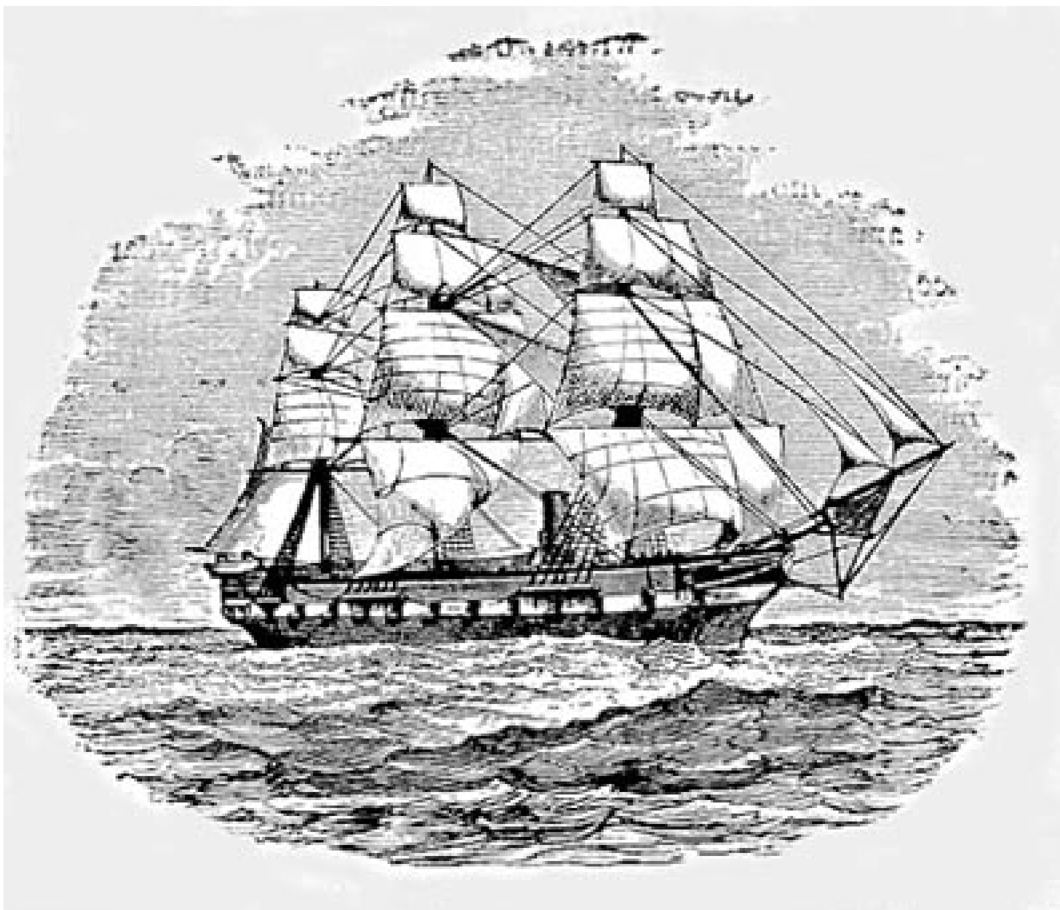
JOIDES EXECUTIVE COMMITTEE

10 – 11 JULY 2003

BERMUDA



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JOIDES EXECUTIVE COMMITTEE MEETING

BERMUDA

JULY 10-11 2003

MEETING AGENDA

THURSDAY 10 JULY 9:00 AM

COFFEE BREAK 10:10 – 10:30 AM

LUNCH BREAK 12:00 – 1:15 PM

COFFEE 3:00 – 3:30 PM

FRIDAY	JULY 11	9:00 AM

Joint with ODP Council

8. JOI Report for FY2004

8.1 FY2004 Program Plan	(Pisias)	180
8.2 PEC VI	(Bohlen/Pisias)	

9. LEGACY Plans

9.1 JOIDES Journal	(Becker)	
9.2 SCICOM Report	(Becker)	357
9.2.1 Suggestions for PEC VI	(Becker)	
9.3 JOI Legacy Web Site	(Pisias)	
9.4 Have any legacy objectives been overlooked?	(Harrison)	

COFFEE BREAK 10:10 – 10:30 AM

10. SCICOM Report

10.1 Achievements on Legs 203-209 (Becker)

11. Any Other Business (Harrison)

JOIDES EXCOM –BERMUDA
JULY 10 – 11 2003
PARTICIPANTS

Executive Committee – EXCOM

Chris Harrison (Chair)	Rosenstiel School of Marine and Atmospheric Science, University of Miami, USA
Robert S. Detrick	Woods Hole Oceanographic Institution, USA
David Falvey	British Geological Survey, United Kingdom
Dennis V. Kent	Department of Geological Sciences, Rutgers University, USA
Mary von Knorring	Swedish Research Council, Sweden
Hermann Kudrass	Bundesanstalt fur Geowissenschaften Und Rohstoffe, Germany
John Orcutt	Scripps Institution of Oceanography, USA
Neil Opdyke	Department of Geological Sciences, University of Florida, USA
Robert M. Owen	Dept of Geological Sciences, University of Michigan, USA
David Prior	College of Geosciences, Texas A&M University, USA
Michael Purdy	LDEO Columbia University, USA
Eli Silver	Earth Sciences Department, University of California, USA
Paul Stoffa	Institute for Geophysics, University of Texas at Austin, USA
Hidekazu Tokuyama	Ocean Research Institute, University of Tokyo, Japan

Associate Member Observers

Philippe Vidal	Department Sciences de l'Universite INSU., Paris, France.
Richard Hiscott	(PacRim), Memorial University of Newfoundland, St John's, Canada.
Jianzhong Shen	Ministry of Science and Technology, Beijing, China

Liaisons

Keir Becker	(SCICOM), RSMAS, University of Miami, USA
Jeff Fox	Ocean Drilling Program (ODP), Texas A&M University, USA
Dave Goldberg	Lamont-Doherty Earth Observatory (LDEO), Columbia University, USA
Jamie Allan	National Science Foundation (NSF), USA
Niklas Pisias	Joint Oceanographic Institutions (JOI), Inc., USA

Guests

Steven Bohlen	Joint Oceanographic Institutions (JOI), Inc., USA
J. Paul Dauphin	National Science Foundation (NSF), USA
John Farrell	Joint Oceanographic Institutions (JOI), Inc., USA
Jimmy Kinoshita	Japan Marine and Technology Center (JAMSTEC), Japan
Bruce Malfait	National Science Foundation (NSF), USA
Ted Moore	University of Michigan, (iPC Co-Chair), USA
JoAnne Reuss	University of Michigan, USA
Kasey White	Joint Oceanographic Institutions (JOI), Inc., USA
Minoru Yamakawa	Japan Marine and Technology Center (JAMSTEC), iSAS, Japan

Guests from JOI BOG

Mark Abbott	Oregon State University, Corvallis, USA
Eric Barron	Pennsylvania State University, USA
Peter Betzer	University of South Florida, USA
Neil Lundberg	Florida State University, Tallahassee, USA
David Farmer	Graduate School of Oceanography, University of Rhode Island, USA
Barry Raleigh	SOEST, University of Hawaii at Manoa, Honolulu, USA
Mark Zobak	Stanford University, USA

JOIDES Office

Elspeth Urquhart	International Liaison, RSMAS, University of Miami, USA

ODP Council Members

Bruce Malfait **(Chair)**	National Science Foundation (NSF) USA
Neil Williams	Australian Geological Survey, Canberra, Australia
TBA	Canada
Sun Hong	Ministry of Science and Technology, Beijing, China
Soren Durr	Deutsche Forschungsgemeinschaft, Bonn, Germany
John Ludden	INSU-CNRS, Paris, France
Isao Koike	Ocean Research Institute, Tokyo, Japan
John Lawton	National Environment Research Council, Swindon, UK
Enric Banda	European Science Foundation, Strasbourg, France
Jan Hertogen	Katholieke Universiteit Leuven, Belgium
Susanne Egelund	Forkningsstyrelsen, Copenhagen, Denmark
Carl Ehlers	Geologisk-Mineralogisk Institute, Finland
Gudmundur Palmason	The Iceland National Energy Authority, Reykjavik, Iceland
Maria Luiga Ruscitto	Consiglio Nazionale delle Ricerche (CNR) Rome, Italy
Peadar McArdle	Geological Survey of Ireland, Dunblin, Ireland
Young Hoon Kwak	Korea Institute of Geology, Taejon, Korea
Jan Stel	The Netherlands Geoscience Foundation, The Hague, The Netherlands
Are Birger Carlson	The Research Council of Norway, Oslo, Norway
Ju-chin Chen	Institute of Oceanography, National Taiwan University, Taipei, Taiwan
José H. Monteiro	Instituto Geológico e Mineiro, Lisbon, Portugal
Menchu Comas	CSIC and University of Granada, Granada, Spain
Mary von Knorring	Swedish Natural Science Research Council, Stockholm, Sweden
Jean-Bernard Weber	Swiss National Science Foundation, Bern, Switzerland

1.2.1 Logistics

LODGING ACCOMMODATIONS:
The Fairmont Hamilton Princess
Hamilton, Bermuda
Phone: 441.295.3000
http://www.princessbermuda.com/

MAKING LODGING RESERVATIONS (Important Deadline Information): A block of rooms has been set aside for this meeting at a special rate of $209.00 USD per night (regular room rate is $249.00). Please email The Fairmont Hamilton Princess **ham.reservations@fairmont.com** **ON OR BEFORE April 7** (mention that a block of rooms has been reserved for The Joint Oceanographic Institutions). If you email your request, be sure to put Joint Oceanographic Institutions reservation in the subject line. You will need to provide the hotel with a credit card number to hold your room.

Rooms have been blocked beginning July 8 for five nights. If you would like to arrive early or stay late it is possible that The Fairmont will be able to extend the special room rate to you.

Here is the link for the official Bermuda Tourism web page www.bermudatourism.com

GROUND TRANSPORTATION:
All flight reservations will come into BDA (Bermuda International Airport). From there you should taxi to the hotel. Taxi fare is approximately $22.00. There is also a public transportation bus that takes you from the airport to the Hamilton Princess for $4.00. Here is their web site: http://www.bermudabuses.com

MEETING LOCATION, DATES & TIMES: Your meetings will be held at The Hamilton Princess Hotel, Princess Victoria Room.
July 10 All day EXCOM Meeting. A continental breakfast will be served at c. 08.30 and lunch will be served at hotel
09:00 – 17:30

July 11 Joint meeting with ODP Council
09:00 – 12:00
A continental breakfast will be served at c. 08.30 and lunch served at 12:00; if you will not join the group for lunch, please let me know.

MEETING HOST:
Steve Bohlen
President, Joint Oceanographic Institutions
1755 Mass. Ave., NW Suite 700
Washington, DC 20036

Logistics Contact:
Bridget Chisholm
Meetings Manager, Joint Oceanographic Institutions

bchisholm@joiscience.org

1.2.2 SOCIAL FUNCTIONS:

July 10

ODP Celebration: BBQ, Ship Tours and More 7:00
The BBQ will be on the dockside at Clocktower Parade, Northern Promenade near to the *JOIDES Resolution*.

July 11

ODP Council Reception and Dinner 7:00
Cocktails at The Bermuda Underwater Exploration Institute (BUEI) in the Overlook Lounge.
BUEI is located at 40 Crow Lane, Pembroke. http://www.buei.bm/
Dinner will be at 8:30 PM in the La Coquille Restaurant, adjacent to BUEI
http://www.lacoquille.bm/

FIELD TRIP:
You are invited to tour Nonsuch Island on Sunday July 13.
•departure by boat from BBSR at 8:00 am. The boat travels east and south of St David's Island
•arrival on Nonsuch 8:45 am
•8 :45-10:30 am, guided tour of Nonsuch Island
•10:30-11:00 am, swim/snorkel off the beach on Nonsuch Island
•11:00 am, departure from Nonsuch
•light refreshments will be served on the boat
•11:45 am, arrival at BBSR
If you are interested in touring Nonsuch Island email Helle Patterson, hpatt@bbsr.edu at Bermuda Biological Station for Research (BBSR). Cost per person: $65.00. BBSR needs a minimum of ten persons, a maximum of 25 to operate the trip. For a description of Nonsuch Island, and why it is so special, please see http://www.bbsr.edu/Education/educationhs/educationhs.html and then scroll down to "Field Trips for Groups" where you'll find "Nonsuch Island".
BBSR has a few rustic lodging options if you would like to lodge there. For over night accommodations contact Lauren Simons lsimons@bbsr.edu and supply your credit card number.

3. Minutes and Matters Arising

Minutes from the EXCOM Granada Meeting June 2002 can be accessed at: http://joides.rsmas.miami.edu/files/EXCOM_02_02_draft.pdf

4. Country and Consortium Reports - Read Only

4.1 ECOD (von Knorring)

ECOD Country Report (1 July 2002 – 30 June 2003) for EXCOM final meeting, Bermuda 10-11 July 2003

1. **EMCO meetings**

Since the last EXCOM meeting, the ECOD management committee has held two meetings; one in Salamanca, Spain 20-21 September 2002, and one in Dublin, Ireland 25-26 April 2003. Both meetings were joint meetings with the ECOD scientific committee (ESCO).

In order to enable as many ECOD member country representatives as possible to participate in the meetings for the future European participation in IODP, the ECORD interim Council held meetings in connection with both ECOD meetings.

The final EMCO meeting will be held in Strasbourg, France on 29 September 2003. In order to commemorate the 17 years of fruitful ESF Consortium participation in the ODP, a jubilee meeting will be held on the same day. A white paper containing the history of ECOD scientific participation in ODP is being prepared by the ESCO secretariat and ready by the meeting.

In September 2002 the Netherlands took a formal decision to join IODP with a contribution higher that their present ODP contribution. Simultaneously the Netherlands decided to contribute on this raised funding level during the last year of ODP, which means, that for the period 1 October 2002 – 30 September 2003 ECOD will provide a full ODP membership.

2. **ECOD administration**

During the reporting period Mary von Knorring, Sweden has chaired the EMCO, and has also represented ECOD in EXCOM, IWG and in the informal ECORD interim Council Core Group. Jeroen Kenter, the Netherlands has been chairman of ESCO, and represented ECOD in SCICOM and iPC. The ESCO Office is hosted

by the Netherlands with Sam Purkis as scientific secretary
http://www.geo.vu.nl/~esco/

The European Science Foundation is hosting the EMCO secretariat with Martina Hildebrand as scientific secretary and Joanne Dalton Goetz as administrative officer.
http://www.esf.org/esf_article.php?language=0&article=66&domain=3&activity=1

3. ECOD acitivites within ECORD

ECOD representatives have been actively involved in the process of building the European partnership for joining IODP. Despite the financial drawback experienced when the expected European Community support for MSP drilling did not come off, much effort has been done to secure funding for the drilling of the highest ranked leg. The Swedsish and the Dutch EMCO representatives have been the ECORD liaisons in the evaluation processe for the designation of an ECORD management agency (EMA) and European Science Operator (ESO) respectively.

ECOD countries have during the reporting period housed a SCICOM/iPC meeting in August 2002 in Gent, Belgium; three ECORD interim Council meetings (Salamanca, Copenhagen and Dublin); as well as the IWG meeting in June 2003 on Capri, Italy.

4. ECOD nominees / members for JOIDES Advisory Structure and iSAS Panels

Committees	**Present Delegate/Alternate**
Executive Committee (EXCOM)	Del: Mary von Knorring (Sweden) Alt: Menchu Comas (Spain)
Science Committee (SCICOM) *Interim Planning Committee (IPC)	Del: Jeroen Kenter (The Netherlands) Alt: Hans Christian Larsen (Denmark)
Technology and Engineering Development Committee (TEDCOM)	Del: Sigmund Stokka (Norway) Alt: Sergio Persoglia (Italy)

Science Steering & Evaluation Panels (SSEPs)	**Present Delegate/Alternate**
Earth's Environment (ESSEP) *Interim ESSEP	Del: Helmut Weissert (Switzerland) Alt: Nalan Koc (Norway)*

Earth's Interior (ISSEP) *Interim ISSEP	Del: Rolf Birger Pedersen (Norway)* Alt: Luis Menezes Pinheiro (Portugal)

Service Panels (SPs)	Present Delegate/Alternate
Pollution Prevention and Safety Panel (PPSP) *Interim PPSP	Del: Juanjo Danobeita (Spain)* Alt: Birger Larsen (Denmark)*
Site Survey Panel (SSP) *Interim SSP	Del: Annakaisa Korja (Finland) Alt: Luca Gasperini (Italy)
Scientific Measurement Panel (SciMP)	Del: Leonardo Sagnotti (Italy) Alt: Eve Arnold (Sweden)

* iSAS Panels

5. ECOD scientists sailing on ODP-legs June 2002 – May 2003 (Legs 204 – 208)

-Leg 204 Gas Hydrates: Eualia Gracia (Spain) and Maarten Vanneste (Norway)
-Leg 205 Costa Rica: Paola Vannucchi (Italy)
-Leg 206 Fast spreading crust: Laura Crispini (Italy) and Paola Tartarotti (Italy)
-Leg 207 Demerara rise: Astrid Forster (The Netherlands) and Jorijntje Henderiks (Sweden)
-Leg 208 Walvis Ridge: Lucas Lourens (Netherlands), Henry Vallius (Finland), Simonetta Monechi (Italy) and Isabella Raffi (Italy)

6. ECOD scientists invited to sail on ODP-legs May – September 2003 (Legs 209 – 210)

-Leg 209 MAR Peridotite: Carlos Garrido (Spain) and Miguel Crespo (Spain)
-Leg 210 Newfoundland Margin: Therese Shryane (Ireland) and Anne Engstrom (Sweden)

7. ECOD Student trainees, participation and applications since Leg 205

-Leg 206 Fast Spreading Crust: Adam Brockdorff (Debmark)
-Leg 208 Walvis Ridge: Appy Sluis (Netherlands)

4.3 Germany (Kudrass)

Germany's approach to IODP

In May 2002, the co-ordinator of the DFG Priority Programme ODP/DSDP, Dr. H.-R. Kudrass, presented the brochure "IODP- Das Integrated Ocean Drilling Program" to the "Geokommission", the major board advising DFG on all geoscientific matters. The brochure describes the benefits of ODP and the scientific targets of IODP to gain support for the participation of the German geoscientific community for IODP. The Commission endorsed the document for presentation to the DFG Senate. At October, 24th 2002, the DFG decided to fund the German participation in IODP. The decision enables DFG to fund the equivalent of 50% of a full membership plus evaluation of data and samples for the first five years. The Research Ministry has asked the Helmholtz Society of Research Centers for provision of the remaining 50% membership fee.

Colloquia

Around 240 scientists of the German ODP and IODP community met in Mainz (26 to 28 March 2003) for their annual joint meeting to present and discuss the latest results. 24 talks and 105 posters have been presented to the topics "paleoclimate", "deep ocean crust and volcanism", "microbiology and gashydrates", "tectonics, energy transport and fluid circulation", and "K/T impact". The German ocean drilling community continues to support a close co-operation within the European ocean drilling communities. Consequently, the 5th European ODP forum will be held at the end of March 2003 in Bremen (Bremen University, Germany).

4.4 Japan (Tokuyama)

1. **Site Survey Cruise**

A)2002

1)R/V Hakuho Maru, Okinawa Trough (June); To investigate tectonic development of the Okinawa Trough and nature of hot seepage in the south western Okinawa Trough using deep tow ocean floor imaging system (WADATSUMI), CTD/water sampler, heat flow measurement instrument, and others.

2)R/V Kaiyo, Okinawa Tough(Nov.); High resolution seismic survey across the venting site for the purpose of IODP proposal.

B)Future Schedule

1) Site survey of the shake down cruise of IODP for safety purpose in the Nankai Trough and Japan Trench using charter ship(Aug. 2003)
2) R/V Kairei, Mariana Trough(Oct. to Nov. 2003) ; To investigate tectonic development of the Okinawa Trough using using deep tow ocean floor imaging system (WADATSUMI).

3) R/V Hakuho-maru, Mariana Trough(Nov. 2003) ; To investigate tectonic development and mantle materials of the Okinawa Trough using MBES, Proton Magnetometer, and rock samplers.
4) R/V Kaiyo, Okinawa Tough(Nov.); High resolution seismic survey across the venting site for the purpose of IODP proposal.
5) R/V Kaiyo, Sagami and Nankai Toughs (Dec.2003-Jan. 2004); To investigate the rate of offset of the active faults off Tokai and the recurrence time of great earthquake using pinpoint piston core and multiple core sampler.

2. ODP related symposium

International symposium to discuss the accomplishment of ODP (March 2004 organized by Japanese IODP office)

4.5 Pacific Rim Consortium (Hiscott)

PacRim Report (consortium members in alphabetical order)

Australia

- Australia was able to obtain funding for the final year and maintain Australia's one third contribution to the PacRim consortium.
- Australia has produced a poster entitled "Paradise Submerged" on the ODP drilling of Kerguelen Plateau. Copies are avialable for AusODP Secretariat. Three other posters are in the final stages of preparation.
- Australia is focused on preparing a final legacy document which includes a summary of participants, legs in the Australian region and a bibliography of publications flowing from our involvement.

Canada

Canadian shipboard participation remained at a high level for the last year of the program, with 6 scientists and trainees sailing on the drillship, including Dave Mosher, who sailed as Co-chief Scientist on Leg 207. Other highlights for the year included two successful portcalls by the JOIDES Resolution in Victoria and the selection of the Newfoundland Basin for drilling on Leg 210, the last leg of the program. Canada will host the last portcall of the Ocean Drilling Program in St. John's at the end of the leg. The only major disappointment was financial. Due to a drop in the exchange rate, Canada was unable to maintain its full 1/3 membership contribution, even though its contribution in Canadian dollars was unchanged, causing the PACRIM consortium to be reduced to Associate membership. (Ironically, if the conversion were made now, there would be no shortfall; six months later, the Canadian dollar is the highest is has been in seven years).

The Canadian ODP Secretariat has begun a review of Canada's participation in ODP and has found much to celebrate. In the past 19 years, we have sailed 135 scientists, including 16 Co-chiefs, from 30 universities, government agencies and corporations. Canadians served as first authors on over 730 ODP-related papers and as co-authors on another 3100 publications. In addition, many of our proposals have been drilled, including five in Canadian waters, contributing to our understanding of clathrates, the origin of VMS deposits, west coast Holocene climate and seismicity and east coast offshore stratigraphy, as well as other scientific issues worldwide.

The situation in Canada regarding participation in IODP remains uncertain despite these successes. With the failure of our proposal to the Canada Foundation for Innovation last June, it became clear that we cannot expect to participate in IODP as a full member. From subsequent discussions with NSERC to determine what grant mechanisms are still available to us, it appears we may be able to submit a compound proposal for targeted science and partial membership in IODP through a consortium with other countries. We are currently looking into the possibility of submitting a proposal to fund the participation of a Canadian icebreaker in the Arctic Armada, scientific investigations of core from the Lomonosov Ridge and membership in ECORD. Although this has sparked considerable interest in Canada, it will be in competition with other earth science initiatives in Canada, including Neptune and ICDP, and we have been advised that funding is tight. While this is being resolved, we still intend to send observers to the meetings of the IODP Planning Committee and other panels as appropriate.

Korea

KODP Members are recently changed as follows:
- Chairman of the Council: Dr. Tai Sup Lee (tslee@kigam.re.kr)
- Secretariat: Dr. Dae-Gee Huh (huh@kigam.re.kr)
- Associate Secretariat: Dr. Young-Joo Lee (yjl@kigam.re.kr)

* Please put e-mail addresses of those members on the mailing list.

KODP Activities
- To promote KODP participation, we had a workshop on “Status of KODP and Participating in IODP” on the second of April, and also have provided research funds for shipboard and shore-based scientists.
- In order to secure funds to participate in IODP, KODP recently submitted a proposal to MOMAF (Ministry of Maritime Affairs and Fisheries). The final decision will be made approximately September 2003.
- KODP is looking for the assistance of IODP member countries to drill in Korean waters during the shake-down period of “Chikyu”. It is very important for us to get funds for IODP participation as well as to promote KODP activities.

Taipei

- Taipei will host several workshops to integrate IODP drilling proposals in the Okinawa Trough and South China Sea.
- A team is working on the core samples from Site 1202, Leg 195, in the Okinawa Trough. The team will have a Leg 195 post-cruise meeting in Taipei in July, 2003.

4.7 United Kingdom (Falvey)

UK-ODP EXCOM REPORT

Working towards IODP

UKODP has successfully bid to NERC for a full support program for IODP until 2007/2008 including IODP national office support costs; a travel and subsistence budget for IODP participation; a IODP thematic grants program and post - doctoral fellowship round. In addition NERC have included monetary support for Site Specific Surveys something that UK have not been able to do effectively in the past. Work is now underway on the setting up of UK-IODP and we are actively working on helping UK-scientist take a full and active part within what is going to be a very exciting new program.

Planning activities for IODP Mission specific platform operations have continued funded through the JEODI program. British Geological Survey has been designated as the European Science Operator for MSP science operations in 2004, along with partners: the University of Bremen and European Petrophysics Consortium (Universities of Leicester ,Montpellier, Aachen & Amsterdam). Detailed planning of the Lomonosov Ridge (Arctic) operation continues. University of Leicester have received additional national funds to undertake further planning of MSP logging operations.

Grants

NAME	TYPE	Affiliation	Amount
Damon Teagle	Rapid Response Grant	SOC	£1980
Damon Teagle	Rapid Response Grant	SOC	£2240
Rosalind Coggon	Rapid Response Grant	SOC	£2000
P. Wilson	Rapid Response Grant	SOC	£2000
P. Sexton	Rapid Response Grant	SOC	£2000
S. Robinson	Rapid Response Grant	Oxford	£1350
P. Kempton	Thematic	NIGL	£30.59539
I. McCave	Thematic	CAMB	£28.5322
James	Thematic	OPEN	£16.75022
P. Kempton	Thematic	LEIC	£33.06523
Stokes	Thematic	OXFORD	£51.34914
D. Teagle	Thematic	SOC	£30.70686
P. Wilson	Thematic	SOC	£83.63925
Peacock	Thematic	BIRM	£75.2686
Coogan	ODP Fellowship	LEICS	£71.86384
Shackleton	Post Doctoral Support Grant	CAMB	£8.10528

A further & heavily over subscribed UK ODP grants round will have been completed by UK Steering committee on June 17th highlighting the continued UK interest in ocean earth science.

Participation

	Institution	Leg	Notes
Cacho Lascorz, I	Cambridge	202	Sailed
Revillon, S	SOC	203	Sailed
Schultz, A	SOC	203	Sailed, Co-Chief
Schultheiss, P	GEOTEK Ltd	204	Sailed
Chavagnac, Valerie	SOC	205	Sailed
Barr, Sam	Leicester	206	Sailed
Teagle, Damon	SOC	206	Sailed
Thurow, Jürgen	UCL	207	Sailed
Wilson, Paul	SOC	207	Sailed
Schmidt, Daniela	Royal Holloway	208	Sailed
Hathorne, Edmund	OPEN	208	Sailed
Chambers, Lynne	NIGL	209	Sailed
Harvey, Jason	OPEN	209	Sailed

Meetings

UKODP Open Forum Meeting - 6th November 2002

Meeting was held at University College London and was attended by 100 UKODP members. The meeting had an international feel about it this year with presentations given by Pierre Henry, Ian Jack, Paul Wilson, Charlie Paull, Ulrich Harms, Stuart Crampin.

Marine Studies Group meeting at Burlington house on the 9th-11th December

UKODP sponsored the Marine Studies group meeting this yea. The meeting was attended by around a 100 people and looked at climate change and ocean chemistry in the Mesozoic to Paleogene eras.

UKODP Drilling Proposal Workshop - 16th May 2003

The workshop was held at the Geological Society of London and was attended by 30 UKODP scientists. The meeting aimed to inform UK scientists of the IODP proposal process, develop further extant UK proposals and to encourage new proposal writing. This meeting appears to have been a success already with new proposal ideas already being formulated Since the meeting 3 workshops are being setup by UKODP members in order to get together scientific groups to write preliminary proposals for the October deadline. These include a meeting in Cardiff on Mantle Plumes, another at the University of Brest on Large Igneous

Provinces and a third one in Cambridge on the Antarctic Circumpolar Current. It is anticipated that that future UK IODP Open forum meetings will be changed in content and extended in duration to encourage proposal development.

4.8 U.S.A (Farrell)

U.S. Country Report (Part II) JOI/USSSP Activities 6/02 to 6/03:

U.S. Science Support Program (USSSP)

Year 19 Program Plan
In February 2003, NSF approved a program plan for year 19 of the USSSP with a budget of $4.6M. Wind-down of USSSP will begin this year, with ODP operations finishing in September, and will conclude before February 28, 2006 (at the end of USSSP year 21). USSSP operation beyond 2003 is necessary to accommodate post-cruise research and other activities, and to enable financial and programmatic closeout.

USSAC
The U.S. Science Advisory Committee (USSAC) met twice since the last EXCOM meeting: July 10-12, 2002 in San Francisco, and February 19-21, 2003 at the University of South Florida, St. Petersburg. At these meetings, USSAC focused its attention on post-2003 planning issues and the outcome of the Conference on U.S. Participation (CUSP) in IODP. In February, the three primary topics of discussion were: U.S. protocol for staffing IODP expeditions, criteria for long-term planning groups, and recommendations for a U.S. IODP education workshop.

USSAC Membership
The following six USSAC members completed their three-year terms on USSAC on September 30, 2002: Tim Bralower (UNC-CH), Margaret Delaney [Chair] (UCSC), Jon Martin (U. Florida), Tommy Phelps (Oak Ridge NL), John Sinton (U. Hawaii), and Debbie Smith (WHOI). The following six new members began their terms as USSAC members on October 1, 2002: Dave Christie (OSU), Gabe Filippelli (IUPUI), Mark Leckie (U. Mass.), John Mahoney (U. Hawaii), Greg Mountain (Rutgers), and Jill Whitman (Pacific Lutheran U). Warren Prell (Brown Univ) is the new USSAC Chair.

US Participation on the iSAS
JOI/USSSP is continuing to assist in the process of selecting and supporting U.S. representatives to the various panels and committees of the interim Science Advisory Structure. U.S. representatives have now been selected for the interim: (a) Planning Committee; (b) Science Steering and Evaluation Panels (both interior and environment); (c) Scientific Measurements Panel (d) Site Survey Panel; (e) Pollution Prevention and Safety Panel; and (f) Technical Advisory Panel (analogous to the JOIDES TEDCOM), and the Industry Liaison Panel. U.S.

representatives chair or co-chair many of these panels. USSSP funds are made available to offset the costs incurred by U.S. panel chairs in fulfilling their duties.

Support for the US iPC Co-Chair

Through a contract to the University of Michigan established in Summer 2001, JOI/USSSP continues to provide financial support (salary, travel, and other costs) to Ted Moore as co-chair of the IODP iPC to implement the mandate specified by the IWG from September 1, 2001 through September 30, 2003. During this period, Moore, and his Japanese iPC co-chair, Hajimu Kinoshita, have lead iPC planning activities. They have overseen the IODP iSAS, administered the evaluation of scientific ocean drilling proposals and helped establish the IODP Science Advisory Structure that will initiate on October 1, 2003. Joanne Reuss has provided programmatic and administrative support to Moore, the iPC, and she has also assisted the iSAS Office at JAMSTEC.

U.S. Planning for IODP

Conference on U.S. Participation (CUSP) in IODP

CUSP was held June 11-14, 2002 in Washington, DC and involved 60 participants. Background documents, conference information, and a draft report are posted at www.joiscience.org/USSSP/iodp/default.html. The CUSP planning subcommittee—including Peggy Delaney, Warren Prell, Nathan Bangs, Earl Doyle, Bob Duncan, and Terry Quinn—assembled recommendations and meeting discussion summaries into a draft report for review by USSAC. Following the conference, a web-based questionnaire was distributed. 150 responses were received and were incorporated into the CUSP report. The final version of the report was completed by JOI and submitted to NSF in November 2002. The report was printed and distributed in November 2002 as a special issue of the *JOI/USSAC Newsletter* (Vol. 15, No. 2).

The two-fold purpose of this workshop was to:

1) Formulate the characteristics, elements, and tasks of the entire U.S. program required to foster and sustain the full range of research and educational activities needed for successful U.S. participation in the IODP.

2) Identify and describe the optimal structure and resources for this program as well as the key entities, their connections, and their respective sets of authority, responsibility, and accountability.

U.S. IODP Education Workshop

Based on recommendations from USSAC and the Conference on U.S. Participation (CUSP) in IODP, JOI/USSAC held a workshop May 6-7, 2003 to focus on the U.S. educational component of the future Integrated Ocean Drilling Program (IODP). A steering committee composed of educational professionals and ODP scientists met at JOI on November 12 to plan the workshop. Two USSAC members, Ellen Thomas (Wesleyan University) and Al Hine (University of South Florida, St. Petersburg) co-chaired the steering committee. The full workshop was co-chaired by USSAC members Al Hine (USF) and Jill Whitman (Pacific Lutheran University).

About 75 participants (mostly from the U.S., but also including Europeans and Japanese representatives) attended the workshop, which was held at the Narragansett Bay Campus, University of Rhode Island. The purpose of the workshop was to develop an effective U.S.-focused educational strategy for the IODP. Recommendations were sought from a range of experts in marine/science education and ocean drilling science. Workshop participants were solicited via targeted notices to recommended educators and through announcing the opportunity on the JOI/USSSP listserver. The recommendations resulting from the workshop address: ideas for initiating and fostering educational activities, the educational role of a future U.S. scientific ocean drilling support program, and potential partnerships to develop and produce educational activities, products, and services needed by educators. A full report of the workshop is pending.

IODP GeoSCAN, a planning workshop focusing on geophysical needs for IODP

To help the U.S. scientific community better understand the geophysical needs associated with developing drilling proposals for the different drilling platforms planned for IODP, USSSP and BP are sponsoring a planning workshop in Houston, TX on June 6, 2003. The primary objectives of the GeoSCAN workshop are to interact with the industry seismic acquisition community in order to discuss and identify geophysical surveying techniques to be used for site characterization in IODP. This focused meeting will be attended by industry representatives and members of the academic geophysical community. The main goals of the meeting will be (a) to identify how to raise the quality of site survey data within the budget constraints of IODP (b) how to acquire data of the appropriate quality to fulfill the site survey needs of the different platforms to be used in the new program, and (c) produce a concrete series of recommendations to NSF concerning the resources that will be needed to acquire and process site survey data in IODP.

IODP ODaSSI (Ocean Drilling and Site Survey Introduction: a primer for the marine community). In order to better educate the marine community on preparing drilling proposals for IODP, and to broaden U.S. participation in ocean drilling, JOI/USSSP is sponsoring the development of a daylong short course to be presented at national meetings that will focus on formulating successful, integrated drilling proposals and facilitate coordination between the geophysical and non-geophysical marine scientific communities. This effort, led by Carolyn Ruppel, will cover issues such as the overall framework of IODP, drilling capabilities, elements of drilling proposals, integration of seismic/site survey data, and case histories. At present, ODaSSI is planned to be initially presented at the 2003 AGU meeting, December 8-12, 2003.

U.S. contribution to the IWG Support Office (IWGSO

The IWGSO has continued to provide administrative, contractual, and logistical support to the International Working Group (IWG) and its designates in their efforts to outline the new IODP since November 30, 1999. Financial support for IWGSO is provided by the US, through JOI/USSSP, and by Japan, through JAMSTEC.

During the past year, the IWG Support Office has provided support for two IWG meetings, June 4-5, 2002, in Stockholm, Sweden, and January 22-23, 2003, in Nice, France. The Industry Liaison Working Group's brochure, titled "Opportunities for Scientific and Industry Cooperation in the Integrated Ocean Drilling Program" was published in August 2003. It has been distributed to ILWG's industry liaisons, all JOIDES and iSAS panel members, and to individuals identified by the IWLG co-chairs.

The IWGSO hosted exhibit booths at the Western Pacific Geophysics Meeting (July 9-12, 2002) in Wellington, New Zealand, the Geological Society of America's annual meeting (October 27-31, 2002) in Denver, Colorado, and the American Geophysical Union's Fall meeting (December 6-11, 2002) in San Francisco, California. An exhibit booth was also held at the joint meeting of the European Geophysical Society, American Geophysical Union, and the European Union of Geophysics (April 6-11, 2003) in Nice, France. Exhibit booths are planned for the Oceanology International meeting (June 4-6, 2003) in New Orleans, Louisiana, and at the International Union of Geodesy and Geophysics General Assembly (July 1-4, 2003) in Sapporo, Japan.

Promotional materials for IODP, including the general program brochure, a powerPoint presentation with note pages, and all exhibit posters and hand-outs are now available online as PDF documents for broad promotion of the program. These materials can be downloaded at http://www.iodp.org/brochure/brochure.html

For more information about IODP planning or for assistance promoting the program, please visit http://www.iodp.org, or contact the IWGSO by e-mail at iwgso@joiscience.org or by phone at 202-232-3900 x262.

Education and Community Engagement

Curriculum Development

Kathleen Marsaglia, California State University, Northridge, is developing a "Web/CD Atlas of ODP Core Photographs." Marsaglia received the subaward in Year 17 ($31,810) and her period of performance has been extended to August 18, 2003. The expected result is a prototype teaching and reference tool using ODP core photographs and associated information.

Katie Tauxe, a middle school teacher and former ODP technician, was awarded $3,269 for her proposal, "Motivating Middle School Students with the *JOIDES Resolution*." The purpose of this proposal is to develop an audiovisual presentation on the *Resolution*, its shipboard laboratories, and the lives of people who work on the ship. Ms. Tauxe sailed on the ship transit following Leg 206 to collect video footage and interviews. The purpose of the video is to convey the variety of jobs and the excitement associated with science and research.

Wolfgang Berger, Scripps Institution, is currently developing the "Seafloor Chronicles, An Outline of Ocean History," an online education course that highlights the scientific advances resulting from ocean drilling. Berger received USSSP funding in Year 17 ($15, 419) and his period of performance has been extended until January 1, 2004. A draft version of the course was submitted to JOI in March 2003. Once complete, this course will be offered online for credit to middle and high-school teachers through the University of California, however, the learning modules will be available to interested educators via the USSSP website and CD-ROM. This is a cost-sharing activity with most of the development costs being covered by the California Space Institute and the University of California.

Distinguished Lecturers Series for 2002-03

Over the past academic year, the following DLS lecturers have given talks at the institutions listed below. The series continues to increase in popularity and success.

Barbara Bekins, USGS
The Subduction Squeegee
Western Michigan University -- Kalamazoo, MI, April 7, 2003
University of Tulsa -- Tulsa, OK, April 2, 2003
University of New Hampshire -- Durham, NH, October 17, 2002
University of Illinois -- Urbana, IL, April 4, 2003
Plattsburgh State University -- Plattsburgh, NY, October 15, 2002

Jerry Dickens, Rice University
Extreme Climates and Frozen Methane: The Global Carbon Cycle with Gas Hydrate
Wright State University -- Dayton, OH, May 29, 2003
Hobart & William Smith Colleges -- Geneva, NY, February 20, 2003
Wesleyan University -- Middletown, CT, November 19, 2002
Lawrence University -- Appleton, WI, October 3, 2002
University of Southern Mississippi -- Hattiesburg, MS, March 6. 2003
University of Southern Mississippi -- Stennis, MS, March 7, 2003
Syracuse University – Syracuse, NY, February 21, 2003

Patricia Fryer, University of Hawaii
Windows on Subduction Zone Processes
University of New Mexico -- Albuquerque, NM, October 18, 2002
University of Oregon -- Eugene, OR, November 20, 2002
University of Maine -- Orono, ME, January 24, 2003
College of William & Mary -- Williamsburg, VA, January 27, 2003
Syracuse University -- Syracuse, NY, January 30, 2003

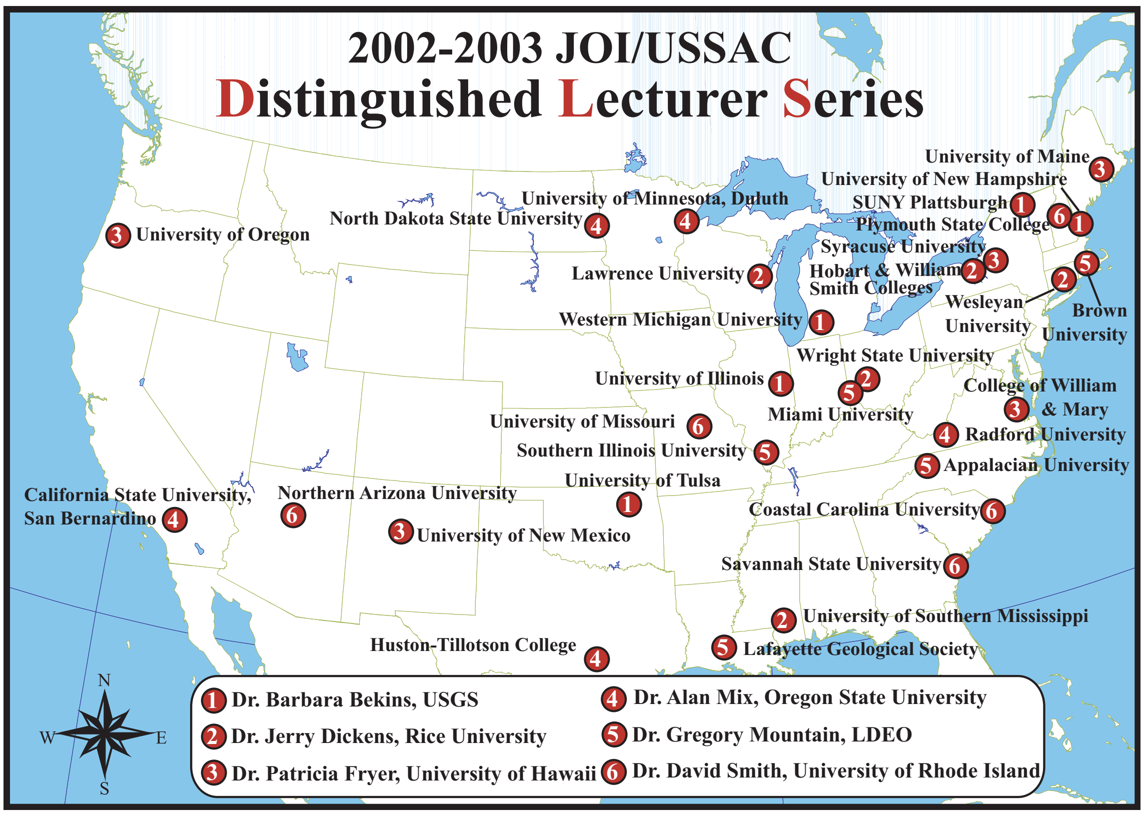
Alan Mix, Oregon State University
The Icy Poles or the Muggy Equator: What Drives Natural Climate Change?
Huston-Tillotson College -- Austin, TX, April 7, 2003
University of Minnesota -- Duluth, MN, April 15, 2003
Radford University -- Radford, VA, April 17, 2003
North Dakota State University -- Fargo, ND, April 14, 2003
California State University – San Bernardino, CA, May 9, 2003

Greg Mountain, Lamont Doherty Earth Observatory
The Ups and Downs of Determining Ancient Sea Level Change
Lafayette Geological Society -- Lafayette, LA, Fall 2004
Appalachian State University -- Boone, NC, April 14, 2003
Brown University -- Providence, RI, April 10, 2003

Miami University -- Oxford, OH, March 19, 2003
Southern Illinois University -- Carbondale, IL, March 21, 2003

David Smith, University of Rhode Island
Life in Marine Sediments: Probing the Limits of Earth's Deep Biosphere
Northern Arizona University -- Flagstaff, AZ, Fall 2004
Coastal Carolina University -- Conway, SC, September 26, 2002
Savannah State University -- Savannah, GA, January 17, 2003
University of Missouri -- Columbia, MO, November 15, 2002
Plymouth State College -- Plymouth, NH, October 22, 2002

National distribution of the JOI/USSSP DLS presentations in academic year '02-'03 is shown below.



Distinguished Lecturers Series for 2003-04
JOI/USSSP received 76 applications for DLS lecturers this year. The lecturers and the venues for talks in the 2003-2004 academic year have been identified. They are listed below and are presented in the attached map. JOI is working with the speakers and the respective institutions to determine the dates of the individual lectures.

Ruth E. Blake, Yale University
The Deep Biosphere: Microbes in the Mud
Calvin College -- Grand Rapids, MI
Univ. of Missouri -- Kansas City, MO
Case Western Reserve University -- Cleveland, OH
Old Dominion University, Norfolk, VA
University. of NC – Wilmington, NC
Huston-Tillotson College -- Austin, TX (HBCU)

Steven C. Clemens, Brown University
Solar Forcing or Climate System Feedbacks: Who's the Boss of Plio-Pleistocene Variations in Asian Monsoon Strength?
Boise State -- Boise, ID
Ohio State Univ.-- Columbus, OH
Lafayette College -- Easton, PA
Montclair State University -- Upper Montclair, NJ
Georgia State University -- Atlanta, GA

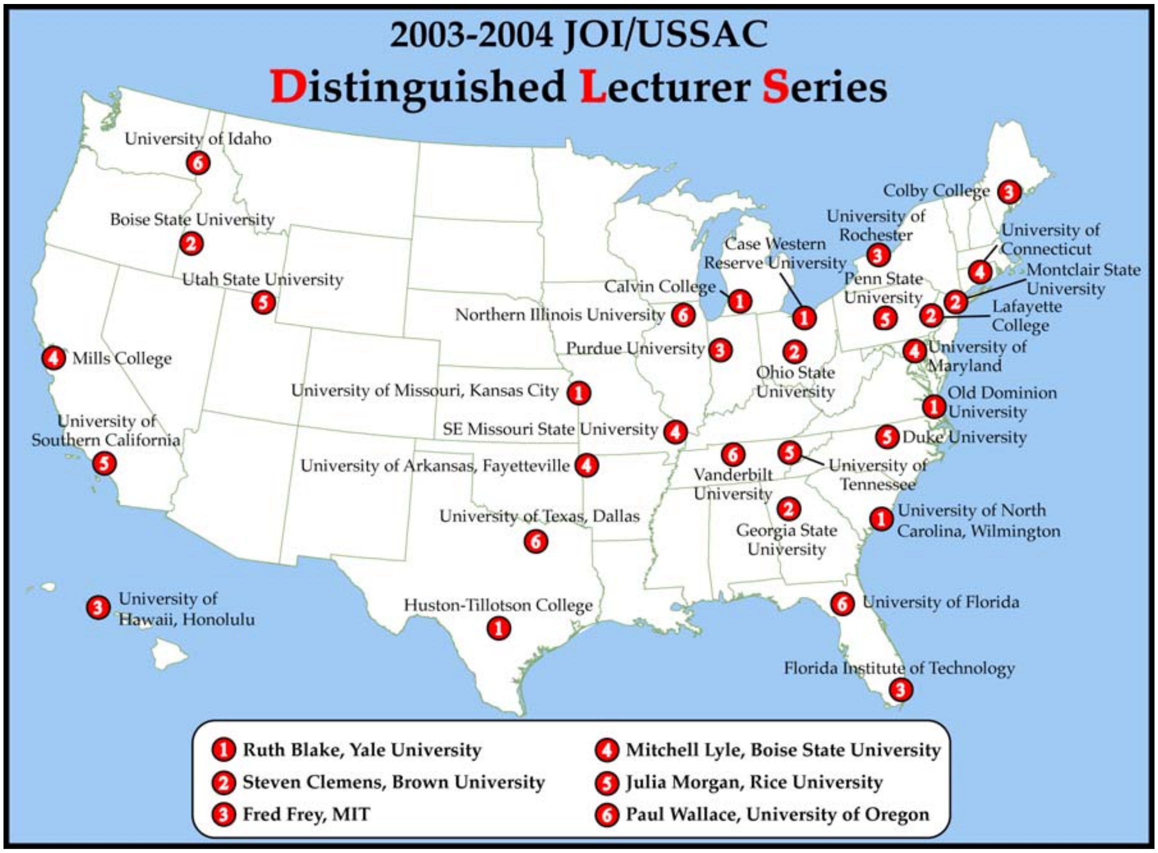
Fred Frey, Massachusetts Institute of Technology
Formation of the Kerguelen Large Igneous Province, Gondwana Breakup, Lost Continents, and Growth of the Indian Ocean
University of Hawaii -- Honolulu, HI
Colby College -- Waterville, ME
Purdue University -- West Lafayette, IN
University of Rochester -- Rochester, NY
Florida Institute of Technology -- Miami, FL

Mitchell Lyle, Boise State University
The Pacific Ocean and Climatic Change, from Eocene Extreme Warmth to Pleistocene Glacial Cycles
Mills College -- Oakland, CA
SE Missouri State University -- Cape Girardeau, MO
University of Connecticut – Storrs, CT
University of Maryland -- College Park, MD
University of Arkansas – Fayetteville, AR

Julia K. Morgan, Rice University
Marine Sediments go to Prism
University of S. California -- Los Angeles, CA
Utah State University – Logan, UT
Penn State -- University Park, PA
Duke University -- Durham, NC
University of Tennessee -- Knoxville, TN

Paul Wallace, University of Oregon
Formation and Environmental Effects of Giant Oceanic Plateaus
University of Idaho -- Moscow, ID
N. Illinois University -- DeKalb, IL
University of Texas at Dallas – Dallas, TX
Vanderbilt University -- Nashville, TN
University of Florida – Gainesville, FL

National distribution of the JOI/USSSP DLS presentations in academic year ‘03-’04 is shown below.



Internship Program

For the second year in a row, JOI/USSSP has employed two recent college graduates as interns. The current interns (Jennifer Anziano and Anthony “Tony” Goodman) began their terms July 15, 2002. Jennifer graduated from Macalester College with a B.A. in Geology, and Tony graduated from the University of Michigan with a B.S. in Geology. The previous year’s interns, Micah Nicolo (B.S. Geoscience, B.A. Political Science, Hobart and Smith Colleges) and Christina Riesselman (B.A. Geology, B.A. English, University of Nebraska) departed JOI in Summer 2002. Both are currently attending graduate school in geology (at Rice University and Stanford University, respectively), and both recently sailed on ODP Leg 208, thus continuing their involvement with ODP research.

During their time at JOI, the current interns have worked on special projects to enhance JOI/USSSP activities as well as assisting with routine administrative duties. For example, in addition to her regular tasks, Jennifer has taken on a major role in producing the *JOI/USSAC Newsletter* and other JOI/USSSP publications (such as the Submerged Coral Drilling Workshop report). She also assists with updating the IODP website and coordinating the Schlanger Ocean Drilling Fellowship. Her largest ongoing project is to organize a JOI archive file or “electronic filing cabinet” to improve access to programmatic files and images. In addition, Jennifer, at the invite of USSAC member Carolyn Ruppel, participated on a Gulf of Mexico research cruise in October 2002. Jennifer wrote an article about the cruise for the Fall 2002 *JOI/USSAC Newsletter*. Also, on February 4, Jennifer presented a talk titled “The JOI of Science Management: the Ocean Drilling Program” to an environmental careers seminar class at the University of Virginia, Charlottesville.

JOI seeks to match intern assignments to their skills and interest, therefore in addition to his routine duties, Tony has worked on several database projects, including developing a comprehensive U.S. participation/post-cruise science-funding database and a database to track the involvement of researchers in both ODP and the NSF MGG program. The latter project has allowed JOI/USSSP to better characterize the scientific community it serves. Tony also has been using GIS and GMT software to create complex maps plotting such things as U.S. participation throughout ODP. His other projects include creating a 10-minute presentation for the AGU booth using Leg 204 video footage and developing a system for submitting Schlanger Ocean Drilling Fellowship applications on line. Because the internship is office-based, JOI has sought cruise opportunities for all the interns. As part of this, Tony, at the invite of Nick Pisias and Doug Hammond, participated on a research cruise in the Pacific off southern California in late February 2003.

Because of its success to date, JOI plans to continue the internship program. In December 2002, and several times in early 2003, JOI issued a call over the JOI/USSSP listserver for applications for next year’s internship. This opportunity was also advertised at national meetings (GSA, AGU) and with an ad in *Eos*. In response, JOI received 23 applications for the 2002-2003 internship program. There were many qualified applicants, and from those, JOI selected two new interns. Anna Henderson, who graduated from Brown University this April with a B.S. in Geology, and a second person to be named. Most intern candidates have expressed strong interest in learning about science management before they continue with grad school. The interns will begin at JOI on July 7, 2003. The term of their internship is one year.

JOI/USSSP presence at scientific meetings

JOI/USSSP co-sponsored a joint ODP/IODP booth at the Geological Society of America (**GSA**) annual conference, October 27-30, 2002, in Denver, Colorado. USSSP hosted an ODP Town Meeting on October 26 in conjunction with the GSA meeting to update the scientific community about plans for the future. USSSP also sponsored an ODP/IODP exhibit booth at the fall **AGU** Meeting, December 6-10, 2002, in San Francisco, California, and hosted another ODP/IODP Town Meeting on December 7, 2002.

JOI/USSSP will co-sponsor a joint ODP/IODP booth at the **Oceanology International** conference, June 4-6, 2003, in New Orleans, Louisiana; at the **GSA** annual conference, November 2-5, 2003, in Seattle, Washington; and at the fall **AGU** Meeting, December 8-12, 2003, in San Francisco, California.

Schlanger Ocean Drilling Fellowship Program

In 2002, 35 proposals were submitted for two fellowship deadlines: April 15, 2002 and November 15, 2002. The April deadline was the last opportunity for ODP shipboard fellowship applications. Shorebased proposals were accepted at both deadlines.

In June 2002, USSAC's fellowship subcommittee met to evaluate the eighteen proposals submitted in April. Three one-year shorebased awards—including one renewal—were made, as follows:

Nicholas Drenzek, Woods Hole Oceanographic Institution
"Spatial and temporal variations in the mixed layer radiocarbon reservoir age through the last glacial maximum"(PhD, one-year, shorebased, ODP Leg 165)

Lorraine Lisiecki, Brown University
"Faster and more accurate construction of composite depth sections using dynamic programming"(PhD, one-year, shorebased, ODP Legs 108, 138, 154)

Matthew Schmidt, University of California, Davis (renewal application)
"Temperature and hydrological changes in the western Caribbean and the central North Atlantic during the last 450 kyr"(PhD, one-year, shorebased, DSDP Leg 94 and ODP Leg 165)

In February 2003, the fellowship subcommittee met to evaluate the seventeen proposals submitted at the November deadline. The following three one-year shorebased awards ($23k each) were made:

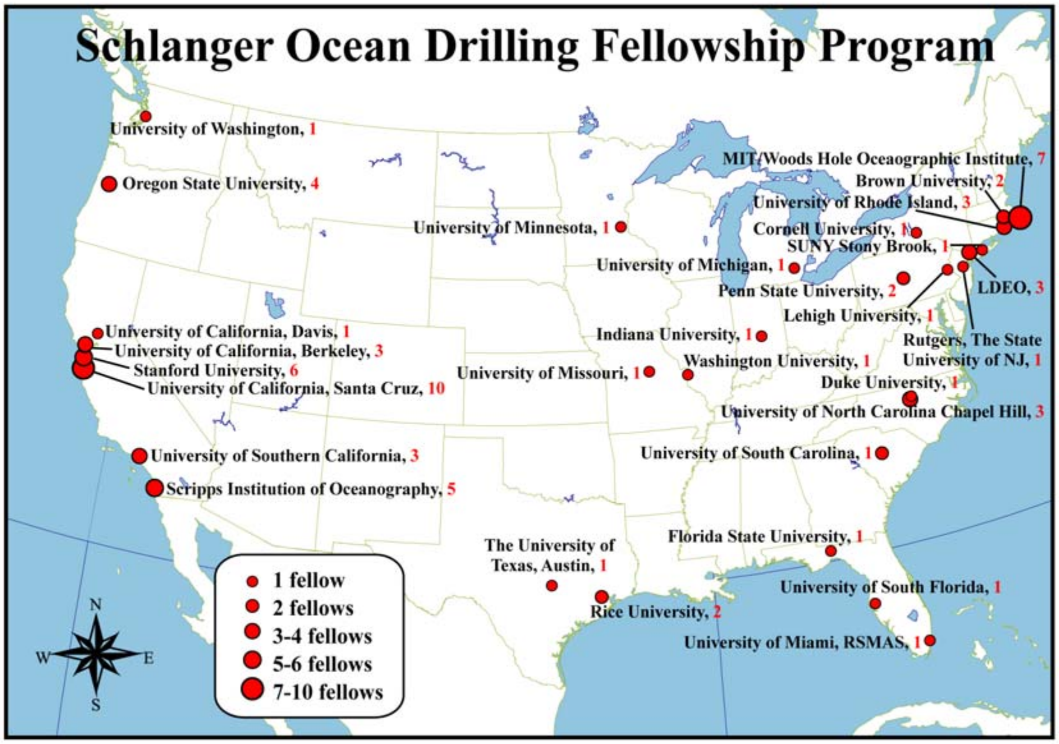
Joshua Feinberg, University of California, Berkeley
"*Magnetization of Seafloor Gabbros: Characterization of Crystallographically Oriented Magnetite Inclusions*" (ODP Legs 118 and 176)

Stephanie Healey, University of South Carolina
"A 500,000 Year Record of Deep Sea Temperature and Ice Volume Based on Benthic Foraminiferal Mg/Ca and $d^{18}O$" (ODP Legs 138 and 172)

Ivan Savov, University of South Florida
"The Role of Forearc in Subduction Zone Chemical Cycles: Elemental and Light Isotope Signatures for Serpentinites from South Chamorro and Conical Seamount" (ODP Legs 125 and 195)

Sixteen proposals were submitted for the April 2003 fellowship deadline. These proposals are currently being reviewed by the selection committee, and awards will be made in July 2003.

In March 2003, JOI developed and distributed a survey to past recipients of JOI/USSAC and Schlanger Ocean Drilling Fellowships. The results of this survey are providing additional background for a longitudinal study of the fellowship since its inception. The results of this study will be available during the next few months.



Undergraduate Student Trainee Program

During the past year, two U.S. undergraduates have participated in the JOIDES Undergraduate Trainee Program. Kimberly Artita, University of Hawaii, sailed on ODP Leg 203 and Christine Glatz, University of Maine, Orono, set sailed on Leg 207. Sharon Stant, Florida State University, will participate on Leg 210 as a trainee. From all reports, the program has been a positive experience for both the participants and the scientific parties on each leg.

Educational CD ROMs and Posters

JOI continues to receive and fill requests for USSSP's popular educational products: *ODP: From Mountains to Monsoons* and *Gateways to Glaciation* educational CD-ROMs and the *Blast from the Past* education poster. The third reprint of the poster is currently underway.

Other events

Earth Science Week and other Washington, DC events

JOI/USSSP continued to support the American Geological Institute's Earth Science Week (October 13-19, 2002) by supplying *Gateways to Glaciation* educational CD ROMs for inclusion in the Earth Science Week "kits" for educators.

World Oceans Day
JOI staff presented an exhibit and community engagement materials at World Oceans Day on Capitol Hill in June 2002. About ten other exhibitors participated.

JOI/USSAC Newsletter
Three issues of the *JOI/USSAC Newsletter* have been printed and distributed during the last year (July and December 2002, April 2003). The next issue is currently being developed. In addition to regular articles and announcements about USSSP and ODP activities, recent newsletters have included updates on IODP planning and funding activities. In particular, the December 2002 included a full version of the CUSP report.

JOI/USSSP Listserver
The JOI/USSSP listserver, which is mostly U.S. scientists, continues to be an effective means of communicating with the scientific community. If you wish to be added to the listserver, or to distribute a message over the list, please send your request to info@joiscience.org. The email list is moderated at JOI to ensure that all the messages are relevant to USSSP, ODP, or scientific ocean drilling in general.

Approximately, 50 messages were distributed via the JOI/USSSP listserver during the past year. These messages informed the scientific community of USSSP and ODP-related activities including: workshops, conferences, employment opportunities, GSA and AGU exhibits and town meetings, and funding opportunities. They also included the results of the CUSP survey, updates on the DSDP/ODP citation database, and publication policy issues. JOI continues to examine ways to improve and extend this highly useful tool.

JOI/USSSP Website
Maintenance and updating of the JOI/USSSP website is ongoing. For example, a new Education section to the site was created early in 2003 to better organize information on USSSP education programs and to identify useful ODP-related educational links. In May 2002, the JOI program staff met and identified several major changes to the website to make it more clear and accessible in general. The need for additional changes and a redesign of the site is recognized and is planned for the year ahead.

Capitol Hill Events
In June 2003, JOI/USSSP participated in two events on Washington DC's Capitol Hill that provided visibility for ocean drilling and made the case for funding of the new US drilling vessel for IODP.

JOI/USSSP had multiple roles in ***Capitol Hill Oceans Week***, a two-day event organized by the National Marine Sanctuary Foundation that featured talks, exhibits, and a reception. JOI's Frank Rack spoke about gas hydrates and Leg 204 as part of a plenary on energy. JOI also held a booth on ODP/IODP as part of the Oceans Technology Fair. Finally, JOI/USSSP hosted a reception as part of the week. In addition to displays on ODP and IODP, scientists including Dick Norris, Andy Fisher, Sarah Sherman, John Tarduno, and David Smith presented their research and its relevance in a poster format to an audience of marine policy professionals and congressional staff. They also made visits to their congressional delegation.

A week later, JOI participated in the Coalition for National Science Funding Exhibit, an event sponsored by many scientific societies to illustrate the types of research funded by NSF. JOI had a booth featuring ODP and IODP and highlighting ocean drilling's role in gas hydrates research.

Site Augmentation Proposals

Funded

Liviu Giosan (WHOI): *Mini-Workshop on Quaternary Sedimentation and Climate History of the Black, Marmara, and Aegean Seas.* This mini-workshop will bring together an international contingent of proponents for drilling in the Black and Marmara seas. The proposed agenda includes: 1. deciding overall strategy: multiplatform vs. deep-sea drilling; one vs. two proposals; 2. adding geochemical and deep biosphere components to the proposals; 3. discussing best strategies on how to obtain a valid chronostratigraphy; 4. choosing best sites for drilling and estimating what survey data are still needed. $15,000.

John Jaeger (University of Florida): *Evaluating Decadal-Scale Climate Change and Geomagnetic Paleointensity Records in Continental Shelf Strata of the Subarctic Pacific.* This site augmentation study was funded to collect shallow sediment cores in the Gulf of Alaska, to study decadal-scale climate change and geomagnetic paleointensity records in support of IODP Proposal 597. $30,486.

Sean Gulick (University of Texas Institute for Geophysics) and **Peter Flemings** (Pennsylvania State University): *Site Augmentation in the Nankai Trough: Geological Reconnaissance, Seafloor Fluid Flow Indicators, and Shallow Seafloor Measurements using Kaiko ROV*. This proposal was funded to conduct an ROV-based geological reconnaissance Site Augmentation study in the Nankai Trough, by participating on a “cruise of opportunity” in May, 2003. The proposed study will investigate the shallow seafloor and fluid flow indicators, increasing the database for future Nankai IODP drilling. $18,830.

Geoffrey Wheat (University of Alaska-Fairbanks): *Retrieval of Data and Continuous Fluid Samplers from the CORK at ODP Site 1200*. This site augmentation proposal was funded to recover data from a CORK installed at the South Chamorro Seamount (ODP Site 1200) during Leg 195. The data were recovered by participation on a NSF-funded “cruise of opportunity” in March, 2003. $20,450.

Charles Paull (MBARI): *Monterey Bay Borehole Test Facility Mini-Workshop.*
This mini-workshop was held March 24-25, 2003 to develop IODP pre-proposal 621 (installation of a borehole instrument test facility in Monterey Bay) into a full IODP proposal. The proposed facility will test instrument packages under development for future deployment in IODP re-entry holes. $9,362.

Terry Edgar (US Geological Survey): *SE Asian Eperic Seas Drilling Project (Proposal #602) Mini-Workshop*. This mini-workshop was funded and held in San Diego November 15-16, 2002, to further develop the SE Asian Epeiric Seas project (262) into a full proposal. $4,716.

Martin Fisk (Oregon State University): *Deep Biosphere Proposal Mini-Workshop*. This mini-workshop was funded to develop an IODP proposal to investigate the subsurface biosphere of the ocean crust. The workshop was held during the two days prior to the International Symposium for Subsurface Microbiology (ISSM), September 5-6, 2002, Bergen, Norway. $18,235.

In review/pending

Margo Edwards (University of Hawaii) and Kathy Gillis (University of Victoria): *Hess Deep Site Augmentation.* This proposed Site Augmentation study will conduct surveying in Hess Deep, using side-scan sonar imagery and bathymetry. The overall goal will be to select specific drilling targets in support of IODP Proposal 551-FULL. $37,500 requested; pending resubmittal.

Peter Clift (WHOI): *Seismic Stratigraphy of the Pakistan Margin and Upper Indus Fan.* This proposed project will fund the interpretation of newly available industry seismic data on the Indus Fan, contributing to the more detailed site characterization needed for a future riser IODP drilling leg. $24,666 requested; in review.

Planning Workshops

Funded

Roland von Huene (University of California, Davis) and **Kevin Brown** (Scripps): *Workshop on Costa Rica Seismogenic Zone Drilling Project*. December 3-5, 2002, Menlo Park, CA.
This workshop was held to further develop an IODP complex drilling proposal for drilling the erosional convergent margin off of Costa Rica. $28,000.

Sean Gulick (University of Texas Institute for Geophysics) and **John Jaeger** (University of Florida): *Interplay of Collisional Tectonics and Late Cenozoic Glacial Climate in Alaska and the northeastern Pacific Ocean*. May 4-5, 2003, Austin, TX.
This workshop was held to develop a science plan for studying the linkages between tectonics, orogenic processes, glacial landscape modification, and continental margin sedimentation in southeast Alaska and the northeastern Pacific Ocean. JOI/USSSP funding: $24,956.

Andrew Fisher (University of California, Santa Cruz) and **Kevin Brown** (Scripps): *Workshop on linkages between the Ocean Observatories Initiative and the Integrated Ocean Drilling Program.* July 17-18, 2003, Seattle, WA.
This workshop will explore linkages between OOI and IODP. The overall goal is to produce a document that identifies essential experiments and technologies to help achieve the primary goals of both programs. Participation estimated to be ~50-55 participants. $37,552.

Peter Clift (WHOI) and **Peter Molnar** (University of Colorado): *Workshop for planning drilling of the Indian Ocean Fan Systems*. July, 23-25, 2003, Boulder, CO.

This workshop aims to bring the core community of those working in the field of climate-tectonic interactions in South Asia together in order to formulate a list of scientific priorities and then to pick appropriate drill sites in the fan systems to address those priorities. Participation will be sought from both marine geoscientists and those working on land in the foreland basins and the ranges themselves, in order to generate the scientific consensus needed to support a multi-leg drilling strategy. $13,440.

Pending/In review

Roland von Huene (University of California, Davis): *Costa Rica Seismogenesis Project (CRISP)*. October 12-14, 2003, Kiel, Germany
This proposed workshop will bring together an interdisciplinary contingent of U.S. and European researchers to further develop planning for CRISP. Specific workshop goals are:

1) A Stage 2 preliminary proposal, a compilation of geophysical and geological data, and a consensus on alternate interpretations based on data.
2) Evaluation of different catalogs of seismicity and consolidation of data.
3) Consensus regarding CRISP hydrology and fluid chemistry objectives and sampling.
4) Interchange and linkage between IODP and ICDP investigators.
5) Identification of new data needed prior to drilling Stage 2

$26,650 *requested;* in review.

Sarah Fowell (University of Alaska-Fairbanks):*The Bering Strait, Global Climate Change, and Land Bridge Paleoecology:* October 31-November 1, 2003, Seattle, WA.
This workshop proposes to discuss future drilling in the Bering Strait in order to address unresolved questions regarding global ocean circulation, rapid climate changes, flora and fauna of the central portion of the Beringian subcontinent, and prevailing climate of the Pleistocene land bridge. $39,077 *requested in preliminary proposal;* JOI now awaiting formal proposal.

Workshop Reports

A workshop report from “Costa Rica Seismogenic Zone Drilling Project” was completed in March 2003 by conveners Roland von Heune and Kevin Brown. The report will be posted on the JOI/USSSP website within the next month.

Post-Cruise scientific research proposals

Seventy-seven USSSP post-cruise science proposals were funded from May 21, 2002 through May 21, 2003, for post cruise research from Legs 198-205. This funding is summarized as follows (these totals do not include funding prior to May 21, 2002 or proposals that are still pending revisions, so the leg totals below may not represent the total post-cruise funding allocation for each leg):

Leg 198 *Extreme Warmth in the Cretaceous and Paleogene: a Depth Transect on Shatsky Rise, Central Pacific*: 7 funded proposals ($190,924).
Leg 199 *Paleogene Equatorial Transect*: 11 funded proposals ($279,515).

Leg 200 *Drilling at the Hawaii-2 Observatory (H2O) and the Nuuanu Landslide*: 7 funded proposals ($160,839).
Leg 201 *Controls on Microbial Communities in Deeply Buried Sediments, Eastern Equatorial Pacific and Peru Margin*: 18 funded Proposals ($333,909).
Leg 202 *Southeast Pacific Paleoceanographic Transects*: 14 funded proposals ($325,516).
Leg 203 *Dynamics of Earth and Ocean Systems*: 3 funded proposals ($52,107).
Leg 204 *Drilling Gas Hydrates on Hydrate Ridge, Cascadia Continental Margin*: 11 funded proposals ($309,898).
Leg 205 *Fluid Flow and Subduction Fluxes across the Costa Rica Convergent Margin: Implications for the Seismogenic Zone and Subduction Factory*: 6 funded proposals ($132,535).

Results symposia

Funded

Will Sager (Texas A&M University) and **Gary Acton** (Texas A&M University): *ODP Contributions to Paleomagnetism.* April 7-11, 2003, Nice, France.
The proponents were awarded funding for travel and logistical support to hold a meeting at the spring 2003 EGU-AGU-EGU meeting in Nice, France, in order to formulate a special volume chronicling ODP's contributions to the field of paleomagnetism. $28,153.

Pending

Gabe Filippelli (Indiana University-Purdue University Indianapolis) and **Detlef Warnke**, (Cal. State Univ., Hayward): *Paleoceanography and Paleoclimatology of the Southern Ocean: A Synthesis of 3 Decades of Scientific Ocean Drilling.* Spring/Summer, 2004, Location TBD
This proposed 3-day workshop will bring together a range of US and international scientists with a focus on the paleoclimatology and paleoceanography of the Southern Ocean, to ultimately produce a Southern Ocean synthesis volume
formal proposal not yet received.

5. Management and Operations Reports

5.2 NSF Management Report (Allan)

NSF EXCOM REPORT, Bermuda 2003

ODP MEMBERSHIP LEVELS

The ESF, United Kingdom, Japan and Germany have committed to full membership participation ($2.95 million), the People's Republic of China has committed to participation at a 1/6 associate member level ($491,667), France has committed to participation at a 2/3 associate member level ($1,966,667), and the PACRIM consortia has committed at slightly more than 3/4 associate member level ($2,256,010) for fiscal year 2003.

FY 2003-2004 ODP COSTS AND FUNDING

The FY 2003 ODP Program Plan (1 October 2002 to 30 September 2003) was initially approved at a budget level of $45,300,000. NSF funds are estimated to support 64% of Program costs, with the remaining 36 % provided by international contributions. The original approved budget was expected to cover remaining support for leg 205 (partially funded from the FY 2002 plan), full support for legs 206 through 210, final portcall costs, and JOIDES Resolution shipboard demobilization costs.

Due in large measure to significant costs savings (over $460,000) in operation of the JOIDES Office, JOI carried forward $1,289,530 of unobligated FY2002 funds into FY2003. This figure includes $714,599 that is designated for fuel in the expected event that fuel costs will exceed $250/ton. Other FY2002 carry-forward funds will be expended on engineering development, tool deployments, computer upgrades, ODP legacy website development, and ODP User Guide publication. The presently approved 2003 Program Plan budget is $46,589,530. Any additional unexpected Program costs above this level will have to be met by re-budgeting of funds.

FY 2004 – 2007 ODP PROGRAM PLANNING

EXCOM reviewed and approved a multiyear Program Plan that covers the final year of ODP operations (2003) and phase-out of contractor activity (2004-2007) at its meeting in Santa Cruz, California, prior to submission to NSF. The National Science Board subsequently approved the plan in August 2002. It is expected that detailed program plans will be re-formulated and negotiated annually in light of developments, particularly with respect to implementation of IODP. From NSF's perspective, the following continue to be critical aspects of the ODP phase-down plan:

- An orderly termination and phase-down of operations, including completion of the ODP legacy documentation identified by JOIDES.
- Continuation of good business practice in contract and program management that have characterized ODP to date.
- Preservation of ODP scientific assets and continuing availability of data and cores to the international scientific community.
- Preservation of ODP equipment assets for use in the IODP.
- Orderly phase-down of personnel assets.

To the extent possible, it is expected that the long-term responsibility for ODP scientific and physical assets will be transferred to appropriate IODP contractor organizations as required during development and implementation of the IODP program.

For FY 2004, NSF has given JOI a target budget of $12.9 million. The budget reduction reflects the cessation of drilling operations, with a focus on demobilization, data access, data migration, data archival, legacy, publication, and Program assessment and evaluation activities. NSF has reviewed the draft FY04 ODP Program Plan.

It is NSF's intent to support all ODP phase-down activities without the need for additional international contributions for operations beginning on 1 October 2003. Both JOIDES and the MOUs for Member participation in the ODP will terminate on 30 September 2003. To ensure continuing international input to ODP phase-down activities, a performance evaluation committee (PEC VI) will be established in late FY2003 to evaluate the status and progress on Program phase-out, with a report expected in early FY2004.

5.3 JOI

5.3.1 Approval of revised ODP Policy Manual (Farrell/Silver)

JOI
JOINT OCEANOGRAPHIC INSTITUTIONS

1755 MASSACHUSETTS AVENUE, NW, SUITE 700
WASHINGTON, DC 20036-2102 USA

TELEPHONE: (202) 232-3900
FAX: (202) 462-8754
EMAIL: info@joiscience.org
WEB: www.joiscience.org

January 17, 2003

Dr. Chris Harrison
EXCOM Chair
Rosenstiel School of Marine & Atmospheric Sciences
University of Miami
4600 Rickenbacker Causeway
Miami, FL 33149

Dear Chris,

Attached please find a copy of the ODP Policy Manual for consideration by the JOIDES Executive Committee. The manual, an update of the 1992 version, contains all policies approved by the JOIDES Executive Committee. The 80-page manual is supplemented by 25 appendices which are available upon request, in electronic format.

If you have any questions about the document, please let me know. We look forward to hearing from you.

Sincerely,

Nick Pisias

Interim ODP Director

Policy Manual
for the
Ocean Drilling Program

Revised: 1/9/03

Compiled by: John Farrell, Associate Program Director
Ocean Drilling Program
Joint Oceanographic Institutions, Inc.

Preface

This Ocean Drilling Program (ODP) Policy Manual is a general overview of the policies and guidelines under which the ODP is managed and operated. The policies stated in this manual are of informational value and in no way take precedence over the contracts negotiated as part of the Ocean Drilling Program: Prime Contract #OCE9308410 between the National Science Foundation (NSF) and Joint Oceanographic Institutions (JOI), Subcontract #JSC1-94 between JOI and Texas A&M Research Foundation (TAMRF), and Subcontract #JSC2-94 and JSC4-97 between JOI and Lamont-Doherty Earth Observatory (LDEO). This document is not an interpretation of the above contracts nor does it supersede or replace any contract items and conditions, or subcontractor's institutional policies. If any conflicts arise between this document and institutions' policies or contracts, the terms and conditions of the contracts and institutional policies shall prevail.

Internal TAMRF and LDEO operating procedures are subject to modification without prior notification to JOI; however, TAMRF and LDEO shall provide notification to JOI within a reasonable amount of time after the modification has been made. As with all policies in ODP, all modifications are subject to review and discussion by JOI, Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES), and NSF.

Policy manual media

The policy manual and appendices will exist in three formats: (a) hard (paper) copy, (b) electronically on CD-ROM as PDF files, and (c) as PDF documents available from an ODP website. JOI will maintain the policy and appendices as Microsoft Word documents (from which PDFs and hard copy will be generated). The one exception to this is Appendix J the "Final Environmental Impact Statement (EIS) for the ODP," an NSF document which JOI has only in hard copy.

Dates on the policy manual

a. The date will be placed in the footer of each page of the policy manual and appendices (except for the EIS, as described above).

b. The dates on each page of the policy manual and appendices will be revised once per year, and only if amendments have been made to those documents. Otherwise, the dates will reflect the original date of publication, or the last fiscal year in which the document was amended.

