

**Sedimentary and Geochemical Processes Panel**  
**SGPP/TECP Joint Fall Meeting**  
**19-21 September 1993, Corner Brook, Newfoundland**  
**Executive Summary**

**Review of Proposals**

SGPP reviewed 4 new proposals and 9 revisions and 12 addenda to previously reviewed proposals. Prior to the ranking of the FY'95 Prospectus, all of the proposals in the Prospectus with or without recent revisions were discussed by the panel members. Proponents were requested to leave the room during the discussion of their proposals.

**SGPP Ranking of FY'95 Prospectus**

The panel elected: (1) to add Proposal 412/-Add/-Add2 to the FY1995 Prospectus and (2) to rank all the proposals. Non-proponent panel members gave a rank from 13 (highest rank) to 1 (lowest rank) to all proposals, with the possibility of averaging ranks for equally favoured proposals. Proponents ranked 12 proposals, omitting their own proposal. Scores were assigned by normalizing the rank totals according to the number of votes cast (i.e., members minus proponents).

<b>ODP Ref. No.</b>	<b>Proposal</b>	<b>Score</b>	<b>Std. Dev.</b>	<b>Ranking</b>
423/ -Add	Gas Hydrate Sampling	11.00	2.13	1
412/-Add/-Add2	Bahamas Transect	10.91	2.39	2
391-Rev2	Mediterranean Sapropels	10.18	1.33	3
SR-Rev2	Sedimented Ridges II	9.58	2.89	4
380Rev3/059	VICAP/MAP	8.58	1.88	5
330-Rev/-Add3	Mediterranean Ridges I	8.25	2.14	6
386/422/386-Add	California Margin	7.25	2.80	7
323-Rev3	Alboran Sea	4.83	2.12	8
NARM-DPG	NARM Non-volcanic II	4.67	3.58	9
NARM-DPG	NARM Volcanic II	4.08	2.75	10
300-Rev	Return to Site 735B	3.75	1.91	11
346-Rev4	E. Equatorial Atl. Transform	3.58	3.06	12
NAAG-DPG	NAAG II	3.42	1.78	13

SGPP's ranking of the FY'95 Prospectus is consistent with SGPP's previous Global Ranking in Spring, 1993, which placed the first 5 proposals listed above among the top 6 proposals in its Global Ranking. The top 2 proposals, Gas Hydrate Sampling and Bahamas Transect, can be considered to have a nearly equivalent ranking, a reflection of the balanced composition of the panel between geochemical and sedimentological interests. The distinct break in the scores between positions 7 and 8 marks the boundary of SGPP thematic interests.

**Evaluation of PCS, PPSC, and VPC**

SGPP strongly endorses both the recent modifications to the PCS and the development of the PPSC. SGPP urges that precedence be given to further testing and improvement of the PCS in parallel with the development of the PPSC. Development of both tools is imperative for achieving SGPP high-priority objectives. Both tools should be made compatible for use with the same BHA's and sampling manifolds. The PCS will be a more appropriate tool for sandy sediments, whereas the PPSC has the potential to provide better samples in muddy lithologies. Simultaneous availability of the both tools will provide flexibility to obtain samples at sites with variable lithologies. SGPP also strongly endorses efforts to acquire an operational VPC tool. The VPC will allow sampling of unconsolidated coarse sediment critical to thematic objectives of sea level and sediment architecture. SGPP considers the development of these tools so important to its thematic objectives that it plans to hold its Spring, 1994 meeting at ODP/TAMU and will devote a half day to meet with the engineers to discuss tool development and testing.

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**ACTION ITEM:** SGPP would like to have a logging liaison from LDEO Borehole Research Group present at one SGPP meeting per year, preferably the Spring Meeting.

### **1995 Thematic Impacts Concerning Deep Drilling**

Although SGPP supports the concept of deep drilling, there are, at present, no ODP proposals requiring deep holes, which are of specific thematic interest to SGPP.

### **SGPP's Leg 157 Contingency Plan**

If Leg 157 DCS engineering test cannot be executed as scheduled, SGPP proposes the following drilling option: The JOIDES Resolution would sail from Barbados to the Cariaco Basin (Southern Caribbean) and drill Proposal 434 - Late Quaternary climate variability in the tropical Caribbean/Atlantic region. This is a single site proposal to triple-APC to 200m or refusal. SGPP feels that this proposal is very mature and has the exciting potential to link an oceanic record of climate change to continental records with the study of fluvial discharge and anoxic variability. After completion, the ship would cross the Atlantic and enter the Mediterranean Basin to drill the Proposal 391-Rev2 - Mediterranean Sapropel Transect. SGPP considers this revision to now be a mature program and has ranked it No. 3 in the FY95 Prospectus. This program, which does not require special equipment, etc. with all sites having straight forward triple APC/XCB coverage, requires 27.2 days on site and would not alone constitute a full leg. If together Proposal 391 and 434 plus transit time do not comprise a full 56-day program, there are other drilling alternatives within the Mediterranean that are included in highly ranked TECP proposals and could be scientifically accommodated in this proposed drilling option for Leg 157.

### **Revision of SGPP's White Paper**

In preparation for revising SGPP's White Paper and in accord with PCOM's request that the panel discuss major accomplishments to date and prioritize themes for the two periods FY1995-98 and FY1999-2003, the panel chose to focus efforts into three broad thematic areas: (1) sea level and facies architecture, (2) fluid flow and geochemical fluxes and (3) geochemical budgets and carbon geodynamics. Panel members have been assigned to each of these topics to prepare draft revisions of the White Paper, emphasizing what can be accomplished with drilling during the specified time periods.

### **Proposal Review Process**

In order to improve the proposal review process, SGPP suggests that the JOIDES Office compile a computer file containing the abstracts for all of the currently active proposals. Once compiled, such a file could easily be updated with each proposal submittal period. The "starter kit" sent to new members should contain a print-out of this document and, for each meeting, all panel members should receive a supplement to the document containing the abstracts of new proposals on the review list. In addition, SGPP members requested the Chair to distribute to them the full review of proposals, which are normally sent only to the JOIDES Office to be passed onto the proponents.

### **New Panel Membership**

New panel membership for positions vacated in 1994 was discussed by the panel. In addition to the three U.S. SGPP members due to rotate off the panel at the end of 1993, the term of the current SGPP Chair will expire in the second half of 1994. In order to adequately cover its broad thematic mandate, SGPP considers it essential that the present speciality balance on the panel be maintained with both U.S. and international partner rotations. In particular, an organic geochemist will be required. J. Alt, F. Sayles, and P. Swart are acknowledged for their service and contributions to the panel and the ODP planning structure.

