive proposals, especially of ones that do not fit within the top themes of panels? Should there be outside reviews of such major planning documents as the Long Range Plan, panel white papers, and the COSOD reports?

We have tried to bring in "fairness" into the decision-making process by establishing a particular process (proposals matched to published thematic objectives; proposals placed in programs; programs ranked regardless of location). Is this the proper process?

6. Publications: quality, speed, and costs. The JOIDES Office continues to receive comments from IHP, TAMU, Co-chiefs, and leg participants about publications. Different countries and different disciplines view ODP publications from different perspectives. Not all of the proposals in the IHP minutes seem to reflect the desire of the EXCOM and PCOM to speed publications and to get publications into the open literature. Co-chief scientists of two legs, who have long histories of service to JOIDES, are not pleased that cruise synthesis manuscripts are so vulnerable in the schedule. Is the Editorial Review Board a solution or part of the problem?

7. Shared advice and shared decisions. Occasionally JOIDES advice is needed before a regular PCOM meeting. In the case of ship operations and budget matters, simple and rapid procedures are in place. Requests from the ship regarding unexpected operations, changed sites or drilling and logging programs, safety, etc. go from the ship to Lou Garrison to the PCOM Chairman and, if necessary, the PPSP Chairman, who can act for JOIDES. In the case of budget matters, the 5-member BCOM can act for both PCOM and EXCOM. In many other matters, the PCOM Chairman can and does contact panel chairs and PCOM members for advice. There have been questions about how adequate these procedures are. Should there be a small subcommittee of PCOM to join on a conference call before decisions that cannot be put over until a regular PCOM meeting? If so, should it be formally established as a "management council" or "crisis committee" or whatever (size?; how constituted?), or always be on an ad hoc basis? Should there be a formal requirement to contact thematic chairs or other chairs before certain kinds of decisions? If so, what kinds?

☛ Before recess: Identification of action items from discussion; take action or postpone to **Item Q** as appropriate. Identification of any remaining issues, for which discussion and action must be postponed.

0830 Wednesday 29 November 1989

Item J
Detailed Planning Information for Easternmost Pacific Drilling.

• Presentation led by D. Rea, except by R. Detrick for program 5; assistance by thematic-panel chairs, PCOM watch dogs, and others as appropriate)

1. Cascadia Accretionary Prism
2. Chile Rise Triple Junction
3. East Pacific Rise Bare-rock Drilling
4. Eastern Equatorial Pacific Neogene Transect
5. Hydrothermal Processes at Sedimented Ridge Crests
6. Lower Crust at 504B.

(approximately 1000) Coffee Break

Item K
Program Plan for FY91

☛ To form the FY91 Science Program, PCOM will select 6 legs from the candidate 9 legs of 6 programs. One of the 6 might be an engineering leg (or set of short engineering legs).

• Cascadia, Chile, and Sedimented Ridges are possible two-leg programs. None of the three has a requirement that a second leg must follow the first. To allow evaluation of results, we were advised that a second leg of Sedimented Ridges should not be scheduled within one year of the first leg. To conserve transit and because there is no need for an evaluation period, a second leg of Chile might follow the first immediately. A second leg of Cascadia might be scheduled for any time.

• Cascadia, Chile, and Sedimented Ridges have scheduling constraints, to avoid the late fall, winter, and early spring weather of their hemispheres. EPR, Neogene, and 504B have no weather constraints.

• EPR and 504B should not be scheduled early after the engineering-operations leg to those areas, because of the possibility of failure in clearing 504B or setting guidebases, and the resultant difficulties in rescheduling and restaffing legs. For the same reason, if EPR or 504B or both are scheduled in mid- or late FY91, PCOM should consider scheduling alternatives at this time.

• The following pages show the rankings of these six programs as reported by thematic panels in their draft minutes.

• For your draft planning, here is a blank schedule:

Leg	Approx Months	Notes	Program
136	Feb-Mar 91		Engineering operations @ 504B & EPR
137	Apr-May	no SE Pac	-
138	Jun-Jul	no SE Pac	-
139	Aug-Sep	no SE Pac	-
140	Oct-Nov	no NE Pac	-
141	Dec-Jan 92	no NE Pac	-
142	Feb-Mar	no NE Pac	-

8-12 September 1989 LITHP priority rankings of CEPAC programs for 1991 drilling

2.2 LITHP Priorities for 1991 Drilling: In response to the PCOM chairman's letter of 25 May, 1988, LITHP ranked the six drilling programs from which the 1991 drilling schedule in the Pacific will be chosen. The results are:

Rank	No. of votes	LITHP Theme	Proposal	Drilling Program
1	95	layer 2/3 transition	286/E	Deepening of hole 504B (1 leg)
2	83	hydrothermal processes at sedimented ridges	232/E, 284/E 224E/Rev, 275E Rev	SR DPG Prospectus (2 legs)
3	83	hydrothermal and magmatic processes at fast, unsedimented ridges	76/E Rev, 321/E 325/E	EPR Bare rock (1 leg) (SRDPG needed for 1 meeting after 12/88 to formulate prospectus)
4	N/A	sedimented ridges (TJ-4); ophiolites (TJ-7); ridge subduction	318/E	Chile triple junction
5	N/A	(fluids and accretionary processes)	CEPAC Prospectus	Cascadia margin
6	N/A	(climate evolution)	CEPAC Prospectus	East Equatorial Pacific Neogene

Our highest priority is deepening hole 504B during 1 leg of drilling after the hole has been clear or deviated on the engineering leg (engineering Leg 3). Second and third place are a tie with sedimented ridges and EPR bore-rock drilling each receiving 83 votes. The three top-ranked thematic programs for 1991 are also among LITHP's top-ranked programs in any ocean (discussed later). Considering the present capabilities of the drill ship and on-going technological development, these three objectives can probably be achieved. LITHP strongly urges that all three programs be drilled in 1991 and 1992. For 1991, LITHP recommends 1 leg of scientific drilling each at 504, EPR and middle valley, with follow up legs in 1992.

24-26 October 1989 OHP priority rankings of CEPAC programs for 1991 drilling

In response to PCOM request, OHP strongly endorsed the Eastern Equatorial Pacific Neogene Transect program based on proposal 221/E as their highest ranked of the far Eastern Pacific programs that the panel was asked to rank (i.e. Cascadia Accretionary Prism, Chile Triple Junction, Eastern Equatorial Pacific Neogene Transect, East Pacific Rise Bare Rock Drilling, Hydrothermal Processes at Sedimented Ridge Crests, Lower Crust at 504B). NJS proposed that it would be inappropriate to prioritise among the remainder since none addresses problems within the OHP mandate. Possible co-chiefs for such a leg were discussed and their names forwarded to PCOM chairman.

19-20 July 1989 and 19-20 September 1989 SGPP priority rankings of CEPAC programs for 1991 drilling

1991 Drilling Schedule
In order to clearly communicate this panel's thematic priorities for 1991-drilling, a vote was taken after lengthy discussions on the programs from which PCOM will formulate the 1991 drilling schedule. The voting resulted in the following ranking:

1) Sedimented Ridge Crests
2) Cascadia Accretionary Prism
3) East Pacific Rise Bare Rock Drilling
4) Eastern Equatorial Pacific Neogene Transect
5) Lower Crust at Site 504B
6) Chile Triple Junction

The SGPP panel wishes to make clear that the two top rated programs (Sedimented Ridge Crest and Cascadia Accretionary Prism) were far ahead of the remaining four. All first and second place votes were cast for the two top rated programs and the numerical difference between these two was small.

Preparation for 16-17 November CEPAC/DPG Meeting

Martin Goldhaber agreed to serve as the SGPP liaison to the CEPAC/DGP meeting to present the panel's justification for highest ranking of (1) hydrothermal processes at sedimented ridges and (2) the Cascadia accretionary margin for the FY91 schedule. A document drawn from the SGPP minutes and other sources should be written to justify SGPP's highest rankings. SGPP's conception of the Cascadia drilling means the Oregon margin because fluids, sediments and hydrology are a documented and integral part of the drilling proposals. Sedimented ridges justification is from the previous meetings discussions and is in the minutes. It should also be noted in the document that, although SGPP ranked drilling EPR with a much priority than the higher two, the panel feels strongly that drilling should occur only on an hydrothermally active segment of the EPR.

26-28 September 1989 TECP priority rankings of CEPAC programs for 1991 drilling

10. After up-dates on the Chile Triple Junction (G. Westbrook) and the Cascadia margin (G. Moore, H.I.G.), TECP voted on priorities for FY 91 drilling. The result was:

	Points
Chile Tripe Junction, Leg #1	39
Cascadia Margin, Leg #1	36
Chile Triple Junction, Leg #2	30
East Pacific Rise Bare Rock	27
Sedimented Ridge Crests, Leg #1	25
Cascadia Margin, Leg #2	21
Return to Site 509B	20
Sedimented Ridge Crests, Leg #2	12
North Pacific Neogene	11

The vote was preceded by a discussion leading to a consensus that spreading ridge proposals need to have tectonic input wherever possible and that a message be conveyed to proponents of proposals in hand that they will receive more support from TECP if they address problems such as fault control of mineralization and stress in the lithosphere.

Item I, Issues Related to Community Concerns, will be continued if time permits, including identification of action items and action as appropriate.

12M-3 PM Lunch break and visit to Argo-Jason Lab

Item L
Planning Requirements for 1990 PCOM Meetings

1. Spring meeting

• Review of procedures involving PCOM, JOIDES Office, thematic panels and DPGs.

- The main purpose of the 24-26 April meeting is for PCOM to decide the general direction of the vessel for the 4-year period to spring 1994.
-Therefore by 10 April PCOM members must receive in their Agenda briefing books annotated lists by each of the four thematic panels of their current ranking of programs.
- Therefore by 3 April the JOIDES Office must receive the lists from the thematic panels.
- Therefore in winter no later than mid-March the thematic panels will have had to (a) review new as well as appropriate older proposals from any ocean, in terms of published thematic objectives and the probability of actual drilling (related to the scientific and technical maturity of a proposal, including existing or anticipated surveys, engineering developments, safety, and perhaps other factors), (b) assemble the thematically acceptable proposals into programs, (c) rank and list the programs, and (d) briefly annotate each program with its thematic objectives and other appropriate comments to guide PCOM.

- At their late winter meetings, thematic panels will also have the opportunity for panel-wide comments of the November 1989 updated CEPACDPG prospectus.

• Is this satisfactory and clear? ☛ Does PCOM want to adjust any part?

2. Summer meeting

• Agreement on procedures involving PCOM and possibly other parts of the JOIDES structure.

- One important purpose of the 7-9 August meeting is preparation for the 1990 Annual Meeting at which the FY92 drilling program will be set.

- Therefore PCOM should receive and discuss watch-dog reports, DPG reports, and other information pertaining to possible candidate programs for FY92 drilling. Presumably, programs that might be in regions visited by the ship early in its 4-year general progress would be examined most closely, but even the potentially later ones must be discussed.

- Therefore at its April meeting, as soon as PCOM sets the 4-year general direction, PCOM must assign its watch dogs for each highly ranked program likely to be a candidate in the 4-year period.

• Watch dogs: After considering carefully the purposes and dates of the various meetings it appears to the PCOM Chairman that reports of its own watch dogs are most needed at the August meeting. An exception is the set that should have been presented this morning (at this present meeting) to assist the evaluations of the candidate programs for easternmost Pacific drilling in FY91. Under routine business tomorrow, watch dogs of the former WPAC and CEPAC regions can up-date us on the status of those programs. If we are, however, pressed for time the PCOM Chairman will request that these be quite brief or even eliminated.

In the case of the April meeting it seems presumptuous to guess in advance that the weight of high-ranking programs will indeed be in the Pacific where we have watch dogs. The majority of our mature proposals are there; we have heard from our panels that many highly ranking themes can best be addressed in the Pacific; and through FY91 we will not have completed a minimum of 18 months of scientific drilling in the CEPAC region. Nevertheless, in fairness we point out that our notice to the community was that the direction of the vessel after 1991 will be based on thematically reviewed proposals from any ocean, we will not have the annotated rankings of programs by panels until April, and almost certainly we will not have assigned watchdogs to all of the high-ranked programs.

☛ Therefore the Chair recommends that April watch-dog reports be given late in the meeting, after the decisions about the 4-year general direction of the vessel.

☛ The Chair also recommends, that in April after the 4-year decisions, watch dogs be assigned to all high-ranking candidate programs not already covered. All watch dogs should be prepared to report at the August meeting.

3. Annual Meeting
• Review of procedures involving PCOM, thematic panels, and other parts of the JOIDES structure.

- One important purpose of the 26-29 November meeting is preparation of the Science Program (drilling plan) for the FY92 Program Plan.

- Therefore PCOM members must receive within early November 1990 the equivalent of a "prospectus", with several candidate programs for FY92 presented in leg form with their objectives, thematic-panel comments and rankings, and wherever possible, their specific sites, drilling and logging times, and whatever else is needed for PCOM's evaluation and decision.

The prospectus should include programs (and perhaps a candidate engineering leg) totaling about 7 to 10 legs, from which 6 will be selected for FY92. The prospectus should have received thematic-panel review and comments before the November Annual Meeting.

- Therefore PCOM (a) at this present meeting should decide how the prospectus will be prepared and what group or groups will be responsible to prepare it, and, (b) at its April meeting after knowing what the range of possible candidate programs will be, should establish and charge the group(s) to prepare it.

• Preparation of prospectus for 1990 Annual Meeting.

Some possibilities are:

- If the general direction of the ship will be only in the Pacific in the early part of the 4-year period, CEPACDPG can be asked to prepare the prospectus. The DPG will need some augmentation (or proper replacement of retiring members) for such a task.

advantages: CEPACDPG exists; most of its prospectus is already up to date.

disadvantages: CEPACDPG not be well constituted for a 1992 theme-driven program. No preparation for the eventuality that sooner or later the ship will be elsewhere (Atlantic, Western Pacific, or wherever).

- If the direction is outside or largely outside the Pacific, the CEPACDPG might be dissolved or inactivated, and an appropriate new DPG formed (perhaps with some transferred CEPAC personnel). Its title might be non-regional ("1990 DPG") or it could indicate the general direction that was selected (for example, "South Atlantic-Southern Ocean DPG").

advantage: By the proper rotation of personnel and periodic changes in title, this could become an open-ended, long-term DPG (corporate memory; efficiency, etc).

disadvantage: Difficult to have a single group of efficient size that would have the regional plus thematic expertise, and not be merely advocates of the members' own proposals. Generally difficult to assemble altruistic volunteers.

- If there are mixed kinds of detailed planning, the JOIDES Office might <u>assemble</u> a prospectus. For example, collect within one volume (a) the reports of a number of program-specific DPGs that must be established, (b) the applicable parts of any existing prospectus, (c) appropriate panel and working-group reports, (d) and single-site legs like 504B that would need little additional attention. At the minimum, there are the proposals themselves and the notations with the thematic-panel rankings.

advantages: Truly detailed planning will mainly be performed by one-time DPG meetings of the most-competent persons. The JOIDES Office can have good knowledge at all times of the status of the various parts of the prospectus.

disadvantages. Unevenness of contributions. Additional workload on JOIDES Office (but summer is the lightest time)

- Combinations of the above (CEPACDPG, other DPGs, direct thematic input, etc., assembled perhaps by a 1990 DPG or perhaps by JOIDES Office)..

advantage: Least effort

disadvantages: Lack of coordination; unevenness of contributions.

☛ As a point for discussion and action, the Chair recommends that PCOM now adopt the concept that it will, before adjournment in April, establish, fill, and charge new DPGs appropriate for those programs needing detailed planning before the Annual Meeting. PCOM will also charge the JOIDES Office to prepare a prospectus for the highly ranked programs and general direction of the vessel for the early part of the 1990-1994 period.

☛ For discussion purposes, the Chair presents but does not recommend the alternative: that PCOM now adopt the concept that it will, before adjournment in April, establish, fill, and charge a new DPG appropriate to prepare a prospectus for the highly ranked programs and general direction of the vessel for the early part of the 1990-1994 period.

(remainder of day: further continuation of **Item I**, time permitting)

0830 Thursday 30 November 1989
(Timing of coffee breaks, lunch, and wine-bibbing will be announced with regards to what work remains to be finished)

Item M
Membership on JOIDES Panels

• Exposure of nominees

- On the one hand, PCOM has asked for more information, namely a few sentences of biography, for nominees.
- On the other hand, we have tried to preserve confidentially, for example, by going into executive session (exclusion of guests) for the discussions and decisions. Nevertheless, I've heard of a few complaints.

- Therefore we will try the following method. 1. This Book will list the necessary actions but it will not list names of persons. 2. A separate set of pages will be handed out at Woods Hole to PCOM members with the nominees and vitas. Some of this may have to be completed at Woods Hole, if new nominations come in. Remember, if you on PCOM nominate someone, a brief biography is required. 3. As in the past, overhead transparencies will show the overall situation for each panel.

• LITHP

- After this year's appointments, LITHP is full and reasonably balanced, except for its impending loss of expertise in sampling and instrumentation. US member Keir Becker would rotate from LITHP at the end of 1989, but LITHP requests that he be held over through the joint LITHP-TECP meeting in early March 1990. US member John Mutter will rotate from LITHP at the end of 1990.

☛ LITHP will request an appointment with interest in instrumentation after its next meeting.

• OHP

-US member Andre Droxler and member-at-large Larry Mayer will rotate from OHP at the end of 1989. US Members Wolf Berger and Dennis Kent will rotate from OHP at the end of 1990.

☛ OHP requests appointment of a person with interests both in shallow-water carbonates and in deep-ocean seismic stratigraphy, to replace Droxler and Mayer.

☛ OHP requests appointments to address its partial weaknesses in Paleogene paleoceanography or in siliceous biostratigraphy or in both.

• SGPP

- US members Martin Goldhaber and Bill Normark will rotate from SGPP at the end of 1989, and Philip Froelich at the end of 1990. Member-at-large Noel James resigned.

☛ SGPP requests appointment of a member with expertise in seismic stratigraphy.

☛ SGPP sees the need for an ocean-crust petrologist, or person with interests in ocean-crust alteration, if this cannot be covered by liaison form LITHP.

☛ Loss of Normark and James leave weaknesses in the field of sedimentary processes.

• TECP

- Four recent replacements of 5 US members who rotated in 1988 or 1989 (or will rotate at the end of 1989), have brought this panel closer to better balance and size. There is unofficial information about an impending rotation of a non-US member.

☛ TECP requests appointment of a member with expertise in active margins or in plate kinematics or plate dynamics.

• DMP

- US Member Eddie Howell rotates from DMP at the end of 1989; a search committee is seeking a nominee from industry, preferably with a background in tool development. Otherwise, DMP is full and reasonably balanced.

• IHP

- Reasonably full and well balanced after this year's appointments.

☛ No request.

• PPSP

- Reasonably full and well balanced after this year's appointment.

☛ No request.

• SMP

☛ No request

• SSP

☛ No request.

• TEDCOM

☛ No request

• None of the panel chairpersons is due to rotate.

☛ PCOM should discuss and decide panel membership appointments, and incorporate the membership changes in a single motion.

Item N
Other Personnel Actions

1. Co-chief Scientists. Nominations for Co-chief Scientist should be given to the Science Operator for legs placed on the FY91 schedule.

2. Liaison Groups. Members should be named to represent JOIDES on liaison bodies for international global geoscience initiatives.

3. Panel Liaison. PCOM liaisons to panels should be updated if necessary. PCOM liaison to late winter meetings of thematic panels should be confirmed.

Item O.
Detailed Planning Groups and ad hoc Working Groups

• It appears to the JOIDES Office that the following detailed planning, if any, is necessary for the candidate legs for FY91. Without knowing in advance which legs will be selected for FY91, all are listed below.

1. Cascadia Accretionary Prism

- The Cascadia Program should be assigned to one of the following for detailed planning. After considerable thought and conversation with representatives of both sets of proponents, the PCOM chair recommends in the following order of priority:

First choice: a Cascadia-specific DPG, chosen from the proponents, nominees from TECP and SGPP, and appropriate others (incl. PCOM watch dog?).

Second choice: a CEPACDPG strongly augmented for this task with at least one each representative from each proposal and each interested thematic panel.

Third choice: a DPG selected from part of a broader Working Group considering Nankai, Barbados, Makran, Cascadia, and other prisms (i.e., first set up an Accretionary Prism Working Group, and after at least its initial meeting and comments by TECP and SGPP, appoint a subset of the Group as a Cascadia DPG).

- In any event, the DPG should prepare a two-leg program, whether or not both legs are in the FY91 schedule.

2. Chile Rise Triple Junction.

-It appears from the present Candé and Lewis proposal that details for one-leg and two-leg drilling campaigns are virtually complete, awaiting PCOM's ultimate selection of the number of legs.

- If PCOM schedules one leg, probably the only additional detailed planning necessary would be at a pre-cruise meeting between TAMU, the proponents if one is not a co-chief, and the PCOM liaison representing the interests of PCOM and the TECP.

- If PCOM schedules two legs, it may be possible to carry out some of the suggestions of the other thematic panels (cores for OHP in transit; better attention to fluids for SGPP and to crust for LITHP), and so either an augmented CEPACDPG, or preferably a one-time Chile-specific DPG could meet one day to set the sites and their drilling and logging times.

3. East Pacific Rise Bare-rock Drilling

- This may become complicated. First, there was the submission after the fall LITHP Meeting of an updated proposal for the EPR at 13°N, and so LITHP will have to select between that area and one at 9°40'N. Next, some group must decide how to fit the template for the EPR long-term drilling strategy to the segment that is selected. Shall that be performed by a EPR-specific DPG (perhaps with several of the members of the old working group that devised the strategy?), or by the CEPACDPG augmented for the task?

- If it is to be a EPR-specific DPG, a membership list nominated by the present and past chairs of LITHP will be presented on an overhead transparency.

4. Eastern Equatorial Pacific Neogene Transect

- If PCOM schedules this leg, probably the only additional detailed planning necessary would be at a pre-cruise meeting between TAMU, the proponents if one is not a co-chief, and the PCOM liaison representing the interests of PCOM and the OHP.

5. Hydrothermal Processes at Sedimented Ridge Crests

- If PCOM schedules the first of these two legs, and if engineering developments progress, probably the only additional detailed planning necessary would be at a pre-cruise meeting between TAMU, the proponents if one is not a co-chief, and the PCOM liaison representing the interests of PCOM and the SGPP and LITHP panels.

6. Lower Crust at 504B.

- PCOM scheduling of this leg would have to be tentative, depending on the success of the operations to clear the hole during Leg 136. If the hole is clear, probably the only additional detailed planning necessary would be at a pre-cruise meeting between TAMU, the proponents if one is not a co-chief, and the PCOM liaison representing the interests of PCOM and LITHP.

☛ Depending on the outcome of Wednesday's scheduling of FY91 legs, PCOM should establish and charge the appropriate groups for detailed planning.

☛ PCOM should designate the appropriate PCOM liaison for the pre-cruise meetings for these FY91 legs.

Item P
Future Meetings

- 24-26 April 1990; Villefranche, France; France to host.
  - Recently the French ODP Executive Council, however, recommended that the meeting be in Paris rather than in Villefranche.

- 7-9 August 1990; La Jolla, California; Scripps to host.
  - US PCOM members meet afternoon of 9 August jointly with USSAC; non-US members of PCOM welcome as guests.

- 26-29 November 1990; Hilo?, Hawaii; HIG to host.
  - Panel Chairmen will meet the preceding day.

- University of Texas at Austin has invited PCOM for its spring 1991 meeting.

- The Federal Republic of Germany has invited PCOM for its summer 1991 meeting.

☛ The chair will give pros and cons, and listen to PCOM's preferences about Hilo, Honolulu, or perhaps Maui or Kauai for the November 1990 Annual Meeting in Hawaii.

☛ J. Austin and PCOM should set dates for the Spring 1991 meeting. Normally, that should be late April, but because the JOIDES Office will be in Austin, time may not be quite so critical between the end of the thematic panel meetings and the meeting of EXCOM and the ODP Council.

☛ U. von Rad and PCOM should set dates for the summer 1991 meeting in Germany.

☛ PCOM should set the venue of its 1991 Annual Meeting.

Item Q
Other Business

- To include completion of **Item I** if necessary.

- To include action items postponed from earlier parts of the meeting.

Item R
Adjournment

JOIDES PLANNING COMMITTEE SUMMER MEETING
22-24 August 1989
University of Washington
Seattle, Washington

REVISED DRAFT MINUTES

Members:

J. Austin - University of Texas at Austin
G. Brass - University of Miami
M. Cita-Sironi - University of Milano, ESF Consortium
D. Cowan - University of Washington
R. Duncan - Oregon State University
H. Jenkyns - Oxford University, United Kingdom
M. Kastner - Scripps Institution of Oceanography
D. Hayes - Lamont-Doherty Geological Observatory (alt. for M. Langseth)
M. Leinen - University of Rhode Island
J. Malpas - Memorial University, Canada-Australia Consortium
C. Mevel - Université Pierre et Marie Curie, France (alt. for Y. Lancelot)
R. Moberly (Chairman) - Hawaii Institute of Geophysics
A. Taira - Ocean Research Institute, Japan
B. Tucholke - Woods Hole Oceanographic Institution
U. von Rad - BGR, Federal Republic of Germany
J. Watkins - Texas A&M University

Liaisons:

R. Anderson - Wireline Logging Services (ODP-LDGO)
L. Garrison - Science Operator (ODP-TAMU)
B. Malfait - National Science Foundation
T. Pyle - Joint Oceanographic Institutions, Inc.

Guests and Observers:

A. Crawford - University of Tasmania, Australia
J. Delaney - RIDGE, University of Washington
P. Fryer - Hawaii Institute of Geophysics
E. Kappel - Joint Oceanographic Institutions, Inc.
A. Meyer - Science Operator (ODP-TAMU)
M. Purdy - Woods Hole Oceanographic Institution
E. Silver - University of California at Santa Cruz
B. Taylor - Hawaii Institute of Geophysics

JOIDES Planning Office:

L. d'Ozouville - Executive Assistant and Non-US Liaison
G. Waggoner - Science Coordinator

Tuesday, 22 August 1989

793 Introduction

PCOM Chairman Ralph Moberly called the 1989 Summer Meeting of the JOIDES Planning Committee to order. Darrel Cowan welcomed everyone to the University of Washington. Cowan explained logistics including the joint PCOM/USSAC boat cruise and dinner party hosted by the College of Ocean and Fishery Science of the University of Washington. Moberly thanked Cowan for leading a wet but nevertheless enjoyable field trip to the San Juan Islands before the meeting. Moberly welcomed new PCOM members J. Austin, M. Cita-Sironi, and R. Duncan, and the alternates standing-in for this meeting, D. Hayes and C. Mevel. He also welcomed A. Crawford from the Australian ODP Secretariat and who is the Canada-Australia Consortium PCOM alternate for J. Malpas.

794 Minutes of 2-4 May 1989 Oslo PCOM Meeting

Moberly called for comments, corrections and approval of the previous minutes.

M. Cita questioned the wording and general tone of a sentence on page 4 of the minutes concerning the 4th Annual Co-Chief Scientist Review Meeting for legs 119 to 124. The wording was substantiated by L. Garrison. B. Tucholke suggested a clarification be made so that the sentence now reads "There was a concern that Co-Chiefs do not always fully understand the objectives of a leg **as defined by PCOM and JOIDES panels.**" (addition in **bold**).

PCOM Motion

PCOM approves the minutes of the 2-4 May 1989 Planning Committee meeting with amendments. (Motion Tucholke, second Leinen)
Vote: for 16; against 0; abstain 0

771 Approval of Agenda

Moberly called for additions or revisions, and then for adoption of the agenda for the meeting.

C. Mevel asked that Y. Lancelot's letter of 5 August 1989 to R. Moberly be discussed. This was placed in Item R, Other Business.

PCOM Motion

PCOM adopts the agenda for the 22-24 August 1989 Planning Committee meeting with amendments. (Motion Brass, second Leinen)
Vote: for 16; against 0; abstain 0

772 Reports By Liaisons to PCOM

Reports were presented by the ODP Liaisons to PCOM.

B. Malfait from NSF gave an update on the NSF budget. Overall the 1989 NSF budget has increased by 9.8% (Appendix A). The 1990 overall NSF request has been cut by Congress from a 14% increase to about a 8% increase. This may shrink even more. Within the Ocean Sciences Division this translates into about a 4% increase in 1990. It will probably be September to October before the budget is finalized. NSF has funded the final increment of the Geoprops probe construction to Dan Karig. Two field programs have been funded: 1) New Jersey Shelf and Slope study by Miller and Christie-Blick and 2) joint funding with MG&G of a study of the Curacao Trench in the Southern Caribbean. The 1990 ODP Program Plan has been officially submitted. NSF is still concerned with the budget and has requested additional information from the program. Al Sutherland has left the NSF Division of Ocean Sciences to be Ocean Projects Manager of the NSF Division of Polar Programs.

Malfait discussed the time frame for ODP renewal (Appendix A). There is a heavy concentration on long-range planning. The main science document is the Long-Range Science Plan which is now being modified by JOI. The last COSOD was in 1987 and a new COSOD should occur in 1993. 1989-1990 is a critical time for beginning discussions with the international partners. 1990 will be a critical year for science and budget planning. 1992 is when the formal discussion of new MOUs will begin. The National Science Board will have a presentation in October 1989.

R. Duncan asked if there were any new developments regarding participation of the USSR in ODP. Malfait said that there has been no new developments. With the confirmation of Presidential Science Advisor Allan Bromley as head of the OSTP, there could be something new in several months.

T. Pyle from JOI discussed the present status of the FY90 Program Plan. NSF has withheld its approval pending additional information on: 1) the raises in salary; 2) how much money has been spent on technological development; 3) negotiation of the fee to Texas A&M Research Foundation.

T. Pyle reviewed the JOIDES response to the Performance Evaluation Committee and the National Science Board reviews of the program. Responses have been made in the following areas:

> Reorganizing the advisory structure on a thematic basis by: 1) deleting the regional panels; 2) emphasizing thematic panels; 3) splitting SOHP thematic panel into SGPP and OHP; 4) adding SMP service panel; and 5) revising and updating mandates.
>
> Emphasizing timeliness of publications and need for thematic synthesis publications by: 1)providing funds for temporary copy editors in FY90 (SOE); 2) providing seed money for thematic publications in FY90 (SOE); and 3) adopting a new publications policy approved by PCOM emphasizing easier outside publication and faster publication of Parts A & B by revising post-cruise meeting schedule.

Criticism of JOI and the lines of communication have been addressed by: 1) providing a mandate for BCOM so that its purpose is not misunderstood; 2) clarifying the JOIDES chain-of-command; and 3) clarifying that JOI is sensitive to the international character of the program.

Coordination with other Earth Science programs has been proposed by: 1) Developing communications with the following groups: Arctic Ocean Drilling; National digital seismic networks (IRIS, POSEIDON, etc.); RIDGE, BRIDGE, FRIDGE; Global Sediment. Geol. Project (IUGS); Continental Drilling; WCRP-WOCE, JGOFS, etc. These should grow to be some sort of formal liaison. 2) Briefings of PCOM by such other programs as GSGP (partially; Miami PCOM), Arctic Ocean Drilling (Oslo PCOM); and RIDGE and Global Seismic Networks (this Seattle PCOM).

A review of ODP drilling answers the question of why there has not been more of the deeper drilling expected from COSOD I: 1) less deep drilling being proposed; 2) some objectives reached higher than expected; 3) some lithologies still causing drilling problems.

Advice on increasing "dues" has been ignored. ODP will seek more partners.

In addition, the JOI Board of Governors is considering increasing outside representation in the planning structure by proposing that 2 of 10 US members of PCOM be non-JOI representatives. Hayes asked if a decision had been made. Pyle said that the concept has been approved but not a plan. Brass asked what was broken that needed fixing. Pyle stated that the perception to PEC II was that the management level of ODP is a "closed shop". Apparently, one proposal before the JOI Board of Governors is that 2 of 10 US members of PCOM be non-JOIDES representatives. Kastner asked why 2 new members couldn't be added to the present 10. The MOUs state 10. The point was raised, that if a person is selected from outside JOIDES institutions, he or she to be effective as a planner must have had considerable experience in the JOIDES advisory structure or on board the *Challenger* or *Resolution;* therefore comments may continue about an "old boy - closed shop" system. This issue generated considerable discussion among PCOM members. Concerns were expressed about which JOIDES institutions would be left out and how the non-JOIDES members would be selected. Austin said that COSOD input gives outside direction to the program. M. Kastner suggested that PCOM members should take up this issue with their EXCOM members. M. Leinen said that a positive statement about outside participation should be made, but the negative consequences for planning should also be pointed out. M. Kastner suggested that a subcommittee prepare a resolution for PCOM approval; J. Austin, B. Tucholke, M. Kastner and G. Brass volunteered to do this. See later Minute 784.

The Long Range Planning Document has been turned over to JOI for additional work. There has been no written input from the critics. Non-US input on educational impact is needed. PCOM members had been asked and are being asked again to supply a list of what, in their opinion, have been the top ten scientific results of ODP. Some input on the benefits for industry achieved by ODP has been supplied by Ted Moore, Jim Franklin and Dave Falvey, additional information would be helpful. A brochure to accompany the LRP is also being prepared by JOI for laymen. The non-US partners may want to prepare a similar brochure to address their own particular concerns. The National Science Board will get a briefing 12 or 13 October.

Pyle gave an update on some of the other global geoscience initiatives with which ODP is attempting to form linkages. In the area of global seismology there are plans for a meeting of the joint JOI/IRIS steering committee in September in Washington. There are also plans for a joint JOI/IRIS proposal workshop for the scientific use of abandoned telephone cables sometime around January 1990. John Orcutt is currently at the IASPEI-FDSN meeting to talk about interaction with ODP. J. Delaney of the RIDGE program will be talking to PCOM at this meeting. The Global Sedimentary Geology Project has sent a favorable response. Continental Drilling presents several opportunities for interaction with ODP, including common use of the DOE Long Valley Caldera drillhole for high-temperature tests of ODP equipment. There is a tentative ad hoc meeting scheduled for October with interested DOE personnel to discuss slimhole drilling and high-temperature logging concerns. ODP has several representatives involved with the Nansen Arctic Drilling Program: Garry Brass on the science steering committee, Mike Storms on the technical committee, and Tom Pyle. Leonard Johnson is on the Executive Steering Committee. G. Brass and M. Leinen attended the workshop run by N. Pisias about linkages between the Global Climate Programs and ODP. M. Leinen is on the GOFS steering committee, which wants to make the best use of data from the drilling program. M. Kastner suggested interaction with the Ice Core Drilling Programs.

Other items brought up included: a reminder to send panel minutes to JOI; a reminder that ad hoc workshops at panel meetings should not be set up without prior consultation and approval from JOI; a RFP is being prepared for the Micropaleontology Reference Centers and should go out in a few months; advice on the use of the "seed money" for thematic publications is requested from PCOM and thematic panels.

L. Garrison gave the Science Operator report. Leg 127 ended at Pusan, Korea, several days prior to the PCOM meeting. Good science came out of the cruise, but there were considerable operational problems. At site 794 (J1b-1), which was to be reoccupied on Leg 128 for downhole OBS and Electrical Resistivity experiments, the pipe got stuck and the BHA was left in the hole. Since neither the proper fishing tool nor casing hanger was available onboard, Leg 127 did not spend additional time at this site. The schedule was rearranged to add 10 days to Leg 128 to prepare another hole. At site 795 (J1d-1) swelling of clay prevented logging of the hole. Additionally, 131 joints of 5-inch pipe and the BHA were lost due to a cracked pin connector. A fire in a transformer blacked out the ship and resulted in the loss of dynamic positioning. At site 796 (J3b-1) caving of coarse sand beds prevented reaching the basement objectives, since there was a danger of losing the last BHA onboard. At site 797 (J1e-1), Leg 127 encountered extensive dikes and interbedded sediments and flows. Problems were encountered using the drilling packer. Successful logging runs were made. Further drilling to deepen this hole resulted in the loss of 34 joints of pipe and the BHA when the drill pipe cracked.

Iron losses in the Western Pacific since Leg 124 have included 10 BHAs and 2 big lengths of drill pipe. These losses are the result of a combination of problems, mainly friable volcaniclastic sediments caving in on the drillstring, and the corrosion and metal fatigue in the 5-year-old drillstring. The immediate solution has been to put the old drillpipe aside and use new premium pipe. In Singapore the old pipe will be taken off the vessel and given a more thorough examination than was done at Tokyo. ODP does not want to throw away this pipe, but it needs to be examined for cracks and other bad places. New drill pipe will be waiting in Singapore and other pipe is currently on order from a contractor in Japan and another bid request will be issued in a few months. If the losses are added up for Legs 124 to 127 about $1M of equipment has been left on the bottom. This may delay the development of the 5-inch DCS capabilities. Drill collars are also getting to be in short-supply.

Garrison discussed the ODP operations schedule (Appendix B). The reason for the change in ports from Niigata to Pusan was twofold. First, the expense for the port calls in Japan was more than twice the average, Tokyo 1 around $185K compared to the average of $75K. Second was the problems caused by Japanese Customs laws, which resulted in time delays getting equipment to the vessel as well as additional cost.

Following Leg 128 the operations schedule has a 9-day transit from Pusan to Singapore, 2 days of preparation before a 10-day dry dock and then a 4-day port call in Singapore. Leg 129 follows a 10-day transit to Guam where the scientific party will come aboard. Drydocking is a requirement after five years of operations.

Because of the long transits from Guam and back to Guam and detailed planning at the pre-cruise meeting, the Ontong Java Leg has been increased to 62-days. Drilling plans made at the pre-cruise meeting indicated additional time was required to drill the four Neogene transect sites and the deep hole to basement. Austin said the site survey proponents wanted to know why the schedule was to drill the deep hole to basement first and then the Neogene transect sites. Austin asked if these changes were substantially different from what PCOM originally approved. Moberly said that as requested, CEPAC had put together two sets of proposals that included the deep basement and pre-Neogene objectives as well as the Neogene transect. Berger has also proposed an alternate site. This discussion was taken up again later during the liaison report about the DMP meeting (Minute 773).

As mentioned previously, 10 days have been added to Leg 128 to accommodate drilling another hole at site 794. The schedule for Leg 128 is constrained by the two rendezvous with other vessels (Appendix B). The first rendezvous will be at JS-2 on 3 September, timed in relation to the UK experiments on biological activity in cores proposed by Parks and Craig. Cores will be transferred to the other vessel for transport to shore and then by air to the UK within 48 hours. The second rendezvous is the meeting with the Japanese seismic vessels at site 794 on 25 September.

A. Meyer discussed operations at TAMU. Cruise staffing is more or less complete through Leg 131 (Nankai). Staffing of Leg 133 (NE Australia Margin) will begin soon. Staffing of Legs 134 to 135 will begin the end of September. Offers to new staff scientists to replace Suzanne O'Connell and Andy Adamson as well as Elliott Taylor have been made. The new publications policy schedule is being applied to Legs 126 and 127. Leg 125 has also requested the two post-cruise meeting schedule, but is not holding to the 3.5-month post-cruise meeting timetable. Leg 126 will be the first to try the 12-month post-cruise publication time for the Initial Reports volume. It is still too early to decide if this new policy is working. Two editors can now be attached to a volume and therefore the time for editing an Initial Report volume will be cut to 10 weeks. von Rad asked what the present schedule for publication of the Initial Reports. Meyer said that it is around 15 months. Moberly asked that a schedule for publications be supplied to PCOM for future meetings, similar to the Engineering development schedules already supplied as a standard item. This way PCOM can keep track of any progress being made in speeding up publications.

R. Anderson gave the Wireline Logging Services report of the Borehole Research Group. He distributed a written report. Hole instability has been the biggest recent problem for the logging program. The SES would have allowed these holes to be logged if the BHAs had not been lost and prevented use of the SES. The use of salt muds and the SES have resulted in a substantially improved record for logging of holes. The SES is being redesigned to make it safer and more reliable, and the new design is scheduled for deployment in early 1990.

On Leg 127 at site 794 the Formation Microscanner (FMS) was successfully deployed. The FMS generates a large volume of information which gives dips of bedding and faults and can also be used to locate the depth and orientation of cores with respect to the drillhole. A new tool is needed for measuring the resistivity of cores, similar to one that has been built in the UK. SMP will be looking into this. The FMS is the first logging tool that goes into the drillhole. Cita and Moberly suggested that Roger Larson be briefed on the capabilities of the FMS for core orientation. Mevel asked how much time was required to use the FMS. Anderson said it is very fast, measurements are taken at 1200 to 1600 feet per hour. New stress measurements have been made using both the Borehole Televiewer and the Formation Microscanner. Leinen asked what plans had been made to use the FMS on the Old Pacific Leg. Anderson said that current plans are for the FMS to be used in one hole.

A boron/tin sleeve has been developed to improve the geochemical logs. The wireline packer for fluid sampling has been bench tested at TAM and the new AMOCO pumps work. There continues to be a problem with the Calcium sensors which continue to fail after 24 hours of continuous work. New sensors are being ordered. The new temperature tool has produced good results. Tucholke wanted to know what was being done about downhole magnetics. Anderson said that because of problems with the susceptibility coil the University of Washington tool is not useful for basalts, but the new French high-resolution magnetometer licensed to Schlumberger will be tried. von Rad suggested that the Bochum magnetometer might be useful.

773 Reports By PCOM Liaisons

DMP

Liaison D. Cowan reported on the 23-24 May 1989 meeting. Cowan called PCOM's attention to DMP recommendations 89/9 to 89/13 in the DMP Minutes. Major DMP concerns that Cowan brought to the attention of PCOM are: need for high temperature logging tools; incompatibility between logging tools and the 4-inch hole of the DCS especially for high-temperature logging; the question if should PCOM specifically endorse the logging programs; and the failure of some Co-Chiefs to heed DMP logging plans at pre-cruise meetings. DMP spends considerable time developing a logging program for a leg and these recommendations are then sometimes ignored by both PCOM and at the pre-cruise meeting. Who adjudicates the differences between DMP and the Co-Chiefs? DMP has recommended that someone be hired to evaluate off-the-shelf high-temperature logging tools. DMP has also recommended a workshop on high-temperature logging tools. DMP has suggested that the Navidrill be tested at-sea on Leg 130 since it is required for the Geoprops probe.

Garrison said that the Navidrill is undergoing a major redesign and reconstruction that may take up to a year to complete. The present design, however, will make a hole for the Geoprops. Brass commented that DMP has formulated a third-party tool policy that was approved by PCOM and yet it has not seemingly been applied to Geoprops, especially the part about testing at sea before scheduling a tool's use on a leg. Tucholke reminded PCOM that Nankai is not predicated upon the use of Geoprops.

A discussion was held about the differences between Co-Chiefs and DMP over logging. This is part of a larger problem involving having more direct PCOM input into the pre-cruise meeting. Moberly said that the purpose of the advisory panels is to advise PCOM, it is PCOM's responsibility to integrate these sets of advice into the larger program that may have competing objectives. A preliminary discussion about Yves Lancelot's letter was held but action was deferred until later (Minute 785). Hayes wanted to know how much autonomy the Co-Chiefs have in shaping the final drilling program plan. Brass said there is a clear need for liaisons from PCOM or the most involved thematic panel and in some cases DMP to attend the pre-cruise meeting where the prospectus is prepared. The problem arises when the Co-Chiefs are writing the cruise prospectus and have to cut out parts of the proposed program to fit within the time assigned to a leg, but do not have advice from the planning structure as to the relative importance of the various aspects. Garrison said that problems may also arise when programs are added to the schedule at a late date. This matter was taken up again in Minute 780.

The discussion once again turned to the question of the order of drilling sites on the Ontong Java Plateau and the location for the deep site. Moberly said that in part the problems arose because of the melding of two programs into one. The Co-Chiefs believe that drilling the deep site first gives all leg participants some material to work on during the leg, and any time gained could be used to deepen the last Neogene site into basement, but on the other hand, if time is lost, the coring and logging of the last Neogene site is jeopardized. Meyer said that it was difficult to make time estimates for drilling until the site surveys were completed. Austin and Kastner maintained that the site surveys on Ontong Java were mainly for a Neogene transect and would not have been funded for basement studies. Moberly pointed out that the Ontong Java Leg was approved at the Miami PCOM meeting from the 1988 CEPAC prospectus, thus including Neogene, pre-Neogene and basement objectives. Garrison asked how the Leg 103 prospectus departed from the program prepared by CEPDPG summarized in the Oslo PCOM Minutes. Austin and Kastner said it departs from the CEPAC plan by having the deep basement site drilled before the four Neogene sites. Kastner, Moberly and Tucholke stated their belief that the Neogene transect drilling probably represents the highest priority of PCOM. *[Note: because of the evident confusion expressed at times about Ontong Java during the Seattle PCOM meeting, the JOIDES Office has reviewed the various proposals, panel minutes, and PCOM minutes and tapes, and is sending with these minutes a summary history of the Ontong Java program during ODP]*

Moberly said that three points apparently need decisions: the order of drilling sites; a survey across the reentry basement site and on to the Neogene ones; and the location for the deep-slope Neogene site. The decision about the order can be made by PCOM or OHP. The location of the deep site OJP-3 vs. OJP-6 should be left to OHP. The survey will tie the various single-channel seismic lines in the area to the holes. Austin commented that the survey tie across the deep hole will be inadequate because the recent site surveys were planned only for the Neogene transect. Meyer discussed the draft drilling plans for Ontong Java (Appendix B). A motion on the order of drilling led to the following discussion.

Discussion

Mevel wanted to know if the Neogene transect was the only priority, since there are obviously some LITHP interests in the basement objectives. The high ranking by SOHP of the Neogene transect may have been the primary reason for scheduling this leg at Miami, but the fact that there was thematic interest in the pre-Neogene and basement also played a role in its acceptance. Cowan said that TECP had questioned if one hole was sufficient to say that basement had been sampled. Moberly said that 300 meters of penetration should be sufficient to establish attaining basement. To date only a few grams of basalt have been recovered from the basement on the Ontong Java Plateau, so any sample would be important.

Leinen wanted to know if Mayer and Berger are sure that the decision has to be either OJP-3 or OJP-6; or, couldn't there be all 5 Neogene sites? It was suggested that because of the time constraints, Mayer and Berger need to convince OHP about one or the other of these two sites. Tucholke wanted to know the time requirements for drilling the four Neogene sites vs. the deep basement site. Meyer said it would take 25.5 days to drill and log the four Neogene sites and 24.8 days to drill and log the deep basement site. The question was called:

PCOM Motion

1) The order of drilling for the Ontong Java Plateau Leg is first the 4 Neogene transect sites followed by the deep basement site; and 2) Decision about the placement of the deepest hole (OJP-3 vs. OJP-6) of the Neogene transect be based on the recommendation of OHP. (Motion Kastner, second Tucholke)

Vote: for 15; against 0; abstain 1

EXCOM & ODP Council

Moberly reported the 31 May- 1 June 1989 EXCOM and ODP Council Meeting. Principal results of importance to PCOM were excerpted in the Agenda Book and include:

- Adoption of the FY90 Program Plan and budget, with concerns discussed about Geochemical Reference Sites and about future program costs.
- Adoption of the Long-range Planning Document with some modifications to come, including a request for PCOM to reconsider the balance of scientific objectives.
- Extensive discussion of the likely incompatibility between the DCS and modern logging, a very troublesome situation.
- Reaffirmation that ODP is a global program driven by proposals that are thematically ranked.
- Adoption of the publications policy forwarded by PCOM, with the exception of the section on details.

- Expression of exceptional concern about both major aspects of the question of radio-isotopes on board the drill ship: the importance of involving new areas of science in the program, and the reluctance to allow possible contamination of the vessel.
- Approval of the mandate changes proposed. EXCOM also asked PCOM to have a general statement on membership where not already present in mandates.
- Decision that no action was needed by EXCOM about the present method whereby ODP-TAMU selects Co-Chief Scientists for drilling legs.

Discussion

von Rad wanted to know why Publication Policy Part C was not approved. Moberly said EXCOM thought some of the recommendations could be implemented by the Science Operator immediately without waiting for IHP to advise PCOM (for example, starting the copyright negotiations with journals). The advice on policy still comes from the advisory panels.

The matter of balance of scientific objectives in the LRP was discussed. Malpas suggested that a short section could discuss the reason for the balance of the plan. Pyle said one concern was that a hard-rock program would not be as interesting to industry. Brass said the balance was cognizant of the level of achievement at the time it was written and where the opportunities will be in the future. Further discussion produced no reason to change the balance and the PCOM position can be stated as below.

PCOM Consensus

> Because the Long Range Planning Document is a general assessment of the research areas where scientific advancement is achievable by drilling, and not a specific drilling plan, the balance of drilling opportunities does not require revision. The balance of actual drilling will be determined by the drilling proposals received and the thematic priorities that evolve as science and technology advance.

SRDPG

M. Langseth attended the 13-15 June SRDPG Meeting and his mailed comments were in the Agenda Book. M. Leinen distributed copies of the draft report supplied by R. Detrick. The DPG was viewed as highly successful, and will provide us good information at our November meeting.

SGPP

Kastner reported on the 19-20 July 1989 SGPP meeting. The meeting was primarily to write a new white paper and examine the panel's mandate. Copies of the draft minutes and the white paper were distributed. Kastner wanted it emphasized that liaisons from the other thematic panels need to attend these meetings. The highest priority technological development needs are for: sediment recovery and fluid sampling, and deep penetration of sandy sediments. A subcommittee of SGPP is to establish how pore waters and gases should be sampled to meet the thematic requirements. Because some important thematic objectives require radioisotope experiments onboard the ship, SGPP is going to prepare a paper on these requirements.

PPSP

Moberly reported on the 25-26 July 1989 meeting of PPSP. At the meeting the following were approved: all remaining sites of the Nankai traverse; all newly surveyed sites for Old Pacific (the remaining two to be decided by M. Ball and L. Garrison); the 5 proposed Ontong Java Plateau sites; and, as a favor to NSF, two non-ODP shallow sites on the Bahama Banks. PPSP also reviewed the geochemistry of all petroleum shows in DSDP-ODP, received information about probable drilling conditions at high-temperature targets, and indicated a need for back-up expertise in petroleum geochemistry.

Of great importance to future planning: PPSP reviewed the Exmouth Plateau operations, including their own role in having approved Site 763, with implications against future "twinning" of industry holes or indeed against riserless drilling in known petroleum basins, especially ones with thick syn-rift or early post-rift Mesozoic sections. Brass was concerned that drilling on margins such as Brazil may have a risk associated with them. Garrison said that the goal of PPSP is to keep that risk as low as possible.

774 Reconsideration of FY90 Program and Geochemical Reference Leg

[For reasons that should become evident to the reader, Minute 774 is recorded in more detail than is a typical minute. In places, the order of speakers is given differently here than their actual order, to group respondents to topics that were raised, as PCOM commonly skipped from topic to topic and back again.]

Moberly explained that since the Oslo meeting, the JOIDES Office has received numerous spoken and written communications about removal of the Geochemical Reference Sites leg from the FY90 Program Plan. The range of comments is shown in the set of letters in the Agenda Book. Some complaints are more justified than others, perhaps depending on which rumors were intercepted, for example, an Atolls and Guyots leg was not "removed" from a Program Plan that never included it, and as PCOM has not met since Oslo, PCOM cannot be "stonewalling". These letters were answered, but the answers were not included in the Agenda Book. Most answers were similar to the one to Bob Detrick (copies already sent to PCOM).

There appear to be two issues, here posed as questions. One is the decision itself: with due consideration to real and imagined factors including thematic worth, status of other planning, logistics, weather, and alternatives, *should PCOM reinstate a geochemical reference leg in the FY90 Program Plan?*

The second is the decision-making process: In the thematic panels, DPGs, and PCOM itself, and with respect to rankings, transfer of information, and record keeping, *how can PCOM improve procedures to prevent in the future whatever real (and imagined) faults there were in this planning process?*

Malpas suggested that the decision was the result of political and regional constraints placed on PCOM. In a proposal-driven program with drilling prioritized by themes, themes need to be ranked as well. Panels should put proposals together in thematic areas. If LITHP had put together a solid thematic program for Geochemical Reference then it would have fared better in the transition from WESTPAC to CEPAC drilling as well as the transition from regional to thematic drilling programs. Brass pointed out that from time to time in ODP, PCOM had been concerned with consideration of themes, for example, how many accretionary prisms around the world would we drill?, but had always had to consider priorities of its regional panels while it was in a regional mode. Malpas said that the decision-making process is not working properly at the PCOM level. The Geochemical Reference Leg was removed without any prior notice or chance for LITHP to have any input into the decision. The prior PCOM motion accepting the Geochemical Reference Leg was overturned, not based on scientific rationale, but for political reasons. PCOM did not discuss the matter with the main people or panels who would have been concerned with the decision.

Austin observed that part of the problem is that there is a perception that the program is going to end if the ship does not appear in the Atlantic. If the program were known to be continuing through 1998, then there would be time to do the important thematic drilling in the various areas.

Discussion turned to ways to improve the process. Moberly said that the basic step to avoid future misunderstandings is to get a common system of ranking proposals and drilling programs. Once prioritized lists of programs are available from panels, PCOM can take the lead for long-range planning. Malpas suggested that the panels may have to go beyond unsolicited proposals to writing their own proposals to cover important themes. Austin thought that proponents of proposals of high thematic interest should be placed on the panels. Cita wondered if there is a good plan and sufficient proposals to carry drilling through to the end of the century. Garrison said that regardless of a set of high thematically ranked proposals, they would have to be superimposed on an ocean-to-ocean scheduling. Otherwise, the ship could spend all of its time drilling high priority objectives in only one ocean. Moberly said that in April of each year we would take the weight of what our various panels tell us, and decide what proportion of time to spend in what ocean over the next four years. Each spring we would be able to reevaluate the next four years. Lienen supported Moberly's proposal of how to decide where the ship should go. Continuing, she agreed with Malpas's contention that panels may have to hustle to get good proposals that address their themes, but that unsolicited ones are important, too. From her experience on the Lithosphere Panel, geochemical reference was not on the panel's list of top problems 5 years ago. It took Langmuir and company's unsolicited proposal to move the theme into the system. Malpas suggested that if LITHP or a DPG had taken the geochemical reference proposal, hustled, and used it as a basis to put together a solid global program of geochemical reference drilling, then it would have looked better to PCOM because the science would hold together better, and it would have fared better. Where necessary, good unsolicited proposals should be taken and put into context by the panels.

Brass said that some concession may have to be made to some regional drilling by doing the high-ranking drilling clustered in one region, then transit to another region to do other high-ranking proposals that are close together there. Kastner thought that should be stopped if it includes some second-rate priority science just because of logistics. She was supported by Austin; transits may be necessary. Kastner suggested that thematic panels should publish their important themes in EOS, which she thought would have wider distribution among those interested in drilling than JOIDES Journal. That would draw proposals to important themes. Mevel said LITHP had just done so.

Moberly asked again if PCOM could suggest ways other than what he proposed to the thematic chairs for the rankings of programs and reporting to PCOM. There were none, and so the thematic panels will be so notified.

Anderson suggested that the future agenda briefing books contain a single-page matrix of the rankings of the four panels, to aid PCOM memory. Moberly said that such lists or matrix should be in every April's book. Watkins thought that basically the decision-making process was fair, and that the idea of something in writing is good, so we do not lose track of the history.

PCOM turned to the second part of the agenda item, specifically the Geochemical Reference leg. Watkins suggested that after 20 or so legs with no major objections, having one leg decision that raised great objections is not a bad record overall. Austin said that the change in success was partly due to going from the mode of a regional prospectus to a thematic mode. Malpas objected strongly to the decision-making process in this particular case in which there was no prior notice to anyone on LITHP. The motion could have been tabled, and then handled by phone after LITHP could respond. He believed that the previous motion was overturned because one person, new to this Planning Committee, made a strong argument for the change[*]. The overturning of the schedule was without a scientific discussion, and that is what has raised such concern among LITHP members and elsewhere in the community. Kastner suggested that PCOM should admit that a mistake in the process occurred at Oslo and that Geochemical Reference should be reinstated into the FY90 Program. She moved to accomplish this, leading to the following discussion.

Discussion

Cowan said that PCOM was entitled to reverse the Miami decision, for the purpose of keeping to the schedule of preparing for drilling on the EPR and at 504B. As for the repeated comments about lack of scientific advice, it is unreasonable to have all proponents and chairs of all thematic panels present at all PCOM meetings; we have to make do with the people in the room.

Malpas said that the science of the Geochemical Reference Leg had been extensively discussed at previous meetings and the decision was made to include it at Miami. At Oslo, Old Pacific and Geochemical Reference were unfairly compared. Austin said that at Miami, Detrick made a good case presenting the scientific justification for a geochemical reference leg. Mevel said that Geochemical Reference suffered from being considered as part of CEPAC, rather than WESTPAC where it was LITHP's highest priority.

Cita expressed her concern earlier, that because the drilling program is a strong program with a strong structure, we should not weaken it by undue discussion of a wrong decision which may not be wrong at all. She compared the superiority in planning of ODP with another major oceanographic program, and stressed the importance of good will in keeping the drilling program strong.

Mevel said that the effects of reinserting Geochemical Reference on the FY90 schedule have to be discussed before any vote.

Kastner said that Oslo we received the erroneous information that this leg was never of high priority of any thematic panel[*]. Watkins said that according to his notes, all of the legs were looked at in Oslo. Moreover, it was established at Oslo that there were more legs than can be accommodated in FY90 and still get to the EPR early in 1991. Moberly reviewed that at Oslo, in order to delay Nankai and the second engineering leg, it was initially proposed to insert two legs from the western part of the Central Pacific that were advanced as to thematic interest and existing and planned surveys. PCOM chose to keep the same length of time before transiting to the eastern Pacific by removing two legs from the expanded slate, one of which had already been scheduled. Brass said that an important point was that at Oslo we had a change in the Old Pacific ranking by OHP, which was now favorable. SOHP had always said they would favor the program if surveys could show a chance to get to basement.

Hayes said that he gathered from the many letters that the decision at Oslo apparently was flawed by misinformation that Geochemical Reference did not have high thematic ranking. Moberly said it was ranked by one thematic panel. Kastner said that was not specifically what was said at the Oslo meeting [*]; it was stated as being way down on the WPAC list. Moberly said that it was, and asked how a true statement could be called misinformation; anyone having additional or different information should have brought it forward. Kastner said that for some time it had been the highest priority leg LITHP had in the Western Pacific[*]. Tucholke and Austin agreed.

Anderson thought that this situation could be more likely as ODP moves into a thematic mode, suggested better documentation for such decisions in the future. Moberly said that at the request of Kastner for a more complete record about the Oslo decision, the tapes had been examined carefully and the Oslo minutes have no insertions or important deletions[*]. The tapes can't pick up the nodding or shaking of heads or what is on the board. Garrison pointed out that the issue was to get to 504B and the EPR sooner, and that people had made the comparison between those Eastern Pacific programs and Geochemical References. Austin stated that the best place to plan schedules is at the Annual Meetings, where the panel chairmen are present. Hayes wondered if it was proper to compare regions, CEPAC and WPAC. Brass reminded PCOM that that the PCOM decision came from working backwards from when it needed to be in the eastern Pacific, to prepare for the highest priority LITHP drilling at 504B and the EPR as soon as possible in 1991, for the long-desired second leg on EPR before the possible end of the project in 1993. Hayes said that a method is needed to merge the priorities of different thematic panels. Did PCOM at Oslo have a comparison by LITHP of eastern and western Pacific? Was that part of the misinformation? Moberly said that he had given the WPAC panel's ranking and its list of the thematic panel rankings. [It was others who had made such comparisons about EPR and 504B; see Olso minutes*]. Malpas said that this decision on how to merge priorities should have been made at the time that PCOM decided to go to a global thematic program. At Miami the decision was to include the Geochemical Reference Leg as part of the Western Pacific program.

Jenkyns wanted to know when Geochemical Reference would be inserted into the program if it were reinstated, since this affects how participating scientists arrange their schedules. Garrison presented two possible scenarios, Leinen noted that the result of either of them would be the delay of getting to the EPR and 504B until April 1991 rather than January which had been the intention of PCOM at both the Miami and Oslo meetings. The question was called:

PCOM Motion

Reinsert the Geochemical Reference leg in the FY90 drilling schedule. (Motion Kastner, second Malpas)

Vote: for 7; against 7; abstain 2 **(Failed)**

Malpas then moved to replace the Old Pacific Leg with the Geochemical Reference Leg as this would not delay the schedule any more than it had already been.

Tucholke said that the effect of this substitution would be the same as what happened at Oslo. Cowan said that PCOM should admit damage was done, but it still remains that the science in the Old Pacific program is the better of the two.

PCOM Motion

Replace the Old Pacific leg with the Geochemical Reference leg in the FY90 drilling schedule. (Motion Malpas, second Kastner)

Vote: for 1; against 12; abstain 3 **(Failed)**

[Later note back in JOIDES Office: as yet we are unable to find a record of its <u>highest</u> priority in the LITHP minutes, e.g. Strasbourg August 1985, plan for crustal evolution of arcs and back-arcs, 12 Mariana and 11 Bonin sites, none east of the forearc. College Station January 1986, 4-leg transects should extend from center of back-arc spreading across arc to undisturbed plate. Seattle April 1986, A minimum of 5 legs to meet LITHP's thematic objectives in the Western Pacific area, unranked but listed in this order are: 2 legs Mariana/Bonin forearc, 1 leg each Lau Basin, Japan Sea, and reference holes into basement east of Bonin-Mariana trenches. Corvallis July 1986, support of WPAC's Mariana, Bonin, and Japan Sea legs, but concern about Lau Basin slipping in WPAC's ranking, and WPAC's list of only one non-reentry Bonin site for reference; LITHP says Bonin 8 merits at least one-half a leg. London January 1987, LITHP's highest priorities are Bonin I, Lau Basin, Bonin II-Mariana, and Japan Sea; a further paragraph is that LITHP strongly endorses the Langmuir-Natland proposal for 6 geochemical reference holes (proposal received in JOIDES Office December 1986). Palisades May 1987, LITHP noted the most serious omission in proposed Western Pacific drilling is the absence of a viable reference-hole program, which has been one of LITHP's top priorities in the area; no ranking. Paris September 1987, there is no ranking of all drilling, but in response to a questions from PCOM about 4 specific programs, , LITHP said that in terms of an extra one-half leg, reference-hole drilling and forearc-diapir drilling are higher priorities than an evaluation of Mississippi Valley-type ore genesis off Australia. Annual Report 1987, the top 6 CEPAC programs are ranked but not WESPAC; again the statement of the serious omission of 1 1/2 legs of reference hole drilling. Honolulu March 1988, extensive discussion but no ranking. Corner Brook September 1988, discussion of a one-leg program; no specific rankings. Miami Annual Meeting November 1988, termed high thematic ranking but no specific rankings. Is termed a part of the Bonin-Mariana drilling, which has had 2 DSDP legs and will have 2 ODP legs; presentation of a proposed 3-hole, >1-leg program. In the tapes Bob Detrick termed the program "a very high part of our Western Pacific drilling". In conclusion, there is no doubt that geochemical reference drilling is of high importance to LITHP; just how high a rank or priority is unknown, except there is no evidence that it was highest. In the "regional mode", it was ranked very low by WPAC.*

The Oslo tapes have also been reviewed. The principal part left out of the minutes was the extensive discussion of possible routings and legs during the part of the meeting in which it was proposed to have both Old Pacific and Geochemical Reference in the FY90 program. The pros and cons of the potential results of the straw-vote called for by Eldholm were clearly stated both before and after that vote (and which led to the Brass-Langseth motion for a rescheduling), namely that in effect it would be a substitution of one leg for another, substitution of one theme for another, that there would be long transits, but that it could preserve weather windows and would allow an early transit east across the Pacific. No single person gave a strong argument one way or the other; most of the stronger arguments had to do with moving the vessel rather than leg substitution. The presentation of rankings of WPAC legs by Moberly was as they were given in the 1987 WPAC prospectus. Twice he asked if others, perhaps watchdogs, had more recent information. Moberly sees now that it was not strictly correct to have said that LITHP <u>ranked</u> Geochemical Reference at the bottom of its thematic list for WPAC as a leg in 8th place, whereas he should have been said it was <u>listed</u> below the LITHP themes of the WPAC programs that would take about 7 legs to drill. Pisias said he didn't think it was last, but that it was ranked low. There were no other comments or corrections about that LITHP priority or next about Moberly's presentation of no ranking at all by the other two thematic panels or the regional one. There was support but no objection to Moberly's statements about high thematic priority of Old Pacific by SOHP and TECP. Only two persons spoke about the potential adverse consequences of the Brass-Langseth motion, namely Tucholke and Moberly.]

PCOM next discussed the Nankai Leg. One problem involves the concern of the Borehole Research Group about the first deployment of the wireline packer on this leg in a bare hole environment. Taira suggested that the first deployment should be in pre-perforated casing. R. Anderson said that BRG would have not problem with that first deployment.

Tucholke wanted to know what PCOM's position would be on which holes should be drilled at Nankai. At Miami, specific sites were given (NKT-10 & -1) but the leg has changed now. Should PCOM leave flexibility or make specific recommendations? Taira said that the drilling will depend on whether Geoprops is used or not.

Wednesday, 23 August 1989

Taira presented the options for Nankai drilling (Appendix C). There are both deep and shallow objectives at Nankai. Sampling and measurements at the deep décollement are the main science objective of the drilling. The décollement is fully developed at NKT-2 but is only incipient at NKT-10. DMP prefers NKT-10 while Taira prefers NKT-2. Taira suggests that the best choice is to use the four-hole-per-site concept at sites NKT-2 and NKT-1. The order of drilling might be different if a two-leg Nankai program were assured, to give both the horizontal and vertical gradient of properties. Only one leg is on the program. Tucholke agreed that the very best science will come out of drilling the décollement at site NKT-2 and the leg should not be planned on the basis of having the Geoprops tool available.

PCOM Consensus

The initial ODP leg of drilling at Nankai will be at sites NKT-2 and NKT-1.

775 Engineering and Technical Developments

L. **Garrison** discussed the engineering and technical developments at ODP-TAMU that were included in the handout distributed at the meeting. Developments discussed included: Diamond Coring System (DCS), Navidrill Core Barrel (NCB), Extended Core Barrel (XCB), Sonic Core Monitor (SCM), Advanced Piston Corer (APC), Drilling and Straddle Packers, Side Entry Sub (SES), Pressure Core Sampler (PCS), Vibra-Percussive Coring (VPC), and High Temperature Drilling. Special note was made that the second generation NCB can be used to deploy the Geoprops tool; it makes a hole but does not recover core. Further information will be provided at the next PCOM meeting on this tool. The concerns about the first deployment of the wireline packer have been mentioned previously. There is a low chance of not being able to retrieve the packer even if it doesn't deflate. It can be used in an open hole on the current leg. The PCB was identified by Kastner as an important tool that has been promised for some time. She suggested that SGPP be asked to identify the important scientific needs for this tool and make recommendations about the types of measurements that need to be made in the Phase II chamber. These recommendations will be sent to SMP for their specifications so that TAMU can proceed with development. PCOM needs to set some priorities for the development of this tool. JOIDES Office will contact the panel chairs; von Rad will see that SGPP considers this matter, while Leinen will see that SMP is also aware of the need.

R. Anderson discussed the implications for logging if the 4-inch hole DCS is used extensively in ODP. Logging tools are technologically advanced and use industry designs. The major problem is that the 4-inch DCS hole is incompatible with the modern logging-tool suite. The tools available for use in the 4-inch hole are generally not designed for high pressures or high temperatures. If the Schlumberger HEL logging tools are used, modern geochemical and geophysical logging data cannot be attained. The problem of repackaging the present suite of tools for a smaller hole is that dewaring them for high temperatures makes them too big for the 4-inch hole. A possible solution, which has been used by the oil industry, is to cool the hole by circulation of drilling fluids. With a small-diameter hot hole, however, there is not enough of a heat sink to keep the temperatures from quickly rebounding and the hole can only be cooled 20%. This has led to a box for the logging of small-diameter holes. The loggers suggest that the only way out of the box is to make bigger holes by: deploying a larger diameter DCS on the ship; reaming of the smaller diameter hole to a larger diameter (however, the problems peculiar to reaming usually results in loss of 50% of the holes); or drilling two adjacent holes, one for core recovery and the other for logging. BRG recommends the third option. The BRG will then use those tools available to log the DCS slimhole and run the modern logging tool suite in the regular-size non-cored hole.

Cowan wanted to know what losing 50% of the holes meant. Anderson said the hole is lost for other purposes half the time. Brass wanted to know if the higher recovery possible with the DCS would eliminate the problem of not being able to use the geochemical and other high tech tools. Anderson said that a lot of geophysical measurements including VSP must be made in the holes. The modern logging tools give a lot of information that cannot be gained from core alone. Malpas and Brass were concerned that the purpose of the small diameter DCS, to recover core where it is not now possible, is also in danger of being overlooked. PCOM evaluated the three options for making the DCS compatible with the modern logging suite. 1) Deploy a DCS that cores a hole greater than 5 inches. 2) Ream the 4-inch DCS hole to one compatible with logging tools. 3) Drill a second hole without coring next to the DCS slimhole. At the present stage of DCS development, PCOM did not see any purpose in locking in to option #1. Brass suggested that it would be useful for ODP to develop tools to use in slimholes, but it might not be practical under the present budget. Therefore, the BRG should not be required to develop an advanced slimhole logging capability. Garrison suggested that option #2 reaming is not very desirable if you lose half of the holes. Hayes and Brass suggested that the ability to accommodate the logging technology should be a PCOM commitment. Moberly said that the Third Engineering Leg may be an appropriate time to test reaming of the 4-inch DCS hole. Garrison said that land testing of the DCS will also look at reaming.

Hayes asked and Moberly agreed that the minutes should reflect that all the options are to be considered by ODP-TAMU to accommodate logging.

PCOM Consensus

The Borehole Research Group is not obligated to develop a suite of advanced logging tools for slim holes drilled with the Diamond Coring System.

PCOM Motion

TAMU shall develop the capability to run the Borehole Research Group suite of logging tools at sites drilled with the Diamond Coring System. (Motion Brass, second Malpas)

Vote: for 16; against 0; abstain 0

776 Second Engineering Development Leg

PCOM has approved a Second Engineering Development Leg for the FY90 schedule. It will be a joint science-engineering leg to test developments aimed at bettering the drilling and recovery of chert-chalk sequences, reefal limestones, and young brittle crust. The JOIDES structure has been asked to find appropriate sites at Shatsky Rise, M.I.T. Guyot, and in the Mariana or Bonin back-arc area, as well as provide appropriate advice on a scientific Co-Chief and other staffing. The science operator has assigned 56 days for this leg, which with transit will give about 3 weeks of operations at each site. D. Rea, S. Schlanger and J. Natland have been asked to provide specific site advice. A prospectus will be prepared by the next PCOM meeting.

Kastner wanted to know if a Scientist Co-Chief had been named. Moberly said that the JOIDES Office has had no answers to the request of panels for site information and Co-Chief and participant nominations; the Office will keep trying. Garrison said that since the leg was an engineering test that may not produce much science, the approach at TAMU will be to have lead scientists invited to participate. Kastner said that the decision at Oslo was to name a Scientist Co-Chief as well, to help ensure success of the legs. Meyer said that there was a concern that naming one of the three lead scientists as Co-Chief might cause problems. Leinen said that Co-Chiefs are named on the science legs where there are multiple science objectives. Garrison said there is also the concern that the Scientist Co-Chief will have his own program that would conflict with the engineering development tests. TAMU wants the engineer in charge of the tests. Leinen said that since there is going to be a prospectus there should be no problem in having different objectives. Kastner said that PCOM had considered this at Oslo and thought it best that there also be a Scientist Co-Chief on these legs. Austin said this was the reason it was suggested that the Scientist Co-Chief be someone who was interested in the successful development of the system undergoing tests. Cita suggested that Jim Natland would be an appropriate choice. Tucholke suggested Jerry Winterer, but he might not be available. By acclamation PCOM agreed that

Jim Natland should be asked to serve as the Scientist Co-Chief on the Second Engineering Development Leg. It was also suggested that rather than having a formal watchdog that M. Langseth, who is the PCOM liaison to TAMU, continue his involvement and watch after the leg.

777 Status of Scientific Recommendations

Thematic Basis The JOIDES Office was asked by EXCOM to prepare a detailed table showing the degree to which COSOD I objectives (major as well as minor objectives) have been met in ODP to date. When finished it will also be distributed to PCOM and the panel chairs.

A draft of the White Paper of the Tectonics Panel has been received (version edited for JOIDES Journal was attached to the Agenda Book). The LITHP and SOHP White Papers have been published, and were part of the basis for the Long Range Plan. SGPP is revising its part of the SOHP document and a first draft was distributed to PCOM.

Proposals The rate of receipt of new and revised proposals has increased slightly. Recent ones are no longer overwhelmingly Pacific. A set of summaries of proposals received by the JOIDES Office since the meeting in Oslo was attached to the Agenda Book. Several new Atlantic proposals have arrived. There also have been proposals for work off Australia. Advertisements soliciting proposals were placed in EOS and the JOIDES Journal. A direct-mail solicitation of new and revised proposals was sent to the "contact" proponent of all proposals received by ODP before this fiscal year.

778 Preparation for One-year and Four-year Planning

At Oslo PCOM decided that the FY91 Program Plan would be selected from among certain eastern Pacific programs. PCOM should become familiar with the scientific objectives and the maturity of these programs. The CEPAC prospectus (mailed separately to PCOM) will aid the discussions which were led by the PCOM watchdogs. Watchdogs should be sure the items are covered that are on the watchdog form that was distributed in Oslo.

Cascadia Accretionary Prism (D. Cowan) Hyndman will conduct a MCS survey of the slope, margin and accretionary prism of the northern part in late August. The work will also cover the Middle Valley section of the ridge. Oregon will be starting their work in September. Canada also plans high-resolution side-scan surveys in 1990. There was an early review of Cascadia by DMP. Realistic time requirements are needed. The present program appears overly optimistic and may require fewer holes and more measurements.

Chile Triple Junction (R. Moberly) This is currently a single leg proposal, but the proponents and TECP will examine to see if a 2-leg program, as suggested by TECP, can be made. All important MCS lines will be ready for examination at the next TECP meeting. (Kastner asked that SGPP get this as well.) J. Austin volunteered to be the new watchdog for this program.

Eastern Equatorial Pacific Neogene Transects (M. Leinen) The site survey cruise is underway. Specific sites will be chosen after the survey work is complete.

East Pacific Rise Bare-rock Drilling (G. Brass) There have been no new developments since Oslo meeting. A revised French proposal has not arrived at the JOIDES Office. There will be a cruise in November to look for hydrothermal activity. Garrison said that sites will need to chosen so that the HRGB can be placed on the third engineering leg.

Hydrothermal Processes at Sedimented Ridges (M. Kastner) M. Langseth has submitted a report of the DPG meeting. Two legs have been proposed and the DPG recommended that they be about one year apart. There was a concern that drilling in the Gulf of California, Guaymas Basin had been removed by the DPG from serious consideration for drilling because of potential clearance problems. This type of decision should not be taken by the panels.

Lower Crust at Site 504-B (J. Malpas) Hangups have not been at casing joints. Massaging of the VSP data suggests that the transition could be 350 meters closer than previously estimated. There are also some interesting dipping reflectors. R. Anderson reminded PCOM that the fluids in the hole at 504B should be sampled before any of the Engineering operations begin. It would be a shame to loose this valuable information, so plans need to be made accordingly.

Remainder of CEPAC Set of Programs (Former prospectus, less Cascadia, et al. above, and less scheduled Old Pacific and Ontong Java legs). These and others will be considered next April. Some are revised in the new CEPAC Prospectus.

Atolls and Guyots (B. Tucholke) There are two mature proposals. The thematic panels need to rank them and recommend either a 1-leg or 2-leg program. There are concerns for all 4 thematic panels in these proposals since they deal with the mid-Cretaceous atoll drowning, hotspot swells, and other topics.

Bering Sea History (J. Watkins) Nothing new to report.

Hawaii Flexure (J. Malpas) The dating resolution problem has not been settled. Mass wasting may also be a problem. Brass and Leinen said that the thematic panels need to answer the question of whether or not the dating resolution can answer the objectives of this proposed drilling or not. This needs to be done by Spring if it is to continue being considered by PCOM.

North Pacific Neogene (J. Watkins) Nothing reported.

Shatsky Rise (H. Jenkyns) This program requires good recovery to be successful. Engineering II will address the recovery problem. If Engineering II is successful, a future Shatsky program would not necessarily be a full leg of drilling. There are at present no basement objectives, and so a proposal will be necessary to justify drilling basement.

Young Hotspots: Loihi (R. Moberly) No changes to report. Drilling would probably encounter high-temperatures and require high-temperature logging tools. One or two bare-rock guidebases would also be required. A hole for a tele-seismic observatory would not be appropriate here.

Additional Programs. Several proposals of apparently high promise will also be considered next April. These include ones that for one reason or other could not be included in the first circumnavigation of the *Resolution*, as identified by the former regional panels, as well as new ones. For example, attached to the Agenda Book are 1) lists of proposals of the 1988 era that have moved on to SSP consideration, 2) seven leg-length programs remaining from WPAC (including Geochemical Reference), and 3) the list from J. Austin of proposals and programs that were highly considered by ARP. SOP and IOP did not respond to PCOM's request. The individual members of these two panels, and Co-Chiefs of legs drilled in the Southern and Indian Oceans will be contacted and asked to identify high priority leftovers.

Watchdogs were assigned to the following targets recommended by WESTPAC:

G. Brass	Banda Sea and South China Sea Basins
M. Kastner	Geochemical Reference Sites
D. Cowan	Nankai II
A. Taira	South China Margin
M. Langseth	Valu Fa Ridge
R. Duncan	Vanuatu Back-Arc Rifts
J. Malpas	Zenisu Ridge

Process of setting priorities. The chairmen of the thematic panels were told that there must be a common inter-panel scheme for reporting priorities to PCOM. They were provided a rather long-winded but (we hoped) complete draft set of working definitions and procedures (please see copy in your attachments), and asked to comment on the draft method of setting and listing priorities. The only two respondents are in favor of the draft method,

Essentially, the proposed method is: Each year before the spring PCOM meeting, each thematic panel would send to PCOM a single priority list of programs, with *program* defined as one or more actual proposals addressing a published theme in a specific locality, and with a good likelihood for operational success, in terms of the status of such factors as site surveys, engineering developments, and safety. PCOM agreed that the proposed method was acceptable but wanted details from the panels of how the ranking was produced. Panel inclusion of a brief paragraph of the rationale and underpinning for each decision will give PCOM less likelihood of misunderstanding the rankings.

Malpas suggested that the thematic panels and perhaps DPGs should either solicit proposals in areas of high thematic interest or write their own. Brass said that JOIDES walks a narrow line in terms of its image of being an open or closed shop. As individual scientists we write our own proposals and for the sake of efficiency it may sometimes be necessary for panels to write proposals. Leinen said that the unsolicited proposals will remain the major source of new proposals. PCOM agreed that thematic panels may write proposals for high-ranking themes that otherwise do not have appropriate proposals or that have proposals that are either too broad or too narrow.

779 Reports of Recent Drilling Legs

Leg 124 Southeast Asian Basins

Co-Chief Scientist Eli Silver described the results of Leg 124. Its goals were to compare the evolution of a set of 4 small adjacent basins. For political reasons two of them, Banda and South China, were not drilled. The Science Operator has presented a summary of results. Points here stressed by Silver were that new stratigraphic information about the Celebes and Sulu basins gives a record of volcanic activity, changing paleoceanographic conditions, collision events, and timing of trench formation. The direction and magnitude of stress within the basins was an important discovery.

The Sulu Sea Basin seems to have formed in an intra-arc environment. The Celebes Sea Basin formed in the open ocean, with low sedimentation rates for the first 20 my. The oldest sediments on basaltic basement are deep-sea and similar to red clays, with fairly low sedimentation rates. Comparisons were made by Jenkyns to Mesozoic ophiolites, covered by lime-free sediments, and by Brass and Leinen to present-day red clays, of much slower rates of sedimentation. It was regretted there was no clearance for a shallow hole in the eastern South China Sea.

Leg 125 Bonin and Mariana Forearcs

Co-Chief Scientist Patty Fryer described the goals and results of Leg 125. Part was to determine the physical nature and geochemical processes in serpentinite diapirs of the Mariana forearc and the basement of the Bonin forearc. Unusual pore waters were recovered in the diapirs, i.e., high *pH*, Mg-depleted, and with exceptionally high chlorinities and salinities. Aragonite crystals and hydrocarbons higher than methane were also unusual. The interpretation is that the present fluids come from the dehydration of the serpentinites, but that the ultimate source of those fluids is the sediments that were subducted. The striking feature of the petrology and major-element geochemistry of the Bonin forearc is the interlayering of island-arc boninites and dacites.

Cowan asked if the low recovery compromised the results. Recovery in the diapir summit holes was low, but was higher in the flank holes. There were many comments about the unusual geochemistry of the fluids, and PCOM awaits the post-cruise work.

Leg 126 Bonin Forearc

Co-Chief Scientist Brian Taylor summarized the results of Leg 126. Drilling showed the general structural and magmatic history from the initial rifting through the development of the present arc to the beginning of the next cycle of back-arc rifting. The Izu-Bonin arc formed in mid-Eocene time. The deep forearc basin formed rapidly in the mid-Oligocene and filled rapidly with turbidites. The Shikoku back-arc spreading commenced about 25 MA and continued for about 10 my. Since the late Pliocene a new rift has started. Back-arc basin basalts were produced within 1 my of the stretching.

PCOM was impressed with the lull in volcanism. Deep erosion of part of the forearc down submarine canyons, combined with the lull in volcanism, suggest that mass balance calculations may be difficult. PCOM also noted the high resolution of paleomagnetism from the high sedimentation rates, the results of logging, heat flow, and VSP experiments, and regretted the loss of bottom-hole assemblies in this very tough drilling.

PCOM congratulated Drs. Silver, Fryer, and Taylor for their success, and thanked them for their presentations.

780 PCOM Liaison to Pre-Cruise Meetings

During the report by L. Garrison in Minute 773 a discussion was held about the necessity of having a more direct PCOM input into the preparation of the leg prospectus at the pre-cruise meeting. A motion was put forward in response to this desire, leading to the following discussion.

Discussion

von Rad was concerned about the additional time and travel commitment this would impose on PCOM members, as well as the additional cost. Other non-US members of PCOM were clearly not at ease. Brass calculated, however, that this motion would require travel to about one meeting every two years for a PCOM member. Besides, there is no specification that the liaison has to be a PCOM member. The liaison could be a member of a thematic panel appointed by PCOM. Meyer suggested that the draft prospectus could also be sent to the appropriate PCOM members for comment. Brass said the idea is to keep everything general and flexible.

Garrison wanted to know why it is assumed that if the program is clear to the liaison, it would not be clear to the Science Operator? Austin said that there have been these kinds of misunderstandings in the past. Hayes said that PCOM is under the obligation of defining, as well as possible, the objectives and priorities of a drilling leg. The liaison method should be given a try and if it is not needed then PCOM should back-off. The liaison to the NE Australia Margin pre-cruise meeting in February will be decided later. The question was called.

PCOM Motion

PCOM shall designate a liaison to each pre-cruise meeting, to provide guidance during the construction of the drilling leg prospectus. (Motion Brass, second Malpas)

Vote: for 10; against 2; abstain 4

781 Role of Detailed Planning Groups

Mark Langseth's memo of June 22, 1989, to the Planning Committee discusses the need to keep the responsibilities for planning and advice separate in JOIDES, and in particular they need to be separate with respect to the function of DPGs. The very name Detailed Planning Group indicates that he is essentially correct in his evaluation of the situation. His recommendations are:

1. DPGs be ad hoc short-lived groups formed by PCOM and reporting to PCOM.
2. Special Working Groups can be formed ad hoc by thematic (and other?) panels with PCOM approval.

Leinen agreed with Langseth that the functions of the two groups should remain separate. Taira, who was on the subcommittee which wrote the mandates, also agreed with Langseth. DPGs provide specific drilling plans; they do not provide advice on other matters to panels. Brass said that DPGs should report through the thematic panels. PCOM should not approve their recommendations until the thematic panels have had a chance to comment on them. Malpas agreed that DPGs should report through the thematic panels. Mevel agreed as well. von Rad feared that having to report a detailed plan through a thematic panel would slow down the process 6 months. Moberly pointed out that PCOM forms DPGs, and can without the request of any one thematic panel. Malpas said that DPGs may have to report through more than one panel. Leinen said that planning by DPGs is usually for some thematic panel and if so should report through the panel. Brass said that a circular planning route should be avoided; a better method would be to have the thematic panels make their comments to PCOM, that way we know where the problems are occurring. Watkins said this is a management problem and PCOM needs to provide specific mandates for DPGs. Cowan asked if the thematic panels should have the right of approval over what comes from the DPG. Brass said that they should not edit what PCOM sees, only comment upon it. von Rad was concerned that these mechanisms would slow down the planning process. Mevel suggested that the thematic panels have a better expertise to evaluate the job done by the DPG. A part of the mandate for DPGs was read aloud: *DPGs provide written documents to those thematic panel(s) specified by PCOM. The DPG documents are transmitted to PCOM with the written evaluation of the appropriate thematic panel.* A straw vote indicated that PCOM did not want any change in the mandate of DPGs.

With respect to the two functions that Langseth wrote about, Watkins wanted it emphasized to the thematic panels that DPGs are not working groups. Cowan said that reconstruction of ad hoc working groups is required. Currently, the JOIDES structure does not provide for them. Brass requested that the PCOM mandate be changed so as to reconstitute ad hoc working groups. Moberly agreed to draft this language, to be presented the following morning..

Thursday, 24 August 1989

The following change in the PCOM mandate was offered, to reconstitute ad hoc working groups.

PCOM Motion

PCOM approves the change in wording of the PCOM mandate shown below.

3.2 Mandate. The Planning Committee is responsible for the mandates of the various panels, planning groups, **and ad hoc working groups** and their membership. (Addition shown in **bold**)

(Motion Brass, second Watkins)

Vote: for 14; against 0; abstain 0; absent 2

The status of the remaining two regional Detailed Planning Groups CEPDPG and WPDPG was considered. WPDPG has finished its work. The remaining work for the CEPDPG might be done mainly through the mail. The following motion was made.

PCOM Motion

PCOM disbands both the Western Pacific Detailed Planning Group and Central and Eastern Pacific Detailed Planning Group. (Motion Kastner, second Hayes)

Vote: for 1; against 13; abstain 1; absent 1 **(Failed)**

Discussion

Austin said that there will be site survey data coming in for CEPAC programs, requiring some group to evaluate it and pick the best sites. Hayes suggested that SSP was the appropriate panel, but was reminded that EXCOM had carefully reworded the SSP mandate. Cowan said that there are no detailed plans for Cascadia. Brass stated that the proper method would be to have CEPAC meet as soon as possible and pass their report for comments through the thematic panels before our Annual Meeting. Tucholke said that at both Miami and Oslo the decision was made by PCOM to keep the CEPDPG to do the detailed planning. Although CEPAC may not have the ideal constitution, someone has to make these plans and CEPDPG has the corporate memory. Tucholke regretted that under the circumstances, the ideal situation that Brass mentioned would not be possible this fall. As a matter of damage control, CEPAC will have to meet late. Leinen supported Tucholke's logic.

