SCIMP APPENDIX 00-1-1

Update on Recommendations -- June 99 Meeting

The sixteen recommendations resulting from the June 1999 SciMP meeting are summarized below. They have been grouped by topic for ease in presentation. More detailed discussion of these recommendations are found in the June 1999 SciMP report and associated appendices.

1) Digital Imaging

SCIMP REC 99-2-12: PURCHASE OF DIGITAL IMAGING SYSTEM.

2) Publications

SCIMP REC 99-2-1: ODP/DSDP CITATION DATABASE
SCIMP REC 99-2-2: PRELIMINARY REPORT AUTHORSHIP
SCIMP REC 99-2-3: LOGGING REPORT AUTHORSHIP

3) Underway Geophysics

SCIMP REC 99-2-10: USE OF SINGLE-CHANNEL STREAMERS
SCIMP REC 99-2-11: TUNED-GUN ARRAYS vs. GI GUNS

4) OD21 Laboratory Design

SCIMP REC 99-2-13: OD21 LAB DESIGN CHANGES
SCIMP REC 99-2-14: WORKING GROUP ON RISER SHIP DATA
SCIMP REC 99-2-15: OBSERVERS ON INDUSTRY DRILL SHIPS.
SCIMP REC 99-2-16: JOINT INDUSTRY PROJECTS

5) Other

SCIMP REC 99-2-4: JANUS DATABASE ENTRY
SCIMP REC 99-2-5: PALEO LAB TECHNICAL SUPPORT
SCIMP REC 99-2-6: PORTABLE JANUS PALEO APPLICATION
SCIMP REC 99-2-8: CORE WRAPPING
SCIMP REC 99-2-9: SAND BLASTER AVAILABILITY
SCIMP REC 99-2-7: MRC RECOMMENDATION

1) Digital Imaging

Background: 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 description, stratigraphy, mapping of lithologic variability, and core-log integration that would derive significant benefits from the shipboard utilization of digital imaging. A clear consensus of the panel emerged that a move to digital imaging on the JOIDES Resolution is scientifically justified and that a strategic plan is needed to move ODP-TAMU in that direction.

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. It does not appear that the continued modification of the imaging system currently on the ship will result in a timely solution to the digital imaging problem and could 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 and 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.

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.

Update: *At this time it appears that sufficient funds are available and ODP-TAMU is proceeding in the expectation that a system will be in place by mid year. See Core Description (Section E.1) and ODP-TAMU Operator's Report in Appendix 00-1-2 for additional information and further SCIMP action on this recommendation.*

2) Publications

•ODP/DSDP Citation Database

Background: In response to a previous SciMP request regarding the costs and feasibility of developing an DSDP/ODP citation list, Ann Klaus (ODP Publication's Manager) presented the panel with several options utilizing the AGI GeoRef data base. A single copy of the database that could only be used by the ODP/TAMU staff to generate reports and statistics 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 new 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.

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.

Update: *At the directive from JOI, ODP/TAMU has finalized the agreement necessary for the American Geological Institute to compile a database of citations to papers published on DSDP/ODP-related research. A single copy of the database has been purchased on CD-ROM and will be housed with the Publication Services Department. During the first half of 2000, the Department will generate a citation report to be distributed to the community. The report will separate citation data for papers published in Program publications vs. journals and books. The database (drawn from the full American Geological Institute GeoRef database) will contain an estimated 12,500 references to Program-related publications produced since 1969. The CD will also contain the software necessary to access the data. The database will be delivered to ODP/TAMU by 20 December 1999, and comes with provisions to update the database on an annual basis.*

See discussion in Section E.11 for SCIMP response to JOI Directive.

•***Preliminary Report Authorship***

Background: Ann Klaus 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 volume 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 publication of the Preliminary Report on the WWW as soon as possible after a cruise is a good way to accomplish this task. The proprietary nature of the report should be eliminated and the report be 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" their 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 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.

Update: *JOI has told TAMU to implement this recommendation*

•***Logging Report Authorship***

Background: 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 credit and 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"

Update: *The authorship of all web based post-cruise logging reports has been changed to follow SCIMP Recommendation 99-2-3.*

3) Underway Geophysics

• ***Streamers***

Background: ODP-TAMU has been unable to dependably obtain data from their two ITI 6-channel streamers. When the streamers have worked, the data are 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 TAMU 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 this recommendation. The *JOIDES Resolution* is not a survey ship and the Teledyne single-channel streamers provide adequate data for site characterization when needed.

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.

Update: *This has been done. The six-channel streamers are no longer on the ship, and ODP is using only the Teledyne single channel streamers.*

•***GI Guns***

Background: 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 TAMU 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 new GI guns. 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 would allow the ODP technical staff the flexibility to expand responsibilities in other domains.

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.

Update: *See ODP-LDEO Operator Update in SCIMP Appendix 00-1-3 for action by ODP LDEO and ODP-TAMU on this issue. Also see Underway Geophysics discussion and recommendations in Section E.5 for further SCIMP action on this issue.*

4) Riser Ship

•OD21 Ship Design

Background: SciMP was asked by the IPSC (IODP Planning Sub-Committee) to assist in planning the laboratory design on the OD21 riser vessel (see SciMP Report and SciMP Appendix 99-2-7 for more details and drawings). 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.

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.

Update: *The OD21 design group incorporated these design suggestions into their second draft. See SCIMP Appendix 00-1-4 revised design drawings*

•Riser Ship Working Groups:

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.

Update: *A visit to Conoco's riser ship by a subset of SCIMP members, IPSC, JAMSTEC and JOI personnel is currently being planned for February 23, 2000.*

•Joint Industry Projects

Finally, discussion centered around the need for increased academia-industry interaction, particularly via Joint Industry Projects (JIPs). 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. An example of such a project includes the TAMU riser-less drilling JIP

Update: *Recent Industry/Technology projects include the JAMSTEC/JOI Memorandum of Understanding for the ADCB project, the HYACE development, tand he Conoco deep water site investigation project . Recent Industry/Science collaborations include the Houston Planning Workshop, the EGI South Atlantic Data Migration Project and the meeting of ODP member offices to review industry partnership efforts.*

5) Other Recommendations

•*Janus Database Entry*

Background: Brian Huber presented the panel with the recommendations set forth by the Micropaleontological Reference Centers workshop. 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.

Update: *This issue is being emphasized to the Co-chiefs at the pre-cruise meetings, and it is now a regular part of the Staff Scientist's duties during the leg to verify that this is being done and, if necessary, to take corrective action.*

•*Paleontology Laboratory Technician*

Background: The workshop participants group feel 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 see 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.

Update:
1) ODP will have the LO or a technician (usually the X-ray or Thin section tech in addition to the photography tech who is responsible for the microscopes) discuss the paleo and paleo prep labs and point out the equipment, safety procedures, supplies and reference material available to the scientists.

2) Reference materials available in the labs will be inventoried each leg.

3) ODP will step up our vigilance in seeing that the equipment is operating and the lab is well supplied

4) In planning for the leg during the pre-cruise meeting, ODP now asks the co-chiefs to keep in mind that the basic staffing cannot provide support for all the possible services/measurements that can be accomplished onboard. Special measurements or high resolution shipboard analyses that require additional support in one lab may mean that they must reduce support in another lab. In some instances, an increase in the size of the technical staff may be possible. If the co-chiefs wish to allocate additional staffing for assistance in sample processing, ODP-TAMU will work with them to prioritize tasks and see if there are duties or responsibilities in other labs that the co-chiefs feel should not be accomplished in order to shift staffing needs to the paleo labs.

•Janus Paleontology Application

Background: The recent change of the SR volume to an electronic format has resulted in more of the post-cruise biostratigraphic data coming to ODP as data reports, but the distribution charts in these 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 can 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. 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 new/revised 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.

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.

Update: *Given the list of Janus-related programming projects, John Firth considers this to be a very low priority in terms of ODP programming. However, ODP will resurrect the old FossiList application code and put it on the web for people to use and modify. FossilList currently outputs data to Excel spreadsheets in a format very similar to the PAL program, which can then be uploaded into the JANUS via the PAL program. Also, if Dave Lazarus can find the time, the FossiList program will be recompiled in 4D to run on both Mac and PC*

•Core Wrapping

Background: 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 in D-tubes. 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 (the ODP Curator) supplied a memo (post-meeting) to SciMP which stated that at the 1998 Curator's meeting held in College Station most curators recommended that the DSDP cores still be wrapped in plastic. 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.

Update: *Core Wrapping proceeding as outlined in the Recommendation. A total of 42,654 core sections have been wrapped to date. See ODP-TAMU Operator Report (Appendix 00-1-2) for more details of this project.*

•Leg 185 Sandblaster Usage

Background: A test use of a sandblaster on Leg 185 to clean samples for geochemical work was previously recommended by SciMP. The sandblaster was purchased by a Leg 185 shipboard scientific participant with the understanding that if the technique was successful ODP-TAMU would 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 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.

Update: *The sand blaster used on Leg 185 is presently stored at ODP/TAMU and can be returned to the ship when required.*

•Micropaleontological Reference Centers

Background: Brian 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.

Update: *Approved by SCICOM.....now in hands of new MRC lead curator, Michael Knappertsbush, to implement.*

SCIMP APPENDIX 00-1-2

ODP-TAMU SCIENCE OPERATOR'S REPORT

Contents:

Operations Schedule (updated 24 November 1999)

	Port (origin)[1]	Dates	Total days (port/sea)	Days at sea (transit/ on site)	Science Operator contact (TAMU)	Logging Services contact (LDEO)
187: Australian-Antarctic Discordance	Fremantle	15 Nov. 1999 - 12 Jan. 2000	58 (5/53)	15/38	J. Miller	F. Einaudi
188: Prydz Bay	Fremantle	12 Jan. - 12 Mar. 2000	60 (5/55)	22/33	C. Richter	T. Williams
189: Southern Gateways	Hobart	12 Mar. - 13 May 2000	62 (4/58)	12/46	M. Malone	U. Ninnemann
Transit (Townsville-Guam)	Townsville	13-24 May 2000	11 (3/8)	8/0	B. Julson	N/A
190: Nankai I	Guam	24 May - 17 July 2000	54 (1/53)	7/46	A. Klaus	S. Saito
191: W. Pacific Ion/HD Engineering	Yokohama	17 July - 13 Sep. 2000	58 (5/53)	12/41	C. Escutia / L. Holloway	V. Louvel
192: Ontong Java	Guam	13 Sep. - 9 Nov. 2000	57 (5/52)	12/40	P. Wallace	G. Cairns
193: Manus Basin	Guam	9 Nov. 2000 - 6 Jan. 2001	58 (5/53)	9/44	J. Miller	G. Iturrino
194: Marion Plateau	Townsville	6 Jan. - 2 Mar. 2001	55 (5/50)	13/37	P. Blum	TBN
195: West Pacific Ion	Guam	2 Mar. - 8 Apr. 2001	37 (5/32)	7/25	C. Richter	TBN
196: Nankai II[2]	Kaohsiung	8 Apr. - 7 Jun. 2001	60 (5/55)	9/46	A. Klaus	TBN
197: Hotspots	Yokohama	7 Jun. - 1 Aug. 2001	55 (5/50)	15/35	G. Acton	TBN
198: Gas Hydrates[2]	Dutch Harbor	1 Aug. - 30 Sep. 2001	60 (5/55)	9/46	M. Malone	TBN
199: Paleogene	San Francisco	30 Sep. - 29 Nov. 2001	60 (5/55)	19/36	C. Escutia	TBN
200: H_2O	Honolulu	29 Nov. 2001 - 6 Jan. 2002	38 (5/33)	18/15	T. Davies	TBN
201: SE Paleoceanography	Panama City	6 Jan. - 3 Mar.[3] 2001	56 (5/51)	21/30	P. Wallace	TBN

Notes:
[1] Although 5 day port calls are generally scheduled, the ship sails when ready.
[2] Mid-leg port calls may occur for Legs 196 and 198.
[3] Leg 201 is tentatively scheduled to end in Valparaiso.

