Report of the
Scientific Measurements Panel

June 28th – 30th, 1999

David Skaggs Research Center

Boulder, Colorado

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Scientific Measurements Panel Participant List

Members

David Anderson (host)	(US, NOAA)
Bernard Célérier	(France, CNRS, Universite de Montpellier II)
Arthur Cheng	(US, Baker Atlas)
Peter Flemings	(US, Penn State University)
Franz Heider	(Germany, GeoForschungsZentrum)
Brian Huber	(US, Smithsonian Institution)
Alan Huffman	(US, Conoco)
Thomas Janecek (Chair)	(US, Florida State University)
Christopher MacLeod	(UK, University of Wales)
Roger Morin	(US, USGS)
Rick Murray	(US, Boston University)
Joe Ortiz	(US, Lamont-Doherty Earth Observatory)
Sverre Planke	(ESF, University of Oslo)
Wonn Soh	(Japan, Kyushu University)
Geoff Wheat	(US, W.Coast &Polar Regions Undersea Res Ctr)

Liaisons

George Claypool	(PPSP)
Gerry Iturrino	(ODP-LDEO)
Jay Miller	(ODP-TAMU)
Carla Moore	(NGDC)
Frank Rack	(JOI)

Guests

David Becker	(ODP-TAMU)
Shunsuke Fujita	(JAMSTEC)
Ann Klaus	(ODP-TAMU)
Ray Kokaly	(USGS, Denver)
Kazushi Kuroki	(ODP-TAMU)
Greg Myers	(ODP-LDEO)
Masatoshi Nakamura	(JAMSTEC)
George Sharman	(NGDC, Boulder)
Peter Sloss	(NGDC, Boulder)
Shinichi Takagawa	(JAMSTEC)

Regrets

Bill Mills	(ODP-TAMU)
Jim Natland	(SCICOM/OPCOM)
Jeff Schuffert	(JOIDES)
Roy Wilkens	(Hawaii Institute of Geophysics & Planetology)

NOTE: This report of the meeting is grouped primarily by agenda items and is not always in chronological order of discussion.

A) Introduction

The meeting started on Monday, June 28th, 1999 at 8:30 am and ended on Wednesday, June 30th, 1999 at 12:02 p.m.

The Chairman welcomed the panel to the meeting at the David Skaggs Research Center and expressed a special welcome to new members Franz Heider and Alan Huffman.

David Anderson, the meeting host, explained some of the arrangements for the meeting.

The Chairman presented a brief overview of the Agenda and asked if there were any other items that panel members wanted to add to the agenda. None were suggested. The Chairman continued with the Agenda, beginning with the Update on Recommendations/Action Items from the June 1998 SCIMP meeting.

B) Update on Recommendations -- June 98 Meeting

1) PERSONNEL AND STAFFING ISSUES

Background: As part of SCIMP's prioritization efforts at its June 1998 meeting the Panel made several recommendations regarding the efficiency of services and personnel distribution within the Ocean Drilling Program. With a balanced budget for the current year the sense of urgency to cut services is reduced, but SCIMP feels it is important for JOI to continue its efficiency evaluation of services and personnel within the Ocean Drilling Program. SCIMP Recommendations 99-1-1 and 99-1-2 are a follow-up to previous recommendations.

SCIMP Recommendation 99-1-1: SCIMP recommends that OPCOM advise JOI to continue its evaluation of the efficiency of Wireline Services within the Ocean Drilling Program.

SCIMP Recommendation 99-1-2: SCIMP recommends that OPCOM advise JOI to continue its evaluation of personnel and staffing within the Ocean Drilling Program.

Background: The January 1999 SCIMP meeting highlighted several deficiencies in the level of technical support on the *JOIDES Resolution*. Areas of limited or non-existent technical assistance include the need for a database administrator (JANUS support), increased software expertise (e.g., Applecore, PALEO, all shipboard data acquisition software), paleontology sample preparation, seismic/UW laboratory, and the new microbiology lab.

The Panel is acutely aware of political, financial, and physical constraints involved in the discussion of technical staffing. The Panel feels, however, that with the ever increasing need for software and database support (as well as other leg-specific needs such a microbiology,

paleontology) it is time to take the necessary steps to address these problems and makes the following recommendation:

SCIMP Recommendation 99-1-20: In the context of current staffing levels, SCIMP recommends that ODP-TAMU re-structure its shipboard technical staff to include a shipboard database administrator above and beyond the current computer/IS staff. In addition, TAMU should have a flexible system to deal with leg-specific technician needs e.g., a seismic/log coordinator, paleontological sample preparation).

Update (all three recommendations): See JOI operator report --- Section C-1

2) PUBLICATIONS

Background: An all electronic version of the JOIDES Journal is under consideration by the JOIDES office. The Panel feels that the hard-copy version of the JOIDES Journal reaches an important audience outside the normal ODP channels and urges the JOIDES office to continue printing a hard copy. Along these lines, SCIMP makes the following recommendation:

SCIMP Recommendation 99-1-3: SCIMP applauds the move toward electronic publication of the JOIDES Journal by the new JOIDES office but recommends that some form of the JOIDES Journal continue in printed form due to the varied audience of the journal.

Update: *JOIDES office to keep hard copy of journal*

Background: During the evolution of the publication requirements over the past few years, some co-chief scientists perceived that a synthesis (in the SR volume) was no longer required/needed. A lengthy discussion occurred at the January 1999 SCIMP meeting concerning co-chief obligations to write a synthesis paper for the SR volume. Overall, the panel feels ***very strongly*** that co-chief scientists from all legs should be required to produce or coordinate the production of synthesis papers for the SR volume. Some Panel members commented that for recent legs it would be difficult to require co-chiefs to write a synthesis paper at this late date. The following recommendation resulted from the discussion:

SCIMP Recommendation 99-1-10: SCIMP recommends that ODP-TAMU reiterate that it is the responsibility of the co-chief scientists to write or coordinate a leg synthesis paper for the SR booklet and CD-ROM as required by the co-chief agreement. The summary paper should provide an overview of the primary results of the leg. This recommendation does not preclude the submission of a separate synthesis to the outside literature, but should include, as a minimum, a discussion of the results from various aspects of the leg based upon post-cruise science.

Update: *Done.*

3) BOREHOLE RESEARCH GROUP

Background: The Temperature and Acceleration Pressure Tool (TAP) has been built to replace the Temperature Logging Tool (TLT).). Recent comparisons (Leg 182) of heave recorded by the TAP tool with heave as recorded on the ship show a good correlation but with slightly different magnitudes.

SCIMP Recommendation 99-1-4: SCIMP recommends that BRG-LDEO use the TAP tool routinely for the purpose of acquiring acceleration data and testing the efficiency of wireline heave compensation under different cable length and heave conditions. The Co-Chief scientists must be informed at the pre-cruise meeting at TAMU of the potential use of this tool and additional logging time that may result from the use of the tool. In addition, the Co-Chief scientists must have the option not to run the tool.

Update: *Starting with Leg 188, the logging scientists have taken special care to educate the co-chiefs on the use of the TAP tool. The additional logging time is inconsequential since it is a "piggy-back" deployment on most standard tool strings.*

Background: The Borehole Research Group has requested time to test the drill-string heave compensator after dry dock (Leg 186E) utilizing MWD technology (weight on bit and torque measurements). SCIMP supports this idea and feels that it would be best to have BRG and ODP-TAMU discuss the most appropriate time/leg for these tests based upon drydock results and the science needs/time constraints on Leg 186E. With this post-drydock testing goal in mind, SCIMP makes the following recommendation:

SCIMP Recommendation 99-1-5: SCIMP recommends that BRG-LDEO evaluate the drill string heave compensator as soon as possible after dry dock using MWD technology (weight on bit and torque measurements).

Update: *Leg 186E plans currently include an MWD bit run at Site 1107 after re-entry.*

Background: Industry has many advanced downhole tools that are too large to be deployed through the pipe on the *JOIDES Resolution*. Several PPGs have noted that deployment of some of these large-diameter tools, in particular the NMR and modular formation dynamics tester, may be very useful for accomplishing the objectives the of the Long Range Plan (gas hydrates, vertical and horizontal permeability). In addition, SCIMP, at its June 1998 meeting, recommended that the Wireline Services program of ODP needs to investigate the use of more specialty tools (See SCIMP June 1998 meeting report, in particular the background material associated with SCIMP Recommendation 98-2-10). At this point, little is known about what engineering developments would be required for large-diameter tools to be deployed on the *JOIDES Resolution*, as well as what is the tool availability and tool expense. With these issues in mind, SCIMP makes the following recommendation:

SCIMP Recommendation 99-1-6: SCIMP recommends that BRG-LDEO begin the evaluation of possible targets for large diameter tool deployments with proponents of active ODP proposals

and pursue the acquisition of technological information and costs of these deployments with ODP-TAMU and SEDCO, if the scientific need for the tools is demonstrated.

Update: *A written description of available tools was requested by the SSEPs for evaluation of tool applications for current and future drilling proposals. The description was presented at the most recent meeting of the SSEPs by ODP-LDEO personnel.*

4) ODP-TAMU

Background: The JANUS steering committee had previously recommended that paleontologists should be trained prior to sailing in the use the old JANUS paleontology program (PALEO). The new JANUS paleontology program (PAL), however, does not appear to have a significant learning curve, based upon input from paleontologists who have sailed on Legs 181-183. Before SCIMP recommends that ODP-TAMU discontinue training paleontologists prior to sailing on the use of the new paleontology program, the Panel feels that input from a few more legs is necessary, particularly in light of the fact that a manual has not been completed.

SCIMP Recommendation 99-1-7: SCIMP recommends that ODP-TAMU continue to provide training for the JANUS paleontology application to scientists prior to sailing on the leg. This training should continue until it can be demonstrated by ODP-TAMU that the paleontologists can easily learn the program on the ship during portcall or transit to the first site.

Update: *PAL progress is steady but the new application is not fully functional and tested (see Appendix 99-2-1 --- ODP-TAMU operators report for more details). ODP-TAMU hopes that by Leg 188 the old PALEO program will be retired. Training will continue at least through Leg 189, until the new age model utility is fully functional and tested on the JOIDES Resolution.*

Background: A recommendation of the Long-Term Observatory PPG is the establishment of an oversight group for legacy of holes, possibly falling to a subset of SCIMP and/or OPCOM. This recommendation would seem to include general guidelines for use of legacy holes, a check on the ability to add or remove equipment, duration of experiments, a repository of information on availability and status of holes, resolution of possible multi-user conflicts, etc. SCIMP feels that, as a first step to developing general guidelines for use, investigators need to know what holes exist and what are the characteristics of those holes. Along these lines SCIMP puts forth the following recommendation:

SCIMP Recommendation 99-1-15: SCIMP recommends that ODP-TAMU develop and maintain a catalogue of the existence and characteristics of legacy holes and other holes potentially capable of being re-entered or equipped with instrumentation packages. This catalogue should be readily accessible to the scientific and engineering community.

Update*: Kier Becker, Chair of the Long-Term Observatories PPG, has placed a compilation of legacy holes on the WWW. ODP-TAMU has established a link to this web-site from the ODP web-site. The drilling services division will work to keep the table updated.*

Background: SCIMP believes it is necessary to keep moving forward with respect to the Deep Biosphere Program in order to achieve the objectives set forth in the Long Range Plan. SCIMP makes the following recommendation:

SCIMP Recommendation 99-1-16: SCIMP recommends that the van recently acquired by ODP-TAMU be equipped for Leg 185 deep biosphere studies to as full an extent as financially and logistically possible in consultation with the Deep Biosphere PPG, Leg 185 scientists, SCIMP, and other interested parties.

Update: *A van was outfitted by ODP-TAMU for Leg 185 deep biosphere tests. See Section G of this report for more details regarding the contamination tests on Leg 185.*

5) MICROPALEONTOLOGICAL REFERENCE CENTERS

Background: SCIMP feels the Micropaleontological Reference Centers (MRCs) project is a very useful and low-cost (but underutilized) asset of the Ocean Drilling Program. The panel supports the idea of Brian Huber to hold a workshop this spring to explore and implement methods to improve the utility of the MRCs. Along these lines, the Panel makes the following recommendation:

SCIMP Recommendation 99-1-8: SCIMP recommends that JOI-USSAC support the travel of two U.S. scientists involved in MRC curation to the proposed MRC meeting in the spring of 1999.

Update: *Funding was provided for travel to a May MRC workshop held in Washington, D.C. See Section D-2 of this report for a summary of recommendations to come out of the workshop.*

Background: Brian Huber is stepping down this year as lead curator of the MRC program. Huber recommends that Michael Knappertsbush (Basel MRC) become the new lead MRC curator. SCIMP accepts Huber's suggestion for a new lead MRC curator and makes the following recommendation:

SCIMP Recommendation 99-1-9: SCIMP recommends that Michael Knappertsbush take over as lead curator of the Micropaleontological Reference Centers.

Update: *Approved by OPCOM/SCICOM and has been implemented.*

6) CORE/LOG/SEISMIC INTEGRATION

Background: The seismic data sets currently used in ODP include physical property data on cores, wireline logging, downhole seismic experiments, and seismic reflection data. SCIMP discussed a plan (See SCIMP Report Appendix 99-1-14) that would focus, strengthen, and coordinate activities related to seismic data acquisition, processing, and interpretation and assure

industry-standard data quality. Discussion among the panel members suggested that many aspects of this plan are in place but not tied together formally. This lack of formal integration often results in a "hit or miss" seismic integration during and after legs and, most-assuredly, an overall lack of quality control from leg to leg. In light of potential post-2003 activities, especially on a riser ship that could sit on site for months, such an integration of core/log/seismic facilities is essential.

The panel further discussed ways (in light of current fiscal and physical constraints) of making core/log/seismic integration a more routine action on the ship before 2003. To initiate this effort SCIMP made the following recommendations:

SCIMP Recommendation 99-1-11: SCIMP recognizes the importance of maximizing the integration between core, log, and seismic data both on the JOIDES Resolution and in post-cruise research. Presently, there are limited formal resources available on the JOIDES Resolution to integrate these datasets. To this end, SCIMP recommends that the Borehole Research Group enable the seismic and sonic analysis software presently installed as part of the GeoFrame system both on the JOIDES Resolution and at the Borehole Research Group at Lamont-Doherty Earth Observatory. .

SCIMP Recommendation 99-1-12: SCIMP recommends that BRG-LDEO should have as their baseline expertise the ability to do time-depth calibration (i.e., to tie depth data [core/log] to time data [seismic]). This capability should include the ability to integrate checkshot data with wireline sonic data and the ability to generate synthetic seismograms at sea.

Update: *ODP-LDEO has software on the ship to make synthetic seismograms and time-depth conversions. They have been available for quite a long time but they are mostly ad-hoc programs located in the DHML on the JOIDES Resolution*

Current shipboard capabilities for depth-time calibration and synthetic seismograms include:

Depth-time calibration:

a) Calibrating depths to travel time by interpolating between known travel times (e.g. WST check-shot). (Unix shell script, Analyseries).

b) Adding up interval travel times of the Sonic logs and/or travel times measured on core (short Igor-Pro script, short Fortran program), to get a depth vs. travel-time relation, then (a).

c) Various editing to remove anomalous data spikes and fill in intervals of missing data prior to (a) and (b) (Excel, Kaleidograph, Igor Pro).

Synthetic seismograms

a) Get a source wavelet by calculation (Igor Pro, Khoros, short Fortran code (e.g. Yue Feng Sun's code) or by extracting from the seismic section (Sioseis).

b) Make an impedance log and reflection coefficient series (Excel, Kaleidograph, Awk, Igor pro).

c) Convolve the source wavelet with the reflection coefficient series to get the synthetic seismogram (Fortran code, Igor Pro, GMT utility).

d) Plot synthetic within seismic section (Khoros/Cantata).

Thus the capabilities to integrate checkshot data with wireline sonic data and the ability to generate synthetic seismograms are currently available on the ship (albeit a somewhat cumbersome process).

To improve these capabilities ODP-LDEO has initiated reviews and evaluation of more comprehensive commercial processing packages for ODP use. In particular, ODP-LDEO is looking at Geoframe/IESX modules that can accomplish the required tasks in a more efficient manner. This review should not take too long, but, in the mean time, LDEO still has the capabilities on board the JOIDES Resolution to integrate checkshot data with wireline sonic data and the ability to generate synthetic seismograms (per the SciMP recommendation). The new modules should better facilitate the entire process.

The evaluation of a larger seismic/log/core package (IESX in conjunction with Geoframe) is also in progress. ODP-LDEO wants to have a package that can display, process, and enable interpretation of seismic sections, synthetic seismograms, checkshots, offset VSP's, sonic data (DSI and SDT tools), and core data. This integrated package should also facilitate training, expand user options, and more importantly, increase compatibility between the different kinds of ODP data. This evaluation should be completed prior to the next SciMP meeting. Barring any unforeseen circumstances or problems, the ODP-LDEO plan is to test the at-sea use of this package during Leg 188. ODP-LDEO will also provide the panel members with a written report at the next SciMP meeting and hopefully post a notice on the message board if they make a decision significantly sooner than the January 2000 meeting

SCIMP Recommendation 99-1-13: SCIMP recommends site seismic surveys in the vicinity of ODP sites (w/in 2 miles) be released in digital form to the general scientific community via a long-term data archive, within 3 years of drilling. "Digital Form" is considered at this point to be both the raw and the final stacked seismic data in SEGY format.

Update: *SciCom removed the "raw" data from this recommendation. Discussion beginning with Site Survey Data Bank on how to proceed.*

7) ENGINEERING AND TOOL DEVELOPMENT

Background: Measurements of torque, weight on bit, penetration rate provide critical information on stress conditions and rock mechanical properties. Data on mud-flow rate is essential for interpreting temperature and heat flow estimates. Both types of measurements provide information on induced thermal stress. SCIMP believes these types of measurements should be part of the routine data sets used by scientists on the ship and urges ODP-TAMU and BRG-LDEO to proceed forward with current engineering efforts to make these types of data available to the shipboard scientific party at sea.

SCIMP Recommendation 99-1-14: SCIMP recommends that ODP-TAMU and BRG-LDEO make drilling parameters, including mud flow rate, torque, weight on bit, and penetration rate available, in digital form, to the scientific party during the leg.

Update: *ODP-TAMU and BRG-LDEO plans to record drilling parameters via memory tools were discussed at the TEDCOM June 1999 meeting.*

ODP-TAMU plans to acquire a Downhole Sensor Sub to measure drilling and coring parameters near the bit. Industry survey taken to examine current technology and RFP will be sent to vendors this summer. Delivery estimated at 15 months from contract initiation.

Initial LDEO Drillstring acceleration tests successful.

Background: The Gas Hydrates PPG has basically stated: without a pressurized core retrieval system, there is no hydrate program. The PPG does not advocate one system or another (i.e., the PCS or HYACE), but for the hydrate program to be successful (and accomplish goals outlined in the LRP) they ***must*** have a viable sampling tool. The HYACE system (a gas hydrate autoclave equipment system- See SCIMP Appendix 99-1-16) represents a healthy alternative to the current pressurized core barrel system but it should not replace development of the present system. SCIMP considers the continued development of the HYACE system a very important item and makes the following recommendation:

SCIMP RECOMMENDATION 99-1-17: SCIMP recommends that ODP-TAMU continue its working arrangements with the HYACE consortium for the development of a pressurized core retrieval system, while continuing with modifications of the extant PCS system. SCIMP recognizes the essential importance of such systems for the Gas Hydrate and Deep Biosphere research programs.

Update*: HYACE system presented at March SciCom. The proposal to have HYACE as a gas hydrate sampling tool would have to go through the ODP Safety Panel. Leg 191 is considered as a candidate for technical and organizational merits. The proposal should be further examined by SciCom at the August, 1999 meeting (which would be welcome by the HYACE group for project planning purposes). Detailed examinations and contributions from ODP engineering staff might be necessary.*

Downhole Sampling Technology within the ODP-TAMU Drilling Services group now involves development projects for those tools and equipment that acquires physical samples downhole and store them. Some examples are Pressure Core Sampler (PCS) Modification, Advanced Diamond Core Barrel (ADCB), Packer/Sampler Adaptation for Advanced CORKs and improvements to standard ODP/TAMU coring tools (RCB/APC/XCB).

Background: The Gas Hydrates PPG stressed the importance of maintaining the ability to collect both temperature measurements and water samples at the same time. SCIMP has also recognized that both measurements are essential to accomplishing LRP objectives (see SCIMP chemistry prioritization -- Appendix 98-2-6 in the June 98 SCIMP report). Along these lines SCIMP makes two recommendations:

SCIMP Recommendation 99-1-18: SCIMP recommends that ODP-TAMU continue efforts towards finalizing the DVTP as a mature tool according to the Third Party Tool guidelines.

Update: *Earl Davis has provided AutoCad drawings and software source code for the DVTP. ODP Drilling Services is making sure the AutoCad drawings are complete (an assembly drawing will need to be made) and ODP Science Services is reviewing the software source code to ensure that TAMU has the software required. Earl is trying to prepare the DVTP with pressure capability for testing on Leg 186 but is uncertain if he can be ready in time (due to the rush, this tool will likely have pressure only capability at this time). He will be supplying two pressure cases with the new dimensions. AutoCad drawings will need to be altered for modifications to implement pressure capability.*

SCIMP Recommendation 99-1-19: SCIMP recommends that ODP-TAMU continue to maintain and develop the capacity to acquire simultaneous in-situ temperature data and interstitial water samples.

Update: *ADARA-WSTP data loggers bench tested and paid for. Tools sent to ship for Leg 185. Installation problems being worked through by shipboard staff. Status update and remaining issues necessary to resolve for full implementation are forthcoming.*

ADARA-APC tool data loggers: ODP-TAMU has requested (1) cost and time estimate for repair of remaining 3 tools at ADARA and (2) timeframe by which all documentation, schematics, and software source to be copied and sent to us.

C) Operator/Liaison Updates -- JOI, TAMU, LDEO

1) JOI REPORT

Frank Rack reported on JOI's review of the efficiency of wireline services (per SCIMP recommendation 99-1-1 and SCIMP recommendation 98-2-10) and personnel within ODP (per SCIMP recommendation 99-1-2 and SCIMP recommendation 98-2-12). Rack presented a new budget reporting format which breaks out the real cost of the delivery of science for each leg and the cost of having wireline services on an annual basis (Appendix 99-2-2). Engineering developments are now reported in a similar fashion, providing a more reliable way to evaluate he costs and value of drilling services. This new reporting format provides panels within the JOIDES structure a better way to evaluate the costs associated with the program and to make recommendations for increases in efficiency or revisions in services. SCIMP commends JOI and TAMU for this new budget presentation.

Rack further reported on the FY 2000 technology plan and Special Operating Expenses (SOEs) for the upcoming year, the schedule of publications to come from recently held COMPLEX meeting, and venues for 2nd post-cruise meetings to improve ODP visibility (Appendix 99-2-2),

Finally, the mandate for the new Conceptual Design Committee was presented to the panel. This committee will formulate the conceptual design characteristics of a single, non-riser drilling vessel, optimally configured, to address the widest possible range of non-riser drilling objectives identified by the JOIDES LRP, the COMPLEX report, and other U.S. planning documents. Of specific concern for the SCIMP panel is the following mandate of the panel:

Identify the optimal configuration of on-board scientific measurement capabilities, i.e., geophysical, geotechnical, and scientific laboratory facilities to achieve the scientific objectives of the program.

Over the next 6 months, the Conceptual Design Committee will regularly request input on these topics from SCIMP members.

2) ODP-TAMU REPORT

Jay Miller reported on some several specific items from the ODP-TAMU operator's report (Appendix 99-2-1) including proposed Dry Dock operations, progress on obtaining an ICP-ES, the use of the SCIMP message boards, and the integrated development strategy underway in the ODP-TAMU Drilling Services Department. Subsequent discussions centered on the software applications for presentation of Rig-floor Instrumentation System data and the need for a "Current SCIMP topics" link to the ODP web home page.

Panel members felt that, at this stage of the program, it was of greater importance to stress aspects of engineering development that would result in the acquisition of rig-floor data over the development of presentation tools for the data. In essence, unless the data is routinely obtained *now*, it cannot be used by shipboard scientists no matter what presentation formats are developed.

The SCIMP message boards seem to be working well. They do, however, require proactive input from the panel (not-so-subtle hint here to panel members). Several panel members suggested that in order to get more community input to SCIMP topics it would be a good idea to have a "banner" on the ODP web-site home page that would show current SCIMP issues and link the user to the SCIMP message board.

ACTION ITEM:

Jay Miller to check with IS department at ODP-TAMU about setting up such a read-only link to the message board for outside users.

3) ODP-LDEO REPORT

Gerry Iturrino briefly updated Panel on web-site data developments, the FY 99-00 logging plans, as well as providing responses to several action items requests from the previous meeting for web-access statistics, satellite data transfer costs, and costs associated with producing extra FMS color copies for Shipboard Scientists (Appendix 99-2-3).

Discussion ensued on how best to provide additional color copies of FMS data to the scientists as ODP-LDEO can only produce black and white copies at LDEO and there is a contractual (and some practical concerns) regarding the number of color copies produced on the ship. A viable alternative to color printed copies may be to provide TIFF files on the USERVOL for anyone to use and take back home. TIFF files would provide higher data resolution than printed copies of the FMS data

ACTION ITEM:

ODP-LDEO to generate TIFF files on the next few legs and report back via the message board as to whether the TIFF images are sufficient to satisfy the needs of the Shipboard Scientific Party.

4) NGDC REPORT

Carla Moore updated the Panel on the progress resulting from SCIMP Recommendation 98-2-8: SCIMP recommends that NDGC work with JOI to investigate the most efficient way to complete the DSDP/ODP data archiving. Since the recommendation last June, considerable progress has been made toward establishing a regularly-updated JANUS archive at NGDC (Appendix 99-2-4). The entire JANUS database is now loaded onto the NGDC server and work is underway at NGDC on designing scripts to produce a comprehensive set of ASCII files from the database for permanent archive at NGDC.

Copies of a NDGC CD-ROM containing the full suite of DSDP sediment/hard rock data were distributed to panel members for their comments. The CD-ROM contains reformatted, tab-delimited versions of the data and is intended to replace the 1989 version funded by JOI/USSSP that has an outdated DOS interface and will soon be out of print.

SCIMP CONSENSUS 99-2-1:

> *SCIMP applauds the progress made on this issue and endorses the continued collaboration between ODP and NGDC/WDC-A for producing and archival ASCII version of the data from the ODP-TAMU JANUS database.*

ACTION ITEM:

SCIMP members to review the new NGDC CD-ROM and submit comments/suggestions to Carla Moore.

D) Review of lab/services status

1) PUBLICATIONS

Ann Klaus updated the Panel on the new Initial Reports (IR) volume format, volume production and distribution statistics, post-cruise publication data (SR vs. Journal), and WWW developments at ODP (Appendix 99-2-1; Publications section). Ann also requested comments about the Leg 177 IR (both the CD and Web version) and passed out a questionnaire for panel members to complete during the meeting.

In response to a previous SCIMP request regarding the costs and feasibility of developing an DSDP/ODP citation list, Ann presented the panel with several options utilizing the AGI GeoRef data base (see Appendix 99-2-1; Publications section). A single copy of the database that could only be used by the ODP/TAMU staff to generate reports and statistics (as originally requested by SCIMP) would cost $8500 with an annual fee of $100 plus $0.80 per new citation. This data base could NOT be distributed to other parts of the Program or member countries. The second option provides for the distribution of the Database on CD-ROM with free distribution rights in CD and print formats. The cost for this option is $17,500 with a $100 annual fee plus $1.00 per new citation and $4500 for the CD printing. The third option provides for free Web access to the database on the AGI server. This latter option costs $23,700 with a yearly $5000 maintenance fee plus $1.50 per citation.

The consensus on the Panel was that unlimited access to the Citation Database on the WWW is best for the program (even considering the high start-up cost and yearly maintenance fee). The new publication system (reduced IR and SR volumes) will result in manuscripts spread out in many different journals and publication formats. The time and effort required for a single user to generate a DSDP/ODP citation database from GeoRef (if one had access) would be prohibitive to most. In addition, in a time when the drilling community will be trying to generate funding for a $100+ Million dollar program it is essential that the scientific community have knowledge of, and easy access to, the results of the previous drilling programs. These results are the Legacy of the program and must be easily available. Thus, SCIMP makes the following recommendation:

SCIMP RECOMMENDATION 99-2-1

SCIMP recommends that ODP-TAMU purchase the yearly subscription to the AGI/GEOREF web-based version of the ODP/DSDP Citation Database.

Klaus next brought to the Panel's attention a problem with the proprietary nature of the Preliminary Report. The Preliminary Report is currently classified as proprietary in nature but is now published on an open Web site. In addition, the publications department regularly receives requests on how to cite this initial post-cruise publication. Historically, The Preliminary Report has been used to provide a timely (contractual) summary of Leg results to the funding agencies. In addition, it provides a useful summary of results to the scientific community (until the IR is published). Because of moratorium concerns and the fear of non-shipboard scientists "scooping" the Shipboard Scientific Party the contents of Preliminary report were classified as privileged proprietary information.

The Panel feels that it is important to get cruise information out to the scientific community as soon as possible and that the Preliminary Report continues to be published on the WWW as soon as possible after a cruise. The proprietary nature of the report should be eliminated and the report given a proper citation. The Panel is also sensitive to the feeling by some co-chiefs and cruise participants that releasing this information before the Initial Reports could result in other scientists "scooping" the results. However, the Panel feels that this risk is very low in relation to the benefits of having the Preliminary Report published on the Web shortly after a cruise. SCIMP makes the following recommendation regarding the Preliminary Report.

SCIMP RECOMMENDATION 99-2-2

SCIMP recommends that the Preliminary Report continue to be published on the World-Wide Web with the following changes:

A) Authorship of the report should read "Shipboard Scientific Party"

B) The report should be referenced as "Preliminary Report"; not as a proprietary document or an in press document.

C) The Preliminary Report will be reviewed by the Co-Chief Scientists and Scientific Party within a few weeks post cruise before final production and publication.

The Borehole Research Group at LDEO publishes a short logging report on the Web shortly after each Leg. In order to standardize its publication and provide proper reference to the Shipboard Scientific Party, SCIMP makes the following recommendation.