### **Next Meetings**

Spring Meeting - 7-9 March 1994, College Station, TX, hosted by L. Stokking  
6 March 1994, Optional field trip from Austin, TX, led by R. Sarg  
Fall Meeting - 1st week October 1994, Fukuoka, Japan, hosted by W. Soh

# Sedimentary and Geochemical Processes Panel

## SGPP/TECP Joint Fall 1993 Meeting

### Minutes

**Date:** Sunday-Tuesday, 19-21 September 1993

**Place:** Corner Brook, Newfoundland

**Host:** Richard Hiscott, Memorial University of Newfoundland

#### Attendees:

##### SGPP members :

Jeffrey Alt , Recorder (USA)  
Gérard Blanc (alt. F)  
Robert Garrison (USA)  
Judith McKenzie, Chair (at large)  
Wonn Soh (J)  
Peter Swart (USA)

Jean Bahr (USA)  
Kay Emeis (G)  
Richard Hiscott (Can-Aus)  
Rick Sarg (USA)  
Finn Surlyk (ESF)  
Michael Underwood (USA)

The following SGPP members could not attend and sent apologies:

Jacques Boulègue (F)  
Charles Paull (USA)

Paul Farrimond (UK)  
Fred Sayles (USA)

##### SGPP liaisons and guests:

Greg Mountain - Co-chief Scientist Leg 150  
Laura Stokking - ODP/TAMU  
Robert Zierenberg - LITHP

Robb Kidd - PCOM  
James Zachos - OHP  
Alistair Robertson - TECP

## I. WELCOMING REMARKS AND INTRODUCTIONS

Panel chair Judith McKenzie and host Richard Hiscott welcomed panel members to Newfoundland. General introductions of panel members, liaisons, and guests were made, and meeting logistics and agenda were presented.

## II. REPORTS

### 1. PCOM REPORT (Robb Kidd)

Kidd reported that the total budget for FY'94 will be 44.9 million, with 5 and 2/3 partners (Canada and Australia have 1/3 partnerships each), and NSF will make up the missing 1/3 partner share. Regarding the FY'95 prospectus: NARM Volcanic II will be the East Greenland transect, and NARM Non-volcanic will be continuation on the Iberia margin. If an ice breaker is needed for NAAGII, it will impact on the FY'95 budget.

There is continuing discussion at EXCOM and PCOM about the new European core repository in Bremen regarding whether to move all cores from the East Coast Repository to the new facility or whether only new cores beginning with Leg 151 will be stored there. The panels and PCOM basically oppose moving the old core, but European EXCOM members feel that some old core should be transferred.

PCOM is interested in investigating alternate drilling platforms. One option is a planned Japanese drill ship that may be operated under a JOIDES-like structure. The new ship would permit deeper drilling with more time on site.

PCOM charges the panel to write a short summary identifying ODP's current progress toward achieving the panel's major goals as outlined in its white paper, and to prioritize the panel's drilling objectives through 1998 and through 2003. PCOM also

requests that SGPP provide comment about its requirements for PCS and VPC to achieve the panel's goals, comment on its priority for computer upgrade for the JOIDES Resolution and state how deep drilling fits in with panel's long-term goals, regardless of engineering feasibility.

The DCS will be tested on land sometime this year. If the test fails or does not occur, then a substitute for Leg 157 DCS Engineering must be found for FY'94 drilling. SGPP was requested to comment on their choice for this leg.

The ASRC report was discussed: PCOM was against major changes to proposal review process; panels should make it clear to proponents if a proposal is doomed; a new DRILOPT subcommittee will present possible ship tracks to PCOM prior to PCOM's decision on the next drilling schedule in order to reduce the time that PCOM spends on this subject; panel chairs will present their high-ranked proposals to PCOM at the annual meeting.

## 2. ODP REPORT (Laura Stokking)

Preliminary results from Leg 151 (NAAG-1) were presented; results from Legs 148-150 will be presented later in the meeting. Although the ship was assisted by an icebreaker, advancing ice sheets prevented some Leg 151 sites from being drilled. This is the worst year for ice this century. An unexpected result was that there was no evidence for ice cover during the Oligocene.

In a PCS update, engineers have: removed one pressure relief valve to combat leaking; designed and implemented a new core catcher and cutting shoe to improve core penetration and recovery; changed design so tool can be deployed without removing seals after testing. The concept of a PPCS (push-in pressure core sampler) was presented for the panel's opinion. PPCS may improve recovery of soft sediments.

The VPC system was discussed. The Novotech system has been abandoned because of flawed design (it won't work), and a currently active Russian system is being investigated. The latter apparently works well and may be the best option.

The DCS is behind schedule. Results of testing (which will probably be in November) must be available prior to the December PCOM meeting.

Current proposals for deep drilling were discussed. The engineers consider that the Somali and Alboran basin proposals are "drillable" with multiple casing strings, but problems exist with deep holes proposed for the Newfoundland Basin, Galicia Margin, and IAP-1. Problems mainly arise from weather and sea state effects.

## 3. LITHP REPORT (Rob Zierenberg)

LITHP expressed concern about preparedness for hard-rock legs, citing problems on recent Legs 147 and 148. The ship has sometimes gone out without sufficient equipment for possible contingencies. LITHP will try to work with TAMU ahead of time to anticipate problems and work out solutions. The panel suggest revision of the generic deep crustal hole to include a fault, based on Leg 148 results. LITHP's global rankings were presented. They were willing to devote time from TAG to corking of Site 395. Looking at their objectives, many potential important legs are not in the Atlantic.

## 4. DMP REPORT (Peter Swart)

The status of various tools was discussed. The RFP for a fluid sampler is still awaiting funds. Meanwhile, Joris Gieskes is taking the lead on evaluating the feasibility of fluid sampling and is building a water sampling device for wireline reentry. A LDEO tool that is of potential interest to SGPP is a Schlumberger top-hat device equipped with a packer which is suitable for use during wireline reentry. The GLT replacement is the PGA tool, which runs using a new computer, and has different crystals that can detect other elements. As the result of some reorganization at Lamont Borehole Research, laboratories in Leicester and Marseilles will process GLT results. Requirements for third-party tool certification were mentioned; there are currently no third-party tools for Leg 158 TAG, including high temperature tools. The need for technicians familiar with third-party tools to be on board is an item that should be discussed at the next DMP meeting.

Logging while drilling (LWD) was discussed in regard to the upcoming Barbados leg. Cores cannot be taken during LWD. A CORK for Barbados was also discussed. There is only time for 3 Barbados holes rather than the 5, as recommended by SGPP. SGPP is concerned about the "screen" construction for Barbados.

There was some DMP discussion about reactivating the GEOPROPS tool, but it was concluded that it was unsuccessful, other tools work better and that it would be a "nightmare". J. Bahr should convey to DMP that SGPP is not interested in pursuing GEOPROPS further.

DMP requests SGPP to prioritize tools they want developed. SGPP responded emphatically that they always have wanted the PCS and VPC and that they maintain these tools are its highest priorities.

**ACTION ITEM:** SGPP would like to have a logging liaison from LDEO Borehole Research Group present at one SGPP meeting per year, preferably the Spring Meeting.

### III. EQUIPMENT

#### 1. DISCUSSION of PCS, PPCS and VPC

In response to a PCOM request that SGPP evaluate its position regarding the PCS, PPCS and VPC tools, the objective and design of the PCS were reviewed, problems were discussed, and recent improvements mentioned. In a letter read in absentia, Charles Paull reviewed the history of PCS use and improvements. He supports the development of the PPCS, as an improvement which should be strongly endorsed by SGPP. The general panel consensus was that the PPCS may work better in soft and muddy sediments, that the PPCS may actually be better than the PCS but that the PCS should not be abandoned, and that dedicated technical support should be aboard the JOIDES Resolution when the either PCS or PPCS is deployed.