Leg Reports

Leg 186 W. Pacific Net

Two borehole geophysical observatories were installed ~1100 m below the seafloor on the deep-sea terrace of the Japan Trench during Ocean Drilling Program Leg 186. Site 1150 (39°11'N, 143°20'E) and Site 1151 (38°45'N, 143°20'E) are located in areas with contrasting seismic characteristics. The northern site is within a seismically active zone where microearthquakes are frequent and M7 earthquakes recur. The southern site is within an aseismic zone where no earthquakes are observed. These features coexist within the seismogenic zone of the Japan Trench plate subduction zone, where the >100-Ma portion of the Pacific plate is subducting at a fast rate (~8 cm/yr) beneath northern Japan causing major earthquakes along the trench. Such a dynamic nature of the subduction seismogenic zone remains unexplained because no geodetic and few seismic stations exist on the seafloor that give us hard evidence in the vicinity of the fault (décollement) zone. Leg 186 is the first scientific venture to succeed in installing state-of-the-art strain, tilt, and seismic sensors for long-term operation in seafloor boreholes. The borehole instruments were installed only 10 km above the gently dipping (< 5°) plate boundary. The systems started collecting data in September 1999 and will be serviced by a remotely operated vehicle (ROV) at least once a year to recover continuous high sampling rate and wide dynamic range data. These stations will make invaluable additions to the existing geophysical network over the western Pacific. This type of multiple-sensor seismo-geodetic observatory can now be emplaced by the *JOIDES Resolution* at many other areas where active processes await to be monitored.

Recovering detailed ash records was another of the drilling objectives. As with previous drilling results, a general increase from ~9 Ma and a peak in the past 0.5-4 Ma is observed at the two sites. Postcruise studies will examine the details of the ash record, which was more completely recovered on Leg 186 than on previous cruises.

Inorganic geochemical analysis confirmed that a large decrease in chlorinity and salinity with depth exists in the Japan Trench region. This was first observed at DSDP Sites 438 and 439 but not at other sites of Legs 56 and 57. The character of the anomalies varies also between the two ODP Leg 186 sites. Overall, the magnitude of decrease seems much larger than other subduction environments such as at Nankai or Barbados.

To further our understanding of the plate subduction dynamics, near-site multiple disciplinary investigations are clearly needed. In particular, geological "hysteresis" concealed in present-day dynamics needs to be better understood in order to to construct physical models by linking geological/geochemical and geophysical studies. Leg 186 is one such investigative attempt to link current and past dynamics by establishing borehole observatories and by obtaining core and logging data at the seismogenic zone of the Japan Trench.

Leg 187

The Australian-Antarctic Discordance (AAD) is an anomalously deep region centered on the Southeast Indian Ridge (SEIR) between Australia and Antarctica. Among its unique

features is an unusually sharp boundary between the ocean-basin scale upper mantle isotopic domains of the Pacific and Indian Oceans. This boundary has migrated westward into and across the easternmost segment of the AAD at a rate of 25-40 mm/yr during the last 4 m.y., yet the long-term relationship of this important boundary to the AAD remains unclear. There is limited evidence to suggest that the boundary has been migrating westward for ~40 m.y., since the separation of the South Tasman Rise from Antarctica. However, it seems likely, perhaps even probable, that the isotopic boundary is genetically linked to the mantle processes that have maintained the existence of the AAD for >90 m.y., since Australia and Antarctica first rifted apart.

The long-term configuration and dynamic history of the isotopic boundary can be determined by systematic off-axis sampling beyond the limit of effective dredging (~7 Ma). The objective of Leg 187 is to extend the sampling program to older crust (10-30 Ma). An array of 19 drill sites has been designed to determine the configuration of the isotopic boundary and to distinguish among competing hypotheses concerning the nature and extent of mantle migration beneath the SEIR. Approximately 10-12 single-bit holes will sample 20-100 m (ideally about 50 m) into igneous basement. A reactive drilling strategy will allow the selection of later sites within a few hours of core recovery on the basis of trace element data obtained from the earlier sites. Reports from the ship indicate that this strategy has been highly successful. Leg 187 is scheduled to end in Fremantle on January 12, 2000, and Jay Miller, Staff Scientist for the leg, will be able to present a report at the SCIMP meeting.

Dry-dock/Yard Period

JOIDES Resolution arrived at Keppel Shipyard, Singapore, on September 1, 1999, following a transit from Yokahama, and departed October 28 for sea trials and transit to Fremantle for the beginning of Leg 187. While in the shipyard, JOIDES Resolution underwent routine maintenance and inspection, and extensive mainentance/refurbishing of the hull, thrusters, and living quarters. The ship's station-keeping and power distribution systems were upgraded, and four modifications of particular interest to SCIMP were carried out:

- Active heave compensation and rig instrumentation were installed
- A new 7th level was added on the top of the lab stack
- The core lab was remodelled to improve core flow
- A breathing system to facilitate safe handling of H2S laden cores was installed

Active Heave Compensation (AHC) System

Improved heave compensation and rig instrumentation will lead to enhanced core quality under adverse environmental conditions, and allow ODP to effectively use a wider range of drilling and coring tools, e.g. hammer drilling. A multitude of installation problems were ultimately rectified during the dry-dock period and the subsequent Fremantle (Leg 187) port call. Sea trials of the AHC were completed and crew training was carried out during tests offshore Albany, SE Australia. Commissioning took place prior to commencing Leg 187 science operations. Initial off bottom tests were observed using the subsea television camera and verified that the AHC provided significant improvement in

reducing bit motion over the passive mode. Although erratic WOB fluctuations were experienced during the limited drilling activities, these were resolved by the Maritime Hydraulics (MH) engineer during the commissioning period. Ultimately the AHC was holding the bit weight variation to 2K with a vessel heave of 8-10 feet peak to peak. In comparison, the passive mode weight-on-bit (WOB) variation was 10K.

Initial field reports from the sailing ODP project engineer indicate there may be a software/gain problem that will require resolution before the system can be considered operational. It appears that the Motion Reference Unit for the AHC is not calibrated properly, causing faulty heave feedback and excessive weight on bit variation during coring operations. Continued trouble shooting of the system is being hampered by the lack of specialized (MH) diagnostic equipment and software. However, the crew continues to operate the AHC as they go into and out of the hole and sometimes just off bottom. The AHC project engineer will be collecting real time active heave data with the new rig instrumentation to send to Maritime Hydraulics for review.

Current plans are to sail a Maritime Hydraulics engineer on Leg 188 to continue refinement of the AHC into a fully functional system.

New 7th level on the lab stack

The shell for the new level was fabricated on the dock at Keppel Shipyard and then lifted and welded into place on top of the lab stack. Interior partitioning and basic plumbing, power, lighting and air-conditioning were completed before the ship left the yard, and equiping and outfitting the space is proceeding during Leg 187. The new level provides for a large shop area for downhole tools and instrumentation, a downhole telemetry space, additional lab space, an additional meeting room/conference room, and a staging platform for on- and off-loading core boxes and supplies. The lab space is intially being outfitted for microbiology, using equipment that was formerly in the temporary van used on Leg 185. SCIMP will be able to inspect the new level during the Fremantle port call.

Core lab modifications

The main change in the core lab is the relocation of the core splitting room to the corner formerly occupied by the whole core track systems. Accompanying this change the air-conditioning/ventilation system has been upgraded, and the track systems relocated to the center of the lab. The new location of the splitting room will improve core flow through the lab, and facilitate safer handling of gassy cores, due to improved ventilation. SCIMP will be able to inspect these modifications during the Fremantle port call.

H2S breathing system

Air lines have been installed on the rig floor and core receiving platform (catwalk) with readily accessible points where personal breathing apparatus can be connected. This system avoids the necessity for individuals working on the cores to wear bulky air tanks, making it easier for them to move around, and making work with H2S laden cores less stressful and less fatiguing. SCIMP will be able to inspect these modifications during the Fremantle port call.

Science Services

ICP

A JY2000 ICP was purchased in July by the U.S. Department of Energy and made available to ODP. The instrument arrived at ODP/TAMU from France in mid September. It was temporarily set up in the lab at ODP/TAMU and both Rick Murray and JY technical representatives conducted training sessions for ODP technical support staff and staff scientists.

The instrument was then shipped to Fremantle and installed in the chemistry lab at the beginning of Leg 187. Reports from the ship indicate that the instrument is performing extremely well. Jay Miller, Staff Scientist on Leg 187, will be able to give an update on the performance of the ICP at the SCIMP meeting.

Microbiology

The temporary van used for microbiology on Leg 185 was removed from the ship during dry-dock and the equipment has been relocated in permanent lab space. Initially this is located in the new top level on the lab stack, but it may be more efficient to locate microbiology activities on the same level as chemistry. This could be achieved when/if the XRF is removed from the ship by relocating the XRD and thin section making activities and using the resulting vacant space on the chemistry lab level for microbiology.

A separate report from the BUGSCOM meeting outlines a planned future routine microbiology program.

Repositories

Curatorial Statistics

See attached figures/tables for FY99 activity.

Numbers of samples issued and requests completed reflect the shift in cores and sampling parties from the BCR to the GCR in FY99. The GCR received 16,358 m of core from Legs 181-186, and had post cruise sampling activity for Legs 181, 182, 183, and 184. The BCR has maintained a relatively high level of activity because of interest in recent legs such as 175, 177 and 178. The ECR has increased its sampling activity for the third straight year, and took more than twice the number of samples than in FY96 (when it took 6104 samples). The WCR has also increased sampling activity for the second straight year, with 64% more samples taken than in FY97 (when it took 1181 samples), although the overall number (1932) still remains low.

The number of visitors to each repository reflects the large amount of sampling activity at the GCR, as well as relatively high activity at the BCR and ECR, whereas the WCR had only a few sampling visitors. However, the WCR has had more time to arrange and accommodate visits of educational groups.

The length of time to complete post moratorium requests shows that 50% of requests were filled within 3 weeks of the date of request, and 75% are filled within 56 days. The long tail on the curve is the result of several situations: (a) requests for large amounts of samples which the investigators took themselves, sometimes over several widely spaced visits to the repositories, (b) a museum request where the cores were requested more than a year before the museum's exhibit hall was ready to receive the cores, (c) samples that had been taken by repository staff, but were held and not shipped at the request of an investigator who was not ready to receive the samples until much later, (d) requests for several thousand samples, where the repository staff took and shipped subsets of the samples over a long period, because of short staffing.

Permanent Archive Sampling

11 permanent archive requests were received during FY99, of which 9 were approved, and 2 (from the same investigators) have decisions pending on them by the CAB until further information is provided by the investigators. The 11 requests were from 7 investigators. The total number of samples taken for these so far is 1069, of which 727 were <2cc. Two requests were for u-channels.

Museum Displays/Conference Displays

Museum Loans:

The American Museum of Natural History (AMNH) display of ODP cores began in July, 1999. The AMNH has a Leg 165 Cariaco Basin core showing annual laminations and the Younger Dryas event, as well as a Leg 108 core showing Milankovitch cyclicity in older (Miocene) sediments.

One new museum loan is pending. The North Carolina State Museum of Natural Sciences has requested two core sections for a new display hall opening in 2000.

Conference Displays:

None were shown in FY99, but Paula Weiss (ECR) made replicas of K/T Boundary and Cariaco Basin cores for display in the future. A couple were on display at the Dec. 1999 AGU meeting (FY00). We plan to make replicas of other types of cores in the future.

Personnel

GCR - one new FTE curatorial assistant position filled.

5 Curatorial Staff sailed on 3 ODP legs in FY99 (182, 184, 186) as Shipboard Curatorial Representatives.

Reprint Collection/Bibliography DB

The Curatorial Bibliographic Database is now current with all published ODP SR volume publications and with all received journal reprints entered into it. What remains to be done is to re-establish links between publications and sample requests that were entered into the old S1032 database. When the old records were migrated into Oracle, these links were not transferred. Thus the statistics on links below reflect primarily the data entered into Biblio (Oracle) after the migration. Updated statistics should be available for the next SCIMP meeting.

ODP Requests: 6105
ODP Requests/parts: 8175
Publications: 5053
Publications linked to one or more sample requests/parts: 2314
Requests linked to one or more publications: 2328
ODP SR volume publications: 2385
Outside journal publications: 1983
Abstracts: 105
Dissertations: 59
ODP IR citations: 521

Core Wrapping Project

A total of 42,654 core sections have been wrapped to date.

The core wrapping project is progressing most rapidly at the BCR, where dedicated student workers have been hired, and where no new core has been received for 1.5 years. The total number of sections wrapped to date at BCR is about 31,900. The BCR should be completed within 1.5 - 2 years at the current rate of progress.

The GCR has had extra help to wrap cores as well, but progress has been hampered there (as at the BCR in FY98) because of a steady influx of new core (see above), a new repository addition opening up and many new core racks to be built, as well as several sampling parties, all of which took resources away from the core wrapping. The GCR has wrapped a total of 4,584 sections to date.

The WCR has begun wrapping core again, after last SCIMP determined that for the older DSDP collections, only soft sediment cores should be wrapped and dried sediment cores should be left as is. The WCR is working backwards from its youngest cores, and has wrapped a total of 700 sections to date.