SCIMP RECOMMENDATION 99-2-3

SCIMP recommends that the ODP-LDEO post-cruise Logging Report continue to be published on the World-Wide Web with the following changes:

A) Authorship of the Logging Report should read "Shipboard Scientific Party"

2) PALEONTOLOGY/MRC/THIN SECTIONS

Paleontology Laboratory

Brian Huber presented the panel with the recommendations set forth by the Micropaleontological Reference Centers workshop participants (Also -- see MRC update below). The workshop participants feel that more attention needs to be given to ensuring that data generated in the Paleontology Laboratory are entered into the database. This issue has been a problem on several legs since JANUS was put into service. Does this problem reflect the immaturity of the old paleontology application, the failure of the application, the lack of computer savvy of the participants or the complexity of data entry? The concept of "prime data" in the Paleontology Laboratory seems to have been lost. The use of the new PALEO application and the development of a user-friendly manual should help in this respect. The workshop group, however, believes the Staff Scientist should be more aggressive in ensuring that the Paleontologists comply with this data entry responsibility. They recommend that the Staff Scientist, early on in each cruise, emphasize the reasons for populating the database and follow-up on a regular basis to ensure there is compliance. The need to correctly and regularly populate the JANUS database with data as it is collected applies to all laboratories on the ship and thus SCIMP makes the following recommendation:

SCIMP RECOMMENDATION 99-2-4

SCIMP recommends that Staff Scientists strongly emphasize to all shipboard scientists that data entry into the JANUS data base must occur when the data are collected in all laboratories and the Staff Scientists should regularly check for compliance.

Huber continued on with other concerns of the workshop participants. The group feels that many of the problems with the Paleontology lab are the result of a very low level of interaction by the marine technical staff with the Paleontologists and sees the need for a marine technician to provide more consistent support. In particular, they feel there needs to be a technician who is responsible for laboratory orientation, for reference inventory, and to actively monitor the lab from leg to leg. Currently, the Laboratory Officer and the Photographer have partial responsibility but this split in

duties does not appear to provide the consistent oversight that is needed. Thus SCIMP makes the following recommendation.

SCIMP RECOMMENDATION 99-2-5

SCIMP recommends that TAMU provide more consistent and coordinated support for the Paleontology laboratory that includes the following:

1) An introduction for the Paleontologists as to the whereabouts of reference material and sample preparation material.

2) An inventory of reference material at the beginning and end of each cruise.

3) Regular monitoring of lab.

4) Inform co-chiefs to notify ODP-TAMU at pre-cruise meeting of the potential need of assistance in sample processing.

JANUS PALEO Application

The MRC participants noted that with the recent change of the SR volume to an electronic format more of the post-cruise biostratigraphic data are coming to ODP as data reports, but the distribution charts in the reports are variable in their quality and degree of completeness (e.g., some lack prime data fields and have spelling errors in the species names). In order to get these data in a consistent and usable format for easier access by the research community, ODP needs to develop a portable paleontology application that mirrors the functionality of the shipboard application. Unless there is a portable JANUS paleontology application that all biostratigraphers MUST use in their shore-based work, there is practically no way to ensure that once the biostratigraphic data leave the ship the data will come back in a format that would be usable by JANUS. That is not the expectation of the workshop group. The data leave the ship in a spreadsheet format, without the JANUS codes for the data fields and with the freedom to move rows and columns around to a different order than JANUS could identify if one were to try to upload the data back into JANUS. The workshop group recommends that a portable paleo application be developed that ensures all the prime data fields are marked as required entries, all species spellings and sample formats are correct, and that it can output the data in a standard spreadsheet format that is readable by any spreadsheet program. Such spreadsheets could easily be accessible as flat files through the JANUS web site, but they would not have to be a part of the JANUS relational database.

Suggestions for the portable application include (1) upgrading the code written for Fossilist (David Lazarus has agreed to look at the code to see if could be done), (2) ODP to write a data entry form on the web that emulates the PAL application formats, and (3) individual scientists purchasing a portable Oracle license for the JANUS database. SCIMP makes the following recommendation regarding the development of a portable paleontology application:

SCIMP RECOMMENDATION 99-2-6

SCIMP recommends that ODP-TAMU determine the feasibility of producing/purchasing a portable paleontology application that duplicates the shipboard paleontology application with regards to data

entry formats and field definitions. ODP-TAMU should report findings of this study to the SCIMP paleontology representative before the next SCIMP meeting.

Micropaleontological Reference Centers

Finally, Huber discussed the recommendations set forth at the recently-held Micropaleontological Reference Centers (MRC) workshop in Washington, D.C. The workshop addressed issues on how to increase access and use of the MRC data sets, how to fill in stratigraphic and geographic gaps in the MRC data sets, and how to effectively deal with the collection and synthesis of postcruise chronostratigraphic data. The recommendations of the MRC Workshop Group were discussed by the Panel and these discussions resulted in the following SCIMP recommendation:

SCIMP RECOMMENDATION 99-2-7
SCIMP recommends the following action with respect to the Micropaleontological Reference Centers:

1) The current policy be changed to permit the loan of MRC samples for the purpose of research and advanced education.

2) Future MRC efforts should concentrate first on identifying stratigraphic and geographic gaps in the MRC collection and then on obtaining and processing samples to fill this gaps.

3) Future MRC sample requests for all new drill sites should be limited to intervals and locations that fill stratigraphic and geographic gaps in MRC sample holdings or are unique in some aspect (e.g., preservation, abundance, etc.).

4) Sample shipments to the Moscow MRC should be discontinued until assurances are provided that the collections are accessible and properly curated.

ACTION ITEM: *Huber to write a proposal to establish a working group that will determine the best course of action to effectively collect and synthesize postcruise chronostratigraphic data.*

3) CURATION

Sample Policy Issues

Rick Murray reported on Curatorial Advisory Board (CAB) action since the last meeting. While Murray was at sea, on Leg 185, Tom Janecek temporarily replaced him on the CAB to avoid a conflict of interest if sample requests for Leg 185 reached the Board. One request was received and effectively dealt with by the CAB during that time.

Murray noted that many scientists are still unfamiliar with the appeal process provided by the new curatorial policy (and in fact, do not even realize there is a appeal process for sample request denials). The new policy is a big document and TAMU needs to become more proactive about insuring that the Shipboard Scientific Party is made aware that a workable appeal process exists.

Core Wrapping

The issue of the core wrapping project (to keep cores from drying out) was brought up again. The project was initiated to replace the continuous rewetting of sponges. The West Coast Repository inquired about the utility of wrapping dry cores. SCIMP members felt it was probably not worth the effort to wrap these older, dried out cores and were ready to recommend that the West Coast Repository no longer continue wrapping DSDP cores on a systematic basis. However, John Firth supplied a memo post-meeting to SCIMP (See Appendix 99-2-5) which stated that at the 1998 Curator's meeting held in College Station many curators recommended that the DSDP core still be wrapped. In addition, Firth also stated that many DSDP cores are still wet enough to sample with a standard ODP sampling tube (and thus should be wrapped to prevent desiccation). Based upon this post-meeting information SCIMP recommends the following:

SCIMP RECOMMENDATION 99-2-8

SCIMP recommends that ODP-WCR cease wrapping older, dry DSDP cores in plastic film but continue wrapping wet cores. SCIMP also recommends that ODP-TAMU continue wrapping all ODP cores and cease the rewetting of sponges in D-tubes.

A short discussion ensued on the issue of potential geochemical contamination with the use of plastic wrap on cores. Most evidence, pro and con, presented to the panel at this point was rather anecdotal in nature. It is not clear to the panel if the risks of contamination and the number scientific projects affected by such contamination, if present, outweigh the utility of wrapping cores to keep the moist for ease in future sampling and curation. Frank Rack presented the panel with a reference list of articles on plastic wrap contamination (Appendix 99-2-6). A subset of Panel members will review the literature on this topic and make a recommendation to the full panel at the next meeting.

ACTION ITEM: *The Curatorial and Chemical Working Groups will review literature on plastic contamination (supplied by Frank Rack) to determine the potential for geochemical contamination of cores with the continued use of plastic core wrap.*

Leg 185 Sandblaster Usage

Rick Murray reported on the use of the sandblaster on Leg 185. A test use of the sandblaster to clean samples for geochemical work was previously recommended by SCIMP via email discussions. The sandblaster was purchased by a Leg 185 Shipboard Scientific participant with the understanding that if the technique was successful ODP-TAMU should purchase the sandblaster and make it available to future Shipboard Scientific Parties, if needed. The purchase price is minimal ($600 USD). The Leg 185 Shipboard Scientific Party appeared to be quite happy with the results of the sandblasting. The ODP-TAMU technical staff, however, were less enthused citing contamination problems with electronic equipment (particularly the laser printers). SCIMP feels that with adequate discussion between co-chief scientists and the ODP-TAMU technical staff at pre-cruise meetings, proper preparations can be made in advance to utilize the sandblaster on future cruises. SCIMP makes the following recommendations regarding the sandblaster used on Leg 185:

SCIMP RECOMMENDATION 99-2-9

SCIMP recommends that ODP-TAMU purchase the sandblaster used on Leg 185 and thus retain this capability to clean rock samples, if requested in advance by the ongoing shipboard scientific party.

Finally, Murray noted that "kudos" should go to John Firth, the ODP Curator, who has been doing an excellent job since taking over the Curator position. John has been responsive to inquiries and has been quite active on the development and implementation of curatorial policy. SCIMP commends John on his work and looks forward to his continued proactive input in the future.

4) DATA MIGRATION/JANUS

Most of the discussion in this section was deferred until the presentation by David Becker (Manager, ODP Information Services).

ACTION ITEM: *ODP to supply Panel members with a regular electronic file update of data migration status.*

5) SHIPBOARD COMPUTERS/NETWORKS

In response to a recurring discussion item, Peter Flemings noted that 33 new machines are targeted for the ship. The core lab area is constantly in need of an extra computer or two and SCIMP requests that several machines are set aside for 'fit-to-mission" duty on each leg.

Flemings notes that back/up speed and resultant interference with report preparation was a common complaint, along with inconsistent versions of software on the ship. The recent upgrade of the backbone network from 100 MB/s to1GB/s is expected to greatly reduce the backup time, and a recent overhaul of the shipboard software should correct the problem of inconsistent software versions on the various machines.

In addition, as of Leg 185, only 2-3 computers had removable backup units attached (i.e., Zip, Jaz drives). No specific formal recommendations deemed necessary by Panel members to rectify these situations. SCIMP members, ODP-SCIMP liaisons and ODP-TAMU guests felt these issues could easily be rectified with simple action items:

ACTION ITEM*: ODP to reserve several new computers for "fit-to-mission" type uses on each leg (i.e., hard rock core description*

ACTION ITEM: *ODP to check on availability of removable media backup units on the ship and purchase more if needed.*

ACTION ITEM: *ODP to post status of software versions of various applications on SCIMP message board.*

Finally, ODP-TAMU reports that CC mail is being replaced with an application that will allow Shipboard Participants to bring their email to the ship and carry new email off after a Leg. The current investigations focus on Novell GroupWise as the mail server and Eudora as the mail client.

6) DOWNHOLE TOOLS

Greg Myers (ODP-LDEO) updated the panel on the Drill String Acceleration (DSA) tool tests on Leg 185. The DSA has been developed to measure the effectiveness of the passive heave compensator, to evaluate future active heave compensation developments in ODP, and to record drill bit vibration signals. The preliminary analyses from Leg 185 show that the data are of good quality and minor changes in mechanical design were made during the leg.

Details of the Leg 186E plans were laid out for the panel (Appendix 99-2-3) and include MWD (per SciMP recommendation 99-1-5), pilot sensor deployment for heave analysis, further DSA test, Rig floor instrumentation tests (per SCIMP recommendation 99-1-14), Standard wireline logging, and operation of the WST-3 Schlumberger 3 axis VSP tool. SCIMP notes this schedule is rather ambitious and it is not clear what the priorities are for these tests should Leg 186E operations fall behind schedule.

Collaborative planning for multiple dry dock projects has occurred with TAMU and Sedco. Three primary LDEO projects will be completed: 7th level expansion and subsequent lab renovation, MAXIS upgrade to an MCM (Minimum Configuration MAXIS), and rig floor instrumentation. Numerous smaller projects involving Schlumberger and LDEO personnel will also be completed as specified in plans submitted to TAMU and Sedco.

ODP-LDEO liaisons were queried about the status of the GHMT tool. It was not clear to the panel what has happened to the polarity data. Is it being processed on a routine basis? How is it being made available to the community? Gerry Itturino responded that data goes to the processing center in France where the polarity is determined from total magnetic field and susceptibility data. Itturino was not sure if the resultant data was available on the LDEO website but said the data was available to scientists who request it.

Action Item: *Gerry Iturrino to determine status of GHMT polarity data (i.e., what Legs have been processed, how accessed, formats, etc.) and report back to SCIMP via the message boards.*

7) UNDERWAY GEOPHYSICS

Streamers

Sverre Planke updated the panel on two U/G lab working group recommendation. ODP-TAMU has been unable to dependably obtain data from their two ITI 6-channel streamers. When the streamers have worked, the data is not appreciably better than that collected from the single-channel

Teledyne streamers. Each of the ITI streamers has been returned to the vendor for repair several times and yet problems still remain. The U/G Lab Working Group feels that sorting out remaining problems will take more ship time than warranted (especially considering the good quality and dependability of the single channel data) and would like to abandon the efforts to implement the ITI 6-channel streamers and remove them from the ship. SCIMP concurs with recommendation. The *JOIDES Resolution* is not a survey ship and the Teledyne single-channel streamers provide adequate data for site characterization when needed. With respect to the seismic streamers aboard the *JOIDES Resolution*, SCIMP makes the following recommendation:

SCIMP RECOMMENDATION 99-2-10

SciMP recommends that efforts to implement the ITI six-channel streamer be abandoned and that the three currently available Teledyne single-channel streamers be kept operational and properly maintained.

GI Guns

The panel received further updates regarding guns for seismic surveys. Currently ODP-TAMU has three SSI S-80 and two HAMCO 200 cu.in. water guns for seismic surveys. One of the S-80 guns is worn out and the replacement cost will be over $15,000. The HAMCO 200 guns have not been used for quite a long time and there appears to be little difference in quality generated by the 80 and 200 cu. in. guns. On recent legs scientists have been bringing and successfully using their own GI-guns for seismic surveys and VSP experiments. The U/G lab working group would like to immediately purchase one new GI-gun (replacement cost about ~$30,000) and ultimately replace all the S-80 guns with GI guns.

SCIMP feels that ODP-TAMU and ODP-LDEO should investigate the cost of a using a tuned gun array for well bore and seismic survey use in lieu of purchasing a GI gun. The tuned array would consist of a three-gun array in a frame that is standard issue from Schlumberger. The cost of leasing a tuned-gun array from Schlumberger may not be significantly different than the cost of purchasing GI-guns. In the long term, obtaining a tuned-gun array could simplify logistics (and ODP technical support) since the contractor would provide the equipment and maintain it for ODP. Such a change in underway operations, perhaps, would allow the ODP technical staff the flexibility to expand responsibilities in other domains. Thus, SCIMP makes the following recommendation:

SCIMP RECOMMENDATION 99-2-11

SciMP recommends that ODP-LDEO and ODP-TAMU investigate the financial and operational aspects of a tuned-gun array for well bore and seismic survey use and report the findings of this investigation to SciMP before purchasing GI guns for seismic use.

Seismic, wireline and drilling data integration

Finally, SCIMP members discussed the need to simplify operations in the U/G laboratory and to develop a longer term vision of what is required for seismic, log, and core data integration. A subset of SCIMP will work towards developing this integrated plan

ACTION ITEM: *SCIMP will convene (via email) a subgroup to plan for better integration of wireline, drilling, core, and seismic measurements. The subgroup will have two goals: 1) describe basic needs for improving integration shipboard (on the JOIDES Resolution) and 2) describe the basic needs for drilling platforms in the post-2003 environment. The report will be ready for the January, 2000 SCIMP meeting*.

8) PALEOMAGNETICS

Franz Heider reported that Cryogenic Magnetometer was filled prior to Leg 186 (only 15% full at time of refill).

Heider also pointed out that a programmer is needed for two to four weeks during an upcoming leg to clean up some software problems. SCIMP decided that it would be best to await the results of the JANUS Programming priority list (see Section H below) before recommending programming efforts take place in any particular laboratory on the ship

9) PHYSICAL PROPERTIES

At the previous SCIMP meeting, a request was presented by Peter Blum (ODP-TAMU) to utilize freeze-drying instead of oven drying for the Moisture and Density (MAD) procedure to improve sample processing times on the ship. Roger Morin surveyed several geotechnical laboratories about this change in methodology. All use the standard ASTM-approved oven drying methodology. These laboratories, however, don't have the backlog of samples that is normally experienced on an ODP leg.

This is the second time that this issue has been discussed in the JOIDES advisory structure. The first time resulted in the science community (through the old SMP) dictating a return to the ASTM oven drying method. At this point in time, there is no compelling statistical evidence utilizing controlled experiments with a wide range of lithologies to suggest that SCIMP recommend a change in methodology.

Several members on the panel sympathize with the longer sample processing times when oven drying is utilized but suggested the answer is not to change the method but the way the samples are taken. Samples should be taken to ground-truth the high-resolution MST data and not to generate high-resolution curves of discrete data.

10) CHEMISTRY

Gas Chromatographs

Rick Murray updated the panel about the status of several equipment issues in the Chemistry laboratory. First, the new Gas Chromatographs are up and running. No problems to report regarding these instrument at this time.

CHNS analyses

Several years ago, the old SMP recommended that ODP-TAMU discontinue regular operation of sulfur analysis using the CHNS because of data reliability, long combustion times, and expense of column configuration. The recommendation was to only install sulfur capability when requested for a specific leg. ODP-TAMU purchased the reconfiguration hardware. However, almost every leg has found a reason to request sulfur analysis, but when chemists see the quality of the data and how long it takes to acquire the data they stop the analyses. In summary, since the data are not ephemeral in nature, the time, effort, and expense related to performing these analyses are probably not justified. The Chemistry Laboratory working group would like to discontinue sulfur analyses with this apparatus and reconfigure it for CN analyses only. SCIMP doesn't see the need to make an additional recommendation here; the Chemistry Working Group should follow the old SMP recommendation. The machine can be reconfigured for CN (only) but ODP-TAMU should retain the shipboard capability (i.e., keep the necessary columns on board) to add on Sulfur capabilities should the Shipboard Scientific Party need the data for leg specific goals. However, these goals should be spelled out in the pre-cruise meeting so the Co-chief scientists fully understand the quality of the Sulfur measurements before rigging up for this type of analysis.

ICP-ES

Murray reported on the progress towards obtaining a ICP-ES for the ship. This moderately priced instrument (less than or equal to $100K) will serve as a one-for-two replacement of the AA (replacement cost approximately $60K) and XRF (replacement cost approximately $150-$250K), both of which are aging instruments with increasing downtime and decreasing lifetime. The ICP-ES instrument will immediately replace the AA and, after a one leg development period, will allow removal of the XRF freeing up a considerable amount of lab space and significantly reducing the labor associated with the XRF's maintenance and operation. These two aspects (space and technical support) are currently very critical in the context of several of ODP's new research initiatives. Appendix 99-2-1 (-- Chemistry section) outlines the ICP-ES implementation timetable from purchasing (Summer 99) to field trials (Leg 187 - Nov 99).

Geoff Wheat noted that the new GC-MS does not have a "cookbook". SCIMP members noted that the state of the "cookbooks" in the chemistry laboratory and other laboratories is not very uniform. A need exists to determine the state of the "cookbooks" before recommending how to proceed with updates. In addition, Wheat suggested that each "cookbook" should contain some documentation on the common pitfalls of interpretation.

> ACTION ITEM*: SCIMP members to query pertinent ODP contacts to determine the status of cookbooks in each laboratory (i.e., when last updated, electronic file?, etc). Information needs to be in hand before the next meeting.*

11) CORE DESCRIPTION

Chris MacLeod and Tom Janecek noted serious deficiencies in both the hard rock and soft rock versions of Applecore. There are numerous suggestions for improvement in both cases. SCIMP, however, withholds making a specific recommendation for programming needs and revisions until

the JANUS Programming Priority department establishes its priority list this fall (see Section H of this report).

E) New Techniques/Measurements/Developments

While much of SCIMP's time and effort involves the current laboratory operations and services in the Ocean Drilling Program it is important for the Panel to stay abreast of new technologies and services that could not only benefit the current program but also drilling operation beyond 2003. To assist the Panel in this endeavor time is set aside at each meeting for presentations from experts working on new and innovative techniques and scientific measurements that could be beneficial to the drilling program.

IMAGING SPECTROSCOPY -

Ray Kokaly (USGS Denver)

Ray Kokaly, from the USGS in Denver, gave a presentation on the Survey's innovative uses of spectral analysis from airborne platforms to map lithologic variations on the earth's surface.

The Survey's primary sensor is the NASA/JPL AVIRIS system (Airborne Visual and Infra-Red Imaging Spectrometer). AVIRIS currently covers the wavelength region from 0.38 to 2.50 microns with 17-meter pixel spacing (20-meter spot) and a 10.5-km swath. AVIRIS is flown on an ER-2 (U2) aircraft at 65,000 feet. The AVIRIS spectral range is excellent for detecting electronic transitions in minerals (e.g., iron oxides, Fe2+ bearing minerals, etc.), vegetation (vegetation species, health, green leaf water content), and vibrational absorptions due to lighter elements (OH, SO4, CO3, CH, etc., so OH-bearing minerals, carbonates, sulfates and organics).

The Survey's objective is to make thematic maps of mineral and vegetation variability. Researchers at the Spectroscopy Lab have measured the spectral reflectance of minerals in the laboratory and have compiled a spectral library with over 350 minerals. Through the use of the "Tetracorder"-algorithm, USGS scientists examine reflectance vs. wavelength, keying in on the position and amplitude of absorbance patterns and matching remotely-sensed spectral data with their spectral library. The "Tetracorder" manuscript is in review and the source code is planned to be made publicly available after publication.
Many aspects of the USGS's spectral research have direct and immediate applications for Ocean Drilling Program, including the spectral mapping of lithologic variations on a split-core face.

> ACTION ITEM: *Joe Ortiz and Tom Janecek will follow up with Ray Kokaly to further investigate the applicability of the USGS spectroscopy research to ODP core analyses.*

STATE OF THE ART IN WIRELINE LOGGING -

Arthur Cheng - (Baker Atlas)

Arthur Cheng gave the panel a very interesting (and timely) presentation on the application of some of newest generation of wireline logging tools utilized by his company, Baker Atlas. In particular,

Arthur presented the latest trends in Resistivity measurements, Nuclear Magnetic Resonance, Reservoir Characterization, Imaging, and Acoustic Logging. The Panel heard about the physical characteristics of the new tools, the enhancements in tool design, and new techniques in data recording processing, and interpretation .

The newly deployed dipole shear sonic tool (DSI) that replaces the sonic logging tool on the *JOIDES Resolution* belongs to this new generation of tools. The DSI offers new capabilities of investigation (especially in formation anisotropy) that only require extra processing interpretation efforts.

The impact that this newest generation of Wireline tools will have on post-2003 drilling operations is quite large. First, the new riser and riser-less ships, with their increased pipe diameter, will be able to take advantage of these latest advances. The tools, however, have become so specialized (and expensive) and require so much processing that a new program my not be able to depend on one contractor to obtain the best suite of downhole logs.

F) Digital Imaging on the JOIDES Resolution and Post-2003

The panel discussed the merits of moving to digital photography aboard the *JOIDES Resolution* (and post-2003). Science, of course, is most important consideration -- what are the benefits to the scientific community. Panel members outlined areas in core descriptions (particularly hard rock), stratigraphy, mapping of lithologic variability, and core-log integration that would derive significant benefits from the utilization of digital photography. A clear consensus of the panel emerged that a move to digital photography on the JOIDES Resolution is scientifically justified and that a strategic plan is needed to move ODP-TAMU in that direction.

The next step was to determine how to accomplish this task. Joe Ortiz outlined three options:

1) Film capture, digital archive

This scenario is business as usual. Cores are photographed and developed on the ship with film-based photography and the photographs are digitized on shore. The major advantage here is minimum impact on current operations. Disadvantages to this operation are (A) a limited access to close up images and limited numbers of close-up images, (B) significant post-cruise scanning efforts and (C) current photographic lighting set up on *JOIDES Resolution* results in significant lighting variability. This latter problem is quite significant from a scientific viewpoint as more and more work is done on the color and grayscale variability. In addition, because of physical space limitations, this lighting problem cannot be rectified.

2) A digital photo station similar to the film-based photo station currently on *the JOIDES Resolution.*

This scenario eliminates post-cruise scanning efforts but has the other limitations describe in Option 1.

3) Fully automated digital capture (via a track-mounted digital frame or line scan camera).

Among the major advantages to this option are (A) unlimited close up images, (B) elimination of core lighting problems, and (C) direct feed into core description operations. Key issues with this option include hard disk space, the concept of a permanent archive, the dynamic range of digital vs. film-based photography and space and core flow considerations

Ortiz then described a commercially-available line scan track system (GEOTEK) that is in use in numerous labs around the world, including many by scientists working on DSPP/ODP cores and projects. Issues related to horizontal-line artifacts and illumination were discussed Panel members that use the GEOTEK GEOSCAN line-scan system felt that these issues are no longer a problem with the new system developed over the past year.

Panel members, guests, and liaisons began a lively discussion of the three options and the consensus among the panel members was that Option 3 was the preferred plan. Further discussions centered on storage issues (40+ GB hard disks now available and ever increasing in size), Dynamic range issues (digital now comparable to film), archive issues (all other data digital....why treat photographs differently),

At this point , the panel felt that scientific need is present, the technology is available and that ODP should move quickly to acquire a line-scan imaging system. Continued modification of what is currently available on the ship will not result in a timely solution to the digital problem and will tax the current ODP-TAMU development staff to the detriment of other tasks. In addition, it is important to focus efforts on just one sensor (a line scan camera) for this track system. The panel stresses that it is important not to "nickel and dime" this effort but to approach this effort with a prudent transitional strategy to effectively deal with issues of storage space, data compression, software, data back-ups and data distribution. The Panel feels these issues are resolvable over a transition period and should not hold up acquisition and use of the dedicated line-scan system. Along these lines SCIMP makes the following recommendation

SCIMP RECOMMENDATION 99-2-12 SCIMP recommends that ODP-TAMU immediately purchase a complete commercially-available RGB line scan digital imaging system. This new digital imaging system should be fully functional and should replace the existing core photography process on the JOIDES Resolution by July 2000. The new system should be designed to address the following:

A) an integrated process approach using appropriate software, hardware, and archiving media.

B) training of technical staff to support the system.

C) integration of the new imaging system and digital images with the publication, archiving, and data management process within ODP-TAMU.

D) a plan for distribution of low-resolution and high-resolution images to the scientific community.

G) Leg 185 Microbiology Update

Rick Murray updated the Panel on the Leg 185 Microbiology contamination tests as well as the status of the Microbiology van (outfitting the van was the subject of a previous SCIMP Recommendation ---99-1-16). Murray reported that, overall, the tests went well and that there was limited contamination in both the drilling and core-handling tests. The perfluorocarbon tracer (PFT, a chemical tracer introduced into the drilling fluids) test and fluorescent microsphere tests (a Whirl-Pak bag containing microspheres placed into the APC barrel) were conducted both during APC coring of unconsolidated sediments and RCB coring of consolidated sediments and igneous rock.

Sediments cored with APC show less susceptibility to contamination and several core interiors were entirely free of contaminants. RCB coring resulted in the presence of chemical (i.e., PFT) but not particulate (i.e., microspheres) tracers in the interiors of the RCB cores. A chapter in the Leg 185 Initial Reports volume will be devoted to detailing the results of the tests (Smith et al., Evaluation of drilling-induced contamination of deep sea sediments and volcanic rocks for microbiological study). The contamination problems are not insurmountable and the microbiologists feel the program should move forward.

Murray suggests that the next four to six months are critical in development of a Microbiology Facility. In the short term, dry dock provides a prime opportunity to develop a new and independent laboratory on the ship, as well as to outfit the lab with the necessary equipment and supplies above and beyond those already provided in the context of the Leg 185 van. The Deep Biosphere community (PPG, Leg 185 scientists, SCIMP liaisons, and any other interested member of the microbiological community) must work together towards ensuring that a properly outfitted Facility is built. In the longer term, many SCIMP issues still abound including, technical support on the ship, tasks involved in routine microbiological sampling, curation of samples, radioisotope usage, continued contamination studies, database entry, and coreflow.

It is difficult, at this time, for SCIMP to comment on these issues as very little information is available about microbiology objectives (i.e., proposals and projects). SCIMP feels that it is imperative that a report addressing these SCIMP issues be given at its next meeting by a representative of the microbiology community. In the interim, several Action Items were suggested.

ACTION ITEM: *SciMP to coordinate with various groups in the microbiological community and TAMU to identify shipboard location and implementation of a radioisotope facility on the JOIDES Resolution in time to take advantage of the upcoming drydock.*

ACTION ITEM: *SciMP to work with various groups in the microbiological community and ODP-TAMU to outline issues of potential significance to the increased usage of the shipboard Microbiological Laboratory (e.g., shipboard technical support, curation of samples, radioisotope usage, continued contamination studies, database entry, and coreflow).*

ACTION ITEM: *Based on responsiveness to A and B, SciMP will identify a representative from the microbiological community to attend the next SCIMP meeting and help coordinate the results from the previous action items.*

H) Information Services Review of JANUS Applications

David Becker, the new Information Services (IS) Manager at ODP-TAMU, gave the Panel a brief update on IS operations and the status of the JANUS database. JANUS is currently getting 600 hits/month with a 50 hit/month growth rate. As measure of JANUS Database success, Becker pointed out that with the improved retrieval methods of the JANUS database, the Data Librarian currently is responding only to requests for data not on the web and that he expects this position to change into a data migration position as more and more data is available on JANUS.