Procedure for revising the policy manual

a. Proposed changes to the ODP Policy Manual, whether additions, deletions, or corrections, should be routed through appropriate channels. These include the JOIDES Advisory Panel structure, JOI Inc. or its major subcontractors, and the NSF Contracting Officer's Technical Representative (COTR).

   Approved changes to this policy manual should be sent to:

   Director, Ocean Drilling Program
   Joint Oceanographic Institutions, Inc.
   1755 Massachusetts Ave., NW, Suite 700
   Washington, DC 20036-2102

b. Amendments to policy will be documented in a section at the back of the policy manual (or the relevant appendix) that is titled “Amendments.” The amendment will be assigned an effective date for the policy change. The amendment will include a reproduction of the original policy, a copy of the revised policy, and other background or explanation as required.

c. Amendments made during the fiscal year will be recorded in two places (in the JOI-maintained Microsoft Word versions of the manual and appendices and in derivative media). The first, will be the specific location in the manual or the appendix. There, the original text will appear in strikethrough font, the new policy text will appear in bold, underlined, and italicized font, and the effective date of change will be inserted. The date in the footer of the page will not be updated at this time. Instead, updating of footer date will occur once per fiscal year, as described elsewhere. The second location will be in the “Amendments” section of the document, described above. If multiple amendments occur on the same page, within the same fiscal year, the effective date of the amendment can be used to discriminate between modifications.

d. At the end of the fiscal year, all amendments during the previous 12 months will be promulgated through the policy manual and appendices as follows. First, at the specific location of the policy change, the old version of the policy text (which is represented in strikethrough text during the fiscal year) will be deleted, and the revised policy text (which appears in bold, underlined, and italicized font) will be converted into the font style that is consistent with the surrounding text. The purpose of this deletion and reformatting is to minimize clutter and confusion in the policy. Second, for posterity’s sake, the amendment will be preserved in the “Amendments” section of the policy or appendix, as described above. This will enable the reader to follow the evolution of the document, through time. Third, once a year, the dates in the footer of every page of the amended document will be changed to the first day of the new fiscal year.

Distribution of policy and amendments

a. The first posting of PDF copies of policy manual and appendices on an ODP website will coincide with approval of the manual by the JOIDES Executive Committee in calendar 2003. At this time, JOI will also distribute the manual and a complete set of appendices to the following entities in the following quantities:

-NSF: five hard copies and five CDs-ROM
-TAMU (Science Operator): one hard copy and one CD-ROM
-LDEO (Logging Operator): one hard copy and one CD-ROM
-LDEO (Site Survey Databank): one hard copy and one CD-ROM
-JOIDES Office: one hard copy and one CD-ROM
-ODP Member Offices: each office will be directly informed by JOI, through a return-receipt email message, of the availability of the manual and appendices on the ODP website.

b. Amendments to the policy during the fiscal year will be incorporated into PDF versions of the manual and/or appendices and will be available from the ODP website. In addition, JOI will distribute, via return-receipt email, copies of the amended PDF files to NSF, the Science Operator, the Logging Operator, the Site Survey Databank, the JOIDES Office, and the ODP Member Offices.

c. At the beginning of each fiscal year (October), JOI will distribute hard copies of any document (policy manual and/or appendices) that has been changed during the past year, as well as CDs-ROM that contain updated versions of the PDF files created from the revised Microsoft Word versions of the policy manual and appendices. Please note that amendments to any page of a policy manual document will be promulgated throughout the entire document because the footer date will be updated, once-per-year, consistent with NSF's request for dated pages. As such, JOI will need to distribution hard copies of the entire document (policy manual or appendix) that has been amended. The revisions will be distributed to the following entities in the following quantities:

-NSF: five hard copies and five CDs-ROM
-TAMU (Science Operator): one hard copy and one CD-ROM
-LDEO (Logging Operator): one hard copy and one CD-ROM
-LDEO (Site Survey Databank): one hard copy and one CD-ROM
-JOIDES Office: one hard copy and one CD-ROM
-ODP Member Offices: each office will be directly informed by JOI, through a return-receipt email message, of the availability of the updates to the ODP policy manual and appendices on the ODP website.

Table of Contents

Introduction

The Ocean Drilling Program (ODP) is an international partnership of scientists and research institutions organized to explore the structure and history of the Earth beneath the ocean basins. The ODP is funded by the U.S. National Science Foundation (NSF) from U.S. funds, together with contributions from non-U.S. partner nations (commingled funds). Joint Oceanographic Institutions, Inc. (JOI) manages ODP as the prime contractor to NSF. As of November 2002, JOI is a consortium of 18 major oceanographic institutions that provides management support to scientific research programs of national and international stature. The eighteen institutions are:

- University of California, San Diego, Scripps Institution of Oceanography
- University of California, Santa Cruz
- Columbia University, Lamont-Doherty Earth Observatory
- University of Florida
- Florida State University
- University of Hawaii, School of Ocean and Earth Science and Technology
- University of Miami, Rosenstiel School of Marine and Atmospheric Science
- University of Michigan, College of Literature, Science & the Arts
- Oregon State University, College of Oceanic and Atmospheric Sciences
- The Pennsylvania State University, College of Earth and Mineral Sciences
- University of Rhode Island, Graduate School of Oceanography
- Rutgers, The State University of New Jersey, Institute of Marine and Coastal Sciences
- Stanford University, School of Earth Sciences
- University of South Florida, College of Marine Science
- Texas A&M University, College of Geosciences
- University of Texas, Institute for Geophysics
- University of Washington, College of Oceanography and Fishery Sciences
- Woods Hole Oceanographic Institution

JOI is advised in the overall objectives of ODP by the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES), an international group of scientists who provide planning and program advice regarding science goals and objectives, facilities, scientific personnel, and operating procedures.

The operation of the drill ship, that includes the logistics planning and implementation of cruises, is managed from ODP facilities at Texas A & M University (TAMU) in College Station, Texas. As science operator, TAMU is responsible for: (1) implementing JOIDES science planning and operations, (2) guiding engineering development and improvement of drilling technology, (3) selecting scientists for the shipboard scientific parties, (4) designing, furnishing, and maintaining shipboard and shorebased laboratories necessary to meet the needs of the shipboard scientific staff, (5) curating and distributing all core samples and data, (6) publishing scientific results, and (7) in coordination with JOI, providing public information about ODP.

The JOI Science Operator subcontract is with the Texas A&M Research Foundation (TAMRF). TAMRF is responsible for the contractual and financial administration of the subcontract. In turn, TAMRF subcontracts the operations of the drill ship *JOIDES Resolution* to Overseas Drilling Limited, a Liberian-based, joint venture company owned 50% by DSND SubSea ASA and 50% by Transocean. The registered name of the drill ship was changed from SEDCO/BP 471 to *JOIDES Resolution* on November 11, 1996.

The Lamont-Doherty Earth Observatory (LDEO) Borehole Research Group (BRG) is contracted by JOI to supply *in situ* downhole logging measurements via services that involve acquisition, processing, and presentation in usable format to JOIDES scientists. Logging services are provided by Schlumberger Offshore Services through a subcontract from LDEO.

The ODP Site Survey Data Bank at LDEO is charged with the responsibility of assisting the JOIDES Site Survey Panel (SSP) and the Pollution Prevention and Safety Panel (PPSP) in the direction and development of the ODP site survey program.

A repository facility located at LDEO stores ODP cores through Leg 150, as well as previously obtained Deep Sea Drilling Program (DSDP) cores from the Atlantic, Antarctic, Mediterranean, and Caribbean. Cores from Leg 151 and onward from the Atlantic Ocean, the Mediterranean and Caribbean Seas and the Southern Ocean are stored in the Bremen Core Repository in Germany. ODP cores obtained from the Pacific and Indian Oceans and from the Red Sea are housed at TAMU in the Gulf Coast Repository. Older cores from those regions obtained by the DSDP are stored at Scripps Institution of Oceanography. ODP/TAMU is curator of all cores in the four repositories.

See Figure I-1 for a diagram of the Contractual Direction in the ODP and Figure I-2 for a diagram of the Science Advisory Structure of the ODP.

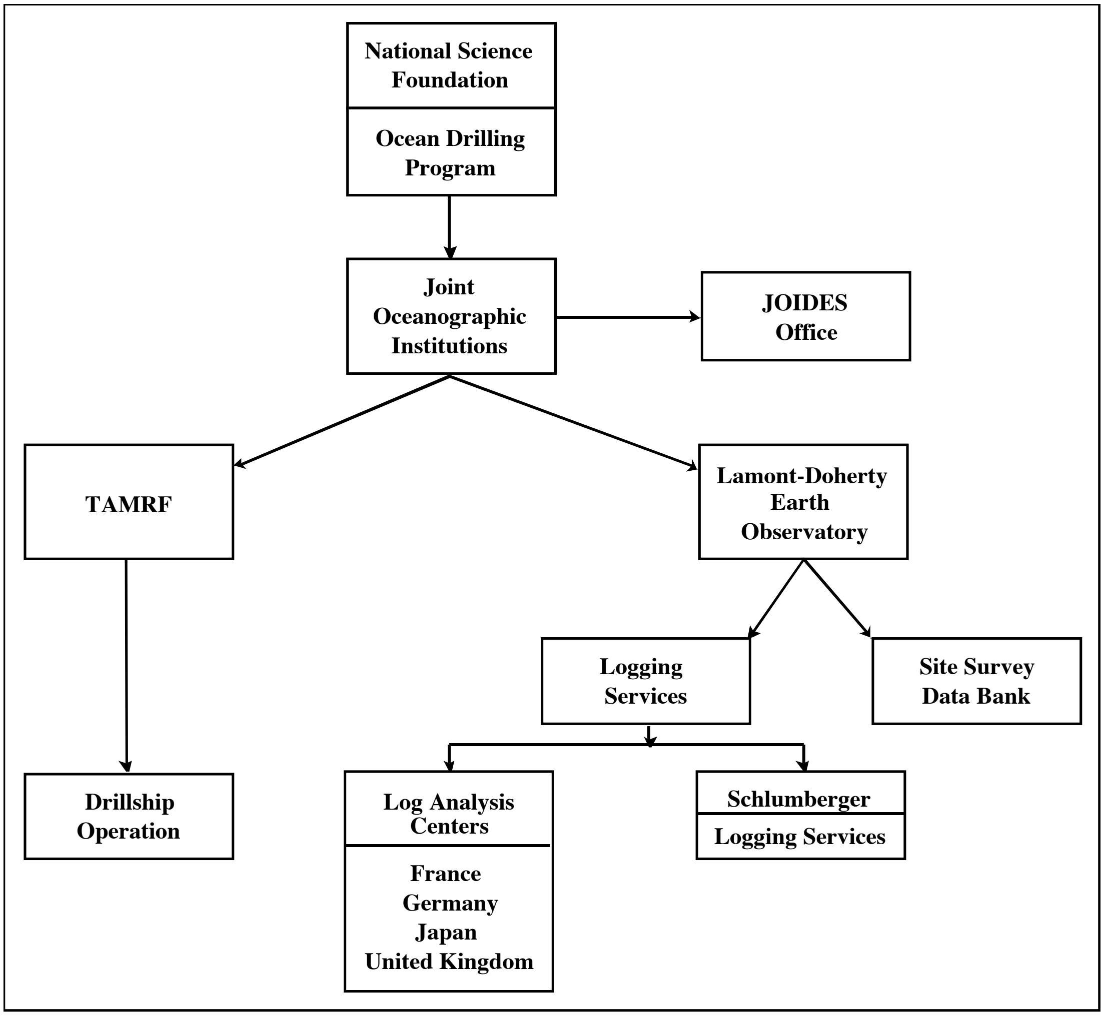


Figure I-1: Contractual Direction in the Ocean Drilling Program

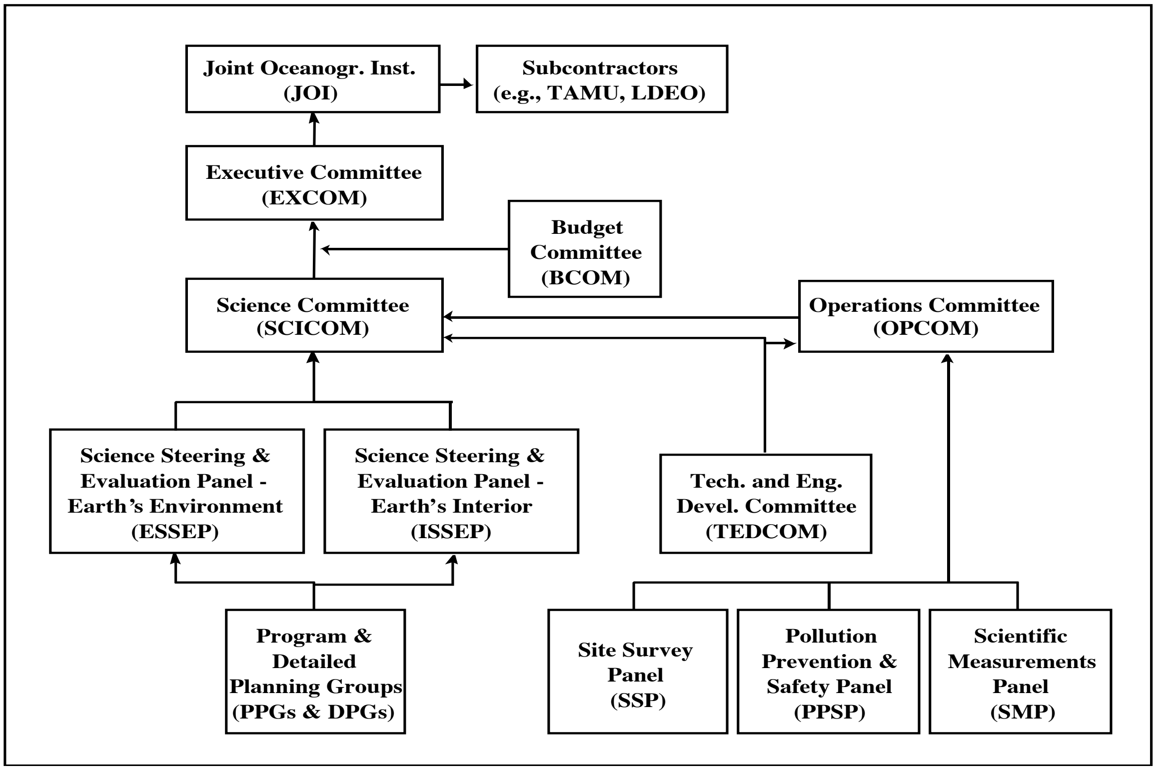


Figure I-2: Science Advisory Structure of the Ocean Drilling Program

I. Operational and Scientific Policy

1.0 Organizational Structure

(Overall organization is illustrated in Figures I-1 and I-2. Contact information for organizational entities is provided in Appendix A.)

1.01 National Science Foundation

The National Science Foundation (NSF) is an independent U.S. federal agency established in 1950 to promote and advance science. NSF is responsible for administering the Ocean Drilling Program (ODP); its responsibilities include:

• Explaining, promoting and obtaining support for ODP within the U.S. federal system

• Administering ODP to meet national and international requirements, including policy directions, fiscal responsibilities, and international agreements

• Developing and maintaining international agreements for joint support of ODP including providing governmental assistance as needed to members and member countries

• Chairing and providing secretariat support for the ODP Council, including maintaining procedures to provide scientific, technical, financial, and managerial information in response to the needs and concerns of international members

• Providing to the ODP Council draft plans and budgets for consultation on financial, managerial, and other matters regarding overall direction of the ODP

• Providing timely comprehensive guidance to JOI for preparation of the annual program plan including schedules, estimated funding level, and documentation required to explain operational activities and budgetary plans

• Administering property and financial audits

• Reviewing the program plan and contractor operations to ensure that the scientific planning and direction of JOIDES are incorporated, contractual requirements are met, and fiscal control/restraint is maintained

• Improving and maintaining procedures for JOIDES to comment and advise on annual program plans and budgets in an appropriate and timely manner prior to adoption;

• Negotiating and executing the annual contract award for program operations responding to JOIDES planning and advice, ODP Council consultation, available financial resources, and NSF administrative requirements

• Managing and monitoring contract execution, including adherence to requirements of final program plan objectives, modification, if needed, to meet unanticipated scientific, technical, operational or financial changes, and U.S. federal regulations.

1.02 Ocean Drilling Program Council

The Ocean Drilling Program Council (ODPC) was established as a consultative body of member countries to review financial, managerial and other matters regarding the overall support of the ODP. The ODPC provides a forum for exchange of views among member countries. Each member country has one representative on the ODPC.

NSF representative acts as the chair of the Council. The Council's annual meeting includes:
• A review of scientific and technical achievements of the past year
• A financial report of the past year
• Audit reports of the past year
• Discussion of potential adjustments to future contribution levels
• Other topics of mutual interest

1.03 Joint Oceanographic Institutions, Inc.

In 1976 the U.S. member institutions of JOIDES formed an oceanographic organization called Joint Oceanographic Institutions (JOI) Inc., to facilitate scientific ocean drilling and advance oceanographic research in general. JOI is a non-profit corporation established under the laws of the State of New York. As of November 2002, the corporation is made up of the 18 academic oceanographic institutions listed in the introduction.

1.03.1 Basic function of JOI

The basic function of JOI is to provide leadership and management support for large programs encompassing worldwide cooperative efforts of various institutions, and to arrange appropriate facility support. Its principal objective is to enhance the effectiveness of earth and ocean scientists and to bring the full complement of interdisciplinary planning efforts to bear on scientific problems. JOI strives to provide the mechanism by which large facilities and complex technology can be used to describe the salient features of the earth and oceans and to understand the important physical processes that determine their structure and behavior.

1.03.2 JOI Board of Governors

A **Board of Governors** that consists of one representative from each member institution governs the corporation. The representatives are the designated heads of the oceanographic units of their institutions, or an appointee.

1.03.3 President

The **President** is the Chief Executive Officer of the Corporation and a non-voting member of the JOI Board of Governors. The President:

• Is elected by the Board of Governors of JOI and reports to the Chair of the Board

• Is responsible for overseeing all aspects of planning, policy, budgets, and operation of the Corporation

• Acts as selecting official in the evaluation and award of subcontracts by the Corporation in accordance with established corporate competitive subcontracting procedures, approved by the appropriate agencies

• Maintains active contact with agencies of the federal government, the academic community, other organizations and the public at large, as appropriate

• Is responsible for exploring and promoting new ideas and proposed activities that can improve oceanography and JOI's role in service to the community

• Is responsible for directing the attention of the Board to issues and questions that JOI must consider

• Formulates the agenda for the Board meetings in consultation with the Chair of the Board and JOI staff.

1.03.4 Director, ODP

The **Director of ODP** is responsible for program management of the ODP and serves as co-PI on the U.S. Science Support Program (USSSP) with the USSSP Director. The position of JOI ODP Director will be advertised internationally. As per contract, NSF must approve changes of the person serving as JOI ODP Director, and the Director's salary. The Director:

• Acts as program manager for both principal and secondary subcontractors to assure that the science objectives established by the JOIDES advisory apparatus are achieved

• Is responsible for the preparation of program plans, budgets, and allocation of resources among ODP organizational elements to carry out approved program plans and budgets (See section 7.0 for details of program planning)

• Coordinates with other JOI staff to assure that financial and contractual terms and conditions of subcontracts are met, and is responsible for the preparation of reports to NSF as required by contract and mutually agreed upon

• Acts as the principal liaison and coordinator with subcontractors, JOIDES, NSF, and other federal agencies as appropriate, other countries, and the scientific, industrial, and other communities in regard to program matters associated with the ODP

1.03.5 Contracts Office

As prime contractor to NSF, JOI is responsible for managing the ODP. JOI's **Contracts Office**:

• Is responsible for administering the prime contract;

• Carries out its operational tasks through qualified subcontractors. The extent and quality of subcontract work is monitored through review and oversight of both technical and financial progress reports, and major funding actions are made with NSF consultation and approval, as appropriate

• Is responsible for overseeing all corporate procurements are executed in accordance with applicable federal regulations

• Provides an administrative center for the direction, monitoring and accountability of prime and subcontract activities

• Collects, processes, and prepares supporting documents for management in coordination with the Finance Office. The Board of Governors and management use this information to resolve issues, establish goals and priorities, and respond to programmatic demands

• Responds to program requirements by initiating appropriate contractual actions

1.03.6 Finance Office

The **Finance Office** is responsible for collecting and analyzing financial and budget data in order to report financial information essential for efficient operations and performance evaluation. The Finance Office:

• Maintains daily financial operations such as cash management, invoicing, journal and ledger postings, budget variances, budget projections and internal and external reporting

• Assists in defining financial objectives and prepares guidelines, policies, and procedures to meet the objectives, using generally accepted accounting procedures

• Is responsible for collecting financial data from program operations. The Finance Office, in coordination with the Contracts Office, prepares financial and budget reports submitted to NSF outlining expenditures incurred on the programs and pertinent related data

1.03.7 Administrative Services Office

The **Administrative Services Office** is responsible for providing logistical support for the day-to-day operation of the JOI Office. This includes:

• Reviewing and approving invoices concerned with office management

• Providing human resource services to JOI employees

• Providing front desk support

• Assisting with conference and travel arrangements for JOIDES/ODP panel and committee meetings, the annual ODP Council Meeting, and other ODP-related meetings as assigned

1.04 JOIDES

Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES) is responsible for providing the scientific direction for the ODP. It does this through an advisory committee structure that consists of an **Exective Committee** (EXCOM), and a science advisory structure headed by a **Science Committee** (SCICOM). The terms of reference and mandates of these and other JOIDES committees, committees, and groups are described in "*The Guide to the Ocean Drilling Program,*" *JOIDES Journal*, Volume 24: Special Issue No. 3, December 1998 (Appendix B). Membership in JOIDES is defined in Memoranda of Understanding (MOU) between NSF and member countries (Appendix B).

As shown in Figure I-2, the remainder of the JOIDES science advisory structure consists of:

- A Budget Committee (BCOM, an *ad hoc* subcommittee of EXCOM)
- An Operations Committee (a subcommittee of SCICOM)
- Two Science Steering and Evaluation Panels
- Two Service Panels: Site Survey Panel (SSP) and Pollution Prevention and Safety Panel (PPSP)
- A Scientific Measurements Panel (SCIMP)
- A Technology and Engineering Development Committee (TEDCOM)
- *Ad hoc* Detailed Planning Groups (DPGs), Program Planning Groups (PPGs), and Working Groups (WGs), approved by SCICOM at the request of the panels or by SCICOM itself.

Each committee, panel, planning group, and working group operates under a mandate, along with guidelines on membership and frequency of meetings. Standing panel mandates, guidelines, and amendments to them are proposed by SCICOM for approval by EXCOM. The SCICOM may ask panels to take up topics not in their original mandates. Considerable overlap in thematic coverage is expected to evolve. Mandates, guidelines, terms of reference, and duration of operation for the short-lived DPGs and WGs are specified in writing by SCICOM (see Appendix B)

The current overall scientific objectives of ODP were set out in its 1996 Long-Range Plan, "*Understanding our Dynamic Earth through Ocean Drilling*." The SCICOM and the JOIDES science advisory panels are charged with the long-term science planning activities necessary to meet, and go beyond, the goals of the ODP Long-Range Plan. The JOIDES panels comprise international groups of scientists drawn from the JOI institutions, other U.S. institutions, and representatives of the other ODP members. JOIDES panels provide planning and program advice to JOI with regard to scientific goals and objectives, facilities, scientific personnel, and operating procedures. ODP national organizations appoint panel members, and over 200 scientists from the international geoscience community are represented on these panels.

The EXCOM formulates scientific and policy recommendations with respect to the ODP. It conducts ODP planning, as well as evaluation and assessment of the Program as to its accomplishments as compared to the goals and objectives that have been established. It may be assigned managerial and operational responsibilities for appropriate tasks. The members of this committee are representatives of oceanographic and marine research institutions or other organizations that have a major interest in the study of the sea floor and an adequate capability to carry out such studies. The membership (full and associate) of this committee is now composed of one representative of each of the seven non-U.S. countries or consortia with an active Memoranda of Understanding (MOU) with NSF [Germany, Japan, United Kingdom, European Science Foundation, Australia-Canada- Korea Consortium, France, and China] and ten representatives from among the eighteen members of JOI, Inc. Appointment of additional members is determined by the JOI Board of Governors on the recommendation of the JOIDES Executive Committee.

The SCICOM provides long-term oversight and advice on the scientific direction of the program. Its subcommittee, the Operations Committee (OPCOM), attends to logistical and scheduling issues, assesses equipment needs, and provides advice on short- and long-term technological developments necessary to carry out drilling programs.

SCICOM receives advice from two **Science Steering and Evaluation Panels** (SSEPs): one for Earth's environment and one for Earth's interior. These panels review proposals and actively nurture those that address high-priority objectives or new and exciting scientific ideas. To address specific issues, SCICOM may set up two types of short-lived (up to 3 years) advisory groups. **Program Planning Groups** (PPGs) develop plans to address new ODP initiatives, or to define new technological strategies. They also play a vital role in promoting high-priority scientific objectives in areas where proposals are lacking and in fostering communication and collaboration between ODP and other international geoscience programs.

Technical, logistical, and safety advice is provided by three panels. The **Site Survey Panel** (SSP) assesses the adequacy of survey data for proposed drilling targets and compiles data packages for drilling legs. The **Pollution Prevention and Safety Panel** (PPSP) gives independent advice on potential safety and pollution hazards. The **Scientific Measurements Panel** (SCIMP) contributes information and advice on handling of ODP samples and data and on methods and techniques used for all shipboard and downhole measurements and experiments. The **Technology and Engineering Development Committee** (TEDCOM) provides long-term technological advice. This committee not only provides advice to SCICOM and OPCOM on drilling tools and techniques required to meet the objectives of planned drill holes, but also identifies and monitors the development of drilling tools and techniques needed to meet the objectives of the long-range plan.

1.04.1 JOIDES Office Structure and Policies

JOI, through a subcontract to the JOIDES office, provides support for JOIDES activities. This office, under the direction of the Chair of the JOIDES SCICOM, is responsible for coordinating all the advisory committees and panels within the JOIDES Science Advisory Structure. This office also integrates advice from the panel substructure in a manner suitable for policy decisions by the JOIDES EXCOM. The JOIDES Office also produces the *JOIDES Journal* that keeps the scientific community informed of planning for the drilling program and summarizes program activities. The responsibilities of the JOIDES office are to:

- Coordinate the executive, planning, and advisory structure of JOIDES, with special reference to JOIDES planning of the ODP
- Provide scientific advice to JOI in the operation of the ODP. Specific requirements include soliciting, receiving, distributing, and tracking drilling proposals; coordinating meetings of EXCOM, OPCOM and SCICOM; maintaining, correcting, and distributing the agenda and minutes of the EXCOM, OPCOM and SCICOM meetings in a timely manner
- Act as a focal point for information, communication, liaison responsibilities, and advice in the international community concerned with drilling in the ocean for scientific purposes
- Prepare, edit, and ship to JOI, in a timely manner, camera-ready copy for the *JOIDES Journal* for printing and distribution
- Prepare and submit to JOI a Science Plan for incorporation into the annual ODP Program Plan
- Coordinate (with JOI's assistance) approximately 10 - 20 additional panel meetings per year, with approximately 50% U.S. and 50% non-U.S. venues
- Coordinate and maintain an electronic database of drilling proposals from the community and communications among proponents and the scientific advisory structure
- Coordinate bilateral scientific liaisons between ODP and other international earth science efforts

The *JOIDES Journal* records the activities of the JOIDES advisory structure. The Journal provides communication between the JOIDES committee and advisory panels, JOI, TAMU, LDEO, NSF, international members, and individual earth and ocean scientists. It is prepared by the JOIDES Office and is published and distributed by JOI.

1.04.2 Rotation of the JOIDES Office and the US/International Liaison

In response to recommendation #7 of the Advisory Structure Review Committee (ASRC), chaired by Hans Durbaum (the ARSC final report is in the August 1993 Planning Committee (PCOM) briefing book), EXCOM passed a motion at their June 1992 meeting, and PCOM passed an affiliated motion in August 1993, regarding the location of the JOIDES Office and the process by which its location should alternate among ODP member countries/consortia. EXCOM decided that the JOIDES Office would move to the University of Washington for the US fiscal years '93-'94. Then, based on a competitive process administered by JOI, through a contractual basis, would alternate locations every two years between non-US (but in an ODP member country or consortium) and US hosted entities. In other words:

FY93-94: US (University of Washington, Seattle)
FY95-96: non-US
FY97-98: US (bid/rotation)
FY99-00: non-US
FY01-02: US (bid/rotation)
Etc.

The PCOM motion said that JOI should continue the RFP process every two years, alternating between US and non-US partners. Each non-US partner may submit only one bid to JOI for consideration. To gain experience, the PCOM chair-elect should attend PCOM for a period of at least one year prior to his/her tenure.

Prior to this change, the JOIDES Office had rotated only among JOI Institutions. With the adoption of this new office rotation schedule, another practice was introduced, regarding liaison responsibilities. When the office is outside the US, JOI, with advice from the US Science Advisory Committee, will hire a US liaison to work in the office as an off-site JOI employee. Similarly, when the office is within the US, JOI, based on input from the non-US EXCOM members, will hire an employee to work in the JOIDES Office and to represent and liaise with the non-US community.

1.05 Science Operator (TAMU)

The ODP science operator is Texas A&M University (TAMU), located in College Station, Texas, USA. The subcontract from JOI for the Science Operator is with the Texas A & M Research Foundation (TAMRF*). TAMU's organizational structure is shown in Figure 1-1.

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* **NOTE:** TAMRF has a "cooperative agreement" with TAMU that outlines each party's responsibilities as they apply to the Science Operator subcontract.

1.05.1 Science Operator Responsibilities

TAMU's responsibilities as ODP science operator are to collect cores from beneath the floors of the world's oceans, provide a borehole for logging, and assure that adequate scientific facilities are available for the initial analysis and preservation of these samples. In addition, TAMU's ongoing responsibilities include:

- Developing an operations plan and drilling schedule based on directions from JOI (in turn, based on scientific advice from JOIDES); ensuring equipment availability, defining operational limitations, providing an adequate supply of consumables (beacons, drillbits, etc.), assessing safety and operations procedures prior to drilling, and ensuring the organized transportation of personnel and supplies between cruise legs

- Staffing the ship with scientific and technical support personnel, such as:

  -Co-chief scientists as per the process identified in Appendix C, excerpted from the *JOIDES Journal*

  -A shipboard scientific party of about 25 people, members who are specialists in the various fields of geosciences (e.g., paleontology, petrology, sedimentology, geophysics, etc.) from universities, government, and industry in JOIDES member and other countries

  -A technical support crew, up to about 25 in number, who are primarily TAMU/ODP employees, including marine instrumentation (electronic) specialists, marine laboratory specialists, curatorial representatives, marine computer specialists, engineers and an experienced operations manager who oversees the drilling operations and acts as a liaison between the drilling and scientific activities

- Maintaining and supporting shipboard laboratories that meet the needs of the shipboard scientific staff

- Storing, archiving, curating and disseminating samples of core material collected during the course of the program. TAMU is curator of all cores obtained during the DSDP and the ODP. The ODP/TAMU Curator is assisted by a Curatorial Advisory Board that consist of the ODP/TAMU Deputy Director, the ODP/TAMU Science Services Manager and two members of the scientific community (selected by the JOIDIES SCIMP on a rotational basis)

- Collecting scientific data and making it available to the shipboard scientific party during the cruise, providing computer and network support during the cruise, archiving and disseminating all data collected during the Program

- Publishing the *Proceedings of the Ocean Drilling Program,* an authoritative series of reference books that summarize the objectives and results of each cruise. These volumes are issued in two parts: *Initial Reports* detailing comprehensive shipboard data, and *Scientific Results* describing shore-based results, sample analyses, theory and synthesis papers. The reports will include pre-drilling geological/geophysical site surveys, objectives, planning documentation, core records, descriptions of physical and geochemical measurements, logging data, core photographs, paleontology and petrological reports and syntheses

- Issuing pre-cruise scientific prospectuses describing cruise objectives and prioritized target site locations about two to four months prior to sailing date, site summary reports during the cruise, and post-cruise contributions reporting shipboard results (mainly *Geotimes, Nature,* and *EOS* articles and a *Preliminary Report*). In addition, TAMU provides public information such as press releases, informational brochures, films, shipboard tours, and speaking engagements presented by the scientific and technical staff

- Improving existing drilling and downhole techniques and developing new ones that are required by the scientific objectives of the JOIDES scientific community at large following the advice given by SCICOM

- Program administration required to meet the scientific objectives

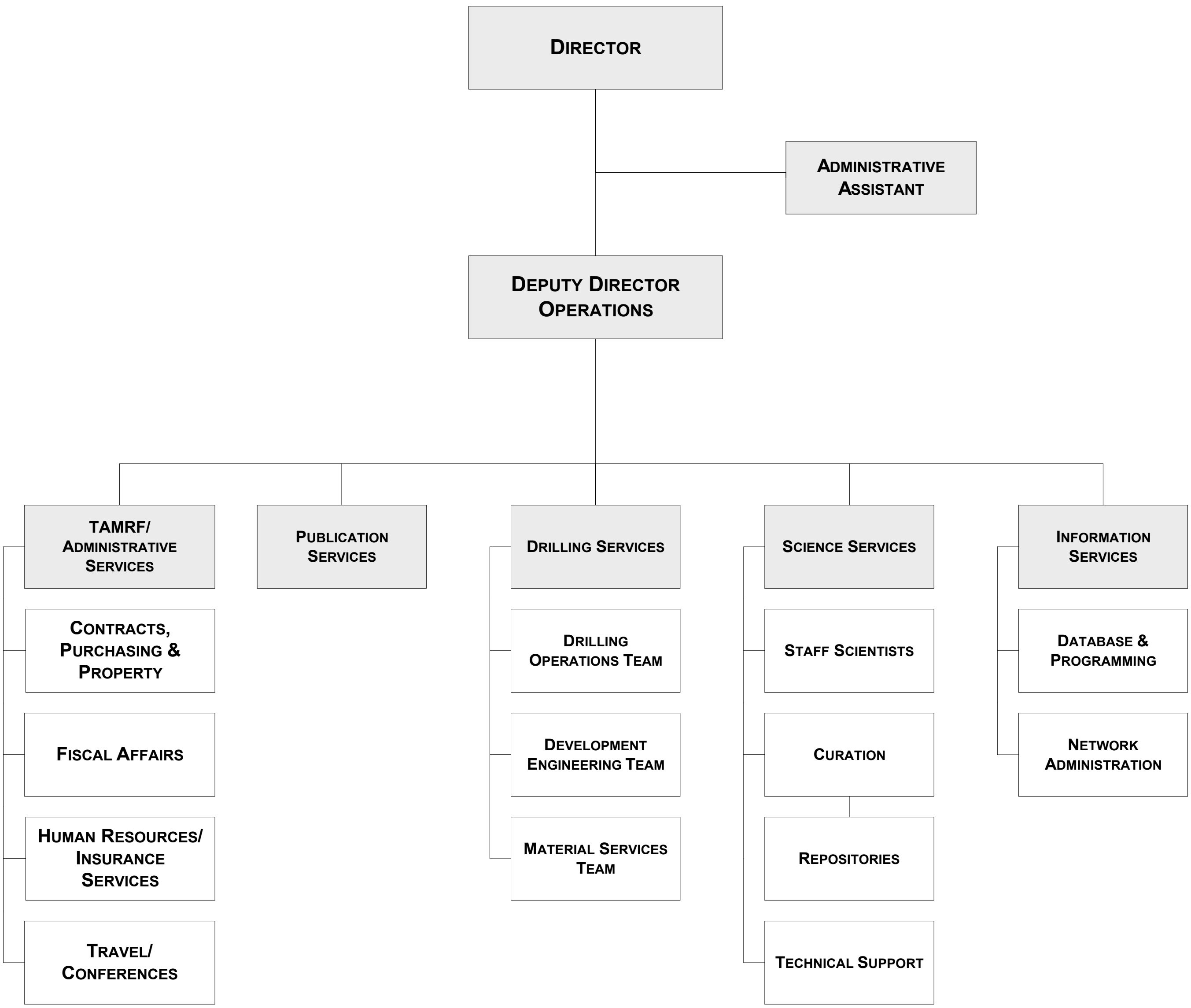


Figure 1-1 Texas A&M University ODP Organization by Task.

1.05.2 Drilling Services Department

The **Drilling Services Department** consists of a **Development Engineering Team,** a **Drilling Operations Team** and a **Material Services Team**.

The Development Engineering Team is responsible for improving the reliability and performance of existing drilling and coring systems and developing new technology to support scientific and operational needs.
The Development Engineering Team acts as a liaison with JOIDES and industry advisory groups for technical briefings and industry assistance in solving technical problems. Development engineers prepare articles and journals and convene meetings and workshops pertinent to engineering operations and development. Included on this Team is a Downhole Tools Service Center. This Center is responsible for documentation, control, maintenance, repair and calibrations of downhole measurement tools (i.e., APCT, DVTP, WSTP, Fissler, APCM, PCS).-

The Drilling Operations Team is responsible for drilling and coring operations aboard the *JOIDES Resolution*. These responsibilities include:

- Coordinating precruise activities with Co-Chief Scientists, ODP key personnel, and ship subcontractor regarding drilling/coring plans, casing, cementing, downhole equipment deployment, drilling time estimates, etc.

- Managing all drilling supplies (e.g., drill string, core bits, beacons, etc.) which includes quality control to ensure against operational consequences of defective components at sea

- Providing an Operations Manager aboard the *JOIDES Resolution*. This person is ODP's interface with the drill ship subcontractor personnel and as such is ODP's key representative while at sea. The manager is charged with ensuring that time and equipment are used efficiently and in a safe manner without jeopardizing long-term capabilities of the program, while maximizing scientific returns as requested by the Co-Chief Scientists

- Interfacing continuously with the TAMU engineering group and LDEO loggers to effectively use new technology

- Preparing post-cruise documentation, including operational successes, experiences, and problems. The operations group also authors and presents papers at various scientific and technical conferences.

The **Material Services Team**:

- Provides logistics personnel to coordinate port call activities

- Provides centralized shipping and receiving services

- Coordinates procurement of shipboard supplies and equipment, as well as repair and maintenance services.

1.05.3 Science Services Department

The **Science Services Department** consists of **Science Services**, **Curation**, and **Technical Support**.

Science Services provides a shipboard science management and organizational team that implements the program objectives as outlined by JOIDES. The Staff scientist assigned to each leg serves as leg project manager to coordinate these activities. Specific leg project manager responsibilities include:

- Providing general pre-cruise planning. Principal tasks include, but are not limited to:

  - Working with the Co-Chief Scientists to meet the scientific objectives outlined by SCICOM to: (a) arrange appropriate shipboard staffing, (b) write the cruise scientific prospectus, and (c) prepare the cruise sampling plan

  -Participating as liaison personnel on JOIDES advisory panels, as necessary, to ensure that the Science Operator is in contact with the planning and goals of the international scientific community

- Implementing organizational procedures for pre-cruise, cruise, and post-cruise activities

- Providing a link at ODP/TAMU for communication with the shipboard scientific party members before, during, and after a cruise

- Coordinating post-cruise meetings and publications. These include:

  -Providing accurate summaries of the cruise results as quickly as possible, including site summary reports distributed on a restricted basis while the cruise is at sea, press releases and preliminary reports

  -Arranging post-cruise coordination and editing of papers containing scientific results that form the basis of the *Proceedings* volumes of the ODP. The Staff Scientist acts as scientific coordinator for the *Proceedings Initial Reports* volume. Editing of the *Scientific Results* volume will be by means of an editorial board that includes the Co-Chief Scientists, the Staff Scientist, an ODP Editor, and one "external scientist." The "external scientist" is selected by the ODP Manager of Science Services, based on advice of the Co-Chief Scientists and Staff Scientists

  -Maintaining shipboard laboratories covering sedimentology, physical properties, paleomagnetics, paleontology, petrology, geochemistry, microbiology, downhole tools and underway geophysics. ODP Science Services continually assesses the quality of the equipment and lab procedures and implements any upgrading or modification necessary to ensure continuation of the state-of-the-art nature of these shipboard laboratories

Curation maintains four operational core repositories, each staffed according to need. The Curators and Repository Superintendents will:

- Curate cores under the guidelines of the "ODP Distribution Sample Distribution and Data Distribution and Publications Policy," which was developed in consultation with the JOIDES Science Advisory Structure (see Appendix D)

- Provide curatorial representation aboard the *JOIDES Resolution* to maintain accurate sampling records, to train scientists in approved sampling techniques and procedures, and to ensure that the shipboard party adheres to policy

- Provide ongoing maintenance of core samples

- Respond to sample requests from the international science community and track samples, requestors and results

Technical Support provides shipboard technical support for core handling, safe and proper operation and maintenance of laboratory equipment, and upkeep and maintenance of laboratories. Responsibilities include:

- Supplying marine technicians to handle, label, split, photograph, and store core material

- Providing expertise in electronics and in specialty science laboratory techniques

- Data acquisition and maintaining the integrity of the data acquired

- Providing shipboard clerical and storekeeping services, and shipping support

1.05.4 Information Services Department

The **Information Services Department** is responsible for capturing ODP data and maintaining data archives. Specific tasks include:

- Designing the data collection process, including data set descriptions and data collection routines

- Editing and quality control of data, including overseeing shipboard data collection process

- Archiving data in the most appropriate format and media

- Responding to data requests from the scientific community

- Providing computer service representation aboard *JOIDES Resolution* to train scientists in computer usage, such as word processing and graphics, and to manage the shipboard computer systems

- Providing shore-based program support for continued user training and education

- Acquiring, installing, and supporting off-the-shelf software required to meet program goals

- Planning, developing and implementing applications software tailored to the needs of the program

- Providing photographic services and slides (etc.) for public affairs activities

1.05.5 Publication Services Department

The **Publications Services Department** provides publishing, editorial, illustration and photographic services for cruise-related and other scientific/technical publications. This department:

- Publishes the *Proceedings of the Ocean Drilling Program Initial Reports* and *Scientific Results*, as well as related series of ODP publications, such as the Scientific Prospectus, Preliminary Report, and Technical Notes

- Manages the ODP/TAMU web site, supports the production of all materials that are published on the web

- Maintains a publications distribution center that warehouses, sells, and distributes program publications

- Provides art services for public affairs activities, other publications, posters, exhibits, and talks, and coordinates printing subcontractor activities

- Edits and produces other program reports.

1.05.6 Administrative Services Department

The **Administrative Services Department (TAMRF)** includes **ODP/TAMU Headquarters.** The department oversees and administers all business affairs and the technical direction of the program. These include:

- Coordinating the functions of all ODP/TAMU managers to ensure that JOIDES advice and direction is implemented

- Managing the ODP/TAMRF Prime Subcontract and lower tier subcontracts and assuring compliance with all applicable government regulations and the JOI/TAMRF Subcontract terms and conditions

- Developing policy and procedures, such as “The ODP/TAMU Website Privacy Policy” (Appendix E), “ODP’s Ship/Shore Communication Policy” (Appendix F), “Shipboard Sexual Harassment Reporting Procedures” (Appendix G), “Shipboard Drug and Alcohol Policy” (Appendix H)

- Managing the fiscal affairs of the program, including budget preparation and monitoring, invoice processing, preparation of weekly cash (wire transfer) requests, estimating required levels of funding for a given time period as the basis of incremental funding requests, fiscal reporting and payroll. The Fiscal Department is divided into three sections: Budgets Planning and Analysis, Accounts Payable/Accounts Receivable, and Payroll

- Managing various administrative functions of ODP including those related to Purchasing, Property, Human Resources, Insurance Services, and Travel

- Managing public information, including pre- and post-cruise press releases, ODP informational brochures, displays, slides, etc.

- Providing a liaison with Texas A&M University, the ship subcontractor, JOI, NSF, and the JOIDES Executive and Science Committees

- Aiding in the development of the most consistent and efficient ship schedule, allowing leg-to-leg continuity

- Aiding in assessing safety and operational procedures prior to and during drilling, considering recommendations of the JOIDES PPSP as well as the Science Operator's internal geologic and engineering panels

- Compiling data and coordinating efforts related to preparation and submission of annual Program Plan

- Managing ODP shipboard activities to ensure compliance with all national (and appropriate international) regulations, including obtaining clearances for work in foreign waters and overseeing compliance with technology transfer restrictions identified in the ODP Technology Safeguards Plan

1.05.7 ODP/TAMU Project Managers

ODP/TAMU has two types of Project Managers and, although similar in nature, their responsibilities and authority are different. There are those that coordinate leg activities and those that manage development projects. The specific responsibilities of each are as follows.

The **ODP/TAMU Leg Project Manager** provides planning, implementation, review, and oversight of a specific cruise. This individual also acts as the facilitator for leg related activities and projects. As the facilitator, he/she coordinates tasks and projects among departments to ensure adherence to schedules and operational plans. Given the complexity of the budgetary process, Leg Project Managers do not coordinate the fiscal aspects of the cruise.

The **ODP/TAMU Development Project Manager** is responsible for planning, development, implementation, review and reporting of project activities. He/She provides the leadership to manage the team to ensure completion of the project within provided targets. Project Managers also have fiscal oversight of the project to ensure that the project is completed within budgetary constraints.

1.06 Logging Services: LDEO

Lamont-Doherty Earth Observatory (LDEO) supplies a suite of downhole logging services that acquire, process, and present logging measurements in a format usable to JOIDES scientists. LDEO will provide state-of-the-art "oil industry" logging that has been customized to the scientific needs of JOIDES scientists. LDEO will also provide certain specialty logs that, though not generally available, are particularly useful to scientific logging. LDEO will process and disseminate results such that JOIDES scientists may use these logs to address scientific problems.

To assist LDEO in these duties, the JOIDES Science Committee has designated the Scientific Measurements Panel to plan long-term tool and services development, to assist in the identification of new technology, to assist in recruiting scientific logging scientists to participate in each ODP leg, and to help coordinate and integrate the LDEO logging services with other downhole measurement programs planned for ODP legs.

1.06.1 Structure of the Logging Services

The management structure of the Borehole Research Group at LDEO is shown in Figure 1-2. The Logging Services for ODP consist of two major components:

(1) Basic oil-field type services are provided under contract by Schlumberger, who supplies LDEO with state-of-the-art commercial logging services for ODP
(2) Log analysis centers provided by LDEO, either directly or through subcontract, provide post-cruise computer processing, log analysis and interpretation services for ODP scientists. These centers help scientists develop interpretative skills to solve geological problems with the assistance of sophisticated *in situ* downhole measurements.

1.06.2 Sea-going Operations

To carry out the logging program at sea, **logging personnel** are staffed on each ODP leg. They assist the Co-Chief Scientists in designing, implementing, and subsequently interpreting the logging program of each leg. These personnel consist of:

- A Schlumberger field engineer to operate their tools
- An ODP Logging Staff Scientist
- A logging scientist from the JOIDES scientific community. The JOIDES Logging scientist is appointed by TAMU with the advice of LDEO, and national program representatives

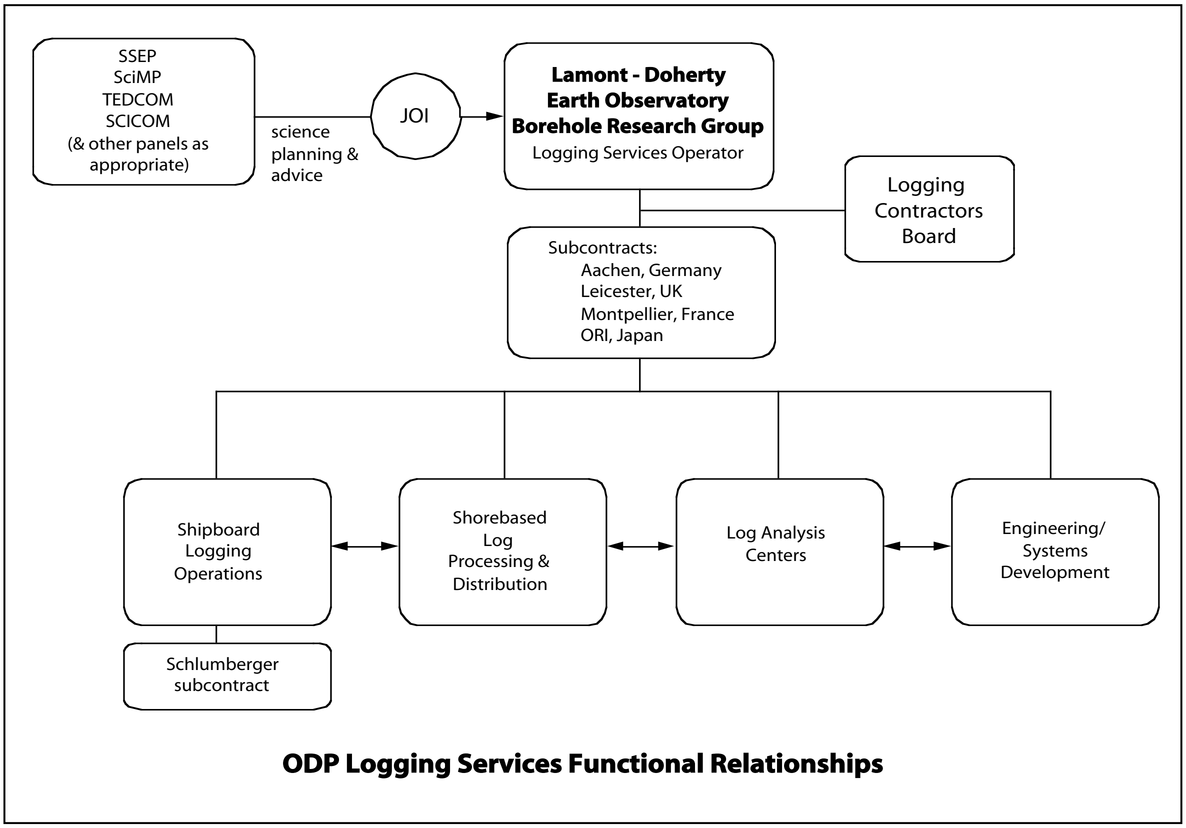


Figure 1-2 ODP Logging Services Management Structure

1.07 ODP Site Survey Data Bank

The **ODP Site Survey Data Bank** at Lamont-Doherty Earth Observatory is responsible for assisting the JOIDES SSP and PPSP. The ODP Data Bank carries out the following functions:

- Provides data packages to each Co-Chief scientist and ODP/TAMU for every drilling leg. These packages consist of seismic and bathymetric profiles gathered during previous research, as well as any other pertinent data contributed to the data bank. Also provides digests, charts, reports and folios of all available data in areas where the ODP vessel will potentially be drilling. The data are provided in a timely manner to facilitate pre-drilling planning and decisions during drilling. Four complete data sets are provided—one for use on the drill ship, one for use by the Science Operator, and two for the Co-Chief scientists

- Prepares site survey and other data summaries for individual drilling proponents and JOIDES panels and Working Groups (when requested) to aid in planning and evaluation of potential drilling sites

- Provides data upon request to the Science Operator to aid in operational planning

- Catalogs data records of completed international site surveys and regional geophysical surveys related to ODP drilling plans

- Searches for data from sources outside the ODP by monitoring data available in other data banks, cataloging data relevant to ODP, and acquiring and archiving data when necessary

- Provides customized packages of relevant geophysical information via the internet for SSP members to use in their evaluations of site survey data adequacy

- Assists panel chairs in facilitating the meeting(s)

- Determines adequacy of data deposited at the Data Bank

- Prepares any special presentations as requested by JOI

2.0 Pre-cruise Preparation

2.01 Proposal Submission

JOIDES accepts scientific input by individuals or groups into the Ocean Drilling Program by means of drilling proposals submitted to the JOIDES Office. The process of submitting such proposals to ODP was significantly revised in September 1997. Those revisions, and a full description of the proposal submission process and guidelines are presented in "*A Guide to the Ocean Drilling Program*" published in December 1998 as a Special Issue of the *JOIDES Journal* (Appendix B). The purpose of this revision was to:

- Programmatically align the proposal submission process with the 1996 version of the *ODP Long Range Plan*
- More quickly provide proponents with feedback as to the likelihood that their project would be considered a high priority to the ODP
- Broaden the scientific evaluation of proposals by including an "external comment" process
- Enable submission of preliminary and full proposals

2.02 Review Process

2.02.1 Preliminary Proposals

The Science Steering and Evaluation Panels (SSEPs) review **Preliminary Proposals** with regard to the fundamental scientific advances that the proposed drilling programs might make, their relevance to the *ODP Long Range Plan* (LRP), and the appropriateness of the geographic locations and proposed drilled sections to addressing the scientific objectives of the proposals.

Written reviews are returned to the contact proponents with one of the following responses:

- The proposal is of high interest and well justified. The panel(s) recommends development of a Full Proposal
- The proposal is of high priority, but could be improved or made more relevant. In this case, the appropriate SSEP may nurture a proposal (possibly through a watchdog system) and request a revised Preliminary Proposal
- The proposal does not address high-priority goals of the LRP, or is of low scientific interest. The Panel(s) rejects the proposal and recommends that a Full Proposal should not be developed
- Some specific additional information is needed to evaluate the preliminary proposal adequately (e.g., insufficient data to evaluate whether drilling addresses the stated objectives). The Panel(s) requests these data from the contact proponent for their next meeting(s). If the data are unavailable and critical, the Panel(s) will recommend that a revised Preliminary Proposal be submitted once the data are available
- The proposal addresses objectives for which other proposals exist. The Panel(s) refers the proposal to a Program Planning Group (PPG), or recommends that the proponents collaborate

2.02.2 Full Proposals

The SSEPs review **Full Proposals** to determine whether they meet the criteria necessary for external comment. The criteria are:

- The proposal addresses a scientific problem that is identified as a high priority in the LRP (or moves the program beyond the LRP)
- There is a clear justification that drilling is the best way to achieve the scientific objectives being addressed
- There is a well-defined drilling strategy, the success of which can be assessed on the basis of the geophysical/geological data as presented in the proposal

If these criteria are met, the Panel(s) recommends to the JOIDES Office that external comments be acquired, and provide a list of qualified evaluators for each recommended proposal. These may include individuals who are active within the international drilling community, as well as others from outside that community who can comment on the science with a broader perspective of its contribution to the appropriate field.

JOI is responsible for managing this review process. Using the proposed list of evaluators and other recommendations from the advisory structure, JOI selects the individuals to provide external comments. JOI manages the external comment process so that all comments are returned from the review process anonymously to the JOIDES Office, the SSEP(s) and the proponents. The proponents are given an opportunity to respond to the external comments with a short letter. The external comments, together with the proponents' response, are then reviewed by the SSEP(s) at their next meeting.

Information on site survey readiness for each proposal is also provided by the SSP liaison(s) to the SSEP(s). For each reviewed proposal, a package is assembled for SCICOM that contains the SSEP(s) review(s) of the proposal and external comments received from anonymous evaluators with the proponents' response letter.

SCICOM uses this package to rank the proposals for incorporation into the annual drilling schedule. Proponents of programs not selected are advised that SCICOM will keep the proposal active for consideration at a later time or will not consider it further. If the proposal is kept active, proponents may be asked to provide additional revisions.

2.02.3 Ancillary Program Letters

Requests to accommodate ancillary programs in the ODP are submitted to the JOIDES Office in the form of **Ancillary Program Letters**. Before doing so, proponents should determine that their programs could not be accomplished by any other means through ODP procedures. For example, in many cases, projects can be accomplished by conducting shore-based scientific research. An Ancillary Program Letter includes:

- A description of the project and its overall scientific goals;
- Types of shipboard measurements/data collection necessary;
- Geographic areas of interest; and
- Ship time and shipboard requirements needed to complete the research.

Ancillary Program Letters are forwarded to the SSEPs who review them and suggest any appropriate collaboration. The SSEPs then forward their reviews to the SCICOM.

2.03 Preliminary time estimates for coring, logging, and transiting

The Science Operator (TAMU) and the Logging Services Operator (LDEO) have prepared guidelines to estimate coring, logging and ship transit times. These are designed to assist proponents in developing realistic operational time estimates. TAMU has compiled and revised curves for estimating these times in the following publication and software product:

• *Preliminary Time Estimates for Coring Operations*: ODP Technical Note 1 (revised December 1986) available from ODP/TAMU

• *A Coring and Transit Time Estimator* (a Microsoft Excel spreadsheet available at: http://www-odp.tamu.edu/dsd/drillest.html)

In the Technical Note, drill string and wireline trip times reflect average operating times. Curves for drill string trip time and rotary core barrel (RCB), advanced piston corer (APC), and extended core barrel (XCB) coring cycles are included. They can be used to estimate times in both single-bit and re-entry holes.

The curves, along with procedures for calculating approximate coring and logging times, are available to assist proponents. Whenever possible, time estimates for ODP holes should be based on data from similar locations and/or lithologies. Because of the complexity of ODP operations, however, these rough estimates should not be used for detailed operational planning. Once a site has been approved and its objectives are finalized, detailed planning becomes the responsibility of the Science Operator.

LDEO has written a web-based “Proponent’s Helper” that was designed to assist proponents with the preparation of logging-related material for ODP drilling proposals. The document is divided into four sections: (a) general information, (b) proposal instructions, (c) logging time calculations, and (d) frequently asked questions. The document can be accessed at:
http://www.ldeo.columbia.edu/BRG/ODP/LOGGING/HELPER/helper.html

2.04 Site survey review

The JOIDES SSP reviews site survey data packages for their adequacy to meet the science objectives of the drilling proposal. Once a drilling proposal is selected for external review by the SSEPs, proponents must submit site survey data to ODP’s Site Survey Data Bank. Site survey data requirements and submission guidelines are presented in an ODP TAMU’s Technical Note “ODP’s Guidelines for Site Survey and Safety” (Appendix I). The ODP has an overarching Environmental Impact Statement (paper copy only) cited in Appendix J.

2.05 Safety reviews

Safety reviews are a critical element in the process of planning a drilling leg. In addition to the JOIDES PPSP, the Science Operator (TAMU) has an independent group of safety advisors. The advice and recommendations of both groups are incorporated into the Science Operator’s final decision as to whether a proposed site will be drilled.

The primary responsibility for documenting hazardous sub-seafloor conditions rests with the Co-Chief scientists (or the lead proponents, if Co-Chiefs have not yet been selected). They are ultimately responsible for ensuring that adequate technical data are obtained, and for processing these data for examination by the safety panels. Failure to document safety considerations in a thorough manner could result in the safety panels not recommending the site to the Science Operator who ultimately has the responsibility for safety decisions.

The principal safety and pollution hazard in ocean drilling is the possible release of substantial quantities of hydrocarbons from a subsurface reservoir. In most deep-sea regions, the risk of hydrocarbon release can be minimized or eliminated by careful planning and proper site surveys. Additionally, safety problems may arise in drilling hot hydrothermal regions, drilling in shallow water, and in areas of gas hydrate or H_2S.

Proponents must adhere to, and or be familiar with ODP's safety policies, procedures, and guidelines detailed in "ODP's Guidelines for Site Survey and Safety" (Appendix I), "ODP's H_2S Drilling Contingency Plan" (Appendix K), "Organic Geochemistry Technical Note," (Appendix L), "Introduction to ODP Safety Management Practices" (Appendix M), "ODP Crisis Management Plan" (Appendix N), "Laboratory Safety and Hazard Communication Compliance Policy for *JOIDES Resolution*" (Appendix O), and "Laboratory Safety and Hazard Communication Compliance Policy for Shore" (Appendix P). The ODP Environmental Impact Statement is on file at NSF, JOI and TAMU, as cited in Appendix J.

2.06 Selection of the Scientific Party

Critical to the success of a scientific expedition is the careful selection of the scientific party. The Science Operator (TAMU) has the responsibility of making final selections of the Co-Chiefs and members of the scientific party. The MOU between the U.S. National Science Foundation and ODP partners define the rights and privileges of each member with respect to co-chief scientists and scientific party members.

2.06.1 Co-Chief Scientist Selection.
The Co-Chief scientists are selected based on input from the JOIDES scientific advisory structure and are ultimately selected based on criteria outlined in Appendix C. A goal of ODP is to have at least one proponent of the proposals associated with a leg be one of the Co-Chief scientists. Obligations of the Co-Chief Scientist are defined in the "Co-Chief Scientist Agreement (Appendix Q).

2.06.2 Members of the Scientific Party.
Members of the scientific party are selected from applications from the international scientific community. Selection is based on expertise needed to achieve the objectives of the leg and balance of participation from all ODP partners. Obligations of the scientific party member are defined in the "Scientific Party Member Agreement (Appendix R).

2.07 Cruise Preparation

Cruise preparation is the responsibility of the Science Operator (TAMU) and LDEO/BRG following direction from JOI, which in turn receives recommendations from the JOIDES advisory structure. Cruise preparation procedures are summarized in the *Shipboard Scientist's Handbook* (Appendix S). A major product of cruise preparation planning is the *Scientific Prospectus* for the leg. This document is a primary responsibility of the Science Operator, Borehole Research Group and the Co-Chief scientists.

3.0 Shipboard Operations

Shipboard Personnel and Responsibilities are summarized below:

3.01 ODP Operations Manager

The Operations Manager represents the Science Operator on the *JOIDIES Resolution* and has the responsibility of ensuring that the leg's Scientific Prospectus is followed during cruise operations. The Operations Manager is the senior shipboard representative of ODP and works in a team environment with the Co-Chief Scientists, the ODP Laboratory Officer, the ODP Staff Scientist (Leg Project Manager) and ship contractor personnel. In consultation with the Co-Chiefs, the Operations Manager is responsible for preparing, scheduling, and modifying the coring program in the field, to maximize the scientific results of the cruise.

The Operations Manager is responsible for executing recommendations and procedures made by SCICOM/OPCOM and the PPSP of JOIDES, and approved by the ODP Director. After consulting with the Co-Chief Scientists and Transocean Offshore Instrumentation (OMI) Manager, the Operations Manager is responsible for ensuring safe drilling operations and determining if or when drilling operations should be terminated.

The Operations Manager represents ODP/TAMU in:

• Determining acceptable drilling conditions
• Matters pertaining to discipline of the ship, drilling, and scientific crews
• Approving on-site changes in equipment or drilling, coring and logging procedures.

The Operations Manager is responsible for:

• Completing accurate reports of drilling, coring, logging, and ship operation/maintenance
• Transmitting this information ashore (daily operations reports)
• Supervising the shipboard Operations engineer(s)
• Assuring compliance with SCICOM guidelines for logging of holes
• Monitoring and implementing the ODP Technology Safeguards Plan as the principal on-board representative

3.02 Scientific Staff

3.02.1 Co-Chief Scientists

The Co-Chief Scientists bear a large part of the responsibility for the scientific success of the ODP legs they lead. At sea, and in consultation with the Operations Manager, the Co-Chiefs determine the optimal use of the vessel's time to accomplish the objectives set forth in the approved science plan, except as abridged by policies set by the ODP Program Plan, safety considerations, and/or the laws of the sea. Use of the vessel for science not included in the approved science plan or deviations to that science, requires prior approval as stated in Section 3.06 below. The Co-Chief Scientists are charged with implementing at sea the recommendations of the JOIDES Advisory Structure for drilling, coring, and logging, after the recommendations have been reviewed operationally and approved by ODP management. The responsibilities of the Co-Chief Scientists extend from the time they accept the Co-Chief position (nominally 1 year pre-cruise) until the Proceedings of the Ocean Drilling Program, *Scientific Results* volume from that cruise is published (nominally 4 years post-cruise). By recommendation of the JOIDES Advisory Structure, one who accepts the position of Co-Chief Scientist and fails to fulfill these responsibilities may not be recommended for future ODP participation in such a leadership role.

Co-Chief scientists agree to assume the responsibilities of the position by signing a "Co-Chief Scientist Agreement" with the Science Operator (Appendix Q). The agreement specifies the duties during the pre-cruise, cruise, and post-cruise intervals.

3.02.2 ODP Staff Scientist

The ODP Staff Scientist is employed by ODP/TAMU, and serves as the Leg Project Manager. In this capacity, the Staff Scientist works with the leg's Co-Chief Scientists, the Science Services Manager, the Operations Manager and other parties in assessing operational requirements and in planning and executing the leg's scientific objectives as stated in the *Scientific Prospectus* for the leg. The Staff Scientist is responsible for overall coordination of ODP/TAMU services and resources required for leg planning, execution, and publication of results, and assists with the cruise scientific staffing and communications with the scientific participants prior to and following the cruise.

Prior to the cruise, the ODP Staff Scientist assists the Co-Chief Scientists in:

- Preparing and distributing a cruise Scientific Prospectus to all members of the sea-going party (scientists, technicians, engineers, and operations personnel) and to certain members of the JOIDES community

- Developing the Leg Sampling Plan, in accordance to the "Sample Distribution, Data Distribution, and Publications Policy" (Appendix D) from the sample requests received before cruise departure. This effort requires significant contact and coordination with all shipboard and approved shore-based requestors prior to the cruise. Accordingly, the Staff Scientist serves as a member of the Sample Allocation Committee, as stipulated in the Sample Distribution, Data Distribution, and Publications Policy

- In addition to being a member of the shipboard scientific party in his or her field of expertise, **while aboard ship** the Staff Scientist acquaints scientists with the shipboard facilities and informs the scientific party of the procedures and policies of ODP regarding format and content of data forms and published materials

- Following the cruise, the Staff Scientist, in conjunction with the Co-Chiefs, coordinates post-cruise activities. These include organizing a post-cruise meeting of the shipboard scientists to complete the *Initial Report* volume, serving as scientific coordinator for the *Initial Report* volume, and serving as a member of the editorial board for review and revision of manuscripts submitted for the *Scientific Results* volume

3.02.3 Logging Staff Scientist/Project Manager

The Logging Staff Scientist/Project Manager is responsible for ensuring the successful implementation and completion of the logging plan as defined by the JOIDES advisory and planning panels. As logging project manager, the logging staff scientist is responsible for cruise-related logging resources, interacts with Co-Chiefs and the Staff Scientist, and coordinates the logging operations planning prior to and during the cruise. In addition, the logging staff scientist participates in the development of shipboard logging measurement procedures and laboratory equipment, interfaces with scientists as customers and with the JOIDES advisory and planning structure when required.

Duties

Pre-cruise:

- Coordinates a project team composed of representatives from each relevant department to ensure efficient pre-cruise, cruise, and post-cruise operations.
- Attends pre-cruise meetings and prepares logging-related sections of the prospectus
- Works closely with Co-Chief scientists, staff scientist, logging engineers, drilling superintendent, and third-party tool developers (see ODP/TAMU Technical Note #10) on logging-related operational planning
- Provides a contact point for shipboard scientists and the scientific community on logging-related issues
- Interacts with ODP Logging Services personnel to ensure successful implementation of port call activities including shipping, receiving, and interchange with Schlumberger and ODP Logging Services personnel
- Provides input into the leg planning process starting at the proposal stage

Cruise:

- Manages all shipboard logging activities, including supervision and quality control of Schlumberger operations
- Coordinates operations with third-party tool developers
- Provides accurate and timely summaries of logging results in the form of weekly reports, site summaries, and the preliminary report
- Coordinates shipboard logging data acquisition and the distribution of data to the shipboard party
- Responsible for Down Hole Measurements Lab systems management.
- Responsible for data preparation and preliminary processing
- Facilitates and participates in core-log-seismic integration efforts
- Coordinates the transmission of log data via satellite to and from LDEO for processing

Post-cruise:

- Participates in the generation of the *Initial Reports* volume through preparation of logging-related material and participation in the first post-cruise meeting, when requested
- Provides scientific and technical advice to ODP Logging Services data processing/analysis and CD-ROM production personnel when required

General:

- Participates as a member of a team that manages and develops the shipboard Down Hole Measurements Lab to insure it has state-of-the-art equipment and procedures
- Conducts scientific research to maintain and expand level of expertise required to act effectively as a logging staff scientist
- Acts as a liaison between ODP Logging Services personnel and the external science community concerning logging-related leg activities

3.02.4 Shipboard Scientists

Shipboard Scientists collect, analyze, and compile data in a manner conformable with ODP standards and format. Scientific participants are responsible for contributing to the overall leg objectives as outlined in the *Scientific Prospectus* in the most effective way possible. All members of the scientific party share all data collected by shipboard scientists during the leg and are required to enter these data into the ODP computer database. All shipboard scientists are required through a signed agreement (Appendix R) to adhere to all ODP policies.

As described in Section 2.06, the scientific party is selected to provide the necessary technical and scientific expertise to achieve the cruise objectives. Example job titles and descriptions of members of the scientific party are provided in Appendix T.

3.03 ODP Technical Personnel

The marine technical staff on board *JOIDES Resolution* generally consists of a Laboratory Officer, Assistant Laboratory Officer, six or more Marine Laboratory Specialists, one Photographer, one Yeoperson, two Chemists, two Marine Instrumentation (Electronics) Specialists, two Marine Computer Specialists, an Application Programmer, and one Curatorial Representative.

3.03.1 Laboratory Officer

<u>Laboratory Officer</u>—While at sea, the Laboratory Officer is responsible for the direct supervision, performance, and safety of the ODP technical staff (Marine Laboratory Specialists, Marine Computer Specialist, Curatorial Representative, Yeoperson, Application Programmer, and Marine Instrumentation (Electronics) Specialists) in the collection of core material and recording of data, and for the proper efficient and safe operation and maintenance of the ship's laboratories and related equipment. In normal practice he/she directs and supervises these activities in a way consistent with the guidelines and overall priorities, policies, and assignments made by ODP/TAMU.

The Laboratory Officer is responsible for all shipboard scientific equipment and supply items for training and scheduling technical support staff.

On site, the Laboratory Officer works with Transocean through the Offshore Installation Manager when his/her areas of responsibility involve ship's personnel, equipment, or operations.

3.03.2 Assistant Laboratory Officer

<u>Assistant Laboratory Officer</u>—Under the direction of the Laboratory Officer he/she assists the Laboratory Officer with all shipboard laboratory responsibilities, serving as laboratory foreman responsible for directing core flow throughout the laboratories. Has the overall responsibility for shipboard storekeeper tasks, which incorporates laboratory inventory control, ordering, receiving supplies and equipment, packing freight, preparing shipping papers and requisitions at the end of each leg. Sail on a rotating basis, working opposite shifts from the Laboratory Officer.

3.03.3 Marine Laboratory Specialists

<u>Marine Laboratory Specialists</u>—Under the direction of the Laboratory Officer, the ODP Marine Laboratory Specialists are responsible for the collection, recording, and preservation of core

material and scientific data and for the proper operation and maintenance of the ship's laboratories and related equipment.

3.03.4 Marine Computer Specialist (MCI)

Marine Computer Specialist—Under the direction of the Laboratory Officer, the ODP Marine Computer Specialist has complete responsibility and authority for the computer system at sea. The Marine Computer Specialist serves as the primary contact for shipboard users and final authority on proposed system operation. He/she maintains the integrity of the hardware, software, and data allocating user accounts that provide access to the system. The Marine Computer Specialist reconfigures system hardware as new equipment arrives and installs software updates and revisions. He/she is also responsible for identifying and reporting problems in system software to the shore-based facility for correction.

3.03.5 Curatorial Representative

Curatorial Representative—The ODP Curatorial Representative is supervised by the Laboratory Officer while at sea and represents the Curator and JOIDES/ODP policies aboard the vessel. He/she assumes responsibility for the care and handling of the cores and core samples as soon as the core liner is removed from the core barrel. The Curatorial Representative maintains records of all samples taken on board the vessel and ensures rigorous adherence to all provisions of the ODP policies regarding core handling, sampling procedures, and sample distribution. For each drilling leg, a Sample Allocation Committee (SAC) is constituted and is comprised of the Co-Chief Scientists, ODP Staff Scientist, and the ODP Curator. During the leg, the Curator's authority and responsibilities to the SAC is ceded to the shipboard Curatorial Representative. Because the SAC best understands the scientific needs of their leg, this group establishes a leg-specific sampling strategy and makes decisions on leg specific sample requests. The curator has responsibilities outlined in the "Sample Distribution, Data Distribution, and Publication Policy" (Appendix D) and the "Guidelines for the Loan of Micropaleontological Reference Center Samples" (Appendix U).

3.03.6 Marine Instrumentation (Electronics) Specialists

Marine Instrumentation (Electronics) Specialists—ODP usually staffs at least two Marine Instrumentation (Electronics) Specialists on each cruise. They are responsible for maintaining and repairing all shipboard ODP electrical equipment, including the computer system, analytical laboratory equipment, copy machines, and some down-hole tools.

3.03.7 Operations Engineer

Operations Engineer—On some cruises, an Operations Engineer is aboard to assist the Operations Manager in running reentry/casing/completions in installation. They also assist in maintaining and deploying special coring tools under development, training the rig crew in the routine use of new tools, and assisting deployment of rarely operated equipment. The Operations Engineer is supervised by the Operations Manager.

3.03.8 Application Programmer

Application Programmer—The application programmer sails every fourth leg and is primarily responsible of ensuring that all computer application programs properly collect, store, upload (to the database), and retrieve (from the database) all prime data gathered from collected core. The programmer also assists the Marine Computer Specialists in the support of the Janus database and

Unix servers and provides support to ODP technicians and visiting scientists, as needed, onboard the ship.

3.04 Transocean Personnel

3.04.1 Master

Master—The Master is responsible for the ultimate safety of the drill ship and its personnel. He has primary command whenever the drill ship is underway from or to location and while in port. While on location drilling, the Master cedes primary operations responsibility to the Offshore Installation Manager.

3.04.2 Offshore Installation Manager

Offshore Installation Manager—The Offshore Installation Manager is responsible for the safe conduct of drilling operations, including casing and cementing, out-of-the ordinary operations, well control measures, and weather monitoring. While on site, the Manager is the primary responsible party for Transocean. Specific duties of the Manager include assuring that drilling/coring operations are conducted in a safe, efficient manner, advising the ODP Operations Manager of unsafe operations or procedures that could compromise safety of the drilling/coring operations, overseeing preventative and planned maintenance programs on equipment, and preparing crew schedules and training.

3.04.3 Electrical Supervisor

Electrical Supervisor—The Transocean Electrical Supervisor is responsible for the proper operation and maintenance of the Dynamic Positioning System and all Transocean electronic/electrical apparatus, including the VIT camera system. This includes advising the Offshore Installation Manager of any Dynamic Positioning System status changes that could affect drilling operations or safety.

Scientific Drilling Operations

3.05 Proper change notification

If any plans that deviate from the *Scientific Prospectus* are being considered, the Co-Chiefs, after consultation with the Operations Manager, shall notify the ODP/TAMU Director or designee to inform them of the conditions and circumstances requiring an action to deviate from the planned operations. If the proposed change(s) could impact the logging activities, the TAMU/ODP Director will contact the ODP Logging Services Director.

The TAMU Director or Designee will then notify the JOI/ODP Director and SCICOM Chair of the proposed deviations to the overall cruise objectives. When appropriate, the SCICOM Chair will consult with JOIDES Panels for guidance. JOI and SCICOM Chair approval are required prior to implementing any proposed deviation from the approved *Scientific Prospectus*.

3.06 Hydrocarbons detected

When a significant amount of **hydrocarbons are detected** in ODP core samples by shipboard scientists, the Co-Chief Scientists and the Operations Manager shall immediately be notified, who will in turn notify the ODP/TAMU Director or their designee. The ODP/TAMU Director will then notify the ODP Director at JOI. **The National Science Foundation shall be notified** immediately by the JOI ODP Director of any such reported discoveries. Also, as soon as possible thereafter, the ODP staff will furnish a planned course of action in regard to the samples including an estimated time of completion of the analysis and release of the findings. For more information, see “ODP’s Guidelines for Site Survey and Safety” (Appendix I), “ODP’s H_2S Drilling Contingency Plan” (Appendix K), “Organic Geochemistry Technical Note,” (Appendix L), “Introduction to ODP Safety Management Practices” (Appendix M), and “ODP Crisis Management Plan” (Appendix N).

3.06.1 Releases

Any release of information regarding hydrocarbons by the Ocean Drilling Program about such discoveries, must be approved in advance by NSF.

Communication

3.07 Ship-to-shore communications (reports)

Communications between the ship and shore are regulated by “ODP’s Ship/Shore Communication Policy” which is maintained by ODP/TAMU. This policy is posted online at http://www-odp.tamu.edu/isg/policies.html, and is presented in Appendix F.

- **Daily Operations Reports**
  Operations reports containing critical information regarding the ship’s location, operational activities and scientific progress are sent each day to ODP Headquarters who in turn sends them to the JOI Office, JOIDES Office, ODP Logging Services, SCICOM and NSF. These reports are the responsibility of the Operations Manager who is assisted by the Staff Scientist. The reports include a brief science operations report, and specifically, a description of the age and lithologies of the material recovered during each 24-hour period.

- **Weekly Hole Summary**
  The Operations Manager writes operational Hole Summaries after leaving a hole, or on a weekly basis if drilling of one hole continues for more than seven days.