The ECR has had no additional staff to help with the core wrapping and was shorthanded for several months as ECR staff filled in a vacant curatorial position on ship on 2 legs. With the increase in sampling activity as well, the ECR has not made significant progress in FY99. With the anticipated hiring of a new shipboard curatorial rep., progress should be made in FY00. The ECR has wrapped a total of 5,470 sections to date.

SCIMP Recommendations

Technical Support Staffing (Rec. 99-1-20)

We are now routinely sailing an additional computer specialist (database administrator) as recommended.

We are also considering adding a dedicated microbiology technician to support the microbiology program. Following discussions at BUGSCOM and at the Biosphere PPG, it is clear that, although much of the sampling and analysis requirements of microbiology overlap with those of organic and inorganic geochemistry, the existing chemistry technicians could not resonably be expected to take on the added workload.

In addition, we have conducted a review of our shipboard technical support staffing requirements. Results of this review will be available shortly.

Digital Imaging (Rec. 99-2-12)

Purchase of a digital imaging system separate from the split core MST being developed by ODP/TAMU was not budgeted in FY2000. However, JOI has made it clear that we should plan to move to routine digital imaging of whole cores as expeditiously as possible. Accordingly, we have been investigating how we can most economically achieve this objective and seeking to identify cost savings elsewhere in the program that will allow us to proceed. At this time it appears that sufficient funds can be made available, and we are proceeding in the expectation that a system will be in place by mid year. Further information will be presented at the SCIMP meeting.

Sand Blaster (Rec. 99-2-9)

The sand blaster used on Leg 185 is presently stored at ODP/TAMU and can be returned to the ship when required.

Information Services

Major activities in Information Services over the past 6 months have been:

(1) migrating the ODP/TAMU e-mail system from ccMail (which is not Y2K compliant) to Groupwise (which is Y2K compliant); and

(2) an extensive review of the JANUS database and related software systems in order to document and prioritize tasks requiring attention.

The migration of the e-mail system is now complete, though there remain a few “bugs” to be worked out.

The JANUS review is the subject of a separate report to be presented at the SCIMP meeting.

Publication Services

New *Scientific Results* Volume Format Development

During the second half of 1999, the Publication Services Department continued development of the new format for the *Scientific Results* volume booklet and CD-ROM product and designed an HTML format for the Web (http://www-odp.tamu.edu/publications/pubs.htm). Beginning with *Scientific Results* Volume 169, all *Proceedings* volumes will be published on the World Wide Web chapter by chapter and on CD-ROM at the completion of the volume four years postcruise. Manuscripts will be published on the web in the order of acceptance in both HTML and PDF formats. The Publication Services Department staff gave presentations about the new electronic format at all precruise and postcruise meetings during the report period and at the San Francisco American Geophysical Union Meeting. Throughout 2000, Department staff will continue their efforts to educate the ODP scientific community about the publication changes.

Volume Production

From July through December 1999, the following *ODP Proceedings* volumes were produced and distributed:

Initial Reports
Booklet and CD-ROM (PDF version): 178, 179, 180, 181
WWW (PDF and HTML versions): 178, 179, 174AX Suppl., 180*
Scientific Results
Book and CD-ROM (PDF version): 163, 164
WWW (PDF and HTML versions): 162, 163, individual papers from 169*
*In progress at time report was written.

From January through June 2000, the following *ODP Proceedings* volumes are expected to be produced and distributed:

Initial Reports
Booklet and CD-ROM (PDF version): 182, 183, 184
WWW (PDF and HTML versions): 181, 182
Scientific Results
Book and CD-ROM (PDF version): 165, 166
WWW (PDF and HTML versions): 164, 165, individual papers from 169 and beyond

***ODP Proceedings* Distribution**

The Department has sold DSDP and ODP volumes for a cumulative revenue of $17,436 between June and November 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 June and November 1999, 6 institutions in 3 countries were sent 717 ODP and 370 DSDP volumes (China–821, Columbia–205, U.S.A.–61). Total book value for these shipments equals $57,155.

SCIMP Recommendations

AGI Database (Rec. 99-2-1)

At the directive from JOI, ODP/TAMU has finalized the agreement necessary for the American Geological Institute to compile a database of citations to papers published on DSDP/ODP-related research. A single copy of the database has been purchased on CD-ROM and will be housed with the Publication Services Department. During the first half of 2000, the Department will generate a citation report to be distributed to the community. The report will separate citation data for papers published in Program publications vs. journals and books. The database (drawn from the full American Geological Institute GeoRef database) will contain an estimated 12,500 references to Program-related publications produced since 1969. The CD will also contain the software necessary to access the data. The database will be delivered to ODP/TAMU by 20 December 1999, and comes with provisions to update the database on an annual basis.

Citation of Preliminary Report (Rec. 99-2-2)

JOI will not issue a directive to ODP/TAMU to make the Preliminary Report citable until they have had the opportunity to review the SCICOM minutes related to this issue. In the SCICOM minutes released in mid-December, SCICOM endorsed the recommendations made during the June 1999 SCIMP meeting.

Synthesis Papers (Rec. 99-1-10)

In May 1999, the Manager of Publications sent the new policy guidelines to co-chiefs reminding them of their responsibility to write or coordinate a leg-synthesis paper to be published in the *Scientific Results* volume. In response, co-chiefs committed to writing leg-synthesis papers for Legs 170, 171A/B, and 174B and leg-synopsis papers for Legs 169, 172, 173, and 174A/AX. Starting with Leg 175, co-chiefs are required to provide a leg-synthesis paper.

Publication Policy

Non-Performers

The Department stopped tracking non-performers as of February 1998 at the recommendation of JOI. ODP/TAMU has resumed tracking and the Senior Publications Coordinator is reporting this information directly to JOI (F. Rack).

WWW Development

ODP and ODP/TAMU Web Pages

ODP/TAMU has finished updating the design of our web site. Feedback on the ODP web pages is welcomed by any ODP Web administrator: Program Manager (JOI)—Tadeusz (Tad) Gladczenko; Science Operator (TAMU)—Katerina Petronotis; Logging Services (LDEO)—Mary Reagan; Site Survey Data Bank (LDEO)—Dan Quoidback; JOIDES Office (GEOMAR)—Emanuel (Manu) Soeding.

ODP/TAMU Publications Web Page

Beginning with Legs 176 and 162, all *Initial Reports* and *Scientific Results* chapters are being published on the Web in PDF and HTML formats. In addition, beginning with Leg

169, *Scientific Results* manuscripts will be published on the Web in PDF and HTML formats in the order in which they are accepted. The goal is to publish ODP postcruise-research papers as quickly as possible.

ODP/TAMU Web Statistics

Numbers represent single-user sessions that originate outside ODP. Each user session results in multiple page views and/or database requests.

1999	May	June	July	Aug.	Sept.	Oct.	Nov.	Date Released
ODP/TAMU site (www-odp.tamu.edu)	19,328	20,188	20,372	18,993	24,354	25,714	24,069	Not applicable
ODP/TAMU main page	5696	4921	4173	4114	5144	5473	5622	Not applicable
Publications main page	836	938	838	953	1057	1157	1211	Not applicable
Database (janusaxp.tamu.edu)†	510	632	611	572	637	876	948	Not applicable
INITIAL REPORTS **VOLUMES**††								
166*	15	21	30	22	20	31	32	1 October 1997
167*	16	24	25	24	–	27	27	13 February 1998
168*	11	12	23	21	24	29	23	23 February 1998
169*	10	15	19	14	21	66	39	17 April 1998
169S*	12	6	18	17	19	19	14	10 April 1998
170*	13	15	17	17	17	18	20	24 April 1998
171A*	9	19	14	18	19	20	22	26 June 1998
171B*	8	19	19	27	22	15	31	26 June 1998
172*	12	15	22	18	13	25	18	31 July 1998
173*	–	14	21	17	18	23	22	4 September 1998
174A*	11	20	16	19	14	18	36	31 December 1998
174B*	5	10	12	14	10	14	17	31 December 1998
174AX*	9	8	11	15	9	12	20	31 December 1998
174AXS							8	December 1999
175*	22	42	31	39	14	27	22	9 February 1999
176		4	37	18	15	26	25	30 June 1999
177		45	59	51	28	29	50	28 May 1999
178				42	46	43	29	31 August 1999
179			33	13	9	28	36	23 July 1999
180							33	December 1999
SCIENTIFIC RESULTS **VOLUMES**††								
150X*	22	20	31	30	24	34	58	7 August 1998
152*	34	31	34	46	31	65	98	8 July 1998
154*	34	55	39	62	54	63	93	1 October 1997
155*	41	50	32	43	60	65	86	15 May 1998
156*	28	34	37	36	33	51	59	21 August 1998
157*	27	31	36	32	37	51	98	14 August 1998
158*	27	50	26	34	35	59	66	15 May 1998
159*	24	24	35	21	22	39	96	31 December 1998
159T*	13	25	13	22	11	24	30	31 December 1998
160*	9	54	56	66	86	79	144	9 November 1998
161*	54	71	39	58	59	79	86	19 March 1999
162			14	78	53	52	50	20 August 1999
163					60	48	62	19 September 1999
169**							14	2000 and beyond

Notes: Numbers are given through the end of November 1999. † = Database sessions are in addition to those given for the overall www-odp site. * = Volumes are PDF replicas of the printed volumes. †† =

Numbers indicate hits to the entry page of each volume. ** = Starting with Leg 169, volumes will be published chapter by chapter in the order of acceptance.

Leg-related Citations

Beginning with Leg 160, authors were permitted to fulfill their ODP publication obligation by either submitting a manuscript to a peer-reviewed journal that is published in English, or by submitting a paper or data report to the *Scientific Results* (SR) volume. To maintain a leg-related compendium of postcruise results, the Publication Services Department posts citations from all published leg-related publications they have been notified about by authors on the ODP/TAMU Publications Web site (http://www-odp.tamu.edu/publications/pubs.htm).

Leg	SR Volume	Journal or Book			
		Projected**	Published††	Submitted††	Citations on Web†††
160	54*	0	2	2	2
161	44*	6	6	1	5
162	20*	10	21	5	23
163	15*	5	2	3	1
164	43*	5	3	3	5
165	20*	6	3	6	5
166	17*	5	2	7	3
167	35*	7	2	8	2
168	13*	21	4	9	4
169S	1*	25	0	7	None received
169	9*	28	2	7	4
170	4†	87	1	6	1
171A	3†	16	3	8	3
171B	16†	45	4	21	5
172	14†	30	0	1	None received
173	14†	37	0	5	None received
174A	9†	35	0	5	None received
174AX	0†	0	0	0	None received
174B	1**	5	0	0	None received
175	20**	70	0	3	None received
176	17**	41	0	2	None received
177	7**	44	0	0	None received
178***	7**	45	0	2	None received
179***	14**	8	0	2	None received

Notes: Numbers are given through the end of November 1999. * = Count from final SR table of contents. † = Count from initial SR submissions. ** = Based on table of contents from second postcruise meeting. †† = "Published" and "Submitted" counts reflect the number of papers authors have notified the ODP Publications Coordinator about. *** = Have not reached journal/book submission deadlines. ††† = The abstract accompanies the citation when the publisher grants permission.

Mirror Site Development

The Publication Services and Information Services Departments continue to work on the development of Web mirror sites. The initial goal was to mirror, at a minimum, the entire ODP/TAMU Web site except JANUS Web. So far, the AGSO (Australia) has established a mirror site (http://www.agso.gov.au/odp). The Natural History Museum (London, UK)

and Universität Bremen (Bremen, Germany) are continuing to develop their sites. This work is progressing at a slower rate than ODP/TAMU had hoped.

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 were 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 and to establish a permanent digital archive for the electronic volumes. The proposal was denied. The reviewers supported the general plan but felt that we should find co-funding to support this initiative. ODP/TAMU will look for co-funding from other sources and intends to resubmit the proposal. There are also other digital library initiatives being developed through NSF that ODP/TAMU may be able to pursue.

SPARC Proposal

In May 1999, the Publication Services Department submitted a letter of intent to SPARC (The Scholarly Publishing and Academic Resources Coalition) to apply for funding for a two-year project to begin converting ODP and DSDP volumes to digital format for international distribution on the Web. This proposal was also denied.

SCIMP Appendix 00-1-3

ODP Logging Service Report
SciMP January 2000

EXECUTIVE SUMMARY

Previous SCIMP Action Items and Recommendations
Action items and recommendations from the June 1999 SCIMP meeting in Boulder, Colorado are addressed in Appendix I of this report. The subjects of ODP-LDEO web database advertisement, FMS GIF images for shipboard scientists, GHMT polarity data availability, the current status of SAGAN, authorship of post-cruise web logging reports, and tuned arrays for VSP and seismic work are discussed in this section.