A consensus regarding the PCS and PPCS was reached by the panel. The panel strongly endorses the development of the PPCS and supports continued development and testing of the PCS, and their use in different environments. The PCS and PPCS are required for sampling gas hydrates, which is an important SGPP thematic objective. Although much can be learned without these tools, their development and utilization will greatly enhance the results of gas hydrate drilling. The panel recognizes the need for a sampling manifold for gases and fluids, and development of a manifold should proceed concurrently with development of the PCS and PPCS. A manifold would not necessarily be developed by TAMU, but would be coordinated with TAMU's work so the two are compatible. Charles Paull will act as the SGPP liaison to TAMU for PCS and PPCS, as well as sample manifold development. It was suggested that a second stage of development should follow the accomplishment of the main objective (to make the PCS and PPCS actually sample core and fluids at pressure, and be able to extract fluid and gas from the sampler). This second-stage development would be to make physical property measurements at in-situ conditions, perhaps by in-situ downhole measurements rather than on recovered core at in-situ conditions.

The past progress and results of the VPC were reviewed. This tool has always been a high priority of SGPP, and recovery of sands has been an important long-term goal of SOHP and SGPP for the last ten years. The main thematic objectives involve sediment architecture and mass accumulation (turbidites, carbonate sands, sands in accretionary and passive margins) and sea level questions (correlating shallow water sites with deeper water fine-grained sediments). SGPP strongly encourages continued development of the VPC, and has assigned Michael Underwood and Richard Hiscott (plus former member Roger Flood) as watchdogs to coordinate with TAMU on continued progress of the tool. SGPP desires development of the VPC to begin immediately, as it is desirable to test the tool on Legs 155 and 156.

SGPP considers the development of these tools so important to its thematic objectives that it plans to hold its Spring, 1994 meeting at ODP/TAMU and will devote a half day to meet with the engineers to discuss tool development and testing.

## 2. PRIORITIZATION OF EQUIPMENT

In response to a PCOM request, SGPP prioritized its desires for equipment. The panel emphatically rated the PCS/PPCS and VPC as its first and second priorities, and pointed out that these have always been high-priority items for the panel. These were followed in priority by in-situ-fluid sampling capability. The shipboard multi-sensor track, X-ray diffraction procedures, DCS, and the shipboard computer upgrade were discussed but not prioritized.

## IV. JOINT MEETING WITH TECP

During the afternoons of 19 and 20, September, 1993, SGPP and TECP held joint sessions chaired by J. McKenzie and E. Moores.

### 1. INTRODUCTION

Following introductions and outline of the agenda, the joint panels' appreciation was expressed to Rick Hiscott for hosting the meeting and organizing a pre-meeting field trip. Moores began the meeting by outlining some of the shared concerns and questions, particularly in view of the charge from PCOM to prioritize drilling to 1998 and 2003:

1. What are our goals? How should we interact as panels? What are our mutual interests? For example, SGPP is interested in fluids and their roles in sedimentary and geochemical processes, whereas TECP is interested in fluids as a tectonic facilitator.
2. What are the achievements? ODP is extremely successful at sampling the top 300 m. Deeper holes and processes become progressively more difficult to access. Deep continental drilling proposals routinely include much greater documentation. What are our technological needs?
3. The program needs spectacular successes. How can the panels focus to achieve our goals?

### 2. SCIENCE REPORTS

**LEG 148 Report.** Jeff Alt, co-chief scientist on Leg 148, presented a summary of Leg 148 results. The main objective of the leg was to deepen Hole 504B into layer 3. Only 111 m were drilled when the drillstring became stuck in a fault. It is speculated that this fault may mark the boundary between dikes and underlying gabbros. The sonic velocity log shows an increase to 6.8 km/s in the newly drilled section, suggesting that the transition to layer 3 may occur within sheeted dikes. Eldridge Moores pointed out that faults such as encountered in Hole 504B may be characteristic of oceanic crust. A second hole, Hole 896A, was drilled on a nearby basement topographic high to investigate variability in crustal structure and igneous geochemistry, and to examine effects of off-axis alteration in a basement fluid upflow zone. The rocks are more well-cemented than in Hole 504B, and contain common several-mm thick smectite and carbonate veins that may be related to off-axis fluid upflow.

**LEG 149 Report.** Dale Sawyer, co chief scientist on Leg 149, presented a summary of Leg 149 results. The principal objective of Leg 149 was to drill a transect of holes across the ocean-continent transition (OCT) off western Iberia. Four sites were drilled on this transect. At Site 897, within the OCT, four holes penetrated up to 693 m sediment and up to 153 m into basement. The latter consists of serpentinitized and brecciated peridotite. Site 898, within the OCT, penetrated 341.5 m of sediment when the catastrophic loss of 3500 m of drill string caused abandonment of the site. Cores obtained from two holes at Site 899, within the OCT, penetrated 562.5 m of sediment overlying serpentinite breccias and boulder-sized blocks of serpentinite. Drilling at Site 900 in the OCT penetrated 748.9 m of sediment and 57 m of amphibolite grade metamorphic basement. The latter may have originated as Paleozoic basalt, cumulate gabbro from the lower crust, or pre-Mesozoic subcontinental mantle invaded by gabbro. The gabbros could be Hercynian or pre-Hercynian ophiolite or pluton, or gabbroic underplated to continent during rifting. Site 901 was cored intermittently down to 247.8 mbsf, and recovered Upper Jurassic (Tithonian) sediments, the oldest recovered on the leg. These sediments may have been pre- or syn-rift, and it is concluded that the site lies on extended continental crust. Yves Lagabrielle pointed out the similarity between drilling results and sections of sediments directly

overlying gabbro in ophiolites often encountered in the Alps. Thus, sediments over gabbro do not necessarily indicate continental crust.

**LEG 150 Report.** Greg Mountain, co-chief scientist on Leg 150, was present as a guest for one day and presented a summary of results. Leg 150 was conceived as part of a global strategy to look at passive margin stratigraphy aimed at testing the global synchronicity of stratigraphic sequence and determine if they are the result of "icehouse", "greenhouse" or "doubthouse" sequences. There are many data available from the New Jersey margin, i.e. good control with pre-existing wells and MCS, etc. The leg spent 39 days on 5 sites for a total of 4600 m of core with 88% recovery. Twenty-two reflectors, most of which correlate with oxygen isotopic changes, were cored in sediments interpreted as sea-level related, or with previously recognized sea-level related boundaries. Variations in magnetic susceptibility of sediments correlates with SPECMAP time scale of glacial/interglacial periods. Evidence for fluid reactions and flow were also identified: organic matter reactions led to dissolution of forams and reprecipitation as carbonate cements, which in many cases were identified as seismic reflectors. High pore-fluid salinities were also observed, suggesting diffusion or flow of material from greater depths. Turbidites and debris flows were mappable reflectors in the U. Oligocene-L. Miocene section, and reflectors in the Pleistocene section correspond to downslope transport (debris flows). A large-scale slope failure began about 13.5 Ma.