Brass then agreed on a matter of pure practicality, and said that PCOM will need these detailed plans in November, to choose 6 legs for FY91 drilling. In some instances we don't even know whether we are talking of a l-leg or a 2-leg program.

Since there was no need to keep the WPDPG the following motion was made and passed without additional discussion. von Rad wanted Jim Gill thanked for taking over the chairmanship of WPDPG during its uncertain tenure.

PCOM Motion

PCOM disbands the Western Pacific Detailed Planning Group. (Motion Brass, second Kastner)

Vote: for 14; against 0; abstain 0; absent 2

Thematic panels will be told that, because it will not be possible to have either CEPACDPG meet before the thematic panels meet (various surveys in the eastern Pacific will not be completed), or the thematic panels meet again after CEPAC meets in November (the Annual meeting is at the end of November), PCOM realized that in the fall of 1989 it will not be possible to have the evaluations by thematic panels of the next prospectus. Therefore, thematic panels should be careful in stating their objectives for the candidate programs of the FY91 eastern Pacific drilling. Further, Brass suggested that PCOM authorize each thematic panels to send a liaison to the November CEPACDPG meeting, and PCOM agreed to this suggestion.

782 Panel Membership

Kastner suggested that in the future that a short c.v. be supplied when candidates for panel membership are nominated. This will help PCOM construct more balanced panels. This was agreed to be a good idea, and will be expected at future PCOM meetings, whether received from a panel or presented by a PCOM member. Malpas said that it would be helpful to have areas that need strengthening identified so that the non-US partners can also make appropriate appointments. Brass suggested that the nominees should also be informally approached prior to the PCOM meeting in order to know if the candidate will accept if asked by PCOM to join a panel. The nominator (panel or PCOM member) should ask, rather than JOIDES Office, which may sound as if appointment is a certainty. Hayes emphasized that those approached should be made aware that they are only under consideration. Moberly reminded PCOM members that they should be prepared to nominate candidates to ensure that panels are balanced, regardless of whether or not nominations come from panels. Hayes stated that PCOM should avoid putting more than one person from one institution on one panel.

Panel membership decisions were made for the following panels.

LITHP- two new members with expertise in seismology will be asked to join the panel in the order shown: Tom Brocher, James McClain and Paul Silver.

It was suggested that Nick Christensen be asked to join the panel after Kier Becker rotates; LITHP Chairman will be asked if that is appropriate.

OHP- one new member with expertise in Mesozoic paleoceanography will be asked to join the panel in the order shown: T. Bralower, W. Poag, R. Parrish. A new panel member with expertise in sealevel change needs to be selected by Chairman Nick Shackleton from the list K. Miller, W. Poag, T. Moore and T. Loutit.

SGPP- one new member concerned with geochemical balancing, Bill Hay, is to be asked to join the panel. Nominations with a brief c.v. are requested for a seismic stratigrapher; Bill Normark will have to fill that category until he rotates.

TECP- one new member concerned with sub-seafloor seismic observatories, Mike Purdy, is to be asked to join the panel. No actions were taken on other panel requests. Further nominations with a brief c.v. are requested to fill gaps in the panel expertise.

DMP- nominations to replace Eddie Howell are requested.

IHP- Ted Moore is asked to continue as chairman of the panel.

PPSP- one new person, Barry Katz, is to be asked to join the panel.

SMP- no actions were needed.

SSP- no actions were needed.

TEDCOM- needs to evaluate whether or not a new panel member is required.

Ted Moore is to be asked to chair the Annual Panel Chairmen's Meeting at Woods Hole in November.

PCOM Motion

PCOM accepts the slate of persons nominated to serve on panels. (Motion Leinen, second Kastner)

Vote: for 15; against 0; abstain 0; absent 1

Moberly stated that he will attend either the fall 1989 or late-winter 1990 meeting of each of the thematic panels, to explain the need for a set of program rankings on a basis common to all panels, and to answer panel questions about the procedures.

In response to a question from Malpas, Pyle said that travel costs of a liaison person are the responsibility of the country of the liaison.

Confirmations of PCOM Liaisons to fall 1989 panel meetings are:

LITHP - Duncan	IHP - Cowan
OHP - Jenkyns	SMP - Leinen
SGPP - von Rad	SSP - Lancelot
TECP - Tucholke	CEPDPG- Leinen
DMP - Cowan	

783 Global Geoscience Programs Other Than JOIDES

FDSN-IRIS

M. Purdy discussed the scientific opportunities for establishing seismic observatories on the seafloor using ODP drillholes. The long-term goal is the placement of 15 to 20 broad-band ocean floor seismographs in areas where no land or island broad-band observatory is nearby. The scientific goals of the program are to image the global earth structure better, and to constrain models of oceanic upper mantle dynamics and lithosphere evolution. The resolution of the present global tomography is limited by the seismic station coverage. A better spatial distribution is needed to sample the ray paths from large earthquakes. Oceanic islands are also not ideal stations because they are relatively noisy and have anomalous structure beneath them.

Several technical issues remain to be worked out. The ability to operate a seismograph downhole for long periods of time has to be demonstrated. Data retrieval options have to be worked out. Possibilities include use of ocean-floor telephone cables, satellite telemetry, and interval recording. Necessary pilot experiments are planned to test the equipment and make a comparison between ocean-bottom observatories and nearby ocean-island observatories. The pilot program is not planned to be extensive; if it is initially successful, the aim is to commence establishing the stations soon.

There has been a workshop at Woods Hole sponsored by JOI/USSAC to examine the need for the observatories. JOIDES is in the position to help catalyze the process. By placing reentry cones and casing holes, suitable sites for ocean bottom seismic observatories are created. This is of great importance in those areas where there are no seismic stations.

Discussion

Leinen asked if there were any areas that were more important than others for establishing observatories. Purdy said that a station off California would have the largest impact. Hayes wanted to know if the holes would have to be dedicated to the seismometers forever. Purdy said that good coupling in the drillhole may require attachment, but in the early development stages the seismometers would have to be removable.

RIDGE

J. Delaney presented the science objectives of RIDGE and importance of the linkages to ODP. The global mid-ocean ridge system is viewed as forming a single system for energy flow from the interior of the earth. One of the important recent discoveries is the impact of this energy transfer on the biology and chemistry of the ocean. An unexpected discovery that has come out of ridge-crest studies has been the ability of volcanoes to sustain life independent of the energy output of the sun. The ridge system provides a linkage between the mantle and the water column. Science objectives of RIDGE are: the study of mantle flow and associated generation and transfer of melts; segmentation and episodicity of volcanism along ridges; the interaction of seawater with basalts; the complex interplay of hydrothermal systems and organisms. Of fundamental importance is the boundary between the magma chamber and the lithosphere, which cannot be studied other than by drilling. A long-term commitment to study this boundary would generate a leap in knowledge in a 5- to 10-year period. Another common long-term goal of both RIDGE and ODP is the establishment of ocean-floor observatories at ridge crests. The success of RIDGE depends on having a drilling capability and thus has linkages to ODP.

Discussion

Moberly wanted to know if there were international links to RIDGE. Delaney said that the UK, FRG, France, USSR, Iceland, Japan, Canada and US all have strong interests in cooperating on ridge-crest studies. An international group INTERIDGE has been formed. Two more meetings are scheduled for the international group.

Austin asked if there were any areas for special cooperation between ODP and RIDGE. Delaney said that there were many areas of overlapping interest, since in many ways RIDGE is an offshoot of LITHP. Areas for closer cooperation are seafloor observatories and downhole instrumentation.

JOI Initiatives

T. Pyle suggested a possible model for the JOIDES structure with liaisons to other global geoscience initiatives (Appendix D). The size of a liaison body would be 2-4 members each from ODP and another group. There would be few meetings, with most of the work being done by mail, telemail, FAX, etc. The body would be established to focus the exchange of information and as points-of-contact.

Moberly asked when the best time to have these meetings would be; the annual meeting or this summer meeting? Brass suggested that the summer meeting seemed more appropriate. Brass said that there is already considerable overlap with some of these groups; isn't this sufficient? Pyle said that for appearance a formal liaison is better. Hayes wanted to know what would be the criteria for liaisons between JOIDES and the other groups? Pyle said that they should be international programs open to outside participation and that have an active interest in the science and objectives of ODP. Cita suggested that with big science projects, it is important to have some formal linkage for both political and international reasons. Brass said that the structure of each group is peculiar to that organization and a set formula for the liaison bodies may not work. Leinen said that the perception of the importance of ODP to these programs will also play a role in the form of the linkages. Kastner suggested that Pyle send his diagram to each group and ask them to respond as to how they view the structure. Delaney said that RIDGE views linkages to ODP as vital. There may be a need, however, to demonstrate that having a drilling capability is necessary for the success of other groups' efforts. Moberly asked if Pyle would pursue establishing these linkages to other groups and see what response is given, and then report to PCOM in November. The answer was Yes.

PCOM Consensus

PCOM approves the JOI, Inc., efforts to establish more formal links with appropriate other international global geoscience initiatives.

784 Non-JOIDES Representation on PCOM

During the presentation by T. Pyle in the reports by liaisons to PCOM (Minute 772), a discussion was held about possible action by the JOI Board of Governors to increase outside representation in the planning structure. Austin read some comments by Kastner and Brass. The Planning Committee represents the end of a lengthy process of planning; its members represent stable constituencies, whereas independent members would have no definable constituencies. Perhaps non-JOIDES observers could be invited, and if the balance changes as we hope between US and non-US members, we could open up a more permanent representation. PCOM should poll US members of panels not from JOIDES institutions, to see if there is a problem. Brass said that he had asked that participants on the *Resolution also* be included. EXCOM should be asked to delay their decision until we can find out if the perception is justified. The time of renewal of MOUs, when the numbers of members and proportion of funding might be changed, would be a good time to consider the issue, if it is still perceived as being important. Brass wondered if 2 of 10 would be considered merely a trivial gesture, if we are being questioned about openness. Watkins agreed with Brass's earlier suggestion that non-JOIDES people be polled, and that EXCOM be asked not to act until we found the extent, if any, of the perception. Austin said we must give a clear signal to EXCOM that we will do something, because they are ready to do something if we don't. The subcommittee that volunteered to prepare a resolution for PCOM approval (J. Austin, B. Tucholke, M. Kastner and G. Brass) produced the following motion and led to the following consensus.

PCOM Motion

PCOM forwards to EXCOM the following resolution. (Motion Watkins, second Austin)

Vote: for 12; against 0; abstain 2; absent 2

PCOM Resolution

PCOM is cognizant of and sympathetic to the PEC and EXCOM concern regarding "openness" of the JOIDES advisory structure to broad community involvement. Nonetheless, PCOM feels strongly that non-JOI input to its deliberations is already substantial. Approximately 50% of U.S. participants currently residing on JOIDES thematic and service panels come from non-JOIDES institutions. Furthermore, because PCOM feels that the JOIDES institutions represent the primary repositories of marine geological and geophysical expertise in the U.S., any long-term 1-for-1 replacement of their present membership on PCOM by others would both dilute necessary corporate memory and disenfranchise JOIDES institutions. However, because PCOM recognizes that various scenarios for non-JOIDES involvement in PCOM decision-making are possible, PCOM looks forward to further JOI, Inc., input on this matter.

PCOM Consensus

In order to evaluate the openness of the ODP planning structure to the interests of scientists at non-JOIDES institutions, the Planning Committee requests that the non-JOIDES ODP shipboard participants and those on the JOIDES advisory panels be asked for their impressions of the openness of the program and to comment on means to improve whatever deficiencies may be apparent.

785 Responsibilities of Operations Superintendent vs. Co-Chief Scientists

PCOM discussed Yves Lancelot's letter of 5 August 1989 to PCOM chairman Moberly concerning statements in a memo given to Co-Chief Scientists as part of a notebook at the pre-cruise meeting, stated as coming from the JOI-ODP Policy Manual. These statements discuss the responsibilities of the Operations Superintendent vs. those of the Co-Chief Scientists onboard the *JOIDES Resolution* concerning implementation of drilling and logging plans. The Policy Manual, however, is still in draft.

Moberly suggested that a subcommittee be formed to examine the ODP Policy Manual draft and recommend to JOI any appropriate changes in parts that have to do with the JOIDES role of providing scientific advice. Garrison wanted to know if there was also a problem with the logging statements made in the ODP-TAMU memorandum. There were no objections to that part of the memo. The logging statements are based on the PCOM motion at the January 8, 1987 PCOM meeting. Leinen said that her reading of the letter suggests that the problem is with the vague wording in the memo about the ODP Policy Manual statement.

Brass said that ODP-TAMU is responsible by contract to carry out as best they can projects given them by the planning structure and therefore has the authority to ensure that the Co-Chiefs follow these instructions. Kastner and Austin agreed with Brass. Moberly expressed concerns about situations where there are valid scientific differences of opinion based on knowledge gained during the drilling. Leinen suggested that the wording should be changed. Tucholke said that deletion of the first three sentences of the paragraph commencing with Departmental policy ... and allow the remainder to follow paragraph 562 would remove the problem. [The remainder should begin: This policy statement is not to imply ...] Moberly pointed out there are also some misstatements; *i.e.* PCOM does not approve the cruise prospectus.

Garrison suggested that unless the ODP-TAMU policies go against PCOM policy, these internal documents should not be a PCOM concern. PCOM suggested that the Science Operator use more appropriate, neutral wording which would solve the problem without affecting ODP-TAMU internal policy. PCOM's recommendation to JOI was that the Science Operator be asked to remove the first three sentences of the TAMU paragraph after draft paragraph 562.

786 Future Meeting Schedule

The next meeting will be the 1989 Annual PCOM meeting to be held in Woods Hole, Massachusetts, on 27-30 November, 1989, and hosted by the Woods Hole Oceanographic Institution. It will be preceded by the Panel Chairmen's meeting on 26 November. A field trip is very tentative.

The The 1990 Spring PCOM meeting is to be held in Ville Franche near Nice in the South of France on 24-26 April, 1990. A tentative field trip in the Alps has been suggested.

The 1990 Summer PCOM is to be held in La Jolla on 7-9 August 1990 and hosted by Scripps.

The 1990 Annual PCOM meeting is to be held in Hawaii on 26-29 November, 1990 and will be hosted by the Hawaii Institute of Geophysics. It will be preceded by the Panel Chairmen's meeting on 25 November. The specific venue (Honolulu, Hilo, or elsewhere) is not yet set.

The 1991 Spring PCOM meeting will be hosted by the University of Texas at Austin in April 1991.

The 1991 Summer PCOM meeting will be hosted by the FRG in August 1991.

787 Conclusion of the Meeting

The Planning Committee thanked Darrel Cowan for his efforts towards making this meeting both productive and enjoyable. Thanks were also forwarded to Paul Johnson and the College of Ocean and Fishery Science of the University of Washington.

The 1989 Summer PCOM meeting adjourned at 1:45 PM so that participants could attend the joint USSAC/US-PCOM meeting scheduled for that afternoon.

In the attempt to finish in time for the joint meeting, the following business item on the agenda was overlooked. Through a poll conducted by PCOM chairman Moberly just before the joint session, PCOM approved the suggested change in mandate for those service panels without a statement about membership. [EXCOM had asked that a membership statement be made for all of the panels; the proposed wording had been printed in the agenda briefing book.]

PCOM Poll of Individual Members

PCOM approves the change in wording of the Terms of Reference for Service Panels as shown below, and forwards to EXCOM the recommended change for EXCOM's approval.

7.1 General Purpose [of Service Panels] is modified by having its last sentence transferred from that section to be the first sentence of a new Section 7.1.1, which reads:

7.1.1 Membership. PCOM appoints the chairman and panelists and keeps membership, including representation from the non-U.S. JOIDES member institutions, under review. The Chairman serves at the pleasure of PCOM, and members serve at the pleasure of PCOM or their non-U.S. appointing member. Representation from all non-U.S. members should be maintained. Panel membership, not to exceed 15, should be maintained as small as is allowed by the range of expertise necessary to meet mandate requirements.

Vote: for 13; against 0; abstain 0; absent 3

Conclusion of meeting.

Material distributed at the meeting

Appendix A	NSF budget
Appendix B	ODP operations schedule; site locations of legs
Appendix C	Nankai drilling
Appendix D	Possible structure to include liaison to other global geoscience initiatives

University of Hawaii at Manoa

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October 10, 1989

Dr. Ralph Moberly
Chairman, JOIDES Planning Committee
HIG JOIDES Office

Dear Ralph,

This is a cover letter for you to our latest minutes and I use it to bring several items to your attention and the attention of PCOM. These items fall into three general categories and I discuss each in turn. Each item is fully covered in the minutes also.

<u>Long-term planning</u>: There are several items which seem to be falling through the cracks of the system, namely long-term planning items of a detailed nature. For example, who ensures that enough ODP reentry cones are placed such that the global seismic array eventually can be deployed? Another example: the ODP long-range plan calls for a deep hole through the crust into the mantle; this will require modifications to the ship and other developments. Who has the task of evaluating what has to be done, the timescale, etc.? We discussed these issues and propose a solution for the latter. We feel that the solution is a DPG called the "Deep-drilling DPG" which <u>is</u> also <u>urgently needed to evaluate proposals for deep drilling and to formulate drilling plans</u>. <u>We urge that such a DPG be approved as soon as possible</u>.

As a reminder, after the Fornari cruise to the EPR at 9°30'N and after we receive a revised French EPR proposal, LITHP will need to formulate a drilling plan for EPR base-rock drilling. The SRDPG (or WG) formulated general guidelines for such drilling and LITHP thinks it would be appropriate to ask them to evaluate the site survey data for 9°30'N, competing EPR proposals and to formulate a drilling plan. If PCOM would prefer to have LITHP do this, we probably could, but it would require another meeting. However, the SRDPG, by virtue of membership and having recently written a report on bare-rock drilling is much better qualified to put together a drilling program.

The issue of how to avoid a recurrence of the "Geochemical Reference Sites" phenomena was also discussed. LITHP feels that disciplinary balance on PCOM is an essential factor to prevent recurrence. Other measures which might help are offered as suggestions:

1.) pass a resolution making it impossible to reverse a decision without a 2/3 majority <u>or</u>

2.) pass a resolution making it impossible to reverse a decision on drilling at the meeting immediately following the one at which the decision was made.

These suggestions might help decrease the amplitude of high frequency noise. Probably these are other ways of doing this also.

Upcoming LITH drilling: LITHP is most concerned that the three programs which we ranked as our top priorities for 1991 will not all get drilled in 1991. These three programs are very exciting scientifically. Further, the technological developments to make drilling them feasible have been a top priority of the drilling program for some time. Even though it may seem that this would represent more than a fair share of drilling for LITHP, it is clear from past experience that one should average over a longer time span to achieve disciplinary balance in ODP. I note that our top three CEPAC programs are also our top-ranked programs overall--this has been true for quite some time. LITHP has had no drilling addressing our highest priorities since 1986. For these reasons, the LITHP and the entire lithosphere/ridge crests/deep crust etc. communities will be most distressed if these programs are not all drilled in 1991. LITHP has waited patiently for many years to accomplish its top priorities. The capabilities now exist to do this and we strongly urge that these plans go forward.

Engineering development--high-temperature, slimhole tools: As you know, LITHP met jointly with DMP. We had a very fruitful meeting from which arose several recommendations. Developing high temperature, slimhole tools is clearly a very urgent priority. We recommend, however, that the LDGO logging group, not TAMU, undertake this task. R. Anderson feels that if resources are made available, a tool could be built by repackaging (dewaring) existing high-temperature (260°C) tools. LITHP urges that resources be made available to do this.

At the same time, TAMU should develop the capabilities that are essential for success at sedimented ridges and EPR drilling. These items include high-temperature bits and core liners, drillable post-drilling seals for the holes, and a tougher Barnes-Uyeda tool. Obviously the DCS and Pogo guidebase will also be essential for some of this drilling.

As you will see in our minutes, we have made some headway toward providing PCOM with a ranked list of drilling programs. Some of these programs are still "proto-programs" or naked (proposal-less) themes. We have only ranked such proto-programs in cases where we know proposals by excellent scientists are being written and will be available by March 1990.

I hope that you will be able to address many of these items at the November PCOM meeting. Thank you for your consideration.

Sincerely,

Rodey Batiza

Rodey Batiza
LITHP Chair

RB:ctk
Enclosure

JOIDES Lithosphere Panel Meeting
Windischeschenbach, FRG (KTB site)
September 8-12, 1989

EXECUTIVE SUMMARY

Leg 129: LITHP endorses the Leg 129 prospectus with at least 100 m of basement penetration at PIG-1, or PIG-2 and PIG-3. The nature of Jurassic ocean crust is extremely important, so if drilling conditions are favorable, up to 300 m of basement penetration at one site would be highly desirable. LITHP objects most strongly to the suggestion of not drilling a deep basement reentry site on Leg 129.

Leg 130: This program has had strong support from LITHP as a multi-objective drilling program. Even so, there has been no LITHP thematic input into the draft prospectus for the Ontong-Java Plateau. We strongly urge that the deep reentry site be targeted to recover at least 150 m of basement and be drilled as the first site on the Leg.

Lack of communication for Leg 130 raises the general issue of the detailed planning of drilling legs. To avoid future problems, LITHP strongly endorses the notion of thematic input/participation in putting together Leg prospectii. A related issue concerns effective communication among all thematic panels. In order to ensure effective communications for multi-objective legs, LITHP requests a permanent liaison to OHP.

Geochemical Reference Sites - Our new ranking places GRS as a very high priority. Fundamental questions raised by Legs 125 and 126 require constraints on the nature of material being subducted. LITHP strongly urges that GRS be drilled in 1992 or 1993.

Sedimented Ridges DPG Prospectus: LITHP strongly endorse the two-leg drilling plan for sedimented ridges formulated by the SRDPG. We strongly urge that the recommendations of this report be implemented and that drilling be scheduled for 1991.

Long-range Planning: LITHP has four long-term goals, incorporated in the ODP long-rage planning document:
range

- -- a deep drill hole traversing normal ocean crust to mantle
- -- establishing global-seismic arrays and ridge-crest observatories
- -- investigating the magmatic and hydrothermal processes of crustal accretion at a variety of spreading rates
- -- improved understanding of off-axis volcanism.

Drilling a deep hole through the crust will require future modifications to the drill ship and development of heavy-duty reentry cores and casing. We strongly urge that a DPG be created to start examining these issues. This "deep drilling" DPG (DDDPG) also should evaluate proposals for deep drilling in offset crustal sections and formulate drilling plans. It is urgent that the DPG be approved soon, as the need to examine these questions in detail will probably arise in 1990.

A pilot hole for global seismic arrays should be drilled before 1992 or 1993. We urge PCOM to discuss the need for more ODP sites equipped with reentry cores, as such sites (15-20) will be need to establish the oceanic part of the array.

LITHP Priorities for 1991 Drilling: LITHP ranks the six programs for possible Central and Eastern Pacific drilling as follows:

1. 504B (1 Leg)
2. Sedimented Ridges (1 Leg)
3. EPR bare rock (1 Leg)
4. Chile triple junction (1 Leg)
5. Cascadia Margin
6. E. Equatorial Pacific Neogene.

LITHP urges that at least 1 Leg of drilling be devoted to each of the three top ranked programs. The long-awaited capabilities of the drill ship now offer promise that the most highly ranked thematic objectives of LITHP can be successfully drilled. Since 1986 there has been no ODP drilling that addresses these themes. We thus feel very strongly that 1991 and part of 1992 be devoted to these highest priority LITHP programs. An engineering leg at the EPR and 504B and three legs of scientific drilling in 1991 should be followed up with at least 2 additional legs at sedimented ridges and the EPR.

High Temperature and Slimhole Logging Needs: LITHP met jointly with DMP to consider immiment logging needs. Our recommendations are that the logging group at LDGO be given the responsibility and needed resources to construct a high-temperature, slimhole tool string to measure as many as possible of the following: temperature, borehole fluid resistivity, formation resistivity, natural gamma, sonic, caliper, flow meter, borehole fluid pressure.

At the same time, we strongly urge that TAMU develop: 1) high-temperature bits and coreliners, 2) a modified Barnes-Uyeda tool, 3) continued development of the DCS and pogo guidebase, 4) post-drilling seals for ODP holes. These developments are deemed essential and urgent.

Next Meeting: First week of March, 1990; New Orleans - to overlap with TECP for a joint meeting.

JOIDES Lithosphere Panel Minutes
September 8-12, 1989
Windischeschenbach, FRG (J. Erzinger, host)

Present: R. Batiza, K. Becker, L. Cathles, S. Cloetingh, J. Erzinger, J. Franklin, T. Fujii, S. Humphris, C. Mevel, J. Mutter, J. Pierce, M. Perfit, J. Phipps-Morgan, G. Smith, E. Davis (CEPDPG), R. Buck (TECP), J. Malpas (PCOM)

R. Anderson (guest; Logging Group)
P. Bitschene (guest; Bochum)

Absent: M. Goldhaber (SGPP)
J. McLain (new LITHP member)
T. Brocher (new LITHP member)

On September 8, LITHP was treated to a complete tour of the KTB deep drill site. The tour included talks by KTB geologists and engineers, who described the geologic results of the completed 4000 m-deep pilot hole and some of the drilling/logging techniques and difficulties. After this, we toured the very impressive on-site laboratory facilities. The pilot hole employed a novel closed-system of synthetic drilling mud. This system allowed analysis of many components mixed into the mud by drilling, including rock flour, deep fluids/gases and cutting. Comparison of chemical analyses of rock cores (>95% recovery with a narrow kerf DCS) with cuttings and rock flour show that the rock flour (whose origin can be pinpointed ± 20 cm in hole) is fully representative of the cored rock, whereas cutting>140 μ in size are mostly from cavings. Since the composition of the drill mud is known and carefully monitored, addition of fluids can confidently be detected. In this way, several horizons of fluid influx were identified. Drilling of the main hole (target depth >10 km) is scheduled to begin in Fall 1990. Overall, the drilling, logging, on site-analytical and follow-up analysis programs are extremely impressive. Many of the new techniques developed at the KTB site may have application to ODP drill holes, so it seemed very appropriate for LITHP and DMP to meet at the site.

On September 9, LITHP officially began its meeting at the Oberpfalz Hof hotel at 0830. Joerg Erzinger made some welcoming remarks and discussed meeting logistics. For those not able to participate in the KTB tours on September 8, a special tour was arranged for the evening. LITHP also welcomed S. Cloetingh (ESF) and (in absentia) Jim McClain and Tom Brocher to the panel.

1.0 LIAISON REPORTS

1.1 PCOM:

John Malpas and Catherine Mevel gave a report on PCOM activitie August meeting in Seattle. Some items also required discussion of the earli meeting in Oslo (March, 1989).

ODP budget - ODP will receive only a 4-5% increase in 1991 for inflation. important to LITHP because the drill string on the RESOLUTION may have replaced and there is a vital need for additional funds to build logging tools temperature slimhole drilling anticipated in 1991.

TAMU report - Of interest to LITHP is the issue of the aging drill string wh ship is presently using. This 5-year old string shows signs of failing and may replaced.

Ontong-Java Plateau (Leg 130) - PCOM discussed a drill plan for the upcomi drilling leg (142/E - Revised and draft of the Leg 130 prospectus). This plan sites as a Neogene transect and one reentry site for deeper penetration into pre sediments and basement. The draft Leg 130 prospectus recommended that the reentry site be drilled first with the four Neogene transect sites to follow. PCC reversed this recommendation, apparently because of a perception that the Neog program was the only goal of the Ontong-Java plateau (OJP) drilling program.

LITHP has provided strong support for Leg 130. At the 1987 LITHP me Paris, LITHP ranked drilling at OJP as its fifth highest priority and sent i st six programs to CEPAC. This strong endorsement from LITHP is one rea tha CEPAC included OJP as a multi-objective program in its prospectus for drilling Central and Eastern Pacific. LITHP recommended at the time that 300 to 500 m basement be recovered from at least one site. As shown by drilling on Leg 81 on Norwegian margin, significant (>100) penetration into basement is needed to inter melting processes and origin of thick submarine volcanic piles. LITHP reaffirms vital importance of drilling at least 150 m into basement. In addition we strongly that the deep reentry site be drilled first because, basement objectives are vital to success of Leg 130 and putting this objective at the very end places it in jeopardy being completed.

LITHP decries the erosion in importance of the basement objectives during 130. We feel that this is partly due to poor communication - LITHP had no liaison the latest OHP and CEPDPG meetings. For this reason we ask that LITHP be allowe have a liaison to OHP. While there is not a great deal of scientific overlap between LITHP and OHP, discussion of objectives and priorities are important to squeeze the best science out of each and every ODP hole. Chances of doing this are greatly improved if all thematic panels communicate effectively and optimize site selection ar drilling strategy to maximize the scientific return for a variety of objectives.

ODP Long-Range Plan - PCOM has approved the ODP long-range planning document. This document recommends an emphasis on lithosphere drilling, which is appropriate given the present and developing capabilities of the drill ship. This plan recommends significant progress on LITHP priority objectives which have been addressed only minimally by previous ODP drilling. In order to meet important COSOD 1 and COSOD 2 goals, the ODP long-range plan calls for 37 drilling legs dedicated to LITHP d 3 i the period 1989-2002 (43% of the total drilling time available). The program is phased (Phase 1, 89-93 - 9 legs; Phase II, 93-97 - 14 legs; Phase III, 93-02 - 14 legs) to achieve significant progress on deep crustal drilling, seismic and ridge crest observations, understanding hydrothermal and magmatic processes at active ridge crests and intraplate volcanism. The amount of drilling for LITHP objectives will be sufficient to make significant progress in these areas and to achieve the long-term goals of LITHP. However these estimates assume that technological developments that are in progress will be successful. Reduction in the amount of drilling time allocated in the ODP long-range plan for LITHP objectives would seriously jeopardize the possibility of achieving the scientific objectives outlined in the LITHP White paper and ODP long-range plan.

<u>Preparation of Prospectii for Drilling Legs</u>: PCOM has proposed that PCOM or thematic panels send representatives to help write the prospectii of upcoming drilling legs. LITHP strongly supports this notion, especially for drilling legs which have been put together without the benefit of a DPG or WG.

<u>Engineering Developments</u>: Barry Harding reported to PCOM on progress of engineering developments. The DCS drill string will be lengthened to ~4000 m and the DCS system will be tested at two land sites in the U.S. The Navidrill has a tendency to stall, but can still be used for several important tasks during Leg 131 (Nankai). The XCB is fully operational.

Roger Anderson of the Logging group raised the issue of high-temperature and slimhole logging capabilities. Later sections of these minutes (section 4.0) also addresses these questions and makes several important recommendations. <u>LITHP believes that the Logging group rather than TAMU should be given responsibility for developing logging capabilities in hot, slim DCS holes. TAMU, in turn, should have the responsibility of developing high-temperature bits and core lines, of improving the Barnes-Uyeda tool and helping to develop needed drillable plugs for holes where hydrothermal objectives are important.</u>

<u>FY91 Drilling Program</u>: Later in these minutes, we give our prioritized listing of the six programs proposed for 1991 drilling in the Central and Eastern Pacific.

<u>DPGs and WGs</u>: PCOM discussed the general issue of detailed planning groups (DPGs) and ad-hoc working groups (WGs). This issue is of great concern to LITHP, which has had experience with both DPGs and WGs. We feel that the most important function for such groups is to hammer out the best drilling programs to achieve both long-term and short-term goals. This is a difficult and time-consuming task, especially in cases where there is more than one proposal addressing a high-ranked drilling theme or in cases where several different proposals address the same theme but in different geographic areas. Thematic panels lack the expertise and time needed to accomplish this reasonably detailed sort of planning at the level of excellence required. However, it <u>is</u> vital that thematic input for such planning be constantly maintained and for this reason we favor DPGs over WGs, at least as presently configured. As an example, or model, of how DPGs can very effectively put together an excellent drilling program, we would cite the sedimented ridges DPG (SRDPG) which used input from several different proposals for drilling in several diverse geographic areas. The fact that the DPG had significant overlap in membership with LITHP, and reported its findings to LITHP for additional discussion, insured strong thematic input into the program that was hammered out in detail by SRDPG.

LITHP has also had excellent experiences with WGs such as the one for Lau Basin drilling. Partly this is, again, because of overlapping membership and excellent communications. If ad-hoc WGs are formed to formulate detailed drilling plans, then it is very important to insure that thematic input is maintained. There are probably several good ways of insuring this, but the easiest is probably by having overlapping membership with the appropriate thematic panels and frequent updates of activity and discussion at thematic panel meetings. This is especially important for drilling programs that address the goals of more than one thematic panel. LITHP has several important concerns regarding thematic long-term planning and thematic input to multi-objective legs. These are discussed more fully later in these minutes under "Long-term planning" and "CEPDPG" respectively.

<u>Thematic Panel Replacements</u>: LITHP is gratified by PCOM's concern for disciplinary balance in thematic panels. LITHP feels that its present membership reflects an adequate balance of expertise to evaluate diverse drilling proposals and for thematic planning of long-range goals. LITHP also feels that disciplinary balance is extremely important on PCOM. We note (ruefully) that in several previous instances, misunderstanding of the scientific goals of particular drilling programs, exacerbated by the absence of the PCOM members expert in the field, has led to great confusion. Such situations could be partly avoided by having a better disciplinary balance on PCOM.

<u>Non-JOI Membership on PCOM</u>: As discussed in the report of the ~~Peck~~ PEC committee, involvement of non-JOI members in ODP could be beneficial for many reasons. Scientifically, of course, the entire Earth sciences community has great interest in ODP results. Further, several long-term goals of ODP (as set out in the ODP long-range plan), such as extending global seismic observations and in-situ stress measurements to the ocean basin, requires active participation by scientists not necessarily working at JOI institutions. For this reason, LITHP endorses the notion of broader community input into ODP. Such input would scientifically strengthen the program but may be most effective at the thematic panel level. Already, most thematic panels have U.S. members from non-JOI institutions. For LITHP, at least, this is very beneficial and we hope the practice will continue in the future.

<u>Geochemical Reference Sites Drilling</u>: PCOM reconsidered its decision to cut GRS from the 1990 drilling schedule but decided not to reverse it. Since LITHP strongly supports GRS drilling, a direct outgrowth of COSOD II, we are disappointed by this decision. LITHP will continue to strongly advocate such drilling because, as shown by the Leg 125 and 126 results, it is essential to provide constraints on the nature of the material being subducted if we are to understand the material fluxes occurring at convergent margins. LITHP has ranked GRS very highly (see later parts of these minutes) and hopes that the drilling can be done in 1992 or 1993.

LITHP believes that the decision to cancel the GRS leg at its Oslo (1988) meeting was an error. However we also believe that the ODP planning structure can benefit from this error if we understand the reasons for it and can avoid future problems of the same type. Several suggestions emerged during a lengthy discussion and we offer these for consideration by PCOM and perhaps other thematic panels: LITHP has identified two factors which we feel contributed adversely to consideration of the GRS program:

<u>Scientific misunderstanding of GRS</u>: We conclude that many members of PCOM did not understand the scientific goals of the leg beyond the superficial and now-famous "cow-eating-grass" analogy. Given that the proponents attempted to clarify the goals and methods numerous times, in both written and oral presentations, LITHP is puzzled

that confusion apparently still existed. Partly, this may be because the name "Geochemical reference sites" does not explicitly convey the scientific goals: "Quantitative tests of material fluxes at convergent margins" would perhaps be a better name. In addition it would convey the vital need for such drilling as an integral part of the Mariannas-Bonin transects (as demonstrated by the Leg 125, 126 results). Partly, however, we feel that this confusion is a direct and negative result of poor disciplinary balances on PCOM. Accordingly, we hope that new PCOM members will be selected partly with consideration of disciplinary balance as an important goals.

Absence of LITHP-PCOM liaison at Oslo: Related to the above, is the feeling that the absence of the LITHP liaison (J. Malpas) at Oslo was an important factor in cancelling the GRS leg. This is difficult to assess with confidence, however it is clearly important for PCOM to have accurate and timely thematic input to important decisions. We offer the following suggestions which may help to prevent future problems.

1.) That PCOM not reverse decisions (positive or negative) on scheduled drilling legs at consecutive meetings.

2.) That PCOM decide to require at least a 2/3 to 3/4 majority to reverse any major decision affecting the drilling schedule.

Leg 132 Plans and Staffing: PCOM recommended that J. Natland be a co-chief on the upcoming engineering leg. LITHP believe this is an excellent choice. LITHP has important concerns regarding detailed site selection and believes it is vital that a good site be chosen to test the capability of the DCS in young, rubbly volcanic rock such as will probably be encountered at the EPR and other young ridge crest terrains.

1.2 TECP:

The Tectonics panel has not met since LITHP's last meeting in Miami, thus C. Mevel (LITHP liaison to TECP) and R. Buck (TECP liaison to LITHP) had nothing new to reports. TECP next meets in Honolulu, September 26-28. TECP and LITHP have agreed to have an overlapping meeting at their early spring meeting in 1990. Tentatively this is set for the 1st week of March in New Orleans so that the TAMU engineers who commonly attend the spring LITHP meeting, will not have to travel long distances to the meeting.

1.3 SGPP:

The Sedimentary and Geochemical Processes Panel has produced its White paper, which indicates considerable scientific overlap with LITHP, particularly in the area of hydrothermal processes at sedimented and unsedimented ridge crests. SGPP will meet next at GEOMAR (FRG) 19-20 September.

1.4 CEPDPG:

The Central and Eastern Pacific DPG met in Hilo, April 11 and 12. Unfortunately, E. Davis, LITHP liaison to CEPDPG was unable to attend. It is the perception of LITHP, that there has been a certain erosion of LITHP priorities within CEPDPG, as reflected in the CEPAC straw-man drilling schedule. This is a serious concern because of LITHP's highest priority drilling themes (3 of the top 4, 6 out of the top 10), most can best be addressed in the Pacific. In the last three years (since Leg 111, there has been no ODP drilling which addresses the highest priorities of LITHP. LITHP has been waiting since 1986, and before, to achieve progress on COSOD I, COSOD II goals and those discussed in the ODP long-range plan. For this reason, we strongly urge that a large proportion of the drilling time available for Pacific drilling in 1991 and beyond be used to start addressing these high-priority LITHP drilling objectives.

Another issue involving CEPDPG is the upcoming Ontong-Java drilling (Leg 130). As discussed earlier, LITHP is distressed over the continued erosion of LITHP goals for the OJP. We feel that this sets a bad precedent for future multi-objective legs and that more effective planning is needed to insure that the scientific accomplishments of each drilling leg reflect joint thematic priorities. The example of OJP can be used to illustrate how not to plan a very important, multi-objective drilling leg. In the future, this perhaps can be remedied by having thematic input to leg prospectii. However, thematic input at an earlier stage would be much more useful. In the case of OJP, the CEPDPG prospectus for CEPAC was well balanced and excellent, so we are puzzled that LITHP objectives have apparently been down-graded. Is this because PCOM chose to ignore the recommendations of the CEPDPG? Is it because realistic drilling estimates were not made soon enough? For the future, it seems clear that an effective way must be found to insure timely thematic input to planned drilling programs. If these programs arise largely from a single thematic panel, (for example through the efforts of a DPG) then the DPG should include representation from all other interested thematic panels as well. Failing this, perhaps the policy of circulating all DPG reports to all thematic panels (in time to respond before drilling decisions are made) will be effective.

Old Pacific Crust (Leg 129): LITHP has important goals (see 2d CEPAC prospectus) which will be addressed by Leg 129, including: 1) Nature and composition of oldest Jurassic basaltic basement, 2) chronology and significance of regional Cretaceous off-axis volcanism, and 3) nature of the Jurassic quiet zone. We strongly support multiple reentry drilling at sites PIG-1 or PIG-2 and 3 as proposed in the Leg 129 prospectus and hope that at least 100 m of basement can be recovered from the deep basement reentry site. For LITHP objectives, up to 300 m would be highly desirable, so if drilling conditions are favorable; LITHP would assign a high priority to achieving this goal.

Lau Basin (Leg 135). J. Pierce, a member of the Lau Basin Working group reports that planning for the leg is well-underway and on track.

1.5 SRDPG:

Earl Davis presented the final results of the Sediment Ridges DPG. These are summarized in the SRDPG's "Sedimented Ridge Drilling Prospectus". The planned two leg program is aimed at 1) a three-dimensional characterization of the fluid flow and geochemical fluxes within a sediment-dominated hydrothermal system, and 2) a systematic investigation of the processes involved in the formation of sediment-hosted massive sulfide deposits. These goals have been and continue to be among the highest LITHP priorities for drilling.

LITHP strongly endorsed the SRDPG prospectus for two legs of drilling. Furthermore, we strongly urge that the engineering developments needed to successfully undertake the program be completed. These essential developments include:

1.) the DCS and pogo guidebase, which are essential for sulfide drilling

2.) high-temperature drill bits and core liners

3.) modifying the Barnes-Uyeda tool for higher temperatures (up to 200°C) and tougher conditions (shortening the tool?)

4.) Post-drilling seals which could be installed and removed either by the drill ship, or (more desirable) by a submersible or ROV.

In addition to these essential developments, there are other developments which are highly desirable and would result in significantly enhanced scientific return. These include:

1.) Openable annulus seals for the DCS system. These are needed to measure interval permeability and apparently such seals already exists.

2.) Standard logging through side entry sub with circulation. This capability also exists for standard-diameter RCB holes. If the DCS is used in basement, reaming with the RCB would be needed to complete standard logging.

3.) Slimeline, high-temperature logging tools of various types. The essential logging needs for the sedimented ridge program (using RCB drilling) can probably be done with standard dewared high-temperature tools if in-hole circulation is maintained. However other programs using the DCS extensively , such as EPR drilling, will require slimhole capability. These needs, possible solutions and joint LITHP-DMP recommendations are discussed later in these minutes.

4.) Pressure core barrel

5.) high-temperature packers.

6.) Capability to measure H_2S and related gases on the drillship.

Overall, the sedimented ridges drilling program is considered by LITHP to be extremely strong. Its overall success, however, depends on technological development for drilling and logging. <u>We thus strongly urge that the necessary resources be made available to TAMU and the logging group to implement the needed developments</u>.

2.0 LONG-TERM PLANNING

<u>2.1 General</u>

LITHP discussed the difficulties of long-term planning in a proposal driven and (partly) ship-track driven program. How can long-term goals such as those of COSOD I, COSOD II and the ODP long-range plan be implemented? LITHP has several important long-term goals:

<u>LITHP Long-term Goals for ODP</u>

1.) A continuous deep drill hole penetrating normal ocean crust into the mantle

2.) Establishing global seismic arrays and ridge-crest observatories

3.) Investigating crustal accretion processes at a range of spreading rates

4.) Improved understanding of off-axis volcanism which modifies oceanic crust and lithosphere.

These priorities have remained more-or-less the same since COSOD I and continue to be the driving force for LITHP in proposal evaluation and long-term planning.

In order to achieve progress on these goals, a phased approach is suggested in the ODP long-range planning document. This phased approach could probably succeed, however, the planning document provides only a broad outline. In addition to this broad outline, there is need for planning groups to insure that the capabilities needed to achieve these goals come on-line in a timely fashion. Many details need to be worked out and strategies to do this have to be developed. It is not clear that the present ODP planning structure is designed to meet these long-term needs. For example, in order to drill through normal crust in water depths of 4-5 km, a total drill-streng length of at least 11.5 km will be required (Report of USSAC Deep Crustal Drilling Workshop). Handling such a long string will probably required some modifications to the drill ship. In addition, much heavier duty reentry cores and casing will have to be developed to sustain 80-100 plus reentries. Other modifications, to the sand line system and elsewhere would have to be implemented as well.

Another example of long-term planning needs concerns the important goal of establishing a network of broad-band seismometers in the ocean basins. To do this will probably require 15 to 20 appropriately located holes equipped with reentry cones. Many people have simply assumed that these reentry-cone-equipped holes will be available, but ODP has placed only about half a dozen reentry cones on the seafloor since its inception (drop-in reentry cones will not work for this purpose).

LITHP tried to consider how long-term issues of this sort could best be handled. While many of these issues may be within its mandate, PCOM already has a great deal to do. It does not seem likely that PCOM could implement long-term planning at this level of detail and still do all the other things it has to do.

Another possibility would be thematic panels. Thematic panels are certainly in a good position to specify what needs to be done, however it is not clear that thematic panels have the necessary expertise to find the best solutions. Thus, the option which seems best is to designate a special group or groups to consider in detail, long-term planning issues for thematic scientific goals.

For total crustal penetration and seismic networks, LITHP has specific recommendations: <u>For long-term planning of total crustal penetration, LITHP recommends that PCOM appoint a DPG. This DPG, called the "deep crustal drilling DPG" should also have the task of evaluating proposals and formulating drilling plans for recovery of deep crustal rocks in offset crustal sections</u>. LITHP anticipates receiving about ten new proposals prior to the November 1989 PCOM meeting and thus formation of such a DPG should not be delayed any longer. The core membership for such a DPG could be drawn from a group of scientists/engineers who will meet (Spring 1989?) at a JOI USSAC sponsored workshop to consider the technological requirements of Deep Drilling.

The reentry cone problem for seismic and RIDGE observatories is a longer lead-time question. New seismometers for the global array will be ready for testing at a pilot hole near Hawaii in 1992 or 1993. Placing of reentry cones could thus be done as an integral part of ODP drilling scheduled in 1990-1992. It is very important that progress be monitored, so that phased installation of new observatories can proceed effectively.

<u>2.2 LITHP Priorities for 1991 Drilling</u>: In response to the PCOM chairman's letter of 25 May, 1988, LITHP ranked the six drilling programs from which the 1991 drilling schedule in the Pacific will be chosen. The results are:

Rank	No. of votes	LITHP Theme	Proposal	Drilling Program
1	95	layer 2/3 transition	286/E	Deepening of hole 504B (1 leg)
2	83	hydrothermal processes at sedimented ridges	232/E, 284/E 224E/Rev, 275E Rev	SR DPG Prospectus (2 legs)
2 ~~3~~	83	hydrothermal and magmatic processes at fast, unsedimented ridges	76/E Rev, 321/E 325/E	EPR Bare rock (1 leg) (SRDPG needed for 1 meeting after 12/88 to formulate prospectus)
4	N/A	sedimented ridges (TJ-4); ophiolites (TJ-7); ridge subduction	318/E	Chile triple junction
5	N/A	(fluids and accretionary processes)	CEPAC Prospectus	Cascadia margin
6	N/A	(climate evolution)	CEPAC Prospectus	East Equatorial Pacific Neogene

Our highest priority is deepening hole 504B during 1 leg of drilling after the hole has been clear or deviated on the engineering leg (engineering Leg 3). Second and third place are a tie with sedimented ridges and EPR bore-rock drilling each receiving 83 votes. The three top-ranked thematic programs for 1991 are also among LITHP's top-ranked programs in any ocean (discussed later). Considering the present capabilities of the drill ship and on-going technological development, these three objectives can probably be achieved. <u>LITHP strongly urges that all three programs be drilled in 1991 and 1992</u>. For 1991, LITHP recommends 1 leg of scientific drilling each at 504, EPR and middle valley, with follow up legs in 1992.

In preparation for its next meeting and the April 1990 PCOM meeting, LITHP also ranked all its present drilling programs and "expected drilling programs" (highly rated theme plus expected proposal). It is expected that all the listed drilling "programs" will in fact be programs (highly rated theme plus highly rated proposal) by January 1990 even though our requested Deep-Drilling DPG may just have begun to work on proposal evaluation and program formulation. Our complete list of programs is:

Rank	No. of votes	LITHP Theme	Proposal	Comments
1	95	layer 2/3 transition	286/E	deepen 504B
2	88	layer 3 - mantle transition	300B	proposals expected for Atlantic & Pacific
3	83	sedimented ridges	SRDPG	Middle Valley - Escanaba
4	83	magmatic, hydrothermal processes at fast ridges	76/E, 321/E, 325/E	revised French proposal expected
5	56	magmatic, hydrothermal processes at slow ridges	312/A, 333A	proposals for VEMA and MARK areas expected
6	53	Geochemical Reference Sites	267/F	could be drilled in 1992 or later
7	49	deep mantle section	-- --	proposals expected for Hess Deep (Pacific) & MARK area
8	44	Layer 3 deep section	300B	proposals expected for Pacific & Atlantic
9	35	Early hot spot evolution	252/E	Loihi
10	30	Early continental rifting	275/E Rev	coordinated Norwegian-Greenland margin proposal expected
11	25	oceanic plateaus	222/E Rev	Ontong-Java (Leg 130)
12	23	transform faults	333A	
13	23	Hawaii Pilot Hole	315E	essential for seismic observations, prior to 1993
14	19	Processes at medium spreading rate ridges	--	proposals may be received

15	15	near-EPR seamounts	279/E, 290/E	
16	11	old Pacific crust	306/E and others	Leg 129
17	10	extinct ridges	352/E	other proposals expected
18	9	temporal evolution of hot spots	291/E	Marquesas
19	7	rift valley master fault	--	
20	4	old Atlantic crust	208B	proposals expected for Atlantic

This list will be updated at LITHP's early March 1990 meeting on the basis of proposals received by then.

3.0 PROPOSAL REVIEWS

3.1 LITHP review of 349/A (VICAP: H.-U. Schmincke et al.)

Understanding processes of mid-plate volcanism is an important long-term priority of LITHP and the VICAP proposal addresses this question by examining the unroofing history of Grand Canaria. The proposal itself is somewhat immature, lacking extensive seismic data needed for selection of specific sites. Nevertheless planned future studies and abundant Exxon data in the region should allow specific sites to be chosen. The proposal presents a very thorough approach to understanding the volcanic apron sediments and addresses a number of important scientific questions including the issue of chemical fluxes involved in insular/seamount aprons. The tie to good on-land mapping is a significant plus as is the comprehensive dating program.

The dating will no doubt present a challenge, especially for altered material, however the resolution of 0.1 Ma should be sufficient to constrain the unroofing history. This resolution, however, is probably not sufficient to examine the history of the lithosphere's response to loading, which already is known to be quite complex. Reworked material in the apron could cause unwanted complications. A more serious problem is that, especially on the northern transect, material from other islands may be incorporated in the apron sediments. This possibility, and the possible influx of material derived from the continent can only be evaluated with precise seismic data of sufficient density. While much of the post-shield stage of Gran Canaria can be studied by VICAP, the early history of the volcano will not be accessible by this approach. This, plus the fact that the Canary Islands are in an unusual tectonic setting make this study unsuitable for characterizing "typical" oceanic volcanoes. The origin of the Canaries and an explanation of their unusually long volcanic history are unknown. Drilling may shed light on these questions, however the Canaries are clearly not suited for a case study of the behavior of typical oceanic islands: for this, a simpler case is desirable.

Even so, the complex environment and evolution of the Canaries may also be turned to advantage. Provided the study can be put in a context that would shed light on fundamental questions of lithosphere evolution, it would potentially be of great interest, not only to LITHP but to TECP as well. We encourage the proponents to submit a proposal which is more mature and which more directly addresses the questions of interest to the Lithosphere Panel (see e.g. LITHP White paper in JOIDES Journal and JOIDES long-range plan). For example, a convincing case can probably be made for wider application of what would be learned by drilling the apron of Gran Canaria. Alternatively, a case could be made that Canary-type island groups constitute a significant proportion of intra-plate volcanism (especially in the Atlantic). Another possibility is to argue that specific hypotheses for the origin and evolution of island groups of this type requires drilling. In any case, a more general applicability of drilling results would strengthen the proposal.

3.2 LITHP review of 303/E (Hawaiian Arch Volcanism; B. Keating)

This proposal, like another (3/E Rev.) reviewed previously by LITHP, addresses the issue of the significance of newly-discovered volcanics on the Hawaiian arch. Since these volcanics are related in some way to the evolution of the Hawaiian hot spot, they are of great interest. This phenomena may be global and thus has important implications for intraplate volcanism. Consequently, this topic is of great interest to LITHP. However, this proposal (like 3/E Rev.) is immature. Not enough is yet known from dredge results, to frame the questions that could be addressed by drilling. Furthermore, the volume of these volcanic rocks and their spatial/temporal significance needs to be assessed with seismic data prior to choosing an optimal site for drilling. The volcanics themselves and the enclosing sediments in the subsurface may be very difficult to date, so some attention should be paid to the potential problems this poses.

Overall, LITHP enthusiastically supports continued efforts to bring a drilling program to maturity. We note that an investigation of the arch volcanics might be possible in less than a full leg of drilling. Possibly this drilling could thus be combined with drilling a hole for tests of the global seismic array seismometers. Alternatively, drilling might be combined with drilling of Loihi. The Lithosphere Panel strongly endorses all three of these programs and encourages continued efforts to bring such a program to fruition.

3.3 LITHP review of 203/E Rev. (Cretaceous guyots, Winterer et al.)

This proposal addresses several questions that are of interest to LITHP, however it mainly is aimed at ocean history questions. LITHP obviously is interested in basement drilling, particularly in areas where sampling by other means is difficult and important questions of global geochemical patterns in the mantle can be clarified. In addition, the paleomagnetic objectives, as they will help to clarify the significance of surface seamount paleomagnetic poles are of some interest to LITHP. We note that many flows (> 30) are generally needed to obtain high-quality results. Since some of the guyots were at one time subjected to subaerial weathering, we question that drilled rocks will necessarily be fresher than dredged samples. This is possible, but depends in detail on the depth of subaerial weathering and other factors. For this reason, radiometric dating of the samples may pose a problem. While single holes, separated geographically by large distances are not sufficient to adequately address many questions of seamount evolution, LITHP nevertheless is interested in basement drilling at all the proposed sites.

3.4 LITHP review of 326/A (Morocco Margin; K. Hinz et al.)

The Lithosphere Panel has highly ranked the scientific theme of learning more about the early rift history of continents. Thus this proposal is potentially of great interest. However, at present, the proposal is judged to be very immature. The proposal is not framed in the context of existing models of early rifting, and thus it is not clear how the drilling will be used to test among competing models. There is no mention of data for the conjugate margin, which is also of interest. It is unclear whether the proponents favor deepening hole 547 to basement or whether they propose a new 3-7 km-deep site. Considering that such a deep hole would probably take several legs of drilling, much stronger justification is needed that the results may definitely solve a very significant question. For example, it is not clear how many holes are really needed to address the questions properly. The lithospheric objectives, beyond obtaining an age for basement, are vague. We encourage the proponents to be more specific in their aims. We note that the VICAP proposal, to drill the insular apron of Gran Canaria may complement drilling of the Morocco Margin and vice versa. Overall, we encourage the proponents to submit a more mature proposal and to make a much stronger case for the importance of the proposed drilling.

3.5 LITHP review of 328/A (Greenland margin; K. Hinz et al.)

LITHP has highly ranked the scientific theme of understanding the early stages of continental rifting. Thus this proposal is potentially of considerable interest. Overall, however, the Panel feels that after Leg 104, fundamental new knowledge requires a better coordinated effort of drilling on both the Norwegian and Greenland margins. Clearly, more information on the conjugate margins is needed to constrain the mechanism of continental rifting; while there is a great deal of information available for the Greenland side; additional drilling on the Norwegian side is also probably warranted to gain a complete picture.

LITHP thus strongly encourages the proponents to coordinate their efforts with those of others interested in this problem. Several proposals have already been reviewed by LITHP and we anticipate receiving others aimed at the same general scientific question. We would welcome a proposal for a well-coordinated program to make fundamental progress on this important question.

3.6 LITHP review of 331/A (Aegir Ridge; R. B. Whitmarsh et al.)

The processes of crustal accretion at mid-ocean ridges is one of LITHP's highest ranked scientific themes. The notion of doing so at extinct ridges is novel and certainly worthy of very serious consideration, because even though extinct ridges are not active, it may be more feasible technologically to approach the problem in this way. Thus even though the theme of drilling extinct ridges per se has not been highly ranked, its relation to crustal accretion processes may make it very attractive in the future. While in principle drilling extinct ridges is of potential interest to LITHP, we feel that this proposal needs better documentation. For example, the rocks of hole 337 exhibit only low-temperature weathering. There is no indication of hydrothermal activity. The irregular mounds along axis may, in fact, be of hydrothermal origin, but this must be documented. Mounds of the size shown could also be of volcanic origin or represent post-extinction volcanism such as found at other extinct ridge axes in the Pacific.

There is inadequate documentation of along-axis variability and if the rocks at the axis are like the ones in 337, most petrogenetic objectives would be very difficult to achieve. Drilling an old magma chamber would be of considerable interest, however the depth to such a chamber is not well documented. Since a very deep hole would be required, much better documentation and stronger scientific justification is needed. Likewise, documentation of sulfides or, in fact any hydrothermal activity, is lacking. Magnetics may be of some help in this regard. However, even if hydrothermal activity could be documented, one or two holes would not provide a good understanding of the extinct system. Finally, it is not clear when the sediments overlying the axis were deposited. Was the axis buried by sediment at this time it was active?

Because of these deficiencies, LITHP does not rank this proposal highly. However if more documentation could be provided and if drilling active ridges is unsuccessful, an extensively revised proposal may be much more attractive.

3.7 LITHP review of 334/A (Galicia margin: G. Boillot et al.)

LITHP has placed a high priority on the scientific theme of learning more about early continental rifting. Leg 103 was very successful and this proposal is reasonably mature. We note that further work is planned in 1990, and LITHP anticipates that this new data will help to clarify some issues regarding site selection. It is very important, for example, to verify that the S-reflector is indeed the same as the deep reflector shown on Figure 6 of the proposal. If it is, drilling would be used to test a well-posed hypothesis of continental rifting.

However stronger justification is needed for drilling. If reflector S is exposed at the surface (as it appears to be), why couldn't parts of this problem be addressed by dredging or at least much shallower drilling? It is also important to establish the nature of the crust west of the peridotite ridge, but is drilling the best way to do this? It is possible that magnetic data could be used to determine where significant basaltic crust is present. We consider this objective very important, but less mature than the main objective. Finally, it would be of interest to know what the conjugate margin shows. The hypothesis predicts early subsidence at the conjugate. Is this observed?

Overall, this proposal is of strong interest to LITHP. We encourage the proponents to update the proposal after more data are in hand. Hopefully, these data can be used to address some of the issues raised in our discussion.

3.8 LITHP review of 335/A (Marshall atolls and guyots: Schlanger et al.)

This proposal is aimed primarily at answering important questions concerning ocean history. Nevertheless, the drilling is of moderate interest to LITHP because of the basement objectives at all sites. As with proposal 203/E Rev., LITHP strongly endorses significant basement penetration for purposes of mapping mantle geochemical provinces. It is not clear that drilled samples will necessarily be significantly fresher than dredged ones, particularly for edifices that may have been subjected to deep subaerial weathering. Even so, significant recovery in basement would also be valuable for paleomagnetic results, of interest to both LITHP and TECP. The new site survey data have clearly been very beneficial for site selection, and this program is quite mature.

Overall, the program is of moderate interest to LITHP because of the proposed basement objectives. We note, however, that addition of these objectives will require additional drilling time. The drilling-time estimates appear to us to be overly optimistic; the full program probably will require more than one full leg of drilling.

3.9 LITHP review of 343/A (Caribbean Window: A. Mauffret and A. Mascle)

Learning more about the circumstances of formation and significance of oceanic plateaus is a highly ranked scientific theme of LITHP. The nature of very old ocean crust, is presenting ranked considerably lower. Even so, this proposal directly and indirectly addresses both of these LITHP priorities. While we believe that a drilling program of the type proposed could potentially be very valuable, the present proposal is clearly not mature. Stronger scientific justification for the drilling needs to be provided. Part of this could come from a combined/ coordinated program which also addresses the question of the origin/significance of the B" horizon. For example, is there a significant hiatus between normal ocean crust and B"? Since there are many other drilling objectives in this region of great potential to LITHP, we believe that a coordinated effort to maximize the scientific return of drilling is warranted. This is particularly true for the Caribbean where the tectonic and paleooceanographic situation is complex.

In addition to a broader scientific context, we suggest that a revised proposal include fuller documentation of the window and it's relationships to the surroundings. Because of the potential importance of this program, additional MCS data is strongly justified. The presentation also needs to be improved. We found many parts of the text to be somewhat confusing and the lack of vertical scales on some of the figures made it difficult to assess the validity of some of the arguments.

Overall, we encourage the proponents to do additional work. The drilling program is potentially very exciting, however, a much more mature proposal with stronger justification is needed.

3.10 LITHP review of 344/A (Jurassic Quiet Zone: R. Sheridan)

The nature of old ocean crust is of interest to LITHP, but is not among the highest priority scientific themes. The history of the Earth's magnetic field is clearly very important since it provides clues about the causes of the geomagnetic field--an issue of fundamental importances in Earth Sciences. Even so, we find that the proposal has some deficiencies and that drilling in the ocean may not necessarily be the only approach to the problem. Resolving the on-going controversy about the nature of the Jurassic quiet zone is of clear importance, however the proposed drilling program may not be the only (or even the best) means of doing so.

Deepening of site 534 may fail to provide a definitive answer, as the lack of reversed intervals would not prove that the Earth's field necessarily remained continuously normal. Sites near hole 603, in sediments, would provide a more continuous record, but still may not be definitive. Because alteration of basalt can render paleointensity data unreliable, sediments are also preferred over old basalt flows. A drilling program in very old basaltic crust could be very attractive if it were done for a number of other objectives at the same time. It is difficult to justify drilling for the paleomagnetic objectives alone.

Overall, we do not rank the proposal in its present form very highly.

3.11 LITHP review of 333/A (Cayman trough: Perfit et al.)

Recovery of rocks from deep levels in the ocean crust and the nature of crustal accretion processes are among the most highly ranked objectives of LITHP. This proposal can potentially address several of these objectives as well as many important objectives of TECP. The Cayman trough represents an end-member case of slow spreading and ridge axial depth. Furthermore, the crust produced by the Cayman trough may be anomalously thin, permitting recovery of deep crustal rocks. Such rocks could be obtained near the axis if tectonic thinning processes are active (i.e. using the offset section strategy). Alternatively, if verification can be obtained that the flanks also are composed of thin crust, drilling the flanks could be used to study the layer 2/3 transition, layer 3 and perhaps even deeper portions of the crust.

Of the numerous objectives and sites proposal, we feel that the transect composed of CAY-4, 5, and 6 has the strongest justification. It is not clear whether the cold-edge effect is better addressed by dredging. The origin and evolution of pull-apart basins is a question of great interest, however it will probably be of greater interest to TECP than to LITHP.

One problem, of course, is that due to poor magnetics the tectonic environment of the Cayman trough flanks is not well-defined. A transect on the flank is attractive because drilling could be used to date the magnetic anomalies. However the present siting of CAY-4 and CAY-6, near the edge of the observed magnetic sequence, can be improved. It is important that the holes be squarely within the anomaly sequence and as far as possible from crustal offset boundaries. CAY-4 and CAY-6 could probably be drilled with conventional RCB; CAY-5 probably would need the DCS, however we note that the great water depth of the Cayman trough adds severe constraints to drilling with the DCS. This affects not only the timing of a potential drilling leg, but also limits the total depth of CAY-5.

We feel that documentation of the petrology and geochemistry of the Cayman trough is inadequate. This makes it difficult to assess what will be gained by drilling for the geochemical objectives. For example, the influence of mantle flow on modified sub-arc mantle below the Cayman trough is potentially of great interest, the proposal would be strengthened considerably if these objectives were framed in the context of existing data and related more directly to the other objectives of the drilling. Are any samples of crust available off-axis? Could the GLORIA data and new SeaMARC II data be used to constrain site selection.

The most serious concern, however, with the prospect of drilling at the Cayman trough, is the relatively poor constraint on crustal thickness. The available data are quite old and the steep dips on layer boundaries may indicate poor data quality. Higher quality data to verify crusted thickness are essential. We strongly encourage the proponents to seek support for a comprehensive program of necessary seismic work.

Overall, we believe that a drilling program at the Cayman trough could potentially be very exciting. Many highly-ranked objectives of LITHP could potentially be met by such a program. We thus strongly encourage the proponents to submit a revised proposal, preferably after additional seismic constraints on crustal thickness can be provided.

3.12 Additional LITHP comments on 315/F (Pilot study for global seismic array, Purdy and Dziewonski)

Initial review of 315/F at the LITHP spring 1989 meeting was very positive. LITHP strongly supports the need for a global seismic network with seismometers in the deep sea. For this long-term objective to succeed, instruments must be built and thoroughly tested prior to deployment. The test site for such a pilot program is proposed, in 315/F, to be near Hawaii. In its initial review, LITHP has several queries for the proponents, mainly regarding logistics and choice of test sites. In a recent letter from G. M. Purdy, these minor concerns were fully addressed. We believe that the justification for choosing Hawaii is considerably strengthened by this letter. In addition, the time frame for drilling is better defined and several minor issues are now clarified.

In view of this, LITHP now very strongly endorses the notion that drilling near Hawaii go forward. Because of the importance of the global seismic array, we feel that providing a hole to basement for the testing of instruments stands on its own merits. Consequently, we strongly support drilling whether any other programs for drilling near Hawaii are approved or not. Obviously, since drilling the pilot hole will take much less than a full drilling leg, this program could be completed either as part of a leg or during a transit.

4.0 ENGINEERING DEVELOPMENTS

A number of recent developments concerning high-temperature logging and logging in slim (DCS) holes were discussed. Earl Davis reviewed the discussion of issues which occurred at the April 11, 1989 Dallas airport meeting. In addition, we reviewed the modest logging needs discussed in the SRDPG Prospectus. On this basis, LITHP discussed and prioritized the scientific needs for logging. Since these capabilities will be needed during 1991, LITHP strongly urges that resources be made available to the logging group and TAMU for development of the needed capabilities and tools. Since LITHP met jointly with DMP, we have prepared joint minutes of this meeting:

4.1 High-Temperature Slimhole Logging

This item of the DMP agenda was addressed through a joint session with the JOIDES Lithosphere Panel (LITHP). The purpose of the meeting was to exchange cultures in the context of LITHP's projected requirements for downhole measurements in hostile environments. The meeting was co-chaired by the DMP Chairman and the LITHP Chairman, R. Batiza. The following are joint minutes.

4.2 Proposed Workshop on High-Temperature Slimhole Tools

DMP Chairman reported that ODP needs a strategy for the phased development of logging tools for deployment in high-temperature, and possibly slimhole, environments. Development costs are likely to be extremely high: it is unlikely that ODP would be able to fund these in isolation. There is therefore a need to involve other scientific programs that face similar problems. As a first step, an interprogram workshop had been proposed. The aim is to bring together all those scientific programs with a need for high-temperature (slimhole) logging tools, to identify the existing technology for various temperature and hole diameter scenarios, to agree on shortfalls that impact on all programs, and to set in motion initiatives designed to remedy the identified shortcomings. In this way, it might be possible to share development costs that would otherwise be prohibitive. However, the involvement of other scientific programs makes the concept more complicated. A pre-workshop planning meeting might be needed to agree on an agenda and structure the required inputs. No date has been fixed for either the pre-workshop meeting or the workshop itself. Possible targets are November 1989 and April 1990, respectively. Before then, we need to identify ODP's scientific requirements and what tools are needed to meet them.

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4.3 Perceived Scientific Requirements for Downhole Measurements

Davis (CEPDPG, SRDPG) introduced the scientific goals in the context of the East Pacific Rise (EPR) and Sedimented Ridge Crests (SR) drilling.

The EPR plan is to drill to about 1.5 km depth bsf as close as possible to the axial magma chamber. The Diamond Coring System (DCS) will be used almost exclusively. Temperatures are not known, but are estimated at about 350° over much of the depth.

The SR aim is to drill through the sediment pile (200-1000 m thick) and to penetrate as far as possible into basaltic basement. Both the DCS and The Rotary Core Barrel (RCB) will be used. Expected temperature range in the sediment section is 200-400°C. In the basement, temperatures are typically expected to be up to 350°C.

Becker (LITHP) described the required downhole measurements in terms of scientific themes, hydrothermal (at SR and EPR) and magmatic processes (at EPR only).

Hydrothermal	Magmatic
Temperature	Natural Gamma
Pressure	Density
Permeability	Porosity
Discrete Fluid Samples	Stress
Borehole Fluid Logs of pH and Resistivity	Sonic & Seismic Velocities (P and S)

A borehole seal is essential for hydrothermal studies.

4.4 Identification of Technical Shortfalls

Howell reported on the status of off-the-shelf high-temperature logging tools. In general, high-temperature tools require more preventive maintenance. Calibration problems can be expected, especially with slimhole tools and those from different contractors, and therefore calibration blocks are needed onboard ship. Laboratory experiments may be needed to verify tool responses at high temperatures. Off-the-shelf high-temperature tools do not afford the same reliability as conventional tools and it is usual to ask for three high-temperature tools of each type at the logging site rather than two.

Various (slimhole) service-company tools are available up to 260°C. These provide for all the hydrothermal and magmatic requirements up to this temperature except for:

permeability
pH
stress

Permeability is impeded by the difficulties of packer design and deployment; the strategy would be to use the packer in the cool part of a hole and measure only interval permeabilities. pH is not measured routinely even at low temperatures. Stress measurement using the BHTV is seriously affected by temperature degradation of the cable. Further, a dewared BHTV requires a large-diameter hole, the other measurements (density, sonic, etc.) do not.

Extending the operating temperature range of tools requires additional thermal insulation or hole cooling. Off-the-shelf 260°C logging tools can be double-dewared to reach 300°C at which temperature they would have a typical operational period of 6-8 hours. Double-dewared tools require a large-diameter hole. They cannot be deployed in DCS holes although with modifications to the dewar design they could be slimholed. Difficulties are anticipated with the very high-temperature operation of nuclear and sonic tools due to the functioning of crystals and transducers, respectively. Also a teflon cable is needed for operations up to 300°C. For 350°C operation, it would be necessary to cool the 300°C tools.

Hole cooling is very difficult in DCS holes because of the restricted annulus around the tool which impedes circulation. Large diameter holes can be cooled during logging, e.g. by using a "toolpusher" system with circulation, in which the SES is deployed with a wet connect and with the (dewared) tool attached to the base of the drillstring. Such a strategy might also require in-hole data recording.

The two possible approaches are:

(a) at DCS sites drill a large-diameter hole, specifically for logging, or

(b) drill each hole with DCS and ream to a larger diameter.

In either case, dewared tools should be used in conjunction with a toolpusher and circulation.

In summary, off-the-shelf temperature and pressure (slimhole) tools exist with ratings up to 350°C, and existing gamma, density, porosity, resistivity and sonic/seismic tools might be dewared in a large-diameter mode to the same temperature rating, especially if deployed in conjunction with cooling.

Anderson proposed the development of a single combination slimhole, 350°C tool string for use as a stand-alone high-temperature logging tool with a logging cable or with downhole recording. Temperature, pressure and fluid and rock resistivity would be logged with this combination. The feasibility of this development will depend on further investigations. Operating a fluid sampler at high temperature and pressure is beyond the capability of the LDGO Borehole Research Group. The development of high-temperature permeability and pore pressure tools is more within the brief of TAMU.

4.5 Future Strategy

A short-term strategy was required to address as far as possible the immediate needs of LITHP, the Central and Eastern Pacific DPG, and the Sedimented Ridge DPG. A longer term strategy should be developed to address those issues that could not be resolved in the short term.

Becker reported that for the short term, the following were the LITHP priorities for downhole measurement at high temperatures to be addressed by the ODP logging contractor.

1. Temperature (all hydrothermal objectives fail without this)
2. Downhole Fluid Resistivity (in borehole)
3. Formation Resistivity (for porosity)
4. Natural Gamma
5. Sonic (preferred over density tool)'
6. Caliper
7. Flowmeter
8. Borehole Fluid Pressure

LITHP view was that 1-5 must be measured, 6-8 were of lower priority.

Other LITHP needs are high-temperature permeability and pore pressure determinations and pore fluid sampling.

In the longer term, provision must be made for developments that are too complex or costly to be met before mid-1991. The concept of an inter-program workshop on downhole measurements at high-temperature should be strongly supported.

After the joint meeting with LITHP, DMP formulated the following.

LITHP/DMP Recommendation 89/17

"A high-temperature logging tool combination rated to at least 350°C be developed by the logging contractor to address as many as possible of the following scientific needs identified by LITHP and listed below in decreasing order of priority.

1. Temperature
2. Borehole Fluid Resistivity
3. Formation Resistivity
4. Natural Gamma
5. Sonic
6. Caliper
7. Flowmeter
8. Borehole Fluid Pressure

These objectives are to be achieved by repackaging existing tools, not by the development of new tools."

LITHP/DMP Recommendation 89/18

"Funds for the development of the high-temperature tool combination, currently allocated as $300,000 for tool hire during FY91 and FY92, should be made available as soon as possible to allow the redirected initiative to be brought to fruition before the estimated tool deployment date of mid-1991."

LITHP/DMP Recommendation 89/19

"A JOI-supported inter-program workshop on high-temperature logging should be planned, and scheduled to take place before mid-1990, in order to develop the necessary engineering science for the longer term."

LITHP/DMP Consensus

DMP support the following recommendations for the Sedimented Ridge DPG.

(i) The Barnes-Uyeda tool be modified for higher temperatures (up to 200°C) and be made stronger.

(ii) A slimline self-contained probe be developed or acquired to measure temperatures up to 350°C.

Further, DMP support the development of a high-temperature fluid-sampling capability.

5.0 NEW LITHP MEMBERS:

PCOM has approved the nominations of Jim Mclean and Tom Brocker as new LITHP members. Keir Becker will be leaving LITHP after our next meeting and John Mutter will rotate off after LITHP's Fall 1990 meeting.

6.0 NEXT MEETING:

LITHP and TECP will plan an overlapping meeting in New Orleans during the first week of March, 1990. There will be no official host, but logistics pose no special problem.

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

KTB Drillsite Laboratory
Windischeschenbach
Federal Republic of Germany

11-12 September 1989

EXECUTIVE SUMMARY

1. A major component of this meeting was the joint session with LITHP on the afternoon of 11 September.

2. "The long-term sealing of re-entry drillholes is essential for fluid sampling and temperature measurements. Hole-sealing technology should be developed to realise COSOD II objectives."

[DMP Recommendation 89/14]

3. The Wireline Packer is due for delivery before the end of 1989, about one year behind schedule, with no overspend. First deployment is the Nankai Leg (131).

4. The Geoprops Probe was contracted to Tam Inc. in June 1989. Official delivery time is 9 months ± 2 months from that date. Unofficial expectations are for delivery in November 1989.

5. "A TAM representative should be invited to the next meeting of DMP to report directly on the status of the wireline packer and the geoprops probe."

[DMP Recommendation 89/15]

6. A Job Description has been formulated for the JOIDES Logging Scientist.

[DMP Recommendation 89/16]

Panel view was that this should be published in the JOIDES Journal.

7. High temperature logging remains the biggest challenge facing the Panel.

"A high-temperature logging tool combination rated to at least 350°C be developed by the logging contractor to address as many as possible of the following scientific needs identified by LITHP and listed below in decreasing order of priority.

1. Temperature
2. Borehole Fluid Resistivity
3. Formation Resistivity
4. Natural Gamma
5. Sonic
6. Caliper
7. Flowmeter
8. Borehole Fluid Pressure

These objectives are to be achieved by repackaging existing tools, not by the development of new tools."

[DMP Recommendation 89/17]

8. "Funds for the development of the high-temperature tool combination, currently allocated as $300,000 for tool hire during FY91 and FY92, should be made available as soon as possible to allow the redirected initiative to be brought to fruition before the estimated tool deployment date of mid-1991."

[DMP Recommendation 89/18]

9. "A JOI-supported inter-programme workshop on high-temperature logging should be planned, and scheduled to take place before mid-1990, in order to develop the necessary engineering science for the longer term."

[DMP Recommendation 89/19]

10, DMP support the following recommendations of the Sedimented Ridge DPG.

(i) The Barnes-Uyeda tool be modified for higher temperatures (up to 200°C) and be made stronger.

(ii) A slimline self-contained probe be developed or acquired to measure temperatures up to 350°C.

Further, DMP support the development of a high-temperature fluid-sampling capability.

11. The deployment of the Formation Microscanner (FMS) is a major success.

"LDGO and TAMU should give high priority to ensuring that full shipboard image processing facilities are available for FMS data. Consideration should be given to incorporating the FMS-dedicated microvax within the TAMU vax cluster."

[DMP Recommendation 89/20]

12. Panel considered that the spinner flowmeter plus injection method constitutes a potentially viable approach to downhole permeability determination subject to solving the problems of heave compensation and packer deployment. The proponent (R Morin) was encouraged to liaise with TAMU to obtain advice on how these problems might be solved.

13. A search committee (Worthington, Sondergeld, Hutchinson) has been formed to nominate replacement candidates for Eddie Howell. A replacement from industry is to be sought, preferably with a tool development background.

14. The next DMP meeting is scheduled for 23-24 January 1990 in College Station, Texas. This is one week later than originally planned to allow Andy Fisher to host. It is hoped to arrange sessions with TAMU engineers and computer specialists during the meeting.

<u>PAUL F WORTHINGTON</u>
25 September 1989

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

KTB Drillsite Laboratory
Windischeschenbach
Federal Republic of Germany

11-12 September 1989

MINUTES

Present

Chairman:	P F Worthington (UK)
Members:	B Carson (USA) J Gieskes (USA) E Howell (USA) M Hutchinson (USA) D Karig (USA) R Morin (USA) C Sondergeld (USA) R Wilkens (USA) H Crocker (Canada/Australia) J P Foucher (France) H Kinoshita (Japan) H Villinger (FRG)
Liaisons:	R N Anderson (LDGO) K Becker (LITHP)* D Cowan (PCOM) A Fisher (TAMU) X Golovchenko (LDGO) J Mienert (SGPP)
Guests:	S Bell (Canadian Geol. Surv.) E Huenges (KTB) K Moran (SMP) M Zoback (Stanford Univ.)
Apologies:	P Lysne (USA)
Absent:	O Stephansson (ESF)

* The entire JOIDES Lithosphere Panel was in attendance for agenda item 8 which was conducted as a joint session.

1. Welcome and Introductory Remarks

The meeting was called to order at 9.00 am on Monday, 11 September 1989. The Chairman welcomed DMP Members, Liaisons and Guests to the first DMP meeting to be held outside the USA for about three years. Kate Moran was attending to provide an update on the Lateral Stress Tool (LAST) and Mark Zoback had been asked to provide an account of the chronology and status of the Wireline Packer from his sub-contractor standpoint. A key aspect of this DMP meeting was the joint session with the JOIDES Lithosphere Panel, scheduled for the afternoon of Day 1, at which the focus was to be on high-temperature slimhole logging. The Panel meeting was to be followed by a logging workshop with the German Continental Deep Drilling Project (KTB) at which it was proposed to share experiences and to explore possibilities for collaboration.

The Chairman noted that this was the second consecutive meeting at which the ESF Representative had been absent (without apology). Chairman to contact Dr Stephansson to see if there are any communication problems.

[ACTION: WORTHINGTON]

Review of Agenda and Revisions

The pre-circulated agenda was modified as follows.

(a) Item 4(i) - Wireline Packer [ZOBACK]

(b) New Item 4(vi) - Formation Evaluation Tool [CROCKER]

(c) New Item 10(iv) - BHTV Software [ZOBACK]

(d) New Item 14 - Spinner Flowmeter [MORIN]

(e) New Item 15 - Panel Membership [WORTHINGTON]

(f) New Item 16 - Measurement while Drilling [WORTHINGTON]

(g) New Item 17 - Interwell Studies [WORTHINGTON]

(h) Renumbered Item 18 - Other Business [PANEL]

(i) Renumbered Item 19 - Dates and Formats of Next DMP Meetings [WORTHINGTON]

With these modifications the pre-circulated agenda was adopted as a working document for the meeting.

2. Minutes of Previous DMP Meeting, La Jolla, California, 23-24 May 1989

The minutes were adopted with the following modifications.

Page 4, para 4, sentence 2:

replace with

"The tool is approximately 9 cm in diameter."

Page 13, para 5:

line 4; ERI for ORI

line 5; should read

"Oblique seismic/electric experiment - ERI ..."

line 6; ORI for ERI

The Chairman signed the master copy for ODP records.

Matters Arising

(a) French High-Resolution Magnetometer

Foucher reported that the tool is unlikely to be ready for Leg 129. Total CFP are positive about its future availability to ODP. Tests are scheduled for the North Sea in the near future. A constraint is the need for a sea-bottom observatory while the tool is in the hole. Vertical resolution is about 50 cm.

(b) Sealing of Drillholes

Fisher reported that during the previous DMP meeting there was a general discussion of plans for FY 91 to drill (1) on and near the crest of the EPR, (2) on and near the ridge crest of the Chile triple junction, and (3) on and near the sedimented Juan de Fuca and Gorda Ridges. Several DMP members expressed interest in developing the necessary technology to plug a re-entry drill hole in these settings, so that the fluids in the hole would have a chance to equilibrate (both geochemically and thermally) with the surrounding rock. Mike Storms at TAMU has indicated that the following techniques might be available to the ODP, given sufficient lead time for development and testing.

1) 'Packing' the top of a re-entry cone

It is a standard oil-field technique to place a packer near the top of a well and seal it in place with cement. This method has the advantage that it may be possible to purchase "off-the-shelf" components to complete this procedure. In addition, the composition of fluids and rock in the hole would be little altered during emplacement of the seal. Upon return, the drill ship would simply locate the cone, run pipe to the sea floor, and drill through the cement and packer. This technique has the added advantage that it would require little additional lead time.

2) Sealing several levels within a single hole

This is also a fairly standard procedure. The hole is filled to some level of interest with heavy mud, and the drill bit is pulled to the top of this section. A slug of cement is 'floated' on the top of the mud where it solidifies. This process can be repeated several times at different levels in the same hole. Cement is easily drilled out upon re-entry of the hole. The mud will help to reduce free convection and mixing in the sealed hole, and so will speed thermal equilibration, but will also contaminate fluid samples. This procedure could probably be accomplished with little lead time and with off-the-shelf materials. It may also be possible to place several packer-cement plugs (as described above) in a borehole, although this would be time consuming and considerably more expensive.

3) Resealable plugs

It should be possible to place a removable lid in a re-entry cone so that the hole can be re-opened by a drill ship, a submersible, or a conventional ship with wireline re-entry capabilities. This possibility requires the most lead time (certainly at least 1 year for development and testing) and would probably also be the most expensive and time consuming to deploy.

In order to undertake any of the above options to develop a method for plugging a borehole, it will be necessary to direct appropriate engineering effort. As the ODP/TAMU engineering group is currently occupied with numerous other projects (DCS, Navidrill, PCB, packers, etc.) development of technology to plug a borehole for later re-entry might cause other projects to be delayed, postponed or dropped. The engineering group needs to be given specific priorities for projects of this kind, including a clear description of the scientific objectives to be addressed.

DMP Recommendation 89/14

"The long-term sealing of re-entry drillholes is essential for fluid sampling and temperature measurements. Hole-sealing technology should be developed to realise COSOD II objectives."

(c) DMP-SMP Collaboration

The Chairman reported that he would be attending the next SMP meeting on 2-3 October 1989. Issues to be raised are:

- DMP view on physical properties
- DMP policy on VSP
- Joint SMP/DMP meeting
- Long-term collaboration, especially as regards the integration of core and log data

The Chairman reiterated the appropriateness of the attendance of SMP Chairman, Kate Moran, at the current DMP meeting.

3. PCOM Report

Cowan reported on the PCOM meeting held in Seattle during the period 22-24 August 1989. PCOM responses to DMP Recommendations 89/9 - 89/13 were as follows.

Rec. No.	Description	PCOM Response
89/9	Logging programme, Leg 129	Supported
89/10	Logging programme, Leg 130 : test Geoprops Probe	Proposal no longer feasible because Geoprops will not now be ready
89/11	Staggering of hostile-environment drilling programmes	Supported, but there are other influencing factors eg. ship scheduling
89/12	Navidrill testing on Leg 130	Navidrill is in a phase of redevelopment: may not yet be able to take core. Too early to test on Leg 130
89/13	Six-month appointment of engineering scientist for high-temperature slimhole logging appraisal	Support; leave to LDGO and TAMU

Other key points:

- geochemical reference leg has not been reinstated in 1990.

- Diamond Coring System (DCS) vs Logging was reviewed. PCOM appreciated that sophisticated logging could not take place with 4-inch DCS holes. PCOM directed TAMU to develop the capability to run ODP logging tools at sites drilled with the DCS. One possibility is a larger-diameter hole dedicated to logging at DCS sites.

- a PCOM liaison to be present at pre-cruise meetings to ensure compliance with approved scientific objectives.

4. **Monitor Reports**

(i) Wireline Packer

Zoback reported that LDGO had originally become aware of the existence of an Amoco wireline packer which would be relevant to the needs of ODP. Amoco could not develop the tool for ODP, but wished to collaborate on development. Amoco tool would not fit through the ODP bottom-hole assembly (BHA) and therefore modification was needed. Since LDGO are not permitted to develop tools, a contract was sublet to Stanford University to oversee the development. TAM, Inc., had previously built the Amoco packers and they were given the contract to build two tools with the same capability as the Amoco tool, but matched to ODP needs. There was no other packer supplier and the tools were offered by TAM as "catalogue items". TAM ran into two problems, motors and pumps. These problems seem to have been solved. There has been no overspend.

Zoback described the current status of the tool. Overall length is about 13 m. Downhole tests at the Nevada Test Site are scheduled for September/October 1989. Calibration problems in the test chamber are inevitable but solvable. Deployment target is the Nankai Leg.

Anderson furnished the following points of embellishment. The Wireline Packer had failed to deflate on its first field test. The sensors functioned for 24 continuous hours before failing. The samplers worked. A new slimhole motor has arrived and a new pump is being machined. Delivery is "guaranteed" for the end of 1989.

Noting that the tool was about one year behind schedule, the Chairman asked for the date when the contract was signed by TAM, Inc.

LDGO liaison to provide a chronology of key dates in the development history of the Wireline Packer.

[ACTION: LDGO LIAISON]

(ii) Geoprops Probe

Karig reported that TAM, Inc., had increased their estimated costs to c. $176,000 prior to signing the contract. There is also a need for land testing. The land test could be undertaken by TAMU in their test hole for circa $16,000. An extra $40,000 was therefore needed. JOI is funding the land test directly : NSF is covering the overspend.

TAM are just completing the construction drawings. There is some commonality with the wireline packer.

The contract was officially signed in June 1989 with delivery scheduled for 9 months ± 2 months thereafter. Unofficially the tool is expected to be ready by November 1989. There was no alternative supplier.

The tool is scheduled for deployment during the Nankai Leg. Deadline for completion is therefore the second week in February.

DMP Recommendation 89/15

"A TAM representative should be invited to the next meeting of DMP to report directly on the status of the wireline packer and the geoprops probe."