Third Party Tool Support: High Resolution Gamma-Ray Tool
An update on the development plan of the high-resolution gamma-ray tool by David Goldberg is provided in Appendix II. The PI is requesting SCIMP endorsement of a plan to conduct the first sea-trial on Leg 191 (Western Pacific Ion) in July 2000, followed by a deployment on Leg 194 (Marion Plateau).

Seismic/log/core integration project
LDEO-BRG arranged for a license for GeoQuest's IESX package (as per the SciMP recommendation). IESX is a seismic processing and analysis software package that sits within the GeoFrame system and is currently under investigation for its suitability to provide improved seismic data integration and synthetic seismogram production for ODP. IESX also offers powerful seismic processing and data handling capabilities that are of broader interest. While addressing the SCIMP recommendation to improve data integration, this capability also brings up several questions about current ODP Site Survey policy, such as data storage, access, protection, and confidentiality. As a start towards framing these questions for JOIDES and ODP, BRG is planning a pilot study in FY00-01 to format digital seismic data and to test the IESX software on the Resolution during Leg 188 and future cruises. Details of the ODP-LDEO initial evaluation of the IESX software package and further information about the pilot study are provided in Appendix III.

Cruise Highlights:
Two logging runs were performed during Leg 186 at Hole 1151D using the Triple Combo and FMS/LSS toolstrings. Due to time constraints, this hole was only drilled to a depth of 874.0 mbsf. The logged depths of these two runs each reached 868 mbsf, with an exceptionally smooth logging operation. This was largely due to the fact that this was a dedicated logging hole and the logging tools were deployed as soon as drilling was

finished. Hole conditions continued to be very good during logging, and the logs are generally of high quality.

Drydock:
Once in Singapore ODP Logging Services and TAMU personnel began preparation for the reconstruction of the Downhole Measurements Lab. This included the placement of power lines, network wiring, and some demolition on the existing floor. The reconstruction included installing walls, unistrut shelving, power outlets, and a drop ceiling. In addition, the DHML was entirely refurbished. Hardware for the LDEO rig floor instrumentation was installed. The HiT wireline cable was serviced in preparation for high temperature operations on Leg 193. The Dipole Shear Sonic Image Tool (DSI) was replaced by the DSI-2. Installation of the data acquisition module and reconstruction of the wet lab remain to be completed. These activities should be finished by the end of the Leg 188 port call.

Database:
The on-line database was updated to provide the ability to do a logical AND search so that to pass a user's test a hole must meet all of the user's search criteria. Previously our search page had only allowed a logical OR search such that hole(s) that pass the user's test must simply meet any of the user's search criteria. The logical OR search is still available and is the default.

Y2K Preparations
Development of the procedure for conventional and FMS log processing using the GeoFrame software. This change in processing is needed, as the Vax-based processing package is not certified as Y2K compliant. Procedures for Unix processing have been successfully tested during Leg 186. Full implementation will commence with Leg 188.

I. STANDARD LOGGING OPERATIONS

Leg 186 W. Pacific Network
Two logging runs were performed at Hole 1151D on August 11 and 12, 1999 using the Triple Combo and FMS/LSS toolstrings. Due to time constraints, this hole was only drilled to a depth of 874.0 mbsf. The logged depths of these two runs each reached 868 mbsf, with an exceptionally smooth logging operation. This was largely due to the fact that this was a dedicated logging hole and the logging tools were deployed as soon as drilling was finished. Hole conditions continued to be very good during logging, and the logs are generally of high quality. Onboard preliminary processing of FMS images was not attempted because it was the end of the leg, however, real-time monitoring of FMS images show that both the hole condition and the log data quality are exceptionally good.

Leg 187 Australia-Antarctic Discordance
No logging operations were planned for this leg.

Pre-cruise preparations
Leg 188 Prydz Bay
Successful implementation of active heave compensation is anticipated to improve core quality and increase core recovery by reducing the variability of weight-on-bit (WOB). Evaluation and testing of the drillstring heave system will occur on Leg 188 using Anadrill technology to record parameters from the rig floor and MWD parameters at-the-bit in a minimum of two holes. Such "at-the-bit" technical measurements have never before been recorded in ODP and the dynamics of the drilling system on the JOIDES Resolution is still largely unknown. The comparison of the uphole to downhole MWD parameters will indicate the effectiveness of drillstring heave compensation, and, in turn, can be used to optimize controller simulations and the performance of this important new system for future legs. During Leg 188, ODP/TAMU will also digitally record the weight on drawworks, drilling parameters, and pressure at the rig floor using the FUSION instrumentation system. A comparison between Anadrill and FUSION uphole measurements will allow the FUSION system to be used and augmented confidently on future legs. A testing plan for Leg 188 has been coordinated among LDEO, TAMU, and Anadrill defining the critical steps of the active heave experiment and the key personnel responsible for each task.

II. SPECIALTY TOOLS AND ENGINEERING DEVELOPMENTS

DSA - Drill String Acceleration/Active Heave Compensation
The second deployment of the Drill String Acceleration Tool (DSA) and the Anadrill Measurement While Drilling (MWD) deployment were rescheduled as a result of the cancellation of Leg 186E. The MWD equipment will now be deployed in two holes during Leg 188 to evaluate the new active heave system.

Successful implementation of active heave compensation is anticipated to improve core quality and increase core recovery by reducing the variability of weight-on-bit (WOB). Evaluation and testing of the drillstring heave system will occur on Leg 188 using Anadrill technology to record parameters from the rig floor and MWD parameters at-the-bit in a minimum of two holes. Such "at-the-bit" technical measurements have never before been recorded in ODP and the dynamics of the drilling system on the JOIDES Resolution is still largely unknown. The comparison of the uphole to downhole MWD parameters will indicate the effectiveness of drillstring heave compensation, and, in turn, can be used to optimize controller simulations and the performance of this important new system for future legs. During Leg 188, ODP/TAMU will also digitally record the weight on drawworks, drilling parameters, and pressure at the rig floor using the FUSION instrumentation system. A comparison between Anadrill and FUSION uphole measurements will allow the FUSION system to be used and augmented confidently on future legs. A testing plan for Leg 188 has been coordinated among LDEO, TAMU, and Anadrill defining the critical steps of the active heave experiment and the key personnel responsible for each task.

High Temperature Cable Head
In preparation for the hot holes on Leg 193, Schlumberger has developed a plan to modify a Hi-T cable head to monitor in situ borehole fluid temperatures during logging operations. All parts have been assembled to complete the modification and they are on track for having the modified cable head ready for Leg 193.

Dipole Shear Sonic Imager (DSI)
The DSI was repaired during dry dock. The tool was entirely rebuilt with new transmitters, receivers and electronics. It is now officially known as the DSI-2, the old DSI no longer exists. Schlumberger reports that the DSI-2 works even better than the DSI in slow formations.

Dry Dock Operations
The new Schlumberger data acquisition unit (MCM) was installed during the Leg 186 portcall. While on transit the LDEO lab was dismantled and materials were stored below deck. When the lab was cleared and all equipment stored, removal of walls and ceiling in the lab began.

Once in Singapore ODP Logging Services and TAMU personnel began preparation for the reconstruction of the lab. This included the placement of power lines, network wiring, and some demolition on the existing floor. The reconstruction included installing walls, unistrut shelving, power outlets, and a drop ceiling. In addition, the DHML was entirely refurbished. Hardware for the LDEO rig floor instrumentation was installed. The Hi-T wireline cable was serviced in preparation for high temperature operations on Leg 193. Tasks remaining to be completed in DHML tool shop (wet lab) include the installation of the cabinets and benches and laying the flooring material. These tasks will be completed by the end of Leg 188 portcall.

Y2K Preparations:
Development of the procedure for conventional and FMS log processing using the GeoFrame software. This change in processing is needed, as the Vax-based processing package is not certified as Y2K compliant. Procedures for Unix processing have been successfully tested during Leg 186. Full implementation will commence with Leg 188.

Third Party Tool Support: High Resolution Gamma-Ray Tool:
A status report and timetable for development of the Multichannel Gamma Ray Logging tool (MGT) is included in Appendix II. The PI's have requested SCIMP endorsement of a plan to conduct the first sea-trial on Leg 191 (Western Pacific Ion) in July 2000, followed by a deployment on Leg 194 (Marion Plateau).

III. SHIPBOARD LOG ANALYSIS

Core Log Integration Platform
Splicer and Sagan have been updated so that they are compatible with Solaris 2.6. Further changes may be needed to make it compatible with 2.7. In addition a new stratigraphy

program was created for entering different types of stratigraphic data onboard the ship to create an input file for Sagan and Splicer.

A CLIP web page for training/information was put on-line. It was later enhanced with the inclusion of on-line downloading of both Splicer and Sagan, as well a registration form for the CLIP mailing list.

Work continues on methods to handshake with the Janus database. In addition, modifications are being worked out so that Splicer and Sagan are more flexible with opening variable file formats directly. There is also a new Strat. entry program to facilitate the input of onboard stratigraphic information into Splicer and Sagan.

Seismic Data Integration
LDEO-BRG arranged for a license for GeoQuest's IESX package (as per the SciMP recommendation). IESX is a seismic processing and analysis software that sits within the GeoFrame system and is currently under investigation for its suitability to provide improved seismic data integration and synthetic seismogram production for ODP.

GeoQuest's IESX software also offers powerful seismic processing and data handling capabilities that are of broader interest. While addressing the SCIMP recommendation to improve data integration, this capability also brings up several questions about current ODP Site Survey policy, such as data storage, access, protection, and confidentiality. As a start towards framing these questions for JOIDES and ODP, BRG is planning a pilot study in FY00-01 to format digital seismic data and to test the IESX software on the Resolution during Leg 188 and future cruises. Evaluation of the procedures and level of effort that would be needed for routine digital data access, while enabling some protected release of site survey data, is the long-term objective.

The current status of the ODP-LDEO adhoc software to make synthetic seismograms and time-depth conversions was discussed in the last SCIMP meeting and further details were included in the June 1999 SCIMP minutes. A report on the ODP-LDEO initial evaluation of the IESX software package and further information about the pilot study are provided in Appendix III. In addition, a presentation of the IESX capabilities will be given during the meeting while panel members tour the ship facilities.

SCIMP comments on this subject are requested.

IV. SHOREBASED LOG ANALYSIS

ODP Conventional Data:
The following holes were processed and prepared for inclusion in the database at LDEO-BRG:
Leg 186: Holes 1150B, 1151D

FMS processing:

The following holes were processed at the Aix-en Provence (France) processing center:
Leg 186: Hole 1151D

Training
Véronique Gardien from the University of Lyon visited LMF to work on Leg 180 FMS data with Véronique Louvel.

Bernard Celerier from the University of Montpellier visited LMF to work on Leg 180 FMS data with Véronique Louvel.

Florence Einaudi (LMF) visited LDEO for training prior to participating on Leg 187 (Australia Antarctic Discordance).

Bernard Celerier from the University of Montpellier visited LMF to work on Leg 180 FMS data with Véronique Louvel.

Dave Feary and Alex Isern (Leg 182 Co-Chief and JOIDES Logger) visited LDEO to use GeoFrame and IESX software with Leg 182 data.

Samantha Barr (LUBR) visited LDEO for training prior to participating on Leg 188 (Prydz Bay).

V. DATABASE

The ODP Log Database has been updated through Leg 186, including Schlumberger original and processed data (conventional, geochemical, and FMS), specialty tools (borehole televiewer, multichannel sonic, and temperature), borehole images, and sonic waveforms.

Data Migration Project
The on-line database was updated to provide the ability to do a logical AND search so that to pass a user's test a hole must meet all of the user's search criteria. Previously our search page had only allowed a logical OR search such that hole(s) that pass the user's test must simply meet any of the user's search criteria. The logical OR search is still available and is the default.

Leg 134 and Leg 154 GHMT data were processed at the LMF processing center for inclusion in the on-line database. GHMT plots were made available through the on-line database. These plots had not previously been included in the on-line database.

Sonic waveform data from 95 holes have been checked for inclusion in the online database. The data are in ASCII format. Future legs will be in binary format.

The entire inventory of processed standard logs is being copied from 9-track to DAT tapes. The transfer will be completed by the end of the year. The transfer of the entire inventory of processed geochemical data has been completed in November.

Post-Cruise Distribution of Log Data
Leg 180 and 181 CD-ROMS have been completed and sent to Freisen Printers, to be included in the Leg 181 Initial Reports publication. The Leg 180 CD was not included in the Leg 180 *Initial Reports* volume due to delays in the production of this CD.