While the basic database structure is in place and is working, Becker said that more work needs to be done on the upload and retrieval portions of the system. Becker further explained now that the system has been in operation for over a year, ODP is in a position to fully evaluate what remains to be done in order to make this system acceptable and responsive to the scientific community. He plans a review all JANUS database applications developed by either TRACOR or ODP-TAMU staff to identify and prioritize the projects needed to satisfactorily complete and maintain JANUS. To accomplish this task he is forming a special committee to review JANUS applications. This committee will serve until a plan has been formulated to deal with existing and future JANUS applications. The committee will have three objectives: (1) to evaluate the current status of JANUS applications, (2) to identify JANUS applications which are currently underway and planned for the near term and, (3) to identify and prioritize JANUS applications over the next three years. Joe Ortiz and Dave Anderson will be SCIMP representatives on the committee and will attend meetings in person or via telecommunication. Becker hopes to have a much of the prioritization finished by the end of the year.

SCIMP lauds the initiatives of David Becker and looks forward to working closely with his group to make the IS department and JANUS responsive to the needs of the scientific community .

I) OD21 RISER SHIP LABORATORY DESIGN

1) IPSC MANDATE

SCIMP was asked by the IPSC (IODP Planning Sub-Committee) to assist in planning the laboratory design on the OD21 riser vessel (see Appendix 99-2-7). IPSC felt that the most important thing that has been learned from the present and past international drilling programs concerning the conduct of science and the achievement of scientific goals is that a substantial shipboard team of scientists who work together to achieve these goals is a critical and indispensable element of a scientific drilling program and should be preserved. The synergistic and educational benefits of such teams, combined with their unparalleled degree of productivity, should not be lost in the new program. Rather they should be enhanced.

IPSC's viewpoint is that the essential laboratory capabilities of the JOIDES Resolution should be preserved and enhanced on the OD21ship. Planning and designing the OD21 ship for a very minimal scientific party may prevent expansion of shipboard capabilities in a cost-effective way, if it is discovered later that a larger shipboard party is desirable. Intellectual ownership of the cores and the holes themselves may also diminish if the scientific team is not intimately involved in the drilling and coring operations. Planning for the maximum shipboard activity is a safer and more flexible strategy. The space will be available, so why not use it?

IPSC laid out several suggestions for SCIMP to consider in an overall laboratory design plan for the OD21 riser vessel.

1. Encourage SciMP to continue their lab planning efforts and request that they provide space-by-space or function-by-function estimates of power usage, cooling and ventilation needs as well as vibration and noise restrictions for the OD21 laboratory space during their June 1999 meeting.

2. Suggest that SciMP combine their functional flow chart of whole-round, archive- and working-half core analyses with their diagram of space layout. of functions in space is critical to a good lab layout.

3. Urge both SciMP and OD21 to preserve a considerable amount of open flat space which can be versatile in its use.

4. Space for the layout of 100 - 300 m of core for viewing should be included in the laboratory plans.

5. The essential laboratory capabilities of the *JOIDES Resolution* be preserved and enhanced on the OD21ship. Enhancement should include:

a) better layout with less crowding

b) addition of "undesignated" (versatile) space and core layout space (3, 4 above).

c) addition of a seismic data interpretation laboratory with appropriate computer data storage as well interpretation and visualization software.

d) plans for the addition of a few containerized laboratories on the upper level with essential laboratory service links. These would be "temporary" labs to be used at special sites or at particular times during the drilling of a deep site.

2) OD21 LABORATORY DESIGNS

The OD21 laboratory design group (under the leadership of Wonn Soh) and several members of JAMSTEC presented the basic plans for ship construction, ship design and laboratory design to SCIMP (Appendix 99-2-8). After this presentation by the OD21 group, SCIMP members discussed the function of each the four laboratory decks and recommended the following modifications to the plan. The OD21 group accepted these recommendations and will redesign the laboratory stack in July 1999,

SciMP recommends the following changes to the OD21 Laboratory Working Group Laboratory Design.

SCIMP RECOMMENDATION 99-2-13

Core Storage Deck:

A) Change current configuration of Catwalk-to-Core Processing Deck to Catwalk-to-Core Storage Deck

B) Allow space on Core Storage Deck for multiple "fit-to-mission" containers and retain 8000 m capacity of core storage.

C) Move the Downhole Measurements Laboratory (DML) to Core Storage Deck and ensure a proper line-of-sight to rig floor is maintained. The DML must have direct access (via a stairwell) to the Core Processing Deck below.

D) A properly enclosed and vented Core Cutting area should be moved to the Core Storage Deck. An elevator will be needed next to the Core Cutting area to move the 1.5 sections of core to the Core Processing Deck.

Core Processing Deck:

A) Enclose port wing of Core Processing Deck. The roof of this enclosure to be used to support DML and "fit-to-mission" containers (see Core Storage Deck items 2 and 3 above).

B) Enclosed port wing should be used for core-viewing area (up to 300 meters of core) and Microbiology lab.

C) Additional magnetic measurement area needed outside of shielded room and away from magnetic noise.

Lab Management Deck:

A Data Integration Center for Core/Log/Seismic data integration and display should be added to the Lab Management Deck. This area is in addition to a Computer User room.

Lab Street Deck:

A) Paleontology laboratory layout must include equipment for handling and venting hydrofluoric acid.

B) Remove the photo darkroom. Digital photography will be the standard photographic mode on the OD21 riser vessel.

Other Recommendations to the OD21 Laboratory plan.

A) The Downhole Measurements Data Acquisition unit, Logging Winch, and Wireline Heave Compensator should be located adjacent to each other.

B) All interior walls in the lab stack should be non-loadbearing where possible for maximum flexibility in laboratory arrangement through the life of the program.

C) OD21 should consult with ODP-TAMU on laboratory storage capacity needs for long duration (i.e. 2-6 month) drilling legs.

D) Improve work flow to assure full access of mud-logging data, drilling parameters, and cuttings on a routine basis to the shipboard scientific party.

E) Allow unallocated bunk space (5-10 berths) for users of "fit-to-mission" containers, particularly non-drilling-type investigators (e.g., atmospheric chemists, physical oceanographers, etc.).

F) Strive for a single berthing configuration for scientists and technicians.

G) Each floor of laboratory stack should have a large door for moving equipment in and out.

ACTION ITEM*: Determine basic equipment needs for each lab using the OD21 Laboratory Working Groups equipment as a guide.*

3) IODP - RISER SHIP OPERATIONS

In the course of the OD21 laboratory discussion, SCIMP members came to the conclusion that the current OD21 laboratory design is primarily centered around the processing of core. In actuality, the laboratory area may be receiving cuttings, not core, for substantial periods of time. Panel members also realized that they have little experience in this mode of riser operations and need assistance in developing a plan to optimize the return of data unique to riser operations. The following two recommendations resulted:

SCIMP RECOMMENDATION 99-2-14:

SciMP recommends that a short-lived Working Group be established as quickly as possible to outline a plan to optimize the scientific benefit of data unique to a riser platform (e.g., cuttings, mud-logging data, drilling parameters, etc).

SCIMP RECOMMENDATION 99-2-15:

SCIMP recommends that ODP seek opportunities to put observers on industry deep-water drill ships. This action will allow ODP to gain knowledge about riser ship operations to aid in IODP planning and design of science operations.

Finally, discussion centered around the need for increased academia-industry interaction, particularly via Joint Industry Projects (JIPs). Alan Huffman described two such projects (TAMU riser-less drilling JIP and the GRI Seismic-While-Drilling JIP) to the panel. Increased interaction in these types of projects would be highly beneficial over the next few years as IODP strategic planning is developed and finalized.

SCIMP RECOMMENDATION 99-2-16:

SCIMP recommends that ODP become more actively involved with industry in Joint Industry Projects (JIPs) that can benefit ODP science operations and IODP strategic planning and

technology development. Examples include the TAMU riser-less drilling JIP and the GRI Seismic-While-Drilling JIP.

J) Third Party Tools Policy Update

The new third party tool guidelines discussed at our last meeting have been revised. The current draft incorporates comments from SCIMP members and liaisons submitted to Jay Miller since the last meeting (January 1999). Panel members felt that document was in good shape at this point and should be fully implemented. Jay Miller will post the document on the message board after the meeting and wait for two weeks for any final comments/questions. After that time, the guidelines will be in effect.

ODP-LDEO submitted to SCIMP a tool development plan and time-table for a new 3rd party logging tool-- the Multi-channel Gamma Ray Logging tool (MGT) (Appendix 99-2-9). This development is independently supported by NSF and is progressing well towards a sea-trial on Leg 189. The tool is designed to be combined with a standard Schlumberger tool string but requires a dedicated logging pass. Logging time will be affected only by this extra pass, extra rig-up time is inconsequential. The Leg 189 co-chiefs are enthusiastic to see the tool used on their leg.

SCIMP endorses the continued development of this tool and will assign a watchdog to oversee compliance with the new third-party tool guideline.

> ACTION ITEM: *SCIMP requests that ODP-LDEO liaison regularly keep the panel abreast of the success of the development. SCIMP also requests that ODP-LDEO inform the panel of the expected additional costs for running this tool on a regular basis.*

K) Leg Evaluations

In response to a previous request to ODP-TAMU asking for access to the post-leg cruise evaluations, Jay Miller provided the SCIMP members with a brief history of the cruise evaluations, some statistics on response rate, and suggestions towards getting this information to SCIMP on a timely basis.

Jay informed the Panel that the raw post-leg overview documents, in their current form, are considered confidential documents by ODP-TAMU and are not appropriate for distribution without some level of editorial censorship and compaction.

Generally, after each cruise ODP would have a debriefing on the issues raised in PLO documents. As the forms were paper copies, they were lucky to get a 30% response, and it was usually only from those who had a specific issue they felt needed attention. The output of the PLO debriefing meetings was a specific list of action items charged to individuals (according to the department

appropriate to the comment) along with responses sent to the scientists who had filled out the forms (to let them know what action, if any, was being taken).

Over the past year or two the forms were revamped into an electronic file. The electronic file provides a somewhat cumbersome document in a software package (Filemaker) that, while pretty intuitive, is not familiar to most scientists. The end result is TAMU has an electronic database for viewing and compiling the comments, but is still only getting a 30% response rate at best. In addition, contact with PLO responders has fallen by the wayside.

Even with the current electronic form, it is still a cumbersome task to compile comments (as TAMU feels it must first remove all personal issues from the comments. SCIMP feels that this current form is not a good format for obtaining useful technical comments from shipboard scientists on a timely basis and considered several options to improve the response rate of shipboard scientists and the flow of information to the Panel.

Many panel members felt that the low response rate was, in part, a result of shipboard scientists feeling that ODP-TAMU would not be responsive to their input. In addition, the panel consensus was that it needed access to raw (uncensored) text of issues within the SCIMP mandate. Perhaps one way to overcome confidentiality issue would be to provide a checkbox on the form that would tell the scientists the form would go directly to SCIMP. This type of action would eliminate ODP-TAMU's concerns over confidentiality as well as the need for ODP to assign personnel to deal with culling the form for SCIMP specific items.

It is important that ODP-TAMU and SCIMP reinstate some type of response to all people who give comments. The current prevailing perception among those who sail is little or nothing happens as a result of their comments. This perception must be changed to improve the PLO response rate.

> ACTION ITEM: *Tom Janecek and Jay Miller will discuss revisions to the form so that the PLOs can provide the information that SCIMP needs on a timely basis. SCIMP members will also consider several web-based forms for people to access post-cruise (even months to years after they sail).*

L) New Member Recommendations

Two US SCIMP members (Brian Huber and Arthur Cheng) are rotating off the panel after this meeting. A third member (Chris MacLeod -UK) may rotate off this meeting depending upon the designation of a replacement by the UK.

With these rotations, SCIMP will be losing expertise in Paleontology (Huber), Downhole tools and Industry (Cheng) and Hard Rock (MacLeod). In addition, Alex Isern has resigned from SCIMP (she has taken on a new job in the United States) and, at the time of this report was written, SCIMP is without a PacRim representative. With Alex Isern's resignation, SCIMP lost expertise in Physical Properties.

Huber's and MacLeod's rotation will leave the panel without any expertise in the areas of Paleontology and Hard-Rock. Adding expertise in these two disciplines is the highest priority for SCIMP.

The panel members suggested several names as potential replacements. Jeff Alt and Bob Duncan were suggested as possibilities for adding hard-rock expertise while Bill Chaisson and Ken MacLeod were suggested as paleontology replacements. Potential industry representatives include Anders Solheimn, Dan Georgi, and Dave Johnston.

M) Future Meeting Date and Place

Two possible meeting places and dates were proposed. The first proposal was to meet in Australia in January during the port call between Legs 187 and 188 (January 9th-14th, 2000). Many members have not seen the ship recently (and some not at all). With the ship recently out of dry-dock the normal January meeting date would provide a timely opportunity for SCIMP members to spend time in the labs and meet with the technical staff.

An alternate proposal was for the panel to meet in Houston with the opportunity to tour a Conoco riser ship currently operating in the Gulf of Mexico. Alan Huffman will investigate this possibility.

One of the two proposals will be decided upon via email within a few weeks post-meeting

N) Acknowledgements

Two SCIMP members rotate off the panel after this meeting, Brian Huber and Arthur Cheng. Both members have served the JOIDES advisory structure for many years and we wish to heartily thank them for their time and effort in steering the Ocean Drilling Program along its way. In addition, Chris MacLeod will rotate sometime within the next year (However, the Chair will not let him rotate off the panel until he can properly spell Chris's last name two times in a row).

Finally, the panel wishes to thank Dave Anderson for hosting the meeting. We greatly enjoyed a sun-soaked, early evening get-together on the deck of new NGDC building (which afforded a spectacular view of the mountains) and a very tasty dinner at Dave's house (Many thanks to Dave's wife for putting up with us!! --- Watch out Dave....we will be back!!!).

O) Appendices

APPENDIX 99-2-1: ODP-TAMU SCIENCE OPERATOR'S REPORT

Executive summary

Action on recommendations from January 1999 SCIMP meeting
Many recommendations from the January 1999 SCIMP meeting have resulted in action by ODP/TAMU. These include but are not limited to, a continuing reconnaissance of training requirements and utility related to the new PAL application development; new policies adopted by JOI and ODP/TAMU regarding postcruise publications; acquisition of a shipboard ICP facility; and action on rig instrumentation and data availability to scientists.

Operations Schedule
A revise operations schedule was released on June 3, 1999. The major changes to the previous schedule are days of operation revisions, revision of estimates for dry dock, and interchanging the last two legs (Manus Basin and Ontong Java) resulting in several days saved in transit.

Leg reports
Legs 183, 184 and 185 have been completed since our last meeting. Leg 183 addressed the formation and evolution of large igneous provinces (LIPs). Leg 184 investigated the Cenozoic depositional history of the South China Sea and the evolution and variability of the East Asian monsoon. Leg 185 sampled the oldest ocean crust ever recovered by deepening Hole 801C to nearly 470 m into basement. A second site drilled provides a section through the upper part of a subducting slab as part of a geochemical mass balance experiment, while drilling induced contamination testing and microbiological sampling was conducted at both sites.

Science Services Update
Highlights include acquisition of an inductively couple plasma spectrometer for major and trace element analysis of pore waters, sediments, and hard rocks. Chemistry LWG recommends immediate implementation of SMP recommendation to reduce use of CNHS to CN only configuration and waiting on community reaction to replacement of existing XRD facility with a table top model. The Underway Geophysics LWG recommends retiring the non-operational multi-channel streamers because we have not had an apparently will not have the time and resources to troubleshoot, maintain, and operate these streamers. This LWG also recommends retiring the 200 cm3 seismic source gun in favor of a GI gun at the earliest opportunity.

Information Services Update
IS has a new Manager, David Becker. David has organized a committee to review existing JANUS applications and devise a prioritization for new developments. We are soliciting volunteers from SCIMP to participate in the committee.

Publication Services Update
Publication Services Department completed the new format for the Initial Reports volume booklet and CD product and designed an HTML format for the Web. In March 1999, the new integrated "ODP Sample Distribution, Data Distribution, and Publications Policy" was released by JOI. The Program now has one central URL. In May 1999, ODP/TAMU and the Texas A&M Sterling Evans Libraries submitted a proposal for the NSF Digital Libraries Initiative. The objectives of the proposal are to develop the first phase of a digital library of geoscience journals and databases.

Drilling Services Update
The contract for dry dock has been awarded to Keppel Shipyard in Singapore. A vendor has been selected for active heave compensation installation. Sea trials of the advanced diamond core barrel are scheduled for Leg 186E immediately following dry dock. Hard rock reentry system development continues with a target of summer 2000 for the next phase of sea trials.

Action on recommendations from January 1999 SCIMP meeting

SCIMP RECOMMENDATION 99-1-7: SCIMP recommends that ODP-TAMU continue to provide training for the PAL JANUS application to paleontologists prior to sailing on the leg. This training should continue until it can be demonstrated by ODP-TAMU that the paleontologists can easily learn the program on the ship during portcall or transit to the first site.

The MRC meeting was held in Washington D.C. last month where John Firth demonstrated the PAL program to Brian Huber and the other MRC curators (all paleontologists) with a positive response. One question was "When can I get a copy of this to use at home?" (Answer: it works on Personal Oracle, which an individual can purchase for ~$500, but they could not expect ODP to provide tech support to maintain their own Oracle database - they would have to go to Oracle for that).

PAL progress:
Leg 183- Woody Wise didn't use PAL at all and he didn't give any postcruise evaluation comments on it. Helen Coxall did use PAL some at the end of the leg and seemed to be O.K with it, but despite queries from the Curator, she has not sent any feedback. Brian Huber is trying to contact her directly.

Leg 184- Did not have the latest version of PAL because the upgrade did not make it in time for the portcall. John Firth trained Stephen Nathan on PAL and Janus before the leg and he trained others. Confusion at the beginning of leg resulted from inconsistencies in the electronic version and the user manual. This was sorted out during the transit. Nathan provided detailed comments based on the experience of the entire shipboard paleo group, which will be considered during revision.

Leg 185 - The version of PAL sent out for Leg 185 has ALL taxa, datum, zone, and geologic age dictionaries working, and also has a sample detail screen. John Firth trained Francesca Lozar for Leg 185 and she used it on board. They only got 130 m of sediment with nannos at their second site, and they are still working on data input. She sent a short note that said it works well, but would send more detailed comments when she is finished with her shipboard work. As of the time of completion of this report, there has been no further update.

Leg 186 - Will have same version as 185, although there is a programmer sailing on Leg 185 who has been working on adding the datum depths utility to PAL. John Firth trained Jingfen Li on PAL, and showed her how to use the datum depths, age model, and depth utilities in Janus.

The age model utility we plan to make independent of PAL, and make it graphic; probably a Java program that anyone on board can use, since not just paleontologists determine the age models. John Firth is going to be working with IS to try to prioritize it to have it done during the (paleo) hiatus between Legs 186 and 188. At the MRC meeting Dave Lazarus showed an age depth and age model utility he wrote for the Mac several years ago. It is free for anyone to use and he said we could use it as a model to create the new Age Model Utility. It includes a graphic age depth plot of datums, plus an interactive line of correlation that can be modified by the user and automatically saves the tie points to define the age/depth model. ODP/TAMU will evaluate Dave's program as a model for developing the new age model utility.

PAL progress is steady but not as fast as hoped for. We suspect, however, that by Leg 188 we will be independent of the old JANUS Paleo program. Training will continue at least through Leg 189, until the new age model utility is fully functional and tested on the JOIDES Resolution.

SCIMP RECOMMENDATION 99-1-9: SCIMP recommends that Michael Knappertbush take over as lead curator of the Micropaleontological Research Centers.

DONE

SCIMP RECOMMENDATION 99-1-10:SCIMP recommends that ODP-TAMU reiterate that it is the responsibility of the co-chief scientists to write or coordinate a leg synthesis paper for the SR booklet and CD-ROM as required by the co-chief agreement. The summary paper should provide an overview of the primary results of the leg. This recommendation does not preclude the submission of a separate synthesis to the outside literature, but should include, as minimum, a discussion of the results from various aspects of the leg based upon post-cruise science.
DONE

SCIMP RECOMMENDATION 99-1-14: SCIMP recommends to ODP-TAMU that drilling parameters, including mud flow rate, torque, weight on bit and penetration rate be recorded and made available, in digital form, to the scientific party during the leg.
Investigation of rig instrumentation systems as part of drydock upgrade is underway.

SCIMP RECOMMENDATION 99-1-15: SCIMP recommends that TAMU develop and maintain a catalogue the existence and characteristics of legacy holes and other holes potentially capable of being re-entered or equipped with instrumentation packages. This catalogue should be readily accessible by the scientific and engineering community.
Link from ODP webpage to report from Long-term observatories PPG which has a compiled list of legacy holes. DSD is working to keep this table updated.

SCIMP RECOMMENDATION 99-1-16: SCIMP recommends that the van recently acquired by ODP-TAMU be equipped for Leg 185 deep biosphere studies to as full an extent as financially and logistically possible in consultation with the Deep Biosphere PPG, Leg 185 scientists, SCIMP, and other interested parties.
DONE

SCIMP RECOMMENDATION 99-1-17: SCIMP recommends that ODP-TAMU continue its working arrangements with the HYACE consortium for the development of a pressurized core retrieval system, while continuing with modifications of the extant PCS system. SCIMP acknowledges the essential importance of such systems for the Gas Hydrate and Deep Biosphere research programs. **See HYACE report,** pg. 30

SCIMP RECOMMENDATION 99-1-18: SCIMP recommends that ODP-TAMU continue efforts towards finalizing the DVTP as a mature tool according to the Third Party Tool guidelines.
See report in Downhole measurements section of Science Services update, pg. 11

SCIMP RECOMMENDATION 99-1-19: SCIMP recommends that ODP-TAMU continue to maintain and develop the capacity to acquire simultaneous in-situ temperature data and interstitial water samples.
See report in Downhole measurements section of Science Services update, pg. 11

SCIMP RECOMMENDATION 99-1-20: In the context of current staffing levels SCIMP recommends that ODP-TAMU re-structure its shipboard technical staff to include shipboard database administrator above and beyond the current computer/IS staff. In addition, TAMU should have a flexible system to deal with leg specific technician needs (i.e., a seismic/log coordinator).

Agenda item for presentation/discussion at June 1999 meeting.

Operations schedule

Leg	Port (origin*)† and dates*	Total days (port/sea)	Days at sea (transit/on site)	TAMU contact
185	Izu-Mariana 13 April - 15 June '99	Hong Kong	63 (5/58)	14/44	C. Escutia
186	W. Pacific Net 15 June - 15 Aug.	Yokohama	61 (5/56)	2/54	G. Acton
Transit (Yokohama-Dry dock)	15-29 Aug.	Yokohama	14 (3/11)	11/0	B. Julson
Dry Dock/sea trials 29 Aug. - 18 Oct.		Singapore	50 (40/10)	10/0	B. Jonasson
186E	Engineering 18 Oct. - 11 Nov.	Jakarta	24 (1/23)	10/13	L. Holloway
187	Australia-Antarctic Discordance 11 Nov. - 9 Jan. '00	Fremantle	59 (5/54)	15/39	J. Miller
188	Prydz Bay 9 Jan. - 9 March	Fremantle	60 (5/55)	22/33	C. Richter
189	Southern Gateways 9 March - 10 May	Hobart	62 /(4/58)	11/47	M. Malone
Transit (Townsville-Guam)	10-21 May	Townsville	11 (3/8)	8/0	. Julson
190	Nankai 21 May - 14 July	Guam	54 (1/53)	7/46	A. Klaus
191	W. Pacific Ion/	Yokohama	57 (5/52)	16/36	C. Escutia/
Engineering	14 July - 9 Sept.				L. Holloway
192	Ontong Java 9 Sept. - 7 Nov.	Majuro	59 (5/54)	14/40	P. Wallace
193	Manus Basin 7 Nov. - 5 Jan. '01‡	Guam	59 (5/54)	9/45	J. Miller

Notes
† Although 5 day port calls are generally scheduled, the ship sails when ready.
‡ Leg 193 is tentatively scheduled to end (and Leg 194 to begin) in Suva.

* ODL crew change occurs on day one except as follows: Dry dock crew change occurs 23 September; Leg 190 crew change occurs 11 May

Leg reports

Leg 183 Kerguelen Plateau

During Leg 183, igneous basement rock and sediment cores were obtained from five sites on the Kerguelen Plateau, one of the type examples of a large igneous province (LIP), and two on Broken Ridge. Based on the recovery of basalt, other igneous rocks, and interbedded and overlying sediment, Leg 183 scientists concluded that the age of the uppermost crust forming this LIP decreases from south to north, from ~110 Ma in the southern Kerguelen Plateau to ~35 Ma in the northern Plateau. The growth rate of the LIP at five of seven basement sites was sufficient to form a subaerial landmass. This was most spectacularly revealed at central Kerguelen Plateau Site 1138 by wood fragments in a dark brown sediment overlying the subaerially erupted lava flows, a result consistent with the charcoal and wood fragments in sediments overlying igneous rocks found previously at Site 750 to the south. The terminal stage of volcanism forming the LIP included explosive eruptions of volatile-rich felsic magmas formed from cooling basaltic magmas that were trapped within the crust when the flux of basaltic magma from the mantle decreased. Previous geochemical studies of basalt from the southern Kerguelen Plateau and eastern Broken Ridge had identified a component derived from continental crust. At Site 1137 on Elan Bank, ~26 m of a braided river conglomerate was intercalated with basaltic flows; the clasts in this conglomerate show the wide range of rock types that were subaerially exposed on Elan Bank. Most notable are clasts of garnet-biotite gneiss, a rock type that is characteristic of continental crust, thereby showing that a continental fragment is present in this oceanic environment.

Leg 184 South China Sea

The broad scientific themes of Leg 184 were (1) to document the Cenozoic history of the South China Sea (SCS), including its biostratigraphy, lithostratigraphy, chronology, paleoclimatology, and paleoceanography; (2) to reconstruct the evolution and variability of the East Asian monsoon during the late Cenozoic on millennial, orbital and tectonic time scales; and (3) to identify and better understand the links between tectonic uplift, erosion and weathering, hemipelagic deposition, and climate change, including the evolution of the Asian Monsoon and the Neogene global cooling. Leg 184 cored 17 holes at Sites 1143-1148 in the SCS and recovered 5463 m of sediment, meeting the mission objectives beyond expectations. At all sites the hemipelagic deposits are rich in calcareous microfossils and yield almost continuous records of the environmental history of the South China Sea during the last 30 Ma. The depositional history of the late Cenozoic of the northern slope of the SCS had three important stages: the Oligocene with extremely high sedimentation rates, the Miocene and early Pliocene with low sedimentation rate and high carbonate content, and the last 3 myr with high clastic sediment accumulation rates. A different trend of depositional history is indicated at the southern Site 1143: the carbonate accumulation decreases from the late Miocene towards the late Pleistocene, and the non-carbonate rises again after 3 Ma. However, the late Miocene sediments were similar in composition between the northern and southern sites, containing over 50% of carbonate. A general increase of non- carbonate sediment accumulation after 2-3 Ma was found at all drill sites, and for the northern sites the increase becomes even more significant in the later part of the last million years. Excellent orbital-scale cyclicity is displayed in color reflectance, natural gamma radiation, magnetic susceptibility, and bulk density, particularly for the Plio-Pleistocene intervals.

Leg 185 Izu-Mariana Margin

Leg 185 deepened Hole 801C, located in Jurassic crust of the Pigafetta Basin in the western Pacific Ocean, where previous drilling during Leg 129 cored 462 m of sediment and 129 m of basement, by an additional 340 m, to a total depth in basement of 469 m. The primary objective was to penetrate the upper oxidative alteration zone of the igneous crust, to determine the chemical fluxes into the Marianas subduction zone. Other important objectives included testing the origins of the Jurassic quiet zone, carrying out drilling/core handling contaminant tests to pave the way for deep biosphere studies and defining the architecture of Layer 2 in fast spreading crust. Recovery was good (47%), and a complete suite of ODP downhole logs was run to 850 mbsf. The hole was left in good condition for future deep penetration. The igneous sequence between 530 and 890 mbsf is tholeiitic and extrusive in character. The tholeiites are all N-MORB, and although it is highly altered, capping tholeiite is very primitive, with abundant chrome spinel and up to 10% MgO. Fresh basaltic glass was recovered in over 20 cores, which represent the oldest volcanic glass in the oceans. Frequent sediment intervals were recovered in the upper volcanic section and the presence of low-temperature hydrothermal units was documented. The basement of Hole 801C shows up to six magnetic polarity intervals. The measurements show a gradual change in the magnetic field direction from one polarity interval to the other; numerous flows between those of opposite polarities display zero inclination values. These results indicate that the cored lavas were erupted in a period of rapid polarity fluctuations of the Earth's magnetic field. The existence of numerous flows with opposite polarities of magnetization thus cancel each others' signatures, resulting in an apparent absence of magnetic anomalies above Jurassic oceanic crust. Water, sediment and rock samples were collected for microbiology studies. Additionally two types of tracers were used to determine the level of contamination of samples recovered by drilling, microspheres and chemical tracers. These tests indicate that while the outside of the core is bathed in fluid and potentially contaminated, the inside of the cores showed little or no evidence of contamination. The second half of Leg 185 was dedicated to sampling a section into basement in the Nadeshda Basin, a ~ 1000 x 1000 km region seaward of the Izu-Bonin trench. In contrast to the East Mariana and Pigafetta Basin sediments subducting at the Marianas trench, the Nadeshda Basin sediments subducting at the Izu-Bonin trench lack a mid-Cretaceous volcaniclastic section, and contain more siliceous and carbonate-rich biogenic material due to its longer passage beneath zones of high biological productivity. The ~410 m sediment section consists of volcanic ash and diatom-bearing clay; dark brown pelagic clay; radiolarian chert, porcellanite and zeolite- bearing clay; and radiolarian chert and siliceous nannofossil chalk and marl. Preliminary age assignment of nannofossils assemblages below ~282 mbsf is early Barremian to late Valanginian at the contact between sediment and basement, consistent with the assigned M11 seafloor magnetic anomaly (~ 131 Ma). Basement rocks consist of pillows and thin flows, which are highly altered and preserve a pervasive dusky-red to light-gray alteration, with extensive vein-associated dark-green halos. Despite the difficult hole conditions and some missing intervals in the shallower units, the logging data recorded below ~170 mbsf provide an important complement to the poor recovery in the interbedded cherts and chalks. Results from tracer tests at Site 1149, combined with those from Hole 801C, indicate that the interior of the APC cores are free of contamination whereas RCB cores in sediment and basement were contaminated by penetration of the chemical tracer into the core's interior.

