Sedimentary and Geochemical Processes Panel
Spring Meeting with TEDCOM
7-9 March 1994, College Station, TX

Executive Summary

SGPP Spring Global Ranking 1994

The primary work of the Spring thematic panel meetings is to make a global ranking of the active ODP proposals, in addition to reviewing the new and revised proposals that have been received since the last meetings. During this Spring meeting, 18 new proposals, 8 revisions, 7 addenda, and 17 letters of intent were handled by the panel prior to making the global ranking. The panel then discussed all active ODP proposals that had previously received a high categorization within SGPP's mandate. After this review, a list of 19 proposals with strong SGPP thematic objectives was compiled for a "straw" ranking to reduce the number of proposal in the global ranking. From these results, a list of the top eleven ranked proposals was finalized. The panel members then ranked these eleven proposals, with the top ranked proposal being No. 11. Proponents were excluded from voting on their own proposals. Scores were assigned by normalizing rank to number of votes cast. The results are basically consistent with the results of previous SGPP global rankings. Based on the results of the straw vote, the panel elected to add a twelfth proposal to the bottom of the list to emphasize its scientific importance. Of the top five ranked proposals on SGPP's global list, all five could be drillable in FY96. Proposal 348-Add will require a site hazard survey, however. The twelve proposals with their normalized scores, ranking and assigned chief watchdogs are as follows:

Ref. No.	Proposal (ODP Number)	Score	Ranking	Watchdog
348-Add	Mid-Atlantic Transect	9.36	11	Paull
400-Add2	Costa Rica Accr. Wedge	8.43	10	Underwood
412-Add2	Bahamas Transect	8.07	9	Sarg
386-Add2	California Margin	7.21	8	Farrimond
SR-Rev2	Sedimented Ridges II	7.00	7	Bahr
434	Carib. Quat. Climate	5.93	6	Macko
354-Rev2	Benguela Current	5.79	5	Emeis
440	Hydrothermal, Juan de Fuca	4.64	4	Shanks
355-Rev3	Gas Hydrate, Peru Margin	3.38	3	Paull
435-Rev2	Crustal Flux, Mariana-Izu	3.29	2	Hiscott
435-Rev	Crustal Flux, Nicaragua	3.07	1	Hiscott
424-Rev	To "CORK" Hole 395A	----	---	France-Lanord

Evaluation of PCS, PPSC, and VPC

SGPP's scientific programs require the development of specific technologies, in particular an operational pressure core sampler (PCS) to recover sediments at in situ pressures and a vibro-percussive corer (VPC) to recover unconsolidated sands. SGPP considers the development of these tools so important for its thematic objectives that it elected to hold its Spring, 1994 meeting in College Station, Texas in order to have direct discussions on tool development and testing with the ODP/TAMU engineers, as well as with the technology experts on TEDCOM. In light of the scheduled Leg 164 Gas Hydrate Sampling, SGPP felt that it was critical to review the progress that

has been made in gas hydrate drilling to date and to evaluate further technologic requirements for the upcoming leg. To this end, a preliminary review session on gas hydrate drilling covered the PCS, potential manifolds, and water samplers, including the WSTP. This session was followed by a joint SGPP/TEDCOM session on technology issues surrounding the future development of the PCS and VPC. Panel members felt that the discussions were overall very productive.

- **SGPP Recommendation:** SGPP recommends that the existing PCS be modified with the current new design ideas in order that it can routinely recover sediment at in situ pressure by Leg 164. SGPP further recommends that the modified PCS be tested on land, as well as at sea on specific legs prior to Leg 164 (e.g. in the Mediterranean on Leg 161). An experienced engineer, preferably T. Pettigrew, must be on-board the JOIDES Resolution to conduct the sea tests. An allotment of the sufficient funding and, equally critical, engineering time is required to accomplish these recommendations in due time.

- **SGPP Recommendation:** As the push-in pressure core sampler (PPCS) could be used only for shallow sampling and would not be useful for gas hydrate sampling, SGPP recommends that its further development be postponed to a later date.

-**SGPP Recommendation:** SGPP recommends that PCOM's decision to put VPC on hold until the BGS testing is finished be reevaluated. SGPP recommends that other VPC options should be pursued by TAMU in parallel with the BGS testing.

Proposed Hydraulic Piston Coring Policy

SGPP agrees that more mudline cores should be taken in order to support the intensive sampling near the sediment/water interface. SGPP supports ODP-TAMU's proposal for revising the ODP hydraulic piston coring policy and recommends that it be accepted by PCOM.

Revision of SGPP's White Paper

The panel continued discussion on the revision of its White Paper 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 focused its efforts into three broad thematic areas: (1) sea level and facies architecture, (2) fluid flow and geochemical fluxes and (3) base of the biosphere. Potential societal relevance of each theme was considered during the discussions. An outline of SGPP scientific programs that could be achieved in the two periods FY1995-98 and FY1999-2003 was formulated. Panel members were assigned to each of the three topics to complete draft revisions of the White Paper, with an emphasis on what can be accomplished with drilling during the specified time periods.