- **Scientific Site Report**
  The Co-Chief Scientists complete and transmit a Site Report at the end of each site, in addition to weekly reports, if drilling in the same hole continues for more than seven days. The site report contains the site identification number, its latitude and longitude, the water depth, site objectives, depths of penetration at the hole(s) drilled, and a brief text detailing the lithologies and ages of the materials recovered, and other preliminary results of interest.

- **Personnel List**
  Shortly after the ship leaves port, the Yeoperson sends a list of all scientific and technical crew to ODP/TAMU Headquarters.

- **Logging Reports**
  The JOIDES Logging Scientist and the ODP Logging Staff Scientist are responsible for a report of logging results after a hole has been logged. This report is sent directly to the Borehole Research Group at LDEO. In addition, a subset of the log data for each hole is sent via satellite to LDEO for processing.

- **Press Release**
  Any press release written during a leg must be transmitted to ODP/TAMU and JOI for review and approval before distribution.

3.08 Ship-to-shore communications distribution

Ship-to-shore communication distribution is described in the "ODP's Ship/Shore Communication Policy" which is maintained by ODP/TAMU. This policy is posted online at http://www-odp.tamu.edu/isg/policies.html, and is presented in Appendix F.

Scientific Site reports received from the Co-Chief Scientists on board ship are edited by the Science Services Manager as necessary and then distributed by ODP Science Services to members of SCICOM and EXCOM, JOIDES panel chairs, ODP member representatives, the JOI Office, the USSAC Co-Chair's Office, the NSF Program Officer, ODP Logging Services, and ODP Core repositories. Within ODP/TAMU, the Director, the Deputy Director, the Managers, key headquarters personnel, Staff Scientists, and the Office of Public Information also receive copies of the site report.

3.09 Shore-to-ship communications

Senders and receivers of communications are responsible for the distribution of information they exchange. Confidential messages must always be copied to at least one of the following: Director, Deputy Director, Administrator, or the recipient's department Manager.

3.10 Personal communications

Personal communications differ from confidential messages in that they do not address shipboard business. Cruise or scientific results are not to be discussed in personal messages.

Electronic (email) non-ODP-related communications to and from the ship is available to all leg participants as described in "ODP's Ship/Shore Communication Policy" which is maintained by ODP/TAMU. This policy is posted online at http://www-odp.tamu.edu/isg/policies.html, and is presented in Appendix F. Before obtaining a shipboard e-mail account for personal use, participants must sign a leg-specific ODP/TAMU "Terms and Conditions" form. ODP will provide a specific allocation of free bytes for both incoming and outgoing mail. For bytes beyond those allocated freely, the user will be charged on a per byte basis, at the rate indicated in the policy. Payment must be made in cash or traveler's checks, in U.S. dollars, before the end of the leg.

To help control the size of incoming mail messages, a 20kb message filter will be used at ODP/TAMU before the e-mail is routed to the ship. Messages that are larger than 20kb will be "bounced" back to the sender and the message sender will be notified that their mail was blocked. E-mail is usually exchanged four times a day between ship and shore on most legs. However, daily e-mail exchanges are not guaranteed due to potential poor transmission conditions and/or equipment and software failure.

Direct voice communication for personal messages is sometimes available to the United States by "ham" amateur radio. The ham operator aboard ship contacts a stateside ham operator who then phones the onshore party collect. The charge for the phone call varies depending on the distance from the onshore ham operator to the onshore party. Direct voice communication is also available via MARISAT.

If it becomes necessary for someone ashore to contact shipboard personnel for **critical personal reasons**, ODP will relay messages to the ship as part of their daily communications. Science Operations provides information to members of the scientific party prior to the cruise explaining the procedures that should be followed in the event of an emergency. These instructions should be left with the participant's closest relative, so that they are informed of how to reach someone aboard *JOIDES Resolution*.

Shipboard Procedures

3.11 Numbering of Sites, Holes, Cores, and Samples and Core Handling

Standardized procedures for numbering sites, holes, cores and samples and for handling core are defined in the "Explanatory Notes" section of each volume of the ODP publication "Proceedings of the Ocean Drilling Program, Initial Reports." This section of the publication also describes core handling procedures, visual core description, and other procedures specific to the leg.

3.12 Procedures for onboard sampling

All sampling procedures and policies are defined by the JOIDES scientific advisory structure as approved by the EXCOM. See "Leg Specific Sampling Strategy Guidelines" within Appendix D for details.

3.13 Down-hole logging all sites 400m or deeper

All sites 400 meters or deeper shall be logged as specified in the approved *Scientific Prospectus*. Any deviation from the approved *Scientific Prospectus* must follow the procedures specified in Section 3.05 of this Policy Manual.

3.14 Responsibility of the Operations Manager and Co-Chief Scientists

The **ODP Operations Manager and Co-Chief Scientists** have the responsibility of seeing that SCICOM drilling and logging objectives are followed during the cruise operations as planned in the *Scientific Prospectus*.

3.15 Logging data availability

All logging data acquired on each leg of the Ocean Drilling Program **shall be available to each member of the scientific party on board ship**. Practical limits to data distribution on board ship are such that some time is required to process, correct, and display the data in a form appropriate for preliminary science. Contractually, Schlumberger supplies a CD-ROM and three copies of each logging run.

3.16 Standard logging

In general, the "standard" Schlumberger logging suite is required in every hole logged. The JOIDES Science Committee decides whether exceptions to this rule are appropriate for individual sites. To decrease use of ship time, several types of logging tools are combined into each logging run. At present, **standard logging** consists of two runs:

Run 1—Triple Combo Tool String
A. Accelerator Porosity Sonde (APS)
B. Dual Induction Tool (DITE)
C. Density Sonde (HLDS)
The Temperature Tool (TAP) and the Natural Gamma Sonde (HNGS) are usually added to this toolstring.

Run 2—Formation MicroScanner/Sonic Tool String
A. Formation MicroScanner (FMS)
B. General Purpose Inclinometry
C. Gamma Ray Tool (SGT)
D. Dipole Sonic Imager (DSI)

In addition to the standard tools, many other types of logging tools are run in selected holes. The SSEPs are responsible for recommending the most useful tools for each proposal, and the SCICOM makes the final recommendation on which tools are to be run.

These additional tools may be Schlumberger tools, LDEO specialty tools, or tools provided by a member of the ODP community ("third party tools"). Details on "third party tools" are available in the ODP/TAMU Technical Note #10. Schlumberger tools are run by the Schlumberger engineer, under the supervision of the LDEO Logging Staff Scientist. LDEO specialty tools are run by the LDEO Logging Staff Scientist. Third party tools are usually run by the individual providing the tool.

3.17 Shipboard log analysis

Log processing services are provided by LDEO-BRG. Logging data are routinely transmitted via high-speed satellite equipment from the *JOIDES Resolution* to shore for processing. Processed data have been routinely turned around in a five to six day period. The processed data can then be used on the ship. Certain data types (e.g., FMS) are not transmitted to the shore because of their large size. These data are sent to LDEO immediately following the cruise for processing. When the processing is completed, the data from the cruise are uploaded to the online ODP Log Database and the shipboard party is informed of its availability.

The Down Hole Measurements Lab on the *JOIDES Resolution* is equipped with a full suite of log analysis and interpretation software. This allows the logging scientists to perform preliminary interpretation in the course of preparing the logging chapter of the shipboard report.

3.18 Shore-based log analysis

ODP Logging Services maintains log analysis centers in France, Germany, Japan, and the United Kingdom to provide ODP scientists with access to state-of-the-art interpretation software and technical support.

Further details of the tools and procedures used may be found in the ODP Logging Manual obtainable from Borehole Research Group, Lamont-Doherty Earth Observatory (See Appendix A for address) or viewable online at http://www.ldeo.columbia.edu/BRG/ODP/LOGGING/MANUAL/index.html.

3.19 Loss of down-hole tools

In the event of loss of down-hole tools, all reasonable efforts at drill string and/or wireline fishing will be made. Exceptions will only be made by TAMU in consultation with LDEO in cases where operational safety or efficiency are involved or by JOI when broader programmatic issues are involved. The kind and number of fishing attempts will be the responsibility of the TAMU Operations Superintendent in consultation with the Logging Staff Scientist.

3.20 Use of logging wireline

LDEO maintains a heave compensated wireline system for routine logging operations. At times, this system is used for non-logging activities, such as seismometer installations. Each non-logging use of the wireline is evaluated individually. Any plans to use the wireline for non-logging activities must be assessed for potential risks to the logging program and approved by the Director, ODP Logging Services, or his designee, as early as possible in the cruise planning process. If the cable is damaged or lost during the non-logging use of the wireline, highest Program priority is given to activities and funding needed for its immediate replacement.

3.21 Monitoring of Third Party Tools

A third party tool is defined as a tool that is not owned by Schlumberger or owned or leased by the Borehole Research Group at LDEO or by ODP/TAMU. Details are provided in the ODP/TAMU Technical Note #10. There are two types of third party tools:

- Development Tools (instruments under development)
- Mature Tools (established tools)

Development Tools

For a tool to be considered an ODP Development Tool, and thereby scheduled for deployment, several criteria should be satisfied.

(a) There must be an identified principal investigator.

(b) LDEO (for down-hole logging tools) or TAMU (for all others) should formulate a development plan in conjunction with the principal investigator, and then inform SCIMP of this plan.

(c) The development plan should:

- Indicate the acceptance, desirability, financial and technical feasibility, and the usefulness of the measurements
- Identify development milestones
- Make provision for initial testing on land
- Satisfy safety considerations
- Specify shipboard requirements such as the data processing necessary to make the formation accessible on board ship, any special facilities (emphasizing areas where the tool is not compatible with existing hardware/software), and appropriate technical support
- Contain a statement of intent that the tool would be available for post-development deployment in ODP

If SCIMP endorses the development plan, subject to SCICOM approval, the Panel will appoint a coordinator to monitor, on its behalf, the tool's progress through the development plan. The Panel monitor will receive reports from the Principal Investigator on request and will present a summary of these to SCIMP. SCIMP will review progress at regular intervals and will evaluate tool performance after each deployment. Day-to-day monitoring will be the responsibility of TAMU and LDEO. A tool cannot be regarded as an ODP Development Tool, and therefore cannot be scheduled for future legs, if it has not undergone the above procedure. All tools that are currently scheduled must have a development plan formulated as soon as possible.

Once a tool has been accepted by SCIMP as a Development Tool, the Principal Investigator will be required to co-sign the development plan with TAMU and LDEO as appropriate as a visible accession to the provisions of the plan. A Development Tool cannot be deployed on an ODP leg unless TAMU/LDEO and SCIMP are satisfied that the terms of the development plan have been fully met.

Mature Tool

For an ODP Development Tool to undergo the transition to an ODP Mature Tool (i.e., an established tool operated by TAMU or LDEO) there must be SCIMP endorsement. This endorsement will be given after Panel review of a proposal prepared by TAMU and/or LDEO and submitted to SCIMP. This proposal must satisfy SCIMP on the following counts:

- Cost of routine operations including shipboard data processing
- Requirements for routine operations/processing
- Availability of spare components
- Facilities and projected costs for maintenance
- Existence of an operating/maintenance manual
- Safety considerations
- Long-term usefulness of data
- Established track record both in land tests and shipboard deployment

Where several Development Tools are competing for the same Mature Tool slot, SCIMP will require that appropriate contractor to evaluate all tools and submit their multiple-tool evaluations to SCIMP for Panel consideration.

Established Third Party Tool on Loan to ODP

Where an established third party tool is loaned for use in ODP, this tool will have to satisfy the criteria listed in the Mature Tool section in order to be accepted as the technical equivalent of an ODP Mature Tool. Tools that do not satisfy these criteria, cannot be programmed for future ODP legs. Detailed guidelines on Third Party Tools are available in the ODP/TAMU Technical Note #10, last updated in 1993.

Last Minute Requests

Last-minute requests to include an unproven third party tool within an ODP leg will not be accepted.

Ship Safety

See the following Appendices for a full description of safety matters "ODP's Guidelines for Site Survey and Safety" (Appendix I), "ODP's H_2S Drilling Contingency Plan" (Appendix K), "Organic Geochemistry Technical Note," (Appendix L), "Introduction to ODP Safety Management Practices" (Appendix M), "ODP Crisis Management Plan" (Appendix N), "Laboratory Safety and Hazard Communication Compliance Policy for *JOIDES Resolution*" (Appendix O), and "Laboratory Safety and Hazard Communication Compliance Policy for Shore" (Appendix P).

3.22 Emergencies and weekly drills

The scientific work of *JOIDES Resolution* takes her to areas where immediate assistance is not available. It is therefore necessary to rely upon the knowledge and experience of the ship's crew to avoid potentially dangerous situations. This is done in a systematic way developed through the practice of weekly drills. These drills are required by law, and the ship takes pride in the serious manner in which they are organized and held.

Verbal instructions about the **duties and assigned stations** of each person during emergencies, including lifeboat assignments, are discussed with all shipboard personnel at the beginning of each cruise. Station bills of emergency signals are conspicuously posted in passageways and personnel stations.

3.23 Drill attendance

Fire drills, man overboard drills, and abandon ship drills are held at least once weekly; **attendance is mandatory.** Helicopter emergency drills are held less frequently. Processes and details connected with these drills are explained by the Master at the first drill, held a few hours out of port.

3.24 Compassionate emergencies

It is the policy of the Ocean Drilling Program not to interrupt or alter the course of a cruise for the purpose of evacuation any shipboard personnel in the event of a person emergency on shore. However, exceptions to this policy can be made as the discretion of the TAMU/ODP Director or their designee. Consideration of an exception to this policy would depend upon an evacuation procedure that did not significantly impact the science plan. This decision would be based, in part, on the location of the drill ship, the availability of transportation and financial resources required for an evacuation, the operating status of the *JOIDES Resolution* and nature of the emergency.

For the purposes of this policy, personal emergencies include, but are not limited to, a serious injury, illness or death of a family member. A family member includes the shipboard personnel's spouse, child, parent, brother, sister, grandparent, or grandchild. Personal emergencies may also include other circumstances, which require the shipboard personnel's immediate attention on shore

A life-threatening situation involving any shipboard personnel is not covered by the above stated policy. The Master and/or shipboard physician shall immediately contact the College Station Transocean office, which in turn contacts the TAMU/ ODP Director or designee to discuss these situations and determine the best course of action on a case-by-case basis.

3.25 Reporting of injury or illness while at sea

Any injury or illness, to any non-Transocean employee aboard ship while at sea or while at a port of call, must be reported to the Lab Officer and the ship's doctor. After obtaining medical attention for the illness or injury, the Lab Officer is responsible for notifying the following personnel:

- Operation Manager
- Ship's Master
- ODP Human Resource/Insurance Supervisor
- Port Agent, if in port

In addition to the notifications, the Lab Officer is responsible for:

- Advising the ODP/ TAMRF Human Resource /Insurance Supervisor, who will notify the relevant department head, within two days of occurrence of injury/illness
- Completing the "Employers First Report of Injury"
- Completing the "Employer's Supplemental Report of Injury," if the injured misses a day of work
- In case of accident, obtaining eye-witness reports, written in accordance with *Witness Reporting Guidelines*, and coordinating the taking of necessary photographs of the accident area
- Hand delivery of all accident/injury reports to the ODP/ TAMRF Human Resource /Insurance Supervisor (per ship-to-shore hand delivery policy)

3.26 Notification of major accidents

JOI shall be notified in a timely manner of any major accident or serious illness occurring on the ship or during a port call. Likewise, JOI will notify NSF.

3.27 Financial responsibility for medical treatment

Although not legally bound to do so, the Ocean Drilling Program accepts **reasonable financial**

responsibility for initial medical treatment for shipboard non-Transocean personnel when:

- An illness or injury occurs on board ship or within a matter of hours before and after boarding the ship
- The injury or illness is so critical as to require emergency treatment or special attention.

Each eligible occurrence will be considered on a case-by-case basis.

3.28 Medical consent agreement and physical examinations

Each shipboard guest must sign a consent agreement allowing the ODP medical personnel to take action that is deemed necessary on behalf of the individual in an emergency situation. Each participant/ODP employee sailing on a cruise or any port of a cruise will be required to obtain and provide TAMRF a completed ODP physical examination, plus any additional medical tests/examination/information necessary to assist in determining eligibility/fitness to sail. After careful review of the circumstances, the ODP/TAMU Director or his/her designee may grant an exception to this policy (i.e., a government official visiting the drill-ship for one or two days).

3.29 Technology safeguard plan

Technology safeguard plans have been implemented on the *JOIDES Resolution*. The ODP Operations Manager is responsible for implementation of the plans and procedures.

Procedures to Minimize Impact on Marine Mammals

3.30 Marine Mammal Protection

Appendix Y provides details on preliminary procedures that have been developed by ODP to minimize the impact of seismic activity on marine mammals.

4.0 Reports and Publications

(See Tables 4-1 and 4-2 for a listing of all ODP reports and their distribution. See Appendix V for a complete listing of publications available from the ODP.)

4.01 Quarterly operations and management reports

JOI will conduct a review of quarterly report format and content at the beginning of each fiscal year with the NSF Program Director.

The Subcontractors shall provide to JOI who shall in turn provide to NSF, **quarterly operations and management reports** addressing each of the following subjects:

- Leg Activities
- Ship Schedules
- Leg Planning Activities
- ODP/TAMU Engineering Development Projects
- ODP/LDEO Engineering Development Projects
- Development Projects
- Long Term Planning Activities
- Appendix A: Contract and Finance Report
- Appendix B: Travel
- Appendix C: Personnel Status
- Appendix D: Conference and Meeting Schedule
- Appendix E: JOIDES Drilling Proposals
- Appendix F: Public Affairs
- Appendix G: Curation
- Appendix H: Publications
- Appendix I: Data Requests
- Appendix J: ODP Site Survey Data Bank
- Appendix K: JOIDES Office Report
- Appendix L: ODP Bi-Monthly Distribution List

Subcontractor reports shall be delivered to JOI no later than twenty (20) days after each three-month period. JOI shall in turn submit the quarterly report to NSF no later than thirty (30) days after each three-month period.

4.02 Acknowledgement of JOI and NSF in publication

All **news releases, publications and other similar items** prepared by the Subcontractors and JOI and/or their employees which describe ODP activities or the results of ODP research shall acknowledge the management and sponsorship of JOI, Inc. and NSF, respectively.

Table 4-1 ODP reports and general distribution

Report	Contents	Frequency	Primary Authors	Distribution
Program Plan	Annual scope of work and budget	Annual	JOI, TAMU, LDEO, JOIDES Off.	ODP Distribution* and ODP Council
Quarterly Operations & Management Report	Operations, Management and Finance	Every 3 months on 30th day of subsequent month	JOI, TAMU, LDEO, JOIDES Office	ODP Distribution*
Scientific Prospectus	Detailed scientific plan for each cruise leg	3-6 months prior to cruise departure	Co-Chiefs, TAMU, & LDEO	Available on ODP/TAMU web site: http://www-odp.tamu.edu/publications/ Limited print distribution (distribution list included in Table 4-2)
Technical Notes	Lab reports, engineering & drilling reports, & other reports	As needed	TAMU	Available on ODP/TAMU web site: http://www-odp.tamu.edu/publications/ Limited print distribution to appropriate ODP personnel & others upon request (distribution list included in Table 4-2)
Daily Operations Report	Daily shipboard operations & hole summaries	Daily	TAMU	NSF, JOI, TAMRF, LDEO, & JOIDES Office
Weekly Operations Report	Composite of daily operations reports	Weekly	TAMU	ODP distribution*
Preliminary Report	Overview of cruise scientific results	One per leg	Co-Chiefs, Sci. Party, TAMU, & LDEO	Available on ODP/TAMU web site: http://www-odp.tamu.edu/publications/ Limited print distribution (distribution list included at the end of Table 4-2)
Geotimes, *EOS* and *Nature*, et al.	Immediate information on cruise results	As they are prepared	Sci. Party TAMU, & LDEO	General public
Press Releases	Cruise goals and results in lay terms	As they are prepared	Co-Chiefs, TAMU & JOI	ODP distribution* & general public
JOIDES Journal	Record of JOIDES activities	Bi-annually	Editor: JOIDES Office	International distribution of approximately 3,000

Proceedings of the ODP: *Initial Report* volume	Scientific and Engineering results from each Leg	Approx. 12 months post-cruise	Shipboard Scientific Party	Electronic version available on ODP/TAMU web site: http://www-odp.tamu.edu/publications/ Print/CD-ROM distribution to: ODP Distribution*, Scientific party, JOIDES member inst., libraries, and individual and inst. subscribers (print distribution list included in Table 4-2)
Proceedings of the ODP: *Scientific Results* volume	Results from post-cruise research for each leg	Approx. 4 years post-cruise	Editors: Editorial Review Board (Co-Chiefs, Staff Scientists, and one external scientist [optional])	Electronic version available on ODP/TAMU web site: http://www-odp.tamu.edu/publications/ Print/CD-ROM distribution to: ODP Distribution*, Scientific party, JOIDES member inst., libraries, as well as individual and institutional subscribers (print distribution list included at the end of Table 4-2)
Data CD	Contains log data, summary plots, and processing notes, and related core data (e.g., gamma, density)	One per leg (if log data are produced)	LDEO	Distributed with *Initial Report* volume to ODP Distribution*, Scientific party, JOIDES member institutions, libraries, as well as individual and institutional subscribers
ODP Policy Manual	General policies of interest to the ODP community	Updated annually	JOI with policy generated from all aspects of program	NSF, JOI, TAMU, LDEO & JOIDES Office

**ODP Distribution is defined as NSF, JOI, EXCOM, SCICOM, JOIDES Office, TAMU, LDEO* — **ODP Distribution is defined as NSF, JOI, EXCOM, SCICOM, JOIDES Office, TAMU, LDEO*

Table 4-2. Specific distribution of Scientific Prospectus, Preliminary Report, Technical Notes, and *Initial Reports* and *Scientific Reports* Volumes.

Scientific Prospectus:

Panel Chairs
All shipboard and shore-based scientists listed as participants (i.e., scientific party members)
Member nation secretariats/offices
Micropaleontological reference centers (upon request)
JOIDES office
JOI office
Certain staff of the TAMU Science Operator
NSF office

TO-SEDCO office
PPSP panel members
TAMU's dean of the College of Geosciences
LDEO
NY Times
(Note: On 1/17/02 the U.S. Department of State requested to be taken off the distribution list for this publication.)

Preliminary Reports:
Panel Chairs
Co-Chiefs and Staff Scientist who participated in the cruise
Member nation secretariats/offices
Micropaleontological reference centers (upon request)
JOIDES office
JOI office
Certain staff of the TAMU Science Operator
U.S. Department of State
NSF office
TO-SEDCO office
PPSP panel members
TAMU's Dean of the College of Geosciences
JOIDES Resolution - Ship
LDEO
NY Times

Technical Notes:
Limited distribution to TAMU Science Operator staff
Limited distribution (~10/yr) to fill special requests (e.g., scientists without access to internet).

Initial Reports and Scientific Results* volumes*:*
U.S. Department of State
All scientific party members (shipboard and shore-based)
JOIDES Office
JOI Office
NSF Office
Member nation secretariats/offices
U.S. JOIDES Institutions
Government Printing Office
Micropaleontological reference centers (upon request)
Current JOIDES panel members
ESF member countries
ODP Marine Techs
ODP / Indexer / TAMU
TO-SEDCO office
LDEO/BGR
External Editorial Review Board (ERB) member
Standing orders/paid subscriptions (e.g., companies, individual scientists)
Libraries/Institutions
JOIDES Resolution - ship

***Single or Standing Orders.** Volumes may be purchased individually or individuals/institutions may be placed on a standing order list. The procedures for being placed on the standing order list are located on the web site referenced in Table 4-1.

4.03 Acknowledgement on signs

The **Subcontractors shall acknowledge the support of JOI, Inc. and NSF** on any signs, paid with ODP funding, identifying the ODP at its various locations.

4.04 Disclaimer to be used in publications

An **acknowledgement of JOI and NSF support** and disclaimer must appear in any publication of any material based upon or developed under the subcontract, in the following general terms:

> The Ocean Drilling Program is sponsored by the National Science Foundation and participating countries under the management of Joint Oceanographic Institutions, Inc. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the National Science Foundation, the participating countries, or Joint Oceanographic Institutions, Inc.
>
> (The preceding sentence may be omitted from scientific articles or papers published in scientific journals.)

4.05 Acknowledgement of other agencies

The Subcontractor or any individual acting under the direction of the ODP must acknowledge the **support of other agencies or international contributors as appropriate.**

4.06 Publication approval

Public information brochures, documentation of scientific nature and other printed information (issued by the Subcontractors) not set forth as a deliverable under their subcontract but with which pertains to or results from work performed under their subcontract shall be sent to the JOI office at least three (3) days in advance of its being made available to the public.

4.07 Testimony approval

The JOI/ODP Director must be notified in writing of any Congressional or court testimony to be given in the name of the Ocean Drilling Program as soon as practical after an ODP employee is notified of the requirement. JOI in turn shall notify NSF.

ODP/TAMU Publications

Publications available from the ODP are listed in Appendix V.

4.08 Pre-cruise Reports

The *Scientific Prospectus* is a pre-cruise plan prepared and published 3 to 6 months before the cruise. Prepared by the Co-chief Scientists and the ODP staff, the Prospectus describes the scientific objectives of the leg and contains brief descriptions of approved sites and technical specifications of the drilling plan.

4.09 Shipboard Scientific Reports

- **Daily and Weekly Operations**
  Operational reports containing critical information regarding the ship's location, operational activities, and scientific progress are distributed daily to recipients by electronic mail. Weekly reports containing composites of the daily reports are posted on the "Drilling" electronic mail bulletin boards and listservers.

- **Hole Summaries**
  Upon completion of drilling at each site, the shipboard scientists individually and as a group prepare a report of the results. At the end of the cruise, these site reports together with the core description data (core photos, visual core descriptions, thin section tables, smear slide tables, and logs) are assembled into one summary report called the Hole Summary. The Hole Summary is the first draft of the *Initial Reports* volume.

- **Preliminary Report**
  This report consists of an outline of the leg achievements and documentation of how the scientific objectives for the cruise were met. This is the first draft of the leg Summary Chapter of the *Initial Reports* volume.

- **Press Release**
  Cruise-related press conferences are held only if a cruise produces information that is of outstanding public interest; however, a press release is prepared for each leg that briefly outlines the essence of the cruise objectives, accomplishments, and results in lay language. Contents and wording of the release are subject to the approval of JOI. This press release is supplied to local area news media before the ship docks, if time permits and is released by ODP soon after the cruise ends.

- ***Geotimes, Nature,* and *EOS* Articles**
  The *Geotimes, Nature,* and *EOS* articles represent press releases to the scientific community. If these articles are authored, they are by the entire shipboard scientific party. They are published within two or three months of the end of the cruise.

4.10 Post-cruise reports

- **General Geological Article**
  The publication of such an article is entirely at the discretion of the shipboard party. The party is encouraged to prepare a technical article discussing cruise scientific results for a major journal, such as *Science* or *Bulletin of the Geological Society of America*, as soon as possible after the cruise ends. Again, authorship is by the full scientific party.

- **Proceedings of the Ocean Drilling Program**
  The *Proceedings of the Ocean Drilling Program* is a two-part series composed of the *Initial Reports* and the *Scientific Results* volumes. These volumes are produced for each leg. They contain a thorough record of the cruise objectives and a summary of the cruise and post-cruise scientific results.

The *Initial Reports* volume records the scientific and engineering results from each ODP leg. Each volume contains leg summary, summaries from each drill site, core descriptions, color core images, and other core description data. The entire contents of each volume are published on CD-ROM in PDF format. The CD also contains ASCII tables that are associated with the volume. The volume CD is distributed with a printed hardcover booklet that contains a copy of the "Leg Summary" chapter and the volume table of contents. The CD is also sold separately. *Initial Reports* volumes are also available on the Web in PDF and HTML formats (www-odp.tamu.edu/publications/). Booklet/CD volume distribution begins approximately 12-months post-cruise, and whenever feasible Web distribution may begin earlier.

The *Scientific Results* volume contains a leg synthesis paper that summarizes the results of post-cruise research related to the leg, which is authored or coordinated by the Co-Chief Scientists, and peer-reviewed papers and data reports. Individual papers are published on the Web in order of acceptance after manuscripts are revised and accepted, and before four years post-cruise. The entire volume is originally published in PDF/ASCII and HTML/ASCII formats on the Web (www-odp.tamu.edu/publications/). At four-years post-cruise, a hardcover booklet is printed that contains the volume table of contents, the leg synthesis chapter and the volume CD-ROM. The CD-ROM contains PDF versions of all volume chapters previously published on the Web and any associated ASCII tables. It is distributed with the booklet and also sold separately. Booklet/CD distribution begins approximately four years post-cruise.

4.11 Cruise participants' responsibilities

The cruise participants' responsibilities are described in the Sample Distribution, Data Distribution, and Publications Policy (Appendix D).

4.12 Manuscript review

The manuscript review procedures are described in the Sample Distribution, Data Distribution, and Publications Policy (Appendix D).

4.13 Miscellaneous reports

ODP/TAMU will produce other publications as occasional series.

- *Technical Reports and Notes*
  A series of technical reports and notes, covering a variety of issues, have been produced by ODP/TAMU (see Appendix V).

Other Publications

4.14 Data CD-ROM

A data CD-ROM containing the log data, summary plots, and processing notes, as well as related core data (e.g., gamma, density) is produced for each leg, and is produced by ODP Logging Services. If space is available on the CD-ROM, additional information may be included at the request of the Co-Chief Scientists.

4.15 ODP logging manual

ODP Logging Services publishes a manual of down-hole logging that is available on CD-ROM, and can be viewed at http://www.ldeo.columbia.edu/BRG/ODP/LOGGING/MANUAL/index.html. The ODP Logging Services website also includes preliminary summaries of the logging operations from each leg (http://www.ldeo.columbia.edu/BRG/ODP/ODP/LEG_SUMM/leg_sum.html). Logging results from ODP cruises are included in the *Proceedings of the Ocean Drilling Program.*

4.16 *JOIDES Journal*

The *JOIDES Journal* is published bi-annually by the JOIDES office. It serves as a means of communication among the JOIDES committees and advisory panels, NSF and non-U.S. participating organizations, JOI and its Subcontractors, and interested earth scientists. The *JOIDES Journal* provides information on JOIDES committees and panels, cruise schedules, science summaries, and meeting schedule. Special issues are occasionally produced on specialty subjects such as pollution prevention and safety.

4.17 NSF policy for oceanographic data

In 1994 NSF issued policy statement 94-126 that updated and revised the guidelines to implement Federal data policy by assuring timely submission of high-quality oceanographic data to the national data centers for secondary use. Guidelines for oceanographic data were first issued by NSF's Division of Ocean Sciences in October 1988. Ocean data collected under Federal sponsorship and identified as appropriate for submission to a national data center are to be made available within a reasonable time. Geophysical, geological and geochemical data collected by the ODP are to be submitted to:

National Geophysical Data Center (NGDC)
NOAA, Code E/GC
325 Broadway
Boulder, CO 80303-3328

Ph: (303) 497-6339
Fax: (303) 497-6513
E-mail: rwarnken@ngdc.noaa.gov

The NSF/ODP supports regional geological and geophysical field studies that can be used to develop mature drilling proposals in the JOIDES system. The data from these projects are a primary source of information in planning drilling and should be available for review by the SSP and the PPSP. Site survey data requirements for mature drilling proposals are identified in the "Guide to the Ocean Drilling Program" (Appendix B) and in other appendices to this policy manual. Additionally, such data can be important in interpreting the results of a drilling leg and should be available to cruise participants.

Successful applicants are expected to deposit data from their cruises in the ODP Site Survey Data Bank at Lamont Doherty Earth Observatory, in addition to other data archiving requirements described above.

The address is given in Appendix A. At the earliest possible date, the chair of the JOIDES SSP, the manager of the Data Bank, and the representative of the appropriate national data center should be notified of the data types and schedule for submission.

The NSF/ODP also supports more limited data collection activities through the U.S. Science Support Program (USSSP), administered by JOI. Data reporting requirements under this program are the same as those identified above.

5.0 Travel and Reimbursement of Travel Expenses

The following policy represents general guidelines for the ODP. Because of minor policy variations at each ODP entity (i.e., JOI, TAMU, LDEO, other subcontractors, and lower tier contractors), all travelers being reimbursed by ODP funds should follow the travel policies of each ODP entity. JOI's travel policy is presented in Appendix W, and the policies of subcontractors are also available upon request.

5.01 ODP support for travel

ODP commingled funds support all travel required for performance under the Prime Contract and Subcontracts, except as stated in 5.02.

5.02 ODP member countries travel funding

Each ODP member country is responsible for the expenses of its scientists involved in ODP. Consequently, funding for travel of U.S. scientists attending JOIDES committees and panel meetings is provided through the JOI/USSSP that is funded by NSF. Panel members from countries other than the ODP member countries are supported by ODP commingled funds. The SCICOM Chair's travel is also paid by ODP commingled funds. Exceptions to this policy must be approved by JOI.

5.03 Reimbursement and subsistence

Reimbursement and subsistence for travel will be made in accordance with the contractor's or subcontractor's established policy.

5.04 Advance authorization of travel

Travel performed on official ODP business must usually be authorized in advance or subsequently approved by the appropriate authority. Those traveling on official business will be reimbursed for all necessary and reasonable expenses of travel, in accordance with approved travel policy.

5.05 Foreign travel and use of U.S. certified air carrier

Any travel outside the United States (other than to Canada or Mexico) is considered foreign travel, and where performed in connection with a project funded by ODP requires prior notification to JOI. Exceptions to this policy are travel:

- Related to port call activities
- To JOIDES meetings (i.e., panels, committees, or groups)
- For any lower-tier subcontractors
- For the ODP/TAMU Director and Deputy Director if their calendars are forwarded at least two weeks in advance to the JOI ODP Director

Unless otherwise provided for in the respective subcontracts, **all foreign air transportation must be provided by a U.S. certified air carrier**, that is, an airline with headquarters in the U.S. Non-U.S. air carriers, that is, an airline with headquarters outside the U.S., may only be used in the following circumstances. This includes not only the initial booking (and any segment thereof) but also any subsequent changes in routing while en route.

A. Travel between a gateway airport in the U.S. and a gateway airport abroad.
- A U.S. air carrier does not serve the airport of origin/destination or interchange point.
- Use of a U.S. air carrier extends the time in travel status by at least 24 hours.
- Use of a U.S. air carrier requires a connecting layover of 6 hours or more, and extends the time in travel status by 6 hours or more.
- Traveler was involuntarily rerouted by a U.S. air carrier on a non-U.S. air carrier due to the unavailability of a U.S. air carrier. (Also applies to item B below).

B. Travel between two points outside the U.S.
- Service not provided by a U.S. air carrier.
- Use of a non-U.S. air carrier eliminates two or more aircraft changes en route.
- One of the two points abroad is a gateway airport to or from the U.S. and use of a U.S. air carrier extends the time in travel status by at least six hours.
- Use of a U.S. air carrier for travel between two points that are not part of the trip to or from the U.S. extends the time in travel status by at least six hours more than by a non-U.S. air carrier.

C. Short distance travel, regardless of origin and destination.
- Service for short distance travel (3 hours or less) between two points by an U.S. air carrier doubles the travel time.

D. Use of a U.S. air carrier would not accomplish the mission of the ODP.
- Requires JOI approval of a signed memo that justifies such action.

5.06 Approval of JOIDES meetings, and post-cruise science meetings

All meetings of the JOIDES Science Advisory Structure, and post-cruise science meetings (other than the first post-cruise (a.k.a. “editorial”) meeting) require advance authorization by the SCICOM Chair. The national ODP program directors authorize the expenditure of travel funds for their respective meeting participants, and the JOI Meeting and Travel Coordinator assists with meeting arrangements and travel-related matters. Details on meeting authorization, timing of meetings, and meeting locations, are described in “A Primer for Planning JOIDES Meetings” in Appendix X.

II. Contractual and Program Management Policy

6.0 Contractual Policy

6.01 ODP contractual relationships

The National Science Foundation (NSF) has awarded an Ocean Drilling Program (ODP) prime contract to Joint Oceanographic Institutions (JOI). The major subcontracts that JOI has let under this prime contract are for the services of a science operator, a down-hole logging group, the site-survey data bank, and the JOIDES Planning Office. JOI's subcontractors may in turn have subcontractors, which are called lower-tier subcontractors. Subcontractors and lower-tier subcontracts are consistent with the terms and conditions of the prime contract.

6.02 JOI's Contracts Department

The primary objective of contracts administration personnel is to facilitate the achievement of ODP objectives within the framework of federal contracts rules and principles. If a program objective cannot be reached through the desired means, contracts personnel will advise on alternative methods of reaching the desired objective. Contracts personnel will counsel against taking any actions that are contrary to federal law, contract provisions, and/or in-house policy.

JOI's Contracts Department is responsible for managing the contractual issues related to ODP and for assuring that its subcontractors comply with their subcontract terms and conditions and applicable federal regulations in the following areas:

- Competition and acquisition planning
- NSF reporting requirements
- Support of federal socioeconomic programs
- General contracting requirements
- Federal contract flow-down provisions

JOI's specific contracting practices and procedures can be found in JOI's Administrative Policy Manual (see Appendix W). JOI has subcontractors' specific policies and procedures on file.

7.0 Program Planning

7.01 JOI-Prime Contractor

The work under the Prime Contract shall be carried out in accordance with an annual "Program Plan" developed by Joint Oceanographic Institutions, Inc. in consultation with the Program Officer at the NSF and approved in writing by the NSF Contracting Officer. Each Program Plan shall be prepared and submitted in accordance with schedules, funding levels, guidelines and formats approved by NSF. The Plan shall cover the upcoming U.S. federal fiscal year and shall address, but not be limited to:

- Programmatic goals
- Scheduled activities
- Scheduled ship operations, staffing, and organizational plans
- Budgets
- Scientific objectives defined by JOIDES
- Major planning and review activities

7.02 Preparation of the Program Plan

The Annual Program Plan is prepared one year in advance. The general timeline and milestones for developing the plan are as follows:

June	EXCOM advice to SCICOM
August	SCICOM prepares Science Plan
December	Draft budgets prepared by JOI and subcontractors
January	NSF provides budget target to JOI
	SCICOM Science Plan to JOI and subcontractors
	Final budget target from JOI to subcontractors
Jan./Feb.	If fiscal concerns arise, Budget Committee meets; else, EXCOM approves Program Plan
March	Draft Program Plans to JOI from subcontractors
March	Draft budget and Plan briefing to SCICOM
April	Draft plan to NSF for administrative review
May	NSF response to JOI. Forward to subcontractors
May	JOI and subcontractors prepare responses
July	JOI sends NSF final Program Plan
August	NSF approves Program Plan, executes option
October 1	Start of contract year

7.03 Program Plan development

Each subcontractor under the Prime Contract shall develop an annual Program Plan in consultation with such representatives from JOI as may be designated by the JOI ODP Director.

7.04 Major cost items

All equipment, systems, materials or procured services costing $100,000 or more shall be specified in the Program Plan. This means any single item or group of similar items (e.g., "supplies") costing $100,000 or more shall either be shown as a line item in the Program Plan budget or described in the narrative section of the budget.

7.05 Subcontractor Program Plan approval

Each Subcontractor's Program Plan shall be subject to the approval of the JOI ODP Director and shall have been prepared in accordance with schedules, funding levels, guidelines and formats approved by JOI. The Plan shall delineate specific supplies/services to be provided in accordance with the terms and conditions of the basic subcontract.

7.06 Changes altering total budget

JOI shall request approval from NSF (and subcontractors shall request approval from JOI) **for any changes** that could increase the **total approved operating budget for the year** in question. Any request from JOI to NSF (and likewise from the subcontractors to JOI) for an increase in budget shall be accompanied by an explanation of the need and supporting information that indicates that the cost cannot be absorbed within the existing approved budget without a notable change in the approved objectives or activities. Request for increases should be a last resort and should always be preceded by mutual discussions and negotiation between the responsible parties.

7.07 Changes in objectives

Proposed changes in research objectives or activities which have a significant effect on:

- Long-range plans or goals
- Services
- Work performance
- Tasks described in the Program Plan

must be approved by NSF **prior to implementation**. The impacts and reasons for the proposed changes must be explained. The changes may require modification to the approved budget.

7.08 Program Plan revisions

JOI shall provide NSF with **copies of all revisions to the Program Plan**. All changes **shall be reported periodically in the Quarterly Report** in a separate section specifically dedicated to Program Plan changes.

7.09 Budgetary restrictions

Redistributions in the approved operating budget. Large-scale revisions to the approved operating budget may indicate that the Program Plan's stated research objectives are being altered. The following thresholds have been established in the contract for determining whether a Program Plan Change is necessary:

7.09.1 Redistribution between JOI's subcontracts.

A change in the approved operating budget of $100,000 in any of the contractor's subcontracts (i.e., Science Operations, Logging Services, Site Survey Data Bank, JOIDES Office, and so on).

7.09.2 Redistribution between Program Plan tasks

A change of $300,000 (or 25% - whichever is smaller) in the approved operating budgets for Program Plan tasks of concern are defined as:

JOI TASKS:

- Headquarters
- JOIDES Advisory Services
- ODP Site Survey Data Bank

TAMRF Tasks:

- Science Services
- Drilling Services
- Information Services
- Publication Services
- Administrative Services
- Ship Operations

LDEO Tasks:

- Logging Services (LDEO and non-U.S. subcontractors)
- Logging Operations

7.09.3 Redistribution between subtasks

JOI will approve revisions to the operating budgets of subtasks as specified in the JOI subcontract with TAMRF and LDEO.

7.10 Program Plan changes

Requests for section 7 prior approvals are made through Program Plan Changes. Program Plan Change requests must contain the following information:

- Program Plan Change number (e.g., fiscal year 02-J1; 02-T1 from TAMRF to JOI, etc.)
- Date of request
- Brief descriptive title
- Description of and justification for the change
- Budget effect of the change

This last information category should include details regarding the subtasks that are affected by budget transfers, if any, and the amount of the increase or decrease in each subtask. This itemization applies only if the transfers amount to the lesser of $50,000 or 10% of the affected subtask.

7.11 Program Plan change authorization

Subcontractor requests for Program Plan changes are sent to JOI's Director of Contracts with copies to JOI's ODP Program and Finance Directors. Program Plan change requests from JOI to NSF require the concurrence of the JOI ODP Program Director (or designee), and the Director of Finance. NSF approvals to JOI are transmitted via contract modifications signed by an NSF Contracting Officer. JOI approvals to subcontractors are also effected by modifications signed by JOI's Director of Contracts.

8.0 Program Evaluation

All references to clauses in this section refer to "flow down" clauses found in the NSF/JOI, JOI/TAMRF, and JOI/LDEO contracts.

8.01 Inspection, audit, and use of consultative services

Program evaluation will be conducted using several of the provisions set forth in the Prime Contract and Subcontracts. NSF and JOI or their authorized representatives, at any reasonable time, have the right to inspect, audit or use third party consultative services to evaluate financial, contractual, and technical performance. Some of those provisions are as follows:

- Government Inspection Clauses
- NSF Liaison/Monitoring Clause
- Audit Clause
- Examination of Records by Comptroller General

8.02 Subcontractor/JOI/NSF liaison

The **subcontractors shall confer with JOI, who shall confer with NSF** as requested. JOI shall notify NSF of all major meetings, and NSF shall have the right to have representatives present at such meetings which the Subcontractor or JOI holds for the following purposes:

- Reviewing costs or progress
- Formulating plans or policies,
- Determining direction of effort
- Any other purposes that may have an effect upon the performance of the work (except those in which JOI has entered into negotiations with the Subcontractor)

8.03 Program review procedure

JOI shall establish and implement a **program review procedure** consisting of a panel of experts [Performance Evaluation Committee (PEC)] who will perform a detailed review and report on the management and performance of the ODP. This review shall be conducted every two years (or as requested), and began in FY85. The results and report(s) shall be presented to NSF. Implementation of the recommendation(s) of these reviews shall be developed in consultation with NSF.

8.04 Program evaluation schedule

The **Performance Evaluation Committee (PEC)** shall be appointed by the JOI President on the advice of JOIDES, NSF, and other experts in geology and geophysics and drilling and logging technology. The evaluation schedule follows:

April-June	Call for nominations to PEC
July-Sept	JOI President selects the PEC in consultation with NSF, EXCOM, SCICOM, and others as appropriate. An Executive Secretary is named.

Oct-Dec	PEC meets and familiarizes itself with the program
Jan-April	PEC schedule of visits planned
April-Sept	Site visits and evaluation carried out
Sept-Oct	Evaluation report prepared and submitted to JOI President
Nov-Dec	JOI receives formal responses from the subcontractors; prepares final report and action plan
Jan	Performance Evaluation Report is presented to EXCOM and then NSF

8.05 *Ad hoc* review panels

Ad hoc review panels shall be set up as recommended by the JOIDES Executive or Planning Committee and agreed upon by JOI. These panels will review specific areas within the Program rather than conduct an overall review that is carried out biannually (contractually required) by the Performance Evaluation Committee. Panel membership shall be appointed by the President of JOI and will report to JOI. JOI will then distribute copies to all parties involved in the review.

8.06 Cruise evaluation forms

The ODP is committed to providing scientists with state-of-the-art equipment and laboratory facilities and a pleasant living environment aboard the *JOIDES Resolution*. To achieve these goals, ODP requests input from shipboard participants as to their general impressions of the facilities and ship operations. ODP asks shipboard scientists to complete the **Cruise Evaluation Form**, and welcomes any additional comments and suggestions. The form is completed electronically onboard, and is returned to TAMU/TAMRF through the Janus database. Confidential comments are made available only to the Deputy Director at TAMU. This person determines who may have a need to know these comments, and what action, if any, may be required. To ensure distribution of feedback, TAMU/TAMRF will also make available the cruise evaluations to the JOI ODP Director and will share useful information with the appropriate JOIDES panels (e.g., SCIMP).

8.07 Co-Chief Scientist Review

An annual **Co-Chief Scientists' Review,** organized by JOI in consultation with its subcontractors, is designed to facilitate an appraisal of operations on the *JOIDES Resolution* as well as the entire program from a participant's standpoint. All recommendations made by review participants are presented to JOI and its subcontractors for response. JOI and its subcontractors will respond in writing to all recommendations. The response will then be distributed to all review participants.

9.0 Memoranda of Understanding & other international agreements

9.01 Participation by countries/consortia other than the U.S.

Participation shall be established by means of a Memorandum of Understanding (MOU) between the U.S. National Science Foundation and the individual country and/or consortium. Membership is negotiated individually with rights, privileges, and financial commitments defined in the MOU. An example MOU is presented in Appendix B.

9.02 Endorsement of a period of program operation

Each member of the Ocean Drilling Program shall endorse an established period of program operation and is ensured of involvement in all scientific activities that take place during the agreed upon period.

9.03 Membership in JOIDES

Each member understands that the scientific planning and direction of the Ocean Drilling Program shall be the responsibility of JOIDES, which will approve the annual program plans and budgets prepared by the contractors, prior to their adoption by NSF.

In 1998 EXCOM modified the ODP membership policy as per Motions 98-2-7 and 98-2-8:

> Although a policy of full and equal participation remains a goal of ODP, the JOIDES Executive committee has identified degrees of participation in the JOIDES Advisory Structure at reduced membership levels. Membership levels will consist of **Full Members** and three levels of **Associate Members**. Each level has defined degrees of participation in the JOIDES Advisory Structure. Countries and consortia at all levels have the right to observer status on all JOIDES panels and committees, and can participate in their discussions at the discretion of the Chair.
>
> Only Full Members of ODP (whether individual countries or consortia) have voting rights in the policy- and scientific-decision making for ODP (i.e., on the Executive Committee (EXCOM) and the Science Committee (SCICOM)). All other levels of membership do not include representation on EXCOM and SCICOM.
>
> For the purposes of defining the Associate Member levels, the standing Panels and Committees within the JOIDES Advisory Structure are divided into three groups:
>
> - Group I (highest level of advice on ODP science and policy) EXCOM and SCICOM
> - Group II (scientific advice) and Environment and Interior Science Steering and Evaluation Panels (ESSEP and ISSEP, respectively)
> - Group III (technical and operational advice) Scientific Measurements Panel, Site Survey Panel, Technical Development Panel, and Pollution Prevention and Safety Panel (SCIMP, SSP, TEDCOM, and PPSP, respectively)
>
> Privileges of Different Membership Levels
>
> 1. Shipboard participation will be directly proportional to the contribution.

2. Participation in the JOIDES Advisory Structure:

Level	Contribution	Privileges
Full	Full	One member on all Panels of Groups I, II & III
3	2/3	One member on all Panels of Groups II & III
2	1/2	One member on one panel from Group II; One member on two panels from Group III
1	1/6	One member on one panel from Group II; One member on one panel from Group III

If a member reduces their contribution below their required membership payment level, they will submit a brief report to the chair of EXCOM explaining how they are working towards attaining that membership level. The report will be submitted by 1 March of each year, with the particulars verified by the JOIDES Office, and the member's status reviewed by EXCOM at the next meeting after 1 March.

9.04 Membership in ODPC

Each member country will be a **member of the Ocean Drilling Program Council** regardless of whether it is participating as an individual full or associate member or as a member of a consortium. Members of the Council and their alternates will be designated by the participating countries. There will be one representative of each participating country, except that additional representation from the U.S. may be appropriate. NSF representative will serve as permanent Chair of the Council.

The annual meeting shall include:
- A financial report and discussion
- An audit report
- A review of scientific and technical achievements for the past year
- Draft program plans and budgets for the coming year
- Other topics of mutual interest

9.05 Each member country shall have the right:

- To make proposals to JOIDES of scientific projects or objectives of special interest to the scientific community of the member country

- To participate in the analysis, and have access to the data, of geophysical and other site surveys performed in support of the program.

9.06 Granting of visas, etc.

NSF will facilitate, to the extent feasible, through collaboration with the appropriate authorities, the **granting of visas and other forms of official permission** for entry to and exit from the U.S. of personnel, equipment, and supplies when required for participation or use in the ODP.

9.07 Financial support

Each member country will **financially support the ODP** to the extent negotiated with each individual country's MOU. The financial contributions of all participants will be commingled to support the total program costs. NSF determines “Program costs,” which are incurred by contractors in performing functions for joint planning and operations of the ODP, and for program direction and management costs incurred by NSF that relate to international participation.

9.08 Salaries and travel expenses

Salaries and travel expenses for participants representing the member countries will be borne by the member country. Costs of accommodations for the member country scientists and members of technical parties aboard the drill ship are program costs and will be funded by the ODP.

9.09 Meetings

Meetings of NSF and representatives of the member countries may be held at any time upon the request of either party to discuss the terms and conditions of the MOU and other matters of mutual interest.

9.10 Obligations

Obligations arising from the MOUs may be terminated by either party giving the other party written notice at least twelve months in advance.

9.11 International purchasing policy

ODP Subcontractors, in the performance of the work set forth in their subcontract, shall enable participating country businesses to compete for subcontracts exceeding $25,000. Partner countries receive an advance notification for items/services that will be competed. The advance notification provides a description to allow the participating partners an opportunity to locate vendors in their country who may be interested in receiving a request for quotes/proposals (RFQ/RFP) when issued. When competition is not practicable (i.e., short lead-times) the decision not to pursue competition from participating countries will be approved by the Vice President, Admin., TAMRF.

9.12 International personnel hiring policy

JOI and its ODP subcontractors shall notify partner country representatives of all non-administrative employment opportunities in the ODP. Following notification, these entities will allow 45 calendar days for individuals to apply. In the event where a position must be filled within 30 days (e.g., shipboard personnel needed just prior to a leg), the position will not be announced to the partner countries. The position of the JOI ODP Director will be advertised internationally.

10.0 Patents

10.01 Retaining the right, title, and interest

The Subcontractors/Contractor may retain the entire **right, title, and interest** throughout the world to each subject invention subject to the provisions of the *Patent Rights Clause* and "35 USC 203." With respect to any subject invention in which the subcontractor retains title, the Federal Government shall have a non-exclusive, non-transferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world. If the award indicates it is subject to an identified international agreement or treaty, the Foundation also has the right to direct the Contractor to convey to any foreign participant such patent rights to subject inventions as are required to comply with that agreement or treaty. Any action taken involving patents in the Ocean Drilling Program must follow the conditions and regulations listed in the *Patents Rights Clause* found in the ODP Prime Contract and Subcontracts.

10.02 Disclosure of subject invention to JOI/NSF

The Subcontractors **will disclose each Subject Invention to National Science Foundation** within two months after the inventor discloses it in writing to Subcontractor/Contractor personnel responsible for the administration of patent matters. The disclosure shall be in the form of a written report and shall identify the Subcontract under which the invention was made and the inventor(s). (*Patent Rights Clause*).

10.03 Notice or claim of patent copyright infringement

The Subcontractor shall promptly notify JOI, and in turn NSF, of each **notice or claim of patent copyright infringement.** (*Notice and Assistance Regarding Patent and Copyright Infringement)*

10.04 Claim or suit against JOI and/or the government

In the event of any claim or suit against JOI and/or the government on account of any alleged patent or copyright infringement arising out of the performance of this subcontract or out of the use of any supplies furnished or work or services performed under the subcontract, the Subcontractor shall furnish to JOI and/or the Government, as requested by the Contract Executive, all evidence and information in possession of the Subcontractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government. (*Notice and Assistance Regarding Patent and Copyright Infringement Clause*)

10.05 Member countries' rights

Member countries should be afforded the minimum rights in data and patented inventions as set forth in their MOUs on file at NSF.

11.0 Conflict of Interest

General Ocean Drilling Program

Prime Contractor and subcontractor employees shall comply with their institutions' Standard of Conduct policies.

11.01 ODP employee or contractor changing employment to another ODP institution

Any NSF, JOI, TAMRF/TAMU, LDEO, or JOIDES **ODP employee or contractor changing employment from one ODP institution to another** will refrain from any involvement in contract negotiation between the two respective institutions for one year. [EXCOM Motion 95-2-13]

11.02 ODP employees as shipboard scientific party members

ODP employees (i.e., those paid directly or indirectly from commingled funds) may serve as part of the shipboard scientific party only at the invitation of the Director of Science Operations, TAMU, with the agreement of the Co-Chief Scientists, and with the approval of the appropriate national program director. [EXCOM Motion 95-2-13]

11.03 No additional salary compensation

When participating in the ODP as part of the shipboard scientific party, **a full-time ODP employee will not receive additional salary compensation**. A full-time ODP employee, working as part of the shipboard scientific party on activities unrelated to his/her terms of employment in the ODP, will be required to take leave without pay. [EXCOM Motion 96-1-4]

11.04 Panel/committee member with interests

If any JOIDES panel or committee member has any actual, perceived or prospective financial interests, affiliations, or relationships (including being a proposal or site survey proponent or Co-Chief Scientist) that might affect his/her review of, or decisions relating to any ODP drilling proposal, the member is required to declare his or her interests to the panel chair. The member will then refrain from any discussions relating in any way to the proposal. Further, the member will abstain from any vote relating in any way to the proposal. In the specific case of proposal proponents, they should not be present during that part of any JOIDES panel meeting when their proposals are being reviewed, ranked, or when any discussion that impacts on reviews or ranking takes place. This includes discussion of the following year's Program Plan and the indicative track of the drill ship. [EXCOM Motion 95-2-13]

11.05 Nomination of any member of a JOIDES panel as a Co-Chief

SCICOM shall not nominate any member of any JOIDES panel for appointment as Co-Chief Scientist to the Director of Science Operations, TAMU, unless that member is a proponent on the relevant proposal or site survey. [EXCOM Motion 95-2-13]

Joint Oceanographic Institutions Board of Governors

11.06 Conflict of Interest Statement for all JOI Programs

This statement requires Governors to absent themselves from deliberations and votes of the Board involving institutions and individuals in which he or she has an interest, prohibits Governors from preparing proposals to JOI or serving as PI on contracts or grants from JOI, prohibits Governors from receiving compensation from an award from JOI, prohibits PIs on contracts or grants from JOI from serving as Governor or alternate for a Governor, and follows the same guidelines as above for preparation and response to RFPs.

The statement does not prohibit Governors from participating in general discussions about issues, but only from those deliberations that will lead directly to a vote or decision about awards to institutions. In order to provide the fullest participation of Governors in the discussions, the term "general discussion" is to be broadly interpreted, while the term "deliberation" is to be interpreted narrowly.

Further details on the guidelines concerning conflict of interest for JOI Governors are provided in Appendix W.

11.07 Abstention from JOI Board of Governors deliberations and votes

11.07.1 Institutional relations

A member of the Board of Governors must excuse himself or herself from deliberations and votes of the Board or any of its committees on any action that would to his or her knowledge affect the direct interests of an institution with which the Governor, his or her spouse, a minor child, a blood relative who lives with such Governor, or anyone who is legally a partner of such Governor, has any of the following affiliations:

1. Current employment
2. Any formal or informal arrangement for future employment
3. Current appointment as professor, adjunct professor, visiting professor, or the like (as opposed to employment)
4. Ownership of the institution's stocks, bonds, notes or other evidence of debt (other than through mutual funds) in which the financial interest exceeds $10,000 in market value, which also represents more than 10% of the current holdings of the Governor or his or her spouse, minor child, or blood relative
5. Governing Board membership
6. Chairmanship or membership of any committee of the institution that has an interest in the Board's action. Note: Individual waivers of this paragraph may be issued for membership but not chairmanship in appropriate circumstances by the Chair of the JOI Board of Governors
7. Any other office (not including ordinary membership in a professional society or association)
8. Any other affiliation with the institution that would be reasonably expected to affect significantly the objectivity of the Governor with respect to such institution

11.07.2 Individual relations

A member of the Board of Governors must excuse himself or herself from deliberations and votes of the Board or any of its committees on any action that would to his or her knowledge affect the direct interests of an individual with which the Governor, his or her spouse, a minor child, a blood relative who lives with such Governor, or anyone who is legally a partner of such governor, has a blood or marriage relationship.

11.08 Participation in proposals, projects, and compensation

General: No member of the Board of Governors may prepare a proposal for submission to JOI or be a principal investigator on such proposals to JOI or on any subsequent award from JOI resulting from such proposal.

Compensation and reimbursement of expenses: No JOI Governor may be a direct beneficiary of an award made by JOI while such Governor is a member of the Board. A Board member may not serve as a principal investigator on a contract or grant from JOI. Conversely, no person who is a principal investigator on a contract or grant from JOI can serve on the Board or as an alternate for a regular member of the Board. Board members may receive reimbursement of expenses incurred in carrying out approved business of the Board.

11.09 Participation in preparation of RFPs and evaluation of proposals

The following procedures will be observed in all JOI procurements. The guiding principles are to eliminate participation by a prospective respondent to a Request for Proposal (RFP), in the RFP preparation and evaluation process, and to assure the widest possible distribution of all pertinent information as soon as it is generated.

11.09.1 Scientist eligibility
If a scientist was directly involved in the final preparation of an RFP, then he or she may not be a Principal Investigator or participant in a proposal to be considered under that RFP

11.09.2 Scientist participation
If the institution of a scientist has submitted a proposal for a procurement, then that scientist will not be permitted to participate in the review or evaluation of that proposal.

III. Amendments and Appendices

Amendments

Appendices

Appendix A: Contact Information for ODP Entities

Appendix B: Guide to the Ocean Drilling Program

Appendix C: Co-Chief Selection Process

Appendix D: Sample Distribution, Data Distribution, and Publications Policy

Appendix E: ODP/TAMU's Website Privacy Policy

Appendix F: ODP's Ship/Shore Communication Policy

Appendix G: Shipboard Sexual Harassment Reporting Procedures

Appendix H: Shipboard Drug and Alcohol Policy

Appendix I: ODP's Guidelines for Site Survey and Safety

Appendix J: ODP's Environmental Impact Statement

(paper copy only; on file at NSF, TAMU, and JOI)

Appendix K: ODP's H2S Drilling Contingency Plan

Appendix L: Organic Geochemistry Technical Note

Appendix M: Introduction to ODP Safety Management Practices

Appendix N: ODP Crisis Management Plan

Appendix O: Laboratory Safety and Hazard Communication Compliance Policy

for the JR

Appendix P: Laboratory Safety and Hazard Communication Compliance Policy for Shore

Appendix Q: Co-Chief Scientist Agreement

Appendix R: Scientific Party Member Agreement

Appendix S: Shipboard Scientist's Handbook

SCIENCE OPERATOR'S EXCOM REPORT

Review of Activities
July 2002 through May 2003

Introduction

The last 12 months of operations for the JR have been very successful (Legs 202-208) with the scientific objectives of each leg having been achieved. Each one of these legs were associated with significant operational challenges: some required complex installations requiring casing (Legs 203 and 206) and the placement of geochemical tools (Leg 205), others required demanding coring strategies (Legs 202, 207 and 208), and one required the deployment of a diverse suite of downhole tools (Leg 204). Even in the face of the uncertainties associated with the ending of ODP drilling operations in September 2003, we have maintained an engaged and dedicated staff that have provided excellent operational support during these legs.

In an effort to codify relevant information and to streamline the summary of the Science Operator's activities during the last 12 months of operations, as much information as possible is presented in tabular form. These data are presented by functional department.

Science Services

Summary of Scheduling the *JOIDES Resolution*: April, 2002 – September, 2003

	Leg	Port (Origin)	Dates ¤	Total Days (port†/sea)	Days at Sea (transit/on site)	TAMU Contact	LDEO Contact
202	SE Paleoceanography	Valparaiso	1 April – 1 June '02	61 (5/56)	20/36	P. Blum	U. Ninnemann
203	Eq. Pac. ION	Balboa	1 June – 8 July '02	37 (5/32)	16/16	T. Davies	A. Buysch
204	Gas Hydrates	Victoria	8 July– 6 September '02	60 (5/55)	7/48	F. Rack	D. Goldberg, S. Barr
205	Costa Rica	Victoria	6 September – 6 November '02	61 (5/56)	11/45	A. Klaus	K.T. Moe
206	Fast Spreading Crust	Balboa	6 November – 5 January '03	60 (5/55)	6/49	G. Acton	F. Einaudi
	Transit	Balboa	5 January – 13 January '03	8 (2/6)	6/0	N/A	N/A
207	Demerara Rise	Barbados	13 January – 6 March '03	54 (3/51)	13/38	M. Malone	B. Rea
208	Walvis Ridge	Rio de Janeiro	6 March – 7 May '03	62 (5/57)	18/39	P. Blum	P. Gaillot

209	MAR Peridotite	Rio de Janeiro	7 May – 8 July '03	62 (5/57)	17/40	J. Miller	G. Iturrino
210	Newfoundland Margin	Bermuda	8 July – 7 September '03	61 (5/56)	6/50	A. Klaus	H. Delius
	Transit	St. John's	7 September – 21 September '03	14 (3/11)	11/0	J. Baldauf	M. Reagan
	Demobilization‡	Galveston	21 September – 30 September '03	9 (9/0)	0/0	J. Baldauf	M. Reagan

Notes:
¤ Start date reflects the first full day in port. This is the date of the ODP and ODL crossover meetings. The JR is expected to arrive late the preceeding day. Port call dates have been included in the dates which are listed.
† Although 5 day port calls are generally scheduled, the ship sails when ready.
‡ Demobilization assumes a seven day (+2 day port call) period tentatively scheduled for Galveston.

10 February 2003

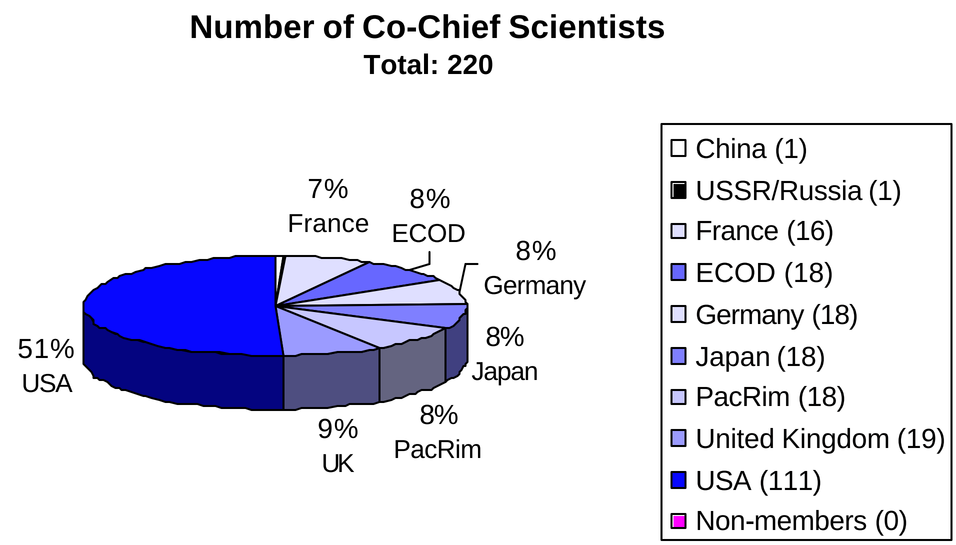
Summary of Co-Chief Scientists for Science Operations

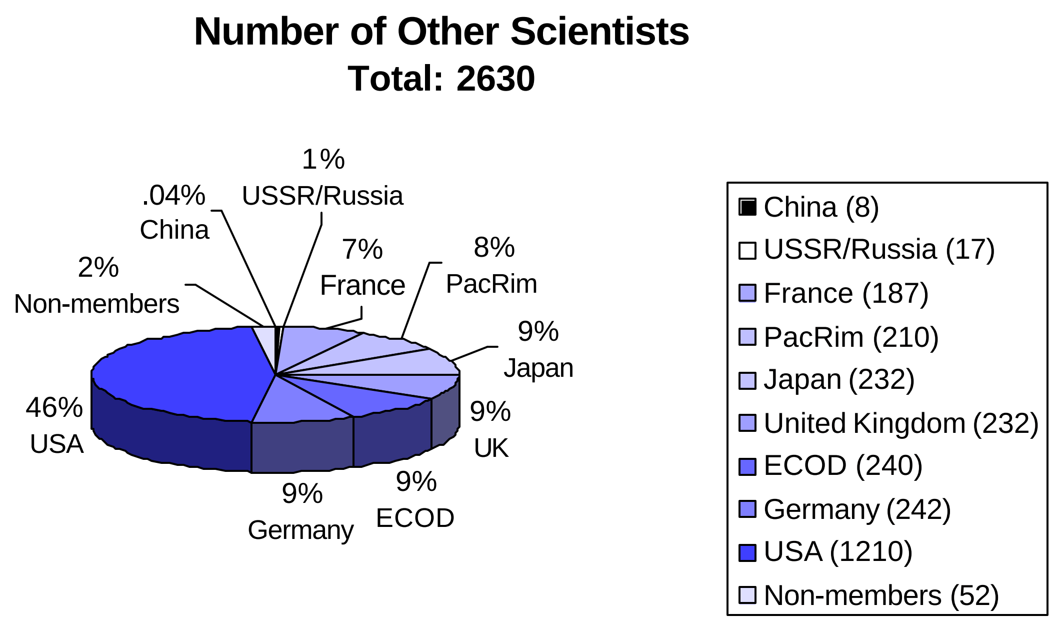
Co-Chief Scientists for Legs 202-210:

	Leg	**Co-Chief Scientists**
202	SE Paleoceanography	A. Mix Oregon State University R. Tiedemann GEOMAR, Research Center for Marine Geosciences
203	Eq. Pac. Ion	J. Orcutt University of California, San Diego A. Schultz Cardiff University
204	Gas Hydrates	G. Bohrmann GEOMAR Forschungszentrum fur Marine Geowissenschften der Christian-Albrechts-Universitat zu A. Trehu Oregon State University
205	Costa Rica	J. Morris Washington University H. Villinger Universität Bremen
206	Fast Spreading Crust	D. Teagle University of Southampton D. Wilson University of California, Santa Barbara
207	Demerara Rise	J. Erbacher Bundesanstalt fur Geowissenschaften und Rohstoffe D.C. Mosher Geological Survey of Canada – Atlantic
208	Walvis Ridge	D. Kroon Vrije Universiteit J. Zachos University of California, Santa Cruz
209	MAR Peridotite	P. Kelemen Woods Hole Oceanographic Institution E. Kikawa Japan Marine Science & Technology Center (JAMSTEC)
210	Newfoundland Margin	J.-C. Sibuet IFREMER

		B. Tucholke Woods Hole Oceanographic Institution

Shipboard Participant Tally:
Following is a compilation of Co-Chief and other scientists for Legs 101 through 210.





Status of Projects

HazMat Building:
The objective of this project was to create safe and refrigerated storage space for gas hydrate samples recovered on ODP Leg 204 and kept in pressurized containers.

An appropriate temporary storage building has been installed near the loading dock at the back of the ODP Gulf Coast Repository for this purpose. Since gas hydrate dissociates at normal temperatures, the building was insulated and refrigerated to maintain an internal temperature of ~40 degrees F, at which temperature the samples remain stable. The building was purchased and installed during September and became operational on September 20.

The storage facility was completed with the installation of a second, back-up refrigeration unit and hook-up to the emergency power generator. We had significant problems with the reliability of the second unit - it failed over a weekend while being tested as the primary cooling system. All large pressure vessels had been removed previously to allow workers to install the second inside cooling fan, but the HYACE pressure vessel had been left inside and it experienced warming up to ~80 degrees F. The consequences of this were that we kept all vessels out of the building until both A/C units were tested at length, and until the Hawkeye surveillance system, which is monitored 24/7 by campus security, had been installed. In addition, a protocol was established for regular monitoring by staff and for improved communications to avoid another mishap. We now have two operational refrigeration units, either of which can serve as the primary or backup cooling system. We also have temperature and methane sensors connected to the Hawkeye surveillance system, which is monitored 24/7 by campus security, and the effectiveness of this system has been tested and proven. Should a temperature alarm go off, campus security has a contact list of repository staff to be called immediately.

A more sophisticated control system, which will smooth out the fluctuations in the internal temperature of the building has been ordered and will be installed. Until a more permanent storage facility for gas hydrates is established, we now have a reliable and safe storage capability considering the present circumstances.

Drilling Services

Summary of Leg Operations: Legs 202-208

	Leg 202 **SE Pac. Paleo** **29 Mar. – 30 May ‘02** **Valpariso - Balboa**	**Leg 203** **Eq. Pac. ION** **30 May – 6 July ‘02** **Balboa - Victoria**	**Leg 204** **Gas Hydrates** **6 July – 2 Sept. '02** **Victoria - Victoria**	**Leg 205** **Costa Rica** **2 Sept. – 6 Nov. ‘02** **Victoria - Balboa**
Transit/Onsite (day)	18.7 / 37.7	18.6 / 14.5	2.5 / 50.4	16.3 / 43.4
Sites	11	1	9	3
Holes	38	2	45	4

Water Depth (m)	4089 - 499	3882 - 3868	1228 - 789	4387 - 4187
Deepest Penetr. (m)	515	223	540	600
Cored Interval (m)	7080	93	3675	405
Tot. Recov. (m,%)	7081 (100%)	28 (30%)	3068 (84%)	281 (69%)
APC Recov. (m,%)	5669 (103%)	0	1861 (88%)	0
XCB Recov. (m,%)	1411 (90%)	0	1125 (81%)	0
RCB Recov. (m,%)	0	28 (30%)	18 (28%) RCB 14 (31%) LWC RAB-C	281 (69%)
PCS Recov m,%)	0	0	38 (98%)	0
Hy.RC Recov (m,%)	0	0	3 (37%)	0
Fugro PC Rec (m,%)	0	0	8 (80%)	0

	Leg 206 **Fast Spreading Crust** **6 Nov. '02 – 4 Jan. '03** **Balboa - Balboa**	**Transit** **4 Jan. – 11 Jan. '03** **Balboa - Barbados**	**Leg 207** **Demerara Rise** **11 Jan. – 6 Mar.'03** **Barbados – Rio de Janeiro**	**Leg 208** **Walvis Ridge** **6 Mar. – 6 May '03** **Rio de Janeiro – Rio de Janiero**
Transit/Onsite (day)	6.3 / 46.5	7.5/0	17.0 / 34.8	20.8 / 32.3
Sites	1		5	6
Holes	4		13	17
Water Depth (m)	3645 -3645		3203 - 1911	4770 - 2512
Deepest Penetr. (m)	752		669	345
Cored Interval (m)	850		4167	3701
Tot. Recov. (m,%)	515 (61%)		3122 (75%)	3591 (97%)
APC Recov. (m,%)	166 (102%)		42 (104%)	3113 (100%)
XCB Recov. (m,%)	60 (66%)		174 (71%)	478 (83%)
RCB Recov. (m,%)	289 (56%)		2906 (75%)	0
PCS Recov m,%)	0		0	0
Hy.RC Recov (m,%)	0		0	0
Fugro PC Rec (m,%)	0		0	0

Review of Operations

Leg 202 (SE Pacific Paleo):

- The objective was to assess climate and oceanographic changes and to investigate the role of those changes in biogeochemical systems in the SE Pacific.
- There were 7080 m of sediment cored with 100% recovery.
- Three APC piston cored holes exceeded 300 m, and the APC was pushed to its limit as 99 stuck core barrels were drilled over.
- Drill sites were situated in the territorial waters of Chile, Peru, Ecuador, and Costa Rica, with observers from the first three.

Leg 203 (Eq. Pacific ION):

- The objective was to establish a cased reentry hole for a geophysical observatory.
- The drill site was located in 10- to 12- Ma lithosphere at a water depth of 3882 m. After a reentry cone was set, the hole was drilled to a total depth of 224 m, which included 121 m of sediment and 103 m of basement penetration. Casing was inserted to 212 m below seafloor and the casing was cemented in place, with the top of the cement at a depth of 199 m below seafloor. Subsequent logging showed that the casing was well bonded to basement in the lower 40 m and that the deviation of the hole never exceeded 1 degree from vertical.
- Hole 1243B was cored and logged to 195 m (85 m into basement), and a free fall funnel was set for future reentry.
- RCB recovery was 25% in basement.

Leg 204 (Gas Hydrates, Cascadia Margin):

- The primary objective was to drill a transect of sites through the gas hydrate stability zone on the southern part of Hydrate Ridge on the Cascadia accretionary margin offshore Oregon.
- The first hole was APC/XCB cored to 350 m for safety.
- 8 of 9 sites were logged with LWD tools to identify rapid changes in physical properties before coring (788-1228 m water depth). The LWD tools were returned at a mid-leg port call.
- 45 holes at 9 sites were double APC/XCB cored through hydrate with 3068 m recovery (83.5%).
- During the leg, funds were obtained to purchase 40 core pressure vessels, six N2 dewars and a hydrate storage container. The pressure vessel and dewars were sent to the ship, and the container was sent to ODP/TAMU.
- 50 m of hydrate core were preserved in pressure vessels.
- 35 m of hydrate core were preserved in liquid nitrogen.
- 42 personnel were transferred by 7 helicopters and 2 boats to maximize the range of operational activities.
- Successful special tools runs included:

DVTP (8 of 8 runs - 100%)	DVTPP (16 of 16 runs - 100%)
APCT (61 of 61 runs - 100%)	APCM (107 of 110 runs – 97%)
PCS (30 of 39 runs – 77%)	HRC (4 of 8 runs – 50%)
Fugro PC (2 of 10 runs – 20%)	Fugro Piezoprobe (1 of 2 – 50%)
LDEO DSA (17 of 28 runs – 61%)	RAB-C (8 of 8 runs – 100%)

Leg 205 (Costa Rica):

- The objective was to install four reentry sites with osmosamplers to determine the character of fluid flow in the upper seismogenic zone.
- Installed three reentry cones with 16-in casing, RCB cored each hole, set and cemented 10-3/4 in casing, and cleaned out the holes to total depth (600, 231, and 380 mbsf).
- Ran osmoscreen with packer on 4-1/2 in tubing and deployed osmosamplers by wireline in Holes 1253A and 1255A.
- Successful installation of CORKS and osmosamplers proved by Alvin dive after leg.

Leg 206 (Fast Spreading Crust):

- The long-term objective of this multileg endeavor is to recover an upper crustal section in gabbros created 15 million years ago at superfast spreading ridge in the East Pacific. The goal of the first leg was to establish a cased hole in the extrusive portion of the oceanic crust; thereby, properly engineering the hole for deep crustal penetration.
- APC/XCB cored 254 m sediment (89% recovery) in two holes.
- Drilled and RCB cored two holes to 120 and 476 mbsf (22% recovery in sediment and 50% recovery in basement).
- Set reentry cone with 20-in casing, set 269 m 16-in casing (19 m into basement), RCB cored through basalt to 752 mbsf (502 m into basement), and logged and ran VSP survey.
- Two 18-1/4 in x 21-1/2 in bi-center hard rock reamers with 9-7/8 in pilot bits were used for the first time to open a 9-7/8 in RCB core hole 26 m into basement. The bi-center reamers have a fixed roller cone that wobbles eccentrically to enlarge the diameter of the hole in hard rock to run casing (as opposed to hydraulic arms used in conventional underreamers in sediments).