Science Services update

Chemistry

ICP status
Thanks to the dedicated effort of several folks (including even some who were at sea during most of the process) it appears as if the ICP will be available for Leg 187. We will also use this opportunity to put the unit through enough tests to determine the long-term functionality of this facility. There is still some risk associated with this project, but that risk is only in the event of catastrophic failure (in other words for some physical reason the ICP will not function in our environment). All previous mitigating factors that have been identified have been addressed, and we are at a point where the only option now is to field test the equipment. The timetable for this processes is outlined below.

Mid-June 1999- Funds have been located for purchase of an ICP. This purchase includes spare parts, shipping, training, and vibration dampening equipment.

July-August 1999- ODP/TAMU Leg 187 technical staff attend training at Rick Murray's facility at Boston U., followed by training at vendor's facility in New Jersey.

Early September 1999- Delivery of instrument to ODP/TAMU for on-site training. Minimum 8 weeks on delivery due to shipment from France, and extended summer holidays at manufacturer.

September 1999- Set up and additional training at ODP/TAMU.

Early November 1999- Instrument and support equipment packed by vendor representative for airfreight to Leg 187 portcall.

November 11-15, 1999-Portcall installation of ICP on JR

November 15, 1999 - January 9, 2000- Field trials during Leg 187.

Drydock projects

As with nearly all suggested upgrades, the budget for replacing cabinets in the chemlab has been denied. The LWG notes that this may now be, and could certainly become a safety concern in the future as cabinets continue to degrade. Counter tops are showing signs of extensive wear (black color rubs off onto cleaning rags) and many cabinet doors are broken. The budget for replacing the hood(s) was approved, but the original vendor is out of business. We may try a vertical door to minimize the current noise problem.

Equipment status

All new GCs and ECD are installed and operating.

Alkalinity: Software development for Titrinos is underway.

CNHS: SMP recommended a couple of years ago that we discontinue regular operation of sulfur analysis using CHNS due to unreliable data, long combustion times, and expense of column configuration. The recommendation was to only install S capability when requested for a specific leg. We purchased the reconfiguration hardware, but every leg since then has found a reason to request S analysis, until they see the quality of the data and how long it takes to acquire, then it pretty much goes out the window. The upshot is, the data are pretty much useless, this is not an ephemeral property, and the time, effort, and expense related to performing these analyses are, in the judgement of our personnel, unjustified. LWG would like to discontinue S analyses with this apparatus and rig it for CN analyses only.

Coulometer: An auto sampler has finally been developed. Cost ($17,500) and space considerations make acquisition an unlikely proposition.

RockEval: There has been intermittent interest in science parties in replacing our unit with the new version, but the cost is in excess of $100K. The LWG is looking into acquisition of a gently used unit from a oil company that has closed their laboratory facilities.

GHM: No space in the chemistry laboratory to set up permanently anymore. If request is made for GHM, one of the GCs has to be taken down which is impractical. Humble Instruments makes a solid sample inlet system for GC and GC/MS for thermal extraction and pyrolysis known as TEPI. This attaches to the inlet of a HP 6890 and performs many of the functions of the RE/GHM. LWG is checking cost.

XRD: Still waiting on response via SCIMP as to replacement possibility.

GC: Dionex makes an automated extraction instrument to speed up, standardize and automate the extraction of samples to be used with GC#3. The instrument is the ASE (Accelerated Solvent Extractor). We should gauge level of interest.

A modification of the coulometer data output program has been requested from IS. We also have requested software to upload Carb and IW spreadsheet from Excel format to Janus. There are still glitches in Labview C1/C2 plotting program which have been reported to IS.

Core description

At the last SCIMP meeting, a proposal for reconfiguring the core lab to improve core flow and lab safety was presented to the panel. This plan was the result of input from our primary users, both scientists and technicians. The model was improved by the discussion at SCIMP as well. With the decision to allocate the majority of our resources to adding a level to the lab stack, no major renovation is possible at this time. A more moderate revision, which has the support of our technical and science staff and that is possible within our budget is planned a this time.

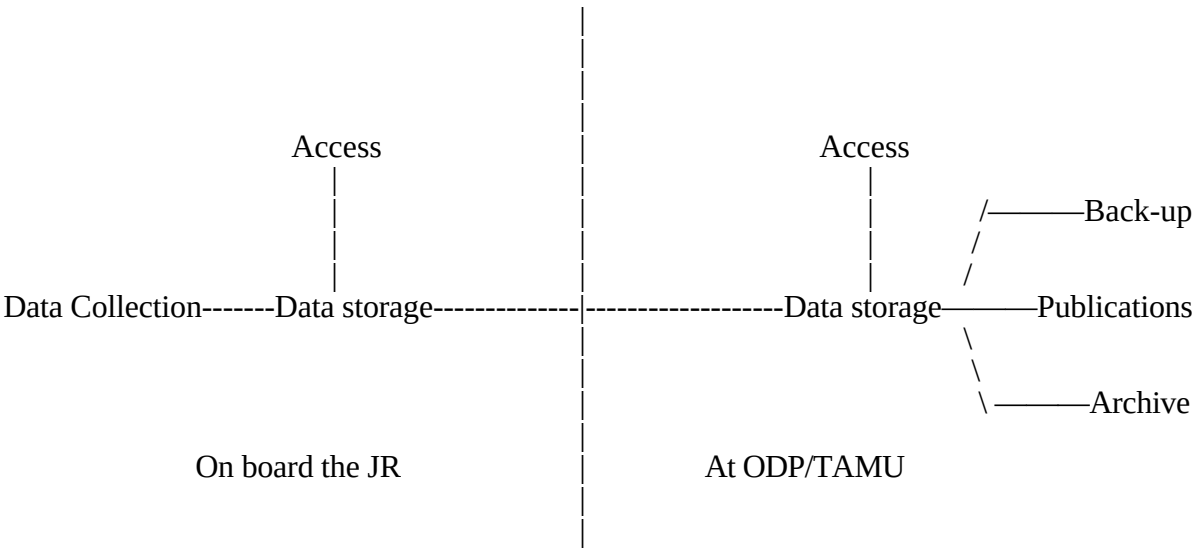
As a result of the SCIMP agenda item regarding digital photography on the JR, a subgroup of interested parties at ODP/TAMU met to discuss our current status and to look at how we might proceed in the future. First, Kate's message makes it clear that we will move to providing digital images of core and that we do not have a strategic plan to do so.

Some fundamental questions that need to be answered before developing this plan are:
What is a permanent archive for images? When we went through the agonizing process of changing from printed volumes to electronic volumes, we accepted the premise that no electronic media is acceptable as a permanent archive, so in effect no permanent archive exists for IR volumes after Leg 175, or SR volumes after Leg 169.

Are we willing to accept the same premise for core photography? In some ways we already have in that all hard rock photomicroscopy done on board now is digital.

How does a change to digital image capture free up personnel and space? The only thing that will change in the tasks required of the photographer is the relatively small amount of time they spend processing film and printing images. This will easily be overwhelmed by new tasks associated with digital image capture. I see no personnel savings at all in any scenario. A small amount of space will be freed up, but the photo lab space is not in a location conducive to alleviating core handling problems (another underutilized space like the second look lab). Even if we can free up the space occupied by the core photo table, without a major renovation of the core lab, this space is pretty useful as it is (a place to lay out cores, maps, etc.) The upshot is I don't think we can't sell this as a personnel or space saving move.

What are some of the real costs associated with complete digital capture?
Beyond replacing existing capture hardware, and even accepting the dropping cost of hard disc space, and even with high speed transfer there is concern with storage (upwards of 150G/cruise), back up of this much data during and at the end of a cruise, transfer of this much data to the shore, network access to this volume of data on the ship, and providing access to data after the cruise.



These prime data issues need to be developed as well:

If the digital images are made available via Janus Web and the Data Librarian, is it necessary to continue to provide these images as part of the Initial Reports volume?

If so what should the format be?
Is it necessary to provide a VCD in the IR ?

Is it necessary to put smear-slide and thin-section tables in the IR?

An example from Leg 185:
The AMST digital camera has been operating in the two sites drilled during Leg 185. The first site cored 339.30 m and recovered 160.42 m of basement rocks (average recovery 47%). The files originated from the digital imaging at this site only are about 1.5GB. To date, Site 1149 has cored a 446 m thick sedimentary sequence, from which we have recovered 202 m (about 51% recovery), and we expect to core about 100-150 m of sediment and basement before the end of the leg. In sum, the digital pictures from the cores recovered during Leg 185 will take about 4GB of space (seven CDs to save the image files from less than 500 m of recovery). The problem we face now is how to handle the digital images data to the Leg 185 scientists. This is the first leg these images are taken of all cores and they have already become indispensable for the scientists. At present, we do not have enough CD-ROMS for everyone and even more critical we do not have the time available for scientists to burn images to the CDs. We could compress the images and provide a smaller set (a not a trivial time investment) but the general feeling is any lossy compression is less than acceptable.

Downhole measurements

ADARA APC and WSTP tools

ADARA-WSTP data loggers bench tested and paid for. Tools sent to ship for Leg 185. Installation problems being worked through by shipboard staff . Status update and remaining issues necessary to resolve for full implementation are forthcoming.
ADARA-APC tool data loggers: We have requested (1) cost and time estimate for repair of remaining 3 tools at ADARA and (2) timeframe by which all documentation, schematics, and software source to be copied and sent to us.

DVTP

Earl Davis has provided Autocad drawings and software source code for DVTP. ODP DSD is making sure the CAD drawings are complete (an assembly drawing will need to be made) and SS is reviewing software source code provided to ensure we have all software required. Earl is trying to prepare DVTP with pressure capability for testing on Leg 186 but is uncertain if he can be ready in time (due to rush, this tool will likely have pressure only capability at this time). He will be supplying two pressure cases with the new dimensions. AutoCad drawings will need to updated for modifications to implement pressure.

TPC methane tool

ODP DSD met with proponents to determine project plan and division of responsibilities.
Proponents are preparing an updated proposal for submission to NSF-ODP. Proponents will be responsible for sensor development and ODP-TAMU will provide data acquisition system (DAS) and packaging. Proponents will not likely start work on this until Sep 99 which coincides with schedule for DAS development. Target of 1 Jan 2001 for initial deployment.

DAS standardization

Sensor board is nearly complete. After 185 portcall principals will meet to discuss data logger configuration, sensors, specifications and capabilities and report to the group regarding meeting results/conclusions.

FY99 Projects in progress

Rig Instrumentation System (RIS) and BHA Sensor Sub: Vendor presentations were help at ODP/TAMU and RFP's being prepared in June. We are working toward having all RIS data streams imported to JANUS for integration with other data. This part of the project will require careful planning with input from DSD, IS, and SS. Once a RIS vendor/system is chosen, then representatives from these departments will need to meet to plan for integration of RIS data into Janus.

Microbiology

To provide additional temporary laboratory space for deep biosphere studies, a 6 m by 3 m portable van was purchased in Australia and installed on the ship during the Fremantle port call (Feb. 11-15). It is placed on top of the lab stack, in front of the downhole lab. During Leg 184, lighting and air-conditioning were installed. Plans to effect temporary hook-ups for electrical power and plumbing were changed to allow more permanent installation, although this resulted in considerably more effort than had originally been planned. Installation and testing of equipment took place during the transit at the beginning of Leg 185. Major equipment items include a large, anaerobic chamber for subsampling cores, a clean laminar flow hood, two incubators, a small refrigerator, and an autoclave. A -80 degree freezer for sample storage is located elsewhere in the ship. Reports from the Leg 185 microbiologists indicate that they are well pleased with their new facility.

Paleomagnetics

Shipboard laboratory

Status of the paleomag database and queries currently available in JANUS are the primary areas of LWG discussion. A programmer sailed on Leg 185, and as time is available they will produce new query options. The LWG identified a query to remove discrete sample data in a 'z-plot' format and a query which will identify and remove the leader/trailer data and the top and bottom 5 cm of each section as the top priority developments for the paleomag lab.

Shorebased laboratory

The status of the shorebased cryogenic magnetometer is still not operational. Our LWG is focussing its discussions on what is needed to get it back online as a valuable measurement tool for both the scientists here at ODP (they are the ones paying for support for this instrument) and the scientific community at large. Bringing the magnetometer back online without any plans to install AF coils was considered by all to be rather pointless endeavor. New AF coils would allow degaussing to be carried out at fields up to 80 mT. Currently the coils cannot exceed 20 mT, which is not enough to remove the drill string overprint. Aside from new AF coils the possibility of installing an ARM coil has been discussed. This would be extremely useful in both ODP studies and as a means to lure outside research money to help maintain the lab.We are waiting on an estimate from 2G for the purchase/installation of new AF / ARM coils. The final decision concerning upgrading and bringing the cryo back online will be made closer to the end of the fiscal year, when issues concerning project funding can be more clearly addressed.

Paleontology

See response to SCIMP RECOMMENDATION 99-1-7, pg. 3.

Physical properties

One of the core lab modifications that we hope will take place during dry dock is relocating the whole core multisensor track to the center of the core lab. This is one of the minor renovations we can probably accomplish to relieve some of the congestion in the core lab. Migration of control to PC/NT platform is virtually complete and will be tested at sea on Leg 186. One new innovation to programming will be quality control in the form of audible warnings when high or low threshold values are returned.

Software modifications to the archive half multisensor track are underway and a high priority for this LWG. Algorithms for X, Y, Z and L*, a*, b* calculations are being tested by the database group. Control for this track will migrate to PC/NT after dry dock.

The working half multisensor track (the modified Geotek track) is still undergoing modification but is a lower priority than other projects and is, therefore, effectively on hold.

We are waiting a bid from Teka for another therm con unit. The LWG needs to detail specifications for the user interface data model and upload criteria before an RFP can be issued. We also expect to relocate the therm con station during dry dock to coordinate with other track relocation.

Underway geophysics

Seismic Streamers:

Despite several years of attempting to implement our two ITI 6-channel streamers, we remain unable to dependably obtain seismic data with these streamers. When they have worked, the data is not appreciably better than that collected from our single-channel Teledyne streamers. Each of the streamers has been returned to the vendor for repair several times and yet problems still remain. The only major problems we have had with the multichannel system have been exclusively with the ITI streamers. We feel that the sorting out remaining problems will take more ship time than warranted- especially considering that the quality and dependability of the single channel data.

Recommendation: Abandon efforts to implement ITI 6- channel streamers and remove from the ship. Ensure availability of properly maintained and refurbished Teledyne single channel streamers for seismic surveys. Continue to rotate the three streamers for shore based refurbishment (at least 1/yr).

Actions: Contact ITI to determine what if anything can be salvaged.

Evaluate logistics/establish plan for rotating the three Teledyne streamers for repair, and refurbishing.

Evaluate potential multichannel systems available in industry and science community. Get information from Teledyne about multichannel configuration if necessary.

Seismic sources:
We have three SSI S-80 and two HAMCO 200 cu.in. water guns for seismic surveys. One of S-80 gun bodies and piston is worn out. The replacement cost will be over $15,000. The HAMCO 200 guns have not been used for quite a long time, are harder to maintain than the other guns; it is difficult to maintain a high maintenance skill level on the gun. There is little difference in data quality generated by the 80 and 200 cu. in. guns. The JOIDES advisory structure and the scientists on recent legs have been requesting and/or bringing their own GI-guns. GI-guns have already been used successfully on the J/R for both seismic surveys and VSP's. A new GI-gun is ~$30k.

Recommendation: We initially propose to purchase one (1) GI-gun. For the near term, we'll continue maintain the S-80 guns on the ship. However, eventually we'd like to replace the S-80 guns with a total of 2 or 3 GI guns.

Recommendation: We propose to remove the HAMCO 200 guns from the ship.

Actions: Get information for GI guns including size, cost, firing circuit, pressures, etc. Assemble all information for review at future meeting.

Assess effectiveness of GI gun compared to S-80 and 200 cc guns.

Contact with SSI about possibility of a trade in of a working S-80s toward purchase of GI gun.

Results of sandblaster trials on Leg 185

Scientific participants from Leg 185 requested we consider purchase of a sandblaster to clean geochemical samples during the leg. The reasoning behind the request can be reduced to a few key issues, but these basically are 1) better than our current method of lapping on a diamond wheel in terms of accuracy and precision of analysis; 2) faster than our current method; 3) cheap; 4) easy; 5) compatible with shipboard environment. In the observations of our technical staff, the test failed on counts 2-5, and the most important, point 1, was never demonstrated or even really tested. Use of the sandblaster was abandoned partway through the leg, and our Chemistry LWG recommends we do not make this a permanent addition to the shipboard facility. Likewise the ceramic powdering vessels, as our tests here on the beach demonstrated, the ceramic vials could not produce a fine enough powder, even with long grinding intervals, and the powder volume was insufficient for shipboard analyses. We may want to revisit this issue, however, for ICP analyses where volume (if not powder grainsize or sample volume to ensure homogenization) may not be an issue, and we may be able to avoid the contamination of WC crushing vessels.

Information Services update

Personnel

We have hired a new Manager of Information Services, David Becker.

Janus applications

JANUS applications are now fully maintained and enhanced by the IS Applications Development Group at ODP. A number of enhancements were made over the past six months including the "Sediment Thin Sections and Smear Slides," which is in use on the ship today, and various cruise related data (Cruise Evaluation, Site names, Close-up Photographs) were added. Tracor's original data model was modified by IS by adding new hard rock attributes, making it more robust (Sample Request), improving data uploads, and adding Natural Gamma for data migration purposes. Now that the applications have been tried over many legs, ODP has initiated a review of all JANUS applications to evaluate their state of use, to determine the need for enhancements, and to plot a course for continued support of JANUS over the next few years. While we view JANUS as a successful implementation of relational database technology, it is rough around the edges. Feedback from users and our own internal reviews indicate that there are a number of areas where refinements are needed, for instance, various data upload programs should be stabilized, additional predefined report queries need to be developed, simpler web-based report writers should be included, and training and documentation need improvement.

A special standing committee has been formed by the new Manager of IS to review existing JANUS applications and prioritize JANUS application development. Volunteers are requested from SCIMP to serve as advisors on this committee.

Programmers at sea

In an effort to improve the use of JANUS by leg scientists and based on a SCIMP recommendation, ODP is evaluating the need to have a database programmer sail on each leg. This will give firsthand experience to IS personnel in a production environment. There appears to be great support from the research community for this effort.

Database maintenance

Regarding ongoing database maintenance, significant progress has been made in processing data which has allowed ODP IS staff to upload data from the ship to the main database within two to four weeks of its receipt. This means that science customers get up-to-date data for the latest leg soon after their return and many months before the first post cruise meeting. During the review period, many new data sets have been added to JANUS in addition to those for new cruises: all data from Legs 171-184, core and sample data from Legs 101-184, DSDP core data from Legs 1 96, and core photographs from Legs 163-175.

Data migration

With the commitment of a position in Database Services to handle data migration, advancement in migrating MST data has resulted. More than 20 different formats in the MST data were recognized from Legs 101-170. IS staff has completed the migration of the first group of MST data (Sites

1037 and 1038 of Leg 169 and all of Leg 170). The Database Services Group expects to complete the migration of all MST data by the end of January 2000.

Visual Core Description Package

The Visual Core Description (VCD) data upload program, which was developed by Tracor, has been completed and is currently being maintained by the IS Applications Development Group. During the review period, this AppleCore application was essentially finished. However, a number of problems were identified during Leg 184 when the program was used by sedimentologists. A review of the critiques revealed a weakness in the BOL/EOL procedures followed during port call. The Applications Development Group is changing those procedures to ensure that the appropriate tables are loaded into the application and that certain tables are protected from accidental loss.

AppleCore

The hard rock version of AppleCore was installed on the JOIDES Resolution in a "beta environment" and reviewed by scientists during transit on Leg 185. The users have found this version difficult to adapt to, but their review has been very instructive in identifying where improvements have to be made. Based on their review, a number of good suggestions were passed to the Applications Development Group who will review these comments with the developer and will incorporate the suggestions where needed. While there is no doubt that much work remains on AppleCore for both sedimentary and hard rock uses, the application is viable and needed to make JANUS a fully integrated data system. Over the next few months, IS will continue its work to make AppleCore a successful system. Part of that success will be based on providing scientists with appropriate training and documentation which will allow a full test of both versions of AppleCore.

Drilling Services update

Technology development

The Program has undertaken an integrated technology development strategy focused on better recovery of core under a range of challenging environmental conditions. The acquisition of an Active Heave Compensation system forms the foundation of this strategy and will improve ODP's operational capabilities. The development of the Hard Rock Reentry System and the Advanced Diamond Core Project are initiatives that will allow us to make hole and/or recover core in hard rock and fractured formations where the Program has historically had problems.

The Development SOE Project reporting format was revised in March into three broad topics, with the following definitions:

• **Downhole Measurement Technology** involves development projects for those tools and equipment that sense physical parameters downhole and store or transmit the data acquired therefrom. Some examples are Advanced Piston Corer with Temperature Shoe (APCT), Water Sampler Temperature Probe (WSTP), adoption of Davis-Villinger Temperature Probe (DVTP), ODP Universal Multi-Process Unit (MPU), Sonic Core Monitor, Dynamic Sensor Subs and Advanced Piston Corer (APC) Methane Sensor.

• **Downhole Sampling Technology** involves development projects for those tools and equipment that acquire physical samples downhole and store them. Some examples are Pressure Core Sampler (PCS) Modification, Advanced Diamond Core Barrel (ADCB), Packer/Sampler Adaptation for Advanced CORKs and Improvements to standard ODP/TAMU coring tools (RCB/APC/XCB).

• **Operational Technology** involves both (1) development projects for operational tools and equipment and (2) operational projects for the transition of Downhole Measurement or Sampling tools and equipment to an operational status. Some examples of (1) are Activation of the Heave Compensator (AHC), Simulator for the AHC, Seals for the Passive DSC, Power Factor Improvement for Ship Propulsion, MG Set acquisition for ship board IS, Hammer Drill and Pulsation Sub, Hard Rock Reentry System (HRRS), Drill-In Casing (DIC) for ACORK emplacement, Operational Procedures for AHC and for HRRS, routine support for Drill String and BHAs and Drill String Wear Knots for Leg 185.Some examples of (2) are Operational Procedures for ADCB, Completion/ Emplacement System for Leg 186 Seismic Equipment, Rig Instrumentation for the Measurement of Drilling Parameters, and routine support for ODP Tools (RCB/APC/XCB) or (APCT, WSTP, DVTP).

Active heave compensator

Activation of the existing, passive heave compensator is the top priority. Revised quotes have been received from the vendor and accepted. Approval from JOI was received April 1, 1999. The named vendor is Maritime Hydraulics. The vendor has sent two representatives to the Hong Kong portcall to do a final assessment of equipment placement and to finalize the design to mount two Active Cylinders onto the existing Passive Compensator.

Software development for the MATLAB simulator is continuing. The effort consists of designing Graphical User Interfaces which allows for manipulating the simulator without requiring an operator to have programming experience. The MATLAB simulator for Passive Heave Simulation will be complete by mid May, with hopes of the Active compensator Simulator to be complete by June. Both dates are subject to change due to higher priority projects.

The Motion Reference Display project has been canceled because Maritime Hydraulics will install ship's motion sensors (accelerometers) at dry dock. Instead of ODP developing a custom display of this data, it will be integrated into the rig Data Collection and Interpretation Project that is underway.

Advanced diamond core barrel

The ADCB project centers around packaging a larger inner core barrel into ODP's 6" drill collars. This will allow a 3.345" core to be cut. The hole diameter for the ADCB is 7". This will allow less material to be removed while obtaining faster penetration rates, better core quality, and twice as much core as the RCB per meter of penetration.

Testing of the small-scale prototype bits was performed at Boart Longyear's facility in Salt Lake, Utah during the later part of February 1999. Both surface set and impregnated bits were tested. Boart Longyear issued two short reports based on the conclusions of these tests. Recommendations included using both types of bits for certain applications based on hardness of formation expected to be encountered.

All prototype ADCB hardware was received 5 April 1999 for land tests were successfully completed in May 1999, and all equipment will be ready for sea shipment to port call for Leg 186E.

Hard rock reentry system (HRRS)

The HRRS system is being developed to provide ODP with the ability to establish a re-entry casing on sloped and fractured hard rock outcrops on the seafloor. The system uses a down hole fluid hammer to advance the hole while casing is installed simultaneously. Presently, 13 3/8" casing is being used in the development program. The hammer was shown to perform satisfactorily during Leg 179, despite problems with severe sea states causing premature failure of the bits.

Meetings were held in Perth during the week of January 18-23 at SDS's offices. This meeting yielded the three types of bits that would be developed for the quarry test program. Quarry test rates and testing procedures/requirements were also established during these meetings. These three bits would include:

1. Modified flat face pilot bit.

2. Modified domed pilot bit with wings intersecting the same radius. This bit is termed the dual cam design.

3. New ring bit design

ODP was informed in February 1999 that the SDS project manager, who was the contact for over three years, was no longer working for SDS. SDS established no new project manager or contact at that time. The proposed testing sequence for the three prototype bits that had been planned and outlined in communications with SDS were modified because of problems with SDS design and manufacturing of the bits. Therefore, the first test was primarily centered on the piloted underreamer type bit. Slightly over 5 hrs of drilling time was performed with this bit. This met the criteria of 10 m of penetration or 5 hrs of drilling. Review of the bit at the conclusion of the 5 hrs

of drilling revealed that some minor changes were needed, but these modifications can be incorporated into the final version and will not require re-testing to verify this approach.

Both the dual cam bit and ring bit are being reviewed internally and modifications will be made in order to correct the problems identified in the field. A new bit concept has also been suggested and will be looked at by SDS before presenting the concept to ODP for review. Because the next HRRS test will be in the July 2000 timeframe, SDS will submit in summer 1999 redesigned bit drawings to ODP for review, and a timetable for bit manufacture and additional quarry tests.

Downhole sensor sub

The membership and scope of the Downhole Tools LWG has expanded to better utilize resources within ODP/TAMU and has been renamed the Downhole Tools advisory team. This team includes members from Drilling Services, Science Services and hopefully SCIMP liaisons. The purpose of this team is to produce a unified downhole measurement strategy. The scope of this team is to 1) evaluate the level of support required for current downhole measurement systems, 2) advise management on downhole measurement priorities, and 3) act as primary interface for 3rd party tool deployment.

Dry Dock

The ship is scheduled to go into dry dock at the end of Leg 186 (mid August) and is scheduled to be finished, including sea trials, 42 days later. The bid documents were sent out to seven shipyards on November 20, 1998. All the shipyards are located in the Western Pacific. The top three shipyards were visited at the end of April for bid clarification meetings. The shipyard contract was awarded to Keppel Shipyards, Singapore.

Engineers at Oversea Drilling Limited are planning the upgrades and enhancements to the JOIDES Resolution. The final project list is an outgrowth of a deliberative process involving ODL and ODP and represents a mix between major capital equipment enhancements (e.g. Automatic Station Keeping System and Data Management System) and extensive refurbishment's of existing equipment. As part of the renewal of the 1999-2003 operations contract extension, NSF has contributed $6,000,000 US. Approximately 50% of this amount has been encumbered and ODL has maximized the return of this investment in the ship's capability by carrying out as many projects as possible during port calls and during scientific legs. By written agreements, ODL is responsible for any costs incurred above the $6,000,000 US.

In FY99 ODP has budgeted and planned for improvements and upgrades to the Laboratory Stack. Discussions and the planning process have identified the list of projects. The list of projects to be considered will cost in aggregate more than there are funds available. Once all potential funds are identified (FY99 cost-savings and external funding), the projects slated for completion will be selected. Currently, the highest priority project among this list is the addition of an 8th floor laboratory to enhance the Program's capability to pursue the Deep Biosphere initiative, to implement more advanced downhole measurements (e.g. CORK tools), and to analyze gas hydrates shipboard. ODP contracted Ocean Design Associates, Inc. in FY98 to assess stability and structural design issues related to the Lab Stack and the addition of an 8th level. Based on Ocean Design's stability and station-keeping assessment, there is no stability problem with adding an 8th level to the lab stack. In addition, structural assessment indicates there are no problems, or need for structural reinforcement, with adding a microbiology van to the roof of the Lab Stack or with stacking the core liner boxes two high, from either a stability or structural viewpoint.

Publication Services update

New *Initial Reports* Volume Format Development

During the first half of 1999, the Publication Services Department completed the new format for the Initial Reports volume booklet and CD product and designed an HTML format for the Web (http://www-odp.tamu.edu/publications/pubs.htm). The department manager presented a demonstration of the new format at the USSAC meeting in January 1999. An article titled "Electrifying ODP Publications" was published in the JOI/USSAC Newsletter's Spring 1999 issue, which summarized the changes in publications formats and policies. The article was also distributed to all ODP member country offices and the JOIDES office for possible publication in their newsletters. The Publication Services Department staff gave presentations about the new IR format at all precruise and postcruise meetings during the report period and will continue their efforts to educate the ODP scientific community about the publication changes.

Volume Production

From January through June 1999, the following ODP Proceedings volumes were produced and distributed:
Initial Reports
Book and CD-ROM (PDF version): 177, 176 (distribution late June)
WWW (175 PDF version; 176 and 177 PDF and HTML versions): 175, 177, 176*
* In development at time report was written.
Scientific Results
Book and CD-ROM (PDF version): 161, 162 (distribution late June)
WWW (PDF version): 161, 162*
* In development at time report was written.

From July through December 1999, the following ODP Proceedings volumes are expected to be printed and distributed:
Initial Reports
New booklet and CD-ROM version: 178, 179, 180, 181, 182
WWW (PDF version): 178, 179, 180, 181
Scientific Results
Book and CD-ROM (PDF version): 163, 164, 165
WWW (PDF version): 162, 163, 164

Note: The Scientific Results schedule was extended from three-years postcruise to four-years postcruise for Legs 160 through 164, which lead to longer periods (>2 months) between the publication of each volume.

ODP Proceedings Distribution

The Department has sold DSDP and ODP volumes for a cumulative revenue of $32,447 between September 1998 and May 1999. This revenue is budgeted annually and supports a portion of the cost of publishing new volumes.