Overall Website Statistics (Feb-June 1999):

Average Requests	13,626/month
Average Visits	2,141/month
Average Unique Visitors	880/month

Log Database Statistics (Feb-June 1999):

Average Requests	2,007/month
Average Visits	430/month
Average Unique Visitors	260/month

These statistics have been filtered to exclude web and database personnel.

VI. OTHER

Informal discussions among Tom Janecek, Gerardo Iturrino, Dave Goldberg and Kate Moran have generated interest in increasing SCIMP's involvement in the earlier planning stages of shipboard and downhole measurements. Greater involvement should facilitate interaction between the advisory panels for future planning, such as the new potential for large-diameter tools that have been presented at recent SSEP meetings (see Appendix IV). LDEO will present a "straw-man" plan for SCIMP discussion at the meeting. The plan categorizes ODP objectives in specific themes, as described by the Long Range Plan (LRP), and highlights potential new technologies to achieve them. Below, themes that summarize the 37 proposals reviewed at the last SSEP meetings include:

Seismogenic zones: 4 proposals
Biosphere: 4 proposals
Gas Hydrates: 4 proposals
Climate/Tectonics: 5 proposals

Sea Level: 3 proposals
Extreme Climates: 4 proposals
Other (high resolution) Climate: 5 proposals
Antarctic: 2 proposals

There are also new PPG's and other new technologies which SCIMP may want to specifically consider:

Hydrogeology: PPG
Arctic Drilling: PPG
Prod Drill
Pressure core sampler
Large-diameter tools

LDEO Appendix I: SCIMP Action Items and Recommendations
Meeting in Boulder, CO - June 1999

Action Items

Following up on the January 1999 meeting action item where BRG-LDEO was asked about their plans to advertise the availability of the web-site access.

1. The following article was published in the JOIDES Journal, volume 25, number 1, 1999 pages 17-19 "Bringing ODP log data to the World Wide Web" Mary Reagan, Cristina Broglia, and Dave Goldberg.

(3) Approximately 150 copies of the logging manual CD were distributed at AGU. Copies will be sent to each pre-cruise meeting beginning with Leg 191 (January 5-6, 2000) however, in the future, copies for the Co-Chief Scientists can be mailed directly to them at the time of appointment. Copies will also be distributed at all upcoming panel meetings as well as among all members of the shipboard party (and any crew/techs who are interested) beginning with Leg 188. Currently we are distributing the CD's at the start of the cruise, but could change this approach to a pre-cruise mailing if needed. Copies will be sent to all JOI subcontractors and all national offices. Additional copies are available through the ODP Logging Services office.

ODP-LDEO to generate FMS 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.

Fortran codes to produce GIF images from Geoframe results will be available starting with Leg 188. The program uses ASCII outputs from Geoframe to produce files with all the buttons and the pad 1 azimuth. These ASCII files can then be removed with all the relevant information stored in binary format. These binary files are then used to create images that can be open in any image viewer application or any browser. File sizes are typically 2.5 MB for a 100-m section with a 1:1 resolution.

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.

All the GHMT processed data is now on-line. For the legs where both susceptibility and total field measurements were recorded (Legs 145, 155, 160, 162, 165, 171B, 175, 178, and 184), the results are available on the BRG-LDEO web database in GIF format.

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.

This action item was specifically directed to the progress of a third-party high-resolution gamma-ray tool currently under development by David Goldberg. A current progress report is given in Appendix II. PI requests SCIMP endorsement for deployment on Leg 191 (West Pacific Ion).

Gerardo Iturrino was asked about the status of SAGAN.

The final Beta version is complete and will be tested at sea minimally on Leg 188 if the recovery is appropriate and fully on Leg 189 by Ulysses Ninnemann. (BRG-LDEO). Despite completion of the two programs, the data interface is undergoing some final improvements that should be finished before Leg 189. These improvements include direct data queries to Janus from within Sagan and Splicer to make data handling and transfer much easier. In addition, modifications are being considered to make the data handling in both Sagan and Splicer more flexible so that they can open any text file that has been downloaded from the Janus database by Netscape. These improvements should dramatically reduce the data preparation time needed to use both programs. In addition, a new Stratigraphic program has been created to import stratigraphic information more easily into Splicer and should be available during Leg 189 as well. Logging scientists at LDEO Borehole Research Group, Leicester, and LMF have already been trained on SAGAN. Further training will be conducted after sea trials to insure that the expertise is available at each logging center. As customary, training to outside personnel will be available at any time. Basic program information is now available online and both programs can be downloaded from the web page at:

http://www.ldeo.columbia.edu/BRG/ODP/ODP/CLIP/clip.html.

The current versions are Sagan V.1.1 and Splicer V.2.1. There is also a web form that can be filled out by people interested in being added to the CLIP updates/changes mailing list. The help pages for SAGAN are currently being updated and added to.

Recommendations

1) 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"

The authorship of all web based post-cruise logging reports has been changed to follow SCIMP Recommendation 99-2-3.

2) 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.

At the direction of SCIMP, BRG-LDEO and ODP-TAMU began investigating alternative seismic sources for use as a VSP and seismic survey source. Initially, an eight gun tuned array from Schlumberger was investigated because of panel industry experience but this was not viable because Schlumberger was not willing to lease this array for 2 months per deployment. Presently there are only 3 in existence and the demand is great. To purchase such an array, the costs would be over $ 200,000. Personnel costs associated with this array would also be prohibitive since one technician would be required to operate and service them. Schlumberger recommended a G/GI as a cost-effective alternative to their 8-gun array. At this time, Greg Myers (BRG-LDEO) began conversations with Jim Hedger of Seismic Systems Inc. (SSI) and other sources in order to obtain more information about a G/GI combination and from his conversations, the following information became available:

2. A full system supplied by SSI of Houston would cost approximately $ 61,718.
3. The G/GI array provides a pulse amplitude through a large primary bubble that increases the low frequency signal required for deeper penetration while maintaining a clean high frequency response.
4. John Diebold of LDEO reviewed the literature and endorsed the array. LDEO has recent experience with a GI gun and they have been found it to be quite reliable.
5. The GI and G guns both use the same internal parts, which makes maintenance simpler and less expensive. The external bodies are different however. A GI/GI array produces a smaller bubble than a G/GI and also exhibits a cluster effect unless spaced 3 meters or more.
6. Schlumberger's existing control box mounted in the MCM can control the G/GI array.
7. The G/GI array can be towed and hung in static mode for both seismic surveys and VSP experiments.

BRG-LDEO inquired about testing a G/GI linear cluster during Leg 186E but SSI did not have a system in stock. The lead-time for delivering a linear cluster from the moment of purchase is 8 to 10 weeks. Gerardo Iturrino (BRG-LDEO) forwarded the information from SSI to Burney Hamlin (ODP/TAMU) and Adam Klaus (ODP/TAMU) for their review. Burney Hamlin had questions regarding the use of such array during seismic survey operations and after further communications with Gerardo Iturrino and Jim Hedger, he was able to visit the SSI facilities in Houston. A summary of the answers from SSI to Hamlin's specific questions is provided below.

RESOLUTION

Is the configuration of the G/GI linear cluster available only in one size? Does it optimize for resolution or penetration?

No, there is also a 250/250/105 cluster for deeper penetration but the bubble is not cancelled as well as on the 150/105 because of 105 injection size.

They are broad band sources and optimizing for resolution vs. penetration can be guided by varying the depth the gun is fired at.

What does varying the pressure to the gun accomplish? Is 3000 psi required?

The strength of the pulse varies with pressure and there is a 50% increase in energy going from 2000 to 3000 psi.

Is the 150/105 GI gun appropriate for high-resolution reflection work Previously the JR has used the 105/45 GI gun. Can we use other chambers on the 150/105 to optimize higher resolution?

The 150/105 cluster is better suited for VSP work. The cluster can be sleeved down to 45 in^3 but the 45/45 GI is the best for resolution. SSI recommended that the best basic gun for our application would be a 105/105 GI gun for a good high resolution source (7 sec repetition rate) that is very flexible and suitable for towing and seismic lines. If deeper penetration and more power are needed, add a 150 chamber to improve penetration during VSP experiments.

DEPLOYMENT/TOWING

1. The longer and heavier G/GI linear configuration imposes larger workloads on the current equipment handling abilities. There are space limitations if changes in the load geometry on the deployment winches/pulleys were required. Burney Hamlin sent the published weight and length to Brad Julson at sea for an area review. Launching and retrieving gun buoy(s) is also a concern but not a showstopper.

OTHER

1. The JR and many other survey ships operate their seismic sources at 2000 psi. The source signature data from SSI is generated at 2000 psi. However the SSI GI guns are built to operate up to 3000 psi.

There is a power gain operating at higher pressure. Is it necessary?

It is recommended to increase penetration in deep hole (i.e. tested in 6000 m commercial holes)

The upgrade in pressure is possible but the cost is not yet determined. There are limitations on conventional high volume regulators, hoses, and compressor limitations reaching 3000-psi service.

Is the G/GI gun configuration modular in any way? Like, approaching the G/GI linear cluster concept by buying regular GI guns and later mounting them together?

Yes, a sensible approach would be the following:

Buy 105/105 GI Gun, tools, hanger	$ 35,000	
Add larger chamber (150 Reservoir)	$ 2,900	
Add larger chamber (250 Reservoir)	$ 4,300	
Buy brackets and 150 G gun		$ 20,000

Gerardo Iturrino and Adam Klaus further discussed this issue in October and agreed that this combination is more cost effective and that it would satisfy both seismic survey and VSP needs. Conversations between BRG-LDEO and ODP-TAMU are underway to determine the next course of action where perhaps ODP-TAMU should take the lead because of their expertise in maintenance and deployment. We request SCIMP endorsement to continue our efforts leading to the purchase of a G/GI gun array.

LDEO Appendix II: Third Party Tool Support
High Resolution Gamma-Ray Tool

Lamont-Doherty
Earth Observatory
of Columbia University

RT 9W / PALISADES, NY 10964 USA
David Goldberg Tel:914-365-8674/Fax:914-365-3182/email: goldberg@ldeo.columbia.edu

December 22, 1999

Dear Tom Janacek, chair, and SCIMP members:

Please note the following revised status report and timetable for development of the Multichannel Gamma Ray Logging tool (MGT), appended to the logging contractor's report to SCIMP. We request SCIMP endorsement of the plan to conduct the first sea-trial on Leg 191 (Engineering) in July 2000, followed by a deployment on Leg 194 (Marion Plateau). The proponents of this leg are enthusiastic about the scientific benefits of this tool to achieve their 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.

Sincerely,

/s/ Dave

D. Goldberg, BRG

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

Tool development status and timetable

D. Goldberg and A. Meltser
LDEO Borehole Research
December, 1999

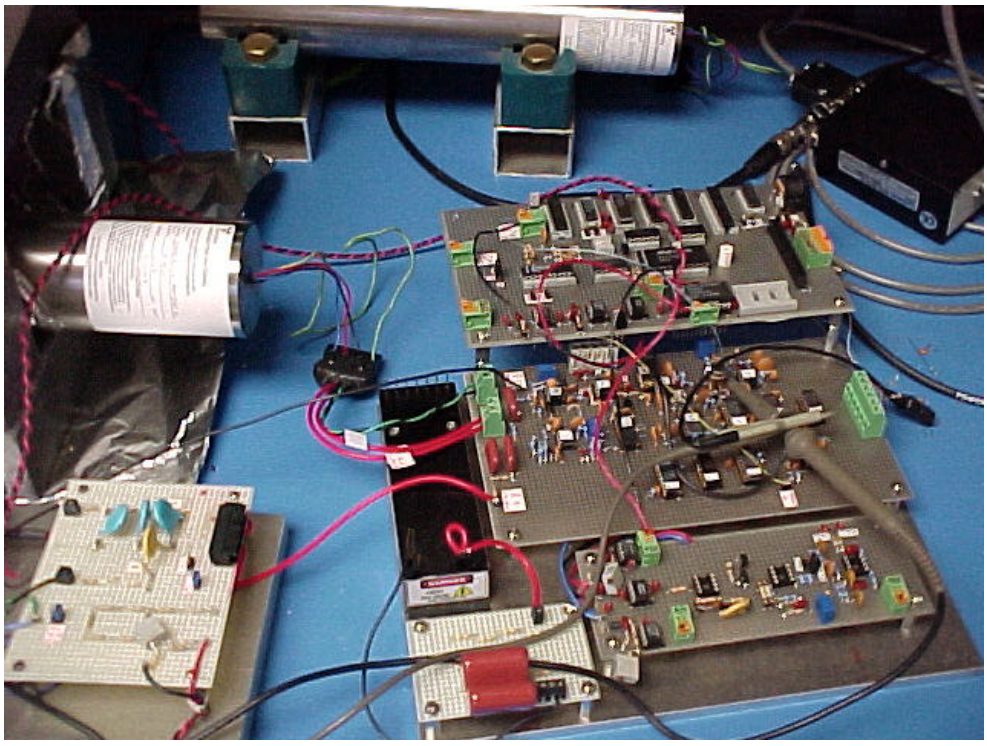
Overview

The purpose of this tool is to improve the vertical resolution of natural gamma-ray log data in the Ocean Drilling Program for scientific applications requiring fine scale core-log integration. The Multi-sensor Gamma-ray logging Tool (MGT) will increase vertical resolution by a factor or 3-4 over conventional Schlumberger tools used in the ODP (e.g. NGT), improving their correlation with core measurements and resolving bedding at lower sedimentation rates. This project 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). See minutes from July 1999 SCIMP meeting for background and the complete development tool proposal.