SGPP Liaisons to Other ODP Panels

The following SGPP members agreed to accept or continue liaison assignments to the designated ODP panels:

LITHP - P. Shanks	DMP - J. Bahr
TECP - M. Underwood (alt. W. Soh)	OHP - P. Baker (alt. K. Emeis)

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Sedimentary and Geochemical Processes Panel
Spring Meeting, 1994
with
Joint SGPP/TEDCOM Session

Minutes

Date: Monday-Wednesday, 7-9 March 1994
Place: Meeting Room 105/106, ODP/TAMU, College Station, TX
Host: Laura Stokking, ODP/TAMU Liaison to SGPP

Attendees:

SGPP members:

Jean Bahr, Recorder (USA)
Kay Emeis (G)
Christian France-Lanord (F)
Richard Hiscott (Can-Aus)
Judith McKenzie, Chair (at large)
Rick Sarg (USA)
Finn Surlyk (ESF)
Paul Baker (USA)
Paul Farrimond (UK)
Robert Garrison (USA)
Steve Macko (USA)
Charles Paull (USA)
Wonn Soh (J)
Michael Underwood (USA)

SGPP members unable to attend:

Pat Shanks (USA)

SGPP liaisons:

Wolfgang Berger (PCOM)
Peter Harvey (L-DEO)
Robert Zierenberg (LITHP)
Laura Stokking (ODP/TAMU)

Invited guests for all or part of the SGPP meeting:

G. Brass (RSMAS)
Miriam Kastner (SIO)
Tom Pettigrew (ODP/TAMU)
W. Hay (UC-Boulder/GEOMAR)
Keith Kvenvolden (USGS),
W. Ussler (UNC, Chapel Hill, NC)

Monday, 7 March

(1) Welcoming, Introductions and Logistics: McKenzie welcomed the participants, who subsequently introduced themselves along with their affiliations. Stokking explained the logistics for the 3-day meeting.

(2) Meeting Agenda: McKenzie outlined the objectives of the meeting describing what needed to be accomplished by the Panel during the following 3 days. The tentative agenda was discussed and revised.

(3) Reports:

(a) PCOM Report: Berger reported on the annual PCOM meeting in Miami. He presented the FY94-95 drilling schedule, noting that the DCS engineering test was removed from the Leg 157 position because it was not going to be ready for a sea test The VICAP/MAP program was substituted for Leg 157. Leg 158 is TAG followed by a dry-dock, presumably in Capetown, South Africa. Leg 159 is Return to 735 in the Indian Ocean with a transit time of over 40 days, essentially making this program equivalent to two legs. Berger was opposed to this scheduling because of the long transit times. Leg 160 is Equatorial Atlantic Transform, followed by 2 legs in the Mediterranean and a North

Atlantic Arctic Gateways II leg. Gas Hydrate sampling was scheduled for Leg 164, followed by a possible DCS engineering leg. This schedule depends to some extent on whether the ship will go to South Africa for dry dock, which alternatively could be in Lisbon. The two legs in the Mediterranean represent a combination of 3 proposals, including the full Mediterranean sapropel program.

PCOM discussed shallow-water drilling and hazard surveys. It is a question of demonstrating safety which can be expensive in terms of site surveys. Who pays for surveys related to safety issues rather than science issues? A cost estimate for a dense network of shallow seismics for NJ Margin was $500,000. Who would do the survey? If the proponent does the survey, the interpretation may be biased, although not necessarily intentionally. Funding for ODP does not look too bad with a 7% increase in the budget, but there must still be cuts in operations due to a shortfall relative to initial predictions of what funding would be. The funding squeeze will affect what items on the "wish list" can be realized. Current priorities include: computer/database upgrade, DCS, downhole measurement tools, shallow-water hazard survey, etc. PCOM endorsed testing of vibro-percussive core (VPC) by BGR at BGR's expense (tool belongs to ODP). PCOM accepted DMP's recommendation that GEOPROPS be shelved but would like to see alternatives for the types of measurements that this tool would have produced if it had worked.

Thematic panel chairs will likely to be asked to attend PCOM meetings more frequently, but it will not be an automatic invitation; only the annual meeting will require that all panel chairs attend. PCOM believes it is time to consider arctic drilling. Two topics of interest are methane rich sediments and overconsolidated sediments. Arctic drilling will likely require an alternate drilling platform. The Bremen repository will be a reality. EXCOM approved the compromise that cores through Leg 150 will remain in the East Coast repository, while cores after Leg 150 will go be housed in Bremen.

(b) ODP/TAMU Operations/Science Report: Stokking reported on the preliminary scientific results of Legs 152, 153, and 154. Leg 152 on the east Greenland margin took place in some of the roughest water ever encountered by the JR. The shipboard party still felt this was a great success despite being forced to pull out of some holes. They penetrated through seaward dipping basalts into pre-breakup sediments. Glauconitic hardgrounds in chalks and glaciomarine sediments were also exciting finds indicating that glaciation of Greenland begin about 7 Ma. This was part of a multi-leg program on rifted margins in the North Atlantic. Leg 153 was an offset drilling leg in the MARK area to understand structure and composition of oceanic crust. Shipboard participants felt this was a success, but there were some technical problems with hardrock guidebase, requiring the relocation of sites and redesign of guidebase on ship. Future legs of this type will require much better site survey data. Recovered serpentinized hartzburgite with relict mineralogy, also olivine. The JR is currently drilling at the Ceara Rise off South America, Leg 154. This is a paleooceanography leg. One site, with several holes, have been completed so far. Biostratigraphy is good. It appears that Amazon terrigenous sediments have been increasing over time.

(c) Status Update Leg 155: Hiscott reported on upcoming Leg 155 Amazon Fan, where drilling will be into multiple levee complexes. The objective is to drill these individually and date them. The deepest hole is about 500 m. Biostratigraphy is believed to be very good. Goals are sedimentary architecture, facies, and sediment redistribution related to tectonics and sea level. They will not be trying to drill in sandy sediments and will not be sampling channels. One of debris flow lobes will be drilled. SGPP members Hiscott and Soh will sail as shipboard sedimentologists.