As safety considerations prevented the drilling of holes in water shallower than 200 m, only deep-water sites seaward of the shelf break could be drilled during Leg 150. Drilling of the shallow-water sites will be necessary to test sea level models because the combination of deep and shallow sites provides information on the amplitudes and mechanisms of base level changes. There was a discussion of the need for more drilling, which included such questions as alternate platforms for shallow water, reoccupation of industry sites, land drilling, etc. The results from Leg 150 need to be tested on different margins having differing tectonic histories. Are other margins overwhelmed by tectonic effects? Discussions at the recent meeting on continental drilling held in Potsdam emphasized the importance of correlating on-land data with ocean drilling results.

### 3. NARM NEWFOUNDLAND-IBERIAN TRANSECT

Eldridge Moores presented a discussion on the non-volcanic rifted margins transect that built on the new revised proposal NARM-Add for drilling in the Newfoundland Basin. He pointed out the possible role of pre-existing structures during rifting and emphasized that on-land data must be integrated with information from the oceanic realm. In his "thought experiment", he proposed that the balanced, restored cross section (NARM-Add Fig. 25) allows consideration of structure just prior to oceanic crustal formation. Most of the faults inferred from this section dip west. Seismic events beneath the "U" unconformity also dip west (e.g. NARM-Add Fig. 21).

These considerations lead to the following points:

1. The central Atlantic region (the Newfoundland-Iberia transect) was a region that underwent a complex collisional history, modified by strike-slip faulting, prior to extension and opening. A paleogeologic map (NARM-Add Fig. 1) suggests that just prior to ocean crust formation, the western part of the Newfoundland-Iberia transect was dominated by a southeast-vergent fold-thrust belt of Devonian-lower Carboniferous age. The eastern part of the transect was dominated by a Permo-Carboniferous strike slip fault zone, perhaps related to tectonic escape during Laurussia-Gondwanaland convergence.

2. The complex strike-slip fault zone included a "ridge and basin" region analogous to that in and adjacent to southern California associated with the San Andreas fault system.

3. The Atlantic rifting geometry was controlled by these pre-existing structures. These structures were dominantly asymmetrical (simple shear) from Iberia to Newfoundland (see NARM-Add Fig. 2A). Iberia is the lower plate, with Permo-Carboniferous strike slip faults converted to west-dipping normal faults. The Newfoundland side was the upper plate, thus accounting for possible volcanic rocks (NARM-Add Fig. 7).

4. The very deep drilling sites on the Iberia Abyssal Plain (IAP 1 and S reflector (Proposal No. 432) may record Permo-Carboniferous basinal formation in the strike-slip ridge-and-basin complex. Thus, they may be the wrong places to drill.

5. The "enigmatic terrane" of the S' site (Proposal No.334 Rev 3) may be a ridge in the ridge-and-basin region. Sediments over it may well record Atlantic opening.

6. The volcanic-rich rifted margins of the North Atlantic were superimposed on the Permo-Carboniferous strike slip and extensional region related to Gondwana-Laurussia escape tectonics. Thus, no transition between these VRM's and Iberia-Newfoundland volcanic-poor margins is to be expected.

7. The detachment zones (reflectors S and S') will exhibit a Permo-Carboniferous history modified by a Jurassic-Cretaceous one.

#### 4. FLUID SAMPLING AND MEASUREMENTS

Peter Swart and Susan Agar were invited to make presentations with the intended goal of letting each panel know what the other's concerns are, and how the panels could possibly work together to achieve their respective goals.

Peter Swart presented the pros and cons of current fluid sampling techniques (see Appendix 1), with the main conclusion that squeezing of pore fluids from sediments has been around a long time and this is still the best technique to sample fluids. New steps forward are needed, however, including sampling fluids from more consolidated rocks (sediment and basement), and under more challenging situations (higher temperatures, up to 350°C). Joris Gieske is evaluating the state-of-the-art with an eye towards improvements in technology.

Susan Agar presented a summary of TECP's interest in the role of fluids in control of active movements. The current status is that a reasonably complete view of fluid action is emerging on accretionary prisms, where distinct hydrogeological regimes are recognizable, including dynamic permeability. Geochemical anomalies reflect these regimes. Deformation and cementation related to deformation bands were found in Nankai and Chile Rise. There is a question regarding how deformation mechanisms vary with pore fluid pressures. On-land studies in the Troodos ophiolite indicate very distinct hydrothermal regimes in dikes vs gabbros. Structures control migration paths of fluids. Even if one cannot drill deep, one must think about the connection between deep circulation and shallow observations.

The TECP objectives can be summed up as understanding the partitioning of fluid flow and deformation. These include understanding distinct hydrological regimes in pores and fractures; dynamic permeability (i.e., evolution of permeability and response to deformation); deformation and cementation histories; deformation mechanisms and relationship to pore fluid pressures and fluid flow, effect of fluids on rheology of rocks and sediments, relation of deformation to structures and fabrics, understanding how far do fluids flow, and the effect of deformation on fluid sources.

Mike Underwood presented an update on the CORK borehole seal at Cascadia. There has been a buildup of pressure and methane concentration in the borehole. The pump on ALVIN that was used to attempt fluid sampling was too small to extract sufficient fluid, but this is a minor problem. Overall, the CORK appears successful in this convergent margin setting.

Upcoming legs of joint interest to both panels that involve fluids include: Barbados and TAG, as well as possible future legs (Sed Ridges II, Galicia S-reflector, and Costa Rica). There was some discussion as to whether SGPP could achieve its goals on the Gas Hydrate leg without the PCS or PPCS. The conclusion was that a great deal will be learned using present techniques, but with a working PCS and/or PPCS the rewards would be greater.

In concluding statements, Eldridge Moores pointed out the difference between pre-historic science (exploration) and historic science (documenting and understanding processes). Current and future goals of both panels involve quantification of processes at in-situ conditions. In the partitioning of fluid flow and deformation, the time aspect is missing. We need to think about how flow patterns may have changed. Also, how do fluid flow paths relate to fabric and anisotropy? We need to think about fluid sources. We need



to think about what can be gotten out of drilling legs, what technology is needed, and what will have to be given up to perform monitoring.

#### 5. INTEGRATED SEA LEVEL APPROACHES

Rick Sarg presented a "thought experiment" concerning the factors that control stratigraphy and the various approaches to understanding sea level variations. He pointed out that multiple methods and sites must be used that investigate different time scales, and the various results need to be integrated in order to solve the fundamental questions. Tectonics controls the "accommodation potential" of the basin. It controls basin subsidence history, and the changes in the rates of subsidence through time. Eustasy controls the shifts in facies architecture. Tectonic effects must be separated from eustatic effects. Sediment type and rates of deposition control the sedimentary geometries developed within sequences, and are in turn affected by climate, ocean chemistry, organic evolution, and source terrains. Sedimentary patterns reveal nested cycles of sea level, the controls of which may be tectonic or glacial, or a combination. One driving mechanism discussed was variations in the geoid, which reflect mantle convection patterns (e.g. Gurnis, 1993) and/or changes in stresses in plates and may be linked to seafloor spreading geometries, mid-plate volcanism, and plate deformation. Again, the sea-level working group's approach was outlined: oxygen isotopic variations of sediments, carbonate platform drilling, and siliciclastic margin drilling, in different settings with different ages and tectonic histories, are all required to address the sea level problem.