Fisher to arrange.

[ACTION: FISHER]

(iii) Lateral Stress Tool

Moran reviewed the phase 1 LAST tool. LAST tools are designed for soft sediments and therefore for use in the APC zone. Tool is self contained and is attached to the APC. Measurements are pore fluid pressure, lateral stress, and possibly temperature. Tool OD is just under 3 inches.

The LAST 1 chronology/schedule is:

Conceptual design	- Sept 1986
Design	- Feb 1987
First tool completed	- Jan 1988
Bench testing	- Feb - Aug 1988
Offshore field test	- Oct 1988
Redesign	- Nov 1988 - May 1989
Onshore field calibration	- Sept - Oct 1989
Offshore field test	- Nov 1989
ODP Leg 131	- April - May 1990

The tool is on schedule for Leg 131 (Nankai).

A phase 2 LAST tool is under development. This measures the strength of a material and the shear modulus. Provisional schedule for the second LAST tool is:

Conceptual design	- Sept 1986
Design	- April 1989
Tool completion	- Sept 1989
Onshore field test	- Nov 1989

The phase 2 tool is unlikely to be fully field tested prior to the Nankai Leg.

The Chairman complimented Moran on her comprehensive and informative report on a tool which is being developed according to schedule.

(iv) VSP/WST

Wilkens recapped on earlier concern as to what VSP tool was to be used in the Nankai Trough. Schlumberger's seismic acquisition tool (SAT) is too large for deployment. The Woods Hole three-component tool remains a possibility : alternative is the Schlumberger WST. Wilkens will continue to monitor.

[ACTION: WILKENS]

(v) Long-term Temperature Tool

Kinoshita reported on progress towards the Nankai Downhole Observatory. The measuring system is an 800 m thermistor cable within an 1100 m hole (NKT 2). This cable incorporates 19 thermistors and two pressure and temperature crystal gauges at the top and bottom. The entire section will be cased with perforations about every 50 cm. There is a downhole data logger with acoustic data transmission. It is hoped for a five-year durability. One data reading from thermistors and gauges will be taken each day.

Satisfactory data will be contingent upon closing the hole to prevent fluid venting. Strategy is for a plastic round plate covered by gravel and then cemented. The new Japanese submersible (6500 m depth capability) will be used.

Expectation is for subsequent tool recovery with some milling, and further experimentation, eg. flowmeter studies and seismic observations.

(vi) Formation Evaluation Tool

Crocker reported on an improved wireline formation tester which he is developing for the oil industry. The aims are a true sample of formation fluid, better pressure measurement, steady state drawdowns for improved permeability determination, and in-situ analysis of any recovered hydrocarbons.

The tool has many similarities to the wireline packer. OD is 5.5 inches, length is 5.5 metres. The sensors monitor produced fluids until constancy is established. The sensors are temperature, pressure, density and resistivity: it is intended to add viscosity and dielectric constant. The flow rate is being designed to maximise the chances of constancy being achieved within 30 minutes. There are ten 40 cc sample chambers. A sample may or may not be taken as desired, according to the nature of the fluid. The flow rates can be varied for multi-rate permeability evaluation corrected for formation damage.

The tool has been tested and is being redesigned. A second prototype is scheduled for testing early next year. A commercial tool should be available in about 12 months' time. In principle, such a tool could be made available to ODP, but it would require appropriate modifications.

An extension would be to use with self-locking packers to investigate inflow, eg. through perforations.

In thanking Crocker for making the Panel aware of these interesting developments, the Chairman noted that the tool affords a potential "quantum leap" in downhole hydrogeology in that its multi-rate testing facility might overcome departures due to well inefficiency.

The tool has interesting refinements which could benefit future generations of the ODP wireline packer. Contact with TAM, Inc., should be encouraged. Fisher to arrange.

[ACTION: FISHER]

Crocker confirmed that he would be pleased to collaborate with TAM. If, however, his tool did come to fruition in the future, and ODP expressed an interest in it, he would not consider it appropriate to participate in related discussions since he would hope to have a commerical interest. The Chairman acknowledged the integrity of Crocker's position and stated that the benefit to the Panel in being informed of this future technology far outweighed any other considerations at this stage.

5. <u>JOIDES Logging Scientist - Job Description</u>

Golovchenko and Wilkens presented a draft Job Description for the JOIDES Logging Scientist. This was reviewed, edited and adopted.

<u>DMP Recommendation 89/16</u>

"The following be adopted as the Job Description for the position of JOIDES Logging Scientist.

The JOIDES Logging Scientist is an integral member of the scientific party of an ODP cruise. The position is open to scientists of any discipline (eg. seismology, rock physics, stratigraphy, geochemistry), with or without previous logging experience, who have an interest in using continuously recorded borehole data to add to the scientific success of the expedition. The JOIDES Logging Scientist will receive pre-cruise training in ODP log operations and interpretation from the Borehole Research Group of the Lamont-Doherty Geological Observatory (LDGO).

During the cruise the JOIDES Logging Scientist will assist in the routine processing of all borehole logging data. During logging runs he/she will assist the Lamont Logging Scientist in monitoring operations and will have the primary responsibility for the rapid distribution and explanation of the logging data to the scientific party immediately after the data have been collected. The second major responsibility of the JOIDES Logging Scientist is to be a primary author of the non-operational sections of the borehole logging site reports. A brief operational report will be required at the end of the leg.

Routine post-cruise processing of logging data will be done by the Borehole Research Group at LDGO. Advanced processing and speciality log interpretation (eg. quantitative mineralogy, sonic waveform analysis) may be undertaken by the JOIDES Logging Scientist (at LDGO if desired), by prior arrangement."

Panel expressed the view that this Job Description ought to be published in the JOIDES Journal.

6. Thematic or Synthesis Publications

The Chairman called for proposals in response to a PCOM request which had been highlighted at the previous DMP meeting. The following suggestions were considered worthy of pursuit.

(i) A thematic issue on technical aspects of new downhole instrumentation, eg. wireline packer, geoprops probe, lateral stress tool, Barnes/Uyeda, drillstring packer.

To be pursued in mid-1990 after the tools have been tested. Target journal is Scientific Drilling.

[ACTION: ANDERSON]

(ii) An overview of geochemical logging, possibly using the material of the logging session at the January 1990 geochemical workshop (see item 13). Target journal is AAPG Bulletin. Editor to be contacted to secure approval in principle.

[ACTION: BELL]

(iii) A contemporary paper on the use of logs to recognise Milankovitch cyclicity. Target at general audience, eg. Nature or Geology. Suggested author is R Jarrard. Golovchenko to pursue.

[ACTION: GOLOVCHENKO]

7. ODP Accomplishments and Benefits

DMP have been asked to identify those aspect of downhole measurements that have advanced science. To allow more efficient use of time, Panel were asked to submit their contributions to the Chairman who would then consolidate these into a list for PCOM information. The following is a synthesis of Panel opinion based on the written submissions.

The key contribution of downhole measurements is the physico-chemical characterisation of oceanic lithosphere through continuous measurements at in-situ conditions and at a scale which is intermediate between core data and surface geophysics. Thus borehole logs permit the extrapolation of rock properties away from cored zones. Specific examples follow.

(i) Structure

Sonic logs and vertical seismic profiles have allowed surface seismic sections to be interpreted in terms of lithology in Crustal Layer II where core recovery has usually been poor. This is leading to an improved definition of seismic structure.

(ii) Composition

Geochemical logs have resulted in an improved documentation of geochemical profiles encompassing both the sediments of Layer I (enhanced by logging through pipe) and the basalts of Layer II. This, in turn, is leading to a better evaluation of chemical flux and thereby of the geochemical budget.

(iii) Hydrothermal Processes

Studies of thermal and fluid-flow regimes through heat-flow measurements, packer experiments, and fluid sampling are providing a new basis for evaluating circulation within, and exchanges between, Layers I and II.

Specific inputs are the characterisation of Layer II permeabilities (at site 504B) and identifying the pulsing fluid activity associated with dewatering of sediments in the Barbados accretionary complex.

(iv) Stress

Borehole televiewer logs are identifying principal directions of stress through breakout delineation both within plates and at plate boundaries such as ridge crests. These data are providing a better insight into spreading mechanisms.

(v) Sediment Stratigraphy

The multi-log recognition of Milankovitch cyclicity in ocean sediments has opened the door to a cyclostratigraphy based on truly continuous measurements. A bonus is that the different resolutions of the various logging tools guide the assignment of Milankovitch periodicities to observed cyclic phenomena. This is but one input to an emerging global event stratigraphy with projected log inputs on the seismic, chemo-, cyclo-, magneto-, and litho-stratigraphic fronts.

(vi) Long-term Observations

Recent downhole measurements effected by wireline re-entry of DSDP/ODP holes have confirmed the feasibility of long-term experimentation to monitor earth processes, eg. seismic, thermal. These holes will also be available for future logging surveys as technology advances.

8. High Temperature Slimhole Logging

This item of the DMP agenda was addressed through a joint session with the JOIDES Lithosphere Panel (LITHP). The purpose of the meeting was to exchange cultures in the context of LITHP's projected requirements for downhole measurements in hostile environments. The meeting was co-chaired by the DMP Chairman and the LITHP Chairman, R Batiza. The following are joint minutes.

(i) Proposed Workshop on High-Temperature Slimhole Tools

DMP Chairman reported that ODP needs a strategy for the phased development of logging tools for deployment in high-temperature, and possibly slimhole, environments. Development costs are likely to be extremely high : it is unlikely that ODP would be able to fund these in isolation. There is therefore a need to involve other scientific programmes that face similar problems. As a first step, an interprogramme workshop had been proposed. The aim is to bring together all those scientific programmes with a need for high-temperature (slimhole) logging tools, to identify the existing technology for various temperature and hole diameter scenarios, to agree shortfalls that impact on all programmes, and to set in motion initiatives designed to remedy the identified shortcomings. In this way, it might be possible to share development costs that would otherwise be prohibitive. However, the involvement of other scientific programmes makes the concept more complicated. A pre-workshop planning meeting might be needed to agree an agenda and structure the required inputs. No date has been fixed for either the pre-workshop meeting or the workshop itself. Possible targets are November 1989 and April 1990, respectively. Before then, we need to identify ODP's scientific requirements and what tools are needed to meet them.

(ii) Perceived Scientific Requirements for Downhole Measurements

Davis (CEPDPG, SRDPG) introduced the scientific goals in the context of the East Pacific Rise (EPR) and Sedimented Ridge Crests (SR).

The EPR plan is to drill to about 1.5 km depth bsf as close as possible to the axial magma chamber. The Diamond Coring System (DCS) will be used almost exclusively. Temperatures are not known, but are estimated at about 350°C over much of the depth.

The SR aim is to drill through the sediment pile (200-1000 m thick) and to penetrate as far as possible into basaltic basement. Both the DCS and the Rotary Core Barrel (RCB) will be used. Expected temperature range in the sediment section is 200-400°C. In the basement, temperatures are typically expected to be up to 350°C.

Becker (LITHP) described the required downhole measurements in terms of scientific themes, hydrothermal (at SR and EPR) and magmatic processes (at EPR only).

Hydrothermal	Magmatic
Temperature	Natural Gamma
Pressure	Density
Permeability	Porosity
Discrete Fluid Samples	Stress
Borehole Fluid Logs of pH and Resistivity	Sonic & Seismic Velocities (P and S)

A borehole seal is essential for hydrothermal studies.

(iii) Identification of Technical Shortfalls

Howell reported on the status of off-the-shelf high-temperature logging tools. In general, high-temperature tools require more preventive maintenance. Calibration problems can be expected, especially with slimhole tools and those from different contractors, and therefore calibration blocks are needed on board ship. Laboratory experiments may be needed to verify tool responses at high temperatures. Off-the-shelf high temperature tools do not afford the same reliability as conventional tools and it is usual to ask for three high-temperature tools of each type at the logging site rather than two.

Various (slimhole) service-company tools are available up to 260°C. These provide for all the hydrothermal and magmatic requirements up to this temperature except for:

permeability
pH
stress

Permeability is impeded by the difficulties of packer design and deployment; the strategy would be to use the packer in the cool part of a hole and measure only interval permeabilities. pH is not measured routinely even at low temperatures. Stress measurement using the BHTV is seriously affected by temperature degradation of the cable. Further, a dewared BHTV requires a large-diameter hole; the other measurements (density, sonic, etc.) do not.

Extending the operating temperature range of tools requires additional thermal insulation or hole cooling. Off-the-shelf 260°C logging tools can be double-dewared to reach 300°C at which temperature they would have a typical operational period of 6-8 hours. Double-dewared tools require a large-diameter hole. They cannot be deployed in DCS holes although with (repackaging) modifications to the dewar design they could be slimholed. Difficulties are anticipated with the very high temperature operation of nuclear and sonic tools due to the functioning of crystals and transducers, respectively. Also a teflon cable is needed for operations up to 300°C. For 350°C operation, it would be necessary to cool the 300°C tools.

Hole cooling is very difficult in DCS holes because of the restricted annulus around the tool which impedes circulation. Large diameter holes can be cooled during logging, eg. by using a "toolpusher" system with circulation, in which the SES is deployed with a wet connect and with the (dewared) tool attached to the base of the drillstring. Such a strategy might also require in-hole data recording.

The two possible approaches are:

(a) at DCS sites drill a large-diameter hole, specifically for logging, or

(b) drill each hole with DCS and ream to a larger diameter.

In either case, dewared tools should be used in conjunction with a toolpusher and circulation.

In summary, off-the-shelf temperature and pressure (slimhole) tools exist with ratings up to 350°C, and existing gamma, density, porosity, resistivity and sonic/seismic tools might be dewared in a large-diameter mode to the same temperature rating, especially if deployed in conjunction with cooling.

Anderson proposed the development of a single combination slimhole, 350°C tool string for use as a stand-alone high temperature logging tool either with a logging cable or with downhole recording. Temperature, pressure and fluid and rock resistivity would be logged with this combination. The feasibility of this development will depend on further investigations. Operating a fluid sampler at high temperature and pressure is beyond the capability of the LDGO Borehole Research Group. The development of high-temperature permeability and pore pressure tools is more within the brief of TAMU.

(iv) <u>Future Strategy</u>

A short-term strategy was required to address as far as possible the immediate needs of LITHP, the Central and Eastern Pacific DPG, and the Sedimented Ridge DPG. A longer term strategy should be developed to address those issues that could not be resolved in the short term.

Becker reported that for the short term, the following were the LITHP priorities for downhole measurement at high temperatures to be addressed by the ODP logging contractor.

1. Temperature (all hydrothermal objectives fail without this)
2. Downhole Fluid Resistivity (in borehole)
3. Formation Resistivity (for porosity)
4. Natural Gamma
5. Sonic (preferred over density tool)
6. Caliper
7. Flowmeter
8. Borehole Fluid Pressure

LITHP view was that 1-5 must be measured, 6-8 were of lower priority.

Other LITHP needs are high-temperature permeability and pore pressure determinations and pore fluid sampling.

In the longer term, provision must be made for developments that are too complex or costly to be met before mid-1991. The concept of an inter-programme workshop on downhole measurements at high-temperature should be strongly supported.

After the joint meeting with LITHP, DMP formulated the following.

DMP Recommendation 89/17

"A high-temperature logging tool combination rated to at least 350°C be developed by the logging contractor to address as many as possible of the following scientific needs identified by LITHP and listed below in decreasing order of priority.

1. **Temperature**
2. **Borehole Fluid Resistivity**
3. **Formation Resistivity**
4. **Natural Gamma**
5. **Sonic**
6. **Caliper**
7. **Flowmeter**
8. **Borehole Fluid Pressure**

These objectives are to be achieved by repackaging existing tools, not by the development of new tools."

DMP Recommendation 89/18

"Funds for the development of the high-temperature tool combination, currently allocated as $300,000 for tool hire during FY91 and FY92, should be made available as soon as possible to allow the redirected initiative to be brought to fruition before the estimated tool deployment date of mid-1991."

DMP Recommendation 89/19

"A JOI-supported inter-programme workshop on high-temperature logging should be planned, and scheduled to take place before mid-1990, in order to develop the necessary engineering science for the longer term."

DMP Consensus

DMP support the following recommendations of the Sedimented Ridge DPG.

(i) The Barnes-Uyeda tool be modified for higher temperatures (up to 200°C) and be made stronger.

(ii) A slimline self-contained probe be developed or acquired to measure temperatures up to 350°C.

Further, DMP support the development of a high-temperature fluid-sampling capability.

9. Logging Contractor's Report

Anderson reported that the logging footage per leg continues to climb with logging now being successfully carried out in over 90% of designated holes. In particular, geochemical logs have been run in 41 wells : the tool now contains a boron sleeve.

The bridging problem is technically under control through the use of the side-entry-sub (SES) and salt muds. However, recently the SES has not been fully deployed because a number of BHAs have been lost and replacement stocks had run low. Since the SES increases the risk of loss, its deployment had been restricted. Consequently, the bridging problem has recently become more serious. A new stronger SES is being developed with TAMU help and this is expected to be available in March 1990.

Funding is available for the lease of one digital borehole televiewer (BHTV) from WBK Bochum. This includes training of LDGO staff, six months operation and analysis of the results. An FRG proposal (Fuchs, Karlsruhe Univ.) incorporates some support for the lease of a second tool. Digital BHTV deployment is scheduled for early in FY90.

Anderson presented a synopsis of logging results from legs 125 and 126. The new temperature tool is operational and was upgraded from 55°C to 85°C for Leg 126.

A key success is the new formation microscanner (FMS). This has also been used to identify breakouts for inferring stress directions.

A major problem concerns the FMS-dedicated microvax workstation. This is proving too complex to operate on a leg by leg basis due to a combination of start-up problems and the fact that the software is not easy to manipulate. Consequently there is, as yet, no real-time processing capability on board ship. This means that shipboard scientists do not have access to FMS images and therefore the benefits of core orientation are being lost. There are two possible courses of remedial action, either remove the microvax workstation from the ship to overcome the start-up problems or incorporate the microvax within the TAMU vax cluster.

The Panel expressed grave concern that much of the scientific value of the FMS will be lost if full image processing is not available on board ship.

DMP Recommendation 89/20

"LDGO and TAMU should give high priority to ensuring that full shipboard image processing facilities are available for FMS data. Consideration should be given to incorporating the FMS-dedicated microvax within the TAMU vax cluster."

Kinoshita informed the Panel of progress on Leg 128. The downhole seismometer system, which was delivered late without an explanatory manual, is not functioning well. There appears to be a fault with one of the horizontal sensors. Further information is awaited.

10. <u>Software</u>

(i) <u>Terralog</u>

Foucher reported that IFREMER were interested in obtaining the basic Terralog package for log reading and processing. No other expressions of interest were received.

(ii) <u>Alternatives to Basic Terralog</u>

Hutchinson reported on other options for reading LIS tapes. The National Geophysical Data Centre (NGDC) has placed all DSDP logging data on optical disc. There are plans to extend this archive to ODP data. A new version of Terralog is being conceived to read this information and this might encompass the LIS option. Other alternatives are pc based. The situation is complicated by the fact that Schlumberger is introducing a new LIS format as a standard.

(iii) <u>Future Strategy</u>

The aim of the survey was to facilitate logs getting out into the community. A list of reading options could usefully be included with LDGO log mailouts. The NGDC option still requires a means of access through personal computer. The NGDC compilation of ODP logging data should be effected, in ASCII format, in batches of, say, ten legs. Input should be sought from the JOIDES Information Handling Panel.

Two actions were identified.

The survey information (Item 10(ii)) should be developed into a releasable form.

[ACTION: ANDERSON/HUTCHINSON]

The Information Handling Panel should be asked for their input to a future strategy for ODP log data archiving and access.

[ACTION: WORTHINGTON]

(iv) BHTV Software

Zoback described MAC interactive processing of BHTV data. The ultimate goal is to have BHTV and FMS data side by side. Stanford are developing general log interpretation software for the MAC. This also allows selected targets to be studied. Shipboard users would have to bring their own MAC. The question of shipboard deployment of MAC software should not be considered until the more pressing problem of shipboard FMS real-time processing has been resolved.

11. WPAC Planning

Fisher and Golovchenko reviewed the current status.

(i) Nankai Trough

Programme similar to that outlined at the previous DMP meeting. Plan is to deploy the wireline packer initially in casing.

(ii) Legs 133-135

No further developments. Detailed planning not yet completed.

12. CEPAC Planning

Fisher and Golovchenko reviewed the current status.

(i) Leg 129: Old Pacific Crust

The following departures were noted from DMP Recommendation 89/9.

PIG 1 is now the deep hole and has the same logging programme previously recommended for the original PIG 4 except for the Dual Laterolog. PIG 1 will not be drilled last.

PIG 3-4 are now shallower holes and have the same logging programme as previously recommended for these except that the FMS is to be run in both holes.

The Barnes/Uyeda tool (WSTP) is to be deployed in two holes, as yet unspecified.

All locations are tentative, pending site-survey reports.

(ii) Leg 130: Ontong-Java Plateau

The following departures were noted from DMP Recommendation 89/10.

The re-entry site (now OJP-5) will have standard logs (including FMS) plus BHTV. Shallow sites, now OJP-1, OJP-2, OJP-4, were recommended for FMS logging in addition to the other standard log combinations: the FMS appears to have been omitted from the current schedule. Fisher to check.

[ACTION: FISHER]

The Geoprops Probe will not be ready for testing during this leg.

(iii) CEPAC Themes

No further developments.

13. **Proposed Geochemistry Workshop**

The Chairman reported that this had now been scheduled for 9-12 January 1990 at the UCLA Conference Center, Lake Arrowhead, California. It is being organised by G W Brass and M Kastner. Kastner had requested input on Geochemical Logging but no further details had been forthcoming. The Chairman hoped that the earlier concept of a geochemical logging session would be developed. Chairman undertook to contact the conveners to progress the initiative.

[ACTION: WORTHINGTON]

14. **Spinner Flowmeter**

Morin outlined the principles of a flowmeter plus injection programme for determining the vertical distribution of permeability around a borehole. The technique is used in hydrology where it is becoming a standard method. The end result is effectively a series of straddle packer tests but with no packer. The flowmeter can be used in stationary mode or as a continuous log. Where frictional head losses are suspected, a pressure log is needed because the head at the surface can no longer be assumed constant. The measurable range of permeability depends on the attainable head and fluid flow. Examples were shown of permeability determinations from 1 mD upwards over several orders of magnitude. The limit of resolution is governed by the resolution of the flowmeter. The lower limit might be extended by emplacing a packer-type oriface within the borehole. Fortunately, many holes are underpressured and suck fluid naturally.

The question was raised of deploying the technique at hole 504B for which there are published data that lie within the measurable range of permeability. The permeable zone of 504B is of greatest interest and it is here that the prospects for a permeability "log" are best. The operational procedure would be to lower the flowmeter through the pipe, set a packer in the casing, and obtain detailed permeability measurements approximately every 20 m.

DMP Consensus

The spinner flowmeter plus injection method constitutes a potentially viable approach to downhole permeability determination subject to solving the problems of heave compensation and packer deployment. Morin is encouraged to liaise with TAMU to obtain advice on how these problems might be solved.

15. Panel Membership

The Chairman noted that Eddie Howell was attending his last DMP meeting and thanked him on behalf of ODP for his input over the past years. In order to maintain the technical balance on the Panel, a replacement from industry should be sought, preferably with a tool development background. A search committee was appointed to nominate replacement candidates for consideration at the November 1989 meeting of PCOM.

[ACTION: WORTHINGTON, SONDERGELD, HUTCHINSON]

16. Measurement while Drilling

The Chairman noted that DMP have been asked to consider this technology in the past and that, while it would be premature to recommend its deployment in ODP, Panel ought to take a preliminary position on its potential usefulness. This position will be taken at the next DMP meeting.

[ACTION: PANEL]

17. Interwell Studies

The Chairman commented on the scientific desirability of performing a detailed characterisation of oceanic lithosphere in places where it was believed to be markedly heterogeneous. Such a study, necessarily carried out at a multi-well site, might involve interwell (tomographic) measurements of velocity and resistivity, as well as interwell comparisons of permeability obtained throughout multipacker deployments (drillstring, wireline, flowmeter/injection, etc.). Panel are asked to consider possible target areas, the key regional scientific issues, the form that the study might take, and the scientific benefits if successful.

[ACTION: PANEL]

18. Other Business

No new business.

19. Dates and Formats of Next DMP Meetings

The next meeting of the JOIDES Downhole Measurements Panel will take place at ODP/TAMU, College Station, Texas on 23-24 January 1990. It is hoped to arrange sessions with TAMU engineers and computer specialists during the afternoon of 23 January. Fisher to host.

Subsequent DMP meetings in 1990 should be scheduled to permit:

(i) a visit to the drillship
(ii) a joint meeting with SMP

Possible target dates (venues) are June 1990 (Seattle) and October 1990 (Brisbane).

The Chairman apologised to Panel members for such a long meeting, albeit extended by the four-hour joint meeting with LITHP. DMP was barely able to cope with its workload over three meetings per year. Yet, no one wished to meet four times per year on a regular basis. A possibility might be to delegate a portion of the workload to an ad hoc subcommittee. An obvious remit for a subcommittee would be the DMP scientific initiative of Item 17. The subcommittee option will be pursued if the DMP business workload warrants it after the next meeting in January 1990.

Close of Meeting

The Chairman thanked Members, Liaisons and Guests for their contribution to the meeting, the KTB of FRG for their kind hospitality, and Dr H Villinger for his gracious hosting. The meeting closed at 7.24 pm on Tuesday, 12 September 1989.

PAUL F WORTHINGTON
19 September 1989

89-445

Information Handling Panel Meeting
18-20 September 1989

Present: Ted Moore (Univ. of Michigan), Ray Ingersoll (UCLA), Kensaku Tamaki (Japan), Chao-Shing Lee (Canada/Australia), Michael Loughridge (NOAA), Andre Schaaf, John Saunders (ESF), Henry Spall (USGS), Will Sager (TAMU), Brian Funnell (U.K.), and Volkhard Spiess (F.R.G.), and William Riedel (UCSD/Scripps)

Liaisons: Darrell Cowan (PCOM), Russ Merrill (TAMU), Mike Hobart (BRG)

Guests: Laurent D'Ozouville (JOIDES Office), Bill Rose (TAMU), Jack Foster (TAMU), Patsy Brown (TAMU), and Fabiola Byrne (TAMU)

Executive Summary

The IHP spent a lot of time discussing means of attaining the 12 month IR volume and 30 month SR volume schedules. To achieve these schedules, the panel felt that the following additions to the budget need to be made.

- In order to have barrel sheets ready at 4 months post cruise for the initial post-cruise meeting, additional drafting assistance is needed. Cost would be about $24,000.
- In order for post-cruise samples to be made available in a timely fashion, cores should be shipped back to the repository after each leg instead of after every other leg. This represents an additional cost of $60,000/year.
- In order to speed up manuscript processing, prime control of the manuscript review and revision process needs to be returned to ODP at TAMU. Editorial Boards for each volume can still serve in an advisory capacity on matters of acceptance and rejection of manuscripts. Additional personnel for taking the SR volume papers from submission through production would cost about $180,000 (with overhead).

The panel reviewed the revised publication policy and made additional recommendations:

- The co-chief scientists and leg participants should mutually and formally agree on what paper(s) for the SR volume will fulfill their obligation to the leg.
- It should be the responsibility of the participants who wish to publish outside the SR volume to inform editors of the outside journal that the manuscript is being submitted to ODP as well, or to obtain waivers of copyrights and/or permissions required to reprint articles in the SR volume which have appeared in non-ODP publications (see Attachment IV).

The panel strongly recommends that we move forward with plans to put the ODP data base on CD-ROMS.

Recommendations to PCOM

1) The panel strongly recommends contracting with NGDC for production of an ODP data base in CD-ROM format at a present opportunity cost of $50,000 to $100,000. Timing is important! In order to avoid loss of the DSDP CD-ROM personnel already trained at NGDC, and to ensure the lower cost, funds need to be allocated by 1 January 1990, and ultimately will require that "clean" data be provided by ODP to NGDC. Use of experienced personnel who are available now, to develop the new access software and browse files will ensure substantially reduced long-term costs for subsequent ODP CD-ROMs.3)
IHP recommends that the new ODP publication policy be amended as indicated in the minutes (Attachment IV).

2) IHP recognizes the 17 years of valuable service that Ray Silk has given to the drilling programs, and recommends that PCOM adopt the enclosed resolution (Attachment V).

4) In order to allow the initial post-cruise meeting to be held 4-5 months post cruise, the IHP recommends that $24,000 per year be allocated for the drafting assistance necessary to complete barrel sheets for review at this meeting. This is essential to assure publication of the *Initial Reports* by 12 months post-cruise.

5) Sample availability is essential to achieving the 16-month manuscript submission deadline. In order to ensure post-cruise sample availability at the earliest possible date, the Panel recommends that $60,000 per year be allocated for shipping cores at the end of every leg (instead of every other leg).

6) IHP also recommends that approximately $180,000 per year be allocated to return control of the review process to the Program. The Panel concluded that it is highly desirable to keep the Editorial Review Board, but to revise its function in order to minimize the delay in manuscript flow and the review process.

7) The Panel recommends that:

a) at the end of each cruise, the co-chiefs define the obligation of each (shipboard or shore-based) participating scientist, indicating exactly which paper(s) would fulfill their obligation to publish their work in the *Scientific Results* volume of ODP. Additionally, it should be made clear that the report should usually be substantial in content, not a data report. This would give JOIDES a measure of exactly when the author has fulfilled this obligation.

b) sample requests for shore-based studies should be accepted only at the time of (or prior to) the initial post-cruise meeting. Later sample requests from scientists other than participants should wait until after the 12-month moratorium.

8) The panel recommends to PCOM that they request organizations or investigators intending to re-enter DSDP/ODP drilled holes to forward scientific plans to the JOIDES office and the current science operator. Scientific results and operational successes and failures should be reported in the same manner. This should avoid duplication of scientific effort and make subsequent investigators aware of the history and condition of the hole.

9) IHP recommends that ODP publish a cumulative index at the end of every 10th leg.

Meeting Notes

1) Ted Moore opened the meeting. He called attention to the agenda, which was included in his letter to the Panel members dated June 16, 1989. The subject of non-performers was added. Darrell Cowan attended the meeting as a representative from the PCOM.

2) Action items from last meeting:

a) Formation Micro-Scanner logging data to be presented as microfiche in the *Proceedings*.

Personnel at LDGO are processing the FMS data from Leg 126. The Borehole Research group would like to have them ready when the ship docks, but they expect that some processing on shore will always be needed. The shipboard system needs to be upgraded and user interface software needs to be developed. R. Merrill mentioned that LDGO is supposed to provide microfiche to ODP for inclusion in the volumes.

Data acquisition on board the ship seems to be working as scheduled. Data are being collected in real time. Data quality is good, and the Schlumberger engineers are happy with it. However, quality does depend on the condition of the hole. The tool can provide data related to orientation in the hole; shape of the hole (elliptical, for example) is not a problem.

The question arose as to whether the tool is run whenever logging takes place. M. Hobart responded that the tool has proven to be quite reliable, but the decision is made on a leg-by-leg basis. He noted that the logging tools have been combined to run more efficiently.

K. Tamaki pointed out that the caliper tool is very precise. M. Hobart explained that the depth of the hole is measured by the length of string.

C.-S. Lee asked about the possibility of putting data in CD format. M. Hobart responded that Lamont has the facilities. However, M. Loughridge noted that the crucial question becomes, "How many people in the community can/need access to data in CD?" LDGO can distribute data in tapes of most formats, and thus they are accessible to a wide range of people. CD format may not be necessary.

b) M. Loughridge evaluated cost of publishing ODP data in CD-ROM. He prepared his analysis for the PCOM, but no action has been recommended as of this meeting. DSDP CD-ROMs have been produced in quantity. The JOIDES office gave M. Loughridge a list for initial distribution, and that should be done soon. He distributed copies of the discs and manual to members of the panel who wanted to review them. He requested that they review the manual (for content, grammar, etc.) and the discs (if possible), and submit comments to him within two weeks. M. Loughridge will handle revisions to the manual, and will distribute revised copies. Hardware needed for the evaluation includes an AT/IBM compatible with a hard disc (5 free megabytes), and a CD reader. A color monitor is desirable, but a monochrome monitor will also do the job. The panel should take credit for the development of the programs and manual that are used to read the CD. The DSDP cumulative index is also included in the disc.

M. Loughridge said that users should be aware of the fact that not all DSDP data are on it. J. Saunders asked if this was a small print run, both for the disc and the manual, and if both would be revised after the comments from the Panel members are received. M. Loughridge said that only a few manuals were printed. It will be revised and printed after the revisions are received. M. Loughridge recommended that the subject be brought up again during discussion of databases. NGDC is not being funded to update the CD-ROM.

c) DSDP Mesozoic paleontologic data base - J. Saunders could not get information through Judit Nowak, who referred him to Paul Cepek. He spoke to Peter Woodbury, who was the person in charge of computers at DSDP. That person ran some tapes, but could not find the information. P. Cepek has all the data, but is not working on data from legs after Leg 68. He offered to complete the job if he could have one person half time for about one year. He asked J. Saunders to send a letter to the effect that IHP is still trying to see the project to completion in order to support his application to BRG for funding. J. Saunders proposed that someone in the panel write to P. Cepek and H. Beiersdorf making the request.

V. Spiess will get in touch with P. Cepek and H. Beiersdorf. After he does, Ted feels that the panel could write them a letter making a formal request so that they can use it to justify funding for the additional person needed. R. Merrill suggested that the panel should request a copy of what they already have from legs prior to 68, in order to complete the record at ODP and NGDC. If a formal letter from IHP is sent, J. Saunders should receive a copy to follow it up.

Cepek's file, called "A Guide to the Cretaceous Paleontologic-Biostratigraphic Data of the DSDP with examples for their electronic processing," is authored by P. Cepek, Kühne and Wolfart, and is dated 15/10/78 (archive No. 81252, diary No. 9591/78, Federal Inst. of Geosciences and Natural Resources, Hannover).

R. Merrill mentioned the ostracode database, which is kept by Dick Benson at the Dept. of Paleobiology, Smithsonian Institution. R. Merrill said that the panel may be interested in making sure that a copy of that database is at ODP, so that it is available to the general community. T. Moore agreed to write to Dick Benson. M. Loughridge said that it may be a good idea to keep a record of any DSDP/ODP databases being kept.

3) Data Base Group Report.

P. Brown elaborated on the report that was distributed to the members of the panel in preparation for the meeting. Efforts have been directed at eliminating the backlog. In 1987, the Data Base Group (DBG) and the Computer Services CSG (CSG) of the ODP evaluated the amount of manpower needed to catch up. Right now P. Brown said, we are almost up to date. At the last meeting in College Station she distributed a graph, and she used the same graph with green highlighting added to indicate what data have been worked on for the past six months.

M. Loughridge asked if ODP intended to capture GRAPE data into S1032. P. Brown explained that this may not be necessary because GRAPE data come in a format that is easily accessible, and ODP has no problems fulfilling requests with the data as they are. Age-profile data are extracted from the *Initial Reports* (IRs), so we are up to date. Paleontology data is extracted from the *Scientific Results* (SRs), and we have students working on data from the volumes published up to now. Underway-geophysics data have been entered through Leg 125.

The data set that is most time consuming is the that from visual core descriptions (VCDs). Hard-rock data are now being collected on the ship, via menu-driven programs, and the IHP recommended that the same be done with VCD data. Currently, one leg's worth of VCD data may take anywhere from one to three months to input. The Panel members present expressed concern about getting a workable system for shipboard collection of VCD data without waiting for the "perfect" system. Ted Moore will ask Ian Gibson to convey this concern to the SMP, and to keep IHP abreast of any progress on the development of such system.

Another concern expressed was the length of time needed to input paleontological data. M. Loughridge feels that, if the Panel can foresee a problem with keeping databases up to date, it is the Panel's responsibility to point it out to PCOM and the BCOM right away so it will not come as a surprise in the future. Patsy will send an updated version of the progress chart to Ted Moore before Thanksgiving.

V. Spiess asked why the DBG extracts paleontological data from the *Scientific Results* and age profiles from the *Initial Reports*. R. Merrill explained that the paleontological database was defined as a finished, SR-volume database. P. Brown said that age-profile data are updated as soon as we have the data from the leg. The DBG relies on students to interpret and enter the paleontological data from the SRs. It was suggested that the problems of data capture should be diminished once the Checklist II program is on the ship.

This raised the question of whether enough pressure is being put on having Checklist II ready sometime soon. J. Saunders suggested that data collected using Checklist II on the ship could be compared with those entered by the DBG from the SR volumes. This would help identify any problems with the data. J. Foster said that the program should be ready at the end of October. Changes in the hardware environment have called for changes in the program, which have delayed completion. R. Merrill explained that ODP was not planning to use Checklist II for data collection on the ship. Checklist II was envisioned as a tool help scientists who needed a way to collect and work with the data on the ship. Once used by the shipboard paleontologist, however, this edited and corrected species lists and range charts can be more easily put in the ODP data base.

V. Spiess suggested that data collected using Checklist II should be put into the database, but it would be subject to revision as soon as the SR volume is published. Once data are in the range chart, prior to the final version, a warning should be given that they are subject to revision by the scientist. T. Moore feels that IHP defined a data item that should always be collected the same way. Rather than having paleontological data entered into the ODP data base prior to publishing the SR volume, scientists who need it before the SR volume is published should access the age-profile database or extract the information from the paleontological reports. It is important to be able to review the raw paleontologic data. T. Moore asked to what extent a scientist can use Checklist II after getting off the ship. R. Merrill answered that scientists need only buy it.

P. Brown distributed copies of data definitions for various databases kept at ODP (see Attachment I). She said that the DBG wants to publish all data definitions as a Technical Note. The Group is working to clean up the data in the databases before they are turned over to NGDC. The Assistant Data Base supervisor position was restructured to a programmer/analyst. This person is working on writing programs that will check the data as they are entered on the ship. This person is also working with NGDC about producing CD-ROMs and other ways of accessing the databases via other computers (e.g. MacIntoshes).

The DBG is also concerned with the problem of integrating subsequent data into the ODP databases. T. Moore explained that this became a concern because there are people using data from the DSDP "blue books" (calcium carbonate, for example), and some of those data do not reside in the databases. V. Spiess commented that data also are collected when scientists go back to their laboratory and work with their samples, collecting data items which do not come in a standard format. M. Loughridge wonders how we make a distinction between data that are to be kept within the ODP. T. Moore says a simple way would be to say that if the data are published in the *Proceedings* they should be in the ODP data base. As it is now, data in the data base are more limited than that.

T. Moore asked the panel to consider what other kinds of data, if any, the panel should request to become a part of the items maintained by the DBG. Suggestions will be studied at the next Panel meeting. T. Moore will forward items to PCOM and will try to get their feedback before the next meeting. R. Merrill asked that a price tag be put on each item requested, so that if ODP is asked to keep any other kinds of data, they should also be provided the manpower to do it so we do not need to turn around and say that this is additional work that cannot be accomplished.

C.-S. Lee asked that digital seismic data be included in the databases kept at ODP. R. Merrill explained that data are being kept at ODP, and people need only request it. ODP may be converting it to WORMs, but it could then be copied to tapes for requestors. M. Loughridge explained that these data are not a part of CD-ROM because they are not used routinely.

It was suggested that a bibliography is needed of what has been published outside the IRs/*Proceedings*. R. Merrill said that a list is being kept by Chris Mato at ODP but that it is only partial. He explained that information on articles published elsewhere was incorporated with the data on papers published in the IRs, so we have as complete a set as we can get. We can also get an electronic list from GeoRef, which contains approximately 4500 entries. B. Rose explained the origin of this search. Last year, R. Merrill and B. Rose asked Sharon Tahirkheli, chief editor of GeoRef, to conduct a search of the GeoRef database for all references published by non-DSDP and non-ODP sources. The key words searched for were "Deep Sea Drilling Project" and "Ocean Drilling Program." The search convered the period from the inception of DSDP (1968) up to early 1989. The search turned up 4,239 bibliographic entries, exclusive of DSDP and ODP publications. The results of this search are in the form of a paper printout, which P. Rabinowitz sent to Tom Pyle at JOI.

Data derived from wireline re-entry of holes are among those that are not kept at ODP. R. Merrill suggested that, if a hole is re-entered, the organization that collected additional data should be in charge of keeping them and making them accessible to others. It may be a good idea to ask that whoever re-enters a hole notify the Program about the operation, the data acquired, and the condition in which the hole was left. M. Loughridge feels that, at this stage, a simple paper file with the history of the hole could be kept. This would allow anyone re-entering the hole at a later date to have reliable information on the condition of the hole. T. Moore agrees with the principle, but wonders who would be in charge of enforcing the rules (add to data-distribution policy?) and what mechanism would be used for enforcement. Compliance would have to be voluntary. Under the scheme, whoever entered the hole would have the responsibility of writing to an authority (ODP director, ODP Council, or the JOIDES office).

After the discussion, the panel decided to forward a recommendation to PCOM to set a requirement that organizations or investigators intending to re-enter DSDP/ODP drilled holes should forward proposals to the JOIDES office and ODP. The results should be reported in the same manner. LDGO would be willing to archive any logging data acquired from re-entries, said M. Hobart.

4) Computer Services Group Report

Jack Foster presented the report (Attachment II). He pointed out changes to the organizational chart. The Computer Services Group (CSG) worked with the Borehole

Research Group to acquire, install and test the equipment necessary to run the FMS to acquire data and to output it in paper form (the equipment was ordered by ODP to take advantage of discounts).

J. Foster distributed a copy of the summary of shipboard cruise evaluation forms through Leg 127. He said that most of the concerns expressed in these forms will be addressed by the changes that will be made during drydock. To the question of why so many more responses are received from some legs, J. Foster responded that it is not mandatory to turn the forms in, so that could account for the variation.

W. Sager asked about the status of the PRO 350s. J. Foster replied that ODP is trying to phase them out, because maintenance is no longer being provided by DEC. However, there are dedicated stations for which software was developed using the PROs. Time will be needed to translate these packages to work on other computers before the remaining PROs can be phased out.

W. Sager asked how ODP envisions interaction with the IBMs, MacIntoshes, and VAX. J. Foster explained that there is a central VAX system, and all the microcomputers are connected to it as terminals. A network is being set up for the new systems. All PCs and MacIntoshes and the LaserWriter will be attached to this network, which will be bridged to the VAX. The VAX has a piece of software, AlisaShare, which will help manage transfer of files. Two additional segments will be set up, and PCs, MacIntoshes and printers will be located conveniently throughout the ship. Files can be transported using diskettes or via AlisaShare on the VAX. Further, a network will be set up that will allow sharing files that reside on a PC. This is currently being developed for the Manuscript Tracking System (MTS), a data base that was developed for a single user on a PC and to which we now need to give access to the editors. We are also considering putting the bibliographic database in this server for the editors to facilitate bibliographic searches.

Based on input from the Scientists (cruise evaluations, comments transmitted via the JOIDES panels, etc.), the CSG is evaluating additional software to be put on the microcomputers. W. Sager asked about graphics programs, and T. Moore wanted to know what graphics software is available for the Macs on the ship. J. Foster said that software includes Adobe Illustrator, MacDraw and MacPaint. However, he said that ODP still requires that graphics for the *Scientific Results* be in a format that can be accessed by the Publications Group at ODP, to be used in the *Proceedings*. Word-processing files can easily be transported between PCs and Macs, and currently we can use and give to scientists files in several formats other than WordPerfect.

Regarding data-bases, J. Foster said that he and two others at ODP are also evaluating new software packages. Oracle is one that appears to be promising because it can work on PCs, Macs and the VAX, and there is software that permits communication between them. R. Merrill clarified that ODP is not planning to move away from S1032 at this time. These evaluations will allow ODP to keep abreast of new developments, and be prepared to make suggestions should a change become necessary. ODP cannot discontinue the license for S1032 because custom programs that use S1032 have been developed over a period of time, and it would take a great amount of resources to adapt those to another database package. The only problem with S1032 is that development of an SQL interface is proceeding slowly.

C.-S. Lee said that the number of hours used on the shipboard computer system seems small relative to the number of hours on the leg. This is in contrast to the concern that has been expressed in the past regarding use of CPU time on the ship and the slow response from the system. R. Merrill pointed out that now the VAX is being used to hold the data, and that most computing is done on the PCs. Only a few programs use the data that reside on the VAX. He also said that CPU usage peaks twice a day, and this only at very specific points during the leg.

In response to a question from W. Sager, J. Foster said that one of the VAX 750 systems on the ship had been replaced by a 3500 system, and that the old 750 is being used as backup. Since the 3500 was installed, ODP has not received many complaints regarding slow response from the VAXes.

T. Moore congratulated the CSG and the DBG for their constant level of achievement to date.

T. Moore wanted to know about the status of the digital imaging system. R. Merrill explained that ODP is evaluating how it compares to the photograph collection. T. Moore asked if the SMP knows about this system. R. Merrill said that they do know, and that it was decided that the system should be a very useful scientific tool. The only decision to be made is whether it should be implemented on the ship. A question to be answered is whether digital images will replace the photo collection, or would both be kept. The new optical WORMs or optical discs make it possible to collect these data without using unreasonable quantities of tapes. The advantage is that color data collected are more accurate and images can be manipulated. As M. Hobart said, the amount of data that can be collected is great. However, some problems have been found, and R. Merrill is working with the software companies to solve them. M. Loughridge mentioned a system that is being used to read Gloria data with a mouse. The cost of implementing the digital imaging system on the ship might be on the order of $150,000 to $200,000, R. Merrill estimated.

Someone expressed a concern about whether decisions on the digital imaging system described above would conflict with the function of the SMP. T. Moore said that I. Gibson is serving as the liaison between SMP and IHP. L. D'Ozouville explained that the liaison can be present at any meeting at the chairman's request. R. Merrill said that SMP knows about and has expressed support for the idea of a color processing and imaging system.

5) Publications Group Report

B. Rose had submitted his report (Attachment III) and proposed models for speeding publication of the *Proceedings* before the meeting. R. Merrill pointed out that most scenarios that ODP could foresee are presented in the models, and each is compared to what would happen to the schedule if no changes were made. B. Rose explained that the main cause of delays is the backlog that has been built. Once ODP is allowed to catch up, and if the two-phase post-cruise meeting scheme is put into operation, ODP should not have a problem keeping up.

R. Merrill notes that the distinction that must be made is how many books we will have at the end of FY91 under each of the models. He called to the attention of the Panel the comparison chart which shows what books will be published at the end of FY91. Analysis of the models indicates that, in the present mode, it will take four years to get rid of the backlog and start working on the "ideal" schedule. However, to be able to overcome the backlog, additional funds would be needed, the amount of which would depend on the model/amount of acceleration chosen. For example, undertaking the 18-month acceleration schedule at a cost of $448,575 would result in three more books on the shelf at the end of FY91 as compared to the current publication schedule.

The updated publications policy from PCOM is specific on many points, and PCOM asked for more detailed guidelines from IHP. With this in mind, consideration of ODP publications was divided into the following segments.

a) Publication schedule for Initial Reports.
b) Publication schedule for *Scientific Results*.
c) Editorial Review Board.
d) Inclusion of preprints/offprints from other journals as part of an SR volume.

T. Moore suggested that the panel review the length of time needed at each point in the production of the books to be able to make a decision regarding the 12- and 30-month deadlines.

a) *Initial Reports* schedule

From cruise end it would take:

4-5 months	for post-cruise meeting; meanwhile barrel sheets are being prepared;
3-4 months	for editing and production of art work;
1 month	for typesetting (some is going on concurrently with editing);
	(Co-chief review takes place when typeset text is ready)
1 month	for paste up and corrections;
1.5 months	for printing;

Given the figures above, production of *Initial Reports* within one year is feasible. However, T. Moore points out that the weak point is production of barrel sheets. He inspected the drafting system being used by ODP, and considers it a great improvement over that used at DSDP. He asked if there is a similar improvement planned for the near future. R. Merrill answered that a system possibly could be developed whereby drafting of barrel sheets could be done by scientists on board the ship. Doing so, though, would require resources and time for development. One concern is whether or not the scientists want to do that kind of work or whether they would ask for a technician instead. It is also likely that the SMP could provide assistance in finding ways of producing barrel sheets more efficiently.

R. Merrill also pointed out that the time frame above assumes that the initial post-cruise meeting will take place 4-5 months post-cruise, and it was requested by PCOM that this meeting be held 3-4 months post-cruise. A meeting at such an early date would not allow sufficient time for preparation of the barrel sheets. ODP has only one illustrator working on barrel sheets, and that person must accommodate both the drafting of new barrel sheets and corrections to old. Furthermore, the idea of an initial postcruise mini-meetings" was proposed by IHP as a two-leg experiment, but the policy that came from PCOM, and that appeared in the JOIDES Journal, seems more like a permanent policy change.

M. Loughridge wanted the panel to view the problem from two angles: 1) what can be done (adding personnel) to facilitate production of the IRs within a year, and how much that would cost; and 2) is there a different way that additional funds could be spent that would facilitate speeding up IR production but at the same time be more profitable over the long run? He proposed that the latter would be the best.

The Panel decided that an automated system for barrel-sheet drafting on board the ship needs to be developed. At the same time, it is important to bring the publications up to date, and this cannot be accomplished without the additional help. Therefore, IHP recommends adding another draftsperson (at a cost of $24,000 per year) to speed up production of the barrel sheets so that the initial post-cruise meeting can be held 3-4 months postcruise.

b) *Scientific Results* schedule

B. Rose noted that the production schedule for the SRs has slipped further behind from our March projections. The delay is due to the indexing work, and we now know that we should expect to have, approximately, a 6-week delay for each volume because of the index. J. Saunders asked if, with all the pressure to publish in a timely manner, ODP can afford to wait until the index is available to publish each book. This consideration has to be weighed against the value of having the index in each book. B. Rose also indicated that Volumes 104/105 are particularly large, and indexing them took a longer time than usual.

It was the consensus of the panel that ODP should continue to publish an index in each book.

ODP is planning to publish a cumulative index to the SRs, and a decision needs to be made on the frequency of such an index. The minimum number of pages for a volume should be about 200, but ODP could also publish the index in the back of a regular volume. W. Sager feels that the cumulative index can be published separately for ease of use, and J. Saunders agrees, saying that it doesn't have to be hard bound. After considering several intervals briefly, IHP recommended that cumulative indexes should be published at the end of every 10th leg; each index would cover the 10 most recently completed volumes only.

The different stages of production were considered, and an ideal time frame for each was considered. This resulted in the following schedule:

4-5 mos.	Initial post cruise meeting - materials for IR
10-12 mos.	Science post-cruise meeting - science meeting/workshop to present and discuss papers.
16-18 mos.	Initial submission (preliminary editorial review checklist, or PERC)
17-21 mos.	Reviews
18-24 mos.	Author revision
19-25 mos.	Re-submission - re-review
20-26 mos.	Pre-production (OCR scanning, editorial markup)
21-27 mos.	Typesetting
21.5-27.5	Galley review
22.5-28.5 mos.	Corrections and paste-up
24-30	Indexing
26-32	Printing

The schedule above should be considered a target but cannot always be adhered to because of unpredictable variables. M. Loughridge pressed to find out where delays happen.

W. Sager said that, in his experience, delays occur at two points: initial submission and submission of revised manuscripts. He said that deadlines are perceived as being very flexible, and that may be a cause for delays in submission. R. Merrill said that the problem has been one of the transition between the previous review system and the current review system, which is handled by Editorial Review Boards. Deadlines for legs that were caught in that transition have been adjusted so that those caught in the middle are not penalized. He pointed out that galley reviews can also cause delays.

L. D'Ozouville reminded the Panel that the 12-month science meeting was proposed to speed up production of the SR. T. Moore points out that most manuscripts would not be submitted by the time of that meeting but that drafts, abstracts and presentations need to be ready for the meeting in order for it to be effective in keeping production to a 30-month schedule. During the science meeting, an initial-submission deadline would be set for 16 to 18 months. M. Hobart feels, however, that papers essential to synthesis chapters should be processed fastest.

It is possible that, in preparation for the science (second) meeting, the chief scientists will want to put together abstracts from the papers that will be presented/discussed. If that is the case, IHP believes that the work should be done independent of the Publications group at ODP.

R. Ingersoll also raised the question of investigators who receive samples too close to the science post-cruise meeting, and who do not have enough time to prepare their papers. R. Merrill explained that, when requests are received close to the end of the moratorium, C. Mato makes sure that the investigator is aware of the time constraints. She routinely asks investigators who fall into that category whether they would prefer to wait until the moratorium elapses.

B. Funnell felt that another factor to be considered is the greater amount of information coming out of the ODP legs.

M. Loughridge asked if receiving reviews in electronic form would speed manuscript flow. It would to a point, said R. Merrill, but a lot of the comments ODP gets from reviewers are handwritten around the text. J. Saunders pointed out the possibility of sending reviews by fax.

R. Merrill pointed out that another cost-saving measure taken in 1987 resulted in shipping cores to the repositories only after every other leg. This means that cores get at the repositories about 4 months after the end of the first cruise in each pair, and after being unloaded, samples are shipped to investigators 6-8 months after the end of the first cruise. This presents a real problem to the early submission of papers. The estimated cost for reinstating shipping after every leg in approximately $60,000 annually. If the additional $60,000 for shipping core every leg, and the additional three staff scientists are replaced (to perform review functions), then the initial submission deadline at 16 months would give investigators enough time and could lead to production of SRs within 32 months after the cruise. However, under the present scheme of shipping core back at the end of every other leg, the initial submission would have to be at 18 months, and the 30-month schedule could not be achieved.

T. Moore asked how the "Present Publishing Schedule" in the models presented by B. Rose can be achieved without additional personnel. R. Merrill explained that much of the delay came from the impact on the system that resulted from budget cuts in 1987. Additional funding would help to speed things up, and perhaps what would help the most would be to refrain from making major changes to the system in the future. Also, he said, part of the time savings comes from the engineering legs, which will not produce SRs.

B. Rose added that ODP has streamlined the production process. The text is received electronically or in capturable form. It then is put in WordPerfect format and sent to the typesetter; ODP normally does not do much processing beyond that. Delays are at the preparation stage, as stated above.

B. Funnell noted that scientists are under pressure to publish their results soon, and ODP publications are taking very long. R. Merrill brought to the Panel's attention the fact that ODP schedules place receipt of manuscript at 18 months under the current schedule. This point would be 0 months for an outside journal. If ODP calculated likewise, ODP's time to publish would actually be 10-14 months (considering that the initial submission would happen at 16-18 months and publication at 26-32 months). Delays could still be incurred, but ODP anticipates that they would most likely not be greater than 2-4 months.

T. Moore concluded that a 30-36 month publication schedule should be acceptable. For this purpose, IHP recommends that $60,000 a year be allocated for shipping cores following every leg (instead of every other leg).

c) Editorial Review Board (ERB)

At PCOM's and EXCOM's request, the panel needs to evaluate the need for an ERB in view of the delays that ERBs have caused in the production of the SR volumes. B. Funnell feels that it is urgent to be able to present the refereed product to funding agencies at a reasonable time post-cruise to justify membership renewal. M. Loughridge points out that this becomes a real problem when people have to convince their constituencies to support continued funding for the Program.

T. Moore explained briefly the reasons for establishing an ERB for the benefit of the new members of the Panel. He noted that there is now a writeup (included with the Publications report) that streamlines the way the ERB was working. He said this plan is an improvement over his experience with the Leg 114 ERB.

R. Merrill reminded the Panel that another major reason for establishing the ERB was to save funds. By eliminating the ERB, the amount of time needed to process each manuscript is reduced, but you would then need to reestablish the three staff scientist positions that were cut in 1987. The ERB, T. Moore said, was also established to increase the scope of the review process and to increase its quality.

T. Moore asked about the assistant manuscript coordinator. (The position was slated as temporary through the end of September, 1989.) If three additional staff scientists are added to return control of reviews to ODP, eliminating the need for ERBs, that employee would no longer be needed. It was recognized that centralizing this activity at ODP would speed publication.

W. Sager felt that the ERB diffuses the responsibility for completing the editorial and review function and is damaging for various reasons. In his experience, he seldom hears from the other members of his ERB and has had to work hard at contacting them. He wondered if this means that the ERB does not have much support from the ODP staff. ERB members are supposed to read each paper and give their comments to the one member responsible for it. However, this is not happening. W. Sager further argued that establishing the boards was tantamount to taking a job that was originally given to a few people to do (staff scientists) for a salary, and then putting that job in the hands of others to do on a voluntary basis.

T. Moore feels that being part of an ERB does entail a great amount of work. He explained that it is true that each member is supposed to assure good, critical review of the papers for which he/she is responsible. R. Merrill said he is concerned about the possibility of mediocre papers being accepted for the volume for the sake of keeping the data in the book, because the ERB is reluctant to reject them outright, but the deadline allows no more time for revision.

J. Saunders would like to have an appraisal of the boards that have acted to this point. M. Loughridge pointed out that, for boards that have worked, there may be a common denominator that determines how they work. However, variations cannot be avoided. The delays will be incurred, and they can be avoided only by providing funds (for regular meetings, for example) to keep communications going.

J. Saunders agreed that, while the ERBs may slow things down, they help eliminate the perception that the SRs are in the "gray" literature. Saunders feels that it is important to maintain a good image for the SRs to encourage potential contributors. R. Merrill pointed out that the problem of perception may be exacerbated by the fact that PCOM and EXCOM members only hear the complaints. He believes that most of the involved scientists have a positive view of the ODP publications but do not convey it to the panel members.

Another question that came up was whether it is important to keep one external Board member. The original plan called for outside representation on the ERB from the general community to aid in eliminating the negative-perception problem. However, co-chiefs are also outside ODP, and all reviewers are now listed in the front part of the book. Nevertheless, R. Merrill said that the outside member has become a safeguard against the potential problem of co-chiefs who do not perform. For that reason, it would be a good idea to keep the outside member of the Board if ERBs are to be kept. Also, in that case, the external member of the ERB should attend the science meeting. The external member may also be free of shipboard politics and can sometimes provide independent judgement where conflicts of interest might arise.

Keeping the ERB concept and letting each Board take as long it needs to complete the volume was also suggested. R. Merrill asked how ODP could do that in view of PCOM's request to publish SR volumes 30 months post-cruise.

The Panel agreed that ERBs do help control the quality of the SRs, but that they also slow production. Retention of the ERBs is worthwhile, but their function needs to be revised. Strong control of the review process has to reside at ODP if an accelerated production schedule (possibly as presented above) is to be achieved. Possible ways to give control back to ODP include, but are not limited to a) increasing the current number of staff scientists to handle review of each volume, b) establishing science editor positions for the same purpose, and c) keeping the assistant manuscript coordinators. The decision on the avenue to pursue should be left to ODP management. However, the Panel recommends that approximately $180,000 per year in additional monies be allocated for this purpose.

d) Inclusion of Reprints/Preprints in SR Volumes.

IHP has discussed this subject in the past. The problem, as presented at that time, was that the outside journals would be the copyright owners. This would put ODP in the position of having to ask permission to reprint papers published elsewhere. On the other hand, if we were to print the paper first, then the outside journal may not want to publish it.

A. Schaaf wanted to clarify that the Panel is seeking: a) to keep the SRs as the archival form with all the leg-related papers included, and b) to publicize the results of the Program in the open literature and thereby achieve a wider distribution.

Manuscripts submitted within 12 months post-cruise:

H. Spall talked with representatives from various journals (*Science*, *Nature*, and others) who were excited about the possibility of publishing early results from ODP cruises. If a manuscript is submitted to an outside journal within 12 months post-cruise, it probably would be published in the other journal before it needs to be submitted for inclusion in the SR volume. In that case, H. Spall found out that most journal editors would not object to SR publication soon after their journal was issued, and that they may even try to publish the paper quickly in order to have it in the open literature before the SR comes out. T. Moore indicated that, talking with other co-chiefs, he found out that only a few papers from each leg would be submitted to other journals first. H. Spall also stated that in quite a few cases, authors would revise what appeared in the journal, in which case ODP may want to typeset and print the revised manuscript. Otherwise the manuscript could just be reprinted.

B. Funnell felt that after a manuscript was published in another journal, the paper should not be revised for publication in the SR. Instead, notations could be added (as a footnote?) to the reprint.

The panel decided that this type of manuscript presents no problem. The author would have plenty of time to review and expand such a manuscript for the SR if he/she considered it necessary.

Manuscripts submitted after the science post-cruise meeting:

This situation would cover a paper whose authorship and theme are presented at the science meeting held 12 months post-cruise, but the paper itself is not yet ready for submission. R. Merrill pointed out that manuscripts for SRs are due at 16 months post-cruise if the volume is to be published at 30 months post-cruise. This means that someone trying to submit a paper elsewhere would have to produce the paper within four months of the science post-cruise meeting. A manuscript in this category would have to be submitted to the outside journal and to the SR at the same time, because most likely the outside journal could not complete the review and publish the paper in time for a reprint to appear in the SR volume.

The panel asked what would happen if a manuscript is submitted only to another journal and is rejected. R. Merrill said that the author would be covered only by submitting the manuscript to ODP as well as to the other journal. The burden would then be on the author to notify the outside journal that the manuscript is being submitted to ODP as well.

In both of these cases, the simple solution would be to make sure that the journal editor understands that the manuscript a) will be reprinted by ODP, or b) that the same (or a similar or a longer) version is being submitted for publication in the SR volume. The author(s) would be required to notify the journal of that situation.

It was noted that the ODP Publication Policy that was published in the June 1989 issue of the JOIDES Journal has already been adopted by EXCOM. However, the Panel, following the request from PCOM to comment on the policy, wanted to expand on it to clarify some points. The changes requested by IHP were incorporated into the policy by R. Merrill. The new policy document was carefully examined by the Panel and, after modifying it, the Panel decided to recommend that the policy be amended (see Attachment IV).

As a closing item on ODP Publications, R. Merrill pointed out that Ray Silk retired after 17 years of service to DSDP/ODP. The panel unanimously agreed to recognize the service that Ray Silk gave to the Program during that time. For that purpose, a resolution was adopted, and IHP will forward it to PCOM with a request that the Committee endorse it (see Attachment V).

6) Borehole Research Group report

The report was presented by M. Hobart (see Attachment VI). A copy of the well-log distribution policy will also be distributed.

D. Cowan said that the Downhole Measurements Panel (DMP) unanimously approved processing Formation Micro-Scanner (FMS) data on board the ship. M. Hobart said that the first goal is to produce the data on board the ship so they can be used by the scientists. However, because the BRG does not have a system manager on the ship, this goal has become very difficult to achieve. Hardware problems also have come up, but they are being solved. These two factors combined have made it necessary to bring the data back to the lab on shore for processing. M. Loughridge wondered if the problem is one that could be resolved, given appropriate resources. M. Hobart responded that he does not know. The system was working on shore before they put it on the ship, and the problems were unexpected.

The BRG is receiving a large number of data requests, particularly from U.K. A new logging data distribution center was established in England. English scientists now can request data from Mike Lovell. Internet is now available, making it easy to give data in a useful format to MacIntosh users. The Group is encouraging electronic submission of requests. They hired a few people to help fulfill requests. Data are provided in ASCII format for the most part. However, the output sometimes is not really ASCII, and additional processing is needed (manipulation using the UNIX system solves the problem most of the time).

Another problem with data distribution is that Teralog, the log analysis system being used by the BRG, is expensive. The BRG received it as an educational gift. Most programs available commercially are geared for the oil industry. However, most questions from users are for packages capable of reading the Schlumberger data, which can be accessed by most packages. Schlumberger and other major oil companies are working to establish LIS2 as a public-domain standard.

All the geophysical logs are routinely processed within a month of the end of the cruise. Geochemical logs present a problem in that custom-designed techniques have to be used, but usually the data are processed before the initial post-cruise meeting. Geochemical-log formats are changing, though, and the Group doesn't know how the changes will affect data processing.

Schlumberger updated their logging system on the ship, so that data are now recorded straight to disk. This system is more reliable. The BRG is routinely recording standard density, velocity, and gamma ray surveys (phys-props logs); FMS logs are included if there is a third run. The heat-flow-measurement data obtained supplement downhole measurements. Temperature logging is an additional useful survey.

The question of non-performers as related to recipients of logging data within the one-year moratorium was brought up. Mike Hobart will draft a modification of the JOIDES/MSF sample and the data-distribution policy to cover logging for the next IHP meeting.

7) Curatorial report

The report was distributed before the meeting (see Attachment VII).

J. Saunders asked how help from the technical staff is working. R. Merrill explained that marine technicians that are not at sea help the Gulf Coast Repository staff, which consists of one FTE. However, the East Coast Repository does not get this kind of help, and they cannot count on getting graduate students from Lamont, as we get at TAMU. The reductions in personnel at each repository have caused difficulties in handling requests for samples promptly, but the situation is particularly difficult for ECR personnel.

R. Merrill also reported that the facilities at each of the repositories are being upgraded, and that a new system for labeling hard rocks needs to be worked out.

The geriatric study of cores made a leap forward with the materials recovered during Leg 124E, R. Merrill said. A progress report was included with the curatorial report. Results should not be expected until about four years from now.

8) Non-performers

T. Moore gave a brief background of this activity. He explained that non-performers are being identified at PCOM's request. Non-performers are participants who received samples and/or data and agreed to produce some report for the SR volumes but failed to do so. An effort is made to identify them and to allow them to explain why they were unable to fulfill their obligation. Their response is kept on file. Future participation in the Program by those who do not respond with a satisfactory explanation may be affected.

The purpose of this effort is twofold: to give scientists who are perceived to be non-performers an opportunity to clear their records, and to forward the information to the secretariats of the international funding partners. Contributing ODP members are allotted limited space on the ship, and they want to offer it to those who will produce results after their participation on the cruise.

The panel asked if scientists are informed about what a non-performer is and what the consequences are for those who might fall into that category. R. Merrill said that all sample recipients receive information regarding the obligations they will incur by receiving samples and/or data from ODP before the moratorium on that data expires. Also, since Leg 118-120, an explanation is made at post-cruise meetings, and in a letter to those who have not submitted papers a month before the deadline. This had not been done for earlier legs, but it is being done routinely now.

R. Merrill pointed out that names forwarded from ODP to IHP may include people who have valid excuses for not contributing to the *Proceedings*. T. Moore emphasized that IHP wants to be very careful about incriminating people who may have valid reasons for not having fulfilled their obligations. For that reason, a fair chance to respond will be given everyone.

While reviewing the names brought from ODP, a problem with the system was identified: those receiving samples after the end of the cruise were not being reminded of publishing deadlines. They were thereby not given the same chance to respond that others were afforded. F. Byrne will get the date of sampling and date of the end of the moratorium for each of the cases reviewed during this meeting. She will send the information to T. Moore for use when composing the letters to those identified as potential non-performers. Also, the countries that the participants represented should be included. This information will also be included in all future reports.

T. Moore suggested that the co-chiefs define the obligation of each (ship or shore) participating scientist before the end of the cruise (by mutually agreeing on the paper(s) that would fulfill their obligation to the *Scientific Results* volume), and will insure that the scientist understand that his/her obligation is to write a substantive paper on a topic needed by the shipboard party. This would give ODP a measure of what the scientist's obligation is. It should be pointed out that this obligation needn't be more than one paper. He also suggested that, unless a request is received and filled soon after the cores are received at the repository, it should not be filled except as a subsequent request. The Panel agreed, and decided to forward to PCOM a recommendation to suggest that ODP instruct each set of co-chiefs to provide this information by the end of each cruise.

9) Micropaleontological Reference Centers

The report on those centers was distributed by John Saunders (see Attachment VIII). He said that the information on foraminifers needs to be reviewed to verify the age of the samples, and to add information regarding richness and number of specimens. A file could be created that could be used as a checklist for the reference centers and to aid scientists in choosing the area from which they want their samples. Such a file would also allow the centers to identify gaps, and could work toward filling them.

T. Moore asked if a meeting of the curators for the centers should be planned. J. Saunders welcomed the idea because he believes that a meeting of the curators would enable them to share ideas on what can be and what is being done.

T. Moore asked whether the centers are being used, and he said that it would be helpful to have statistics in that regard. J. Saunders explained that statistics at this point may not be fair because the centers are not being advertised. The center in Basel has advertised to a limited extent, but not with promotional materials. This is changing, after production of the brochures.

J. Saunders said that he has not received any response from some of the centers acknowledging receipt of the samples that he has distributed. At this point, he is prepared to stop sending samples to those centers that do not acknowledge safe receipt of the last shipment. This is the case for the center at TAMU. M. Loughridge suggested finding another home for the collection, where it can be advertised and its use fostered. The possibility of transferring it to ODP was brought up, but R. Merrill mentioned that if it is given to ODP, it is likely that the collection will be moved whenever another institution is assigned as the Science Operator. In that case, one institution would likely end up with two collections, whereas there would not be one near the Gulf Coast. He suggested that it might be better to keep it separate from ODP. W. Sager will check into the status and accessibility of that collection. R. Merrill pointed out that problems of this sort are not exclusive to the center at TAMU.

The IHP should continue to support the centers with the understanding that more effort will be made to advertise their existence. It was suggested that this task might be better done by ODP. P. Brown said that the DBG is distributing the booklets at meetings. Another possible avenue would be to include them in distribution of one of the issues of the *JOIDES Journal*, or to give the information to scientific journals as a news item. B. Riedel pointed out that the centers must be accessible before we allow any announcements. R. Merrill said he believes that having people making inquiries may stimulate action to get the centers set up. A news release to *Geotimes* and EOS may well be called for. J. Saunders will prepare some material for such a release.

K. Tamaki asked about the possibility of having one of the centers in Australia. J. Saunders explained that, because of the way samples are split, only eight centers could be set up. The decision on distribution of the centers was on a geographic basis and independent of membership. That decision was made 12 to 15 years ago.

B. Riedel said that the DSDP sample database included information on origin, abundance and preservation of the species. That was also the requirement for publication at DSDP. He wanted to know whether that is the case with ODP. P. Brown answered that the same information is being collected routinely at ODP, but the data are not standard. Variations cannot be avoided even within a single leg's scientific party.

10) NGDC report

M. Loughridge brought a copy of the CD-ROM that contains DSDP data and the accompanying manual that were produced by NGDC. He asked for volunteers to review the manual and, if possible, the disc. Those who agreed to review them were to return their comments to Mike within two weeks of the end of the meeting. The initial distribution will be done from NGDC, based on a list received from JOI, Inc. M. Loughridge said that this is an achievement of the Panel, which backed the project. USSAC funded it, and he is not sure whether distribution will include the foreign partners.

M. Loughridge evaluated ODP data and concluded that they are very different from DSDP's. Accession software for a CD-ROM containing ODP data would need to be developed. He said that the people who developed the software for accessing DSDP data are still at NGDC, and using their expertise would save the time and expense of training new personnel. Production of accession software would include creation of browse files that would be part of the CD-ROM. The cost of updates in CD-ROMs would be significantly less than that of the initial development. The task, he estimated, would take approximately eight months. The situation would be different if he has to let the personnel go and start over from the beginning. M. Loughridge said he hopes the project will be started, but that anyone charged with accomplishing this task will need funds to proceed.

There are already approximately 20 legs of ODP data, and they could constitute the first issue (Volume I) of a CD-ROM with ODP data. Updates of that volume could be done at regular intervals until it is full, at which point the second issue (Volume II) could start. C.-S. Lee asked if another CD containing seismic data would be published. M. Loughridge replied that that had not been planned, and may not, be unless the community asks for it.

After evaluation of this report, IHP recommended to move forward to try to contract production of an ODP database CD-ROM at a cost of between $50,000 and $100,000. Timing is important because of the availability of the personnel that are already trained at NGDC. The lower cost would apply only if funds are allocated within the next couple of months. After that, costs will increase significantly because of the need to train new personnel for the task.

11) Closing

The Panel agreed to meet next at ODP, March 7-9. A request will be submitted to the JOI office to have the Fall 1990 meeting in Basel. J. Saunders agreed to host that meeting, and will confirm the dates. The Panel's first choice is October 8-10; the second is September 24-26.

ACTION ITEMS

People who do receive the CD-ROM containing DSDP data should review the manual for content, grammar, etc. They also need to exercise the data, and all should submit comments to Mike Loughridge within two weeks.

P. Cepek and H. Beiersdorf need approximately 6 months' manpower to complete the Mesozoic paleontological database. V. Spiess will get in touch with them and will contact T. Moore. T. Moore feels that the Panel could write them a letter making a formal request so that they can use it to justify funding for the additional person needed. He will write the letter when he hears from V. Spiess, and J. Saunders will receive a copy of it to follow up.

Patsy will send an updated version of the database progress chart to Ted Moore before Thanksgiving.

IHP is concerned about getting a workable system for shipboard collection of VCD data, without waiting for the "perfect" system. Ted Moore will ask Ian Gibson to convey this concern to the SMP. Ted Moore will ask I. Gibson to keep IHP abreast of any progress on developing such a system.

T. Moore requested that Panel members get a feeling for additional (subsequent) data that people may want incorporated into the ODP databases, and those will be studied at the next meeting. W. Sager suggested that the assignments be given according to specialty. Oxygen and carbon isotopes, calcium carbonate, and data derived from re-entry of holes are examples.

Nick Pisias has pointed out that additional databases have resulted from work on DSDP/ODP materials. Should those be kept at ODP? What about others of the same kind? Ted Moore will include this subject in the agenda for the next meeting. Panel members will come prepared with ideas on the subject. W. Sager will draw up a questionnaire on this matter to be reviewed at the next IHP meeting.

Mike Hobart will draft a modification of the JOIDES/NSF sample and data-distribution policy to cover logging data. This will be reviewed at the next IHP meeting.

F. Byrne will check into the date of sampling vs. the date of the moratorium for assessing non-performers (how long they had for study). Countries that participants represented are not on that list but should be included in the future.

W. Sager will check on duties and obligations of participants with Audrey Meyer, Manager of Science Operations for ODP, and will draft an appropriate checklist. The checklist could include references to manuals and other documents that expand on that obligation.

J. Saunders will check on dates for the next fall meeting. The first choice is October 8-10, the second choice is September 24-26.

W. Sager will check into the status and accessibility of the TAMU Paleontological Reference Center.

J. Saunders said that he will continue to advertise the availability of the collection at the Paleontological Reference Center in Basel. A news release to *Geotimes* and EOS may be called for, and he will prepare material for such a release.

T. Moore will write to Dick Benson regarding the Ostracode database.

The Panel (T. Moore) will forward a recommendation to PCOM to set a requirement that organizations or investigators intending to re-enter DSDP/ODP drilled holes should forward proposals to the JOIDES office and ODP.

IHP Recommended ODP Publication Policy

In order to provide a framework for more timely publication, both in the ODP literature and in the open literature, while maintaining the integrity of the "*Scientific Results*" volumes, PCOM recommends the following policies for publications.

A. The "*Initial Reports*" volumes will be scheduled to appear within one year of the end of a drilling leg. A small meeting of the Co-Chief scientists and key personnel, about 4 to 5 months post-cruise (the initial post-cruise meeting), will refine, edit, and complete the "*Initial Reports*" volume.

B. The "*Scientific Results*" volume will be scheduled to appear 30 months from the end of a drilling leg. All shipboard and shore-based cruise participants who receive samples and/or data prior to 12 months post-cruise are required to submit a substantive formal report to this volume. The precise nature of this report will be negotiated between the participant and the co-chiefs prior to the initial post-cruise meeting. Acceptance of this report to the SR volume by the deadline will fulfill the participant's obligation to the ODP, although additional papers are welcome. The SR volume may consist of direct contributions, as well as reprints of papers submitted to non-ODP publications under the following guidelines:

1. Prior to the science post-cruise meeting:
Any submission to a non-ODP publication prior to the science post-cruise meeting (10-12 months post-cruise) must have had its authorship and theme agreed to by a consensus of the scientific party before the end of the cruise. The co-chief scientists will examine the manuscript to ensure that the agreement about theme and authorship has been fulfilled. Authors are responsible for: a) alerting the editor(s) of the non-ODP publication of the fact that the paper also may be reprinted in the SR volume, b) obtaining waivers of copyrights and/or permissions required, and c) submitting camera-ready copy of the paper published by the non-ODP publication to the SR volume. Authors may, alternatively, expand and/or rewrite such papers for submission to the SR volume in the normal fashion.

2. Between the science post-cruise meeting and fulfillment of obligation:
Any submission to a non-ODP publication between the time of the science post-cruise meeting and the fulfillment of the author's obligation for publication in the SR volume must have had its theme and authorship agreed to by the co-chief scientists and a consensus of the scientific party. The co-chief scientists will examine the manuscript to ensure that the agreement about theme and authorship has been fulfilled. The same paper or an expanded version must be submitted simultaneously to the SR volume. It will be subjected to the ODP peer-review process independently of the review conducted by the non-ODP publication. It is the author's responsibility to inform the editor(s) of the non-ODP publication of the submission, and that the paper may be accepted or rejected by the ODP independently of the non-ODP publication's decision.

3. After fulfillment of obligation:
After the participant's promised contribution to the SR volume has been accepted by the ODP, authors may publish at will in the open literature. Authors who fail to contribute an acceptable manuscript to the *Proceedings* may not publish in any other medium until the SR volume has been published.

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Meeting of the Sedimentary and Geochemical Processes Panel
GEOMAR-Kiel, Federal Republic of Germany
19-20 September 1989

Executive summary

The meeting was devoted to (1) review of drilling proposals, (2) revision of SGPP white paper, (3) preparation for CEPAC/DPG and (4) discussion of technology issues.

(1) Review of drilling proposals
SGPP has in hand 48 (!!) proposals for post-1991 drilling; of these the following ones will be in the **ranking which should be completed during the spring meeting:**

330/A	Mediterranean Ridge	332/A	Florida Escarpment
335/A	Drowned atolls	337/D	Test sea level curve
338/D	Marion Plateau	340/B	North Australian foreland
342/A	Barbados accretion	345/A	West Florida sea level
348/A	US middle Atlantic margin	349/A	Gran Canaria clastic apron
59/A	Madeira turbidites	351/C	Bransfield Strait
341/A	St.Lawrence late Wisconsian		

Several other proposals will be re-considered:

329/A	Cretaceous Atlantic	336/A	Arctic drilling
339/A	Benguela Current	350/E	Gorda deformation

A few proposals have not been reviewed because they were received late:

352/E	Mathematicians Ridge	353/C	Antarctic-Pacific margin
354/A	Namibia upwelling	355/A	Peru gas hydrates

(2) White paper
Evident was the discrepancy between the panel mandate as handed down by PCOM and the few themes to which SGPP has devoted its energies. A new introduction will explain this selection as well as the chapter sequence and linkage between themes. An executive summary of the white paper should **highlight technology** issues. Further needs to incorporate are: more explicit statement about instrumented holes; section on ice margin processes; greatly expanded section on sediment fluxes (including carbon budget as it pertains to paleocean chemistry); divide evaporate discussion between metallogenesis and paleocean chemistry. No outside comments were received.

(3) Preparation for CEPAC/DPG
Martin Goldhaber to present SGPP's justification for highest ranking of (1) hydrothermal processes at sedimented ridges and (2) the Cascadia accretionary margin. Document -drawn from the SGPP minutes, Fluid Working Group and Sedimented Ridge Crest Working Group reports- should reiterate: ***that drilling of sedimented ridge crests to occur only at an hydrothermally active segment and that SGPP's conception of the Cascadia drilling means the Oregon margin because fluids, sediments and hydrology are a documented and integral part of the drilling proposals.***

(4) Technology issues
Sand drilling was discussed based on the TAMU document (88-0300; see Appendix to panel minutes) rather than took the direct exchange with a TAMU engineer as hoped for. Because of the concern for improved recovery, specifically in the thematic areas achievable through drilling of:
-shallow water sands to secure one end-member for determining magnitude of sea level changes;
-volcanoclastics in accretionary margins;
-contourites for deep water history;
-carbonate sands in atoll drilling;

-sulfide sand & gravel in ridge valleys and sedimented ridge crests;
-unconsolidated mounds at mid-ocean ridges,
SGPP feels that the issue is ***not resolved with the receipt of this document (88-0300).***

The panel wishes to learn if there are **really new technologies** being considered to overcome the old problems or if these advances are not pursued at an innovative level because of lack of funds ? SGPP to prepare a short summary document to highlight the issue and ***send a one-time liaison to the annual TEDCOM meeting.***

Fluid sampling; this document will deal with:

1. *Extraction of pore fluids* - modification of present pore water protocol. All objectives cannot be accomplished with a single procedure but there is need for a variety; i.e. inert atmosphere, *in situ* temperature of squeezing, metal-free squeezers. What is minimum standard program needed ? What is the permissible flexibility for high density/volume sampling?
2. *Pressurized Core Barrel (PCB)* - flexibility to meet many scientific objectives. Sampling methane/hydrocarbon clatherates in order to measure their physical properties, imaging of internal structures, extraction of helium or other noble gases, CO_2, N_2, microbiological rate experiments injecting labeled tracers, mineral phase transition studies, and calibration of logging tools. PCB to be used at both high and low temperatures making temperature and in chemically-corrosive environments.
3. *High-temperature sampling* - upper limit for SGPP scientific targets is more likely 350-400°C and not 1200°C; feasibility of *in situ* extraction of fluids at these temperatures versus chemical logging using a dewared down-hole recording instrument will be considered.
4. *Instrumented holes* - monitoring should be done on either sealed or open holes at sedimented ridges, accretionary margins, marginal seeps and bare rock ridges for a duration of 2-4 months. Properties monitored should include temperature, flow rates, gases (e. g. CH_4), pore pressure, and specific ions.

Meeting of the Sedimentary and Geochemical Processes Panel
GEOMAR-Kiel, Federal Republic of Germany
19-20 September 1989

Minutes

SGPP members in attendance:

Erwin Suess (chairman)
Nicholas Christie-Blick
Henry Elderfield
Martin Goldhaber
Judith McKenzie
William Normark
Dorrik Stow
Jacques Boulegue
Shirley Dreiss
Philip Froelich
Makato Ito
Juergen Mienert
Frederick Prahl
Chris van der Borch (for Steve Macko)

Liaisons in attendance:

Lawrence M. Cathles (19 Sept) (LITHP)
Graham Westbrook (20 Sept.) (TECP)
Andre Droxler (OHP)
Ulrich von Rad (PCOM)

19. September 1989

Welcoming

The panel was welcomed to GEOMAR by host and chairman **Erwin Suess**. The minutes of the previous meeting were approved and the agenda was discussed.

Reports

Downhole Measurement Panel

Jürgen Mienert reported on the DMP meeting held in Sept., 1989, in Windisch-eschenbach, West Germany. He presented an update on the following developments:

1. *Wireline packer* - the tool is operational but not tested; at sea testing will be done in November,1989.
2. *Geoprops* - development of the tool requires 9 more months; i. e. it will be ready for testing in March, 1990. It is unlikely that the tool will be ready for the Nankai Leg 131 (4/1-6/2/90). Panel questions whether this will jeopardize the proposed original scientific objectives.
3. *Lateral stress tool* - this tool is to be tested in November, 1989 and is scheduled for use on Leg 131.
4. *Long-term temperature tool* - this tool, developed by the Japanese for a sealed bore hole, is ready for use.
5. *High-temperature logging* of hydrothermal drill sites (such as, Site 504, sedimented ridges, EPR) - most logging tools are good only to 100-250°C; none are available for higher temperatures and probably will not be available in the near future. Therefore, in order to log hydrothermal holes, they must be cooled, but this presents a problem as cooling causes more fracturing. ARCO has logging tools available which can measure temperature, pressure, density and porosity up to 260°C. No high-temperature geochemical tools are available. Calibration is also a problem. It was concluded that it will be very difficult to get the critical measurements from high-temperature drill sites with the currently available logging tools.

Planning Committee Summer Meeting

Ulrich von Rad reported on the **PCOM** summer meeting in Seattle on 22-24 August 1989 in Seattle, Washington. The following items from the meeting were discussed:

1. Bruce Malfait from **NSF** presented the time frame for ODP renewal and reported that there is a heavy concentration on the long-range planning. The main science document is the Long-Range Science Plan, which is now being modified by JOI. A new COSOD should occur in 1993. New members for ODP are needed. To date there are no new developments. There is still hope that the Sowjet Union, which are eager to join, will be invited. An invitation from the USA is required.

2. *ODP Operations Schedule*

Leg 127, Japan Sea I has been completed. Three bottom hole assemblies (BHA) were lost. A new drill string is required as the present one is 5 years old.

Leg 128; Japan Sea II is underway and has received as 10 day extension to prepare the reentry hole which was not successfully completed by Leg 127.

Leg 129, Old Pacific Crust, co-chiefs Y. Lancelot & R. Larson - site surveys are not in, but still optimistic that a Jurassic window can be drilled.

Leg 130, Ontong Java, co-chiefs, W. H. Berger and L. Kroenke, has received two extra days of ship time. Co-chief Kroenke proposed changing the order of drilling with crustal objectives drilled prior to Neogene objectives. PCOM restated that the Neogene was the first objective of the Leg. It was suggested that to avoid future misunderstandings, the pre-cruise meeting should be attended by a PCOM member, who will ensure that the approved objectives be incorporated into the scientific prospectus.

Leg 131, Nankai, co-chief A. Tairo reported that the final plans for the leg are in and scientific staffing is almost complete.

Leg 132, Engineering II, co-chiefs Harding and J. Natland will be testing developments which improve drilling technology and improve recovery. Three areas have been select for test drilling, which will also produce scientific results; shallow water carbonates on MIT Guyot, young brittle crust in the Mariana or Bonin back-arc areas, and chert-chalk sequences on Shatski Rise.

Leg 133, 134, and 135 - co chiefs (see Appendix A) have been chosen and selection of scientific parties is underway.

Leg 136, Engineering III - will set the guide base on EPR. Successful bare-rock drilling is a high priority for the Memorandum of Understanding to be signed in 1992.

3. The Geochemical Reference Leg incident was discussed at length (1/2 day). A motion to reinsert the Geo. Ref. Leg into the present schedule was defeated (for 7, against 7, abstain 2), while one to replace Leg 129, Old Pacific Crust with Geo. Ref. Leg was also defeated (for 1, against 12, abstain 3). It appears that the Geo. Ref. Leg is out for the present period but resubmittal was encouraged for the 1991-1992 program. The Geo. Ref. Leg must be competitive with other proposed legs. The confusion surrounding the insertion and subsequent removal of the Geo. Ref. Leg in the FY 90 program was apparently caused by a misunderstanding about the original LITHP ranking of the Leg. In order to avoid misunderstandings with future rankings, PCOM proposed that panels submit more detailed documentation for their rankings. Letter from R. Moberly, PCOM chairman, to SGPP discussed below.