(d) Status Update Leg 156: Kastner reported on upcoming Leg 156 N. Barbados Ridge. There have been 2 precruise meetings because of technology issues. This is evidence of active fluid flow along the decollement. The focus of Leg 156 is to examine

this and to determine if flow is episodic or steady state etc. Shipley made a 3-D seismic survey and found that the decollement is a variable surface, sometimes it is a negative polarity reflector and sometimes a normal polarity. Normal polarity is assumed to represent a "drained" area and this is probably why the decollement was easy to drill on Leg 110. The plan for Leg 156 is to attempt to drill both normal and negative polarity sites. The third site is an incipient decollement, not a strong reflector. Based on seismic data, the decollement seems to be about 15-m thick. New technologies that will be available for Leg 156 include logging while drilling (LWD). Goldberg, Borehole Research Group, will bring LWD equipment to the JR with a special ship. LWD will take 4 to 5 days (for 3 sites). At the first CORK site, they will not core except across the decollement. The secondsite will be cored completely. The third site will be cored only across decollement and below. Temperatures will be measured with WSTP before casing. (The WSTP should be redesigned to work for pore water sampling.) After casing, there will be VSP experiments in cased hole (air guns and shear wave explosive experiments). There will also be packer experiments for pressure and permeability. Instruments are under construction by Kastner and co-workers for fluid sampling. These will sample on continuous or weekly basis and will be retrieved by opening the cork during submersible visits.

(e) LDEO Borehole Research Group Report: Harvey reported that there will be a logging representative at all future thematic panel meetings. The borehole research group will benefit by learning what legs are proposed and can help come up with logging proposals. Also the representative can then provide information to thematic panels during the proposal review process.

(f) Downhole Measurements Panel Report: Bahr reported on the fall DMP meeting, which was held jointly with LITHP. During the joint session, the upcoming Leg 158 TAG was discussed along with the status of high temperature logging and sampling tools. The status of the borehole televiewer was also discussed. In the DMP session, there was continued discussion of the certification process for third-party tools, as well as LWD and VSP experiments on Leg 156. DMP felt that PCS, PPCS and VPC were items that fall under TEDCOM's mandate. Gas hydrate sampling was flagged as potentially difficult. Several new tools from Schlumberger are being tested or considered for future use by ODP, including downhole shearwave tool, Modular Formation Dynamics Tester (MDT), Geochemical Reservoir Analysis (GRA) and magnetic susceptibility tool (GHMT). All of these may be of interest to SGPP.

(g) Lithosphere Panel Report: Zierenberg reported on the Fall LITHP meeting and their ranking of the FY95 Prospectus. LITHP suggested that VICAP/MAP be substituted for Leg 157 DCS. LITHP continues to support DCS with high priority, is not interested in VPC, but do support a pressure core sampler. LITHP has high interest in the Caribbean that could possibly be coordinated with OHP. LITHP is concerned that proposal life is longer than panel member life. Interdisciplinary legs may be getting overlooked because they do not fit into thematic structure. Logistic problems also stem from lack of regional considerations. LITHP is currently revising its white paper.

(4) Proposed Hydraulic Piston Coring Policy:

> PCOM Action Item: "PCOM asks that SGPP and OHP evaluate ODP-TAMU's proposal for revising the ODP hydraulic piston coring policy and make a recommendation of it for the April PCOM meeting" (PCOM Minutes, Dec. 1993).

Stokking explained that ODP-TAMU's proposal for revising the ODP hydraulic piston coring policy is to address problem of oversampling. In many cases, the shallowest cores

were most sampled due to strong gradients present in shallow cores. The recommendation is to increase the number of HPC cores taken through the mudline at sites where HPC is already being done. This does not necessarily include a waiver to current sampling restrictions. Discussion by Hiscott raised the question whether increased coring would just generate increased numbers of samples. Some of this is an archiving issue. Paull comments that as long as the wording remains "should" and not "must", it seems like good policy. Berger notes that this type of sampling assists paleoclimate studies and that could be sold as a benefit of the program. McKenzie suggests that it should be required, with exceptions needing a waiver. Emeis commented that this seemed like a good idea for geochemical purposes.

SGPP Consensus SGPP agrees that more mudline cores should be taken in order to support the intensive sampling near the sediment/water interface. SGPP supports ODP-TAMU's proposal for revising the ODP hydraulic piston coring policy and recommends that it be accepted by PCOM.

(5) Gas Hydrate Sampling:

PCOM Consensus: "PCOM recommends that C. Paull and other SGPP members and J. Geiskes work with ODP-TAMU, TEDCOM and G. Brass to develop a plan to modify the existing PCS system and/or construct a new one (PPCS) to meet the needs of the scheduled gas hydrate leg and future legs that must recover gases and gassy sediments. The plan, together with a cost estimate, should be presented to PCOM in April 1994" (PCOM Minutes, Dec. 1993).

(a) Background on PCOM's PCS/PPCS-SGPP Action Item: Berger explained PCOM's request to SGPP. The current urgency on this item is due to the scheduled Leg 164 Gas Hydrate Sampling. In scheduling this leg, PCOM accepted SGPP's argument that an operational PCS was not needed for a successful leg, but certainly would be advantageous. There were discussions at PCOM about whether there is an existing working system. PCOM's reaction was to request a report on the status of the PCS/PPCS. Another question raised was that of transferring the sample from the PCS; there is some feeling that such a transfer system should be available first. McKenzie requests that the panel come up with specific recommendations of what SGPP requires for the gas hydrate leg. It is decided that a functioning PCS is required. It is listed as an operational tool, but it has not recovered much core and water recovered is always surface sea water. Paull and Kastner both indicate that they have ways to handle samples once the PCS is brought up on deck.

(b) "Subaquatic Gas Hydrate Occurrence -- Models and Settings": A presentation by Keith Kvenvolden serves as an introduction to the participants on gas hydrates and their scientific importance. He explained what gas hydrates are and compared and contrasted hydrates found at active and passive margins. Why are hydrates important? (1) There is little current knowledge about gas hydrate formation in the deep sea, other than that they exist and produce bottom simulating reflectors (BSR). Drilling could help better inform us with respect to resources, hazard, global change. We need to make more accurate estimates of actually how large is the reserve of methane in gas hydrates. Reduced carbon stored in gas hydrates could be an important component in the global carbon cycle. (2) Slumping or other disturbances on the ocean floor can be caused by collapsing gas hydrates. (3) Methane is a potential greenhouse gas. Gas hydrates have implications for global climate change. A sea level rise over the shelf in the arctic could cause escape of methane into water. Seasonal rises in methane that have been observed could be result of decomposed hydrates that are released when ice goes away. Methane released from hydrates is only about 1% of annual release to the atmosphere.