The extended dry dock operations in Summer/Fall 1999, and the cancellation of Leg 186E (Engineering), delayed manufacturing and testing of the MGT. We have revised the target deployment to Leg 191 (Engineering) which will drill in the western Pacific. The proponents of ODP Leg 194 (Marion Plateau) are also enthusiastic about deployment of the MGT to assist in achieving the scientific objectives of resolving sediment cyclicity in a carbonate reef complex.

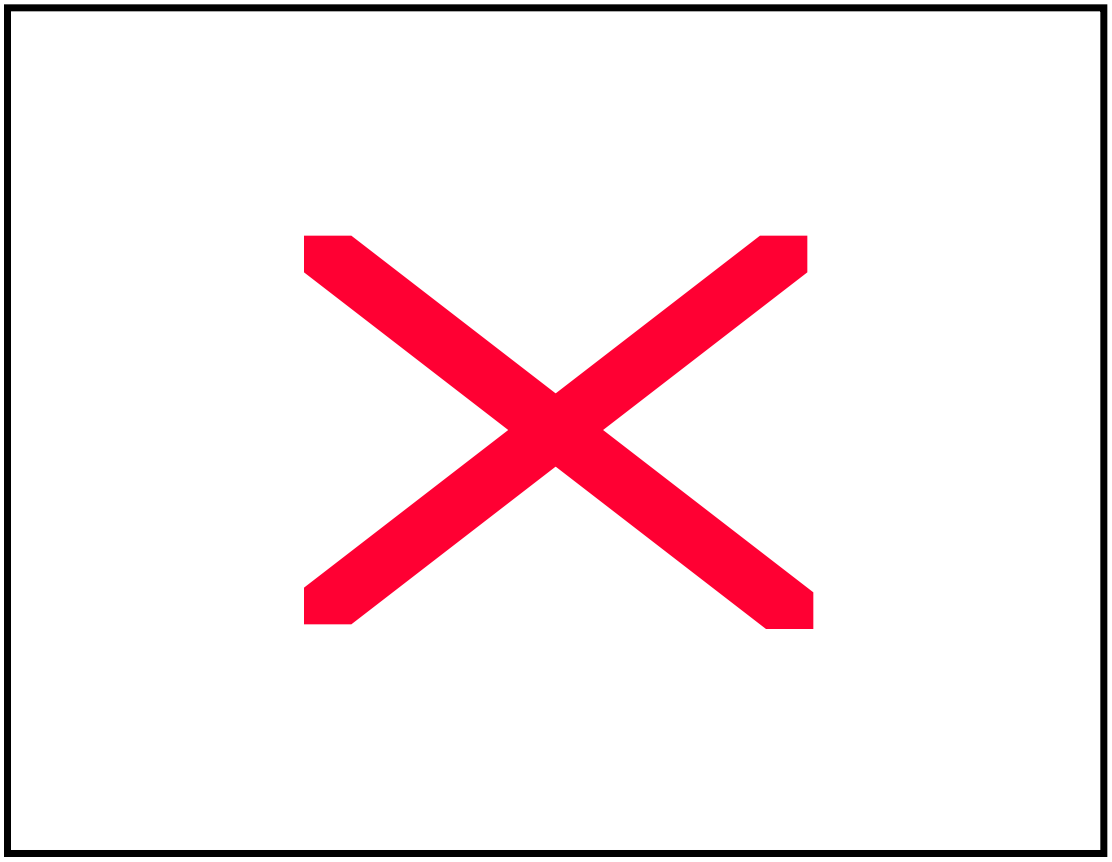
Progress -to-date

During1999, we completed design of critical elements of the MGT system hardware. Major efforts were concentrated on developing the electronics for pulse processing and natural gamma ray spectrum analysis. Our concept of an array of 4 independent, self-contained gamma spectrometry sensors proved to be highly effective in terms of power distribution and the data interface, but challenging in terms of its mechanical implementation. Each sensor module includes a NaI detector with an internal Am_{241} calibration source that is approx. 13" long and electronics that are approx. 11" long. For the 4 modules, a total length of 8' (excluding connectors) was required within the pressure case. The photo below shows a prototype of the module electronics with detectors during bench test experiments.



Despite the small size the downhole electronics, each module includes a programmable HV power supply, a full digital pulse analyzer with independent three-level pulse height stabilization, and a simple but effective pulse pile-up rejection circuit. The results of the system bench testing with an internal Am_{241} source and Co_{60} and Cs_{137} calibration sources are shown in the figure below. These tests confirm the system

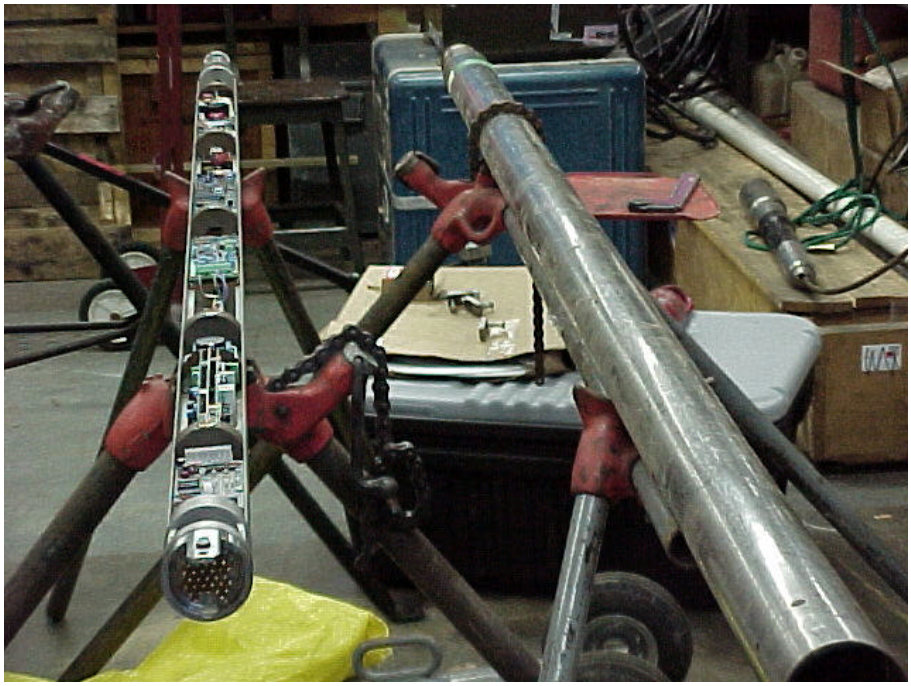
specifications, including a combined spectral resolution of the detector of about 8%. Individual calibration results for each sensor will be stored in microcontroller memory which makes the modules interchangeable and independently replaceable.



During 1999, we also completed design and manufacturing of the Universal Data Telemetry Module (UDTM). The UDTM contains: 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.

During the extended dry dock operation in Summer/Fall 1999, the Schlumberger logging systems on the JOIDES Resolution were upgraded, including the FMS/DSI tool combination and the new MCM data acquisition unit. These upgrades required certain modifications in UDTM circuit design, primarily in the interface to Schlumberger power and telemetry systems (e.g. remote line switch and control circuitry). In addition, we modified the UDTM to measure cable tension using the Schlumberger cablehead sensor, which is important for operational safety. The completed UDTM is shown in the photo

below. The tool is currently undergoing bench tests to simulate the load of Schlumberger logging tools.



Statement of work for year 2000

During the next year, development efforts will be primarily concentrated on completion of the MGT manufacturing, software design, and system testing. Manufacturing of the MGT and surface panel is expected to be complete in February 2000. Embedded software is required for both the UDTM and MGT and for the surface panel. LabView data acquisition software will be used for depth/time data recording, preliminary real-time data processing, and an operator interface for quality control and system diagnostics.

During Q1/Q2 of 2000, all separate components and the complete system will be tested. These tests will include combining the UDTM with Schlumberger logging tools, bench and field testing of the complete system, and calibration of the MGT module in the University of Houston/API test facility. Subsequent to these tests, the MGT/UDTM

system is planned for at-sea trials during Leg 191. The tool design engineer (A. Meltzer) will deploy the tool during this leg.

The following timetable outlines the development and testing schedule for the MGT and UDTM.

Development timetable

UDTM

Telemetry system electronics design	Done
Power system and switching system electronics design	Done
PC boards design and manufacturing	Done
Embedded software development	Jan 2000
UDTM mechanical design	Done
UDTM manufacturing, assembly and wiring	Done
Telemetry surface panel design and manufacturing	Jan 2000
UDTM software/hardware integration and testing	Feb 2000
UDTM testing with Schlumberger tools (Houston)	Feb 2000

MGT (measurement system)

NG detectors development and manufacturing (Bicron)	Done
NG detectors testing and preliminary calibration	Done
NG pulse spectrometry electronics development	Done
Single channel electronics module design	Done
Embedded software development	March 2000
MGT PC boards design and manufacturing	Done
MGT mechanical design	Jan 2000
MGT manufacturing assembly and wiring	Feb 2000
Data acquisition software development (LabVIEW)	May 2000
MGT software/hardware integration and testing	March 2000

System Testing

Complete system bench testing	Apr 2000
Borehole testing in LDEO Well	Apr 2000
Testing with Schlumberger tools and API calibration (Houston)	June 2000

Deployment on ODP Leg 191

July

Appendix III: Seismic/Log/Core Integration

December 24, 1999

Dear Tom Janecek, chair, and SCIMP members:

The attached report summarizes the capabilities of the IESX seismic software package and its comparable limitations. The IESX software appears to meet the fundamental needs for shipboard science and will be tested again at sea during Leg 188. In addition, the Site Survey Data Bank and ODP Logging Services are planning a joint pilot study to continue testing the IESX software and evaluate its applicability to seismic data handling and distribution. We welcome SCIMP comment on the IESX package and its potential use in ODP, and, in particular, any specific recommendations that could be addressed in the pilot study.

Sincerely,

/s/ Dave

D. Goldberg, BRG

Pilot study for the seismic data handling using IESX software

Site Survey Data Bank and ODP Logging Services

January, 2000

To date, log-seismic data integration has been undertaken on the JOIDES Resolution as an ad-hoc activity when a shipboard scientist or co-chief scientist provides the relevant seismic data in digital form. In these instances, LDEO-BRG has on occasion been requested to provide software for basic log-seismic integration capabilities (e.g. 1-D synthetics). These capabilities were reported in previous SCIMP minutes and will continue to be available on the JOIDES Resolution along with technical assistance to shipboard scientists. However, a more robust and routine capability is clearly desired. For particular legs, some individual PI's have preferred to bring commercial-licensed software packages with them to sea for their personal use, such as the GeoQuest IESX package used during Leg 182.

Following the January 1999 SCIMP recommendation, BRG has reviewed commercial seismic software packages that allow for better integration of digital seismic data for shipboard science. We were able to arrange for an evaluation license of GeoQuest's IESX software that enables synthetic seismograms and time-depth profiles to be calculated. In addition to the basic functions, IESX offers powerful seismic processing and data handling capabilities that are of broader interest.

While addressing the SCIMP recommendation, this new capability also brings up several questions about ODP Site Survey policy, such as data storage, access, protection, and confidentiality. Recently, JOI and JOIDES panels have recommended that ODP move towards better use of and access to digital seismic data for drilling-related planning as well as shipboard science. Data access and handling issues related to seismic surveys, as well as log-seismic data integration, must then be considered. For example, in order to select drill sites before a leg has been approved for drilling seismic data must be reviewed by Site Survey Panel and other JOIDES panels. Given the varied funding of site surveys (i.e. from international or industrial sources), these data are often proprietary and ODP use of the data is limited to analog images. The IESX software offers a particular advantage regarding this issue in that digital data access can be password protected and restricted to particular users for certain periods of time. PI's and SSP only could be allowed access for planning purposes before a drilling leg; afterwards, the restrictions can be lifted and some members of the scientific party could access digital data and the software for post-cruise research. Additional shore-based licenses for the software may also be made available.