4. *FY 91 Drilling Program* in Central East Pacific includes:

Cascadia Margin - surveys of slope, margin and accretionary prism as well as Middle Valley are underway,

Chile Triple Junction - currently a single leg proposal,
East Equatorial Pacific - site surveys underway,
East Pacific Rise - no new developments, proposals must be combined,
Lower crust Site 504B - massaging of VSP data suggest that the transition could be 350 m closer than previously estimated. There are some interesting dipping reflectors. Concern was expressed about sampling the fluids prior to any Engineering operations.
Hydrothermal Processes at Sedimented Ridges - new prospectus is ready, 2 legs have been proposed that may be planned about 1 year apart.
Comments on *other CEPAC drilling* proposals:
Atolls & Guyots - 2 new proposals from Schlanger and Winterer are in, which are good, but no time is available in 1991 program,
Bering Sea - nothing new to report,
North Pacific Neogene - nothing reported,
Shatsky Rise - program requires good recovery, which will be evaluated during Leg 132 Engineering II. Drilling during this leg may accomplish many of the scientific objectives making a full follow-up leg unnecessary.
Young Hot Spot (*Loihi Seamount)* - no changes to report. Drilling would probably encounter high temperatures, requiring high temperature logging tools.
Hawaiian Flexure - low priority as dating resolution problem has not been resolved.

5. *Engineering and technical developments* were discussed, in particular the problem involving the logging of the 4 inch-hole cut by the diamond coring system (DCS). Optimism remains high for success with DCS but the problem remains, how to log with the current larger diameter logging tools? Three options were presented: (1) drill 4 in. hole and ream it to 5 to 6 in., (2) drill 4 in. hole and a second 6 in. hole nearby without coring but solely for logging, and (3) drill 4 in. hole and use and/or slim down existing tools. PCOM favors first option, which will be tested on next engineering leg, followed by second option. To slim down existing tools would be too expensive, so option 3 is not a viable one.

6. *Detailed planning groups (DPG)* - thematic panels need to give greater input to the DPG's but the two must maintain separate identities, i. e. planning and advising have separate functions.

7. *Global science programs other than JOIDES* - coordination has been proposed with other earth science programs, such as IRIS, POSEIDON, RIDGE, BRIDGE, FRIDGE, Global Sediment. Geol. Project (IUGS), Continental Drilling, WCRP-WOCE, JGOFS, Arctic Ocean Drilling and Global Seismic Networks. Tom Pyle of JOI suggested a possible model for the JOIDES structure with liaisons to other global geoscience initiatives.

Comment: S. Dreiss suggested that SGPP have a greater input into testing of tools on engineering legs as development goals appear to fall behind scientific needs.

Directive from Planning Committee chairman

Erwin Suess reported on the contents of a letter from **R. Moberly** concerning panel's ranking of proposed legs. The main points in the letter are: (1) panels should write-up a justification for their priority of specific legs. This should be done for the April, 1990 PCOM meeting. Is more Pacific or Atlantic drilling necessary? (2) Justification should include latest material and information available, such as on-going site surveys, (3) panels should send a delegated liaison to 16-17 November, CEPAC/DPG meeting to represent the respective panels viewpoint, and (4) thematic panels can and should write proposals and combine proposals.

Lithosphere Panel

Larry Cathles reported on LITHP meeting September, 1989 in West Germany. LITHP has defined four thematic entitles: (1) ocean crust, (2) ocean ridges & hydrothermal activity, (3) case studies, such as intraplate volcanism etc., and (4) sea floor observations (seismic, ocean ridges). The LITHP ranking for 1991 drilling is as follows:

1. 504B-crust
2. Sedimented ridges
3. EPR
4. Geochemical Reference Holes
5. Cascadia Accretionary
6. Chile Triple Junction
7. Eastern Equatorial Pacific.

LITHP voted on its thematic priorities. The main interests deal with crustal and sedimented ridge objectives. The top 8 drilling priorities from a list of 20 are:

1. Layer 2-3
2. Layer 3/mantle transition
3. Sedimented ridges
4. Fast spreading ridges
5. Slow spreading ridges
6. Geochemical drilling
7. Deep mantle drilling
8. Deep layer 3.

Targets of opportunity while the JOIDES Resolution is still in the Pacific were discussed:
- Hawaiian bulge in conjunction with work at near-by on-shore laboratory
- Hole 333 A in Cayman Trough, an uplifted Cretaceous window with potential drilling access to basement.

Down-hole instrument needs were listed for following joint meeting with DMP and potential high temperature tool with double Dewar packaging was discussed. LITHP has decided to put together a strong sedimented ridge program. The goal is to study one area very well to define hydrology, inflow and outflow, and to have sealed-off holes to study pressure, permeability, chemistry etc. Middle Valley looks like a good candidate. The LITHP and SGPP have common goals and need new technology to meet high-temperature objectives. Suggestions should be passed on to engineers.

- Coffee Break -

SGPP White Paper

The chairman opened a general discussion of the current draft of the White Paper Document. It was stated that in general the Document must be a balance between the broad mandate given to panel by PCOM and what the panel has decided are the important priorities for ocean drilling. An around-the-table discussion included the following items, in order discussed:
- *Introduction* - must be rewritten with due reference to the PCOM mandate
- *Technology* - as currently written, technology is scattered throughout the Document under various sections. It should be collated into a separate section entitled Technology and also should be highlighted in the Executive Summary.
- *Sediment fluxes* - Carbon budgets (item 4, p.2 of current draft) actually should be discussed under two sections of the Document; i. e. under mass transport the suspended load and under paleocean chemistry - the dissolved load Discussion of the latter should be expanded. What drilling approach would be required to obtain the needed information? **Action:** F. Prahl will supply the write-up for the dissolved carbon load.
- *Marine evaporites and early rifting systems* - M. Goldhaber expressed second thoughts about where these items should be located in the Document as they are concerned with the dissolved load. He suggested that they should be included partially under metallogenesis and partially under paleocean chemistry?
- *Sedimentary geometry* - M. Ito suggested that this items missing and should be added to the mandate.

- *PCOM mandate* - should be placed at the back of the Document
- *Themes* - the chapter sequence will be as follows:
  - Sediment fluxes
  - Sea level
  - Fluids
  - Metallogenesis
  - Paleocean chemistry
  - Technology

  A ranking is not implicit in order of the chapter listing. This should be explained in the summary along with an explanation of the link between the themes
- *Executive summary* - very important section of Document!
- *Petroleum generation* - U. von Rad pointed out that this subject was not dealt with specifically in the Document. As it will be a strong selling point for future ODP programs, a statement in the text relating fluid flow and hydrocarbon movement would be appropriate.
- *Chairman's summation of discussion* - The White Paper will contain the following changes or additions:
  1. present introduction will be eliminated,
  2. new introduction will discuss the selected items chosen by the panel from PCOM mandate, as well as present an explanation of the chapter sequence and linkage between the themes,
  3. executive summary, highlighting technology, will be added,
  4. PCOM mandate will be moved to appendix,
  5. a more explicit statement about instrumented holes will be added,
  6. section on ice margin processes will be expanded,
  7. sediment flux chapter will be expanded using W. Hay's work and will include a discussion of carbon budget issue,
  8. evaporate discussion will be divided between metallogenesis and paleocean chemistry,
  9. editorial revision to remove inconsistencies and smooth style will be made,
  10. small number of key citations will be added.

- Lunch Break -

During 1-3 pm the panel devoted this time to work on their respective White Paper revisions. The Chairman will collect these revisions and integrate the above 10 points into the White Paper.

Technology issues

Sand Drilling

During the July, 1989 SGPP meeting at Lamont, the panel requested that an ODP representative be present at the following meeting to discuss the problem of good recovery of unconsolidated sediments. A representative did not appear but a document entitled *Unconsolidated Formation Recovery* (Summary Statement 88-0300) was sent (See Appendix B). A cover letter from M. Storms, Supervisor of Development Engineering, to E. Suess discussed in further detail issues of interest. In particular, the Christensen rubber sleeve core barrel is thought to be not suitable for use offshore on a floating drilling platform. W. Normark pointed out that there seems to be some discrepancies between the offshore use of the rubber sleeve technique by industry and the ODP decision not to pursue it. He further suggests that other techniques, such as vibrocoring, should be considered. The letter also states that advance piston corer should resolve the problem of recovery, "once a reliable breakaway piston head is developed". Because of our concern for good recovery of unconsolidated sediments in many target areas, the panel ***feels the issue is not resolved with the receipt*** *of this document*. We are concerned that required technology is not being developed for lack of sufficient funding. To strengthen communication, a SGPP delegate should meet with the engineers at TAMU. The panel recognized that recovery of unconsolidated sediments of all types and hole stability will present problems in the following, not all inclusive, thematic areas:

1. Continental margins - shallow water sand drilling to secure one end-member for determining magnitude of sea level changes;
2. Active margins and accretionary prisms - volcanoclastics,
3. Contourites - deep water history
4. Atoll drilling - carbonate sands
5. Sedimented ridges - sulfide sand & gravels in ridge valleys,
6. Mid-ocean ridge drilling - unconsolidated mounds.

Action: 1. Make strong statement in minutes about SGPP's concern that not enough is being done to make technologic advances to overcome problems related to recovery of unconsolidated sediments and hole stability in areas of key scientific targets.

2. Send a short document extracted from the minutes to PCOM, TEDCOM and TAMU which reflects the concern of SGPP and states the required technologic needs. **Action:** Sand Working Group- E. Suess, D. Stow, W. Normark, J. McKenzie.

3. Send one time liaisons to annual TEDCOM meeting. **Action:** delegated liaisons are D. Stow and N. Normark.

- Coffee Break -

Fluid Sampling

1st Outline: *Document on Fluid Sampling and Shipboard Protocol* prepared by H. Elderfield, which identifies deficiencies and requirements in current fluid sampling program.

1. Improvements in shipboard extraction of pore fluids - the need for a versatile system or systems that deal effectively with the various the problems of artifacts;
2. The pressurized core barrel - the need to carry through with the development of the complete system to the stage of sample extraction and processing;
3. In situ sampling - the need to redesign the current system,
4. The packer - the need for improvements,
5. The sampling policy - the need, when required, for more frequent sampling and larger samples of particular importance in larger numbers,
6. Implementation - the need for funds and action.

Comment: P. Froelich posed the questions; What is it that we would like to have measured and do we want to consider the instrumenting of holes?

2nd Outline: Discussion of ***Document on Fluid Sampling and Shipboard Protocol*** - identified key sampling & measurements topics.

1. *Extraction of pore fluids* - modification of present pore water protocol. Should the present program be abandoned or continued? Stainless squeezers should be retained, but a system should be added which would be compatible for trace element studies, e. g. titanium, Teflon squeezers. The need to work in an inert atmosphere cannot be resolved with present system. The temperature artifact remains a problem. It is possible to centrifuge in an inert atmosphere. All objectives cannot be accomplished with a single procedure but there is a need for a variety of procedures to accomplish the objectives. What is minimum standard program needed? What is the permissible flexibility for high density/volume sampling?

2. *Pressurized Core Barrel (PCB)* - The system should be designed to be flexible to meet many scientific objectives, e. g. sampling methane or hydrocarbon clatherates in order to measure their physical properties, imaging of internal structures, extraction of other gases (helium or other noble gases, CO_2, N_2), microbiological rate experiments injecting labeled tracers, mineral phase transition studies (sulfides and magnetic properties), and calibration of logging tools. Sub-sampling should be possible via compartments. The PCB will be used at both high and low temperatures making temperature insulation important. As corrosive chemicals, such as sulfides, may be present, the PCB should be made of stainless steel.
3. *High-temperature sampling* - the actual maximum temperature is not 1200°C but more likely 350-400°C, the upper limit for SGPP scientific targets. The feasibility of *in situ* extraction of fluids at these temperatures versus chemical logging using a dewared shown-hole recording instrument should be considered. To test the packer at high temperatures, experimental measurements of pressure, fluid flow, and permeability should be conducted.
4. *Instrumented holes* - monitoring should be done on either sealed or open holes at sedimented ridges, accretionary margins, marginal seeps and bare rock ridges for a duration of 2-4 months. Properties monitored should include temperature, flow rates, gases (e. g. CH_4), pore pressure, and specific ions. Monitoring can provide more information than single "snapshot" measurements, e. g. detect changes in flux rates.

Action: This outline will evolve into a Document of Fluid Sampling to be presented to Shipboard Measurements Panel (SMP) and TAMU. SGPP recognizes that the document will meet with some resistance to change current shipboard pore sampling procedures but feels strongly that the science requires these suggested changes. The document should be ready for JOI/USSAC sponsored workshop on ODP Geochemistry: Progress and Opportunities to be held 9-12 January, 1990, which is prior to the next SGPP meeting.

Action: Fluid Sampling Working Group - H. Elderfield, P. Froelich, F. Prahl; Suess to gather and edit.

20. September 1989

INTERNAL REVIEW OF PROPOSALS

SGPP has in hand a total of 48 proposals; 11 were reviewed in Denver, 9 were reviewed at Lamont, 28 are to be reviewed in Kiel or will be reviewed in Santa Cruz. After an initial ranking of the new proposals, those receiving a 3 or 4 were discussed at greater length under thematic groupings. Proposals receiving a 1 or 2 were deemed not appropriate or of lower priority for this panel. Ranks1 to 4 reflect the categories on the ODP review form

1. = Not within SGPP mandate
2. = Does not address high-priority thematic objectives of SGPP
2a. = Does, however, have secondary interest to SGPP
3. = Addresses SGPP objectives, but with deficiencies
4. = Addresses high-priority SGPP objectives)

NOTE: Prior to reviewing Proposal 342/A, a discussion on whether proponents of a proposal, who are members of SGPP, should stay in the room or leave while the proposal was under panel review. The consensus was that panel needed as much information as possible. Therefore, the proponent should remain in the room during the discussion but should leave the room when a vote on the proposal was taken.

The following proposals considered at the Kiel meeting are listed in numerical order with their watch dogs and Kiel rankings and are not necessarily in the order discussed:

329/A - Cretaceous Atlantic
S. Macko, M. Ito, W. Normark - 2a - needs a second review.

330/A - Mediterranean Ridge: An Accretionary Prism in a Collisional Contest
P. Froelich, M. Goldhaber, S. Dreiss - 3.

The proposal is to drill on mud diapirs on the Ridge. Piston core data from Prometheus med dome demonstrates that Aptian material is moving upward. Proposal would be potentially more interesting if it proposed to also study fluid circulation in the sediments. Boulegue suggested that there are published French data (Villefranche) as well as data from recent surveys (LePichon) which could be integrated into the proposal. Proponents need to include more information on existing brine data and geophysical measurements from the area.

331/A - Aegir Ridge
H. Elderfield, J. Boulegue, E. Suess - 2- proposal is not going anywhere and was also ranked low by LITHP.

332/A - Florida Escarpment Drilling Transect
J. Boulegue, S. Dreiss, H. Elderfield - 3.

The proposal is to designed to study the hydrology and fluid patterns along a well-studied area of the Florida Escarpment, where know seeps occur. Three holes are proposed; 1. on the more seaward plain, 2. above the seep colonies to obtain fluids and 3. more landward on the slope to capture the entire stratigraphic column of the carbonate platform with hopes of securing dense brines. The proposed area has been studied by Paull using the Alvin. Methane of a definite biogenic origin has been identified in the area of seeps. Open questions are: Do the organism surrounding the seeps utilize this methane? What is the relationship of the seeps to large-scale erosional patterns along the escarpment, dissolution of carbonate by H_2S? Thus, diagenesis of carbonates is an important aspect of the proposal. There are no allusions in the proposal to the available (?) petroleum-industry well data. Boulegue questions what can ODP bring to such an area as much of this work can be done from land based drilling and some of the objectives could be achieved by sea-floor instrumentation. Although the proposal is very interesting, is deep-sea drilling the correct approach?

333/A - Cayman Trough
Not within SGPP mandate - 1.

334/A - Galicia margin
Not within SGPP mandate - 1.

335/E - Drowned Atolls of the Marshall Islands: Paleocean.Lithosph.Tect. Implications
D. Stow, J. Mienert, S. Macko -4.

A number of Pacific atolls have been targeted with the following objectives:

1. to obtain atoll sea-level record and tie to other eustatic records,
2. to understand why some atolls drown and some do not,
3. to study mid-plate volcanism & sea level,
4. to evaluate the relation of diagenesis and depositional horizons to acoustic characteristics
5. to study horizontal and vertical tectonics in Pacific.

Drill sites on atoll tops will provide low-stand exposure records, while sites on the flanks will give a more continuous record with better dating potential. Turbidites may represent a low stand record, but this is controversial; does high or low stand shedding occur from carbonate platforms? It was questioned how tectonic movements versus simple subsidence would not affect the eustatic record and how this might be resolved. It may be possible to drill atolls in other areas to distinguish between the two mechanisms.

336/A - Arctic drilling
M. Ito, J. McKenzie, F. Prahl - 2a - needs a second review.

337/D - Ocean Drilling Program Tests of the Sedimentary Architecture of the Exxon Sea-Level Curve
N. Christie-Blick, D. Stow - 4.

A total of 12 holes are proposed primarily to calibrate sequence boundaries and secondarily to investigate the paleoceanographic significance of the mid-Oliogocene event in the southwest Pacific, i.e. a global sea-level fall vs. a high stand in New Zealand. The proposal has good potential with the strong point being that there are good controls on subsidence rates in the area and good ties to land sections. (See hand-out from N. Christie-Blick).

338/D - Absolute Amplitude of Neogene Sea-level Fluctuations from Carbonate Platforms of the Marion Plateau, Northeast Australia
W. Normark, N. Christie-Blick, J. Mienert - 3.

The proposal is very immature and does not consider the results that will derive from the upcoming ODP Leg 133. It is a single objective proposal, which is overly simplified. The proponents do not state how they will determine sea-level falls. (See hand-outs from W. Normark & N. Christie-Blick). Discussion was as follows:
Elderfield - questioned if it were possible to discard a proposal which has serious deficiencies but is within the SGPP mandate.
Suess - Such proposals cannot be discarded it in this preliminary round but can be compared and ranked with other proposals within themes.
Normark - Feed-back from OHP is necessary to determine whether the stated biostratigraphic precision of depth is actually feasible.

339/A - Benguela upwelling
F. Prahl, J. McKenzie, J. Boulegue - 2a - needs a second review, mostly OHP
340/B - Evolution of Foreland Basins - A Record of Tectonic, Climatic and Oceanographic Change from the Northern Australian Margin
S. Dreiss, M. Goldhaber, P. Froelich - 3.

Focus of the drilling is the development of the foreland basin in the Banda Arc, which will serve as a modern analog for the development of ancient foreland basins because all stages of development can be documented. There are two subproposals along the W.E. transect: a. five drill holes to investigate the early tectonic and stratigraphic evolution of the foreland basins and b. five drill holes to study Cenozoic global climate evolution including one deep hole to obtain a reference section for East Indian Ocean, Paleogene-Cretaceous paleoceanography. The theme of fluid flow was only mention not fully developed. Drill holes were not sites to focus diagenesis. Discussion was as follows:
Suess - In this area, deep-sea tube worms at vents were fist described in 1904. The proposal is immature but has promise for interesting fluid objectives and should be redevoloped.

341/A - Global Climatic Change as Measured through a Continuous Late Wisconsin an Quaternary Record with Special Emphasis on the Holocene
J.McKenzie, H. Elderfield, F. Prahl - 3 - low level of development. The theme of the proposal is not of high interest to SGPP. To be more interesting the drilling should be sited more off-shore where it would be possible to secure a real marine record. Ice margin sediments do not have a high priority for SGPP..

342/A - Growth Mechanics and Fluids Evolution of the Barbados Accretionary Prism, M. Goldhaber, P. Froelich, D. Stow - 3 to 4.

Results from ODP 110 showed that methane from deep in the sediment pile is moving along the decollement. Fluid flow is apparently fault controlled. The new drilling proposes to drill along the accretionary prism to investigate changes in sediment patterns and fluid flow along strike. The proposal represents a large drilling effort with 20 some sites and 10 km of drilling. It takes a broader view of the prism environment than does the Cascadia drilling proposal, which is hydrologically driven. The objectives are primarily tectonic including the structural development of the prism. It proposes to study the timing of events. For SGPP, the themes of fluid circulation and sources are too broadly stated and need to be developed further. The diagenesis objective was left out in the submitted copy of the proposal. Discussion was as follows:

Goldhaber - proposal is a good integrated approach to study a prism which has varying thickness and sediment type, i.e. mud vs. sand.

Stow- proposal could pinpoint sedimentary geometry tying it to seismics and the thinning of sedimentary blanket.

Goldhaber - proposal is immature in that objectives are written in very broad generalities and the available data are mentioned but not given.

Westbrook - proposal is a product of R. Speed's attempt to meet 1 August deadline. There will be a supplementary proposal coming. Westbrook, a co-proponent of the proposal, wanted to show overheads supporting the proposal but was refused.

343/A - Cretaceous Carribean volcanics
J. Mienert, M. Ito, N. Christie-Blick, - 1 to 2.

344/A - Atlantic Magentic Quiet Zone
Not within SGPP mandate - 1.

345/A - The West Florida Continental Margin, Gulf of Mexico: Sea Level and Paleoclimatic History
N. Christie-Blick, D. Stow, S. Macko - 3.

The proposal is to evaluate the timing and amplitude of eustacy with mainly Neogene targets. The approach may be too simplistic. Six sites and 40 days of drilling are proposed. In addition, drilling should obtain data on the formation of tertiary phosphorites, history of the Loop Current and fluctuations of melt (fresh) water inflow into the Gulf. It is not entirely certain what effect the Loop Current would have on the sedimentary record of eustatic change due to its erosion potential. Another problem may be that the subsidence history is not as simple as the proponents suggest. (See hand-out from N. Christie-Blick).

346/A - Equatorial Atlantic transform margin
Not within SGPP mandate. - 1.

347/A - S Equatorial Atlantic
J. McKenzie, J. Boulegue - 1 -100% paleoceanography (OHP)

348/A - Upper Paleocene to Neogene Sequence Stratigraphy: The Ice House World and the U. S. Middle Atlantic Margin
J. Mienert, D. Stow - 4.

The proponents want to drill a transect across the N. Atlantic passive continental margin to calibrate deep to shallow water sedimentary sequences with the seismic record and tie these to the oxygen-isotope record for Miocene-Oliogocene ice volume changes. This is generally a very mature proposal which could feasibly provide constraints on the timing of sea-level events and the actual magnitude (amplitude) of change. A new seismic survey will be made in 1990 with 15 m resolution.

349/A - Drilling into the Clastic Apron of Gran Canaria: Evolution of a Linked System Volcanic Ocean Island - Sedimentary Basis
H. Elderfield, J. Boulegue - 3.

The proposal should really have a ranking closer to a 2a than a 3. It is a case study of interplate volcanism and is basically a LITHP proposal. A good land-based study is available, which the proponents would like to tie to sediments in the off-shore, submarine areas. The sedimentary aspect of the proposal could be related to both global mass balance as well as volcanoclastic sediments. Potential geochemical aspects of the proposal have not been developed. The framework of the proposal has potential for SGPP if it were developed. Nevertheless, the proposal looks very interesting. Normark expressed concern that what is identified as a debris flow could be a volcanic failure resulting in loss of stratigraphic control. A new site survey will be made in June 1991, so action is not pressing.

59/A Rev. - Continental Margin Sediment Instability Investigation by Drilling Adjacent Turbidite Sequences
D. Stow, M. Ito - 4.

The upper 20 m in the target area, the smallest deepest abyssal plain in Madeira basin, has been extensively studied as a radioactive waste deposition site. The proponents would like to:

1. date large turbidites and correlate them with sea-level changes,
2. test model for periods of erosion and growth of N. W. African margin, and
3. correlate distant turbidite layers.

With drilling it could be possible to make a sediment budget for the whole abyssal plain and reconstruct the timing of events. Other objectives include dating basement, physical properties of sediments, and diagenesis with respect to the organic carbon budget & redox diagenesis. The latter is related to the so-called "burn-down effect", whereby fresh organic matter is carried to the oxic environment of the abyssal plain with turbidites. The proposal addresses high SGPP priorities, i. e. sediment fluxes and related topics but it is immature and needs to be strengthen, particularly in geochemistry. P. Froelich pointed out that, although "burn-down" diagenesis in piston cores can be significant, it is questionable what can be learned from the study of this process in a deeper hole. This idea needs to be further developed. J. Mienert suggested that the ability to make a sediment budget in the target area is very difficult because of stratigraphic problems. Correlation among piston cores was questionable and will become even worse in older sediments. The proposal would promote technology.

350/E - Gorda deformation zone
M. Goldhaber, S. Dreiss - 2a - needs a second review, has secondary implications for sedimentary processes.

351/C - ODP Proposal for Bransfield Strait, B. C. Storey et al.
E. Suess, J. Boulegue - 3.
This proposal, which is to drill a young back-arc basin in the Antarctic Straits, has mainly lithosphere objectives related to petrogenic processes. The lithosphere and petrology goals are well-documented. There are, however, two other objectives which may be of interest to SGPP: 1.) a climatic theme (OHP) together with ice margin sedimentation and 2.) a geochemical, hydrothermal theme, i. e. the study of hydrothermal alteration of siliceous-rich, carbonate-poor sediments in a back-arc rifting zone. Although the global climatic objectives are well-documented, the scientific objectives for studying the hydrothermal system are very poor developed. Much more could be done with this latter theme, which could document a case for an integrated study. Although the proposal would be carried by another panel, SGPP could have an input, particularly, concerning the hydrothermal aspect. A fourth tectonic objective concerns Indean-type orogeny in an extension of a South American oil basin. The proposal should be rated 3 if the hydrothermal aspect is strengthened, but only 2a, if not.

The following proposals arrived late and will be held over for internal review during the Santa Cruz Meeting, 14-16 January, 1990:

352/E - Mathematician Ridge
H. Elderfield, J. Boulegue - .

353/C Rev. - Pacific margin of the Antarctic Peninsula
N. Christie-Blick, M. Ito - .

354/A - Angola/Namibian upwelling
J. Mienert, P. Froelich - 2a - has diagenesis and phosphorite objectives.

355/A - Peru gas hydrates
M. Goldhaber, F. Prahl -3.5.

Miscellaneous

Open Discussion on Proposals for Sea-level Theme

It was noted that there are currently 6 proposals with SGPP which related to the sea-level theme, i.e. 203/E (Cretaceous guyots in the Northwest Pacific, E. L. Winterer et al.) discussed in Lamont and 335/E, 337/D, 338/D, 345/A, & 348/A discussed in Kiel. It was recognized that there are two basic approaches to obtain the record of sea-level change, i. e. drilling on atolls and on passive continental margins. The two atoll proposals (203/E & 335/E) may have to be combined into a single proposal. The feasibility for using bio-, chemo-, and magneto-stratigraphies to date atoll and guyot sediments must be evaluated; a task for OHP. Also, two of the proposals (335/A & 348/A) have strong implications for OHP. The success of drilling in these targeted areas will be directly linked to technologic developments(i.e. sand drilling), which will enable good recovery.

At the Lamont meeting SGPP was asked to rank proposals for the FY 91 schedule and highest priority was given to hydrothermal processes at sedimented ridges and the Cascadia accretionary margin. **At that time the atoll and guyot proposals were not included in the list that SGPP was asked to rank. As the sea-level theme does have a high SGPP priority, some open concern about this omission was expressed. If a slot in the FY91/92 schedule should appear, SGPP would like to unofficially request that PCOM consider inserting a mature atoll/guyot proposal into the Pacific drilling program.**

Sea level will be a prime item for discussion on the agenda for the January meeting and will revolve around the sea-level related contents of the White Paper and USACC Workshop Report.

Preparation for 16-17 November CEPAC/DPG Meeting

Martin Goldhaber agreed to serve as the SGPP liaison to the **CEPAC/DGP meeting** to present the panel's justification for highest ranking of (1) hydrothermal processes at sedimented ridges and (2) the Cascadia accretionary margin for the FY91 schedule. A document drawn from the SGPP minutes and other sources should be written to justify SGPP's highest rankings. SGPP's conception of the Cascadia drilling means the Oregon margin because fluids, sediments and hydrology are a documented and integral part of the drilling proposals. Sedimented ridges justification is from the previous meetings discussions and is in the minutes. It should also be noted in the document that, although SGPP ranked drilling EPR with a much priority than the higher two, the panel feels strongly that drilling should occur only on an hydrothermally active segment of the EPR.

This justification will be a direct input to CEPAC from SGPP and should assist with the planning, as requested in the written directive from R. Moberly.

Update on Central Oregon Accretionary Complex

Fred Prahl presented with documentation new SeaMark data acquired during recent site surveys for the proposed FY91 drilling on the central Oregon accretionary complex. In addition multi-channel seismic profiling for more than 700 nautical miles will be available by the end of October. Areas showing strong back-scattering with the SeaMark survey are of special interest and have been partially investigated during submersible dives. They were found to be sites of active venting. Apparently, precipitation of carbonates around vent sites causes high back reflection. The alignment of high back scatter areas, their elongated, oval shape parallel to ridge crests, and their size (several tens of meters) were particularly striking. These observations will be useful for locating futures vents.

Ten drill sites with 500-700 m penetration are proposed. Geochemical reference sites on the abyssal plain and holes on the accretionary complex towards landward verging phenomena are planned. One reference site will be primarily a fluid site, which should provide information about fluid movements associated with dewatering or deformation and will, thus, be located near the deformation front.

New Proposals from Australia

Chris van der Borch reported on themes of prospective Australian drilling
- the Australian Southern Oceans margin, an E-W spreading ridge moving northward
- the northern Australian margin, a continental-arc collision zone. There will be 3 main themes:
- lithospheric extension between Antarctica & Australia
- magmatism during opening of Southern Ocean
- sea-level and paleoclimatic record.

A number of proposals are currently in various stages of development.

New SGPP Members

The panel is most pleased do learn that Bill W. Hay has accepted the invitation to join SGPP and will attend the January meeting. A second new member with an expertise in seismic stratigraphy has been requested, but it has been suggested that this individual be W. Normark's replacement, after he leaves the panel in January, 1990. Roger Flood has been suggested. An ocean crust petrologist is still badly needed. **Action**. W. Normark will forward Flood's c.v. to E. Suess to present at November PCOM meeting.

NEXT MEETING SCHEDULES

14-16 January 1990 - Santa Cruz, CA - The meeting, hosted by S. Dreiss, will run for 3 days with a possible half-day field trip lead by Dr. R. Garrison to see outcrops of the Monterey Formation. It is best to fly into San Jose airport and take the van to Santa Cruz; reservations are necessary. Plan to arrive Saturday evening and leave Wednesday morning. Let S. Dreiss know arrival times well in advance.

24-25 September - Paris, France - The meeting will be hosted by J. Boulegue and a one day excursion to the Diois area to see uplifted sea-floor containing Jurassic black smokers and black muds is tentatively planned.

Summary

Required from SGPP for November PCOM Meeting

* **White Paper** -executive summary + technology
  -input from other panel members
* **Fluid sampling document** -reduced version containing two topics
  - pressurized core barrel
  - shipboard sampling protocol
* **Justification of 1991 drilling priorities**
  -to be included in minutes from Kiel (still to come)
* **First ranking of 1992 drilling priorities** (48+ proposals)
  -with final priority list provided for April PCOM meeting

E.Suess
GEOMAR
Kiel, 23 October 1989

OCEAN DRILLING PROGRAM

SUMMARY STATEMENT SS-0300

UNCONSOLIDATED FORMATION RECOVERY

Introduction

Coring in unconsolidated formations is commonplace in ODP operations. Ordinary pelagic oozes, unconsolidated muds and semi-consolidated clays are cored with normally very good results using the Advanced Piston Corer (APC). More indurated mudstones, claystones, conglomerates and clay/sand mixtures are cored using the Extended Core Barrel (XCB) with results varying from poor to very good depending on the sometimes subtle differences in formation physical properties. Fully competent, lithified rock is normally cored using the Rotary Core Barrel (RCB).

Another category of sediments which cause more difficult coring problems are uncemented sands, turbidites, and loose or friable sediments which tend to be structurally destroyed during the coring process prior to becoming entrapped safely in the core barrel. Recovery in such formations has historically been difficult and sometimes impossible for DSDP/ODP. In the past, loose sands have been designated as scientific targets in a number of settings (e.g. submarine fans) or have been encountered by chance in holes aimed at other objectives. In many cases they have been cored with little or no satisfactory undisturbed recovery.

This Summary Statement outlines ODP's recognition of the unconsolidated formation recovery problem and attempts to detail the current technology available to cope with this problem both inside ODP and in the Oceanographic and Oilfield sectors. It also explains the developments now underway by ODP Engineering to improve upon the current state of the art for future ODP operations.

Oceanographic Tools and Techniques

In the course of core sampling the sea and ocean floor in support of oceanographic survey work a range of core sampling tools and techniques have been developed. Selection of the appropriate tool and technique tends to depend on several factors but will ultimately be controlled by formation.

Push coring, limited to upper layer sediments, relies on a reaction force to overcome the resistance of the formation to the entry of the core barrel. A seabed frame or template is generally deployed and a hydraulic jack is utilized to push the core barrel (or insitu test probe) into the unconsolidated material.

Gravity coring, used in limited water depth applications, utilizes a high velocity penetration of unconsolidated formations under the influence of a falling weight to achieve core recovery. Core catcher and internal valve arrangements are employed to protect core during withdrawal from the seabed and recovery through the water column. The technique is dependent on knowledge of the relationship of the corer to the seabed through metering and acoustic measurement to ensure best possible control of the tool during coring.

Piston coring, in effect an extension of gravity coring, allows deployment in ocean depths where gravity core control would be difficult, if not impossible, to achieve. System design and a preset free fall distance determine core barrel energy and velocity of approach to the formation. A piston positioned within the core barrel immediately above the core cutter and core catcher, helps to minimize core disturbance and displaces water from the core barrel during penetration minimizing resistance to entry of core material into the barrel. Bypass valves and shear pin techniques are used to minimize core extrusion and flow-in on withdrawal of the coring tool from the seabed particularly in the event of only partial penetration.

Vibro-coring tends to be used where formation resistance is greater than can be overcome by gravity and piston techniques. Generally this type of coring is electrically or electro-hydraulically achieved and therefore has depth limitations less than that which is possible by the other techniques. It is, however, a more effective method for achieving core recovery in many compacted and sandy formations. The introduction of impaction or percussion may also enhance the ability to core in more compacted materials.

With the exception of vibration coring, the foregoing techniques are in effect available through the ODP drillstring with the tools and techniques now in use by ODP.

Oilfield Tools and Techniques

Mud Control / Hole Stability A significant amount of research has been conducted in the oil industry in the past decade concerning core recovery in unconsolidated sands. Several important hydrocarbon reservoirs have been discovered where loose sand formations constitute the zones of interest, notably the Faja Petrolifera del Orinoco oil sands in Venezuela and the sands of the Green Canyon Area in the Gulf of Mexico. Both field experimentation and laboratory model testing has been conducted on coring tools and techniques to optimize undisturbed core recovery in those formations.[5,6] Unfortunately for ODP the best results in such uncemented sands have been obtained by application of over pressure in the wellbore achieved by careful control of the mud system used. This approach to sand stabilization and enhanced core recovery is not available to ODP because mud return circulation via a riser would be required. Many oilfield successes are reported in the literature and by word of mouth about core recovery in sand formations which are determined through further investigation to be zones that are naturally stable enough to withstand the mechanical and pressure disturbances of the coring process. In similar formations, current ODP techniques (APC and XCB) achieve good results also.

Because the oil industry is obliged to drill and core with full time mud recirculation they have another set of advantages unavailable to ODP. In any given formation the mud system is selected to produce a stable mud cake on the wall of the hole which promotes hole stability while drilling. This leads to less fill in the hole between core runs. It also promises less troublesome (or catastrophic) hole problems (e.g. total collapse of the hole) which allows the drillers to continue deeper in the formation before abandoning (or casing) the hole. Generally lower circulation rates can be used while coring (as compared to ODP practices) since the mud system is much more efficient at cuttings removal than seawater as used by ODP. These lower flow rates help to reduce detrimental core washing effects. Oilfield practice also commonly calls for several selected casing strings to isolate unstable intervals so that drilling and coring can continue safely at greater depths. All of these factors make the probability of success for the oilfield coring contractors higher than for ODP.

Rubber Sleeve Core Barrels In any discussion of oilfield coring attempts in unstable sands rubber sleeve core barrels (RSCB's) are inevitably mentioned. The literature reports that RSCB's have sometimes been successful and sometimes not, and certainly do not represent any panacea for sand coring problems.[3,4,5,6]

Although RSCB's have been produced in several forms in the past the only current supplier of the service and equipment is Eastman Christensen. They make one size (6-7/8" O.D., 3" x 20' core) which is not wireline deployable. The concept of encasing the incoming core in a tight rubber sleeve is excellent. The mechanism which accomplishes this is ingenious. It uses a telescoping section with a 2-foot stroke similar to DSDP/ODP bumper subs to decouple the core bit from the drillstring. As the drillstring is rotated from the rig floor it is held motionless in the vertical direction while the RSCB advances to cut the core and wrap it in the rubber sleeve. Since it is mandatory that the drillstring be vertically motionless this design makes it completely impractical for use from a floating vessel even if the best possible passive heave compensation is employed.[3,4] Thus the RSCB is not useful for ODP operations even if a pipe round trip for each core was considered acceptable.

If a different style of RSCB, suitable for ODP operations, was developed if is doubtful that recovery in loose sands would be greatly improved. The RSCB only improves upon more routine coring techniques in terms of: (1) core protection after the core has entered the barrel, (2) improvement in the efficiency of core catchers attempting to retain loose materials, and (3) helping to support the weight of core already in the barrel to prevent jamming of core attempting to enter. If the primary problem is inability to get the core to remain stable enough to get it in the core barrel in the first place, only item (3) above would offer any improvement. It is doubtful that detail alone would have a dramatic impact on sand coring success.

Full Closure Core Catchers The issue of adequate and appropriate core catchers for service in unconsolidated sediments is fundamental. The oilfield literature extensively analyzes this question and points to the necessity for core catchers which open fully with no restrictions to incoming core then close totally to prevent any core loss by fluidic leakage.[1,2] Christensen has a special core barrel which is offered to solve this problem specifically. Examination of this technology has led ODP Engineering to conclude that our standard flapper core catcher is as good or better than any similar device used in the oil or oceanographic industries. In DSDP/ODP operations when virtually unrecoverable loose sands have been encountered in XCB or RCB holes experience has shown that alterations in core catcher types almost never net any improvement in recovery. This strongly suggests that the recurring problem is one of getting the core material into the core barrel rather than one of retaining the material after it has been captured.

ODP Tools and Techniques - Existing and Developmental

Advanced Piston Corer The most notable successes in DSDP and ODP operations in coring loose sands have come when using piston coring techniques. Legs 96, 113, 116, and 117 all cored submarine fans using the APC with some success. On Leg 126 considerable success was experienced with the APC in uncemented vitric volcanic materials including sands and pebbles.

The APC system has the advantage of eliminating the problem of stability of the formation at the core cutting interface. If the core barrel will penetrate the formation it is assured to form a core inside the core barrel. Problems and shortcomings of the APC system in unconsolidated formations focus around: (1) inability to penetrate the full 9.5m of the APC stroke due to material incompressibility, (2) flow-in disturbance and false core after incomplete strokes, (3) core disturbance caused by other factors (e.g. weather/ship's heave, friction, drag and corehead pressure effects), and (4) getting the APC permanently stuck because overpull to extract it tends to exceed the tensile strength of the piston rods (most common in formations containing at least some clay).

Looking at the above items in more detail, incomplete penetration of the APC in loose sands is only a problem in terms of time spent in coring to any given target depth. If the scientific objective has a high enough priority to justify slow progress (e.g. as little as 1-2 meters per core) the APC approach is viable. Flow-in disturbance after incomplete cores results when the core barrel is retracted from the formation after the initial stroke. The piston head is pulled to the top of the core receptacle and the flow-in material is sucked into the core barrel like a blood sample into a hypodermic syringe. In the past this has been a significant problem. Not only is the flowed-in portion of the recovered core generally worthless (and sometimes difficult to identify on the description table) it also camouflages the actual length of "true" core taken after a partial stroke. The driller then has no means to determine how much to drill down for the start of the next core and must play it safe and drill at least a depth equivalent to the measured core as it appears on deck. A prototype breakaway piston head for the APC was deployed on Leg 96 in an attempt to eliminate that problem. It worked on the test bench but not downhole. An improved version is now under development by ODP which, if successful, will virtually eliminate flow-in core. It will allow the piston head seals to be completely bypassed when retrieval begins thus obviating the reverse hypodermic affect. This, in turn, will allow the driller to advance the core bit only the distance of the recovered core which will normally be accurate as first measured (APC Advance-by-recovery method).

When the APC becomes stuck after shooting into the formation it is common to have to exert 20,000 to 130,000 pounds of overpull to extract it. If the core barrel does not come free at 130,000 lbs it generally is pulled apart at the piston rod weak link. This then junks the hole forcing a redrill operation in an adjacent hole if deeper penetration is desired. Normally the coring system is changed to the XCB at that time as well. Desire to avoid losing the APC hole (and the APC itself) due to excessive overpull commonly leads to a conservative approach where APC "refusal" is defined somewhat early. An upgraded version of the APC has recently been developed and will be available starting with Leg 129. The APC-129 version will improve on the present situation in two ways. It will feature piston rods capable of sustaining over 200,000 lbs of overpull for extraction. It will also provide a bearing-landing-shoulder feature which will allow a stuck APC barrel to be successfully drilled over by advancing the core bit until the material holding the core barrel has been drilled away. These two enhancements will enable the operators to safely continue APC operations much deeper into hostile formations.

Extended Core Barrel The XCB system has enjoyed some successes in sandy formations in the past. If any binding material is available the XCB has a chance of getting acceptable core recovery for many scientific objectives. Recent improvements to the XCB system include significant strengthening of the core barrel connections where torsion failures have occurred in the past, and inclusion of a flapper-type, full closure core catcher for XCB use. Both of these improvements should enhance XCB recovery possibilities and penetration depth potential in unconsolidated formations.

Vibracorer Extensive work carried out in several parts of the world in areas of vibration or vibro-impact coring have demonstrated the potential of this form of coring for application to ODP operations. The techniques, although not the answer to coring in all unconsolidated formations, have been tried and tested and do enhance core recovery where push coring and piston coring fail. Applied in areas of offshore mineral resource evaluation (e.g. European offshore sand and gravel surveys, Southeast Asia heavy mineral exploration) and in offshore site investigation for geotechnical requirements (e.g. coastal developments, seafloor emplacements, pipeline and cable routes) vibration and impact coring has become accepted by both industry and research study groups.

Due mainly to lack of commercial application, limited work has been undertaken to develop downhole, wireline retrievable vibration or percussion coring equipment. However, research and design work, motivated by achieving higher drilling rates, has been undertaken to develop downhole hammers. These units, when mounted in the drillstring and activated by mud flow and pressure, will induce a reciprocating force behind the drill bit introducing vibra-percussive drilling to hard rock formations.

It is a development of this work which is being considered for transfer into the design and manufacture of a prototype vibration or percussive coring tool for ODP. It is accepted that some disturbance of core will occur. With existing vibrocoring and vibro-impact systems, however, core disturbance, although to a degree formation dependent, tends to be concentrated in a zone adjacent to the core barrel liner. For the ODP tool an attempt will be made to provide for variation of vibration amplitude and frequency, by mechanical presetting prior to deployment and subsequent control of driving fluid flow. This facility will be used to maximize core recovery and with experience potentially minimize core disturbance.

Bailer Tool As a low cost alternative in those cases where recovery of loose materials proves to be simply impossible, ODP intends to deploy an off-the-shelf oilfield tool called a bailer. It is an in-the-pipe grab sampler and will be deployed when routine coring attempts fail to recover any core at all over an interval of several successive cores. The bailer will offer no more than the possibility of a cupful of material which will certainly be disturbed. However, it will fill a gap that currently exists in certain ODP operations and enable identification of intervals of zero recovery with some form of minimal sample.

Hole Stability in ODP Operations Unlike the oil industry, ODP success at recovering cores in unconsolidated formations, especially loose sands, cannot be divorced from the ability to stabilize the hole above the zone at which the coring is taking place. ODP is not able to take advantage of a recirculating mud system to apply hydrostatic over pressure and produce a mud cake. Also, a planned multiple casing system and the time necessary for installation is not generally a part of ODP holes. Without either of these formation stabilization techniques coring operations are often dominated by hole cleaning requirements rather than coring hardware or technology. In formations that lack the property of self-stabilization it is necessary to remove fill and sloughed materials as fast as they accumulate. The pumped flow rates that may be required for such hole cleaning are often counter-productive to coring and commonly lead to increased hole erosion.

The alternative approach in highly unstable formations is to wall off the loose material to prevent ingress into the wellbore. In almost all cases, setting casing strings is possible in ODP holes only if a reentry cone is first emplaced on the seafloor to act as a casing hanger. The exception to this rule is a Drill-in Casing system (DIC) developed by DSDP. It was deployed once during DSDP but without full success. It has been revamped for use by ODP but never deployed. At best it offers the possibility of casing off a single, unstable zone without requiring a reentry cone. The geometry of the DIC components would limit the hole to a single bit, 9-7/8 inch diameter with no reentry possibilities. Thus, it would be a poor choice for coring loose materials if the standard RCB roller cone bit and coring system was used. A special 9-7/8 inch PDC core bit for use with the APC and/or XCB coring systems would be an option. This approach has never been tried, however, and success would depend partially on whether or not PDC cutters could withstand the duress of drilling-in the casing string prior to beginning the loose formation coring operations.

ODP also has a Triple Casing String system inherited from DSDP which is available but has never been deployed. It allows up to three casing strings to be hung from a reentry cone to wall off successively deeper zones of unstable formations. The innermost string would be 11-3/4 inch and would prohibit the use of a standard 11-7/16 inch APC/XCB roller cone core bit. Therefore, a specialized core bit would be required for APC or XCB coring with the same potential problems and restrictions mentioned in the case of the DIC. Additionally, if a PDC core bit was chosen it would be vulnerable to severe cutting structure damage due to impact with the reentry cone.

In summary, conventional hole stabilization techniques using sophisticated mud systems are not currently applicable to ODP operations. The setting of re-entry cones and multiple casing strings and/or use of drill-in-casing systems may help but are unlikely to be off benefit in most unconsolidated coring situations. Although ODP continues to pursue new or applicable technology to aid in solving hole instability problems, major break throughs in this area are not anticipated. Careful site selection will therefore most likely be the most important ingredient in achieving scientific depth objectives.

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5. Tibbits, G.A. and Radford, S.R., "New Technology and Tools for the Recovery of Representative Cores From Uncemented Sand Formations," SPE 14297, presented at the 60th Annual Technical Conference and Exhibition of the Society of Petroleum Engineers, Las Vegas, Nevada, 1985.

6. Whitebay, L.E., "Improved Coring and Core-Handling Procedures for the Unconsolidated Sands of the Green Canyon Area, Gulf of Mexico," SPE 15385, presented at the 61st Annual Technical Conference and Exhibition of the Society of Petroleum Engineers, New Orleans, LA. 1986.

9-11-89

Mike Storms *Mike Storms*

Dave Huey *D. P. Huey*

September 11, 1989
MAS/M09/009

Dr. Erwin Suess
GEOMAR, Research Center for Marine Geoscience
Wischhofstrasse 1-3, D-23 Kiel 14
Federal Republic of Germany

Dear Erwin,

Enclosed you will find the most recent ODP "Summary Statement" (SS-0300) entitled "Unconsolidated Formation Recovery". The preparation of summary statements was initiated several months ago in an attempt to dispel misconceptions which arose concerning the applicability of state-of-the-art industry technology to ODP operations. Earlier SS issues dealt with Hard Rock Orientation and Free Fall Funnel Reentry Capabilities. In addition to clarifying misconceptions, the statements attempt to define the scientific problem statement (as understood by ODP engineering) and explain the current status of the required development within ODP. We feel that the JOIDES panel structure will benefit from this information and that this mechanism will help foster better communications and understanding between the scientific community and ODP development engineering.

Unfortunately the current engineering workload dictates that we not send an engineer to your September 1989 SGPP meeting in Kiel. However, we do appreciate your concerns and hope that you will consider holding a meeting of your sand coring sub-committee here in College Station so that several members of our engineering and drilling operations staff will be able to participate. I certainly agree with you on the importance of getting scientists and engineers together for constructive interactive dialogue. In the interim, I hope that the enclosed document will (1) provide you and your committee members with some valuable information, (2) clear up some misconceptions, and (3) serve as a starting point for discussions aimed at ensuring that the appropriate technology is ready when required.

In general, I would like to reiterate a few points made in the summary statement. First, the idea that industry rubber sleeve core barrel technology is readily applicable for ODP use is not true at all. The Christensen rubber sleeve core barrel requires a round trip of the drill string for each core. However, further investigation has determined that the tool is designed for use on land and the concept, in its present form, is not adaptable to offshore operations.

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In talking with the users of the Christensen rubber sleeve system we have determined that while it may preserve the quality of sand cores slightly better than other coring systems it does little to improve actual recovery over that achieved with other coring systems. In our opinion, if you are willing to consider a drill string round trip for each core, then a more efficient, and potentially better, solution would be to use the Advanced Piston Corer [redacted] (recognizing that you will get some 'limited' recovery but probably not achieve full stroke). We believe that this technique will become an option once a reliable breakaway piston head is developed. At this time we are just completing the design refinements to a breakaway piston head concept that has great potential. If this tool works as well as we anticipate then it should all but eliminate flow-in disturbance due to mechanical pullout of the APC after incomplete stroke. This means deploying the APC in an "advance by recovery" mode will become a more viable alternative and therefore should allow the APC to be successfully used in a sand coring mode, achieving high percentage, mostly undisturbed recovery.

Where appropriate, it is our feeling that the use of PDC core bits in conjunction with the newly strengthened Extended Core Barrel (XCB) or Rotary Core Barrel (RCB) may satisfy some requirements. In any case our ability to recover sand or sandy material should definitely be better than it has been in the past.

In addition to the modification of existing coring systems, ODP engineering is pursuing the application of oceanographic vibracoring techniques. We feel that vibracoring technology when merged with our standard APC or XCB coring systems, will significantly improve our ability to recover unconsolidated formations - particularly sand. Funding cuts experienced over the past two years have put this development program behind where we hoped to be at this time, however we are hopeful that progress will continue, additional funding will become available, and that this new technology will be developed and operational within the required time frame. Meeting your desired schedule will depend heavily on PCOM priority assignments.

Another important question to be answered is whether hole stability in unconsolidated formations can be maintained long enough to achieve the required scientific depth objective. This portends to be a much more serious problem than that of recovering the core samples. ODP drilling operations personnel are investigating alternative techniques for maintaining hole stability. Operationally, the importance of careful site selection cannot be over emphasized. Particular attention will have to be given to determining sites where science objectives can be achieved while minimizing the potential of unstable hole conditions as much as possible. These two objectives appear to be in complete contradiction with each other. Therefore this particular topic is one in which a round table discussion here at ODP with scientists, engineers and operations personnel all in attendance, would be particularly beneficial and of major importance to the success of any future unconsolidated coring attempts.

If you need any further assistance or information please do not hesitate to call. I look forward to hearing from you concerning the possible scheduling of a joint SGPP sub-committee/ODP meeting.

Best regards,

Michael A. Storms

Michael A. Storms
Supervisor of Development Engineering

MAS:lf

enclosures: SS-0300 "Unconsolidated Formation Recovery"

cc: L. Garrison
B. Harding
R. Grout
A. Meyer
R. Moberly
J. McKenzie
W. Normark

JOIDES Tectonics Panel Meeting

26-28 September 1989

Hawaii Institute for Geophysics
Honolulu, Hawaii

DRAFT MINUTES

Members:

I. Dalziel (Chairman), University of Texas
J. Bourgois, Université Pierre et Marie Curie
R. Buck, Lamont-Doherty Geological Observatory
D. Davis, S.U.N.Y., Stony Brook
D. Engebretson, Western Washington University
K. Klitgord, U.S.G.S., Woods Hole
E. Moores, University of California, Davis
Y. Ogawa, Kyushu University
R. Riddihough, Geological Survey of Canada
D. Sawyer, Rice University
T. Watts, Lamont-Doherty Geological Observatory
G. Westbrook, University of Birmingham
(Absent — M. Purdy, Woods Hole Oceanographic Inst.
K. Hinz, Bundesanstalt fur Geowissenschaften und Rohstoffa)

Liaisons:

S. Driess (SGPP), University of California, Santa Cruz
C. Mevel (LITHP), Université Pierre et Marie Curie
R. Moberly (PCOM), Hawaii Institute of Geophysics

JOIDES Planning Office:

P. Cooper
L. D'Ozouville

Tuesday Morning, September 26, 1989

1. Chairman Dalziel welcomed new members and liaisons.

2. Ralph Moberly welcomed TECP members and liaisons to Honolulu.

3. The Minutes of the Hannover, F.R.G. meeting (March 1989) were accepted.

4. Chairman Dalziel announced that the TECP White Paper is now in press and should be published in the JOIDES Journal in October 1989.

5. Report of PCOM Liaison (R. Moberly)

- TECP should submit priorities for FY 1991 program to the JOIDES Planning Office for consideration by PCOM at the JOIDES Annual Meeting to be held in late November 1989 at Woods Hole Oceanographic Institution.

- By its late winter meeting TECP should have priorities selected for a four-year plan to be decided on at the PCOM spring meeting.

- There will be a CEPAC DPG meeting in mid-November 1989 (November 16-17 at Lamont-Doherty Geological Observatory. Results from surveys now being conducted will be available for consideration of Cascadia margin drilling.

- There was a lengthy discussion of western Pacific drilling including Old Pacific Crust, Geochemical Reference Holes and Nankai with much emphasis on the status of downhole measurements for Nankai leg or legs. Considerable concern was expressed as to the value of Nankai drilling in the absence of suitable downhole instrumentation.

6. Report of SGPP Liaison (S. Driess).

- SGPP has prepared a White Paper.

- SGPP has rated sedimented ridges and the Oregon margin as top priorities for drilling.

- In response to a question about SGPP's rating of the Cascadia margin as a whole, Liaison Driess stated that the Oregon margin was rated particularly highly because a lot of work had been done there and the proposal specifically addressed geochemical themes. The Vancouver margin, on the other hand, did not go to the top because there was little new information (in thematic terms) and less geochemical emphasis.

- In response to a question about the Chile Rise Triple Junction, Liaison Driess indicated that this program did not get a top rating from SGPP because fluid flow was not specifically written in to the proposal and no submersible work was in sight. Also, the problem was regarded as a more complex case than a simple convergent margin.

7. Report of LITHP Liaison (R. Buck)

- Considerable LITHP concern was reported over the dropping of Geochemical Reference Holes. The Panel was also reported to be unhappy about the downplaying of a basement hole on the Ontong-Java Plateau.

- Liaison Buck also reported on LITHP voting on a long list of drilling priorities and discussed aspects of high temperature drilling in oceanic lithosphere that are of concern to LITHP.

- Chairman Dalziel reported that he has been in touch with LITHP Chairman R. Batiza concerning a plan for an overlapping TECP-LITHP meeting in the late winter.

Tuesday Afternoon, September 26, 1989 and Wednesday, September 27, 1989

8. Proposal review

• The following material was made available to the TECP:

- New data on Oregon margin (Proposal 271E (Rev.); Kulme)
- Report on stress determinations (Moos and Zoback)
- Response by M. Purdy to LITHP questions on Hawaiian geophysical experiment
- Sedimented ridge crests prospectus
- Preliminary Australian proposals for conjugate margin, lithosphere extension, and magma genesis drilling
- Proposal 271E (Neogene upwelling, California current)
- Proposal 355A for drilling gas hydrates (not yet circulated by JOIDES)

9. Proposals of interest to TECP were reviewed in detail. The decision reached by TECP is recorded below. Review forms will be written up in more detail and returned to the JOIDES Planning Office for distribution to the proponents.

203/E	Cretaceous Guyots in the New Pacific
335/E (202/E Rev.)	Drowned Atolls of the Marshall Islands

While some of the goals of these proposals are of considerable interest to TECP, concern was expressed that the tectonic "signal" expressed in the stratigraphy will be ambiguous. This is because different factors (e.g., vertical tectonic motions and eustasy) may have influenced sedimentation. TECP recommends combining these two proposals into a one leg drilling program since the general goals are the same and the atolls and guyots appear to have originated in the same general area of the Pacific.

319/E	Proposal to Drill an Extinct Hydrothermal System
321/E	Drilling a Fast-spreading Mid-Ocean Ridge Crest
325/E	Proposal to Drill a High-temperature Hydrothermal Site
331/A	"Zero-age" Drilling on an Extinct Spreading Axis

TECP has considerable interest in the tectonic evolution of spreading ridges. It is not clear, however, that these proposals address the tectonic issues. Recent work on hydrothermal systems in ophiolites (e.g., Troodos) strongly suggests that a three-step process is involved in development and localization of hydrothermal deposits: 1) formation of an oceanic crustal section, 2) faulting and fracturing giving rise to brecciated fault zones that form the plumbing system of the hydrothermal system, and 3) re-intrusion into the fractured oceanic crust to provide the heat source that drives the hydrothermal system. The geometry of the fault-breccia zones thus exerts strong control upon the localization of hydrothermal vents.

Revised proposals that present images (GLORIA or SEAMARC) of all faults and fractures in the area(s) of the hydrothermal vent(s) and that address the question of their possible fault or fracture control would be more within the thematic interest of TECP. The proposals might address the three-dimensional geometry and temporal evolution of fault systems.

320/A To Drill in the Nordic Seas
336/A Arctic to North Atlantic Gateways

TECP has no great interest in these proposals although they do address some minor tectonic objectives. Tectonic targets could be incorporated into the drilling plans, for example the tectonic evolution of the complex topography, evolution of transform margins, etc. This would, however, considerably alter the original thrust of the proposals.

322/E Ontong-Java Plateau - Pipelike Structures

TECP has little interest in this proposal. It does not address a high priority theme.

323/E Neogene Evolution, Etc. in the Alboran Sea

The plate boundary deformation and orogenic processes discussed in the proposal are of interest to TECP. It is not clear, however, how the proposed drill sites will elucidate these processes. The proposal needs to be revised before it can be supported by TECP.

324/A Malta Escarpment

This proposal was judged to be mainly of local (i.e., Mediterranean) interest, although a "limited" tectonic theme concerning rifting of continental margins and distinction of Alpine/Tethyan models was recognized. Hence the proposal was not judged to address "high-priority thematic objectives."

326/A Continental Margin of Morocco/NW Africa

The proposal was judged by TECP to be of secondary interest if judged to be of high priority by another panel. The tectonic interest is largely of a regional nature in the absence of process-oriented goals related to transform margin development.

327/A Argentine Continental Rise

This is one of a suite of proposals to address problems of drilling on volcanic margins and was discussed in that context. 327/A certainly addresses TECP thematic objectives, but has major deficiencies. For example, penetration of 1900 m of sediments before reaching the seaward-dipping reflector sequence (SDR) may be unrealistic. Also, it is doubtful that penetration of 350 m of the SDR will add anything to the knowledge gained from drilling on the Voring Plateau. The proposal suggests (with similar proposals for drilling on the East Greenland margin) the need for an *ad hoc* group to formulate a drilling program for volcanic margins.

328/A Continental Margin of East Greenland

Again the proposal is addressing TECP thematic objectives. The proposal does not, however, indicate how the proposed drilling would discriminate between models of formation of SDR's. The question arises once more of where is the best location for SDR drilling.

330/A Mediterranean Ridge

The proposal addresses TECP themes with considerable deficiencies. The Panel believes that the overall tectonic architecture and context of the Mediterranean Ridge is not sufficiently clear to justify the proposed drilling. Lack of deep seismic data confirming the current interpretation of the ridge is particularly critical. The proponents need to justify drilling the Mediterranean Ridge in the context of other accretionary prisms of the world.

333/A A Drilling Transect Across the Cayman Trough

TECP has strong interest in the proposed objectives of:

(1) constraining the kinematics of Caribbean plate motion;
(2) drilling structures at a singular (cold) ridge crest;
(3) looking at "pull-apart" basin evolution; and
(4) determining the stress field associated with transform faulting.

Nevertheless it was felt that aeromagnetic, MCS and seismic refraction data are needed for thorough evaluation of this proposal. It is well organized and cogent and TECP would be eager to review it again when additional data are available.

334/A The Galicia Margin

TECP feels that drilling to and through the S-reflector is a very high priority thematic objective for rifted margins. The Panel looks forward to strong evidence correlating the S-reflector where it is proposed for drilling in 334/A with S further south where it is better known. TECP believes it is critical to have high-quality refraction data to Moho available before new drilling is planned. TECP would also like to see arguments as to why the Galicia margin is better than that of Armorica for S-reflector drilling. TECP is skeptical about the importance of peridotite drilling.

340/B North Australian Foreland Basins

TECP has major concern as to whether the proposed drilling belongs in the ODP or industrial realms. The panel was also skeptical that single holes would supply the required information and whether the problem is of local Australian or general concern. TECP did not see how the proposed drilling program would distinguish between different models. Hence the proposal was viewed as addressing thematic objectives but with serious deficiencies.

342/A Barbados Accretionary Prism

High priority TECP themes are addressed with excellent survey data. TECP would like to review a revised version of the proposal that is more explicit about the relationships between the various components and explains more fully the choice of individual sites.

343/A Drilling a Caribbean "Window"

The tectonic history of the Caribbean plate and its interaction with adjacent major plates is of thematic interest to TECP. The proposal does not, however, adequately explain how it will address these objectives. It does not explain why the basement will be different from that penetrated at Site 151.

344/A Jurassic Quiet Zone

As presented, the proposal does not address high-priority thematic objectives. It could be resubmitted after M-series anomaly calibration in the "Old Pacific."

346/A Equatorial Atlantic Transform Margin

The evolution of transform margins is of major thematic interest to TECP. The area proposed does look like an excellent location for the pursuit of this objective. The panel would like to see additional data to justify the specific sites identified in the proposal.

349/A Clastic Apron of Gran Canaria

This proposal, although well thought out, is of only marginal interest to TECP. To gain major TECP interest it would have to address:

(1) response of the oceanic lithosphere to loading; and/or

(2) the relationship of early magmatic activity in the Canaries and tectonic changes caused by mid-Tertiary spreading center reorganization in the Atlantic Ocean.

350/E Gorda Deformation Zone

The internal deformation of plates is of interest to TECP. TECP has concern about the core-orientation technique proposal, the accuracy of the rotations that can be derived, and the ability of the results to distinguish between various deformation models. Similar observations have not always been diagnostic on land.

351/C Bransfield Trough

The proposal addresses numerous issues of thematic importance to TECP including the kinematics and dynamics of back-arc basin formation and the study of convergent margin processes in general. Major deficiencies include:

(1) additional MCS data are required before final site selection can proceed;

(2) there are inconsistencies in the "roll back" model and questions as to how drilling can resolve them;

(3) there is need to compare Bransfield with other back-arc basins (e.g., Ryuku); and

(4) the proposal was viewed by several panel members as being of only local significance. A stronger case needs to be made for its broader application and/or its uniqueness for quantifying tectonic processes.

Thursday, September 28, 1989

10. After up-dates on the Chile Triple Junction (G. Westbrook) and the Cascadia margin (G. Moore, H.I.G.), TECP voted on priorities for FY 91 drilling. The result was:

	Points
Chile Tripe Junction, Leg #1	39
Cascadia Margin, Leg #1	36
Chile Triple Junction, Leg #2	30
East Pacific Rise Bare Rock	27
Sedimented Ridge Crests, Leg #1	25
Cascadia Margin, Leg #2	21
Return to Site 509B	20
Sedimented Ridge Crests, Leg #2	12
North Pacific Neogene	11

The vote was preceded by a discussion leading to a consensus that spreading ridge proposals need to have tectonic input wherever possible and that a message be conveyed to proponents of proposals in hand that they will receive more support from TECP if they address problems such as fault control of mineralization and stress in the lithosphere.

11. TECP then addressed the issue of Oregon vs. Vancouver margin proposals for Cascadia and decided to have a postal vote in mid-November based on up-dated input from the proponents.

12. Robin Riddihough was elected as liaison to the CEPAC DPG meeting at Lamont-Doherty in mid-November 1989.

13. The following were proposed as replacements for "retiring" U.S. members of TECP:

T. Atwater (University California, Santa Barbara)
J.C. Moore (University of California, Santa Cruz)
G. Moore (Hawaii Institute for Geophysics)
E. Silver (University of California, Santa Cruz)
R. Detrick (University of Rhode Island)
M. Zoback (Stanford University)
J. Karson (Duke University)
R. Speed (Northwestern University)

The Chairman is to communicate the names of these scientists and the number of votes they received to PCOM.

14. A. Watts presented an up-date on the drilling proposed for the Hawaiian flexural moat.

15. The next TECP meeting will be held overlapping that of LITHP in New Orleans, Louisiana, the week of March 5, 1990 (subject to coordination with LITHP Chairman R. Batiza and approval of PCOM).

16. Finally TECP considered PCOM's request for a prioritization of drilling programs for the four years following FY 1991. This prioritization has been requested for consideration with those of the other thematic panels by the PCOM meeting in the northern spring of 1990. It must therefore be completed by the TECP late winter meeting early in 1990.

    Reviewing TECP's Long-Range Planning Document/White Paper, and comparing likely drilling through FY 1991 with goals through 1995 led to the following analysis that is set out by TECP themes:

    • CONVERGENT MARGINS

    - Likely Drilling Through FY 1991

      Nankai (1 leg) — Accretionary Prisms
      Cascadia (1 leg) — Accretionary Prisms
      Vanuatu (1 leg) — Collision Processes

    - Needed Through 1995

      Three more legs on accretionary prisms

    - Action Required

      TECP agreed to reinstate its earlier request to PCOM for establishment of an *ad hoc* group (?Working Group) to address strategy for drilling accretionary prisms in the medium- to long-term.

    • INTRAPLATE DEFORMATION

    - Likely Drilling Through FY 1991

      ?Hawaii (1 leg)

    - Needed Through 1995

      One additional leg — no program yet

    - Action Required

      A. Watts to consider this matter and foster a suitable program(s).

- DIVERGENT PLATE BOUNDARIES

  - Likely Drilling Through FY 1991

    East Pacific Rise etc., requiring liaison with LITHP and proponents for enhanced tectonic input.

  - Needed Through 1995

    Three legs on rifted continental margins (including transform margins)

  - Action Required

    Consideration of existing proposals and fostering of additional options led by:

    D. Sawyer (non-volcanic margins)
    H. C. Larsen (volcanic margins)
    K. Klitgord (transform margins)

    In addition TECP is to recommend to PCOM that an *ad hoc* group (?Working Group) be established to formulate a reasonable plan for drilling volcanic margins for existing and future proposals. This group should, TECP believes, convene a workshop (seeking support from USSAC and equivalent non-U.S. bodies) on the whole scientific problem of magmatism associated with supercontinental break-up. The specific drilling plan could be formulated in the context of input from the entire community, terrestrial- and well as marine-oriented. TECP sees this move as an excellent way for ODP to reach outward beyond the ocean science community towards elucidation of a major earth science process by ocean drilling.

- PLATE KINEMATICS

  - Likely Drilling Through FY 1991

    Old Pacific (1 leg)

  - Needed Through 1995

    Three legs — no programs yet in sight

  - Action Required

    E. Engebretson to foster appropriate proposals in part through advertising.

- PLATE DYNAMICS

  - Likely Drilling Through 1991

    Installation of geophysical observatory off Oahu and stress determinations.

- Needed Through 1995

  Three legs devoted to stress determinations to determine drilling forces, dynamics of transform faults and to install geophysical observatories; no proposals in hand.

- Action Required

  M. Purdy to foster appropriate proposals.

Executive Summary

Shipboard Measurements Panel
Second Meeting
Lamont-Doherty Geological Observatory
2-3 October 1989

The meeting focused on four main topics: (a) improvements to current laboratory procedures and equipment; (b) potential upgrades to sedimentological/visual core description; (c) requirements for full integration of downhole and shipboard measurements; and (d) specific shipboard requirements for upcoming legs. Specific recommendations are listed below. The most urgent requirement is the development of standard methods for the measurement and calculation of bulk density, water content, and grain density. Some improvements have been made since our first meeting in Underway Geophysics and the panel is closely monitoring this progress. Potential upgrades to sedimentological methods and visual core descriptions were discussed in detail and the panel encourages the upgrades to the barrel sheets as proposed by TAMU. The panel discussed the requirements for downhole and shipboard data integration. It is recommended that DMP and SMP meet together to prepare a plan for full data correlation and integration. Specific requests made by the Working Group on Fluid Regimes of Accretionary Wedges were discussed. Some of these requests overlap with the requirements and concerns of SGPP. The most technologically difficult requirement identified in our discussions is the development of sample handling equipment (for fluids and for bulk physical properties) for the pressure core barrel (PCB). As requested by PCOM, SMP discussed the requirements for guidelines on radioisotope use onboard JOIDES RESOLUTION. Specific guidelines will be drafted at the next SMP meeting (6-7 March, 1990).

SMP Recommendations
2-3 October 1989

The panel recommends that temperature-dependent susceptibility equipment be purchased for the paleomagnetics laboratory (89-26).

The panel recommends that an ARM coil be built at TAMU by an electronics technician (89-27) for the paleomagnetics laboratory.

The panel recommends that a group of physical property specialists prepare a document of standard methods for shipboard determinations of bulk density, grain density and water content (89-28).

The panel recommends that (1) a list of the shipboard micropaleontological library material be distributed to paleontologists from the most recent ten legs and request suggested additions; (2) paleontological material should be indexed for access by shipboard scientists and (3) the older taxonomic literature should be accessible in the paleontology lab (89-29).

SMP recommends that a documented reference slide collection be made available on the Resolution and at TAMU. This collection should be checked at the end of each leg and deficiencies should be corrected in order to maintain the collection (89-30).

The panel recommends that a proper Angstrom shatterbox be purchased ($7k - $8K) and that the cracked vessel be replaced ($5k) or repaired ($3k) in time for Leg 134 (89-31).

SMP recommends the following actions by TAMU related to computers and data:

(1) where the same plots are generated for each leg, standard plot templates should be developed using Mac and PC plotting software;
(2) a variety of software with manuals that provide flexible data manipulation such as spreadsheets, databases and graphics packages should be made available onboard for Mac and PC environments;
(3) develop data entry software as described above for the micropaleontology lab; and
(4) provide data transfer from VMS XRD/XRF files to the Mac and PC environments (89-32).

TAMU should begin the development of a sedimentological visual core description computerized form to be compatible with the new developments in the Barrel sheets (89-33).

The panel re-emphasizes the importance of our recommendation made at the first meeting which states: the evaluation of the smear slides should not be broken down into absolute percentages; rather the percent composition should be represented by descriptive terms which represent ranges of percent compositions (89-20).

SMP re-emphasizes their recommendation that if VSP becomes a routine part of the program (i.e. a zero offset VSP is run at each site where a sonic log is collected), underway geophysical operations should be integrated with the VSP program (89-9).

SMP recommends that TAMU purchase a photocopier and adapt it for photocopy of whole core rock samples (89-34).

Shipboard Measurements Panel
2-3 October 1989
Minutes

I Introduction of new members, guests, and TAMU representatives. The meeting was attended by the following:

Jack Baldauf (ODP/TAMU)
Henry Elderfield (guest; SGPP)
Ian Gibson (member)
Xenia Golovchenko (ODP/LDGO-BHRG)
Denis Graham (ODP/TAMU)
John King (member)
Kate Moran (chair)
Mike Mottl (member)
John Mutter (guest; host)
Adrian Richards (member)
Mike Rhodes (member)
Ellen Thomas (member)
Hidekazu Tokuyama (member)
Jean-Pierre Valet (member)
Robert Whitmarsh (member)
Paul Worthington (liaison; DMP chair)

II The chair called for additions to agenda which resulted in a modified agenda (attachment #1).

III Minutes of the last meeting were reviewed and approved. Business arising from the last meeting was discussed as follows:

Paleomagnetics (J. King)

J. King evaluated the needs for a pulse magnetizer and came up with some cost estimates. This equipment is commercially available. However, the equipment would have to be placed far away from the cryogenic magnetometer and this option is not practical. An alternative is to measure the temperature dependance of magnetic susceptibility. This equipment is also available commercially from Bartington Instruments at an approximate cost of $18k. After further discussion, the panel recommended that temperature-dependent susceptibility equipment be purchased for the paleomagnetics laboratory (89-26).

J. King and J-P. Valet also reported that an ARM coil may not be available in the paleomagetics lab. This equipment is important for hard rock legs. There is very little capital cost for making this available and the panel recommends that an ARM coil be built at TAMU by an electronics technician (89-27). Action: J. King will provide technical drawings to TAMU.

Contamination of core samples which influences the quality of paleomagnetics data was reported by J. King at the first meeting. Action: J. King will assess Broken Ridge XCB cores and will report to the next SMP meeting.

Physical Properties (K. Moran)

The measurement of bulk density, grain density and water content onboard the vessel has not been consistent from leg to leg. Shipboard scientists report problems with the penta-pycnometer; scientists change the software for calculation of these properties; and some established standard methods are not being employed onboard. The panel is very concerned about these trends which may mean that measurements are not consistent from leg to leg and may not be able to be used in comparison with other data collected worldwide. The panel therefore recommends that a group of physical property specialists prepare a document of standard methods for shipboard determinations of bulk density, grain density and water content (89-28). This group should consist of the following membership: A. Richards, K. Moran, E. Taylor, A. Fisher, M. Mottl, and R. Chaney. In addition, M. Mottl pointed out that since electrical resistivity equipment is available for use onboard, recommended resistivity methods should also be documented by this group.

Considering the wide variety of equipment in the physical properties laboratory and the variety of scientific staff expertise which utilizes the equipment on each leg, the panel feels that a workshop attended by previous physical property specialists would be very productive. The objectives of the workshop would be to:

1. review current equipment and procedures;
2. evaluate these procedures for consistency and discuss problems which have been identified by individual scientists;
3. identify any equipment/procedures/measurements which are not presently done onboard, but should be done routinely;
4. discuss measurements which should be incorporated into the current suite of physical property measurements in order to link shipboard measurements with downhole measurements;
5. identify and recommend upgrades to standard procedures; and
6. review the job description of the physical properties specialist.

The panel requests PCOM's endorsement of this proposal.

Micropaleontology (E. Thomas)

1. There have been numerous complaints regarding the shipboard paleontological library; these problems

can be broken down into two categories:

a) There is not enough documentation of Mesozoic material and there are still deficiencies in documentation of the Cenozoic.

b) Some material onboard is not very accurate, including the reprint collection and the old taxonomic bound volumes from the Challenger. This material is not indexed; the older taxonomic literature should be indexed and placed in the paleo lab. Indexing should be done so that valuable material is present on the ship, and cannot be used because of lack of documentation.

The panel recommends that (1) a list of the shipboard library material be distributed to paleontologists from the most recent ten legs and request suggested additions; and (2) paleontological material should be indexed for access by shipboard scientists and the older taxonomic literature should be accessible in the paleontology lab (89-29). Action: E. Thomas to monitor and coordinate suggestions from shipboard paleontologists.

2. Micropaleontological reference collections are not available to shipboard scientists with the exception of the badly depleted slides of planktonic foraminifera from the Challenger. Availability of theses slides is essential so that reliable data can be generated onboard. Relatively small groups of scientists could provide most of the material for each of the major fossil groups of planktonic foraminifera, benthic foraminifera, calcareous nannofossils, diatoms, radiolarians, and silicaflagellates.

   SMP recommends that a documented reference slide collection be made available on the Resolution and at TAMU. This collection should be checked at the end of each leg and deficiencies should be corrected in order to maintain the collection (89-30). The panel discussed how this may best be accomplished and agreed that funding for individual scientists to duplicate slides for the collection could come from USSAC and that the coordination of this effort would best be done from TAMU. In order to initiate this effort, TAMU should send a letter to appropriate micropaleontologists to ask for their participation. Action: E. Thomas to provide a list of scientists names to J. Baldauf at TAMU.

3. J. Baldauf reported that HF is no longer a problem onboard. However, some safety issues need to be

addressed. The fumes should be tested and checked when HF is in use to be sure that a proper job is being done. Also, can the medical facilities onboard handle HF burns? Action: J. Baldauf to report at the next meeting on status of HF safety.

Petrology (M. Rhodes)

The XRF/XRD laboratory is working well. Very good results were achieved on Leg 126, particularly with the XRD. However, geochemical standards need to be provided. Standards are available from the USGS, France, Japan, and Canada. Action: M. Rhodes and J. Baldauf to coordinate and report at the next SMP meeting.

The cracked vessel for the shatterbox has not yet been repaired, although it has been successfully used. The next leg where this equipment will be heavily utilized is Leg 134. The panel recommends that a proper Angstrom shatterbox be purchased ($7k - $8K) and that the cracked vessel be replaced ($5k) or repaired ($3k) in time for Leg 134 (89-31).

Computers: Standard Plots (all members)

At the first SMP meeting, the panel decided that standard software templates should be developed for each shipboard lab in order to reduce duplication by shipboard scientists and to improve the efficiency of data output for Vol A. However, the panel discussed more general issues of data handling and data presentation which apply to all of the shipboard labs. M. Mottl noted that although standard plots exist on the Vax system for geochemistry, the scientists opted to use the Mac and the PC for data presentation. I. Gibson noted that flexibility is required. The panel agrees that there are minimum requirements for data handling as follows:

a) an easy transfer capability from the Vax to either the Mac and/or the PC environment;
b) flexible software packages available for spreadsheets, database applications, and plotting; and
c) where the same plot is generated each leg, standard plotting templates should be available on PC or Mac supported softwate packages.

D. Graham reported that with the installation of the Ethernet network onboard, requirement (a) will be met. The panel reviewed each lab with respect to these requirements. The labs which require the most improvement in this area are the micropaleontology and the XRD/XRF labs.

Shipboard data input for micropaleontology is not yet computerized; quadruple forms are still in use. This strongly inhibits use of micropaleo data in the database. TAMU is working on adapting the micropaleontological database program CHECKLIST; however, this program is not suitable for direct data entry. Its application is producing and plotting range charts. TAMU should place highest priority for software on the development of a computerized form to replace the current quadruple forms. The computerized version should have the following attributes:

- user-easy shipboard data entry in the database
- spelling checker to eliminate discrepancies
- customized forms for each major microfossil group
- compatibility with CHECKLIST
- dataentry should be available both via keyboard at the microscope and using a forms menu

The XRD/XRF laboratory does not yet have file transfer from VMS to a PC-based or Mac-based system. This requires duplicate data entry. Data transfer from VMS to the micro environment should be developed and implemented for the XRD/XRF lab.

In summary, SMP recommends the following actions by TAMU related to computers and data:

(1) where the same plots are generated for each leg, standard plot templates should be developed using Mac and PC plotting software;

(2) a variety of software with manuals that provide flexible data manipulation such as spreadsheets, databases and graphics packages should be available for Mac and PC environments;

(3) develop data entry software as described above for the micropaleontology lab; and

(4) provide data transfer from VMS XRD/XRF files to the Mac and PC environments (89-32).

III Sedimentology and Visual Core Descriptions (all members)

J. Baldauf began the discussion with a presentation of TAMU's proposed modifications to the dreaded Barrel Sheets. At present much of the data that is entered on these sheets is done by hand. Not only is this a repetitive exercise, errors are easily incorporated into the data set when copied manually from one medium to another. TAMU's proposed modifications include: presentation of the entire visual core description; removal of the smear slide data; include graphic lithology, structure and core disturbance; show sample locations with code designations for each lab or data type; present quantitative colour data; include down core plots of physical properties and allow for space for downhole logs, if appropriate. SMP endorses and encourages these proposed changes to the Barrel Sheets.

M. Leinen was unable to attend the meeting, her report on benchtop XRD for the sedimentology lab is deferred until the next SMP meeting. R. Jarrard (LDGO-BHRG) noted that on leg

124E with a scientist and a dedicated technician, 1 XRD and 1 XRF analysis was completed per core. Other methods for bulk mineralogical analyes were discussed. However, the panel needs more information on these techniques. Action: M. Rhodes will report on infrared and other methods for bulk mineralogy to the next SMP.

J. Baldauf and D. Graham reported that TAMU is working on a core video scanner. Action: TAMU report to next SMP on status of the video scanner.

Image analysis of smear slides was reported by A. Richards. Researchers at the Univ. of Miami may have the most advanced approach. Action: A. Richards to follow the developments at Miami and report to next SMP.

K. Moran presented the new method for digital core colour analysis used at Bedford Institute. The method uses an 'off the shelf' product manufactured by Instrumar Engineering Ltd. The product is a hand held spectrophotometer which uses a xenon flash as a light source and an array of light sensitive detectors which receive light after a prism separates the light into a wavelength spectrum in the range of 400 to 700 nanometers. The method may be applicable to ODP. Action: K. Moran to present comparative Munsell and digital colour analysis at the next SMP.

The panel discussed the hard rock visual core description computer method at our first meeting. We agree that TAMU should begin the development of a sedimentological visual core description computerized form to be compatible with the new developments in the Barrel sheets (89-33).

The panel re-emphasizes the importance of our recommendation made at the first meeting which states: the evaluation of the smear slides should not be broken down into absolute percentages; rather the percent composition should be represented by descriptive terms which represent ranges of percent compositions (89-20).

The topic of improvements to sedimentology and visual core description was not completed at this meeting and should be reviewed again, as a high priority at the next SMP meeting.

IV Requirements of Downhole Logging and Shipboard Measurements: Data Integration/Analyses (P. Worthington)

P. Worthington presented a summary of the recommendations made by DMP's physical properties working group which met on 17 August 1987 (attachment #2) One philosophy of the working group is that for each downhole measurement, there should be an equivalent shipboard measurement and that laboratory data should be obtained at restored temperatures and pressures where possible. Presently there are no examples from shipboard operations which meet this philosophy. The panel agrees generally with the philosophy of the working group; however, are cautious about suggesting complete duplication of each measurement because of scale problems, measurement interference among instruments, and cost/benefits. The panel discussed possible equivalent measurements which can be accomplished by supplementing the current physical property laboratory suite. The most obvious addition to the lab is the measurement of natural gamma spectrometry (Action: Moran research and report to next SMP). Other additional measurements include induced gamma with pulsed or accelerated source (Action: I. Gibson research and report to next SMP) In addition, the panel suggested that additional downhole measurements could be made to link logs to core using magnetic susceptibility. At present the shipboard scanned measurement of magnetic susceptibility is being used to correlate between holes. H. Toyuyama reported that a downhole magnetometer/magnetic susceptibility tool has been developed in Japan (attachment #3). Action: J.P. Valet to monitor French and Japanese tool development and report status of application of this tool to ODP hole-size and vertical resolution in sediments.

Other issues which were presented by Worthington are:

- how representative are the properties of one hole at, for example, a lithosphere site?
- should samples be tested at their in situ temperature and pressure?
- with the addition of the formation microscanner to the suite of logging tools, we may be able to better locate the core samples in the hole.

P. Worthington also suggested that the two panels (DMP and SMP) should hold a joint meeting in order to define the requirements for directly linking downhole measurements to shipboard measurements. SMP agrees that we need to procede with this effort as a high priority and a joint meeting would be appropriate in one year. A. Richards recommended that we prepare a framework for the joint meeting in order to basically define available technologies. An outline of this framework is attached (#4). Action: D. Graham to prepare ODP technology database using Richards' outline for review at the next SMP meeting.

V SGPP Report on Fluids Sampling (H. Elderfield)

H. Elderfield presented the concerns of SGPP regarding the need for new or modified procedures for fluid sampling. A report which details these concerns is attached (#5). These concerns are directed toward the panel's highest priorities, sedimented ridge crests and accretionary prisms.

The SGPP's concerns about methods specifically relate to sample squeezing and to the method(s) for obtaining uncontaminated pore fluid samples, i.e. the Barnes\Uyeda Tool (WSTP) and the Pressure Core Barrel (PCB). Because the geochemistry lab now has an AA, trace element analysis can be done. However, the sqeezers require titanium sleeves in order to eliminate contamination. SMP fully endorses this request and, as we discussed at our first meeting (89-1), SMP agrees that it would be advantageous to have available a few non-plastic squeezers to minimize contamination. Titanium should be considered first, and if the material is too weak, other materials which will not cause contamination for trace element analysis should be considered. Action: M. Mottl to investigate possibility of using titanium squeezers. SGPP also requests that ultra-centrifugation be available for pore fluid extraction in the upper 200 metres. SMP, again, fully endorse this request (89-1). In addition, SGPP echoes our request that a greater flexibility in whole round sampling be adopted (89-1). J. King noted that, although we agree that more flexible sampling is required, there is danger in loosing whole core scanned data if these samples are cut from the core at the catwalk. Whole round samples which do not require immediate attention/analyses should be removed from the core just prior to splitting.

H. Elderfield also presented the concerns of SGPP regarding the WSTP. M. Mottl noted that WSTP may only have a "bad" reputation because of one failure. In general, the tool works well and is only limited by sample size and the strength of the probe. P. Worthington also noted that DMP has discussed improvements to the tool, one of which is strengthening the probe. It was agreed that the PCB is also required in order to acquire larger volumes of pore fluid samples and for gas analyses. The PCB was successfully tested on the engineering leg (refer to attachment #6); however, there is as yet no procedure for handling the sample on deck. Engineering development for sample handling will require two separate methods which have different requirements:

1. for fluids/gas compositional analysis; and
2. for determination of physical properties at in situ pressures.

SMP agrees that the first method may be more easily accomplished and should be considered first, with the Cascadia/Vancouver Is. Leg as the operational goal. The primary requirement is separation (squeezing) of fluid from solids within the barrel. The second technique requires either transfer of the sample to a pressure chamber or measurements of some properties directly in the cell (e.g. thermal conductivity, acoustic velocity, resistivity). Action: TAMU Engineering group representative attend next SMP meeting to discuss methods of PCB sample handling.

VI Underway Geophysics (J. Mutter)

Data Acquisition
LDGO loaned their high speed streamer to TAMU for onboard testing. Because the fire which occurred onboard now limits the maximum ship speed to 10 knots, tests could not be fully performed. D. Graham thought that the streamer was required back at LDGO shortly. However, J. Mutter thought otherwise. If the streamer is not yet required at LDGO, it should remain onboard for tests following the drydock.

Processing
SIOSEIS (as recommended by T. Shipley, attachment #7) was used successfully during Leg 127 for post processing. However, real-time processing is not yet happening onboard. Action: TAMU to report on the status of real-time and post processing at the next SMP meeting. Also, scientists on Leg 130 should be encouraged to fully test and report on the processing capabilities of the current system.

Real-time Navigation
D. Graham reported that they had visited URI and Lamont to discuss JOIDES RESOLUTION navigation requirements. Subsequent to the visits, they sent out an RFP for the provision of a real time navigation system. They received bids back from 4 groups with a lowest bid of $250,000. Because the costs were high, the acquisition is on hold. Action: TAMU to provide RFP to Mutter, Tokuyama and Whitmarsh for review prior to the next SMP meeting. Mutter, Tokuyama and Whitmarsh to present proposed recommendations at the next SMP meeting.