(c) Review of Progress in Gas Hydrate Drilling: Kastner reported on the progress that has been made in drilling and sampling of hydrates based on Leg 146 Cascadia results. At Cascadia, there was interest in the origin of the BSR, how much hydrate or free gas is responsible for the reflector, can BSRs be used for heat flow mapping. A low chlorinity zone was observed above and below the BSR. This is thought to be due to dilution, presumably by hydrate decomposition, but the profile does not show an expected rise in Cl below the BSR. The location of the brine that should have been produced by formation of hydrates remains an open question. In a second hole, all the soupy cores had low chlorinity and also tended to contain coarser grained sediments. This may be evidence for the concentration of hydrates in specific horizons. A discrepancy between seismic BSR depth and predicted depth based on stability field for hydrates in fresh water was found. An extrapolated stability field for seawater can bring these into better agreement. Analyses indicate the presence of some thermogenic methane. Geophysicists have concluded that the reflector is the result of both free gas and gas hydrates, which complicates the use of BSRs to quantify hydrates. A possible explanation for the absence of brines is that hydrates may have moved up in the column over time and decomposed in situ. Slow diffusion would allow the low Cl signature from decomposed hydrates to persist for thousands of years.

Gas hydrates that were recovered at very shallow depths had high H_2S and $\delta^{34}S$ values, indicating that these hydrates were formed in the sulfate reduction zone. Kastner showed illustrations of the existing sampling manifold that is capable of bleeding off the gas from a PCS. She suggested that equipment for core extraction, gas sampling manifold etc., should be close to place where the core comes up on deck. Kvenvolden worries that the existing manifold has never been used with very gassy samples. Paull suggests that the manifold should be tested in the lab rather than on board the JR.

(d) Engineering Review of PSC and PPSC: Pettigrew reviewed the current status PCS and PPCS status. The project is on hold from the engineering standpoint, but TAMU has used some year-end money to do some work, particularly in the redesigning of the cutting shoes. Also, a basket type core catcher has been made up . The PCS will go out on Leg 155, but there will not be a special technician to run it. It was questioned, what ccould be done to improve recovery? Would a push-in PCS system work better? Kvenvolden noted that most previous gas hydrate recoveries were made with rotary drilling. It was questioned why the PCS will be on Leg 155 when the cutting shoe has not yet been changed. Sarg asked questions about PPCS status and how this relates to PCS development. Pettigrew replied that the PPCS is only useful for shallow, very soft materials. It would not help with gas hydrate recovery.

(e) Status of Manifolds & Gas Hydrate Recovery in Preparation for Leg 164: Ussler commented on problems of fluid extraction from PCS.These include: (1) plugging of filters and valves due to silty sediment , (2) poor valve control and (3) potential isotopic fractionation during extraction or by chromatographic effects of fine sediments. He suggests a need for calibration. He presented a design for manifold that would avoid plugging, allow reversible flow and controlled sampling for depressurization experiments and to control sample size and pressure. Further discussion of sampling manifold by Kastner explains how current manifold works and how an additional regulator could be added. Paull comments that the main thing that is needed is testing and calibration in the lab. Panel should recommend this testing and this recommendation may help obtain funding to support development. Kastner recommends a redesign of WSTP for Leg 164. Ussler agree to pursue this.Paull feels that VSP experiments are going to be important for Leg 164.

(6) Joint TEDCOM/SGPP Session: TEDCOM and SGPP members are introduced. McKenzie describes SGPP's interests in PCS and VPC.

(a) Discussion of Pressure Core Sampler: Paull details how a sample from the PCS could be used even if there were not a manifold to store pressurized samples after collection. The first priority is to recover sediments plus fluids. It is necessary to bring these to the surface without losing gas from decomposition. The decomposing hydrate can then be bled to sample gases on deck. Pettigrew describes current status of PCS. TEDCOM members question how you can prevent a hydrate containing sample from becoming a bomb when it reaches the deck. This is not a problem as the core remains cool during transit to the surface.

Comments from TEDCOM members: Part of the problem of recovery may be that the driller tends to integrate weight on bit, rotation etc. to get recovery and the PCS will be unlikely to perform similarly to rotary core barrel. With PCS, driller does not have the opportunity to make adjusts to improve recovery. Is the sediment type a factor for recovery? The small barrel size is a potential problem for coarser material. This seems to correlate with observation by Paull that recovery of sediment with PCS has been better with fine sediment. On Leg 164 at Blake Ridge, sediments will be fine grained and shallow hydrates are likely to be disseminated. Getting the core tube as close as possible to the drilling bit would be desirable to improve recovery. Off-ship testing of redesigned cutting shoe might be desirable. Pettigrew indicates that would be feasible and could help. Testing could be done on geotechnical ships that operate in the Gulf of Mexico. It is highly recommended that land and/or geotechnical vessel testing be done prior to PCS deployment on Leg 164. TEDCOM believes that recovery of sediment with the PCS may not be a big problem and may only require a minor redesign of the tool. TEDCOM coring specialist W. Svendsen agreed to help with modifications/testing of the PCS. TAMU engineers need to make a cost estimate for the further development of the PCS, to be presented to PCOM. PCOM needs very specific information about PCS costs, testing, etc. Engineering staff at TAMU says that PCOM has not made this a priority in TAMU's objectives and budget. TEDCOM would like time on almost all legs to test equipment. Berger comments that PCOM may balk at an across-the-board recommendation of 2 days per leg for engineering. Experienced engineers need to sail with the tool in order to insure proper deployment. There needs to be lobbyists on the ship to convince drilling crew and co-chiefs to test tools.