#### 6. JOINT MEDITERRANEAN DRILLING STRATEGY

Alastair Robertson outlined three proposals in the Mediterranean, which are potentially of joint interest to the two panels: Alboran Sea, Mediterranean Ridge, and Mediterranean Sapropels. New data from recent site surveys were discussed, along with common goals of the various proposals. Med. Ridge, and Med. Sapropels sites could be the same, although the needs for the two programs are not the same. Extensive mud diapir fields indicate active fluid venting. Eratosthenes seamount records the initial collision processes. Options for combining the three proposals were discussed, and two options were prioritized: first choice would be to have 2.5-3 legs to accomplish the proposed drilling; the second choice would be to compromise and have only two legs of drilling. Such a compromise would benefit from getting the proponents together to work out alternatives. The panel chairs can also come up with alternatives at the DRILOPT meeting. The question was raised as to what happens to scheduling following the scheduled two-week dry-dock in Lisbon at the end of 1994, and whether it would be possible to have a short leg (0.5-0.75 leg) that could drill the sapropel objectives. Such a short sapropel leg following dry dock would be welcomed by SGPP. (Kay Emeis, proponent on Med. Sapropel proposal, and Robb Kidd, proponent on the Alboran proposal, were present for discussion.)

### V. PROPOSAL REVIEWS

SGPP reviewed 4 new proposals and 9 revisions and 12 addenda to previously reviewed proposals. Prior to the ranking of the FY'95 Prospectus, all of the proposals in the Prospectus with or without recent revisions were discussed by the panel members. Proponents were requested to leave the room during the discussion of their proposals.

079-Rev2: The Mesozoic Somali Basin: Tethys and the Birth of the Indian Ocean.

This proposal is for a single deep hole, which addresses a variety of objectives including hydrothermal alteration of crust, mass balance, black shales, global stratigraphy, sea level, and old sediments. It was argued that this is not the best place to address all these questions. A transect would be a better approach to sea level questions, but the margin is too steep for such a transect. This proposal was originally revived when SGPP had to come up with a possible deep drilling site, but never really was ranked highly by the panel. SGPP had previously categorized as a 3 because of the mass balance objectives. Objectives in this proposal are likely of more interest to OHP. Proposal will likely never be of high priority to the panel. Category 3.

**323-Rev3: Tectonic Evolution of an Extensional Marine Basin in a Collisional Setting: The Alboran Sea.**

This proposal has been redesigned to avoid overpressure zones. It addresses mainly tectonic objectives. SGPP has a secondary interest in this project due to the overlap of sites with the sapropel transect. The data are not adequate for SGPP objectives, such as sapropels or sea-level signal. However, the basin development aspect is important for sedimentologists although not strictly in SGPP's mandate. The proposal is likely to remain of secondary interest to SGPP. Category 3.

**330-Add3: Time Progressive Continental Collision: The Mediterranean Ridge Accretionary Complex in the Eastern Mediterranean (Phase 1 Shallow Drilling).**

The objectives of this proposal fall well within the SGPP mandate as has been noted in previous reviews. The addendum is designed to address specific comments from previous reviews by SGPP and TECP. Of particular interest to SGPP is the discussion of "rationale on fluid processes" and the existence of a CEC funded program on the fluid flow regime of the Mediterranean ridge. No information is given about how to set up experiments, what elements will be analyzed or what results will tell. If scheduled, there must be sufficient input from fluid-flow experts in final planning of the leg. The drilling strategy could be significantly aided by preliminary quantitative (numerical) simulation of fluid flow and solute transport to further refine the conceptual models and to test the sensitivity of solute profiles to parameters such as permeability distributions and rates of dewatering. Category 4.

**333-Rev2: Cayman Trough: Ocean Continent Boundary in a Transform Environment.**

This proposal is entirely outside of SGPP objectives. An earlier version had a proposed hole that would have been used to examine effects of hydrothermal alteration of crustal rocks. That hole would have required the DCS and has been eliminated from the current revision. Hydrothermal alteration is not discussed in this version of the proposal. Category 1.

**334-Rev3: Galicia Margin S' Reflector.**

Not in SGPP's mandate. Category 1.

**346-Rev4: The Cote d'Ivoire Ghana Transform (translational) Margin (Eastern Equatorial Atlantic).**

Not in SGPP's mandate. Category 1.

**354-Add2: Neogene History of the Benguela Current and Angola/Namibia Upwelling System.**

This proposal no longer includes the transects of SGPP interest included in original proposal. Primary paleoceanographic objectives are directed towards OHP. Carbon cycling and lateral transport of sediment aspects would be within SGPP mandate. The main deficiency from SGPP perspective is choice of transects that are not optimal for carbon cycle study. Addressing objectives of both panels would turn the proposal into a 2-leg proposal. Category 3.

**372-Add: Cenozoic Evolution of Intermediate Water Circulation and Vertical Chemical Gradients in the North Atlantic.**

Proposal does not contain high priority SGPP objectives. Category 3.

**386-Add: Ocean Drilling of the California Margin and Southern California Borderland.**

The California Margin is a well studied upwelling system. The themes of this proposal, late Neogene productivity, organic carbon burial, and diagenetic processes, are of interest to SGPP. The proponents have done a good job of merging two proposals. Expanding gas in cores may cause problems. Previously vented core

liners may avoid some of the problems. There is a need for the development of core handling procedures prior to the leg. Category 5.

**391-Rev2: Depositional History and Environmental Development During the Formation of Sapropels in the Eastern Mediterranean.**

This proposal is the one SGPP has been waiting for as it now has both sites and science. ODP drilling is required because standard piston cores are not long enough to recover entire Plio/Pleistocene record. Reoccupation of Site 652 will provide good magnetostratigraphic control. Site surveys are now basically complete. Days on site represent less than a single leg of drilling. It should be possible to combine this proposal with other Mediterranean proposals with tectonics objectives. Fine-scale sampling needs will require a waiver from standard ODP policy. Perhaps, one of 3 APC cores could be frozen for post-cruise organic geochemical sampling. Category 5.

**400-Rev: Determination of Mass Balance, Fluid Flow, and Deformation Mechanisms of the Middle America Trench and Accretionary Complex off Costa Rica.**

This proposal is interested in the fate of subducted sediments and the role of fluids in convergent margins. It plans to attempt mass balance calculations based on drilling. The sediment mass balance questions focus on the partitioning of sediment into offscraping, underplating and subducted portions of the accretionary prism. The main interest in fluids concerns their effects on the mechanical properties of the prism. These questions address high priority objectives of SGPP, as well as objectives of TECP. The proponents argue that Costa Rica is the best place to attempt a material mass balance because it lacks turbidites, has a slope cover that has prevented erosion of accreted material and for which internal structural control is available from seismic reflection data. (See below for comparison of proposals 400-Rev and 435.) The specific drilling objectives include evaluating the rate of fluid expulsion from the underthrust section and evidence for fluid "stratigraphy" and flow distribution within wedge materials. The proposed sampling could provide an intriguing set of data to prompt further studies, as did the first leg to Barbados. The conceptual model presented by the proponents builds heavily on lessons learned from previous ODP legs. Additional information and improved technologies that become available as a result of the return to Barbados may prove very useful to additional planning of a leg off Costa Rica. Category 5.