The Department has continued to distribute free sets of volumes to academic institutions that do not already have accessible sets of DSDP and ODP volumes (institutions pay shipping costs). Between January and mid-June 1999, 5 institutions in 4 countries were sent full volume sets (U.S.A.–1, Chinese Taipei–1, Italy–2, Germany–1). Total book value for these shipments equals $49,335. An

additional request was just submitted by the Institute of Marine Geology & Geophysics, China University of Geosciences, in Beijing. The request states "It may be incredible, but we can not find a complete set of the ODP and DSDP volumes in Beijing. This dampens our ability to keep pace with our international colleagues."

Policy Update

In March 1999, the new integrated "ODP Sample Distribution, Data Distribution, and Publications Policy" was released by JOI. The Publication Services Department has contacted all co-chiefs and scientific party members to alert them of the changes in policy guidelines that pertain to specific legs.

Status of Action Related to SCIMP Recommendation 99-1-10
SCIMP Recommendation 99-1-10 stated "SCIMP recommends that ODP-TAMU reiterate that it is the responsibility of the co-chief scientists to write or coordinate a leg synthesis paper for the SR booklet and CD-ROM as required by the co-chief agreement."

Action: This responsibility is outlined in the revised Policy. The Manager of Publication Services has sent notices to all co-chiefs for legs beginning with Leg 169 reminding them of their responsibility to write or coordinate a leg synthesis paper for the SR booklet. Co-chiefs for Legs 185 and beyond were notified of this responsibility at the precruise meetings or the initial postcruise meetings.

Ann Klaus has begun to receive communications from the co-chiefs for Legs 169 through 174B regarding whether they will choose to write leg synthesis papers or short leg synopses for publication in the Scientific Results volumes.

WWW Development

New ODP Main Web Page: In February and May, the Web administrators for all the ODP sites met to integrate and refine the Program's Web sites. The Program now has one central URL (www.oceandrilling.org) that is the launching point for accessing all ODP resources on the Web. The goal is that users should be able to locate any service from this main page. ODP/TAMU has begun to update the design, structure, and content of all our pages. Feedback on the new structure or design is welcomed by any ODP Web administrator: JOI—Johanna Adams; Science Operator—Katerina Petronotis; Logging Services—Mary Reagan; Site Survey Data Bank—Dan Quoidback; JOIDES Office—Emanuel (Manu) Soeding.

ODP Publications Web Page: The Publication Services Department has redesigned the entry page of the Publications Web materials. Users can access all leg-related publications by leg, as well as author guidelines, policy documents, and optional charge information. For each leg, a listing of all leg-related publications is provided, with live links to any electronic publications (see citation list below).

Publication Services has also developed an HTML format for the Initial Reports volume chapters. Beginning with Leg 176, all volumes will be published on the Web in Acrobat and HTML formats. The goal is to post ODP publications on the Web as soon as possible, preferably before the booklet/CD distribution begins. However, this probably won't be accomplished until late this fall.

Proceedings Volume Web Hits: The following table summarizes the number of hits to specific ODP site URLs relating to the on-line volumes*.

1999 Statistics	Jan.	Feb.	March	April	Date Page Opened
ODP main page		5,743	5,801	5,755	5,247 NA
Publications main page			1,005	1,134	1,102 872 NA

INITIAL REPORTS VOLUMES**					
166 IR	36	25	29	16	1 Oct. 1997
167 IR	22	23	35	25	13 Feb. 1998
168 IR	29	24	17	2	23 Feb. 1998
169 IR	13	12	17	16	17 April 1998
169S IR	28	15	18	6	10 April 1998
170 IR	22	16	11	7	24 April 1998
171A IR	14	15	13	3	26 June 1998
171B IR	20	19	18	9	26 June 1998
172 IR	61	17	15	12	31 July 1998
173 IR	35	24	16	9	4 Sept. 1998
174A	28	18	11	7	31 Dec. 1998
174B IR	18	38	13	2	31 Dec. 1998
174AX IR	6	13	8	3	31 Dec. 1998
175 IR —	—	12	31	9 Feb. 1999	

SCIENTIFIC RESULTS VOLUMES**					
150X SR	33	32	36	25	7 Aug. 1998
152 SR	45	42	44	51	8 July 1998
154 SR	61	52	71	55	1 Oct. 1997
155 SR	56	66	56	56	15 May 1998
156 SR	42	32	26	40	21 Aug. 1998
157 SR	44	31	45	25	14 Aug. 1998
158 SR	53	54	46	67	15 May 1998
159 SR	27	25	14	11	31 Dec. 1998
159T SR	23	12	10	9	31 Dec. 1998
160 SR	129	110	124	80	9 Nov. 1998
161 SR	—	—	73	65	19 March 1999

Notes: May statistics not available at time report was written.
* Volumes 166–175 IR and 150X–161 SR are PDF replicas of the printed volumes.
** Numbers indicate hits to the first/entry page of each volume.

Leg-related Citation List

Beginning with Leg 160, authors were permitted to fulfill their ODP publication obligation by either submitting a manuscript to a peer-reviewed journal that published in English, or by submitting a paper or data report to the Scientific Results volume. To maintain a leg-related compendium of postcruise results, in January 1999, the Publication Services Department began to post citations from all published leg-related publications on the ODP Web site (www odp.tamu.edu/publications/pubs.htm) for Legs 160 and beyond. The following leg-related journal and book publications were posted between January and April 1999.

Leg-related citations posted on ODP Web site from January to May 1999

Leg 160:

Major, C.O., Pirmez, C., Goldberg, D., and the Leg 166 Scientific Party, 1998. High-resolution core-log integration techniques: examples from the Ocean Drilling Program. In Harvey, P.K., and Lovell, M.A. (Eds.), Core-Log Integration , Geol. Soc. Spec. Publ. London, 136:285-295.

Roberts, A.P., Stoner, J.S., and Richter, C., 1999. Diagenetic magnetic enhancement of sapropels from the eastern Mediterranean Sea. Mar. Geol., 153:103-116.

Schulz, H.-M., Emeis, K.-C., Volkmann, N., 1997. Organic carbon provenance and maturity in the mud breccia from the Napoli mud volcano: indicators of origin and burial depth. Earth Planet. Sci. Lett., 147:141-151.

Leg 161:

Bernasconi, S., Meyers, P.A., and O'Sullivan, G., 1999. Early diagenesis in rapidly accumulating sediments on the Alboran slope, ODP Site 976. Geo-Marine Letters, 18:209-214.

Platt, J.P., Soto, J.-I., Whitehouse, M.J., Hurford, A.J., and Kelley, S.P., 1998. Thermal evolution, rate of exhumation, and tectonic significance of metamorphic rocks from the floor of the Alboran extensional basin, western Mediterranean. Tectonics, 17:671-689.

Soto, J.I., and Platt, J.P., 1999. Petrological and structural evolution of high-grade metamorphic rocks from the floor of the Alboran Sea Basin, Western Mediterranean. J. Petrol., 40:21-60.

Tandon, K., Lorenzo, J.M., and de La Linde Rubio, J., 1998. Timing of Rifting in the Alboran Sea Basin — correlation of borehole (ODP Leg 161 and Andalucia A-1) to seismic reflection data: implications for basin formation. Mar. Geol., 144:275-294.

Torii, M., 1997. Low-temperature oxidation and subsequent downcore dissolution of magnetite in deep-sea sediments, ODP Leg 161 (Western Mediterranean). J. Geomagn. Geoelectr., 49:1233 1245.

Leg 162:

Andersen, E.S., Dokken, T.M., Elverhøi, A., Solheim, A., and Fossen, I., 1996. Late Quaternary sedimentation and glacial history of the western Svalbard continental margin. Mar. Geol., 133:123-156.

Channell, J.E.T., Hodell, D.A., and Lehman, B., 1997. Relative geomagnetic paleointnesity and d18O at ODP Site 983 (Gardar Drift, North Atlantic) since 350 ka. Earth Planet. Sci. Lett., 153:103-118.

Channell, J.E.T., Hodell, D.A., McManus, J., and Lehman, B., 1998. Orbital modulation of the Earth's magnetic field intensity. Nature, 394:464-468.

Channell, J.E.T., and Lehman, B., 1997. The last two geomagnetic polarity reversals recorded in high-deposition-rate sediment drifts. Nature, 389:712-715.

Crane, K., and Solheim, A. (Eds.), 1995. Seafloor Atlas of the Northern Norwegian-Greenland Sea, 137: Oslo (Nor. Polarinst. Meddel.).

Elverhøi, A., Hooke, R.LeB., and Solheim, A., 1998. Late Cenozoic erosion and sediment yield from the Svalbard-Barents Sea region: Implications for understanding erosion of glacierized basins. Quat. Sci. Rev., 17:209-241.

Elverhøi, A., Norem, H., Andersen, E.S., Dowdeswell, J.A., Fossen, I., Haflidason, H., Kenyon, N.H., Laberg, J.S., King, E.L., Sejrup, H.P., Solheim, A., and Vorren, T.O., 1997. On the origin and flow behaviour of submarine slides on deep sea fans along the Norwegian Barents Sea continental margin. Geo-Mar. Lett., 17:119-125.

Elverhøi, A., Svendsen, J.I., Solheim, A., Andersen, E.S., Milliman, J., Mangerud, J., and Hooke, R.LeB., 1995. Late Quaternary sediment yield from the high Arctic Svalbard area. J. Geol., 103:1-17.

Faleide, J.I., Solheim, A., Fiedler, A., Hjelstuen, B.O., Andersen, E.S., and Vanneste, K., 1996. Late Cenozoic evolution of the western Barents Sea-Svalbard continental margin. Global Planet. Change, 12:53-74.
Mazaud, A., and Channell, J.E.T., in press. The top Olduvai polarity transition at ODP Site 983 (Iceland Basin). Earth Planet. Sci. Lett..
McManus, J.F., Oppo, D.W., and Cullen, J.L., 1999. A 0.5 million year record of millennial scale climate variability in the North Atlantic. Science, 283:971-975.
Oppo, D.W., McManus, J.F., and Cullen, J.L., 1998. Abrupt climate events 500,000 to 340,000 years ago: Evidence from subpolar North Atlantic sediments. Science, 279:1335-1338.
Ortiz, J.D., Mix, A.C., Harris, S.E., and O'Connell, S.B., in press. Diffuse spectral reflectance as a proxy for percent carbonate content in North Atlantic sediments. Paleoceanography.
Solheim, A., 1994. Glacial deposits on the western Svalbard margin. In Eiken, O. (Ed.), Seismic Atlas of Western Svalbard, 130: Oslo (Nor. Polarinst. Meddel.), 52-57.
Solheim, A., and Andersen, E.S., 1995. Late Cenozoic seismic stratigraphy and character of the Svalbard-Barents Sea margin. In Crane, K., and Solheim, A. (Eds.), Seafloor Atlas of the Northern Norwegian-Greenland Sea, 137: Oslo (Nor. Polarinst. Meddel.), 155-164.
Solheim, A., and Andersen, E.S., 1997. Seismic character of the western Svalbard continental margin. In Davies, T.A., Josenhans, H., Polyak, L., Solheim, A., Cooper, A., Bell, T., Stoker, M., and Stravers, J. (Eds.), Seismic Atlas of Glacimarine Features: London (Chapman and Hall), 256-259.
Solheim, A., Andersen, E.S., Elverhøi, A., and Fiedler, A., 1996. Late Cenozoic depositional history of the western Svalbard continental shelf, controlled by subsidence and climate. Global Planet. Change, 12:135-148.
Solheim, A., Faleide, J.I., Andersen, E.S., Elverhøi, A., Forsberg, C.F., Vanneste, K., Uenzelmann-Neben, G., Channell, J.E.T., 1998. Late Cenozoic seismic stratigraphy and glacial geological development of the East Greenland and Svalbard-Barents Sea continental margins. Quat. Sci. Rev., 17:155-184.
Solheim, A., and Forsberg, C.F., (Eds.), 1996. Norwegian Polar Institute's cruise to the northern margin of Svalbard and the Barents Sea 25/7-2/9, 1994. Marine Geology/Geophysics and Physical Oceanography, 92: Oslo (Nor. Polarinst. Rapport.).
Solheim, A., Riis, F., Elverhøi, A., Faleide, J.I., Jensen, L.N., and Cloetingh, S., 1996. Impact of glaciations on basin evolution: data and models from the Norwegian margin and adjecent areas. Global Planet. Change, 12:1-9.

Leg 163:

Clift, P.D., Carter, A., and Hurford, A.J., 1998. The erosional and uplift history of northeast Atlantic passive margins: constraints on a passing plume. J. Geol. Soc., 155:787-800.

Leg 164:

Dickens, G.R., Paull, C.K., Wallace, P., and the ODP Leg 164 Scientific Party, 1997. Direct measurement of in situ methane quantities in a large gas hydrate reservoir. Nature, 385:426-428.
Holbrook, W.S., Hoskins, H., Wood, W.T., Stephen, R.A., Lizarralde, D. and the Leg 164 Science Party, 1996. Methane hydrate and free gas on the Blake Ridge from vertical seismic profiling. Science, 273:1840-1843.
Ruppel, C., 1997. Anomalously cold temperatures observed at the base of the gas hydrate stability zone on the U.S. Atlantic passive margin. Geology, 25:699-702.

Leg 165:

Bralower, T.J., Thomas, D.J., Zachos, J.C., Hirschmann, M.M., Röhl, U., Sigurdsson, H., Thomas, E., and Whitney, D.L., 1997. High-resolution records of the late Paleocene thermal maximum and circum-Caribbean volcanism: is there a causal link? Geology, 25:963-967.
Driscoll., N.W., and Haug, G.H., 1998. A short circuit in the ocean's thermohaline circulation: A cause for northern hemisphere glaciation? Science, 282:436-438.

Haug, G.H., Pedersen, T.F., Sigman, D.M., Calvert, S.E., Nielsen, B., and Peterson, L., 1998. Glacial/interglacial variations in production and nitrogen fixation in the Cariaco Basin during the last 580 ka. Paleoceanography, 13:427-432.
Haug, G.H., and Tiedemann, R., 1998. Effect of the formation of the Isthmus of Panama on Atlantic Ocean thermohaline circulation. Nature, 393:673-676.
Lind, I., 1997. A modified Wyllie equation for the relationship between porosity and sonic velocity of mixed sediments and carbonates from the Caribbean Sea. In Middleton, M. (Ed.), Nordic Petroleum Series III, Research in Petroleum Technology: Aas (Nor. Ener. Forsk.), 123 137.

Leg 166:

Major, C.O., Pirmez, C., Goldberg, D., and the Leg 166 Scientific Party, 1998. High-resolution core-log integration techniques: examples from the Ocean Drilling Program. In Harvey, P.K., and Lovell, M.A. (Eds.), Core-Log Integration, Geol. Soc. Spec. Publ. London, 136:285-295.

Leg 168:

Davis, E., and Becker, K., 1998. Borehole observatories record driving forces for hydrothermal circulation in young oceanic crust. Eos, Transactions, 79:369,377-378.
Hunter A.G., and ODP Leg 168 Scientific Party, 1998. Petrological investigations of low temperature hydrothermal alteration of the upper crust, Juan de Fuca Ridge, ODP Leg 168. In Mill, R.A., and Harrison, K. (Eds), Modern Ocean Floor Processes and the Geological Record, Spec. Publ. Geol. Soc. London, 148:99-125.
Hunter, A.G., Kempton, P.D., Greenwood, P., 1999. Low-temperature fluid-rock interaction-an isotopic and mineralogical perspective of upper crustal evolution, eastern flank of the Juan de Fuca Ridge, ODP Leg 168. Chem. Geol., 155:3-28.
Meldrum, R.D. Davis, E.E., Jones, G., and Macdonald, R.D., 1998. A Two-Way Acoustic Communication Link for Deep-Ocean Observatories, MTS Journal, 32:24-31.

Leg 169:

Brunner, C.A., Normark, W.R., Zuffa, G.G., and Serra, F., 1999. Deep-sea sedimentary record of the late Wisconsin cataclysmic floods from the Columbia River. Geology, 27:463-466.

Leg 171A:

Moore, J.C., Klaus, A., Bangs, N.L., Bekins, B., Bücker, C.J., Brückmann, W., Erickson, S.N., Hansen, O., Horton, T., Ireland, P., Major, C.O., Moore, G.F., Peacock, S., Saito, S., Screaton, E.J., Shimeld, J.W., Stauffer, P.H., Taymaz, T., Teas, P.A., and Tokunaga, T., 1998. Consolidation patterns during initiation and evolution of a plate-boundary decollement zone: Northern Barbados accretionary prism, Geology, 26:811-814.
Zhao, Z., Moore, G.F., and Shipley, T.H., 1998. Deformation and dewatering of the subducting plate beneath the lower slope of the northern Barbados accretionary prism. J. Geophys. Res., 103:30431-30449.

Leg 171B:

Kroon, D., Norris, R.D., Klaus, A., and the ODP Leg 171B Shipboard Scientific Party, 1998. Drilling Blake Nose: the search for evidence of extreme Paleogene-Cretaceous climates and extraterrestrial events. Geology Today, November-December: 222-226.

Mirror Site Development:

The Publication Services and Information Services Departments continue to work on the development of Web mirror sites. The initial goal is to mirror, at a minimum, all of the ODP/TAMU Web site except Janus Web. So far, institutions in three member countries have shown committed interest to hosting mirror sites and we are in the process of establishing these sites at the Natural History Museum, London, UK; AGSO, Australia; and Universität Bremen, Germany.

The German and Australian sites are interested in mirroring the entire site, including the Janus database. They both already support Oracle. The UK site plans to mirror everything on the ODP/TAMU site except the Janus database because they do not have the software or support staff to run an Oracle database system. While progress is being made to set up the basic foundation for the three sites and establish protocols for transferring files, no mirror sites were functional at the time this report was written. We plan to have the sites up and running something in the summer of 1999.

ODP/TAMU has prepared a link to the mirror sites. Currently the page announces that three sites are under development. Once the sites are open this page will be replaced with one that contains links to mirror sites.

Electronic Publication Initiatives

NSF Digital Libraries Initiative Proposal: In May 1999, ODP/TAMU and the Texas A&M Sterling Evans Libraries submitted a proposal for the NSF Digital Libraries Initiative. The objectives of the proposal are to develop the first phase of a digital library of geoscience journals and databases based in the Sterling Evans Digital Library at Texas A&M University (TAMUDL).In May 1999, ODP/TAMU and the Texas A&M Sterling Evans Libraries submitted a proposal for the NSF Digital Libraries Initiative. The objectives of the proposal are to develop the first phase of a digital library of geoscience journals and databases In this project, the TAMUDL would house, catalog, distribute, and archive geoscience data from three geoscience projects (the Proceedings of the Ocean Drilling Program publication series, the Palaeontologia Electronica electronic journal, and the Antarctic Marine Geology Research Facility of Florida State University database).

The central goal of the project is to prepare specific geoscience journal and database material already in electronic format; deliver digital representations of text, images, and data in HTML/XML or ASCII formats; and make all material accessible to the international community of geoscientists via the Internet. This goal will be met through (1) the creation of a cumulative index, and (2) the development of an intuitive user interface for access through a Web search engine. The search engine will incorporate an intelligent index (an edited index capable of identifying concepts or ideas that may not be specifically listed within a file) through metadata process. The TAMUDL is fully equipped to support these digital materials through recent investments of hardware and software in excess of 1.5 million dollars. TAMUDL has also teamed up with Silicon Graphics, Inc., to develop media asset management software and user management software designed specifically for large academic libraries. If funded, the materials in this project would be the first to be available on-line through a university library using this new software system.

A secondary goal of the project is the creation of an archive-quality site for this digital information. If this project is funded, the TAMUDL is committed to maintaining the digital material and ensuring it remains available for scientists, researchers, students, and the general public when the programs creating these data end.

ODP & DSDP Citation Database Produced by AGI

The Publication Services Department has continued to work with AGI to calculate the costs for producing and disseminating an ODP and DSDP citation database. Using a set of key words, AGI would pull a subset of citations from the GeoRef database and build a database that included citations to publications associated with ODP and DSDP. Though the database would include all ODP Proceedings and DSDP Initial Reports citations, the database could easily be sorted to identify all non-program produced publications. AGI estimates there are approximately 10,000 ODP-related references in the GeoRef database (4,700 are Proceedings citations) and 4,300 DSDP references (ODP has already purchased these). AGI would provide citations, associated metadata, and searchable database software. We are currently evaluating the different presentation options for accessing this database (see table below).

Options for presentation of AGI Citation Database.

	Initial Cost	Annual Update
Single copy of database*	$8,500	$100, plus $0.80 per new citation
Database on CD-ROM with free distribution rights in CD and print formats**	$17,500	$100, plus $1.00 per new citation and $4,500 for CD manufacturing
Database with free Web access†	$23,700	$5,000 maintenance, plus $1.50 per new citation.

* Could only be used by ODP/TAMU staff to generate reports and statistics; copies of the database can't be distributed to other parts of the Program or to member countries.
** Includes cost for manufacturing 3,000 CDs.
† Database would be housed on the AGI server.

HYACE Report

Minutes of meeting on March 29, 1999, 14:00 - 18:00, at the European Science Foundation, Strasbourg

1. Background : a suggestion by Kate Moran, Director JOI, to Hans Amann, Project Manager HYACE, at the PPG Gas Hydrates Meeting in Monterey, Cal., on Dec. 11, 1998, to investigate opportunities of a partnership of ODP in the HYACE Project and to establish industrial relations, with FUGRO in particular.

The ESF, M. d'Ozouville, was generous to host the meeting. It was attended by

Sven Plasman, Fugro Engineers BV
Jeff Fox, Director General ODP
Gilles Ollier, EU-DG XII, Scientific Officer HYACE
Laurent d'Ozouville, ESF
Kate Moran, Director JOI
Herman Zuidberg, Managing Director Fugro Engineers BV

Hans Amann, TU Berlin/MAT, Projekt Manager HYACE

2. Hans Amann presented the scope and present state of the EU Project HYACE. An actual technical link HYACE-ODP beyond the existing contacts and eventual uses of the autoclave coring systems should be organized. Uses will be for ODP's projects on gas hydrate and the deep biosphere which are expected by ODP for 2001 and beyond. An imminent opportunity of cooperation and mutual benefit would be a technical feasibility test for HYACE. Leg 191 in July/August of 2000 was singled out as a good candidate for such technical feasibility in the deepsea upon contacts with ODP staff scientists, the PPG Gas Hydrates and the Joides Office. Scientific pilot application tests on gas hydrate legs, including necessary further technical research such as optimization, measurement while coring, onboard evaluation (autoclave core loggging), land based tomographic imaging and structural properties research, and subsampling for sediments and/or pore water should be considered.

3. Herman Zuidberg complemented the HYACE overview by commenting development efforts of novel HYACE subsystems, e.g. the flap valve. He outlined FUGRO's contribution to HYACE: the proposal to apply the well known concept of an inverse moyno motor as the downhole actuator for novel rotary autoclave coring and the percussion autoclave corer. The latter is being (onshore) tested in February/May 1999. FUGRO coring equipment will be used on the Japanese MITI gas hydrate well in Nankai, in Fall 1999, as backup. Percussion and hammer coring as used and further developed by Fugro may cover more satisfactorily a large part of sediments between soft sediments and rock, say in between APC and ADCB.

4. Gilles Ollier underlined the interest of the EU to offer HYACE as a technological contribution from the European side to ODP and international scientific drilling. The final users are important. The EU actually contributes a large part to the overall HYACE project. The EU staff recognizes the necessarily risky task of complex downhole technology to reach and sample ephemeral phenomena and requires risk awareness and risk reduction measures. The contribution from Fugro as the industrial partner are welcome. Applications of HYACE for gas hydrates and the deep biosphere are recognized, as they are already planned by the HYACE group. Ways to utilize, "sell" the technology to Third Parties, should fit the EU subvention contract and the EU sponsored HYACE consortium contract. Opportunities to have extensions or new HYACE projects beyond 2000 may come up later in 1999 under the 5th Framework program, IV Environment/Energy and 3. Sustainable Marine Ecosystems (including scientific drilling methods).

5. Kate Moran and Jeff Fox outlined the decision making and operating structure of JOI and ODP. They confirmed their interest in HYACE and in the contributions from the geotechnical industry, from Fugro in particular, for actual and future work of ODP and IODP. The scientific and cooperative success of ODP is vested in the science driven, competitive project structure, coordinated by ODP's Science Committee, its advisory panels and ad hoc project planning groups. The proposal to have HYACE as a gas hydrate sampling tool would have to go (after a technical feasibility test in 2000?, H.A.) through the ODP Safety Panel. Leg 191 is considered as a candidate for technical and organizational merits. The proposal should be further examined by SciCom and finally decided at the next SciCom Meeting in August 1999, (which would be welcome by the HYACE group for project planning purposes). Detailed examinations and contributions from ODP engineering staff might be necessary.

As for further cooperation and uses JOI and ODP expects proposals from the HYACE coordinator and from Fugro. Herman Zuidberg suggested the rent out as service of fully developed equipment and methods. Hans Amann suggested a royalty free use of the rotary corer (and a derived push corer) to reciprocate for ODP contributions, especially ship time. Further necessary development needs and wishes (e.g. pilot application tests, subsampling, autoclave remote sensing, structural analysis, measurement while coring) could be done in a mutually supported development project in 2001 to 2003.

APPENDIX 99-2-2: JOI REPORT

FY 2000 Technology Plan (Special Operating Expenses)

Hard Rock Re-entry	$350K
Diamond Core Barrel	$175K
Downhole Measurements	$210K
Downhole Sampling Tools	$175K
Large Diameter Logging Tool	$10K
Total	**$920K**

- Leg 191 will conduct engineering tests of the Hard Rock Re-entry System (HRRS) once the science drilling is completed (15 days of testing are planned at a bare rock setting).
- Leg 186E will serve as a short shakedown for the new active heave compensation system and will test the prototype Advanced Diamond Core Barrel (ADCB) as part of the Memorandum of Agreement between JOI and JAMSTEC.

FY 2000 Technology Plan

The Plan includes :

- Continued development of the Hard Rock Re-entry System (HRRS) based on hammer drilling technology;
- Continued development of the Advanced Diamond Core Barrel (ADCB) to improve both core quality and core recovery;
- Improvements to, and development of, ODP downhole measurement tools to extend our *in situ* measurement capabilities for science related to the dynamics of fluid flow and variable pressure regimes;
- Improvements to the ODP downhole coring and fluid sampling tools;
- Design of Advanced CORKs for long term seafloor and sub-seafloor observatories;
- Modifications to drilling systems to enable future deployment of large diameter logging tools in ODP boreholes.

FY 2000 Technology Plan (continued)

Hard Rock Re-entry System

- Based on current JOIDES proposal pressure, we estimate that this technology will be needed in early FY 2002. This year engineering tests are focused on resolving bit design problems identified during sea trials on Leg 179. These tests include bit trials for unsupported spud-in and management of the cyclic pressure response of the system on hammer operation; casing drill-in tests are also required. The primary development tasks in FY00 include (1) redesign of the hammer piston control valve to eliminate cracking, (2) correction of hammer piston coating to spalling, and (3) control/reduction of operational cyclic pressure vibrations.

Advanced Diamond Core Barrel

- This project involves modifying ezisting commercial diamond core tools that will then be run in the existing ODP drillstring and bottom hole assembly. Industry experience has shown that a reduced kerf (the ratio of the diameter of the borehole cut by the ADCB bit compared with the diameter of the recovered core) greatly improved core quality and increases recovery. Installation of the new active heave compensation system will reduce variations of weight-on-bit.

Downhole Measurements

- The purpose of this new direction is to provide engineering and maintenance support for ODP's existing downhole measurement tools to achieve science objectives that are of high priority for meeting LRP initiatives. The focus of this development is to standardize the downhole computers and software of the existing memory tools (Adara, WSTP) and to develop new tools that can be readily adapted to these standard devices. The Development Engineering Team will take over the support role for the Adara temperature tools and the Water Sampler and Temperature Probe (WSTP). The Davis-Villinger Temperature Prove (DVTP) will be supported by ODP as a standard operational tool.

- ODP will jointly develop with Monterey Bay Research Institute, a methane sensor package to be installed at the top of the APC core barrel. This sensor will be used to monitor resistivity and temperature changes of hydrates as they are recovered through the water column.

- To collect data needed for improving coring and drilling methods, a bottom hole assembly memory tool will be developed to measure weight-on-bit, vibrations, and downhole wellbore pressure.

Downhole Sampling Tools

- The focus in FY 2000 will be (1) to improve the Pressure Core Sampler (PCS) for gas hydrate objectives that will likely be scheduled in FY 2001, and (2) to improve the design of the Advanced CORK, which will be needed in FY 2001 for the proposed second leg of Nankai Trough drilling.

- The PCS tool will be modified to better recover core in gas hydrate bearing sediments.

- The Advanced CORK (ACORK) will allow multiple intervals in the borehole to be isolated and will allow measurements of fluid pressure, temperature, and fluid sampling at multiple intervals, rather than over a single interval, as in existing CORKs. The ACORK is a multi-packer liner system designed for unstable formations, such as are found in accretionary prisms. ODP/TAMU is designing the drill-in casing and re-entry cone for ACORK deployment. The multi-packer string system will be developed as a third-party tool, funded by the JOIDES proponents. In FY 2000, funds are allocated to initiate the design of the drill-in casing.

- We anticipate that additional development of sampling tools will be required in FY 2000 for the deep biosphere pilot project. Based on the results of tracer experiments completed on Leg 185, the APC, RCB, and XCB coring systems will be modified, as necessary, to minimize and, if possible, to eliminate contamination of the core.

Large Diameter Logging Tools

- In FY 2000, a mechanical system will be designed and constructed so that large-diameter logging tools can be lowered through the water column, outside of the drillstring, and then guided into the borehole. Currently,

- ODP operations restrict logging tools to those that can be lowered through a 10-cm drill pipe, yet they must be able to make measurements inholes that are often as large as 40-cm across. This seriously limits tool selection, sometimes impacts log quality, and excludes the use of many industry devices that are larger than 10 cm. Downhole samples that extract in situ pore fluids, like the Modular Formation Dynamics Tester (MDT) can be used in ODP boreholes, but cannot pass through the drillstring. The MDT can be directly applied to meet high priority objectives related to fluid flow and fluid pressure studies. To this end, ODP will design and manufacture the components required to deploy large diameter tools. They will be available for use in FY 2001.