Recommendations to PCOM: SGPP recommends that the existing PCS be modified with the current new design ideas in order that it can routinely recover sediment at in situ pressure by Leg 164. SGPP further recommends that the modified PCS be tested on land, as well as at sea on specific legs prior to Leg 164 (e.g. in the Mediterranean on Leg 161). An experienced engineer, preferably T. Pettigrew must be on-board the JOIDES Resolution to conduct the sea tests. An allotment of the necessary funding and engineering time will be required to accomplish these recommendations in due time. As the PPCS would not be useful for gas hydrate sampling, SGPP recommends that its development be postponed.

Recommendations to PCOM: As the push-in pressure core sampler (PPCS) would be used only for shallow sampling and would not be useful for gas hydrate sampling, SGPP recommends that its further development be postponed to a later date.

(b) Discussion of Vibro-percussive Corer: Underwood notes that there are many depositional environments, particularly submarine fans, where we have not been able to sample because of problems of drilling in sand. Sarg says this represents a bias in sampling by failure to recover sands. Sand recovery is important for fluid flow and sea level questions. Question from engineering staff: If a vibro-corer homogenizes the sample, it is still a useful sample? Underwood responds that you certainly lose information

on sedimentary structures, but you still get composition, which is important. Sarg notes that FMS etc. can provide information on sedimentary structures. The engineering staff is also concerned with hole stability in sandy environments. If the hole is unstable, the ability to core is not the limiting factor. It is suggested that a cone penetrometer might be an alternative. This was suggested long ago but did not receive much support from scientists. The current status of VPC under development at TAMU: the tool was developed and used on Leg 133 and 146. Analysis by stress engineering indicated that the VPC has a propensity to stall and concluded that it could be improved but would never meet the specifications that were desired. ODP is contracting for testing of the VPC by British Geological Survey. ODP will wait on results of this testing. Berger comments that these tools need to be sold on the basis of a problem that will grab the attention of the public. Pettigrew comments that a sinusoidal loading will probably work better than a hammer. Most manufacturer's of these tools don't really know how their tools work so that they can't predict how they could optimize performance. Development of this tool is probably a long range goal. It was noted that Russians have developed and tested a number of tools in a variety of conditions. One used at Lake Baikal was a wireline tool and would fit ODP string. Further discussion indicates that it was successful in sediments that could also be recovered by piston coring. In response to a suggestion that SGPP recommend that ODP pursue the Russian tool, Pettigrew indicates that he would prefer we recommend that they pursue a VPC of some type, not necessarily the Russian tool.

Recommendations to PCOM: SGPP recommends that PCOM's decision to put VPC on hold until the BGS testing is finished be reevaluated. SGPP recommends that other VPC options should be pursued by TAMU in parallel with the BGS testing.

Tuesday, 8 March

(7) New and Revised Proposal Reviews: During this Spring meeting, 18 new proposals, 8 revisions, 7 addenda were reviewed by the panel. There were 17 letters of intent distributed by the JOIDES Office, which were available at the meeting for panel members to read. Due to the large number of proposal submitted for this round of reviews, the panel required a full day to discuss all of them. Proponents did not remain in the room during the discussion of their proposals. The new ranking procedure appeared to be complicated and required frequent discussion. Hopefully, it will be useful to the proponents. The abstract book for "Active Proposals in the ODP System", compiled by the JOIDES Office, was extremely valuable for reviewing the proposals, especially for new panel members. SGPP recommends that this compilation be continued in the future with annual updates to coincide with the spring thematic panel meetings. The rankings under the various new review criteria are given below. Full reviews of the proposals compiled from watchdog reports will be distributed separately to the proponents via the JOIDES Office.

330-Add4: Time Progressive Continental collision: The Mediteranaen Ridge Accretionary Complex in the Eastern Mediteranaen (Phase 1 Shallow Drilling)
Proponent: A.H.F. Robertson
Ranking: A3, B1.2, B2.1, C1, D1, E3, E6, E8, F2 (previously 4 , Leg 162)

354-Rev2 Neogene History of the Benguela Current and Angola/Namibia Upwelling System
Proponent: G. Wefer, W.H. Berger, U. Bleil, M. Breitzke, L. Diester-Haass, K. Gohl, W.W. Hay, P.A.Meyers, H. Oberhansli, R. Schneider, V. Spiess and G. Uenzelmann-Neben
Ranking: A1, B1.3, B2.1, C3, D1, E8, F2 (previously 3)

355-Rev3 Geophysical Estimates of Gas Hydrate Quantities: A Calibration Through ODP Drilling
Proponent: R. von Huene, E. Suess, K.C. Emeis, K. Kvenvolden, T. Shipley and N. Kukowski
Ranking: A1, B1.1, B2.1, C0, D3, E3, E8, F2 (previously 4)

367-Rev: Great Australian Bight: Evolution of a Cenozoic Cool-water Carbonate Continental Margin
Proponent: N. P. James and D.A. Feary
Ranking: A1, B1.2, B2.1, C1, D3, E3, E8, F2 (previously 4)

380-Rev4 Drilling into the Clastic Apron of Gran Canaria and the Madeira Abyssal Plain: Volcanic Island Evolution, Continental Margin Instability, Global Sealevel History and Basin Analysis
Proponent: U. Schmincke, P.P.E. Weaver, P.v.d. Bogaard, S. Cloetingh, R.E. Cranston, J.J. Danobeitia, A. Freundt, H. Hirschleber, K. Hoernle, I. Jarvis, R.B. Kidd, R. Rihm, M. Schnaubelt, R.T.E. Schuttenhelm, K. Stattegger, H. Staudigel, J. Thompson, A.B. Watts, W. Weigel, G. Wissmann and R. Zahn
Ranking: No action required. (previously 5 - scheduled Leg 157)