**406-Add: North Atlantic Climatic Variability: Sub-orbital, Orbital, and Super-orbital Time Scales.**

Proposal does not contain high priority SGPP objectives. Category 3.

**408-Add: Miocene Segmentation of the Carbonate Megabank Covering the Northern Nicaragua Rise: Gateway Opening for the Initiation of the Caribbean Current.**

Proponents have reduced the number of holes and concentrated somewhat more on SGPP objectives. One hole is to penetrate recemented breccias. Another hole on margin of Jamaican bank will look at late Quaternary carbonate shedding. These address sedimentary architecture and sea level objectives. Other holes will extend into an early Miocene carbonate bank to investigate drowning unconformities. The panel felt that the questions asked in the proposal are better addressed elsewhere, and that the proposed sea-level site is not the best to test sea-level questions. Category 3.

**412-Add2: The Bahamas Transect: Neogene/Quaternary Sea-Level Fluctuations and Fluid Flow in a Carbonate Platform.**

In this addendum, the proponents have addressed issues previously raised by OHP and SGPP. Fluid flow discussion has been expanded to include 3 models. A site survey has been funded by NSF. The site survey information will be required to improve siting of relatively shallow fluid flow holes. A major issue raised about this proposal concerns the biostratigraphic control derived from existing shallow-water slope and platform holes. Compressed sequences on the shelf are the likely result of progradation, leading to stressed environments which may produce biostratigraphic

anomalies. The solution to this correlation problem lies in the biostratigraphy obtained from the proposed deeper-water drill sites, whereby seismic data resolution is good enough to allow correlation from the basin to the shelf. Oxygen isotopes may provide a higher resolution stratigraphy than biostratigraphy. In any case, multiple dating techniques need to be used. The Sea Level Working Group recommended both clastic and carbonate margin studies. As the shallow-water drill sites have been completed on the Bahamas transect, this is probably currently the best carbonate proposal in the system to study sea level problems. The proposal is mature and SGPP has elected to add it to the FY'95 prospectus. The proposal could be ready as a replacement for Leg 157 if the DCS test fails, but it would benefit from a later scheduling to allow time for the evaluation of the funded site survey. It still might be possible to schedule it using the existing survey data. Category 5.

**415-Add: Caribbean Ocean History, Ocean Plateau and the Cretaceous - Tertiary Boundary Impact Event: Multi-objective Drilling in the Caribbean Sea.**

This is a merger of proposals and, in this form, it has been improved with the addition of other objectives besides the K/T boundary. The proposal has interest for the larger geologic community, but it may "fall through the cracks" of the system. Sites are generally located in the right areas for OHP interest in history of Caribbean Sea. Better site survey data are needed. Category 3.

**423-Add: Gas Hydrate Sampling on the Blake Ridge and Carolina Rise: A Proposal to the Ocean Drilling Program.**

In this addendum, the proponents have responded to SGPP suggestions that the option to drill through the BSR be considered. They have included the possibility of drilling through the BSR, contingent upon site survey data and recommendations of the safety panel. SGPP favors this approach if the safety panel approves it. The necessity of the PCS to the success of the leg was discussed, and it was concluded that it would be of great benefit, but that the goals of the leg could be achieved without the PCS. Drilling through the BSR by coring and logging would also provide valuable data. Modification of shipboard procedures to accommodate opening cores with hydrates immediately must be considered prior to leg. If the PCS can be successfully used, it would be an aid in quantifying gas contents of the hydrates and calculating mass balances. The Gas Hydrate proposal would be ready as a replacement for Leg 157 if the DCS test fails, but it would benefit from a later scheduling as more work could be done on the PCS and PPCS. Category 5.

**425-Rev: Offset drilling within the Rift Valley of the Mid-Atlantic Ridge in the 15°20'N Region: Drilling of Lower Crustal Gabbros, Mafic/Ultramafic Transition Zones, and Residual Mantle along the Magma-starved Ridge.**

This proposal is directed towards LITHP, but secondary hydrothermal objectives are of SGPP interest, particularly those related to hydrothermal alteration and mineralization. Methane seeps identified from water column studies provide evidence of active fluid circulation. The fluid flow objectives will be addressed primarily by studies of rock alteration rather than by attempts to sample fluids. A leg devoted to active hydrological experimentation in this area would be of SGPP interest, but this would require a completely different proposal. Category 3.

**427-Add: High-resolution Sequence Stratigraphy and Sea-level History, South Florida Margin.**

The panel was concerned about the presence of high-velocity bottom currents at present and in the past. Sites are shallow and with the currents it may not be possible to drilled safely with JR. The proponents need to address the question of whether the sites can be drilled and logged given the strong currents. Can the ship properly maintain its position? Proponents should solicit advice on safety before going on with proposal. Are the seismic units controlled by sea level or could they be sediment drifts resulting from the currents? There are also problems correlating from the basin to the

shelf, given the strong currents and incomplete records expected. Problems also exist with dating reflectors other than oxygen isotopes: there is poor or no biostratigraphic control, and isotope stratigraphy may be impossible in basin sections because of reworking. Category 4.

- 432: A Deep Hole off Galicia to Study the Mechanism of Continental Breakup: Sedimentary and Subsistence History and the Nature of S Reflector. Not in SGPP's mandate. Category 1.
- 433: A Proposal to Test a New Theory of Orogeny by Drilling the Eastern Mediterranean Sea, Especially the Area in the Vicinity of the Eratosthenes "Seamount". Proposal is not within SGPP's mandate, but there is overlap in its location of holes with one of the sapropel sites. It would be possible (and interesting) to combine a deepened hole for 433 objectives with a sapropel leg. Proposal is immature as the proponents have not incorporated any of the newest geophysical data. Category 3.
- 434: Late Quaternary Climate Variability in the Tropical Caribbean/Atlantic Region: A Proposal for Ocean Drilling in the Cariaco Basin (Southern Caribbean). SGPP is very enthusiastic about this proposal concerning anoxia, diagenetic effects, sea level, and the position of the ITCZ. Varve resolution is on yearly scale. Records from this site could be tied to the ice cores. Oxygen isotope composition of the sediments is preserved in the pore water and there should be salinity variations, too. 30 m piston cores have already been studied. The justification for using the drill ship is to obtain longer cores. The proposal is very mature. It would require only take 3 days and could actually be expanded to a larger proposal. HPC cores should be taken to deepest penetration possible until refusal. Proposal could be scheduled for Leg 157. Category 5.
- 435: Crustal Fluxes into the Mantle at Convergent Margins: Nicaragua and Izu-Marianas Margins. This proposal, as the one for the Costa Rica Margin (400-Rev), is interested in the fate of subducted sediments and the role of fluids in convergent margins. See general discussion concerning scientific objectives on convergent margins above under the review of proposal 400-Rev. The contact proponent is also a proponent on proposal 400-Rev, indicating that the proponents see the set of proposals for drilling in convergent margins as a series of related legs rather than as competing sites. This new proposal combines drilling in two distinct and geographically distant areas. Although the total number of sites is small, do the proponents consider the sites to constitute a single leg with a long transit or as two separate legs (or portions of legs) to be scheduled in conjunction with more geographically proximal legs? The proposal provides a general discussion of the generic mass balance problems they want to address. The sediment flux emphasis is on cycling into the mantle and then back up through the arc. Thus, the proposed program looks at a larger scale than the accretionary prism. It also looks both along the direction of subduction and parallel to the margin with an attempt to understand lateral variations in arc chemistry as a function of lateral variations in the subducted sediments. The data presented as evidence of lateral variations in Sr isotope and Ba/La ratios provide a good justification for the choice of a Nicaragua transect. There are also significant geochemical variations between the Izu and Marianas volcanics and drilling is proposed to test whether these are the result of variations in crustal input. The questions posed are certainly within the SGPP mandate. Joint LITHP/SGPP support for this could be generated if the deepening of Hole 801C is included, an excellent possibility of looking at aging of ocean crust. SGPP suggests that proponents of 435 get together with Hole 801C return proponents. Category 4.