Leg 207 (Demerara Rise):

- The objective was to core a transect across Demerara Rise on the Surinam margin to study the history of multiple Cretaceous ocean anoxic events in an equatorial setting and thereby test competing hypothesis for their causes and climatological effects.
- Leg 207 was originally planned as a triple APC/XCB coring leg; however, in the first hole the APC overpull safety limit was reached at 40.6 mbsf. The XCB had good recovery (71.1%), but cores were severely biscuited with a slow rate of penetration of 12.2 m/hr. A decision was made to switch to the RCB coring system, which recovered 2906 m of core with 74.9% recovery with an average rate of penetration of 32.5 m/hr.

Leg 208 (Walvis Ridge):

- The objective was to core fully intact sequences spanning both the Paleocene/Eocene, Eocene/Oligocene, and Cretaceous/Tertiary boundaries along a depth transect on the northwest flank of the Walvis Ridge.
- 19 holes were APC/XCB cored at six sites recovering 3590.8 m or 97.0% of the cored interval. There was another 1356.8 m drilled.
- The APC cored 3125.4 m (99.6% recovery) and the XCB cored 576.2 m (82.9%. recovery).
- There were 76 stuck core barrels that were drilled over, thereby pushing the capabilities of the piston corer to recover critical boundaries.
- The Drilling Sensor Sub was deployed at Site 1262/63 and Site 1264. See engineering report for details.
- The Interstitial Water Sampler was deployed a total of five times at two sites (Site 1266 and Site 1267).
- There were 32 downhole temperature measurements with the Advanced Piston Corer Temperature (APCT) tool.

- There were 118 piston cores obtained with the non-magnetic core barrel assembly.

Review of Engineering Development Projects

The ODP/TAMU developmental engineering projects are divided into two categories: surface equipment and downhole instruments. The first category includes Active Heave Compensation (AHC) and the Rig Instrumentation System (RIS). Both of these systems were installed in the fall of 1999. These systems are functioning and continue to undergo refinements as they are incorporated into the daily drilling operations of the *JOIDES Resolution*. The second category consists of downhole tool development projects that are currently underway and include: Davis-Villinger Temperature Pressure Probe (DVTPP), APC Methane (APCM), PCS Methane (PCSM), Pressure Core Sampler (PCS), the Memory Drilling Sensor Sub (DSS), Drilling Sensor Sub with wireless transmission to Retrieval Memory Module (RMM), and Instrumented Water Sampler (IWS).

Active Heave Compensator (AHC)

AHC Hydraulic Bundle:
Hose bundle covers were experiencing premature wear. Replacement of the old bundle covers with new covers was completed during Leg 204.

AHC Remote Diagnostic System:
Service calls by engineers from Maritime Hydraulics were performed during the port calls for Legs 207 and 208 to address jerky operation of the system. Minor adjustments were made to the operating software and the system appeared to be functioning according to vendor specifications during simulated heave tests. However, the frequent service calls have not successfully addressed the chronic issues experienced during on-site operations. To resolve this problem, Maritime Hydraulics installed a Remote Diagnostic System during the Leg 209 port call to allow near- or real-time analysis of the data by the Maritime Hydraulics programmer in Norway. Based on his analysis of the data, the programmer can make software changes immediately and send the new program to the ship without waiting for the next port call. This capability is possible because of the 24/7 VSAT communication system that was installed at the start of Leg 207.

Rig Instrumentation System (RIS)

The Rig Instrumentation System (RIS) provides real-time monitoring and electronic storage of drilling parameters and vessel motion. The RIS system is a PC-based data acquisition system with a master computer serving the Driller's Console and broadcasting the data to remote workstations in the ODP Operation Manager's office and other offices throughout the ship. The RIS system provides algorithms for tracking depth and calculating WOB and ROP.

Weight-on-Bit Filter:
Because the AHC imparts significant dynamic forces to the derrick-mounted load cells, there were large variations in the weight-on-bit (WOB) indicator used by the driller. The large variations made it difficult for the driller to effectively control the WOB because of excessive needle bounce. A WOB filter was developed that electronically filters the dynamics of the top drive and AHC. The hardware was installed over the course of Legs 201 and 202. The WOB filter system, hardware, and software are operational, though fine-tuning of the filter continues to be made. A large dial WOB meter display was installed during the Leg 206 port call, which replaced a smaller meter that the drillers found hard to read.

Wireless Transmission of Load Pin Data:
The load pins, which are installed in the hook, previously received power and transmitted data through an umbilical cable suspended between the crossbeam dolly junction box and the top drive. The umbilical cable had a connector break ~2 m below the dolly junction box that had to be connected when the top drive was put into service and disconnected when set back. The umbilical cable was prone to damage during operation (it has been replaced twice since 1999). To resolve this problem, wireless data transmission was employed, and the umbilical was eliminated. This was done by relocating the radio transmitter box from the top drive to the lower crossbeam dolly (location of load pin junction box) and accessing power by dropping a cable from the AHC junction box located on the traveling frame. Moving the transmitter box to the lower cross beam allowed the cables from the load pins to go directly into the box, eliminating a junction box and an umbilical from the system. A dedicated power supply for the transmitter box was supplied by using spare conductors in the AHC junction box. Wireless transmission for the load pins was implemented during Leg 208.

Firmware changes will be made to the system during Leg 209 to allow the drill string weight measurement from the load pins to be used in the filtering algorithm for Weight on Bit, which is expected to improve the effectiveness of the filter.

Downhole Measurement Technology

APC Temperature Tool (APCT):
ODP is developing new electronics for the APCT to replace the obsolete electronics of the Adara systems. The new electronics will use a thermistor temperature sensor in place of an Resistance Temperature Detector (RTD). Calibration procedures for the new APCT will be the same as all other ODP downhole temperature tools and will not require the special set-up hardware and baths that are needed for the Adara System. Prototype electronics will be built by the end of FY03.

Davis-Villinger Temperature and Pressure Probe (DVTPP):
The purpose of this project is to incorporate pore pressure measurements into the DVTP. The prototype DVTPP was developed by Pacific Geosciences Center in Canada and was first deployed on Leg 190. Though the deployment confirmed the viability of the measurement, significant improvements were required to bring the tool up to operational

status. The tool underwent a redesign prior to Leg 201 to address corrosion and assembly issues.

A redesigned DVTPP, using the prototype electronics, was deployed 12 times during Leg 201 as a test. The temperature measurement never functioned properly because of a corrupted setup file in the prototype data logger. Overall, the pressure measurement functioned as designed and recorded valid pressures on nine runs.

Another cycle of redesign followed Leg 201. A new, upgraded data logger was used and minor mechanical changes were made to improve reliability. Two DVTPP tools were run during Leg 204. The tools were run 16 times with no failures. Valuable data was acquired on all runs except for those where the formation fractured during penetration. The new DVTPP had a slightly noisier temperature signal than the standard DVTP. However, the data reduction program was able to process the noisy data and resolve equilibrium temperatures.

The DVTPP and Fugro's Piezoprobe were both run at the same site and depth during Leg 204 to evaluate both tools' pressure measurements. A cursory look indicated closely matched pressure results, though the DVTPP seemed to reach equilibrium at 3-5 psi higher than the Piezoprobe.

After Leg 204, one tool was returned to shore and the other was left on the ship for use during Leg 205. Deployments during Leg 205 experienced problems when used in the rotary core barrel (RCB) bottom-hole assembly (BHA). Noisy temperature signals continued to be a problem during Leg 205. All DVTPs and the DVTPP tools were shipped back to shore to analyze the noise issue.

Post Leg 205 evaluation of the DVTPs and DVTPPs discovered that one of the DVTPP tools had faulty electronics; however, testing showed that the electronics in the other DVTPP data logger were more stable than the old DVTP electronics. Additional testing on the DVTPP also turned up intermittent problems caused by variations in the thermistor assembly construction. The DVTPP thermistor construction was redesigned to improve ruggedness and reliability. A recalibrated DVTP and a rebuilt DVTPP were returned to the ship for use during Leg 207, but the tools have not been deployed to date.

A Technical Note is being prepared for the DVTPP tool.

APC Methane Tool (Temperature, Pressure, Conductivity):
The APC Methane (APCM) tool monitors the effects of gas exsolution in cores from the time the core is cut until it reaches the deck by recording temperature, pressure, and electrical conductivity in the core headspace. The sensors are mounted in the APC piston. The APCM tool is a joint development between ODP/TAMU and MBARI.

The tool was deployed eight times during Leg 201 to establish baseline data. The data degraded significantly on the fourth run when the tool experienced excessive shock and vibration. The data quality for the remaining runs was poor because of noisy signals.

Based on experience gathered during Leg 201, the methane tool electronics were "hardened" by tightening clearances and adding additional cushioning. The methane tools successfully collected data on 107 of 110 cores during Leg 204. Of the 107 cores, 33 were PCS cores.

The Pressure Core Sampler Methane (PSCM) tool is a version of the APCM tool, which was integrated into the PCS tool for use during Leg 204. Three new PCSM assemblies were manufactured to provide temperature and pressure measurements of the PCS core headspace. Thirty-three runs recorded temperature and pressure data with the PCSM.

A Technical Note is being prepared for the APC Methane tool.

Pressure Core Sampler (PCS):
The PCS is a free-fall deployed, hydraulically actuated, wireline retrievable pressure coring tool for retrieving core samples maintained at bottom-hole pressures. Modifications of the tool for Leg 204 were made to improve reliability and to add continuous measurements of pressure and temperature of the core headspace.

The changes made to the PCS for Leg 204 were 1) larger link pins, 2) longer links to eliminate over-rotation, and 3) integration of the methane tool at the top of the inner core barrel. The addition of the methane tool was the most significant change. Three PCS core barrel assemblies, two actuation assemblies and three PCSM tools were deployed during Leg 204.

Leg 204 results:

Total Deployments:	39
Complete success (core under pressure):	30
100% Core recovery:	36
Full Tool Closure (recovered pressure):	32

Nine runs were unsuccessful. On seven of these runs, the ball valve did not actuate properly, either because the tool failed to actuate or the ball valve linkage jammed. The other two retrieved pressure but did not recover core, because the core was washed out when the flow check valve failed. Methane gas was found in the 30 cores retrieved under pressure (Core 1249F-4P contained over 94 liters of methane). The Methane tool was run on 36 PCS deployments and successfully recorded data during 33 runs.

Two Gas Manifold Systems were set up in the Dry Lab (outboard of the Downhole Tools Lab). Pressure monitoring and recording of bleed-off was added for Leg 204 deployments using a laptop. The high number of PCS deployments and the long turn-around time (typically 8 to 24 hr) for gas sampling, frequently required the third PCS tool be stored in an ice trough until a gas manifold station became vacant.

Conceptual designs for post Leg 204 PCS tool changes were generated. These designs are intended to improve pressure retention and provide continuous temperature and pressure data during deployment and lab degassing. The proposed changes are: 1) a new ball valve pin with fixed stops to prevent over-rotation, 2) a temperature probe that penetrates the core material, 3) repackaging Methane tool electronics and sensors to allow the data logger to remain on the tool during degassing, and 4) modify firmware/software to display pressure and temperature data directly from the tool while in the gas manifold station.

Memory Drilling Sensor Sub (DSS):

The purpose of this project is to create a Memory Drilling Sensor Sub (DSS) that would operate near the bit to: 1) provide data to better understand the dynamic forces at work downhole and 2) quantify the impact of heave and surface inputs (torque, weight, rpm, and flow rate) on bit performance. The DSS provides data from sensors packaged in the drill collar wall. These sensors measure weight on bit, torque on bit, annulus pressure, pipe pressure, and annulus temperature. The DSS is an 8-1/4 in OD memory sub with a 4-1/8 in through bore to allow for core retrieval. It is positioned in the BHA above the Outer Core Barrel.

A subcontract was issued to APS Technology for Phase II work on December 12, 2001. The first two stages (Mechanical Design and Electronics Design) were completed, reviewed by ODP, and accepted. The contract for the last two stages (Manufacturing of Test Article and Preliminary Testing and Sub Manufacture System Integration and Testing) was awarded on September 20, 2002. The DSS prototype was delivered on February 25, 2003 and forwarded to the Leg 208 port call.

The DSS was deployed for the first time during Leg 208. The first test started on March 29 with deployment in the first hole at Site 1263 (WALV-8E) and ended almost 10 days later with the last hole of Site 1264 (WALV-8A) on April 8. Since the battery packs were designed to provide a minimum of four days of operation and the memory capacity was designed to hold 4-1/2 days of data, the tool was expected to stop functioning at some time during the deployment. The tool was set up to record weight and torque on bit, annulus pressure, and bore pressure at a 1-second sample rate. The DSS was positioned 13.8 m above the bit in the APC/XCB BHA. After the tool was retrieved and the data downloaded, the memory was found to be only 56% full. Staff assumed the batteries failed prematurely. Fresh batteries were installed and the tool was promptly deployed in two holes at Site 1265 (WALV-9B) on April 8, and retrieved five days later on April 13 at the end of Hole 1265B. Communication with the tool was never established. When the tool was opened to access the electronics, water was discovered inside. Water was also found in the other access and sensor hatches. The battery compartments remained dry. When the pressure transducer pocket was opened, we found that the o-ring on the pressure transducer housing was cut. The type of cut indicated that the cut occurred when the cover was installed during fabrication at APS Technology, which meant the tool took on water as soon as it was deployed. The data confirmed this as most data signals were lost in the first 15 min of tripping in. The annulus temperature and tool diagnostics data continued to transmit for two days before the system completely shut down. The cut was the result of the sealing cover plate not having enough clearance for the o-ring to pass over a slot cut across the sealing surface. The "sharp" edges of the slot cut the o-ring as the cover was installed. A design change is warranted to correct the problem.

A major failure occurred; however, it was not a result of the drilling environment. Fortunately, the causes were easily identified and can be solved by minor component redesign and improved qualification procedures. The initial deployment is a testament to the ruggedness of the design. The electronics continued to operate for over two days despite being immersed in seawater at 4000 psi. After the tool was recovered 10 days later, the electronics were still able to communicate with the laptop and download data--an amazing feat. The basic design of the tool remains very solid, and the basic engineering quality is outstanding. The tool was shipped back to APS Technology for refurbishment under warrantee conditions.

DSS and Retrievable Memory Module (RMM):
An amendment to the APS Technology contract was made for design work on the development of wireless transmission of DSS data to an instrumented core barrel in February 2003. Wireless transmission to a RMM will allow the five drilling parameter data sets to be recovered and analyzed after every core recovery instead of after a pipe trip, i.e., “near time.” This design work is the first step in the development of transceiver electronics and antennae for the DSS and RMM. The RMM will be connected to the drill string acceleration tool (DSA), which will augment the DSS data with BHA acceleration data. This is a joint development project with the LDEO wireline engineers. The goal is to have an operational system for Leg 210. The DSS and RMM system is a precursor to transmitting data in “real time” with a commercial, pulse telemetry, measurement-while-drilling (MWD) system.

Instrumented Water Sampler (IWS):
The impetus for developing a new water sampler was the need to replace the current ODP Water-Sampling Temperature Probe (WSTP) with a more reliable tool with improved water-sampling capability. Joris Gieskes of Scripps Institute of Oceanography, who had modified the hydraulic and mechanical elements of the Fisseler Water Sampler (FWS), performed preliminary work. The principle behind the Scripps modification was the use of a motor driven screw mechanism to operate a syringe plunger (sampling piston). The motor, with a low-speed gearbox, provided a constant fluid extraction rate. The modified tool was returned to ODP in late March of 2002.

ODP engineers took the Scripps concept and designed a new water sampler with feedback controls and additional sensors for measuring formation properties and recording diagnostic data. The project was begun in earnest in mid-November 2002. The tool was renamed the Instrumented Water Sampler. Along with a sampling function, a thermistor and a pressure sensor were included to measure in situ formation properties as well as a differential pressure sensor to measure pressure across the intake port. The tool will eventually use a software controlled feedback system to maintain the pressure drop across the probe tip intake screen. The goal is to control extraction rate to reduce the probability of screen pack off. The software will also use the frictional heat spike of the thermistor as a trigger to start the sampling motor, instead of a timer. The project is a two-phase development. The first phase was deployment of a prototype without the feedback feature during Leg 208 for sea trials to collect downhole data for analysis and gain operational experience. The second phase will implement the software feedback control based on the data gathered during Leg 208. Design changes will also be made based on the lessons learned during Leg 208.

The compressed design and manufacture timeline for Leg 208 (three working months from mid-November to late February) meant that hardware delivery schedules were critical. The tool was shipped in pieces with no on-shore assembly or testing and the untested electronics were sent separately. The beta software was sent out 2-1/2 weeks after the ship sailed. IWS development continued on the ship with the support of highly competent and motivated staff (two Electrical Technicians and one Downhole Technician) working with the shore-based Senior Designer and Electrical Engineer.

The following is a brief overview of the five deployments:

Run 1
Deployment date and time: 4/19/03, 2319 hr
Hole: 1266C
Depth: After core 14 at 192.0 mbsf, 3999.9 mbrf
Result: Data port connector leaked and water entered the electronics chassis pressure case. No damage to electronics. Only 15 minutes of data recorded. No sample.

Run 2
Deployment date and time: 4/23/03, 1758 hr
Hole: 1267A
Depth: After core 33 at 312.1 mbsf, 4677.7 mbrf
Result: Data logger recorded 2-1/2 hours of data. Excellent temperature measurement. Good tip pressure and differential pressure measurements. Motor-on command for sampling not sent (software bug). No sample.

Run 3
Deployment date and time: 4/24/03, 2201 hr
Hole: 1267B
Depth: After core 19, in the pipe at 2297 mbrf
Result: Pressure fitting in upper transducer manifold leaked and caused sensors to fail. No damage to sensors or electronics. Erratic motor-on commands caused by a weak battery prevented motor from responding. No sample

Run 4
Deployment date and time: 4/25/03, 2101 hr
Hole: 1267B
Depth: After core 32, in the pipe at 2267 mbrf
Result: Good run. A full set of data on all channels. Sample recovered.

Run 5

Deployment date and time: 4/26/03, 0343 hr
Hole: 1267B
Depth: After core 36 at 325.4 mbsf, 4691.4 mbrf
Result: Data logger recorded 2-1/2 hours of data. Excellent temperature measurement. Good tip pressure. New software fixed the motor-on command for sampling. A broken solder joint on the motor prevented power to motor. No sample.

Each run resulted in development advances despite the inability in this initial design to fully test the equipment prior to deployment. The sea trials identified the need for more comprehensive pre-run checkout capabilities and the need for sophisticated lab testing equipment. The second phase of design will concentrate on providing the ability to run a full system test after the tool is completely assembled. Currently, this is not possible because the sampling piston cannot be reset unless the tool is disassembled. For Phase 2, a pressurized chamber is needed for testing and evaluating sample intake filters. This test stand will simulate overburden pressure and hydrostatic pressure on a sediment layer and provide the capability to push the IWS probe tip into the sediment and draw fluid samples. Several enhancements were incorporated into the electronics during the at-sea development. Those features will be incorporated into a new printed circuit board, and work will be done to improve the reliability of connectors and electrical terminations. Modifications to the prototype will be completed by the end of FY03.

Labview Software Interface for Downhole Tools:
The communication software for current ODP downhole tools was written for DOS operating systems. These programs are being converted to Labview for Windows to create a commonality in support software for all downhole measurement tools. The communication and analysis software for the DVTP tool was rewritten in Labview and is operational on the ship. Work on the APCT tool has commenced. The communication software will be integrated into the base Labview program to have the same software front-end as the DVTP. A beta version of the APCT communication software was tested during Leg 208. The communication program is easy to use and works well. APCT raw data from the same core was processed with the Labfit program and the standard Tfit program. Results were collected during the first two sites. These data were sent to Bill Mills for evaluation. Project completion is expected at the end of the 2003 calendar year.

Leg 204 Third-Party Tool Support

A measurement-while-coring concept was tested during Leg 204 using an Anadrill Resistivity-at-Bit (RAB) LWD tool modified to allow a special Motor Driven Core Barrel (MDCB) to land in it. The coring tool was tested at the Genesis rig on the Schlumberger campus in Sugarland, Texas on 21 June 2002. The test performed well with significant core recovery. All parts fit and the tool deployed successfully. The RAB tool was run without batteries and without the correct button sleeve because of problems with the battery pins and unfinished machining on the button sleeve. This project has been a joint development initiative with the LDEO wireline engineers.

Piezoprobe: Fugro modified their Piezoprobe tool to deploy it in the ODP APC/XCB BHA. Two engineers accompanied the tool for testing during Leg 204. The first test of the Fugro Piezoprobe was on 12 July in Hole 1244B; however, the connection failed at the top of the tool, and the run was aborted. The second deployment of the Piezoprobe occurred in Hole 1244C at a depth of 53.0 mbsf. This deployment went very well with recovery of good data and a good decay curve after ~45 min in the formation. The DVTPP was deployed at Site 1244 at the same depth, as well as above and below that depth, for a comparison of the measurements. The DVTPP remained in the formation for 30 min for all runs. Peter Flemings of Penn State is evaluating the data.

Fugro Pressure Corer: The percussion corer was developed by Fugro Engineers and is known as the Fugro Pressure Corer (FPC). The FPC uses a water hammer driven by circulation to drive the core barrel into the sediment up to 1 m ahead of the drill bit. The core diameter is 58 mm. The FPC is designed to retain a pressure of up to 3600 psi. The percussion corer is suitable for use with unlithified sediments ranging from stiff clays to sandy or gravelly material. The FPC was deployed a total of 10 times during Leg 204 and retrieved some core on each run for an average of 0.80 m of core per run. Sealing problems with the flapper valve were dealt with and full pressure was recovered on the final two runs. Pressurized cores were successfully transferred under pressure to storage and logging chambers.

HYACE Rotary Corer: The Technical University of Berlin and the Technical University of Clausthal developed the HYACE Rotary Corer (HRC). The HRC uses an Inverse Moineau Motor driven by circulation to rotate the cutting shoe up to 1 m ahead of the roller cone bit. The core diameter is 50 mm. On completion of coring, the wireline pulls the core barrel into the autoclave and sealed by a flapper valve. The HRC is designed to retain a pressure of up to 3600 psi and is suitable for use in sampling lithified sediment or rock. The HRC was deployed a total of eight times during Leg 204 and recovered some core on seven of the eight runs for an average of 0.37 m of core per run. Pressure was also recovered on four of the eight runs with full pressure on two runs. Pressurized cores were successfully transferred under pressure to storage and logging chambers.

Workspace Enhancement For Downhole Tools

Anticipated heavy downhole tool usage during Leg 204 (APCT, DVTP, DVTPP, WSTP, PCS, FPC, HRC, RAB coring, and LWD) and space for pressurized core transfer chambers required an expansion of workspace facilities on the *JR.* Exterior workbenches and tool racks were designed and installed on the Core Tech Shop roof and outside of the Downhole Lab during Leg 203. Weather protection materials, tarps and awnings, were purchased and were installed at the beginning of Leg 204. The additional facilities saw maximum utilization. Because of rather mild weather, the awnings were rarely used.

The tool racks outside the Downhole Lab were exclusively used for the HYACINTH Pressure Core Transfer System. Both the FPC and HRC pressurized cores were successfully transferred to storage chambers or logging chambers using this system.

Hole 1200C CORK Operations

The data logger, thermistor string, and OsmoSamplers were successfully recovered from the CORK located at Hole 1200C (Leg 195). ODP/TAMU wireline tools were used in conjunction with the WHOI remotely operated vehicle *Jason II* from the *R/V Thompson* to carry out the recovery. The original operations plan called for replacing the data logger with a plug. However, the borehole was observed to be flowing and thus it was left open to flush out any remaining remnant fluids from the drilling operations.

Information Services

Digital Imaging System (DIS)

An additional contract for programming services was negotiated with Geotek, Ltd. for ODP-required enhancements to their proprietary *ImageTools* software package. The contracted work included the addition of an automated method to produce whole core color images for use by scientists during a cruise. Geotek completed the contracted work before Leg 207. The software application was fully implemented by the Information Services Department during Leg 207. No additional work is proposed for the digital imaging system during the remainder of this program.

New Shipboard Satellite Communication System

Twenty-four by seven communications between the JOIDES Resolution and shore is now a reality. A new satellite system (VSAT) was installed on the JR during the Barbados port call, providing limited service, and then enhanced during the Leg 207 port call in Rio, providing full service. ODP/TAMU, with support and guidance from JOI, saw an opportunity to provide this additional communications capability using available programmatic savings and cost avoidance measures.

The results have been an overwhelming success, both in terms of the added capabilities and the acceptance by the shipboard participants including scientists, technicians, and ship’s crew. Capabilities now include: local phone service to the ship (the JR is part of the Texas A&M phone system); inexpensive long distance service from College Station using phone cards and credit cards; “fast” file transfers; access to the Worldwide Internet on selected workstations; hourly e-mail service; access to current news; remote systems (server and network) management; and the potential for video conferencing and distance learning.

The project was a success because of the highly professional activities of a number of diverse participants including Texas A&M University telecommunications staff, Houston Southwestern Bell phone company, Houston DMS satellite company staff, ODL shipboard staff, and ODP/TAMU Information Services Department and Drilling Services

Department staffs. Without their help and dedication, this project would not have been possible.

Status of Migration of Historical ODP Data into the Janus Database

To date, all ODP Core, Sample, MST, Physical Properties, Downhole Temperature, and Splicer data have been migrated to the Janus database. Of the chemistry data, only XRD remains to be migrated. XRD data falls into two categories: that collected during Legs 101-138 and that collected during Legs 139-170. While XRD data from the latter set will be migrated to Janus, data for the previous set will be available in digital format from scanned documents and will not be available through Janus. Migration efforts regarding paleomagnetic data and paleontology data are 96% and 15% completed, respectively. All Paper Prime Data (for example, visual Core Descriptions, Paleontology Investigations, etc.) are currently archived on microfilm. ISD plans to have a subcontractor scan the microfilm. ISD will index the files and present them on the Internet in PDF format. Planned completion dates for all data types may be found in the following table. The ODP web site, located at http://www-odp.tamu.edu/database/migration.htm, provides detailed and up-to-date information on the data migration projects.

Data Migration Progress Table

Data Type	Percent Completed	Begin/End Dates
1. Core, Sample	100%	Jan 97/Aug 98
2. MST: GRAPE, P-wave, Magnetic susceptibility, Natural gamma, and Color Reflectance	100%	Sep 98/Aug 01
3. Physical Properties: Thermal conductivity, Moisture and density, PWS, Shear strength	100%	Dec 99/Aug 02
4. Chemistry:		
Rock Eval	100%	Apr 01/Mar 03
Carbonates	100%	Apr 01/Sep 02
Interstitial water	100%	Apr 01/Sep 02
Gases	100%	Apr 01/Sep 02
XRF	100%	Apr 01/Sep 02
XRD (Legs 139 – 170)	10%	Mar 03/Sep 03
XRD (Legs 101 – 138)	0%	Mar 03/Mar 04
5. Miscellaneous:		
Paleomagnetism	96%	Sep 02/Sep 03
Downhole temperature	100%	Mar 02/Mar 03
Splicer	100%	Mar 02/Sep 02
Paper Prime Data	0%	Mar 03/Sep 04
6. Paleontology: Paleo sample information, Range charts, Datum depths, Age models	15%	Dec 01/Sep 07

*Notes (1) No core description data will be migrated. (2) No DSDP data will be migrated. (3) No contributory (postcruise) data will be migrated.

ODP Data Archive at NGDC

The National Geophysical Data Center (NGDC) is the designated organization responsible for the archiving of the ODP digital data. After several meetings JOI, ODP/TAMU and NGDC have defined a model for how the ODP digital data will be archived. The model calls for extracting data from the Janus database using the pre-defined Janus web queries and saving the data as ASCII text files. Along with the ASCII text data files, ODP will produce a data flowchart for each data type, meta data files, and calibration files. A prototype of the model was created and tested by ODP during this reporting period. The results were presented to JOI for peer review and approval. Transfer of all archived data will occur during FY 2005.

Mirror Sites

Web Mirror Sites. Web mirror sites that contain all the e-publication products of ODP continue to operate successfully in Australia, the Federal Republic of Germany, and the United Kingdom. A new disk drive was ordered for the facility in the United Kingdom and installed in early 2003. None of the sites mirror the Janus database. The sites are updated at the end of each week and are listed below.

Australian mirror site: http://www.agso.gov.au/odp (Australian Geological Survey Organisation)

Federal Republic of Germany mirror site: http://odp.pangaea.de/ (Institute for Marine Environmental Sciences [MARUM] and Alfred Wegener Institute for Polar and Marine Research [AWI])

United Kingdom's mirror site: http://owen.nhm.ac.uk/odp/ (The Natural History Museum, London)

Publication Services

ODP/TAMU Web Site

Overall Site User Statistics:
The number of site visitors (defined as single computers accessing the site that did not originate from ODP/TAMU) and the number of pages (or files) accessed at the ODP/TAMU Web site increased by 31% and 75%, respectively, between the 12-month during 2002. In the 12-month period ending in December 2002, there were 825,713 visitor sessions, or an average of 68,809 visitors per month. During 2003 (January through April), site use continued to increase and there were 418,202 visitor sessions, or an average of 104,550 visitor sessions per month. See Table 1 for monthly statistics and a list of the most active Web pages on the ODP/TAMU site for January 2002 through April 2003. (All tables appear at the end of this section.)

New feature—*JOIDES Resolution* Virtual Tour:
QuickTime panoramas of the *JOIDES Resolution* (various labs on Levels 2–7, fantail, forward living quarters, and rig floor) were added to the Web site in December 2002. This project was a collaborative effort between the Texas A&M University Digital Library (photographed the laboratories during the Leg 205 port call and produced panorama images) and the ODP Publication Services staff (assisted with photography and created the enhanced panorama images for the Web). The labs can be viewed at http://www-odp.tamu.edu/drillship/index.html.

New feature—Electronic Manuscript Submission:
Online electronic manuscript submission was initiated in August 2002. From August 2002 through April 2003, 90% of *Scientific Results* initial manuscript submissions and 80% of *Scientific Results* revised manuscript submissions were submitted electronically. Whereas only 50% of the reviewers of *Scientific Results* manuscripts chose to receive manuscripts electronically, 90% of these reviewers submitted their reviews electronically. In addition, 75% of the journal/book manuscripts received by ODP were sent electronically through this site.

ODP *Proceedings* Online Publications:
As of the end of April 2003, 41 *Initial Reports* volumes and manuscripts from 40 *Scientific Results* volumes were published in HTML and PDF formats on the ODP/TAMU Web site. User statistics for the *Proceedings* volumes are counted from single unique computer user sessions to the entry page of a volume that did not originate from ODP/TAMU. (If users enter the web site directly to a chapter and do not pass through the volume entry page they are not counted in these statistics.)

The number of individual users of the *Proceedings* volumes continues to rise on the ODP/TAMU Web site. Figure 1 (all figures appear at the end of this section) shows the total number of user sessions for all online *Proceedings* volumes per month for the period of February 2000 through April 2003. During 2002 and 2003 the number of site visitors accessing the *Proceedings* volumes increased by 49% and 20%, respectively. In the 12-month period ending in December 2002, there were 41,998 visitor sessions, or an average of 3,500 visitor sessions per month. In addition, during 2003 (January through April) there were an average of 4,824 visitor sessions per month. *Initial Reports* volumes were accessed during 40% of these user sessions and *Scientific Results* volumes during 60% of these sessions. This ratio has remained stable for the past three years. Figures 2 and 3, respectively, show the number of user sessions per *Initial Reports* and *Scientific Results* volume for the same period of February 2000 through April 2003.

Users representing all member countries have accessed the online *Proceedings* volumes within the last six months. In addition, users from 91 other nations have used the online volumes during this period. On average, 42% of the users who access the *Proceedings* volumes from this site are from the United States. In February 2003, countries with higher than 1% of the total site visits included United States (45.1%), Germany (8.1%), Japan (8.1%), United Kingdom (7.2%), Italy (3.2%), Canada (3.1%), France (3.0%), China 1.6%, The Netherlands (1.4%), Australia (1.3%), and Korea (1.1%). Note that these statistics do not include users who access the publications through the mirror sites in Australia, Germany, and the United Kingdom. Currently user statistics are not monitored from the mirror sites. Examination of the top 75 nations and the top 50 institutions accessing the online *Proceedings* volumes illustrates that the use of these publications is broader than the constituency of the ODP membership and extends worldwide.

Printed Volume and CD-ROM Production

The *Proceedings of the Ocean Drilling Program* volumes are produced electronically and distributed in three formats. A printed booklet (containing the table of contents to the entire volume and a summary chapter) is accompanied by a CD-ROM that contains all volume chapters and core description information (*Initial Reports* only) in PDF format and selected tabular material in ASCII format. The volumes are also published on the ODP/TAMU Web site. Chapter material is presented in both HTML and PDF formats, core description information (*Initial Reports* only) in PDF format, and selected tabular material in ASCII format. User statistics for online versions of the publications are discussed above.

The *Initial Reports* volume booklet/CD-ROM package and Web publication formats are distributed approximately one year postcruise. For the *Scientific Results* volumes, papers are published individually on the Web in order of acceptance. The booklet/CD-ROM package is produced and distributed after completion of the leg synthesis paper, which is produced by the Co-chiefs, and is scheduled to be distributed four-years postcruise.

Initial Reports:
From July 2002 through April 2003:

The following booklet/CD-ROM sets were distributed and the volumes were also made available online: 197 (August 2002); 198 (October 2002); 199 (November 2002); 200 (January 2003); 174AX Supplement (February 2003).

From May 2003 through June 2003:

The following booklet/CD-ROM sets are expected to be distributed: 201 (May 2003); 203 (June 2003). These volumes are also expected to be available online in HTML and PDF format during the same time period.

Scientific Results:

From July 2002 through April 2003:

Publication of online volumes began for volumes: 184 (October 2002); 185 (November 2002); 186 (November 2002); 187 (February 2003); 188 (February 2003).

The following booklet/CD-ROM sets were distributed: 180 (September 2002); 176 (December 2002); 178 (December 2002); 174A (February 2003); 177 (March 2003).

From May 2003 through June 2003:

Publication of chapters online is expected to begin for volumes: 189, 190/196, and 191. Chapters from other volumes will be published when manuscripts are accepted and processed for publication.

The following booklet/CD-ROM sets are expected to be distributed: 181 (June 2003); 183 (June 2003).

Note: Beginning with *Scientific Results* Volume 176, Co-chiefs were required to write or coordinate a synthesis paper for each volume, which was due 35-months postcruise. Completion of the *Scientific Results* volumes for the following legs were, or will be, delayed by more than one month (and by as much as 20 months [Leg 179]) because the leg synthesis papers were not completed on schedule: 176, 179, 181–189. Volumes with delinquent synthesis papers are distributed as soon as the publications schedule allows once the synthesis papers are finalized.

Leg-Related Postcruise Publications

Since Leg 160, when the publication policy changed and scientific party members were allowed to publish their postcruise research results in either books and journals or the *Scientific Results* volumes, it has been important to track the number of papers projected and published in the different venues. Table 2 reflects the number of ODP-related papers that are projected for, submitted to, in press, or published in *Scientific Results* volumes and books/journals for Legs 160 through 198. Projected statistics are generated at the time of the second postcruise meeting. The other data on book/journal publications are based on the information ODP receives from the scientific participants from each leg. (There is no guarantee the counts are complete.) 541 papers (or 52% of all published papers tracked) have been published in the *Scientific Results* Volumes 160 through 188, and 490 papers (or 48% of all published papers tracked) have been published in books and journals related to Legs 160 through 198.

The average number of papers published per leg has remained relatively constant over the history of ODP, even after the Policy changed with Leg 160 and papers could be published in books and journals. Figure 4 shows the total number of papers tracked for each leg. For Legs 101 through 159, only *Scientific Results* papers were tracked; beginning with Leg 160, papers published in books and journals as well as in-press and submitted manuscripts were also tracked. All legs through Leg 184 have passed the four-years postcruise mark. Legs through Leg 193 have passed the 28-months postcruise mark, which is the date when all *Scientific Results*, journal, and book submissions are due (Leg 194 deadline = 7 July 2003).

Although the average number of publications per leg has remained relatively constant since the beginning of ODP, the range of time over which postcruise research papers are published has expanded since the Publication Services Department began tracking the numbers and types of papers published per month beginning with Leg 169 (the first *Scientific Results* volume published in the electronic format). Of the 528 papers that have been published related to Legs 169 through 198, 8% (44 papers) were published by 28-months postcruise, 60% (319 papers) were published between 29-months and four-years postcruise, and 31% (165 papers) were published later than four-years postcruise (see Table 3). For these legs, all of the publications that were published between 0- and 28-months postcruise were in books or journals (this equates to an average of 1.6 papers per leg). Thus, while a few scientific participants have taken advantage of the policy revisions that allow authors to publish papers before or shortly after the moratorium has ended, a growing number of manuscripts are now published past the four-year postcruise deadline. Figure 5 illustrates the number of papers published per month postcruise for Legs 169–198 in both the *Scientific Results* volume and in journals/books.

Leg-related Citation Lists:
Authors from Leg 160 and beyond have been required to provide ODP/TAMU with copies of all citations from papers published in books or journals during the first 48 months postcruise. ODP/TAMU posts these citations on the ODP Publications Web site (http://www-odp.tamu.edu/publications/, click on “Leg-Related Citations”).

The Publication Services Department began collecting leg-related citations in January 1999. The citation lists now include 796, of which 647 are submitted, in press, or published papers and 149 are conference abstracts. Of the 647 papers, 300 have abstracts reproduced on the ODP/TAMU web site. ODP requests abstract reprint permission from all publishers, but only receives it from some. Nature is one frequent publisher of ODP science who does not allow ODP to reproduce abstracts, whereas Science, the Geological Society of America, and Elsevier are some of the publishers who do. Recently, we received permission from the American Geophysical Union to link to their abstracts, and will proceed with that project in the upcoming months. The numbers of citations listed per leg depend on whether authors notify ODP once their papers have been accepted for publication; whereas, the availability of abstracts depends on whether publishers permit their reproduction.

We know the leg citation lists are not complete despite efforts by the ODP staff to remind scientific party members of their publication obligations and review of geoscience journals looking for ODP-related publications. The success of the leg-related citation lists is dependent upon authors submitting all published citations and a reprint of each publication to ODP, as outlined in the ODP Policy.

ODP Proceedings Distribution

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 July 2002 and April 2003, four institutions (University of Copenhagen, Demark; Hobart & William Smith College, USA; and University of Michigan, USA; University of California, San Diego, USA) were sent 684 ODP and 234 DSDP volumes. Total value for the books in these shipments equals $45,463.

The Department sold DSDP and ODP volumes for a cumulative revenue of $9,595.99 between July 2002 and April 2003. This revenue supports a portion of the cost budgeted for the printing and distribution of new volumes. Between FY00 and FY02 there was an average annual revenue decline of 34%. We expect this trend to continue because the cost of newer volumes is 60% less than older volumes and there will continue to be a decrease in volume orders as the Program phases out.

DSDP and ODP Citation Database

The Citation Database, which contains more than 19,000 ODP- and DSDP-related citations and is produced by the American Geological Institute (AGI) has been online since August 2002 (http://odp.georef.org/dbtw-wpd/qbeodp.htm). Residing on the AGI server, the database is updated on a weekly basis from the GeoRef database. Users can access the database via the Internet and also download data into common bibliographic software.

ODP/TAMU also receives a copy of the database on CD-ROM annually that is used to generate citation reports and statistics for the program and provide statistics for member country offices and individual authors who request citation data.

Overview of the Database:
AGI indexes and records citations from approximately 3,500 foreign and domestic publications, as well as citations from books, other citation databases, and publications arising from meetings. To create the “Citations from Deep Sea Drilling Project and Ocean Drilling Program Research” database (or DSDP/ODP citation database), AGI used a series of key words to extract a subset of citations related to DSDP and ODP research from the AGI GeoRef database.

The CD-ROM produced at the end of February 2003 contained a total of 19,093 records. These can be divided into "program proceedings" and "nonproceedings" citations (42% and 58%, respectively; see Figure 6). These percentages have remained fairly consistent throughout each annual study.

Database Parameters:

- AGI indexes and records citations from approximately 3000 foreign and domestic publications, in addition to books and publications arising from meetings. AGI also obtains citation information from international data-exchange partners in Canada, China, the Czech Republic, Finland, France, Germany, Hungary, Italy, the Netherlands, New Zealand, Poland, Russia, and Spain. There is no guarantee that this covers all publication venues for ODP or DSDP research, but scientific publications throughout the world are represented.
- There is a time lag between the date new papers are published and the date they are input into the GeoRef database. The length of the time lag varies depending on the source from which AGI gets its information. As a result, the DSDP/ODP citations database does not contain a complete listing of citations from 2002. It is possible that some citations are still pending from 2000 and 2001 as well.
- The "program proceedings" citations include publications produced and published directly by DSDP or ODP. This includes *ODP Proceedings* and *DSDP Initial Reports* series publications, as well as Scientific Prospectus, Preliminary Report, and Technical Note publications. It does not include other Program publications, such as the *JOIDES Journal*.
- Most of the information presented in this report is based on author affiliation (institution and country of contributing authors). AGI did not begin recording author affiliation information until 1975, so this information is absent from 1,933, or 1%, of the records. Affiliation is also absent from some records simply because there are many publication venues that do not require an author to supply such information. In addition, some authorships, such as "Shipboard Scientific Party," cannot be given author affiliations because the "author" is a group of individuals from a variety of countries. The majority of these records are "nonproceedings" citations. AGI has no plans to update these records in their master database except when ODP/TAMU supplies AGI with the information to complete those data fields. Although 1,933 records of the citations in the ODP/DSDP citation database do not contain country affiliation information, this database represents the best and most accurate record available of the science produced in the scientific literature. (Note: the number of records without author affiliation now remains constant from year to year because this information is now required by most publishers and by AGI.)
- Since this database contains citations for meeting abstracts and proceedings, a single citation may indicate where a paper/abstract was presented as well as where it was published after the meeting. So, a single record may represent "double" dissemination into the scientific community.

Author Information:

Authors from 76 countries have contributed to DSDP and ODP "nonproceedings" publications (see Table 4). This number appears to have decreased since the last report, however, this reflects an effort to report these data in a manner that is historically consistent rather than in a manner that reflects current political boundaries. (For example, countries such as the USSR and Czechoslovakia have divided into new geographic and governmental entities. However, throughout the programs' joint history publications from these countries have been attributed to, for instance, the USSR rather than Estonia, the Russian Federation, or the Ukraine.) The breakdown by current country names is provided in the footnote of Table 4.

Scientists from countries that have been members of either DSDP or ODP have first-authored nearly 9,000 "nonproceedings" publications related to the programs. Authors from current member countries (Table 5) have contributed over 8,700 of these publications. This list only reflects the country of the first author. Approximately 59% of these "nonproceedings" publications have been published by first authors from the United States.

Citation Distribution in Geoscience Publications:

Figure 6 shows the number of "nonproceedings" citations accounted for in the DSDP/ODP citations database vs. the total number of citations from ODP and DSDP publications. "Proceedings" citations include *DSDP Initial Reports* and *ODP Proceedings* volumes, as well as the ODP Technical Notes, Scientific Prospectus, and Preliminary Reports series.

Table 6 shows a list of some of the journals most frequently published in by the DSDP/ODP community. A complete list of serial publications is available upon request.

Table 1. Web User Statistics for the most active ODP/TAMU Main Entry Points *

2002	Jan 02	Feb 02	Mar 02	Apr 02	May 02	Jun 02	Jul 02	Aug 02	Sep 02	Oct 02	Nov 02	Dec 02	2002 total
ODP/TAMU web site	47,057	68,115	72,528	66,230	70,844	51,761	69,347	61,309	79,893	83,752	72,544	82,333	825,713
Indicative pages:													
ODP/TAMU homepage	7,393	8,820	8,660	9,087	8,559	7,019	7,870	8,610	10,045	9,641	8,739	7,374	101,817
Publication Services†	1,624	1,963	2,086	2,209	2,132	1,726	1,917	1,862	2,123	2.374	2,409	1,954	24,379
Cruise Information	1,328	1,549	1,425	1,639	1,425	1,093	1,461	1,258	1,567	1,339	1,212	1,020	16,316
Janus Database	1,245	1,488	1,580	1,657	1,719	1,306	1,549	1,462	1,550	1,529	1,447	1,154	17,686
Operations Schedule	1,090	910	847	882	811	663	810	729	1,236	1,200	1,005	740	10,923
Search	810	952	962	993	943	652	845	762	880	945	792	615	10,151
Drilling Services	716	919	905	901	851	571	735	701	846	796	671	655	9,267
Site Maps	450	565	625	670	562	459	616	480	736	828	716	525	7,232
JOIDES Resolution	493	660	576	589	495	434	534	502	830	744	687	632	7,176
Science & Curation	539	616	643	665	583	466	577	509	638	598	503	400	6,737
ODP/TAMU jobs	312	518	745	1,138	963	789	408	309	408	394	322	287	6,593
Staff Directory	483	527	546	564	619	509	585	585	520	539	393	386	6,256
Cruise Participation	373	460	449	454	406	309	413	309	453	484	419	293	4,822
Sample request form	319	346	334	421	373	301	342	318	406	385	363	302	4,210
Meeting and travel info	352	332	313	367	342	258	335	315	421	—	289	—	3,324
Life on the ship	672	883	823	886	873	811	855	797	1,565	1,468	1,335	1,233	12,201
Leg 199–206 photos	1,366	1,631	1,634	1,480	1,457	1,758	977	1,378	1,276	1,667	1,004	934	16,562

2003	Jan 03	Feb 03	Mar 03	Apr 03	May 03	Jun 03	Jul 03	Aug 03	Sep 03	Oct 03	Nov 03	Dec 03	2003 total
ODP/TAMU web site	95,139	95,884	109,479	117,700									418,202
Indicative pages:													
ODP/TAMU homepage	9,280	9,055	10,340	9,177									
Publication Services	2,504	2,456	2,751	2,578									
Cruise Information	1,631	1,377	1,474	1,341									
Janus Database	1,630	1,482	1,661	1,535									
Operations Schedule	1,209	1,019	1,047	837									
Search	867	863	926	858									
Drilling Services	805	774	846	801									
Site Maps	785	764	800	774									
JOIDES Resolution	762	697	796	776									
Science & Curation	573	572	600	564									
ODP/TAMU jobs	454	370	386	392									
Staff Directory	594	515	490	476									
Cruise Participation	438	432	435	377									
Sample request form	426	476	437	456									
Citation Database	380	340	424	349									
Life on the ship	1,734	1,681	1,823	1,841									
Leg 206–208 photos	1,186	1,235	896	1,316									

Notes: * = numbers represent unique-computer sessions that originate outside ODP/TAMU; each session may result in multiple page views and/or database requests; mirror sites are not included. † = see "ODP *Proceedings* Online Publications" section for statistics on unique-computer sessions for each volume. — = not in the top 50 pages accessed.

Table 2. ODP-related peer-reviewed papers projected, submitted, in press, and published in *Scientific Results* volumes vs. books or journals.

Leg	SR Volume				Journal or Book			
	Projected*	Submitted	In Press	Published	Projected*	Submitted†	In Press†	Published†
160	62			58	2		1	33
161	47			46	6	2		12
162	24			46	32	3	1	39
163	22			17	4			5
164	35			44	18			9
165	26			22	2		1	12
166	28			21	7	2		23
167	40			33	11			10
168	17			14	47			27
169S				1	28			25
169	14			10	29	1	1	20
170	6			7	15			16
171A	1			3	16			10
171B	15			11	43	2	2	49
172	8			12	36	2		18
173	8			12	19			26
174A	8			8	17	1	3	19
174B	1			2	5			1
175	14			24	24			20
176	17			14	20	1		9
177	7			15	44	3		26
178	8			37	44	1		13
179	15	4	2	1	8	1		1
180	15	26		26	25	1		7
181	21	10	1	9	25	7		6
182	13	16	1	14	37	3		7
183	15	16	5	11	25	6		13
184	23	25	3	5	34	20	12	5
185	9	12	4	7	29	3		5
186	19	19	6	11	11	7		
187	4	3	2		15	2		
188	16	13	4	4	19	6		1
189	14	9	3		50	12		3
190/196	21	13	6		50	9	1	8
191	13	6			16			
192	5	4			20	17		2
193	12	2			27	3		1
194	13	7 Jul 03**			26	1		
195	TBD‡	TBD**						
197	4	5 Jan 04**				1	1	
198	Sep 03‡	23 Feb 04**						1

Notes: * = estimated number of papers at second postcruise meeting. Submitted data = number of papers received (and in peer review) as of 31 January 2003. † = number of published papers ODP has received from authors or has identified in journals. ‡ = date of second postcruise meeting. ** = deadline when initial submissions are due (28 months postcruise). TBD = date to be determined (meeting and deadlines being revised because of SARs).

Table 3. Publication dates of *Scientific Results* and Journal/book papers.

Legs 169–190	= 28-months postcruise	29 – = 48-months postcruise	>48-months postcruise	Total
Scientific Results	0	192	50	242
Journals or books	44	127	115	286
Total	44 (8%)	319 (60%)	165 (31%)	528

Table 4. Number of contributions to "nonproceedings" publications by authors from each country.

Country	Number of publications contributed to	Country	Number of publications contributed to	Country	Number of publications contributed to
Argentina	28	Hungary	5	Philippines	5
Australia	280	Iceland	5	Poland	12
Austria	22	India	96	Portugal	4
Barbados	2	Indonesia	2	Puerto Rico	7
Belgium	54	Ireland	3	Romania	1
Botswana	1	Israel	21	Saudi Arabia	1
Brazil	20	Italy	266	Senegal	1
Bulgaria	1	Jamaica	6	Seychelles	1
Canada	691	Japan	604	Solomon Is.	2
Chile	7	So. Korea	14	So. Africa	20
Chinese Taipei	14	Lebanon	1	Spain	76
Colombia	5	Malaysia	1	Sri Lanka	1
Costa Rica	3	Malta	2	Sweden	136
Cuba	2	Mexico	45	Switzerland	191
Cyprus	6	Morocco	2	Tanzania	2
Czechoslovakia*	5	Namibia	1	Tonga	2
Denmark	80	Netherlands	189	Trinidad/Tobago	2
Dominican Rep.	1	N. Caledonia	3	Tunisia	4
Ecuador	1	New Zealand	119	Turkey	11
Egypt	1	Nigeria	4	Venezuela	2
Fiji	1	Norway	193	UK	1139
Finland	9	Oman	3	Un. Arab Em.	1
France	981	Pakistan	2	USA	5887
Fr. Polynesia	2	P. New Guinea	3	USSR**	269
Germany	1083	P. R. China	82		
Greece	9	Peru	2		

Notes: These figures only account for citations with author affiliation data (see "Database Parameters"). Numbers include serial publications, meetings, and miscellaneous publications (see "Publication Categories").
* Czechoslovakia = 3 "Czechoslovakia"; 1 "Czech Republic"; 1 "Slovak Republic"
** USSR = 142 "USSR"; 104 "Russian Federation"; 1 "Estonia"; 2 "Ukraine"

Table 5. Number of contributions to "nonproceedings" publications by authors from current ODP member countries.

	Serial publication	Meeting Publication	Misc. book, map, etc.	Total
Australia	67	84	2	153
Belgium	6	8	0	14
C. Taipei	7	3	0	10
Canada	159	266	2	427
Denmark	17	16	0	33
Finland	2	4	0	6
France	299	271	16	586
Germany	311	383	16	710
Iceland	1	0	0	1
Ireland	0	0	0	0
Italy	65	53	1	119
Japan	234	134	27	395
Netherlands	68	33	0	101
Norway	63	44	0	107
P. R. China	33	8	0	41
Portugal	1	1	1	3
So. Korea	7	4	0	11
Spain	24	14	0	38
Sweden	50	32	0	82
Switzerland	42	53	3	98
Turkey	3	2	0	5
UK	356	296	9	661
USA	2,128	2,898	106	5,132
Total	**3,943**	**4,607**	**183**	**8,733**

Notes: This list only reflects the country affiliation of the first author. These figures only account for citations with author affiliation data (see "Database Parameters"). Numbers include serial publications, meetings, and miscellaneous publications (see "Publication Categories").

Table 6. Serial publications with 35 or more DSDP- and ODP-related citations, 1969–2002.

Serial Title	Total
EOS	1,490
Abs/prog GSA	910
AAPG Bulletin	296
Earth & Planetary Sci Letters	268
Marine Geology	257
J Geophysical Research	236
Nature (London)	223
Geology (Boulder)	228
Geotimes	194
Intl Geological Congr, Abs (Congres Geolog Intl, Resumes)	173
Marine Micropaleontology	155
Geol Soc Special Publ (London)	154
Paleoceanography	144
Terra Nostra (Bonn)	140
Palaeogeogr, Climatol, Ecology	142
Prog/Abs - Geol Assoc Canada; Mineral Assoc of Canada; Canadian Geophys Union, Joint Ann Mtg (GAC/MAC/CGU)	138
Geochim et Cosmochim Acta	103
Science	100
Annual Mtg [Ext] Abs - AAPG/SEPM	91
GSA Bull	81
Terra Abstracts	78
Geophysical Research Letters	76
JOIDES Journal	76
Chemical Geology	72
Micropaleontology	71
Comptes-Rendus Seances de l'Acad Sci, Ser 2: Mecanique-Physique, Chimie, Sci de l'Univers, Sci de la Terre (several vol title changes)	70
Bull Soc Geologique de France [Huitieme Ser.]	68
Organic Geochemistry	53
Prelim Rpt - Ocean Res Inst, Univ Tokyo	52
AAPG Memoir	51
Palynology	49
USGS Open File Report	49
Geophysical Monograph	48
Maurice Ewing Series	47
J Conference Abs	45
J Foraminiferal Research	45
Spec Publ - Soc Econ Paleon Mineralogists (SEPM) [Soc Sedimentary Geol] [3 titles]	43
Sedimentary Geology	41
Spec Paper - GSA	40
Canadian J Earth Sci - J Canadien des Sciences de la Terre	39
Tectonophysics	36
Abs Geol Soc Australia	35
Trudy - Geol Inst, Akad Nauk SSSR	35

Figure 1. Number of *Proceedings* volume user sessions per month (February 2000–January 2003).

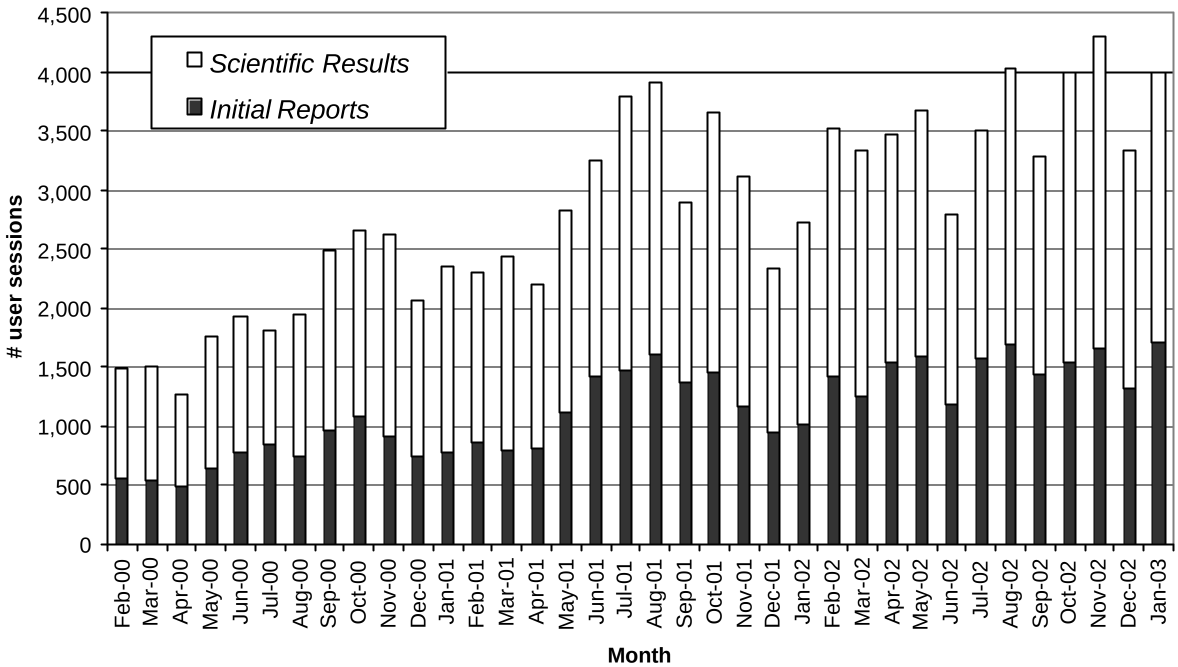


Figure 2. Number of user sessions per *Initial Reports* volume (February 2000–January 2003).

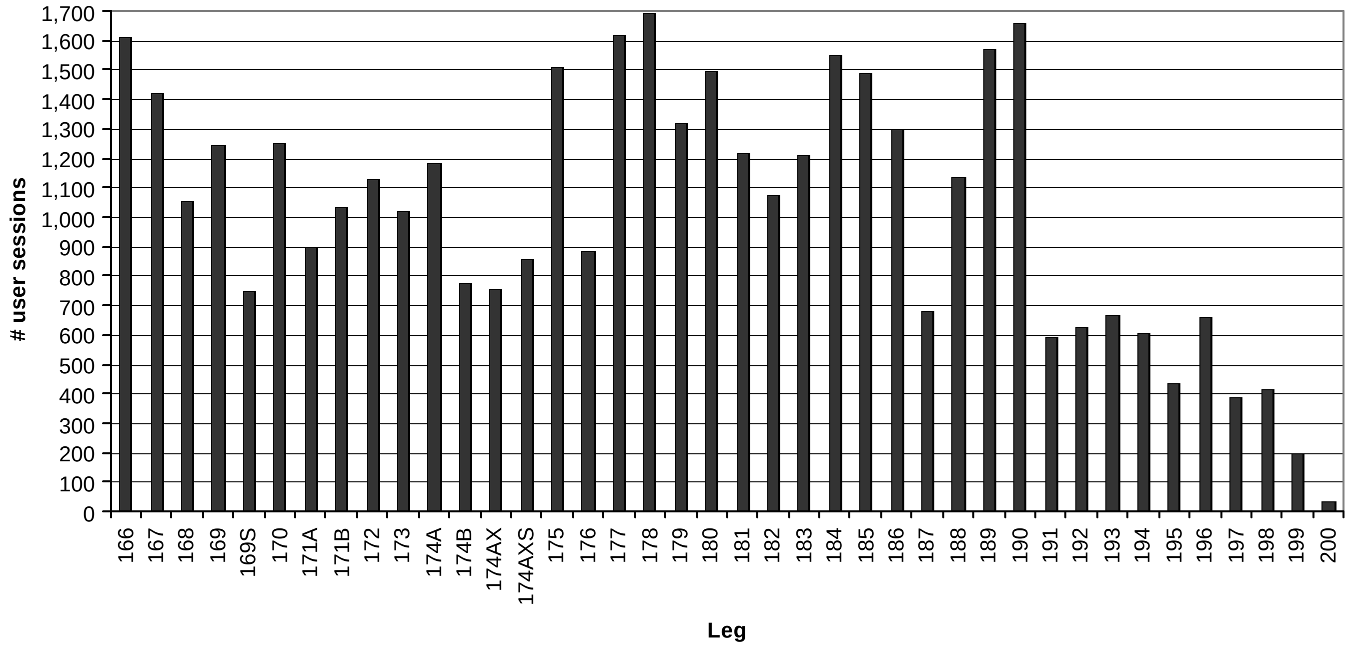


Figure 3. Number of user sessions per *Scientific Results* volume (February 2000–January 2003).

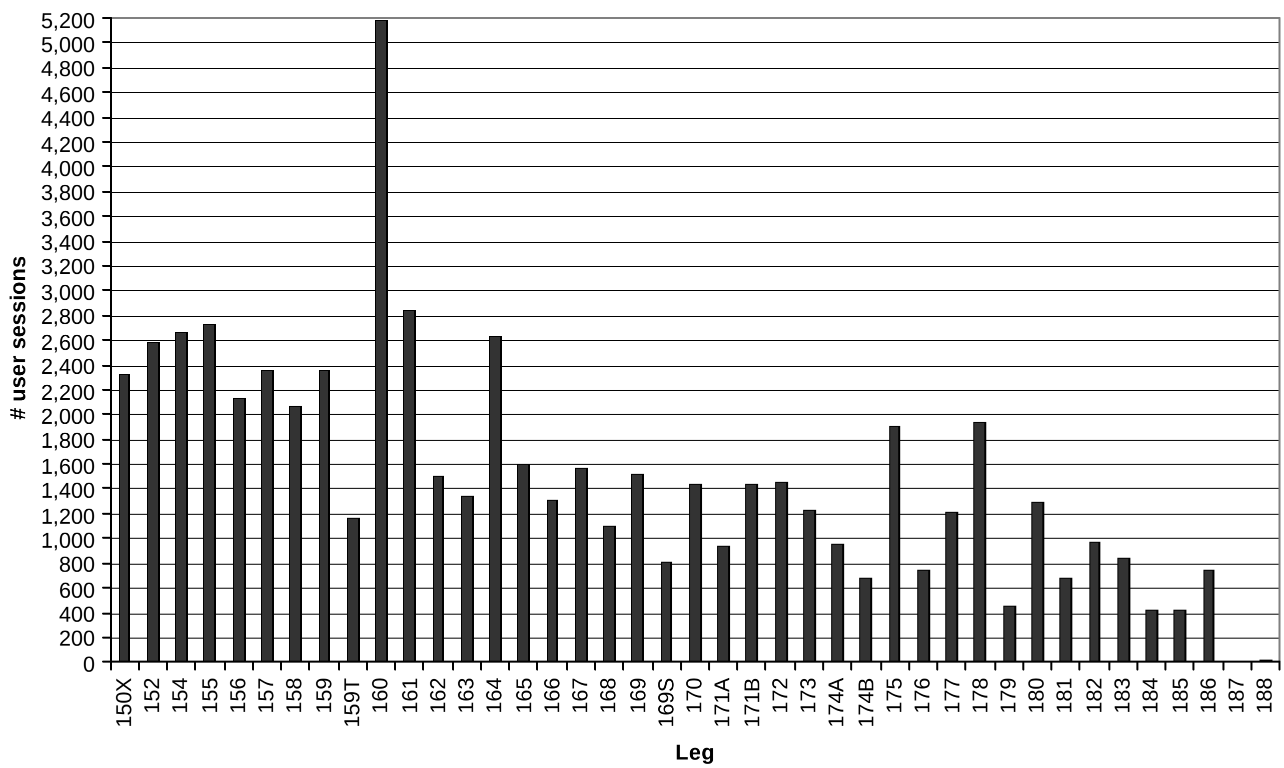
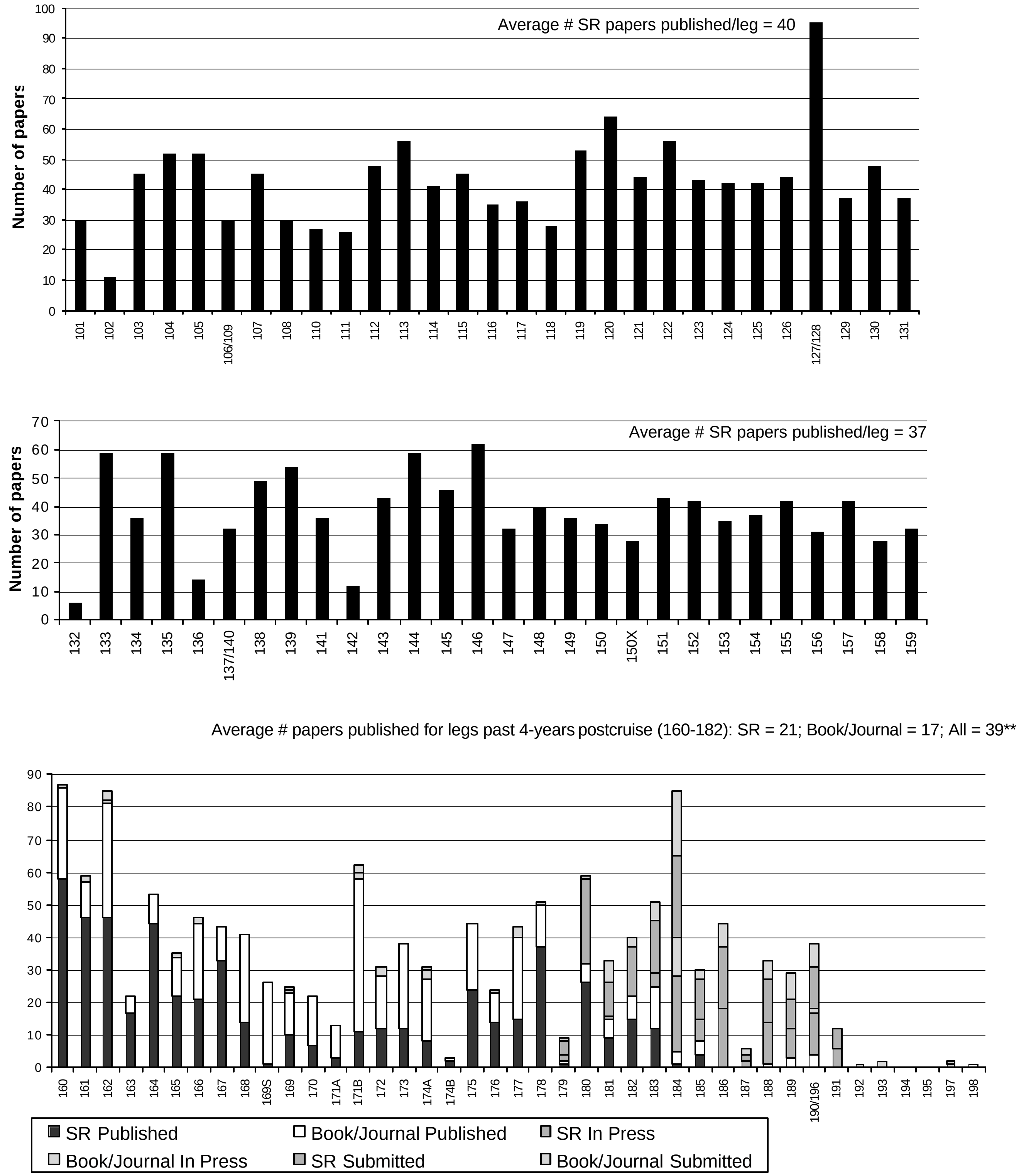


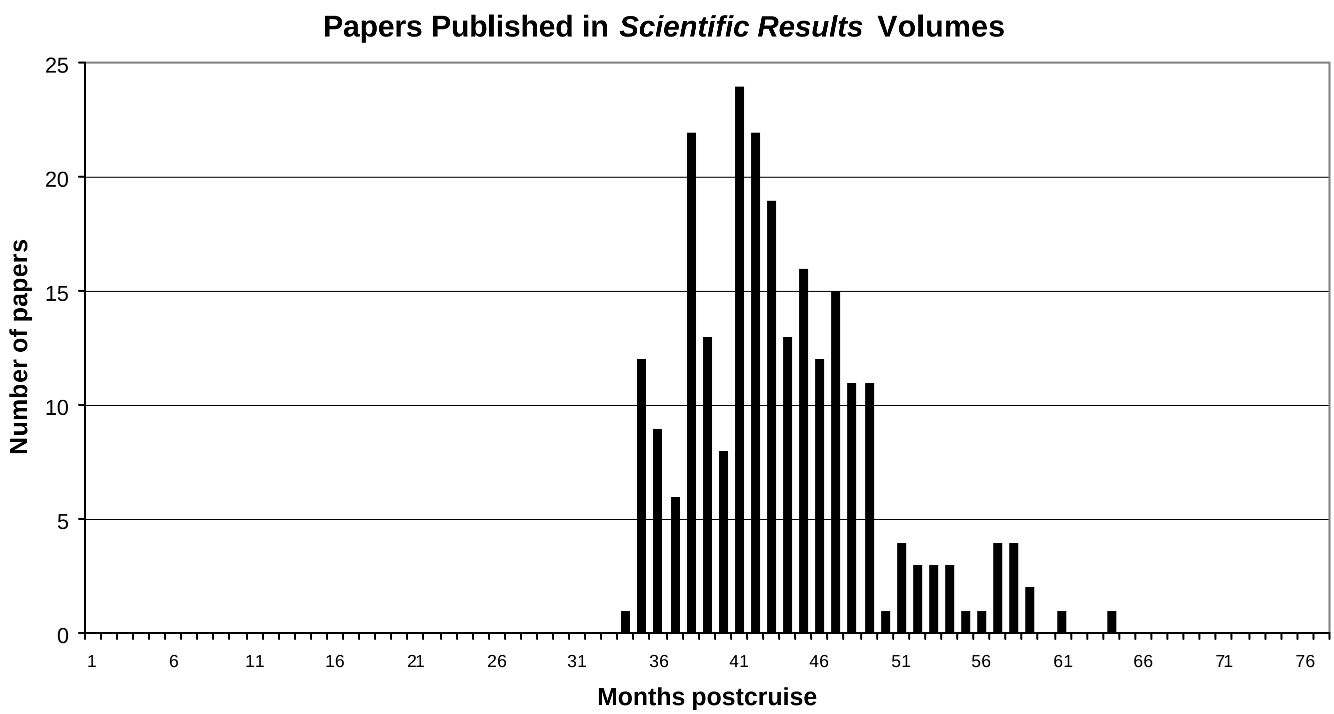
Figure 4. Total number of papers tracked for each ODP leg.*



*Legs 101–159: number of *Scientific Results* papers; Legs 160–198: number of papers published, in press, and submitted to the Scientific Results volume or journals/books).

**Data on papers submitted, in press, or published in books/journals is provided by authors and may not be complete or up-to-date.

Figure 5. Number of papers published per month in *Scientific Results* volumes vs. books/journals.



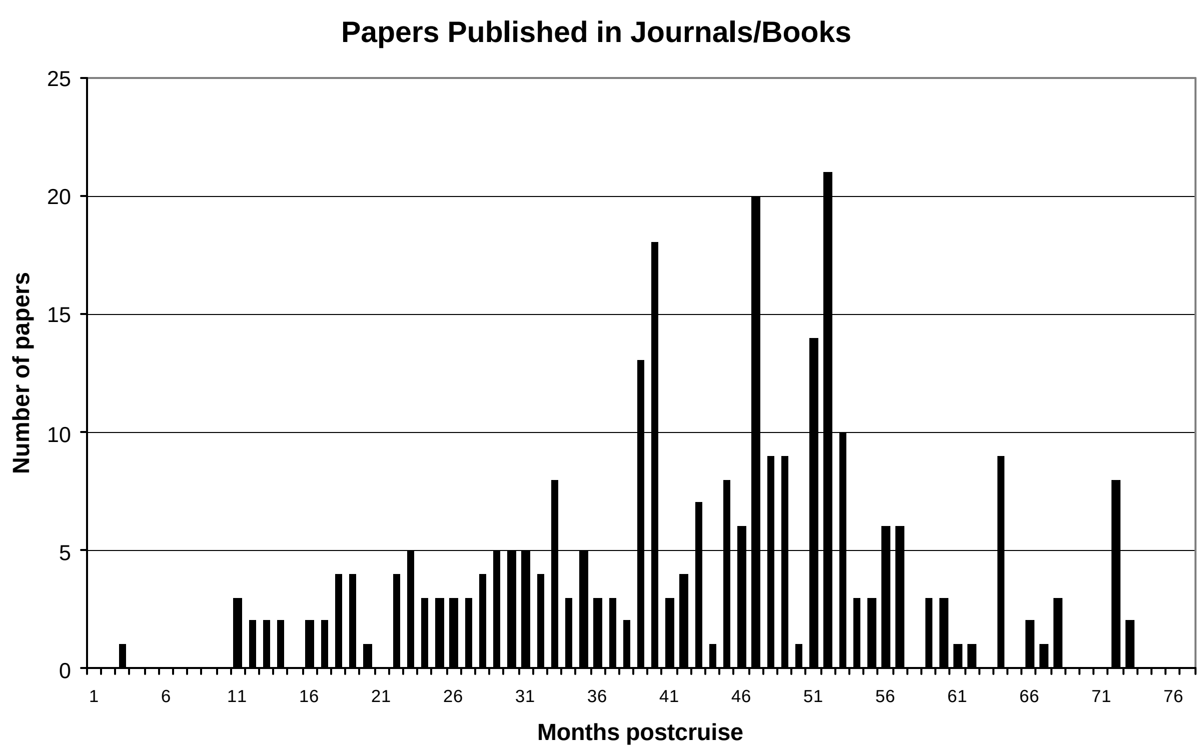
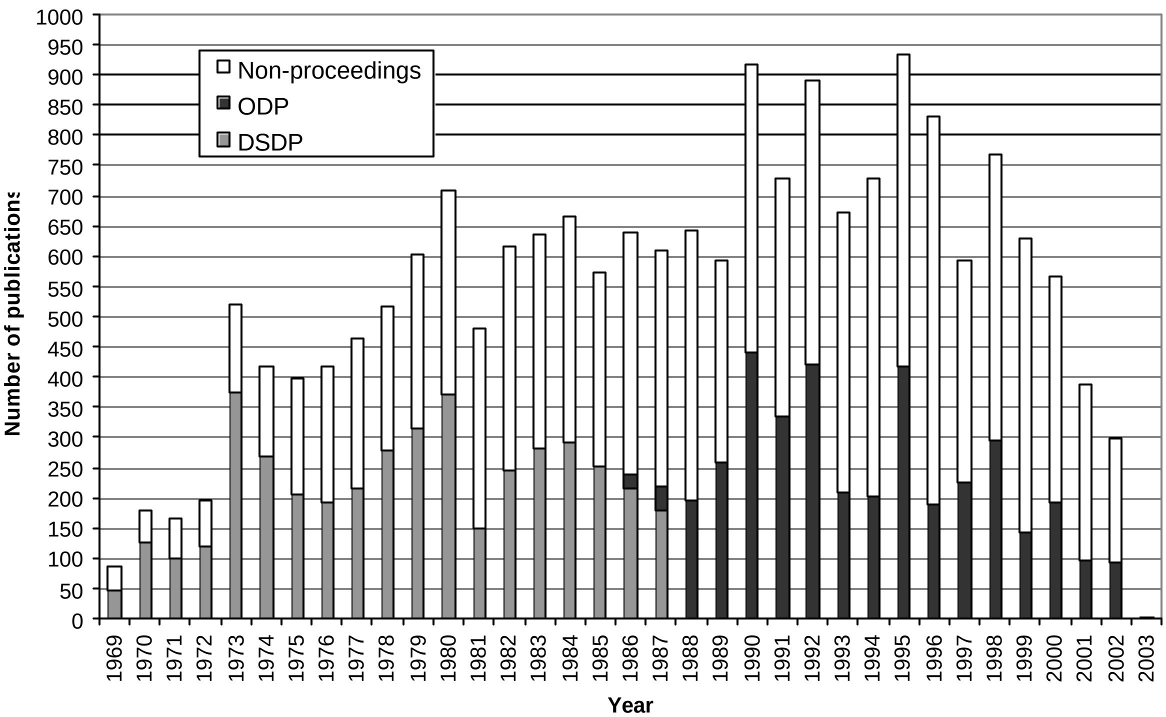


Figure 6. Number of "proceedings" and "nonproceedings" citations per year.



Public Information

Public Information Requests:
During the last six months, ODP/TAMU has responded to 22 requests for scientists, news media, television producers, universities, K-12 schools, government administrators and publishers. The material distributed includes: general PR packages, slide sets, B-roll footage, ODP video Planet in Motion, and the Cretacious-Tertiary Impact Poster.

5.5 LDEO Borehole Research Group (Goldberg)

Executive Summary

Leg 204 Gas Hydrates
Logging-while-Drilling (LWD) and Measurement-while-Drilling (MWD) tools were deployed in ten holes and wireline logging tools were deployed in six holes, an ODP record total of sixteen logged holes during a single leg. Log images can be interpreted to reflect lithological features such as the turbidite sequences and several ash layers, the regional structure, and of particular interest for this leg, the presence and distribution of gas hydrates.

Leg 205 Costa Rica
Standard logging operations were conducted at the reference site on the incoming plate. Conductive features on the FMS images can be used to identify structurally important fractures, and to infer potential fractured intervals, which were important in determining the correct depth to deploy the osmotic samplers. The logs were also significant in identifying the exact depth of the igneous and sediment unit boundary where core recovery was poor.