As a start towards framing these issues for JOIDES and ODP, the Site Survey Data Bank and ODP Logging Services are jointly planning a pilot study in FY00-01 to format digital seismic data and to test its use for future cruises. Evaluation of the procedures and level of effort that would be needed for routine digital data access, while enabling some protected release of site survey data, is the long-term objective. The main tasks of this project involve acquiring and converting seismic survey data into IESX-

compatible format for use prior to and during a leg. This approach will standardize deliverables to and from the SSDB and assist them with digital data management. The integrity of the digital data can be monitored and assured using a standardized format. Processed data and navigation output can be maintained in an on-line data catalog (similar to the on-line log catalog). Seismic images could also be produced and displayed online. Eventually, the routine submission of digital data and modern data handling capability should bring ODP up to "industry standard" in this area, although the resources required to do so on a routine basis could be considerable. We anticipate that the IESX pilot study will allow the scope of the data handling requirements and resources to be evaluated, allowing SSP and other JOIDES panels to consider the appropriate approach for seismic data handling in the future.

Review/Evaluation of the Geoframe/IESX

Review/Evaluation of the Geoframe/IESX package is complete. IESX allows for the integration of reflection seismic and borehole data in a single data base and user interface system. There are four key components relevant to ODP:

(4) *Basemap display of all relevant seismic, borehole, and geophysical data for a project region:*

The seismic track map is implicitly linked to the seismic sections, as are the boreholes. Selecting either a seismic line or a borehole from the basemap opens a window displaying the seismic and/or the borehole data.

(5) *Display, process, and interpretation of seismic sections (as a combination of single lines, 2D seismic grids or a 3D seismic volume; the IESX package is completely 3D compatible):*

A combination of single lines, 2-D or 3-D seismic grids can be displayed, processed and interpreted with IESX. The seismic display modes, number of traces, wiggle characteristics, etc. are easily modified by the user. Automated seismic interpretation, both faults and horizons, are features of the IESX package. With a minimum number of horizon picks, surfaces can be interpolated through a seismic grid/volume in order to generate isopach or structure contour maps. The maps, both in contouring and surfaces, automatically display faults as discontinuities. Selecting the appropriate picks on crosslines is straightforward.

(6) Display and process seismic sections with superposed synthetic seismograms:

Synthetic seismograms can be generated using borehole velocity and density information coupled with information from checkshot surveys. These data are easily augmented with Physical Properties information (DSI and SDT sonic data) input as ASCII files downloaded from the JANUS database. The derived synthetic seismograms are used to convert well log data to time for overlay on the seismic

lines. It is possible to perform time-depth conversions and display the seismic data with the borehole information as a function of depth. However, this requires significant amount of well control to generate the appropriate velocity-depth relationships across the project region. Superposition of well logs onto the seismic data greatly aids interpretation/explanation of reflectors etc.

(7) 2-D and 3-D seismic packages

Both 2-D and 3-D seismic packages have been assembled and coupled with borehole information to produce a "training data set". This package is courtesy of Geoquest (Houston). A series of Geoquest manuals walk users through the IESX processing, display, and interpretation modules.

Routine use of IESX and the data browser and management system of choice allows an ease of data sharing (while maintaining strict confidentiality as per users' requests) and interpretation assessment. The IESX package is suitably advanced that it will expand data manipulation and interpretation possibilities with an increasing number of users. More importantly, a standard data integrator/manipulator should increase compatibility between the different kinds of ODP data.

LDEO Appendix IV: Large Diameter Tools

Modular Formation Dynamics Tester (MDT) Tool

The Modular Formation Dynamics Tester (MDT) tool consists of individual modules that can be configured to meet almost any testing and sampling need. A new high-accuracy, high-resolution quartz gauge with a fast dynamic response provides formation and hydrostatic pressure measurements. Sensors mounted in the flowline provide measurements of formation fluid resistivity and temperature while fluid flow is controlled from the surface.

The tool configuration, including a single-probe module and 1-, 2 3/4, and 6 gallon sample chambers, allows multiple pressure measurements and the recovery of multiple fluid samples during the same trip in the well. Adding a pumpout module to the tool string greatly enhances the fluid sampling operation. A multisample module allows the retrieval of six 450 cc pressure-volume-temperature (PVT) -quality samples.

Quick, accurate pressure measurements provide dynamic profiling.

MDT pressure gauges exhibit improved dynamic response with no compromise in accuracy--and precise flowline control during testing ensures monophasic flow. Together, these unique features contribute to efficient, accurate determination of permeability.

By running two probe modules, contiguous sands can be monitored during an interference test. The MDT two-probe configuration also enhances pressure gradient measurements, since the distance between the two measuring points is precisely known.

Interpretation of data from the MDT three-probe configuration provides an evaluation of horizontal and vertical permeabilities and formation heterogeneity. A spatial distribution of permeability can then be computed from a profile of the tests.

The larger borehole wall area tested with the MDT packer tool provides a pressure buildup with a much deeper radius of investigation. Where there are safety, environmental, and economic considerations, this small-scale DST-type test offers several advantages over conventional DST tests.

Real-time tool control facilitates interpretation.

The MAXIS-500 service unit controls the sampling pressure and pretest flow rate and volume from the surface. This control reduces the hydraulic shock to the formation that

can contribute to flowline plugging or loss of seal. In addition, full surface control of the downhole tool allows selection of optimum sequences of flow periods during a test.

With the MDT flow control module, flow rate and draw-down pressure are precisely regulated--even during a one-liter test. Sampling pressure can be kept above the bubblepoint pressure of the fluid, which eliminates the need for multiphase interpretation, preserves the sample integrity and allows good permeability measurements.

Many fluid samples can be taken in just one trip downhole.

The MDT tool collects formation fluid through a probe that is placed hydraulically against the borehole wall. Controls from the MAXIS 500 service unit direct this fluid into any selected sample chamber.

The tool is equipped with additional sample chamber modules to collect several PVT-quality samples during a single trip into the hole. A number of different zones can be tested on the same trip, and multiple samples can be collected from a single zone.

Resistivity measurement aids fluid identification.

Flowline resistivity mesurements taken by the probe module help discriminate between formation fluids and filtrate from water-base muds. Real-time resistivity measurements, performed during sampling, allow the dumping of formation fluid until an uncontaminated sample can be obtained.

***POTENTIAL FUTURE APPLICATIONS**:*

Paleo/Sediment Legs: The recovery of in situ pore fluid would provide samples for analysis of noble gas concentrations (e.g. Xe, Kr, Ar) whose ratios allow a measure of past temperature change in deep water. In situ sampling into pressurized chambers avoids problems of bubble contamination and exchange with atmospheric gasses associated with other methods.

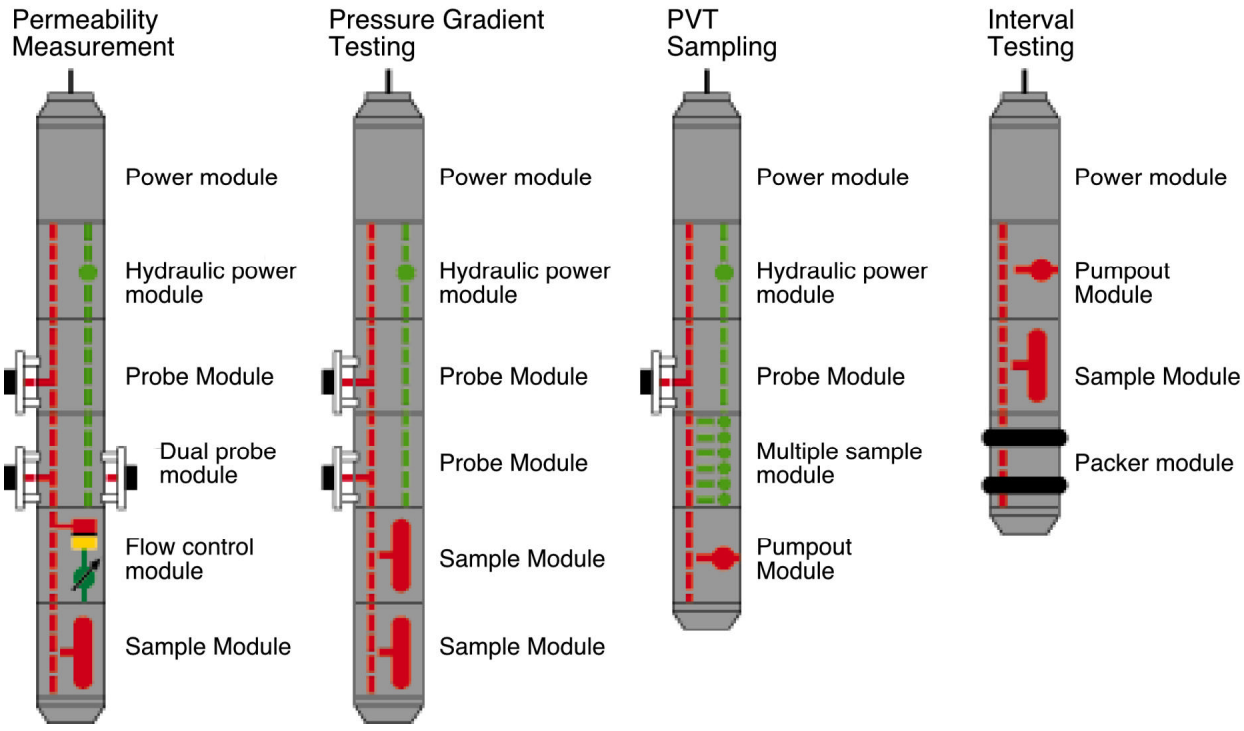
Hydrothermal Fluids: Analysis of low temperature hydrothermal processes have been based on the interpretation of samples venting at the seafloor and from pore fluids extracted from recovered core. Results are diminished by poor core recovery (e.g. Leg 158). The MDT samples provide continuous profiling to assess hydrothermal alteration, water/rock interactions and fluid chemistry.

Nankai: MDT testing in isolated intervals would allow for analysis of permeability and fluid flow while the JR is on site. Deployment of a multi-level CORK provides similar information although it is acquired over an extended period of time.

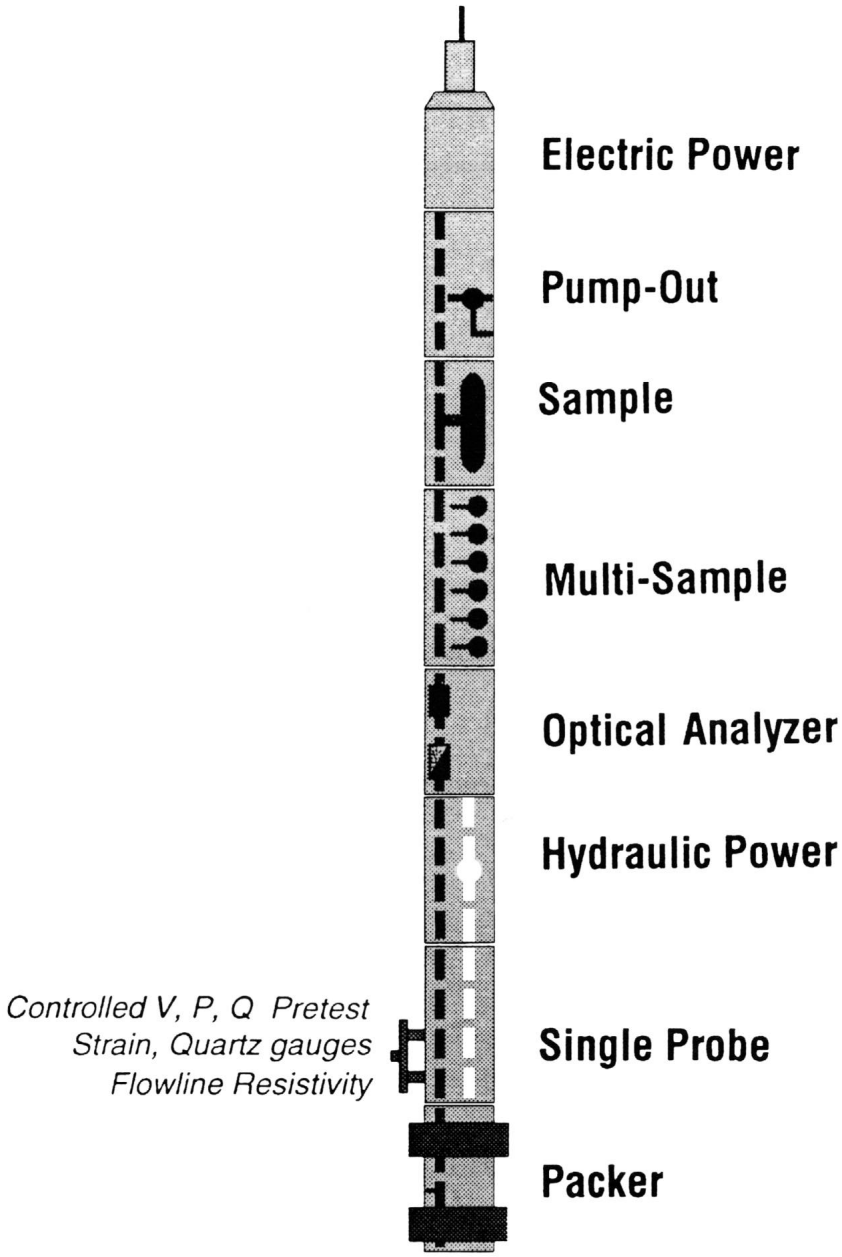
OPERATIONS:

The deployment of MDT will constitute the first step toward deployment of a variety of large diameter tools. The Diameter for MDT is large (approx. 6-in.) and will require a drillpipe-conveyed deployment for ODP use. A special BHA sub and tool connections can be assembled with standard ODP packers for this purpose.