VSP
P. Worthington presented a history of DMP's recommendations on VSP (summary attached #8). DMP had recommended that VSP's should not routinely be done on the ship. Although DMP agrees that there are major benefits achieved when VSP's are run, their main concern was that there was not an appropriate level of support for tool acquisition and for data processing, which could possibly be achieved with a 'national VSP laboratory'. J. Mutter pointed out the JOI/USSAC supported workshop on VSP and ODP recommended the formation of a "US National VSP Laboratory" and that VSP's should become an integral part of ODP science (see Executive summary, attach #9). Although the deployment of the tools for VSP should be evaluated by DMP, the data acquistion and processing is an SMP concern; consequently the two panels play a joint role. SMP agrees that the VSP is the only direct tie between seismic reflection data and well log data. SMP suggests that DMP reconsider their recommendation after reviewing the recommendations of the JOI/USSAC workshop. SMP re-emphasizes their recommendation that if VSP becomes a routine (i.e. a zero offset VSP is run at each site where a sonic log is collected) part of the program, underway geophysical operations should be integrated with the VSP program (89-9).

VII Upcoming Legs (K. Moran)

J. Baldaulf presented the schedule for upcoming legs. The upcoming leg which has requested special shipboard measurements is Leg'131 to Nankai Trough. SMP reviewed the recommendations made by the Working Group on Fluid Regimes of Accretionary Wedges. K. Moran presented a framework for shipboard measurements which can be used in deciding what measurements are appropriate for the ship. Measurements fall into the following categories:

1. Standard (routine) tests and procedures that are required on all recovered core samples.
2. Non-routine measurements which must be performed onboard because of degradation/changes to the sample with time. Equipment for these measurements fall into two categorie:
   a. ODP available
   b. Supplied by the shipboard scientist
3. Non-routine measurements which should be done onshore because it is either very specialized or very labour-intensive. Equipment for these measurements fall into three categories:
   a. ODP available at TAMU
   b. Located at individual scientists' institution
   c. Equipment supported by JOIDES or member countries, but located at a designated institution or university.

The Working Group recommended that equipment should be available onboard for matrix permeability. SMP agrees that this equipment falls into the 3a and 3b categories. The equipment is too specialized and labour-intensive for routine use onboard. M. Langseth (PCOM) confirmed this by commenting on the results of Leg 128. The equipment was set up onboard for Leg 128, but was not used. However, the equipment is presently operational at TAMU and can be used for post-cruise testing of whole round samples. If whole rounds are removed for this testing, they should be sealed in the plastic liner with wax and stored in salt water until tested onshore.

Recommendations were also made for testing samples onboard for 'seismic' velocity under in situ pressure. SMP agrees that this type of measurement falls into the 3b or 3c category. This equipment is very specialized and can be performed post-cruise, if appropriate sample handling and storage is carried out.

An upgrade to the thermal conductivity device was also recommended and this action has been completed by TAMU.

Modifications to the whole-round sampling policy were also recommended and SMP agrees as stated in the minutes of our Feb., 1989 meeting. However, consideration should be given to when the whole rounds are removed in the core flow and should be removed after the MST.

The Working Group also recommended use of the PCB, which was discussed earlier under the SGPP report heading and will be reviewed at the next SMP meeting. It was noted by A. Richards that a pressure core barrel has been successfully used by a group of researchers at TAMU. Action: J. Baldauf to invite a representative from TAMU to discuss their experience with pressure core barrels and to present current research on gas hydrates.

An anelastic strain relaxation (ASR) device was recommended by the Working Group for estimates of relative maximum/minimum stress direction. B. Whitmarsh reported that the instrumentation for this measurement is simple; however the results from Leg 123 are not yet fully understood. R. Jarrard suggested that given the limited number of downhole measurements of stress direction from the BHTV, this measurement may be quite valuable. Since ASR must be performed immediately after sample recovery, the measurement falls into category 2b at present and should be considered for 2a following the results of Leg 131 to Nankai Trough. Action: K. Moran to investigate the equipment to be used on 131 and report at the next SMP meeting. SMP discussed and noted that for true stress direction, core orientation is required.

Structural fabric analysis was also recommended by the Working Group. Some possible methods are X-Ray fluoroscopy, X-Ray tomography, and direct core photocopy. The high technology methods need further review by SMP. For hard rock core recovery, the photocopy method (as used by KTB) should be implemented. SMP recommends that TAMU purchase a photocopier and adapt it for photocopy of whole core rock samples (89-34). The method should follow that of KTB. Action: A. Richards investigate the high technology methods and report at the next SMP meeting.

VIII Guidelines for Radioisotope Use Onboard JOIDES RESOLUTION

PCOM requested that SMP provide satisfactory guidelines for the use of enriched stable or radioactive isotopes onboard the Resolution. SMP agrees that guidelines are required. However, in order to define guidelines appropriate to the program, SMP requires a better understanding of the priority of the science which requires radioisotopes onboard. SMP requests input from SGPP, OHP, TECP, and LITHP on what scientific objectives require the use of these substances and their relative ranking. SMP also needs additional information on the results of radioisotope use on Leg 128, information on the how clean was the Sedco/BP 471 upon delivery to the program, and the current guidelines used by member country oceanographic institutions. Action: All SMP members forward their respective institution/member country guidelines to K. Moran; J. Baldauf report on the "cleanliness" of the ship at the next SMP meeting and the results of Leg 128 radioisotope use; and K. Moran to solicit thematic panel input on scientific requirements/ranking. With this information SMP will draft guidelines for approval by PCOM.

IX Review and Status of ODP Sampling Tools

K. Moran reviewed the results of Leg 124E. An ODP Development Engineering representative was unable to attend with regrets. SMP outlined issues which should be discussed with a representative at the next meeting. These issues are:

PCB sample handling requirements
XCB/Hard rock core orientation (status)
Sonic core monitor (status)
APC core recovery/disturbance
APC temperature sensor (status)

X Next Meetings

SMP is striving to hold every other meeting at TAMU. In addition, I. Gibson recommended that SMP overlap with IHP. SMP requests the next meeting to be held at ODP/TAMU on 6-7 March, 1990. IHP is meeting 7-8 March at TAMU. In addition, the panel discussed the need to meet at a port of call as recommended by PCOM in our mandate. At present, 55% of the panel membership have not been on the ship. Consequently, we feel that it is imperative for the panel to visit the ship. SMP requests our fourth meeting be held in Brisbane following Leg 133 (tentative dates 11-13 Oct 1990). In order to address the requirements of full integration of downhole and shipboard measurements, a three day meeting is requested, allowing for a one day joint meeting with DMP.

XI The chair thanked our host, John Mutter, for making the arrangements for the meeting and for his quick reponse to the blackout by providing light. Thanks were also extended to Xenia Golovchenko for arranging lunch and a tour of the Borehole Research Group facility. The meeting was adjouned at 1700, 3 October.

JOIDES SITE SURVEY PANEL MINUTES

BGR Hannover FRG

October 16-19, 1989

89-467

Present: Rob KIDD* (Chairman, UK)

Fred DUENNEBIER* (USA)

Birger LARSEN* (ESF)

Steve LEWIS* (USA)

Keith LOUDEN* (Canada/Australia)

Heinrich MEYER* (Host, FRG)

Guy PAUTOT* (France)

Hidekazu TOKUYAMA (Alternate for SUYEHIRO, Japan)

Mahlon BALL (PPSP)

Yves LANCELOT (PCOM Alt. for WATKINS)

Laurent D'OZOUVILLE (JOIDES Office)

Helmut BEIERSDORF (BGR, Observer, CEPAC Member)

Michael WIEDICKE (BGR, Observer)

Ulrich von RAD (BGR Observer, PCOM Member)

Apologies were received from:

Kim KASTENS* (New Member, USA)

Dick von HERZEN* (New Member, USA)

Carl BRENNER (SSB)

Audrey MEYER (TAMU)

* Denotes Panel Member

AGENDA FOR SSP MEETING

October 16th - 20th, 1989
Hannover, FRG

1. PRELIMINARY MATTERS - Monday 17th October - 09.00

   1.1 Introductions (Kidd).
   1.2 Logistics (H. Meyer).
   1.3 Changes in minutes from previous meeting.
   1.4 Updated ship schedules.
   1.5 Other business for Agenda.

2. REPORTS

   2.1 PCOM (Lancelot)
   2.2 JOIDES (D'OZOUVILLE)
   2.3 TAMU (A. Meyer, written report)
   2.4 PPSP (Ball)
   2.5 [SMP (Moran - not present)]
   2.6 Data Bank (Brenner, written report)

3. SITE SURVEY UPDATES ON SCHEDULED LEGS

   3.1 Leg 129 - Old Pacific (Lancelot)
   3.2 Leg 130 - Ontong Java (H. Meyer)
   3.3 Leg 131 - Nankai Trough (Tokuyama)
   3.4 Leg 132 - Engineering 2 (A. Meyer, written report - including Bonin Back Arc Hole, MIT, Guyot and Shatsky Rise*)
   3.5 Leg 133 - NE Australia (kidd)
   3.6 Leg 134 - Vanuatu (Pautot)
   3.7 Leg 135 - Lau Basin (Duennebier)

4. SITE SURVEY STATUS OF PACIFIC PROGRAMS CURRENTLY UNDER SSP ASSESSMENT - Tuesday 18th October - 09.00

   4.1 Cascadia Accretion + Oregon Proposal Review (Louden)
   4.2 EPR Bare Rock Drilling (Lewis)
   4.3 Sedimented Spreading Ridges (Louden)
   4.4 Atolls and Guyots (Duennebier)
   4.5 Eastern Equatorial Pacific (H. Meyer)
   4.6 Chile Triple Junction (Lewis)
   4.7 North Pacific Neogene (Larsen)
   4.8 Bering Sea History (Larsen)
   4.9 Shatsky Rise Anoxic Events (Suyehiro)
   4.10 Hawaii Flexure (Pautot)
   4.11 Lower Crust at 504B (Brenner)
   4.12 Young Hot Spots: Loihi (Duennebier)

5. ASSIGNMENT OF NEW PROGRAMS FOR PANEL MEMBER 'WATCHDOG' ASSESSEMNT

6. UPDATE ON 17-18TH OCTOBER TAMU PLANNING MEETING FOR ENGINEERING 2 (A. MEYER, FAX REPORT)* -Wednesday 20th October - 09.00?

7. ITEMS FOR REPORT TO PANEL CHAIRMAN'S MEETING 29TH NOVEMBER, WHOI

8. OTHER BUSINESS - DRAFT MINUTES

9. SCHEDULE OF NEXT MEETING

JOIDES SITE SURVEY PANEL MEETING

BGR, HANNOVER, OCTOBER 16TH-20TH, 1989

EXECUTIVE SUMMARY

1. The meeting began with only a partial complement of members since all of the newly assigned members: von HERTZEN, KASTENS and HEDBERG, were unable to attend and TOKUYAMA attended as alternate to SUYEHIRO for Japan. Most difficult was the fact that BRENNER was unable to attend from the DATA BANK because of illness and A. MEYER from TAMU had a conflicting meeting on the upcoming Engineering-2 Leg. Written reports from these two representatives appear in the minutes.

2. OLD PACIFIC:

Yves Lancelot (PCOM Liaison) reviewed the history of 'OLDPAC' surveys up to the Shipley/Meyer cruise in Pigafetta basin on the "Fred Moore" as reported at the last SSP. His update included the new Japanese and "SUROIT" data which have been used to refine drilling sites for Leg 129. Previous aeromagnetic surveys have now been supported by "SUROIT" data in identifying M-series anomalies in the Pigafetta and Marianas Basins. A new selection of PIG sites was presented. New SRP and MCS seismic lines were presented but successful Sonobuoy stations are still being processed. The main effort was to find prime sites with enough sediment section above the indigenous chert to spud-in. There is an internal ringing on the airgun records, but not on the watergun records. Chert and basement reflectors are well shown except in the Quiet Zone.

LANCELOT's drilling strategy is to drill a pilot hole to date basement in the area of M-series anomalies (PIG 2A, M36) which has a sediment thickness of possibly 0.55 sec. Then the drilling would move to PIG - 3 or 4. SSP noted that one option might be to first drill a dome-like location near PIG 3A on profile 6 to date basement where there is clearly an attenuated section (0.25 sec).

SSP can confirm that the best possible data set has now been collected; but must conclude at this stage that there remains a possibility that reflectors exist below the interpreted locations of basement; also that the uncertainty could still be sorted out after sonobuoy processing. SSP notes however that this Old Pacific Data set is received very late and the processing is still to be done.

3. ONTONG JAVA

Data bank (Carl Brenner), Mayer, Kroenke, Shipley and Winterer prepared a safety package for PPSP. The seismic lines for the four Neogene sites (as approved at the last SSP) are now processed. For the pre-Neogene (= deep basement) site there were only old analog-type records from SCRIPPS EURYDICE and from KANA KEOKI available. These lines were never discussed by SSP.

4. NANKAI

TOKUYAMA presented new IZANAGI sidescan and bathymetry data on the Nankai area. SSP approved the previous NANKAI package at its Swansea (September 1988) meeting, and at Hawaii (April 1989) it was noted that PPSP had approved the original sites. BALL commented once more that two new sites had been presented to PPSP at its July meeting (NKT-2A and NKT-10).

5. N.E. AUSTRALIA

This package was approved by SSP at its Swansea meeting. BRENNER has recently been working with Peter DAVIES in Australia and PPSP consideration is expected by BALL to be in mid-February. In terms of operations KIDD noted BRENNER's phone comments on the shallowness of some of the holes in an area of strong boundary currents.

6. VANUATU

The Vanuatu data set has been already been approved by SSP. It was concluded at this meeting, however, that the diving data now showed that sufficient 'spud-in' sediment is present at all sites; no outcrop was observed in the dives near the sites.

7. LAU BASIN

SSP has approved in general the data package on Lau Basin. All presently proposed sites have been reviewed and approved by SSP. Final review, including any new sites, must take place at the next SSP meeting.

8. CASCADIA ACCRETION : OREGON AND VANCOUVER MARGINS

Both regions have recently had detailed MCS profiling completed. These data are necessary for final evaluation of site locations but were not available for this meeting. Processing of these data should concentrate on site locations so that proponents have it ready for the next SSP meeting in April 1990.

Oregon: this represents SSP's first review of the detailed Oregon data set. The proponents have essentially met the other requests from SSP's last assessment regarding High-resolution SCS and MCS. SSP is impressed with the regional coverage and this is certainly adequate. However, in view of the fluid pathways objectives for this drilling, SSP requests that the proponents present for the next meeting a detailed near-site compilation of data tracks and types of data collected to demonstrate that the potential to trace the 3D structure and faulting is there. SSP notes that the processing is unlikely to be available before decisions are made by PCOM on scheduling this drilling and also that true 3D processing is not possible with the existing track spacing.

Vancouver: LOUDEN presented an update on the Vancouver program noting the presence of BSR's and that the proponents would like to drill one of the BSR's to study their temperature/pressure implications and also their relationship to fluid migration.

Specific responses from proponent HYNDMAN to SSP's recommendations from its last meeting including questions about imaging of the BSR's have not been forthcoming. SSP recommends that Oregon and Vancouver proponents be invited to the next SSP meeting in April 1990.

9. EPR BARE ROCK DRILLING

Site survey requirements are met by the present package except for video imagery to be collected with ARGO on the "Thomas Washington" in

November 1989. SSP approves these sites with the provision that video imaging for guide base location will become available from the above cruise.

10. SEDIMENTED RIDGES

Much new data has now come through for SSP assessment. All that is missing presently is the processed MCS data, but SSP does not believe this is crucial to our approval of the sites.

On MIDDLE VALLEY, SSP approved the data set as adequate but requests that for completeness a compilation map of coring and rock drilling stations along with logs and physical properties data is submitted for its next meeting.

On ESCANABA Trough, SSP noted that no nearbottom sidescan data are presently available at Escanaba trough, although GLORIA coverage does exist. SSP strongly endorses the acquisition of high resolution SEAMARC-type data for this data package.

11. ATOLLS AND GUYOTS

Two revisions of Schlanger's and Winterer's proposals now exist, plus new USGS "Farnella" cruise data (Hein) just completed. SSP wishes to invite Hein to present at SSP's next meeting and also Winterer to be invited to attend or send a data package.

12. EASTERN EQUATORIAL PACIFIC

N. Pisias finished a cruise on R/V "Washington" with a data package for 12 potential drilling sites in the areas of the earlier proposal, plus 2 new locations. The data package for the proposed site locations: EEQ-1, EEQ-2, EEQ-3, EEQ-4(1), EEQ-4(2), WEQ-2, WEQ-3, WEQ-4, WEQ-5, WEQ-6 and WEQ-7; as defined after the R/V "Washington" cruise, contains all the data and information that SSP requires for approval. SSP approves the sites as presented through this data package but notes that care must be taken to collect good 3.5 KHz records on site approaches where the sediment is thinnest (e.g. WEQ-2). All sites should be checked by proponents for sediment thickness.

13. CHILE TRIPLE JUNCTION

Three suites of holes are proposed to address the three major thematic objectives endorsed by TECP at their October 1988 meeting.

SSP concluded for the Hannover meeting that the data package is regionally adequate but final site locations are still being refined. Apart from the CDP seismics and GLORIA, the regional data package can be considered as having been lodged with SSB. Detailed site specific data packages, including processed CDP and parts of GLORIA swaths are expected to be lodged as the final sites become defined. SSP noted that BSR's are a clear feature of many of the lines reviewed in Hannover.

14. NORTH PACIFIC NEOGENE

A new NPAC Neogene summary has been produced and new site locations have been inserted but the site numbers have been retained. All proponents should ensure that changes in site location are given new site numbers or suffices in order to flag these changes to SSP and

PPSP. Data for some of the new sites is very poor e.g. NN-3. There are some sites for which data appears sufficient for the palaeoceanographic objectives. Other sites are based on poor data and the possibility exists that the sections are not typically pelagic. SSP recommends that the proponents look to more recent USGE-EEZ survey data or to NGDC compilations.

15. <u>BERING SEA</u>

SSP noted that again there is a potential confusion arising from site numbering designation in the new Bering Sea proposal. Geophysical coordinates and other information is missing from the site summary forms. No new sites are involved. The USGS data package is sufficient.

16. <u>LOWER CRUST AT 504B</u>

The data package is considered complete at SSB and was previously approved by SSP.

17. <u>ENGINEERING LEG 2</u>

An SSP style survey matrix form was faxed by A. Meyer to Hannover following the TAMU pre-cruise planning meeting for this Leg held 17-18th October. SSP commented "that the drilling was now to take place and our only concern was to give general approval and provide any necessary recommendations on how the ship's visit to the sites could improve existing regional data sets in the area. Chairman was asked to request ODP to ensure that 3.5 KHz and digital high resolution seismic data was collected on approach and departure from each site. New Shatsky Rise data is of particular importance due to the lack of an existing high quality geophysical data set there."

18. Ten new proposals that have passed initial thematic and PCOM assessments with favourable reviews were assigned to SSP 'watchdogs'.

SSP HANNOVER MEETING

Action Item List

Item No.	Person	Action
1	LOUDEN/ D'OZOUVILLE	LOUDEN to check with Kate Moran on her status as liaison to SSP. She is invited and expected to attend SSP meetings. D'OZOUVILLE to check same about Jim Hedberg.
2	LOUDEN/LARSEN SUYEHIRO	ESF, Japan, Australia ship schedules are still requested for SSP Appendix I. LOUDEN, LARSEN and SUYEHIRO to check.
3	KIDD	Chairman's report to PCOM is to stress again the need for good underway geophysics and real-time navigation on JOIDES RESOLUTION.
4	KIDD	KIDD to include in his report for Panel Chairman's meeting ned for Panels to prioritize proposals, early. SSP needs more time for evaluation of site survey data.
5	ALL PANEL MEMBERS	All PANEL MEMBERS to note to national committees that SSP guidelines for proposals have been revised - see appendix II. New guidelines are presently being sent to all proponents by JOIDES Office.
6	D'OZOUVILLE/ BRENNER	D'OZOUVILLE to send all thematic panel minutes and working group reports to Data Bank as they are received. BRENNER to send any revised proposals and relevant reports as received to 'watchdogs'.
7	LEWIS	LEWIS to remind USGS proponents, especially Normark/Clague, to send Hawaii flexture and other data to the Data Bank.
8	LOUDEN	LOUDEN to request Cascadia proponents to send a near-site data compilation confirming that data necessary to delineate 3D structure of the faulting is available. This is to include all 3.5 KHz data that is available.
9	BRENNER	BRENNER to check whether Vancouver margin data in the Data Bank? If not, he is to 'torque' proponents, if so BRENNER is to send copies to Keith LOUDEN.
10	KIDD/LOUDEN	KIDD to request to PCOM chairman that Oregon and Vancouver site proponents be invited to next SSP meeting. LOUDEN to pass on information that invitations are likely.

11	LOUDEN	LOUDEN to request that a compilation map of core stations with logs, and physical processes data be submitted to SSP, for the completeness of the Middle Valley data set.
12	DUENNEBIER	DUENNEBIER to send updated Atolls & Guyots matrices and reports to KIDD, ASAP.
13	KIDD/ DUENNEBIER	KIDD to request PCOM chairman to invite Jim Hein and Jerry Winterer to present Atolls & Guyots data at next SSP meeting. DUENNEBIER to pass on information that an invitation is likely.
14	DUENNEBIER	DUENNEBIER to ensure ATOLLS & GUYOT's data is sent to Data Bank by Winterer & Hein and himself.
15	LARSEN	LARSEN to notify Neogene proponents that they should re-number sites when they are relocated or designate with a letter suffix. He will also pass on SSP's reservations over the quality of data at some sites.
16	LARSEN	LARSEN to check that al Bering Sea USGS data is with BRENNER in the SSB.
17	D'OZOUVILLE	D'OZOUVILLE to sent out the assigned Atlantic and WPAC proposals to SSP watchdogs from JOIDES Office.
18	KIDD	Chairman to add "culling" of watchdog list to the agenda of the Fall meeting of SSP.
19	KIDD	Chairman to request ODP to ensure that 3.5 KHz digital high resolution seismic systems are operating on approach and departure from each site on engineering. New Shatsky Rise data is of particular importance due to the lack of an existing high quality geophysical data set there.
20	BRENNER	BRENNER report on new proposals was very useful, but the Panel would like also to have a listing of data that is existent in the data bank from each area.
21	KIDD	KIDD to recommend to PCOM Chairman the following dates for the next SSP meeting: Monday - Wednesday 9-11 April 1990 at Menlo Park, California, to be hosted by LEWIS.

1. PRELIMINARY MATTERS

1.1 The meeting began at 08.45 on Monday 16th October with Site Survey Panel being welcomed to BGR by its President Prof. M. Kursten who traced the history of BGR back to the Prussian Geological Survey in the late 1900's. Chairman responded with thanks for the use of the institute's facilities and for Prof. Kursten's enthusiastic welcome.

Chairman introduced alternates, liaisons and observers present for the meeting and reported on the absence in particular of Carl BRENNER of SSB who had an ear infection which prevented him flying and Audrey MEYER of TAMU who had a conflicting planning meeting on the Engineering-2 Leg. Arrangements have been made to receive reports by Fax from both of these representatives. It was pointed out that Carl BRENNER was dispatching data direct to the meeting and that time would be allotted late on Monday afternoon for 'watchdogs' to assess and prepare their reports for the second day. Chairman noted that no information was available on whether J. HEDBERG (new member) and K. MORAN (SMP LIAISON) presently consider themselves part of SSP.

Action Item 1:

LOUDEN/D'OZOUVILLE: LOUDEN TO CHECK WITH KATE MORAN ON HER STATUS AS LIAISON TO SSP. SHE IS INVITED AND EXPECTED TO ATTEND SSP MEETINGS. D'OZOUVILLE TO CHECK SAME ABOUT JIM HEDBERG.

1.2 H. MEYER discussed logistics for the meeting and BGR's plans for presentations on the institute and for the Thursday fieldtrip.

1.3 No changes to previous minutes were considered necessary.

1.4 Updated ship schedules were received from US, UK, France, Canada and Germany (Appendix I), but none yet from Japan, ESF, and Australia.

Action Item 2:

LOUDEN/LARSEN/SUYEHIRO: ESF, JAPAN, AUSTRALIA SHIP SCHEDULES ARE STILL REQUESTED FOR SSP APPENDIX I. LOUDEN, LARSEN AND SUYEHIRO TO CHECK.

1.5 No other items were inserted for the Hannover Agenda.

2. REPORTS

2.1 PCOM (LANCELOT)

Yves LANCELOT noted that the overall budget for NSF geosciences has increased by 9%, but ODP received only a 4% increase. He suggested that this indicated that ODP was less strong than other major US natural science programmes. No new foreign members appear to be on the horizon. This is likely to put pressure on ODP continuation after the end of 1992.

The JOI Report to PCOM noted the criticism by the PEC Committee of JOIDES' apparent 'closed shop' but a motion to open the organisation to non-JOIDES members was heavily defeated. The Long-Range Planning Document is now with JOI. France had criticised its emphasis on the benefits for education and resources for the US and suggested a more 'global' wording. Discussion of links to other major programs, such as the Continental Drilling, Ridge and WOCE Programs was to be included in the text.

The most disturbing aspects of the TAMU operator report to PCOM was the overall WPAC loss of 10 BHA's plus two 'big' lengths of pipe. This problem of metal fatigue is being reviewed. Replacement orders for 5000 ft of drillpipe are now out to tender, and the commitment of these funds could affect the development of the DCS. The ship will now go to Singapore instead of Pusan to dry dock.

Discussion ensued on the problems of underway geophysics and real-time navigation on JOIDES RESOLUTION. Chairman is to emphasise the need for increased shipboard capability in these areas at the Panel Chairmans meeting with PCOM.

Action Item 3:

KIDD: CHAIRMAN'S REPORT TO PCOM IS TO STRESS AGAIN THE NEED FOR GOOD UNDERWAY GEOPHYSICS AND REAL-TIME NAVIGATION ON JOIDES RESOLUTION.

LANCELOT reported on PCOM discussion on science objectives for contentious legs and its own procedures in decision-making. The Panel was referred to R. MOBERLY's investigations of the ONTONG-JAVA issue. The outcome was that there now would be a PCOM representative at final pre-drilling prospectus meetings with co-chiefs.

Concerns by EXCOM as to the balance of soft- versus hard-rock drilling were discounted by PCOM arguing that lithosphere drilling is a prime objective of COSOD-II and takes more drilling time. Deep lithosphere drilling developments may involve choices between slim-hole diamond drilling (DCS) and normal size holes for logging. Reaming of slim-holes was discussed as another option. TAMU were recommended by PCOM to compromise by drilling 2 holes at such sites: one uncored mainly for logging and one a cored slim-hole.

The new ODP Publication Policy designed to allow shipboard scientists earlier publication of results outside the ODP reports, given certain provisos, was approved by PCOM and will be brought into operation after Leg 125. Two post-cruise meetings will be necessary, one mainly editorial for the Initial Report and the second, a full participants meeting for the Science Results volume.

SSP were interested in LANCELOT's suggestion at PCOM that co-chiefs selected for ODP Legs should be proponents and that, if necessary, shipboard representation clauses in MOU's should be revised to allow for this.

PCOM's planning for the Engineering-2 Leg was discussed and it was noted that an Engineering-3 Leg was likely to be inserted early in the CEPAC program to get further information on EPR and for 504 B hole cleaning.

Current PCOM plans for the start of the CEPAC program include Cascadia, EPR, Sedimented Ridges, Child Triple Junction, and 504 B; but where the Program goes from there is uncertain. Many new proposals from the Atlantic and Caribbean are arriving at the JOIDES office. PCOM will prepare a 4 year plan at its spring '90 meeting. SSP stresses the lead-time it needs for adequate data assessment. Thematic panels must be asked to prioritise proposals at an early stage. SSP will only begin work on proposals that have been indicated as favourable by them and PCOM. LANCELOT was questioned on PCOM's perception of the role of the DPG's in relation to SSP.

Action Item 4:

KIDD TO INCLUDE IN HIS REPORT FOR PANEL CHAIRMAN'S MEETING THE NEED FOR PANELS TO PRIORITISE PROPOSALS EARLY. SSP NEEDS MORE LEAD-TIME FOR EVALUATION OF SITE SURVEY DATA.

2.2 JOIDES Office (D'OZOUVILLE)

D'OZOUVILLE presented the final version of the JOIDES proposal guidelines (Appendix II) which will be sent out to all new proponents. It is slightly modified from JOIDES' one year old 'Blue Book'. National representatives were asked to advertise this fact in their own communities.

D'OZOUVILLE explained how the proposals are now handled by the JOIDES Office. Each proposal is sent to the four thematic panels for review. Copies are sent to JOI, Science Operator and Site Survey Databank and, depending on the topic of the proposal, to other panels for information. After the four thematic panels have reviewed the proposal, a copy of the review forms is mailed to the contact proponent as well as to JOI, Science Operator and Site Survey Databank. A list of proposals with favourable evaluations is reviewed by PCOM and then, transmitted to the Site Survey Databank for SSP action.

D'OZOUVILLE distributed a list of all the proposals received by the JOIDES Office since the inception of ODP (Appendix III). A list of abstracts of new proposals (Appendix IV) received by the JOIDES office from July to September 89 was also distributed. It was noted that there has been a large increase in the number of proposals received during this period.

D'OZOUVILLE also reported on a listing of proposals that has been prepared for PCOM by the old regional panels and the thematic panels of sites that have not been drilled or still had objectives not yet fulfilled. LARSEN asked whether JOIDES Office could send updated information such as this on to SSP 'watchdogs'. After discussion, it was agreed that JOIDES Office will be asked to send thematic and service panel minutes, as well as DPG minutes and reports to Carl BRENNER who will distribute them, as necessary from the Databank to SSP's most appropriate 'watchdogs'.

Action Item 6:

D'OZOUVILLE/BRENNER: D'OZOUVILLE TO SEND ALL THEMATIC PANEL MINUTES AND DETAILED WORKING GROUP REPORTS TO DATA BANK AS THEY ARE RECEIVED. BRENNER TO SEND ANY REVISED PROPOSALS AND RELEVANT MINUTES AND REPORTS TO ASSIGNED 'WATCHDOGS'.

D'OZOUVILLE pointed out that two important deadlines for PCOM decisions were approaching: 1) November 89: FY91 drilling program plan; 2) April 90: four year drilling program plan.

2.3 TAMU Report (A. MEYER written report)

I. Past Leg Results

Legs 125-127:
(MEYER enclosed Preliminary Reports from these Legs for detail).

Leg 128:

"This cruise is currently at sea, scheduled to end in Pusan, South Korea on 16th October. To date, they have conducted operations at three sites: (1) Site 798 (proposed site JS-2); (2) Site 794 (proposed site J1b, first occupied during Leg 127); and (3) Site 799 (proposed site J2a-1). Hole 799A bottomed at 468.7 mbsf in Pliocene siliceous claystone and porcellanite, and was successfully logged with the standard Schlumberger tools plus the formation microscanner (FMS). Coring at Hole 799B is currently at 1077.7 mbsf, with plans to continue 50m into basement before logging and starting into port."

II. Future Cruise Plan/Status

[See enclosed updated drilling schedule (8/7/89).]

Leg 129 (Old Pacific Crust):

"Additional pre-cruise site survey work was completed (by Roger Larson and Yves Lancelot in early September. They have finalised the locations of some of the sites proposed in the prospectus based on these new seismic data, and will soon forward the new data and site locations to ODP/TAMU and the Safety Panel. Once approved by the Safety Panel, we (ODP/TAMU) plan to put out a brief addendum to the existing scientific prospectus with updated site locations and data for each of the new sites. I believe Yves and Roger are going to ask the Safety Panel to approve a range of hotpoints at each of the proposed sites, because they are working hard to process the data before they sail on Leg 129 and want flexibility to move site locations a bit after safety review to accommodate the results of their processing efforts. [The Co-Chiefs for Leg 129 are Roger Larson and Yves Lancelot; Andy Fisher is the ODP Staff Scientist.]"

Leg 130 (Ontong Java Plateau):

"A meeting of interested parties (Wolf Berger, Loren Kroenke, Larry Mayer, Tom Shipley, and Jerry Winterer) was held in late June to pick sites for this Leg based on data collected earlier this year. These sites were subsequently approved by the Safety Panel, and incorporated into a draft scientific prospectus that was discussed at the Planning Committee meeting in August. Based on deliberations at the Planning Committee (see enclosed portions of the PCOM minutes), we are now revising the prospectus to reflect PCOM preferences for cruise proprities before publishing it. I expect the final prospectus to be out by the end of

ODP OPERATIONS SCHEDULE

Leg	Objective	Days At Sea*	Cruise Dates	Port
127	Japan Sea I	58	6/24-8/21	Pusan-8/21-8/25
128	Japan Sea 2	51	8/26-10/16	Pusan -10/16-10/17 (Leg 128 Scientists Off)
---	Transit	9	10/18-10/27	Singapore-10/27-11/11 (dry dock and port)
---	Transit	10	11/12-11/22	Guam I - 11/22-11/23 (Leg 129 Scientists On)
129	Old Pacific Crust	56	11/24-1/19/90	Guam II - 1/19-1/23
130	Ontong Java	62	1/24-3/27	Guam III - 3/27-3/31
131	Nankai	62	4/1-6/02	Pusan - 6/2-6/6
132	Engineering 2	55	6/7-8/1	Guam IV - 8/1-8/5
---	Transit	7	8/6-8/13	Port Moresby-8/13-8/14
133	N.E. Australia	56?	8/15-10/10	Brisbane-10/10-10/14
134	Vanuatu	56?	10/15-12/10	Suva - 12/10-12/14
135	Lau Basin	56?	12/15-2/9/91	?

*Schedule subject to change pending detailed planning after Leg 131.

Revised 8/7/89

JBJ

October. [The Co-Chiefs for Leg 130 are Wolf Berger (FRG) and Loren Kroenke; proponents Larry Mayer and Tom Shipley will also be on board; Tom Janecek is the ODP Staff Scientist.]"

Leg 131 (Nankai):

"The pre-cruise meeting for this Leg was held in early May, and a draft scientific prospectus was compiled at that time which described the drilling strategies that we hope to use at NKT-2 (accretionary prism site) and NKT-1 (reference site). [The Co-Chiefs for Leg 131 are Asakiko, Taira and Ian Hill; proponents Dan Karig, Miriam Kastner, Joris Gieskes, Greg Moore, and Makoto Yamano will also be on board; John Firth is the ODP Staff Scientist.]"

Leg 132 (Engineering Test Leg II):

"The "pre-cruise" meeting for this Leg will be held on October 17th, during your SSP meeting. Attending the pre-cruise meeting will be Jim Natland, Jerry Winterer, Bill Sliter, Brian Taylor, a number of ODP/TAMU engineers, and perhaps Marc Langseth (the PCOM "watchdog" for Leg 132). We intend to pick proposed drilling sites on Shatsky Rise and MIT Guyot and in the Bonin backarc basin during this meeting, and plan drilling strategies to complete the planned engineering tests of the diamond coring system (DCS). All scientists coming to this meeting have told me verbally that they believe we can find sites at each of these three locations that are sufficiently well defined to satisfy at least engineering and safety requirements; their hope, of course, is that some interesting science will also come out of the Leg. For your information, I will FAX you completed site survey matrices on the evening of October 17th; I feel confident that the sites we identify at the pre-cruise meeting will indeed adequately cover our engineering and safety requirements. [We have asked Jim Natland to serve as Co-Chief Scientist on this cruise, and we await his final decision on this matter. I expect to sail a scientific staff of maybe 6 or 7 folks, sufficient to get the core described and data collected that the engineers need to document what they are recovering.]"

Leg 133 (Northeast Australian Margin):

"The Co-Chiefs and Science Operations put together a preliminary scientific prospectus for this Leg several months ago (see enclosed copy), which we send to interested scientists enquiring about the cruise. I expect to invite the bulk of the scientific party for this cruise in the coming month or so, plan to hold the pre-cruise meeting sometime after the beginning of next year. [The Co-Chiefs for Leg 133 are Peter Davies and Judith McKenzie; the ODP Staff Scientist is as yet unnamed, but will probably be a new person that I hire around June 1990.]"

Leg 134 (Vanuatu) and Leg 135 (Lau Basin):

"The Co-Chiefs and Science Operations put together preliminary scientific prospectuses for these Legs several months ago (see enclosed copies), which we sent to interested scientists enquiring about the cruise. I expect to invite the bulk of the scientific parties for these cruises before the end of 1989, and to hold pre-cruise meetings in the spring of 1990. [The Co-Chiefs for Leg

134 are Jean-Yves Collot and Gary Greene; Laura Stokking is the ODP Staff Scientist. The Co-Chiefs for Leg 135 are Lindsay Parson and Jim Hawkins; James Allan is the ODP Staff Scientist."

III. Ship-Related Information

Free-fall funnels:

"One of the action items for ODP/TAMU from your last SSP meeting was for Jack Baldauf to send you a history of mini-cone (= free-fall funnel) deployment, which I believe he did early last summer. I have enclosed another copy of that information - Summary Statement SS-0200 ("Free Fall Funnel Reentry Capabilities and Recommendations"); also a copy of a memo from Ron Grout and Glen Foss, which summarizes when our Engineering and Operations Department feels it is appropriate to use a free-fall funnel."

(Now SSP-APPENDIX V).

Underway Geophysics:

"Update on the status report Suzanne O'Connell presented at your last meeting:

(1) SIOSEIS is now up and running on the ship, and has been used with no negative comment since Leg 125.

(2) We borrowed and tested LDGO's French high-speed streamer during Leg 128. Thus far, the ship reports no improvement over records collected with our existing streamer, but they have yet to test the high-speed streamer at speeds over 7 knots. They hope to get such a test in before the end of Leg 128.

(3) We have gone ahead with modifications to the sonar dome, and will indeed replace the existing 3.5-kHz transducers (arranged in an array in the sonar dome) with a single 10kw transducer, in an attempt to get records in the combination of deeper water and rougher sea state. These modifications will be completed during the upcoming dry dock period.

(4) We invited Magnavox to ODP to give us a presentation of their integrated real-time navigation system, and then sent a small group to LDGO and URI to look at their navigation systems. Following those activities, we sent out an RFP to various JOIDES institutions and several companies, asking for bids to develop a real-time navigation system for ODP. Though we received several responses, which were analysed by both technical and cost review teams, all the bids were for dollar amounts well over what we can currently afford to spend. At least for the time being, we have placed the idea of developing an ODP real-time navigation system "on hold". The Shipboard Measurements Panel has formed an informal subcommittee to look at our original RFP, and possibly make recommendations as to ways we could decrease our desired navigation system requirements so that the development costs might become more affordable."

2.4 PPSP (BALL)

PPSP continues to monitor clathrate studies in anticipation of drilling in proximity to bottom simulating reflections (BSR's) on Leg 131 in the Nankai Trough and in the Cascadia accretionary prism. Canadian proponents for clathrate studies, Roy Hyndman and Earl Davis, are now working in cooperation with John Miller and the Peruvian margin study group. PPSP is carefully following their progress.

ODP, at the request of PPSP, has taken steps to acquire expertise needed to ensure safe drilling in high temperature environments. A decision is pending on whether to create a separate panel to judge safety aspects of high temperature drilling or to add authorities on this subject to the present safety panel to meet its needs. A review of oil shows encountered in DSDP and ODP drilling, led by Barry Katz of Texaco, has shown that they are typically anomalous. The oil show at DSDP site 2 in cap rock of the Sigsbee Deep salt dome, Challenger Knoll, is an exception to this generalisation. The show in the Gulf of California was related to the occurrence of an igneous sill that provided a local heat source or maturation of hydrocarbons. Shows in the Tyrrhenian Basin resulted from this region's high heat flow and organic-rich sediments. Hydrocarbons at DSDP site 535 in western Florida Straits probably migrated laterally a considerable distance from the deep Gulf of Mexico. Katz was unable to substantiate some reported shows perhaps because the samples in question had not been properly sealed and frozen.

A critique of Exmouth Plateau drilling, led by Alistair Bent of British Petroleum, acknowledged the role of PPSP in the safe and scientifically successful drilling of sites 762 and 763. It is nevertheless clear that some members of PPSP continue to have misgivings concerning scientific drilling in known oil and gas provinces. The PPSP chairman is compiling a summary expressing opinions on this subject to be used as a guide for safety panel decisions, if similar situations are encountered in the future.

In the discussions of Leg 130, Ontong Java Plateau, it became apparent that sites ODP-5 and 5A had been approved by PPSP without having been considered by SSP. A similar situation exists regarding Leg 131, Nankai Trough, where 3 new sites, NKT 2A, 3 and 10 have been presented to and approved by PPSP without the consideration of SSP.

Members of SSP expressed concern at the above oversights and Chairman is asked to cover this in his November report to PCOM.

The next PPSP meeting in February will look at the Engineering-2 and NE Australia packages.

2.5 SMP (MORAN not present: comments by SMP member TOKUYAMA, alternate for SUYEHIRO)

TOKUYAMA noted that there had already been discussion at this meeting of underway geophysics but he said that SMP had recommended that TAMU purchase further processing software that was now common to many of the JOIDES institutions in the US and is free to IRIS institutions. SMP recommends that, if further new software is purchased by ODP an individual should be identified to sail on the ship and implement the system in real-time. Possibly TAMU has the opportunity in its new hiring to recruit a geophysical staff scientist, or perhaps someone associated with the Lamont Logging Group could assume this role.

2.6 DATA BANK (BRENNER written Report)

"Statistics for FY 1989 Data Bank activity are presented in SSP APPENDIX VI with a graphic representation of number of packages prepared over the last several years. A record number of packages were mailed out over last year, but the slightly large number has more to do with circumstances of "split" packages than anything else.

The Data Bank works at maximum capacity year after year, and the modest changes in the number of packages from year to year is more an artifact of how things got split up than an accurate reflection of true Data Bank activity. Nevertheless, these figures are useful in showing the consistency of Data Bank performance.

Summaries of some of the higher-ranked proposals that the JOIDES OFFICE said SSP should look at are enclosed for SSP 'watchdog' consideration (APPENDIX VII).

As far as "other" (non-possible for FY-91) CEPAC programs go, none of the data sets are fully prepared. Jerry Winterer expressed shock when I told him that the seismics from his A & G Survey were not yet in the Data Bank and promised to remedy that situation shortly. The data from Fred's survey are also not yet here. Both data sets should be ready for evaluation at our spring meeting if necessary. The USGS folks have been pretty lax about the NPac Neogene and Bering Sea data sets, probably because they know those programs are out of the running for FY'91. A spring review, however, seems reasonable. I imagine that the Hawaii Flexure data could be ready by the spring as well, though I have no idea how that proposal is being viewed in the community these days. Is TECP still interested? Finally, Shatsky appears dead in the water unless additional survey data is collected. The Shatsky data set that I sent to TAMU for the Leg 132 (Engineering Leg II) meeting is the definitive one at this point, at least as far as I know".

Action Item 7:

LEWIS TO REMIND USGS PROPONENTS, ESPECIALLY NORMARK/CLAGUE, TO SEND HAWAII FLEXURE AND OTHER DATA TO SSB.

3. SITE SURVEY UPDATES ON SCHEDULED LEGS

3.1 Leg 129 - Old Pacific (LANCELOT)

Yves Lancelot reviewed the history of 'OLDPAC' surveys up to the

Shipley/Meyer cruise in Pigafetta basin on the "Fred Moore" as reported at the last SSP. His update included the new Japanese and "SUROIT" data which have been used to refine drilling sites for Leg 129. Previous aeromagnetic surveys have now been supported by "SUROIT" data in identifying M-series anomalies in the Pigafetta and Marianas Basins. Geophysical interpretation of sediment sections is controlled by DSDP site 307 in Ptolemy Basin which shows that most of the Tertiary is missing and that basement there is late Cretaceous. A new selection of PIG sites was presented. New SRP and MCS seismic lines were presented but successful Sonobuoy stations are still being processed. Six water guns were in operation at one time in the French reflection system providing good resolution and penetration: The main effort was to find prime sites with enough sediment section above the indigenous chert to spud - in. Lancelot wants to start with a site on the identifiable anomalies and then to move into the magnetic Quiet Zone to the SE.

There is internal ringing on the airgun records, but not on the watergun records. Chert and basement reflectors are well shown except in the Quiet Zone. Smooth reflectors here may be siliceous limestone on basement if the sites have crossed the equatorial high productivity zone twice. Unconformities between basement and the lowermost sediment reflector are well resolved in places and become the main drilling targets at the prime sites; but processed data will not be available till just before the cruise.

LANCELOT's drilling strategy is to drill a pilot hole to date basement in the area of M-series anomalies (PIG 2A, M36) which has a sediment thickness of possibly 0.55 sec. Then the drilling would move to PIG - 3 or 4. SSP noted that one option might be to first drill a dome-like location near PIG 3A on profile 6 to date basement where there is clearly an attenuated section (0.25 sec). If the prime Leg objectives are to date and calibrate the M-series anomalies, the panel considers that this might be a useful initial investment in time on the cruise.

LARSEN commented that SSP can confirm that the best possible data set has now been collected; but must conclude at this stage that there remains a possibility that reflectors exist below the interpreted locations of basement; also that the uncertainty could still be sorted out after sonobuoy processing. SSP notes however that this Old Pacific Data set is received very late and, because the processing is still to be done, the set must still be considered essentially incomplete for drilling.

3.2 Leg 130 ONTONG - JAVA (H. MEYER)

Scientific objectives are:

1. a depth transect for high resolution Neogene Palaeoceanography and Palaeoclimatology;
2. Palaeogene and Mesozoic palaeoceanography, palaeoclimatology and anoxic events;
3. the age, nature and palaeolatitude of basement.

Leg planning:

In response to PCOM's directive, CEPAC and OHP prepared a one-leg program of 4 sites for the Neogene depth transect and one deep site for the palaeogene and basement objectives (merging of two proposals; Neogene, pre-Neogene and basement).

Status at last SSP Meeting (spring 1989: Hawaii):

Preliminary items for the Neogene objectives were approved. Correlations into NAURU Basin (3500-4000 m waterdepth) were not clear. Palaeocene to Mesozoic sequences and basement are not well imaged beneath a high amplitude chert reflector. Site 289/586 shows hiatus of 30 my. SSP hoped for better site selections after the processing of 300 cu in watergun results from the "Washington" cruise. SSP asked for sight of HIG data from 1970 and 1980 for the basement site packages. Cores from the "Washington" cruise were not to come available before May or June (still on the ship).

Developments since the last SSP:

6-89: Data bank (Carl Brenner), Mayer, Kroenke, Shipley and Winterer prepared a safety package for PPSP.
The seismic lines for the four Neogene sites (as approved at the last SSP) are now processed. For the pre-Neogene (= deep basement) site there were only old analog-type records from SCRIPPS EURYDICE and from KANA KEOKI available. These lines were never discussed by SSP and Carl Brenner commented "SSP would probably not sanction this site if it were considered at a typical meeting".
7-89: PPSP approved all sites as proposed.

PCOM 8.89 extended the Leg to 62 days, because of the long transit from/to Guam. After several discussions regarding the priorities of the deep holes PCOM decided the following order of drilling:
first the 4 Neogene and then deep basement site; also placement of deepest hole or Neogene transect (OJ3 or OJP6) was left open to decision by OHP;

3.3 Leg 131 - NANKAI TROUGH (TOKUYAMA for SUYEHIRO)

TOKUYAMA presented new IZANAGI sidescan and bathymetry data on the Nankai area and dicussion ensued on the nature of possible translational faults indicated by this data set and by the existing SEABEAM data. SSP approved the previous NANKAI package at its Swansea (September 1988) meeting, and at Hawaii (April 1989) it was noted that PPSP had approved the original sites. BALL commented once more that two new sites had been presented to PPSP at its July meeting (NKT-2A and NKT-10).

3.4 Leg 132 Engineering Leg 2 (Discussion deferred to Wednesday, Agenda Item 6).

3.5 Leg 133 N.E. Australia (Kidd)

This package was approved by SSP at its Swansea meeting. BRENNER has recently been working with Peter DAVIES in Australia and reports that the data is 'AOK' and is now considered 'lodged' with SSB. PPSP consideration is expected by BALL to be in mid-February. In terms of operations KIDD noted BRENNER's phone comments on the shallowness of some of the holes in an area of strong boundary currents.

3.6 Leg 134 - VANUATU (PAUTOT)

PAUTOT considered whether there are remaining specific SSP requirements for the bare rock drilling on the Vanuatu area. He commented that the observations during the submersible ('Nautile') cruise in March 1989 conducted by the ORSTOM team provide some new data:

1. Close to the proposed ODP sites DEZ 1 and DEZ 2, both the north d'Entrecasteaux Ridge and the toe of the arc slope are blanketed by greenish muds, also the deformation front is marked by a scarp that is 1 or 2 metres high and shows slightly indurated mudstones.

2. The arc slope is primarily composed of volcanic and volcaniclastic rocks, most likely shed from the arc. The bedding of the arc-slope rocks, dips steeply (40° - 80°) arcward near the contact of the colliding features. The arc-slope rocks are generally highly fractured and sheared and are incised by erosional channels and numerous fresh slump scars.

The Vanuatu data set has been already been approved by SSP. It was concluded at this meeting, however, that the diving data now showed that sufficient 'spud-in' sediment is present at all sites; no outcrop was observed in the dives near the sites.

3.7 Leg 135 - LAU BASIN (DUENNEBIER)

SSP has approved in general the data package on Lau Basin. All presently proposed sites have been reviewed and approved by SSP. Final review, including any new sites, must take place at the next SSP meeting. BRENNER must ensure that the data will be available. PPSP has not yet reviewed Lau Basin. A video of submersible dive observations in the Lau Basin was presented to the Panel in Hannover by M. WIEDICKE of BGR. None of these dives were in the vicinity of any of the proposed drillsites.

The first day of the Hannover meeting ended with a presentation by Dr. J. DRAXLER of BGR on the German Continental Drilling program (KTB). Dr. DRAXLER is responsible for borehole logging in KTB (the "Roger Anderson of KTB") and he commented on the joint workshops that are now held regularly between ODP and KTB. DMP had its last panel meeting at the KTB site. Ultimate objectives of KTB include a 1200 m hole through nappe complexes developed by the convergence of the African and European plates through southern Germany. Some ODP tools, like the slim-hole DCS, have ben tested in the KTB site. The present pilot hole is to 4000 m and already there are some surprises in downhole temperatures which suggest by extrapolation 300 C temperatures at 10000 m instead of at 14000 m. The timescale for the Superdeep Hole is July 90 - December 1994. The total KTB project budget is DM 500 million over 10 years and it is entirely funded within Germany (!).

4. SITE SURVEY STATUS OF PACIFIC PROGRAMS

4.1 Cascadia Accretion: Oregon + Vancouver Margins (LOUDEN)

Both regions have recently had detailed MCS profiling completed. These data are necessary for final evaluation of site locations but were not available for this meeting. Processing of these data should concentrate on site locations so that proponents have it ready for the next SSP meeting in April 1990. Also noted for both regions was the importance of downhole logging measurements using the GEOPROPS tool which is still under development and will probably now not be available for the NANKAI Leg.

Oregon: this represents SSP's first review of the detailed Oregon data set but the MCS data collection is only recently completed and thus processed lines are not available. Based on SEAMARC sidescan coverage collected this summer there have been some slight moves of sites and some new sites have been added. Some of the site moves are in response to an initial preliminary review by PPSP. LOUDEN presented a summary of objectives of the present set of holes. He commented on proponent Vern KULM's response to SSP's request for detailed 3.5 KHz around the sites. KULM noted the general distribution of 3.5 KHz data but as yet has presented no detailed near-site 3.5 KHz data, although near bottom 3.5 KHz will have been collected during the SEAMARC survey. The proponents have essentially met the other requests from SSP's last assessment regarding High-resolution SCS and MCS. SSP is impressed with the regional coverage and this is certainly adequate; also the Panel notes that, in the vicinity of the sites, the data probably does exist to eventually trace the 3D structure of the thrust faulting after processing. However, in view of the fluid pathways objectives for this drilling, SSP requests that the proponents present for the next meeting a detailed near-site compilation of data tracks and types of data collected to demonstrate that the potential is there. SSP notes that the processing is unlikely to be available before decisions are made by PCOM on scheduling this drilling and also that true 3D processing is not possible with the existing track spacing.

Vancouver: LOUDEN presented an update on the Vancouver program noting the presence of BSR's and that the proponents would like to drill one of the BSR's to study their temperature/pressure implications and also their relationship to fluid migration.

There remains some question of whether all of the required downhole logging and measurement capability will be available for by the time of this drilling. Specific responses from proponent HYNDMAN to SSP's recommendations from its last meeting including questions about imaging of the BSR's have not been forthcoming. HYNDMAN says latter data has gone to the Data Bank but this has not arrived in Hannover. More seismic survey cruise work and nearbottom surveys are scheduled. LOUDEN recommended that Oregon and Vancouver proponents be invited to the next SSP meeting in April 1990.

Action Item 9:

BRENNER TO CHECK WHETHER VANCOUVER MARGIN DATA IN THE DATA BANK?

IF NOT, HE IS TO 'TORQUE' PROPONENTS, IF SO BRENNER IS TO SEND COPIES TO KEITH LOUDEN.

Action Item 10:

KIDD/LOUDEN: KIDD TO REQUEST TO PCOM CHAIRMAN THAT OREGON AND VANCOUVER SITE PROPONENTS BE INVITED TO NEXT SSP MEETING. LOUDEN TO PASS ON INFORMATION THAT INVITATIONS ARE LIKELY.

4.2 EPR Bare Rock Drilling (LEWIS)

The scientific goals of this proposal (JOIDES Proposal No. 321/E) to drill into the bare-rock and fast-spreading East Pacific Rise include:

1. Continuous sampling and borehole logging to deep crustal levels (1-1.5 km below the seafloor) very close to the axial magma chamber which has been identified by seismic reflection studies.

2. Insitu sampling of crustal fluids and determination of the physical properties (temperature gradients, pore pressures, permeability, etc) of the rock sequences, and quantify the chemical and physical reactions between hydrothermal fluids and crustal rocks.

3. Continuous sampling and logging of shallow (300-500 m) crustal holes spaced along the crest of a spreading ridge that includes an Overlapping Spreading Centre (OSC) at one end.

4. Establish a long-term "natural laboratory" for long-term monitoring of geological, geochemical, and biological processes associated with crustal accretion at a spreading center.

These scientific goals have been endorsed by COSOD I and COSOD II, and the technical means to accomplish the goals (bare-rock guidebase, narrow-kerf diamond drilling, etc.) are mostly in place to make such a program feasible.

Existing data:

A great deal of effort has gone into acquiring data in this segment of the East Pacific Rise for many years. There is no lack of surface and deep-towed acoustic data of all types. An ARGO cruise scheduled for November 1989 will acquire photographic and additional acoustic data over the proposed drillsites.

Existing data have been compiled through a synthesis project sponsored by JOI, Inc. (Updated matrices for EPR-1 and EPR-2 are included in Appendix VIII).

Other Programs:

A competing proposal, with many of the same objectives as this one, will most likely be submitted soon by J. Franchteau et al. for a region of the East Pacific Rise at 13 N. That proposal had not been received by the JOIDES Office as of October 12, 1989.

Lewis' conclusions are that site survey requirements are met by the present package except for video imagery to be collected with ARGO on the "Thomas Washington" in November 1989. SSP approves these sites with the provision that video imaging for guide base location will become available from the above cruise.

In an interval in the proceedings, Dr. H. DURBAUM kindly presented a resume of the activities of BGR to the Panel and was warmly thanked for providing us with some insights into the work of the institute and its involvemenT in ODP site survey work.

4.3 Sedimented Ridges (LOUDEN)

Most of the emphasis of the Sedimented Ridge Working Group is now on the Middle Valley and Escanaba Trough area, rather than the Gulf of California. The WG has put sites from both of these areas into a two-leg proposal. Much new data has now come through for SSP assessment. All that is missing presently is the processed MCS data, but Louden does not believe this is crucial to our approval of the sites. SSP has no information yet on the technical meeting that took place in April 1989 on the development of high temperature drilling capability for ODP.

On MIDDLE VALLEY, SSP approved the data set as adequate but requests that for completeness a compilation map of coring and rock drilling stations along with logs and physical properties data is submitted for its next meeting. These data may become important in later technical considerations.

On ESCANABA Trough, SSP noted that there was more emphasis here on coring data. Location of basement in the Trough is not easy because of side echoes, but it was noted that sites would actually be selected on dive data for verification of surface sediment type. Proponents Morton and Zierenberg (USGS) indicated that further seismic data is being prepared for data bank submission in early 1990. No nearbottom sidescan data are presently available at Escanaba trough, although GLORIA coverage does exist. SSP strongly endorses the acquisition of high resolution SEAMARC-type data for this data package. Lewis noted that there was potential for the collection of such a data set through a joint USGS/IOSDL cruise with TOBI. The GLORIA data should anyway be lodged with SSB.

Action Item 11:

LOUDEN TO REQUEST THAT A COMPILATION MAP OF CORE STATIONS WITH LOGS, AND PHYSICAL PROCESSES DATA BE SUBMITTED TO SSP, FOR THE COMPLETENESS OF THE MIDDLE VALLEY DATA SET.

4.4 Atolls and Guyots (DUENNEBIER)

Two revisions of Schlanger's and Winterer's proposals now exist, plus new USGS "Farnella" cruise data (Hein) just completed. DUENNEBIER will send written reports and new matrices to KIDD. Chairman should invite Hein to present at SSP's next meeting and also Winterer should be invited to attend or send a data package.

<u>Action Item 12</u>:

DUENNEBIER TO SEND UPDATES ATOLLS & GUYOTS MARTICES AND REPORTS TO KIDD, ASAP.

<u>Action Item 13</u>:

KIDD TO REQUEST PCOM CHAIRMAN TO INVITE JIM HEIN AND JERRY WINTERER TO PRESENT ATOLLS & GUYOTS DATA AT NEXT SSP MEETING. DUENNEBIER TO PASS ON INFORMATION THAT AN INVITATION IS LIKELY.

<u>Action Item 14</u>:

DUENNEBIER TO ENSURE ATOLLS & GUYOT'S DATA IS SENT TO DATA BANK BY WINTERER & HEIN AND HIMSELF.

4.5 Eastern Equatorial Pacific (H. MEYER)

Scientific objectives are:
- evaluation of equatorial circulation of the ocean and atmosphere;
- hemispherical symmetry/asymmetry of oceanic + atmospheric changes;
- Miocene and Pliocene variability in contrast to the Pleistocene;
- circulation before and after closing of Panamanian Seaway;
- the effects of the above on history of biological productivity;
- seen as a complement to the Ontong Java Plateau transect.

Drilling strategy is to: APC and XCB along two transects at 110°W and 95°W where the data is supported by incorporation of earlier DSDP sites 571 + 572 + 403.

The sites cover the following major oceanographic features:

NEC north equatorial current, SEC south equatorial current, ECC equatorial counter current, CAC California Current, PC Peru current, CHC Chile current, EUC equatorial undercurrent.

The two drillsite transects are aimed to provide a continuous record of these current systems throughout the past 8 million years.

PCOM 8.89: leg planned for 1991 program.

SSP developments:

Fall 1988: presentation of scientific objectives plus a lot of seismic lines, but none high quality, no high resolution seismics.
Fall 1989: N. Pisias finished a cruise on R/V "Washington" with an excellent data package for 12 potential drilling sites in the areas of the earlier proposal, plus 2 new locations. The new data includes: analog single channel seismic (80 cu. in SSI watergun); on board processed digital seismic lines; 3.5 KHz records; SEABEAM contour maps; gravity and magnetics; piston core data.

Drill site (and core) locations were selected for maximum sediment thickness, but free from evidence of turbidites or other redepositional processes or erosion.

Status of the proposal EASTERN EQUATORIAL PACIFIC with all developments

site	original	1.prospectus			2.prosectus			after WASHINGTON cruise				
	221/E (86) (only cores no sites)	analog. seism. no HRS	water depth (m)	penetr (m)	mentioned	seism.lines (bad) V = VEMA RC= CONRAD GG= Glom. Chall.	crossings	latitude	longitude	wat.depth.	sed.thick	pro-posed as basem. site
EEQ-1	x	x	3950	200-500	x	V,RC	x			3720 m	325 m	
EEQ-1A	-	x			x	V,RC	x					
EEQ-2	x	x	3365	200-500	x	RC	-			3450 m	300 m	
EEQ-3	x	x	3255	250-500	x	RC	x			3355 m	330 m	x
EEQ-4	x	x	3109	500	x	RC,GG	x			3530 m	195 m	x
EEQ-4A	-	x			x	RC,GG	x			3330 m	450 m	
EEQ-5	x	x	3391	350	x	RC,V,GG	x			3550 m	240 m	x
EEQ-5A	-	x			x	RC,V,GG	x					
EEQ-6	x	-	-	-	-	-	-					x
WEQ-1	x	-	4000	100	x	-	-					x
WEQ-2	x	-	4000	100	x	-	-			3520 m	48 m	x
WEQ-3	x	x	3877	120(375	x	RC-	-			3880 m	135 m	x
WEQ-4	x	x	3731	300(600	x	V	-			3770 m	320 m	x
WEQ-5	x	-	-	-	-	-	-			3875 m	105 m	
WEQ-6	-	-	-	-	-	-	-	new		3850 m	325 m	
WEQ-7	-	-	-	-	-	-	-	new		3775 m	90 m	

The conclusions of the SSP meeting October 1989 are that the data package for the proposed site locations: EEQ-1, EEQ-2, EEQ-3, EEQ-4(1), EEQ-4(2), WEQ-2, WEQ-3, WEQ-4, WEQ-5, WEQ-6 and WEQ-7; as defined after the R/V Washington cruise, contains all the data and information that SSP requires for approval. SSP approves the sites as presented through this data package but notes that at site WEQ-2 with the thinnest sediment cover (48 m) the surveys could have done a better job of obtaining good 3.5 KHz records. The watergun records here are essentially useless because of ringing and the 3.5 KHz record poorly images basement. SSP recommends care be taken to use a slow site approach if drilling takes place here to ensure firstly a good 3.5 KHz record, secondly that there is sufficient sediment for spud-in and thirdly to control the position of the lowermost HPC coring. SSP also noted that sediment thickness calculations appeared incorrect for some sites e.g. WEQ-4 given as 325 m but with at least 0.5 sec of sediment cover. All sites should be checked by proponents for sediment thickness.

4.6 Chile Triple Junction (LEWIS)

The region of the Chile Trench between 46°S and 47°S latitude is the site of ridge-trench collision. The active Chile Ridge spreading system intersects the Chile Trench in a ridge-trench-trench triple junction involving the South American, Antarctic, and Nazca plates. This triple junction is one of only two such features on the globe that are presently active. Thematic goals of this program (JOIDES Proposal No. 8/E) include: (1) Investigation of the amounts and rates of subsidence of the forearc in the immediate vicinity of the triple junction; (2) Drilling into the Taitoa Ridge, a possible fragment of oceanic crust in the process of uplift and emplacement into the South American margin; (3) Investigation of the deformation associated with accretion of sediments at the base of the trench slope following ridge-trench collision. The Chile triple junction program is amongst the high priority programs of TECP for the Central and Eastern Pacific region.

Scientific Objectives: Plate reconstructions of the Pacific indicate that during the Tertiary numerous spreading ridges have been subducted at the surrounding trenches. The geological expressions of ridge/trench collision include: (1) rapid uplift and subsidence of the forearc region as the point of intersection of the ridge and trench migrate along the trench axis; (2) increased thermal gradients and resulting regional metamorphism; (3) cessation of arc magmatism, (4) anomalous near-trench magmatism, and (5) rapid tectonic erosion of the inner trench slope often followed by "rebuilding" of the margin following the collision. In addition, the Chile margin triple junction is the site of emplacement of a 3-my ophiolite sequence onto the South American margin.

Regional Setting: New SEABEAM bathymetric data and MCS seismic reflection profiles accurately delineate the present-day geometry and location of the ridge-trench collision near the Taitao Peninsula. North of about 46° 20'S, the Nazca plate is being subducted beneath the South American plate. South of that latitude the Antarctic plate is being subducted beneath South America. The rate of relative convergence between the Nazca and South American plates is about 90 mm/yr, while south of the triple junction the convergence rate between the South American and Antarctic plates is only about 20 mm/yr. The Nazca/Antarctic plate boundary is comprised of the Chile Ridge spreading center, which intersects the Chile Trench at 46°20'S, forming a ridge-trench-trench triple junction. The triple junction probably formed the southern limit of coseismic rupture during the great 1960 Mw = 9.1 Chile earthquake. The onland geology in the area near the triple junction is characterized by: (1) pre-Late Jurassic metamorphic rocks, forming pre-Andean South American basement, (2) the largely Mesozoic-aged Patagonian batholith, (3) Mesozoic and Cenozoic volcanic rocks associated with the Patagonian batholith, and (4) Neogene sedimentary and igneous rocks. Additional important, but areally limited, rock types include an unusual suite of young (Pliocene-Pleistocene) grandioritic plutons in and around the Golfo Tres Montes, within about 20 km of the trench axis and about 150 km seaward of the main axis of the Quaternary Andean volcanic arc, and a tilted but apparently coherent Pliocene-aged ophiolite sequence on the Taitao Peninsula.

Drilling Strategy: Three suites of holes are proposed to address the three major thematic objectives endorsed by TECP at their October 1988 meeting:

(1) subsidence, deformation, volcanism, and metamorphism within the collision zone,
(2) the processes of ophiolite emplacement at the Taitao Ridge, and
(3) the process of "rebuilding" the margin in the wake of the northward-migrating triple junction.

Following TECP recommendations, two drilling legs are anticipated to implement all of the components of this program.

Five primary sites and one low-priority alternate site to address the problems related to ridge subduction. Three of the sites, TJ-1, TJ-2, and TJ-3, form an east-west transect of the margin adjacent to the "rift contact zone". The other two primary sites, TJ-4 and TJ-5, together with TJ-1, form a north-south transect parallel to the margin along the base of the landward trench slope. Site TJ-6, is an alternate site to TJ-3, and Site TJ-4B is an alternate to site TJ-4.

One proposed drillsite, TJ-7, is located on the flank of the Taitao Ridge. This hole will confirm the oceanic affinity of the Taitoa Ridge inferred from magnetic anomaly interpretations, and address question regarding the mechanisms of ophiolite emplacement in the triple junction region.

Site TJ-9, TJ-9, TJ-10 and TJ-12 are located south of the triple junction, and are intended to address questions involving the rebuilding of the forearc and accretionary prism following the tectonic erosion associated with the actual ridge-trench collision. TJ-8 will sample the material exposed in the forearc in the wake of the triple junction, and represents the material that will become the backstop for the accretion of sediment further south. TJ-10, TJ-11 and TJ-12 together comprise an east-west transect that will sample the post-collision recovery zone south of the triple junction, where sdediment is being deformed and accreted to the margin.

TJ-13, TJ-14, and TJ-15 comprise a transect across the margin north of the triple junction and collision zone, and represent the state of the margin during "steady-state" subduction.

Site Survey Data

A series of single-channel seismic reflection profiles, accompanying geophysical data from R/V "Conrad" cruises 18-03, 21-07, and 23-04, and industry data support the original draft of this proposal. Nineteen heat flow measurements and 6 piston cores were available prior to the return to the Chile margin triple junction by the R/V Conrad in January and February, 1988. Data collected in 1988 include: (1) a SEABEAM bathymetric survey of the triple junction region, (2) approximately 1800 miles of 249-channel CDP seismic reflection profiles shot with a 4000 in^3 airgun source array in three regions along the margin, (3) continuous gravity and magnetics datalong track, (4) approximately 1200 miles of closely-spaced watergun single-channel digital seismic reflection data, and (5) sonobuoy seismic refraction profiles. Previous cruises to the triple junction region have acquired dredge samples, piston cores, single-channel seismic reflection profiles, and heat flow measurements along two transects across the trench slope. In addition, ENAP (Chilean National Oil Company) has made available an extensive grid of commercial CDP reflection data and information from two offshore wells on the shelf that are valuable for understanding ODP drilling results as part of a regional tectonic framework. KIDD reported from proponent Westbrook that a US Navy aeromagnetic survey is planned to take place in November 1989. [Note: Westbrook has since the Hannover Meeting submitted a copy of the recent RRS Darwin cruise report which included a GLORIA survey and 3.5KHz, SRP and MCS profiling plus gravity surveys. Proponents now expect four sites to be deleted from the original proposal and three to be shifted to 'better positions'. Three new sites will be added.]

Lewis concluded for the Hannover meeting that the data package is regionally adequate but final site locations are still being refined. Apart from the CDP seismics and GLORIA, the regional data package can be considered as having been lodged with SSB. Detailed site specific data packages, including processed CDP and parts of GLORIA swaths are expected to be lodged as the final sites become defined. SSP noted that the BSR problem is a clear feature of many of the lines reviewed in Hannover, but that safety of the sites is an eventual PPSP matter.

Updated SSP matrices for Chile Triple Junction are presented in Appendix VIII.

4.7 North Pacific Neogene (LARSEN)

A new NPAC Neogene summary has been produced and new site locations have been inserted but the site numbers have been retained.

SSP CONSENSUS: ALL PROPONENTS SHOULD ENSURE THAT CHANGES IN SITE LOCATION ARE GIVEN NEW SITE NUMBERS OR SUFFIXES IN ORDER TO FLAG THESE CHANGES TO SSP AND PPSP.

Data for some of the new sites is very poor e.g. NN-3. There are some sites for which data appears sufficient for the palaeoceanographic objectives. Other sites are based on poor data and the possibility exists that the sections are not typically pelagic. SSP recommends that the proponents look to more recent USGE-EEZ survey data or to NGDC compilations. Updated NW Pacific site matrices are in Appendix VIII.

Action Item 15:

LARSEN TO NOTIFY NEOGENE PROPONENTS THAT THEY SHOULD RE-NUMBER SITES WHEN THEY ARE RELOCATED OR DESIGNATE WITH A LETTER SUFFIX. HE WILL ALSO PASS ON SSP'S RESERVATIONS OVER THE QUALITY OF DATA AT SOME SITES.

4.8 Bering Sea (LARSEN)

LARSEN noted that again there is a potential confusion arising from site numbering designation in the new Bering Sea proposal. Geophysical coordinates and other information is missing from the site summary forms. No new sites are involved. The USGS data package is sufficient.

Action Item 16:

LARSEN TO CHECK THAT ALL BERING SEA USGS DATA IS WITH BRENNER IN THE SSB.

The problem over the Shirshov Ridge site in Russian waters was again noted.

4.9 Shatsky Rise Anoxic Events (KIDD for SUYEHIRO)

Only the Engineering-2 drilling on Shatsky Rise has been considered in Hannover (See TAMU report).

4.10 Hawaii Flexure (PAUTOT)

No new data has been collected since our Hawaii meeting. The objectives of the proposal appear to be shifting to emphasise the gravity sliding, sedimentation in the moat and the lava fields as identified by the GLORIA surveys. PAUTOT requests access to USGS GLORIA coverage and the simultaneously collected SCS lines. LEWIS will follow up SSP's request to Cleque and Normark at USGS. (See Action item 7).

4.11 Lower Crust at 504B (KIDD for BRENNER)

Chairman reported that the data package is considered complete at SSB and was previously approved by SSP.

4.12 Young Hot Spots: LOIHI (DUENNEBIER)

No new data has been collected since the last SSP meeting. Probably a new SEAMARC-S survey will take place next year. This is a bare rock site destined to become a seismic monitoring station. AT and T has donated 18 km of cable to run from the seamount to the land which will be emplaced following the SEAMARC survey at the site.

5. ASSIGNMENT OF NEW PROGRAMS FOR SSP 'WATCHDOG' ASSIGNMENT

Proposals listed by D'OZOUVILLE as having favourable evaluations were assigned thus:-

A. Pacific Proposals with Favourable Evaluations to 10/88

1. Axial Seamount, Juan de Fuca Ridge (290/E) - LOUDEN
2. Marquesas Island Chain (291-E) - DUENNEBIER
3. Reactivated Seamounts, Line Islands (308-E) - DUENNEBIER
4. West Pacific Gas Hydrate Hole (316-E) - KIDD
5. California Current transect (271-E) - LEWIS
6. Ross Sea/Antarctica (296-E) - LARSEN
7. Antarctic Pacific Margin (297-C + 353-C Revised) - LARSEN

B. Atlantic Proposals with Favourable Evaluations to 10/88

1. Geochem, Dipping Reflectors, E. Greenland (310-A) - LOUDEN
2. Sedim Equiv. Dipping Reflectors, Rockall (311-A) - MEYER
3. Arctic Ocean Drilling (305-F) - LOUDEN

C. Remaining WPAC Targets

1. Banda Sea and S. China Sea Basins - MEYER
2. Geochemical Reference Sites - KIDD
3. Nankai II - SUYEHIRO
4. S. China Margin - PAUTOT
5. Valu Fa Ridge - LEWIS
6. Vanuatu Back Arc Rifts - PAUTOT
7. Zenizu Ridge - SUYEHIRO

Pacific proposals were distributed to members by D'Ozouville and he will send out the remaining Atlantic and WPAC proposals to individuals from the JOIDES OFFICE.

Action Item 17:

D'OZOUVILLE TO SEND OUT THE ASSIGNED ATLANTIC AND WPAC PROPOSALS TO SSP WATCHDOGS FROM JOIDES OFFICE.

The Chairman distributed with these proposals copies of Brenner's initial assessment of what SSB holds on each. (Appendix VII) SSP notes PCOM's initial favourable assessment of the Ocean Floor Seismometer Network proposal, but will await information from PCOM on how the site survey data packages are to be finally assembled for assessment by SSP and PPSP.

Discussion ensued on the new SSP tracking procedure. At least an equal number of new assignments is expected to be necessary at the next SSP meeting. Duennebier recommended that SSP should "cull" or downgrade watchdog tasks in parallel with making new assignments. D'Ozouville commented that this can be done first only after PCOM's April meeting when PCOM will receive a list of priority programs from each thematic panel and expects to make a 4-year program at that stage. SSP will therefore be able to begin "culling" at its Fall 1990 meeting.

Action Item 18:

CHAIRMAN TO ADD "CULLING" OF WATCHDOG LIST TO THE AGENDA OF THE FALL MEETING OF THE SSP.

SSP THIRD DAY - Wednesday October 18th

Panel members reconvened at BGR on October 18th at 09.00.

6. UPDATE ON 17-18TH OCTOBER TAMU PLANING MEETING ON THE ENGINEERING-2 LEG (A. MEYER, FAX REPORT)

Only an SSP-style survey data matrix on the three Engineering-2 sites was received (See Appendix VIII): No written report was Faxed as had been expected. SSP members commented that the drilling was now to take place and our only concern was to give general approval and provide any necessary recommendations on how the ship's visit to the sites could improve existing regional data sets in the area.

Chairman was asked to request ODP to ensure that 3.5 KHz and digital high resolution seismic data was collected on approach and departure from each site. New Shatsky Rise data is of particular importance due to the lack of an existing high quality geophysical data set there.

Action Item 19:

CHAIRMAN TO REQUEST ODP TO ENSURE THAT 3.5 KHz DIGITAL HIGH RESOLUTION SEISMIC SYSTEMS ARE OPERATING ON APPROACH AND DEPARTURE FROM EACH SITE ON ENGINEERING. NEW SHATSKY RISE DATA IS OF PARTICULAR IMPORTANCE DUE TO THE LACK OF AN EXISTING HIGH QUALITY GEOPHYSICAL DATA SET THERE.

7. ITEMS FOR JOIDES PANEL CHAIRMAN'S MEETING, NOVEMBER 29TH AT WHOI

7.1 SSP Chairman will report on the Panel's new procedure for tracking proposals and demonstrate the periodicity of the Panel's workload. He will seek PCOM's comments on the new procedures in relation to their 4-year planning.

7.2 On the insertion of new NANKAI Sites and one extra ONTONG JAVA site (see PPSP Report), SSP recognises that PPSP has always moved sites within the regional data coverages that have been approved by SSP. But the new Nankai sites were not based on newly-collected data, neither were they placed on safety considerations. Ball commented that this resulted from the postponment of drilling and the proponents having more time to refine their objectives. SSP Chairman is to recommend to PCOM that proponents should be encouraged to submit a large number of alternate sites at the initial stage, rather than so late as in this case. Examples of good practice in this regard are the Bonins and Lau Basin.

7.3 Chairman is to refer PCOM to Action item 3 at underway Geophysics and real-time navigation for JOIDES Resolution.

7.4 Chairman is to refer PCOM to Action item 4 on early Thematic panel Prioritization of proposals.

7.5 Chairman is to refer PCOM to Action item 6 on SSB receiving Thematic Panel Minutes.

7.6 Chairman is to ask for PCOM to consider ways of ensuring that there is post-drilling assessment of the adequacy of site survey packages.

7.7 Chairman is to notify PCOM that it sees the attendance of a TAMU representative at its meetings as absolutely essential.

8. OTHER BUSINESS

A. Discussion of faxed Data Bank report.

Panel members commented that Brenner's initial proposal assessments (Appendix VII) along with D'Ozouville is original screening of proposals through to SSP has worked well this far. There were requests however that Carl adds a short listing to each assessment on what data was actually held in the SSB.

B. Feedback from Panel to Proponents

Discussion took place on 'feedback' mechanisms between SSP 'watchdogs' and proponents.

√O SSP CONSENSUS: ALL PROPONENTS WHO SEND DATA PACKAGES SHOULD BE INFORMED OF THEIR ARRIVAL, THAT ASSESSMENT TOK PLACE AND THAT THE DATA WAS NOW LODGED WITH THE DATA BANK.

Further discussion ensued on whether proponents should be put in touch with SSP watchdogs at an early stage.

SSP CONSENSUS: MEMBERS WITH NEW WATCHDOG ASSIGNMENTS SHOULD MAKE INITIAL CONTACT WITH THE PROPONENTS OF THESE PROPOSALS.

C. Summary of SSP Status of projected early CEPAC Legs and the likely Agenda for the next SSP meeting.

SSP has effectively already approved the following potential 'early' CEPAC Legs:

Eastern Equatorial Pacific
Sedimented Ridges
504B Lower Crust

Proponents of the following are likely to attend the next SSP meeting for detailed next stage assessment:

Cascadia-Oregon and Vancouver
Atolls and Guyots
N. Pacific Neogene
Hawaii Flexure

_If_ PCOM approves Chile Triple Junction and East Pacific Rise for the early CEPAC drilling at its November meeting, these two data packages must go through _final_ evaluation at SSP's spring 1990 meeting.

9. SCHEDULE FOR NEXT MEETING

PCOM meets 24-26 April 1990 in Nice, France and SSP must meet and submit its minutes for that meeting. Best dates for the Chairman are after the end of the University of Wales Spring Term because of teaching commitments. This runs to 6 April. After discussion of the possible constraints of the Easter weekend holiday 13-16 April, SSP Panel agreed that its next meeting should be 9-11 April. It is requested that it takes place at USGS Menlo Park, hosted by Steve

Lewis. Key proponents for Eastern Pacific proposals will be encouraged to attend or to lodge updated data packages (see SSP Action item 5). USGS proponents in particular will be urged to lodge data with SSB. (See Action item 7). Lewis has agreed to arrange a local fieldtrip preferably prior to the meeting (Sunday 8th) with a view to holding open the 12th April for Chairman to complete the minutes for direct dispatch from Menlo Park to Hawaii.

The Panel was hosted to lunch and a tour of PRAKLA-SEISMOS AG by Dr. H. Jorg Dostmann in the early part of Wednesday afternoon.

The meeting ended, after further review of the Panel minutes, at 17.00 on 19th October.

SSP HANNOVER MEETING

LIST OF APPENDICES

APPENDIX I	Updated Ship Schedule
APPENDIX II	Latest ODP Proposal Guidelines - revised 22 May 1989
APPENDIX III	Full Listing on JOIDES Proposals to 29 September 1989
APPENDIX IV	Abstracts of latest Proposals received by JOIDES Office to July 1989
APPENDIX V	TAMU-ODP Summary Statement on Free Fall Funnel entry and recommendations
APPENDIX VI	Data Bank Statistics
APPENDIX VII	Preliminary Data Bank Assessment of Proposals Newly Assigned to SSP Watchdogs
APPENDIX VIII	Updated SSP Site Survey Matrices

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APPENDIX V

TAMU-ODP SUMMARY STATEMENT ON FREE FALL FUNNEL ENTRY AND RECOMMENDATIONS

Appendix V

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OCEAN DRILLING PROGRAM

SUMMARY STATEMENT SS-0200

FREE FALL FUNNEL REENTRY CAPABILITIES AND RECOMMENDATIONS

Introduction

The purpose of this summary statement is to clarify the capabilities and address the limitations of the Ocean Drilling Program's (ODP) Free Fall Funnel and to recommend guidelines for future FFF deployment planning.

Description

The FFF, ODP part number OH-4600, is an 8-foot diameter by 40-1/2 inch high, "temporary" reentry cone, with a 12-1/2 inch diameter throat. A casing pup joint (13-3/4 inch diameter) is welded to the bottom of the FFF. The casing pup joint keeps the FFF aligned with the bore hole. The FFF has no ability whatsoever to suspend a casing string. The FFF has also been referred to as the "free fall reentry cone" or "mini cone".

The Free Fall Funnel is not a direct substitute for a full size reentry cone with the concomitant sediment stabilizing casing string. The FFF is a relatively inexpensive piece of hardware (less than five thousand dollars) which requires a few hours of rig time to deploy and can result in a dramatic increase in productive science. Conversely, a full size reentry installation is an expensive exercise (approximately 100,000 dollars in hardware and three or more days of rig time) which should only be attempted when unstable upper sediments make progress in the hole unlikely and/or when reentry in subsequent legs is considered likely.

A schematic illustrating an "ideal" FFF deployment is attached. The schematic also includes the overall dimensions of the FFF.

Problems Associated with FFF Deployments

The FFF relies entirely on its 8-foot diameter "footprint" in contact with the sea floor and/or cuttings mound for support. The FFF does not benefit from "pile" support as does the full-size reentry cone with casing. Therefore, if the top of the bore hole is washed out or the sediments are not consolidated enough for adequate support, the FFF can and occasionally does sink out of sight.

The problem of the FFF sinking out of sight can be addressed in two ways. First, three glass floatation balls are attached to the FFF on 3-meter tethers. If the floatation balls survive the trip to the sea floor and providing that the FFF does not sink below the surface more than the length of the tethers, the floatation balls can be used to visually guide the drillstring via underwater television for reentry. Secondly, a small mud skirt has been designed which will help support the FFF. Neither of those aids is a guarantee that the FFF can be located and reentered.

Since the FFF is not equipped with a casing string to prevent the upper soft sediments from sloughing, the borehole can collapse beneath the FFF before a reentry is accomplished.

Should the FFF be snagged by the Bottom Hole Assembly (BHA) during a pipe trip and be pulled from the hole, there is no means of reinserting it and thus reentry would be virtually impossible.

In those cases where the FFF settles into the crater at the seafloor created by enlargement of the hole plus deposition of cuttings, it can be difficult or impossible to locate. Sonar will probably not help in such cases and no FFF has been reentered to date by using sonar.

Development Philosophy

The FFF was not developed to replace the reentry cone/casing combination. The premise under which the FFF was developed was to provide an expedient, low-cost means of maximizing scientific results in a borehole where reentry was not expected but is later found to be necessary.

It must be noted that the FFF is not a guaranteed reentry mechanism and the extra science gathered must always be weighed against the very real possibility of an unsuccessful reentry versus the time and expense to set a full size reentry cone and casing.

Typical uses for the FFF would include:

1. Deepening holes that have not reached their objective due to premature bit failure can now be deepened by round tripping for a new bit.

2. In the event of a bit release failure, a round trip to change to a logging BHA can be made.

3. Packer work can now be performed in single bit holes while avoiding the undesirable practice of drilling with a packer in the string.

4. A round trip to change from an XCB bit to an RCB bit in the same hole, thus saving the time to drill down to the previous TD in a new hole. In this application, consideration must be given to the time required to deploy the FFF and the subsea TV. In most cases, it is more expedient to simply spud a new hole with the RCB.

FFF Deployment Synopsis Through Leg 125

Number of sites with FFF deployments	12
Number of sites with attempted FFF reentries	10
Number of successful reentry sites	9
Number of sites where the FFF was not visible	5
Number of multiple FFF reentry sites	3
Total number of successful FFF reentries	12

Although the ninety percent success rate of reentering a FFF appears high, one should not lose sight of the fact that fifty percent of all the reentries were achieved without the FFF being exposed. Also, two of the FFF reentries were accomplished without even the glass floatation balls being visible and one FFF (and associated hole) was never found at all. These statistics may reflect more upon the expertise of the ships crew than on the reliability of the FFF. Additionally, the BHA is at risk when a "blind" stab at the FFF is made. Loss of the BHA would not only cost rig time for a trip, but also the expense of a replacement.

ODP General Recommendations

A. The FFF should only be deployed when time constraints preclude setting a reentry cone with casing and the science to be gathered by reentry can be risked against the very real possibility of an unsuccessful reentry.

B. The FFF should not be deployed when reentry on subsequent legs is a strong possibility.

C. The FFF should be used only when its deployment would represent a significant savings in rig time over drilling a new hole.

FFF Deployment History

There is no hard and fast rule about the appropriate application in all cases of a Free Fall Funnel. To better understand the rationale employed in the Ocean Drilling Program to date, here is a brief synopsis of past deployments:

Leg 108, Site 658; The first FFF deployment. A FFF prototype was deployed in Hole 658A. The TV camera was used to observe "pull-out" of the BHA and the FFF was clearly visible. The ship was offset 30 meters to intentionally lose visual contact with the FFF. The ship was then repositioned over the FFF and the first successful FFF reentry was accomplished. No coring or drilling was attempted through the FFF.

Leg 110, Site 671; Coring was terminated in Hole 671B due to a core barrel stuck in the BHA. A FFF was deployed for reentry for logging operations. The TV was lowered to observe "pull-out" and it was noted that the FFF had sunk below the cuttings with only two glass floatation balls visible. A logging BHA was made up and tripped to the sea floor. After five hours of maneuvering the ship, reentry was accomplished by lowering the BHA between the floatatio balls into the cuttings mound.

Leg 115, Site 713; Hole 713A was extended by deploying a FFF a round tripping the BHA for a bit change. Deployment of th TV for "pull-out" observation revealed the FFF to be clear visible. Only two glass flotation balls survived the trip to the sea floor. After three hours of maneuvering the ship, reentry was achieved.

Leg 116, Site 718; Failure of an HBR to release in Hole 718E prevented deployment of the logging tools. A FFF was deployed and the drill string round tripped for a logging BHA. Deployment of the TV to observe "pull-out" revealed the FFF to have sunk below the surface of the cuttings mour and only the four glass floatation balls were visible. Reentry was achieved after 13.5 hours of maneuvering the ship and several mis-stabs.

Leg 117, Site 722; After logging Hole 722B, the logging tools would not reenter the BHA and the crimper and cutter had to be deployed. Before pulling the BHA clear of the sea floor a FFF was deployed to aid in reentering the hole should it have become necessary to fish for the logging tools. The logging tools were retrieved with the drill string and no reentry was attempted.