Leg 206 Fast Spreading Center
In addition to the standard logging tools, the Schlumberger Ultrasonic Borehole Imager (UBI) recorded excellent images of lava flows and pillow basalts at this site. The UBI complements FMS images for fracture analysis, and indicates stress-induced breakouts in the deeper flows.

Leg 207 Demerara Rise
Four holes were logged during this leg. The continuous log data sets measured through the black shale interval provide a basis for producing the full sedimentary stratigraphy in this environment. A synthetic seismogram calculated from the density and velocity data was used as the basis for re-interpretation of the regional seismic data.

Leg 208 Walvis Ridge
The log data provided an assessment of the physical, chemical and structural characteristics of the formation. A number of high-resolution data sets were recorded including gamma ray measurements from the Multi-Sensor Gamma Ray Tool (MGT) and FMS images that are appropriate for detailed to time series analysis. The logs also allowed the identification and characterization of the chert layers, which were poorly recovered in cores.

Drillstring Measurements System (DMS)
Development of the retrievable memory module (RMM) for use with the downhole sensor sub (DSS) is underway. Engineering teams from TAMU and LDEO visited the manufacturer of the downhole sensor sub in mid-January and finalized the system mechanical and electronic design. Deployment of this system is scheduled for Leg 210.

RAB Coring Project
The RAB LWD coring tool was deployed successfully on Leg 204. Core recovery averaged 35% over a 45-m drilled interval during this test, and reached as high as 68%. The cores were processed and archived normally on board the *JOIDES Resolution.* Modifications to the coring apparatus were completed and the system is currently deployed on Leg 209.

Data Migration and Archiving Project
The online database from Leg 101 through Leg 198 was thoroughly reviewed by the database group and a copy was transferred to NGDC for long-term archive. Projects to archive seismic data, sonic waveforms, and multi-channel sonic data are underway.

Special and Third-party Tool Legacy Data.
The ODP Logging legacy will include data collected from specialty tools (e.g., CBTT, NMR, DSA) and third-party tools. Initial efforts for this FY 03-04 project include the identification of the primary points of contact for each tool deployed and the development of a migration plan.

I. MANAGEMENT

The ODP Logging Services FY 03 Program Plan was submitted to JOI in August. The FY 04-07 Program Plan was submitted in October. A draft FY 04 Program Plan was submitted to JOI in January and updated in May.

ODP Logging Services assisted JOI personnel in the updating of the ODP Policy manual.

Stuart Robinson (Oxford Univ.) joined BRG as a logging scientist in November.

Aleksandra Janik (RSMAS, U. Miami) was selected and accepted the open technical services position at BRG. She began work in January.

II. STANDARD LOGGING OPERATIONS

Leg 204 Gas Hydrates

During Leg 204, nine sites were drilled through the gas hydrate stability zone on the southern part of Hydrate Ridge on the Cascadia accretionary margin, offshore Oregon. The downhole logging program was specifically designed to obtain the data needed to assess the occurrence and concentration of gas hydrates on Hydrate Ridge. Logging-while-Drilling (LWD) and Measurement-while-Drilling (MWD) tools were deployed in ten holes and wireline logging tools were deployed in six holes, an ODP record total of sixteen logged holes during a single leg. The US Department of Energy provided additional funding support for an NMR-LWD tool, as well as a modified RAB imaging tool specially designed to be used in conjunction with an ODP core barrel, allowing coring and LWD data recording to be conducted simultaneously for the first time. Vertical, offset, and walkaway VSP data were obtained using the WST-3 tool at Holes 1251H and 1244E and using the VSI (multi-level sensors) at Holes 1247B and 1250F, all in conjunction with the R/V *Maurice Ewing* as the seismic shooting ship.

The wireline and LWD logs, especially the FMS and RAB electrical images, reflect lithological features such as the turbidite sequences and several ash layers, the regional structure, and of particular interest for this leg, the presence and distribution of gas hydrates. The resistivity and acoustic logs were used to estimate the concentration of gas and gas hydrate, and resistivity images identify fault planes that have been filled by gas hydrate. Borehole breakouts, which result from horizontal stress differences, were also observed in the RAB images from several holes in the vicinity of Hydrate Ridge.

Leg 205 Costa Rica

Leg 205 had two primary objectives: determining the history of the uppermost part of the downgoing oceanic plate, and sampling subsurface fluid flow along faults by installing CORKs. Standard logging operations (triple combo and FMS-Sonic toolstrings) were conducted at Hole 1253A, the reference site on the incoming plate. The primary objectives at this site were to characterize the structure and petrology of the igneous basement, determine the alteration mineralogy and distribution and their implications for fluid flow, investigate microbial activity in altered basaltic crust, better constrain the temperature profile, and install the CORK for pressure and temperature monitoring with osmotic samplers for fluid and gas sampling. The logs indicated three lithospheric units on the basis of changes in hole diameter, velocity, resistivity, bulk density, and porosity. These units correspond to an upper igneous unit, sedimentary unit, and the lower igneous unit. The upper and lower igneous units are characterized by low porosity and high density, resistivity and velocity values. Unlike the igneous units, the sedimentary section is characterized by large caliper values, high porosity and low density, resistivity, and velocity. FMS images can be used to characterize the structure and fabric in the igneous units. Conductive features may be used to identify structurally important fractures, and to infer potential fractured intervals, which were important in determining the correct depth to deploy the osmotic samplers. The logs were also significant in identifying the exact depth of the igneous and sediment unit boundary where core recovery was poor.

Leg 206 Fast Spreading Center

Leg 206 was dedicated to coring the upper section of 15-Ma crust on the Cocos plate generated during superfast seafloor spreading in the eastern Pacific. Five tool strings were deployed in the hole: the triple combo toolstring including the Dual Laterolog (DLL), the Formation MicroScanner (FMS)-Sonic (Dipole Shear Imager, DSI) toolstring, the Bundesanstalt für Geowissenschaften und Rohstoffe (BGR) Magnetometer, the Ultrasonic Borehole Imager (UBI), and the Well Seismic Tool (WST). The Schlumberger UBI was used in a hard rock environment for the first time in Hole 1256D and provided excellent images. Three attempts were made to deploy the BGR magnetometer, however the tool failed before it entered the open hole.

The top of the igneous basement consists of a massive lava producing distinctive FMS images with numerous veins of variable dip. This massive unit is characterized by high resistivity, low porosity, and high density. Veins and fractures are observed in the UBI data, and complement the higher resolution data recorded by the FMS. Pillow lobes are easily recognized on the FMS and UBI images at the uppermost part of this interval. In the lower interval, some massive units can be recognized on the FMS and UBI images (resistive zones with abundant veins) but they are more altered and/or vein rich (lower resistivity) than those above. Borehole washouts are seen in the UBI images in the deeper flows penetrated by this hole.

Leg 207 Demerara Rise

The main aim of Leg 207 was the recovery of Paleogene and Cretaceous pelagic oozes and chalks and Cretaceous black shales. Four holes were logged during this leg (Holes 1257A, 1258C, 1260B and 1261B) and standard logging operations and check shot surveys were conducted in each of these holes. The log data were used to locate significant core recovery gaps and to provide a complete stratigraphy through the black shale horizons. Temperature and resistivity data were useful in corroborating pore water chemistry data and indicated the presence of brine flowing through the black shale unit. A checkshot survey was used to calibrate the downhole sonic log. A synthetic seismogram calculated from the density and velocity data was used as the basis for re-interpretation of the regional seismic data.

Logging operations at Hole 1260B provided extremely high quality data. Porosity, resistivity and FMS data show strong periodic signals superimposed on the normal downhole consolidation trend through the Eocene interval, suggesting cyclic variations may be identifiable. Natural gamma logs delineate the black shale facies particularly well, but all the data show distinctive changes in profile shape and a high degree of variability in this interval. Recovered critical intervals, such as the P/E and K/T boundaries, are recognizable in the log and physical property data. As a consequence, lithologic changes and critical event horizons can be correlated to the seismic reflection data with a high degree of confidence.

Leg 208 Walvis Ridge

The objective of Leg 208 was to recover intact sequences spanning the Paleocene/Eocene and Eocene/Oligocene boundaries, as well as the Cretaceous/Tertiary boundary at the deep end-member sites. Three standard logging runs including the Multi-Sensor Gamma Ray Tool (MGT) and vertical seismic profiling using the WST-3 were recorded in Holes 1263A and 1265A. Despite difficult drilling conditions, the acquired log data are generally of high quality and were very useful for achieving the leg objectives.

The log data provided an assessment of the physical, chemical and structural characteristics of the formation, as well as providing the baseline for depth matching the core-derived composite depth (mcd) scale. Formation properties correlated well with the lithostratigraphy and pattern matching between the core and the log data was excellent. A number of data sets were recorded including gamma ray measurements from the MGT and micro-resistivity from the FMS, which measure high-resolution cyclicity that is appropriate for further time series analysis. The FMS logs also allowed the identification and characterization of the chert layers, which were poorly recovered in core in the bottom part of Hole 1265A. Log-seismic integration (time/depth model and synthetic seismograms) also allowed for identification and dating of seismic reflectors at a regional scale.

III. SPECIALTY TOOLS AND ENGINEERING DEVELOPMENTS

Active Heave Compensation/MWD Project

Measurement-while-drilling equipment was successfully deployed on Leg 204. The downhole and uphole drilling dynamics data acquired on this leg will be evaluated with data from Legs 188 and 196, providing analysis of the drilling compensation system in a wide variety of conditions.

Drillstring Measurements System (DMS)

This project is a joint TAMU/LDEO engineering development. The cooperative effort to design the downhole sensor sub (DSS) and the retrievable memory module (RMM) is scheduled to be completed by Leg 210. TAMU is delivering the DSS and LDEO will build the RMM. LDEO and TAMU engineers visited the contractor selected to build the sensor sub and inductive link antennae. A design was agreed upon and machining of parts began immediately. Approximately 25% of the machining for the RMM has been completed. PC board prototyping is also underway and on track for the Leg 210 deployment. Both the DSS and RMM will be tested on Leg 210.

Drill string Acceleration –Extended Memory Version (DSA-XM)
The drill string acceleration tool was repaired after Leg 204. Faulty components were replaced and the system is now being retrofitted into the retrievable memory module (RMM).

RAB Coring Project
The RAB LWD coring tool was deployed successfully on Leg 204. Core recovery averaged 35% over a 45-m drilled interval during this test, and reached as high as 68%. The cores were processed and archived normally on board the *JOIDES Resolution.* The borehole images were processed post-cruise and correlated to recordings of standard RAB tool results in nearby Hole 1149A. The RAB underwent calibration checks, which verified the validity of the acquired data. Some modifications to the coring apparatus, including the manufacture of new shorter core tubes, were recommended after Leg 204. The system was modified and land tested prior to delivery to Rio de Janeiro for deployment during Leg 209.

TAP Tool Replacement
The two new TAP tools delivered for use on Leg 204 were deployed successfully.

Seismic Tool Development
Schlumberger developed, at no cost to ODP, a 3-axis downhole seismic tool and in-line check shot tool for specifically for ODP use. The two new tools were successfully tested on Leg 204. The in-line check shot tool (QSST) will be deployed on Leg 210.

IV. SHIPBOARD LOG ANALYSIS

CLIP (Splicer/Sagan)
The project manager for CLIP support (Stuart Robinson) has updated and expanded the CLIP user guide. The update encompasses information on using both Splicer and Sagan and instructions on using X11 to run CLIP on Mac OSX.

V. SHOREBASED LOG ANALYSIS

The following holes were processed and prepared for inclusion in the database:

ODP Conventional Data
Leg 204 – Holes 1244E, 1245E, 1247B, 1250F, 1251H, and 1252A

Leg 205 - Hole 1253A
Leg 206 – Hole 1256C/D
Leg 207 – Holes 1257A, 1258C, 1260B, and 1261B
Leg 208 – Holes 1263A, 1265A

FMS Processing
Leg 204 – Holes 1244E, 1245E, 1247B, 1250F, 1251H, and 1252A
Leg 205 – Hole 1253A
Leg 206 – Holes 1256C/D
Leg 207 – Holes 1257A, 1258C, 1260B, and 1261B
Leg 208 – Holes 1263A, 1265A

UBI Processing
Leg 206 – Hole 1256D

LWD Processing
Leg 204 – Holes 1244D, 1245A, 1246A, 1247A, 1248A, 1249A, 1250A/B, and 1251A

RAB Processing
Leg 204 – Holes 1244D, 1245A, 1246A, 1247A, 1248A, 1249A, 1250A/B, and 1251A

Temperature Processing
Leg 200 – Hole 1224F
Leg 201 – Holes 1225A, 1226A, 1229A, and 1230A
Leg 204 – Holes 1244E, 1245E, 1247B, 1250F, 1251H, and 1252A

VI. DATABASE

The ODP Log Database has been updated through Leg 208 including Schlumberger original and processed data (conventional, geochemical, and FMS), specialty tools (borehole televiewer, multi-channel sonic, and temperature), borehole images, and sonic waveforms.

Post Cruise Distribution of Log Data
The Leg 197-201 Data CD's have been completed and duplicated. The Leg 202 Data CD is currently in production.

VII. LEGACY PROJECTS

Historical Data Migration
Online data. The online database from Leg 101 through Leg 198 was thoroughly reviewed by the database group and a copy was transferred to NGDC for long-term archive. The next update will be sent to NGDC in June.

Seismic data. All ODP data recorded with seismic tools (WST, WST-3, BGKT, ASI) have been transferred to a Unix directory for future archiving onto a dedicated ODP Seismic CD-ROM. All data available in LIS or DLIS format (25 holes) have been translated into SEG-Y. The seismic archive now contains data from 39 holes.

Sonic waveforms. The sonic waveforms from Legs 143 thru 149 have been converted from DLIS into binary format and put online. The project is estimated to be completed at the end of the summer.

Multi-channel sonic (MCS) data. Data from eight holes have been downloaded into a Unix directory for future archival onto a dedicated ODP MCS CD. Review of the data has been completed, and the data are available online.

Proprietary data. The archiving of all ODP proprietary data has been completed.

Special and Third-party tool data. A project was begun to expand the ODP Logging Database to include data collected with special tools (e.g., CBTT, NMR, DSA) and third-party tools. Initial efforts have included the identification of the primary points of contact for each tool deployed and the development of a migration plan. Current efforts are focusing on the specialty tools. During the next phase of the project, third-party tool proponents will be contacted to determine what data can be included in the database and what formats the data are in. Work is expected to continue through the end of FY 03 and likely into FY 04.

Technical Documentation

Reviewing and updating the documentation of log processing procedures was begun. Efforts focused on updating the documents relating to the process for processing ODP image logs (FMS, RAB, UBI) using GeoFrame.

Tool summary sheets were uploaded to the ODP Logging Services web site (http://www.ldeo.columbia.edu/BRG/ODP/legacy.html). The most recent addition to the list was a technical summary for the RAB coring system.

VIII. PUBLICATIONS AND REPORTS

Barr, S. R., Révillon, S., Brewer, T.S., Harvey, P.K., Tarney, J. Determining the inputs to the Mariana Subduction Factory: Using core-log integration to reconstruct basement lithology at ODP Hole 801C. Geochemistry, Geophysics, Geosystems, 3 November 2002.

Bartetzko, A. and H. Delius, 2002, Application of downhole magnetic field measurements in the identification of petrological variations in basalts, gabbros and volcaniclastic sediments, Eos, Transactions, American Geophysical Union, 83(47), Abstract GP11A-1062, 2002.

Collett, T., Goldberg, D., Guerin, G., Barr, S., and Leg 204 shipboard scientific party, 2003, Assessment of gas hydrate concentrations (saturations) with downhole electrical

resistivity logs on Hydrate Ridge, Abstracts of the Contributions of the EGS-AGU-EUG Joint Assembly, Nice, France, Vol 5, 2003.

Delius, H., T.S. Brewer, P.K. Harvey Petrology of Fe-Ti Oxides in Subaerial and Submarine Basalts and Their Effect on Magnetic Rock Properties Poster presented at the UK ODP Open Forum, London.

Einaudi, F., P. Gaillot, J. Stoll and M. Leven, General Purpose Inclinometry Tool in Hard-Rock Formations. Are Borehole Wall Micro-Resistivity Images Properly Oriented?, Eos, Transactions, American Geophysical Union, 83 (47).

Gaillot, P., ODP-PLOT and MAP-PLOT: Software for integration of geosciences data set. Trans. Eos, Transactions, American Geophysical Union, 83 (47).

Goldberg, D. Data Report: Reprocessing of wireline sonic logs in turbidites and hemipelagic sediments at ODP Site 1173, Proc. Ocean Drilling Program, Sci. Results*,* 190, 2003, in press.

Goldberg, D., Myers, G., Grigar, K., Pettigrew, T., Mrozewski, S., Arceneaux, C., Collins, T., and ODP Leg 204 shipboard scientific party, 2003. Logging-while-coring: first results from a new tool development and field test results, Soc. Prof. Well log Analysts 44^{h} Ann. Sympos*,* in press.

Goldberg, D., G. Iturrino, G., and K. Becker, 2003. Fracturing and fluid flow in the crust: Insights from borehole imaging and other downhole measurements, In: Hydrogeology of the ocean crust*,* H. Elderfield, E. Davis (Eds.), Ch. 4, Cambridge University Press, in press.

Goldberg, D., Janik, A., Johnson, J.E. Moos, D., Flemings, P., Barr, S., and ODP Leg 204 shipboard scientific party, 2003, Stress orientations and estimated in situ strength of gas hydrate—evidence from borehole breakouts at ODP Leg 204 sites, Hydrate Ridge. Abstracts of the Contributions of the EGS-AGU-EUG Joint Assembly, Nice, France, Vol 5, 2003.

Goldberg, D. and Burgdorff, K., 2003. Natural fracturing and petrophysical properties of the Palisades dolerite sill, Geol. Society, London, Special Publ.*,* in press.

Guerin, G., and D. Goldberg, 2002, Sonic waveform attenuation in gas hydrate-bearing sediments from the JAPEX/JNOC/GSC Mallik 2L-38 research well, Mackenzie Delta, Canada J. Geophys. Res.*,* 107 (B5), DOI#10.1029/2001JB000556.

Guerin, G., and D. Goldberg, 2001, Initial evaluation of drilling dynamics on the JOIDES Resolution: measurements of downhole bit motion while coring, Geo-Marine Lett., www.springer.de/link/service/journals.

Guerin, G., and D. Goldberg, 2002, Modeling of elastic wave attenuation in gas hydrate-bearing sediments, Trans. 4th Intl. Conf. on Gas Hydrates, Yokohama (expanded abstract).

Guerin, G., Goldberg, D., Collett, T., Barr, S., and ODP Leg 204 shipboard scientific party, 2003, Acoustic energy dissipation in gas hydrate bearing sediments, ODP Leg 204, Abstracts of the Contributions of the EGS-AGU-EUG Joint Assembly, Nice, France, Vol 5, 2003.

Hesselbo, S.P., Robinson, S.A. and Surlyk, F., Sea-level change and facies development across potential Triassic-Jurassic boundary horizons, southwestern Britain, Journal of the Geological Society.

Iturrino, G.J., and Bartetzko, A., 2002. Subsurface fracture patterns in the PACMANUS hydrothermal system identified from downhole measurements and their potential implications for fluid circulation. Eos, Transactions, American Geophysical Union, 83 (47).

Iturrino, G., and Goldberg, D., 2003, Looking beneath the seabed, ODP Highlights: International scientific contributions from the Ocean Drilling Program, 26-27, Joint Oceanographic Institutions (print document).

Iturrino, G., Goldberg, D., Glassman, H., Patterson, D., Guerin, G., Sun, Y. -F., and Haggas, S., 2003. Shear wave velocity anisotropy from dipole shear logs in oceanic crustal environments, Geol. Society, London, Special Publ., in press.

Ketcham, R.A. and Iturrino, G.J., 2002. Visualization and quantification of three-dimensional porosity variation and anisotropy in altered igneous rocks from deep-sea drilling. Eos, Transactions, American Geophysical Union 83 (47).

Kock, I., Buysch, A. and R. Pechnig, 2002, In-situ petrophysical properties of volcanic rocks from Detroit Seamount (ODP-Leg 197, Site 1203A), Eos, Transactions, American Geophysical Union, 83 (47), Abstract T62A-1287, 2002.

Matter, J. M., T. Takahashi, D. Goldberg, and Z. Alessi-Friedlander, 2002, Secure Long-Term Sequestration of CO_2 in Basaltic Rocks: Results from Preliminary Field and Laboratory Experiments, Trans. Am. Geophys. Union, EOS suppl., 83 (LL).

Myers, G., Goldberg, D., Grigar, K., Pettigrew, T., Mrozewski, S., Arceneaux, C., Collins, T., and ODP Leg 204 Shipboard Scientific Party, 2003, Logging-while-coring—first results from ODP Leg 204, Hydrate Ridge, Abstracts of the Contributions of the EGS-AGU-EUG Joint Assembly, Nice, France, Vol 5, 2003.

Pechnig, R., Stoll, J. and A. Buysch, 2002, Borehole magnetometer data as information source for internal structure and stratigraphic evolution of Mauna Kea volcano, Eos, Transactions, American Geophysical Union, 83 (47), Abstract GP11A-1061, 2002.

Rea, B.R. and Shipboard Scientific Party, Using Core (mcd) to log (mbsf) Depth Miss-Matches as a Basis for Interpreting Core Elastic Rebound and Re-calculating Core

Physical Properties. Results From ODP Leg 199. Poster presented at the UK ODP Open Forum, London.

Rea, B.R., Gaillot, P. and Leg 199 Shipboard Scientific Party ODP Leg 199 - Paleogene Equatorial Transect: Preliminary Logging Results. Poster presented at the UK ODP Open Forum, London.

Rea, B.R. and Shipboard Scientific Party, Using Core (mcd) to log (mbsf) Depth Miss-Matches as a Basis for Interpreting Core Elastic Rebound and Re-calculating Core Physical Properties. Results From ODP Leg 199. Eos, Transactions, American Geophysical Union, 83 (47).

Révillon, S., Barr, S. R., Brewer, T.S., Harvey, P.K., Tarney, J. An alternative approach using integrated gamma-ray and geochemical data to estimate the inputs to subduction zones from ODP Leg 185, Site 801. Geochemistry, Geophysics, Geosystems, 3 November 2002.

Robinson, S.A. and Hesselbo, S.P., Fossil-wood carbon-isotope stratigraphy of the non-marine Wealden Group (Lower Cretaceous, southern England). Journal of the Geological Society.

Williams, Trevor, David Handwerger, Samantha Barr, A high resolution record of Early Miocene Antarctic glacial history from downhole logs, Site 1165, ODP Leg 188, Eos, Transactions, American Geophysical Union, 83 (47).

Wood, J. L., Delius, H., Stewart, D., The Marion Plateau (Coral Sea): Integrating the history of Miocene carbonate platform set-up, subtropical lithofacies development and sea-level change from ODP Leg 194 drilling Poster were at the UK ODP Open Forum, London.

5.6 JOIDES

5.6.1 JOIDES EXCOM Public Affairs Subcommittee(Orcutt/White)

ODP Highlights and Greatest Hits, Volume 2

The JOI and JOIDES offices worked together to finalize a web-based *ODP's Greatest Hits, Volume 2* and *ODP Highlights*, a brochure of hits selected by the SSEPs for their appeal to non-scientists. *Greatest Hits*, *Volume 2* represents nearly 50 submissions by the international scientific community, and *ODP Highlights* contains 20 abstracts and background information helpful to understanding ODP. The abstracts represent a wide range of research, including climate change, microbiology, resources, technology, and the architecture of the Earth. *ODP Highlights* also contains a section addressing frequently asked questions, the "Life of a Core," and brief history of ocean drilling.

All abstracts are available on the web at <www.joiscience.org/greatesthits2>. Of the 7,000 copies of *ODP Highlights*, JOI initially distributed 3,500 internationally to the *JOIDES Journal* mailing list. JOI/JOIDES also distributed copies at the EUG/EGS/AGU meeting in Nice and the JOI/USSSP Education Workshop. JOI is responding to requests from ODP member country office, professional societies such as the American Geological Institute, and individual scientists for additional copies of the document.

Scientific Meetings

For the Fall 2002 Geological Society of America and American Geophysical Union meetings and Spring 2003 EGS-AGU-EUG meeting, JOI staff prepared a binder of abstracts of ocean drilling-related research used as a reference in the booth and press room. A press release highlighted selected sessions of interest to the media. JOI also created and distributed a press release on Town Meetings at the conferences, which led to members of the press, including reporters from *Science*, *Nature* and *Geotimes*, to attend.

JOI also worked with the AGU Public Information Manager to include ODP results in press conferences at AGU meetings. At the Fall AGU meeting, John Tarduno, David Scholl, and Bob Duncan held a press conference on Leg 197 hotspot results. At EGS-AGU-EUG meeting in Nice, Leg 204 Co-Chief Scientists Anne Trehu and Gerhard Bohrmann, as well as ODP scientists Charlie Paull, Erwin Suess, and Jim Kennett, participated in a press conference on hydrates. The well-attended press conference entitled "Gas Hydrates: Free methane found and controversy over the 'hydrate gun'" led to stories in *Nature* and BBC radio, among others.

ODP in the News

JOI staff worked with co-chiefs and staff scientists from each leg to prepare and distribute press releases on each leg except Leg 206. All legs have received coverage in scientific/popular press, and Leg 204 has received the most media attention. Additional articles, along with the press releases for each leg, are updated on the Newsroom portion of our website <http://www.oceandrilling.org/Newsroom/News.html>.

Leg 204

- Cover story for Fall 2002 issue of NETL's Fire in the Ice newsletter
- Business Week (September 23, 2002, p. 67),
- Sea Technology (October 2002, p. 63)
- EOS (September 24, 2002)
- Quadnet (9/9) <http://www.quad-net.com/archive/DRILL9-9ODP>
- Newswise: <http://www.newswise.com/articles/2002/9/GASHYD.NSF.html>
- Eurekalert <http://www.eurekalert.org/pub_releases/2002-09/nsf-sel091002.php>
- Science Daily <http://www.sciencedaily.com/releases/2002/09/020911072713.htm>
- First Break, October 2002 <http://www.firstbreak.nl/>
- Earth and Sky – to come

Leg 205

- Sea Technology, January 2003, pp. 69-70
- ODP France website

Leg 207

- Sea Technology (April 2002, p. 68)
- NSF News Tips
- CORE Weekly Report
- Quadnet

Leg 208

A press release on leg 208 was distributed just prior to this report.

General

- A Sea Change in Ocean Drilling, Dick Kerr and Dennis, *Science*, Vol. 300 pp, 410-411, 2003.
- No Cataclysm Brought Down Maya: New Research Suggests 200-Year Dry Spell and Drought Had Big Role in 'Collapse', Guy Gugliotta, *Washington Post*, March 14, 2003; Page A13.
- Partners Dig Deep for Ocean-Drilling Project, Geoff Brumfiel, *Nature*, Vol 422, 17 April 2003, pp 651.

B-Roll Footage

JOI staff developed ODP B-Roll footage from Leg 204 to distribute to the media. ODP Public Affairs and the IWGSO office shared the cost of the tapes, as the tapes also contain footage from the launch of the *Chikyu* in an effort to underscore the continuation of ocean drilling from ODP to IODP. A script of the footage accompanies the tapes.

End of ODP Celebrations

Plans are underway to celebrate the achievements of ODP during the final year of drilling. Working with an international committee, JOI staff have been planning events in Washington D.C., Bermuda, St. Johns, and San Francisco.

Capitol Hill Oceans Week

To celebrate 20 years of ocean drilling, JOI will hold a reception on Capitol Hill in conjunction with Capitol Hill Oceans Week that features research from ODP that has contributed to understanding policy issues, as well as general information on ODP, IODP, logging, and drilling technology.

Bermuda

In addition to the BBQ and ship tours, recognizing the contributions of the scientific advisory structure of ODP, JOI staff are working with local scientific organizations to conduct tours for local Bermudian scientists and policymakers.

St. Johns

The Canada ODP Office and JOI are working together to plan tours, press conferences, and scientific talks for the final port call in St. Johns. In addition, plans are underway for a celebration to recognize the technical staff during this final crossover port call.

AGU

The JOIDES and JOI offices are working together to plan a special session on the contributions of ODP at the Fall AGU meeting in San Francisco. Plans are also underway for a celebration dinner for scientists who have participated in ODP.

7. IODP Planning

7.1 IWG **(Harrison)**

Report to JOIDES Executive Committee about IWG meetings

Nice 22-23 January 2003

The main point of agreement was that ECORD would provide co-mingled funds equivalent to 2 Participation Units for the first four years of operation of IODP (reminder, PU for year 1 is $1.5m, years 2 and 3 is $3.5M, year 4 is $5m) and will provide additional funds for MSP operations for 2004.

The iPC will submit a proposed rotation scheme for the SPC chair and vice-chair to the IWG co-chairs.

ECORD will provide the CMO founding members with the names and contact information of entities that may be interested in membership of IMI Inc.

7.4 MEXT Report

Japanese IODP activities

A) IODP Planning Committee was established by JAMSTEC on 1st of Nov., 2002
B) Launching the Japan Earth Drilling Science Consortium (IODP Section) on 22nd of Feb. , 2003
The Consortium is an association formed by Japanese scientists whose purpose is to develop a new earth/life science by taking advantage of IOPD activities.

The roles and duties

1) Establishment of IODP international planning management section (CMO) and participation in its management.
 * Selection and assignment of foundation members and board members.
2) Participation in IODP scientific project planning activities.
 * Recommendation and assignment of members of IODP Science Advisory Structures (SAS).
 Establishment of IODP domestic scientific committee, panels, working groups and other organizations.
3) Domestic research development
 * Planning and support of drilling projects and relevant research plans (such as site survey).
 * Securing operating/research budgets for Earth Drilling Science Consortium activities.
4) Review of consignments from the IODP and proposals for them.
 * SAS, Site Survey Date Bank, Core Center, Microfossil Reference Center, and Logging Analysis Center.
5) Miscellaneous
 *Information exchange among participating organizations.
 * Public relations activities
 * Collaboration with East Asian countries

Founders of the Consrtium are Ikuo Kushiro (Head, IFREE), Itaru Koizumi (Professor Emeritus, Hokkaido University), Tomoro Hirasawa (Professor Emeritus, Tohoku University), and Tetsuya Hirano (Professor Emeritus, University of Tokyo), who helped us by writing prospeutus for the establishment of the Consortium. We would like to appreciate their corporation.

By-Laws of Japan Earth Drilling Science Consortium, (IODP Section)

Article 1: Organization of IODP Section
As stated in Article 11 of Japan Earth Drilling Science Consortium -hereafter called CONSORTIUM- regulation, IODP Section –hereafter called BUKAI- is organized within CONSORTIUM.

ARTICLE 2: Purpose
The main purpose of IODP Section shall be to provide science planning and support to facilitate Integrated Ocean Drilling Program, hereafter called IODP, projects and plans.

ARTICLE 3: Activity
IODP Section shall undertake the following activities to fulfill the above stated purpose.
To undertake activities, except as may be otherwise stated below, approval by the consent of the members at the membership meeting is required. Recommendation of the candidate for IMI governors elected by IODP Management International – hereafter called IMI.

1) Recommendations of the candidates for IMI governors elected by IODP Management International – hereafter called IMI.
2) Recommendations of various panel and committee members of IODP/SAS (IODP Science Advisory Structure)

3) Support and suggestions for scientific drilling proposals initiated by Japanese scientists.
4) Recommendation of platform scientists for IODP drilling Programs.
5) Promotion of IODP research results, public relations, and outreach activities.
6) Coordination and organization of committee and special groups, as necessary, for addressing the IODP related scientific matters detailed above.

ARTICLE 5: Executive Committee

The Executive Committee shall consist of a President and several officers, who shall be Nominated by the members of BUKAI, and subject to approval by the Board of Governors. Final approval will be confirmed by majority vote at the membership meeting of BUKAI.

2) The term of the Executive Committee will be 3 years, and the members shall 1be eligible for re-election one more term only.

3) The President will be the Chief Executive Officer of BUKAI, presiding over all activities of the Executive Committee.

ARTICLE 6: Organization of IODP Section

BUKAI will operate the organization stated below.

1) Board of Governors : The Board of Governors will consist of a President and other governors. BUKAI shall pass a resolution to operate this group, which will include selection of the Executive Committee, recommendation of various panel and committee members, recommendation of platform scientists of IODP drilling programs, and etc. Moreover, BUKAI will request recommendations of the IMI Governor candidate, selected by the IMI membership organization, at t all membership meetings.
2) Executives : Executives will consist of a President and a few members appointed by the president and shall prepare draft proposals and/or execute the decisions of the Board of Governors.

ARTICLE 7: Call for the Board of Governors' Meeting

1) Board of Governors' Meeting will be called by a President and the President him/herself will serve as the Chairperson.
2) Board of Governors' Meeting will be effective if attended by the majority of members of the Board of Governors.
3) The proposal in question shall be decided by consent of the majority of the governors. Voting may be in person or by proxy –email vote is acceptable.
4) The members of CONSORTIUM, regardless of whether an associate member, an individual member, or a supporting member, may attend the Board of Governors' Meeting and may give his/her opinion. However, approval of the_Executives is required for the attendance in advance.

ARTICLE 9: Administration

The Administration Office will be set up and will be responsible for administrative matters. The Administrative Office will be composed of Executive division / the Clerk in charge of the organization subject to the President, and Clerk in charge of AESTO. And shall be set up under the organizations subject to the AESTO IODP Promotion Room and the President belongs.

ARTICLE 10: Amendments to the By-Laws

All By-Laws in question shall be subject to amendment by proposal of the Executives, and shall be effective only after the approval by the majority of all members present at the all membership meeting.

Supplementary Clause

1) Effectiveness

This By-Law shall be in effect as of February 22, 2003

2) By-laws of AESTO says the Administration Office of BUKAI, stated in ARTICLE 9 of these By-laws in question, shall come in effect by the conclusion of the protocol between CONSORTIUN and Earth Structure AESTO as stated in the additional Clause 3 of the CONSORTIUM LAW

AESTO : Advanced Earth Science Technology Organization

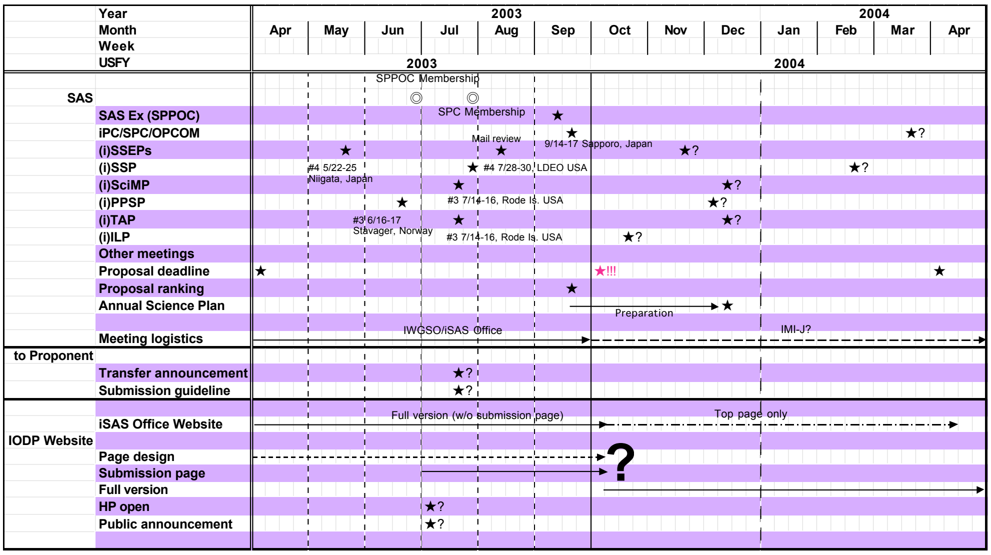
iSAS Office Report

- Transition from iSAS Office to SAS Office -

EXCOM meeting
Bermuda, USA
July 10-11, 2003

Minoru YAMAKAWA
iSAS Office, Yokosuka, Japan

Schedule of Needed Start-up Actions in Support of Smooth Transition from iSAS to SAS



Smooth Transition Items

1 Scientific Drilling Proposal

1) Proponent's Approval Letter for Transferring from ODP to IODP
2) Administration of Submitted Scientific Drilling Proposal
3) Record of Review Processes including External Review

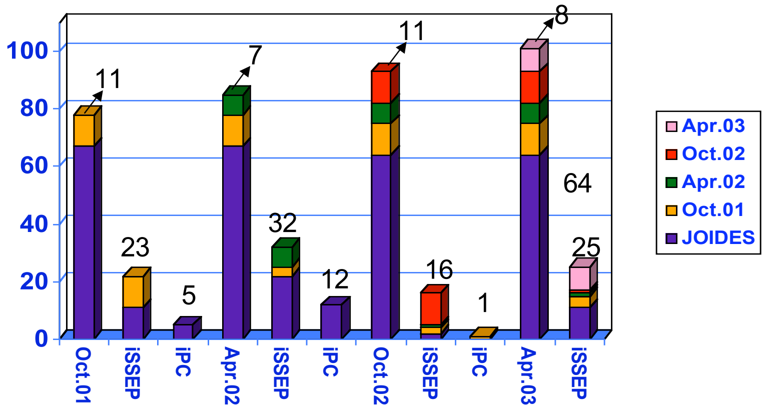
2 iSAS Office Report

4) Document on Interim Science Advisory Structure (iSAS) for the transition to IODP
5) Address List of Members for iSAS Committee and i-Panels
6) Address List of Representatives for Country Members and ODP Members
7) Agenda Book & Minutes of iPC and i-Panels Meetings
8) Outcome from Technical Discussion through i-Panels and Working Groups
9) iPC co-chairs Letter

3 Website

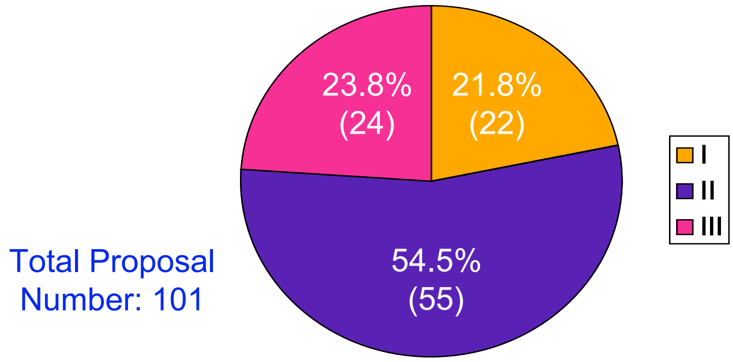
Proposal status (as of April 2003)

Total: 101



Three Broad Scientific Themes for IODP Initial Science Plan

I: The deep biosphere and the subseafloor ocean
II: Environmental change, processes and effects
III: Solid earth cycles and geodynamics

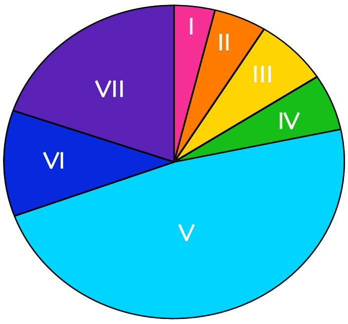


Lead Proponent by Country

Australia	2	New Zealand	2
Belgium	1	Norway	3
Canada	4	South Korea	1
France	4	Spain	2
Germany	10	Sweden	2
Ireland	1	United Kingdom	2
Italy	2	United States	50
Japan	14		
Netherlands	1	**Total**	**101**

Status of Active Proposals (readiness)

I. Up for review 4
II. Already ranked 5
III. Ready for ranking 7
IV. Not ready for ranking 6
V. Reviewed by iSSEPs but not ready for ext. review 48
VI. Reviewed by SCICOM but not updated in iSAS 11
VII. Reviewed by SSEPs but not updated in iSAS 20



Present status of iSAS/IODP active proposals

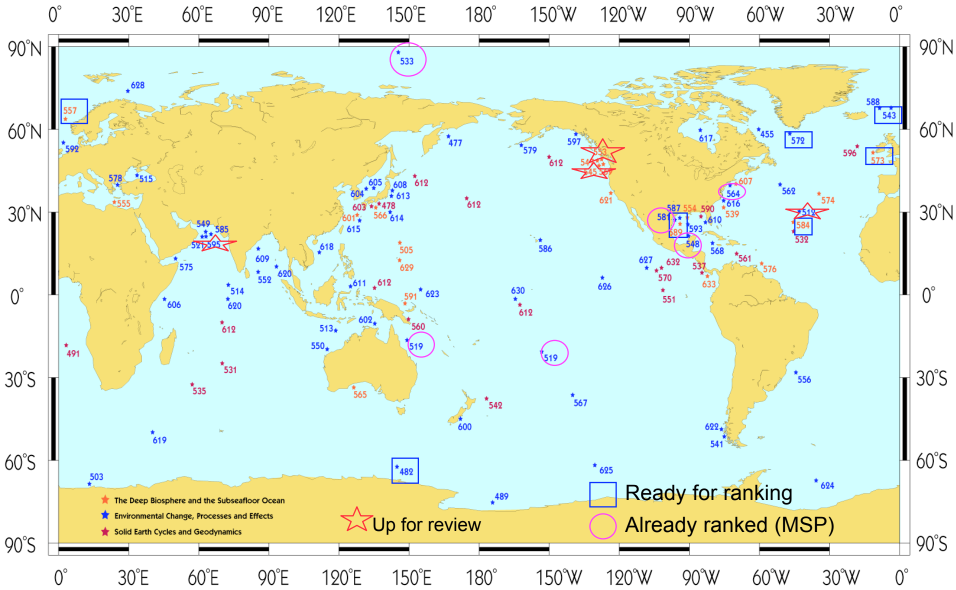
1. Already ranked (MSP)

Proposal No.	Short Title	Lead Proponent	ISP theme
519-Full2	South Pacific Sea Level	Camoin	2
533-Full3	Arctic-Lomonosov Ridge	Backman	2
548-Full2	Chixculub K-T Impact Crater	Morgan	2
564-Full	New Jersey Shallow Shelf	Miller	2
581-Full2	Late Pleistocene Coralgal Banks	Droxler	2

2. Ready for ranking

Proposal No.	Short Title	Lead Proponent	ISP theme
482-Full3	Wilkes Land Margin	Escutia	2
543-Full2	CORK in Hole 642E	Harris	2&1
557-Full2	Storegga Slide Gas Hydrates	Andreassen	1
572-Full3	Late Neogene-Quaternary climate records	Channnell	2
573-Full2	Porcupine Basin Carbonate Mounds	Henriet	1&2
584-Full2	TAG II Hydrothermal	Rona	1
589-Full3	Gulf of Mexico Overpressures	Flemings	1

IODP Proposed Sites



Outcome from Technical Discussion through i-panels and Working Groups

Policies and Principles

Guideline & Criterion for Scientific Drilling Proposal

Working Group's Report (partially in Progress)

Policies and Principles

○ IODP Principles of Scientific Investigation

○ Proposed Mandate for IODP Operations Committee

○ IODP Policy Statement on Ancillary Projects

○ IODP Sample and Data Policy

Guideline and Criterion for Scientific Drilling Proposal

○ Guide to the Integrated Ocean Drilling Program

○ IODP Project/Proposal Development Evaluation Procedures

○ Guidelines for Submitting Proposals to iSAS

○ Guidance to Proponents

○ Development, Evaluation and Planning of Multi-phase, Multi-Platform, Complex Drilling Projects (CDPs)

Working Group Reports

○ Procedures and Requirements for an IODP Databank

○ IODP Safety Manual for Riser Drilling

● Matrix Working Group Report
-to provide IODP a more automated and integrated way of informing proponents what data types are needed to characterize a drill hole.

● Database Working Group Report
-to achieve database consistency and availability across all IODP.

● Project Management Working Group Report
-to develop the project management system, using existing industrial project strategies.

● Project Scoping Working Group Report
-to develop project description, risk analyses, preliminary cost estimates and project planning.

● Microbiology Working Group Report
-to examine the conditions and duration of sample storage and to make sure of importance of patent rights and to formulate the requirements for data reporting and publication.

7.7 OD21 Report **Kinoshita**

OD21/CDEX Report for EXCOM / ODP Council Meeting
July 10-11, Bermuda

OD21 Program Department and CDEX in JAMSTEC have made continued progresses toward the IODP official start in October 2003 and beyond.

1. "Chikyu" Construction
Accommodation and laboratory outfitting for "Chikyu" were completed in Tamano, Japan this spring. Then she underwent the sea trial of the ship hull part including evaluations of the vessel's Dynamic Positioning System (DPS) off the coast of Shikoku from late April to mid June. Finishing the sea trial, "Chikyu" moved to Nagasaki early in July and has just begun to install the vessel's drilling systems. After the installation is completed, the sea trial of the whole system will be performed. The vessel's construction will be completed in 2005 and then the training cruise is planed for about a year to be ready for IODP international activities in late 2006.

2. CDEX
CDEX, established last October as the operator of "Chikyu" and headed by Dr. Asahiko Taira, has been conducting various preparations for "Chikyu's" safe and efficient operations; (1) forming an HSE management system and organizations, (2) developing drilling plans for the training cruise, based on the site survey data acquired in 2002&3, and (3) building science support systems and structures for core analysis and repository at both onboard "Chikyu" and onshore. CDEX has been cooperating with the JAMSTEC engineering/vessel constructing department and will provide advices on the drilling systems installation and commissioning from operator's point of view.

3. Japanese Core Center
The Center for Advanced Marine Core Research at Kochi University completed the construction of its new research laboratory in March 2003. The laboratory will have capabilities to store core samples collected by "Chikyu" in refrigerator and freezer storage areas, and will provide measurement and analysis capabilities for technicians and researchers. The center celebrated the laboratory's opening on May 24, 2003.

7.9 U.S. Plans **Allan**

IODP PROGRAM PLANNING

The Memorandum between NSF and MEXT for IODP has been signed.

The acquisition process for the U.S. assets and operational components, including the non-riser vessel and associated science support, is progressing. In November, 2002, the National Science Board (NSB) approved release of the Request for Proposal (RFP) for the U.S. System Integration Contractor (SIC), outlining an expected strategy for providing a non-riser drillship and its scientific support services for IODP. As funds for conversion of this non-riser ship for IODP use were deferred from the President's FY2004 budget, the NSB was briefed in early March, 2003 on a new strategy of drillship procurement. After initial identification of the SIC, the SIC will, together with the NSF, procure a Phase 1 non-riser drilling ship that is capable, without significant modification, of scientific IODP drilling for approximately 2 legs in late FY2004 and others in FY2005. Conversion funds, currently estimated at about $90M, are expected to become available in FY2005 or 2006, and will result in the SIC and NSF procuring and converting a Phase 2 non-riser drillship for IODP drilling. This Phase 2 vessel will be used for non-riser drilling for the remainder of the 10-year IODP.

On March 4, a synopsis of the RFP was released, outlining the new strategy for providing a non-riser drillship and its scientific support services for IODP. On March 18, the RFP for the U.S. SIC was released (http://www1.eps.gov/spg/NSF/DCPO/CPO/DACS-03-00001/listing.html), with a May 5 deadline for proposals. The evaluation process is currently underway. NSF expects to award the U.S. SIC contract this summer.

NSF, MEXT, and interim officers of IODP Management International, Inc. (IMI) will meet with representative leaders of iSAS May 29-30 in Austin, TX to discuss IODP coordination and planning efforts and CMO start-up activities. Dr. Paul Stoffa, interim President of IMI, will be the host.

NSF has requested that the U.S. Science Support Program (USSSP), through the Joint Oceanographic Institutions, Inc., formulate a process for identifying: 1) U.S. members of the IODP Science Policy and Planning Oversight Committee (SPOCC), the Executive Authority of the IODP; 2) U.S. members of the Science Planning Committee (SPC); and 3) the SPC Vice-Chair.

DRAFT

FY 04 Program Plan for the Ocean Drilling Program

Submitted

April 18, 2003

to

National Science Foundation

Table of
Contents

Executive Summary

Ocean Drilling Program Organization

The Ocean Drilling Program (ODP) is an international partnership of scientists and research institutions organized to explore Earth's history and structure as recorded in the ocean basins. ODP provides sediment and rock samples (cores), shipboard and shore-based facilities for the study of these samples, downhole geophysical and geochemical measurements (logging), and opportunities for special experiments to determine *in situ* conditions beneath the seafloor. ODP studies have led to a better understanding of plate tectonic processes, Earth's crustal structure and composition, environmental conditions in ancient oceans, and climate change.

ODP is funded by the US National Science Foundation (NSF) and by international partners, which currently include: the Australia/Canada/Chinese Taipei/Korea Consortium for Ocean Drilling, the European Science Foundation Consortium for Ocean Drilling (representing twelve countries), France, Germany, Japan, the United Kingdom, and the People's Republic of China. The ODP Council, representing all of these partners, provides a forum for consultation among the NSF and other national funding agencies.

Scientific advice for ODP is provided by the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES), an international organization of advisory committees and panels. The scientific basis and justification for ODP was initially documented in the report on the Conference on Scientific Ocean Drilling (COSOD) held in November 1981. The COSOD report identified twelve major scientific themes around which JOIDES continues to develop specific drilling plans. The report of a second COSOD meeting (COSOD-II) held in July 1987 provides the framework for scientific ocean drilling through the 1990s. The first ODP *Long Range Plan*, published by Joint Oceanographic Institutions, Inc. (JOI) in 1990, distills COSOD-II themes, JOIDES panel white papers, and other scientific and technical advice into a scientific and engineering road map through 2002. The latest ODP Long Range Plan (referred to here as LRP), published in 1996, updates and extends the 1990 Long Range Plan to provide a vision into the twenty-first century. ODP Planning documents may be accessed at www.oceandrilling.org/Documents/Docs.html.

Overall program management is provided by Joint Oceanographic Institutions (JOI). JOI contracts with Texas A&M Research Foundation (TAMRF) for business services and Texas A&M University (TAMU) to serve as Science Operator, and with the Borehole Research Group at Lamont-Doherty Earth Observatory (LDEO) to serve as Logging Operator and also to provide Site Survey Data Bank Services. The Science Operator is responsible for operation of the drillship, *JOIDES Resolution* , and associated activities of cruise staffing, logistics, engineering development and operations, shipboard laboratories, curation and distribution of core samples and data, and publication of scientific results. The Logging Operator is responsible for providing a full suite of geophysical and geochemical logging services, involving acquisition, processing and interpretation of logging measurements. The Site Survey Data Bank prepares safety packages for pre-cruise review of designated sites, and supplies each shipboard scientific party with the geophysical data necessary to properly conduct scheduled drilling cruises. The Data Bank also assists scientists interested in developing ODP proposals by providing information in regards to scientific problems of interest to the scientific ocean drilling community.

Coordination of the ODP Program Plan

Primary scientific programs are based on proposals submitted by the international science community to the JOIDES Office. Reviews of these scientific proposals are completed by various JOIDES advisory panels that then make recommendations to the JOIDES Science Committee (SCICOM) for implementation. From this input, SCICOM writes a science plan and submits it to JOI. JOI prepares the program plan from the science plan with budgetary input from subcontractors. The program plan is reviewed by the JOIDES Executive Committee (EXCOM) and forwarded by JOI to NSF for formal approval.

This program plan is different from previous plans in that this is the first year of the phase out of the Ocean Drilling Program and no field operations will be conducted. This program plan outlines the activities in five areas: 1) Continues support of scientific activities of field program including publications of final reports and management of data and sample moratoria; 2) final demobilization of all equipment removed from the *JOIDES Resolution*; 3) migration of all ODP digital data into the relational data base Janus; 4) permanent archival of all digital data at the National Geologic Data Center (NGDC) in Boulder Colorado and; 5) preparation of an extensive set of legacy documents that will record the laboratory and engineering development activities of ODP.

In this executive summary of the FY04 program plan we outline the scientific highlights since the last program plan (ODP Legs 204 to 207), the phaseout \activities of FY04 and, provide a summary of the FY04 budget request.

FY 03/04 Field Programs (Legs 198 – 210)

During the period from October 2001 until January 2003 nine cruises were completed by the Ocean Drilling Program (ODP), Legs 198 – 206. In the Program Plan (PP5-20) we summarize the scientific goals accomplished in the format first laid out by the ODP Long Range Plan (LRP), published in 1996. The LRP plan outlines the fundamental scientific objectives of ODP that guides the evaluation and ultimate selection of field activities. Four further ODP cruises (Legs 207-210) are scheduled between January 2003 and the end of the final phase of ocean drilling in October 2003. Although these cruises have yet to take place their aims and objectives are also summarized in terms of the Long Range Plan.

FY04 Program Activities

Post cruise support – ODP Publications

During FY04 one Preliminary Leg Report will be produced, six *Initial Reports* and five *Scientific Results* volumes will be published. Beginning in FY05, all *Initial Reports* work will be completed. Thus, the central tasks for the Department will be the coordination of the peer-review process for the *Scientific Results* volumes for Legs 189–209; production of the *Scientific Results* volumes for Legs 187–192; management and production of leg citation lists and associated citation reports; development of a cumulative index; and daily management of budgetary tasks.

Demobilization

By 30 September 2003, all scientific equipment will be removed from the *JOIDES Resolution*. Starting 1 October this equipment will be fully inventoried, refurbished and stored in preparation for transfer to the new Integrated Ocean Drilling Program (IODP). This will be a major activity of the Science Serviced Department of the Science Operator and at the Bore Hole Research Group.

Data Access and Data Migration

Full support of the ODP relational database (Janus) is provided in FY04. Activities include the continued web access of ODP digital data, maintenance of the data moratorium policies for legs completed in FY03 and the final migration of pre-Janus ODP data. By the end of FY04, all data except the micropalenotologic/biostratigraphic data sets, will be incorporated into Janus.

Data Archival

To provide a permanent archival of ODP shipboard data, including all logging data, ODP will be generating digital data tables in ASCII format to be archived at NGDC. NGDC guarantees that these data files will be available on computer readable media "forever". Meta data files documenting data processing and laboratory procedures will also be archived. All data tables and meta data files will be reviewed by members of the scientific community to assure that all relevant information is in the data archive.

Legacy

In addition to the publication and data archival activities there are two goals in our effort to preserve the ODP Legacy:

- Documenting and annotating designs of drilling and scientific equipment pertinent to IODP.

- Creating a record of the analytical procedures used during the acquisition of data aboard the JOIDES Resolution.

To achieve these goals ODP will be preparing over 20 operational reports and databases, 25 tool operations manuals and 46 engineering technical notes. To assure wide access to these and other legacy material of ODP, JOI plans to maintain a central ODP legacy website. This site can be distributed on computer media and centrally maintained on a long term basis.

Other Activities - Review of ODP

During FY04 two important review activities will be completed. The JOI Inc. and NSF contract specifies a regular review by a Performance Evaluation Committee. In FY04 the last of these committees will be convened to assist in the evaluation of the final phase out activities of ODP. Issues to be considered by PEC VI include:

- The committee should assess to what extent the goals set up in the Long Range Plan have been achieved, ***and to what extent the program was implemented in comparison to the Strategic Implementation Plan 1998 to 2003 presented by JOI (1997).***
- The committee should examine all aspects of the phase out program.
- The committee should look at all aspects of the phase out as it impacts the commencement of the new IODP drilling program.
- The committee should assess provisions to present and preserve the legacy of ODP. This should include the legacy of cores and core repositories, the legacy of tools and techniques, the legacy of databases and the scientific legacy. Since the science will not be completed for several years after the formal end of ODP, it is necessary to ensure that adequate plans are in place for carrying out this task until the end of the program in the absence of an international oversight group.
- The committee should assess the effectiveness of the JOI program management and the JOIDES scientific advice structure, which was changed in the middle of ODP on the advice of a previous PEC, ***to determine whether these are the most appropriate models*** for the IODP, and if not, suggest changes.

The second review activity is the Co-Chief review. Approximately every 2-3 years, a Co-Chief Review is held to retrospectively examine how ODP has performed in meeting the scientific objectives of the drilling legs in the period since the last co-chief review. In 2004, JOI will host the final co-chief review meeting (the last being held in April 2001). All facets of ODP will be discussed, including: Scientific Advice (JOIDES); Science Operations (TAMU), Logging Operations (LDEO), Site Survey Data Bank (LDEO), management (JOI), and any other relevant aspects. A report from the review will be prepared by JOI, and forward to NSF and other appropriate parties.

Budget Overview

This Program Plan budget requests $12,927,935 for FY04 the first year of the phase out of ODP operations. The total FY04 budget is summarized in Table ES-1. As noted above, there are no operations planned for this year and the mark reduction compared to previous program years reflects the end of the field program and the associated decrease in personnel. (Table ES-2). Detailed budget justification can be found in the Appendices of the FY04 Program Plan.

Table ES-1. Budgets for FY 03 and FY 04 ($K)

TAMU	**FY03**	**FY04**
Science Services	4,020	2,450
Drilling Services	3,699	2,139
Information Services	2,369	1,732
Publications	1,619	1,692
Headquarters/Administration	1,855	1,983
Ship Operations	23,838	-
TOTAL TAMU	**37,400**	**9,996**
LDEO	**5,427**	**1,325**
JOI/JOIDES	**2,473**	**1,606**
TOTAL ODP BUDGET	**45,300**	**12,927**

Table ES-2 ODP FTE Comparisons for FY 01 - FY 03.
Additional details are provided in the TAMU and LDEO appendices.

TAMU	FY02	FY03	FY04 (start/end of yr)
Headquarters/Administration	24.80	24.80	25.15/23.00
Publications	23.00	22.00	19.00/19.00
Drilling and Engineering	19.50	19.50	20.00/16.00
Science Services	51.50	48.50	48.50/10.50
Information Services	26.25	26.25	27.00/19.00
Total	145.05	141.05	139.65/86.50
LDEO			
Borehole Research Group	12.58	12.58	4.01
NEB-LMF	1.58	1.58	1.58
University of Leicester	2.05	2.05	2.05
University of Aachen	.50	.50	.50
Ocean Research Institute	.50	.50	.50
Total	17.21	17.21	8.54
JOI/JOIDES			
JOI Direct	7.50	6.75	5.10
JOIDES Office (RSMAS)	2.75	2.75	0.25
ODP Data Bank	4.00	4.00	4.00
Total	14.25	13.50	13.50
TOTAL	176.51	171.76	171.76//118.61

Ocean Drilling Program Organization

Organizational Framework

The Ocean Drilling Program (ODP) is funded by the US National Science Foundation (NSF) using commingled funds from the US and the international partners, that currently include the Australia-Canada-Chinese Taipei-Korea Consortium, the European Science Foundation Consortium for Ocean Drilling, Germany, Japan, the United Kingdom, the People's Republic of China and France. The ODP Council provides a forum for consultation between the NSF and the international funding agencies.

The technical management relationship for ODP consists of four basic components: the overall Program Manager, Joint Oceanographic Institutions, Inc. (JOI); the scientific advisory structure, Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES) with a main office presently supported at the University of Miami; the Science Operator Texas A&M University (TAMU); and the Logging Services Operator, Lamont-Doherty Earth Observatory (LDEO). The management relationship among these components is illustrated in Fig. PP-1.

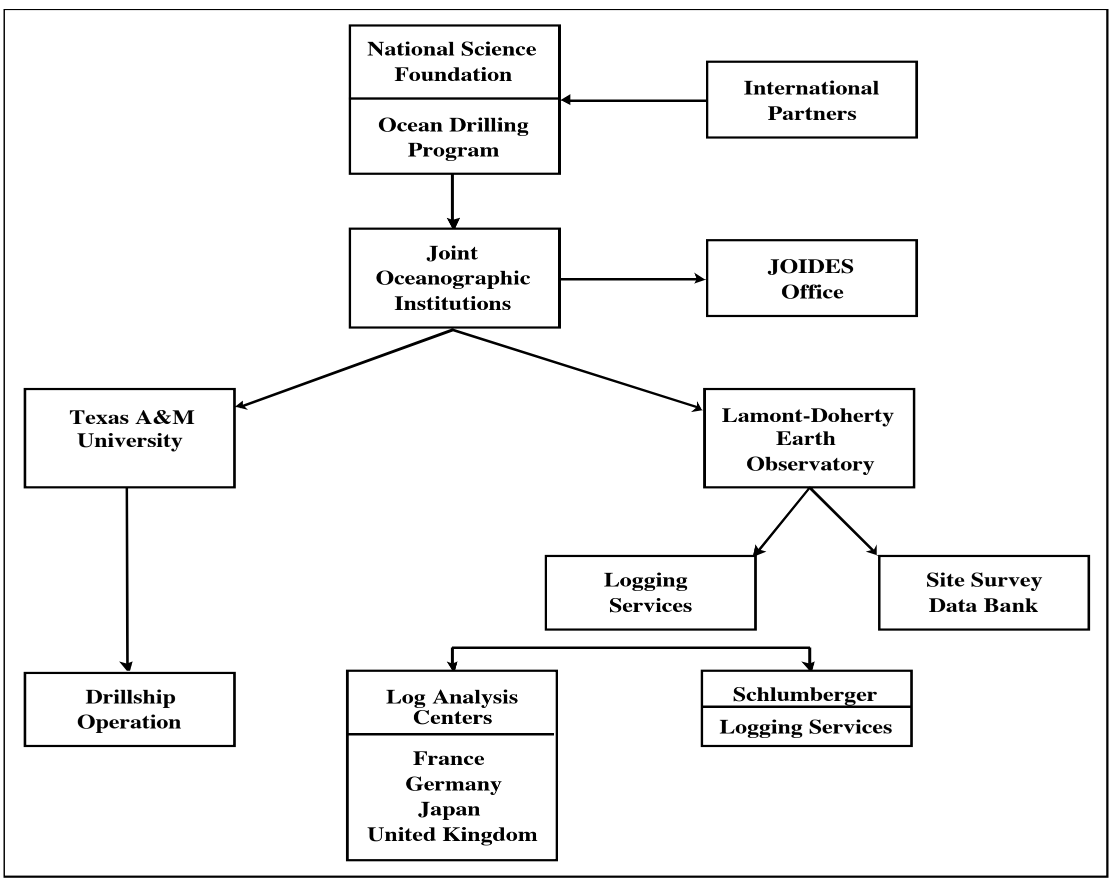


Figure PP-1: ODP Management Structure

In considering the organization of ODP, it is important to bear in mind that not only are the organizational components physically separated, but also that the program organization cuts across institutional lines. For example, LDEO houses portions of three different ODP organizational components (i.e., logging services, ODP Site Survey Data Bank and the TAMU-operated ODP East Coast Core Repository).

Program Manager

ODP is managed by JOI as the prime contractor to NSF. JOI is a consortium of eighteen major U.S. oceanographic institutions (in legal terms, a not-for-profit corporation), which provides management support to large, multi-institutional, international, scientific research programs such as the ODP. JOI is located in Washington, DC. In FY04 we anticipate a staff of 21 of which approximately 5.1 Full Time Equivalents (FTE) will be charged to ODP as compared to 6.75 FTE in FY03. JOI provides scientific, contractual, management, and fiscal links between NSF and the various operational and advisory components of ODP. Figure PP-2 shows the organizational chart for JOI as well as changes in FTE for each JOI employee from FY03 to FY04.

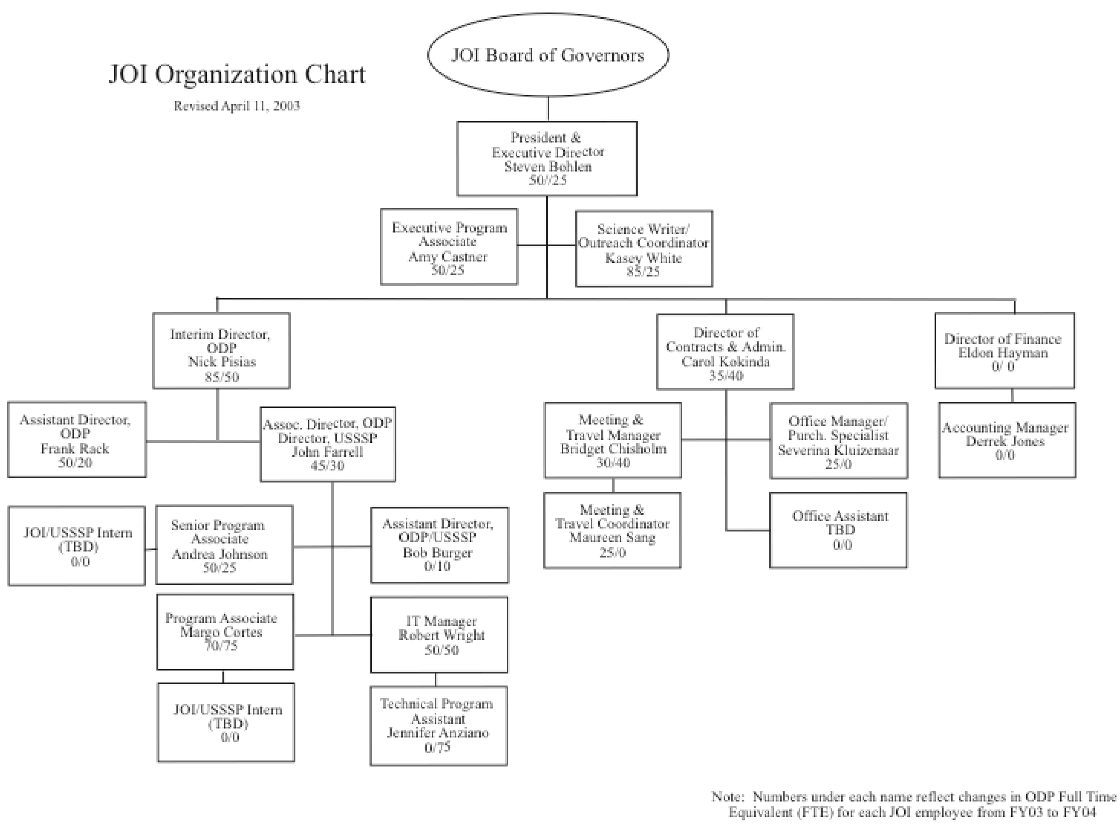


Figure PP-2: JOI Organizational Structure

Scientific Advisory Structure

The scientific objectives of ODP were established by JOIDES panels, international groups of scientists drawn from the JOI institutions, other US institutions, and representatives of the non-US partners. JOIDES panels provided planning and program advice to JOI with regard to scientific goals and objectives, facilities, scientific personnel, and operating procedures. With the end of ODP, the JOIDES panels will not be active after the end of FY03. However, to complete final publications of the JOIDES Journal the JOIDES Office will be extended at the University of Miami through a no-cost extension.

ODP Site Survey Data Bank

The ODP Site Survey Data Bank, formerly the IPOD Data Bank, is located at LDEO and is funded by a subcontract from JOI. It has served the JOIDES community since 1985 by cataloging, collecting, and distributing site survey and other geophysical data to various panels and individuals associated with scientific ocean drilling. The Data Bank staff is planned to be 4 FTEs in FY04. Activities for the Site Survey Data Bank will include support of planning activities for the new Integrated Ocean Drilling Program (IODP) in addition to archival and legacy activities planned for FY04.

Science Operator

Texas A&M University (TAMU), located in College Station, Texas, serves as Science Operator for ODP through a contract between JOI and the Texas A&M University, JOI also contracts with Texas A&M Research Foundation (TAMRF) for business services. As Science Operator, TAMU is responsible for implementing science and operations, including managing the operation of the *JOIDES Resolution* (owned and operated by Overseas Drilling, Ltd. [ODL]); engineering development and improvement of drilling technology; selecting scientists for the shipboard scientific parties; designing, furnishing, staffing and maintaining shipboard laboratories; curation and distribution of all core samples and core-related data; publishing scientific results; and working with JOI to provide public information about ODP. TAMU has facilities that serve as a repository for ODP cores from the Pacific and Indian Oceans. In addition, TAMU is responsible for core repositories at LDEO for Atlantic, Mediterranean, and Caribbean cores through Leg 150; at Bremen, Germany for Atlantic, Mediterranean and Caribbean cores from Leg 151 onward; and at Scripps Institution of Oceanography, which houses previously-collected Deep Sea Drilling Project cores from the Pacific and Indian Oceans. The general organization of the Science Operator is shown in Figure PP-3 and is detailed in Appendix B (TAMU section) of this Program Plan. Staff staffing level at TAMU is planned to be 139.65 FTEs at the beginning of the year but will be reduced to 86.5 by the end of the FY04.

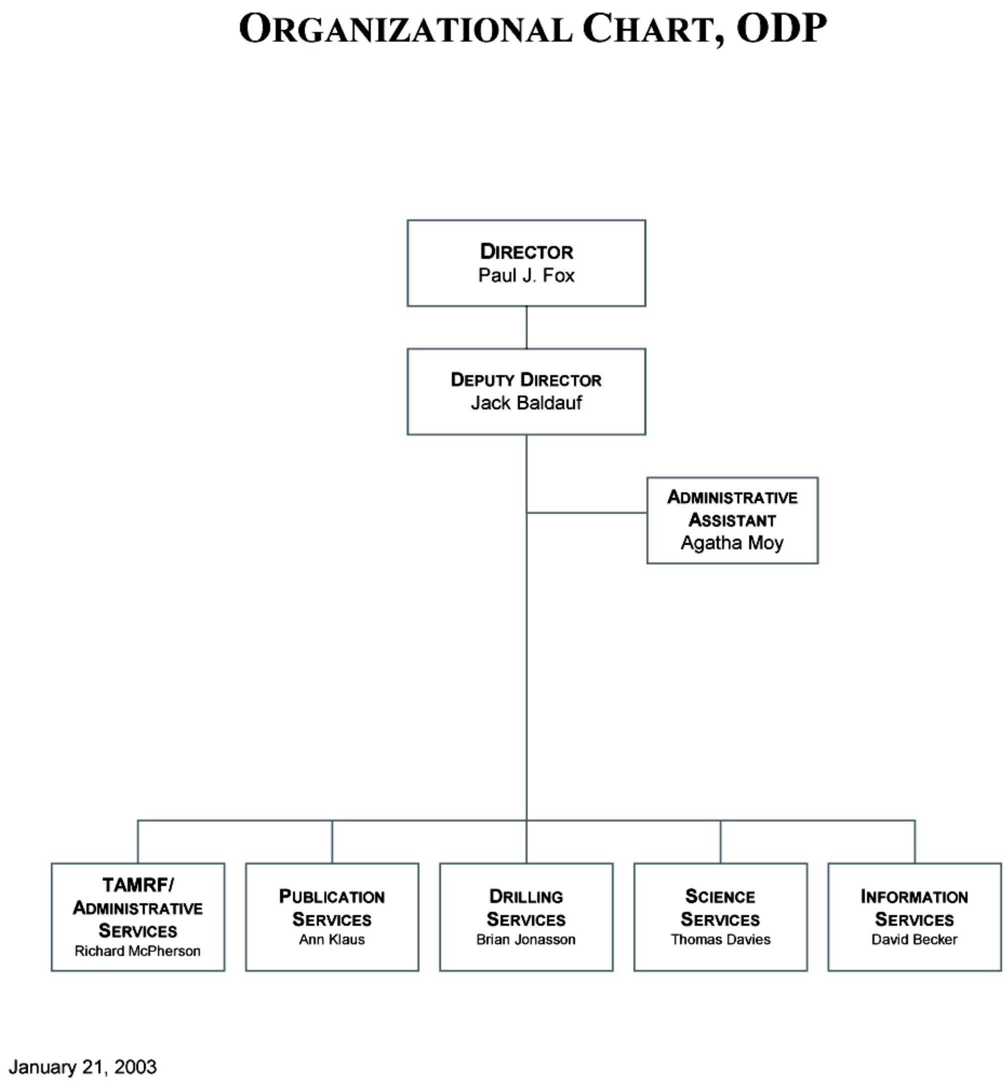
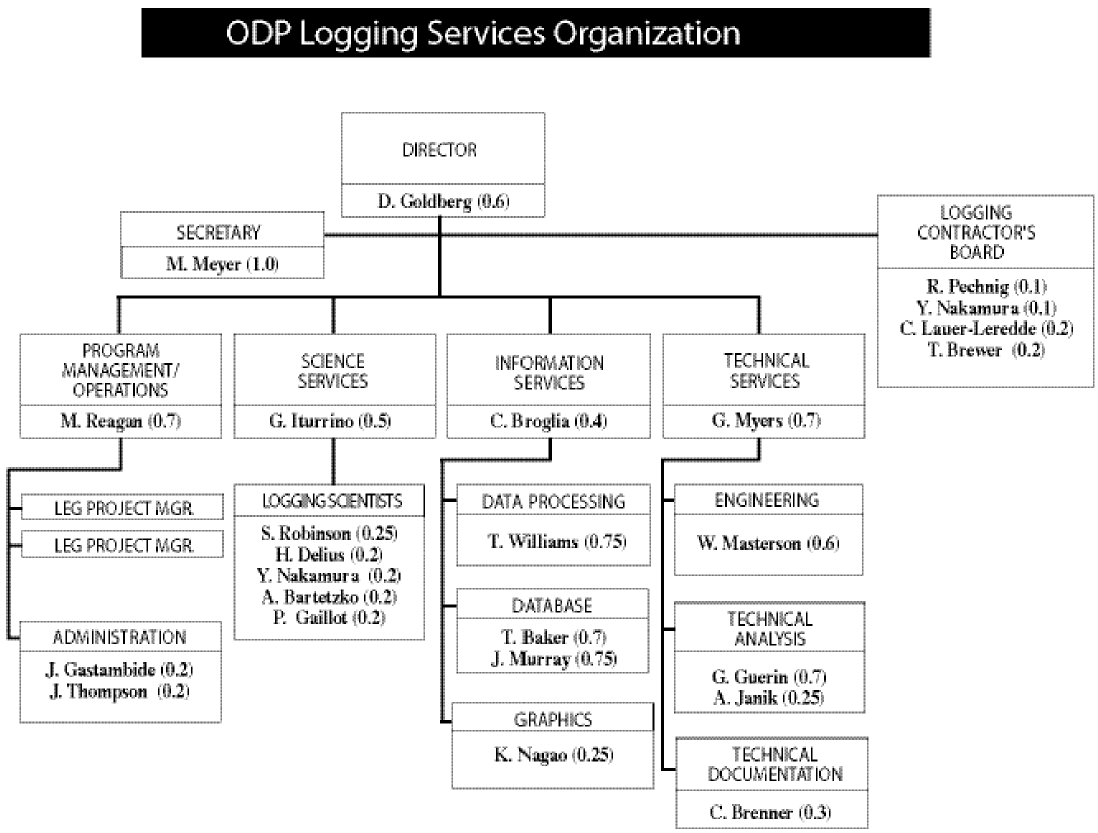


Figure PP-3: ODP Science Operator Organization

Logging Services

Lamont-Doherty Earth Observatory (LDEO), located in Palisades, New York, and affiliated with Columbia University, provides, through its Borehole Research Group, a full suite of geophysical and geochemical services. These services include the acquisition, processing and presentation of in situ borehole logging measurements. LDEO is charged with providing state-of-the-art "oil industry" logging customized to the scientific needs of ODP, plus certain specialty logs. LDEO also provides interpretation and dissemination services to ODP scientists.

The organization of the ODP logging services operation is shown in Figure PP-4 and is detailed in Appendix C (LDEO section) of this Program Plan. A log analysis center operated by the Borehole Research Group at LDEO with additional centers in France, United Kingdom, Germany and Japan, has computer processing, log analysis and interpretation services for post-cruise use by ODP scientists. LDEO also contracts for basic oil-field type logging services from Schlumberger Offshore Services. The Logging Services staff is planned to be 8.54 FTE as compared to 17.21 FTE in FY03.



Numbers in parentheses represent approximate levels of support in full-time equivalent (fte) personnel

Figure PP-4: ODP Logging Services Organization

Scientific Accomplishments During FY 2003

Introduction

During the period from October 2001 until January 2003 nine cruises were completed by the Ocean Drilling Program (ODP), Legs 198 – 206. The scientific goals accomplished are summarized below in the format first laid out by the ODP Long Range Plan (LRP), published in 1996. This plan outlines the fundamental scientific objectives of the program.

Dynamics of Earth's Environment

Understanding Earth's Changing Climate

Understanding the Earth's changing climate is an important issue for a number of reasons, not least because of the potential impact on the many and varied anthropological activities. Recent ODP legs primarily concerned with the further study of this topic include Legs 198, 199 and 202.

Climate Change in the West-Central Pacific

The first of these scientific cruises, Leg 198, drilled sites in an area in the northwest Pacific on a series of topographic highs. The main aim of this leg is to achieve a better understanding of life in the ocean, both at the surface and at the seafloor during past climatically warm periods. It is also hoped to use the cores to determine the causes, as well as the consequences, of global warming at different times in Earth's past. Leg 198 therefore aims at understanding the long-term climate transition in and out of warm climate greenhouse (Cretaceous and Paleogene global warmth) as well as transient but critical events that involved major changes in ocean environment, geochemical cycles and marine biota recorded in the marine sediments on the Shatsky Rise. Shatsky Rise is a medium-sized large igneous province (LIP) in the west-central Pacific and it contains sediments of Cretaceous and Paleogene age at relatively shallow depths on three prominent highs. Eight sites were drilled in 4 transects across the Shatsky Rise.