Comparison of 400-Rev (Costa Rica Margin) and 435 (Nicaragua and Izu-Marianas margins): Comparing these two proposals, Costa Rica is very mature in terms of site survey data etc., Nicaragua is very immature, Marianas transect includes previously

drilled sites. In reviewing and ranking the proposals for convergent margin drilling, we need to consider whether these, along with Barbados, Cascadia and the Mediterranean ridge, represent an integrated multi-leg theme or if they are competing proposals, one of which may represent the best place to do the proposed experiments. How many future legs should be devoted to such questions remains an open question.

**NARM-Add: NARM - Non-volcanic Transect 1: Deep Drilling in the Northern Newfoundland Basin.**  
Not in SGPP's mandate. Category 1.

**NARM-Add2: Amendment to the North Atlantic Rifted Margin Detailed Planning Group Report (NARM-DPG): Volcanic Transect East Greenland (EG63-transect).**  
Not in SGPP's mandate. Category 1.

**SR-Rev 2: Sedimented Ridges II: Revision of the Sedimented Ridges Detailed Planning Group Drilling Strategy Based on Results of Leg 139 Drilling at Middle Valley.** Following a very successful first leg (Leg 139), the panel felt that this was a good follow up program that could be another success. Some problems came out in the discussion, however. The existence of a CORKed hole near sites proposed for future drilling provides an exceptional opportunity to conduct active hydrogeological experiments aimed at defining the finer scale flow system of an active vent field. The "fine-scale hydrology of the system" is quoted in the proposal, but no details of experiments, etc. are given. Revisions to the proposed fluid-flow experiments, as recommended previously by SGPP, have not been incorporated into the current revision. The panel strongly suggests that the proponents include a hydrogeologist in their program, and that specific hydrologic experiments be designed rather than giving vague references to such a program. Another question that was not clear was how fluids will be collected from the sulfide mound (300 m South of Bent Hill): will these be squeezed sediment or borehole fluids? This proposal is well within the SGPP mandate and would lead to completion of SGPP themes begun on Leg 139. Category 5.

## **VIII. PANEL DISCUSSION ABOUT SEA LEVEL OBJECTIVES**

Wishing to have input from invited guest Greg Mountain, who had been a member of the Sea Level Working Group, SGPP elected to add the topic of sea level objectives to its agenda in preparation for its white paper revision. Peter Swart, proponent on Bahamas Transect Proposal 412, was present for the discussion. Robb Kidd, PCOM liaison, asked the panel to discuss what it has accomplished toward sea level goals so far, and what needs to be done in the next fiscal years until 1998.

Multiple dating techniques were discussed. Premature species disappearances are often found in prograding sequences. The fauna and flora display strong environmental control in such settings that leads to premature exits as they follow their preferred environment in a seaward direction. The best approach for stratigraphic resolution is to use multiple techniques that are affected by different processes (Sr isotopes, O isotopes, magnetic susceptibility, etc.). SGPP recommends that multiple dating techniques are considered as essential to achieve the best time control for sea level studies on margins.

To date, several legs have addressed the question of sea level: Leg 133, NE Australian margin; the recent Atolls and Guyots legs; and Leg 150, New Jersey margin. The "dipsticks" of the atolls and guyots did not provide much useful sea level information because the hiatuses present were too large. The New Jersey and Australian margin legs contribute data from a siliciclastic and carbonate margin, respectively. However, there still exists a need for a transect across a siliciclastic margin of differing tectonic age from the New Jersey margin (e.g., New Zealand), and a carbonate margin transect is necessary to complement the New Jersey Margin (e.g., Bahamas Transect). The panel's priority for the carbonate margin is reflected in its inclusion of the Bahamas Transect in its ranking of the FY'95 prospectus.

There was concern on the panel about poor recovery of sands, especially on the shelf during the New Jersey margin drilling, again emphasizing SGPP's priority of development

of the VPC. All the ODP efforts to date have been toward the Miocene "icehouse" period, but there is a need to obtain results which are complementary to other on-land studies of the Cretaceous "greenhouse" time.

## IX. RANKING OF PROSPECTUS

Prior to ranking proposals in the prospectus, the panel briefly reviewed the included proposals for the benefit of new members as well as to refresh everyone's memory. The panel elected: (1) to add the Bahamas Transect Proposal 412/-Add/-Add2 to the FY1995 Prospectus and (2) to rank all the proposals. Non-proponent panel members gave a rank from 13 (highest rank) to 1 (lowest rank) to all proposals, with the possibility of averaging ranks for equally favoured proposals. Proponents were not allowed to vote for their own proposal, giving their highest ranked proposal a 12 and the lowest a 1. Scores were assigned by normalizing the rank totals according to the number of votes cast (i.e., members minus proponents). Rob Zierenberg, the LITHP liaison, tallied the votes.

<b>ODP Ref. No.</b>	<b>Proposal</b>	<b>Score</b>	<b>Std. Dev.</b>	<b>Ranking</b>
423/ -Add	Gas Hydrate Sampling	11.00	2.13	1
412/-Add/-Add2	Bahamas Transect	10.91	2.39	2
391-Rev2	Mediterranean Sapropels	10.18	1.33	3
SR-Rev2	Sedimented Ridges II	9.58	2.89	4
380Rev3/059	VICAP/MAP	8.58	1.88	5
330-Rev/-Add3	Mediterranean Ridges I	8.25	2.14	6
386/422/386-Add	California Margin	7.25	2.80	7
323-Rev3	Alboran Sea	4.83	2.12	8
NARM-DPG	NARM Non-volcanic II	4.67	3.58	9
NARM-DPG	NARM Volcanic II	4.08	2.75	10
300-Rev	Return to Site 735B	3.75	1.91	11
346-Rev4	E. Equatorial Atl. Transform	3.58	3.06	12
NAAG-DPG	NAAG II	3.42	1.78	13

SGPP's ranking of the FY'95 Prospectus is consistent with SGPP's previous Global Ranking in Spring, 1993, which placed the first 5 proposals listed above among the top 6 proposals in its Global Ranking. The top 2 proposals, Gas Hydrate Sampling and Bahamas Transect, can be considered to have a nearly equivalent ranking, a reflection of the balanced composition of the panel between geochemical and sedimentological interests. The distinct break in the scores between positions 7 and 8 marks the boundary of SGPP thematic interests.