POST CRUISE MEETING VENUE

Dear Co-chief:

The Ocean Drilling Program initially hosted all of the second post-cruise meetings at Science Operations Headquarters in College Station, Texas. Because these meetings were held at TAMU, ODP/TAMU (the Staff Scientist) was the host. Following Leg 124, JOIDES recommended that the second post-cruise meeting could be held elsewhere, in other places in the U.S., as well as in other member countries. Although this change was made, no guidelines were initially established for selecting the meeting venue. This letter outline the guidelines to follow for selecting and requesting the time and location of your second post cruise meeting.

The most important consideration is selecting a venue where your science party can appropriately review the scientific results in advance of publicaton. This requires a location that has meeting space, projection equipment, and a minimum of office support (e.g., photo copy machine) to meet your logistic needs. The meeting host should also be selected and it is preferred that the host is a member of your science party. To enhance the visibility of the ODP and to get your leg results broader exposure in the science community, please consider holding your post-cruise meeting in conjunction with an appropriate national or international science conference or workshop. To maintain consistency with the JOIDES advisory structure, with the international partner agreements, and to maintain equitable contact among member countries, please consider holding your meeting in a member country before considering other locations. Other locations are only appropriate if there is a need to visit a specific location to enhance your scientitic results.

For approval, please send a letter to me with your preferred location and host, one alternate location and host, the proposed dates, and a brief summary of the reason(s) for these selections. I will follow the same approval process as other JOIDES meetings.

Sincerely,

William W. Hay

APPENDIX 99-2-3: ODP-LDEO LOGGING SERVICES REPORT

ODP Logging Service Report
SciMP June 1999

EXECUTIVE SUMMARY

Cruise Highlights:

Logs across the K/T boundary were acquired during Leg 182 in Hole 1126D and possibly Hole 1134A, but core recovery of the mainly unconsolidated siliciclastic deposits below the boundary was poor. Post-cruise interpretation of geophysical logs will include inversion analysis of the data to determine stratigraphic changes in cool water-carbonate platform mineralogy, including intervals in which there was no core recovery; and interpretation of cyclicity identified from the logs.

During Leg 183, the basement section in Hole 1140A consisted of pillow lavas and interbedded sediments and the log data clearly identified six basement units. For example, density, resistivity, and velocity are high in the basalts and they drop when the tools encounter thick pillow rims and in sedimentary beds. The FMS images pillow lavas, massive lava flows, fractures, sedimentary interbeds and unit thickness can be estimated. The well seismic experiment (checkshot) enable a time-depth conversion at Site 1040, tying the logging data to the crossing reflection seismic lines.

In Leg 184, gamma ray, resistivity, PEF, and density logs revealed fine-scale cycles. FMS images also showed frequent alternation of relatively conductive and resistive sediment layers. The implications of these fine-scale variations are yet to be explored, but they might relate to Milankovitch cycles driving monsoon climate. Variations in the density, PEF, and gamma ray logs also reflect clearly the internal changes in the carbonate content.

The general character of the various logs obtained during Leg 185 correlate very well with the lithologies recovered from drilling. High natural gamma-ray values were found within the alkalic basalt, tholeiitic basalt, pillows and flow sections drilled in Site 801. Relatively high resistivity, bulk density and seismic velocity are associated with the more massive flow units. Resistivity logs and FMS images allowed the characterization of many of the partially recovered intervals from the basaltic flow sections. The temperature log recorded with the TAP tool identified areas with strong negative thermal anomalies which are thought to be considerably more permeable than the surronding formations.

Engineering and Software Developments:

A real-time data telemetry module for the TAP has also been designed and manufactured. The real-time data link will be useful in refining the current wireline heave control parameters and will also provide a real time data link for other compatible third party tools. Deployment of the TAP telemetry module is expected for Leg 186E.

The Drill String Acceleration tool (DSA) has been developed to measure the effectiveness of the passive heave compensator, evaluate future active heave compensation developments in ODP and to record drill bit vibration signals. The DSA was shipped to Hong Kong and deployed on Leg 185.

Collaborative planning for multiple dry dock projects has occurred with TAMU and Sedco. Three primary LDEO projects will be completed: 8th level expansion and subsequent lab renovation, MAXIS upgrade to an MCM (Minimum Configuration MAXIS), and rig floor instrumentation. Numerous smaller projects involving Schlumberger and LDEO personnel will also be completed as specified in plans submitted to TAMU and Sedco. A detailed tentative schedule of LDEO events

has been generated but cannot be confirmed until the dry dock location and master project schedule are released.

In response to requests at the Co-Chief Review Meeting, modifications to the GeoFrame processing system are nearly complete which will allow averaging of the 64 individual button traces from a single FMS pass

The new download interface in the ODP Log Database will allow users to have greater control over the types of data they download from each hole. It will also provide direct links from the log data to the corresponding core data from each hole in the Janus database. An article outlining the new features of the database will appear in the next issue of the *JOIDES Journal*.

I. STANDARD LOGGING OPERATIONS

Leg 182 Great Australian Bight

The principal objectives of Leg 182 were to investigate the evolution of the Cenozoic cool-water carbonate margin of the Western Great Australian Bight and produce a more detailed understanding of global environmental changes in high to mid-latitude settings. Eight of the nine sites drilled in the western Great Australian Bight during Leg 182 were logged. High levels of hydrogen sulfide gas were detected in cores recovered from several sites. Exposure to hydrogen sulfide gas is deleterious to metal causing stress cracking. Special precautions were take to protect the wireline cable and logging tools in these holes, which included coating the wireline cable with a protective oil based inhibitor and loading the hole with sepiolite mud to help limit gas entering the hole.

Gamma-ray logs have revealed high frequency cycles (10-20 m) in the Pleistocene succession that can be traced from the shelf break to the upper slope in the eastern transect. These cycles may record changes in accommodation space caused by relative sea-level changes and/or changes in the distribution of the sedimentary budget between the carbonate factory and foreslope during progradation. Gamma-ray logs also proved useful for differentiating logging units in the piped interval that correlate to lithostratigraphic units identified towards the top of the succession from core.

Porosity and density logs were useful in characterizing stratigraphic changes in lithological composition, especially the occurrence of dolomite. Porosity-density logs in combination with natural gamma-ray, resistivity, and sonic logs proved valuable for identifying and differentiating chert bands, silicified horizons, and potential hard and firm grounds in intervals of poor or no core recovery. Firmgrounds identified from the logs may correspond to key sequence stratigraphic surfaces.

Down hole changes in the character of continuous precision temperature logs identified some lithological boundaries, also recognized in core, related to changes in formation geothermal conductivities and permeabilities, and the depths of significant fluid and gas flows in and out of boreholes. Firmgrounds, chert beds, gas escape features, potential cycles, and some of the major stratigraphic boundaries can be seen on the FMS resistivity images.

Logs across the K/T boundary were acquired in Hole 1126D and possibly Hole 1134A, but core recovery of the mainly unconsolidated siliciclastic deposits below the boundary was poor. Post-cruise interpretation of geophysical logs will include inversion analysis of the data to determine stratigraphic changes in cool water-carbonate platform mineralogy, including intervals in which there was no core recovery; and interpretation of cyclicity identified from the logs.

Leg 183 Kerguelen Plateau

Large Igneous Provinces (LIPs) are the result of massive extrusive magmatic events, possibly capable of effecting major changes to global scale. The Kerguelen Plateau - Broken Ridge LIP is the second largest LIP on Earth, and is thought to have formed through mafic magmatism in Cretaceous time. ODP Leg 183 drilled about 100-350 m through the sediment cover into these rapidly emplaced igneous rocks at six locations on the Kerguelen Plateau and two on Broken Ridge. The thickness of the sedimentary cover on the Plateau varies from ~200 m to >2000 m.

Holes 1137A, 1139A, and 1140A were logged successfully. Rough seas and large swell were the main problem during the logging operations. Heavy weather terminated or precluded logging in some cases. The data in the sedimentary sections of all holes was generally of poor quality because of hole enlargement. The logging data in the basement sections of Holes 1137A and 1140A are of excellent quality, since no hole enlargements influenced the measurements. Igneous units determined in the cores could be distinguished by the downhole measurements. Variations in density, velocity, resistivity, and porosity reflect changes in the properties of the lava flows.

In Hole 1137A, subaerially-exposed lava flows show highly altered flow tops (increased potassium) due to clay minerals. The FMS images also distinguish lava flows, cobbles, conglomerate, and sandy volcaniclastic interbeds. Within individual lava flows, the FMS images reflect structural changes, such as vesicularity, fracturing, and brecciation. The basement section in Hole 1140A consists of pillow lavas and interbedded sediments and the log data clearly identifies six basement units. For example, density, resistivity, and velocity are high in the basalts and they drop when the tools encounter thick pillow rims and in sedimentary beds. The FMS images pillow lavas, massive lava flows, fractures, sedimentary interbeds and unit thickness can be estimated. The well seismic experiment (checkshot) enable a time-depth conversion at Site 1040, tying the logging data to the crossing reflection seismic lines.

The Dual Lateral Log (DLL) was successfully combined with Triple Combo tool string during Leg 183. A separate run to acquire DLL data will no longer be required, although it may be desired in some cases.

Leg 184 East Asia Monsoon

The main scientific objectives of Leg 184 were to determine the evolution and variability of the East Asian monsoon during the late Cenozoic. The records from the South China Sea will be used to establish the links between the East Asian and Indian monsoons and to evaluate mechanisms of internal (climate system feedbacks) and external (orbital and tectonic) climate forcing. The Leg 184 logging plan was designed to provide complete stratigraphic coverage, proxy data not available from core measurements (such as resistivity and yields of K, U, and Th), and in situ sonic velocity for the modeling of synthetic seismograms.

Four sites were logged in the South China Sea. Hole 1143A, northwest of the “Dangerous Grounds” or the Nansha Islands area, was logged with two tool strings: the Triple Combo and the FMS-Sonic. This site lies between the high-accumulation rate (10-30 cm/ky) terrigenous deposits of the paleo-Sunda and Mekong Rivers to the south and the carbonate-rich but low sedimentation rate (1-2 cm/ky) region of the northernmost southern margin. As an accumulation rate of about 5 cm/ky was anticipated, the site would be a sensitive indicator of both the pelagic and terrigenous sources in the SCS. But turbidites were recovered in the cores, leading to higher sedimentation rates. The turbidite layers are clearly distinguishable in both log profiles and FMS images. The base of the turbidites (sandy part) is characterized by lower gamma-ray, density and resistivity, and higher porosity and P-wave velocity values, while it is the reverse is true for the top, clay-rich part. By looking at both the standard logs and the FMS images, it will be possible to count the number of turbidite layers present in the lower part of Hole 1143A, yielding a good estimate of sedimentation rate.

The remaining sites were logged with three tool strings: the Triple Combo, the FMS-Sonic, and the GHMT. The primary objective of these sites on the northern margin of the South China Sea was to recover a continuous sequence of hemipelagic sediments that will enable reconstruction of the paleomonsoon history on a millennial, centennial, or higher resolution time scale for much of the Quaternary (~1 My) (Site 1144), the upper Miocene (~10 my) to present (Site 1146), and Oligocene to Miocene (Site 1148). The preliminary interpretation of the log data suggests multiple, well sorted, coarse-grained sand layers.

For all these sites, gamma ray, resistivity, PEF, and density logs revealed fine-scale cycles. FMS images also showed frequent alternation of relatively conductive and resistive sediment layers. The implications of these fine-scale variations are yet to be explored, but they might relate to Milankovitch cycles driving monsoon climate. Variations in the density, PEF, and gamma ray logs also reflect clearly the internal changes in the carbonate content.

Leg 185 Izu-Mariana

The primary scientific objectives of Leg 185 were to charactize the sediment and crustal input fluxes into the arc-trench subduction systems of the Mariana trench (Site 801) and the Izu-Bonin trench (Site 1149). Despite very similar settings and the same subducting plate, there are significant geochemical differences between the two volcanic arc compositions. Characterizing the inputs should determine if the observed difference in the volcanics result from different input materials or different processes in the subduction factory.

Site 801 had been drilled and logged during ODP Legs 129 and 144. The sediments had been logged during Leg 129 in 801B, and the ~80 m of basement drilled during Leg 129 in 801C were logged during Leg 144. The objectives of Leg 185 at this site were to sample the upper oxidative zone of alteration and possibly the entire extrusive layer of this oldest in situ oceanic crust. The maximum depth reached was 926 m or ~450 m into basement, which is still in the extrusives section. Unfortunately the minitron used to activate the Gamma Ray Spectroscopy sonde of the geochemical tool (GLT) could not reach the ship in time, and the logging program consisted of the triple combo (with DLL instead of standard DIT) and the FMS/Sonic strings. The good quality of the hole, despite additionnal fill between each run, allowed a complete characterization of the basement penetrated.

The general character of the various logging data correlate very well with the lithologies recovered from drilling. High natural gamma radiation values associated with K, U and Th are present within the alkalic basalt section (483-510 mbsf), the highly altered tholeiitic basalt (525-530 mbsf) below the upper hydrothermal unit, and the upper half of the upper pillows and flows section (590-640 mbsf). Relatively high resistivity, bulk density and seismic velocity are associated with the more massive flow units (530-595 and 715-760 mbsf). The resistivity log and the FMS images allowed the characterization of many of the partially recovered cores of the upper massive flow, upper pillows and flow, and lower massive flow sections of the hole. The FMS image also allow to identify many large veins present in the highly altered basalts constituting most of the upper pillows and flows and upper massive flows units. The temperature log recorded with the TAP tool attached at the bottom of the triple combo identified two areas with strong negative thermal anomalies. These intervals (~510-530 and ~700-720 mbsf) have very low resistivity, they are very distinct in the FMS images, and are thought to be considerably more permeable than the surrounding formations because presumably, they were invaded by the drilling fluid. The thermal anomalies indicate the resulting slower return to equilibrium.

Results from Site 1149, off the Izu-Bonin trench, are still very preliminary and involve only the sedimenatary section logged at Hole 1049B. Hole 1049D, which is currently being drilled, should provide over 150 m of basement to log before the end of the leg. The logging program included the triple combo, the GLT and the FMS sonic. In general, difficult hole conditions in the shallower ash- and diatom-bearing clays and pelagic clays only allowed the triple combo to record data in this section. The data recorded below ~180 mbsf are excellent and allow a complement to very poor core recovery in these units with alternating cherts or chalks. The logging units correlate very well with the lithological units, with high resistivity and high silica associated with the radiolarioan chert, porcelanite and zeolite-bearing clays (180-280 mbsf) and higher Ca, lower gamma-ray and lower resistivity in the Radiolarian chert and siliceous nannofossil marls/chalks (280-410 mbsf). Preliminary observations of the FMS images show a clear southward average dip within the chalks (below 280 mbsf), and a slight north-east bound dip of the cherts (180-280 mbsf). The change might be related to a hiatus or possibly a tectonic event.

II. SPECIALTY TOOLS AND ENGINEERING DEVELOPMENTS

Temperature, Acceleration and Pressure Tool (TAP)

Two TAP tools have been designed, fabricated, assembled and tested at LDEO. TAP 001 has been available for downhole deployments on JR since Leg 182. TAP 002 was completed in March and has been in use at LDEO for research and development with other tools. Data acquired on recent legs is being evaluated on shore to test and enhance the performance of the wireline heave compensator. Further data is needed and SciMP endorsed a request for more routine deployments during upcoming legs (Rec 99-1-4).

A real-time data telemetry module for the TAP has also been designed and manufactured. The real-time data link will be useful in refining the current wireline heave control parameters and will also provide a real time data link for other compatible third party tools. Deployment of the TAP telemetry module is expected for Leg 186E.

DSA - Drill String Acceleration/Active Heave Compensation

The Drill String Acceleration tool (DSA) has been developed to measure the effectiveness of the passive heave compensator, evaluate future active heave compensation developments in ODP and to record drill bit vibration signals. The DSA tool attaches rigidly to the top of APC or RCB core barrels and operates as a memory tool recording simultaneously four acceleration signals, external pressure, and internal temperature. The tool starts recording automatically at predetermined depth and can record all parameters for approximately 2 hours (or heave and pressure/temperature data for 9 hours). Fully encapsulated electronics module and special design allow the DSA to survive harsh conditions of deployment and operation. The measurement strategy and mechanical design for the DSA were endorsed by SciMP (Rec. 99-1-5).

The DSA was shipped to Hong Kong and deployed during Leg 185 in several boreholes. The test results established that the DSA tool can be deployed on the drillstring and that data was successfully recorded during drilling operations. The preliminary analysis shows that recorded data are of good quality and they are under evaluation. Minor changes to the mechanical design were made on board the ship during Leg 185 and the effect of these changes are also being investigated. Future modifications of the tool design based on these results are currently under discussion.

Wireline Heave Compensator - WHC

During the December Fremantle portcall, a replacement 150 horsepower electric motor for the wireline heave compensator was installed. The old motor was removed from the ship and sent to a local repair shop for refurbishing. Following the replacement of the primary motor, the WHC has performed reliably.

Dry Dock Operations
Collaborative planning for multiple dry dock projects has occurred with TAMU and Sedco. Three primary LDEO projects will be completed: 8th level expansion and subsequent lab renovation, MAXIS upgrade to an MCM (Minimum Configuration MAXIS), and rig floor instrumentation. Numerous smaller projects involving Schlumberger and LDEO personnel will also be completed as specified in plans submitted to TAMU and Sedco. A detailed tentative schedule of LDEO events has been generated and will be coordinated with the master project schedule when it is released.

Third Party Tool Support: High Resolution Gamma-Ray Tool
Third party tool development plan for high-resolution gamma-ray measurements is appended (P.I. David Goldberg). SciMP is requested to endorse the target tool deployment on Leg 189 in March 2000.

III. SHIPBOARD LOG ANALYSIS

Core-Log Integration Platform
Coding efforts focused on final development of the beta release version of Sagan v1.0 for deployment on Leg 184 - the first official beta test leg for this software product. Main areas of development centered around the concept of exactly how the core-log ties should be performed. The problem has been how to handle (internally) and transfer the defined core-log correlation tiepoints between three possible core-log correlation scenarios: (1) raw core mbsf - mld; (2) multiple hole composite (Splicer output) core - mld; and (3) single spliced core record - mld.

In addition coding efforts focused on the need to include how core-based biostratigraphic and magnetistratigraphic age control information is applied to the log depth. We developed a subroutine whereby the user can key in the age control datums themselves using a spreadsheet format. The core-log depth correlations are then used to define the accurate equivalent log depth locations of the preliminary age-model for any log data from a given hole. This represents a full integration of core physical property and age control data to the full suite of downhole measurement data. Executable versions of this software have been distributed to JOIDES scientists.

FMS Button Averaging Routine
In response to requests at the Co-Chief Review Meeting, modifications to the GeoFrame processing system are nearly complete which will allow averaging of the 64 individual button traces from a single FMS pass to be accomplished by simply adding a module in the Process Manager during routine FMS processing. This module should allow the average trace to be a standard part of both shipboard and final FMS log presentation without more than a 5-minute increase in processing time or having to export large data sets from GeoFrame.

IV. SHOREBASED LOG ANALYSIS

ODP Conventional Data:
The following holes were processed and prepared for inclusion in the database at LDEO-BRG:
Leg 182: Holes 1129D, 1131A, 1132C, and 1134A
Leg 183: Holes 1137A, 1139A, and 1140A
Leg 184: Holes 1143A, 1144A, 1146A, and 1148A

FMS processing:
The following holes were processed at the Aix-en Provence (France) processing center:
Leg 182: Holes 1127B, 1128D, 1129D, 1130C, 1131A, 1132C, and 1134A
Leg 183: Holes 1137A and 1140A
Leg 184: Holes 1143A, 1144A, and 1146A

GHMT processing:
The following holes were processed at the Aix-en Provence (France) processing center:
Leg 182: Holes 1126D and 1127B. Susceptibility only, no magnetostratigraphy.
Leg 184: Holes 1144A, 1146A, and 1148A

Temperature processing:
The following holes were processed at LDEO-BRG:
Leg 181: Holes 1119C and 1125B
Leg 182: Holes 1126D, 1127B, 1131A

Ronald Cronze, Frank Krysiak, Lothar Wohlgemuth, Jochem Kück, and Thomas Wöhrl from GFZ Potsdam met with members of the LDEO-BRG staff to discuss database and engineering issues, and potential areas of collaboration between ODP and International Continental Drilling Program (ICDP) logging programs.

Data Migration Project
All processed GHMT data and relative documentation are currently being formatted for inclusion in the on-line database. Twenty-eight out of 35 holes have been reviewed and formatted. Legs 145 (2 holes) and 155 (2 holes) are currently being processed, while Legs 134 (1 hole) and 154 (2 holes) need complete processing.

The following FMS data have been converted to GIF files for inclusion in the on-line database:

Leg 133: 8 holes		Leg 171B: 3 holes	
Leg 135: 3 holes	Leg 155: 7 holes	Leg 172: 2 holes	
Leg 136: 1 hole	Leg 157: 3 holes	Leg 173: 1 hole	
Leg 138: 7 holes	Leg 159: 3 holes	Leg 174A: 1 hole	Total holes = 155
Leg 139: 3 holes	Leg 160: 6 holes	Leg 174B: 1 hole	Gif Conversion = 132
Leg 143: 4 holes	Leg 161: 4 holes	Leg 175: 4 holes	On-line files = 122
Leg 144: 6 holes	Leg 162: 4 holes	Leg 176: 1 hole	
Leg 145: 3 holes	Leg 164: 2 holes	Leg 178: 1 hole	
Leg 146: 4 holes	Leg 165: 4 holes	Leg 179: 1 hole	
Leg 147: 1 hole	Leg 166: 3 holes	Leg 180: 4 holes	
Leg 150: 3 holes	Leg 167: 6 holes	Leg 181: 3 holes	
Leg 151: 4 holes	Leg 168: 1 hole	Leg 182: 7 holes	
Leg 152: 1 hole	Leg 169: 1 hole	Leg 183: 2 holes	
Leg 154: 2 holes		Leg 184: 4 holes	

With the conversion of the majority of the FMS images from PBM to GIF completed, we have begun to put FMS image data on-line in the ODP Log Database. The new download interface will allow users to have greater control over the types of data they download from each hole. It will also provide direct links from the log data to the corresponding core data from each hole in the Janus database. An article outlining the new features of the database have been submitted for the next issue of the *JOIDES Journal*.

Post-Cruise Distribution of Log Data
Composite logs of the processed data of Legs 181-184 were made available to the shipboard parties.

The data CD-ROMs for Legs 176-177 have completed and sent to Friesen Printers for distribution.

Training

Ted Baker attended Solaris 2.6 System Administration II and Oracle 8 System Administration courses.

Jian Lin (WHOI) received training at LDEO prior to sailing as the Leg 184 JOIDES Logging Scientist.

Christophe Basile (Leg 173 JOIDES logger) from the University of Grenoble visited BRG@LMF to work on Hole 900A data with GeoFrame 3.0.

Christine Lauer-Leredde visited LDEO for Leg 184 pre-cruise briefing and training.

Bernard Celerier (University of Montpellier) and Veronique Gardien (University of Grenoble) visited BRG@LMF to work on Leg 173 data using GeoFrame.

Graeme Cairns received training at LDEO-BRG prior to sailing as the logging trainee on Leg 185.

The following people received CLIP software/training:
Stefanie Brachfeld (Univ. Minnesota): Splicer
Steve Clemens (Brown University): Splicer, Sagan
Dyke Andreason (Univ. of Calif, Santa Cruz): Splicer
Dr. David J. Mallinson (Univ. of S. Florida): Splicer

Appendix I: SciMP Action Items - Meeting Jan 1999

1) Action Item: The web-based User's Manual for accessing downhole data is now running (URL:www.ldeo.columbia.edu/BRG/ODP/DATABASE/DATA/manual.html). **Iturrino was questioned about the usage of the web site. He will provide statistics at the next meeting as well as how BRG plans to advertise the availability of the web-site access**.

- The ODP Log Database on the ODP Logging Services web site has become the primary means of distributing data. For the first year following a cruise, shipboard participants have secure access to the log data files. Following the end of the moratorium period, the data are available to the general scientific community.

- **An article entitled "Bringing ODP log data to the World Wide Web" will appear in the next issue of the *JOIDES Journal*. This article outlines the types of data available and how to access the log database.**

- The ODP Logging Services website includes the On-Line Log Database, Guide to Logging, the Proponent's Helper, and an overview of logging operations on upcoming cruises. A third party tool support page is under development.

- In addition the on-line data, ODP Logging Services also prepares a CD-ROM of the log data for distribution with the *Initial Reports* volumes.

- Website statistics are outlined below:

Overall Website Statistics (Feb-May 1999):

Average Requests	13,626/month
Average Visits	2,145/month
Average Unique Visitors	906/month

Log Database Statistics (Feb-May 1999):

Average Requests	2,132/month
Average Visits	440/month
Average Unique Visitors	265/month

2) Action Item: Query about the cost of satellite data transfer vs. email data transfer?

- With the installation of high-speed satellite transmission capabilities on the *JOIDES Resolution*, we have been able to send standard data back to the shore for processing and return within one week in most cases.

Satellite log data transfer rate is $ 12.29 per min which equals to approximately $ 32.54 per 1 MB for an average transmission speed of 45 kb/s.

3) Action Item: SciMP requested that at its next meeting BRG-LDEO provide the panel with a paper trail that details the review process used to evaluate the proposals for these projects.

· **Drill String Acceleration (DSA):**

SCICOM Meeting 1997 (@ Biosphere): Presented active heave compensation project as FY 98 specialty project (joint with TAMU).

SciMP Meeting February 1998: Active heave compensation project discussed with modifcations to the TAP tool with a drillpipe seating mechanism for measuring drillpipe acceleration while the heave compensator is active. Future developments with this technology were under discussion with TAMU engineers.

SCICOM Meeting March 1998: Outlined future directions for active heave project. Discussions of LWD/MWD strategy.

SciMP Meeting June 1998: A 3-stage development concept was presented. Presentation of downhole and data acquisition equipment design for measuring accelerations of the drill string (DSA), evaluating heave compensation effectiveness and implementing future MWD technologies. Plan for coordination with TAMU engineering and the schedule for initial testing in late FY98 were also presented.

JOIDES Journal Fall 1998: Article on MWC, upcoming DSA and MWD plans.

SCICOM Meeting August 1998: Update of active heave project. SWD experiment results presented and future applications were also discussed.

TEDCOM Meeting November 1998: Discussions about potential transfer of TAP tool technology to MWC. Presentation and endorsement of DSA/MWD plan by panel.

SciMP Meeting January 1999: Plans for Leg 185 DSA deployment and Leg 186E MWD measurements were presented and discussed.

Engineering Meeting March 1999: Coordinated effort with TAMU engineering for DSA/MWD plans for Legs 185 and 186E.

SCICOM/OPCOM Meeting March 1999: Data presented and discussions for technology transfer to MWC from logging string technology (TAP).

TEDCOM Meeting June 1999: Review of plan and initial success on Leg 185.

1) **Large Diameter Tools**:

OPCOM/SCICOM Meeting August 1998: Concept presented for consideration of tool advancements in the future.

SciMP Meeting January 1999: Tool applications for scientific applications in existing proposals presented (SCIMP RECOMMENDATION 99-1-6).

EXCOM Meeting January 1999: Possible new tools discussed.

SCICOM Meeting March 1999: Preliminary feasability study for tool deployments presented.

SSEP Meeting May 1999: Started review process for tool applications specific to current ODP proposals and LRP objectives.

2) **Dry Dock/Rig Floor Instrumentation:**

SciMP Meeting February 1998: Presented plan for developing rig floor instrumentation and control package tied to Maxis.

OPCOM Meeting August 1998: Presented the dry dock plans.

OPCOM Meeting March 1999: Updated plans and coordinated with the TAMU effort.

SciMP Meeting January 1999: Mentioned in minutes (SCIMP RECOMMENDATION 99-1-14).

TEDCOM June 1999: TAMU and LDEO plans refined and scheduled.

Updates for all these projects are also provided in the bi-monthly reports.

4) Action Item: **Iturrino said he will investigate the cost of producing more color copies.** [Note from SciMP minutes 1/99: Iturrino noted that all conventional data has now been migrated into the BRG database. More that 50 holes of FMS data have been transformed to GIF files for web availability. They should be on-line in February 1999. Panel members who have recently sailed noted that there have been numerous requests for paper copies of FMS data on recent legs. Iturrino replied that color copies can be made by Schlumberger on the ship, but the BRG-LDEO can only produce black and white copies at LDEO. It was noted that there is a contractual issue as to the number of color copies that can be produced on board the ship (as well as some practical time concerns).]

A meeting between BRG-LDEO and Schlumberger scheduled for June 22nd, 1999 will include this topic as one of the agenda items. The results will be discussed at the upcoming SciMP meeting in Boulder.

Appendix II: SciMP Recommendations - Meeting Jan 1999

1) SciMP 98-2-13: SCIMP recommends that the WST be a part of standard logging operations.

Update: The WST is now included as a routine part of the shipboard tool suite available. Concern from ODP/TAMU about resource allocation of topside operations if this is to become a standard measurement has been discussed and a solution that minimizes the routine preparations required for WST deployment has been worked out with the shipboard technical staff.

2) SciMP Recommendation 99-1-4: SciMP recommends that BRG-LDEO use the TAP tool routinely for the purpose of acquiring acceleration data and testing the efficiency of WHC under different cable length and heave conditions. The Co-Chief scientists must be informed at the pre-cruise meeting at TAMU of the potential use of this tool and additional logging time that may result from the use of the tool.

Starting with Leg 188, the logging scientists have taken special care to educate the co-chiefs on the use of the TAP tool. The additional logging time is inconsiquential since it is a piggy back deployment on most standard tool strings.

3) SciMP Recommendation 99-1-5: SciMP recommends that BRG-LDEO evaluate the active drill string heave compensator as soon as possible after dry dock using MWD (weight on bit and torque measurements).

Leg 186E plans currently include an MWD bit run at Site 1107 after re-entry.

4) SciMP Recommendation 99-1-6: SciMP recommends that BRG-LDEO begin the evaluation of possible targets for large diameter tool deployments with proponents of active ODP proposals and pursue the acquisition of technological information and costs of these deployments with ODP-TAMU and SEDCO, if the scientific need for the tools is demonstrated.

Presented at SSEP's. A written description of available tools was requested for consideration by SSEP's in evaluating tool applications for current and future drilling proposals.