In summary the Cenozoic sediment cores recovered by Leg 198 provide the evidence for an abrupt rise in the level of the calcite compensation depth (CCD) during the late Paleocene Thermal Maximum (LPTM), deepening of the CCD at or during the Eocene–Oligocene transition, major deep-water cooling during the Oligocene and other important events. The cores contain an archive of sediment layers from the last 145 million years and indicate vivid signs of multiple bursts of climatic warming that began almost instantaneously measured on a geological timescale. These bursts may have been triggered by large volcanic eruptions that released greenhouse gases, mainly carbon dioxide ($CO2$). The warming apparently decreased the ocean's oxygen-carrying capacity and caused the waters to become anoxic and therefore more corrosive, producing layers of organic-rich black shales. In addition, the corrosive waters dissolved the shells of surface-dwelling organisms before reaching the bottom, leaving only remains of algae and bacteria in the sediment. Results indicate that vast regions of the Pacific Ocean were devoid of oxygen for intervals of about a million years. These ocean-wide anoxic events represent some of the most radical environmental changes experienced by Earth in the last several hundred million years.

Climate Change in the Equatorial Pacific

ODP Leg 199 was designed to systematically explore the evolution of the Pacific equatorial current system as the Earth moved from maximum Cenozoic warmth to initial Antarctic glaciations. Objectives of Leg 199 include defining the sedimentary record of paleoproductivity, paleocirculation and paleowind patterns in the Paleogene Equatorial Pacific and examining critical paleoclimatic intervals such as Paleocene/Eocene boundary and the Eocene/Oligocene boundary in the Equatorial Pacific, where they have not previously been extensively sampled. A third objective is to obtain a complete Oligocene/Miocene record of ocean atmospheric circulation from Cenozoic warmth to initial Antarctic glaciation. The Paleogene was the focus interval because of the extreme perturbation in global climate at that time. Two major peaks in sedimentation rates were recorded, one in the lower Oligocene in the carbonate ooze sediments and the other in the upper middle Eocene in radiolarian ooze intervals. Sedimentary records of important boundary intervals were recovered including the Oligocene/Miocene, the Eocene/Oligocene and the Paleocene/Eocene boundaries. Cores recovered have also yielded very good magnetostratigraphic records and display excellent cyclostratigraphy in the carbonate units. One of the important preliminary conclusions drawn from this leg, based on the degree to which the upper Eocene through Oligocene and Miocene sections at Sites 1218 and 1219 correlated, is that the central Pacific was behaving as one system in those times.

Climate Change in the Southeast Pacific during the past ~31.5 million years

Leg 202 drilled a transect of holes along the western margin of South America. Primary scientific objectives of the leg sought a greater understanding of the response of the South Pacific Ocean to major tectonic and climatic events, such as the opening of the Drake Passage (creating a circumpolar current), uplift of the Andes Mountains (modifying wind systems), closure of the Isthmus of Panama (separating the Atlantic and Pacific Oceans), and major expansion of polar ice sheets in the high latitudes of the Southern and Northern Hemispheres at different times. Additionally linkages between climate changes in the high southern latitudes and the equatorial Pacific, related to rhythmic changes in Earth's orbit, and the relationship of such changes to well-known glacial events of the Northern Hemisphere are part of the investigation. Data collected by Leg 202 will be used in shore-based studies to test global and regional changes in climate, biota, and ocean chemistry on scales of centuries to millennia.

In addition detailed dating methods put the new South Pacific records into a global framework. The combination of magnetic stratigraphies, in unprecedented detail, with excellent biostratigraphies based on all major fossil groups provided a unified chronologic framework at sites that range from cool transitional to warm tropical settings. Another kind of age control comes from small changes in Earth's orbit, which are revealed in rhythmic changes in sediment type. Again, complete recovery of long and well-preserved sediment sequences will provide unprecedented resolution of biotic and environmental changes. The new high-resolution logging tools used by ODP record the changes of Earth's orbit from the rhythmic changes in the characteristics of the downhole sediment sequence and this logging data was found to correlate well with the other evidence yielded by the sediment cores.

Leg 202 has opened a new window into understanding global climate change, by providing high-quality sediment sequences from a previously unsampled region of the Southeast Pacific by targeting sites that record variations on timescales ranging from decades to tens of millions of years, and by analyzing transects of both depth and latitude. It is expected that this strategy will establish the linkages between a broad range of systems and will reveal the role of the southeast Pacific in global climate.

Causes and Effects of Sea-level Changes

Although recent ODP legs have not been dedicated to causes and effects of sea-level changes two Ocean Seismic Network (OSN) ocean observatories will be greatly improved by their installation boreholes drilled on Legs 200 and 203. These observatories will provide scientists with an opportunity to measure many oceanographic variables in addition to the obvious seismic ones. For example, the depth of the ocean can be monitored with great accuracy to both record tsunami which pass overhead, but have an expression on the surface of only fractions of an inch, and quantify the rate of increase in sea level in a mid-ocean environment over the course of years and decades. Presently, such observations are made only near continents and islands where the measurements are biased by shallow water phenomena.

Sediments, Fluids and Bacteria as Agents of Change

Gas Hydrates

An understanding of the importance of sediment properties in the distribution of hydrate within sediments may provide clues to their locations. Leg 204 drilled offshore Oregon in the Northeast Pacific, concentrating on an area known as Hydrate Ridge. The primary objective was to determine how much gas hydrate is present beneath the seafloor in a region where hydrates have previously been observed and where geophysical evidence indicates that they are widespread. These methane hydrates are frozen deposits of natural gas. Methane is a powerful greenhouse gas and these deposits have the potential to cause global warming if released suddenly by landslides. Gas hydrates are common in the seafloor on the margins of continents around the world although the extent of these deposits is, at present, unknown. Evidence suggests may eventually serve as a major new worldwide energy source. Measurements made during this cruise will permit more accurate estimates of the volume and flux of methane and other hydrocarbon gases trapped in the sediments on the Oregon continental margin and, by extension, in other regions.

Ocean drilling plays a critical role in addressing questions about hydrates because it provides the only means available to the international academic community of directly sampling gas hydrates and the sediments that host them deep beneath the seafloor. In 1995, ODP drilled into gas hydrates off the U.S. east coast. From that study it has been estimated that this area could contain enough methane to supply U.S. needs for more than

100 years. Evidence also suggests that hydrates are involved in the global climate cycle and that they can cause, and or be released by massive landslides. Leg 204 provided ODP the opportunity to study the dynamics of hydrate formation on a geologically active margin.

Nine sites on the Oregon continental margin were cored and logged to determine the distribution and concentration of gas hydrates in an accretionary ridge and adjacent slope basin, investigate the mechanisms that transport methane and other gases into the gas hydrate stability zone (GHSZ), and obtain constraints on physical properties of gas hydrates in situ. A three-dimensional seismic survey provided images of potential subsurface fluid conduits and indicated the depth of the GHSZ throughout the survey region. After coring at the first site, logging-while-drilling (LWD) data was acquired at all but one site to provide an overview of downhole physical properties prior to coring. The LWD data confirmed the general position of key seismic stratigraphic horizons and yielded an initial estimate of gas hydrate concentration through the proxy of in situ electrical resistivity. These records proved to be of great value in planning subsequent coring. The use of infrared thermal imaging of cores as a new and effective tool to identify gas hydrates while the cores were on the catwalk as rapidly as possible after core retrieval was tested. The thermal images were used to estimate the distribution and texture of hydrate within the cores. Geochemical analyses of interstitial waters and of headspace and void gases provided additional information on the distribution and concentration of hydrate within the stability zone, the origin and pathway of fluids into and through the GHSZ, and the rates at which the process of gas hydrate formation is occurring. Biostratigraphic and lithostratigraphic descriptions of cores, measurement of physical properties, and in situ pressure core sampling and thermal measurements complement the data set, providing ground-truth tests of inferred physical and sedimentological properties.

Among the most surprising findings of Leg 204 was the rate at which hydrate is forming near the summit of the ridge. High concentrations of sea salts were observed in the upper 10-15 meters of sediment at the summit, indicating that hydrate is forming very rapidly below the seafloor in this region. Leg 204 was the first of what is hoped will be a series of drilling expeditions dedicated to understanding the distribution, concentration and environmental impact of gas hydrates in nature. This leg was also a test-bed for several technological innovations that promise to make an important contribution to hydrate studies in the future. Breaking new ground, Leg 204 saw, for the first time, laboratory measurements of the physical properties of natural hydrates at sub seafloor pressures without ever releasing this pressure. Analysis of this extensive, integrated data set is just beginning. Ultimately it will yield a better understanding of the processes that form and focus hydrate in nature and lead to more precise methods to predict regional hydrate distribution and concentration.

Understanding Natural Climate Variability and the Causes of Rapid Climate Change (ODP Initiative I)

Global and regional changes in climate, biota, and ocean chemistry on scales from centuries to millennia are thought to be interactive and interdependent. Such features have been detected in selected locations around the world, but how these regions are linked, or whether the driving mechanisms originate in the high or low latitudes, remains unknown.

Climate variability -timescales from the West Central Pacific

Sedimentary layers recovered by Leg 198 from the Shatsky Rise in the west central Pacific show that the abnormally warm Cretaceous and Paleocene conditions gradually began to moderate about 50 million years ago, and a pulse of rapid cooling about 33 million years ago finally terminated the warm interval. This cooling pulse happened at the same time that glaciers began to cover Antarctica. Although these past episodes of warming were far more severe than temperature rises over the last century and conditions on earth were different millions of years ago, the data captured during Leg 198 could provide valuable insight into modern global warming. These cores from Shatsky Rise demonstrate most clearly that climate change can occur in a geologic heartbeat and that, once warming gains a certain amount of momentum, a series of rapid environmental changes can quickly follow.

Orbital Cyclicity records from the Southeastern Pacific

Investigations by Leg 202 of orbital scale cyclicity before and during the ice ages reveal clear lithologic changes in meter and decimeter scales. These changes are most likely related to orbitally induced changes in precession and obliquity. If so, these cycles provide a basis for both developing orbitally tuned age models and for testing the phase relationships between major climate and oceanographic components. This would enable the assessment of the role of South Pacific oceanography and biogeochemistry within a chain of climate forcing mechanisms related to orbital changes in the capture of insolation. An apparent ~400- k.y. cycle of lithologic change is found at several sites, especially prior to 1 Ma. With refined post-cruise timescales based on stable isotopes along with a refined biostratigraphy and magnetostratigraphy, the evolution of such climate cycles with a 400-k.y. period will be examined, as well as associated cycles near 100-k.y period, to explore the possibility that climate oscillations of tropical origin provide a forcing template that eventually lead to large Pleistocene oscillations of polar ice sheets.

Ultra-high-resolution records from the continental margin of Chile

Another exciting result of Leg 202 was the successful recovery of ultra-high-resolution records from the continental margin of Chile, which show abrupt magnetic and climatic changes. These records of exceptionally high sedimentation rates were apparently the result of extremely high terrigenous fluvial sediment supply in response to rapid erosion of the southern Andes under heavy continental rainfall. Lithologic variability, primarily associated with rapid changes in biogenic and terrigenous sediment components extend a record of abrupt changes within Holocene time through the last glacial interglacial cycle. A rich array of biogenic, mineralogic, and geochemical tracers at these sites offer the potential to reconstruct regional climate variations down to the scale of decades.

Dominance of siliciclastic sediments here also yielded a highly refined record of paleomagnetic variations. The Laschamp magnetic event at ~41 ka is particularly pronounced (e.g., covering an interval of ~2 m at Site 1233). These extraordinary paleomagnetic records provide opportunities for high-resolution regional and global correlation of marine and terrestrial records using paleomagnetic secular variation and paleointensity variation. This stratigraphic synchronization strategy will help to establish the relative phasing of millennial-scale climate changes in the Southern and Northern Hemispheres. In the tropics, rapid climate change and oceanographic changes on the scale of centuries and millennia are recorded at Site 1240 in the Panama Basin and at Site 1242 on Cocos Ridge. Both sites provide a complete stratigraphic sequence of the last ~2.6 m.y. with sedimentation rates in the range of 5–17 cm/k.y. Relatively high sedimentation rates of 5-10 cm/k.y. also characterize the early Pliocene to late Miocene intervals of Sites 1238 and 1239 at Carnegie Ridge. Persistent decimeter- to meter-scale variability in core logging data here are tentatively interpreted to reflect millennial-scale changes in tropical productivity, which are likely related to changing upper ocean structure and wind-driven upwelling. These tropical sites will help to address questions on role of the tropics in large scale climate change, including the possibility that long-term ocean-atmosphere changes analogous to El Niño-Southern Oscillation events of the modern world may help to trigger global climate changes, and whether fresh-water transport from the Atlantic to Pacific Basins, via winds that cross the Panama Isthmus, modify the global thermohaline circulation through control of basin-scale salinity.

Together, the array of sites recovered during Leg 202 provides a new view of Southern Hemisphere and tropical climate variability and biogeochemical systems across a broad range of spatial and temporal scales in a region of the ocean that has received relatively little study in the past.

Earth's Deep Biosphere (ODP Pilot Project)

Although the Deep Sea Drilling Project (DSDP) demonstrated nearly 20 years ago that microbial processes were active in deeply buried marine sediments, and although studies of ODP cores during the past 15 years have extended our understanding of these processes showing that living microbes can be recovered from burial depths as great as 800 meters, we still know very little about this sector of the biosphere. It has been estimated that the number of prokaryotes in the subsurface biosphere may compose as much as 30% of the world's living biomass. In situ metabolic activity by at least a portion of this biosphere is demonstrated by hydrates of methane produced by microbes in deep-sea sediments. On a global scale these hydrates contain four to eight times as much carbon as in living surface biosphere and soils combined. Current microbiological studies within the ODP have a number of aims including the study of the continuity of subsurface life from one oceanographic region to another, the specialized metabolic properties, if any, that are required to survive in deeply buried marine sediments and the conditions under which subsurface microbes are active or inactive and living or dead. The implications of the effects that the microbial activity may have on the global biogeochemical cycles are thought to be significant.

ODP Leg 201 was the first research cruise wholly dedicated to the study of the Earth's deep biosphere. Leg 201 sailed from San Diego in January 2002 after much meticulous planning and the installation of a new, dedicated, shipboard laboratory. The science plan was focused on the study of controls on the marine microbial communities in the eastern equatorial Pacific on the Peru margin. The basic plan for this leg was to return to sites that had been previously cored (so the environments were very well known) and to focus on intensive microbiological studies in order to understand how the chemical hydrological environments control activity in the deep biosphere. The eastern Pacific was chosen because it provides a range of environments where the characters of chemical signatures vary but there are very similar *in situ* temperatures. This meant that the effects of the chemistry and hydrogeology could be isolated, as opposed to temperature effects on the biosphere. The sites were selected to represent the general range of subsurface environments that exists in marine sediments throughout most of the world's oceans. Subsurface communities are documented by a large number of microbial experiments utilizing a wide range of techniques. The shipboard scientists documented metabolic interactions in deeply buried sediments both in ocean margin and open ocean sediments by measuring reactants and products in the interstitial waters of the cores. Preliminary shipboard results show that microbial abundances are much higher in sediments buried in the continental shelf of Peru than in sediments of the open Pacific Ocean sites. The abundance in the shelf sites was found to be highest in a narrowly focused zone of anaerobic methanotrophy tens of meters below the seafloor.

The expedition drilled as deep as 420 m into oceanic sediments and the underlying rocky crust and the temperature of the sediments ranged from 1 degree to 25 degrees Centigrade. The preliminary results from Leg 201 need post-cruise confirmation, particularly for the microbiological analyses. The main result illustrated by cell counts on the ship generally follow an exponential decline with depth, as did the methane production, with a higher concentrations at the Peru margin sites where there is richer organic input over open ocean sites. Other chemical indicators tracked were sulfate and manganese, which are also by-products of microbial activity. Pore fluid chemistry shows that net microbial activity is also higher than at ocean margin sites but at the same range of processes is occurring at all the sites, i.e. methane production. Fluid flow processes are clearly affecting the microbial activity. The depths of greatest microbial activity are related to sediment properties that in turn are controlled by oceanographical conditions at the time of deposition. The main results at the present time are for the chemistry that is controlling microbial activity. A large number of samples were successfully shipped in dry ice back to shore-based laboratories and culture experiments are continuing there in order to identify the species recovered by DNA sequencing.

The recent expedition found evidence of active life in all of the explored marine sediments. The shipboard scientists also discovered that the life buried in these sediments is fueled by chemicals that migrate down from the overlying ocean, by chemicals released by the degradation of the surrounding sediment, and by chemicals that migrate up from the underlying rocky crust. To the extent that this microbial life relies on degradation of the sediment that surrounds it, its ongoing activity depends on the oceanographic conditions that prevailed when the sediment was deposited, millions of years ago.

The subsurface biosphere of marine sediments may affect the surface Earth in a variety of ways. It is now widely recognized that release of methane from marine sediments may affect atmospheric carbon stocks and climate. It is less widely recognized that sulfate reduction by the buried biosphere may also change Earth's surface chemistry and climate.

The main results of Leg 201 at the present time are for the chemistry that is controlling microbial activity. A large number of samples were successfully shipped in dry ice back to shore-based laboratories and culture experiments are continuing there in order to identify the species recovered by DNA sequencing. With regard to the ODP Long Range Plan, this is the first dedicated leg for microbiology and it shows that when the relevant resources are applied then evidence of microbial activity can be determined almost everywhere.

Dynamics of the Earth's Interior

Exploring the Transfer of Heat and Material to and from the Earth's Interior

Leg 206 successfully accomplished the initial phase of a multi-leg drilling program. This program aims to sample a complete section of upper oceanic crust through the extrusive lavas, the sheeted dike complex, and into the gabbros. The accretion of the oceanic crust is one of the major means of heat loss from the Earth's interior and is a fundamental component of the plate tectonic processes responsible for the formation and evolution of our planet's surface. Hydrothermal interactions at mid-ocean spreading centers and on the ridge flanks influence the chemistry of the oceans and, through subduction, the composition of the upper mantle. Despite the role the ocean crust has played in the evolution of our planet, sampling of in situ oceanic basement remains rudimentary. Samples of basalt, dikes, gabbros, and peridotites have been retrieved by dredging and from shallow drill holes from most of the ocean basins, but the geological context of these samples is rarely established. As such, the nature and variability of the composition and structure of the ocean crust away from transform faults and other tectonic windows remains poorly known.

A preliminary exercise of Leg 206 was to characterize the sedimentary overburden above the oceanic crust and determine the stratigraphy, sedimentation and mass accumulation rates, and the role of fluid processes in the sedimentary blanket. Following the sampling of the sedimentary section, operations then concentrated on the underlying basement, and a re-entry cone and casing string to basement could be installed to enable deep drilling of the upper oceanic crust.

The re-entry hole (Hole 1256D) drilled during Leg 206 provides the first test of the lateral variability of the ocean crust and provides an essential comparison for the models of crustal accretion, hydrothermal alteration, and the secondary mineral/metamorphic stratigraphy principally developed from ODP Hole 504B. This will refine models for the vertical and temporal evolution of ocean crust, including the recognition and description of zones of hydrothermal and magmatic chemical exchange.

Although perhaps only 20% of the present-day mid-ocean ridges are spreading at fast rates (>80 mm/yr), ~50% of the present ocean basins formed at this style of ridge axis. Hence, one deep drill hole through a complete upper crustal section can be reasonably extrapolated to describe a significant portion of the Earth's surface.

Investigating Deformation of the Lithosphere and Earthquake processes

Hawaiian Landslide

A secondary objective of Leg 200 was an ancillary program (APL 20), which involved the coring of a distal turbidite record of the landslide on the north shore of Oahu. The volcanic event associated with the landslide is thought to have been of a complex pyroclastic nature, of a similar model to the Mt. St. Helens eruption, although an order of magnitude larger, and which spread pyroclastic debris over distances up to 300 km. Tentative results from this coring have supported this model. There seems to have been multiple phases of the landslide lasting, in total, for at least 600,000 years. Two tuff units were recovered with tholeiites indicative of a very deep eruptive source and associated with two different eruptions. Identification of the source of the eruptions will depend on some very detailed geochemical post-cruise analyses.

Convergent Margins – Costa Rica

The character of an incoming plate subducting at convergent margins and the processes affecting it as it passes below the shallow forearc may play a major role in the nature and extent of hazardous intraplate seismicity as well as the magnitude of volcanism and the chemistry of lavas produced in the overlying volcanic arc. The fate of incoming sediments and ocean crust and of their associated volatiles as they pass through the shallow levels of a subduction zone (0–50 km depth) has profound effects on the behavior of the seismogenic zone, which produces most of the world's destructive earthquakes and tsunamis. Fluid pressure and sediment porosity influence fault localization, deformation style, and strength and may control the updip limit of the seismogenic zone.

ODP Leg 205 drilled three sites at the convergent margin off the coast of Costa Rica. The incoming plate subducting at this margin and the processes affecting it as it sinks into the deep mantle of the earth may play a major role in the nature and extent of hazardous seismicity, as well as the magnitude of volcanism and the chemistry of lavas produced in the overlying volcanic arc of Central America. The fate of incoming sediments and ocean crust and of their associated fluids and gases has profound effects on the behavior of this zone, in which many of the world's destructive earthquakes and tsunamis are produced. The drilling operations of ODP Leg 205 had two primary objectives. The first was to determine the history of the uppermost part of the downgoing oceanic plate by drilling the deepest part of the trench, just before the plate is subducted. The second was sampling subsurface fluid flow along faults by installing long-term observatories in boreholes. The installation of these observatories, known as Circulation Obviation Retrofit Kits (CORKs) is described in the following section, *In Situ Monitoring of geological processes*.

Costa Rica is an important area for studies of the seismogenic zone and subduction factory for several reasons. As one of the few modern arcs subducting a carbonate-rich sediment section, Central America permits study of CO2 recycling through a subduction zone. Changes along strike in seismicity, plate coupling, and volume and composition of the arc lavas (between Nicaragua and Costa Rica) appear to correlate with changes in sediment dynamics. This balance between sediment accretion, underplating, erosion, and subduction may ultimately result from changing bathymetry, thermal structure, or hydrological behavior along the margin.

Determination of the igneous and alteration history of the uppermost part of the downgoing plate at reference site, Leg 205, Site 1253, along with the inferred distribution of fracture permeability in the core and borehole is being addressed by analyses of the cored sediments and basement rocks recovered from drilling the boreholes. Two of the three hydrological systems inferred from previous drilling by Leg 170 were targeted. The first of these is in basement at Site 1253 and the others along the décollement (or upper fault zone) at Sites 1254 and 1255. In situ CORKs installed in these holes will subsequently monitor conditions over a period of time.

Site 1253 on the incoming plate, was drilled first as a reference site and intervals were selected for downhole temperature and pressure measurements together with downhole logging. At Site 1254 in the non-accretionary prism, coring penetrated a thrust fault zone and the underlying décollement zone. The cores revealed high concentrations of thermogenic hydrocarbons in the gases and sediments and unique pore water chemistry are seen within both zones, indicating advection of deeply sourced fluids preferentially along sandy horizons showing brittle fracture. At Site 1255, ~0.4 km inboard of the deformation front, very limited coring was conducted. The base of the décollement corresponds to the lithologic boundary between prism and underthrust sediments.

In conjunction with Leg 170, the coring at Leg 205 provides samples that will allow an estimate of the sedimentary carbonate flux to the trench to be made. Post cruise analysis of structural fabrics and experiments on whole-round samples will better constrain hydrological modeling and permit integration of fluid flow and deformation models.

Results from Leg 205 can be integrated with those from the deep basement hole drilled during Leg 206 (also on the part of the Cocos plate generated at the East Pacific Rise) to constrain the composition of the oceanic crust subducting at this margin. Microbial samples were taken (and contamination tests run) from the sedimentary horizons and from larger veins and fractures in the lower part of the igneous sections for post cruise studies. Logging, coring, and physical properties measured during Leg 205 establish key characteristics relevant to fluid flow and deformation, such as porosity, density, fracture distribution, orientation, and strength, ultimately to be used in conjunction with pressure, temperature, and chemical data from the CORK-II seafloor observatory.

In Situ Monitoring of Geological Processes (ODP Initiative II)

The installation of observatories in deep boreholes in the ocean floor is designed to help to better understand variations of processes in the subsurface of the ocean floor and also allow insight into the integral physical properties of the sediments and the oceanic crust.

CORK Observatories

As described in the previous section ODP Leg 205 focused on sites in the Pacific Ocean off Costa Rica where long-term observatories were installed deep into the Earth's crust. Installation of these observatories, otherwise known as Circulation Obviation Retrofit Kits (CORKs) was carried out at two sites: one in the subduction trench, Site 1253, and the other, Site 1255, about 500 m away on the continental margin. The third installation, planned at Site 1254 was abandoned, after several attempts, due to adverse hole conditions.

Science objectives specific to the reference Site 1253 center on mass flux to the subduction trench (and ultimately the volcanic arc) as well as the permeability and hydrology of the downgoing igneous section. A CORK-II was installed, with temperature probes and pressure monitors together with osmotic fluid and gas samplers. At Site 1255 the CORK-II was installed successfully into the plate boundary fault, with the OsmoSampler along with a temperature logger and pressure-monitoring screen. Science objectives for the prism, Site 1255 center on the development of the décollement and the use of pore fluid chemistry to infer local diagenetic and deeper dehydration reactions. Fluids within both fault zones and sediments underthrust at the trench affect early structural development and are a key agent in transport of chemical species. The mineralogy and chemistry of any subducted sediments and their dehydration reactions during subduction may control the physical properties of the deeper subduction interface and, hence, the updip and downdip limits of the seismogenic zone wherein interplate earthquakes are generated. The mineralogy, composition, and volatile content of the slab, transformed during its progress through the shallow subduction zone, will govern the flux of fluids or melts from slab to mantle wedge, which is an important control on the extent of mantle melting and formation of arc lavas.

The instruments in these observatories will collect vital data over the next decade to better understand the processes that control and are associated with earthquakes and tsunamis in the region. The CORKs will sample fluids and gases and monitor temperature and pressure in the subsurface over a period of two years before the first data is downloaded. A CORK consists of two parts: instruments installed in the sealed part of the borehole itself and a data logger sitting on the seafloor. These logged data can be downloaded during a visit to the site with a manned submersible or a ROV (Remote Operated Vehicle) by hooking up a computer to the data logger via an underwater connector. In 1-2 years, scientists will return to Costa Rica to recover the recorded data and the fluid samplers and new samplers and temperature probes will be installed.

For the first time ODP successfully installed long-term monitoring fluid samplers together with pressure monitors in an area with a high level of seismicity.

Ocean Seismic Network

A new Ocean Drilling Program project is building observatories equipped with instruments, including seismometers, deep below the seabed that will allow scientists to continuously monitor and record information and gain long-term understanding of geological hazards, such as tsunamis and major earthquakes. These observatories fill an important void in scientific monitoring. On land, the Global Seismic Network (GSN) provides adequate earthquake monitoring capabilities for most continental regions and islands, but large areas of the ocean floor remain unmonitored until now. The US Global Seismic Network and its international affiliate, the Federation of Digital Seismic Networks, operate nearly 200 seismic stations. However, even though nearly every island has a modern seismic observatory, enormous gaps in the coverage exist limiting scientific and operational coverage for seismic studies of sources and the deep interior of the Earth.

Two legs were drilled in2002 (Legs 200 and 203) that provide important sites for locating long-term seismic observatories in the Pacific Ocean Basin. The primary objective of Leg 200 was to establish a cased re-entry hole in fast-spread crust at the Hawaii-2 Observatory (H2O) site in the Pacific Ocean east of Hawaii. This station is a permanent, continuously operating seafloor observatory more than 16,000 feet below the surface of the water, about halfway between Hawaii and California, installed in 1999. The observatory utilizes the Hawaii-2 submarine cable system, which is a retired AT&T transoceanic telephone cable. The equipment on the seafloor allows power to be sent to instruments in the observatory and data to be retrieved from the seafloor in real-time and relayed to any laboratory in the world through the Internet. Currently, sensors at the Hawaii-2 observatory sit directly on the seafloor but scientists have known for many years that broadband seismic installations, the equipment used to detect vibrations from earthquakes and man-made explosions, give better quality results if the sensors are placed in boreholes, away from the noise generated by wind and ocean currents. During ODP Leg 200 such a borehole was successfully drilled near the Hawaii-2 cable and the H2O junction box on the cable. The re-entry hole established for the observatory site is approximately 60m deep and casing has been emplaced 30m into basement and cemented at the bottom to prevent water circulation. Rotary coring was deployed for coring into basement, and it should be noted that coring into east Pacific crust is alone quite a scientific accomplishment. Leg 200, therefore, succeeded in preparing a cased re-entry hole suitable for future installation of a seismometer.

The site is located in one of the high-priority regions for the Ocean Seismic Network (OSN) and the National Science Foundation (NSF) has since funded a program to instrument the hole with a broad-band borehole seismometer and link it to the H2O junction box.

The same drilling strategy as for Leg 200 was followed on Leg 203, i.e. to establish an observatory site in the eastern equatorial Pacific. Hole 1243A was successfully drilled in the just north of the equator at 110^{o}W. The hole will serve as the location of a future observatory and will contain several types of seismometers and other instrumentation that will connect to the Internet through a satellite communications telemetry link. The equipment will include a multidisciplinary observatory-quality broadband three-component seismometer (0.001–5 Hz) as well as a high-frequency three-component seismometer (1–20 Hz) to ensure high-fidelity recording over the range of frequencies normally recorded by the terrestrial Global Seismic Network. The seismic system, as well as other instrumentation associated with the observatory, will be connected to a DEOS mooring for both power and high-speed data telemetry to a land station and the Internet.

Drilling in Hole 1243A met the primary objectives of Leg 203 by completing a cased and cemented legacy hole penetrating nearly 100 m of basement for the installation of broadband seismometers in a future observatory. This was accomplished in an area of considerable interest to other disciplines in the earth and ocean sciences, with the prospect of providing the infrastructure for a future DEOS multidisciplinary observatory.

The expedition was the second ODP cruise in 2002 to create observatories in boreholes deep below the seafloor. In terms of significance to the Long Range Plan successful completion of these two re-entry holes has fulfilled ODP's commitment to prepare six sites for the ION network. Both sites are located in one of the high-priority regions for the Ocean Seismic Network (OSN) and the Dynamics of Earth and Ocean Systems (DEOS).

Exploring the Deep Structure of Continental Margins and Oceanic Crust (ODP Initiative III)

The location of Leg 203 Site 1243, in oceanic crust created by fast seafloor spreading, provided a rare opportunity to examine crustal genesis, evolution, and crust/mantle interaction for a seafloor-spreading end-member responsible for generating the majority of the oceanic lithosphere. In addition to the primary objective, i.e. to drill and case a re-entry hole, (Hole 1243A) as part of the OSN as described above, Leg 203 also drilled a second uncased hole (Hole 1243B) fitted with a re-entry funnel 600 m east of Hole 1243A. In this hole basalts were recovered from the upper oceanic crust in fast-spreading young lithosphere in the Pacific, and from depths well in excess of any drilled during most previous legs. Rotary coring alone was used in an effort to sample the sediment/basement interface as well as the uppermost fast-spreading lithosphere. Hole 1243B is characterized by 110 m of sediment and a total penetration of 195 m

This modest sample return from coring Hole 1243B is significant, however, given the sparse catalogue of deep basement rocks as yet recovered from young Pacific seafloor. Some sediment was recovered of the same lithologies and colors as oozes recovered during ODP Leg 138. The first basement rocks were recovered from Hole 1243B at 108–113 mbsf. Basement was drilled and cored to a total depth of 195.3 mbsf, which represents 87.1 m of basement section. On the basis of hand specimens, thin section descriptions, and shipboard geochemical analyses, eight basement units were defined, volcanic basaltic units together with aphyric and phyric basalts. All these basement basaltic units are interpreted as pillow lavas and no evidence of thicker massive lava flows was found in the cores. This interpretation of the environment of eruption is further confirmed by downhole measurements in Hole 1243B. Core recovery throughout basement averaged 25%, and the lower sediment and basement were logged. These data are the focus of ongoing shore-based analyses.

Paleomagnetic measurements indicate that the basaltic cores recovered from Hole 1243B, after the removal of the drilling-induced remagnetization, recorded a stable component of magnetization with both normal and possibly reversed inclinations. Although it is thought that this lava sequence recovered at Site 1243 may have recorded a reversal sequence (normal-reversed-normal) the hypotheses will be tested in subsequent shore-based investigations.

Recovery of in situ oceanic crust is imperative to understand igneous accretion and the complex interplay between magmatic, hydrothermal, and tectonic processes, as well as a means for calibrating remote geophysical observations, particularly seismic and magnetic data. Only by drilling a complete section of upper crust formed away from fracture zones can the processes operating at normal mid-ocean ridges be understood.

Drilling a complete section of oceanic crust and exploration of the deep structures has been an unfulfilled ambition since the inception of scientific ocean drilling. Hole 504B, initiated during the Deep Sea Drilling Project and completed during ODP Leg 111, on the southern flank of the Costa Rica Rift, remains our only complete section of in situ upper crust and the only hole to penetrate the extrusive lavas and most of the way through the sheeted dike complex. The dike/gabbro boundary has never been drilled, and the nature of the plutonic rocks directly underlying the sheeted dike complex has never been established.

Recent recognition of an episode of superfast spreading (200–220 mm/yr) on the East Pacific Rise ~11–20 m.y. ago in the Guatemala Basin presented ODP with an opportunity to drill through the upper oceanic crust into the gabbroic rocks in minimal time. Leg 206 drilled ocean crust that formed at a superfast spreading rate in the equatorial Pacific ~15 m.y. ago. The rationale for choosing this particular location is that drilling crust formed at a superfast spreading rate provides the best chance of reaching gabbros in normal oceanic crust in a two-leg drilling strategy

The initial phase of the planned two-leg project to drill this complete in situ section of the upper oceanic crust into the Cocos plate on the East Pacific Rise in the Guatemala Basin was completed in December 2002. Hole 1256D was drilled to a depth of 502 meters into basement and left clean of debris, in excellent condition, and ready for the next phase of deep ocean crust drilling due to be completed early in the Integrated Ocean Drilling Program (IODP). The subsequent drilling phase will eventually extend through the complete section of extrusive lavas and sheeted dikes and into gabbros.
The return visit to this site, by the Integrated Ocean Drilling Program, should be able to penetrate deep enough to determine the geological nature of the geophysically imaged "axial melt lens" believed to be present close to the gabbro–dike transition. Drilling of this boundary in situ will allow the relationships between vigorous hydrothermal circulation, mineralization, dike injection, and the accretion and freezing of the plutonic crust to be investigated.

Final Legs of ODP

Four further ODP cruises are scheduled between January 2003 and the end of this particular phase of ocean drilling in October 2003. Although these cruises have yet to take place their aims and objectives and their place within the structure of the Long Range Plan are also mentioned briefly here.

Dynamics of Earth's Environment

Understanding Earth's Changing Climate – Leg 207 will endeavor to understand the underlying causes and effects of critical climatic events in Earth history by drilling high-resolution Cretaceous to Paleogene paleoceanographic records at tropical sites. Leg 208 will be drilled in the southern Atlantic near the Walvis Ridge. This cruise aims to provide a detailed history of paleoceanographic variations associated with several prominent and critical episodes of early Cenozoic climate.

Dynamics of Earth's Interior

Exploring the transfer of heat and material to and from Earth's interior: Mantle dynamics - Leg 209 of the Ocean Drilling Progra`m will be devoted to coring mantle peridotite along the Mid-Atlantic Ridge (MAR) from 14° to 16°N. The primary aim of drilling is to characterize the spatial variation of mantle deformation patterns, residual peridotite composition, melt migration features, and hydrothermal alteration along axis.

Deformation of the lithosphere and Earthquake Processes - Leg 210 will investigate continental rifting models at a conjugate margin by drilling a deep hole on the Newfoundland margin. This Leg will complement Legs 149 and 173, drilled previously on the Iberia Margin.

Overview FY04 Program Activities

Introduction

Scientific field operations of the Ocean Drilling Program will come to completion at the end of FY03. This first, post-operations Program Plan will focus on activities to orderly begin the phase out of ODP. There are four primary foci of these activities: 1) completion of all activities associated with the field programs ending in FY03, including publication of all ODP *Initial Reports* and *Scientific Results* volumes and incorporating all data into the ODP Janus database system; 2) final demobilization of all ship board equipment, including proper storage, archival, and documentation; 3) preservation of the ODP legacy, including documenting all data analysis procedures, all equipment developments, and providing recommendations on further technical developments for a future ocean drilling program; and 4) preparation of the transfer of ODP assets to the appropriate entity(ies) in IODP. It is assumed that the transfer of ODP assets will occur at the end of FY04 and with the exception of publications of final ODP scientific volumes and the continued maintenance of digital databases (both Janus and borehole data), core repositories and borehole data processing centers, all other operations departments will be phased out at the end of FY04.

Prime Contractor

Introduction

JOI will work with its subcontractors to ensure that all phase-out activities are carried out in the same professional manner with which scientific operations have been conducted since the beginning of the program, nearly 20 years ago.

JOI will continue to manage the Program under the terms and conditions of the NSF ODP contract (OCE 93-9308410), in accordance with this phase-out plan, and consistent with subsequent annual program plans until the ODP contract has been completed. JOI staff will continue to be responsible for the overall management, planning, data dissemination, and reporting of ODP.

Activities

JOI will focus on the following general activities:

- Work with major support subcontractors to conduct programmatic activities.
- Select and work with other subcontractors, as required, to meet programmatic objectives.
- Finalize policy manuals, which contain a clear and up-to-date summary of the policies and guidelines under which the Program is managed and operates.
- Evaluate the Program. See conduct of Performance Evaluation under "Other Activities," below.
- Prepare and submit quarterly reports to NSF that summarize the ODP financial, operational, and phase-out activities.

- Conduct public affairs activities through the first quarter of FY04.
- Continue liaison responsibilities.
- Provide business and administrative support to JOIDES as its activities conclude. For example:
  - o provide for final JOIDES publications, and specifically the final issues of the *JOIDES Journal* to be published in the late Fall of 2003.
  - o support JOIDES efforts to document the scientific legacy of the ODP.
- JOI will also oversee two major review activities, the Performance Evaluation Committee and the Co-Chief Scientists reviews.

Performance Evaluation

JOI is contractually required by NSF to periodically evaluate the management of the Program and the performance of its subcontractors. This evaluation is accomplished at 2-3 year intervals by a committee of experts appointed by the president of JOI. The president will consult with NSF, the JOIDES EXCOM, SCICOM, and others as appropriate, in the formation of the evaluation committee. The Performance Evaluation Committee (PEC) will report to the JOI Board of Governors through the president of JOI. JOI will report the findings of the PEC, along with their response, to NSF.

The last PEC, the fifth since the beginning of the Program, was held in 1999. The results were formally transmitted to NSF in 2000. PEC-VI is scheduled to occur in 2004. The Terms of Reference and the membership of the committee will be established by early 2003. Based on past performance, JOI requests funds to support the travel of PEC-VI members for site visits, meetings, and for administrative and clerical support.

The mandate for this review as approved by EXCOM includes:

- The committee should assess to what extent the goals set up in the Long Range Plan have been achieved, ***and to what extent the program was implemented in comparison to the Strategic Implementation Plan 1998 to 2003 presented by JOI (1997).***
- The committee should examine all aspects of the phase out program.
- The committee should look at all aspects of the phase out as it impacts the commencement of the new IODP drilling program.
- The committee should assess provisions to present and preserve the legacy of ODP. This should include the legacy of cores and core repositories, the legacy of tools and techniques, the legacy of databases and the scientific legacy. Since the science will not be completed for several years after the formal end of ODP, it is necessary to ensure that adequate plans are in place for carrying out this task until the end of the program in the absence of an international oversight group.
- The committee should assess the effectiveness of the JOI program management and the JOIDES scientific advice structure, which was changed in the middle of ODP on the advice of a previous PEC, ***to determine whether these are the most appropriate models*** for the IODP, and if not, suggest changes.

Co-Chief Review

Approximately every 2-3 years, a Co-Chief Review is held to retrospectively examine how ODP has performed in meeting the scientific objectives of the drilling legs in the period since the last co-chief review. In 2004, JOI will host the final co-chief review meeting (the last being held in April 2001). All facets of ODP will be discussed, including: Scientific Advice (JOIDES); Science Operations (TAMU), Logging Operations (LDEO), Site Survey Data Bank (LDEO), management (JOI), and any other relevant aspects. A report from the review will be prepared by JOI, and forward to NSF and other appropriate parties. To support this activity, JOI seeks funds for travel, meeting and logistics costs, and for administrative support.

Science Operations

Introduction

The ODP Science Operator (ODP/TAMU) Program Plan (Appendix A-1) defines their FY04 activities. In FY04 the focus of ODP/TAMU's mission will change from one dominated by service delivery related to ship operations, to one of stewardship of the Program's legacy. These activities will continue traditional responsibilities associated with drilling activities and new activities associated with preserving the ODP legacy.

Traditional Responsibilities of Science Operator include:

- Curating and distributing cores and research samples from the four repositories;
- Managing, verifying, storing and distributing ODP data;
- Publishing the *Proceedings of the Ocean Drilling Program*, consisting of the *Initial Reports* and *Scientific Results* volumes; and
- Providing cost-effective program management and administrative services including fiscal contracts, purchasing, budgeting, and inventory control (TAMRF responsibilities).

New responsibilities associated with legacy activities include:

- Cataloging, maintaining, and archiving all equipment and records that could be utilized by IODP;
- Documenting and annotating designs of drilling and scientific equipment pertinent to IODP; and
- Creating a record of the analytical procedures used during the acquisition of data aboard the *JOIDES Resolution*.
- Providing for a permanent archive of all digital data and all ODP publications.

Science Services Department

With the end of drilling operations the activities of science services will significantly be reduced. Activities will focus on completion of all post cruise reports from the FY03 field program, preparation of legacy documents and materials, equipment demobilization and continuous operations of the core repositories.

Completion of Post Cruise Reports

Completion of the final scientific reports will be the primary responsibility of the staff scientists. Since the *Initial Report* for each leg is completed approximately nine months to a year following the conclusion of the leg, we assume that this task can be completed within FY04, with the last volume, for Leg 210, being completed near the end of the fiscal year.

Demobilization

All equipment to be demobilized from the *JOIDES Resolution* will be removed from the ship at the end of FY03, 30 September 2003. In FY04 Science Services will begin dismantling, inventorying and packing laboratory equipment for removal and storage and/or disposal. Drilling Services and Science Services personnel will inventory, preserve and crate remaining equipment for shipment back to College Station. This aspect of demobilization will be completed in FY04. ODP/TAMU plans to store all equipment that requires a climate-controlled environment in unrefrigerated (but air-conditioned) space at the Gulf Coast Repository.

Preparation of Legacy Materials

In addition to core descriptions and documentation of the scientific results of ODP, a necessary component of the successful conclusion of the Program is the assembly of various other legacy materials that may be of potential archival interest, or of value to the operator of a future program. In the area of Science Services this will entail completing and updating of technical notes and laboratory manuals describing procedures used at various times in the different shipboard laboratories. Such documents will be a valuable adjunct to the ODP scientific database and will supplement information contained in the published *Proceedings of the ODP*, providing important insights into the quality and reliability of the data. ODP/TAMU will also ensure that manufacturers' operation, maintenance, and repair manuals are cataloged and available for future users of the equipment. These tasks will be the responsibility of the technical support staff, under the supervision of the Laboratory Officers.

ODP/TAMU also expects to develop, in conjunction with JOI, a series of statistical compilations showing different aspects of participation in the Program by the global scientific community (e.g., by geographic location, type of institution, or rank of participating scientists, size, origin and type of study associated with sample requests, etc).

A detailed list of all Legacy material is given in Appendix B – Science Operator Program Plan.

Repository Activities

To enhance preservation of ODP core samples, ODP/TAMU's goal for FY04 will be to finish the core wrapping project by wrapping roughly 99,000 sections. This will result in both the Bremen Repository and Gulf Coast Repository collections being 100 percent finished, and the East Coast Repository and West Coast Repository having been at least 66 percent wrapped.

Other repository activities, such as providing materials for meeting and museum displays and conducting educational tours and class activities, may continue at a steady rate through FY04. These activities will probably slow down in following years.

ODP/TAMU's goal is to have moratorium sampling and core wrapping completed at all the repositories by the end of FY04 so that whatever entity assumes responsibility for their continuing operation will be able to take over a smoothly functioning, steady-state activity focused on long term service to the scientific community.

Drilling Services Department

Drilling Services will focus final demobilization of drilling and coring equipment and preparation of legacy documents.

Drilling and Coring Equipment Demobilization

In FY04, the preventive maintenance program will be done on the drill pipe and drill collars to preserve the drill string for IODP. This includes inspection of each joint (including the tubes, box, and pin); recutting of the box and pin, if required; and internal and external coating of the joint. All other coring and drilling equipment will be brought to controlled warehouse space to be preserved, inventoried, and crated for future use by other NSF scientific coring programs. Specific tasks include:

- Inventory and organize equipment in an auditable manner;
- Preserve equipment;
- Package and crate equipment;
- Transport equipment to a secure storage environment;
- Create inventory of all equipment removed from the ship;
- Refurbish equipment, as appropriate;
- Segregate the material into lots for:
- Transfer to IODP, or disposal by sale or surplus; and
- Act as a caretaker until final disposition of the property.

Technical Legacy Documentation

The purpose of the Technical Legacy Documentation is to catalog tool systems and important technical innovations, review the scientific benefit, explain tool operations and important functions, consolidate design drawings and specifications, provide a history of the technical development, and explain operational parameters, performance, and limitations. The Technical Legacy Documentation will cover: coring tools; bits; drill string; reentry and casing systems; downhole tools; borehole completions (CORK, ION); other equipment; and various design, database, and software documentation. Specific tasks include:

- Finalize and issue all Science Overview tool sheets.
- Finalize and issue the DSD Safety Manual.
- Prepare recommendations and specifications for the document control system including the Operations Equipment Manuals and drawing files.

- Prioritize and finalize the coring equipment operations manuals.
- Prioritize and finalize the downhole tool equipment manuals.
- Catalog and organize the Leg Operations and Engineering Reports.
- Prepare a specification for drill pipe procurement and recommend a drill string configuration to achieve science objectives of IODP.
- Prepare recommendations and specifications for a new reentry system (TV system).
- Prepare a recommendation and specification for new positioning beacons.
- Prepare recommendations and specifications for drilling equipment for scientific coring operations for IODP.
- Create a reference manual of Legacy Holes (cased reentry holes).
- Migrate the time and cost estimator for legs to Access software, and create a manual on how to use the time and cost estimator software.
- Prepare a recommendation and specification on the inventory control database management system for IODP.
- Prepare recommendations and specifications for lab stack regulated power for any new ship.

Coring System Design Improvement

The ODP Drilling Services engineering and operations staff will continue to work on coring system improvements during FY04 to ensure that there is a smooth design and development engineering transition to the IODP from the ODP. It is estimated that there are ~40 technical notes to finalize on design tool improvements and upgrades. Specific tasks include:

- Prioritize and finalize the Technical Notes on coring and drilling equipment.
- Document the development studies reports.
- Prioritize and document operational coring and downhole measurement tool improvements.
- Compile and catalog the Core Tech Bulletins.
- Standardize bottom-hole assembly (BHA) to be common for all coring systems (APC/XCB/RCB).
- Upgrade, standardize, and harden the electronics on downhole sampling tools.
- Upgrade drill string specifications, including recommendations on bend restrictors needed for deep water operations and recommendations for the drill string configuration necessary to reach science objectives.
- Refine and upgrade the existing designs for tools under current development and important for IODP, such as the Sonic Core Menitor, Advance Diamond Core Barrel, and Vibra Percussion Coring System.
- Integration of pulse telemetry for real-time transmission of drilling parameters for use with DSS-RMM.
- Integration of pulse telemetry for real-time transmission of core jamming downhole for use with the Sonic Core Monitor.

Information Services Department

The Information Services Department will focus on five major areas of activities: These include the basic infrastructure support for all other ODP departments, continued support of the Janus database to assure global access to the OPD digital data, data migration of all digital shipboard data into the Janus data base, development of legacy documents and reports including the archiving of ODP data in a permanent repository and completion of the digital image archive.

Daily Computer Systems and Network Support

While the program will operate during this fiscal year with fewer staff, all current computer and network support services, with the exception of support of the drillship, still need to be provided to remaining staff. The IT services include:

- Support of desktop workstations, servers, and network infrastructure, e-mail support services, and administrative services in support of the department,
- UNIX and Oracle/Janus systems management and Janus Web support,
- Support of the Publications Department to complete leg-related publications and WWW maintenance,
- Support of the Science Services Department to complete tasks related to archiving information and curation of core,
- Support of the digital communications network, and
- Administrative and general support during phaseout, including preparation of the ODP "Final Technical Report".

Data Availability

ISD will continue to provide access to as much ODP data as possible via the "World Wide Web" (http://www-odp.tamu.edu/database) and to fulfill all requests for data, not available on the Web, in a timely manner. Thus, a "data librarian" will be needed to process any requests from the scientific community. While ship operations will conclude at the end of FY03, the need for ODP data will not. Web access must be supported through the year, or at least until the Janus database is transferred to the new program.

A number of tasks are planned for the year. They include:

- Maintaining the Oracle and Janus database (table spaces, disk files, backups, etc.),
- Verifying and loading shipboard data from the last legs into the Janus database,
- Transferring new sample and sample request information from core repositories to the Janus database,
- Migrating these functions to the new program operator, as is appropriate,
- Developing and/or maintaining publications mirror sites, and
- Checking the data collected during FY03.

Data Migration

By the end of FY03, all ODP MST, Physical Properties, and Chemistry data will be migrated to the Janus database while efforts to migrate Paleontology, Age, and

Paleomagnetic data will be underway during FY04. ISD plans that by the end of FY04, Paleomagnetic, Downhole Temperature, and Splicer data will be migrated. However, only part of the ODP Paleontology data would be migrated to the Janus database. Paleontology data is in a condition that will require significant resources to unravel and migrate. It is projected that all Paleontology data will be migrated by the end of FY07. The ODP web site, located at http://www-odp.tamu.edu/database/migration.htm, provides detailed and up-to-date information on the data migration project.

Documenting the ODP ISD Legacy

ISD has planned to archive and document what may be called the "ISD/ODP legacy." The legacy includes the preparation of documentation for about thirty ODP/Janus applications that are to be handed over to IODP and NGDC. This includes meta data files, ASCII data files, attribute tables, and the Janus data model. (While the ODP data is planned for transfer to NGDC in FY05, the collection of meta data and the customization of Web queries to maximize extraction of data from the Janus database will begin in FY04.) Other legacy documents include policies and procedures, action plans, various computer programs, inventories, Web pages, IS "Ship Weekly Reports", and vendor records. A more detailed list of ODP/ISD legacy documents to be prepared during this fiscal year can be found in Appendix III.

Digital Image Archive

ISD plans to scan the remaining ODP and DSDP film archives (over 50,000 core images). While Leg 130 is our targeted leg for FY03, our goal in FY04 is to complete the scanning of all ODP legs (i.e., Legs 100 through 210). Scanning of the 96 legs of the DSDP program are scheduled to begin in FY05 and completed by the end of January 2007. Time permitting, work on the DSDP photographs could begin as soon as the ODP task is completed.

Publication Services Department

Due to the nature of the work that falls under the Publication Services Department, tasks handled by the department will only decline slightly in FY04 (only one Preliminary Report will be produced, and six *Initial Reports* and five *Scientific Results* volumes will be published). Beginning in FY05, all *Initial Reports* work will be completed. During FY04, the central tasks for the Department will be the coordination of the peer-review process for the *Scientific Results* volumes for Legs 189–209; production of the *Scientific Results* volumes for Legs 187–192; management and production of leg citation lists and associated citation reports; development of a cumulative index; and daily management of budgetary tasks.

Logging Services

During FY 04, Logging Services will focus on the completion of demobilization of the equipment from the drillship, the demobilization of shorebased facilities, and completion of the log data processing and distribution tasks for recently completed ODP legs. One of the main achievements of the Ocean Drilling Program has been to make an unprecedented amount of data readily available and easily analyzed. A limited number of activities proposed during the phase out period will be continued in order to insure ongoing access to software and data. A summary of the required tasks is given below. Activities in FY04 include: demobilization of logging facilities taken off the *JOIDES Resolution*, publication of data fro the last set of ODP *Initial Reports*; data archival, data operation of analysis centers; and other legacy activities including the processing and archiving of DSDP data.

Demobilization

During final demobilization of the logging facilities will involve equipment inventory, storage, and transfer after demobilization of the *JOIDES Resolution.* These activities will continue through FY 04.

Publication

Publication of the last *ODP Initial Reports* Data CD will occur on or before the end of FY04. Thus, all cruise-related activities are expected to be complete by the end of FY 04. This will allow time to complete contractual requirements, log processing and database archiving, and leg summary reports. Logging Staff Scientists will not be retained beyond FY 04 for work related to the *ODP Scientific Results* volumes.

Database Archiving/Distribution

The Ocean Drilling Program has collected and archived an unprecedented amount of log data that is readily accessible to the scientific community. Maintenance of the ODP Log Database will continue through FY 07. Staff and hardware necessary for this activity will remain at LDEO-BRG. A limited personnel and computer services budget is required to provide services associated with insuring the integrity of the data and security of the database, monitoring database performance and utilization, distributing data not available online, and assisting users with data handling and usage questions. Data access and handling issues related to the site survey seismic data must also be maintained as the drilling community continues to improve its use of and access to digital seismic data for drilling-related planning as well as post-cruise science. This function will continue to be jointly supported by LDEO-BRG and the LDEO-SSDB.

Log Analysis Centers

Having the means to integrate core, log, and seismic data is a critical function associated with ODP scientific research. The GeoFrame/IESX data processing and interpretation package provides this capability at the five shore-based facilities, among several other University-based locations, that are affiliated with ODP logging services: Columbia University (USA), University of Leicester (UK), University of Aachen (Germany), University of Montpellier (France), and University of Tokyo (Japan). Usage of these systems is stead at all five locations, both prior to and after ODP legs.

Log analysis centers will be maintained through FY 07 in order to provide access to processing, interpretation, and core-log-seismic integration capabilities. Borehole image log interpretation, in particular, requires this specialized software to take full advantage of the data. One month per year of personnel time at each center is budgeted for a log analyst/technical support. An additional month is budgeted at LDEO to provide oversight of all the centers. Funds are budgeted at each center to cover the cost of GeoFrame/IESX maintenance.

Additional Legacy Activities

Legacy activities will also involve the completion and finalization of documentation related to downhole tools (including machine drawings, schematics, operations manuals, software, and performance reports) and the maintenance/refurbishment of equipment as appropriate.

Our list of data holdings also includes shipboard operations reports. They are not currently part of the online log database, but are an important legacy of the program as noted by NSF in its review of the FY 03-07 Program Plan. As most of these reports are in analog format and contain varying levels of detail, approximately 3.5 man-months would be needed in FY 04 to organize this information into a standard format and convert it from analog to digital. The digital files would then be included in the documentation files in the ODP Log Database.

Processing and archiving of digital DSDP log data will occur in FY 04. The majority of these data are only available in LIS format, which requires specialized software to read and process, limiting its usefulness and accessibility in its present form by the scientific community. Translation to ASCII format will also allow DSDP data to be merged with the ODP log database and interpreted using more common software packages. In addition, while operations reports are not readily available for DSDP holes, it is possible to recover some of this information from the original volumes and processing notes. These notes will be used to fully document operations of all holes logged during DSDP.

Budget Overview

This Program Plan budget requests $12,927,935 for FY04 the first year of the phase out of ODP operations. The total FY04 budget is summarized in Table PP-1. There are no operations planned for this year and the marked reduction compared to previous program years reflects the end of the field program and the associated decrease in personnel. (Table PP-2).

Table PP-1: Budgets for FY 03 and FY 04 ($K)

TAMU	**FY03**	**FY04**
Science Services	4,020	2,450
Drilling Services	3,699	2,139
Information Services	2,369	1,732
Publications	1,619	1,692
Headquarters/Administration	1,855	1,983
Ship Operations	23,838	-
TOTAL TAMU	**37,400**	**9,996**
LDEO	**5,427**	**1,325**
JOI/JOIDES	**2,473**	**1,606**
TOTAL ODP BUDGET	**45,300**	**12,927**

Table PP-2 ODP FTE Comparisons for FY 02 - FY 04
Additional details are provided in the TAMU and LDEO appendices.

TAMU	FY02	FY03	FY04
Headquarters/Administration	24.80	24.80	25.15
Publications	23.00	22.00	19.00
Drilling and Engineering	19.50	19.50	20.00
Science Services	51.50	48.50	48.50
Information Services	26.25	26.25	27.00
Total	145.05	141.05	139.65
LDEO			
Borehole Research Group	12.58	12.58	4.01
NEB-LMF	1.58	1.58	1.58
University of Leicester	2.05	2.05	2.05
University of Aachen	.50	.50	.50
Ocean Research Institute	.50	.50	.50
Total	17.21	17.21	8.54
JOI/JOIDES			
JOI Direct	7.50	6.75	5.10
JOIDES Office (RSMAS)	2.75	2.75	0.25
ODP Data Bank	4.00	4.00	4.00
Total	14.25	13.50	13.50
TOTAL	176.51	171.76	171.76

Science Operator (TAMU)

Details of the Science Operator Budget are given in Table PP-3. Budgets were determined based on the primary tasks for FY04: the final demobilization of all shipboard equipment removed from the *JOIDES Resolution,* completion of all legacy documentation of the program, archival of all shipboard data and the continued access of data and samples from the core repositories and database system. In FY04 all repositories and data base operations will be fully maintained at FY03 levels with the anticipation that these tasks will ultimately be transitioned to the new IODP.

The only two departments at the Science Operator (TAMU) that remain fully staffed throughout FY04 are Publications and Administration. Slight increases in these departments from FY03 primarily reflect salary raises given in mid-FY03.

Table PP-3 Science Operator (TAMU) Budget			
		FY03	**FY04**
Account	**Description**	**Budget**	**Budget**
418051-01	Science Services	939,181	639,863
418051-06	East Coast Repository	224,407	229,224
418051-07	West Coast Repository	145,952	149,209
418051-08	Gulf Coast Repository	148,908	147,010
418051-09	Curatorial Section	133,672	131,864
418051-10	Bremen Core Repository	26,500	26,500
418051-11	Bremen Core Repository - OI	4,000	4,000
418051-12	Technical Support	2,397,158	1,121,881
Subtotals		**4,019,778**	**2,449,551**
418031-01	Drilling Services - Office	296,956	256,072
418031-02	Drilling Operations Team	1,700,150	932,327
418031-03	Development Engineering Tea	553,448	507,636
418031-04	Material Services Team	978,307	443,290
418031-24	Downhole Measurement Technology	170,000	-
Subtotals		**3,698,861**	**2,139,325**
418091-01	Information Services	2,369,332	1,731,715
Subtotals		**2,369,332**	**1,731,715**
418021-01	Publication Services	1,619,481	1,692,499
Subtotals		**1,619,481**	**1,692,499**
418011-01	Administration/Headquarters	1,852,588	1,983,376
418011-02	Public Information	2,000	-
Subtotals		**1,854,588**	**1,983,376**
418061-01	Ship Operations - ODL	23,024,743	-
418061-02	Ship Operations - ODP	813,218	-
Subtotals		**23,837,961**	**-**
TOTAL		**37,400,000**	**$ 9,996,466**

Decreases in other departments primarily reflect the decreases in FTE anticipated through the year. While FY04 starts with nearly the same FTE as FY03, the reduction in staff will total over 34 FTE by the end of the year (Table PP-4).

Table PP-4 ODP Science Operations (TAMU) FTE Comparisons				
		FY03	**Begin FY04**	**End FY04**
Headquarters/Administrative	Services	24.80	25.15	23.00
Publication	Services	22.00	19.00	19.00
Drilling	Services	19.50	20.00	16.00
Science	Services	48.50	48.50	10.50
Information	Services	27.25	27.00	19.00
Total		**142.5**	**139.65**	**86.50**

Borehole Research Group (LDEO)

As with the Science Operator's budget, the budget at the Borehole Research Group reflects significant reduction associated with 50% decrease in staffing (Table PP-1 and 2). Budgets are again based on the primary tasks of completing demobilization of all equipment removed from the JOIDES Resolution, finishing data processing for the FY03 drilling legs and preparing the legacy documents for ODP. Also included in the Borehole Research Group budget are funds to continue support of data processing centers in Japan, France and the UK.

Prime Contractor (JOI Inc.)

Reductions in the JOI budget from previous years reflect the absence of significant scientific advisory panel activity and the reduction in FTE directly charged to ODP management activities. One activity added at JOI was the development and maintenance of a unified legacy web site that will contain all legacy material of ODP. This activity was initiated in FY03.

D R A F T

OCEAN DRILLING PROGRAM

Prime Contractor
JOI Inc.
PROGRAM PLAN
FY04

For Time Period
1 October 2003 to 30 September 2004

Introduction

As the ODP Program Office and the prime contractor to NSF for the international ODP, JOI Inc. has the principal responsibility for overseeing programmatic, contractual, and the fiscal activities associated with the FY04 ODP Program Plan. The key elements of this plan are: 1) the final phase of the demobilization of all scientific equipment removed from the drill ship *JOIDES Resolution* during the final operation year; 2) stewardship of the program's legacy (data, samples, cores, equipment, engineering products, materials, publications, etc.) as it is maintained, documented, cataloged, and archived; 3) archival of digital data at the National Geologic Data Center (NGDC) and; 4) development of a single comprehensive website of all ODP Legacy documents and records.

JOI will work with its subcontractors to ensure that all of these primary tasks are carried out in the same professional manner in which scientific operations have been conducted since the beginning of the program, nearly 20 years ago. It is our ultimate goal to have the legacy of ODP ready for transfer to a successor entity or entities in the Integrated Ocean Drilling Program (IODP). Finally, JOI will maintain communications with the international scientific community through the JOIDES Office housed at the University of Miami which will be completing the last issues of the JOIDES Journal and will assist with evaluation of data archival documents as needed. In FY04 JOI will conduct the complete the last Performance Evaluation Committee and the last co-chief scientist review.

General Operations

JOI will continue to manage the Program under the terms and conditions of the NSF ODP contract (OCE 93-9308410), in accordance with this phase-out plan, and consistent with subsequent annual program plans until the ODP contract has been completed. JOI staff will continue to be responsible for the overall management, planning, data dissemination, and reporting of ODP.

Specifically, JOI will continue to:

a. Work with major support subcontractors to conduct traditional and phase-out programmatic activities.
b. Select and work with other subcontractors, as required, to meet programmatic objectives.
c. Develop annual Program Plans in consultation with the NSF program officer and as approved by the NSF contracting officer that address, but are not limited to:
    i. programmatic goals
    ii. scheduled activities and organization plans
    iii. budgets
    iv. review activities
    v. recent scientific results and distribution of samples, data, and program publications
    vi. all other phase-out activities and responsibilities
d. Maintain a policy manual that contains a clear and up-to-date summary of the policies and guidelines under which the Program is managed and operates.

e. Evaluate the Program. See conduct of Performance Evaluation under "Other Activities," below.
f. Prepare and submit quarterly reports to NSF that summarize the ODP financial, operational, and phase-out activities.
g. Conduct public affairs activities through the first quarter of FY04.
h. Continue liaison responsibilities.
i. Provide business and administrative support to JOIDES as its activities conclude. For example:
    i. provide for final JOIDES publications, including the *JOIDES Journal*
    ii. support JOIDES efforts to document the scientific legacy of the ODP.

Other Activities

In addition to conducting general management operations, JOI will also carry out the following tasks and activities.

Performance Evaluation
During the life of the ODP, JOI is contractually required by NSF to periodically evaluate the management of the Program and the performance of its subcontractors. This evaluation is accomplished at 2-3 year intervals by a committee of experts appointed by the president of JOI. The president consults with NSF, the JOIDES EXCOM, SCICOM, and others as appropriate in the formation of the evaluation committee. The Performance Evaluation Committee (PEC) reports to the JOI Board of Governors through the president of JOI. JOI reports the findings of the PEC, along with their response, to NSF.

The last PEC, the fifth since the beginning of the Program, was held in 1999. The results were formally transmitted to NSF in 2000. PEC-VI is scheduled to occur in 2004. The Terms of Reference and the membership of the committee will be established by early 2003. Based on past performance, JOI requests funds to support the travel of PEC-VI members for site visits and for meetings and for administrative and clerical support.

The committee is charged with addressing the following specific issues, as well as other items considered important by the committee.

- The committee should assess to what extent the goals set up in the Long Range Plan have been achieved, ***and to what extent the program was implemented in comparison to the Strategic Implementation Plan 1998 to 2003 presented by JOI (1997).***
- The committee should examine all aspects of the phase out program.
- The committee should look at all aspects of the phase out as it impacts the commencement of the new IODP drilling program.
- The committee should assess provisions to present and preserve the legacy of ODP. This should include the legacy of cores and core repositories, the legacy of tools and techniques, the legacy of databases and the scientific legacy. Since the science will not be completed for

several years after the formal end of ODP, it is necessary to ensure that adequate plans are in place for carrying out this task until the end of the program in the absence of an international oversight group.

- The committee should assess the effectiveness of the JOI program management and the JOIDES scientific advice structure, which was changed in the middle of ODP on the advice of a previous PEC, ***to determine whether these are the most appropriate models*** for the IODP, and if not, suggest changes.

At the present time Susan Humphris of the Woods Hole Oceanographic Institution has agreed to chair the committee.

Co-Chief Review

In FY04, JOI will host a final co-chief review meeting. The purpose of this review is to retrospectively examine how ODP has performed in meeting the scientific objectives of the drilling legs since the last co-chief review, held in April 2001. All facets of ODP will be discussed, including: Scientific Advice (JOIDES); Science Operations (TAMU), Logging Operations (LDEO), Site Survey Data Bank (LDEO), management (JOI), and any other relevant aspects. A report from the review will be prepared by JOI, and forward to NSF and other appropriate parties. To support this activity, JOI seeks funds for travel, meeting and logistics costs, and for administrative support.

Arctic Ocean Drilling Expedition Planning

To fulfill **SCICOM Motion 01-02-18: "**SCICOM endorses the joint JOI/European initiative to set up a Lomonosov Ridge Project Management team," from the Portland, Oregon meeting in August 2001, JOI initiated a two-year (and two-phase) planning contract with the Swedish Polar Research Secretariat (SPRS) in February 2002. This contract (#JSC 2-02) is to provide JOI with a report that describes the "services to develop an implementation plan for an ocean drilling expedition to the Lomonosov Ridge, central Arctic Ocean." Contract activities and planning progress reports have been included in ODP quarterly reports and provided to SCICOM at meetings in Tokyo (March 2002), Ghent (August 2002), and Austin (March 2003).

In December 2002, JOI received a report on the 1st phase of the contract. It's available from: http://www.joiscience.org/JOI/PPT/arctic/SPRS_Arctic_planning_phase1.doc.

In February 2003, NSF approved an extension of the JOI-SPRS contract ("Completion of the operations, science support, logistics, and implementation plan for a scientific ocean drilling expedition to the Arctic's Lomonosov Ridge (IODP proposal 533)"), for a second and final year-long phase.

In FY04, JOI will continue to oversee the subaward to the SPRS, which will terminate on February 1, 2004. JOI staff will coordinate planning efforts and will assess deliverables described (below) in the JOI-SPRS contract on the basis of technical and scientific merit.

Plans developed under this contract will be provided to the entity that may ultimately implement this expedition in calendar 2004. The entity will be European (i.e., European Science Operator, ESO) and it will provide Mission-Specific Platforms (MSP) to IODP. Joint European Ocean Drilling Initiative (JEODI) is currently providing advice and guidance to European funding agencies on the establishment of this new entity. Therefore, close interaction will continue to be necessary between JOI/ODP, the Swedish Polar Research Secretariat (SPRS) and JEODI.

The specific tasks that will be accomplished during FY03 and FY04 are described below, in the contract's work statement and deliverables.

<u>Work statement</u>

1. Based on information gained during phase one of the contract, update and refine the critical path of major timelines and milestones for planning and implementing the expedition. Presume a field program of approximately 35 days within August-September 2004.

2. Further develop the operational plan in concert with developments in JEODI Work Package 2 and with the interim European Science Operator (British Geological Survey). Five specific tasks are defined:

    a. Based on the operational responsibilities assigned to each class of vessel in phase one, choreograph, during phase two, the fleet of icebreaker vessels to: (a) transit from ice edge to the initial drill sites; (b) defend the drilling vessel that is maintaining position (in DP mode) and drilling and coring in a variety of ice and weather conditions; (c) transit among drill sites; and (d) transit back from the high Arctic to the open ocean.

    b. Refine the position descriptions of the key personnel in the upper level of the management team defined in phase one, and develop descriptions for second, third, and lower tier scientific and technical positions necessary to successfully implement the field program. These positions will include operational groups responsible for, among other things, ice and weather monitoring, vessels, logistics and science.

    c. Re-examine the drilling, logging, safety monitoring, and sampling options in light of phase one findings.

    d. To minimize the eventual cost of mobilization and shakedown of drilling platform and tools, investigate options to coordinate and collaborate with other initiatives (e.g., Lake Malawi program funded by NSF, DOSECC, etc.).

    e. Flesh out the plans for ice monitoring, ice management, air operations, communications (ship-to-ship, ship-to-shore, coring platform dynamic positioning reference), environmental and weather database capture plans, and medical services.

3. The draft operational manual prepared by the SPRS during phase one should be updated and refined in phase two through the following five tasks:

    a. "scenario test" the manual's procedures against emergency situations, and then modify the procedures as necessary;

    b. excerpt the appropriate sections of the manual to prepare vessel audit/inspection plans;

    c. as necessary, incorporate procedures that will address all guidelines of the International Maritime Organization and other organizations for ships operating in ice-covered Arctic waters;

    d. prepare training guidelines that are consistent with the procedures of the manual; and

    e. prepare the "Expedition Safety Case" to help define liabilities and project insurance requirements

4. The Arctic Detailed Planning Group and the SPRS recommended that ODP-type sampling and logging tools be used in this expedition. The two tasks required to meet this recommendation are:

    a. review potential contributions from the ODP in light of recent developments (e.g., schedule for demobilization and availability of BHAs, pipe, coring hardware, and other surplus equipment and supplies); and

    b. based on drilling and coring options for the expedition, identify the potential design modification needs for ODP tools (e.g., APC/XCB).

5. Successful operations will require an improved understanding of the performance of a dynamically positioned drilling platform supported by icebreakers in 8/10 to 9/10 ice (often typical conditions in the high Arctic). To gain such an understanding, three tasks must be completed:

    a. organize and analyze data from prior *Oden* Arctic expeditions as input to the design of the model tests (can also be used to prepare the ice management procedures);

    b. conduct model tests of the drill ship; and

    c. conduct an assessment of the below-hull ice protection needed for the coring platform.

6. This expedition will likely take on a high profile in public, scientific, and possibly political circles. As such, the SPRS will need to develop a preliminary public affairs plan,

to be provided to the implementing organization, which is designed to provide information so as to minimize misunderstanding and to maximize scientific and educational return from the expedition. This work initially requires two tasks:

a. Define the full range of activities (meetings, conferences, briefings) and the necessary knowledge base and experience required of individuals who would be most appropriate to represent the expedition; and

b. prepare descriptions of tasks and specific projects that can be developed by the implementing organization.

7. Prepare a program-wide insurance plan that accommodates the various classes of anticipated expedition vessels. This work requires two tasks:

   a. Defining liabilities based on the "Expedition Safety Case" and on program procedures; and

   b. Establishing recommendations on insurance plans based on these liabilities and the roles and responsibilities of the indemnifying groups and companies.

Deliverables & Milestones

1. Prepare a report that describes the revised timeline and milestones (Workstatement Item #1).

2. Complete the operational plan and manual, and prepare the recommended insurance plans as described in Work statement Items #2, #3 and #7.

3. Prepare a summary report on potential ODP contributions and on options to modify the design of the drilling and coring tools as per Work statement Item #4.

4. Prepare a summary report on the results of the model tests (Work statement Item #5).

Prepare a timeline and public affairs plan as described in Work statement Item #6.

ODP-to-IODP Hand-Off Meeting of International Program Offices

We envision the need for a meeting of representatives from ODP Program Offices and from IODP Program Offices, in late 2003 or early 2004. The purpose of such a meeting would be to transmit information before a critical mass of personnel have departed, taking with them corporate experience and knowledge. Ted Moore, the US iPC co-chair, strongly endorsed this idea. Such a meeting would be analogous to the "International Program Office Meeting" that JOI hosted in September 1999. At that gathering, over 20 representatives from the US, the European Consortium for Ocean Drilling (ECOD), Japan, Germany, Australia, the UK, China, Canada, and Chinese Taipei convened to exchange information on a wide variety of topics, ranging from staffing of scientific parties to publication of post-cruise results; ways to communication among program offices; how to effectively disseminate information, especially via the internet; sharing methods for involving a broader cross-section of scientists in scientific ocean drilling, and discussing techniques for improving and coordinating educational and outreach activities on an international level. The expense of this activity to ODP would be minimal since the travel costs will be borne by the member countries. To facilitate such a meeting, JOI would be willing to work with an IODP entity.

ODP Site Survey Data Bank

The ODP Site Survey Data Bank, located at Lamont-Doherty Earth Observatory, accepts and archives site survey data for proposals that are active in the JOIDES system. The Data Bank makes these data available for examination by several review panels, and produces shipboard data packages for all ODP Legs. At this time, the only active data packages are for Legs 208, 209 and 210.

In FY 2003 the data bank began managing survey data for IODP drilling proposals. There are now active data packages for three MSP proposals (519, 533 and 564), and for four other proposals for which a platform has not yet been identified. There are also 7 pre-proposals that are having data requirements assigned by iSSP. These requirements are being tracked in the Data Bank.

<u>FY 2004 Program Plan</u>
ODP support activity will cease in the Data Bank at the end of ODP Drilling Operations in September 2003. The original FY ’04 Program Plan called for a one-year phase-out period, during which the data used for ODP Legs are archived at NGDC. Uncertainty about when a new IODP Data Bank will be operational has led to a request for the ODP Data Bank to continue to support IODP operations through FY ’04. The plan presented below provides for both ODP Phase-out activities and IODP support at FY ’03 levels.

<u>Phase-out of ODP Data Bank</u>
Data Bank services to ODP will cease at the end of FY ’03. In FY ‘04 the Data Bank will conduct phase-out operations by preparing data packages for each drilled ODP site for archiving at NGDC. A final inventory of data holdings will be created and passed, with the survey data itself, to the IODP Data Bank. If a new Data Bank is not operating by the end of FY ‘04, instructions will be needed on how to dispose any data holdings not archived at NGDC.

IODP Data Bank Services

In FY ’04 the ODP Data Bank will continue to provide services to IODP at the FY ’03 level. This will entail maintaining the current, mostly paper-based system of archiving and reviewing data. No new initiatives will be undertaken, but incremental improvements to the data tracking system will be made as required. Digital seismic data submissions will be encouraged and the data will be managed with the GEOFRAME/IESX tools that are currently available. No reduction will be made in the size of the Data Bank staff.

Budget Justification for JOI/ODP, JOIDES, and Site Survey Data Bank

The Washington Office budget is presented in Table 1.

JOI salaries and benefits: The budgets for FY04 are based on FY03 salary levels with an annual 5% increase (which is designed to cover cost of living adjustments, merit increases, vacation buy out, and termination leave pay). The estimated JOI benefit rate is 31%. See Table 2 for current (FY03), FY04 as outlined in the original FY04-FY07 phase out program plan and proposed FY04 staffing levels. The primary change in the proposed FY04 staffing level is a redistribution of personnel to add a digital publication and legacy website coordinated who will be responsible for the completion and management of a unified OPD legacy website. This position was initiated, with NSF approval, in FY03 using uncommitted FY02 carry forward funds. The second positive change in FTE support is for Dr. Robert Berger, Program Associate who was hired in 2003. The addition of this FTE effort reflects a rearrangement in tasks assignments at JOI between associate program managers. Note that the total salary request for FY04 does not change from the original FY04-FY07 program plan.

Other Direct Costs (Materials, Services, Supplies, Communication/Shipping and ODC, and Contractual Services): These budget figures are predicated on past experience and are adjusted in light of phase-out activities. Contractual services may include the hiring of temporary help.

Public Affairs: Activities will conclude in FY04, and will require funds for printing and distributing documents, shipping, materials, supplies, communication, and other expenses. The public affairs/science writer will provide support for developing content for the unified ODP website during FY04.