384-Rev3: The Connection Between the Pacific and Atlantic Oceans: The Venezuela Basin and Aruba Gap
Proponent A. Mauffret and S. Leroy
Ranking: A5 (previously 1)

386-Add2: California Margin drilling: Neogene paleoceanography of the California Current, Coastal Upwelling, and Deformation of the Gorda Plate
Proponent: M. Lyle, J. Barron, A.C. Mix and L. Stott
Ranking: A1, B1.1, B2.1, C1, D2, E2, E8, F1 (previously 5)

400-Add2: Determination of mass balance, fluid flow, and deformation mechanisms of the Middle America Trench and accretionary complex off Costa Rica
Proponent: E.A. Silver, K. McIntosh, M. Kastner, T. Plank, J. Morris, and T. Shipley.
Ranking: A1, B1.1, B2.1, C1, D1, E8, F1 (previously 5)

408-Add2: Neogene drilling transects in the Caribbean
Proponent: A.W. Droxler, G.A. Haddad, R.T. Buffler, E. Rosencrantz, R.D. Norris, L.C. Peterson, A.C. Hine, P. Hallock and A. Mascle
Ranking: A3, F4 (previously 3)

415-Add2: Multi-objective ODP Drilling in the Caribbean Sea: Caribbean Ocean History, Ocean Plateau and the Cretaceous-Tertiary Boundary Impact Event.
Proponent: H. Sigurdsson, S. Carey, S. D'Hondt, A.W. Droxler, R.A. Duncan, C.W. Sinton, L. Abrams, T.W. Donnelly, L.C. Peterson, R.D. Norris, E. Rosencrantz, R.T. Buffler, A. Hine, P. Hallock and A. Mascle
Ranking: A3, F4 (previously 3)

421-Rev: Alkali-acidic Rocks of the Volcano Trench
Proponent: B.I. Vasiliev
Ranking: A5 (previously 1)

431-Add: Western Pacific Seismic Network: Interaction of subducting plates and mantle
Proponent: K. Suyehiro, T. Kanazawa, N. Hirata and Y. Fukao
Ranking: A5 (previously 1)
Not in SGPP mandate.

435-Rev: Crustal Fluxes into the Mantle at Convergent Margins: A. The Nicaraguan Margin
Proponent: T. Plank, M.J. Carr, E.A. Silver, J.B. Gill and J. Morris
Ranking: A1, B1.1, B2.1, C2, D3 (PCS), E5, E8, F2 (previously 4)

435-Rev2: Crustal Fluxes into the Mantle at Convergent Margins: B. The Mariana-Izu Margins
Proponent: T. Plank, J.B.Gill and R.L. Larson
Ranking: A1, B1.1, B2.1, C1, D1, F0, F1 (previously 4)

NARM-Add3: Basement Sampling of the Ocean-Continent Transition West of Iberia: Sequel to Leg 149 studies of a non-volcanic rifted margin
Proponent: T.J. Reston, M. Beslier, R. von Heune, D. Sawyer and R. Whitmarsh
Ranking: A5 (previously 1)

436: Neogene Sequence Stratigraphy, Northern Campeche Bank
Proponent: C.S. Fulthorpe, R.T. Buffler and M.B. Lagoe
Ranking: A1, B1.3, B2.2, C3, D3, D4, E8, F4

437: Lau-Havre-Taupo: Convergent margin spreading to rifting transect
Proponent: L.M. Parson, J. Gamble, J. Hawkins, J. Pearce, U. von Stackleberg, M. Wiedicke, and I. Wright
Ranking: A5

438: A drilling test of the origin of reflecting interfaces in oceanic crust
Proponent: J.C. Mutter, J. Karson and C.Z. Mutter
Ranking: A5

439: Mass Budget of Hot Spots: Deep Apron Drilling at the Marquesas
Proponent: M.K. McNutt, J.H. Natland and C. Wolfe
Ranking: A3, B1.1, B2.1, C3, D2, E8, F4

440: Investigating the Nature and Consequences of Hydrothermal Circulation in Oceanic Crust: Drilling on the Eastern Flank of the Juan de Fuca Ridge
Proponent: E.E. Davis, M. Mottl, K. Rohr, K. Becker, D. Chapman, A. Fisher, G. Wheat and H. Villinger
Ranking: A1, B1.1, B2.1, C1, D1, E8, F2

441: Southwest Pacific Gateway I & II: Paloceanography, Climate & Sediment System dynamics of the Deep Pacific Source
Proponent: R.M. Carter, L. Carter, K.B. Lewis, I.N. McCave, C.S. Nelson & P.P.E. Weaver
Ranking: A3, B1.2 , B2.1, C3, D1, E3, F4

442: The Magmatic and Tectonic Evolution of Rift Initiation in Back-Arc Basins: Drilling the northern Mariana Trough
Proponent: R.J. Stern, T. Yamazaki, J.F. Allan, P.Fryer, F. Martinez, J. Hawkins and K. Marsaglia
Ranking: A5

443: Oceanic Faults, Crustal Heterogeneity, and and Ridge Flank Hydrology and Alteration: Deepening of ODP Holes 504B and 896A
Proponent: J.C. Alt and K. Becker
Ranking: A3, B1.1, B2.2, C4, D4, E0, F4

444: History for Glacial-induced Sea-level fluctuations from siliclastic shelf and slope records of the Western Pacific, Joban Margin, off northeast Japan
Proponent: W. Soh, F. Saito and Y. Yanagisawa
Ranking: A1, B1.3, B2.0, C3, D1, E4, E6, E8, F2

445: Deformation and Fluid Flow Processes in the Nankai Trough Accretionary Prism
Proponent: G.F. Moore, D.E. Karig, M. Kastner, T. Byrne and W. Brockmann
Ranking: A1, B1.2, B2.0, C0, D3, E8, F3