Leg 119, Site 740; Hole 740A was extended by deploying a FFF an round tripping the BHA for a bit change. In preparation fo reentry, it was observed that the FFF was visible but appeared to be 6 m below the surface of the cuttings mound with only the floatation balls above. Reentry time was minimal since the FFF was found directly below the drill string.

A second reentry was made after a round trip to clean a plugged bit. The second reentry was also made in short order. Again, the FFF was found directly below the drill string, probably a result of the shallow water depth (818m).

Leg 119, Site 742; A FFF was deployed in Hole 742A as "insurance" for a reentry if the ship had to temporarily abandoned the hole due to an approaching iceberg. The iceberg changed direction and no reentry was attempted.

Leg 121, Site 752; Due to a lost suite of logging tools in Hole 752B, a FFF was deployed. The BHA was round tripped to renter the hole with fishing tools. In preparation for reentry, the FFF could not be found either by sonar or TV. The drill string was stabbed into a disturbance on the sea floor near what appeared to be one of the glass floatation balls. Miraculously, the hole was reentered and the logging tools were successfully fished.

A second reentry was attempted to complete the logging operations. More that 12 unsuccessful stabs were required before the hole was successfully reentered the second time.

Leg 121, Site 758; In order to advance Hole 758A with the RCB, a FFF was deployed for reentry. A small mud skirt was fabricated and attached to the FFF. Upon reentry, The FFF was found to be setting high on the sea floor, clearly visible and reentry was achieved in 12 min.

A second reentry was made after round tripping for a routine a bit change. The second reentry was accomplished in three minutes once the BHA had reached the sea floor.

Leg 122, Site 762; A FFF with mud skirt was deployed in Hole 762C for reentry after round tripping for a logging BHA. The TV was lowered to observe "pull-out" and the FFF was found sitting high on the sea floor clearly visible. Only 8 min. were required to reenter the hole once the logging BHA had reached the sea floor.

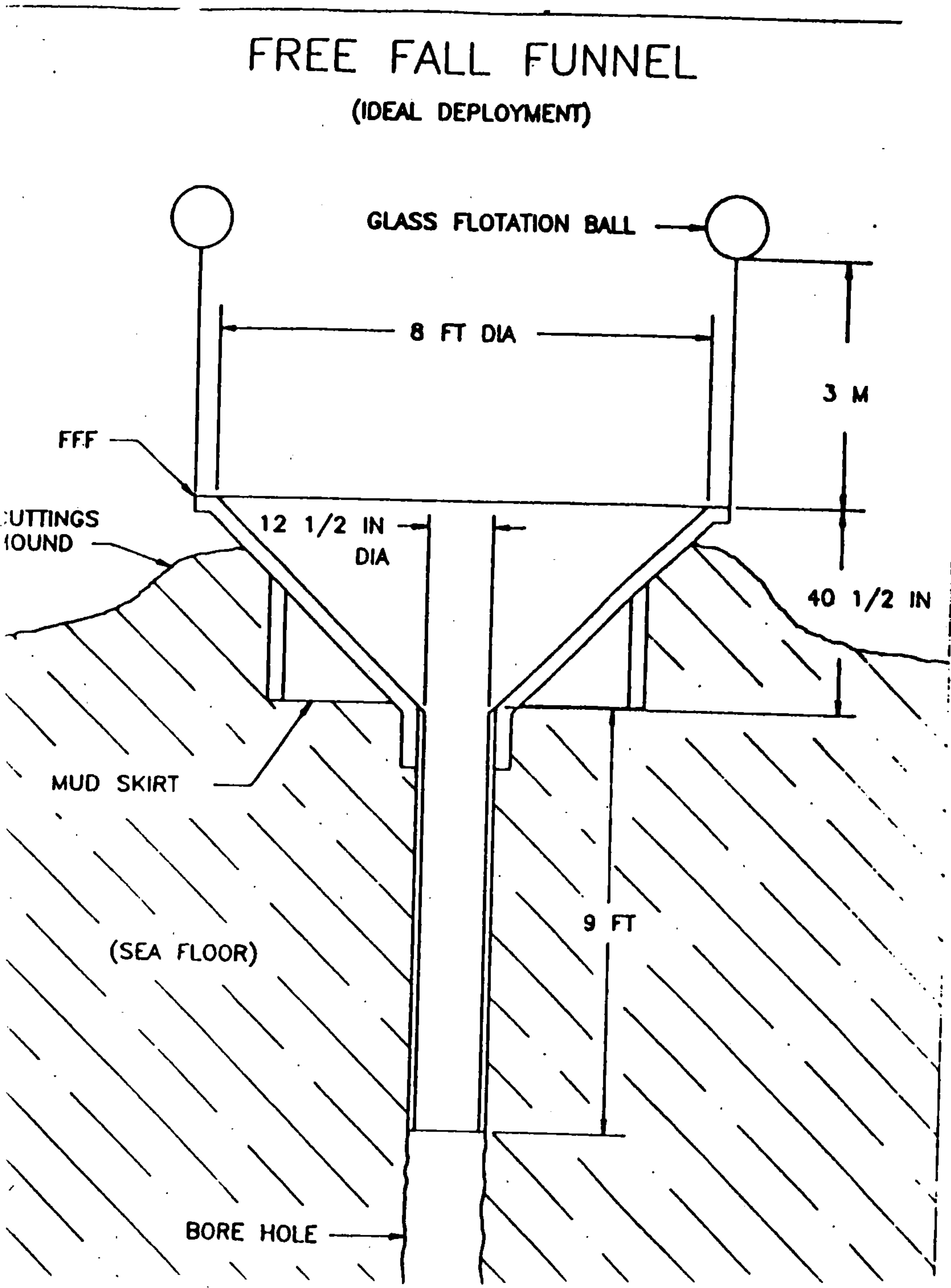
Leg 124, Site 767; A FFF was deployed in Hole 767B for reentry after a round trip for the RCB. During reentry procedures, neither the FFF nor the glass floatation balls could be found. After several hours of searching and several mis-stabs, the effort was discontinued and a new hole was spudded.

Leg 125, Site 779; A FFF without mud skirt was deployed in Hole 779A for reentry after a round trip for a bit change. The TV was lowered for observation of the "pull-out" and the FFF was found sitting high on the sea floor clearly visible. Reentry was accomplished in 1.5 hours once the BHA had reached the sea floor.

Revised: 7-6-89

Ron Grout

Dave Huey



Meyer

To: Those Concerned
From: Ron Grout/Glen Foss
Subject: Free-fall Reentry Funnel
Date: 27 November 1988

This memo supersedes the Glen Foss memo of 1 May 1986 on the same subject.

The free-fall funnel (FFF) has now been in use in the ODP for over two years. It has proven to be useful in some situations and has saved holes for further penetration and/or logging. The track record for "reenterability" is good, and the odds of making one, or possibly two, reentries into a given FFF are fairly high. On at least two occasions, the FFF has gone completely out of sight in soft sediments. In one case it was reentered on a blind stab, and in another case, reentry was not achieved.

Though some doubts concerning the utility of the FFF have been assuaged, there is no change in the basic policy and philosophy toward its use. It remains a remedial tool to salvage single-bit holes that fall short of their drilling or logging targets. The lack of casing makes deepening of the hole or downhole science vulnerable to problems arising from deterioration of soft shallow sediments. The small "footprint" and lack of elevation above the seafloor will continue to make the FFF prone to "burrowing" or being lost in soft-sediment craters if drilling operations are conducted with the FFF in place.

We will continue to stock and use the FFF for those situations where a "second chance" is needed. The following guidelines remain in force for the deployment of the FFF:

A. The FFF should be used only when its deployment would represent a significant savings in rig time over drilling a new hole. In many cases, a new hole can be drilled in less time than FFF deployment and reentry would take. As hole conditions deteriorate with time, a redrill hole should be more stable for deepening and logging than the original hole.

B. Because of the risk of losing the hole, the bit should never be pulled clear of the seafloor unless it has been determined that the site objectives cannot be achieved without reentry.

C. Observing the withdrawal of the bit from the FFF prior to the pipe trip is encouraged. The anticipated problem of pulling the FFF out of the hole has not occurred, but the TV would determine whether the FFF is in position and visible for reentry. The risk and amount of time involved should be considered by the O.S. in deciding whether to take this step.

D. The existence of the FFF should not be a consideration in scientific and operational planning. As a general rule, ODP sites should be planned either for single-bit holes or for full dual-casing-string reentry installations.

cc: L. Garrison
B. Harding
A. Meyer
J. Baldauf
M. Storms
P. Thompson
Development Engineers
Staff Scientists

APPENDIX VI

DATA BANK STATISTICS

Data Supplied (FY '89)

Recipients listed by Institution (US) or Country (non-US)

U.S.	#	% of Total Requests
ODP	21	16.5%
LDGO	8	6 %
HIG	6	5 %
UT	6	5 %
SIO	5	4 %
URI	5	4 %
OSU	2	1.5%
WHOI	2	1.5%
TAMU	1	1 %
RSMAS	0	0
UW	0	0
OTHER US*	22	23 %
Total U.S.	85	67.5%

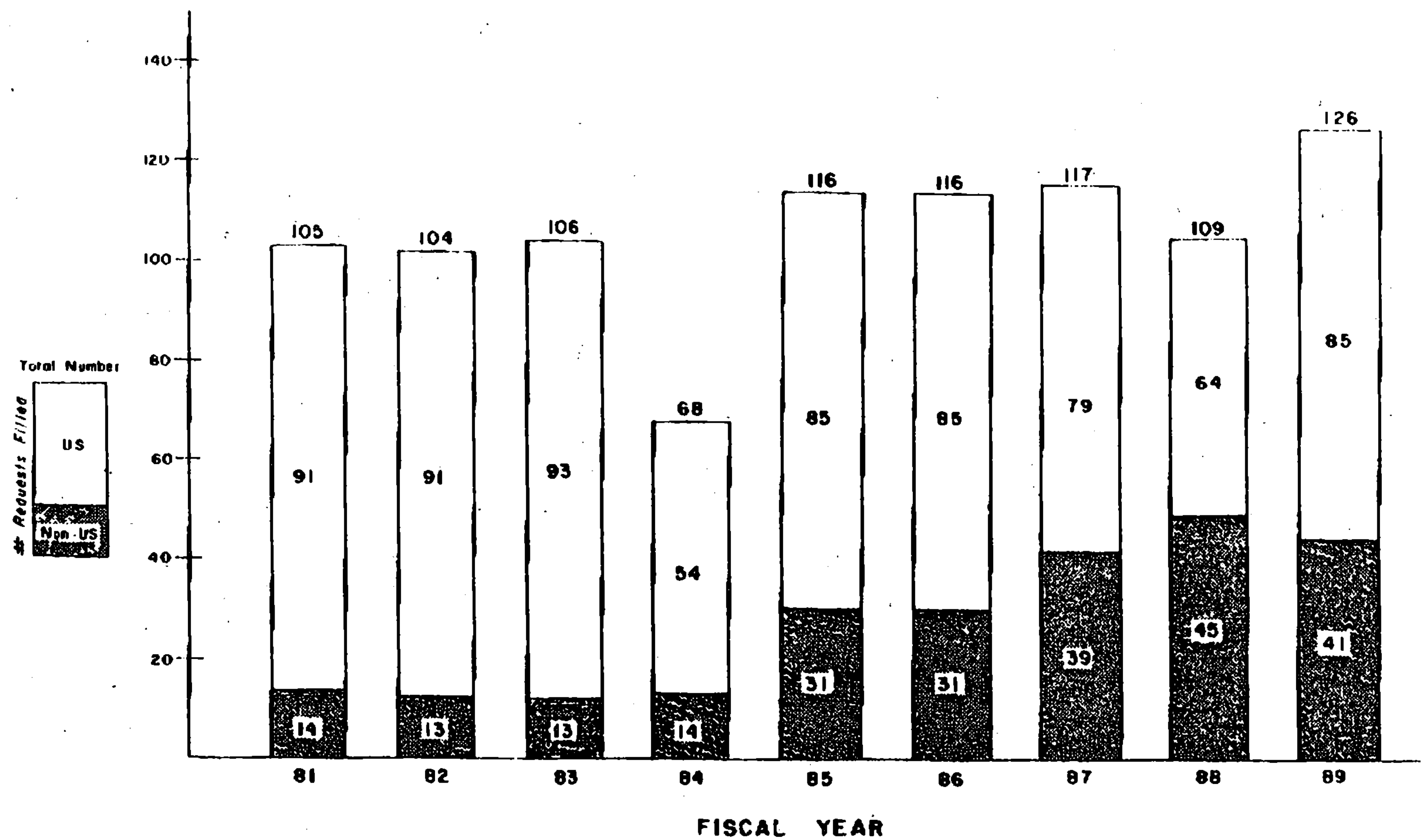
NON U.S.	#	% of Total Requests
U.K.	9	7 %
FRANCE	8	6 %
ESF	6	5 %
JAPAN	6	5 %
FRG	3	2.5%
CANADA/AUSTRALIA	2	1.5%
OTHER**	7	5.5%
Total non U.S.	41	32.5%
Total Requests	126	100%

*Includes:

a) Requests filled for panel members or site proponents from non-JOI institutions
b) Requests filled for co-chiefs from non-JOI institutions
c) Requests filled for panels (such as PPSP)
d) Requests filled for post-cruise studies by non-JOI members of a site survey team

**Includes safety packages (one to each country)

215


Total Number
US
Non-US
Requests Filled
140
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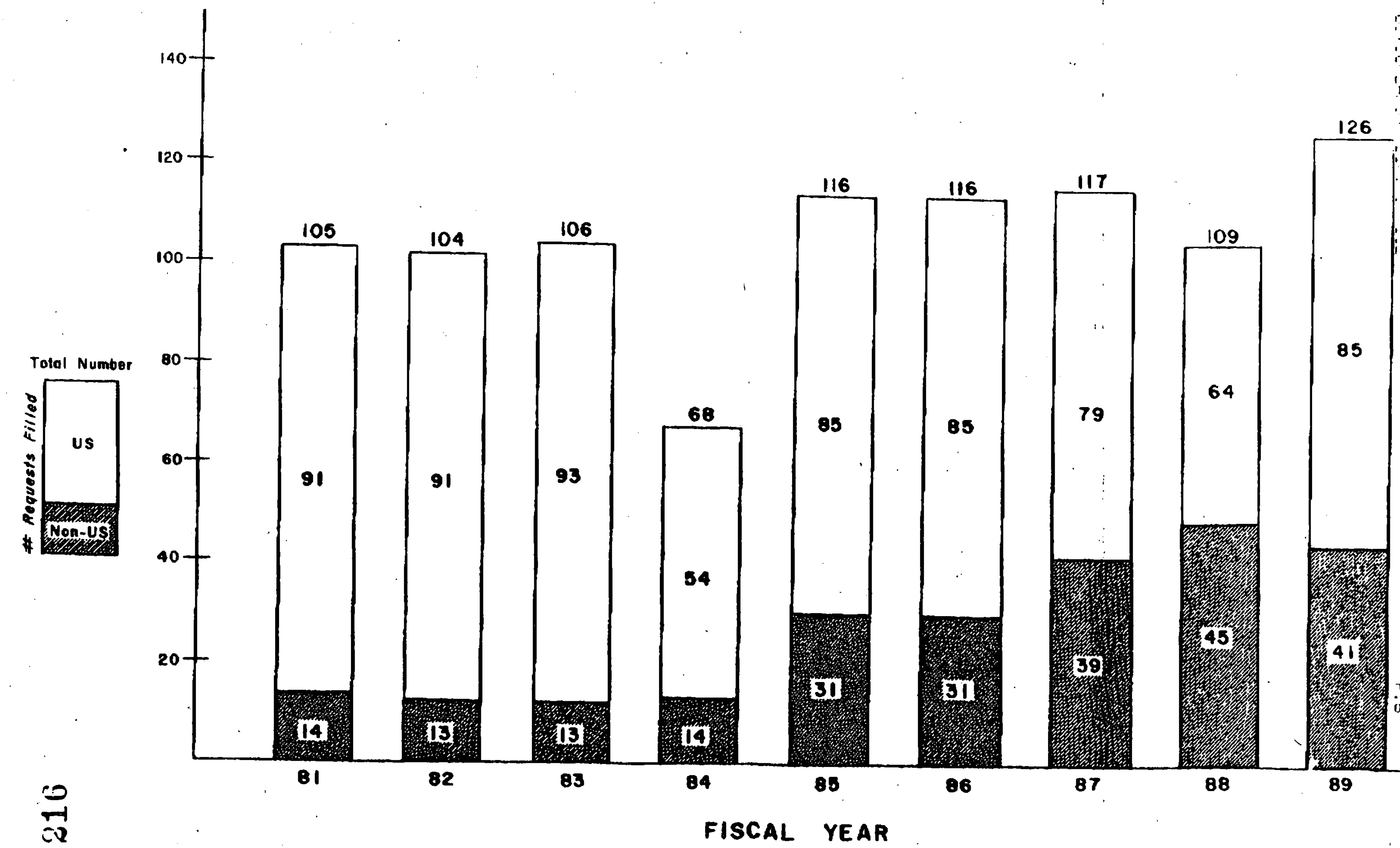
FISCAL YEAR



Requests Filled
Total Number
US
Non-US
140
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100
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FISCAL YEAR

F.S.SONNE Operations-schedule 1989-1991

cruise	dep. - arr.	from - to: (area)	Program (Charter)
SO-64	9-89 — 10-89	-Callao	Uni Hamburg [DISCOL Biology and Geology environmental st. ,Central Pacific
SO-65	10-89— 12-89	-Tahiti	Uni Kiel [MIDPLATE 2,Hydrthermal studies in south.centr.Pacific and Geophys.Tahiti
SO-66	12-89— 2-90	-Fidji Isl.	TU Clausthal [MIDPAC 4, Hydrthermal stud.within the area of KIRIBATI/equatorial Pacific
SO-67	2-90— 4-90	-Fidji Isl.	BGR [Geology of the Manihiki Plateau,geolgical and hydroth. studies in the Lau Basin, training CCOP/SOPAC
SO-68	4-90— 6-90	-Fidji Isl.	Uni Marburg
SO-69	6-90— 8-90	-Guam	Uni Kiel /Marianen Back Arc
SO-70	8-90— 9-90	-Guam	Uni Hamburg/Marianen Graben
SO-71	9-90— 10-90	-Naha	TU Clausthal / Hydromin 2
SO-72	10-90— 12-90	-Singapur	Uni Hamburg/ South China Sea

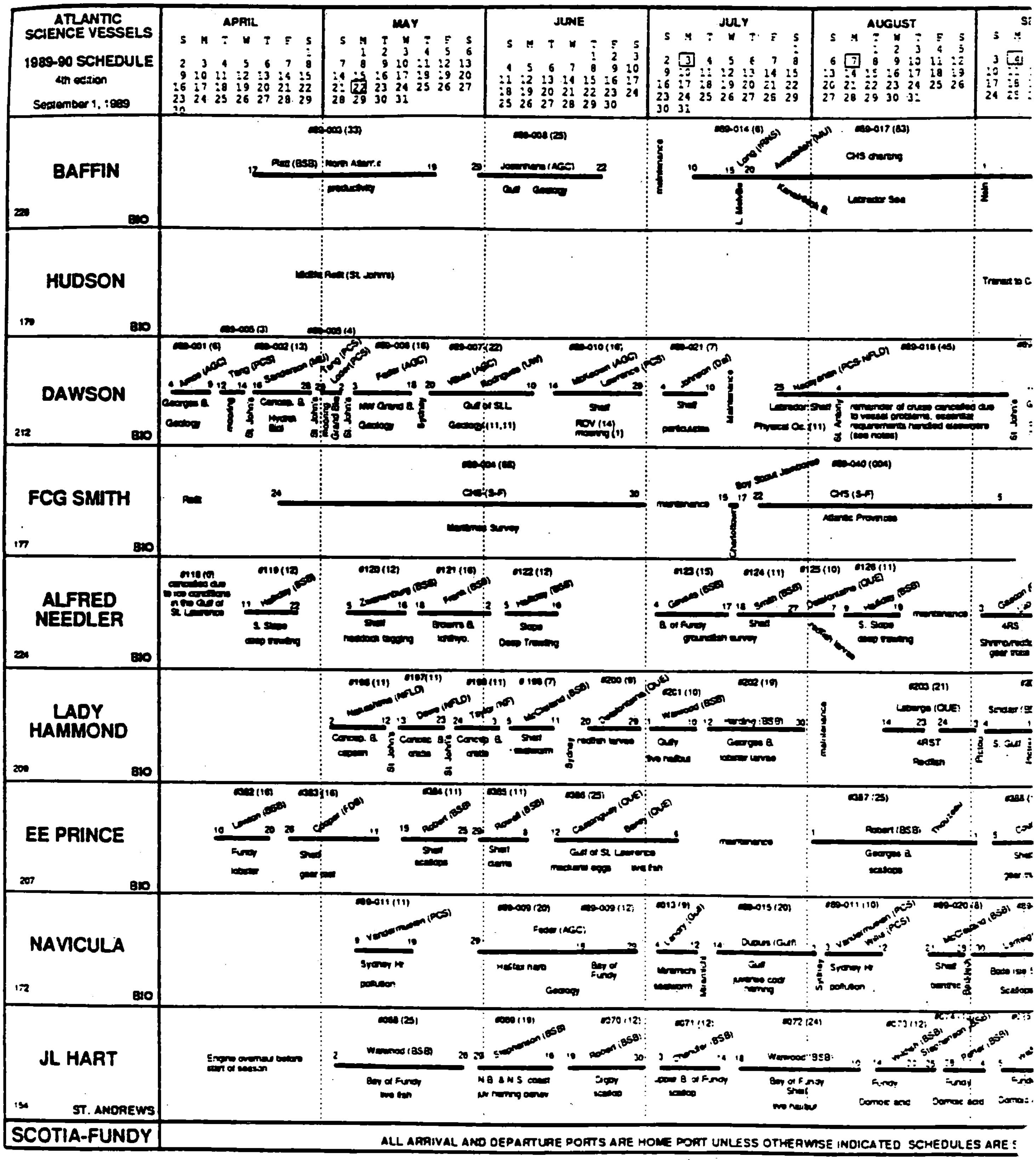
F.S. POLARSTERN Operations-schedule 1989 - 1990

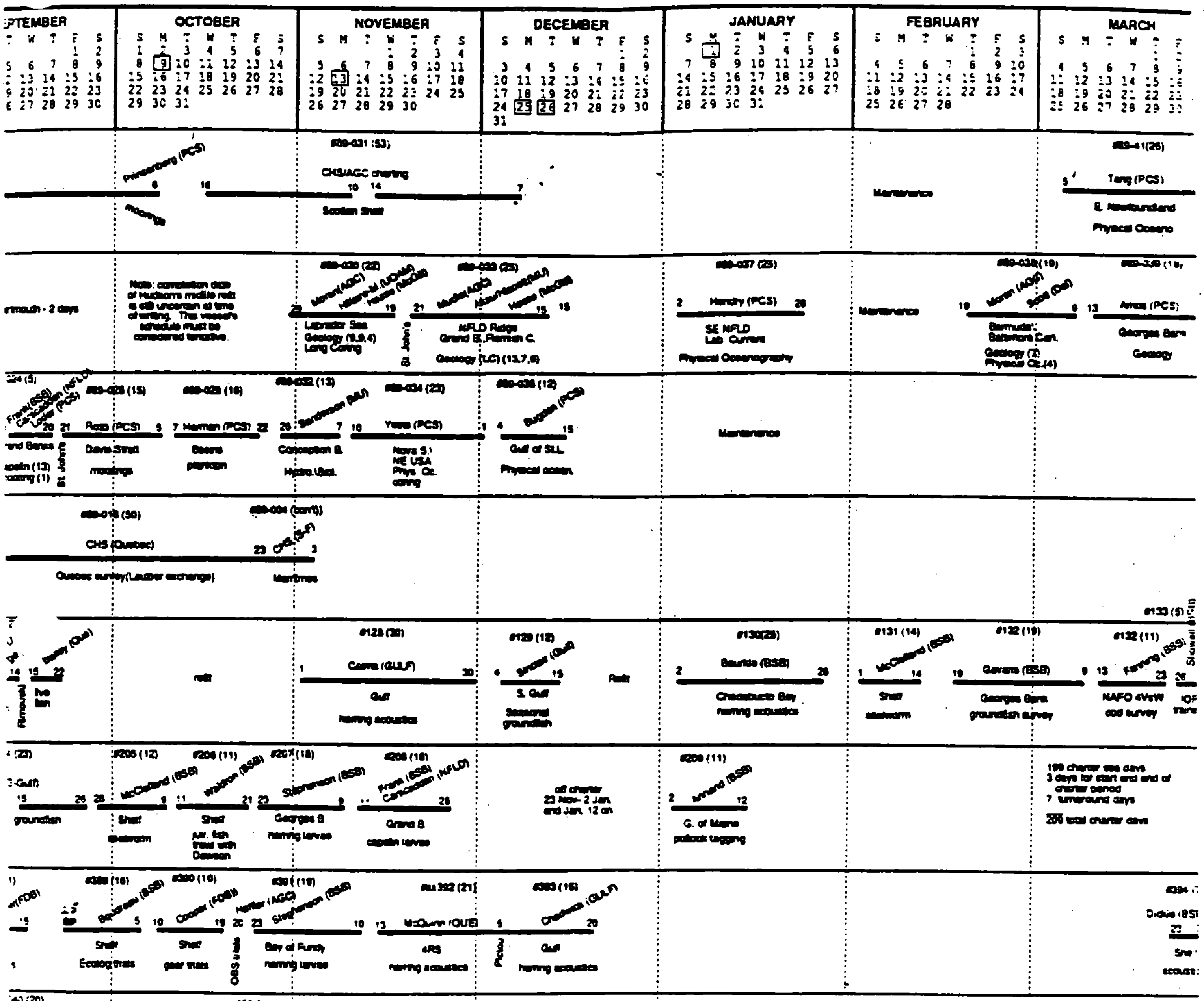
cruise	dep. arriv.	from - to	area/program
ANT VIII/2	9/89-10/89	Puerto Madryn - Kapstadt	Weddel Sea/Meteorol.Oceanogr.
ANT VIII/3	10/89-11/89	-Punta Arenas	Antarc.Converg.
ANT VIII/4	11/89-12/89	-Ushuaya	Antarc.Peninsula
ANT VIII/5	12/89- 3/90	-Kapstadt	east.Weddel Sea,Filchner
ANT VIII/6	3/90- 4/90	-Kapstadt	Astrid Ridge/Geophysics and marin
ARK VII/1	6/90- 7/90	Oslo -Tromsoe	Jan Mayen,Scresbysund
ARK VII/2	7/90- 8/90	-Tromsoe	Framstreet,Greenland Sea
ARK VII/3	8/90-10/90	Tromsoe-Bremerhaven	Svalbard,Scoresbysund
ANT IX/1	10/90-11/90	Bremerhaven-Puntas Arenas	
ANT IX/2	11/90-12/90	-Kapstadt	north. Weddel Sea
ANT IX/3	1/91- 4/91	-Kapstadt	south-west. Weddel Sea
ANT IX/4	4/91- 4/91	-Bremerhaven	

F.S. METEOR Operations-schedule 1989 - 1991

M11/1	10.89- 10.89	Hamburg -Pt.Delgade	nordeast Atlantic/Paleoceanog.
M11/2	10.89- 11.89	-Rio de Janeiro	Atlant.Transect/
M11/3	11.89- 12.89	-Montevideo	Patagonischer Shelf/fish.biologie
M11/4	12.89- 1.90	-Ushuaia	Antarct.Peninsula/Krill,Biomass.
M11/5	1.89- 3.90	-Capetown	Circumpolar drift,Tracerphysics
M12/1	3.90- 4.90	-Funchal	East.Atlantic/Sedimentation
M12/2	4.90- 5.90	-Las Palma	Centr.Atlantic Seamounts/Geophys.,Petrolc
M12/3	5.90- 6.90	-Hamburg	East.Northatlantic/Biotrans.
M13/1	7.90- 7.90	Hamburg -Tromsoe	Norweg.Sea
M13/2	7.90- 8.90	-Hamburg	Norweg.Sea
M14/1	9.90- 10.90	Hamburg -Cape Verde	Biskaya/Test of Rainmeter
M14/2	10.90- 10.90	-Receife	equatorial.Atlantic/tropic.Circulation
M14/3	10.90- 12.90	-Rio de Janeiro	Southameric.Eastcoast/Geophys.,Seismic
M15/1	12.90- 2.91	-Rio de Janeiro	centr.Southatlant./Brazilstream,Geol.,Bic
M15/2	2.91- 3.91	-Libreville	subtrop.Southatlant./Oceanograph.
M16/1	3.91- 4.91	-Recife	Southatlantic/Geoscience
M16/2	4.91- 5.91	-Balem	Southatlantic/Doescience
M16/3	5.91- 6.91	-Las Palmas	offshore Brazil/Oceanograph.
M16/4	7.91	-Hamburg	?
M17/1	7.91- 8.91	Hamburg- Hamburg	Norweg.Sea
M18	8.91- 9.91	Hamburg- Hamburg	Northatlantic
M19	9.91- 10.91	Hamburg- Hamburg	Northsea

Canada East Coast





NOTES

-Senior scientists on joint cruises are listed first

-cruises are Scotia-Fundy unless otherwise indicated

-unused cruise numbers: 12,19, 21,22,23,27

Levy (PCS, Georges Bk.) cancelled due to Dawson shaft problem. Levy arctic mooring recoveries to be done on DOT icebreaker. Prinsenberg (PCS) and NFLD moorings to be retrieved by Baffin (Hain) and W. Templeman (Hamilton Bk.)

...ECT TO CHANGE AT ANY TIME TO DUE TO PROGRAM OR VESSEL REQUIREMENTS. FOR MORE INFORMATION ON SCOTIA-FUNDY BASED VESSELS CONTACT A. ADAMS (902) 426-7292

JOIDES SITE SURVEY PANEL MEETING

BGR, HANNOVER, OCTOBER 16TH-20TH, 1989

221

89-465

EXECUTIVE SUMMARY

1. The meeting began with only a partial complement of members since all of the newly assigned members: von HERTZEN, KASTENS and HEDBERG, were unable to attend and TOKUYAMA attended as alternate to SUYEHIRO for Japan. Most difficult was the fact that BRENNER was unable to attend from the DATA BANK because of illness and A. MEYER from TAMU had a conflicting meeting on the upcoming Engineering-2 Leg. Written reports from these two representatives appear in the minutes.

2. OLD PACIFIC:

   Yves Lancelot (PCOM Liaison) reviewed the history of 'OLDPAC' surveys up to the Shipley/Meyer cruise in Pigafetta basin on the "Fred Moore" as reported at the last SSP. His update included the new Japanese and "SUROIT" data which have been used to refine drilling sites for Leg 129. Previous aeromagnetic surveys have now been supported by "SUROIT" data in identifying M-series anomalies in the Pigafetta and Marianas Basins. A new selection of PIG sites was presented. New SRP and MCS seismic lines were presented but successful Sonobuoy stations are still being processed. The main effort was to find prime sites with enough sediment section above the indigenous chert to spud-in. There is an internal ringing on the airgun records, but not on the watergun records. Chert and basement reflectors are well shown except in the Quiet Zone.

   LANCELOT's drilling strategy is to drill a pilot hole to date basement in the area of M-series anomalies (PIG 2A, M36) which has a sediment thickness of possibly 0.55 sec. Then the drilling would move to PIG - 3 or 4. SSP noted that one option might be to first drill a dome-like location near PIG 3A on profile 6 to date basement where there is clearly an attenuated section (0.25 sec).

   SSP can confirm that the best possible data set has now been collected; but must conclude at this stage that there remains a possibility that reflectors exist below the interpreted locations of basement; also that the uncertainty could still be sorted out after sonobuoy processing. SSP notes however that this Old Pacific Data set is received very late and the processing is still to be done.

3. ONTONG JAVA

   Data bank (Carl Brenner), Mayer, Kroenke, Shipley and Winterer prepared a safety package for PPSP. The seismic lines for the four Neogene sites (as approved at the last SSP) are now processed. For the pre-Neogene (= deep basement) site there were only old analog-type records from SCRIPPS EURYDICE and from KANA KEOKI available. These lines were never discussed by SSP.

4. NANKAI

   TOKUYAMA presented new IZANAGI sidescan and bathymetry data on the Nankai area. SSP approved the previous NANKAI package at its Swansea (September 1988) meeting, and at Hawaii (April 1989) it was noted that PPSP had approved the original sites. BALL commented once more that two new sites had been presented to PPSP at its July meeting (NKT-2A and NKT-10).

5. N.E. AUSTRALIA

This package was approved by SSP at its Swansea meeting. BRENNER has recently been working with Peter DAVIES in Australia and PPSP consideration is expected by BALL to be in mid-February. In terms of operations KIDD noted BRENNER's phone comments on the shallowness of some of the holes in an area of strong boundary currents.

6. VANUATU

The Vanuatu data set has been already been approved by SSP. It was concluded at this meeting, however, that the diving data now showed that sufficient 'spud-in' sediment is present at all sites; no outcrop was observed in the dives near the sites.

7. LAU BASIN

SSP has approved in general the data package on Lau Basin. All presently proposed sites have been reviewed and approved by SSP. Final review, including any new sites, must take place at the next SSP meeting.

8. CASCADIA ACCRETION : OREGON AND VANCOUVER MARGINS

Both regions have recently had detailed MCS profiling completed. These data are necessary for final evaluation of site locations but were not available for this meeting. Processing of these data should concentrate on site locations so that proponents have it ready for the next SSP meeting in April 1990.

Oregon: this represents SSP's first review of the detailed Oregon data set. The proponents have essentially met the other requests from SSP's last assessment regarding High-resolution SCS and MCS. SSP is impressed with the regional coverage and this is certainly adequate. However, in view of the fluid pathways objectives for this drilling, SSP requests that the proponents present for the next meeting a detailed near-site compilation of data tracks and types of data collected to demonstrate that the potential to trace the 3D structure and faulting is there. SSP notes that the processing is unlikely to be available before decisions are made by PCOM on scheduling this drilling and also that true 3D processing is not possible with the existing track spacing.

Vancouver: LOUDEN presented an update on the Vancouver program noting the presence of BSR's and that the proponents would like to drill one of the BSR's to study their temperature/pressure implications and also their relationship to fluid migration.

Specific responses from proponent HYNDMAN to SSP's recommendations from its last meeting including questions about imaging of the BSR's have not been forthcoming. SSP recommends that Oregon and Vancouver proponents be invited to the next SSP meeting in April 1990.

9. EPR BARE ROCK DRILLING

Site survey requirements are met by the present package except for video imagery to be collected with ARGO on the "Thomas Washington" in

November 1989. SSP approves these sites with the provision that video imaging for guide base location will become available from the above cruise.

10. SEDIMENTED RIDGES

Much new data has now come through for SSP assessment. All that is missing presently is the processed MCS data, but SSP does not believe this is crucial to our approval of the sites.

On MIDDLE VALLEY, SSP approved the data set as adequate but requests that for completeness a compilation map of coring and rock drilling stations along with logs and physical properties data is submitted for its next meeting.

On ESCANABA Trough, SSP noted that no nearbottom sidescan data are presently available at Escanaba trough, although GLORIA coverage does exist. SSP strongly endorses the acquisition of high resolution SEAMARC-type data for this data package.

11. ATOLLS AND GUYOTS

Two revisions of Schlanger's and Winterer's proposals now exist, plus new USGS "Farnella" cruise data (Hein) just completed. SSP wishes to invite Hein to present at SSP's next meeting and also Winterer to be invited to attend or send a data package.

12. EASTERN EQUATORIAL PACIFIC

N. Pisias finished a cruise on R/V "Washington" with a data package for 12 potential drilling sites in the areas of the earlier proposal, plus 2 new locations. The data package for the proposed site locations: EEQ-1, EEQ-2, EEQ-3, EEQ-4(1), EEQ-4(2), WEQ-2, WEQ-3, WEQ-4, WEQ-5, WEQ-6 and WEQ-7; as defined after the R/V "Washington" cruise, contains all the data and information that SSP requires for approval. SSP approves the sites as presented through this data package but notes that care must be taken to collect good 3.5 KHz records on site approaches where the sediment is thinnest (e.g. WEQ-2). All sites should be checked by proponents for sediment thickness.

13. CHILE TRIPLE JUNCTION

Three suites of holes are proposed to address the three major thematic objectives endorsed by TECP at their October 1988 meeting.

SSP concluded for the Hannover meeting that the data package is regionally adequate but final site locations are still being refined. Apart from the CDP seismics and GLORIA, the regional data package can be considered as having been lodged with SSB. Detailed site specific data packages, including processed CDP and parts of GLORIA swaths are expected to be lodged as the final sites become defined. SSP noted that BSR's are a clear feature of many of the lines reviewed in Hannover.

14. NORTH PACIFIC NEOGENE

A new NPAC Neogene summary has been produced and new site locations have been inserted but the site numbers have been retained. All proponents should ensure that changes in site location are given new site numbers or suffices in order to flag these changes to SSP and

PPSP. Data for some of the new sites is very poor e.g. NN-3. There are some sites for which data appears sufficient for the palaeoceanographic objectives. Other sites are based on poor data and the possibility exists that the sections are not typically pelagic. SSP recommends that the proponents look to more recent USGE-EEZ survey data or to NGDC compilations.

15. BERING SEA

SSP noted that again there is a potential confusion arising from site numbering designation in the new Bering Sea proposal. Geophysical coordinates and other information is missing from the site summary forms. No new sites are involved. The USGS data package is sufficient.

16. LOWER CRUST AT 504B

The data package is considered complete at SSB and was previously approved by SSP.

17. ENGINEERING LEG 2

An SSP style survey matrix form was faxed by A. Meyer to Hannover following the TAMU pre-cruise planning meeting for this Leg held 17-18th October. SSP commented "that the drilling was now to take place and our only concern was to give general approval and provide any necessary recommendations on how the ship's visit to the sites could improve existing regional data sets in the area. Chairman was asked to request ODP to ensure that 3.5 KHz and digital high resolution seismic data was collected on approach and departure from each site. New Shatsky Rise data is of particular importance due to the lack of an existing high quality geophysical data set there."

18. Ten new proposals that have passed initial thematic and PCOM assessments with favourable reviews were assigned to SSP 'watchdogs'.

SSP HANNOVER MEETING

Action Item List

Item No.	Person	Action
1	LOUDEN/ D'OZOUVILLE	LOUDEN to check with Kate Moran on her status as liaison to SSP. She is invited and expected to attend SSP meetings. D'OZOUVILLE to check same about Jim Hedberg.
2	LOUDEN/LARSEN SUYEHIRO	ESF, Japan, Australia ship schedules are still requested for SSP Appendix I. LOUDEN, LARSEN and SUYEHIRO to check.
3	KIDD	Chairman's report to PCOM is to stress again the need for good underway geophysics and real-time navigation on JOIDES RESOLUTION.
4	KIDD	KIDD to include in his report for Panel Chairman's meeting ned for Panels to prioritize proposals, early. SSP needs more time for evaluation of site survey data.
5	ALL PANEL MEMBERS	All PANEL MEMBERS to note to national committees that SSP guidelines for proposals have been revised - see appendix II. New guidelines are presently being sent to all proponents by JOIDES Office.
6	D'OZOUVILLE/ BRENNER	D'OZOUVILLE to send all thematic panel minutes and working group reports to Data Bank as they are received. BRENNER to send any revised proposals and relevant reports as received to 'watchdogs'.
7	LEWIS	LEWIS to remind USGS proponents, especially Normark/Clague, to send Hawaii flexture and other data to the Data Bank.
8	LOUDEN	LOUDEN to request Cascadia proponents to send a near-site data compilation confirming that data necessary to delineate 3D structure of the faulting is available. This is to include all 3.5 KHz data that is available.
9	BRENNER	BRENNER to check whether Vancouver margin data in the Data Bank? If not, he is to 'torque' proponents, if so BRENNER is to send copies to Keith LOUDEN.
10	KIDD/LOUDEN	KIDD to request to PCOM chairman that Oregon and Vancouver site proponents be invited to next SSP meeting. LOUDEN to pass on information that invitations are likely.

11	LOUDEN	LOUDEN to request that a compilation map of core stations with logs, and physical processes data be submitted to SSP, for the completeness of the Middle Valley data set.
12	DUENNEBIER	DUENNEBIER to send updated Atolls & Guyots matrices and reports to KIDD, ASAP.
13	KIDD/ DUENNEBIER	KIDD to request PCOM chairman to invite Jim Hein and Jerry Winterer to present Atolls & Guyots data at next SSP meeting. DUENNEBIER to pass on information that an invitation is likely.
14	DUENNEBIER	DUENNEBIER to ensure ATOLLS & GUYOT's data is sent to Data Bank by Winterer & Hein and himself.
15	LARSEN	LARSEN to notify Neogene proponents that they should re-number sites when they are relocated or designate with a letter suffix. He will also pass on SSP's reservations over the quality of data at some sites.
16	LARSEN	LARSEN to check that al Bering Sea USGS data is with BRENNER in the SSB.
17	D'OZOUVILLE	D'OZOUVILLE to sent out the assigned Atlantic and WPAC proposals to SSP watchdogs from JOIDES Office.
18	KIDD	Chairman to add "culling" of watchdog list to the agenda of the Fall meeting of SSP.
19	KIDD	Chairman to request ODP to ensure that 3.5 KHz digital high resolution seismic systems are operating on approach and departure from each site on engineering. New Shatsky Rise data is of particular importance due to the lack of an existing high quality geophysical data set there.
20	BRENNER	BRENNER report on new proposals was very useful, but the Panel would like also to have a listing of data that is existent in the data bank from each area.
21	KIDD	KIDD to recommend to PCOM Chairman the following dates for the next SSP meeting: Monday - Wednesday 9-11 April 1990 at Menlo Park, California, to be hosted by LEWIS.

UNIVERSITY OF CAMBRIDGE
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CB2 3RS

November 1, 1989

Ralph Moberley,
PCOM Chairman
HIG

Dear Ralph,

This letter refers to two items in the OHP minutes on which the panel has asked me to give PCOM guidance:

1. Co-chiefs for a possible Eastern Equatorial Pacific Neogene Transect. OHP strongly favours PCOM inviting Pisias (failing Pisias, Mix). In the event of a second US co-chief being selected, Rea would be an excellent choice. The non-US co-chief should be Mayer (although it was not appropriate to discuss it at the meeting I should say in this letter that OHP members were extremely dissatisfied at the way national allocations prevented Mayer being a co-chief for Leg 130. I do not wish to imply that he should be given this leg as a consolation prize - but I think there is no doubt whatever that he would be the best choice).
OHP also explicitly discussed possible co-chiefs from among the other participating nations and were unable to come up with any other name except Shackleton (UK). I did reiterate the question privately with most of the non-US nominees on OHP.

The second matter is possible members of OHP following the retirements of Droxler and Mayer.
There was considerable agreement that the best replacement for the expertise lost would be Sy. Schlanger. I believe that you will have no difficulty in providing PCOM with an adequate resumé of his qualities.
We discussed other areas in which we are weak. As several of the first order Neogene problems formulated by SOHP will have

been addressed within the next few years it is becoming important to give more attention to Paleogene themes that will rise to highest priority, and the panel is relatively weak in committed Paleogene paleoceanographers; K. Miller would be an excellent choice in this area. I felt that it would have been somewhat difficult having him as my only sea-level expert because I consider that he would advocate his own opinions and approaches too strongly; however, he would be a valuable addition to Loutit's expertise in that area also. You mentioned that you do not know him well. New Jersey background; graduate student at Woods Hole, then several years at Lamont, now at Rutgers (but still partly Lamont). Has worked on: biostratigraphy, bio-magneto correlations, stable isotope paleoceanography, sea level, sequence stratigraphy, all in the Cenozoic.
There was also discussion regarding siliceous biostratigraphers, and broad-ranging paleoceanographers, and several names came up of whom John Barron (USGS) found by far the most favour. The panel were equally in favour of Barron and of Miller as valuable additions to our expertise.

I also brought up the matter of a spokesman for the high Southern latitudes. I think that we need to have somebody in the panel structure- and the OHP is probably the best place- who can adequately cover the whole range of Antarctic paleo-environmental problems both relating to the continent and to the ocean. I would prefer to discuss a few names with the panel before coming to you with a request for that area

Two other matters. We did discuss the fact that ideally the cruise prospectus should be distributed to the thematic panel(s) that were responsible for convincing PCOM that the leg should be scheduled. At the time of our meeting we accepted that this would be impractical from the point of view of timing. However, it does seem to me that if three copies of the draft were automatically sent to the responsible thematic panel chairman and to his designated watchdogs this would provide a useful safety net if PCOM feels this would be desirable. I don't want to push this, only an idea.

Secondly, Tom Loutit mentioned to me that he might (depending on his reaction after looking at their minutes) be interested in being a liaison to TECP. This did alert me to the fact that there is a tectonic aspect of ocean history that might render such a liaison valuable. There is more than one function for a liaison and in this case I think that it would be (a) to indicate to OHP if any TECP proposals would warrant support from OHP and (b) to alert TECP to those proposals that might elicit such support. I will discuss this at the Panel Chairs meeting.

All the best,

N.J. Shackleton, Chairman OHP

OHP October 24-26 1989: Executive Summary

89-470

1. OHP consider that if JOI are forging formal links with major global initiatives, it would be appropriate for the IGBP to be one of these. This could be raised at the IGBP Working Group on Past Global Change chaired by Hans Oeschger.

2. In order for the DPG's to report to PCOM through the thematic panels it is essential that thematic panel members receive copies of their reports (e.g. the CEPACDPG prospectus). An appropriate mechanism would be for the JOIDES Office to take responsibility for copying and distributing these. This mechanism will ensure that even if the thematic panel does not meet between the DPG and the PCOM meetings, at least the Thematic Panel Chairmen will be able to transmit panel reactions to PCOM should this prove necessary.

3. TAMU must be aware that for Leg 130 (Ontong Java) it is essential that the core orientation device is operational and in place for all APC holes, and that all precautions are taken to avoid impediments to its successful use such as the barrel magnetization problem that was identified on Leg 115. This will also be the case if the Eastern Equatorial Pacific Neogene Transect program is drilled.

4. In view of the importance of high-resolution physical properties data for achieving the objectives of some legs (including Leg 130 Ontong Java), and in view of the mistrust that is generated by the presence of a systematic offset between careful discrete sample bulk density measurements and high-calibre continuous GRAPE data, OHP requests the SMP chairman to provide clear guidelines as to the most appropriate way of using these two independent estimates in the context of detailed Mass Accumulation Rate reconstructions.

5. OHP recommends that the sampling strategy required to achieve the scientific objectives of a leg such as 130 should be properly planned and that the presence of a

statement of the sampling requirements and strategy within the cruise prospectus may be the appropriate means to ensure that a conflict between routine sampling directives and the needs of the shipboard scientific party does not either prejudice the achievements of the leg, or give rise to the drilling of needless extra holes or to petty subterfuges designed to circumvent the TAMU directives.

6. OHP unanimously selected the Eastern Equatorial Pacific Neogene Transect for drilling in FY 1991 from amongst the list given by PCOM. This leg is as highly regarded by OHP as it was by former SOHP and is based on one of the best-formulated proposals before the panel. OHP do not wish to discriminate among the remainder of the list since none of them addresses themes in the OHP mandate.

7. OHP discussed the relative merits of proposed sites OJP3 and OJP6 on Leg 130 and on balance favour drilling the deeper OJP3. In addition (a) OHP recommend that the chief scientists be permitted to reverse this choice if the material recovered at Site OJP4 suggests that this would be preferable; (b) in the event that unforseen circumstances were to permit it (e.g. premature termination of the last Site) OHP would be happy to see both OJP3 and OJP6 drilled.

8. OHP emphasise that the upper part of shallow site OJP1 essentially duplicates DSDP586 and that the primary purpose of this site is to obtain greatly improved recovery of the very important Middle-Late Miocene and Early Miocene records revealed in a fragmentary and distorted form at DSDP289. Time should be devoted to double-XCB recovery of this part of the section rather than to needlessly replicating the Latest Neogene in order to maximise the amount of high-resolution Cenozoic record that can be recovered at the site.

9. Mix should immediately send Shackleton a copy of the survey cruise report relating to the Eastern Equatorial Pacific Neogene Transect.

OHP met in Giessen F.R. Germany from October 26th to 28th 1986, hosted by Ruediger Stein. Uncorrected minutes follow:

Present: OHP members Shackleton (chairman), Berger, Berrgren, Bralower, Davies, Delaney, Droxler, Jansen, Kent, Loutit, Mayer, Mix, Saito, Stein, Vincent, etc plus Brass (PCOM), Jenkyns (PCOM), McKenzie (SGPP), Smith (LithP), Sliter (CEPAC), and R. Moberley (PCOM chairman). An apology was received from Barron, unable to attend. After a welcome from Stein, corrected minutes were distributed. The chairman thanked Peggy Delaney for having done an excellent job in taking notes at the previous meeting.

Hugh Jenkyns reported on the last two PCOM meetings.

Of particular note: the manner in which legs will be selected given the move away from planning by circumnavigation; each spring PCOM meeting will examine the priority programs of each panel and on that basis plan an outline ship track. Each winter PCOM meeting will finalise a further fiscal year of actual drilling legs selected from the ones on that track.

A new publications policy allows more freedom to publish in the open literature while spelling out rather explicitly what can be published before the acceptance of material for the B volume: papers that have been agreed (content and authorship) either by the shipboard party aboard ship, or by the time of the post-cruise meeting. See ... for the new directives.
OHP assumes that TAMU are responsible for explaining this procedure to co-chiefs and shipboard scientists.

We were interested to hear of the new proposal whereby the cruise prospectus is written with a PCOM liaison present: Moberley emphasised that this person is selected by PCOM but is not necessarily a PCOM member; it can be a panel member or a proponent. The object is to ensure that the prospectus does reflect PCOM's intentions, since from that point on TAMU are responsible for ensuring that the cruise follows it. Although OHP felt that the appropriate thematic panel(s) should approve the prospectus it was appreciated that this may be impractical from the point of view of timing.

WPDPG is disbanded.

JOI inc. is setting up formal links with certain global geoscience programs. Both Shackleton and Davies queried why IGBP was not included and OHP proposed that NJS should investigate the receptiveness at the level of the "past global changes" subset of IGBP.

Explicit PCOM instructions to panels (quote)
In reply to a question Moberley stated that if OHP feels (for example) that the APC recovery of the sediment at the location of a proposed lithosphere site were important, it would be desirable to produce a formal proposal.

PCOM specifically charged OHP to select between deeper sites OJP3 and OJP6.

In future PCOM would like a short CV for proposed new panel members.

NJS apologised to the panel for the fact that the minutes actually in the PCOM agenda book were retyped at HIG from TELEMAIL (not downloaded from TELEMAIL) and were abbreviated).

Sea Level Responsibility

NJS reported his concern at the shared responsibility for Sea Level, a major theme of the COSOD II report. The reality of frequent global eustatic sea-level changes is not properly established; this slows down attempts to verify that such variations occur during periods of Earth history when glaciation could not have been the mechanism (assuming there have been such times, which is also uncertain) and parallel attempts to provide alternative mechanisms. NJS argued that the problem is so important that it would be better for it to be clearly mandated to one panel and that panel given appropriate expertise to handle it. He requested such expertise at the Nov 1988 PCOM meeting, and when one of the names he proposed to PCOM was assigned to

SGPP he assumed that PCOM intended mandating that panel to handle the question. Others argued that the problem may have a better chance of being tackled if it is mandated to more than one panel. It was agreed that having fully aired the question it may be safe to give the present divided mandate a trial.

After McKenzie had listed the chief content of the SGPP white paper (Sediment Fluxes; Sea Level; Fluids; Metallogenesis; paleocean chemistry; technology) it was remarked that paleocean chemistry is also in the brief of both OHP and SGPP and that this could also be seen as rational.

Items to report

NJS welcomed R. Moberley's decision to attend one meeting of each thematic panel in order to promote understanding (especially with reference to the planning process).

The policy of supplying 50 offprints from ODP volumes free of charge is being reinstated.

T. Pyle has prepared a summary of the number of days spent doing useful work per leg and finds that the faster transit between sites has been the major improvement compared with the Glomar Challenger.

K. Moran (SMP Chair) had requested through Moberley that OHP should send a guest to their meeting to advise on possible changes in core description procedure. NJS proposed either Kent or Ruddiman (Ruddiman attended).

A meeting on Upwelling Research in Scientific Ocean Drilling is being organised by Colin Summerhayes and Kay Emeis for July 1990 in London (Colin Summerhayes, Director, IOS Deacon Laboratories, Brook Road, Godalming, Surrey GU8 5UB UK).

Davies, tentatively nominated SGPP liaison at our last meeting, had been unable to attend and Droxler had attended instead.

NJS reported that he had received a copy of a letter to PCOM chairman expressing concern at a TAMU memo issued to him as a chief scientist which stated that the Operations Manager, not the Chief Scientists, had responsibility at sea to assess how best to achieve the scientific objectives. Moberley reported that the offending paragraphs had been struck out of the draft document from which they were quoted. He did however point out that PCOM had realised that contractually TAMU had responsibility to carry out the objectives laid out in the Cruise prospectus approved by PCOM, yet at the same time PCOM realised that in practice they have not approved the cruise prospectus. This realization is behind the decision that PCOM should nominate a liaison to ensure that the prospectus does in fact reflect their intentions.

On a related matter Moberley stated that OHP should send a liaison to a DPG (eg CEPAC) to ensure that proposals that the DPG are authorized to include in their detailed planning, are correctly represented. Sliter pointed out that they had (on OHP advice) invited proponents to achieve this objective, a procedure that was at the time endorsed by OHP as being appropriate. However Moberley reiterated that a panel member should attend the next CEPACDPG November 16-17 to ensure that the planning that they perform on the basis of the newly acquired survey data properly reflects the interests of the panel. Mix (failing Mix, Mayer or possibly Pisias since it is a one-proposal program so that there is no conflict of interest) should attend.

Moberley also reported that it is his intention in future that operational DPG's should meet in summer so that the intention of their reporting to PCOM via the thematic panels can be realised. It was reiterated that thematic panels must receive copies of DPG prospectuses if this system is to be operable, and that the JOIDES office rather than the DPG chairmen would best be responsible for doing this. Moberley undertook to ensure that the recent updates of the North Pacific and Bering Sea portions of the CEPAC prospectus are circulated to all OHP members.

NJS reported that the third International Paleoceanography Conference recently held in Cambridge had been judged very successful and that the next will be hosted by Thiede in Kiel in

1992 (spare abstracts books may still be available from Margaret Johnston, administrator, Department of Earth Sciences, Downing Street, Cambridge UK).

The Nansen Arctic Drilling organization has an international organizational framework with connections to ODP. For a recent report contact Torre Vorren.

Mix reported that the USAC meeting to promote interaction among members of the WOCE, GOFS and ODP communities had been very successful and that reports had appeared eg in the JOIDES JOURNAL.

East Pacific Neogene Planning

Mix reported on the results of a recent survey cruise for proposal 221/E which permits a cruise plan to be completed. All sites on both the 110 West and the 95 West transects were surveyed successfully and the proposed sites cored. NJS reminded the OHP that the original proposal had been very highly ranked because it was particularly well designed in terms of the present physical oceanography of the region, the well documented reflection of this physical situation in the underlying sediment, and the clearly formulated external changes (Milankovich forcing, evolution of major glacial episodes over the last few million years, closure of the ocean circulation between North and south America).

Kent emphasised that a WORKING ORIENTATION DEVICE (and demagnetized core barrels) is ESSENTIAL for all holes on this leg. NJS read a letter from Backman relevant to the objectives of this leg, highlighting the importance of high-resolution physical properties measurements (wet bulk density). Mayer responded that the GRAPE data is of good quality and Stein reported on recent detailed comparisons between GRAPE and discrete-sample measurements which suggest that although there is a calibration offset, the quality of the GRAPE data is excellent. NJS asked whether the origin of the offset is being investigated, since the fact that the numerical GRAPE data do not agree with the carefully made discrete measurements, tends to strongly discourage people from trusting and making use of the GRAPE data.

It was emphasised that both this leg and the upcoming Ontong Java leg will lead to intense sampling pressure. On the one hand, OHP recommend that on such legs the sampling procedure should be carefully planned in advance in such a manner that those scientists intending detailed studies do receive samples representing a complete cover of the record at the Site taking advantage of overlapping Holes. On the other hand, TAMU should ensure that routine sampling (particularly whole-round sampling but also other low-frequency sampling) is focussed on sections of core that will not be required to make up these detailed suites. Such a sampling strategy will also aid in assessing how much of each hole should be triple-cored with the APC. Kent suggested that channel-sampling such as has occasionally been adopted for paleomagnetic studies might be appropriate. OHP were unclear whether or not this would optimise the use of the material; it should be considered. OHP reiterated that the regulations for sampling MUST be sufficiently flexible to ensure that they permit the objectives of the cruise to be achieved properly. It is highly inappropriate if it becomes necessary to propose that triple coring of a Site solely in order to circumvent TAMU regulations and equally it is inappropriate that sampling density required can only achieved by subterfuge. The sampling plan should be communicated to TAMU at an early stage, which could be achieved if some statement of sampling requirements and strategy were included as a part of the cruise prospectus.

In response to PCOM request, OHP strongly endorsed the Eastern Equatorial Pacific Neogene Transect program based on proposal 221/E as their highest ranked of the far Eastern Pacific programs that the panel was asked to rank (i.e. Cascadia Accretionary Prism, Chile Triple Junction, Eastern Equatorial Pacific Neogene Transect, East Pacific Rise Bare Rock Drilling, Hydrothermal Processes at Sedimented Ridge Crests, Lower Crust at 504B). NJS proposed that it would be inappropriate to prioritise among the remainder since none addresses problems within the OHP mandate. Possible co-chiefs for such a leg were discussed and their names forwarded to PCOM chairman.

Ontong Java Leg 130

Ontong Java will be Leg 130 (January-March 1990; Berger and Kroenke co-chiefs). In response to PCOM request the relative merits of OJP3 and OJP6 were discussed at length; good cases were made for both, and OHP felt that had there been more time to develop and discuss the proposal after survey, both would have been included. A majority favoured the deeper OJP3 with the proviso that the co-chiefs should be free to alter this decision in the light of their findings at the next-shallower site OJP4. If unforseen circumstances force OJP5 to be abandoned with time spare it might be valuable to return and core OJP6.

Concern was expressed at the manner in which basement objectives not highly ranked by LITHP (Dec 1987: 5th priority, thereafter not ranked) had been scheduled to the detriment of highly-ranked OHP objectives. Of particular concern is the loss of the depth-transect in the Mesozoic which had potential to shed considerable light on the Pacific Ocean at the time of the mid-Cretaceous "Ocean Anoxic Events"; Stein expressed the view that these sites had been even more promising than those on Shatsky Rise for the understanding of that problem. This would have required that one of OJP3 and OJP6 was drilled to the base of the sedimentary section rather than OJP4 (3400m water depth), which is too close in water depth to OJP5 at 2600m.

The drilling strategy for OJP1 was discussed. It was pointed out that the APC portion of this site more-or-less duplicates the section double-APC recovered at Site 586 and is not the prime objective. On the other hand the lower part of the section provides the opportunity to exploit the XCB to recover the remarkably important and exciting events observed by Woodruff and Savin at the base of the Late Miocene in Site 289, which are interpreted as reflecting major glacial-interglacial cycles on Antarctica. In addition the Milankovich-scale fluctuations documented by Shackleton in one relatively undisturbed core in the Lower Miocene in rotary-drilled Site 289 should be accessible. Any time accruing from quicker completion of OJP 4,3 and 2 should be used to double-XCB this part of the section so as to optimise the possibility of compiling long truly complete

sections suitable for detailed work through the whole Miocene, in preference to repeating the upper part of the section.
The issue of the sampling strategy for this leg is similar to that discussed for the Eastern Equatorial Pacific Transect.

Engineering leg 132

Sliter reported on plans for leg 132 (Engineering 2). This leg will test the new Diamond Coring System in three scientific applications (Bonins, Shatsky, and MIT Guyot), of which the last two will be of OHP interest. Sliter was involved in site selection for Shatsky while the MIT Guyot site is from proposal 203. OHP would like a reliable report on this cruise at their late 1990 meeting since it will have a critical influence on the viability of several important proposals. Possibly one of the scientists from Leg 132 can be invited to part of our meeting.

Proposal Reviews

OHP embarked on the reviewing of proposals numbered 321 onwards together with a few revisions affecting earlier submissions. several have no OHP objectives, or have some side-objectives within the OHP mandate but which OHP consider will not much enhance the chance of their being tackled: 321; 322; 324; 325; 328; 330; 331; 333; 334; 342; 343; 344; 346 (OHP are of the opinion that the paleoceanographic objectives probably weaken this proposal and might profitably be removed); 349. For the remainder there was significant discussion.

At the end of the meeting the proposals discussed were categorised according to the theme addressed, and then roughly prioritized on the basis of their degree of maturity and plausibility. It was agreed that those in the lowest priority ranking would probably not be put forward at the end of the next meeting and that attention should be given to optimising the consideration given to the remainder so that they can be prioritized in the manner recommended by PCOM. At least the following proposals or programs will be reconsidered at the next meeting: 203, 271, 305, 320, 326, 329, 335, 336, 337, 338, 347, 348 together with the North Pacific Neogene, Bering Sea and Deep

Stratigraphic Tests (Somali Hole) programs. Members were asked to contact the JOIDES Office in Hawaii to request copies of any of these proposals that they do not already have.

Panel Membership

NJS thanked retiring members Larry Mayer (much appreciated former chairman) and Andre Droxler for their service to the Panel and the Ocean Drilling Program. Several names were discussed both in relation to the areas covered by the retiring members and to and other areas (siliceous biostratigraphers; Paleogene paleoceanography; high Southern latitude problems) and OHP selected three names for forwarding to PCOM.

Next Meeting

The constraints considered were the PCOM meeting (April 24th) and the end of Leg 130 with three OHP members on board (March 27th, Guam). We plan to meet in Hawaii at a location to be announced, March 29th-31st (unless a major change in ship schedule in the near future forces a change).

FINAL

Sedimented Ridge Drilling Prospectus

October 1989

Preface

The Sedimented Ridge Detailed Planning Group (SRDPG) was established by PCOM in December, 1988 and charged with developing a detailed prospectus for drilling at sedimented ridges in the eastern Pacific. The members of the DPG were drawn from the combined membership of LITHP's EPR and Sedimented Ridge Working Groups (see Appendix 1). The SRDPG met 13-15 June 1989 in Ottawa and developed the drilling program presented in this document. The panel relied heavily on the 1988 LITHP White Paper *"A Drilling Strategy for Sedimented Ridge Crests"* in its discussions and the reader is referred to that document for a more thorough presentation of the thematic goals and scientific objectives of sedimented ridge drilling. This prospectus focuses on the drilling strategy required to address these scientific goals, the geological setting and location of the proposed drilling sites, and associated coring, logging and sampling requirements. The format of the prospectus follows that used in the current CEPAC Prospectus.

Thematic Goals

Sediment-covered spreading centers, although relatively rare, provide the Ocean Drilling Program with a unique opportunity to investigate a number of fundamental geologic processes including hydrothermal circulation, sulfide metallogenesis, and crustal formation. These objectives have been identified as a high priority for drilling in both the COSOD I (Working Group I) and COSOD II (Working Groups II and III) reports and in the LITHP White Paper. Sedimented ridge drilling has been rated a top CEPAC priority by LITHP and should also be of considerable interest to the newly formed Sedimentary and Geochemical Processes Panel (SGPP).

Scientific Objectives

Sedimented ridges provide an unparalleled opportunity for quantitative studies of the fundamental physical and chemical processes associated with submarine hydrothermal systems. A regionally continuous, relatively impermeable sediment cover over zero-age crust limits the recharge and discharge of hydrothermal fluids, and conductively insulates the underlying crust. Where discharge of fluids does occur, very large hydrothermal sulfide deposits can be produced. The sediments may also preserve a relatively continuous stratigraphic record of magmatic, tectonic and thermal events, providing clues to the spatial and temporal variability of these processes. Although a sedimented ridge drilling program will provide information on all of these processes, LITHP and the Sedimented Ridge Working Group have recommended the primary focus of drilling at sedimented ridges should be on hydrothermal problems. Specifically, the two highest priority objectives are:

- *A three-dimensional characterization of the fluid flow and geochemical fluxes within a sediment-dominated hydrothermal system*
- *A systematic investigation of the processes involved in the formation of sediment-hosted massive sulfide deposits*

Geological Setting of Proposed Drilling Sites

Three sedimented rift valley settings were considered for this drilling program: Guaymas Basin in the Gulf of California, Escanaba Trough along the Southern Gorda Ridge, and Middle Valley on the Northern Juan de Fuca Ridge. Detailed descriptions of the sites and site survey data are given in drilling proposals 232/E, 275/E, and 284/E. Summaries for Middle Valley and Escanaba Trough are given below. These rifts have much in common, including their general dimensions, the extensiveness of sediment fill, the occurrence of syn-sedimentary volcanism, and the presence of demagnetized or non-magnetic crust. Distinct differences exist in sediment type, the level of current hydrothermal activity, and the size and type of massive sulfide deposits at each of the rift valley sites. These differences are important with respect to the nature of the sulfide deposits, and this is reflected in the selection of several sites at both Middle Valley and Escanaba Trough for a sulfide drilling program. The differences are believed to be less important as they relate to fundamental hydrothermal processes at sedimented ridges. For this reason, a single site was selected for the hydrologic study. On the basis of simplicity, level of current hydrothermal activity, and completeness of site survey information, Middle Valley was favored for this phase of the program.

Middle Valley

For most of the length of the Juan de Fuca Ridge, magma is supplied in abundance, and although the spreading rate is only 58 mm a^{-1}, the morphology of this ridge is similar to that of faster spreading ridges. At the north end of the ridge, at its intersection with the Sovanco Fracture Zone (Figure 1), the supply of magma is diminished significantly and a deep extensional rift is present known as Middle Valley (Figure 2). The proximity of this rift valley to the continental margin has caused it to be filled with Pleistocene turbidite sediments. Basement shoals to the south away from the fracture zone intersection, but continuous sediment cover over the full 10-15 km width of the valley between the primary bounding normal faults persists over a distance of 60 km along the axis.

Early heat flow measurements in the valley indicated that temperatures in the oceanic crust beneath the sediments were buffered by ubiquitous hydrothermal circulation. In spite of large variations in sediment thickness, temperatures fell within a range of about 150 to 320°C. Subsequent detailed measurements have substantiated this conclusion and have provided a more complete picture of the heat flow and basement temperature variations in the southern part of the valley. A compilation of heat flow measurements is shown in Figure 3. This information is combined with estimates of sediment thickness from seismic reflection data (Figure 4) to give estimates of temperatures at the sediment-basement interface (Figure 5). There is a general tendency for basement temperatures to increase toward the center of the valley and away from the normal faults that bound the valley on the eastern side. This may be due to the influence of hydrothermal recharge supplied through the thinner sediments that fill the eastern part of the valley, and through basement exposures along the normal faults themselves. Estimated temperatures also decrease in the northern part of the survey area where high sedimentation rates cause the simple estimates of basement temperature to be erroneously low, and in the southern part of the area where the sediments are probably too thin to prevent advective heat loss. Elsewhere, temperatures range from about 150 to 350°C. In a few isolated cases, estimated temperatures exceed 350-400°C. These estimates are probably erroneously high. Fluid discharge through the sedimentary section is known to occur at two of these locations, and thus the assumption of conductive heat transfer used to calculate temperature profiles from the surface heat flow measurements breaks down.

Within the Middle Valley area, discharge currently is focussed at two locations. The most vigorous occurs above a small buried basement edifice (the location of site MV-1 in Figs. 2-5). This area, referred to below as the High Heat Flow Area (HHFA), is associated with conductive heat flow values ranging from 2 to over 20 W m^{-2}. A small number of isolated chimneys vent black "smoke" and areas with active vent fauna communities have been observed. These and other small sulfide outcrops occur in a rift-parallel zone roughly 1200 m long and 300 m across within a minor (10 m relief) local topographic depression (Figure 6). Detailed piston coring shows that the amount of sulfide deposited in this area is very minor with large lateral gradients in the degree of alteration of the upper 4 m of sediment. Cores recovered from the center of this zone are highly altered and have been dewatered by heating to the point that sediments from depths of less than 3 m are semi-indurated. Sediments just tens of meters away are relatively unaltered. The hydrothermally altered sediments are weakly mineralized with disseminated pyrite and contain secondary carbonate concretions. No temperature measurements or fluid samples have been collected from these vents, but judging from the regional basement temperature estimates, vent fluid temperatures are probably of the order of 350°C. The lack of surficial topography suggests that the basement edifice predates and is simply buried by the overlying sediment section. The amount of burial is illconstrained by the seismic data; the best, but maximum, estimate is 120 m. All available evidence suggests that this area represents a hydrothermal discharge zone in the initial stages of formation. Although high temperature fluids are discharging at the seafloor, the system has not been active long enough to form a large sulfide deposit.

A second area of current hydrothermal discharge occurs just south of a large sediment/sulfide dome, referred to below as the North Sulfide Mound (NSM; location of site MV-2). NSM is a circular feature approximately 400 m in diameter that rises 40-50 m above the relatively flat floor of Middle Valley, with a less prominent elongate feature about 10 m high that extends about 400 m to the south (Figure 7). Several domes having similar morphology and dimensions occur in this part of the valley. All appear to be the result of lacolithic intrusions within the sediment section. Photography and sampling show the domes to be ringed by massive sulfides. An extensive area of pyritic massive sulfide with fragmental textures occurs on the west flank of NSM (Figure 7). The southern flank of the mound is covered by an area of outcropping pyrrhotitic massive sulfide. These outcrops extend southward along the less prominent elongate mound, and terminate in an area of localized high heat flow (Figure 3). Although the sulfides overlie an area with high projected temperatures at the sediment-basalt interface, the major element composition of the sulfides (Pb-poor), the Pb isotope ratios of sulfide, and the Sr isotope ratios of barite are consistent with formation from a fluid which equilibrated with predominantly basaltic source rocks. The north-to-south changes in the morphology of the sulfide outcrops, the change from pyritic to pyrrhotitic sulfide, and the southward increase in heat flow are all consistent with a southward migration of the area of active venting with time. While there is no present evidence for active hydrothermal vents on NSM, the southern portions of this mature sulfide deposit have clearly formed very recently.

Escanaba Trough

The southern Gorda Ridge spreads at a rate of about 25 mm a^{-1}, and has a morphology characteristic of other slowly spreading ridges. A deep axial rift flanked by high rift mountains runs fairly continuously along the length of the ridge between the Blanco and Mendocino fracture zones (Figure 1). Sediments from the continental margin (locally from northern California and from Astoria Fan) flood the deepest part of the axial valley near the Gorda Ridge-Mendocino Fracture Zone intersection. In the proposed drilling area (40°50'N to 41°02'N), the thickness of sediment within the southern rift valley floor ranges between 350 and 600 m. Localized normal faulting disrupts the entire sediment section in the center of the valley. At several locations along this 2-3 km wide inner rift zone, volcanics have intruded the sediment section, and in some cases extensive flows are observed on the sediment surface. Volumetrically, the intrusions appear to be small, for only minor topographic relief is produced (typically a few tens and up to 100 meters). As in the case of the domes or plugs above the lacoliths in Middle Valley, many of the "mature" domes in Escanaba Trough are ringed by massive sulfides (Figure 8).

Detailed mapping and sampling of sulfides in this part of the Escanaba Trough (known as the NESCA area) was carried out on two submersible cruises in 1988. Single channel seismic reflection profiling, multipenetration heat flow, and piston coring were conducted in this area in 1989. Large surface exposures of massive sulfide occur in the NESCA area; massive sulfides have also been encountered below the surface in piston cores. The large central deposit is the only mature sediment-hosted massive sulfide deposit that is known to be hydrothermally active. Hydrothermal fluids, with a maximum temperature of 220°C, issue from vents composed of anhydrite-barite-saponite which sit atop pyrrhotitic massive sulfide mounds. The exiting vent fluids are depleted in metals and rich in alkalies. Fluid chemistry is strongly influenced by hydrothermal interaction with sediment as exemplified by $^{87}Sr/^{86}Sr$ ratios that are more radiogenic than seawater. The composition of the sulfide deposits also reflects the importance of sedimentary source rocks in this hydrothermal system. Relative to basalt-hosted deposits, the Escanaba Trough sulfides are strongly enriched in Pb, As, Sb, Bi, and Sn. Pb isotopes are radiogenic and require a dominantly sedimentary source. Some sulfide samples contain hydrothermal petroleum. Altered sediment recovered in cores near the active sulfide deposit confirm that magnesium metasomatism is occurring in the hydrothermal upflow zone. Sediment cores near the active deposit also contained high concentrations of H_2S.

Volcanic intrusions in Escanaba Trough are numerous and large, as are the associated sulfide deposits, but in general, the level of *current* hydrothermal activity appears to be low. Three multipenetration heat flow and seismic lines across the valley a few km south of the profile shown in Figure 6 indicate heat flow is relatively low, about 0.2 W m^{-2}, and remarkably constant. Despite the extensive evidence for hydrothermal interaction with the sediment, the present heat flow values indicate basement temperature of only 75 to 90°C, much lower than in Middle Valley.

Drilling Strategy and Logistics

To address the scientific goals of the sedimented ridge drilling program outlined above, three types of holes are proposed (Table 1):

Type A holes – A-holes are non-reentry holes that will be drilled down as close to the sediment-basement interface as possible (up to 500 m bsf). The unconsolidated and semi-consolidated sediment in the upper part of the section will be cored by APC/XCB; the highly indurated sediments expected in the lower part of the sedimentary section will require the RCB or DCS systems.

Type B holes – B-holes are reentry holes that will penetrate into basement, and be cased to basement. All B-holes will be drilled at least a short distance (~50 m) into basement; at least one will be deepened substantially into basement (>500 m). The DCS would be desirable for basement drilling.

Table 1

Summary of Proposed Drilling

Site	Hole	Type	Location		Penetration (m)		Drilling	Downhole
			Latitude (N)	Longitude (W)	Sediment	Basement	Time	Time
MV-1	H1	A	48 27.33	128 42.51	120	-	1.5	2.0
		B			Wash	Bit Destruction	2.5	2.0
	S1-S5	C			50-100	-	7.5	2.5
MV-2	H2	A	48 25.82	128 40.90	120	-	1.5	2.0
		B			Wash	Bit Destruction	2.5	2.0
	S6-S10	C			300	-	12.0	4.0
MV-3	H3	A	48 26.63	128 42.65	400	-	3.0	2.0
		B			Wash	>500	14.0	6.0
MV-4	H4	A	48 27.45	128 46.28	520	-	4.0	2.0
		B			Wash	Bit Destruction	3.0	2.0
MV-5	H5	A	48 27.15	128 41.58	250	Bit Destruction	3.0	2.0
MV-6	H6	A	48 27.00	128 40.43	200	Bit Destruction	3.0	2.0
MV-7	H7	A	48 26.61	128 38.55	120	Bit Destruction	3.0	2.0
ET-1	S11-S14	C	40 00.0	127 29.5	50-100	-	7.5	2.5
	S15	A			500	Bit Destruction	4.0	2.0
ET-2	S16	A	41 00.5	127 31.0	500	Bit Destruction	4.0	2.0
							76.0	39.0
						Total	115	days

Type C holes – C-holes consist of shallow (<100 m), closely spaced holes across sulfide bodies to sample and define their structure in three-dimensions. High sample recovery is extremely important in these holes; the DCS and "pogo" guidebase would be very desirable for this part of the program.

Hydrogeology experiment ("H" holes)

In order to characterize the fluid flow and geochemical fluxes in the Middle Valley hydrothermal system an array of seven holes is recommended, designated "H" holes in Table 1. The highest priority is a single basement reentry hole which has the objective of drilling into the high-temperature reaction zone of this active system. This reentry hole is targeted to drill at least 500 m into basement and should be located in a well-defined high heat flow zone near, but not directly on, an active vent. Complementing this hole is an array of six shallower holes to define the three-dimensional pattern of fluid flow over a 100-200 km^2 area. The main objective of these holes is to penetrate into, but not substantially below, basement. They are located in areas of high and low heat flow within both active discharge and potential recharge zones. At least three of these holes will be outfitted with reentry cones for potential subsequent deepening into basement to address both magmatic and hydrothermal problems. At all seven holes an extensive program of logging, fluid sampling and borehole experiments is recommended, and plans should be made to seal the four reentry holes for possible latter hydrogeological and geochemical experiments.

Tentative sites for these holes are shown on the maps in Figures 2-5 and along the single channel seismic profiles shown in Figure 9. Multichannel seismic data will be collected in this area in September 1989, and the final position of the proposed holes may be adjusted on the basis of these and other new data.

Holes H1 and H2 are located in currently active hydrothermal discharge areas at sites MV-1 and MV-2. Both of these sites will also be part of the sulfide drilling program; one may be the location of a basement reentry hole. Site MV-1 is in the High Heat Flow Area described above where numerous black smoker chimneys occur (vent fluid temperatures and chemistry to be determined during a proposed *Alvin* program in June 1990) and the conductive heat flux ranges from 2 to nearly 30 W m^{-2}. Local basement temperatures are estimated to be in excess of 300°C. In the vicinity, depths to basement are of the order of 400 m. Directly beneath the peak of the heat flow anomaly and the hydrothermal field, a local basement edifice rises to within about 120 m of the sea floor; above that level sediment reflectors are disturbed, but it is not clear whether this is due to hydrothermal induration (the surficial sediments are highly indurated in this area) or to the presence of volcanic rock.

Site MV-2 is located in an area where massive sulfide deposits occur in the near-surface sediments just south of North Sulfide Mound. The mound is cored by a small basement edifice roughly 120 m below the surface. The drill site is located where the conductive heat flow peaks at about 5 W m^{-2} and where inactive chimneys have been photographed. The underlying sediment section is relatively-undisrupted to a depth of about 120 m, at which point a small sill or volcanic edifice is visible. Basement depths in the vicinity are roughly 250 m.

Site MV-3 is located within the same thermal anomaly as site MV-1 (heat flow = 2 W m^{-2}; estimated basement temperature > 300°C) but where no local basement edifice is visible (sediment thickness = 400 m). It is anticipated that the hole at this site will penetrate a section of sediment where temperatures are high, but where conductive heat transport dominates, and intercept a "reservoir" zone of high-temperature fluid in basement. This site is also a candidate for multiple reentry, basement penetration.

Site MV-4 is located where basement temperatures are also expected to be high and fluid flux through the sediments low. This site lies near the center of the rift valley where the heat flow is about 0.4 W m^{-2}, the sediment thickness is 520 m, and the basement temperature is estimated to be over 200°C. Site MV-4 is about 4 km away from sites MV-1 and MV-3.

Sites MV-5, MV-6, and MV-7 are located between the high temperature discharge site where site MV-1 is located and the normal faults which bound the valley. Basement temperatures decrease systematically toward the faults (roughly 150°C at site MV-5, 80°C at site MV-6, and 60°C at site MV-7). This pattern is believed to be due to the influence of hydrothermal recharge of seawater through the crustal outcrops at the normal fault scarps that bound the valley, and perhaps through the thinner sediments that fill this part of the valley.

A great deal of information about the hydrologic system active in Middle Valley should be gained with this array of sites. The influence of sediment thickness on regional recharge can be determined by sampling and logging sediment sections that are away from discharge sites and that have a wide range of thickness (120 m at site MV-7, 200 m at site MV-6, 250 m at site MV-5, and 520 m at site MV-4). The importance of local recharge at fault scarps can be investigated by determining fluid chemical gradients and physical conditions in basement along the profile from site MV-7 to site MV-3. Temperatures, permeabilities, fluid chemistry, and pressures at all of the diverse sites will provide important new constraints for models of hydrothermal flow in basin settings. Observations in possible high-temperature fluid reservoir zones at sites MV-3 and MV-4 and directly beneath the discharge sites (sites MV-1 and MV-2) will provide important information about the source region for the fluids that produce massive sediment-hosted sulfides. The role that intrusive and extrusive volcanics within the sediment section play in enhancing permeability can be examined at sites MV-1, MV-2, and MV-5. The influence of faults on permeability can potentially be examined if site MV-7 can be located to intersect the eastern boundary normal fault.

Sulfide mineralization drilling sites ("S" holes)

Processes involved in the formation of submarine base-metal sulfide deposits operate in two distinct regimes. The upper regime is the area of focussed hydrothermal upflow, sulfide deposition, and "footwall" alteration. The lower regime is the area of high temperature seawater-rock interactions that control metal transport and metamorphism of the metal source rocks. The proposed drilling sites ("S" holes in Table 1) address fundamental processes operative in both regimes.

Upper Regime – The upper part of the hydrothermal system will be investigated in three areas of current or recent sulfide deposition: the High Heat Flow Area in Middle Valley, the North Sulfide Mound in Middle Valley and the NESCA sulfide deposits in Escanaba Trough. In the HHFA (site MV-1) a minimum of five shallow (<100 m), closely-spaced (~10s of m) holes will be drilled across the sulfide deposit (Figure 6). This transect of shallow holes will be located in the same areas as hole H1, one of the basement holes drilled for the hydrogeology experiment. A similar suite of closely-spaced, shallow holes are proposed at site ET-1 in the NESCA sulfide deposit (Figure 8). Finally, four holes will be drilled at site MV-2 in the NSM deposit in Middle Valley in the vicinity of hole H2 (Figure 7).

Two aspects of the upper part of the hydrothermal system will be investigated with these holes: temporal and spatial variations in depositional mechanisms within the sulfide mounds and in the subsurface, and the alteration associated with sub-surface flow of hydrothermal fluid and seawater entrained in the upper part of hydrothermal discharge zones. Comparative investigations of the three areas will establish whether temporal changes occur in fluid composition, determine the role of post-depositional interactions within sulfide mounds on their composition, and explore the effects of differing hydrothermal fluids and source rocks on deposit composition. The HHFA at Middle Valley represents the earliest, progenitive stage of sulfide formation, where high-temperature venting is prominent, but sulfide deposition is minimal. The NSM in Middle Valley represents a intermediate stage of formation; focussed venting is not present, but the southernmost heat flow anomaly probably indicates discharge of lower temperature fluids, and may indicate active growth and metal redistribution within the mound. Escanaba Trough contains the most mature deposits of the sediment-associated type known on the seafloor. Some of these are actively venting while others are cold and degraded by seafloor weathering. This area may represent the terminal stage of massive sulfide formation.

Variations within individual deposits may be as important as variations between deposits. Closely-spaced drilling of at least two relatively mature deposits (like NSM and NESCA) is necessary in order to investigate lateral and vertical zoning within individual deposits. Ancient ore deposits can have large compositional gradients that strongly affect the economics of mining. The controls on compositional zoning are poorly understood. Studies of the surface exposures of ridge-crest deposits indicate that economically important commodities, such as gold and tin, may be deposited only in those parts of the sulfide deposits where a narrow set of chemical and structural conditions exist. Studies of the vertical distribution of elements in a sulfide mound are needed to test these hypotheses.

Closely-spaced drilling across active and inactive sites will also delineate the extent of alteration, and determine the geochemical reactions which control alteration. Specifically, these holes will establish the relative effects of high-temperature metalliferous fluid, versus locally advecting seawater and heated pore water, on the mineral assemblages in sediments adjacent to vent sites. Hydrothermal alteration and transferral of heat into sediments in the upflow zone changes the physical properties of the sediment, inducing dewatering and fracturing. These changes influence the relative importance of movement of hydrothermal fluids along beds with high primary permeability (i.e. turbidites) versus the movement of fluids along thermally induced fractures. The local subsurface plumbing affects the cooling and mixing rates of sub-surface hydrothermal fluids and therefore the mechanism and extent of sulfide deposition and alteration within the sediments.

Lower Regime – The lower part of the hydrothermal system, including the high-temperature reaction zone where evolved seawater interacts with hot sediment and basalt, will be investigated in the "A" and "B" holes drilled in Middle Valley as part of the hydrogeology experiment (especially at sites MV-1 and MV-2) and in two additional "A" holes drilled in Escanaba Trough at sites ET-1 and ET-2 (Table 1). Site ET-1 is located in a large sulfide deposit on the western edge of a large lacolith; ET-2 is about 5 km to the northwest (Figure 8). Drilling at the later site will obtain a reference section of unaltered sediment in the upper part of the hole and determine the degree of alteration and pore fluid chemistry in the lower part of the section away from a major hydrothermal upflow zone.

Drilling at these sites in both Middle Valley and Escanaba Trough will provide important controls on fluid-rock ratios, fluid residence times and reaction rates. The high temperature alteration mineralogy in the deeper source region is distinct from the shallow alteration zones that form below sulfide deposits in hydrothermal upflow zones. The deeper alteration is an aspect of seafloor metamorphism and records the chemical exchange between seawater and the upper oceanic crust. This drilling will address the differing responses of sediment and basalt to high-temperature hydrothermal interaction. The deposits in Escanaba Trough reflect extensive alteration of sedimentary source rocks; those in Middle Valley suggest the hydrothermal system is dominated by reaction with basalt. The drilling will investigate the origin of these differences in what appear to be similar sediment-buried rifts.

Factors which control the distribution and localization of hydrothermal systems will also be investigated with these holes. The basaltic signature of the Middle Valley deposit could indicate that fluids primarily reside in and react with the permeable, fractured portions of the upper oceanic crust. Fluid discharge controlled by faulting could provide rapid transport of this fluid to the seafloor with minimal opportunity for interaction with sediment. The sedimentary signature of the Escanaba Trough deposits might result from extensive hydrothermal interaction within permeable capped aquifers such as the turbidite sands which fill the median valley. Areally extensive reservoirs of hydrothermal fluid could contain the huge volumes of fluids required to form the large sulfide deposits observed in Escanaba Trough. Volcanic edifices which locally penetrate the sediment cover of the ridge could provide both topographic and thermal foci for harvesting hydrothermal fluid from a large reservoir and localizing hydrothermal discharge. The deeper drilling proposed for Middle Valley and Escanaba Trough will test these hypothesis.