Travel: The budget includes support for JOI personnel travel to subcontractors and other management meetings as needed.

JOI General & Administrative Costs: The NSF-approved provisional rate of 30% was used to calculate G&A. G&A is charged on all direct costs and on the first $100,000 of all subcontracts JOI administers. As the G&A base decreases during the phase-out period, it may be necessary to increase this rate, subject to NSF approval.

Co-Chief Review: As described in the text, this activity is will require funds to cover the cost of travel for co-chiefs and other representatives, as well as meeting expenses. A budget of $40,000 is requested.

Performance Evaluation Committee in 2004: As described in the text, this activity will require funds to cover the cost of travel for PEC members and for administrative and clerical support. A budget of $60,000 is requested.

ODP Site Survey Data Bank: The Data Bank is located at Lamont-Doherty Earth Observatory and is managed by Mr. Daniel Quoidbach. Activities during FY04 will focus archiving the survey data for all drilled ODP Sites and the duplication of data to be archived at NGDC and the completion of a final data inventory that will be passed, along with the survey data, to IODP. In FY04, the staff will be reduced to the Data Bank Manager and the Database Assistant.

JOIDES: Given the time span between the conclusion of the final ODP drilling legs in FY03 and the printing of preliminary results in the *JOIDES Journal*, funds are requested to print and distribute one final issue of the JOIDES Journal in FY04.

Table 1: JOI/JOIDES and ODP Data Bank Program Plan budgets for FY03 and FY04

JOI Wash. Office	**FY 03**	**FY 04**
Salary & Benefits	693,498	483,167
Materials, Serv., Suppl.	42,930	35,000
Comm. & Shipping	36,000	35,000
Travel	128,000	70,000
Other Direct Costs	40,000	35,000
Contractual Services	220,000	24,167
Public Affairs	50,000	5,000
Co-Chief Review	-	40,000
PEC Activities	-	60,000
JOIG&A (indirect)	476,229	329,199
Total JOI	1,686,657	1,116,528
JOIDES Office	327,000	-
JOIDES Publication	15,000	10,000
ODP Data Bank	432,013	479,470
Panel Chair Support	12,000	--
Total JOIDES	786,013	489,470
Grand Total	2,472,670	1,605,998

Table 2: JOI Office personnel percent labor direct charged to ODP

Employee/Title	**'03**	**'04**	**Revised '04**
Dr. Steven Bohlen, President	50	25	25
Dr. Nicklas Pisias, Interim Director, ODP	85	50	50
Dr. John Farrell, Assoc. Program Director	45	30	30
Dr. Frank Rack, Assist. Program Director	50	30	20
Dr. Robert Burger, Assist. Program Director	-	-	10
Dr. Elspeth Urquhart, JOIDES Intl' Liaison	25	0	0
Ms. Carol Kokinda, Contracts & Admin. Director	35	40	40
Ms. Andrea Johnson, Sr. Program Associate	50	25	25
Ms. Margo Cortes, Program Associate	70	100	75
Mr. Robert Wright, Tech. Program Assoc.	50	50	50
Ms. Katherine White, Sci. Writer/Outreach Coord.	85	25	25
Ms. Jennifer Anziano, Technical Program Assistant	-	-	75
Ms. Bridget Chisholm, Manager, Travel	30	40	40
Ms. Amy Castner, Exec. Program Assist.	50	25	25
Ms. Severina Kluizenaar, Contracts Specialist	25	20	0
Mr. Maureen Sang, Travel Coordinator	25	0	0
Total Full Time Equivalent	**6.75**	**4.60**	**5.10**

ODP Site Survey Data Bank Budget Details

The budget request for the ODP Site Survey Data Bank will allow a smooth phase out of the ODP activities and will provide data bank services for the iPC activities of FY04. Salary request for FY04 are based on 4 FTE.

Staffing

Name	**Title**	**Support Level**
Daniel Quoidbach	Manager	12 Months
Artem Fishman	System Manager	12 Months
Milly Giarratano	Data Archivist	12 Months
Ana Maria Alvarez	Database Assistant	12 Months

Fringe rates will change during FY '04 due to the LDEO fiscal year being offset from the NSF fiscal year. For the first 9 months the fringe rate will be 26.2%, with the rate increasing to 26.4% for the last 3 months of NSF FY '04.

Permanent Equipment
No purchases of permanent equipment are anticipated for FY '04

Materials and Supplies
The Materials and Supplies budget will remain at the FY '03 level.

Travel
Data Bank personnel will attend iSSP and iPPSP meetings during FY '04. In addition to two domestic trips to NGDC, two domestic and two overseas trips to panel meetings are budgeted. Total travel costs of $11,000 are slightly less than during full operations in FY '02.

Communications and Shipping
The budget for communications and shipping has two components. First, routine costs for mailing and telephone service and shipping of packages to NGDC for archiving is budgeted at $4000. This will cover the cost of shipping the equivalent of 110 shipboard data packages. Secondly, an estimated cost of shipping the entire data collection to the IODP Data Bank has been included. As this new Data Bank does not exist yet, Oregon State University was chosen as representative of a West Coast USA location. Shipping the entire data archive to OSU by surface freight will cost $5000.

Services
This budget line includes the cost of duplicating data for archiving at NGDC. This will cover Ozalid and Xerox reproduction of seismic lines and maps, duplication of video and magnetic tapes, and reproduction or scanning of photographic material. Also included are the costs of duplicating data for review by the IODP SSP and PPSP.

Computer Services
The LDEO Computer Group charges a mandatory fee of 3% of direct costs that are subject to overhead to cover support of Sun Workstations, maintenance of the LDEO computer network, and Internet connectivity through the LDEO T-3 line. This fee also provides access to discount rates and commercial trade-in offers from various vendors, as well as access to software site licenses for tools such as ArcGIS and MATLAB.

Indirect Costs
Indirect costs are charged at 53% of all expenses except those relating to Permanent Equipment and LDEO computer services.

Table 3. ODP Data Bank Budget - FY 2004

		FY2004
SALARIES AND WAGES	Mos.	
Dan Quoidbach	12	$ 67,076
Millie Giarratano	12	$ 45,818
Ana Maria Alvarez	12	$ 45,274
Artem Fishman	12	$ 60,726
DBA (TBD - Only in Plan C)	0	$ -
Total Salaries and Wages		*$ 218,894*
FRINGE BENEFITS		
July 1, 2003 - June 30, 2004 @26.2%		$ 43,013
July 1, 2004 - June 30, 2005 @26.4%		$ 14,447
Total Fringe Benefits		$ 57,460
Total Salaries, Wages, Fringe Benefits		$ 276,353
TRAVEL		
Domestic Travel		$ 6,000
Foreign Travel		$ 5,000
Total Travel		$ 11,000
PERMANENT EQUIPMENT		
Total Permanent Equipment		$ -
OTHER DIRECT COSTS		
1. Materials and supplies		$ 4,000
2. Publication costs		
3. Computer		$ 9,221
4. Other:		
Communications and shipping		$ 9,000
Services		$ 7,000

Total Other Direct Costs			$ 29,221
TOTAL DIRECT COSTS			$ 316,574
INDIRECT COSTS			
FY2004 MTDC = 53% x	307,353		$ 162,897
TOTAL COST			$ 479,470
Computer Subscriptions			
FY 2004 Plan B	$	9,221	

D R A F T

OCEAN DRILLING PROGRAM

Science Operator
Texas A&M University

PROGRAM PLAN
FY04

CONTRACT 1-94
For Time Period
1 October 2003 to 30 September 2004

AMOUNT PROPOSED FY04: $9,996,466

Respectfully Submitted to:
Joint Oceanographic Institutions Inc.

Paul J. Fox
Director, Science Operations, ODP
TEXAS A&M UNIVERSITY
College Station, Texas 77845

20 May 2003

TABLE OF CONTENTS

APPENDICES

Introduction

Our FY04 Program Plan defines the first year of an incremental phaseout plan for the Science Operator/ODP. Given the broad portfolio of science services which we deliver in support of ODP, the phaseout of science operations is a protracted process having a four-year duration. During the phaseout, the focus of ODP/TAMU's mission changes from one dominated by service delivery related to ship operations, to demobilization of equipment on the ship, and finally to one of stewardship of the Program's legacy. Indeed, during phaseout some of our traditional services remain:

- Curating and distributing cores and research samples from the four repositories;
- Managing, verifying, storing and distributing ODP data;
- Publishing the *Proceedings of the Ocean Drilling Program*, consisting of the *Initial Reports* and *Scientific Results* volumes; and
- Providing cost-effective program management and administrative services including fiscal contracts, purchasing, budgeting, and inventory control (TAMRF responsibilities).

There are, however, major new responsibilities that are a direct consequence of the closing down of a program that will have successfully implemented 109 legs of scientific expeditions during its 19 years of seagoing operations. Given this rich history, ODP/TAMU has the additional responsibilities during phaseout to protect the legacy of ODP by:

- Cataloging, maintaining and archiving all equipment and records that could be utilized by IODP;
- Documenting and annotating designs of drilling and scientific equipment pertinent to IODP; and
- Creating a record of the analytical procedures used during the acquisition of data aboard the *JOIDES Resolution*.

The process by which we bring Science Operations to an end has been one of exploration for us for two reasons: the experience is new and we are without relevant historical models; and the boundary constraints that will affect the details of phaseout (i.e., the identity of the IODP operator(s); the timing of the start of IODP operations) are not yet known. In order to frame our phaseout plans for FY04, we have adopted a number of important assumptions to aid us in our planning process.

- The last operational leg/cruise will conclude 9 September 2003.
- The current subcontract between the Joint Oceanographic Institutions Inc. and Texas A&M Research Foundation (JOI/TAMRF) will be extended through FY05, and there is an intent to continue the contract through FY07.
- The USSSP agreement will be administered through CY05, at which time a new agreement with TAMRF will be negotiated.
- The current contract between TAMRF and Transocean Sedco Forex will terminate 30 September 2003.

- Except for Publication Services and administrative closeout, all other functions will be transferred to the new (i.e., IODP) science operator. The date of transfer is not known at this time, but for purposes of phaseout planning, the conclusion of FY04 (30 September 2004) has been used.
- Publication of the *Proceedings of the Ocean Drilling Program* through Leg 210 will continue on the standard schedule: *Initial Reports* completed one year postcruise, *Scientific Results* completed four years postcruise, with publication costs based on an average volume size.
- The ODP Publications Web site contents will continue to be managed by the ODP/TAMU Publication Services Department throughout FY04.
- The responsibility for the distribution of the Deep Sea Drilling Project and Ocean Drilling Program publications will be a responsibility of the Publication Services Department throughout FY04.
- Fiscal forecasts, including payroll, are based on the FY03 Program Plan, escalated at the historical state average of 3% per year and include regular compensation, temporary employment extension pay and vacation buyout.
- All four ODP/DSDP repositories will continue to operate at present staffing levels during FY04, with the responsibility for staffing and management of the repositories transferred to IODP by the start of FY05.
- During FY04, after the Staff Scientist full-time positions have ended, the costs associated with these services will be covered by the Publication Services Department budget. Projected costs are based on time estimates that Staff Scientists spend 45–55% of their time working on postcruise publication tasks.
- Computer hardware/software equipment, support, and maintenance will all be provided by the Information Services Department through FY04. It is planned Publication Services will cover the costs of new computer equipment for FY05–FY07 and the costs of computer support staff and equipment maintenance for FY05–FY07.
- Funds for temporary employment extension and vacation buyout for staff leaving at the end of FY04 will be included in the FY05 request.

FY04 will be a busy year for ODP as the responsibilities of the Science Operator for the Program focus on the orderly phaseout of a majority of the tasks presently shouldered by Science Services, Drilling Services and Information Services. In addition to phasing out the tasks related to scientific ocean drilling, staff will transition in an orderly fashion to a new set of tasks associated with the stewardship of the ODP legacy as it pertains to Science, Drilling and Information Services. Since our initial submission of our FY04-07 Phaseout Planning document in FY02, we have had time to more fully define and understand the requirements associated with demobilization of scientific and drilling equipment, the archiving of ODP data, and the documentation of operational equipment and procedures. Our analysis reveals that for us to attain high standards of stewardship, and to assure an orderly transition to operations in the Integrated Ocean Drilling Program, a significant commitment of staff is required in FY04. FY04 will start with a compliment of 139 staff (all numbers rounded to the nearest whole number) on hand to handle phaseout activities and by the end of the second quarter of the year this number will be reduced to 116 as the tasks associated with the demobilization of ship-related scientific and drilling equipment has been completed. Staff levels will then slowly decline through the rest of FY04 as the remaining staff finish, one by one, tasks related to preservation of ODP's legacy. At the end of FY04, the staffing level is projected to be 87, but it is anticipated that at the start of FY05 staffing levels in Science, Drilling and Information Services will decline markedly with the conclusion of legacy-related documentation. At the commencement of FY05, we anticipate that only 35 staff (Publications – 18; Administration – 17) will be on hand.

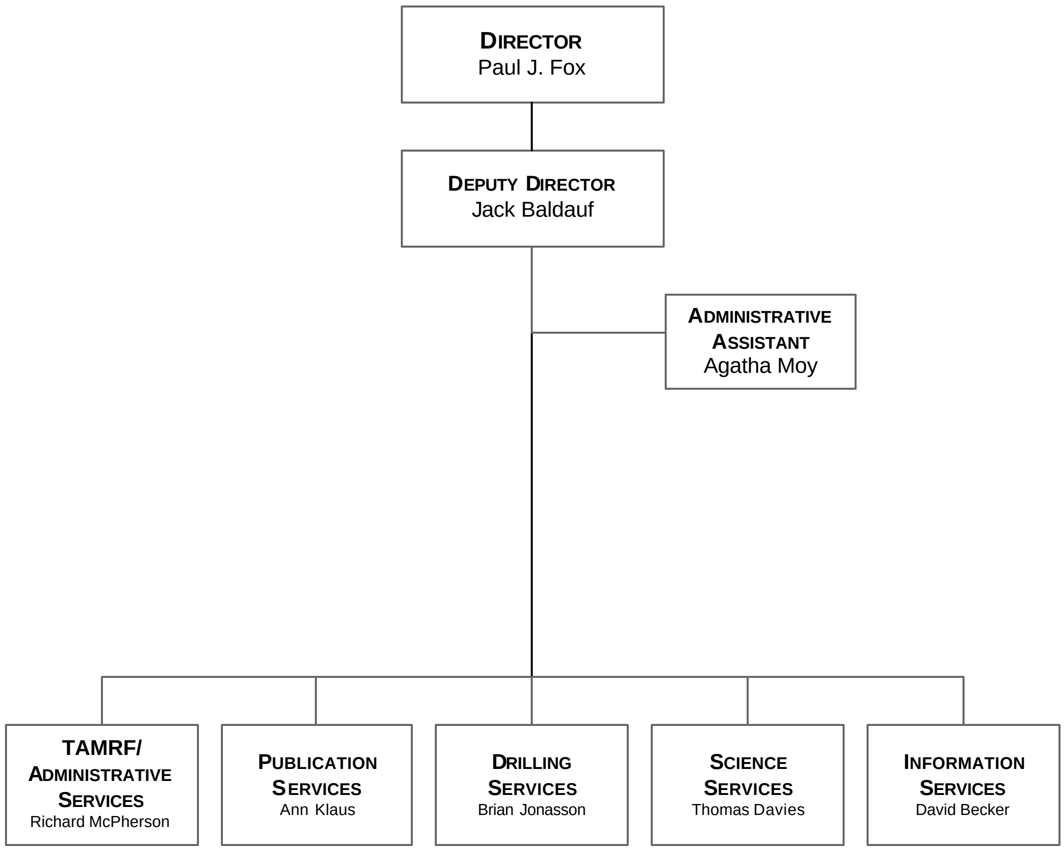
During this time of demobilization and legacy stewardship in FY04, Science Services will be devoted to two major phaseout tasks: the inventory, refurbishment and storage of scientific equipment, and the complete documentation of our scientific activities relating to installation, operation and use of ODP scientific equipment, as well as maintenance of our cruise staffing database. In addition, curatorial responsibilities and post-leg activities leading to the production of the *Proceeding* volumes will continue to be delivered. In Drilling Services, the focus will be on the demobilization of drilling and coring equipment removed from the *JOIDES Resolution*. Moreover, there will be a major effort on documentation of all the Program's technical developments. This is a major task and the goal will be to catalog tool systems and important technical innovations, refurbish all tools to ensure optimal functionality based on lessons learned during ODP operations, review the scientific benefits of each tool, explain tool operations and important functions, consolidate design drawings and specifications, provide a history of technical development, and explain operational parameters, performance and limitations. By the end of FY04, the phaseout tasks of these two Departments will be completed and the legacies of Science Services and Drilling Services will be ready to transfer to the IODP.

During FY04, the tasks for Information Services will be to create a complete archive that documents all software relevant to ODP, continue the migration of old ODP data to the Janus database, maintain the Janus database with all Janus data available on the Web, continue to provide computer system and network support at ODP/TAMU and remote repositories, and, at the end of FY04, hand the ODP database off to the new IODP operator. Please note that there will be a few data legacy tasks that will continue into FY05 requiring the support of seven staff from Information Services (i.e., transfer of ODP digital data to the National Geophysical Center; scanning of DSDP whole core photographs; and migration of ODP paleontology data to the Janus database). At this time, it is not known whether these staff will be transferred to IODP, or whether they will remain with ODP during FY05.

The tasks and responsibilities for Publication Services in FY04 are similar to a "normal" year of operations, as this Department's deliverables remain essentially the same. Administrative Services will also have a busy year with all the activities associated with the closeout of the subcontract for the *JOIDES Resolution*, enhanced personnel requirements related to staff turnover and reductions, and the preparation of a thorough equipment inventory.

The staff at ODP/TAMU is proud of the outstanding contributions that they have made to ODP over almost two decades and it is with great sadness that we bid farewell to ODP. Although FY04 will be challenging for us, we will bring the same exemplary level of service to the Program's phaseout that we have brought to the Program's 109 scientific expeditions.

ORGANIZATIONAL CHART, ODP



January 21, 2003

FY04 Budget Outline General Overview

FY04 begins the phaseout of activities associated with the Ocean Drilling Program (ODP) and participation of Texas A&M University (TAMU) as the science operator and Texas A&M Research Foundation as the business and compliance agent. Total resources in this request are $9,996,466. Following demobilization of the *JOIDES Resolution* at the end of FY03, Program staffing begins to decrease. Each fiscal year, 2004 to 2007, until publication of the scientific results from Leg 210 in FY07, positions will be eliminated as the requirement for that service/skill is no longer required. The specific details of each department's activities and staff reductions are contained in the Department overview that follows and in more detail within the cost center explanations.

Cost Center Detail

Salary and Fringe—Total payroll requirements, along with the full-time equivalents supported at the beginning of the fiscal year are shown below. Besides normal compensation (an average 3% salary increase over FY03 salaries for all eligible employees), each cost center contains the estimated cost of temporarily extended employment ($508,137) and vacation buyout ($375,515) for employees whose positions are eliminated in FY04.

Fiscal Year	Total Payroll*	Full-Time Equivalents**
04	$7,723,903	139.65

* Involves compensation (i.e., regular salary, fringe, temporary employment extension and vacation buyout) for budgeted employees terminating in FY04.
** Reflects total number of employees at the beginning of the fiscal year.

1805 Science Services—In FY04 the department's base budget will decrease by 39% ($1,570,227) from FY03, reflecting the reduction of personnel following the completion of ODP seagoing operations in FY03. All personnel costs, including temporary employment extension (TEE) and vacation buyout for budgeted employees terminating in FY04, are included in the base budget. TEE and vacation buyout for staff completing their duties on September 30, 2004, will be budgeted in FY05. Costs for science support (cost center 1805-01) will decline steadily through FY04 as tasks are completed and the remaining Staff Scientists terminate. Similarly, costs for technical support (cost center 1805-12) diminish rapidly during the first six months of FY04 with the last personnel, the Laboratory Officers and Supervisor of Technical Support, completing their duties at the end of March 2004, as tasks related to demobilization and disposal of equipment are completed. Repository operations will, however, continue at a normal level, with the focus on moratorium sampling and completing the core-wrapping project by the end of the fiscal year. We assume that at the end of FY04 responsibility for the continued operation of the repositories will be transferred to IODP.

The phaseout in FY04 exposes the department to some risks. The repositories are now staffed at the minimum level necessary to provide reliable service to the community. Continued volatility of utilities costs at both the East Coast and West Coast repositories remains a cause for concern.

1803 Drilling Services—In FY04, the preventive maintenance program will be done on the drill pipe and drill collars to preserve the drill string for IODP. This includes inspection of each joint (including the tubes, box, and pin); recutting of the box and pin, if required; and internal and external coating of the joint. The preventive maintenance of the drill string has been budgeted at $399,379. In addition, Temporary Import Bonds (TIB) will have to be filed on the imported drill string, on a yearly basis up to a maximum of three years. Duty of 10% will need to be paid on foreign drill pipe if it is still in the USA after three years. Japanese drill pipe may require an additional dumping fee of ~40% of original cost, but this situation can be avoided by moving the Japanese drill pipe onto the IODP riserless vessel when the new program commences in 2005.

Funds have also been budgeted for 9.0 full-time equivalents (FTEs) from DSD and 2.0 Core Technicians from Transocean Sedco-Forex (TSF) to work in the controlled warehouse space breaking-out, preserving, inventorying, and crating coring and drilling equipment and consumables for future use by other NSF scientific coring programs. This includes the salary for the two TSF Core Technicians for the month of October, and the rental of a breakout skid, forklift, and stevedore crew. Crating materials are budgeted at $15,000.

Shipping has been budgeted at $70,000 to return the Drilling Services and Science Services equipment and consumable supplies to College Station for long-term storage.

The majority of the DSD phaseout budget is for staff payroll to accomplish the following two major tasks of DSD:

- Drilling and Coring Equipment Demobilization (24.0% of FTE effort)
- DSD Technical Legacy Documentation (76.0% of FTE effort)

DSD staffing reductions will occur in a stepped approach. The FTE of 20 staff at the end of FY03 will be reduced to 19 FTEs starting in December 2003. Staffing in MST will decrease in an incremental fashion as the equipment is demobilized, with reductions in December 2003 and January, March, and April 2004 when all of the equipment has been moved from the controlled warehouse space at the demobilization port to College Station for disposal and long-term storage. All positions will be carried in the FY04 payroll as they complete their temporary employment extension (TEE) time. There will be 16 FTE staff at the end of FY04.

It is expected that DSD will complete less than 10% of the documentation required for the DSD Technical Legacy prior to the end of the ODP program in September 2003 and, as a result, legacy documentation will be a major effort in FY04.

1809 Information Services—For FY04, it is anticipated that the Information Services Department (ISD) will require 27 FTEs at the beginning of the year and 19 FTEs by the end of the year. Primary expenditures will take place in salaries, software licenses, and computer software and hardware maintenance contracts. All other expected expenditures are related to normal functions of a department. It is planned that two members of the department will be transferred to the Publication Services Department at the end of FY04 to support that department's computer automation needs through FY07. Although the department disappears at the end of FY04, three ISD projects are planned beyond FY04. The projects include the transfer of ODP digital data to National Geophysical Data Center (NGDC) in FY05, scanning of DSDP whole core photographs (through January 2007, although with additional scanners purchased in FY03, this date will move up), and migration of ODP paleontology data to the Janus database (to end of FY07). To support these projects, preliminary forecasts suggest that a staff of seven, four and four will be required during FY05, FY06, and FY07, respectively, along with five graduate student assistants. Overall supervision of the projects could be transferred to the ODP Publication Services Department or to the new IODP Information Technology (IT) department during FY04 or at the start of FY05.

1802 Publication Services—The overall budget for the Publication Services Department increased by 4.5% ($73,018) compared to the FY03 Program Plan, although the main operational costs for the department decreased from FY03. Significant budget increases in FY04 include $38,767 for staff scientist freelance salaries to complete their postcruise Editorial Review Board duties and travel funds to attend second postcruise meetings related to their final legs after their positions in the Science Services Department are phased out; and the inclusion of $120,000 for the ODP Cumulative Index Project. Payroll costs are 3.2% ($36,634) lower than in the FY03 Program Plan. Costs include the addition of the freelance wages for phased-out staff scientist positions mentioned above. Several positions vacated in late FY02/early FY03 were not filled due to the upcoming phaseout of publication activities. Travel and training costs are 292% ($29,934) higher than was budgeted in FY03, but only 9.2% ($3,392) higher than the actual costs in FY02 (FY03 costs were significantly reduced to meet budget targets and do not reflect the actual cost of training needed to keep up with industry standards.). Costs for supplies, software, and shipping are higher than those projected for FY03 (49.8% [$7,475]; 29.0% [$7,250]; and 19.8% [$4,750], respectively), but lower than FY02 actual costs (–11.6% [$2,960]; –7.4% [$2,572]; and –7.7% [$2,385], respectively). This reflects refined estimates based on what is needed to carry out the publications tasks. Services costs decreased by 14.2% ($8,285) from FY03 because of differences in the number of payments made to Editorial Review Board members and the number of CD-ROMs to be manufactured. Subcontract costs increased by 20.5% ($66,400) from FY03. Seventy percent of subcontract expenses in FY04 cover the printing, indexing, and distribution of six *Initial Reports* and four *Scientific Results* volumes in the *Proceedings of the Ocean Drilling Program* series and 30% covers work on the ODP Cumulative Index Project. In addition, revenue projections are reduced by 66% to $10,000 because of on an average annual decline in revenue of 34% between FY00 and FY02. This trend in declining revenue is expected to continue because the cost of newer volumes is 60% less than older volumes, newer volumes are available in HTML and PDF format on the Web for free, and volume booklet/CD-ROM orders should decrease as the Program phases out.

1801-01 Administration/Headquarters—At the beginning of FY04 funds are provided for payroll and support activities associated with 25.15 FTEs (2.2 in Headquarters and 22.95 in Administration) or 30 actual employees. The numbers of personnel are reduced to 23 FTEs (27 actual employees) by year's end. Payroll increased by 9.25% ($132,335) over the FY03 request. The difference involves an anticipated salary increase, $20,914 for vacation buyout, $37,155 in salary adjustments associated with increased responsibilities and $36,321 for temporary employment extension associated with terminating employees. Most expense categories were reduced or remained relatively the same as in FY03, except for Travel, Travel-Port Call, Business Conferences and Services. Because there are no ship operations in FY04, the first two declined. The latter two increased as a result of phaseout and the need for additional conferences and providing out-placement assistance to any Program employees terminating in FY04.

FTE COMPARISON FY02 - FY03 - FY04

TAMU/TAMRF	FY02	FY03	FY04*
Headquarters/Administrative Services	24.80	24.80	25.15
Publication Services	23.00	22.00	19.00
Drilling Services	19.50	19.50	20.00
Science Services	51.50	48.50	48.50
Information Services	26.25	27.25	27.00
Total	**145.05**	**142.05**	**139.65**

* Start of FY04

NUMBER OF FTE BY DEPARTMENT
SEPTEMBER 2003 – SEPTEMBER 2004

Month/ Year	Science Services	Drilling Services	Information Services	Publication Services	Administrative Services*	Total
Sep 03	50.50	20	27.25	19.00	24.80	141.55
Oct 03	48.50	20	27.00	19.00	25.15	139.65
Nov 03	48.50	20	27.00	19.00	25.15	139.65
Dec 03	40.50	19	21.00	19.50	25.15	125.15
Jan 04	39.50	18	21.00	19.50	25.15	123.15
Feb 04	32.50	18	21.00	19.50	25.15	116.15
Mar 04	26.50	17	19.00	19.50	25.15	107.15
Apr 04	25.50	16	19.00	19.00	24.35	103.85
May 04	21.50	16	19.00	19.00	23.00	98.50
Jun 04	11.50	16	19.00	19.00	23.00	87.50
Jul 04	11.50	16	19.00	19.00	23.00	87.50
Aug 04	10.50	16	19.00	19.00	23.00	86.50
Sep 04	10.50	16	19.00	19.00	23.00	86.50

* Includes 2.2 FTEs in Headquarters.

FY04 BUDGET SUMMARY

Account	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
418051-01	Science Services	$ 939,181	$ 639,863
418051-06	East Coast Repository	224,407	229,224
418051-07	West Coast Repository	145,952	149,209
418051-08	Gulf Coast Repository	148,908	147,010
418051-09	Curatorial Section	133,672	131,864
418051-10	Bremen Core Repository	26,500	26,500
418051-11	Bremen Core Repository - ODP	4,000	4,000
418051-12	Technical Support	2,397,158	1,121,881
	Subtotals	**4,019,778**	**2,449,551**
418031-01	Drilling Services - Office	296,956	256,072
418031-02	Drilling Operations Team	1,700,150	932,327
418031-03	Development Engineering Team	553,448	507,636
418031-04	Material Services Team	978,307	443,290
418031-24	Downhole Measurement Technology	170,000	-
	Subtotals	**3,698,861**	**2,139,325**
418091-01	Information Services	2,369,332	1,731,715
	Subtotals	**2,369,332**	**1,731,715**
418021-01	Publication Services	1,619,481	1,692,499
	Subtotals	**1,619,481**	**1,692,499**
418011-01	Administration/Headquarters	1,852,588	1,983,376
418011-02	Public Information	2,000	-
	Subtotals	**1,854,588**	**1,983,376**
418061-01	Ship Operations - ODL	23,024,743	-
418061-02	Ship Operations - ODP	813,218	-
	Subtotals	**23,837,961**	**-**
	TOTAL	**$ 37,400,000**	**$ 9,996,466**

Science Services Department

The mission of the Science Services Department in FY04 is to provide scientific, management, and technical support to complete the Initial Reports and other post-leg science activities, to complete the orderly demobilization of ODP's seagoing facilities, and to maintain archives of the cores for use by scientists throughout the world.

The Science Services Department has been responsible for scientific, technical, and curatorial support of both individual drilling legs and the broader, longer-term scientific goals of the program as set forth in the Long Range Plan. With the conclusion of drilling operations at the end of FY03 the primary focus of the department will shift from new and ongoing operations to bringing the scientific and technical aspects of the program to an orderly conclusion. Major tasks for FY04 will be (1) completing the scientific reports (*Proceedings of the Ocean Drilling Program*), particularly the *Initial Reports*, for the final legs of ODP; (2) completing demobilization of *JOIDES Resolution*; (3) completing legacy documentation; (4) continuing curation and sampling oversight of core samples. Completion of demobilization and preparation of reports will be carried out at the demobilization port (assumed to be Galveston, Texas) and at ODP/TAMU. Core curation and sampling takes place at four core repositories located at TAMU (Gulf Coast Repository); Lamont-Doherty Earth Observatory, Columbia University (East Coast Repository); Scripps Institute of Oceanography (West Coast Repository); and the University of Bremen, Germany (Bremen Repository). Collectively, these repositories will, by the time the last cores are delivered from the drillship, house as much as 320 km of core material, the enduring legacy of more than 35 years of scientific ocean drilling (including the Deep Sea Drilling Program).

The Science Services Department is the largest ODP/TAMU department and encompasses all the ODP scientific, repository and seagoing technical support staff, with the exception of the marine computer specialists (Information Services Department) and Borehole Research Group staff (LDEO). The Science Services Manager, who has overall responsibility, is assisted by the Supervisor of Technical Support and the Curator. The Staff Scientists and administrative staff report to the department manager, while the technical support staff and repository staff report to the Supervisor of Technical Support and the Curator, respectively.

The scientific findings of ODP are the subject of over 200 volumes of the *Proceedings of the Ocean Drilling Program*, published in two series: the *Initial Reports* and the *Scientific Results*. Completion of the final volumes of scientific reports will be the primary responsibility of the Staff Scientists. Since the *Initial Report* for each leg is completed approximately nine months to a year following the conclusion of the leg, we assume there will be a steady reduction in effort required for this activity through FY04, with the last volume, for Leg 210, being completed near the end of the fiscal year. Completion of the *Scientific Results* volumes is a long-term task requiring a low level of effort but extending over several years. This will most likely be handled via consulting arrangements with the ODP/TAMU Publications Department.

The Supervisor of Technical Support oversees the technical support staff and will have responsibility for completing demobilization and related tasks. Demobilization will involve removing, inventorying and placing in storage all the laboratory equipment from *JOIDES Resolution*, and completing all the associated documentation of methods and procedures. While initially intensive, we estimate that this task will require a rapidly reducing level of effort and can be completed in less than six months.

Beginning in FY04, the repository staff within Science Services will focus on processing requests for postcruise sampling, completing the core-wrapping project, and working with Information Services on data verification and completeness during the moratorium period following FY03 legs. The Bremen Core Repository will receive the cores from Legs 209 and 210 in the early part of FY04, which we project to be about 1.8 km of core.

Although we will no longer receive sample requests for upcoming legs, which averaged about 150 per year, moratorium (within 12 months postcruise) and post moratorium sampling will continue and should result in at least 400 sample requests in FY04. A postcruise sampling party for Leg 208 may occur in late FY03 or the early part of FY04, at the Bremen Repository. The high recovery projected for this leg, and the nature of the science program, indicate postcruise sampling on the order of more than 30,000 samples, based on previous sampling parties. Shipping of all of these samples to Leg 208 scientists will occur within the first quarter of FY04. Even with this large amount of samples, previous experience indicates that even more samples from this leg and also from Leg 207 will be taken during the moratorium period that extends through most of FY04. Such sampling is in support of the postcruise research and publication obligations of the shipboard scientists from those legs. The Gulf Coast Repository will have experienced most of its moratorium sampling during FY03; however, further sampling of recent legs from FY01 to FY03 is still likely to take place as scientists try to complete their research within the publication deadlines. Thus both of these repositories should each expect to see at least 25-30,000 samples taken. The East Coast Repository (6-9,000 samples) and West Coast Repository (2,000 samples) should expect to remain at lower sampling levels, similar to the last few years.

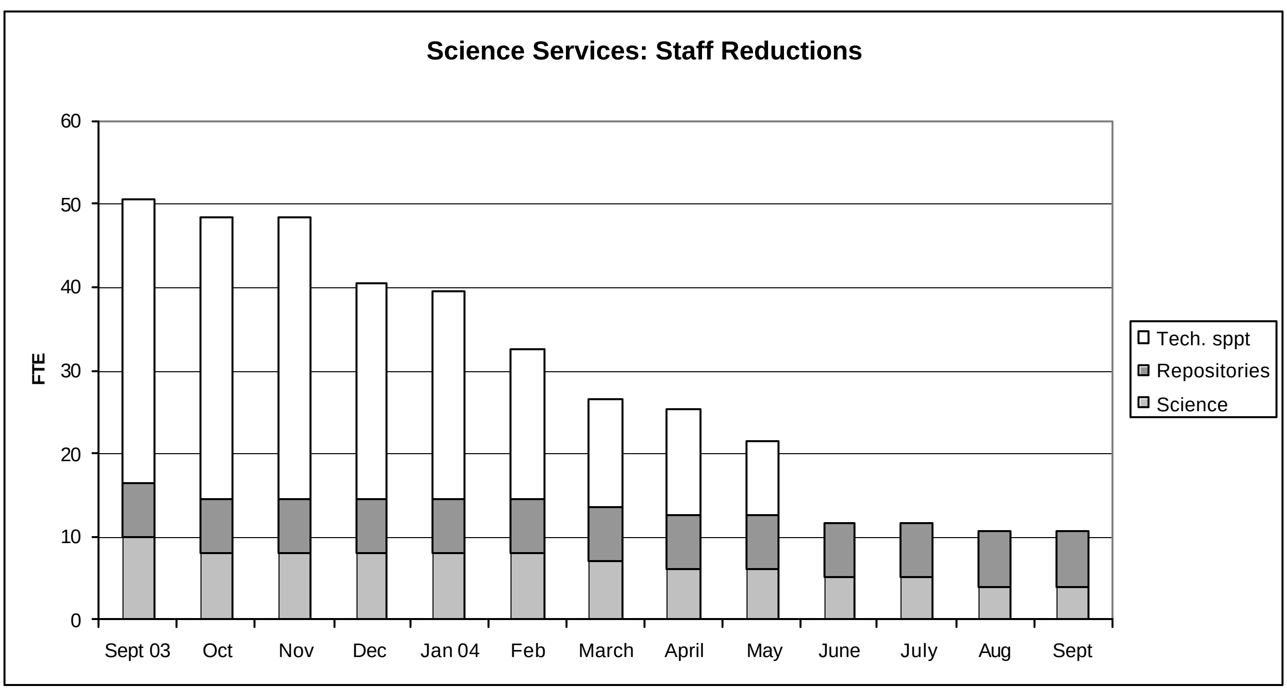
Although the ODP and DSDP cores are stored in D-tubes at near-freezing temperatures, deterioration of the material by desiccation and oxidation is an ongoing problem for the soft sediments that make up the bulk of the collection. To combat this, a program of wrapping all of the soft sediment cores, even older DSDP material, in plastic film was initiated in FY98. By the end of FY03, we project to have at least 80% of the collection wrapped. This project will be completed in FY04.

The Curator's office will continue to oversee the operations and budgets of the four repositories, receive, process, and distribute sample requests to the repositories, help develop educational and museum related uses of the cores, maintain the scientist, sample request and bibliographic databases, and perform data verification of FY03 leg-related curatorial data during the final moratorium period that extends to the end of FY04.

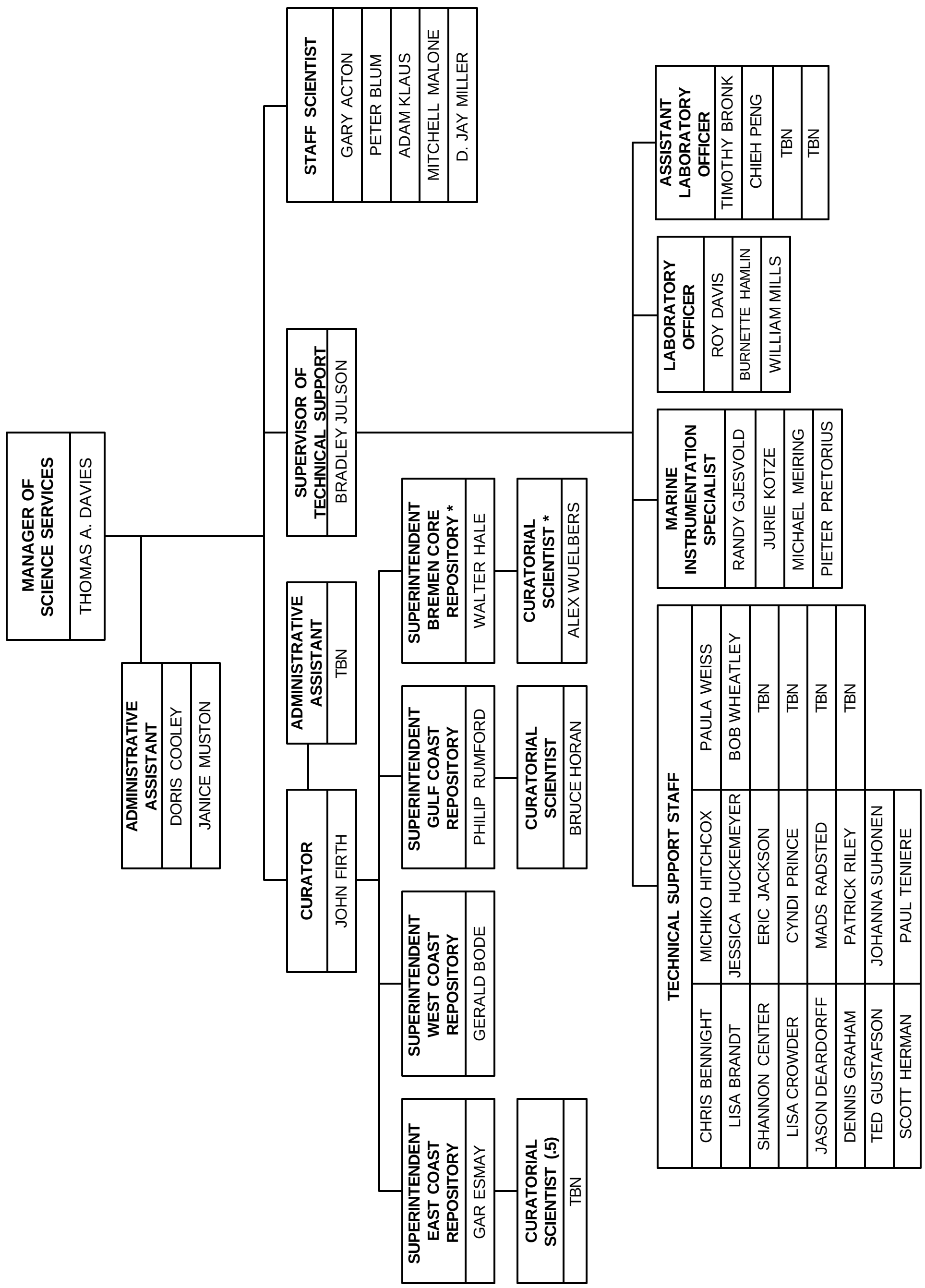
Thus we expect that FY04 will be a full year of typical operations for the repositories and curation group, requiring a sustained level of effort with no expected reductions. We assume that at the end of FY04 responsibility for the continued operation of the core repositories will be transferred to another entity and they will no longer be an ODP/TAMU responsibility.

SCIENCE SERVICES – FY04 PERSONNEL STRUCTURE

Month	Science	Repositories	Technical support	Total
September 03	10.00	6.50	34.00	50.50
October	8.00	6.50	34.00	48.50
November	8.00	6.50	34.00	48.50
December	8.00	6.50	26.00	40.50
January 04	8.00	6.50	25.00	39.50
February	8.00	6.50	18.00	32.50
March	7.00	6.50	13.00	26.50
April	6.00	6.50	13.00	25.50
May	6.00	6.50	9.00	21.50
June	5.00	6.50	0	11.50
July	5.00	6.50	0	11.50
August	4.00	6.50	0	10.50
September	4.00	6.50	0	10.50



ORGANIZATIONAL CHART, SCIENCE SERVICES



Task: 1805 Science Services
Subtask: Curation; Technical Support
Functions: Implements operational science plan under direction of JOIDES, including scientific staffing, management of shore-based laboratories, processing and archiving of cores, and distribution, record keeping, and inventory of samples.

* University of Bremen employees

January 23, 2003

TASK SUMMARY 1805: SCIENCE SERVICES
SUBTASKS: TECHNICAL SUPPORT, CURATION

POSITION	DESCRIPTION
Manager of Science Services (1.00):	Manages and directs activities of Science Services.
Administrative Assistant (2.00):	Coordinates activities for department and Manager. Interacts with international science community and governmental agencies concerning science activities and meetings, supervises office staff, and manages department inventories. Manages shipboard staffing database; provides coordination of purchase orders and other clerical and administrative tasks. Provides administrative and database support for the supervisor of technical support. Maintains administrative records for technical employees.
Curator (1.00):	Interacts with science community to ensure an effective JOIDES/ODP Sample Distribution Policy; develops and implements a long-range strategic plan to ensure core collections are preserved in the best interest of JOIDES and the scientific community; manages shore-based sampling programs.
Administrative Assistant (1.00):	Provides administrative and database support for the Curator. Maintains administrative records for curatorial employees. Performs data entry for sample requests, bibliographic reprint files, and other sample-related databases; compiles monthly reports and other routine reports as required.
Superintendent of Repository (3.00):*	Supervises local operation of East, West, or Gulf Coast Repository; fulfills sample requests under instructions from the Curator.
Curatorial Scientist (1.50):*	Fulfills sample requests and maintains collections.
Supervisor of Technical Support (1.00):	Provides direct scientific oversight of technical personnel and shore-based laboratories. Responsible for coordination of the laboratory working groups and overseeing cost center expenditures.
Technical Support Staff (22.00):	Maintains and inventories laboratory equipment. Collects, records, and preserves core material, scientific data, and laboratory procedures (legacy documentation).
Marine Instrumentation Specialist (4.00):	Responsible for the electronic/electro-mechanical readiness of the state-of-the-art scientific laboratory equipment, underway geophysical equipment, and downhole measurement instrumentation in conjunction with the equipment's scientific operating technician.
Laboratory Officer (3.00):	Responsible for training, scheduling, and supervising of marine specialists and for planning, coordinating, and supervising shore-based technical activities.
Assistant Laboratory Officer (4.00)	Assists the Laboratory Officer with all areas of responsibilities, serving as laboratory foreman responsible for directing activities of technical personnel.
Staff Scientist (5.00):	Serves as Leg Project Manager, coordinating postcruise scientific research and publication of cruise results.
Total Personnel:	48.50

* BCR employees shown on organizational chart are non-TAMU employees, and are not included in total.

ACCOMPLISHMENTS

Leg Project Management

The primary responsibility of the Science Services Department is to provide services in support of the science mission of ODP. This responsibility falls largely on the staff scientists and technical support staff. As leg project managers, staff scientists play a central role in leg planning and staffing, participate in the leg as members of the science party, and contribute to post leg research and publications. As the last year of shipboard operations for ODP, FY03 presents many new challenges as the science community strives to gain maximum benefit from the few remaining months of drilling. We have been fortunate to have a group of experienced staff scientists who are willing and able to step up to the challenge and focus on maintaining a high quality of service to the science community, allowing the department manager to focus on other issues associated with preparations for demobilization and the orderly conclusion of the program.

Technical Support Career Ladder

ODP seagoing technical support activities are unique, to the extent that even technicians with prior seagoing experience require a period of orientation and training before they can become effective. Furthermore, the nature of ODP activities, with a different scientific mission on every cruise, requires that management have the ability to reassign staff to different duties promptly in response to rapidly changing needs. To facilitate this, the majority of seagoing staff were classified under the same title, based on a generalized position description. This enabled us to reassign staff without having to go through the time-consuming hiring process. However, the net result of this arrangement was that our technical support staff, who have won worldwide acclaim in the international scientific community for their skill and capability, have had no clear career path for advancement. This has been a source of frustration and discouragement.

With the support of the university administration, in FY03 we successfully implemented a new technical support classification structure that offers a “career ladder” which individuals can climb as they grow in skill and experience. Accompanying this reorganization were significant salary adjustments for some members of the technical support staff, designed to recognize their skills, experience and high level of performance. The new technical support staff structure has led to a major boost in morale which will help the organization carry through the difficult transitions of FY04.

Demobilization

The final ship-related activity involving Science Services will be demobilization of the laboratories on the *JOIDES Resolution*. ODP Leg 210 will end in St. John’s, Newfoundland. At that port call the science party will leave the ship and additional technical support staff board. We expect to leave St. John’s with approximately 50 per cent more than the usual complement of technical support staff on board. During the transit from St. John’s to the demobilization port we will begin de-installing, inventorying and packing laboratory equipment for removal and storage and/or disposal. These activities will continue at the demobilization port, and all items will be removed from the ship to a staging facility and warehouse in the demobilization port in late September 2003. Completion of demobilization, involving inventory, preservation and shipment of equipment back to College Station (or other locations) will extend into the beginning of FY04.

Preparation of Legacy Materials

In addition to core descriptions and documentation of the scientific results of ODP, for which existing publication mechanisms are already in place, a necessary component of the successful conclusion of ODP is the assembly of various other legacy materials that may be of potential archival interest, or of value to the operator of a future program. This entails completing and updating of technical notes and laboratory manuals ("cookbooks") describing procedures used at various times in the different shipboard laboratories. Such documents provide a valuable adjunct to the ODP scientific database and supplement the information contained in the published *Proceedings of the ODP*, providing important insights into the quality and reliability of the data. This activity began in FY03 and will be completed in FY04.

Repository Activities

A major challenge in FY03 was the installation and operation of a facility to store gas hydrate cores from Leg 204. These cores were collected and stored under pressure, using methane gas to pressurize the containers. In order to comply with safety regulations this required installation of a separate, refrigerated hazardous material locker, outside of the Gulf Coast Repository, equipped with redundant refrigeration units, and appropriate temperature and gas sensors and emergency alarms. This unit was successfully installed in early FY03, using funds provided by the U.S. Department of Energy.

By the end of FY03, we expect to have received more than 11 km of new core, of which more than 10 km will ultimately be stored at the BCR. We expect to host a postcruise sampling party for Leg 207 at the BCR in late FY03 or early FY04. Other repository activities, such as providing materials for display at meetings or museums, conducting educational tours and class activities, should continue at a steady rate through FY03.

Core wrapping

In FY03, more student labor will be added in order to achieve the goal of wrapping 122,000 sections. Total FY03 student labor costs for this project will be about $45,000 and supply costs about $5,700, for an average cost of $0.42 per wrapped section, a small amount relative to the cost of acquiring the core material from the seafloor. Most of the effort will be focused at the Gulf Coast Repository, which will receive only minimal core in FY03, allowing student labor to be redirected from building core racks and racking new core to wrapping core.

GOALS

Completion of Post Cruise Reports

Completion of the final scientific reports will be the primary responsibility of the staff scientists. Since the *Initial Report* for each leg is completed approximately nine months to a year following the conclusion of the leg, we assume that this task can be completed within FY04, with the last volume, for Leg 210, being completed near the end of the year. As indicated earlier, completion of the *Scientific Results* volumes is a separate, long-term task which will be handled directly by the ODP Publications Department.

Demobilization

The final ship-related activity involving Science Services is demobilization of the laboratories on the *JOIDES Resolution*. ODP Leg 210 will end in St. John's, Newfoundland, in late FY03. During the transit from St. John's to the demobilization port we will begin de-installing, inventorying and packing laboratory equipment for removal and storage and/or disposal. Equipment will be rapidly removed from *JOIDES Resolution* to a staging facility and warehouse in the port of Galveston in late September 2003. At the staging area Drilling Services and Science Services personnel will inventory, preserve and crate remaining equipment for shipment back to College Station. This aspect of demobilization will continue into early FY04 and will be completed within six months. We assume that adequate storage space for scientific equipment that requires a climate-controlled environment will be available in vacant unrefrigerated (but air-conditioned) space at the Gulf Coast Repository.

Preparation of Legacy Materials

As indicated above, in addition to core descriptions and documentation of the scientific results of ODP, a necessary component of the successful conclusion of the program is the assembly of various other legacy materials that may be of potential archival interest, or of value to the operator of a future program. This task commenced in FY03 and will be completed in FY04 following demobilization. In Science Services we will focus on completing and updating of technical notes and laboratory manuals ("cookbooks") describing procedures used at various times in the different shipboard laboratories. Such documents will be a valuable adjunct to the ODP scientific database and will supplement information contained in the published *Proceedings of the Ocean Drilling Program*, providing important insights into the quality and reliability of the data. We will also ensure that manufacturers' operation, maintenance and repair manuals are cataloged and available for future users of the equipment. These tasks will be the responsibility of the technical support staff, under the supervision of the Laboratory Officers.

We also expect to develop, in conjunction with JOI, a series of statistical compilations of showing different aspects of participation in the program by the global scientific community, e.g., by geographic location, type of institution, or rank of participating scientists, size, origin and type of study associated with sample requests, etc. We expect this task to be completed by the end of the second quarter of FY04.

Repository Activities

In FY04, we expect sampling activity to drop significantly, after cores from the last ODP legs are stored and the last postcruise sampling parties are held. Both the Bremen Repository and Gulf Coast Repository should still expect requests for 25-30,000 samples each, whereas the East Coast Repository (6-9,000 samples) and West Coast Repository (2,000 samples) should expect to remain at lower levels. We expect the final postcruise sampling party, for Leg 208 samples, to occur at the Bremen Repository in late FY03 or early in FY04.

Our goal is to finish the core-wrapping project in FY04 by wrapping approximately 99,000 sections. This will result in both the Bremen Repository and Gulf Coast Repository collections being 100 percent finished, and the East Coast Repository and West Coast Repository having at least 66 percent wrapped. The number of sections needed to be wrapped in the East and West Coast repositories can only be estimated until the students check every section. If one-half of these two repositories' collections do not need wrapping, then the East and West Coast repositories could finish in early FY03. At least 2.5 percent of these collections are igneous and metamorphic rock cores, and an indeterminate amount is of lithified sedimentary rocks. The remaining sections are of soft sediments that may or may not have dried out. We assume that wrapping at least two-thirds of these collections, and possibly less, will cover all soft sediments still moist enough to benefit from wrapping. Most of the activity in FY04 will be in the Gulf Coast Repository, which has the largest core collection (about 120 km by end of FY03). A small amount (about 6 km) will remain for the Bremen Repository to wrap from the last few ODP legs.

Other repository activities, such as providing materials for display at meetings or museums, conducting educational tours and class activities, are expected to continue at a steady rate through FY04, but will probably slow down in following years.

Our goal is to have moratorium sampling and core wrapping completed at all the repositories by the end of FY04 so that whatever entity assumes responsibility for their continuing operation will be able to take over a smoothly functioning, “steady state” activity focused on long-term service to the scientific community.

418051-01 SCIENCE SERVICES

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 841,718	$ 605,964
3500	Travel	30,403	15,024
3580	Travel - Port Calls	22,560	875
3720	Business Conferences	3,000	1,500
4000	Supplies	12,000	6,000
4765	Software	3,500	-
5261	Shipping	3,500	1,750
5370	Telecommunications	12,000	6,000
5373	Ship-to-Shore Communications	6,000	-
5550	Services	3,500	1,750
6820	Maintenance & Repair	1,000	1,000
	TOTAL	**$ 939,181**	**$ 639,863**

This cost center covers the shore-based activities of the Science Services Department, including support for the Manager, Staff Scientists, and administrative staff, office expenses, and necessary travel.

Payroll—It is assumed that Staff Scientists will remain on the payroll for one year following their last tour of duty at sea. This will allow time to finish the *Initial Reports* volume and deal with any questions regarding leg sample requests (sampling parties) and/or importing the leg scientific data into the Oracle database. Under this scheme the last staff scientist would complete their duties at the end of September 2004 and leave the payroll November 30, 2004. The responsibilities for the *Scientific Results* volumes will have to be completed as an extra-curricular duty in each scientist's new position, with reimbursement arrangements made through the ODP Publications Department.

The manager and one administrative assistant will remain on the payroll for the whole of FY04, but the second administrative assistant position will be terminated at the end of the first quarter of FY04. Funds for TEE and vacation buyout for staff completing their duties at the end of September 2004 will be included in the FY05 budget.

Overall, this cost center will begin FY04 with 8 FTEs and end the fiscal year with 4 FTEs.

Travel—In order for ODP/TAMU to maintain contact with the science community, and be able to effectively disseminate program results, as well as for their own professional development, Staff Scientists are encouraged to attend one professional meeting each year (typically, but not always, the fall meeting of the American Geophysical Union) to present the results of their ODP-related research. Funds for the Manager and five Staff Scientists to each attend one professional meeting have been included in the base budget for FY04.

One of the key responsibilities of the Staff Scientists is to oversee the postcruise meetings for their particular leg. This is critical to the Program as here the *Initial Reports* and *Scientific Results* volumes are pieced together. The first postcruise meeting is normally held at ODP/TAMU, at only minor cost to Science Services (budgeted under Business Conferences). It is assumed that the first postcruise meetings for Legs 208-210 will occur in FY04. Funds are also included for attendance at second postcruise meetings occurring in FY04.

No funds are budgeted for travel to JOIDES, USSAC, or other advisory group meetings, since at present no meetings have been scheduled beyond FY03. If further meetings are scheduled to facilitate the transition to IODP, travel funds will be sought from other sources.

Travel–Port Calls—All scientific equipment will be removed from the *JOIDES Resolution* into a dockside temporary storage facility at the demobilization port (assumed to be Galveston, Texas) at the end of FY03. Funds are included in FY04 for 2 trips by the Manager to the temporary storage facility in order to monitor progress on inventory and movement of equipment into longer-term storage.

Supplies**—**The supplies category includes office consumables for the department and laboratory supplies (not including equipment) for the shore-based laboratories. Funds are reduced over prior years to reflect the reduction in the number of staff, and generally decreasing level of activity through FY04.

Software**—**No funds are budgeted for upgrades and the acquisition of new departmental software. If such expenditures become necessary due to communication or compatibility problems resulting from upgrades to commonly used programs, funds will be rebudgeted as needed.

Shipping**—**Covers general postage costs and overnight delivery.

Telecommunications—The telecommunications budget covers communications costs for all Science Services staff at ODP/TAMU, except for the Curator and repository staff.

Services**—**This category includes the cost of photocopying, printing (business cards, etc.), programming, and TAMU physical plant services. Funds are reduced over prior years since we do not expect to be printing business cards, or incurring similar expenses in FY04.

Maintenance/Repair**—**This covers routine service to copiers and other office equipment.

418051-06 EAST COAST REPOSITORY

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 77,907	$ 80,374
4000	Supplies	3,000	1,500
5261	Shipping	4,000	3,000
5370	Telecommunications	3,500	3,500
5550	Services	136,000	140,000
6820	Maintenance & Repair	-	850
	TOTAL	**$ 224,407**	**$ 229,224**

The East Coast Repository (ECR) at LDEO contains about 75,000 m of core and typically distributes about 9,000 samples annually (five-year average). We can expect that the demand for samples will gradually diminish; however, use of the ECR core collection is growing in other ways, (e.g., core sections are being analyzed by visual inspection/description or by non-destructive measurements such as scanning XRF or MST). The number of visitors is expected to remain at more than 100 annually. It is also expected that the ECR will distribute 6,000 samples. Finally, as many as 20,000 core sections may need to be wrapped in FY04 in order to complete the core-wrapping project by the end of the year.

Payroll—The sampling activity and number of visitors at the ECR requires that we maintain 1.5 full-time employees through FY04 to provide prompt, continuous service to the science community. Funds are included for an anticipated 3% salary increase over FY03.

Supplies, Shipping—Funds are budgeted for sampling, core wrapping, office and miscellaneous supplies, sampling equipment supplies (e.g., saw blades, etc.) and sample shipping and mailing costs.

Telecommunications—Funds are budgeted for routine phone communications for ECR staff. This includes a base monthly cost for phone services provided by LDEO/Columbia, which makes up more than two-thirds of the amount budgeted.

Services—This category provides for the lease payments and utility costs (power, refrigeration) associated with the operation of the ECR. In addition, this service line covers a purchase order with Columbia University to cover charges incurred through LDEO/Columbia University, such as phone service, shipping, supplies, etc. We have assumed that these costs will continue to rise at 3% annually, using the FY03 Program Plan as a base.

Maintenance/Repair—This category includes funds for the repair of sampling equipment, office equipment, etc.

418051-07 WEST COAST REPOSITORY

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 72,352	$ 74,759
4000	Supplies	1,000	1,000
5261	Shipping	1,600	1,600
5370	Telecommunications	3,000	1,000
5550	Services	68,000	70,000
6820	Maintenance & Repair	-	850
	TOTAL	**$ 145,952**	**$ 149,209**

The West Coast Repository (WCR) at Scripps Institution of Oceanography in San Diego contains about 50,000 m of core. Sampling activity has averaged 1,900 samples per year over the past six years; however educational use of the cores has grown steadily, as increasing numbers of classes from regional secondary schools and colleges are visiting the facility. FY01 saw more than 300 student visitors, more than any other repository. In FY04, we expect the WCR to take about 1600-1800 samples, and to continue to host several hundred students in classroom visits. As with the ECR, depending on the preservation of the oldest DSDP cores, the WCR may need to wrap up to 17,000 core sections to complete the core-wrapping project.

Payroll—Funds are budgeted for one FTE through FY04. A part-time undergraduate student worker is also employed to help the regular employee in certain physical tasks that require two people, and to work on core wrapping.

Supplies, Shipping—Although costs will surely rise, funds are budgeted at the same level as FY03 for sampling, office and miscellaneous supplies. Supplies and shipping funds are requested at lower levels than in the recent past, reflecting the lower level of activity predicted for this repository.

Telecommunications—Funds are budgeted for routine phone communications for WCR staff. This includes a base monthly cost for phone services provided by Scripps/UCSD, which makes up a large part of the amount budgeted.

Services—This category provides for the lease payments and utility costs associated with the operation of the WCR. Also included in this category are overhead charges of approximately 22%, which UCSD adds to any shipping that goes through Scripps/UCSD. We have budgeted on the assumption that the overall costs will rise at 3% annually, using the FY03 Program Plan as a base.

Maintenance/Repair—This category is budgeted for upkeep of sampling and computer equipment, and other office and laboratory equipment.

418051-08 GULF COAST REPOSITORY

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 117,508	$ 116,410
4000	Supplies	20,000	18,000
5261	Shipping	10,000	10,000
5370	Telecommunications	1,400	1,600
6820	Maintenance & Repair	-	1,000
	TOTAL	**$ 148,908**	**$ 147,010**

The Gulf Coast Repository (GCR) at ODP/TAMU is the largest ODP repository, and is expected to house about 120 km of core by the conclusion of ODP seagoing operations. Overall sampling activity is expected to drop from FY03 levels, but residual post moratorium sampling from FY01-FY03 legs will carry over into FY04, and we expect that the GCR will take and distribute at least 25-30,000 samples. Educational use of the GCR core collection has grown in recent years, with both high school and college level classes returning regularly for tours and classroom activities. We expect the GCR will host several hundred student visitors and 40-50 visiting scientists in FY04. The core-wrapping project at the GCR will be completed in FY04, with an estimated 46,000 core sections to be wrapped by the end of the year.

Payroll—Funds are budgeted for two FTEs in FY04. In addition, extra student labor is needed in FY04 to complete the core-wrapping project. Total student labor (2,000 hours) is estimated at $18,865.

Supplies, Shipping—Funds are budgeted for sampling, office, and miscellaneous supplies, shipping samples, and shipping supplies to the remote repositories. Although costs will surely rise, funds budgeted for these activities are reduced over prior year levels because the GCR will not be receiving new core after the middle of FY03, and thus overall sampling activity can be expected to drop in FY04. Similarly there will not be a need to purchase and assemble new core racks.

Communications—The amount requested for communications is slightly higher than for FY03 in anticipation of rising costs.

Maintenance/Repair—This category provides for repair costs on office equipment, sampling equipment, etc.

418051-09 CURATORIAL SECTION

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 130,472	$ 128,664
3500	Travel	2,500	2,500
5370	Telecommunications	600	600
5550	Services	100	100
	TOTAL	**$ 133,672**	**$ 131,864**

The office of the Curator oversees the operation of all four ODP Core Repositories. ODP's Core Repositories will contain over 310 km of core, gathered from the Deep Sea Drilling Project and the ODP by the time seagoing operations end. The Curator provides guidance to and supervision of the repository superintendents in reviewing and filling 400-450 shore-based requests per year, manages the budgets of all of the repository cost centers, helps develop educational use of ODP cores, decides upon appropriate core material to fulfill long-term loans of core for museums, supervises the maintenance of the sample request, scientist, sample, and bibliographic databases. The Curator has one assistant who processes 400-450 new sample requests per year, enters them into the database, maintains the scientist and bibliographic databases, and performs data verification of curational data from recent drilling legs during the final moratorium period that extends to the end of FY04.

Payroll**—**Funds are budgeted for two FTEs through FY04, with a 3% salary increase over FY03. No undergraduate support is budgeted in FY04.

Travel**—**Funds are budgeted for the Curator to make a three-day site visit to one remote repository.

Supplies**—**Supplies are budgeted for developing educational material and promoting educational use of cores.

Telecommunications**—**Funds are budgeted for routine phone communications for Curator and Administrative Assistant.

Services**—**The Curator's office routinely microfiches leg curatorial notebooks. The cost of this activity is charged under services.

418051-10 BREMEN CORE REPOSITORY

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
4000	Supplies	$ 3,000	$ 1,000
5261	Shipping	8,000	10,000
5370	Telecommunications	1,500	1,500
5550	Services	500	500
6509	Subcontracts	13,500	13,500
	TOTAL	**$ 26,500**	**$ 26,500**

The Bremen Core Repository (BCR) will contain approximately 77 km of core after the end of ODP drilling operations (Leg 210), with the last 1.8 km of core to be received in early FY04. Thus, we expect sampling activity to be at least 25-30,000 samples, partly because of residual moratorium sampling of Legs 207 and 208. The final postcruise sampling party, for Leg 208 samples, will occur at the Bremen Repository in late FY03 or early in FY04. We expect to wrap about 10,000 new sections of core in FY04, to complete the core-wrapping project, and we expect at least 200-300 scientists and educational visitors in FY04.

This repository requires two FTEs to maintain the facility. Out of two FTEs, 1.5 FTEs equivalent is provided by the University of Bremen (0.5 FTE for the repository superintendent, and 1 FTE for the Curatorial Scientist). The remaining 0.5 FTE, plus some student workers to complete core wrapping, is funded by ODP/TAMU through FY04. After FY04 it is assumed that the University of Bremen will take over complete responsibility for staffing the BCR.

***Supplies*—**Includes funds for supplies purchased for BCR through the University of Bremen.

***Shipping/Postage*—**Costs for shipping supplies, samples, etc.

***Communications*—**Funds are budgeted for routine phone and fax communications for BCR, charged through the University of Bremen.

***Services*—**This covers repository security system charges and other minor services.

***Subcontracts*—**Includes salary for half-time repository technician, and extra student worker support for unloading and racking the last ODP cores, and wrapping the cores.

418051-11 BREMEN CORE REPOSITORY – ODP

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
4000	Supplies	$ 2,500	$ 2,500
5261	Shipping	1,500	1,500
	TOTAL	**$ 4,000**	**$ 4,000**

The Bremen Core Repository in Bremen, Germany, is operated by the University of Bremen under an agreement with ODP/TAMU (see 1805-10). This cost center (1805-11) covers costs incurred at ODP/TAMU in support of the BCR.

Supplies—Includes funds for supplies purchased for BCR from ODP/TAMU.

Shipping/Postage—Costs for shipping supplies, etc. from ODP/TAMU to BCR.

418051-12 TECHNICAL SUPPORT

Exp. Cat.	Description		FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll		$ 1,817,714	$ 1,017,881
3500	Travel		-	12,000
3580	Travel - Port Calls		295,689	12,000
3600	Training		10,000	-
4000	Supplies		203,195	10,000
	Hardware	1,000		
	Shipping Materials	8,000		
	Shop/Tools	1,000		
4765	Software		3,000	-
5550	Services		43,560	25,000
6820	Maintenance & Repair		24,000	45,000
	TOTAL		**$ 2,397,158**	**$ 1,121,881**

During the operational phase of ODP this section was responsible for technical support aboard the *JOIDES Resolution.* During phaseout, responsibilities will include removal, inventory, and packaging of all laboratory equipment and supplies from *JOIDES Resolution*. Equipment will be returned to ODP/TAMU for appropriate disposal or refurbishment, and then placed in storage, along with all necessary documentation.

***Payroll*—**Payroll costs are based on retaining the Supervisor of Technical Support, Laboratory Officers, Assistant Laboratory Officers and 26 of the technical support staff (including those who will be on TEE and vacation buyout) for the first month of FY04, after which the technical staff will be steadily reduced, with the Supervisor, Laboratory Officers and Assistant Laboratory Officers going off the payroll at the end of May 2005.

Overall, this cost center will begin FY04 with 32 FTEs. Of these, eight will begin the year in temporary employment extension status. This cost center will be completely phased out over FY04 and end the fiscal year with 0 FTE.

***Travel*—**Funds are budgeted to cover travel, room and board for four ASPP senior technicians to spend the first two months of FY04 in College Station. No travel funds are budgeted for attendance at panel meetings, or workshops.

***Travel-Port Calls*—**Funds are budgeted for up to 12 technical support staff to remain at the last port of call, where demobilization occurs, for the first week (7 days) of FY04, continuing to inventory and package for transportation remaining laboratory equipment removed from the ship. Funds are sufficient to cover hotel accommodations on shore, should this become necessary.

***Supplies*—**This covers packing materials required for transportation and storage of laboratory equipment. Note that many items may require custom-built crates and boxes, and that additional shelving will be required in the long-term storage area. Most of these costs are budgeted in FY03, but some funds are included in FY04 to cover any unforeseen remaining items.

***Services*—**This includes the costs for vendor representatives (principally 2G, Zeiss) to attend the port call to oversee mothballing of specialized equipment items. Funds are also included to air condition the unoccupied space at the GCR in order to store laboratory equipment requiring a climate-controlled environment.

***Maintenance/Repair*—**This category covers the costs of refurbishing shipboard laboratory equipment to be retained for future use. Some of this can be done in-house, but we anticipate the majority will require return to the vendor/manufacturer for service. During the operational phase of ODP funds in this category have been allocated based on expected preventive maintenance needs for the coming fiscal year. However the details of required maintenance work following demobilization will be heavily impacted by decisions regarding the ultimate disposition of equipment (i.e., to retain or declare surplus), as well as the work required to rebuild/refurbish specific items. For this reason we have budgeted a lump sum without attempting to make specific allocations.

Drilling Services Department

The Drilling Services Department (DSD) is a team-oriented project group that has the responsibility of: protecting the National Science Foundation (NSF) drilling and coring equipment assets; completing demobilization of the coring and drilling equipment from the JOIDES Resolution at the end of the ODP contract; and completing technical legacy documentation on operational procedures, design manuals, and the coring, downhole tools and drilling equipment for the future use of scientific coring to ensure there is a smooth transition to IODP operations. DSD will provide these services in an administratively efficient, cost effective, and timely manner.

Introduction

During phaseout of the Ocean Drilling Program (ODP) DSD will achieve the goals and objectives of the National Science Foundation (NSF) for demobilization and development of technical legacy documentation.

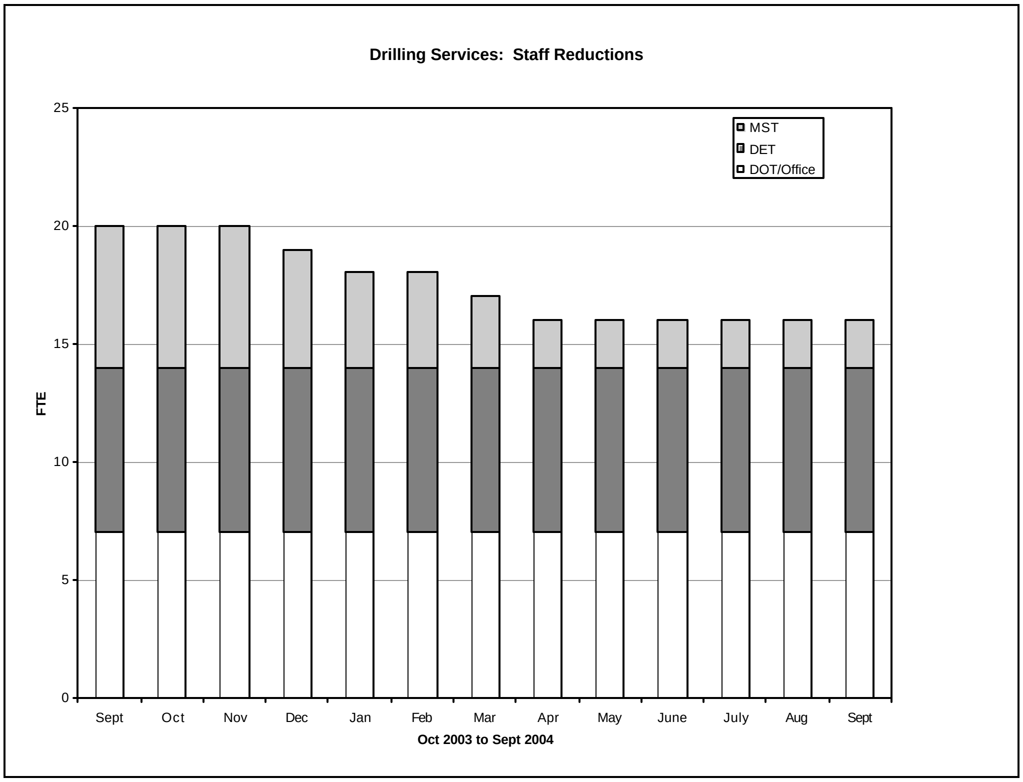
At the end of ODP in September 2003 DSD will have a staff of 20 professionals with 3.0 in the Drilling Services Office (DSO), 4.0 in the Drilling Operations Team (DOT), 7.0 in the Development Engineering Team (DET), and 6.0 in the Material Services Team (MST). In addition, the DOSECC funding support for 50% of an FTE salary will cease at the end of May 2003.

The DSD available staffing will decrease starting in FY04 in natural stages following the completion of ODP leg operations in September 2003 and the completion of the demobilization and storage of the drilling and coring equipment in January 2004. Work will then focus on the development of technical legacy documentation.

DRILLING SERVICES – FY04 PERSONNEL STRUCTURE

Month	DOT & Office	DET	MST	FY04 Total FTE
September 03	7	7	6	20
October	7	7	6	20
November	7	7	6	20
December	7	7	5	19
January 04	7	7	4	18
February	7	7	4	18
March	7	7	3	17
April	7	7	2	16
May	7	7	2	16
June	7	7	2	16
July	7	7	2	16
August	7	7	2	16
September	7	7	2	16

The reduction in staff in December 2003 reflects the ending of ODP leg operations on September 30. The leveling of staffing in April 2004 reflects the end of equipment demobilization and a change in effort as the staff focus on completing legacy documentation.



Cost Center 01-Drilling Services Office (DSO)

DSO manages, supports, and guides the three teams (DOT, DET, and MST) to achieve the overall goals of the NSF to preserve the technical legacy and equipment of the Ocean Drilling Program. The FTE of three staff at the end of FY03 will remain in place through out FY04. The DSO has overall administration, financial responsibility, and travel authorization for the department during phaseout.

Cost Center 02-Drilling Operations Team (DOT)

- DOT staff will plan and coordinate the demobilization of coring and drilling equipment from the *JOIDES Resolution*, but their primary focus after demobilization of the drilling equipment will be on the technical legacy documentation – planning, coordination and preparation. Four FTEs will remain in place throughout FY04.
- Two additional Core Technicians will be contracted by ODP to sail the transit (Leg 210T) and to work five-day weeks (60 hrs) during October 2003 at the controlled warehouse facility completing coring and drilling equipment inventory control, packaging, and preservation.

Cost Center 03-Development Engineering Team (DET)

The DET development strategy has been focused on operational legs and supporting the development and deployment of downhole tools. DET also maintains a design drafting and a document control system for ODP drawings, specifications, equipment manuals, and operations manuals and recommends upgrades to shipboard drilling and coring systems. DET also designs, develops, and modifies legacy hole instrumentation packages. The FTE of seven staff at the end of FY03 will remain in place throughout FY04.

DET staff will support the demobilization of downhole measurement equipment from the *JOIDES Resolution*, but their primary focus will be on the completion of the technical legacy documentation, the completion of necessary design improvements and specifications for the smooth transition to IODP operations, and modifications that are ongoing that must be completed.

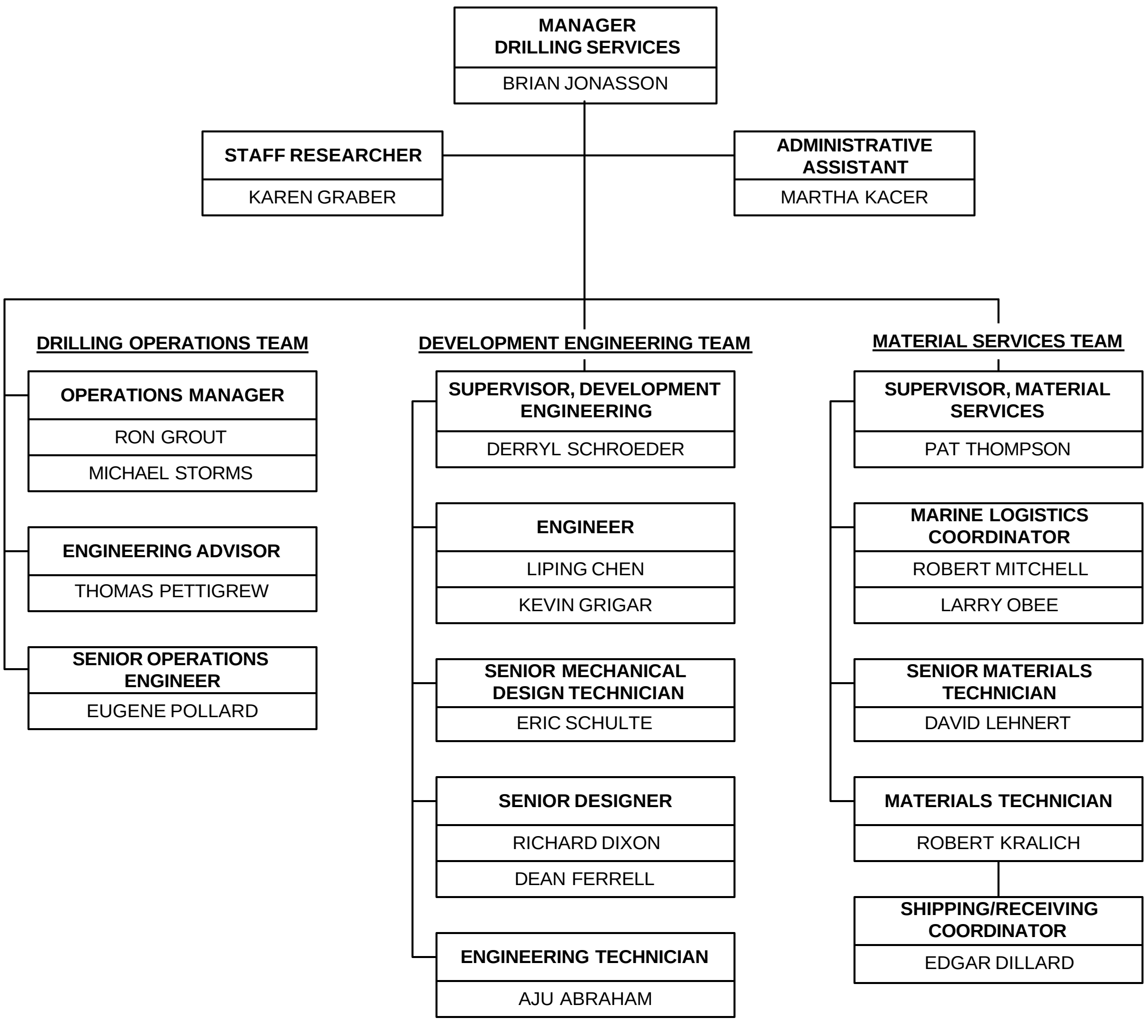
Cost Center 04-Material Services Team (MST)

The MST has responsibility for inventory control, shipping and long-term storage of all coring and lab stack equipment and consumables during demobilization of the *JOIDES Resolution*. The MST manages and maintains an inventory and tracking database for all coring and science equipment and consumable supplies. All supplies and equipment for DSD and Science Services are under a unified inventory system that supports the goal of protecting NSF drilling, coring, and science laboratory equipment assets. The MST manages all DSD warehouses on land. The FTE of six staff at the end of FY03 will be reduced to five FTEs in December 2003 due to the cessation of ODP leg operations. This staff will be reduced to two FTEs by April 2004 after all of the NSF equipment is inventoried and stored at College Station. All positions will be carried in the FY04 payroll as they complete their temporary employment extension (TEE) time.