5) SciMP Recommendation 99-1-11: SciMP recognizes the importance of maximizing the integration between core, log, and seismic data both on the JOIDES Resolution and in post-cruise research. Presently, there are limited resources available on the JOIDES Resolution to integrate these datasets. To this end, SCIMP recommends that the Borehole Research Group enable the seismic and sonic analysis software presently installed as part of the GeoFrame system both on the JOIDES Resolution and at the BRG at Lamont.

Reviews of commercial processing packages have been intitiated for ODP use. Capabilities of these systems include joint display and processing of seismic, log, and image data. The evaluation of these systems is still underway and results will be presented at the next SciMP meeting in January 2000.

6) SciMP Recommendation 99-1-12: SciMP recommends that BRG-LDEO should have as their baseline expertise the ability to do time-depth calibration (i.e., to tie depth data [core/log] to time data [seismic]). This capability should include the ability to integrate checkshot data with wireline sonic data and the ability to generate synthetic seismograms at sea.

See update on SciMP Recommendation 99-1-11.

7) SciMP Recommendation 99-1-14: SciMP recommends to ODP-TAMU and ODP/LDEO that drilling parameters, including mud flow rate, torque, weight on bit and penetration rate be recorded and made available, in digital form, to the scientific party during the leg.

Plans for rig floor instrumentation are scheduled to begin during dry dock. ODP-TAMU and BRG-LDEO plans to record drilling parameters were discussed and coordinated at the TEDCOM June 1999 meeting.

APPENDIX 99-2-4: NGDC LIAISON REPORT

NGDC Liaison Report to the ODP Scientific Measurements Panel

June, 1999

1) Progress on SCIMP Recommendation 98-2-8:

"SCIMP recommends that NGDC work with JOI to investigate the most efficient way to complete the DSDP/ODP data archiving."

At the last meeting NGDC reported (via email) that a preliminary agreement had been reached with ODP/TAMU to test JANUS database transfers via 4-mm DAT to NGDC.

Project status as of June 1999:

- ODP/TAMU successfully exported the database to 4-mm DAT in a form readable by NGDC.
- The entire JANUS database is now loaded on an NGDC server.
- ODP/TAMU has agreed to send NGDC an update following each leg.
- NGDC has sent ODP a supply of 4-mm DAT media for data transfers.
- Work is underway at NGDC on designing scripts to produce a comprehensive set of ASCII files from the database for permanent archival at NGDC/World Data Center A for Marine Geology & Geophysics.
- NGDC will give an updated progress to report at the next SCIMP meeting.

2) Additional developments at NGDC of interest to SCIMP:

In 1989 JOI/USSSP funded a project by NGDC to place the entire DSDP database on CD-ROM. Over the last decade, nearly 700 copies of the DSDP CD-ROM set has been distributed to researchers worldwide. The set is provided free to US academic institutions.

Last fall, sediment and hard rock data from the CD-ROM in their original DSDP formats were posted on NGDC's FTP site for free download. This month, the data were posted in an additional, tab-delimited format with selection capability by Leg/Hole, also for free Internet downloads.
(ftp://ftp.ngdc.noaa.gov/MGG/geology/dsdp/data/dsdpdata.html).

NGDC has just produced a test CD-ROM containing the full suite of DSDP sediment and hard rock data in both the new tab-delimited flat-file format currently offered online and in the original DSDP format. This new CD-ROM is being tested as a replacement for the 1989 CD-ROM, which has outdated DOS-based extraction software, only offers the data in the original DSDP multi-card format, and is nearly out of print.

The test CD-ROM has a browser interface and operates on PC, Macintosh, and UNIX platforms with any recent release of either Netscape Communicator or Microsoft Internet Explorer. There is a possibility that platforms running Solaris 2.7 may experience a problem with the disc. To use the CD-ROM, insert it in the drive and use the 'Open File' option in your

Web browser to navigate to the top level of your CD-ROM drive, then choose to open the file *dsdptest.html*

We would appreciate comments and suggestions on the new test DSDP CD-ROM from members of SCIMP. Please send your input to cmoore@ngdc.noaa.gov

APPENDIX 99-2-5: CORE WRAPPING

From: John_Firth@odp.tamu.edu
Date: Fri, 02 Jul 99 12:00:58 CST
To: Thomas Janecek <janecek@quartz.gly.fsu.edu>
Cc: Jay_Miller@odp.tamu.edu
Subject: Re[2]: Core wrapping

Hi Tom:

Okay, that sounds good. For everyone's understanding, I define a moist DSDP core to be one that I can still push my finger into the sediment.

Cheers,

John

Subject: Re: Core wrapping
From: Thomas Janecek <janecek@quartz.gly.fsu.edu> at #Internet
Date: 7/2/99 11:46 AM

Hi John,

Thanks for the update. At SCIMP, we made a recommendation to stop DSDP wrapping but that is because we thought those cores were all dry. I will send around your comments regarding your plan for DSDP cores and suggest a minor change in our recommendation to include wrapping of wet DSDP cores. In addition, we deemed that the use of sponges was not a worthwhile endeavor and recommended stoppage of that practice completely.

Cheers,

Tom

>Hi Tom:
>
>I don't know when you get back from SciMP, but when you do, this is a quick
>follow-up on the core wrap issue which Carla Moore polled the curators about.
>After your meeting, she told me one question that came up was the issue of
>wrapping old cores, i.e., ones that have dried significantly, like the DSDP
>collections. After the Core Curator's workshop last October which you missed,
>and where I asked the other curators about this issue of old cores, they
>seemed to indicate it was still worth wrapping even old cores (specifically Bobbi
>Conard and Nick Pisias). The WCR tried wrapping some cores last summer but
>because they were fairly dry, the wrap didn't stick very well, so they wondered
>if it was worth it. Pisias and Conard just said to use tape to tape up each end
>and in the middle, to keep the wrap tight around the core. So, I instructed my
>staff to do that. The BCR staff said they get pretty good seal without
>tape and so mostly haven't used tape. The GCR is using tape. The WCR actually has some
>cores that are still moist, and others that are dry, and there is no rhyme or
>reason as to which are which, especially based on age of core. My last
>instructions to ECR and WCR were to begin with the most recent cores they

>have, focus on APC only, and wrap those, working backwards to older cores. Also, if
>they see cores that are completely dry they are supposed to ignore them.
>If they see even somewhat moist cores, I ask them to wrap them. Main problem with ECR/
>WCR is their staff has been out at sea or gone much of the last year, and so
>they haven't had time to do much of it. However, now that Jerry is back and
>should be on shore for quite awhile, I will expect him to get his student and
>Steve Prinz to get working on it. Paula is at sea now, and the ECR staff has a
>heavy sampling load right now, so they probably wont start up again till Paula
>gets back. BCR is going full steam in wrapping their cores since they have a
>break from receiving new cores, and I think they will get most of them done in
>the next year; and GCR is focusing on receiving new cores, sampling
>parties, and building new core racks in the new repository, so won't get to wrapping again
>till say drydock time. However, all of them are supposed to wrap sections
>after they have been pulled for sampling, so some still gets done even if
>not in large quantities. Will try to see how to focus more resources (student
>labor) in next year to push this along.
>
>
>
>Regards,
>
>John

APPENDIX 99-2-6: PLASTIC WRAP REFERENCES

X-Sender: frack@mail.brook.edu
Mime-Version: 1.0
Date: Tue, 22 Jun 1999 16:23:59 -0400
To: janecek@quartz.gly.fsu.edu
From: Frank Rack <frack@brook.edu>
Subject: Plastic Wrap research
Cc: jerry_bode@odp.tamu.edu

Tom (and Jerry),

Here are a bunch of web sites that deal with the issues surrounding plastic wrap, health, and other information. I've started to look through this stuff to find out what the geochemical species might be when plastic breaks down. The potential health issues have been highlighted and debunked lately by many articles from what I can find, but it points out the levels of chemicals that may evolve from plastic wrap. I'll bring all of this to the SciMP meeting and you can also ask people to start to investigate the relevant issues themselves - especially the geochemists and the microbiologists. I also found some discussion among plant tissue culturists, and they seem to use plastic wrap for their cultures for the same reasons we are trying this on sediments - retain moisture, prevent contaminants to enter, etc. - although I don't microbiologists would agree.

I've also attached a .pdf file about plastic film, which should containmost of the information that we need to evaluate the chemical aspects ofthis product. More to come. Stay tuned.

Cheers,

Frank

Plastics Gateway on the web:

<http://www.plastics.org/#>

Plastics - The Basics:

<http://ameriplas.org/benefits/about_plastics/primer.html>

Plastics Resource:

<http://www.plasticsresource.com/>

Plastics and your health:

<http://www.plasticsinfo.org/>

<http://www.plasticsinfo.org/index.html>

Plastics (general information):

<http://www.plasticsresource.com/index.html>

<http://www.plasticsresource.com/resource_conservation/plastics_in_perspective/plastics.html#one>

American Plastics Council:

<http://www.ameriplas.org/>

APPENDIX 99-2-7: IPSC MANDATES TO SCIMP

OD21 Laboratories

Shipboard

The committee (IPSC) felt that the most important thingwe have learned from the present and past international drilling programs concerning the conduct of science and the achievement of scientific goals is that a substantial shipboard team of scientists who work together to achieve these goals is a critical and indispensable element of a scientific drilling program and should be preserved. The synergistic and educational benefits of such teams, combined with their unparalleled degree of productivity, should not be lost in the new program. Rather they should be enhanced.

Because of the very long drilling times of these holes, no single group of scientists will be onboard for the entire drilling operation at a site. However, through telecommunication links a larger team of scientists can both serve onboard the ship for extended periods and remain in touch with other members of the team who have already been onboard or will come out to the ship at a later time. These expanded scientific teams will be a new element in planning and executing the deep well-controlled drilling.

Shipboard Laboratory Recommendations:

1. We encourage the SciMP to continue their lab planning efforts and request that they provide space-by-space or function-by-function estimates of power usage, cooling and ventilation needs as well as vibration and noise restrictions for the OD21 laboratory space during their June 1999 meeting.

2. We suggest that SciMP combine their functional flow chart of whole-round, archive- and working-half core analyses with their diagram of space layout. We feel that this mapping of functions in space is critical to a good lab layout.

3. We urge both SciMP and OD21 to preserve a considerable amount of open flat space which can be versatile in its use.

4. Space for the layout of 100 - 300 m of core for viewing should be included in the laboratory plans.

5. The essential laboratory capabilities of the JOIDES Resolution be preserved and enhanced on the OD21ship. Enhancement should include:

a) better layout with less crowding

b) addition of "undesignated" (versatile) space and core layout space (3, 4 above).

c) addition of a seismic data interpretation laboratory with appropriate computer data storage as well interpretation and visualization software.

d) plans for the addition of a few containerized laboratories on the upper level with essential laboratory service links. These would be "temporary" labs to be used at special sites or at particular times during the drilling of a deep site.

Shore-based Laboratory Recommendations

Shore-based laboratories, preferably established in close proximity to core repositories, be part of the IODP infrastructure. These labs should contain state-of-the-art equipment used in the scientific investigations to be addressed in the long-range science plans. This equipment would include instruments that are particularly sensitive to vibration, low frequency rolling motion, temperature fluctuation, or air pressure variation that are difficult or impossible to control adequately aboard even a large ship.

These labs would also contain duplicates of the shipboard laboratory equipment used in advanced core description. Such instruments would be used to provide compatible core descriptions of material returned from smaller drilling platforms where space constraints may prevent the use of a full suite of such instruments, as well as for checking ship-board measurements.

There are two extreme viewpoints:

1) All that is required is a rather small, perhaps technically oriented scientific party capable of making all measurements that are either ephemeral in nature or are required in order to make sound scientific judgements pertaining to the drilling, coring, and down-hole measurements programs. All detailed scientific studies of the recovered cores can be more efficiently and cost effectively made at shore-based laboratories.

2) Given the larger ship required to handle the casing and riser technology, and the additional space available to scientists that accrues as a result of such a large ship (perhaps 50% larger than the JR), we should adopt a "floating institute" approach to scientific facilities on the OD21 vessel. We should provide this institute with all the latest technical and scientific measurement equipment that can be reasonably operated at sea, and staff the legs with rotating teams of scientists that work extensively on all the core material and data associated with each riser site. Parallel shore-based facilities could and perhaps should also be available, so that rotating scientific teams can access data bases, cores, and logs there, too.

The members of IPSC have discussed this issue and have rather quickly come to unanimous agreement that it is most desirable to lean toward option 2 (above), but with some modifications:

a) The initial shipboard laboratory capabilities need not be greatly in excess of what will soon be available on the JOIDES Resolution; however, additional space that we already know will be available will allow a less crowded layout;

b) additional facilities should include a capability to perform interactive interpretation of 2D and 3Dseismic data sets and an integration of core and log data with seismic data;

c) there should be space set aside for laying out and examining as much as a few hundred meters of recovered core material; this lack of observational capability is one of the real limitations of the JR;

d) there should be space reserved for special, containerized laboratories; and

e) there should be "flexible" space reserved for special onboard experiments and facilities, as needs arise.

IPSC also feels that the makeup of the scientific team onboard at any one time will not necessarily be constrained to a set mix of expertise, but instead depend on the nature of the section being drilled. The rotation of scientific parties may also depend more on the section encountered than tied to a fixed time interval. Flexibility and fluidity should be the new guideline for staffing.

Rationale:

1. We as a community have yet to gain any real experience with "riser" drilling. Planning and designing the OD21 ship for a very minimal scientific party may prevent us from expanding our shipboard capabilities in a cost-effective way, if it is discovered later that a larger shipboard party is desirable. Intellectual ownership of the cores and the holes themselves may also diminish if the scientific team is not intimately involved in the drilling and coring operations. Planning for the maximum shipboard activity is a safer and more flexible strategy. The space will be available, so why not use it?

2. Many of us feel that one of the greatest benefits of the DSDP and ODP drilling programs has been our shipboard experiences. The bringing together of a large, international group of scientists with diverse expertise has been an invaluable educational experience for both young, as well as more mature scientists that cannot be adequately duplicated in a shore-based laboratory. This "pioneering" expeditionary aspect of scientific ocean drilling has also historically been one of the program's strongest selling points, with a) international funding agencies, b) young scientists and graduate students, c) the media, and d) the general public, whose tax dollars ultimately support our efforts.

3. Because no one set of scientists will stay onboard during the drilling of an entire riser site, the size of the total scientific team and the breadth of the interactions is likely to be expanded over that experienced on ODP legs. This may well increase the synergistic aspects of working closely with a broad range of scientists in a very intense shipboard effort linked to a concentrated "site-focused" shore-based effort of an expanded scientific team. Again, this kind of environment simply cannot be duplicated in any shore-based setting alone.

4. The ODP mode of shipboard operations produces the equivalent of about 15 person-years of normal scientific work during one 56-day leg (assuming 30 shipboard scientists). This degree of productivity is practically impossible to match in other modes of operation.

APPENDIX 99-2-8: OD21 DESIGNS

(as of June 5, 1999)

Mime-Version: 1.0
Date: Sat, 5 Jun 1999 14:50:36 +1228
To: dma@ngdc.noaa.gov, Bernard.Celerier@dstu.univ-montp2.fr,
arthur.cheng@waii.com, flemings@essc.psu.edu,
fheider@rockmag.geophysik.uni-muenchen.de, huber.brian@nmnh.si.edu,
alan.r.huffman@usa.conoco.com, janecek@quartz.gly.fsu.edu,
macleod@cardiff.ac.uk, jortiz@ldeo.columbia.edu, rhmorin@usgs.gov,
rickm@bu.edu, planke@geologi.uio.no, soh@planet.geo.kyushu-u.ac.jp,
wheat@mbari.org, janecek@quartz.gly.fsu.edu
From: =?ISO-2022-JP?B?IhskQj15ISEzQBsoQiI=?= <soh@geo.kyushu-u.ac.jp>
Subject: OD21 shipboard measurement facility

Greetings:

This is a revised, update draft for result of OD21 shipboard measurement facility WG. Abandon the previous one and read up this ms.

Wonn

June 1999
OD21 Shipboard Measurement Facilities (Draft)

by OD21 Shipboard Measurement Facilities Sub-committee

Background
Subjects for the Shipboard Measurement Facilities sub-committee:

Shipboard Measurement Facilities sub-committee, chaired by W. Soh (Kyushu Univ.), was organized under OD21 Science Advisory Committee in 1998, on the two subjects/objectives set out below:

I) Construction of a better research environment reflecting scientists' requests on OD21 Riser Drill ship initial design ,

II) Evaluation of on-board equipment which was reported in 1997 to the first OD21 Science Advisory Committee.

In order to attain those objectives, this sub-committee was organized as below;
- to obtain input from appropriate specialists in the related fields

- to nominate committee members over 30 persons to represent each category of age and sex for coordinating various opinions in different fields such as scientist, drilling engineer, lab technician, shipbuilding engineer. Members from each specific field were asked to make their utmost efforts to put together needs from their communities.

Specific subjects included;
- General arrangement of a science compartment and a living compartment on the OD21 Riser Drillship, placing a high priority on safety,

- Ways to construct a better environment for research based on exchange of opinions between scientists, technicians and engineers,

- What shipboard measurement facilities should be installed with due regard to a future land facility plan.

Principle of Shipboard Measurements on OD21 Riser Drillship

The following principal has been confirmed:

(1) JOIDES Resolution-type routine core measurement system are to be carried out in OD21 Riser Drillship to keep continuation of the present ODP measurement system.

(2) Raw materials should be processed (analyzed and sampled) on board promptly with higher priority. "Raw materials" here mean materials which when drilled up from the original site, deteriorate and/or alter immediately caused by temperature, pressure, Eh and pH changes. It covers pore-water chemistry, physical properties, and living microorganism so on. Obviously it provides a great benefit to measure and sample the Raw materials, in keeping the original condition as possible.

Recommendations

In order to construct a better research environment in the OD21 Riser Drillship, the science compartment / living compartment, shipboard measurement equipment and related matters were discussed in the sub-committee. Our recommendations is as below.

1. Science Compartment

1.1 Arrangement of Science Compartment

The science compartment consists of the following:

(1) Downhole Measurement Laboratory
(2) Whole Round Core Research Area (inc. QA/QC lab. so on)
(3) Half Round Core Research Area (Core lab.)
(4) Laboratory Research Area (inc. chemistry, paleontology, microbe, XRF/XRD, thin-section labs)
(5) Rest Space (Off-time space)
(6) Computer Room / User Room
(7) Science Lounge
(8) Library
(9) Science Office
(10) Core Sample Storage (Freezer/Refrigerator Containers)
(11) Science Storage
(12) Container Laboratory

Because prior investigation is to be carried out thoroughly by the other research vessel, the underway geophysics laboratory is excluded in this report. A final decision as to the location of drilling sites' whereabouts relies on a DGPS based on a high resolution 3D seismic profile analysis.

1.2 Science Compartment Area

Total area of the Whole Round Core Research Area (see 2.2) and the Half Round Core Research Area (2.3) needs to be more than 450m2. The other laboratories are explained in 2.4.

2. Contents of Science Compartment Area

2.1 Downhole Measurement Laboratory

A data processing room with a server-type computer, and a working room with at least 10m long table for logging tool maintenance and calibration, are necessary in the laboratory. It should be in a position from where the rig floor can be seen directly. A room for a special technician who treats on the downhole measurement is installed within the laboratory. In addition to the laboratory, a space to store air gun system for VSP is necessary on the main deck.

2.2 Whole Round Core Research Area

In general case, core samples retrieved on board will be cut into lengths of 1.5m, the core samples are first registered into the database, then are processed through X-ray CT scanner to obtain scan images of the whole round core sample. After the processing, the JR-type routine measurements, such as whole round core MST and thermal conductivity measurements, are to be carried out. See the function flow chart attached.

When focusing on research for the Raw Material, some part of samples are to be sent to the following laboratories before the half round core analysis. Following new equipment should be installed in this area so that prompt processing for the Raw materials is possible: 9.5m core sample cutting facility in the Catwalk, X-ray CT scanner laboratory for high speed non-destructive sample imaging, microbe/interstitial water quality analysis/quality control laboratory (QA/QC Lab), Whole-round core Multi Sensor Track and thermal conductivity rate test facility.

In order to ensure safety, thorough installation of ventilation devices for counter-measures against anticipated emission of toxic gas such as hydrogen sulfide should be provided in this area.

2.2.1 X-Ray CT Scanner Laboratory:

In most cases, core samples retrieved onboard are, after being registered into the database, to be immediately processed through the helical type X-ray computed tomography (CT) scanner which makes possible very fast core scanning (a few minutes per 1 m core length). The scan image is recorded by digital data, and the density and internal structure image is figured out on the monitor in a moment.

The CT scanner measurement requires a special separate room with an even temperature maintained and covered with lead shield all over for preventing escape of X-ray leaks together with control room installed computer.

2.2.2 QA/QC Laboratory:

The current JOIDES Resolution does not have this kind of laboratory. The purposes are summarized as below:

(1) To examine a part of retrieved samples with regard to contamination by sea water and/or drilling mud water because they contain substances and various germs.

(2) Based on this examination to check the quality, to sample a chemically and microbiologically clean material.

'

Therefore, the laboratory should be equipped with detectors (such as fluorescent microscope and ECD gas chromatography) for contamination tracer (such as fluorescent microbes). In order to take out a chemically and microbiologically clean sample, the special samplers, which is under consideration at ODP Deep Subsurface Biosphere PPG, are necessary, if available. A large anaerobic glove box (container filled with nitrogen gas) should also be installed to handle core samples under anoxic and anaerobic subsurface environment. Within the glove box, a mechanical edging machine is installed in order to scrape the contaminated part on the core surface. A draft

chamber is also essential as a countermeasure against toxic gas such as hydrogen sulfide volatilized from core samples during sample handling. In addition, it is desirable that extraction of interstitial water also be performed in the QA/QC laboratory. In such a case, a pressing machine with capability tens times larger than the one used on board the JOIDES Resolution will be used with increase of degree of lithification. Retrieved interstitial water samples are to be examined at the Geochemistry Laboratory, and the leftovers should be sealed and frozen for storage.

2.3 Half Round Core Research Area
This area together with a part of the whole round core research area is equivalent to the core laboratory on the present JOIDES Resolution used for conventional measurements. Whole round core is cut into a working half and an archive half in a core splitting room.

2.3.1 Core Laboratory:
The analyzing process carried out includes measurement of physical properties (index properties), core description, smear slide (thin-section) observation, color determination, paleomagnetic measurements, individual sample retrieval and photographing. Soft-X-ray scan system is also necessary. The process of the measurement in the core laboratory is shown in the attached function flow chart in details.

Because the half round cores are carried by hand for analysis and measurements, the room should be open and free of partitions, the floor have no steps and the space should be large enough for equipment to be kept separate.

2.3.2 Paleomagnetic Laboratory:
A paleomagnetic laboratory required to be magnetically shielded should be appropriately enclosed space. As the measurement precision of paleomagnetic properties in core sediment becomes lower as pH and Eh change from the original condition, the measurement procedure should be prompt as possible. The laboratory is therefore located next door or within corner of the core laboratory. Basically if the sample is fully lithified, the half round core should be measured, and if the sample is still unlithified, the U-channel sampling method should be applied.

2.4 Laboratory Street Area
This area, which we call Laboratory Street Area, includes a geochemistry, a paleontology, a thin-section, XRD/XRF, and a microbe laboratories. Discharge of waste fluid and exhaust gas, as well as vibration and stable power supply, should be all taken into account for each laboratory. In principle, in order to keep flexibility in use of such lab space, use of detachable walls and partitions, as safety matters allow, should be considered, to avoid enclosed space with a number of doors.

2.4.1 Geochemistry Laboratory:
The present JR-type measurements should be performed in the geochemistry laboratory. However, it is recommended that the space be larger than presently necessary to allow for the future addition of equipment. This area should be a dry lab with dust-free design feature, however, there should be a drain on the floor. A ventilation fan should have sufficient power for protection against toxic gas escapes in an emergency. Sufficient power supplies (100VAC, 220VAC, 24VDC etc.) should be designed. There needs to be a sink with 3 faucets for a drinkable water supply, a miscellaneous fresh water supply (from fresh water generators) and a sea water supply. The faucet for the miscellaneous fresh water supply should have a hot/cold mixer. Several draft chambers should be installed. A space to store gas bottles for analysis devices is necessary. A space to place a disposal box which can take divided experimental wastes is necessary.

In the JIODES Resolution, regular hydrocarbon monitoring of cores has been carried out in geochemistry laboratory to insure that sediments being drilled do not contain greater than expected amounts of hydrocarbons. On board the OD21 Riser Drillship, on the other hand, this hydrocarbon

monitoring will be usually implemented in a mud logging unit being installed when riser drilling. However, supposing that riserless drilling is also done in the OD21 Riser Drillship, lab equipment for hydrocarbon monitoring may be necessary.

2.4.2 Paleontology Laboratory:
The room should be designed as a complete dry lab and free of dust inside and from outside as far as possible. There needs to be a appropriate size table for a microscopy observation. It is desirable that the laboratory should be located in a clean place with little vibration. A sample processing space and a microscopy space should be half isolated each other. Microscopes should be separated from each other enough so that researchers can work comfortably for quite a long time during the microscopy process. A draft chamber is required at the corner of the laboratory for sample pretreatment.

2.4.3 Thin section Laboratory:
Basically this room is used in a wet lab. Because noise and vibration occur in polishing/cutting the hard rock sample, thus sound insulation is necessary. As the sample becomes to be more lithified with burial depth, demand for the thin section is expected to be greater than with the current JOIDES Resolution. This leads to a need for installation of automatic equipment and a larger space for the laboratory space than the present JOIDES Resolution.

2.4.4 XRF/XRD Laboratory:
Even though the measurement precision of shipboard XRF, XRD is not satisfactory, these should be on board as on the current JOIDES Resolution for an shipboard evaluation of drilling science results. There needs to be a separate room. The laboratory needs clean and dry rooms. Power supply with extra margin (eg.100VAC, 220VAC) is necessary. Because of the need for pre-processing water content, ignition loss analysis, particularly in sediment sample, the laboratory should be near the geochemistry laboratory installed a draft chamber of inorganic chemistry.

2.4.5 Microbe Laboratory:
Because most microbes from beneath ocean floor treated in this laboratory are expected to be previously poorly known, in order to avoid biohazard for scientists/technicians there, the lab should be designed in accordance with the Level P2 of physical seal as stated in the DNA rearrangement experiment regulations. The specific work is as follows:

a) Extracting microbes from core samples. Suspending core sample in various media to culture under various conditions of temperature and pressure. b) Dividing core sample into small pieces to store in liquid nitrogen and in pressurized containers with an environment similar to that the sample had been in.

c) Extracting DNA and fatty acids directly from the core sample itself.

Waste fluid from the core sample treatment and used experimental utensils should be abandoned after sterilization. It should be possible for the whole laboratory to be washed and sterilized. It is desirable that the laboratory is located on the next door to the QA/QC laboratory, if possible.

2.5 Container Lab.
Besides above mentioned permanent laboratories, the planned vessel should have enough deck space for container laboratories for temporary use. For example, a radio isotope laboratory which is essential for microbe research and expected to be in demand and laboratory with special facilities such as a clean room can fit in the container laboratory.

3. Supporting Area
3.1 Rest Area (Off-time Space)

Though the current JOIDESResolution is equipped with a library and a computer user room, only limited space near the laboratory area is available for shipboard scientists/technicians who get mentally stressed at times during cruises of approximately two months. For the new drilling vessel, the scientists' off time should not be considered as only sleeping, resting and eating, but also for thinking over their research results or future research, and discussion with colleagues beyond their own fields. In order to construct a better research environment, it is necessary that the space for researchers be enlarged and used as a space where researchers put together their reports, discuss with other scientists/technicians in different fields, and work on their own using mobile PCs. The rest space, therefore, should be located on each floor to give scientists/technicians easy access to the latest data and samples, especially near the half round core laboratory area where most participants tend to get together. To be more specific, each rest space should have a space of approximately 15m2 with a table and chairs for about four people.

3.2 Computer Room / User Room
The computer user room should have enough space for approximately 10 people or so to be able to work. The total area of the computer room and the computer user room should be more than 60m2.

Taking Virtual Cruise plan into account, an on-board networking environment should be of a decentralized server type system to flexibly deal with future changes of circumstances. A science computer system should not only be a data repository but have a comprehensive ability to communicate interactively with computer systems for drilling and navigation. A number of ports should be located at many places for mobile PC access. In addition, devices for satellite communications such as a parabola antenna supporting the Virtual Cruise and enabling a virtual meeting with researchers onshore is desired to also be set up.

3.3 Science Lounge
A science lounge should be located inside the science compartment next to the living compartment lounge and used for meetings (virtual meetings if necessary) and video projection. The space should accommodate 50 persons or so (half of this can use spare chairs) and the area more than 60m2.

3.4 Library
The library should store books in the relevant fields and be able to accommodate 10 persons or so. Each table should have ports for mobile PCs. The area should be more than 50m2.

4. Science Office
Science offices are necessary as below;
-Drilling office (1 operation supervisor, 2 assistants) [20m2 or more] [1 room] (living compartment)
-Drilling contractor office [20m2 or more] [1 room] (living compartment)
-Co-chief researcher office [25m2 or more] [1 room]
-Lab officer office [17m2 or more] [1 room]
-Yeoperson office [17m2 or more] [1 room]
-Curator office [12m2 or more] [1 room]

Drilling office should be located next to the drilling contractor office with a view of the rig floor. At present, considering the vessel's general arrangement plan, both offices are likely to be located in the living compartment.

5. Storage
5.1 Core Sample Storage (Freezer/Refrigerator container)
Containers should be used to store samples such as half round cores. The maximum quantity of half round cores stored should be equivalent to 10 20ft-containers (equivalent to 8km of whole

core length, may vary with storage method). The containers are to be placed on top of the science housing. One of them should be a freezing container with temperature -20deg.C and the rest are refrigerator containers with temperature 4deg.C. Samples needing special care should be sealed with inert gas such as nitrogen gas for preventing from oxidation and dehydration. The containers may need a kind of countermeasure against gas generated from stored cores.

Unloading of containers should be performed at a portcall in principle. Science plan of certain leg, however, may require that samples be transferred to a land laboratory quickly and a supply boat then carry such containers if sea conditions allow.