Local controls on the distribution of hydrothermal discharge sites include faulting, igneous intrusion and the permeability structure of the sediments. Most of the larger deposits are associated with the flanks of uplifted sediment hills. Drilling will test the proposed mechanisms of formation of these hills, including uplift over bysmalithic intrusion and displacive growth through hydrothermal precipitation within the sediment. Drilling near these structures (e.g. ET-1) will penetrate the transition from the deeper reaction zones to the focused discharge zones and investigate the controls on the transition from interstitial porosity-controlled fluid flow to fracture-dominated fluid discharge. Local topography, sedimentary facies, unconformities, faulting, intrusion, hydrothermal alteration , thermal dewatering, and lithification will all affect development of cross-stratal permeability and the localization of discharge zones

Downhole Measurements and Sampling Strategy – Four types of measurements are considered essential to the success of the sedimented ridge drilling program:

- temperature
- pore pressure
- permeability
- fluid sampling

In the "A" holes, temperature, pore pressure and fluid sampling should be carried out every 20 m with a high-temperature version of the Barnes-Uyeda tool in unconsolidated and semi-consolidated sediments. In more indurated sediments, bottom hole temperature measurements should be made every 100 m using a tool like the USGS/Sandia slimline high-temperature probe, the Japanese P-T tool, or the high-temperature tool under development by von Herzen and Cann. Standard physical property measurements and fluid sampling should also be routinely carried out on core material aboard the drillship. Permeability can be measured by setting a near-surface (low temperature) packer and determining the integrated permeability in a step-wise fashion as the hole is drilled. A similar suite of measurements should be carried out in the basement reentry holes. If these are drilled with the DCS, reaming these holes with the RCB could allow some standard logging to be done through the side-entry sub while maintaining circulation.

If the DCS is available, borehole hydrological experiments would be feasible in the "B" holes by developing seals between the standard drill pipe and casing, and between the standard drill pipe and the DCS drill pipe. This would allow measurements of permeability and pressure to be made on the rig floor of the drillship and allow drawdown and slug tests. It will also be necessary to develop some type of post-drilling seal (ideally wire-line re-enterable) for the "B" holes. Borehole seismic experiments, including an oblique seismic experiment, should be carried out in the deep basement reentry hole.

Drilling Logistics and Scheduling – Drilling time estimates for the program outlined above are given in Table 1. The total is ~115 days for drilling, logging and sampling, exclusive of transits (transits are potentially minimal due the proximity of the proposed sites to several major North American ports). Thus nominally, two legs will be required to carry the program proposed here. It would not be feasible to adequately address *both* the hydrogeological and sulfide mineralization objectives in a single leg of drilling.

In recommending a tentative drilling schedule, the SRDPG considered several factors. First, all of the "A" holes in the hydrogeology experiment should be completed before final selection of the "B" sites is made (for planning purposes in Table 1 four sites have been designated as "B" sites). Second, the deepest holes, and those drilled in the hottest parts of the hydrothermal system, should be drilled on the second leg to allow additional time to develop the tools needed to drill and log under high-temperature conditions. Third, the best weather window for drilling at these sites is a six-month period from April to September. Based on these considerations, the following breakdown of drilling on the two legs is recommended:

Leg I (Spring/Summer, 1991)

	Days
7 "A" Holes in Middle Valley (sites MV-1-7)	33
3 "B" Holes in Middle Valley	14
Sulfide Drilling in Middle Valley (site MV-1)	10
	57

Leg II (Spring/Summer, 1992)

	Days
2 "A" Holes in Escanaba Trough (sites ET-1 and ET-2)	12
Sulfide Drilling in Escanaba Trough (site ET-1)	10
Sulfide Drilling in Middle Valley (site MV-2)	16
Deepening one "B" hole in Middle Valley ~500 m into basement	20
	58

Engineering Requirements

Based on the drilling and borehole measurement strategies summarized above, and following LITHP review, the SRDPG prioritized the technical developments required for a successful sedimented ridge program as follows:

Drilling Capabilities:

- High temperature drill bits and core liners
- Post-drilling seafloor seals for re-entry holes
- Diamond coring system
- "Pogo" guide base for DCS
- Return circulation system with annulus seal for DCS
- Pressure core barrel

Downhole Measurements Capabilities:

- Barnes-Uyeda tool, modified for higher temperatures (up to 200°C) and made stronger (shorter)
- Slimline, self-contained probe to be developed or acquired to measure bottom-hole temperatures up to 350°C
- High-temperature (350°C) fluid sampler
- Side-entry sub modified to permit cooling of logging tools by circulation
- Slimline high-temperature logging tool (temperature essential, plus fluid resistivity, formation resistivity, natural gamma radiation, sonic velocity, caliper, flow velocity, and pressure, in order of priority) and high temperature logging cable
- High-temperature packers

It should be established at the earliest possible date which of the above items cannot be dealt with by the ODP engineering staff or the Borehole Research Group, so that third-party development can be encouraged and carried out in time to meet the schedule for drilling.

Supporting Information

Both Middle Valley and Escanaba Trough are extremely well-surveyed and no additional site survey information is *required* prior to drilling. Some of the available data are shown in Figures 2-5. Additional, more detailed descriptions of the geological setting, hydrothermal systems and sulfides in Middle Valley and Escanaba Trough are available in the publications listed below. E. Davis (Pacific Geoscience Center) is the principle contact for site survey data from Middle Valley; J. Franklin (Geological Survey of Canada) and R.

Zierenberg (U. S. Geological Survey) are the principle contacts for site survey data on the sulfides in Middle Valley and Escanaba Trough, respectively.

Although not required for site selection, additional data from both areas would be *desirable* prior to drilling. These data include additional high-resolution side-scan imagery in both areas; multichannel seismics to better constrain the physical properties of the sedimentary section and identify shallow crustal drilling targets including possible crustal magma chambers; and sampling of the vent waters in Middle Valley. Multichannel seismic data will be collected in September, 1989 and the hydrothermal vents in Middle Valley will be sampled during a proposed *Alvin* program in June 1990. Numerical modeling of the hydrogeology of the Middle Valley area before drilling, and after Leg I, would also be extremely useful.

Selected References

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Davis, E.E., Goodfellow, W.D., Bornhold, B.D., Adshead, J., Blaise, B., Villinger, H., and Le Cheminant, G.M., 1987, Massive sulfide in a sedimented rift valley, northern Juan de Fuca Ridge, *Earth Planet Sci Lett.*, **86**, 49-61.

Goodfellow, W.G. and Blaise, B., 1988, Sulfide formation and hydrothermal alteration of hemipelagic sediment in Middle Valley, northern Juan de Fuca Ridge, *Can. Min.*, **26**, 675-696.

Holmes, M.L. and Zierenberg, R.A., 1990, Submersible observations in Escanaba Trough, southern Gorda Ridge, in G.R. McMurray (ed.), *Gorda Ridge: A Seafloor Spreading Center in the United States' Exclusive Economic Zone*, New York, Springer-Verlag, p. 93-116 (in press).

Koski, R.A., Shanks, W.C., III, Bohrson, W.A., and Oscarson, R.L., 1988, The composition of massive sulfide deposits from the sediment-covered floor of Escanaba Trough, Gorda Ridge: Implications for depositional processes,*Can. Min.*, **26**, 655-673.

Kvenvolden, K.A., Rapp, J.B., Hostettler, F.D., Morton, J.L., King, J.D., and Claypool, G.E., 1986, Petroleum associated with polymetallic sulfide in sediment from Gorda Ridge, *Science*, **234**, 1231-1234.

Morton, J.L., Koski, R.A., Normark, W.R. and Ross, S.L., 1990, Distribution and composition of massive sulfide deposits at Escanaba Trough, southern Gorda Ridge, in G.R. McMurray (ed.), *Gorda Ridge: A Seafloor Spreading Center in the United States' Exclusive Economic Zone*, New York, Springer-Verlag, p. 77-92 (in press).

Appendix 1

Members of Sedimented Ridge Detailed Planning Group

Harald Baecker (FRG)
Keir Becker (RSMAS)
Jacques Bouleque (France)
Earl Davis (Canada)
Robert Detrick* (URI)
Craig Forster (Utah)
James Franklin (Canada)
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Jan Hertogen (ESF)
Mitchell Lyle (L-DGO)
Mike Mottl (HIG)
Toshiyasu Nagao (Japan)
Bernard Simoneit (OSU)
Robert Zierenberg (USGS)

Marc Langseth (PCOM)

*Chairman

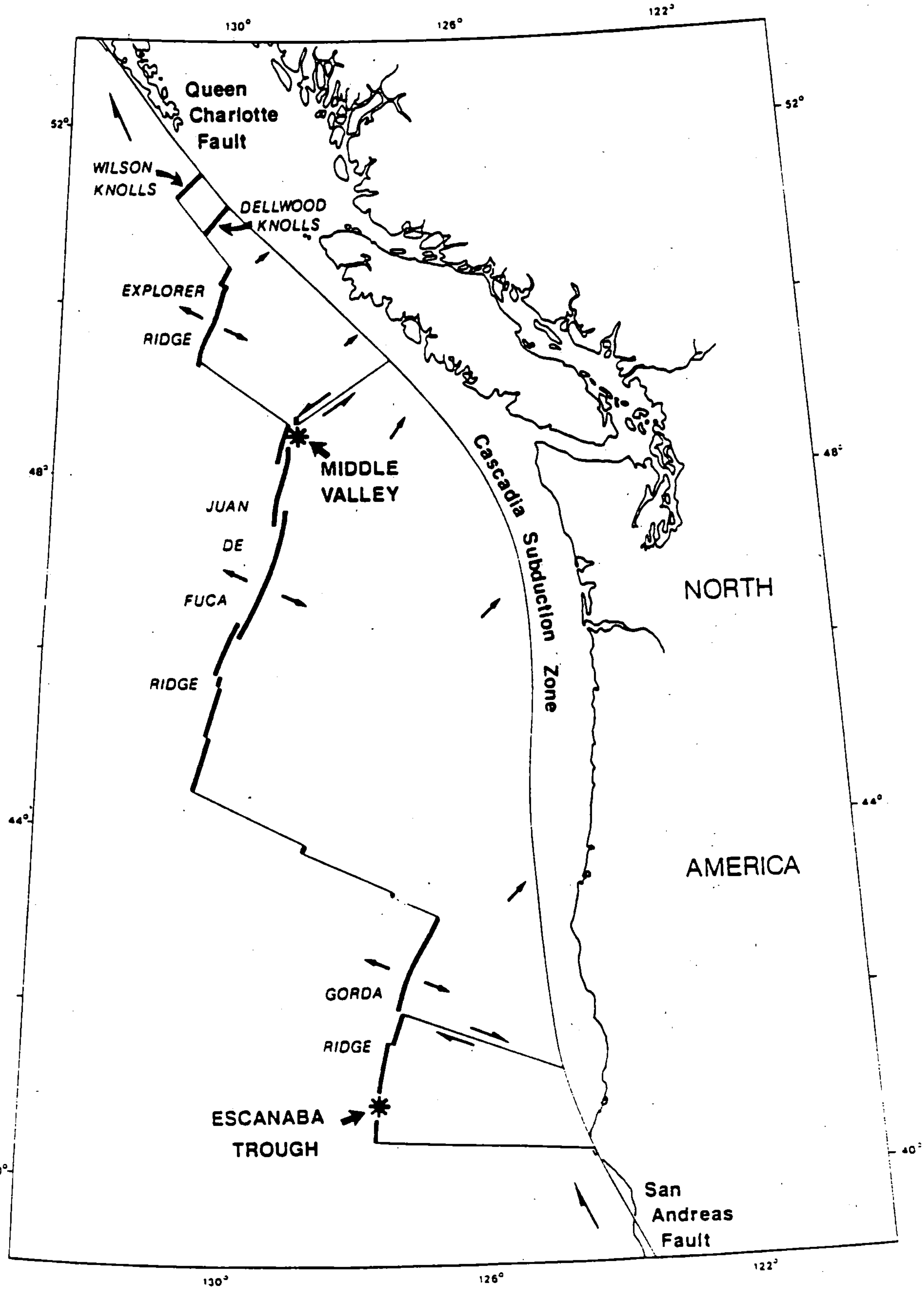


Figure 1 - Location map for Middle Valley and Escanaba Trough.

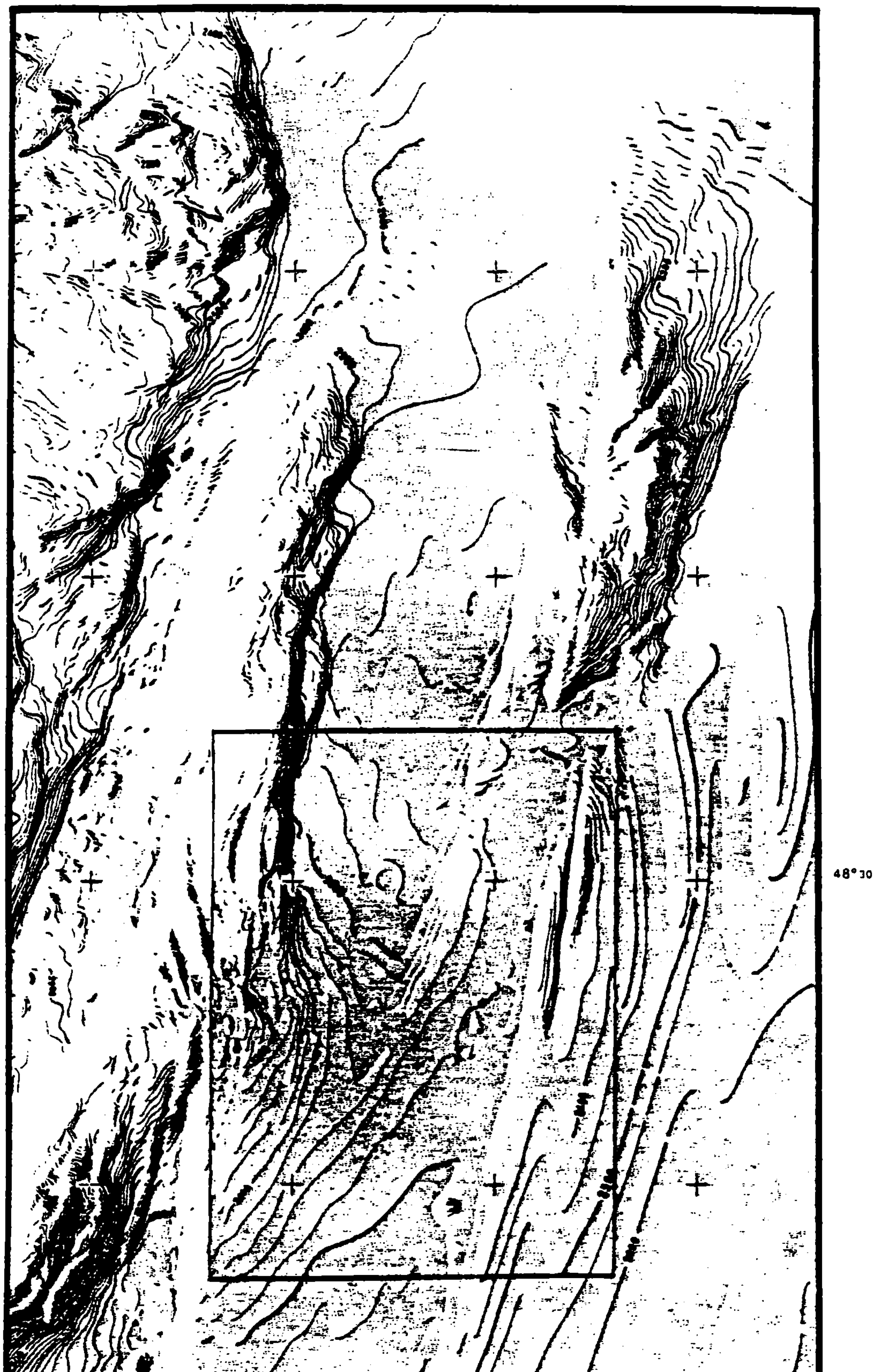


Figure 2. Bathymetry of the southern part of Middle Valley showing the main boundary fault scarps, the generally smooth sedimented rift valley floor, and a number of hydrothermal edifices near the eastern boundary fault. The area included in Figures 3-5 is outlined.

Figure 3. Heat flow measurements in Middle Valley contoured at 0.2 W m^{-1} intervals. Locations of proposed drilling sites are shown for reference.

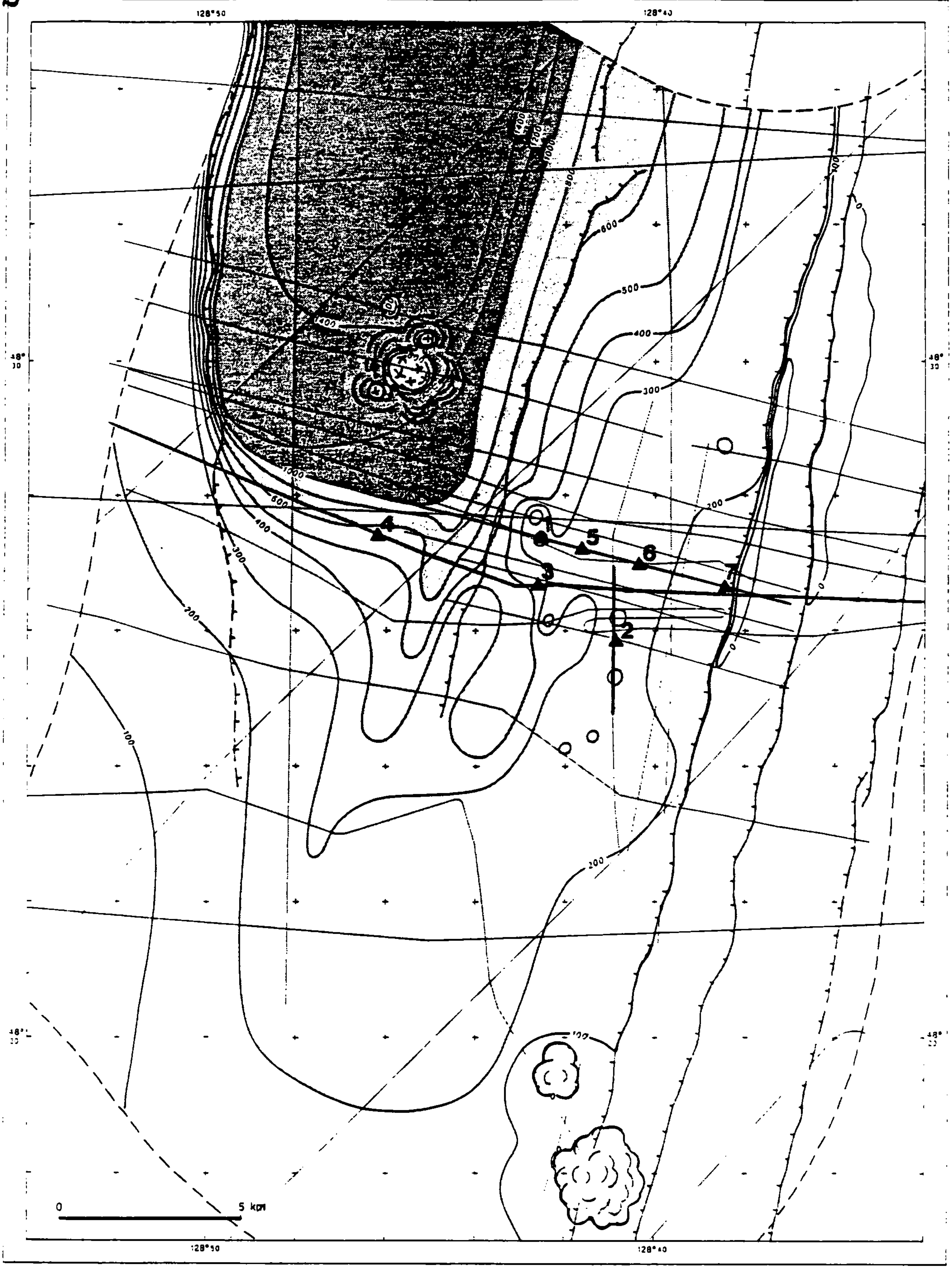


Figure 4. Sediment thickness in Middle Valley contoured at 100 m intervals. Thicknesses are minimum estimates, since in many parts of the valley full acoustic penetration of the valley fill may be prevented by thick interbedded flows or sills. Location of proposed drilling sites and of seismic profiles included in Figure 9 shown for reference.

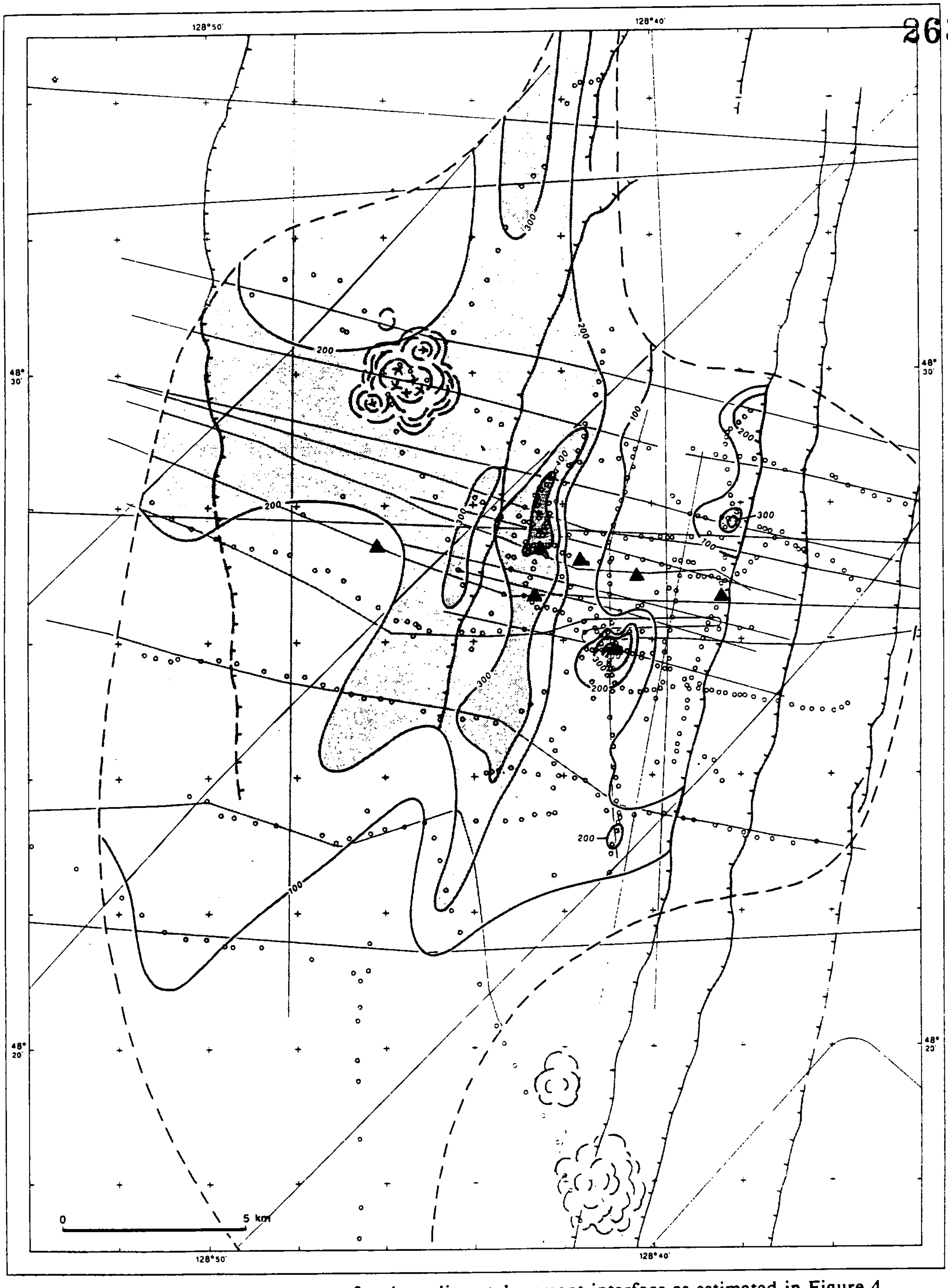


Figure 5. Estimated temperatures for the sediment-basement interface as estimated in Figure 4, assuming an equilibrium conductive temperature profile through the sediment section. Contours are shown at 100°C intervals. Location of proposed drilling sites are shown for reference.

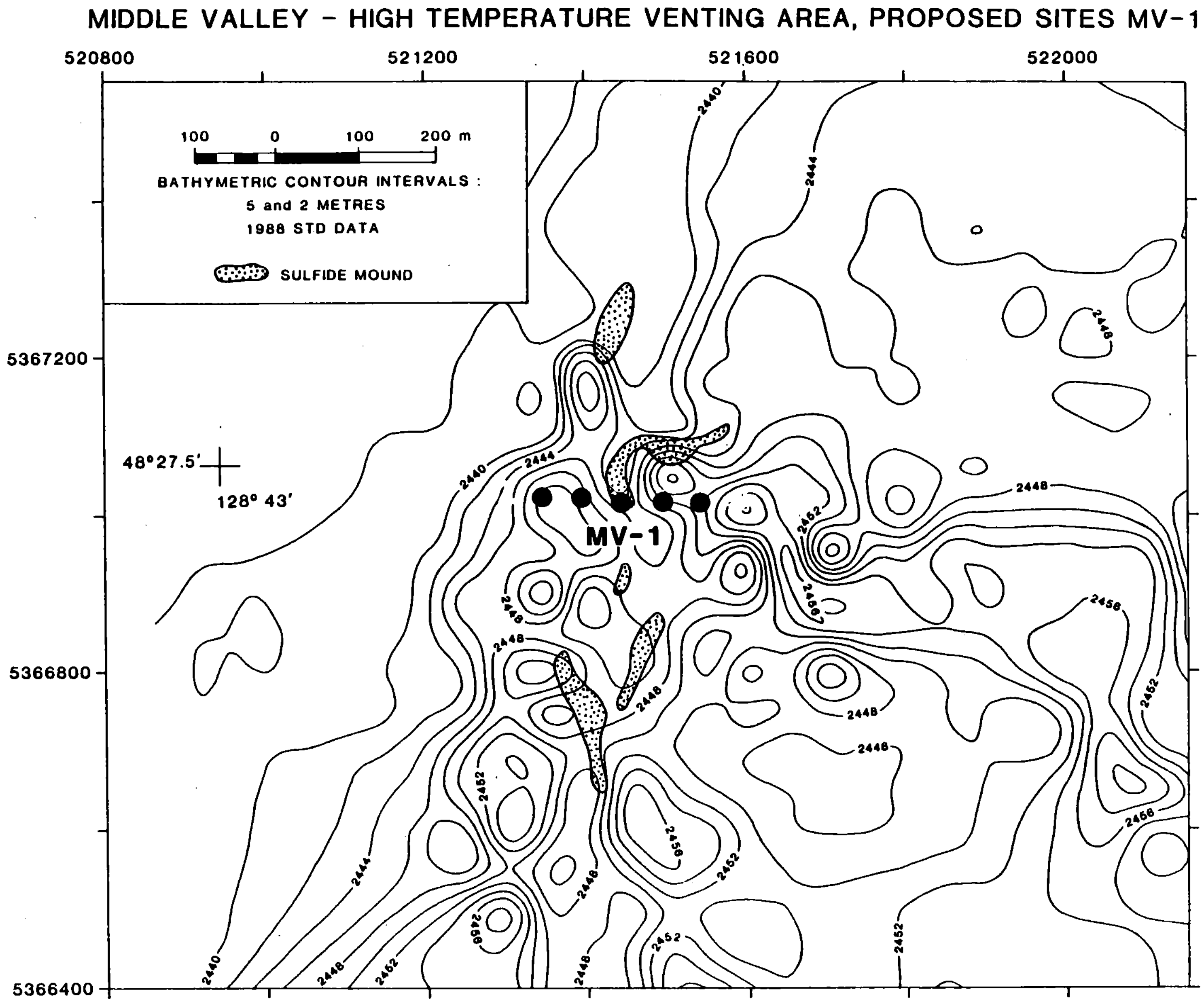


Figure 6 - Detailed bathymetry and sulfide outcrops in the High Heat Flow Area at site MV-1. Black dots show location of "S" holes at this site.

MIDDLE VALLEY - BENT HILL/NORTH MOUND, PROPOSED SITES MV-2

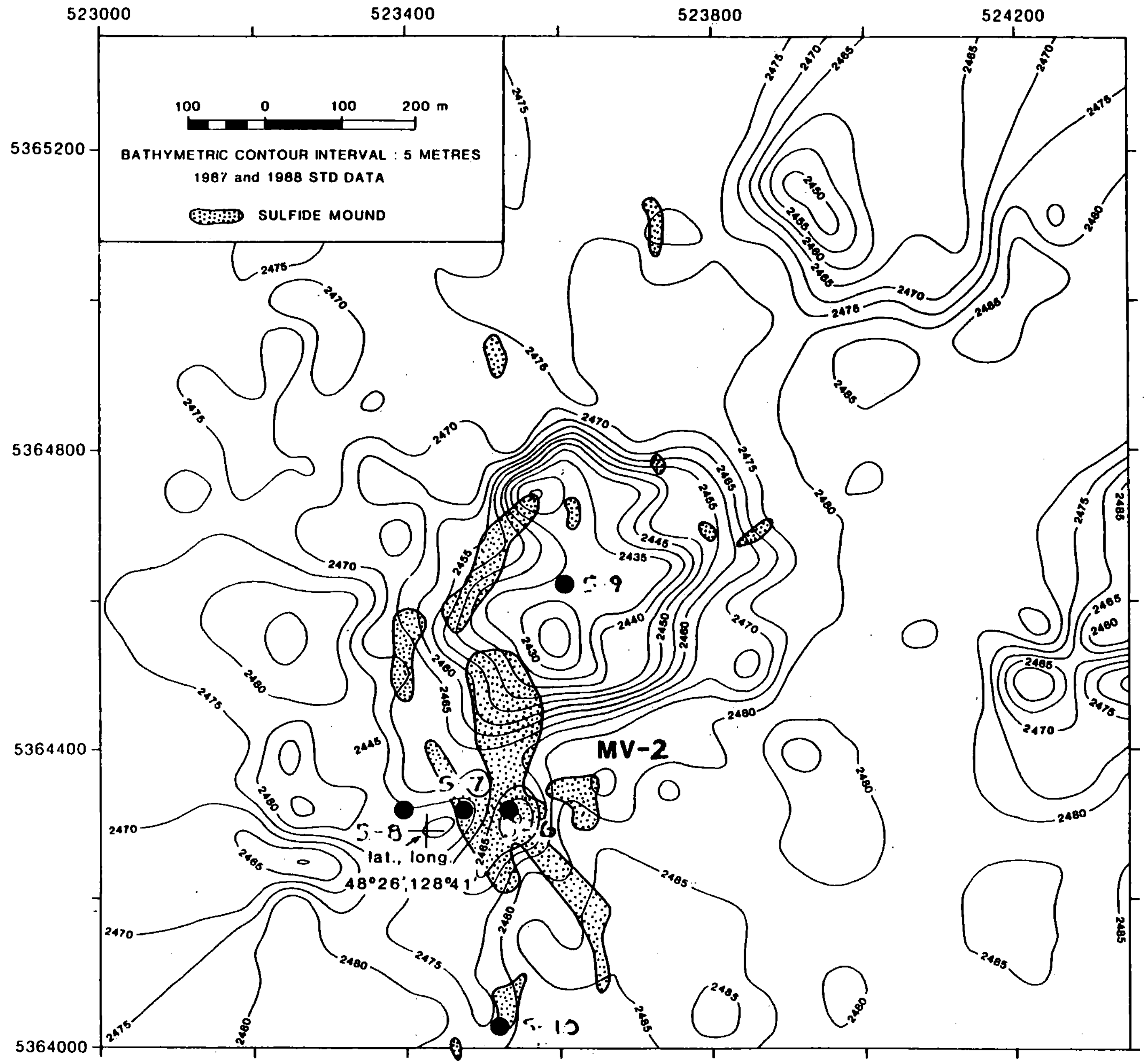


Figure 7 - Detailed bathymetry and sulfide outcrops on North Sulfide Mound at site MV-2. Black dots show location of "S" holes at this site.

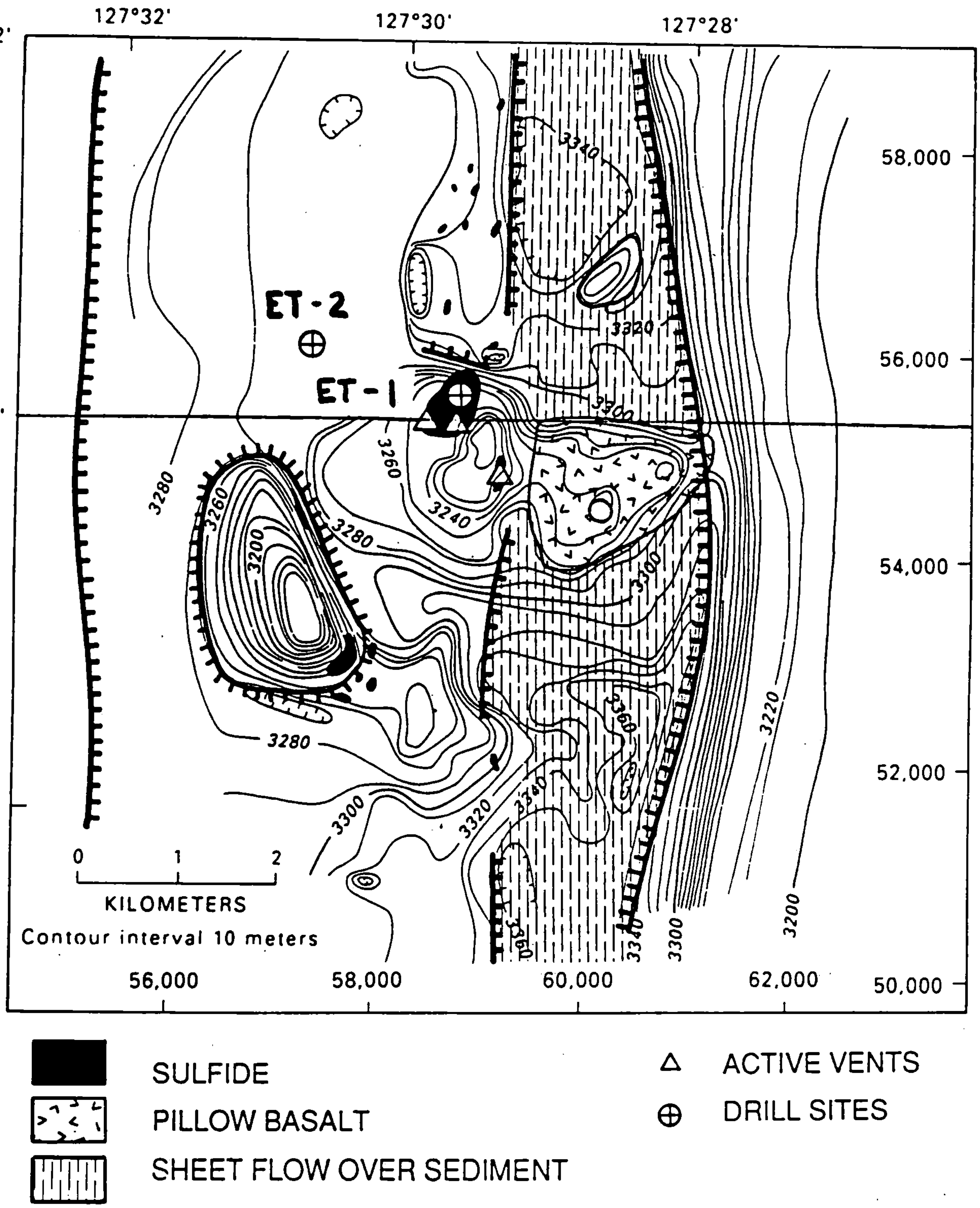


Figure 8 - Geological and bathymetry map of Escanaba Trough showing the location of proposed drilling sites ET-1 and ET-2.

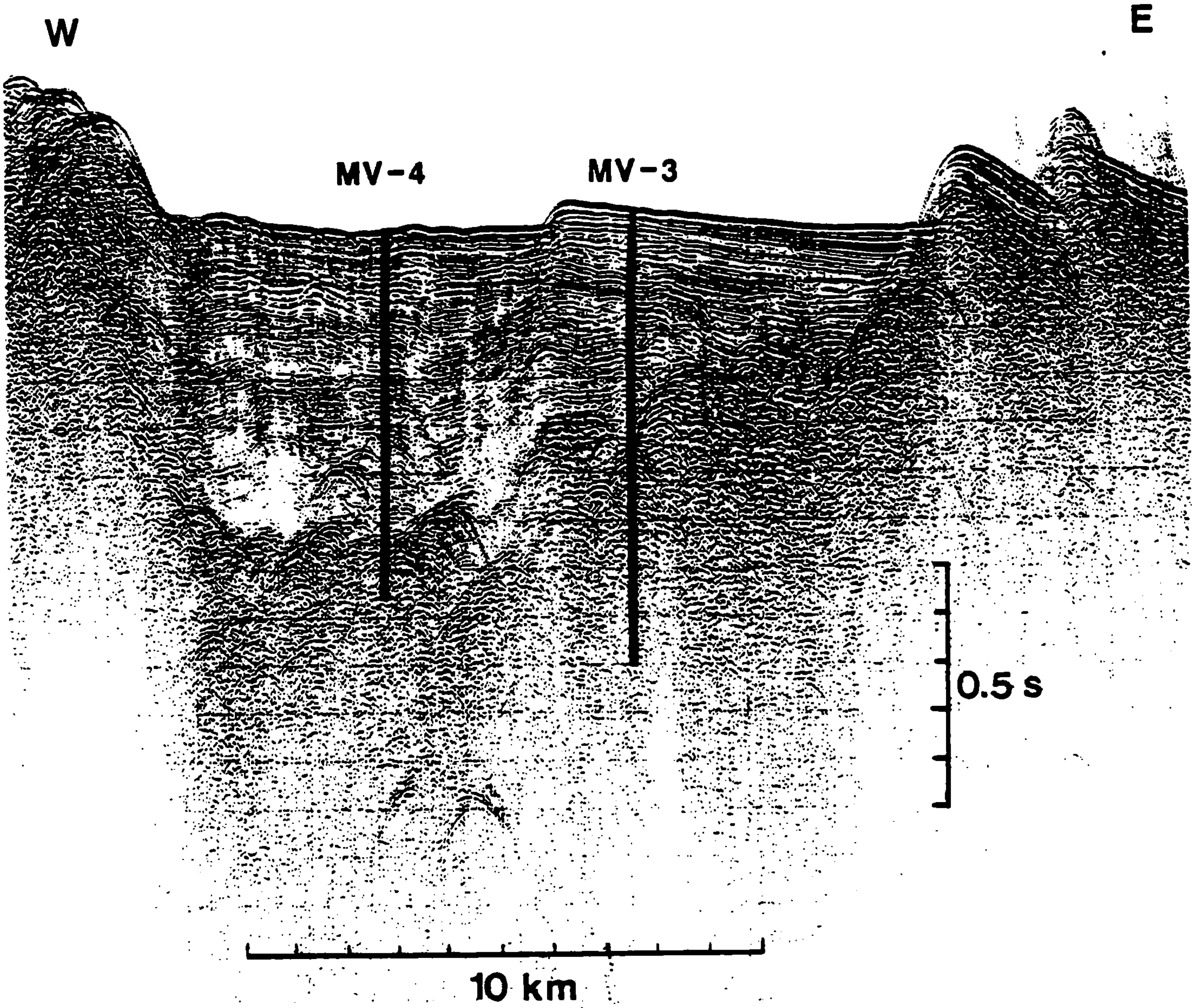


Figure 9. Seismic reflection profiles through proposed drilling sites in Middle Valley and Escanaba Trough. Locations of the profiles are shown on Figures 4 and 8.

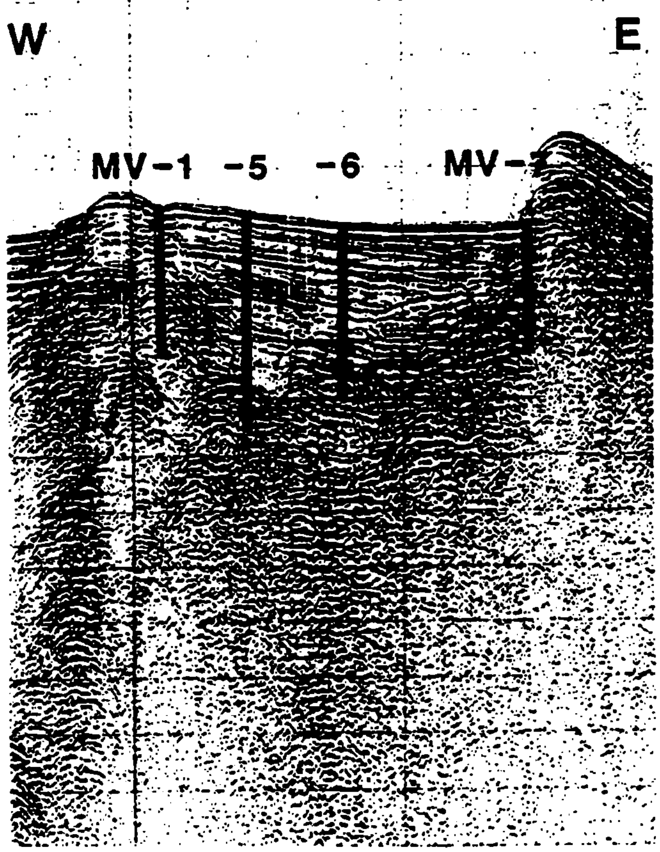
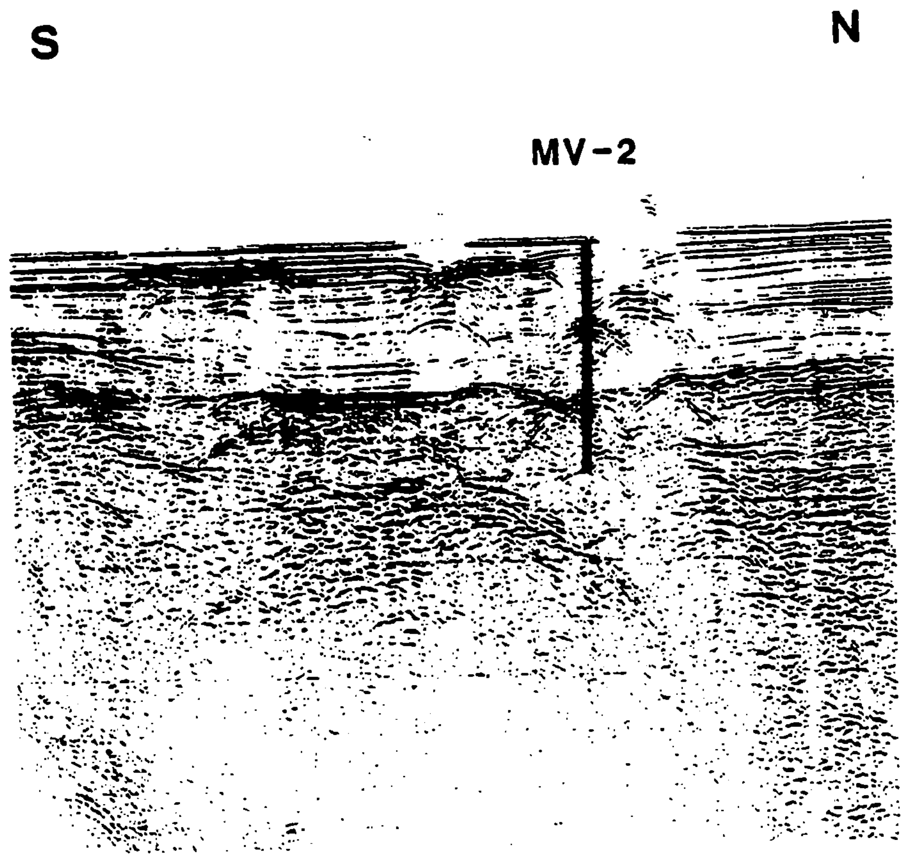


Figure 9. (Continued)



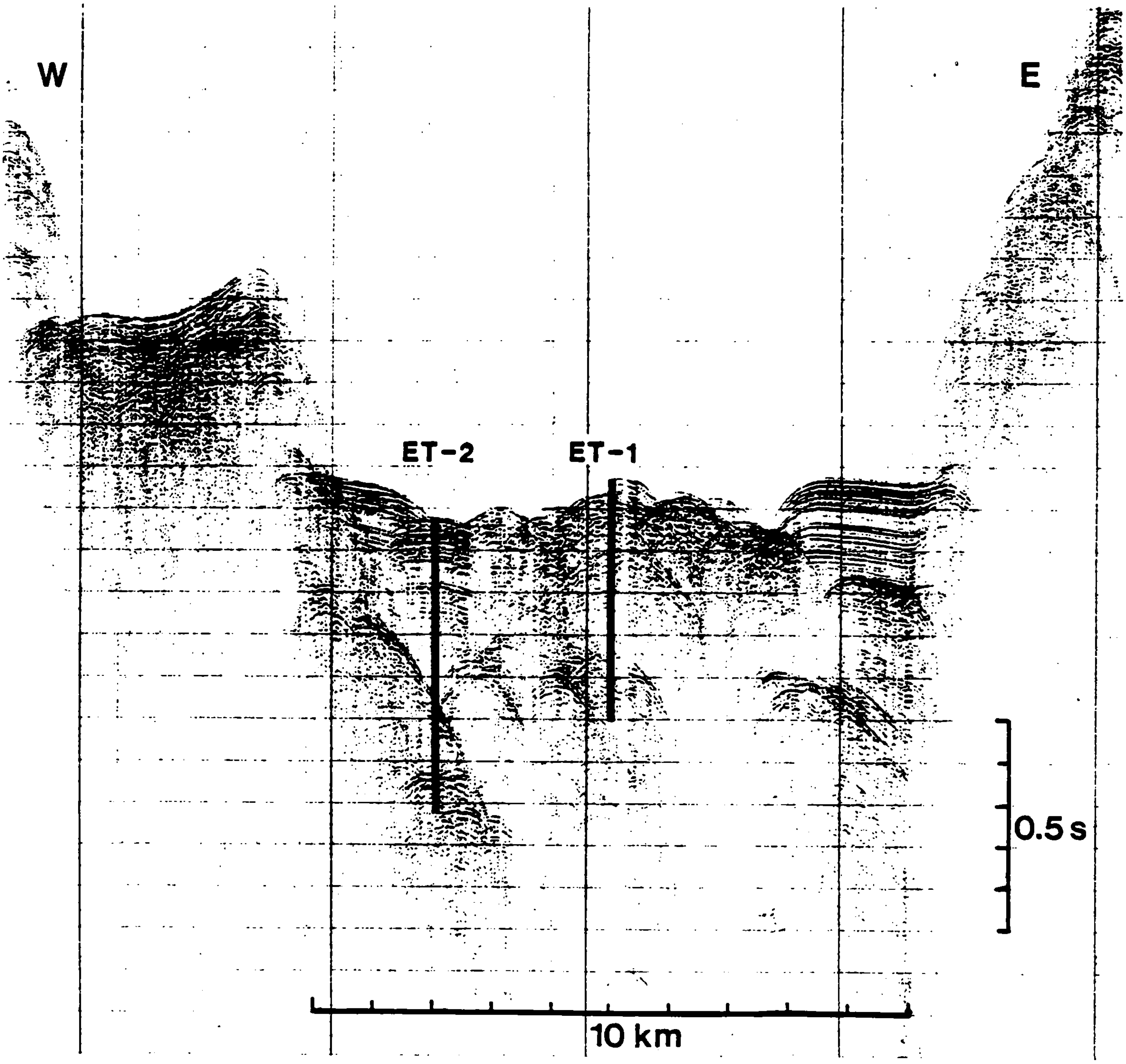


Figure 9. (Continued)

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August 28, 1989

OCEAN DRILLING PROGRAM

Dear Rodey, Nick, Erwin and Ian:

Several important issues that affect the thematic panels were raised at last week's PCOM meeting in Seattle. This letter to all of you passes on some information now, in advance of the minutes which will take several more days to complete. Some additional points, mainly about membership or specific charges for a single panel, are in enclosed separate letters addressed to you individually.

1. Four-Year Planning: PCOM accepted the procedures I sent to you in draft on 25 May and about which I received some agreement and no objections. That is to say, at its April meeting, PCOM will determine the general track of the vessel for the period January 1992 through April 1994 to carry out a set of the drilling programs which one or more of your panels have ranked highly and have a good chance of success. Programs come from actual proposals addressing a published theme in a specific locality, and might require less than one, one, or more than one leg. Good chance of success refers to present and anticipated site surveys, engineering developments, drilling platforms, and political or safety clearances. Ranking refers to a single list from each thematic panel, listing in numerical order of priority the programs favored by the panel.

Some new points:

a. PCOM requests that each panel's late winter list be accompanied by paragraphs about each ranked program, to reduce the chance that PCOM will misunderstand the importance or aim of the program

b. I will visit each thematic panel, at either its fall or its late winter meeting, to answer questions and reduce the chance that the panels will misunderstand PCOM's requests.

2. FY 91 Program Plan: At the Annual Meeting in latest November in Woods Hole, PCOM will select a plan for Fiscal Year 1991 from among the following six programs (alphabetically; 1, 2, and 5 may require more than one leg):

1) Cascadia Accretionary Prism
2) Chile Triple Junction
3) Eastern Equatorial Pacific Neogene Transect
4) East Pacific Rise Bare-rock Drilling
5) Hydrothermal Processes at Sedimented Ridge Crests
6) Lower Crust at 504B.

Your panel should rank these for PCOM's November consideration (and also include them in your listing for April, because obviously not all can be accommodated in FY 91).

3. CEPAC and Other DPGs: Bearing on the FY 91 topic, PCOM discussed DPGs in general and CEPAC in particular. At present the mandate for DPGs states that they "provide written

documents to those thematic panel(s) specified by PCOM. The DPG documents are transmitted to PCOM with the written evaluation of the appropriate thematic panel." A part of PCOM thought the DPGs, because they "plan", should report directly to PCOM. Some others thought their reporting should be to the thematic panels, who should be given the opportunity to modify the report. In a straw vote it was decided to retain the present arrangement.

CEPAC has carried out the specific tasks that PCOM gave it last year for the north and western parts of the old CEPAC region: proposed single-leg Bering Sea, North Pacific, and Ontong Java programs for these multiple-proposal regions; requested Atolls and Guyots updates; and yielded its Sedimented Ridges work to a new DPG. Presumably, you have these CEPAC materials; the SRDPG report is in draft but you should get it shortly. You will be able to evaluate these materials before the December PCOM meeting.

Most of the rest of the "CEPAC Prospectus" will have little or no change (Hawaii Flexure, 504B, etc.) The problem arises, however, that three surveys are in progress or imminent that will affect PCOM's decisions for FY 91, namely, one each US and Canadian for Cascadia and one US for Eastern Equatorial Pacific. So there may be an update of those programs and perhaps others at CEPAC's mid-November meeting. PCOM recognized that there is no opportunity for thematic panels to meet again between the CEPAC meeting and the Annual Meeting.

Therefore, PCOM authorizes each thematic panel to send a liaison to the 16-17 November CEPAC meeting, to express the viewpoints of the thematic panels about the Pacific programs, and in particular, the ones from which the FY 91 program will be selected.

4. Thematic Panels May Write Proposals: Although it was common in early DSDP, but frowned on in IPOD because of possible conflicts in voting, PCOM suggests that panels may write their own proposals. In particular, if a highly regarded theme is not otherwise addressed, or if a drilling proposal is too broad or too narrow, a group of panel members may want to correct the situation. For example, I see in the comments of your panels about Chile Triple Junction, that there is no two-leg proposal to address certain tectonic objectives, and that no proposal exists for ocean-history drilling in the area.

5. Thematic Publications: Thematic panels are again urged to pursue ways of improving the number and quality of theme-centered publications about ODP results.

6. PCOM Liaison to Pre-cruise Meetings: In order to pass along PCOM's intention at the pre-cruise meeting when the leg prospectus is being written, PCOM will send a liaison. From time to time there have been differences between recommendations by the leg proponents, the thematic panels, the DPGs or old regional panels, the DMP, or the co-chiefs.

7. Panel Membership: PCOM now asks panels to submit, with each nominee, a brief c.v. that shows the appropriateness of the person's expertise to the panel's need. Panels should also contact the persons informally to get a tentative answer to the question, "If PCOM does select you, would you serve?"

8. Proposals: Let JOIDES Office know if you need copies of particular proposals.

9. Engineering Leg II: Let us know if you have proposals for sites or staffing.

I wish you success in your work and look forward to seeing you in Woods Hole on 25 November, if not sooner.

Sincerely yours,

Ralph Moberly

Enclosure

cc: PCOM/Woods Hole Agenda Book
PCOM Liaisons to fall meetings of Thematic Panels

LDG, then to PCOM Agenda for WHOI

275

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

Department of Geological Sciences, AJ–20

September 29, 1989

Dr. Ralph Moberly
JOIDES Office
Hawaii Institute of Geophysics
2525 Correa Road
Honolulu, HI 96822

Dear Ralph,

Further to our phone conversation a couple of days ago, here are the issues stemming from the recent DMP meeting that I recommend be considered for the November PCOM meeting:

(1) DMP will advocate that all FMS data be processed on board the RESOLUTION. However, the LDGO-BRG is encountering severe problems with both the requisite software and the MICROVAX hardware. One solution would be to incorporate the dedicated MICROVAX into the TAMU cluster so that TAMU can fix it on board. DMP (and Andy Fisher) recognize that TAMU will vigorously resist this and probably want more money. PCOM should consider how to resolve the crisis.

(2) DMP made LITHP identify and prioritize the downhole measurements and sampling that it feels are essential for scientific success in hot environments at EPR and sedimented ridges. These are, in order: T (absolutely essential, up to 400°C); resistivity of borehole fluid; resistivity of formation fluid; gamma ray; sonic. Caliper, flow rates, pressure of fluid in the hole are lower priority. Pore pressure, permeability, and especially fluid samples at high T are also desirable. Roger Anderson said his group would be willing to take on the task of repackaging existing hi-T tools in a double-dewared configuration (via a contract to someone who will actually do the work). It may, however, take 18 months, so the sooner they get the money, the better. To me it is obvious that scheduling these hi-T legs depends on the availability of yet more vaporware.

(3) Keir Becker (and I think others on the panel) is very concerned about the lack of device for high-T fluid sampling, and the apparent lack of any plans to develop one. PCOM may want to consider whether there is some way to precipitate action among scientists interested in the problem.

(4) DMP wants TAMU to do a feasibility study (i.e., spend money) on sealing holes. It will probably ask for PCOM's endorsement.

Regarding the recent IHP meeting, PCOM will take great interest in and need to hash over the modifications and elaborations in policy concerning *Scientific Results*. Judging from our conversation and my recollections, PCOM and IHP differ in their perception about whether all papers submitted outside also must be reviewed for and appear in *Results*. Ted Moore can report.

Best regards,

Darrel S. Cowan
Professor and Chairman
Geological Sciences

DSC/scb

CHAIRMAN

C. Cavelier

Dr. R. Moberly
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
HONOLULU
H196822
USA

RECEIVED
OCT 19
Hawaii Institute
University of

11 October 1989

Dear Dr. Moberly

Draft - ODP Long Range Plan 1989 - 2002

I am concerned that in the Long Range Plan there is an over-emphasis on the study of "hard-rock" geology at the expense of research into sediments and related topics. In a way this reflects the panel structure of ODP and also the hard lobbying normally undertaken by the specialists.

Thus the emphasis of the objectives of research (pp.35 - 46) appears to be directed towards "hard rock" research whereas hidden away in the document are such phrases as:

> p.34: "More than any other aspect of ODP, paleoceanographic research has evolved to the point where global systems models can be tested" and

> p.43: 12. Short Period Climate Change. "Understanding the causes and consequences of global climatic and environmental change is one of the most important challenges facing us today:..."

Surely if you take these statements seriously then they should be given utmost priority in programming the ODP Legs. It is imperative that we now marshal our resources to study the causes and consequences of climatic change; there is no similar urgency in the study of "hard-rocks". These sediment studies should span the Cretaceous, Paleogene and Neogene (including Pleistocene) and consequently I have copied this letter to the chairmen of the other International Subcommissions.

As it stands now, the European NEREIS Project appears to be far more responsive and attractive to the study of Mesozoic - Cenozoic sediments. Before you finalise the ODP Long Range Plan, bear in mind that your eventual responsibility is towards the international scientific community.

Yours sincerely

D. Graham Jenkins

D. Graham Jenkins
Chairman

cc: Professor J. Hancock, Cretaceous Subcommission
Professor M.B. Cita, Neogene Subcommission
Dr. M.N. Alekseev, Quaternary Subcommission

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October 12, 1989

Dear Colleague:

According to a report brought to the attention of the JOIDES Planning Committee, there is discontent among many Americans interested in ocean drilling but who are not in JOIDES institutions. Their concern is not so much about the panel advisory structure, but is more about the lack of non-JOIDES representation at the higher levels of the decision-making structure.

PCOM asked me to write all of you from US non-JOIDES institutions with an interest in JOIDES evidenced by either panel membership or by shipboard participation during ODP. Please let me know the extent of your anxiety on this issue and any suggestions you may have about the situation.

Thanks for your help.

Sincerely yours,

Ralph Moberly
PCOM Chairman

Duke University
DURHAM
NORTH CAROLINA
27708

DEPARTMENT OF GEOLOGY
BOX 6729 COLLEGE STATION

TELEPHONE (919) 684-2206

October 20, 1989

Dr. Ralph Moberly
PCOM Chairman
JOIDES Planning Office
Hawaiian Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, Hawaii 96822

Dear Ralph:

I have been an active supporter of deep sea drilling for many years during DSDP and ODP days. I am vaguely discontent about ODP and JOIDES, mostly because I don't really understand their seemingly cumbersome bureaucracies. Perhaps this discontent would grow if I knew more.

Basically, my perception is that American deep sea drilling is controlled by a few insiders, well meaning, but autocratic. I once asked about Duke University becoming a member of JOIDES and was told it was not important to have such representation. Not knowing exactly what JOIDES does or how it does it, I couldn't really argue the point. Thus, one suggestion I would make is to clarify the role of JOIDES (and the other arms of the Drilling Program).

I think it would also be useful if panel membership was made a more open or democratic process. Although the panel advisory structure may not be subject to much criticism as you suggest, I am certain that panel membership is of more immediate concern. Again, I feel uninformed, but I am interested.

I attended the COSOD II meeting in Strasbourg. As you certainly know, many American scientists felt that the outcome of this meeting was preordained and ramrodded down our throats. I recognize the effort that went into that meeting, but I don't think the outcome represents a real consensus of the American drilling community. Without widespread agreement and cooperation, the future of ocean drilling is undoubtedly up in the air (a lousy pun).

Would it be too much to suggest a meeting of the JOIDES Planning Committee and a representative from each of the non-JOIDES American institutions who are concerned about these issues? Keep the meeting small enough so it can be democratic. Ensure that all participants are informed enough, in advance, so they can contribute profitably. Such a meeting should focus on the scientific future of ocean drilling as well as the infrastructure best suited to achieving our goals.

Dr. Ralph Moberly
October 20, 1989
Page 2

In summary, I have been vaguely concerned about the issue you raised or at least about related issues. I am certain I am not alone nor are all the concerns centered only in non-JOIDES institutions. I appreciate your concern and I hope that something can be gained by your analysis.

Sincerely yours,

Paul A Baker

Paul A. Baker
Associate Professor

PAB/mr

Sandia National Laboratories

Albuquerque, New Mexico 87185

October 24, 1989

89-454

Dr. Ralph Moberly, PCOM Chairman
JOIDES Planning Office
Hawaii Institute of Geophysics
School of Ocean and Earth Science
and Technology
University of Hawaii
2525 Correa Road
Honolulu, HI 96822

Dear Dr. Moberly:

A short response to your October 12 inquiry is that I see no major problems. I and several other people at Sandia have served on your panels. One of my staff has been on shipboard and I have been asked to participate several times. My impression is that if a scientist is truly interested and the research is relevant to the mission of the leg, that scientist will be accommodated.

As far as decision making, that should be a JOIDES responsibility and not open to multiple input. Outside input comes up through the panels and the panels have wide representation. You could consider a completely independent consultant panel from industry that might add new perspectives, although that is another indirect cost in time and monies. I think you do great as now comprised.

Sincerely,

R.K. Traeger

Richard K. Traeger, Manager
GeoEnergy Technology
Department 6250

Copy to:
6250 File

89-448

MOBIL RESEARCH AND DEVELOPMENT CORPORATION
Dallas Research Laboratory

13777 Midway Road
Dallas, Texas 75244

October 19, 1989

Dr. Ralph Moberly
JOIDES Planning Office
Hawaii Institute of Geophysics
School of Ocean and Earth Science and Technology
University of Hawaii
2525 Correa Road
Honolulu, Hawaii 96822

Dear Ralph:

In response to your letter about non-JOIDES representation at the higher levels of the decision-making structure, I am pleased to report that this fact has not caused me any great personal anxiety. However, it seems that a revised formula for national and institutional representation on EXCOM and PCOM could be considered. For example, make representation proportional to national financial contribution, then have a national committee or agency that elects or appoints the alloted representatives. In the U.S. this role could be filled by a committee along the lines of USSAC. Alternatively, what prevents any University geoscience department from applying for and getting JOIDES membership. It is obvious that the activity of ODP is not oceanography, so membership in JOIDES should not be restricted to oceanographic institutions.

I hope these thoughts are helpful.

Sincerly,

George

George E. Claypool
(member PPSP)

1839-1989 Department of Geological Sciences of the University of Michigan
150
1837-1987 The University of Michigan Ann Arbor
1837-1987 Michigan Statehood

October 31, 1989

Dr. Ralph Moberly
PCOM Chairman
JOIDES Planning Office
Hawaii Institute of Geophysics
2525 Correa Rd.
Honolulu, HI 96822

Dear Dr. Moberly,

In response to your letter of 12 October, 1989, in which you asked my opinion about the perceived bias toward JOIDES members in the higher levels of decision-making at ODP, I admit that I am not yet at the point in my career where I have begun to worry about the make-up of committees and have no opinion. However, I would suggest that if many people perceive a bias in the selection process, you might alleviate concern by publishing a letter in EOS and/or Geotimes in which the criteria by which committee members are chosen. In that way the scientific community can argue about the fundamental motives behind the choice of committe members which appears to be the root of the problem.

Yours truly,

Peter Vrolijk

Peter Vrolijk

The University of Michigan Department of Geological Sciences 1006 C.C. Little Building Ann Arbor, MI 48109-1063 (313) 764-1435

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Sandia National Laboratories

Albuquerque, New Mexico 87185

November 1, 1989

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NOV - 7 1989

Hawaii Institute Of
University of Hawaii

89-474

Dr. Ralph Moberly
Hawaii Inst. of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, HI 96822

Dear Ralph:

As a member of a U.S. non-JOIDES institution, I am happy to report no difficulty in getting my thoughts to the higher levels of the JOIDES decision-making structure.

I appreciate your concern.

Sincerely yours,

Peter Lysne
Geoscience Research
Drilling Office
Division 6252

PL:6252:ia

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NOV - 6 1989
Hawaii Institute ...
University of ...
89-471

30 October, 1989

Dr. Ralph Moberly
JOIDES Planning Office
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, Hawaii 96822

Dear Ralph:

As a marine scientist at a non-JOIDES institution who is co-P.I. on two drilling proposals, I do feel very far removed from the decision-making structure of ODP. Perhaps my situation is better than that of most other non-JOIDES scientists because MIT at least maintains some comunication with Woods Hole through our joint program in oceanographic education. However, I still feel that I hear of PCOM decisions third hand (or from Ellen Kappel's newsletter), and that I have no mechanism for influencing those decisions via access to a PCOM representative.

My own view is that the very existence of JOIDES is not apparent at the panel level. Thematic emphasis may shift with panel membership, but there are virtually no institutional politics at that level of ODP. It is not my impression that the same can be said of EXCOM and PCOM, where it is dictated that committee members represent institutions or nations. I can understand, based on knowing how the program is funded, why those making the programmatic decisions must represent all ODP nations, but it is less clear to me why, if the program is to be thematically driven, selection of the U.S. PCOM representatives must reflect the JOIDES institutions.

How many drilling legs resulted from U.S. proposals by entirely or predominantly non-JOIDES P.I.'s? What fraction of the total is it, and how does that ratio compare with that for field programs funded by NSF-MG&G, which has no JOIDES bias built into the decision-making structure? If the ratio of ODP legs is significantly lower, I think it is a good indication that a segment of the community has been closed out.

Sincerely,

Marcia

Marcia McNutt
Professor of Geophysics

(P.S. Don't be fooled by the LDGO letter head. I am on sabbatical.)

EVALUATION OF DRILLING RESULTS IN TERMS OF COSOD I OBJECTIVES

▼=proposed, not achieved; ■=proposed, partially achieved; ◆=proposed & achieved; ●=achieved but not proposed;

General and Specific Themes	Leg 101	Leg 102	Leg 103	Leg 104	Leg 105	Leg 106	Leg 107	Leg 108	Leg 109	Leg 110	Leg 111	Leg 112	Leg 113	Leg 114
ORIGIN AND EVOLUTION OF THE OCEANIC CRUST														
1. Processes of Magma Generation and Crustal Construction at MORs		■												
Spacing of Submarine Eruptions		▼				▼								
Periodicity of Submarine Eruptions		▼				▼								
Volume of Submarine Eruptions						▼								
2. Configuration, Chemistry and Dynamics of Hydrothermal Systems														
Formation of Ore Deposits on Crust														
Formation of Ore Deposits Within Crust														
Physico-Chemical Distribution of Alteration in Crust in Time						◆			◆					
Physico-Chemical Distribution of Alteration in Crust in Space						◆			◆					
Relationship Between Hydrothermal Activity and Physical State of the Crust						◆			◆					
Relationship between Hydrothermal Alteration and Volcanism														
B.2.a. Compositional Heterogeneity of the Mantle						◆								
Mantle Evolution														
Origin of Structural Compexity of MORs									◆					
B.2.b. Aging of the Crust		◆												
Evolution of the Crust		◆							◆					
B.2.c. Formation of Overly Thick Crust & Flood-Type Volcanism														
B.2.d. Structure of Transform Faults						▼								
Petrology of Transform Faults						▼								
Geochemistry of Transform Faults						▼								
Fracture Zone Offsets						▼								
B.2.e. Processes Operating in Young Ocean Basins							◆							
Initiation of Rifting							◆							
B.2.f. Island Arcs and Backarc Basins							◆							
TECTONIC EVOLUTION OF CONTINENTAL MARGINS AND OCEANIC CRUST														
B.1. Dynamics of Magma Chambers and the Formation of the Oceanic Crust														
Problems of Magma Chambers									◆					
Problems of Magma Migration														
B.2. Hydrothermal Circulation at MORs														
B.3. Composition and Structure of the Lower Oceanic Crust and Upper Mantle														
Lower Two-Thirds of Layer 2		◆							◆		■			
Nature of the Layer 2/3 Boundary														
Upper Portion of Layer 3									●					
Validity of the Ophiolite Analogy														
B.4. Transform Faults														
Structure of Transform Faults						▼								
Petrology of Transform Faults						▼								
Fracture Zone Offsets						▼								
Geochemistry of Transform Faults						▼								

General and Specific Themes	Leg 101	Leg 102	Leg 103	Leg 104	Leg 105	Leg 106	Leg 107	Leg 108	Leg 109	Leg 110	Leg 111	Leg 112	Leg 113	Leg 114
B.5. Oceanic Plateaux & Aseismic Ridges														
Crustal Structure of Oceanic Plateaux														
Origin of Oceanic Plateaux														
Tectonic Evolution of Oceanic Plateaux														
Crustal Structure of Aseismic Ridges														
Origin of Aseismic Ridges														
Tectonic Evolution of Aseismic Ridges														
B.6. Origin of Intraplate Volcanism														
3. Early Rifting History of Passive Continental Margins			◆	◆	◆									
C.1. Detailed History of Vertical Movements at Passive Margins			◆	◆	◆									
Evolution of Passive Continental Margins			◆	◆										
C.2. Deep Crustal Structure			■											
C.3. Thermal and Mechanical Evolution														
C.4. "Global" Unconformities and the Synchroneity of Tectonic & Sea-Level Events														
4. Dynamics of Forearc Evolution														
D.1. Structure and Evolution of Forearc Regions										◆		◆		
D.3. The Detailed History of Vertical Movements of the Forearc										◆		◆		
5. Structure and Volcanic History of Island Arcs										◆				
D.2. Tectonic Evolution of Back-Arc Basins							◆							
D.4. Stress Field at Active Margins										◆				
ORIGIN AND EVOLUTION OF MARINE SEDIMENTARY SEQUENCES														
6. Response of Marine Sedimentation to Fluctuations in Sea Level														
B.1. Deep-Sea Sedimentation and Sea Level														
Sea Level and the Pelagic Record														
Sea Level and Deep Margin Effects														
Relation of Sea Level to Abyssal Currents				◆										
Sea Level and the Shallow Margin														
Catastrophic Sea-Level Events														
B.2. The Sedimentary Record of Abyssal Circulation				◆										
Contourite Drifts														
Mud Waves														
Unconformities														
History of Abyssal Circulation														
B.3. Gravity-Displaced Sediments														
Submarine Fans														
Submarine Slides, Slumps & Debris Flows														

General and Specific Themes	Leg 101	Leg 102	Leg 103	Leg 104	Leg 105	Leg 106	Leg 107	Leg 108	Leg 109	Leg 110	Leg 111	Leg 112	Leg 113	Leg 114
7. Sedimentation in Oxygen-Deficient Oceans														
B.4. Sedimentation in Oxygen-Deficient Oceans	◆													
Geochemical Indicators of Organic Matter Preservation														
Transects of Modern Oxygen-Minimum Zones and Their Neogene Record														
The Red Sea as an Analogue to Eocene and Cretaceous Oceans														
The Mediterranean as an Analogue to Eocene and Cretaceous Oceans								■						
Cretaceous "Anoxic Events"	●													
Phosphatic Sediments												◆		
B.5. Carbonate Platforms and Carbonate Reefs	◆													
Eustatic Sea Level	◆											◆		
Paleogeograph												◆		
Vertical Tectonics												◆		◆
Sclerochronology & History of Climate														
Modern Carbonate Plateforms as Facies Models														
B.6. High Latitude Glacio-Marine Sedimentation				◆				◆					◆	◆
B.7. Rhythmic Sedimentation								▼						
B.8. Hiatuses & Unconformities, All Types														
B.9. Carbonate Dissolution Profiles														
B.10. Tectonic Setting and Sediment Facies														
8. Global Mass Balancing of Sediments														◆
C.1. Sedimentation in the Deep Sea														
C.2. Paleogene Sediment Budget														
C.3. Basin-Basin and Latitudinal Fractionation													◆	◆
C.4. Sediment Masses of the Continental Slope												◆		
Sediment Masses of the Continental Rise														
C.5. Large Volume Marine Evaporites														
C.6. Diagenesis and Global Cycling of Elements														
C.7 Carbon Cycles														
Sulfur Cycles												◆		
D. Post-Depositional Alteration											◆	◆		
D.1. Alteration of Carbonate Minerals												◆		
D.2. Silica Diagenesis												◆		
D.3. Clays and Related Phases												◆		
D.4. Alteration of Organic Matter												◆		
D.5. Gas-Hydrates														
D.6. Hydrothermal Sediments														
D.7. Hydrology														

General and Specific Themes	Leg 101	Leg 102	Leg 103	Leg 104	Leg 105	Leg 106	Leg 107	Leg 108	Leg 109	Leg 110	Leg 111	Leg 112	Leg 113	Leg 114
CAUSES OF LONG-TERM CHANGES IN THE ATMOSPHERE, OCEANS, CRYOSPHERE, BIOSPHERE, AND MAGNETIC FIELD														
9. Ocean Circulation History											◆			
B. Long-Term Changes in the Ocean and Atmosphere														
B.1. Mesozoic Ocean														
The Jurassic Superocean														
Hypsography of the Mesozoic Ocean														
Sea Level and Oceanic Climate in the Mesozoic														◆
B.2. Oceanic Circulation														
Formation of Deep Water								▼					◆	
Circulation of Deep Water				◆	◆			◆						◆
Gateways and Oceanic Circulation														◆
Surface Circulation					◆							◆		◆
Response to Transient Events														
B.3. Polar Oceans			◆											
◆														
10. Response of the Atmosphere and Oceans to Variations in Planetary Orbits														
C.1. Climatic Response to Orbital Variations								◆						
C.2. Orbital Tuning														
D. Geochemical Cycling												◆		
D.1. Oceanic Biogeochemistry														
D.2. Oceanic Anoxic Events and Organic Carbon Sinks in the Mesozoic Ocean														
D.3. Marine Record of Continental Environments								◆						
11. Patterns of Evolution of Microorganisms														
E. Biotic Evolution and Biogegraphy														
E.1. Speciation and the Tempo of Evolution of Species													◆	
Speciation and the Mode of Evolution of Species													◆	
E.2. Macroevolution: Evolutionary Radiations													◆	
Macroevolution: Mass Extinctions											◆		◆	
Macroevolution: Biogeographic Realms														
External Causes of Evolution and Extinction in Biotas				◆								◆	◆	
F. History of the Earth's Magnetic Field														
F.1. Magnetostratigraphic Record		▼												
F.2. Record of Polarity Transitions									◆					
F.3. Excursions of the Magnetic Field														
F.4. Plate Motions														
F.5. Reversal Timescales														

General and Specific Themes	Leg 115	Leg 116	Leg 117	Leg 118	Leg 119	Leg 120	Leg 121	Leg 122	Leg 123	Leg 124	Leg 125	Leg 126	Leg 127	Leg 128
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1. Processes of Magma Generation and Crustal Construction at MORs				▼	▼	▼	▼							
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B.2.c. Formation of Overly Thick Crust & Flood-Type Volcanism										■				
B.2.d. Structure of Transform Faults				■										
Petrology of Transform Faults				■										
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Fracture Zone Offsets				■										
B.2.e. Processes Operating in Young Ocean Basins														
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Structure of Transform Faults				■										
Petrology of Transform Faults				■										
Geochemistry of Transform Faults				■										
Fracture Zone Offsets				■										
B.5. Oceanic Plateaux and Aseismic Ridges														
Crustal Structure of Oceanic Plateaux					■	■	■							
Origin of Oceanic Plateaux					■	■	■							
Tectonic Evolution of Oceanic Plateaux					■	■	■							
Crustal Structure of Aseismic Ridges					■	■	■							
Origin of Aseismic Ridges														

Tectonic Evolution of Aseismic Ridges

General and Specific Themes	Leg 115	Leg 116	Leg 117	Leg 118	Leg 119	Leg 120	Leg 121	Leg 122	Leg 123	Leg 124	Leg 125	Leg 126	Leg 127	Leg 128
B.6. Origin of Intraplate Volcanism	◆													
3. Early Rifting History of Passive Continental Margins					◆	◆	◆	◆		◆				
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B.7. Rhythmic Sedimentation														
B.8. Hiatuses & Unconformities, All Types							◆	◆						
B.9. Carbonate Dissolution Profiles	◆													
B.10. Tectonic Setting and Sediment Facies		◆	◆				◆	◆			◆	◆		
8. Global Mass Balancing of Sediments														
C.1. Sedimentation in the Deep Sea														
C.2. Paleogene Sediment Budget														
C.3 Basin-Basin and Latitudinal Fractionation														
C.4. Sediment Masses of the Continental Slope			■											
Sediment Masses of the Continental Rise			■											
C.5. Large Volume Marine Evaporites														
C.6. Diagenesis and Global Cycling of Elements														
C.7. Carbon Cycles														
Sulfur Cycles														
D. Post-Depositional Alteration	◆	◆	●											
D.1. Alteration of Carbonate Minerals	◆													
D.2. Silica Diagenesis														
D.3. Clays and Related Phases														
D.4. Alteration of Organic Matter			●											
D.5. Gas-Hydrates														
D.6. Hydrothermal Sediments														
D.7. Hydrology														
CAUSES OF LONG-TERM CHANGES IN THE ATMOSPHERE, OCEANS, CRYOSPHERE, BIOSPHERE, AND MAGNETIC FIELD														
9. Ocean Circulation History					◆	◆	◆	◆	◆					
B. Long-Term Changes in the Ocean and Atmosphere														
B.1. Mesozoic Ocean														
The Jurassic Superocean								▼	▼					
Hypsography of the Mesozoic Ocean														
Sea Level and Oceanic Climate in the Mesozoic					◆			◆	◆					
B.2. Oceanic Circulation														
Formation of Deep Water					◆									
Circulation of Deep Water	◆													
Gateways and Oceanic Circulation			◆		●	◆								
Surface Circulation														
Response to Transient Events	◆					◆								
B.3. Polar Oceans														

General and Specific Themes	Leg 115	Leg 116	Leg 117	Leg 118	Leg 119	Leg 120	Leg 121	Leg 122	Leg 123	Leg 124	Leg 125	Leg 126	Leg 127	Leg 128
10. Response of the Atmosphere and Oceans to Variations in Planetary Orbits			◆		◆	◆								
C.1. Climatic Response to Orbital Variations														
C.2. Orbital Tuning														
D. Geochemical Cycling	◆		◆		◆	◆								
D.1. Oceanic Biogeochemistry	◆													
D.2. Oceanic Anoxic Events and Organic Carbon Sinks in the Mesozoic Ocean														
D.3. Marine Record of Continental Environments		◆	◆		◆	◆								
11. Patterns of Evolution of Microorganisms							●							
E. Biotic Evolution and Biogeography														
E.1. Speciation and the Tempo of Evolution of Species							●							
Speciation and the Mode of Evolution of Species														
E.2. Macroevolution: Evolutionary Radiations						■	■							
Macroevolution: Mass Extinctions					●	■	■							
Macroevolution: Biogeographic Realms						■	■							
External Causes of Evolution and Extinction in Biotas							■							
F. History of the Earth's Magnetic Field														
F.1. Magnetostratigraphic Record			●			◆				●				
F.2. Record of Polarity Transitions														
F.3. Excursions of the Magnetic Field	◆													
F.4. Plate Motions						◆	◆	◆	◆	◆		◆		
F.5. Reversal Timescales								▼	▼					

EVALUATION OF DRILLING RESULTS OF PAST LEGS IN TERMS OF OBJECTIVES AS STATED IN PROSPECTUS

▼-proposed, not achieved; ◆-proposed & achieved; ●-achieved, not proposed
■-partially achieved

Leg 100 (Shakedown)

▼1. Biostrat. ref. sections for Gulf of Mexico.
▼2. Lithostrat.-seismostrat correlations.
▼3. Unconformities as they correspond to seismic reflectors.
  **Insufficient penetration.
◆4. Biostrat.-magnetostrat.-global geochronology & sea level.

Leg 101 (Bahamas)

◆1. Evolution of carbonate banks/slopes; "megabank" vs "graben" hypotheses.
◆2. Response of banks to sea level changes.
■3. Cretaceous anoxic events.
■4. Neogene climatic history of platforms.

Leg 102A (Old Oceanic Crust; W. Atlantic; reenter Hole 418A)
Leg 102B (Training)

◆ 1. Velocity structure of old crust; layer 2.
◆ 2. Permeability in old crust.
◆ 3. Porosity vs. depth.
◆ 4. Thickness of magnetic layer.
▼ 5. Presence of convection and underpressure?
▼ 6. Direction & magnitude *in situ* stresses.
◆ 7. Pore-water chemistry.
◆ 8. Temperature vs depth; heat transfer mechanism.
▼ 9. Eruptive history of layer 2.
◆10. Seismic anisotropy in layer 2.
▼11. Presence of sub-basement seismic reflectors?

Leg 103 (Galicia Margin)

◆1. History of rifting & subsidence of starved passive margin.
■2. Initiation of rifting.
◆3. Conjugate N. Am. passive margin history.

Leg 104 (Norwegian-Greenland Sea)

◆1. Early stages of passive continental rifting.
  -age & nature of dipping reflectors.
  -age & nature of basement below dipping reflectors.
  -subsidence & depositional history.
◆2. Paleoceanographic history - currents.
◆3. Paleoclimatic history - glaciation.

◆4. Cenozoic evolution in response to (2) and (3).

Leg 105 (Labrador Sea/Baffin Bay)

◆1. Tectonic development (subsidence history) of region.
◆2. Gateways & history of circulation.
◆3. Timing and nature of paleoclimatic changes.
●4. Rhythmic sedimentation.

Leg 106 (MAR - Kane Fracture Zone)

◆1. Composition of magmas & relationship to erupted basalts.
▼2. Variation in space & time of magma generation & accretion.
▼3. Relationship of (2) to tectonic & hydrothermal activity.
▼4. Effects of transforms.
◆5. Duration & extent of hydrothermal activity; effects of alteration in crust.
◆6. Nature of earliest low-temp. alteration; effect on crustal mineralogy.
●7. Crustal magnetization vs depth; effects of hydrothermal and tectonic activity.
**Insufficient penetration; technical problems-bit failure.

Leg 107 (Tyrrhenian Sea)

◆1. Timing & rate of extension & subsidence.
-stretching phase.
-spreading phase.
◆2. Pre-rift sedimentary section.
◆3. Post-rift sedimentary section.
◆4. Syn-rift sedimentary section.
◆5. Plio-Pleistocene sedimentary section.
◆6. Stratigraphic correlations between Mediterranean & open ocean.
◆7. Back-arc basin evolution; test seaward migration of subduction zone hypothesis.

Leg 108 (E. Equatorial Atlantic)

◆1. History of upwelling intensity; seasonal vertical movement of thermocline:
-Atlantic-wide changes in paleo-productivity.
-variations in global CO_2 budget.
-deposition of organic carbon-rich sediments.
◆2. Late Neogene latitudinal stability of thermal equator:
-southern equatorial divergence zone.
-eastern boundary current & upwelling regions.
-response to major gateway changes.
▼3. Driving factors of tropical SST signals.
◆4. Wind-blown particle abundance; timing of changes in atmospheric circulation-climate fluctuations.

◆5. Neogene history of deep-water exchange between E. & W. Atlantic basins & through Kane Gap; incursions of Antarctic bottom water.

▼6. Changes in global ice volume vs deep water temperature during Tertiary.

Leg 109 (MAR - Kane Fracture Zone; deepen hole 648B)

◆1. Crustal accretion processes at oceanic spreading centers.
-nature and relative abundance of parental and primitive melts; their relationship to evolved basalts in time and space
-definition of magma "batches," small magma chambers, depth of chambers
-depth and extent of low-T alteration, hydrothermal alteration & nature of transition between them; mineralization & effects
-tilting and deformation at depth; effects on magnetic polarity
-comparison of rock type, crustal structure & phys. props. with seismics

◆2. Layer 2.
-In situ velocity structure of young Atlantic crust-porosity vs depth
-permeability
-temperature vs depth; heat transfer by convection or conduction?
-underpressures and downhole flow of ocean bottom water
-re-sample & analyse borehole fluids/pore fluids
-refine eruptive history of Layer 2 extrusives from variations in magnetic susceptibility and NRM intensity, inclination and declination.

**technical problems=sticking, caving,lack of adequate drilling jars

●3. Upper mantle (peridotite in axial valley)

Leg 110 (Barbados Ridge, Lesser Antilles Forearc)

◆1. Mechanisms and conditions by which accretionary prisms develop, specifically, the geohydrological and structural; styles associated with an active accretionary margin.

Leg 111 (Hole 504B, EPR)

■1. Coring and logging the sheeted dike complex, Layer 2C.

◆2. High-resolution studies of Plio-Pleistocene biostratigraphy and paleoceanography of the E. Equatorial Pacific.

◆3. Geochemical studies of the advection of pore waters in the sediments and its effect on sediment diagenesis.

**technical problems-tool damage & failure, bit failure; poor recovery; bad hole conditions-inability to flush cutting from very deep hole, junk in hole, spalling, dense, crystalline nature of dikes.

Leg 112 (Peru Continental Margin)

◆1. Uplift and subsidence history of forearc.
- relate vertical movements to tectonic accretion & erosion

■2. Nature and age of transition zone between lower-slope accretionary complex and metamorphic block of continental affinity.

▼3. Age of metamorphic basement beneath outer Andean margin; P-T conditions of metamorphism through time.
◆4. Vertical movement of continental margin.
◆5. Reconstruct paleoceangraphic conditions of upper-slope basin deposits in terms of response of the biological and sedimentary system to fluctuations in intensity & source of upwelling waters.
◆6. Quantify biogenic and clastic fluxes for evaluation of sea-level, climate & oceanic circulation interaction.
◆7. Conditions leading to formation of dolomites, phosphorites & cherts in upper-slope basin deposits.
◆8. Show that microbial activity persists to considerable depths & contributes greatly to diagenetic environment in carbon-rich sediments.
●9. Presence of subsurface brines & influence on early diagenesis.

Leg 113 (Weddell Sea, Antarctica)

◆1. When did first Antarctic ice sheets form; have they been permanent?
◆2. Timing of marine glacial conditions and formation of Antarctic Bottom Water.
-How have bottom & intermediate water temperatures responded to Antarctic glacial development?
◆3. History of oceanic plantonic productivity.
-How is it linked to Antarctic climatic evolution?
-How is it linked to oceanic environment?
◆4. Evolution of Antarctic planktonic and benthic biota & biogeographic patterns.
-How is this linked to environmental changes?

Leg 114 (Subantarctic South Atlantic)

1. Development and influence of teleconnective passageways to oceanic circulation within the Southern Atlantic Ocean.

Paleoceanographic record:
◆a. Document late Cretaceous-Holocene paleoenvironmental evolution of passageway linking South Atlantic & Weddell basins.
◆b. Determine latitudinal and vertical temperature gradients in subantarctic South Atlantic during Paleogene.
◆c. Document the establishment of the Antarctic Circumpolar Current.
◆d. Record more fully the middle to late Cenozoic Polar Front migrations.
◆e. Obtain records of changes in Antarctic climate and ice volume.

Mesozoic and Cenozoic regional geologic history:
■a. Ages and subsidence histories of Islas Orcadas & Meteor rises, and basin between them.
◆b. Age and nature of basement of Northeast Georgia Rise & its role in the evolution of Malvinas plate.4.
**Severe weather conditions

Leg 115 (Mascarene Plateau - Carbonate Dissolution Profile)

Tectonic:
◆a. Age of volcanism and its petrologic and geochemical character.

◆b. Definition of true polar wander within fixed hotspot framework.

Paleoceanographic & Stratigraphic:

◆a. Interplay between the flux in carbonate production and the dissolution of this material as a function of water depth during late Cenozoic.

◆b. How did intermediate and deep water masses respond to Miocene closing of Tethyan seaway, formation of permanent Antarctic ice cap during middle Miocene, and onset of northern hemisphere glacial/interglacial cycles during late Pliocene.

▼c. Fluctuation through time of boundary between the Equatorial Water and the Central Water.

●d. Diagenetic processes in periplatform oozes.

**Hole instability problems

Leg 116 (Distal Bengal Fan - Intraplate Deformation)

■1. Determine the age of the beginning of intraplate deformation and the subsequent history of the displacement of the fault blocks.

◆2. Characterize the lithofacies present on the distal Bengal Fan and determine the depositional processes responsible for them.

◆3. Nature of early diagenesis (to 1 km) in the submarine fan sediments.

◆4. Establish the provenance of the terrigenous sediments and use facies variations to document Himalayan uplift.

◆5. Relationship between fault zones, bedding planes, fractures and the flow of water as deduced from surface heat flow measurements.