446: Ocean Drilling in the Tonga forearc: A test of models for the origin of supra-subduction zone ophiolites, early arc volcanism, subduction initiation and subduction erosion/accretion
Proponent: C.J. MacLeod and S.H. Bloomer
Ranking: A5

447: Active Continental Extension in the Western Woodlark Basin
Proponent: B. Taylor, J. Mutter, F. Martinez, R. Binns, H. Davies, G. Abers, S. Scott, M. Benes, C.Mutter, A. Goodliffe and R. Rogerson
Ranking: A5

448: Assessing the origins, age and post- emplacement history of the Ontong Java Plateau through basement drilling
Proponent: L.W. Kroenke, J.J. Mahoney and A.D. Saunders
Ranking: A5

449: Drilling proposal for the Dronning Maud Land Margin (NE Weddell Sea): Evolution of the restricted Mesozoic Weddell Basin
Proponent: S.W. Wise, S. O'Connell and W.V. Sliter
Ranking: A2, B1.2, B2.1, C1, D1, E0, F3

450: Taiwan Arc-Continent Collision: Forearc Basin Closure and Orogenic History
Proponent: N. Lundberg, D.L. Reed and T. Byrne
Ranking: A3, B1.2, B2.1, C3, D1, E4, E8, F3

451: The Tonga Ridge Longitudinal Island Arc Transect (Southwest Pacific Ocean)
Proponent: D. Tappin, J.Hawkins, D. Scholl and B. Pelletier
Ranking: A5

452: Antarctic Peninsula Pacific Margin: Antarctic Glacial History and Causes of Sea-Level Change
Proponent: P.F. Barker, R.D. Larter, M. Rebesco, A. Camerlenghi and L. Gamboa
Ranking: A1, B1.2, B2.1, C2, D1, E8, F2

453: Bransfield Strait, Antarctica: Marginal Basin Formation, Timing of Rift Volcanism, Mantle Geochemistry, and Antarctic Glaciation
Proponent: M. Fisk, R.0 Keller, J. Anderson, L. Banfield, J.A. Austin, Jr., J. Bialas, R. Larter, A. Maldonado and L. Gamboa
Ranking: A3, B1.2, B2.1, C2, D1, E8, F3

Wednesday, 9 March

(8) 1994 Spring Global Ranking: After reviewing all new and revised proposals, the panel then discussed all active ODP proposals that had previously received a high categorization within SGPP's mandate. After this review, the following list of 19 proposals with strong SGPP thematic objectives was compiled:

Ref. No.	Proposal (ODP Number)
253-Rev	Ancestral Pacific
348-Add	Mid-Atlantic Transect
354-Rev2	Benguela Current
355-Rev3	Gas Hydrate, Peru Margin
367-Rev	Great Australian Bight
386-Add2	California Margin
400-Add2	Costa Rica Accr. Wedge
404	NW At. Sed. Drifts
412-Add2	Bahamas Transect
420	Evolution of Oceanic Crust
424-Rev	To "CORK" Hole 395A
427-Add	South Florida Margin
434	Carib. Quat. Climate
435-Rev	Crustal Flux, Nicaragua
435-Rev2	Crustal Flux, Mariana-Izu
440	Hydrothermal, Juan de Fuca
444	Joban Margin Sea Level
452	Antarctic Peninsula
SR-Rev2	Sedimented Ridges II

The panel made a "straw" ranking of this list to reduce the number of proposals to be included in the Spring global ranking. Fom this "straw" ranking, a list of the top eleven ranked proposals was finalized. The panel members then ranked these eleven proposals, with the top ranked proposal being No. 11. Proponents were excluded from voting on their own proposals. Scores were assigned by normalizing rank to number of votes cast. The results are basically consistent with the results of previous SGPP global rankings. Based on the results of the "straw" ranking, the panel elected to add a twelfth proposal to the bottom of the list to emphasize its scientific importance. Of the top five ranked proposals on SGPP's global list, all five could be drillable in FY96. Proposal 348-Add will require a site hazard survey, however. The twelve proposals with their normalized scores, ranking and assigned cheif watchdogs are as follows:

SGPP Spring Global Ranking 1994

Ref. No.	Proposal (ODP Number)	Score	Ranking	Watchdog
348-Add	Mid-Atlantic Transect	9.36	11	Paull
400-Add2	Costa Rica Accr. Wedge	8.43	10	Underwood
412-Add2	Bahamas Transect	8.07	9	Sarg
386-Add2	California Margin	7.21	8	Farrimond
SR-Rev2	Sedimented Ridges II	7.00	7	Bahr
434	Carib. Quat. Climate	5.93	6	Macko
354-Rev2	Benguela Current	5.73	5	Emeis
440	Hydrothermal, Juan de Fuca	4.64	4	Shanks
355-Rev3	Gas Hydrate, Peru Margin	3.38	3	Paull
435-Rev2	Crustal Flux, Mariana-Izu	3.29	2	Hiscott
435-Rev	Crustal Flux, Nicaragua	3.07	1	Hiscott
424-Rev	To "CORK" Hole 395A	-----	---	France-Lanord

(9) SGPP White Paper Revision:

The panel continued discussion on the revision of its White Paper beginning where it had left off at the end of the Fall meeting in Newfoundland. Previously, the panel had elected to focus its 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. The panel decided after much discussion that "base of the biosphere" was a more appropriate title for thematic area No. 3.

Potential societal relevance of each theme was considered during the discussions. The White Paper must relate it thematic objectives to problems of general importance to society, e.g. the microbial activity at the lower limit of the biosphere with the global carbon cycle and climate change or sedimentary architecture as a response to sea level variations and fluid flow on margins with hydrocarbon resources. Achieving these thematic objectives can also contribute to solving fundamental problems in earth science. The thematic panels should make sure that their highly ranked proposals reflect their proposed goals. One important audience is the geologic community as a whole. The continuation of the marine drilling program will only be possible if the geologic community as a whole is committed to it. One strategy for writing the white paper would be to write a longer paper directed towards scientific peers with a cover page directed to the wider audience to whom the program must be sold.