Each sample requires a packer set and pumping time to evacuate the interval. A specialized MDT engineer is also needed.



POSSIBLE MDT CONFIGURATIONS



Schematic of the MDT tool. Advantages of this tool include:

1. Accurate pressure measurements
    - sampling pressure dynamically controlled
8. Fluid sampling capabilities
    - fluid resistivity and optical properties analyzed
    - multiple PFT-grade samples can be obtained in one pass
9. Estimation of horizontal and vertical permeability components
    - multiple probes produce direct anisotropy measurements
4. Packers allow sampling under difficult conditions

MDT Tool Specifications

Tool	OD	Hole Size			Maximum Rating	
		Minimum	Maximum	Maximum With Kit	Pressure	Temperature
Single-probe tool	4 3/4 in. (12.1 cm)	6 in. (15.2 cm)	14 in. (35.6 cm)	19 in. (48.3 cm)	20 kpsi* (13.8 kPa)	400°F * (205°C)
Multiprobre tool	6 in. (15.2 cm)	7 5/8 in. (19.4 cm)	13 in. (33 cm)	15 in. (38.1 cm)	20 kpsi* (13.8 kPa)	400°F * (205°C)
Dual-packer tool	5 in. (12.7 cm)	6 1/4 in. (15.9 cm)	12 in. # (30.5 cm)		20 kpsi* (13.8 kPa)	300°F ** (150°C)

* 350°F (175°C) and 15 kpsi with the CQG quartz gauge and/or the optical fluid analysis module
** 250° F (120° C) in oil-base mud
# Maximum hole size depends on the packer installed. Larger packers are available for larger hole sizes.

Sample Modules	OD	Maximum Rating	
		Pressure	Temperature
1- and 2 3/4 gal units	4 3/4 in. (12.1 cm)	14 kpsi (9.7 kPa)	400°F (205°C)
1- and 2 3/4 gal units H_2S versions	5 in. (12.7 cm)	20 kpsi (13.8 kPa)	400°F (205°C)
6- gal unit	4 3/4 in. (12.1 cm)	10 kpsi (6.9 kPa)	400°F (205°C)
Multisample unit * (6 bottles of 450 cm^3)	4 3/4 in. (12.1 cm)	20 kpsi (13.8 kPa)	400°F (205°C)

* H_2S and mercury compatible

Pressure Gauge Specifications

Specification	Strain Gauge	CQG Quartz Gauge
Accuracy	0.10% full scale *	1.0 psi + 0.01% of reading
Repeatability	0.06% full scale *	1.0 psi
Resolution	0.001% full scale at 0.14 sec sampling (0.1 psi for a 10 kpsi gauge)	0.01 psi at 0.8-sec sampling
Temperature Rating	400°F (205°C)	350°F (175°C)
* 90% confidence limit		

Combinable Magnetic Resonance (CMR) tool

The innovative, high-resolution, CMR Combinable Magnetic Resonance tool provides a free-fluid-index measurement, a permeability estimate, and lithology independent porosity not available with any other tool. It is a pad-type tool that can be used to log holes 6.5 in. and larger in diameter. The CMR tool provides continuous, reproducible measurements with excellent vertical resolution (6-in.) to identify very thin permeable zones. Measurement accuracy is improved because the compact magnet and antenna sensor package is mounted in a pad-like skid that is pressed against the borehole wall.

The CMR signal is processed to estimate the distribution of pore sizes. This is a fundamentally new wireline formation measurement you get only with the CMR tool.

CMR benefits:

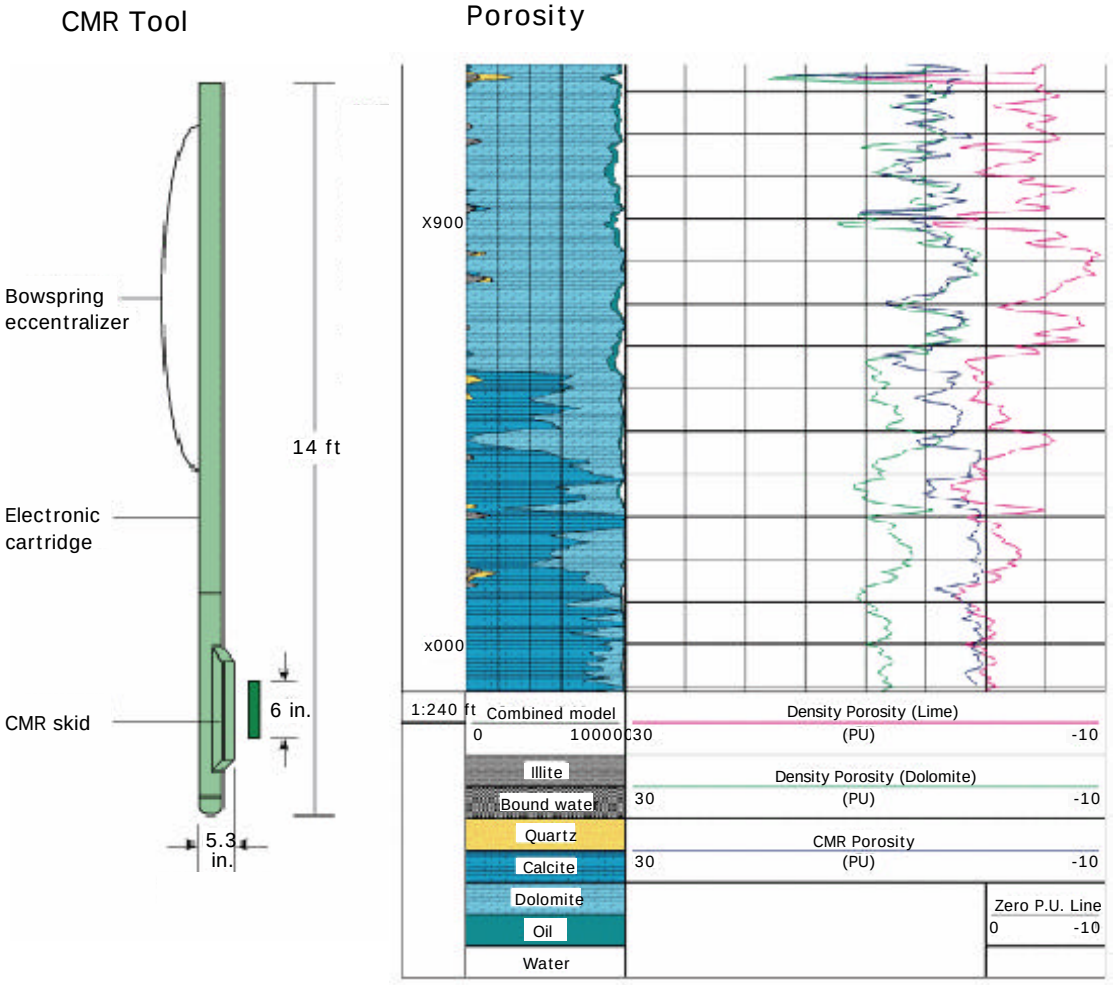
Pore-size distribution data improve prediction of permeability.
Free-fluid porosity information.
High resolution reveals thin beds.
Porosity is lithology independent.
Pad-like skid permits evaluation of large boreholes and highly deviated holes.
Measurements can be made in any drilling environment because there are no mud conductivity limits.

Potential Future applications

- Gas Hydrate legs (determination of in situ non-frozen gas volume)
Determination of Permeability in accretionary prism environments

CMR tool specifications

Length	14 ft [4.3 m]
Minimum hole size	6.5 in. [7.8 in. with bowspring]
Maximum temperature	350°F [175°C]
Maximum pressure	20,000 psi
Weight	300 lbm [136.3 kg]
Measurement aperture	6 in.
Depth of investigation	1 in.

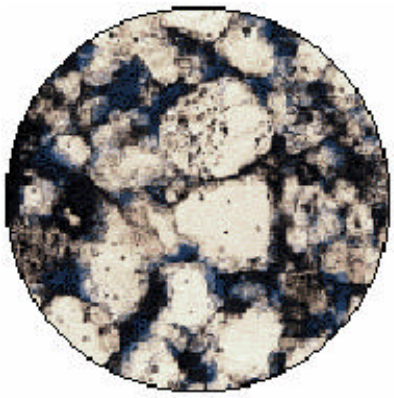


This example shows that the CMR tool provides a lithology-independent porosity useful in complex lithologies. The lower half of the log is predominantly limestone, and densit porosity on a limestone matrix overlays CMR porosity. At X935 ft the lithology changes dolomite and the density porosity on a dolomite matrix overlays CMR porosity.

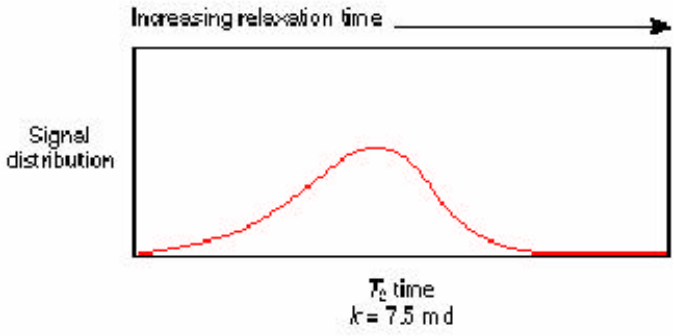
The CMR tool also provides information regarding:

* Pore size distribution
* Continuous permeability measurements
* Free fluid volume
* Thin-bed resolution
* Lithology independent porosity
* Hydrocarbon identification

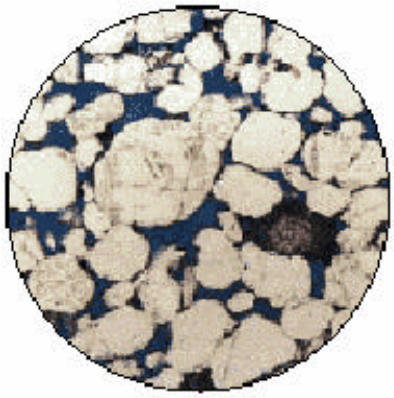
Core Samples



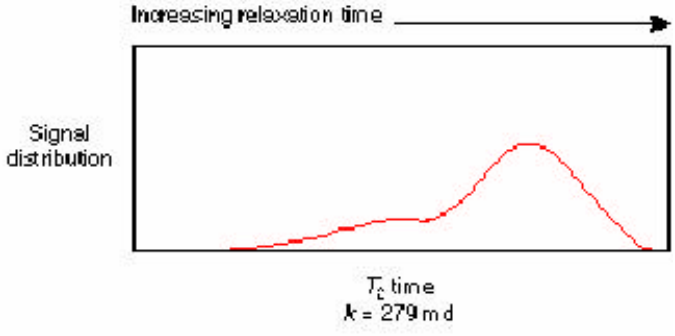
Porosity = 20%
Permeability = 7.5 md



Low permeability, nonproducer



Porosity = 19.5%
Permeability = 279 md



High permeability producer

The CMR transverse relaxation time, or , T2 measurement, which is the area under th red curve, is directly proportional to porosity, and the decay rate relates to pore siz times indicate small pores and low permeability, while longer times indicate larger with generally higher permeabilities. These two samples have about the same T2 a indicating similar porosity characteristics, but the considerably different relaxatior clearly identify the sample with higher permeability.