The refrigerator containers are to be used to store the cuttings to be examined and the amount of such should be 200cc for every 5m of drilling depth which makes 1600 200cc bottles for 8000m of total drilling length (when applying 2 holes or more). A space to store 1600 bottles should then be considered in the containers.

5.2 Science Storage
A general storage is a place to store materials for research, gas bottles, sample lapping materials, spare research equipment and various medicines. There needs to be a refrigerator (4m2 or more) to store various medicines and chemicals. The storehouse in the research compartment should be more than 100m2.

6. Compartment Arrangement
6.1 Science Compartment Arrangement
The science areas specified in 2.1 to 2.5 above are best arranged in a row on the same floor, except for a downhole measurement laboratory (2.1). If they must be on separate floors by requirement of the vessel's general arrangement, they may be located on two floors, but scientists strongly request not to exceed two floors. If two floors are used, it is essential from the view-point of safety and efficiency regarding core transportation and working flow, that the whole round core research area (2.2) and the half round core research area (2.3) should be on the same floor and the laboratory street area (2.4) should be on the down floor. In this case, each floor should have a rest area (3.1) to offer researchers opportunities to strengthen their communication.

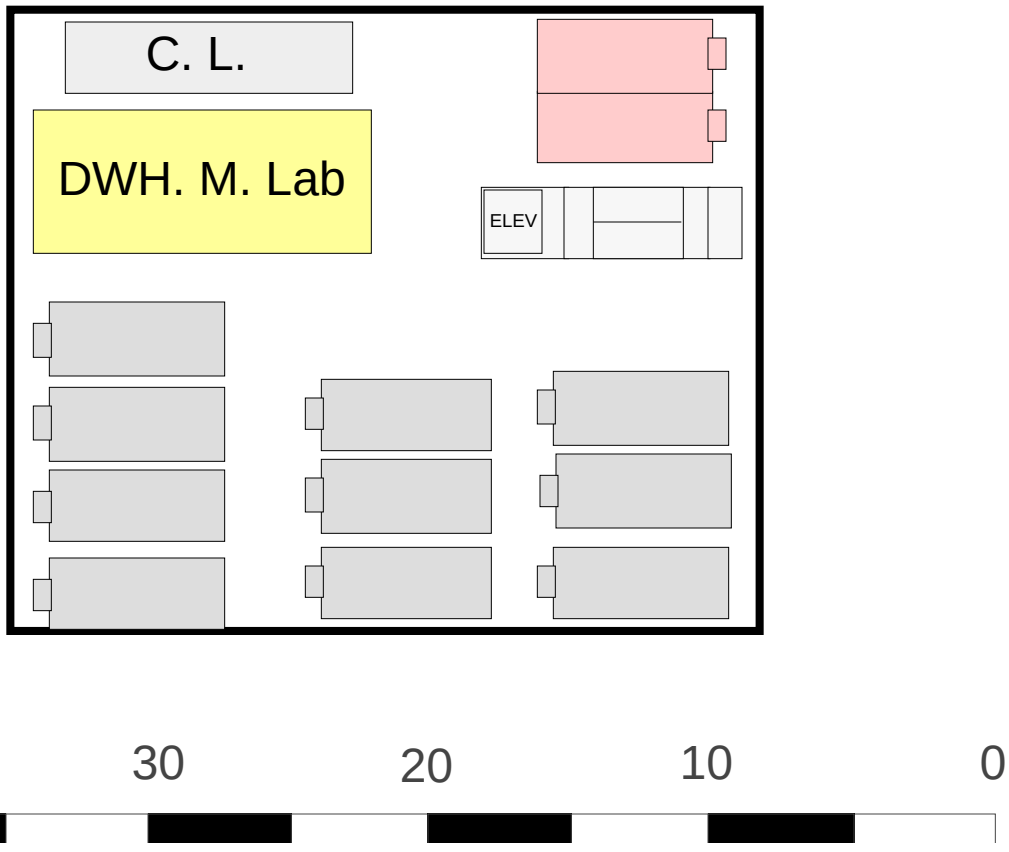
Computer room / user room (3.2), science lounge (3.3), library (3.4), science office (4) are to be located on a different floor from the science areas mentioned earlier.

6.2 Living Compartment Arrangement
A living compartment usually includes a cabin, a dining room, a meeting room, a lounge, a recreation room, a video room, an athletic gym, a locker room etc. For in this report, however, only general cabin space for scientists/technicians will be described.

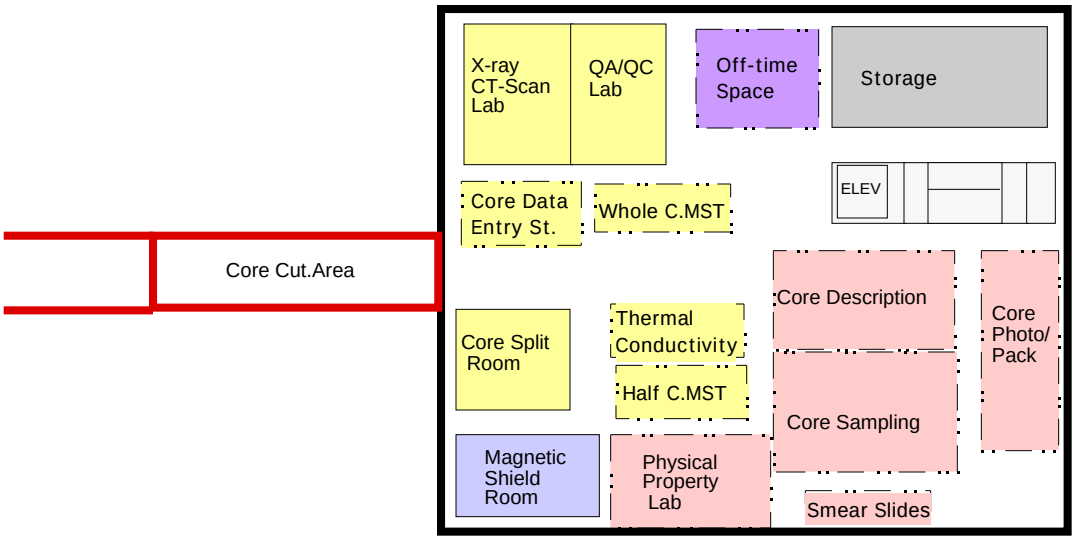
The cabin space of the scientists may comprise a number of units one of which involves 3 simple private rooms and a common space. Each common space should have a shower/toilet unit. The ceiling should be as high as 2.4m (or more) for openness. Each private room should have a port for mobile PCs. Each common space, if necessary, will be equipped with CCTV for information transmission. Natural light windows are not especially requested in each cabin for scientists, technicians and drilling crew.

6.3 Others
It is suggested that toilets and dressing rooms are located appropriately so that female participants feel comfortable during long-range cruising. Laundry machines should be placed for individual use in addition to the catering services.

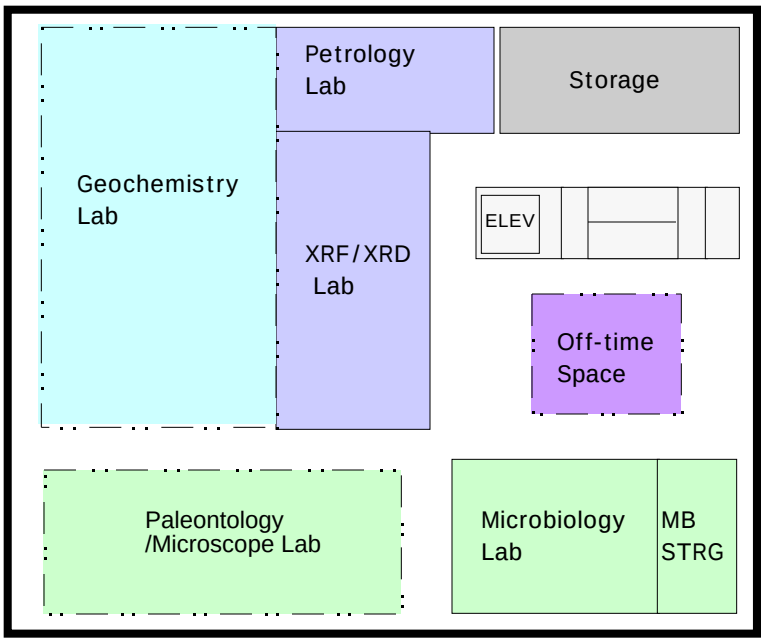
Lab Roof Deck



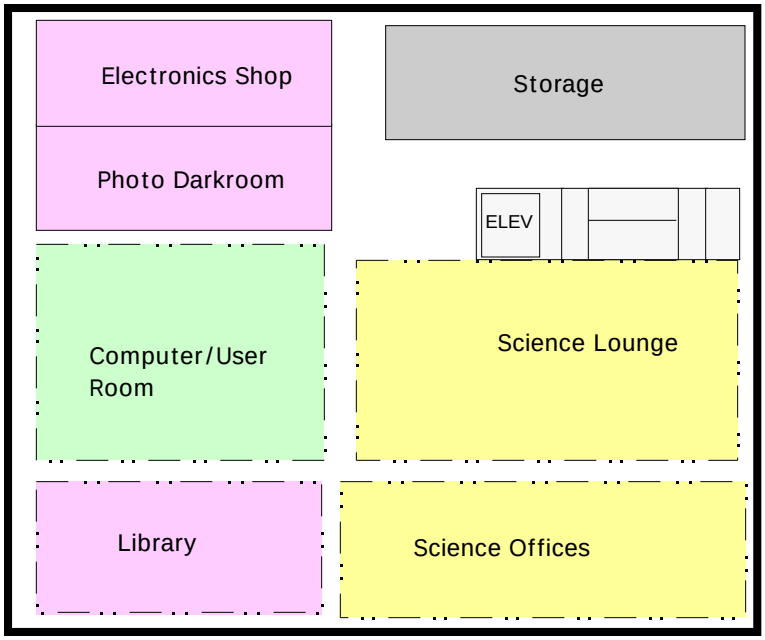
Core Processing Deck



Lab Street Deck



Lab Management Deck



APPENDIX 99-2-9: THIRD PARTY TOOL SUPPORT

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June 11, 1999

Dear Tom Janacek, chair, and SCIMP members:

Please find following our tool development plan and timetable for a new 3rd party logging tool – the Multichannel Gamma Ray Logging tool (MGT). I am appending this to the logging contractor's report to request SCIMP endorsement of our plan to conduct the first sea-trial on Leg 189 in March 2000.

This development is supported independently by NSF and is progressing well towards an at-sea trial on Leg 189. A key innovation of this tool is its ability to be run in series with a standard Schlumberger tool string, minimizing the additionally required rig time for another log. The co-chief scientists are also enthusiastic about the scientific benefits of this tool for the leg objectives. Results of the at-sea test and, ultimately, the universal telemetry module from this tool itself will be made available to ODP for other 3rd party tool developments.

Thank you for your attention to this matter. I apologize for not being able to present this plan in person at your meeting in Boulder.

Best wishes for a successful and enjoyable meeting.

Sincerely,

/s/ Dave

D. Goldberg, BRG

Multi-sensor Gamma-ray logging Tool (MGT) for core-log integration & Universal Downhole Telemetry Module (UDTM) for third-party logging

Tool development plan and timetable

Summary

The purpose of this tool development is to improve the vertical resolution of natural gamma-ray log data in the Ocean Drilling Program for scientific applications requiring high vertical resolution in the borehole and fine-scale core-log integration.

The development of a Multi-sensor Gamma-ray logging tool (MGT) will increase the vertical resolution of downhole gamma ray logging data by a factor or 3-4 over conventional Schlumberger tools used in the ODP, improving their correlation with core measurements and the resolution of low sedimentation-rate cyclicity.

The target deployment of this tool is ODP Leg 189 SW Pacific gateways, which addresses the oceanographic and paleoclimatic effect of the opening of the Tasmanian seaway and initiation of the Antarctic Circumpolar Current. The co-chief scientists for this cruise are enthusiastic about the use of the tool to assist in achieving the scientific objectives of the leg.

This tool development is supported by NSF award OCE 95-31279 to C. Pirmez* and D. Goldberg. (*C. Pirmez resigned as PI of this project in April 1998).

Rationale

In many ODP paleoclimatic and paleoceanographic applications, resolving the cyclic frequency of variation in sediment deposition is a primary goal. Core and downhole tools that measure fine–scale variations enable the periodicity, and thereby the driving forces, to be deduced. All such measurements are limited by the sampling resolution of the downhole instrument at the Nyquist frequency, requiring 2 samples per period to resolve a spatial or temporal cycle, and the core recovery. Downhole tools have the advantage of sampling quickly and regularly at specified depth intervals (typically 6") and without the uncertainties associated with poor recovery and core disturbance. Natural gamma ray measurements are one of only two measurements that are recorded as continuous profiles on both ODP cores and in ODP boreholes. Such continuous measurements have proven especially useful for resolving sediment cyclicity.

Reducing logging speed, the sampling time, and/or the detector size are direct means to improve the vertical resolution of a natural gamma-ray logging tool. Even in the limit of a stationary measurement, however, beds thinner than the dimensions of the sensor crystal cannot be resolved. Hence, there is little to gain in terms of improved vertical resolution by reducing logging speeds and oversampling at intervals shorter than the crystal dimension. Decreasing the detector size is the best way to achieve higher resolution. The crystal dimension is directly related to the number of gamma rays that reach the detector that in turn determines the statistical reliability of the measurement. With a smaller detector, longer counting times are needed to achieve the same statistical stability made with a large detector. To overcome this constraint, the approach taken with the MGT is to stack the gamma ray counts from several smaller detectors in order to achieve a statistically significant number, yet preserve the higher vertical resolution of each independent measurement.

A related concern is the time required to run the MGT (or any other) 3rd party logging tool in ODP holes. A significant amount of rig time is spent for hole preparation and tool rig-up/rig-down, including running it down, then up, through the drillpipe. This time increases significantly for sites located in deep water. Figure 1 illustrates the total logging time for three scenarios in a 500-m deep hole beneath the seafloor. One standard Schlumberger run may take 11-15 hours depending on water depth and hole preparation requirement. A second run would add 5-9 hours.

In contrast, by integrating a 3rd party tool into the Schlumberger string and simply logging a second pass, only 2.5 hours would be added to the total time. Even assuming a reduced logging speed for the second pass, time savings of 2-6 hours per hole (depending on water depth) could quickly amount to a day or more over a full ODP drilling leg.

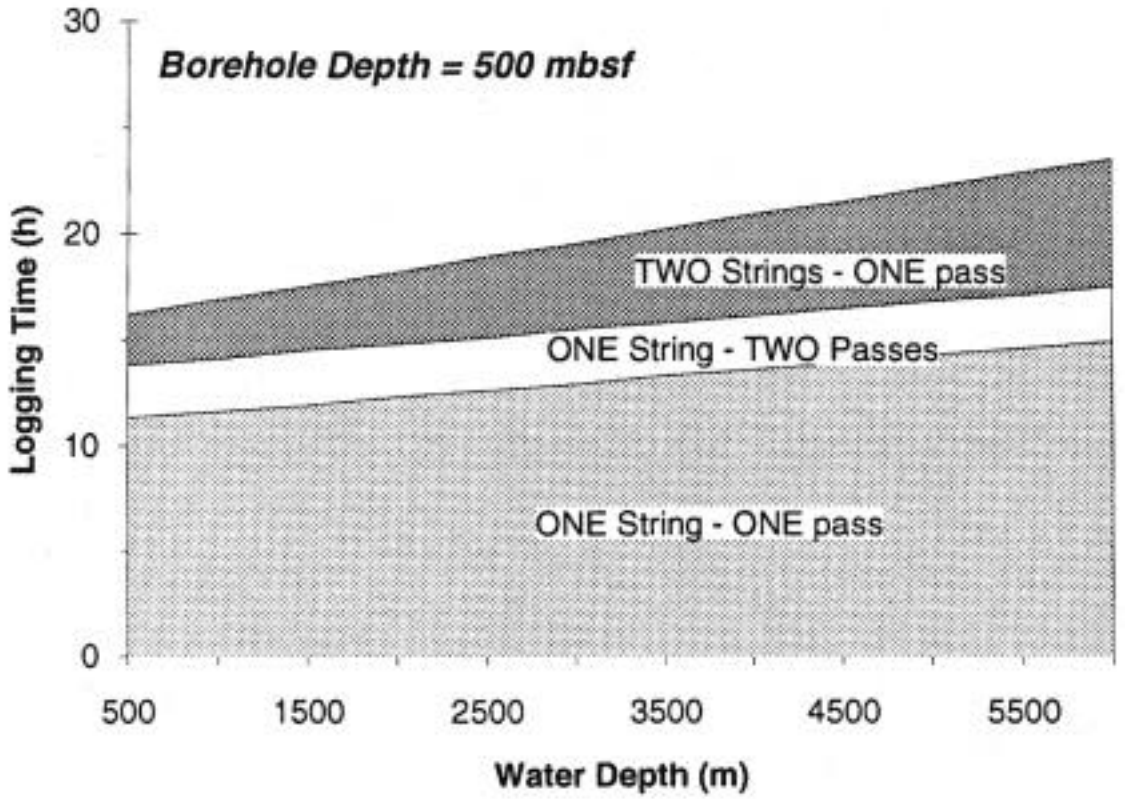

Figure 1. Comparison of logging time on the JOIDES Resolution at various water depths. One and two passes of a single tool string versus two tool strings in the same borehole are shown. A second pass of a single tool string adds 2.5 hours to the total logging time. The time savings using the two-pass approach ranges from 2.4 to 6 hours depending on water depth. Logging times include hole preparation, tool rig-up and rig-down (without the conical side-entry sub). The first tool string is assumed to run at 275 m/h (standard for Schlumberger geophysical tools) and the second at a reduced speed of 200 m/h (likely speed for the MGT).

Tool Design

To implement these new efficiencies in ODP logging, a Universal Downhole Telemetry Module (UDTM) will enable the MGT to be run in a "two-pass" rather than "two-run" logging operation, integrated within the standard Schlumberger tool string. The telemetry system of the UDTM and receiving surface panel can be used as a general-purpose platform for deployment of other 3rd-party tool sensor modules. It will also have the capacity to serve as an independent platform for tool deployments where the integration with Schlumberger tools is not desirable or not possible (e.g. very shallow ODP holes or non-ODP holes). The UDTM-MGT string will be mechanically and electrically compatible with the Schlumberger tools used on the ship. A block-diagram of the downhole tool design as well as the surface data acquisition system is shown in Figure 2. The UDTM and the MGT are housed in stainless steel pressure cases (approx. 2.5 and 3 m long, respectively) ending with standard 31-pin Schlumberger connectors. The tool will be centered in the hole using Schlumberger centralizers.

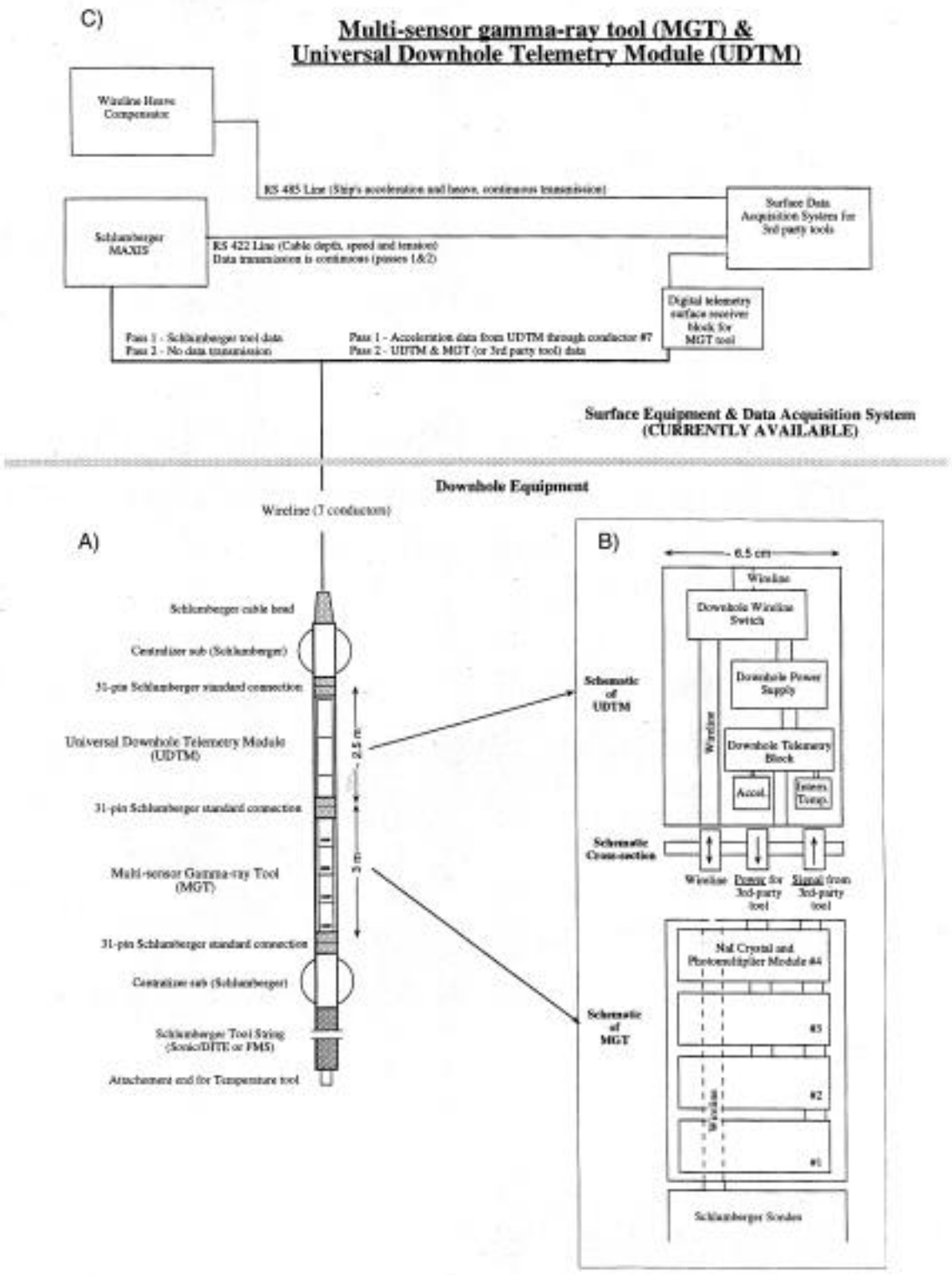

Figure 2. A) Schematic of MGT and UDTM 3rd party tools system. B) Internal components of UDTM and MGT sondes. The UDTM will contain a wireline switch to enable data acquisition and power supply to either the Schlumberger tools or to the MGT, allowing for either tool string to be used during a logging pass. C) Data acquisition system on the JOIDES Resolution. This system is currently in place.

MGT

The MGT will contain an array of 4 independent, self-contained gamma spectrometry measurement modules. Each module contains a ruggedized detector assembly (4"x2"NaI(Tl) crystal and PMT) and an electronics block containing a high-voltage power supply, pulse-shaping and counting circuitry, and a programmable microcontroller for real-time pulse spectrometry and communication with the UDTM. The MGT will provide spectral gamma-ray data in counts per second that will be calibrated to standard API units in the surface system.

The nominal resolution of Schlumberger's NGT gamma-ray tool is 36-46 cm, considering its detector size and typical ODP logging speeds. The nominal resolution of the MGT will be 12.5 cm, under the same conditions. For logging speeds of the order of 600 ft/hr (5 cm/s) and an averaging time constants of 1-2 seconds, a maximum statistical error of +/-10% in total counts is realizable in very weakly radioactive formations (10-20 API units) with much smaller errors in more active formations. The data from each MGT detector will be averaged at constant depth intervals and selected for the best possible vertical resolution given the logging speed and adequate statistical stability (e.g. 5 cm sampling at 600 ft/hr).

UDTM

The UDTM will contain: 1) a digital telemetry system to transmit the MGT (or other) data uphole through the wireline; 2) a power supply providing standard voltages for downhole sensors; 3) a vertical accelerometer and internal temperature sensor; and 4) a downhole wireline switch connecting logging cable lines either to the MGT or to a Schlumberger tool string upon a surface command. The digital telemetry system will collect the natural gamma ray spectral data from the MGT modules, accelerometer and temperature sensors at 4-8 Hz sampling rate and transmit them uphole. The accelerometer and temperature measurements enable tool motion and temperature variations to be corrected in post-processing (see below).

Data acquisition

The telemetry data receiver in the surface panel will interface the MGT to the existing PC-based data acquisition system (DAS) currently available on the JOIDES Resolution. The DAS provides access to depth data from the Schlumberger MAXIS system and uphole acceleration/heave data from wireline heave compensator. The DAS is currently used for other specialty and 3rd party tool deployments, such as the TAP tool. Software based on LabView (National Instruments) will be developed to control tool operations, acquire the MGT data, merge them with time and depth information, and provide an operator interface. This will be a real-time display of the total gamma-ray count at each detector, the stacked gamma-ray log based on cable depth and tool acceleration, and other relevant operational information. The data records including time, depth, and acceleration will be written to hard drive for post-processing.

Post-processing

The MGT post-processing steps are somewhat analogous to the filtering, depth correction (based on the accelerometer and cable speed information), and signal stacking approach used in multi-channel seismic data acquisition and processing. The MGT readings will also be corrected for hole diameter variations using standards charts (e.g. Schlumberger, 1994) and caliper data from Schlumberger tools run in the same hole. The data from individual modules will be corrected, depth shifted, and then stacked in real-time based on MAXIS depth information. The stacking process is expected to provide a 4/3 increase in count effectiveness when compared to a detector 3 times larger in volume, such as those in Schlumberger's NGT tool. Accelerometer-based depth shifting will precede the summation of the gamma counts. The quality of the stacking process will be evaluated by the statistical characteristics of the shifted data prior to and after acceleration correction using the variance of sample populations.

To achieve the highest possible resolution using the MGT, initial analyses of downhole tool motion associated with ship heave (~0.1 Hz or periods of ~10 s) must be corrected during the stacking process. Correcting for this become crucial when the residual tool motion, i.e. the actual displacement minus the displacement assuming a constant logging speed, is of the same order as the detector dimension. These corrections may reach quite large values in the case of extreme stick-slip conditions while logging, such as for the FMS tool. Downhole tool accelerations will be determined during the at-sea testing program on Leg 189. Errors associated with hole deviation from vertical (generally < 5deg for ODP holes) will be neglected. The MGT data will be corrected based on the single-axis accelerometer data included in the UDTM.

On-shore system testing

Shore-based testing of the MGT and UDTM modules will be performed under simulated in situ conditions to verify the temperature and pressure ratings of the tools, the performance of the telemetry system, and the operation of the wireline switch with the Schlumberger tool string. The MGT and UDTM are rated for operation up to 85°C, limited primarily by the electronic components. The pressure cases will be rated to 10,000 psi (~7 km below sea level) which should be appropriate for most ODP logging conditions. These tests will be conducted at the Borehole Research Group facility at LDEO and at the Schlumberger Testing Facility in Houston. The calibration of the gamma-ray counts to GAPI (Gamma-ray American Petroleum Institute units) will be done at the University of Houston calibration pit. This calibration is important because API units are the industry standard for gamma-ray tools, enabling direct comparison of the measurements with this tool to other logging tools and core systems.

At-sea system testing

The first at-sea deployment of the MGT and UDTM is targeted for Leg 189, SW Pacific Gateways, which addresses the oceanographic and paleoclimatic effect of the opening of the Tasmanian seaway and initiation of the Antarctic Circumpolar Current. These sites will allow the documentation of the Southern Ocean's role in, and response to, climate events such as early Pliocene warming, the mid-Pleistocene climate transition, its chemical variations compared to other Southern Ocean ODP sites, and the cyclic movements of the polar front at astronomical periods. A continuous record of polar front variability will provide new information on its relative sensitivity under different circulation and climatic regimes.

On Leg 189, the MGT will dramatically extend the range of the Eocene sedimentary environments in which such cyclicity can be characterized. Both orbital and shorter sediment cyclicity related to periodic polar front movement over the previous 40 Ma (a primary leg objective) can be monitored despite expected sedimentation rates that may be as low as 1-3 cm/kyr. Many ocean sediments accumulate at rates similar to the Leg 189 sites, thus the potential to conduct similar studies in a broad range of environments will eventually be possible. The ability to monitor suborbital variability at more rapidly accumulating sites may also allow the characterization of millennial scale climate variability. Armed with the MGT records, it may then be possible to both verify the existing astronomical age scale and extend it well into the middle Eocene.

The co-chief scientists for this cruise have been in contact with the LDEO Logging Staff Scientist (U. Ninnemann) and are enthusiastic about the use of the MGT to assist in achieving the scientific objectives of the leg.

Development timetable

The following timetable outlines the development and testing program for the MGT and UDTM. The design and manufacture of mechanical parts and tool assembly tasks are being carried out largely in parallel with the design and manufacture of electronic components and software coding. At-sea testing is targeted for Leg 189.

Bibliography

Pirmez, C., A. Meltser, and D. Goldberg, 1998, A high-resolution, multi-sensor gamma-ray tool, AAPG International Conference, Rio de Janeiro, Nov. 1998.

DEVELOPMENT TIME TABLE

UDTM	
Telemetry system electronics design	Done
Power system and switching system electronics design	Done
PC boards design and manufacturing	Done
Embedded software development	July 1999
UDTM mechanical design	Done
UDTM manufacturing, assembly and wiring	July 1999
Telemetry surface panel design and manufacturing	Aug 1999
UDTM software/hardware integration and testing	Aug 1999
UDTM testing with Schlumberger tools (Houston)	Sept 1999
MGT (measurement system)	
NG detectors development and manufacturing (Bicron)	Done
NG detectors testing and preliminary calibration	Done
NG pulse spectrometry electronics development	Sept 1999
Single channel electronics module design	Oct 1999
Embedded software development	Nov 1999
MGT PC boards design and manufacturing	Oct 1999
MGT mechanical design	Oct 1999
MGT manufacturing assembly and wiring	Dec 2000
Data acquisition software development (LabVIEW)	Dec 2000
MGT software/hardware integration and testing	Jan 2000
System Testing	
Complete system bench testing	Jan 2000
Borehole testing in Tree-Ring Well (LDEO)	Feb 2000
Testing with Schlumberger tools and API calibration (Houston)	Feb 2000
Deployment on ODP Leg 189	March 2000