(a) Sea Level and Facies Architecture: On the short term, SGPP proposes to pursue only targets through the Neogene because it is possible to study processes and sedimentary architecture by looking primarily at a relatively recent record. SGPP's goal is not to reconstruct ocean history, that is the domain of OHP, but is to study how sedimentary architecture is related to sea level change. How do small fans, areas near ice margins, etc. respond to sea level change? Active and passive margins should be drilled. These types of process studies can be made entirely in Neogene sequences, which are accessible without deep drilling. These studies can provide an understanding of processes that will allow us to relate modern analogs to ancient systems, as well as to relate geophysical signatures to sedimentary architecture. There are a number of models and paradigms in the sedimentology community that can be tested with ODP holes. There should be more explicit use of these models to develop testable hypotheses for ODP legs. In summary, the SGPP sea level and facies architecture program should:

- determine the effects of sea level on facies architecture,
- identify and provide analogs,

- be restricted to the Neogene which contains large amplitude sea level changes,
- integrate predictive modeling and
- include both active and passive margins.

(b) Fluid Flow and Geochemical Fluxes: The relative importance of fluid flow through continental margins versus ridge flanks and crests was discussed. Have continental margins and accretionary prisms been overemphasized relative to flow through midocean ridges? Perhaps, they are simply end-members with mass fluxes in subduction zones being at the other end of the system from the ridge crest. Some important outstanding problems pertaining to fluid flow in the deep sea environment are: (1) the effects of fluid flow on the alteration of oceanic crust with the feedback between alteration and flow, (2) the effects of fluid flow on sediments and the feedback between sediment architecture and diagenesis, and (3) the effects of fluid flow on fluid chemistry and metallogenesis (eg. sediment hosted ore deposits). In summary, the SGPP fluid flow and geochemical fluxes program should evaluate:

- fluid pathways as a function of sedimentary architecture, i.e., the "plumbing",
- rates of flow and fluxes of mass and heat and
- effects of fluids on diagenesis of sediments and alteration of oceanic crust.

(c) Base of the Biosphere: The third major thematic area is intrinsically related to the global carbon cycle. The importance of the microbial influence in the carbon cycle can be addressed by shallow drilling, but microbial activity or diagenesis apparently continues into much deeper zones, where it remains an unknown quantity in the global carbon budget. In addition to looking at amounts of carbon that are preserved in the sediments, it is also important to look at form/quality of preserved carbon. The study of the microbial effects also addresses the recycling of other elements besides carbon (eg., phosphorus and nitrogen) within the sediments. Continuation of SGPP's gas hydrate sampling program, remains a high priority thematic objective. Additional drilling objects for SGPP's base of the biosphere program should include:

- the mapping of spatial and temporal variations in organic carbon burial,
- the study of transport mechanism and material cycling of organic carbon,
- the role of anoxia on organic carbon preservation,
- the impact of rivers on productivity and organic carbon burial,
- the production of high resolution records of organic carbon response to climate and sea level change.

In accord with PCOM's request that the panel prioritize themes for the two periods FY1996-98 and FY1999-2003, a hypothetical outline of SGPP's thematic program that could be achieved in the two periods was formulated in terms of drilling legs and/or topics these legs might address. See Table 1 below. The scheduling of such a full program would require support from other thematic panels in areas where overlap of thematic objectives exists.

Panel members were assigned to each of the three thematic topics to complete draft revisions of the White Paper, with an emphasis place on what can be accomplished with drilling during the specified time periods:

(1) sea level and facies architecture - Hiscott, Sarg, Soh, Surlyk, Underwood
(2) fluid flow and geochemical fluxes - Baker, Bahr, Paull, Shanks, and
(3) base of the biosphere - Emeis, Farrimond, France-Lanord, Garrison, Macko.

Table 1. SGPP's Proposed Drilling Program for FY1996-98 and FY1999-2003

Fiscal Yr	Sea Level	Fluid Flow	Base of Biosphere
FY1996-1998	New Jersey Margin Bahamas Transect	Costa Rica Sed Ridge II Juan de Fuca Oceanic Crust	Gas Hydrates II California Margin Benguela Current
FY1999-2003	Sandy fan (off CA) Near ice margin (Antarctic) Subduction margin Cool water carbonates	Red Sea Carbonate Platform Nicaragua/Mariana Mantle methane???	Other margin transects C transport & burial Microbiology at hydro-thermal zones
		C cycling through subduction zones microbiology and deep diagensis organic C-rich sediments (eg. black shales)	

(10) SGPP Miscellaneous:

(a) DCS Review: W. Rhinehart,ODP/TAMU engineering staff, provided the panel with a comprehensive, up-to-date review on the progress of the DCS.

(b) Liaisons to Other ODP Panels: The following SGPP members agreed to accept or continue liaison assignments to the designated ODP panels:

LITHP - P. Shanks
TECP - M. Underwood (alt. W. Soh)
DMP - J. Bahr
OHP - P. Baker (alt. K. Emeis)

(c) SGPP Chair and Membership: William Hay will become the new SGPP Chair at mid-year and will be in charge of the 1994 Fall meeting in Fukuoka, Japan. Judith McKenzie will attend this meeting in an advisory capacity. New membership was discussed for the next U.S and U.K. rotations. Members due to rotate off the panel after the Fall, 1994 meeting are: U.S. members - Bahr and Paull; U.K. member - Farrimond.

(d) Next SGPP Meetings:

Fall Meeting: 3 to 5 October 1994, Fukuoka, Japan, hosted by W. Soh
Sunday, 2 October 1994, Optional field trip to active volcano
Spring Meeting: March 1994, Boulder (or Denver), CO, hosted by W. Hay