## X. PROPOSAL REVIEW PROCESS

The ASRC's recommendations about changing the proposal review process were discussed. PCOM's response to the recommendations was to establish a trial experiment with the DRILOPT panel this year. The consensus of SGPP was that the current proposal review process is basically OK, but the panel had some recommendations to further the panel's goals and to help new panel members become familiar with the backlog of proposals already in the system.

SGPP will assign watchdogs to top proposals to help further development of the proposals and accomplish high-priority SGPP objectives. All panel members will receive copies of the reviews sent to proponents so that panel members will have the official version of comments. It is suggested that new panel members receive a "starter kit" that includes copies of abstracts of all current proposals prior to the global ranking meeting. Also, all panel members should receive copies of all new abstracts. In this way, all members should be familiar with what topics are addressed and the main goals of all proposals. As always, the complete proposals are available at the panel meetings, and several watchdogs are assigned to each proposal to review it in detail.

## **XI. POSSIBLE REPLACEMENT FOR LEG 157**

Various scenarios for replacement of Leg 157 (DCS) if the DCS test is unsuccessful were discussed. The Bahamas transect would likely not be ready for drilling, as the evaluation of data from the upcoming site survey could not be accomplished in time. The panel would rather wait for whatever PCS development will occur prior to the Gas Hydrate Sampling leg rather than advancing this high-priority objective. The Med. Saprofels and the Cariaco Basin were the favorites for Leg 157 replacement. SGPP suggests that the Cariaco Basin drilling (which requires only 1-3 days) might be done during transit from the Amazon Fan to Barbados. The panel feels that this could be very exciting science for the ODP and the general geological, paleoclimate, and global change fields in general, linking ODP results to "global change" programs. As a Leg 157 substitute, SGPP proposes a 3-day drilling program at Cariaco Basin, followed by transit to the Mediterranean and drilling the Med. Saprofel program, ending up in Lisbon.

## **XII. SGPP WHITE PAPER REVISION**

In response to PCOM's request, SGPP is beginning revision of the panel's white paper, in order to address accomplishments of major goals so far and prioritize drilling objectives through 1998 and through 2003. Significant discussion was centered around whether and how to reorganize the white paper. It was eventually decided to organize the paper under three main headings: (1) sea level and facies architecture, (2) fluid flow and geochemical fluxes and (3) geochemical budgets and carbon geodynamics. Panel members were assigned to the different topics to prepare a draft version of the white paper, which will be circulated and then be revised at the next SGPP meeting. As part of this process, a short version summarizing current accomplishments and priorities for the coming several years will be prepared to be presented by J. McKenzie at the annual PCOM meeting.

## **XIII. NEW MEMBERS AND NEXT MEETINGS**

Panel members J. Alt, F. Sayles, and P. Swart will rotate off the panel prior to the next meeting. SGPP discussed replacements for these members as well as a replacement for J. McKenzie, the panel Chair, who will complete her term in the second half of 1994. In order to adequately cover its broad thematic mandate, SGPP considers it essential that the present specialty balance on the panel be maintained with both U.S. and international partner rotations. In particular, an organic geochemist will be required. J. McKenzie will contact individuals nominated by the panel and present a list of names to PCOM. J. Alt, F. Sayles, and P. Swart are acknowledged for their service and contributions to the panel and the ODP planning structure.

The next SGPP meeting will be held 7-9 March, 1994 in College Station, TX, and will be hosted by Laura Stokking. SGPP plans to meet with TAMU engineers about tool (PCS, PPCS, VPC) development. The fall meeting will be held the first week of October, 1994 in Fukuoka, Japan, and will be hosted by W. Soh.

Rick Hiscott and Jeff Saunders were thanked for their kind hospitality and the double effort required to flawlessly handle two panel meetings simultaneously. The meeting was adjourned late afternoon on 21 September, 1993.

## **APPENDIX I. Fluid Sampling: Some Considerations from P. Swart.**



## Fluid Sampling Some Considerations

### Existing Mechanisms for Taking Samples from Formations

#### 1 Core squeezing.

Advantages: (i) easy and provides a reasonable amount of sample within a short period of time, (ii) provides qualitative information on what is taking place in the sediments.

Disadvantages: (i) Can only be applied to soft sediments or semi-consolidated rocks, (ii) subject to contamination and squeezing and retrieval artifacts, (iii) does not recover fluids at *in situ* pressure or temperature and therefore chemical changes due to pressure changes during retrieval.

**2. WSTP- Barnes Tool.** Only works effectively in soft sediment and therefore essentially duplicates the core squeezing technique.

Advantages: (i) the sample can be obtained under some type of pressure and the fluids are largely isolated from the sediments sample during retrieval preventing reaction with the sediment; (ii) gas samples can be obtained, (iii) provides temperature measurement.

Disadvantages: (i) cannot penetrate semi-consolidated rocks, (ii) it disturbs the upper portion of the next core, (iii) does not always work reliably, (iv) takes 60 minutes to turn around, (v) needs a dedicated wire-line trip, (vi) does not provide an additional information than squeezed samples.

**3- Pressure Core Barrel-** Retrieves a section of core and fluids under hydrostatic pressure.

Disadvantages: (i) time consuming, (ii) it has not yet retrieved both a sediment core and its fluid under pressure, (iii) no method for getting sample out of the core barrel

Advantages: (i) can obtain sample under pressure.

**4- Bore Hole Water Samplers-** These only exist as non-approved third party tools and are not routinely deployed on ODP legs.

Advantages (i) easy to deploy and relative straight forward.

Disadvantages: (i) only able to sample formation fluids if formation is over pressured

Also included in this group are fly by fluid samplers which can be deployed into old bore holes using ROV and ship of opportunities. Work is underway to construct devices which will accommodate pressure changes without excessive expense. Several test flights have been successful.

**5- Geoprops-** Designed to take formation fluid samples with the motorized core barrel

Disadvantage: Does not work

### Non-existing or Third Party Technologies

#### 6- Packers

**Wireline Packer-** This tool was designed to pass through the drill stem (less than 6 inches) and then expand to over 12 inches to pack off an interval in the formation. Water would then be pumped from the formation for some period of time being monitored by chemical sensors. eventually a water sample would be taken. Upto to four samples would be taken in one pass.

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The instrument failed as a result of design flaws.

**Drill stem Packer-** Existing drill stem packers are used in the oil industry for formation pressure tests and indeed have been used for such purposes on the ODP. It has been suggested that it might be possible to engineer a go-Devil type arrangement in which a drill stem packer could be set and then a water sampling device hooked upto the packer using a wireline.

**Multi Formation Tester-** Off the shelf designs of formation testers (Schlumberger) exist. Unfortunately these do not fit inside the existing drill pipe and therefore cannot be used with wireline unless it is into an open hole. These tools also have some design limitation in that they use a doughnut packer rather than a straddle packer (It is rumored that a straddle packer is available).

Consensus is needed on the following questions

1. Is it realistically possible to take any kind of fluid samples from a formation through which some one has just been pumping thousands of liter of seawater?
- 2- If so, how long must one wait until the formation can yield uncontaminated formation fluid?
- 3- What is the best technology for obtaining fluid samples and pressure measurements from such formations?
- 4- Will it ever be realistic to sample fluids from underpressured formations? (No.
- 5- If it is only possible to sample from overpressured formation why don't we just use a bore hole sampler?
- 6- Add your own