◆6. Effects of regional compressive stress regime and high heat flow on the physical, hydrological and magnetic properties of the sediment and on the diagenetic process.

◆7. Depositional processes and rates through time and the growth of the Bengal Fan.

**Biostrat. for key site poor

Leg 117 (Oman Margin/Neogene)

◆1. History of Neogene monsoonal upwelling; variations in response to changing radiation budgets caused by changes in the earth's orbit around the sun and tectonic evolution of Central Asia.

◆2. Effects of changes in monsoonal intensity and glacio-eustatic sea-level fluctuations on sedimentary facies of organic carbon-rich, biogenic and eolian sediments on Arabian margin.
-extent of diagenesis; dolomite, phosphorite, etc.
-pore-water indicators of evaporitic hydrologic regimes, Oman Shelf.

◆3. Record of paleoceanographic circulation and origin of intermediate water flowing out of the Red Sea.

◆4. Mid-Indus fan record of Tibet-Himalaya uplift.
-depositional history of fluvial sediments in Pakistan.
-erosion of coastal deposits in climatic and sea-level cycles.

◆5. Tectonic origin and uplift history of Owen Ridge.
-tectonic history of Oman Basin.
-tectonic history of continental margin east of Masirah anticline.

Leg 118 (SW Indian Ridge - Fracture Zone Drilling)

▼1. *In situ* sampling and stratigraphy of oceanic mantle.
■2. Magma chamber processes.
-partial melting.
-melt extraction and modification in shallow magma chambers.
▼3. Determine lateral and vertical variability of rock types on floor of fracture zone.
▼4. Nature and distribution of deformation in a fracture zone and determination of whether there is a single slip plane, multiple slip planes or penetrative slip across the entire width of the feature.
◆5. Thermal structure of transform-generated crust; extent of alteration and sea-water penetration.
▼6. Nature and thickness of oceanic crust in the nodal basins where ridge crests meet the transform fault.
◆7. Physical properties, magnetism and seismic velocities of transform-generated crust; documentation of any anisotropy.
**Unstable hole conditions; sites unsuitable for guide-base deployment.

Leg 119 (Kerguelen Plateau and Prydz Bay)

◆1. Mesozoic through Holocene climatic and glacial history of E. Antarctica shelf sediments.
◆2. Role of changing climate in meridional and vertical evolution of water masses and their associated biota in the Southern Ocean.
◆3. Growth of E. Antarctic ice sheet through Oligocene and early Neogene.
◆4. History of glacial erosion of the shelf, an indication of ice sheet volume changes and with implications for bottom-water formation.
◆5. Documentation of other changes in shelf environment (depth, temperature, and sea-ice cover) before and during glaciation, providing secondary indications of climatic change.
◆6. Timing of E. Antarctic-India rifting and subsidence history of Kerguelen Plateau.
◆7. Nature and age of basement in S. Kerguelen Plateau region.
◆8. Documentation of geologic development of N. Kerguelen Plateau.

Leg 120 (Central Kerguelen Plateau)

◆1. The nature and age of Kerguelen Plateau basement at sites located on identified structural elements.
◆2. Nature and ages of the different sedimentary sequences.
◆3. Tectonic history of Kerguelen Plateau.
-ages of unconformities.
-rifting.
-vertical movements.
■4. Paleoceanographic history of the region..
-latitudinal and vertical variations of water masses and biota through time.
-shift of the polar front.
-initiation and development of Circumpolar and Antarctic Bottom Water circulation.

●5. Patterns of evolution of microorganisms.

Leg 121 (Broken Ridge, Ninetyeast Ridge)

Broken Ridge (response of the lithosphere to rifting processes):

◆1. Age, lithology and depositional depth of the sediments in the dipping and truncated sedimentary sequence at Broken Ridge.

■2. Age, lithology and depositional depth of the sediments making up the subhorizontal sediments which cap the crest of B.R.

■3. Using (1) and (2), determine what parts of the total sedimentary section are pre- syn- and post-rift deposits.

◆4. Use the drilling results as constraints on the timing and duration of the rifting event; determine vertical motion of B.R. as it responded to the rifting process.

**RCB bit failure

Ninetyeast Ridge (origin & tectonic history; plate motion; paleoceanography):

◆1. Obtain petrological and geochemical data from basement rocks to understand the origin of Ninetyeast Ridge and its relationship to Kerguelen Plateau.

■2. High-resolution study of northward motion of India from paleomagnetic inclinations of recovered samples. (POST CRUISE STUDY)

◆3. S-N transect in E. Indian Ocean as a data base for paleoclimatological changes.

Legs 122 and 123 (Exmouth Plateau and Argo Basin)

■1. Understand Late Triassic-Jurassic pre- and syn-rift history and rift-drift transition in a starved passive contiental margin setting.

▼2. Determine the geochemical and and physical characteristics of the oldest Jurassic Indian Ocean crust and the bulk geochemical composition as a reference section for understanding global geochemical fluxes at subduction zones.

■3. Study Late Jurassic-Early Cretaceous to Cenozoic post-breakup development of sedimentation and paleoenvironment from a juvenile to a mature ocean.

■4. Study the temporal and spatial distribution of Jurassic, Cretaceous and Tertiary sequence stratigraphies in order to evaluate the effects of basin subsidence, sediment input, and sea-level changes in an almost complete, undisturbed, classic passive margin section.

▼5. Refine the Mesozoic geological time scale.

■6. Investigate Middle Jurassic and Middle Cretaceous anoxic sedimentation in terrigenous, shallow-water marine and deep-water marine environments.

■7. Document Cretaceous/Tertiary boundary stratigraphy.

■8. Log proposed site AAP1B.

Leg 124 (Southeast Asia Basins: Sulu, Celebes and Banda Sea)

◆1. Determine ages of the SE Sulu, Celebes and Banda Sea basins in order to establish the time of drifting and to test various proposed models for their origin.

◆2. Establish stratigraphic history of the basins, particularly with respect to whether its paleoenvironment reflects a basin with an open, closed, or restricted circulation, and to the timing of major volcanic, collisional, and paleoceanographic events.
◆3. Determine in situ regional stress orientations within the basins and discern whether subduction- or collision-related forces predominate.
●4. Excellent magnetostratigraphic records.
●5. Sedimentary geochemistry/crustal alteration.

Leg 124E (Philippine Sea)

Engineering Objectives:
◆1. Shallow-water concept evaluation of diamond coring system (DCS).
■2. Continued operational evaluation of developmental navidrill core barrel system (NCB).
◆3. Prototype testing of pressure core sampler (PCS), phase I.
■4. Performance testing of the newly redesigned extended core barrel (XCB).
◆5. Performance evaluation of ODP coring systems in deep-water chert sequences.
▼6. Testing and evaluation of Lamont/BRG logging technology.
▼7. Evaluation of deep-water operating capabilities of *JOIDES Resolution.*
*Scientific objectives were secondary.
**Basement too deep; bad weather; hole instability

Legs 125 and 126 (Bonin-Mariana Arc-Trench System)

Bonin back-arc:
◆1. The differential uplift/subsidence history of the rift basin and adjacent arc.
◆2. The nature of volcanism and sedimentation in the rift and on the arc.
◆3. The duration of rifting and the nature of the rift basement.
◆4. The chemistry of hydrothermal fluids circulating in the rift basin.

Bonin forearc:
◆1. The uplift/ subsidence history across the forearc to provide information on forearc flexure and basin development, as well as the extent of tectonic erosion.
◆2. The stratigraphy of the forearcs with its record of (a) sedimentation, depositional environment and paleoceanography; and (b) the variations in intensity and chemistry of arc volcanism through time.
◆3. The nature of igneous basement forming the frontal arc, outer-arc high and beneath the intervening basin to answer questions concerning the initial stages of subduction-related volcanism, the origin of boninites, and the formation of the 200 km wide arc-type forearc crust.
◆4. The micro-structural deformation and the large-scale rotation and translation of the forearc.

Mariana forearc:
◆1. The timing and mechanism of emplacement of the serpentinite seamounts, including their internal fabric, facture patterns and flow structures.
◆2. The chemistry and, hence, source of the associated fluids.
◆3. The conditions at depth in the outer forearc from the igneous and metamorphic petrology of the lower crustal/upper mantle rocks.

COSOD I Themes Not Yet Successfully Addressed

ORIGIN AND EVOLUTION OF THE OCEANIC CRUST

1. **Processes of Magma Generation and Crustal Construction Operating at Mid-Ocean Ridges:**
   •Spacing of Submarine Eruptions
   •Periodicity of Submarine Eruptions
   •Volume of Submarine Eruptions
2. **Configuration, Chemistry and Dynamics of Hydrothermal Systems:**
   •Formation of Ore Deposits on Crust
   •Formation of Ore Deposits Within Crust
   •Relationship Between Hydrothermal Alteration and Volcanism

B.2.c. Formation of Overly Thick Crust & Flood-Type Volcanism

TECTONIC EVOLUTION OF CONTINENTAL MARGINS AND OCEANIC CRUST

B.3. Composition and Structure of the Lower Oceanic Crust and Upper Mantle:
   •Nature of the Layer 2/3 Boundary;
   •Validity of the Ophiolite Analogy;
   •Problems of Magma Migration

COSOD I Themes Not Yet Successfully Addressed, Cont'd.

ORIGIN AND EVOLUTION OF MARINE SEDIMENTARY SEQUENCES

B.1. Deep Sea Sedimentation and Sea Level:
- Catastrophic Sea-Level Events

B.3. Gravity-Displaced Sediments:
- Submarine Slides, Slumps & Debris Flows

B.4. Sedimentation in Oxygen-Deficient Oceans:
- Geochemical Indicators of Organic Matter Preservation;
- Transects of Modern Oxygen-Minimum Zones and Their Neogene Record;
- The Red Sea as an Analogue to Eocene and Cretaceous Oceans

B.5. Carbonate Platforms and Carbonate Reefs:
- Sclerochronology & History of Climate;
- Carbonate Reefs

C.1. Sedimentation in the Deep Sea
C.2. Paleogene Sediment Budget
C.5. Large Volume Marine Evaporites
C.6. Diagenesis and Global Cycling of Elements
C.7. Carbon Cycles
D.5. Gas-Hydrates
D.6. Hydrothermal Sediments
D.7. Hydrology

COSOD I Themes Not Yet Successfully Addressed, Cont'd.

CAUSES OF LONG-TERM CHANGES IN THE ATMOSPHERE, OCEANS, CRYOSPHERE, BIOSPHERE AND MAGNETIC FIELD

B.1. Mesozoic Ocean

•Hypsography of the Mesozoic Ocean

C.2. Orbital Tuning

D.2. Oceanic Anoxic Events and Organic Carbon Sinks in the Mesozoic Ocean

F. History of the Earth's MagneticField

F.5. Reversal Timescales

COSOD I Themes That Have Been Addressed with Partial Success

ORIGIN AND EVOLUTION OF THE OCEANIC CRUST

1. Processes of Magma Generation and Crustal Construction at Mid-Ocean Ridges

B.2.a. Compositional Heterogeneity of the Mantle;
- **Origin of Structural Compexity of MORs**

B.2.b. Evolution of the Crust;
- **Aging of the Crust**

B.2.c. Formation of Overly Thick Crust

B.2.d. Structure of Transform Faults;
- **Petrology of Transform Faults;**
- **Geochemistry of Transform Faults;**
- **Fracture Zone Offsets**

B.2.e. Processes Operating in Young Ocean Basins;
- **Initiation of Rifting**

B.2.f. Island Arcs and Backarc Basins

2. Configuration, Chemistry and Dynamics of Hydrothermal Systems
- **Physico-Chemical Distribution of Alteration in Crust in Time**
- **Physico-Chemical Distribution of Alteration in Crust in Space**
- **Relationship Between Hydrothermal Activity and Physical State of the Crust**

COSOD I Themes That Have Been Addressed with Partial Success, Cont'd.

TECTONIC EVOLUTION OF CONTINENTAL MARGINS AND OCEANIC CRUST

B.3. Composition and Structure of the Lower Oceanic Crust and Upper Mantle:

•Lower Two-Thirds of Layer 2;

•Upper Portion of Layer 3

B.5. Crustal Structure of Oceanic Plateaux:

•Origin of Oceanic Plateaux;

•Tectonic Evolution of Oceanic Plateaux;

•Crustal Structure of Aseismic Ridges

B.6. Origin of Intraplate Volcanism

3. Early Rifting History of Passive Continental Margins

C.2. Deep Crustal Structure

C.3. Thermal and Mechanical Evolution

C.4. "Global" Unconformities and the Synchroneity of Tectonic and Sea-Level Events

5. Structure and Volcanic History of Island Arcs

D.4. Stress Field at Active Margins

6. Response of Marine Sedimentation to Fluctuations in Sea Level

B.1. Deep-Sea Sedimentation and Sea Level:

•Relation of Sea Level to Abyssal Currents;

•Sea Level and the Shallow Margin

B.2. Abyssal Circulation; Hiatuses/Unconformities

COSOD I Themes That Have Been Addressed with Partial Success, Cont'd.

B.4. Sedimentation in Oxygen-Deficient Oceans:
- •The Mediterranean as an Analogue to Eocene and Cretaceous Oceans;
- •Cretaceous "Anoxic Events;"
- •Phosphatic Sediments

B.5. Carbonate Platforms and Carbonate Reefs:
- •Eustatic Sea Level;
- •Paleogeography;
- •Vertical Tectonics

B.7. Rhythmic Sedimentation

B.8. Hiatuses and Unconformities of All Types

B.9. Carbonate Dissolution Profiles

8. Global Mass Balancing of Sediments

C.3. Basin-Basin Latitudinal Fractionation

C.4. Sediment Masses of the Continental Slope; and
- •Sediment Masses of the Continental Rise

D.1. Alteration of Carbonate Minerals

D.2. Silica Diagenesis

D.3. Clays and Related Phases

D.4. Alteration of Organic Matter

COSOD I Themes That Have Been Addressed with Partial Success, Cont'd.

CAUSES OF LONG-TERM CHANGES IN THE ATMOSPHERE, OCEANS, CRYOSPHERE, BIOSPHERE AND MAGNETIC FIELD

B.2. Ocean Circulation:
- •Formation of Deep Water;
- •Circulation of Deep Water

B.3. Polar Oceans

10. Response of the Atmosphere and Oceans to Variations in Planetary Orbits

C.1. Climatic Response to Orbital Variations

11. Patterns of Evolution of Microorganisms

E.1. Speciation and the Tempo of Evolution of Species;
- •Speciation and the Mode of Evolution of Species

E.2. Macroevolution: Evolutionary Radiations;
- •Macroevolution: Mass Extinctions;
- •Macroevolution: Biogeographic Realms

12. History of the Earth's Magnetic Field:

F.1. Magnetostratigraphic Record
F.2. Record of Polarity Transitions
F.3. Excursions of the Magnetic Field

COSOD I Themes That Have Been Successfully Addressed on Three or More Legs of ODP Drilling

TECTONIC EVOLUTION OF CONTINENTAL MARGINS AND OCEANIC CRUST

C.1. Detailed History of Vertical Movements at Passive Continental Margins (103,104,105,121)

C.3. Thermal and Mechanical Evolution of Passive Margins (103,104,121)

D.2 Tectonic Evolution of Back-arc Basins (107,124,125,126)

D.3. History of Vertical Movements of the Forearc (110,112,125,126)

ORIGIN AND EVOLUTION OF MARINE SEDIMENTARY SEQUENCES

B.1. Deep-Sea Sedimentation and Sea Level: Sea Level and Deep Margin Effects (119,121,122,123,124)

B.3. Gravity-Displaced Sediments (116,117,121)

B.6. High Latitude Glacio-Marine Sedimentation (104,108, 113,114,119,120)

B.10. Tectonic Setting and Sediment Facies (116,117, 121,122,125)

D. Post-Depositional Alteration (111,112,115,116,117)

COSOD I Themes That Have Been Very Successfully Addressed by Drilling, Cont'd.

CAUSES OF LONG-TERM CHANGES IN THE ATMOSPHERE, OCEANS, CRYOSPHERE, BIOSPHERE, AND MAGNETIC FIELD

B.1. Mesozoic Ocean:
- •Sea Level and Oceanic Climate in the Mesozoic (114,119,122,123)

B.2 Ocean Circulation History
- •Gateways and Surface Circulation (104,105,108,114,117,119,120)
- •Response to Transient Events (105,112,114,115,120)

D. Geochemical Cycling (112,115,117,119,120)

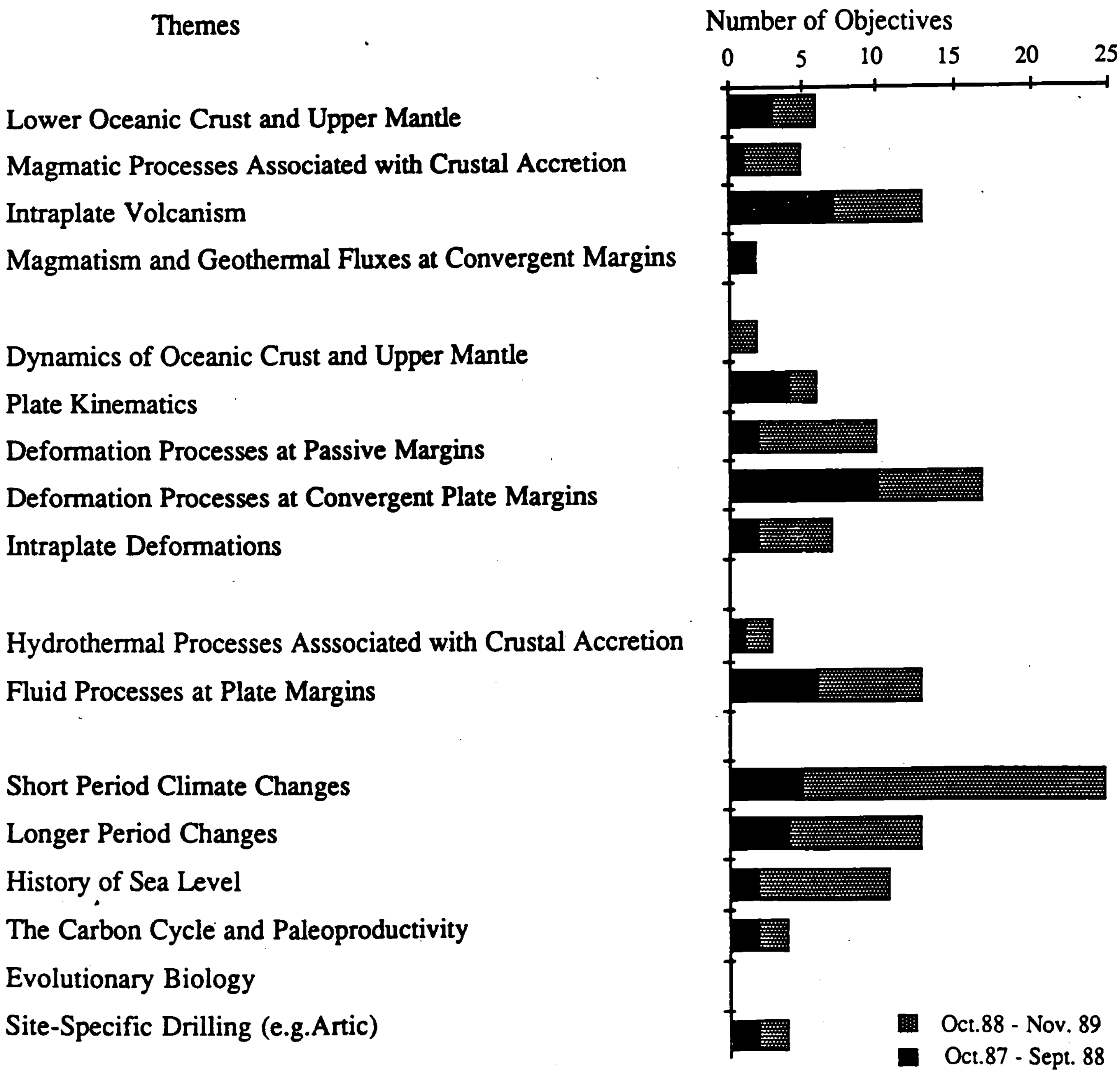
D.3. Marine Record of Continental Environments (108,116,117,119,120)

E.2. Macroevolution:
- •External Causes of Evolution and Extinction in Biotas (104,112,113,121)

F. History of the Earth's Magnetic Field

F.4. Plate Motions (120,121,122,123,124,126)

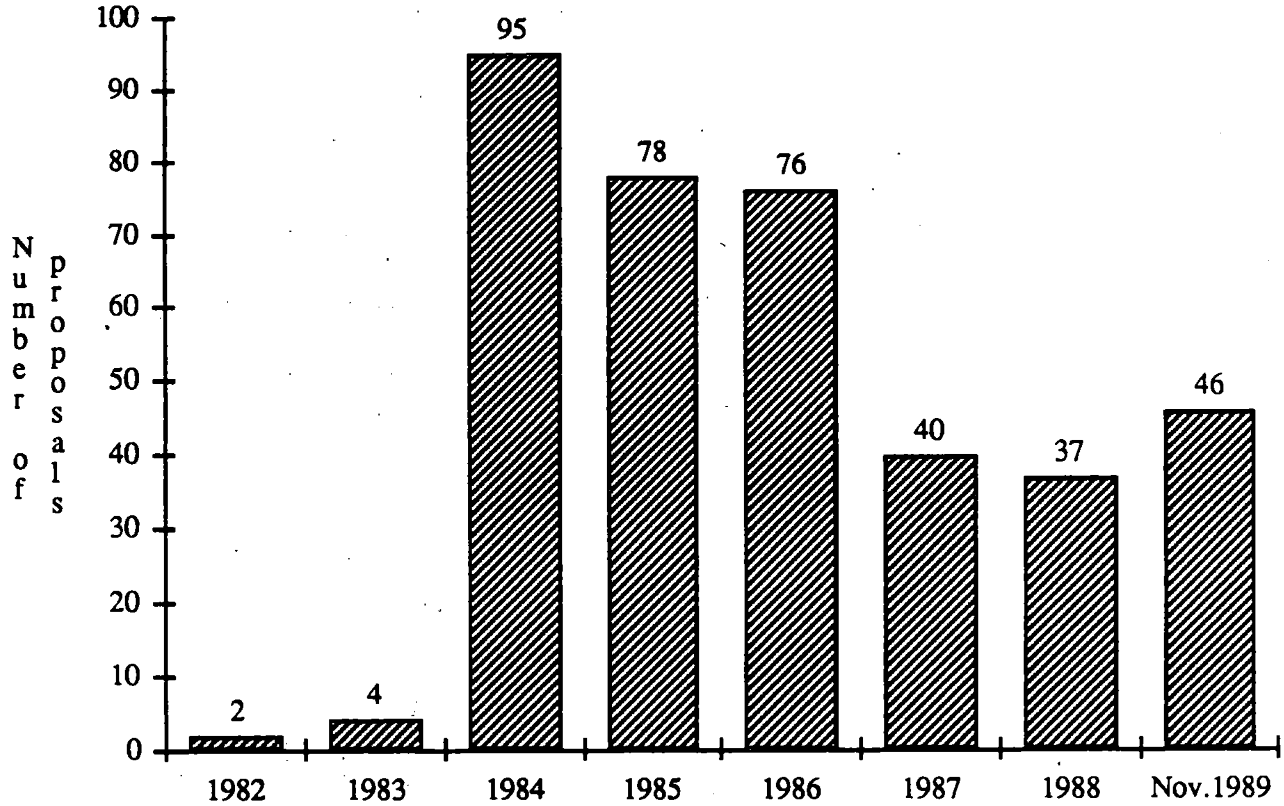
OBJECTIVES OF RECENT PROPOSALS
(October 1987 to November 1989)
IN RELATION TO THEMES IN THE LONG RANGE PLAN



- 87 proposals have been received by the JOIDES Office from 1st October 1987 to 5 September 1989.
- A proposal can address more than one objective.

6 November 1989

Proposals received by the JOIDES Office
1982 - November 1989



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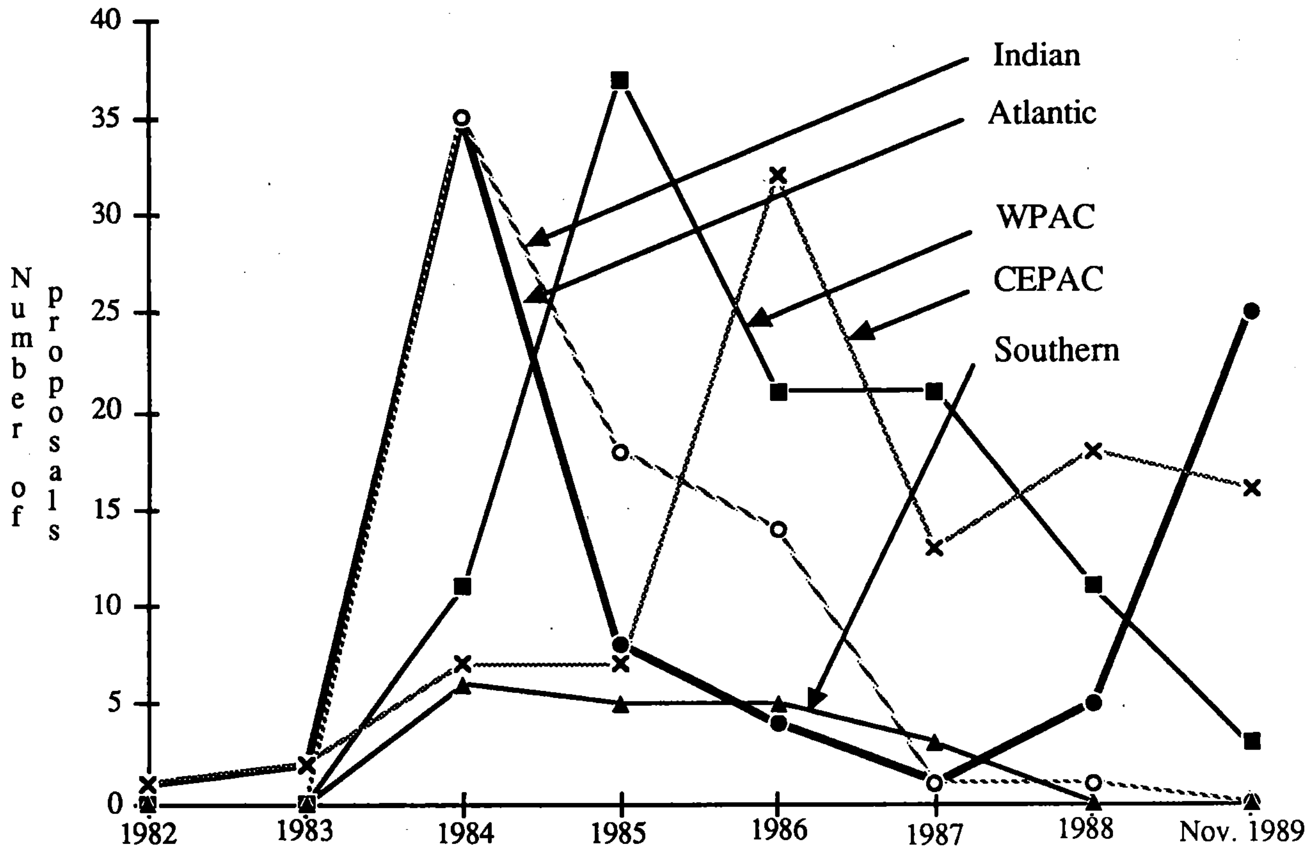
Proposals vs Years and Oceans



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LISTING OF PROPOSALS

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A: Atlantic; B: Indian; C: Southern; D: Western Pacific; E: Central and Eastern Pacific; F: Instrumental

JOIDES No	Title	Proponents	Country	Date
71	[idea proposal]	-	-	
1/A	Pre-m. Cretac. history of SE Gulf of Mexico	Phair & al.	US	12/82
2/E	Middle America trench and Costa Rica margin	Crowe & al.	US	12/82
4/E	Tuamoto Archipelago (French Polynesia)	Okal & al.	US	6/83
5/A	Struc. & sedim. carbonate platforms	Mullins & al.	US	7/83
7/A	Gulf of Mexico & Yucatan	Buffler & al.	US	8/83
8/E	Southern Chile trench	Cande	US	9/83
9/A	Pre-Messinian hist. of the Mediterranean	Hsu & al.	ESF	1/84
11/A	Porto & Virgo seamounts, Iberian margin	Kidd & al.	UK/FR	1/84
12/A	Tyrrhenian back-arc basin transect	Cita & al.	ESF	1/84
13/F	Water column research lab	Wiebe	US	1/84
14/E	Zero age drilling: EPR 13°N	Bougault	FR	1/84
15/A	Formation of the Atlantic Ocean	Herbin	FR	1/84
16/A	Atlantic-Mediterranean relationship	Faugeres	FR	1/84
17/A	Gorringe Bank, deep crust & mantle	Mevel	FR	1/84
19/A	Eleuthera fan, Bahamas	Ravenne & al.	FR	1/84
20/A	Subduction collision: Outher Hellenic Arc	J.Mascle	FR	1/84
22/A	Rhone deep sea fan	Bellaiche & al.	FR	1/84
23/A	Carribean basins	A.Mascle & al.	FR	1/84
24/A	Barbados transects	A.Mascle & al.	FR	1/84
25/D	New Hebrides arc	ORSTOM team	FR	1/84
28/D	South China Sea	Letouzey & al.	FR	1/84
29/D	Ryukyu Island & Okinawa backarc basin	Letouzey	FR	1/84
31/B	Red Sea, paleoenvironmental history	Guennoc	FR	1/84
32/A	Yucatan basin	Rosencrantz & al.	US	1/84
33/A	Mediterranean drilling [same as 9/A]	Hsu	ESF	1/84
35/A	Barbados ridge accretionary complex	Westbrook	UK	2/84
38/A	Gulf of Mexico (DeSoto Canyon)	Kennett & al.	US	2/84
39/A	Cape Verde drilling	Hill	UK	2/84
40/A	Logging of site 534 (Blake-Bahamas basins)	Sheridan & al.	US	2/84
34/E	Pacific-Aleutian-Bering Sea (Pac-A-Bers)	D.W. Scholl & al.	US	3/84
41/A	N Barbados forearc: Struc. & hydrology	C.Moore	FR/US	3/84
42/D	Sunda Straits area	Huchon	FR	3/84
43/D	SW Pacific drilling outline	Falvey	AUS	3/84
44/B	Andaman Sea: Tectonic evolution	Peltzer & al.	FR	3/84
45/A	Equatorian Atlantic: Paleoenvironment	Ruddiman	US	3/84
47/D	Manila trench, S.China Sea	Lewis & al.	US	3/84
49/D	Eastern Banda arc/Arafura Sea	Schluter & al.	G	3/84
52/D	Solomon Sea	Milsom	AUS	3/84
53/F	Vertical Seismic Profiling	Phillips & al.	US	3/84
54/C	Sub-Antarctic & Weddell Sea sites	Kennett	US	3/84
55/B	Makran forearc, Pakistan	Leggett	UK	3/84
57/B	Deformation of African-Arabian margin	Stein	US	3/84
58/A	West Baffin Bay	Grant & al.	CAN	3/84
59/A	Continental margin instability testing	Weaver & al.	UK	3/84
60/A	Newfoundland basin: E. Canadian margin	Masson	UK	4/84
6/A	Labrador Sea, ocean crust & paleoceanogr.	Gradstein & al.	CAN	5/84
36/A	Norwegian Sea	Hinz & al.	G	5/84
18/A	Off Galicia Bank	Mauffret & al.	FR	6/84
63/A	Madeira abyssal plain	E.J.T. Duin & al.	NETH	6/84

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JOIDES No	Title	Proponents	Country	Date
64/A	Site NJ-6	Poag	US	6/84
67/D	Tonga-Lord Howe Rise transect	Falvey & al.	AUS	7/84
68/A	Deep basins of the Mediterranean	L.Montadert	FR	7/84
69/F	Rock stress meas. in part of Norwegian Sea	Stephansson	ESF	7/84
70/F	Borehole seismic experim. at 417 & 603	Stephen & al.	US	7/84
72/A	Two-leg transect on Lesser Antilles forearc	Speed & al.	CONSOR.	7/84
37/E	Costa Rica, test of duplex model	Shipley & al.	US	8/84
74/A	Continental margin of Morocco, NW Africa	Winterer & al.	US	8/84
75/E	Gulf of California	K.Becker & al.	US	8/84
77/B	Seychelles bank & Amirante trough	Mart	US	8/84
78/B	Indus fan	Kolla	US	8/84
79/B	Tethyan stratigraphy & oceanic crust	Coffin & al.	US	8/84
81/A	Ionian Sea transect, Mediterranean	Hieke & al.	G	9/84
82/D	Sulu Sea	Thunell	US	9/84
84/E	Peru margin	Kulm & al.	US	9/84
85/A	Margin of Morocco, NW Africa	D.Hayes & al.	US	9/84
56/B	Intraplate deformation	Weissel et al.	US	10/84
61/B	Madagscar & E Africa conjugate margins	Coffin & al.	US	10/84
65/B	S. Australian margin: Magnetic quiet zone	Mutter & al.	US	10/84
80/D	Sunda & Banda arc	Karig & al.	US	10/84
87/B	Carlsberg Ridge, Arabian Sea: Basalt obj.	J.Natland	US	10/84
90/B	SE Indian Ocean Ridge transect	Duncan	US	10/84
91/B	SE Indian Ocean Oceanic Crust	Langmuir	US	10/84
93/B	W Arabian Sea: upwelling, salinity etc.	Prell	US	10/84
94/B	Owen Ridge: History of upwelling	Prell	US	10/84
95/B	Asian monsoon, Bay of Bengal	D.Cullen & al.	US	10/84
96/B	Bengal Fan (Indus & Ganges Fans)	Klein	US	10/84
98/B	History of atmosph. circ. (Austral. desert)	D.Rea	US	10/84
99/B	Agulhas Basin paleoceanogr. clim. dynamics	W.Coulbourn	US	10/84
100/B	SE Indian Ridge transect: Stratigr. section	J.Hays & al.	US	10/84
101/B	Ridge crest hydrothermal activity	Owen & al.	US	10/84
102/B	Somali Basin	Matthias	US	10/84
103/B	Laxmi Ridge, NW Indian Ocean	Heirtzler	US	10/84
104/B	90° E Ridge transect	Curray & al.	US	10/84
105/B	Timor, arc-continent collision	Karig	US	10/84
106/B	Broken Ridge, Indian Ocean	Curray & al.	US	10/84
107/B	SE Indian Ridge: Stress in ocean lithosph.	Forsyth	US	10/84
108/C	E. Antarctic continental margin (Prydz Bay)	SOP-Kennett	US	10/84
109/C	Kerguelen - Heard Plateau	SOP-Kennett	US	10/84
110/C	Wilkesland - Adelie continental margin	SOP-Kennett	US/FR	10/84
111/C	SE Indian Ocean Ridge transect (subantarc.)	SOP-Kennett	US	10/84
112/B	Lithosphere targets	SOP-Kennett	US	10/84
113/B	Agulhas Plateau	SOP-Kennett	?	10/84
114/C	Crozet Plateau	SOP-Kennett	FR	10/84
117/B	Northern Red Sea	Cochran	US	10/84
118/B	Cenozoic history of E. Africa	Kennett & al.	US	11/84
76/E	Proposal for axial drilling on the EPR at 13°N	R. Hekinian & al	FR	11/84
62/B	Davie Fracture Zone	Coffin & al.	CONSOR.	12/84
119/B	Early opening of Gulf of Aden	Stein	US	12/84
120/B	Red Sea, Atlantis II deep	Zierenberg & al.	US	12/84

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JOIDES No	Title	Proponents	Country	Date
122/A	Kane fracture zone	Karson	US	12/84
123/E	Studies at site 501/504	Mottl	US	12/84
124/E	To deepen Hole 504B	LITHP-K.Becker	US	1/85
125/A	Bare-rock drilling at the Mid-Atl. Ridge	Bryan & al.	US	1/85
126/D	Drilling in the Australasian region	Crook & al.	AUS	1/85
127/D	E Sunda arc & NW Austral. collision	Reed & al.	US	1/85
128/F	Phys.props. in accretionary prisms	Karig	US	1/85
130/D	Evolution of the SW Pacific (N of New Zeal.)	J.Eade	NZ	1/85
131/D	Banda Sea basin: Trapped ocean crust etc.	Silver	US	3/85
132/D	TTT-Type triple junction off Bosco,Japan	Ogawa & al.	J	3/85
133/F	In-situ sampling of pore fluids	McDuff & al.	US	3/85
135/B	Broken Ridge: Thermo-Mechanical Models	Weissel & al.	US/UK	3/85
10/A	Cenozoic circulation off NW Afric	Sarnthein & al.	G/US	4/85
115/B	Agulhas Plateau and adj. basins	Herb & al.	ESF	4/85
116/B	E & Chagos-Laccadive Ridge drilling	Oberhansli & al.	ESF	4/85
142/E	Ontong-Java Pl.:Equat. Pacific depth trans.	L.Mayer & al.	CAN/US	4/85
88/B	Chagos-Laccadive-Mascarene volc. lineament	Duncan & al.	US	5/85
147/D	South China Sea	Wang & al.	CHINA	6/85
179/D	Daito ridges region: NW Philippines Sea	Tokuyama & al.	J	6/85
21/A	Thyrrenian Basin: Rifting, stretching,accr.	Rehault & al.	FR	7/85
51/D	Sea of Japan	Tamaki & al.	J	7/85
97/B	Equatorial Indian Ocean:Fertil.& carb.comp.	Peterson	US	7/85
136/C	Kerguelen - Heard Plateau	Schlich & al.	FR	7/85
146/D	Toyamu fan, E Japan Sea	Klein	US	7/85
150/B	90°E Ridge & Kerg.-Gaussb. Ridge: hard rock	Frey & al.	US	7/85
151/D	Japan Sea: Mantle plume origin	Wakita	J	7/85
152/F	Borehole seismic experim., Tyrrhenian Sea	Avedik & al.	FR/US	7/85
153/E	Three sites in the SE Pacific	J.Hays	US	7/85
154/D	Banda-Celebes-Sulu basin entrapment	Hilde	US	7/85
156/D	Kita-Yamam. trough, Japan Sea: Massive sulf.	Urabe	J	7/85
157/D	Japan Sea paleoceanography	Koizumi & al.	J	7/85
158/D	Japan Sea & trench: Geochem & sedimentol.	Matsumoto & al.	J	7/85
159/F	Phys.cond. across trench: Izu-Mariana-...	Kinoshita & al.	J	7/85
160/F	Geophys. cond. of lithosp. plate, Weddell Sea	Kinoshita & al.	J	7/85
161/F	Magn.field & water flow measurement	Kinoshita & al.	J	7/85
162/F	Offset VSP on the SW IO Ridge fract.zones	Stephen	US	7/85
164/D	Japan trench & Japan-Kuril trenches juntion	Jolivet & al.	FR	7/85
165/D	Shikoku basin ocean crust	Chamot-Rooke & al.	FR	7/85
166/D	Japan Sea: Evolution of the mantle wedge	Tatsumi & al.	J	7/85
168/D	Japan Sea: Sedim. of siliceous sediments	Iijima & al.	J	7/85
169/C	South Tasman Rise	Hinz & al.	G	7/85
170/D	Valu Fa Ridge, Lau Basin: Back-arc spread.	Morton & al.	US	7/85
30/B	Davie Ridge & Malagasy margin, Indian Ocean	Clocchiatti & al.	FR	8/85
50/D	Nankai trough & Shikoku forearc	Kagami & al.	J	8/85
73/C	Antarctic margin off Adelie coast	Wannesson & al.	FR	8/85
92/B	Crozet Basin, seismic observatory	Butler & al.	US	8/85
137/B	Fossil ridges in the Indian Ocean	Schlich & al.	FR	8/85
138/B	Rodrigues triple junction, Indian Ocean	Schlich & al.	FR	8/85
139/B	Agulhas Plateau, SW Indian Ocean	Jacquart & al.	FR	8/85
140/B	Central & N. Red Sea axial areas	Pautot & al.	FR	8/85

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JOIDES No	Title	Proponents	Country	Date
141/B	Indus Fan	Jacquart & al.	FR	8/85
172/D	Mariana forearc, arc & back-arc basin	P.Fryer	US	8/85
173/B	Seychelles, Mascarene Pl., NW Indian Ocean	Patriat & al.	FR	8/85
174/D	Japan Sea: Forearc tectonics	Otsuki	J	8/85
175/D	Japan Trench: Origin of Inner Wall	Niitsuma & al.	J	8/85
176/D	S.Japan Trench: Migration of Triple Junction	Niitsuma	J	8/85
178/D	Nankai trough forearc	Shiki & al.	J	8/85
180/D	N.Philippines Sea: Kita-Amami basin & plat.	Shiki	J	8/85
181/D	Izu-Ogasaw.-Mariana forearc:Crust & mantle	Ishii	J	8/85
182/E	Sounder Ridge,Bering Sea: Stratigraphy	A. Taira	J	8/85
184/D	Papua New Guinea/Bismark Sea Region	N.Exon & al.	AUS/US	8/85
185/C	Kerguelen Plateau: Origin, evol. & paleo.	Coffin & al.	AUS	8/85
186/F	SW Ind.Ocean fracture zones hydrology etc.	von Herzen	US	8/85
86/B	Red Sea	Bonatti	US	9/85
187/D	New Hebrides arc region, SW Pacific	F.Taylor & al.	US	9/85
188/F	395A boreh.geophys. & 418A drill.& geophysics	M.Salisbury	CAN	9/85
189/D	Tonga Ridge and Lau Ridge Region	A.Stevenson & al.	US	10/85
191/D	Solomon Isl.: Arc-plateau coll. & intra arc	Vedder & al.	US	10/85
192/E	Baranoff fan, SE Gulf of Alaska	Stevenson & al.	US	10/85
193/F	Upper ocean partic.fluxes in Weddell Sea	Biggs	US	11/85
3/E Rev/1	Flexural moat, Hawaiian Islands	A.B. Watts & al	US	11/85
143/F	In-situ magnet. susc. measurements	Krammer & al.	G	12/85
195/E	Paleoenv. & Paleoclim. in the Bering Sea	C. Sancetta & al.	US	12/85
196/B	90°E Ridge: Impact of India on Asia	J.Peirce	CAN	12/85
197/B	Otway Basin/W.Tasman region	Wilcox & al.	AUS	12/85
198/D	Ulleung Basin: Neogene tectonics & sedim.	Chough & al.	COREA	12/85
199/E	Pelagic sediments in the sub Artic gyre (N.Pacific)	T.R. Janecek & al.	US	12/85
200/F	Borehole magnet. logging on leg 109 (MARK)	Bosum	G	12/85
201/F	High-precision borehole temp. measurements	Kopietz	G	12/85
205/A	Bahamas: Carb.fans, escarpm.erosion & roots	Schlager & al.	ESF	12/85
202/E	N.Marshall Isl. carbonate banks	S.O. Schlanger	US	1/86
203/E	Guyots in the central Pacific	E.L. Winterer & al.	US	1/86
207/E	Bering Sea basin & Aleutian ridge tectonics	Rubenstone	US	1/86
208/B	Ancestral triple junction, Indian Ocean	Natland & al.	US	1/86
209/C	Eltanin fracture zone	Dunn	US	1/86
210/E	NE Gulf of Alaska: Yakutat cont. margin	Lagoe & al.	US	1/86
211/B	Deep stratigraphic tests	SOHP -Arthur	US	1/86
212/E	Off northern & central California	Greene	US	1/86
213/E	Aleutian subduction: accret. controlling p.	McCarthy & al.	US	1/86
214/E	Central Aleutian forearc:Trench-slope break	Ryan & al.	US	1/86
215/B	Red Sea: Sedim. & paleoceanogr. history	Richardson & al.	US	2/86
216/D	South China Sea	Rangin & al.	FR	2/86
217/D	Lord Howe Rise	Mauffret & al.	FR	2/86
218/D	Manila trench & Taiwan collis.zone, SCS	Lewis & al.	US	2/86
219/B	Gulf of Aden evolution	Simpson	US	3/86
220/D	Three sites in the Lau Basin	J. Hawkins	US	3/86
222/E	Ontong-Java Pl.: Origin, sedim. & tectonics	Kroenke & al.	US	3/86
221/E	Equatorial Pacific: late Cenoz. Paleoenv.	N.G. Pisias	US	3/86
83/D	Izu-Ogasawara (Bonin) arc transect	Okada & al.	J	4/86
134/B	Gulf of Aden	Girdler	UK	4/86

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JOIDES No	Title	Proponents	Country	Date
171/D	Bonin region: Intra-oceanic arc-trench dev.	B.Taylor	US	4/86
223/B	Central Indian Ocean fracture zone	Natland & al.	US	4/86
225/E	Aleutian Basin, Bering Sea	A.K.Cooper & al.	US	4/86
224/E	Escanaba Trough (Gorda Ridge), NE Pacific	M. Lyle & al	US	4/86
89/B	SWIR, mantle heterogeneity	Dick & al.	US	5/86
121/B	Exmouth & Wallaby Pl. & Argo Abys. Plain	U.von Rad & al.	US	5/86
129/C	Bounty trough	Davey	NZ	5/86
227/E	Aleutian Ridge, subsidence and fragment.	Vallier & al.	US	5/86
228/C	Weddell Sea (E Antarctic contin. margin)	Hinz & al.	G	5/86
229/E	Bering sea, Beringian conti. slope & rise	A.K. Cooper & al.	US	5/86
230/C	Wilkes Land margin, E Antarctica	Eittreim & al.	US/J	5/86
231/E	North Pacific magnetic quiet zone	Mammerickx & al.	US	5/86
232/E	N.Juan de Fuca R.: High temp.zero age crust	E.Davis & al.	CAN	5/86
26/D	Tonga-Kermadec arc	Pelletier & al.	FR	6/86
144/D	Kuril forearc off Hokkaido: Arc-arc collis.	Seno & al.	J	6/86
145/D	Ryukyu arc: Left-lateral dislocation	Ujiie	J	6/86
148/D	Near TTT-type triple junction off Japan	Ogawa et al.	J	6/86
149/D	Yamoto Basin,Sea of Japan: Active Spreading	Kimura & al.	J	6/86
167/D	Okinawa trough & Ryukyu trench	Uyeda & al.	J	6/86
234/E	Aleutian trench: Kinematics of plate cover.	von Huene & al.	US	6/86
235/D	Solomon Sea: Arc-trench dev., back-arc...	Honza & al.	CONSOR.	6/86
236/E	N.Gulf of Alaska	Bruns & al.	US	6/86
237/E	Active margin off Vancouver Isl., NE Pac.	Brandon & al.	CAN/US	6/86
238/F	Pore pressure in the Makran subduction z.	Wang & al.	US	6/86
239/D	Two sites in the Lau Basin	D.Cronan	UK	6/86
214/E	Gulf of Alaska (Yakutat block) & Zodiak fan	Heller	US	6/86
243/D	Outer Tonga trench	Bloomer & al.	US	6/86
240/B	Argo abyssal Plain	Gradstein	CONSOR.	7/86
245/E	Transform margin of California	Howell & al.	US	7/86
246/B	Mesozoic upwelling off the S.Arabian margin	Jansa	CAN	7/86
247/E	NE Pacific: Oceanogr.,climatic & volc. evol.	D. Rea & al.	US/CAN	7/86
226/B	Equat.Indian Ocean: carb. system & circul.	Prell & al.	US	8/86
244/C	Western Ross Sea	Cooper & al.	US/NZ	8/86
248/E	Ontong-Java Plateau	Ben-Avraham & al.	US	8/86
249/E	Sedimentation in the Aleutian trench	Underwood	US	8/86
250/E	Navy fan, California borderland	M..B. Underwood	US	8/86
251/B	Seychelles-Mascarene-Saya de Mayha region	S.N. Khanna	SEYCH.	8/86
253/E	Shatsky Rise:Black shales in ancestr. Pac.	S.O. Schlanger & al.	US	8/86
254/A	NW Africa: Black shales in pelagic realm	Parrish & al.	US	8/86
255/A	Black shales in the Gulf of Guinea	Herbin & al.	FR/US	8/86
256/E	Queen Charlotte Transform fault	Hyndman & al.	CAN	9/86
257/E	Farallon Basin, Gulf of California	L. Lawver & al.	US	9/86
204/A	Florida escarpment transect	Paull & al.	US	10/86
252/E Rev.	Loihi Seamount, Hawaii	H. Staudigel & al.	US	10/86
258/E	Stockwork zone on Galapagos Ridge	R. Embley & al	US	10/86
260/D	Ogasawara Plateau, near Bonin arc	T. Saito & al.	J	10/86
261/E	Mesozoic Pacific Ocean	R.L. Larson & al.	US/FR	10/86
262/B	Mid Indus Fan	B.Haq	US	11/86
263/E	S.Explorer Ridge, NE Pacific	R.L. Chase & al.	CAN	11/86
206/D	Great Barrier R.: Mixed carb/epiclast.shelf	Davies & al.	AUS	12/86

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264/A	Montagnais impact struct.,Scotia Sh.	Grieve & al.	US	12/86
265/D	Western Woodlark Basin	S.D. Scott & al.	CAN/AUS/PNG	12/86
266/D	Lau Basin	Lau Group	CONSOR.	12/86
267/F	Old crust at converg. margins: Argo & W.Pac	C.H. Langmuir & al	US	12/86
268/D	Hydrothermal ore deposition, Queensland Pl.	Jansa et al.	CAN	12/86
269/E	Aleutian pyroclastic flows in marine envir.	Stix	CAN	12/86
27/D Rev.	Sulu Sea marginal basin	Cl. Rangin & al	FR	1/87
48/D Add.	Sulu Sea transect	Cl. Rangin	G/FR	1/87
270/F	Tomographic imaging of hydrotherm. circul.	Nobes	CAN	1/87
271/E	Paleoceanogr. trans. of California current	Barron & al.	US	2/87
272/F	Long-term downh. measurem.in seas a. Japan	Kinoshita	J	2/87
183/D	Periplatform ooze, Maldives, Indian Ocean	Droxler & al.	US	3/87
259/E Rev.	Meiji sediment drift, NE Pacific	L.D. Keigwin	US	3/87
274/D	South China Sea	Zaoshu & al.	CHINA	3/87
275/E	Gulf of California (composite proposal)	Simoneit & al.	US	3/87
232/E Add.	Clay miner. & geoch.: Juan de Fuca Ridge	B. Blaise & al.	CAN/FR	3/87
276/A	Equat. Atlantic transform margins	J.Mascle	FR	4/87
277/E	Aseismic slip in the Cascadia margin	Brandon	US	4/87
278/E	Blanco transf. fault: Alter., layer three.	R. Hart & al	US	5/87
279/E	Anatomy of a seamount: Seamount 6 near EPR	R.Batiza	US	5/87
280/E	Cretac.Geisha Seamounts & guyots, W-Pac	P.R. Vogt et al.	US	6/87
281/D	Accret.prisms at Kuril/Japan trench&Nankai Tr.	Y. Okumura & al.	J	6/87
282/E	Tracing the Hawaiian hotspot.	N. Niitsuma & al.	J	6/87
283/E	Kuroshio current and plate motion history	R.D.Jacobi & al.	US	6/87
284/E	Escanaba Trough,S-Gorda Ridge Hydrothermalism	Zierenberg & al.	US	7/87
285/E	Jurassic quiet zone ,Western Pacific	Handschumacher & al.	US	7/87
286/E	Return to 504/B to core & log layer 2/3 trans.	K.Becker	US	7/87
287/E	Deep drilling in the M-Series,Western Pacific	D. Handschumacher & al.	US	8/87
288/B	Repositioning of EP2 to EP12,Exmouth Plateau	Mutter & al.	US	8/87
289/E	Mass budget in Japan Arc-10Be Geochemical Ref.	S. Sacks & al.	US/J	8/87
66/F Rev.	Laboratory rock studies to reveal stress	N.R. Brereton	UK	9/87
76/E Rev.	EPR: oceanic crust at the axis	R. Hekinian	FR	9/87
177/D Rev.	Zenisu Ridge: Intra-oceanic plate shortening	A. Taira & al.	J/FR	9/87
224/E Rev.	Escanaba trough (Gorda Ridge), NE Pacific	M. Lyle & al	US	9/87
242/D	Backthrusting & back arc thrust., Sunda arc	Silver & al.	US	9/87
290/E	Axial Seamount, Juan de Fuca Ridge	P.Johnson & al.	US	9/87
291/E	Drilling in the Marquesas Islands chain.	J.H. Natland & al.	US	9/87
292/D	Drilling in the SE Sulu Sea	Hinz & al.	G	9/87
293/D	Drilling in the Celebes Sea	K. Hinz & al.	G	9/87
155/F Rev/1	Downhole measurt.in the Japan Sea	T. Suyehiro & al	J	9/87
294/D	Ophiolite analogues in the Aoba Basin,Vanuatu	J.W.Shervais	US	10/87
46/D	South China Sea margin history	D.Hayes & al.	US	11/87
273/C	Southern Kerguelen Plateau	Schlich et al.	FR/AUS	11/87
295/D	Hydrogeol.& structure,Nankai accr.complex	J.M. Gieskes & al.	US	12/87
296/C	Ross Sea, Antarctica	Cooper & al.	US/NZ/G	12/87
297/C	Pacific Margin of Antartic Peninsula	P.F. Barker	UK	12/87
247/E Rev.	NE Pacific: Oceanogr.,climatic & volc.evol.	B.D. Bornhold	CAN/US	1/88
298/F	Vertical seismic prof. in Nankai Tr. ODP Sites	G.F. Moore	US	1/88
299/F	Self-bor. p-meter: study deform.in accr. sed.	M.Brandon & al.	US/CAN	2/88

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JOIDES No	Title	Proponents	Country	Date
300/B	Return to site 735B-SW Indian Ridge	H. Dick & al.	US/CAN	2/88
301/D	Integrated proposal: Nankai forearc	J.Gieskes & al.	US/J	3/88
302/F	Electrical conductivity structure,E-Japan Sea	Y.Hamano & al.	J	3/88
194/D Rev/2	South China Sea	K.J. Hsü & al.	CHINA	4/88
303/E	Fracturing /volcanism on Hawaiian swell	B.Keating	US	4/88
190/D Add.	New Hebrides (Vanuatu) arc-ridge collision	Fisher & al.	US/FR	5/88
163/D Rev.	Zenisu Ridge: Intraplate deformation	S. Lallemant & al	FR	6/88
221/E Suppl.	Equatorial Pacific: L.Cenozoic paleoenviron.	N. Pisias & al.	US	6/88
304/F	ODP Nankai downhole observatory	H.Kinoshita & al.	J	6/88
305/F	Artic Ocean drilling	P.J. Mudie & al.	CAN	6/88
306/E	Old Pacific History	Y.Lancelot & al.	FR/US	6/88
233/E Rev.	Oregon accr. complex: fluid proc. & struct.	L.D. Kulm & al.	US	7/88
307/E	Cross Seamount, Hawaiian swell	B. Keating	US	7/88
308/E	Reactivated Seamounts,Line Island chain.	B.Keating	US	7/88
3/E Add.	Drilling in vicinity of Hawaiian Islands	R.S.Detrick & al	US	7/88
222/E Rev.	Ontong Java Pl.: origin, sedim. & tectonics.	J. Mahoney & al.	US	7/88
155/F Rev/2	Downhole measurement in the Japan Sea	T. Suyehiro & al	J	8/88
309/F	VSP Program at sites Bon-2 and Bon-1	P.Cooper	US	9/88
310/A	Geochemical sampling ,dippings ,E-Groenland	A.Morton & al.	UK	9/88
311/A	Sedim. equivalent of dippings ,Rockall	D.Masson & al.	UK	9/88
312/A	Potential of drilling on Reykjanes Ridge	J.Cann & al.	UK	9/88
313/A	Evolution of oceanog. pathway: The Equat. Atlan.	E.Jones & al.	UK	9/88
314/D	Fluid flow & mechan. response, Nankai	D.Karig & al.	US	9/88
316/E	To drill a gaz-hydrate hole (West Pacific)	R. Hesse & al.	CONSOR.	9/88
59/A Rev.	Continental margin sediment instability	P.P.E.Weaver & al	UK/NETH/CAN	9/88
3/E Rev/2	Flexural moats, Hawaiian Islands	A.B. Watts & al.	US	10/88
315/F	Network of perm. ocean floor broad band seism.	G.M. Purdy & al.	US	10/88
275/E Rev.	Drilling the Gulf of California	Simoneit (ed.) & al	US	10/88
271/E Rev.	Paleocean. transect of California current	J.A. Barron & al	US	10/88
195/E Suppl.	Paleoenviron. and paleoclim. in the Bering Sea	D.W. Scholl & al	US	10/88
199/E Suppl.	High latitude paleoceanography	D.W. Scholl & al	US	10/88
231/E Suppl.	Plate reconstr. & Hawaiian hotpsot fixity.	D.W. Scholl	US	10/88
225/E Suppl.	Plate-Reconstr.: Bering Sea	D.W. Scholl & al.	US	10/88
317/E Rev.	Northern Cascadian Subduction Zone	R.D.Hyndman & al.	CAN	12/88
318/E Rev.	Chile Margin Triple Junction	S.C.Cande & al	US	1/89
319/E Rev.	An extinct hydrotherm. syst., East Galapagos	M.R. Perfit & al	US/CAN	2/89
320/A	High Northern latitude paleoceano. & paleoclim.	E. Jansen & al	NOR/SWED.	3/89
321/E	The EPR ridge crest near 9°40' N	D.J. Fornari & al	US	3/89
322/E	Ontong Java Plateau-pipelike structures.	P.H. Nixon	UK	3/89
323/A	Gibraltar Arc	M.C. Comas & al	CONSOR	4/89
324/A	Tecton. evol. of W. & E. Mediterr. since Mesozoic	P. Casero & al.	IT/G	4/89
142/E Rev.	The Ontong Java Plateau	L. Mayer & al.	CAN/US/UK	4/89
325/E	High temp. hydrother. site N. Juan de Fuca Ridge	H.P. Johnson & al	US/CAN/UK	5/89
326/A	Continenetal margin of Northwest Morocco	K. Hinz & al	G	5/89
327/A	Argentine continental rise	K. Hinz & al	G/ARG	5/89
203/E Rev.	Cretaceous guyots in the Northwest Pacific	E. L. Winterer & al	US	5/89
328/A	Continental margin of East Greenland	K. Hinz & al	G	6/89
329/A Rev.	Paleocommunication between N & S Atlantic	J.P. Herbin & al.	FR	7/89
330/A	Mediterranean ridge, accretionary prism	M.B. Cita & al.	I/G	7/89
331/A	"Zero-age" drilling: Aegir ridge	R.B. Whitmarsh & al.	UK/G/FR	7/89

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JOIDES No	Title	Proponents	Country	Date
332/A	Florida escarpment drilling transect	C.K. Paull & al.	US	7/89
333/A	Tectonic and magmatic evolution: Carribean sea	B.Mercier de Lepinay &al.	FR/US	7/89
334/A	The Galicia margin new challenge	G. Boillot & al.	FR/SP	7/89
335/E Rev.	Drowned atolls of the Marshall Islands.	S.O. Schlanger & al.	US	7/89
336/A	Artic to north Atantic gateways	J. Thiede	G	7/89
337/D	To test the sedim. architect. Exxon sea-level curve	R.M. Carter & al.	A/NZ/US,	7/89
338/D	Neogene sea-level fluctuations: NE Australia.	C.J. Pigram	A	8/89
339/A	Drilling transects of the Benguela current	L. Diester-Haass & al.	G/US	8/89
340/D	Evolution of foreland basins: N. Australia	M. Apthorpe & al.	A	8/89
341/A	Global climatic change-Holocene	J.P.M. Syvitski	CAN	8/89
342/A	The Barbados accretionary prism	R.C. Speed & al.	US/UK/FR	8/89
343/A	Drill in window Cret. volc. form. Caribbean	A. Mauffret & al.	FR	8/89
344/A	Western N. Atl. Jurassic magnetic quiet zone	R.E. Sheridan	US	8/89
345/A	Sea level and paleoclim. West Florida margin	J.E. Joyce & al.	US	8/89
346/A Rev.	The Equatorial Atlantic transform margin	J.Mascle & al.	FR	8/89
347/A	Late Cenozoic paleocean., S.Equat.Atlantic	G. Wefer & al.	G/US	8/89
348/A	Upper Paleoc. to Neog. sequence: mid Atl. margin	K.G. Miller & al.	US	8/89
349/A	Clastic apron of Gran Canaria.	H.-U. Schmincke & al.	G/US/UK	8/89
350/E	Gorda deformation zone off N. Calif.	M. Lyle & al.	US	9/89
351/C	Bransfield Strait	D.C. Storey & al.	UK/US/G	9/89
352/E	Drilling into Layer 3, Mathemat. Ridge	D.S. Stakes & al.	US	9/89
353/C Rev.	Antarctic Peninsula, Pac. margin	P.F. Barker & al.	UK	9/89
354/A	Angola/Namibia upwelling system	G. Wefer & al.	G/US	9/89
355/E	Formation of a gaz hydrate	R. von Huene & al.	G/US	9/89
271/E Rev/2	APC coring seamounts off California.	J. Barron	US	9/89
233/E Rev/2	Oregon accretionary complex	L.D. Kulm & al.	US/G	9/89
356/A	Denmark Str.,Greenl. Scotl.&Jan Mayen ridges	P.P. Smolka & al.	G	9/89
357/E Rev.	East Pacific Rise near 12°50'	R. Hékinian &al.	FR/US	10/89
286/E Add.	Layer 2/3 transition at hole 504B	K. Becker	US	10/89
221/E Add.	Eastern Equatorial Pacific Neogene	N.G. Pisias & al.	US	11/89
317/E Add.	Northern Cascadia subduction zone	R.D. Hyndman & al.	CAN	11/89

PROPOSALS RECEIVED AT THE JOIDES OFFICE

SINCE AUGUST 1989

JOIDES Number: **340/D** ***Date: 8/89***
Title: **Evolution of Foreland Basins - a Record of Tectonic, Climatic and Oceanographic Change from the Northern Australian Margin**
Proponents: **M. Apthorpe, M. Bradshaw, P.J. Davies, D.A. Feary, R. Hillis, D. Jongsma, C.J. Pigram, M.G. Swift and P.A. Symonds**

This drilling proposal is divided into two sub-proposals.
1) Neogene/Quaternary collisional tectonism and foreland basin development across the northern australian margin. This region is probably the only place on earth where ocean drilling can be used to understand the early tectono-stratigraphic evolution of foreland basins. Also this region is a modern analogue of the anciant orogens in western North America and Europe. (5 sites).
2) Cenozoic global climate evolution - the record across the northern Australian margin. The stable isotope record within sedimentary sequences across the northern Australian margin will document many of the major events in the dramatic evolution of global climates during the Cenozoic related to the nortward movement of Australia folowing breakup with Antarctica. A separate objective will be to obtain a Late Cretaceous biostratigraphic reference section for the eastern Indian Ocean. (5 sites).

JOIDES Number: **341/A** ***Date: 8/89***
Title: **Global Climatic Change as Measured trough a Continuous Late Wisconsinan Quaternary Record with Special Emphasis on the Holocene**
Proponents: **J.P.M. Syvitski**

This proposal presents a drilling program of two sites in the Saguenay Fiord and in the St. Lawrence Estuary (Laurentian Trough). Both sites have an extensive supporting database of high-resolution geophysics, have an expanded (thick) sequence of fluvially transported and pelagically-deposited Holocene sediment that past research suggests to be resolvable at an annual level of resolution. Geophysical data also suggests at least one, if not two, deglacial sequences that properly analyzed could provide a measure of the rates of climate change going into and out of the last glaciation and its associated ablation.

JOIDES Number: **342/A** *Date: 8/89*
Title: **Growth Mechanics and Fluids Evolution of the Barbados Accretionary Prism**
Proponents: **R.C. Speed, G.K. Westbrook, J.C. Moore, A. Mascle, X. Le Pichon, S. Dreiss, D. Karig, M. Langseth**

This drilling program in the Barbados addresses the mechanics and fluids evolution of accretionary forearcs, emphasizing mechanisms and episodicity of acccretionary prism growth and progressive deformation; sources, pathways, and rates of flowing fluid; and time dependence of events and physical properties. Sites proposed for these investigations are in partial transects across the Barbados forearc and the immediately adjacent Atlantic ocean floor. The questions posed are global and applicable to an understanding of the tectonic evolution of convergent margins and some ancient orogenic belts in general, materials budgets, and processes of consolidation and defluidization of sediments under compression. It is believed that a maximum advance toward solutions can be gained by drilling within a single forearc whose features change systematically in response to lateral changes of major controlling variables. The Barbados forearc amply provides such a natural laboratory because of large changes on strike in the major variables, thicknesss, rheology, and permeability of incoming sediment. (3 to 4 legs).

JOIDES Number: **343/A** *Date: 8/89*
Title: **Drill in a Window of the Cretaceous Volcanic Formation in the Caribbean Sea**
Proponents: **A. Mauffret and A. Mascle**

The evidences of a window in the Cretaceous volcanic flow give the opportunity to reach the oceanic basement at a moderate depth of penetration (1 sec. max., 1100 m) and to solve the main problems posed in the Caribbean region as defined during the ODP symposium on Caribbean (nov. 1987). The first objective is to study the composition of the volcanic rocks below the Coniacian volcanic flow. A second objective is to drill (0.8 sec., 900 m) and to reach the rough basement at the top of Pecos Fault Zone so as to complete the sampling of the Caribbean crust and also to precise the neotectonics. (7 sites).

JOIDES Number: **344/A** *Date: 8/89*
Title: **Proposal to Study the Western North Atlantic Jurassic Magnetic Quiet Zone by Ocean Drilling**
Proponents: **R.E. Sheridan**

The origin of the Jurassic magnetic quiet zone remains problematic. Possible origins now include 1) typical oceanic crust spreading when the earth'smagnetic field had a constant normal polarity for an extended interval (10-15 my), 2) typical oceanic crust spreading when the earth's magnetic field had a rapidly reversing polarity (greater than 7.5 reversals/my), or 3) typical oceanic crust spreading when the earth's magnetic field was either of constant normal polarity or rapidly reversing, but with a weaker magnetic field intensity. It is proposed that Site 534 be reentered and drilled through 500 m of basaltic flows to get a good probability that a reversed polarity be detected. Another site should be drilled into basement as further verification and it is proposed a new site close to the Site 603 of DSDP.

JOIDES Number: **345/A** *Daet: 8/89*
Title: **Drilling Proposal for the West Florida Continental Margin, Gulf of Mexico: Sea Level and Paleoclimatic history**
Proponents: **J.E Joyce, H.T. Mullins, L.R.C. Tjalsma and S.W. Wise**

Carbonate ramps offer unique opportunities to study the interactions between ocean basins and surrounding land masses, and evaluate the timing and amplitude of global sea level change. The West Florida margin is an excellent example of a carbonate ramp which meets the general requirements for a potential drilling area to address sea level change. A transect of 6-7 sites, strategically positioned along an optimal, high-resolution seismic reflection profile extending from shallow (90 m.) to deep water (1125 m.), will provide documentation of the timing of sea level change and bracket amplitudes of Cenozoic sea levels. The proposed deep-water sites provide the basis for multi-disciplinary paleoclimate studies addressing 1) the timing and magnitude of Pliocene meltwater discharge from mid-latitude ice sheets, 2) the extent of phosphorite deposits along the West Florida margin especially within the Tertiary, and 3) the history of Loop Current circulation in the eastern basin.

JOIDES Number: **346/A Rev.** *Date: 8/89*
Title: **A Proposal for Scientific Drilling on the Equatorial Atlantic Transform Margin**
Proponents: **J. Mascle, Ch. Basile, J.P. Herbin, M. Moullade and Ch. Robert**

This proposal is dealing with both the evolution of transform margin and gateways within the Equatorial Atlantic. It intends to promote a better understanding of sedimentary, tectonic, and others processes (diagenesis, vertical motion, magmatism) appearing to be specific at transform extensional margins. This drilling proposal is part of an integrated program devoted to the structure and evolution of the Ivory coast-Ghana margin, considered as one of the best example of transform margin. (7 sites).

JOIDES Number: **347/A** *Date: 8/89*
Title: **Late Cenozoic Paleoceanography, South-Equatorial Atlantic**
Proponents: **G. Wefer and W.H. Berger**

Drilling is proposed along 3 transects in the area of the equatorial Atlantic: east and west of the south-equatorial MOR and south-east of São Paulo. The purpose is to reconstruct the dynamics of the transequatorial heat transport in relation to the North Atlantic Deep Water (NADW) formation, intermediate curents, and productivity variations throughout the Neogene. Comparison of records from eastern and western transects allows assessment of east-west asymmetries in the productivity, and of strength of surface circulation. At depth, these comparisons allow reconstruction of NADW and AABW transport patterns. The transect near São Paulo is to recover the record of heat import of the North Atlantic through the South Equatorial Current. Also, a north-south comparison in the west-equatorial region will give clues to the vigour of NADW flow, from the inclination of the abyssal thermocline separating NADW and AABW.(1 leg).

JOIDES Number: **348/A** *Date: 8/89*
Title: **Upper Paleogene to Neogene sequence stratigraphy: the Ice House world and the U.S. Middle Atlantic Margin**
Proponents: **K.G. Miller, N. Christie-Blick and G.S. Mountain**

The upper Paleogene to Neogene section of the U.S. middle Atlantic margin is ideally suited for the study of changes in relative sea level recorded in passive margin sediments. Features unique to the region during this time interval include:

- rapid sedimentation (occasionally above 200m/m.y.) that provides an unusually high-resolution record during a time of known glacio-eustatic change;
- tectonic stability that simplifies subsidence considerations;
- mid-latitude setting that optimizes biostratigraphic potential , and yields sufficient carbonate for Sr-isotope stratigraphy; and
- abundant reconaissance -quality seismic profiles, well samples and logs, boreholes and outcrops that can guide efforts to concentrate on features that best reveal the record of sea-level change.

These unique possibilities will be exploited in drilling 11 possible sites on the shelf and upper slope of the Mid-Atlantic continental margin. The objective will be to determine the geometry and age of Oligocene to Miocene depositional sequences, and to evaluate the role of relative sea-level changes in developing this record. It will be evaluated possible causal links between ice-volume (glacio-eustatic) changes inferred from the deep sea ∂18O record and depositional sequences dating from this Oligocene to Miocene "ice house world". This program should define precisely the ages of these depositional sequences and test models of sedimentation and relative sea-level changes.

JOIDES Number: **349/A** ***Date: 8/89***
Title: **Drilling into the Clastic Apron of Gran Canaria: Evolution of a Linked System Volcanic Ocean Island-Sedimentary Basin**
Proponents: **H.-U. Schmincke, U. Bednarz, A. Freundt, P.v.d. Bogaard, K. Hoernle, M. Menzies, W. Weiger and G. Wissmann**

This proposal presents a drilling program of five holes into the volcanic oceanic island of Gran Canaria (Canary Islands). The drilling targets are the ultimate aim of the interdisciplinary research project **VICAP** = *Volcanic Island Clastic Apron Project.* The purpose of this project is to study the physical and chemical evolution of a confined system "asthenophere - lithosphere - seamount - volcanic island - sedimentary basin" by drilling into the proximal, medial and distal facies of a volcanic apron, which formed by submarine volcanic activity during the early seamount stage, explosive volcanic activity in shallow water and on land, lava flows and pyroclastic flows enterin g the sea, and erosional activity.
The clastic apron is expected to contain material from throughout the entire evolution of the volcanic complex, including material no longer present on the island and - most importantly - material from the unexposed and unaccessible submarine stage. A major element of the program will be high precision single-crystal age dating with the aim of monitoring the island and basin evolution in time slices as detailed as 100.000 years.

JOIDES Number: **350/E** ***Date: 9/89***
Title: **Plio-Pleistocene Sedimentation and Plate Deformation : Gorda Zone Deformation off Northern California.**
Proponents: **M. Lyle, R. Jarrard, S. Halgedahl and R. Karlin**

This proposal is to study the processes of deformation in young ocean crust by examining rotation of crust in the Gorda Deformation Zone through a series of 3 holes along an isochron approximately 4 millions years old. Sedimentary studies will be used to determine the history of rotation of different crustal regions within the plate. It could also be possible to measure the present state of stress in the crust. The Gorda Deformation Zone is also well-located for the study of both palaeoceanographic history of the Californian Current system and the evolution of the chemistry of temperate north Pacific deep waters. Finally, Late Pleistocene turbidite sections can be found nearby to hemipelagic sediment sites of paleoceanographic interests, and sampling of the coupled sites will be important to study the history of turbidite deposition from the northwest coast of North America. (1/4 leg).

JOIDES Number: **351/C** *Date: 9/89*
Title: **ODP Proposal for Bransfield Strait**
Proponents: **J.B. Anderson, P.F. Barker, I.W.D. Dalziel, M.R. Fisk, J.D. Jeffers, R.A. Keller, R.D. Larter, R. Meissner and J.L. Smellie**

This proposal presents a drilling program in the Branfield Strait -an young active back-arc basin that formed during the past 4 Ma along the remaining active portion of the Antartic Pacific margin. Sedimentation is dominated by glacial marine processes and their associated lithologies. It forms an ideal natural laboratory for a multidisciplinary, multinational drilling project. The main objectives are :

- Continental lithosphere extension in a convergent margin setting.
- Driving forces responsible for the formation of ensialic back-arc.
- Petrogenetic processes operating during initial back-arc rifting.
- Global climatic, environmental and sea level changes.
- Hydrothermal systems in active back-arc basins.
- Aspects of Andean-type orogenesis.

It is proposed to address these problems by drilling through sediment into crystalline basement to get a complete sedimentary record of the opening of the strait as well as samples of crystalline basement for geochemical and petrological studies of the transition from continental to oceanic crust in a back-arc setting. This would set Bransfield Strait as a example of an ensialic suprasubduction zone back-arc basin. (10 sites).

JOIDES Number: **352/E** *Date: 9/89*
Title: **Drilling into Layer 3 of East Pacific Crust at the Mathematician ridge.**
Prôponents: **D.S. Stakes and D.A. Vanko**

The phenomenal drilling results of ODP Leg 118 dramatically illustrated the advantages of drilling into gabbro that has been tectonically unroofed. The proponents present a drilling program into oceanic crust created at a fast-spreading center, the Mathematician Ridge, a failed rift in the Eastern Pacific which may provide the best "tectonic windows" for fast-spread crust. Also the Mathematician Ridge is far from any large offset transform intersections and thus avoids the inherent ambiguity of ridge - transform intersection. The main objective to drill this site will be to recover a continuous section of oceanic Layer 3 and the optimal site will start at or near the dike-gabbro boundary to avoid ambiguity of lithostratigraphic horizon. A second major objective of a drillsite for the Mathematician Ridge would be to determine the role of ductile normal faults in young plutonic rocks created at fast-spreading centers. A third objective would be to study the mechanics of rift failure. The relationship between the axial structures and post-rift failure structures and magmas could be determined. (1 site).

JOIDES Number: **353/C Rev.** ***Date: 9/89***
Title: **Antartica Peninsula, Pacific Margin**
Proponents: **P.F. Barker and R.D. Larker**

A length of the Pacific margin of the Antartic Peninsula has subducted a series of ridge crests of the Pacific-Phœnix plate boundary. The ridge crest collision event migrated along the margin, from the SW 50Ma ago to the last collision in the NE 3-5.5Ma ago. Subduction before collision had a simple geometry and, after collision, subduction stopped. Thus, the evidence of this event is well preserved, in the young ocean floor and in margin sediments. Since collision the margin has gently subsided (rather like a young passive margin) and glacial erosion has provided sediment to a large prograded wedge which extends the outer shelf.

Drilling on the Antartic Peninsula Pacific Margin would investigate:

1. the history of uplift and subsidence of the fore-arc resulting from subduction of a ridge crest. Fore-arc regional thermal metamorphism, from the same event, and heat flow;
2. the assumption that global eustatic sea-level change through the Plio-Pleistocene has been caused by changes in grounded ice volume;
3. the history of Antartic Peninsula glaciation over the past 5 to 10Ma;
4. the usefulness of continental rise turbidites and hemipelagics as indicators of cyclicity in continental glaciation.

JOIDES Number: **354/A** ***Date: 9/89***
Title: **Late Cenozoic History of the Angola/Namibia Upwelling System.**
Proponents: **G. Wefer and W.H. Berger**

It is proposed to drill 4 transects off Angola and Namibia, in order to reconstruct the upwelling history of the region between 5°S and 25°S, for the last 6 millions years. The region represents one of the most important upwelling systems in the ocean. The northnmost transect is to recover the record of productivity variations in a complex area, dominated by river input (Zaire), seasonal upwelling, and a pelagic offshore divergence. The transect off mid-Angola provides a "low-productivity" standart for comparison, with the possibility of detailed correlation between the margin record and the pelagic record. The transect off southern Angola targets the northern end of the continuous, high productivity portion of the Angola/Namibia upwelling system. The Namibia transect, finally, is to provide the record of maximum upwelling in this region.

JOIDES Number: **355/E** ***Date: 9/89***
Title: **Formation of a Gas Hydrate-its Effect on Pore Fluid Chemistry, its Modulation of Geophysical Properties, and Fluid Flow.**
Proponents: **R. von Huene, E. Suess, K. Kvenvolden and T. Shipley**

This proposal presents a drilling program through the base of a gas hydrate at a site where this can be accomplished safely. Such drilling is needed to understand the formation of gas hydrate in the marine environment and to improve the grounds on which the safety of ODP continental margin drillsites are judged.

The Peru margin has sites where the lower gas hydrate boundary can be penetrated without undue risk. Proposed sites are in the axis of a syncline where free gas and fluids tend to migrate up-structure. The reflection at the base of the hydrate (BSR) is strong on one flank and fades away in the synclinal axis. The major source of methane gas is probably Quaternary organic-rich sediment and where the depth of this layer reaches the transition between hydrate and gas, the BSR is observed.

Geochemical objectives:

1. Quantify the parameters controlling gas hydrate formation by constraining physical conditions and chemical inputs.
2. Characterize chemically and isotopically the gas in the hydrate, the bound clathrate water, and establish where the residual brine from gas hydrate formation is localized.
3. Identify the sources of methane, characterize the pore fluids unaffected by gas hydrate formation, and quantify rates of fluid and gas transport in the accretionary regime.

Geophysical objectives:

1. Test the use of acoustic properties from seismic data to quantify the distribution of gas hydrate and free gas by making down-hole and physical properties measurements in the hydrate-free-gas-sediment system.
2. Determine the precision of heat flow values derived from the depth of the BSR. Measure the effects of hydrate on thermal conductivity.
3. Estimate impedance to the flow of fluid at the BSR caused by the restriction of permeability plugged by gas and measure the consequent variability in formation overpressures.

Other objectives.

1. Determine the tectonic erosion of the Nasca Ridge and the concurrent change from erosion to accretion at the margin.
2. To study the apparent landward shift of coastal upwelling since the Miocene and the concurrent shift in a major contour current indicated by the sedimentary structure in Lima basin.

JOIDES Number: **271/E Rev/2** ***Date: 9/89***

TITLE: **Proposal for limited APC coring on seamounts of the California coast during a possible transect of that coast in 1991 and initial response to OHP feedback on proposal 271/E, "Neogene Upwelling and Evolution of the California Current System".**

Proponent: **J. Barron**

The California current constitutes the major eastern boundary current of the northeastern Pacific Ocean and sits astride one of the most climatically and oceanographically sensative mid-latitude gradients in the world ocean. Of equal importance, the associated continental margin of California represents one of the four principal regions of coastal upwellling and high productivity in the modern ocean. A series of north-south (and east-west, if possible) transects across the path of the California Current are proposed in order to:

1-Develop models of how the California Current system has evolved in response to major polar cooling events and increased latitudinal thermal gradients in the later part of the Neogene.

2-Determine the width of the California Current through time and the character of gradients both across and along the track of the current.
3-Determine whether fluctuations in the California Current have responded in phase or out of phase with high latitude climate changes including mid Miocene buildup of ice on Antarctica, later Neogene initiation of glaciation in the northern hemisphere.
4-Determine seasonality affects (e.g. upwelling) first evolved and/or accelerated during Neogene time. Related questions include when is the earliest record of El Niño-like events and their durations?
5-Search for patterns possibly related to closing of major Pacific gateways including the Isthmus of Panama.

(2 to 3 APC cores, 1 to 2 weeks of drilling time).

JOIDES Number: **233/E Rev/2** ***Date: 9/89***
Title: **Update Proposal to the Ocean Drilling Program for Fluid Process and Structural Evolution of the Central Oregon Accretionary Complex.**
Proponents: **L.D. Kulm, J.C. Moore, B. Carson, G.R. Cochrane, B.T.R. Lewis, P.D. Snavely Jr., R von Huene**

This document is an update of the Proposal to the Ocean Drilling Program referenced as 233/E and it concentrates solely on the specific drill holes and objectives previously described in Proposal 233/E.
The overall objective is to study active and past fluid venting and dewatering processes occurring within the accretionary complex and to relate these processes to the structural and stratigraphic framework. Specific objectives include the following:

1. Determine the sources of pore fluids and hydrologic conditions above the decollement.
2. Determine the nature of fluid expulsion pathways.
3. Determine the subsurface distribution and magnitude of carbonate cementation, diagenesis, and Ca-transport through the accretionary prism in the different structural settings and during the various stages of deformation.
4. Evaluate the transition from a hydrologic regime with significant intergranular fluid towards one dominated by flow along faults.
5. Define the characteristics of fluids and the physical properties of the associated deposits at incipient deformation zones in the abyssal plain, seaward of the main deformation front.
6. Determine the velocity structure of the accretionary complex and its relationship to diffusive regional dewatering versus localized vent expulsion sites.

JOIDES Number: **356/A** ***Date: 9/89***
Title: **Denmark Straits, Greenland Scotland Ridge, Jan Mayen Ridge (North Atlantic)**
Proponents: **P.P. Smolka and F. Strauch**

The main objectives of this proposal are:

1- To get an insight into Neogene climatology and 21st century's climatic conditions.
2- To study sediments immediately above/below the unconformity separating the glacial from the preglacial interval.

3- To gaine detailed knowledge on the subsidence history of the Greenland Scotland Ridge (GSR), especially its impact on feedback processes caused by enabled / disabled inflow of warm atlantic watermasses modulating the precipation history supporting / inhibiting glaciations in the Norwegian-Greenland-Sea (NGS).
4- To understand the initiation and the history of the East Greenland-Irminger- and EastIceland Current, exchange mechanism of water between NGS and Atlantic Ocean.
5- To decipher the oceanographic history of the Faeroe Shetland Channel including its paleoenvironment to end the discussion about the mode and intensity of deep water exchange.
6- To study the subsidence history and the sedimentological paleoenvironment of the East Greenland passive margin.
7- To supply knowledge to the paleoenvironmental and paleoclimatic history of the Jan-Mayen Ridge.

It is proposed to drill 9 sites.

JOIDES Number: **357/E Rev.** *Date: 10/89*
Title: **Proposal for Axial and Off-Axial Drilling on the EPR near 12°50'N**
Proponents: **R. Hékinian, J. Francheteau, F. Avedik, F. Albarede, Ph. Pezard, G. Thompson, D. Bideau**

A program for East Pacific Rise ridge crest drilling is proposed near 12°50'N in a region extensively surveyed since1981. This ridge crest segment located about half way between major transform faults (Orozco and Clipperton) is bounded by two minor overlapping spreading center discontinuities. The ridge crest is characterized by a well defined and prominent axial ridge cut by a small continuous graben in which an extensive set of hydrothermal vents has been located and sampled using primarily the deep submersible Cyana.

The prime objective of the proposed suite of holes is to understand the inter-related magmatic, structural and hydrothermal processes active at a fast spreading ridge crest and in an off-axis volcanic environment (seamount).

The first priority (EPR 13-1) is a single deep hole about 2 km west of the axis, outside the central zone of active fissuring and normal faulting intended to penetrate as close as possible to the top of the well-defined axial magma chamber i.e. about 1.5 km below the sea floor.

A second hole (EPR 13-2) about 500m deep is sited adjacent to an active discharge zone, the Chainette vent area, and is aimed at drillling the upper crusat of the axial fissured zone. The hole should penetrate through the permeable extrusive layer of the newly emplaced crust and into the underlying dike complex to characterize the thermal field and permeability.

A third hole (EPR 13-3) also 500m deep located about 6 km east of the ridge axis on the southern flank of a small 300m high seamount (southeastern seamount) should provide a short transect and enable comparisons between hydrothermal processes associated with ridge crest and off-axis volcanism. The hole, as planned, would traverse the whole constructional edifice.

Joides Number: **286/E Add.** *Date: 10/89*
Title: **Drilling the Layer 2/3 Transition at Hole 504 B**
Proponents: **K. Becker**

This update is intended to firstly discuss the recent ODP assessments of the engineering problems in Hole 504B. The best prospect for significant deepening of Hole 504B seems to involve milling and fishing the junk, setting a liner casing if necessary, and coring/drilling ahead with either the standard RCB or a medium-diameter diamond system on the existing drillstring. Also, it is discussed a possible timing dilemma regarding downhole measurements on the engineering leg. Finally it is presented the new and reassessed thematic justifications for deepening 504B.

Joides Number: **221/E Add.** *Date: 11/89*
Title: **Data Supplement to Eastern Equatorial Pacific Neogene Drilling Proposal**
Proponents: **N.G. Pisias and A. Mix**

The principal objective of the proposed drilling program is to obtain sediment records of the Neogene history of oceanic and atmospheric circulation in the equatorial Pacific. Two drilling transects are proposed crossing the major currents systems of the equatorial Pacific. These transects are located at 110°W and approximately 95°W. Based on the results of site surveys and the scientific objectives, two drilling plans are presented. An attached data package represents site survey information collected on recent cruise of the R/V Thomas Washington.

Joides Number: **317/E Add.** *Date: 11/89*
Title: **Accretionary Sedimentary Wedge Deformation and Fluid Expulsion Processes: the Northern Cascadia Subduction Zone off Vancouver Island**
Proponents: **R.D. Hyndman and E.E. Davies**

The purpose of this addendum is, first, to provide an update on site survey work being carried out in the Vancouver Island margin proposal area. Second, in response to the reviews of some of the thematic panels, clarification is provided of the proposed deformation and fluid expulsion model based primarily on geophysical data, along with some geochemical implications. The primary objectives for drilling outlined in the original proposal remain unchanged:

- to obtain the data required to constrain models of sediment fluid expulsion and deformation during the accretion process;
- to provide calibration of shipborne geophysical measurements that provide the main regional constraints on accretion models;
- to estimate the area on the subduction thrust where the brittle rupture of major earthquakes can occur, using borehole fluid pressure and thermal data.

It is proposed to drill six sites. Four of these sites which have modest penetration (c. 500m.) are given highest priority: a basin reference, a coherent deformation site, an incoherent deformation site and a hydrate site. Two additional sites (penetration >1000m.) are listed for a more complete program: a mature prism site and a deformation front thrust site.