MST staff will play a key role in demobilizing the coring and lab stack equipment from the *JOIDES Resolution*, which will start at the Leg 210T port call in St. John’s and will continue through the transit to optimize the demobilization effort once the ship arrives at the Gulf Coast port. Bulky consumables and some equipment in the lab stack will be removed at the St. John's port call to make room to pack other equipment. The drill collars will be removed at St. John's to reduce crane usage at the final port call and to reduce truck congestion at the final port call. MST will arrange for the lease of 10,000 ft^2 of controlled warehouse space and 1,500 ft^2 of air-conditioned office space for a month at the final port call site for demobilizing, including taking inventory and preserving and crating coring, drilling, and laboratory equipment. A five-man stevedore crew will also be hired to prep tools, build crates, and load containers and flats when the ship arrives in port. MST will arrange the shipment of the drill string and drill collars to the inspection and coating facility in the USA. MST will be responsible for the drill string inspection and coating in FY04.

MST will ship all drilling, coring, and laboratory equipment to College Station for long-term storage and inventory control.

ORGANIZATIONAL CHART, DRILLING SERVICES



Task: 1803 Drilling Services
Subtask: Development Engineering, Material Services, and Drilling Operations
Function: Liaison and coordination of drilling services to support the goals and objectives of the science community.

January 16, 2003

TASK SUMMARY 1803: DRILLING SERVICES DEPARTMENT SUBTASKS: DEVELOPMENT ENGINEERING, MATERIAL SERVICES, DRILLING OPERATIONS

POSITION	DESCRIPTION
Manager, Drilling Services Department (1.00):	Manages and directs the Drilling Services Department as a team-oriented project group to support the goals and objectives of the National Science Foundation (NSF) for demobilization and technical legacy documentation. Has overall administrative and financial responsibility for the department.
Administrative Assistant (1.00):	Performs administrative duties in support of the Drilling Services Department Manager and the Drilling Operations, Development Engineering, and Material Services branches. Assists Manager of Drilling Services with departmental fiscal affairs, development of budgetary projections, organizing training programs, and correspondence. Prepares and completes annual Fiscal Year Program Plan for the Drilling Services Department. Compiles and generates bimonthly reports for the Drilling Services Department to report to the Program Plan. Compiles technical, financial, and monthly reports and departmental manuals. Responsible for entering data into the FoxPro database during demobilization, and oversees the computer-indexing filing system for the department. Supports staff in compiling technical legacy documents. Interacts with ODP managers, ODP affiliates, and TAMU officials as necessary in the absence of the manager.
Staff Researcher (1.00):	Manages, coordinates, and distributes information. Analyzes and synthesizes information into different types of scientific and engineering reports, manuals, and other technical legacy documents. Manages Filemaker database. Maintains project management documents for demobilization and technical legacy within the department and interfaces with staff on documentation analyses and design for department.

Drilling Operations Team (DOT)

Operations Manager (2.00):	The Operations Manager plans and coordinates demobilization of coring equipment from the *JOIDES Resolution*. The Operations Manager prepares legacy documentation on tools and procedures utilized by the Ocean Drilling Program.
Engineering Advisor (1.00):	Works as an advisor or consultant in a particular field of engineering, development, or research. The Engineering Advisor also plans and coordinates demobilization of coring equipment from the *JOIDES Resolution* and prepares legacy documentation on tools and procedures utilized by the Ocean Drilling Program.
Senior Operations Engineer (1.00)	Plans and coordinates development of technical legacy documents for scientific drilling/coring operations. Maintains and develops equipment maintenance procedures, guidelines, and audit documents. Participates in demobilization. Functions as a Project Engineer with full responsibility and authority for a project.

Development Engineering Team (DET)

Supervisor (1.00):	Supervises a group of professional and nonprofessional technical people performing a variety of duties in a single field of engineering or concerned with a single area of operations. This is the first level of direct and sustained supervision of other professionals. Requires effective leadership and application of mature engineering and operational knowledge in planning and conducting the activities of the team. Responsible for the technical oversight of functional area and for the administrative and financial management of the team. May function as a Project Manager with full responsibility and authority for a project. Prepares and reviews technical legacy documentation.

POSITION	DESCRIPTION
Engineer (2.00):	Performs assigned duties associated with design of projects. Uses a variety of standard engineering methods and techniques and will assume responsibility for moderately complex components and systems. Functions as a Project Engineer with full responsibility and authority for a project. Prepares technical legacy documentation.
Senior Mechanical Design Technician (1.00):	Responsible to the functional supervisor and Project Engineers for completion of assigned technical support duties utilizing sound technical practice in a cost-effective and timely manner. Responsible for control of the department's drawing files and confidential documents. Assists in preparation of technical legacy documentation.
Senior Designer (1.00):	Carries out the design, development, improvement, and testing of downhole tools and equipment. Responsible to the functional supervisor and Project Engineers for completion of assigned technical support duties utilizing sound technical practice in a cost-effective and timely manner. Prepares technical legacy documentation.
Senior Designer (1.00):	A primary function of the Senior Designer is the management of the Service Center, with responsibility for documentation control, inventory control, technical support, and orderly implementation of upgrades and changes. Responsible to the functional supervisor and Project Engineers for completion of assigned technical support duties utilizing sound technical practice in a cost-effective and timely manner. Prepares technical legacy documentation.
Engineering Technician (1.00):	Responsible to the functional supervisor and Project Engineers for completion of assigned technical support duties utilizing sound technical practice in a cost-effective and timely manner. Assists in preparation of technical legacy documentation.

Material Services Team (MST)

Supervisor (1.00):	Supervises a group of professional and nonprofessional technical people performing a variety of duties concerned with a single area of operations. This is the first level of direct and sustained supervision of other professionals. Requires effective leadership in planning and conducting the activities of the team. Responsible for oversight of functional area and for the administrative and financial management of the team. May function as a Project Manager with full responsibility and authority for a project. Supports demobilization of government equipment, preservation of drill string and sale of excess government equipment.
Marine Logistics Coordinator (2.00):	Responsible for the material management (inventory control and ordering) system for scientific consumables and equipment. Supports demobilization of government scientific equipment. One position is not maintained due to the ending of leg operations on the Ocean Drilling Program.
Senior Materials Technician (1.00):	Maintains shore-based inventory of coring equipment and procures coring tools and supplies. Responsible for maintaining FoxPro inventory/purchasing database system on coring equipment. Supports demobilization and preparation of technical legacy documentation.
Materials Technician (1.00):	Supervises quality assurance, warehouse, and shipping. Responsible for training and coordinating the activities of the departmental student worker pool and ensuring safe work practices. Supports demobilization and storage of government equipment and sale of excess government equipment.
Shipping/Receiving Coordinator (1.00):	Ensures proper movement, packaging, and documentation for materials and equipment removed from the ship for demobilization.
Total Personnel:	20.00

ACCOMPLISHMENTS

Cost Center 02 – Drilling Operations Team (DOT)

Leg 205—Established two successful long-term hydrological observatories in the Costa Rica accretionary prism. Set reentry cones with 16-in and 10¾-in casing, ran 4½-in casing with packers and screened sections, and installed OsmoSamplers.

Leg 206—Before and during the precruise meeting, optimized the operational plan and equipment required to achieve the engineering-intensive objectives of setting a reentry cone and casing and coring into superfast spreading ridge. The reentry cone was set with 20-in casing at 95 mbsf. The hole was then drilled to a depth of 276.1 mbrf (26 m into basement) using a new hard formation bi-center reamer.

Leg 207—Before and during the precruise meeting, optimized the operational plan and equipment required to core sites in the Demerara Rise sediments.

Leg 208—Before and during the precruise meeting, optimized the operational plan and equipment required to core sites on the Walvis Ridge.

Leg 209—Before and during the precruise meeting, optimized the operational plan and equipment required to core sites up to 150 m penetration into peridotite basement on the MAR slow spreading ridge.

Leg 210—Before and during the precruise meeting, optimized the operational plan and equipment required to achieve the engineering-intensive objectives of establishing a reentry and cased legacy hole in 2100 m of sediment and 100 m basement penetration during Leg 210, Newfoundland Margin. Four casing strings were planned to case off the hole to the basement/sediment interface. Modifications were made to the bi-center bit to improve drilling and underreaming for casing installation.

Demobilization—Planning for demobilization of the coring and laboratory equipment on the *JOIDES Resolution.* Demobilization planning will also include resolving which permanently mounted government equipment will be removed during demobilization and preparing and issuing the bid documentation for the drill string inspection, pin and box end recuts and internal and external coating.

Drilling Tool Purchases—The following tools were purchased because the purchase cost was less than the rental cost for 3-4+ months:

- Hole Opener Corp. (HOC) hydraulic underreamers were purchased to underream (enlarge hole) under casing and to run inside casing to assist in drilling the casing to bottom in unstable or swelling sediments. The hydraulically activated arms can be adjusted to drill a larger hole in sediment, if required. The standard sizes purchased were: 11¾-in body by 17.5 to 22-in hole and 9½-in body by 14¾-in hole.
- Downhole Design Inc. (DDI) bi-center roller-cone "eccentric or wobble" reamers were purchased to underream (enlarge hole) under casing and to assist in running casing in hard rock. The hard rock bi-center reamer designs are a fixed hole size for 16 to 10¾-in casing: 12.25-in pass through by 14.625-in hole, 14.5-in x 18.5-in, and 18.25-in x 21.5-in. The bi-center reamers were used successfully on Leg 206.

- A Drilex D950SSHF (slow speed high flow rate) mud motor was purchased to drive both hydraulic and bi-center underreamers when they are used to enlarge a hole or are run inside casing to assist in drilling the casings to bottom in unstable or ruggose holes.
- **Technical Legacy Documentation**—Finalize the plan for development of the documentation for DSD technical legacy. Finalize the initial (15) Science Overview tool sheet documents. Complete the draft of the remaining Science Overview tool sheet documents. Approve the standard format for the operations manuals and technical notes. Update or develop and issue operations manuals and technical notes on the coring, borehole completion, and downhole tools. Update the DSD Operations and Safety Manual and related Operations Bulletins.

Cost Center 03 – Development Engineering Team (DET)

The availability of additional funding through DOE provided for significant upgrades and increased capabilities for downhole tools on Legs 201 and 204.

DVTPP—The prototype DVTPP was redesigned to address corrosion and assembly issues, which were uncovered during the initial deployment on Leg 190. The redesigned DVTPP was deployed using a "CORK" data logger on Leg 201. Unfortunately, the temperature channel did not function properly, and only formation pressure measurements were taken. Twelve deployments were made, and after some early problems, the pressure measurement functioned properly. The DVTPP was returned to ODP, and design improvements were made based on findings during Leg 201. A second DVTPP was fabricated for use on Leg 204, and both tools were fitted with new electronics. The DVTPP tools were run 16 times on Leg 204 with no failures. Valuable data was provided on all runs except for those where the formation fractured during penetration.

APC Methane—A single APC Methane tool was deployed on 19 coring runs during Leg 201, which produced excellent results. The tool then encountered shock loads that damaged the electronics, resulting in erratic data. After returning to ODP, the electronics were "hardened" for Leg 204. Two tools were used on 74 coring runs during Leg 204 without failure and provided quality data.

PCS—Modifications to the Leg 164 tool design were made to improve coring capabilities and to extend performance, primarily in the rotary coring mode.

The changes made to the PCS for Leg 201 were (1) new cutting shoes, (2) extension of the cutting shoe ahead of the bit by 1/2 m, (3) improved flow to the cutting shoe, (4) increased inner core barrel I.D., and (5) improved swivel support of inner core barrel.

Two complete tools and a spare pressure barrel were sent to Leg 201. The PCS was deployed 17 times on Leg 201. Full closure was not achieved on only two runs. Of the successful closures, 12 recovered at least 67% of hydrostatic pressure. Ten runs recovered the full 1-m core and only two recovered no appreciable core. On the 15 runs where full closure occurred, gas was collected and methane was present in 11 of those samples.

Modifications of the tool for Leg 204 were made to improve reliability and to add continuous measurements of pressure, temperature and conductivity of the core headspace.

The changes made to the PCS for Leg 204 were (1) larger link pins, (2) longer links to eliminate over-rotation, and (3) integration of the Methane tool at the top of the core barrel. The addition of the Methane tool to the PCS (PCSM) was the most significant change. Three PCS core barrel assemblies, two actuation assemblies, and two PCSM tools were deployed on Leg 204.

Leg 204 Results:

Total Deployments:	39
Complete success (core under pressure):	30
100% Core recovery:	36
Full Tool Closure (recovered pressure):	32

Nine runs were unsuccessful. On seven of these runs, the ball valve did not actuate properly, either because the tool failed to actuate, or the ball valve linkage jammed. The other two retrieved pressure but did not recover core because the core was washed out when the flow check valve did not close. Methane gas was found in the 30 cores retrieved under pressure (Core 4P from Hole 1249F contained over 94 liters of methane). The Methane tool was run on 36 PCS deployments and successfully recorded data on 33.

Two Gas Manifold Systems were set up in the Dry Lab (outboard of the Downhole Tools Lab) similar to Leg 201. Pressure monitoring and recording of bleed-off was added for Leg 204 using a laptop. The high use of the PCS and the long turn-around time (typically 8 to 24 hr) for gas sampling, frequently resulted in having to store the third PCS in an ice trough until a gas manifold station became vacant.

Modifications to the Leg 204 design are being made to improve pressure retention and provide continuous temperature and pressure data through deployment and through laboratory degassing. The changes made will include (1) installing a new ball valve pin with fixed stops to prevent over-rotation, (2) installing a temperature probe to penetrate the core material, (3) repackaging the Methane hardware to allow the data logger to remain on the tool during degassing, and (4) modifying the datalogger firmware/software to display pressure and temperature data while the tool is in the gas manifold station.

Leg 204 Third-Party Tool Support

- **RAB-C—**A measurement-while-coring concept was tested during Leg 204 using an Anadrill Resistivity-at-Bit (RAB) Logging While Drilling (LWD) tool modified to allow a special core barrel to land in it. Eight cores were cut. Six 4.5-m cores were recovered using core liners, and two 9.5-m cores were recovered without liners. Logs from the RAB-C were very promising. This was the first time ODP logged a hole and cored at the same time.

- **Piezoprobe**—Fugro modified their Piezoprobe tool to deploy it in the ODP APC/XCB bottom-hole assembly (BHA). The Fugro Piezoprobe was deployed twice on Leg 204. The first test aborted when a connection at the top of the tool failed. The second deployment went very well with good data and a good decay curve after ~45 min in the formation. The DVTPP was deployed at the same site and at the same depth, as well as above and below that depth, for a comparison of the measurements. The DVTPP remained in the formation for 30 min for all runs. Peter Flemings of Penn State is evaluating the data.

- **Fugro Pressure Corer—**Fugro Engineers BV developed the Fugro Pressure Corer (FPC). The FPC uses a water hammer driven by the circulation to drive the core barrel into the sediment up to 1 m ahead of the drill bit. The percussion corer is suitable for use with unlithified sediments ranging from stiff clays to sandy or gravelly material. The FPC was deployed a total of 10 times on Leg 204 and retrieved some core on each run for an average of 0.80 m of core per run. Sealing problems with the flapper valve were dealt with, and full pressure was recovered on the final two runs. Pressurized cores were successfully transferred under pressure to storage and logging chambers.

- **HYACE Rotary Corer**—The Technical University of Berlin and the Technical University of Clausthal developed the HYACE Rotary Corer (HRC). The HRC uses an Inverse Moineau Motor driven by the circulation to rotate the cutting shoe up to 1 m ahead of the roller cone bit. On completion of coring, the recovery of the corer with the wireline then pulls the core barrel into the autoclave where it is sealed by a flapper valve. The HRC is suitable for use in sampling lithified sediment or rock. The HRC was deployed a total of eight times on Leg 204 and recovered some core on seven of the eight runs for an average of 0.37 m of core per run. Pressure was also recovered on four of the eight runs with full pressure on two runs. Pressurized cores were successfully transferred under pressure to storage and logging chambers.

- **Workspace Enhancement For Downhole Tools**—Heavy downhole tool usage during Leg 204 (APCT, DVTP, DVTPP, WSTP, PCS, FPC, HRC, RAB coring, and LWD) and the space needed for the pressurized core transfer chambers required an expansion of workspace facilities on the *JOIDES Resolution*. Exterior workbenches and tool racks were designed and installed on the Core Tech Shop roof and outside of the Downhole Lab during Leg 203. Weather protection covering, tarps and awnings were installed at the beginning of Leg 204. The additional facilities saw maximum utilization.

  The tool racks outside the Downhole Lab were exclusively used for the HYACINTH Pressure Core Transfer System. Both the FPC and HRC pressurized cores were successfully transferred to storage chambers or logging chambers using this system.

- **Rig Instrumentation System (RIS)**—The dynamic effect of Active Heave Compensator (AHC) operation renders the hookload signal from the crown-mounted load cell unreliable. A Weight-on-Bit (WOB) filter was developed that electronically filters the extraneous forces from AHC operation and ship motion. The goal of this project was to provide the driller with a stable, accurate measurement for WOB control. The hardware was installed over the course of Legs 201 and 202. After evaluating the data from Legs 202 and 203, the filtering scheme was modified to increase its effectiveness. The new software was installed at the beginning of Leg 204. The preliminary results are very encouraging. The filtered WOB output tracked the AHC generated WOB (AHC average cylinder force) very closely.

APC Temperature Tool—New electronics for the APCT are being developed to replace the obsolete electronics of Adara Systems. The new electronics use a thermistor temperature sensor in place of an RTD. Calibration procedures for this new APCT tool will be the same as that for the rest of the ODP downhole temperature tools and will not require the special Adara System fixturing/baths.

Fisseler Water Sampler (FWS)—The Fisseler water sampler is being upgraded to control the rate of sample intake. The tool uses a feedback system based on the pressure drop across the sample port and the sampling coils. This provides a smooth extraction rate and reduces the probability of screen pack offs. A temperature and pressure sensor was also added into the probe tip to measure formation properties.

Drilling Sensor Sub (DSS)—The DSS should be initially deployed on Leg 208. The DSS is an 8¼-in O.D. memory sub with a 4?-in through-bore to allow for core retrieval. It is positioned in the BHA on top of the Outer Core Barrel. The DSS is designed to record downhole WOB, TOB, annulus pressure, and annulus temperature at 1-s intervals. The data will be used to improve the understanding of the dynamic forces at work downhole and to quantify the impact of heave and surface inputs (torque, weight, rpm, and flow rate) on bit performance. The long-range plan is to eventually transmit this data to the surface in real time to improve coring performance.

Load Pin Wireless Transmission for Weight-on-Bit Filter—The load pin measurement of hookload is used in the Weight-on-Bit Filter (WOBF) algorithm. The data from the load pins were previously transmitted to the WOBF through a cable connection between the crossbeam dolly junction box and the top drive. The connection had to be made up when the top drive was put in service and disconnected when the top drive was set back, thus, the connecting cables were constantly being damaged. DSD plans to move the WOBF radio transmitter box during Leg 208 from the top drive to the crossbeam dolly and add batteries on the crossbeam. Once the transmitter is added, the load pin data will be transmitted via radio waves to the rig floor WOBF box. Reliability will be increased with the elimination of the cables.

Cost Center 04 – Material Services Team (MST)

The MST provides logistic services and has responsibility for procurement, inventory control, and shipping of all coring and lab stack equipment consumables. The MST had the following accomplishments in FY03.

Logistics Database—Developing the specification for the software changes and additional programming effort necessary to support an auditable materials management effort during demobilization.

An interdepartmental meeting was held in November of FY03 to investigate ODP's software and hardware requirements for demobilization. Key personnel from Information Services, Material Services, Science Services, and Administration attended. The basic points determined were:

- *Software*—The software needs for demobilization will be driven by the data storage requirements of each group. Most of the needed data exists in several programs that are to some degree compatible and can be easily moved into a common computer language database. Each department has furnished a list of computer record fields needed to store demobilization information. The database programmer assigned to MST has begun to assemble this data and map out a strategy to have software in place to accomplish demobilization.
- *Hardware*—The system aboard the vessel may not be available so we need to have a stand-alone server system that can be used to record the packing efforts at demobilization. This hardware exists within ODP and can be provided by Information Services.
- *Packing*—The packing effort included a dockside warehouse where custom crates and pallets were constructed. A crate fabrication shop will be set up at the demobilization site.

Reduce Warehouse Inventory—ODP maintains an on-shore auditable warehouse. In FY03, the Material Services group in conjunction with Administration removed over 100 tons of obsolete material and made it available for disposal through GSA and University surplus. These actions bolstered the effort to create some of the space needed to support the increased storage effort needed in conjunction with demobilization.

New Shipping Procedures to Support Biological Sampling—Legs 201, 204, and 205 brought about the requirement to transport samples with living organisms from the ship to the participating scientists both during and at the end of the voyage. These shipments are either shipped packed in ice or in many cases frozen with dry ice. It also created the need for a new shipping system that could monitor the location of sample shipments by both the receiving institution and the shipping group.

In FY03, Material Services instituted the logistical procedures necessary to move highly perishable samples around the world. We put in place a monitored shipping process where samples are under the control of one shipper. This firm has offices and contact personnel at each juncture of the shipping process from reception on the dock to delivery at the investigator's home institution. They can replenish the ice or dry ice as necessary. We can also monitor the course of these shipments at ODP and have knowledge if the shipment is stopped for any reason.

Resupply—Continue the regular resupply, shipping, port call, and logistic effort in 2003. The marine logistic coordinators and operations materials technician re-calculated all reorder quantity numbers using the revised leg forecast work-ups by DET. Pool and leg specific coring supplies are being purchased based on leg requirements while minimizing inventory at the end of ODP. This procedure insures we end the program with the least amount of expendable drilling supplies aboard the vessel.

Demobilization—Locate and contract the controlled warehouse space required during demobilization of the *JOIDES Resolution* on the Gulf Coast after Leg 210T.

FY04 GOALS

DSD has overall administrative and financial responsibility for demobilization and compiling the technical legacy documentation (see Appendix III for a list of legacy documents) associated with meeting the goals and objectives of the NSF to protect the coring and drilling equipment and preserve the technology of scientific coring for IODP.

Cost Center 02 – Drilling Operation Team (DOT)

Due to limited resources and complex legs, DOT has focused on supporting leg operations to the end of the ODP program. However, DOT staff will play a critical planning, coordination, and execution role for both the drilling and coring equipment demobilization and compiling the technical legacy documentation.

Cost Center 03 – Development Engineering Team (DET)

Due to limited resources and time, DET has been focused on meeting leg requirements vs. compiling technical legacy documentation. However, in FY04, DET will devote all of its resources to preparing the technical legacy documentation.

Cost Center 04 – Material Services Team (MST)

MST provides logistic services and has responsibility for inventory control and shipping of all coring and lab stack equipment consumables. Because of limited resources, the staff has been focused on supporting leg operations to the end of the program. However, MST staff will play a key role in the drilling and coring equipment demobilization. This includes long-term storage and inventory control and drill string preservation.

Drilling and Coring Equipment Demobilization

During FY04, efforts at inventory, preservation, temporary storage and long-term storage and compliance with NSF instructions on distribution of Program property will continue. The efforts will initially be at the demobilization port and later in College Station, Texas. Immediately following the off-load of property at the demobilization port; property will inventoried, packaged as necessary, disbursed to facilities (e.g., College Station, TX, pipe inspection and preservation facilities, etc.) where items will be unpacked as required, inventories confirmed/reconciled, preservation activities occur, property retained/transferred to another program will be warehoused awaiting disposition instructions and excess/unusable property will be disposed of in accordance with directions received.

Technical Legacy Documentation

A preliminary plan was prepared in FY01 for creating or updating legacy documentation. This plan identified the equipment requiring scientific tool sheets, technical notes, operations manuals, drilling procedures and Operations Bulletins and miscellaneous databases, analysis programs, and legacy hole documents.

Fifteen out of twenty-four Science Overviews were prepared in FY01. Based on the time required to prepare a document, it is estimated that there are 160-200 man-months of work to be completed by DSD staff on technical legacy documentation. Because of leg-related tasks and other higher-priority responsibilities, it is estimated that only 10% of the Technical Legacy Documentation will be completed by 30 September 2003.

Refer to Appendix III for information on technical legacy documentation.

418031-01 DRILLING SERVICES – OFFICE

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 248,956	$ 235,572
3500	Travel	5,000	5,500
3580	Travel - Port Calls	5,000	-
3600	Training	5,000	-
4000	Supplies	6,000	6,000
5261	Shipping	1,500	-
5370	Telecommunications	15,000	6,000
5373	Ship-to-Shore Communications	1,500	-
5550	Services	3,000	3,000
6820	Maintenance & Repair	5,000	-
8510	Library	1,000	-
	TOTAL	**$ 296,956**	**$ 256,072**

DSO manages, supports, and guides the three teams (DOT, DET, and MST) to achieve the overall goals of the NSF to preserve the technical legacy and equipment of the Ocean Drilling Program. The DSO has overall administration, financial responsibility, and travel authorization for the department during phaseout.

The Office budget will support the Manager, the Staff Researcher, and the Administrative Assistant of Drilling Services during the phaseout. The Manager is estimated to spend 75% of his time on technical legacy and 25% on demobilization. The Staff Researcher will spend 100% of the time on technical legacy. The Administrative Assistant will spend 25% of the time on demobilization and 75% on technical legacy.

Payroll—The payroll budget includes funds for three full-time equivalents (FTEs) throughout FY04. No undergraduate support is budgeted in FY04.

Travel—Since the ship will be demobilized very fast in order to minimize the costs associated with the ship, drilling equipment will be taken directly from the ship to an adjoining warehouse where all equipment will be inspected, inventoried, refurbished and, if appropriate, surplused. The travel funds are to support the DSD Manager for 30 days (on-site living expenses and travel).

Telecommunications—Funds are for Departmental communications.

418031-02 DRILLING OPERATIONS TEAM

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 583,937	$ 488,088
3500	Travel	15,018	22,000
4000	Supplies	764,295	-
5261	Shipping	10,000	-
5550	Services	22,440	422,239
5931	Equipment Rental	299,460	-
6820	Maintenance & Repair	2,500	-
8400	Equipment	2,500	-
	TOTAL	**$ 1,700,150**	- **$ 932,327**

DOT staff will support the demobilization of coring equipment from the *JOIDES Resolution*, but their primary focus will be on the technical legacy documentation, specifically the coring tool operations manuals and the DSD Operations Safety Manual. Two additional Core Technicians will be contracted by ODP to sail the transit (Leg 210T) and to work five-day weeks (60 hrs) at the controlled warehouse facility on coring and drilling equipment inventory control, packaging, and preservation. The drill pipe will be broken down and, along with drill collars, will be offloaded for shipment to the pipe inspection and coating yard.

Payroll—The FTE of four staff at the end of FY03 will remain in place throughout FY04. It is estimated that 25% of their time will be spent on demobilization and 75% will be spent on legacy documentation.

Travel—Since the ship will be demobilized very fast in order to minimize the costs associated with the ship, drilling equipment will be taken directly from the ship to an adjoining warehouse where all equipment will be inspected, inventoried, refurbished and, if applicable, surplused. The travel funds are to support two Operations Engineers and two Core Technicians for 30 days (on-site living expenses and travel).

Services—Drilling Operations provides a preventive maintenance program for the drill string tubulars. The drill string tubular inventory has two complete drill strings on the drillship and the balance is in Houston, Texas. A complete drill string is composed of ~1,500 m of 5½-in drill pipe and 3,500 m of 5-in drill pipe. The drillship has one active string and one in reserve. DSD will remove both operational drill strings and drill collars and carry out a planned preventive maintenance program prior to storing the drill string. The preventive maintenance program consists of inspections, repairs, and recoating at a budget of $399,379. Services also include the costs for two Core Technicians during the demobilization of the ship.

418031-03 DEVELOPMENT ENGINEERING TEAM

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 546,448	$ 502,136
3580	Travel - Port Calls	5,000	5,500
5550	Services	2,000	-
	TOTAL	**$ 553,448**	**$ 507,636**

DET staff will support the demobilization of downhole measurement equipment from the *JOIDES Resolution*, but their primary focus will be on legacy documentation. As part of the technical legacy, DET will also focus on documenting the ODP drawings and specifications and equipment manuals.

***Payroll*—**The FTE of seven staff at the end of FY03 will remain in place throughout FY04. No undergraduate or graduate assistant support is budgeted in FY04.

***Travel*—**Funds are budgeted for two senior designers to attend the demobilization of the ship to preserve the downhole tools.

418031-04 MATERIAL SERVICES TEAM

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 449,933	$ 305,290
3500	Travel	2,800	-
3580	Travel - Port Calls	32,124	27,500
4000	Supplies	35,000	15,000
4765	Software	5,000	-
5070	Insurance	5,000	-
5261	Shipping	420,300	70,000
5373	Ship-to-Shore Communications	1,200	-
5550	Services	21,950	25,500
8400	Equipment	5,000	-
	TOTAL	**$ 978,307**	**$ 443,290**

MST staff play a key role in demobilizing the coring and lab stack equipment from the *JOIDES Resolution*, which will start at the Leg 210T port call in St. John's and will continue through the transit to optimize the demobilization effort once the ship arrives at the Gulf Coast port.

MST will ship all drilling, coring, and laboratory equipment to College Station for long-term storage and inventory control.

Payroll**—**The FTE of six staff at the end of FY03 will be reduced to five FTEs starting in December 2003 due to the cessation of ODP leg operations. The remaining FTE count of five staff will be reduced to two FTEs starting in April 2004, once demobilization is completed and will remain in place throughout FY04. Positions will be carried in the FY04 payroll to complete their temporary employment extension (TEE) time.

Travel-Port Calls**—**Since the ship will be demobilized very fast in order to minimize the costs associated with the ship, drilling equipment will be taken directly from the ship to an adjoining warehouse where all equipment will be inspected, inventoried, refurbished and, if appropriate, surplused. The travel funds are to support two Marine Logistics Coordinators, two DSD Materials Technicians and the Supervisor of the MST group.

Supplies**—**Funds are budgeted for all packing and crating materials, inspections, and shop consumables.

Shipping**—**Funds are budgeted for shipping all drilling and coring supplies from the Gulf Coast to College Station for storage.

Services**—**Funds are budgeted for the lease of 10,000 ft^2 of controlled warehouse space and 1,500 ft^2 of air-conditioned office space for a month at the final port call site for demobilizing; inventory; and preserving and crating of coring, drilling and laboratory equipment. A five-man stevedore crew will also be hired to prep tools, build crates, and load containers and flats when the ship arrives in port.

Information Services Department

The mission of the Information Services Department is to provide the scientific community with the most accurate, complete, and reliable data through an efficient and easy to use data entry and retrieval system on shore; to provide high-quality software solutions and support to users in the scientific community and all ODP departments; and to design, implement, operate, and safeguard all ODP computing facilities, as well as to provide technical computer support for the ODP user community.

The primary objective of the Information Services Department will change in FY04 as a result of program wind down and the absence of the drillship. The department's mission is to provide direct, inclusive computer and network support for the ODP/TAMU center at College Station, Texas including the Gulf Coast Repository, and to develop technical documentation sufficient to facilitate a smooth transition to IODP. Our mission is based on the basic requirement that the ODP will be functional (but without the *JOIDES Resolution*) during FY04, requiring full computer and network support, albeit operating with a reduced number of staff. Also, the Ocean Drilling Program has created a formidable legacy of data, procedures, and accomplishments that require documentation efforts.

The primary computer environment supported by the department will remain a client-server environment with UNIX, Macintosh, and Windows NT clients that are served by UNIX and Novell servers. The Information Services Department will provide systems operation and maintenance, database management, photographic and digital imaging support, Help Desk services, software support, Internet access (http://www-odp.tamu.edu), and e-mail services to remaining staff at ODP/TAMU. The department will continue to support hundreds of local and international users of the Janus database until the responsibility is passed on to the new program. Its customers employ computer systems for data archiving, scientific analysis, publishing reports, administrative services, illustrating, writing, editing, database searches and retrievals, curation of cores and samples, communications, and Internet access and these will not simply disappear at the end of the program. The Information Services Department will continue to provide photographic services that focus on the support of the shore-based photographic laboratory, the Publications Department, and the public relations efforts of the Program. Principal activities will include: responding to scientists' requests for photographs from legs, preparing photographs for publication, scanning ODP photographs, and providing the Program with photographs and video materials as may be required. Additionally, the department will continue the migration of paleontology data to the database during FY04.

While routine services provided by the Department are required during FY04, special responsibilities exist that are related to the demobilization of the drillship and to the phaseout itself. While some computer and network equipment will be declared excess equipment during the transit, the remainder are planned for removal from the drillship and returned to College Station.

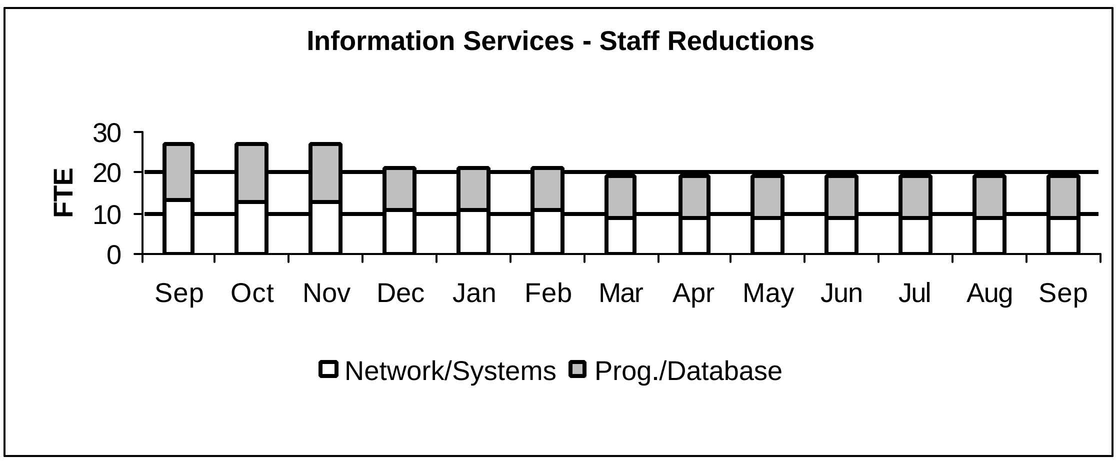
Equipment that has a “DEC” label and is not needed for a special legacy application during Phase I will be placed into excess. Peripherals will be evaluated for retention based on age and performance characteristics or legacy use. All other equipment will be judged for retention based on legacy use or whether it is representative of latest technology. Thus, the inventory of over 130 controlled items and another 500 miscellaneous items currently in use on the drillship will be processed and either retained for use on shore during FY04 or on the ship during Phase I of IODP. At this time, it is not known how much equipment will be retained. All equipment will be processed before being discarded or retained for future use. Processing includes inventory control, cleaning all proprietary and licensed software from all hard drives, cleaning all equipment, and sorting, testing, and packaging all equipment, components and peripherals. Four ISD staff will be assigned for three months (or 1.0 FTE) to complete these tasks.

As part of the phaseout itself, as the number of ODP/TAMU staff decreases, an ongoing effort will exist to appropriately dispose of all program-owned equipment. By the end of the fiscal year, all computer and network equipment would be transferred to the Publication Services Department or the new IODP, or placed in excess. Likewise, all contract information, software licenses, and documentation would be archived or destroyed. Additionally, considerable effort will be made to document the legacy of the program. The Information Services Department’s legacy includes: the Janus database system with over 450 separate tables and a size of nearly 20 gigabytes; all Janus computer applications (about thirty); operations and maintenance of the Janus database and the Web servers; data migration efforts (nearly five years of effort); support of the three international mirror sites; data quality procedures; shipboard computer operations procedures; ship-to-shore data communications procedures; and, the digital, photographic archive of over 50,000 core photographs.

The following table and chart illustrate the required number of FTEs for the department by month of year during FY04. The staffing level in FY03 ends with 27.25 FTEs. It begins FY04 with 27 (the half-time photographer position is reclassified to a Graduate Assistant Researcher (GAR) for a reduction of .5 FTE and the Database Administrator position (Systems Analyst II) is changed from .75 FTE to 1 FTE, an increase of .25 which totals 27 FTEs). Six FTEs are on temporary employment extension (TEE) for the first two months of FY04. Two positions are placed into TEE for the months of January and February. This sets the total FTEs for the remainder of the year to 19. While no undergraduate student technicians are budgeted in FY04, five graduate student half-time positions are calculated into the budget to help support data migration activities during the year. While these reductions are primarily due to the absence of the drillship, the majority of tasks to be performed during FY04 are related to routine maintenance and support, data migration, and scanning of core photographs. As such, the number of FTEs required by the department to meet its mission will not fluctuate during the remainder of the year.

INFORMATION SERVICES – FY04 PERSONNEL STRUCTURE

Month	Network	Database	Total FTE
September 03	13.50	13.75	27.25
October	13.00	14.00	27.00
November	13.00	14.00	27.00
December	11.00	10.00	21.00
January 04	11.00	10.00	21.00
February	11.00	10.00	21.00
March	9.00	10.00	19.00
April	9.00	10.00	19.00
May	9.00	10.00	19.00
June	9.00	10.00	19.00
July	9.00	10.00	19.00
August	9.00	10.00	19.00
September	9.00	10.00	19.00



While most tasks will cease and the Information Services Department will be dissolved on September 30, 2004, a number of tasks will need to be carried out beyond FY04, including support for the Publication Services Department. The tasks relate to supporting the PC and Mac workstations, the Novell servers, the UNIX Web server, e-mail, and the computer network infrastructure, scanning the DSDP whole core photographs, transferring ODP legacy data to NGDC, and migrating paleontology data to the Janus database. To support these projects, preliminary forecasts suggest that a staff of seven, four and four will be required (in addition to the two staff transferred to the Publication Services Department) during FY05, FY06, and FY07, respectively, along with five graduate student assistants. Overall supervision of the projects could be transferred to the ODP Publication Services Department or to the new IODP IT department during FY04 or at the start of FY05.

The organizational chart for the Information Services Department is provided on the next page. Following the chart is a table that illustrates the expected job functions to be performed during the year by each group of positions identified.

ORGANIZATIONAL CHART, INFORMATION SERVICES

- **MANAGER, INFORMATION SERVICES** — DAVID BECKER
  - **DATABASE & PROGRAMMING SERVICES SUPERVISOR** — RAKESH MITHAL
    - **UNIX/ORACLE SYSTEMS ADMINISTRATOR** — MATTHEW MEFFERD
    - **SENIOR SYSTEMS ANALYST II** — DAVID FACKLER
    - **SENIOR SYSTEMS ANALYST I** — SUSAN FREEMAN; DWIGHT HORNBACHER
    - **SYSTEMS ANALYST II** — JOHN EASTLUND; LAYNE WESTOVER; YUNYOU YAO
    - **SYSTEM ANALYST I** — KIM BRACCHI; ROBERT GOLL; DONALD SIMS; WEINING CHEN
    - **PROGRAMMER/ ANALYST I** — DEEPAK KANNOJU; YING ZHU
  - **NETWORK & ADMINISTRATIVE SERVICES SUPERVISOR** — PHILIP GATES
    - **SENIOR PHOTOGRAPHER** — JOHN BECK
    - **NETWORK ADMINISTRATOR** — J. CESAR FLORES
    - **NETWARE SYSTEMS ADMINISTRATOR** — JENNIFER HUTCHINSON
    - **INFORMATION SERVICES ASSISTANT** — DENISE PONZIO
    - **MICROCOMPUTER SPECIALIST** — TARIQ AYYUB
    - **SENIOR SYSTEMS ANALYST I** — MARGARET HASTEDT; ERIK MOORTGAT
    - **MARINE COMPUTER SPECIALIST** — JOHN DAVIS; MICHAEL HODGE; DAVID MORLEY; TBN

Task: 1809 Information Services

Functions: Develops, maintains, and disseminates all numerical and photographic data associated with cores and underway geophysical data that were collected on ship. Provides shore facilities with computer services and support.

January 13, 2003

TASK SUMMARY 1809: INFORMATION SERVICES SUBTASKS: MANAGEMENT, DATABASES, APPLICATIONS, COMPUTERS, NETWORKS, PHOTOGRAPHY, AND USER SUPPORT

POSITION	DESCRIPTION
Manager of Information Services (1.00):	Manages and directs computer and network services and database activities at ODP/TAMU facilities.
Database & Programming Services Supervisor (1.00):	Develops and administers policies for collecting, maintaining, and handling data for all aspects of ODP. Supervises the Oracle database system and the Oracle servers. Also supervises ODP software development and provides technical assistance for software development to programmers and other ODP departments. Supervises the development and implementation of administrative software.
UNIX/Oracle Systems Administrator (1.00):	Responsible for overall performance and maintenance of ODP UNIX/Oracle servers. Ensures system users receive support, maintains current software and hardware configurations, and supports the Oracle database system.
Senior Systems Analyst II (1.00):	Analyzes, designs, develops, and implements enterprise-wide computer applications. Provides supervision and technical direction to other programmers. Provides technical leadership and assistance to other ODP personnel in the area of software development. Ensures legacy programming documents and documentation are in order.
Senior Systems Analyst I (2.00):	Responsible for maintaining the quality of ODP data in the Janus database as well as older ODP and DSDP data. Will collect meta data to foster transfer of ODP data to National Geophysical Data Center (NGDC).
Systems Analyst II (3.00):	Performs development and maintenance of complex software applications. Provides technical direction to other Programmer Analysts and student employees, customized programming for Web queries in support of data transfer to NGDC, and programming support for FoxPro-based applications.
Systems Analyst I (4.00):	Curates physical data files (paper, tape, film, etc.) and provides data upon request to science community; migrates old ODP data to the Janus database, and assists in quality assurance of databases. Performs software development and maintenance. On occasion, may provide supervision and technical direction to student employees. Positions must support Oracle, SQL, MS Access, and FoxPro (or any combination thereof) and assist with in-house data migration efforts.
Programmer/Analyst I (2.00):	Performs software development and maintenance. Participates as member of a project team. Supports applications in Oracle and MS Access using SQL and C.
Network & Administrative Services Supervisor (1.00):	Supervises the Network & Administrative Services Group. Responsible for network design, performance, and maintenance. Performs new technology evaluations, makes acquisition recommendations, and oversees implementation. Provides administrative support to Department Manager as needed.
Senior Photographer (1.00):	Operates shore-based photo laboratory and maintains core photo archive. Equips and maintains shore photo laboratories, scans ODP and DSDP core photographs, and responds to requests from scientists.
ODP Photographer	Position is converted to a half-time graduate assistant researcher in FY04.
Network Administrator (1.00):	Provides Internet services support and security management. Manages e-mail servers and network components, including upgrades, installation, troubleshooting, and maintenance.

POSITION	DESCRIPTION
Netware Systems Administrator (1.00):	Manages and maintains shore-based NetWare file and print servers. Ensures data availability, including managing and executing data backup routines. Maintains current software and hardware configurations. Monitors computer and network usage and configuration for efficient use of resources.
Information Services Assistant (1.00):	Provides administrative support to the Network & Administrative Services Supervisor and the Manager of Information Services. Performs help desk functions. Maintains software library and monitors software licensing compliance.
Microcomputer Specialist (1.00):	Responsible for maintaining all shore-based desktop and related server hardware and software. Responds to user requests via the Help Desk and supervises student technicians.
Senior Systems Analyst I (2.00):	Assists with shore-based system management and programming. Works directly with desktop/server staff, UNIX Systems Manager, and Network Administrator. Responsible for ISD portion of ship demobilization, preparing computers and peripherals for ownership transfer or disposal and archiving all shipboard computer documentation.
Marine Computer Specialist (4.00):	Provides support to the desktop/server staff, UNIX Systems Manager, and Network Administrator, as needed. Provides assistance with ISD portion of ship demobilization, preparing computers and peripherals for ownership transfer or disposal and archiving all shipboard computer documentation.
Total Personnel:	27.00

ACCOMPLISHMENTS

Data Migration—To date, the department has completed the migration of ODP data to the Janus database for these data types: GRAPE, P-Wave, Magnetic Susceptibility, Natural Gamma, Thermal Conductivity, Moisture & Density, PWS, Shear Strength, Interstitial Water, Gas, Carbonates, XRF and Splicer data (Legs 101-170). While the migration of Paleontology, Downhole Temperature and Rock Eval data is underway, migration of Paleomagnetic and XRD data has not yet started. The status of the Data Migration project can be checked on the Web at http://www-odp.tamu.edu/database/migration.htm.

***Database Maintenance*—**Database initialization at the start of each leg and data synchronization at the end of each leg has been performed for Legs 205 and 206. By the start of FY04, data initialization and synchronization are expected to be completed for Legs 207 through 210.

Data Quality Control—ISD staff has spent a significant amount of time maintaining high quality data in Janus database. Data were analyzed for accuracy and completeness and corrected and appended, as needed. The Database Group takes pride in the quality of the data in the Janus database.

***Data Availability*—**The amount of ODP data available on the “World Wide Web” (http:// www-odp.tamu.edu/database) continued to increase during FY03. At present, these data are available: (1) All ODP data collected on Legs 171-205 as well as data migrated from Legs 101-170; (2) ODP core and sample data from Legs 101-205; (3) DSDP core data from Legs 1-96; and, (4) Paleontology Range Charts (Excel spreadsheets) from Legs 101-144. Any data not available on the Web can be requested from the Data Librarian at database@odpemail.tamu.edu.

***Janus Applications*—**We expect work to be completed on five major applications in FY03. First, modifications made to the P-Wave Logger (PWL) and the discrete sample P-Wave system (PWS), which allows the use of improved calibration methods. Second, modifications made to the Paleomagnetic data acquisition software, allowing acquisition of paleomag data from discrete samples. Third, modifications to a data viewer application (CompositeLogViewer, written by CCS for JAMSTEC) that integrates ODP data. Fourth, shipboard and shore-based sampling applications merged into one, new Java application. Fifth, modifications made to an application that allows a researcher to enter Paleontology data into the Janus database.

***Documenting the ODP ISD Legacy*—**Developed a prototype of how to transfer ODP data to NGDC at the end of the program. To test the methodology, MST data for two legs (122 and 177) were extracted from the Janus database and saved as ASCII files. Along with the extracted data, comprehensive meta data were collected, compiled, and saved with the ASCII files. The prototype was sent to JOI to be reviewed by JOI and NGDC.

***Excellent Support Services*—**As in recent years, the department continued its tradition of excellent customer support services to all ODP departments and personnel onboard the *JOIDES Resolution*. This accomplishment is evidenced by a 99% availability of file and print services during normal business hours, no loss of scientific data from any legs due to a robust backup methodology, and sub-hour responses to help desk requests and resolution of most help desk issues in a very short time.

***Addition of Two New Scanners*—**Two new, high quality, Heidelberg drum scanners were installed in January 2003. The machines are expected to greatly shorten the projected time needed to convert the ODP and DSDP color whole core film archives to digital image archives.

***New Monitoring Capability*—**While system presence monitoring has been in place at ODP since 2001, FY03 saw the enhancement of those monitoring capabilities to include machine room temperature and building power. The additional capability now allows key ISD personnel to receive pages and email notification in the event of any deviation from "normal" operating conditions. This allows them to respond to incidents before our customers become aware of changes in operations.

***Upgrade of Data Communications Infrastructure*—**While the data communications infrastructure onboard the *JOIDES Resolution* was upgraded to 100-Mb speeds last year, a similar upgrade occurred on shore. A completely new wiring plant in the A and B wings of the TAMU facility now provides our customers with 100-Mb network service to their desktop.

GOALS

In general, several major efforts will be underway this fiscal year. First, the department will develop documentation required to facilitate a smooth transition to the new IODP. In addition to archiving data to the Janus database, efforts will be made to complete the data migration projects, except the paleontology project, which is expected to last through FY07. ISD will provide daily computer support throughout FY04 for all ODP/TAMU departments. Also, the department will continue to support access to as much data as possible via the worldwide Internet. Lastly, plans are in place to complete the scanning of the ODP core photographs by the end of FY04. A more detailed discussion of specific goals and tasks for ISD during FY04 follows.

***Documenting the ODP ISD Legacy*—**ISD has planned to archive and document what may be called the "ISD/ODP legacy." The legacy includes the preparation of documentation for about thirty ODP/Janus applications (see following table) that are to be handed over to IODP and NGDC. This includes meta data files, ASCII data files, attribute tables, and the Janus data model. (While the.

ODP Janus Legacy Applications

Adara Downhole Temperature	AppleCORE Reader
Chemistry*	Color Reflectance (RSC)
Core*	Core Description*
Coulometrics	Cruise Evaluation
CryoEdit	Curation*
Gas Analysis (GAP)	Generic Up Loader
Hard Rock Labels	Janus database
Janus Repository Sampling (JRS)	JanusWeb data reporting suite
Moisture and Density	MST*
MST View	Operations*
Paleontology*	Paleontology Analysis Log (PAL)
Physical Properties*	Precruise Names
Sample*	Smear Slides
Splicer*	Tensor Tool
X-ray*	

Note: Original Janus Applications noted with an asterisk "*".

Data Migration**—**By the end of FY03, all ODP MST, Physical Properties, Paleomagnetic, Downhole Temperature, Splicer, and Chemistry data (except XRD data for Legs 101-138) will be migrated to the Janus database. XRD data for Legs 101-138, currently on microfilm, will be scanned, indexed, and placed on the web for access by the scientific community. Completion of this work is scheduled for March 2004. ODP paper prime data, now on microfilm, will be scanned and migrated to digital PDF files by the end of FY04. Only part of the ODP Paleontology data will be migrated to the Janus database during FY04. Paleontology data is in a condition that will require significant resources to unravel and migrate. However, it is projected that all Paleontology data will be migrated by the end of FY07. The following table illustrates the progress of the data migration effort. The ODP web site, located at http://www-odp.tamu.edu/database/migration.htm, provides detailed and up-to-date information on the data migration project.

Data Migration Progress Table

Data Type	Percent Completed	Begin/End Dates
1. Core, Sample	100%	Jan 97/Aug 98
2. MST: GRAPE, P-wave, Magnetic susceptibility, Natural gamma, and Color Reflectance	100%	Sep 98/Aug 01
3. Physical Properties: Thermal conductivity, Moisture and density, PWS, Shear strength	100%	Dec 99/Aug 02
4. Chemistry:		
Rock Eval	100%	Apr 01/Mar 03
Carbonates	100%	Apr 01/Sep 02
Interstitial water	100%	Apr 01/Sep 02

Gases	100%	Apr 01/Sep 02
XRF	100%	Apr 01/Sep 02
XRD (Legs 139-170)	10%	Mar 03/Sep 03
XRD (Legs 101-138)	0%	Mar 03/Mar 04
5. Miscellaneous:		
Paleomagnetism	96%	Sep 02/Sep 03
Downhole temperature	100%	Mar 02/Mar 03
Splicer	100%	Mar 02/Sep 02
Paper Prime Data	0%	Mar 03/Sep 04
6. Paleontology: Paleo sample information,		
Range charts, Datum depths, Age models	15%	Dec 01/Sep 07

*Notes (1) No core description data will be migrated. (2) No DSDP data will be migrated. (3) No contributory (postcruise) data will be migrated.

Data Availability—ISD will continue to provide access to as much ODP data as possible via the "World Wide Internet" (http://www-odp.tamu.edu/database) and to fulfill all requests for data, not available on the Web, in a timely manner. Thus, a "data librarian" will be needed to process any requests from the scientific community. While ship operations will conclude at the end of FY03, the need for ODP data will not. Web access must be supported through the year, or at least until the Janus database is transferred to the new program.

A number of tasks are planned for the year. They include:

- maintaining the Oracle and Janus database (table spaces, disk files, backups, etc.),
- verifying and loading shipboard data from the last legs into the Janus database,
- transferring new sample and sample request information from core repositories to the Janus database,
- migrating these functions to the new program operator, as is appropriate,
- developing and/or maintaining publications mirror sites, and
- checking the data collected during FY03.

Daily Computer Systems and Network Support—While the program will operate during this fiscal year with fewer staff, all current computer and network support services, with the exception of support of the drillship, still need to be provided to remaining staff. The IT services include:

- support of desktop workstations, servers, and network infrastructure, e-mail support services, and administrative services in support of the department,
- UNIX and Oracle/Janus systems management and Janus Web support,
- support of the Publications Department to complete leg-related publications and WWW maintenance,
- support of the Science Services Department to complete tasks related to archiving information and curation of core,

- support of the digital communications network, and
- administrative and general support during phaseout, including preparation of the ODP "Final Technical Report".

Digital Image Archive—ISD plans to scan the remaining ODP and DSDP film archives (over 50,000 core images). While Leg 130 is our targeted leg for FY03, our goal in FY04 is to complete the scanning of all ODP legs (i.e., Legs 100 through 210). Scanning of the 96 legs of the DSDP program are scheduled to begin in FY05 and completed by the end of January 2007. Time permitting, work on the DSDP photographs could begin as soon as the ODP task is completed.

418091-01 INFORMATION SERVICES

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 1,912,938	$ 1,502,916
3500	Travel	4,300	4,000
3580	Travel - Port Calls	68,014	316
3600	Training	73,430	16,000
4000	Supplies	54,100	17,800
4765	Software	30,000	13,270
5261	Shipping	1,100	1,200
5370	Telecommunications	23,500	4,928
5373	Ship-to-Shore Communications	1,000	-
5550	Services	11,650	4,985
5569	Other Computing Services	600	-
6820	Maintenance & Repair	130,000	57,000
8400	Equipment	57,000	109,300
8510	Library	1,700	-
	TOTAL	**$ 2,369,332**	**$ 1,731,715**

The above table projects the budget requirement to carry out the tasks identified earlier. The largest cost item is payroll, which includes allowances for annual merit increase, payment of temporary employment extension (TEE), and payment for vacation buyout. In addition, appropriate fringe rates have been applied to arrive at the total payroll cost of $1,502,916 for FY04. Other expenses are expected in support of the computer hardware and software, e.g., maintenance of UNIX and Novell servers, a power conditioner, and the network equipment. In all, a budget of $1,731,715 will be needed to carry out the required ISD tasks during FY04.

Payroll—The department has a total of 27.25 full-time equivalents (FTEs) at the end of FY03. It begins FY04 with 27 FTEs and drops to 19 FTEs by the end of the fiscal year. It is planned that two ISD computer support staff will be transferred to the Publication Services Department at the beginning of FY05. While no undergraduate technicians are programmed, five graduate assistants are included in the budget projections for the year.

***Travel*—**Some funds are made available for business and conference travel for staff during the year.

***Port Call Travel*—**These are the funds required to pay for ground transportation for six Information Services Department specialists between the demobilization port and College Station, Texas at the end of the demobilization activities.

Training—Training activities will be available for some staff during the year to help in staff retention and to allow for the advancement in needed skill sets.

***Supplies*—**This category covers replacement parts for microcomputers (e.g., hard drives, plug-in memory, and keyboards), supplies for computer operations (e.g., DLT, DAT, 4 mm, and 8 mm tapes), photographic and imaging supplies (e.g., photographic film, paper, and chemicals), and general office supplies (toner, paper, binders, pens, and cables).

***Software*—**New software programs, software upgrades, and replacement software are included and will be purchased for the entire department. Typical purchases have included operating system software and utilities, virus scanners, compression/decompression software, file conversion software, cross-platform communications software, and disk management software. These are part of the department's normal complement of software.

***Shipping*—**Covers general postage and shipping charges to repair equipment and to deliver data on various media, including photographs and images, to members of the scientific community.

***Telecommunications*—**This departmental category includes funds for office telephones, computer dialup modem bank, pagers, and costs for fax telephone services. It accounts for a reduction in the number of department personnel over the course of the year.

***Services*—**Services include utility charges for vault storage for digital data and paper documents, copier charges, rent for safe deposit boxes at a local bank for microfilm, pager service, and miscellaneous repair services. Also included in this category are funds to microfilm profiler records and any analog data sent back to shore from the last legs of FY03.

***Maintenance and Repair*—**Maintenance contracts will be needed through FY04 for selected computer hardware (e.g., servers and network equipment) and computer software (e.g., database and utilities). For some equipment (e.g., monitors and printers) not covered by a manufacturer's warranty, a separate hardware maintenance contract may be needed to cover the equipment for repairs during the year. Software maintenance includes coverage for the distribution media, the software documentation, software revisions, and telephone support with the software vendor. This budget category also includes maintenance funds for various pieces of photographic laboratory equipment, such as the drum scanner. The assumption is made that sufficient spare parts will be available from both ship and shore locations, based on the demobilization of the ship and the expected decrease in staffing, in order to keep costs down.

Equipment Replacement—A contingency of $20,000 is requested to provide replacement of computer and network equipment that has failed and cannot be repaired. No funds are requested for new equipment in this year, except for the Publication Services Department (PSD), which requests $89,300 for various personal computers, monitors, and printers to replace aging equipment. Mac computer upgrades will be requested in the FY05 program plan. All replaced equipment in FY04 is expected to last through PSD's contract extension, i.e., the end of FY07.

Publication Services Department

The Publication Services Department safeguards the legacy of the Ocean Drilling Program by publishing the **Proceedings of the Ocean Drilling Program** ***series that includes ODP leg-related summaries, photographic images, and scientific interpretations. The department also publishes informal leg-related publications, coordinates distribution of all ODP and DSDP publications, manages the ODP/TAMU Web site, tracks all ODP-related publications, and provides support services for other ODP/TAMU publishing needs. In FY04 the department will also take on costs associated with completion of postcruise Editorial Review Board work previously covered by Science Services, assist with the editing and production of ODP phaseout documents and reports, and work on the ODP Cumulative Index Project.***

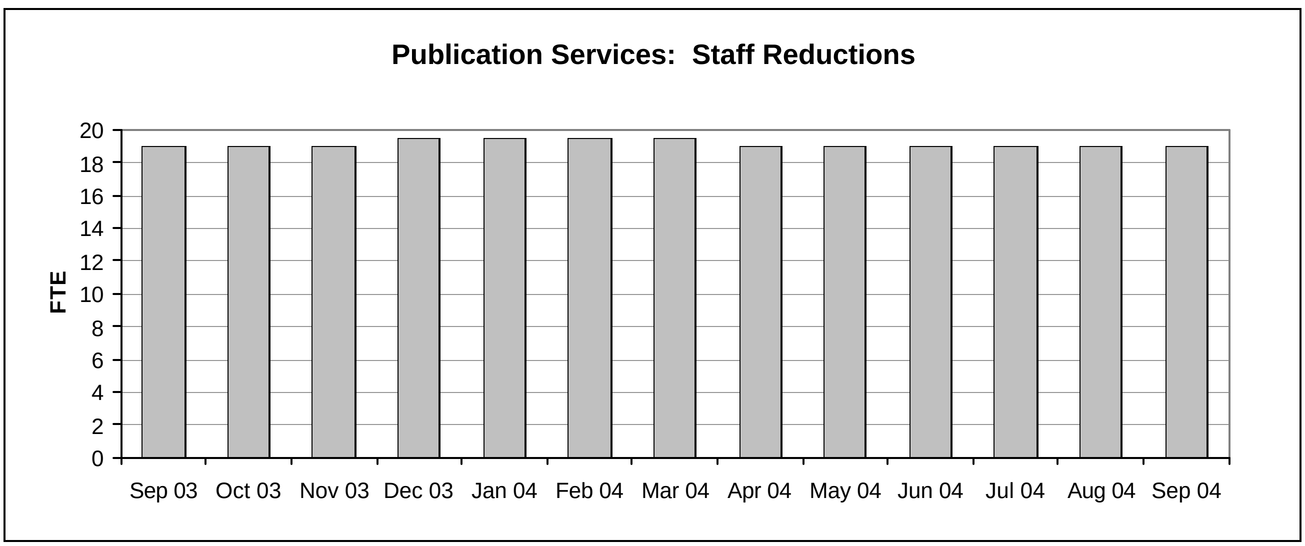
The Publication Services Department is responsible for producing the *Proceedings of the Ocean Drilling Program*—a two-part series composed of the *Initial Reports* and the *Scientific Results* volumes. The department also produces other leg-related publications including the Preliminary Report, the Preliminary Summary of Drilling Results, and the Technical Note series. Publication Services is responsible for the distribution of back issues of ODP and DSDP publications and tracking all ODP-related publications. In addition, the department manages the ODP/TAMU Web site and supports the production of all ODP/TAMU materials that are published on the Web. The department also prepares materials for ODP-related public relations activities and publications. Other departmental responsibilities include the preparation of materials for scientific lectures and the editing and production of other Program reports. In FY04 this will include editing and producing ODP phaseout documents and working on the ODP Cumulative Index.

During FY04 the last six *Initial Reports* volumes will be completed and the amount of work related to postcruise publication activities will remain the same as in past years. However, several positions vacated in late FY02/early FY03 will not be filled in FY04 due to the upcoming phaseout of publication activities. Eighteen full-time employees will be on the Publication Services staff during all of FY04. In addition, two part-time employees will work for the department in FY04. One position will be phased out in March 2004 after work related to the Leg 210 first postcruise meeting is completed; the second position will be retained through the end of the fiscal year to assist with publishing *Initial Reports* and *Scientific Results* manuscripts on the Web. Staff scientists will be supported as freelancers in the Publication Services Department to complete leg-related Editorial Review Board (ERB) responsibilities after their regular positions in the Science Services Department are phased out. At this time we anticipate supporting staff scientists to work on ERBs from six to ten different legs. Each ERB position is estimated to receive a total of one month's salary over the period of manuscript peer-review for a volume, which is estimated as a half-month's salary per month beginning in December 2003. (Note this schedule could change depending on the tenure of the staff scientists in their current positions.)

PUBLICATION SERVICES – FY04 PERSONNEL STRUCTURE

Month	FTE *
September 03	19.0
October	19.0
November	19.0
December	19.5
January 04	19.5
February	19.5
March	19.5
April	19.0
May	19.0
June	19.0
July	19.0
August	19.0
September	19.0

* Count includes part-time employees and freelance staff scientists.



The *Initial Reports* and the *Scientific Results* volumes make up the set of companion volumes called the *Proceedings of the Ocean Drilling Program.* These volumes are produced for each leg and contain a thorough record of the cruise objectives and summarize the cruise and postcruise scientific results. In FY04 six *Initial Reports* (Legs 205–210) and four *Scientific Results* (Legs 187–189 and 191) booklets with CD-ROMs will be produced and distributed. The *Initial Reports* volumes will also be published on the Web. In addition manuscripts for *Scientific Results* volumes 187–189 and 191 and other *Scientific Results* volumes will be published on the Web upon acceptance.

The *Initial Reports* volume records the scientific and engineering results from each ODP leg. Each volume contains a leg summary, chapters that summarize the results from each drill site, graphics that describe the core from each site linked to digital color core images, and tabular data relating to the core. The contents of the volume are written at sea by the shipboard scientists. The Publication Services Department coordinates and supports the initial postcruise meeting where the material undergoes scientific review as part of the editing process. The department then formats and prepares all volume materials for publication in print and electronic formats. The entire contents of each volume are published on CD-ROM in PDF format and are viewable with the freeware Adobe Acrobat Reader software. The CDs also contain ASCII tables that are associated with the volume. The volume CD is distributed with a printed booklet that contains a copy of the "Leg Summary" chapter, and is also available as a stand-alone product. *Initial Reports* volumes are also available on the Web in PDF and HTML formats at www-odp.tamu.edu/publications. Volume distribution begins approximately 12 months postcruise, and whenever feasible, Web distribution may begin earlier.

Scientific participants who sail on cruises during FY03 are required to follow the "ODP Sample Distribution, Data Distribution, and Publications Policy" guidelines established in 1999. These guidelines state that all scientific party members who sail as invited participants on ODP cruises, and all shore-based participants who are included in the scientific party, incur an obligation to ODP that must be fulfilled by using samples or data from the leg they participated in to conduct postcruise research and by publishing associated results in (a) a paper in a peer-reviewed scientific journal or book that is published in English, or (b) a paper or a data report in the peer-reviewed *Scientific Results* volume.

The department orchestrates the submission and peer review process of the *Scientific Results* papers, which occurs between 12 and 28+ months postcruise. The Editorial Review Board for each volume, made up of the two co-chief scientists, the staff scientist, and one external specialist (optional), with support from the ODP Publications Coordinator, are responsible for obtaining peer reviews of papers and data reports submitted to the volume. Accepted papers and data reports are published on the Web and later reproduced on the volume CD-ROM. This CD is distributed 4 years postcruise with the volume booklet that contains a leg synthesis paper authored, or coordinated, by the co-chief scientists.

The Publication Services Department is also responsible for tracking all leg-related publications that stem from ODP research. Two departmental functions cover this task. Department staff members collect journal and book citations from scientific participants and other resources (reviewing journal contents, etc.) and publish a leg-related citations list on the Web: www-odp.tamu.edu/publications/pubs_ct.htm. The Publication Services Department also subcontracts to the American Geological Institute (AGI), who maintains a database with over 18,800 citations related to ODP and DSDP research. This database is available for free via the Web: http://www-odp.tamu.edu/publications/cite/ and includes a feature where citations can be downloaded into reference software such as ProCite and Endnote. In addition to providing this database to the user community for research purposes, ODP/TAMU staff use the database to produce citation statistics for the Program. These statistics are reported each year and are also available to member countries and individual scientists upon request.

Publication Services Department staff and the indexing subcontractor will continue work on the production of the ODP Cumulative Index during FY04 and also plan to assist the TAMU Digital Library with the production of digital versions of previously printed publications (e.g., ODP *Proceedings* volumes).

In addition to the *Proceedings* volumes, the JOIDES scientific community requires the publication of the following publications.

Preliminary Report: An overview of the leg that outlines the principal scientific results of the cruise and summarizes shipboard and engineering operations. It is written at the end of each cruise and is authored by the Shipboard Scientific Party. The Publication Services Department is responsible for editing and preparing all material for publication, reproducing and distributing the report in hard copy, and formatting and publishing the report on the Web: www-odp.tamu.edu/publications/pubs_pr.htm.

The Preliminary Summary of Drilling Results (Hole Summary): A preliminary draft of the *Initial Reports* volume that is assembled from shipboard files prepared by the scientists who participate in each cruise. It is formatted, reproduced, and distributed by the Publication Services Department. This report appears in print approximately 1 month after the completion of each leg and is distributed to the shipboard scientific party and shore-based scientists who have approved sample requests. This document contains proprietary data that should not be accessed by anyone but shipboard and shore-based leg scientists for 1 year postcruise, or until the *Initial Reports* is published, whichever comes first. Also, because of the limited distribution, it is less expensive to reproduce and distribute the report in hard copy than to format it for electronic distribution.

Technical Notes: A series that documents technical aspects of ODP science and drilling. Technical Notes are written by ODP scientific and technical staff members and other members of the scientific community. The goal of this series is to keep the marine geoscience community abreast as new tools and techniques related to drilling engineering are developed and to publish new laboratory guides or manuals. The department edits this series, formats the material for publication on the Web in PDF and HTML formats (www-odp.tamu.edu/publications/pubs_tn.htm), and copies and distributes limited printed copies as needed.

The Publication Services Department also supports the other ODP/TAMU departments in producing presentations, scientific talks, papers, poster sessions, and legacy documentation for ODP.

ODP/TAMU has formally adopted the Web as the publication medium for the dissemination of a variety of Program-related materials. Working with representatives from each ODP/TAMU department and other organizations involved in the Program (e.g., JOI and LDEO), Publication Services is responsible for maintaining all existing material and coordinating the submission of all new materials for publication on the ODP/TAMU Web site and for assisting with coordination of mirror sites. ODP/TAMU has also led in the effort to develop mirror Web sites in Germany, the United Kingdom, and Australia.

The Publication Services Department is responsible for managing the storage and distribution of current and back issues of the *Proceedings of the Ocean Drilling Program* as well as the *Initial Reports of the Deep Sea Drilling Project* series and other ODP report series. An air-conditioned warehouse facility is maintained for volume storage, and shipping is handled at ODP/TAMU.

Support for publications operations will involve a total of 19 FTEs (18 full-time employees and two part-time employees) to produce the *Proceedings* volumes and carry out the other tasks described above. A team of eight publishing professionals currently leads the department with over 125 years of experience in the publishing industry. Staff members have a total of over 320 years of experience in the field, or an average of 18 years per person. In addition, staff scientists will be supported by Publication Services as freelancers to complete leg-related Editorial Review Board (ERB) responsibilities after their regular positions in the Science Services Department are phased out.

The Publication Services Department is composed of seven sections. Individuals from all sections are involved in the daily production of the publications and reports that the department produces. Below is a brief summary of the support staff required for the production of specific publications. On an annual basis during the year the department staff provide ongoing support for the production and distribution of 6 *Initial Reports* volumes, approximately 20 *Scientific Results* volumes; the peer-review process for 22 *Scientific Results* volumes; and also host postcruise meetings, track citations, and publish a variety of report series. The following staff members are involved in each task or publication.

Initial Reports *Volumes*—The production and distribution of the *Initial Reports* volumes require the expertise and efforts of members of the editorial section (Assistant Editor, Editors, and Senior Editor); production section (Production Editors and Senior Production Editor); graphic design section (Graphic Designers and Senior Graphic Designer); as well as those of the Web Administrator; Electronic Publications Specialist; Distribution Specialist; and Manager.

Scientific Results *Volumes*—The peer-review process for the *Scientific Results* volume is coordinated by the Senior Publications Coordinator, who is assisted by one Publications Coordinator Assistant. The Manager also participates in this process. The staff scientists play a leading role in the peer-review process. Production and distribution of the *Scientific Results* volumes requires the expertise and efforts of members of the publication coordination section (Publications Coordinator Assistant); editorial section (Editors and Senior Editor); production section (Production Editors and Senior Production Editor); graphic design section (Graphic Designers and Senior Graphic Designer); as well as those of the Publications Specialist; Web Administrator; Electronic Publications Specialist; Distribution Specialist; and Manager.

***ODP Cumulative Index Project*—**Work on the development and production of the ODP Cumulative Index is handled by the Manager, Publications Specialist, and other staff working in conjunction with the indexing subcontractor.

***Leg-Related Citation Lists*—**The tracking process for logging all leg-related citations is handled by the Senior Publications Coordinator and the Web Administrator, with assistance from the Publications Specialist. The staff scientists also contribute to the creation of accurate and up-to-date lists.

***DSDP and ODP Citation Database*—**The Publications Specialist is responsible for producing reports from the data for panels and member countries.

Preliminary Report—The production and distribution of this report series requires the expertise and efforts of members of the editorial section (Assistant Editor, Editors, and Senior Editor); graphic design section (Graphic Designers and Senior Graphic Designer); as well as those of the Web Administrator and Distribution Specialist.

***Technical Notes*—**One to two new issues of the Technical Note series are produced each year on an as-needed basis. The production and distribution of a new issue requires the expertise and efforts of members of the editorial section (Editors and Senior Editor); graphic design section (Graphic Designers); as well as those of the Web Administrator; Electronic Publications Specialist; and Distribution Specialist.

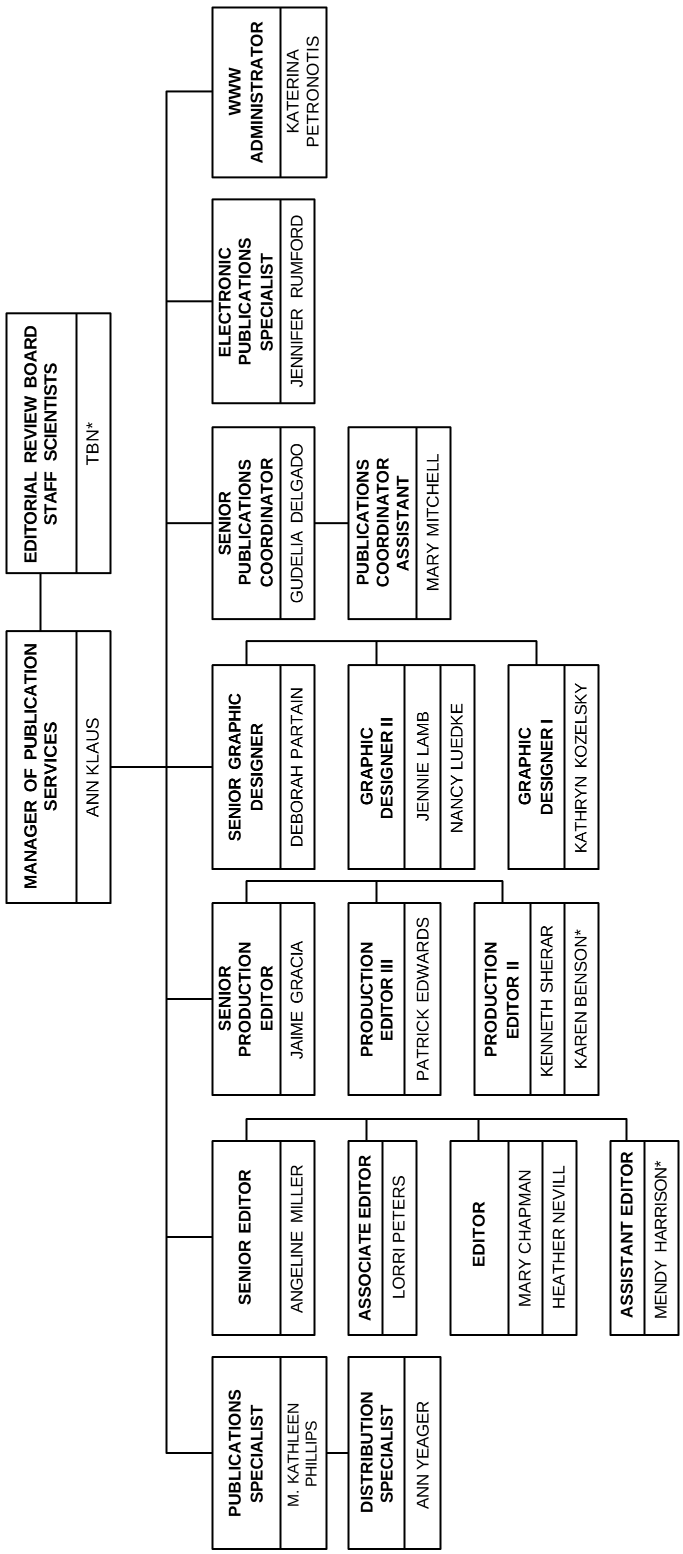
***Web Site*—**The publication and ongoing maintenance of the ODP publications on the Web, and the production of new publications is handled by the Electronic Publications Specialist, the production section staff (Production Editors and Senior Production Editor), the Web Administrator, the editorial section (Editors and Senior Editor) and graphic design section staff (Graphic Designers and Senior

Graphic Designer). The Web Administrator is responsible for managing the production and maintenance of all other material on the ODP/TAMU site and serves as the liaison with other ODP Web sites. The coordination of ODP mirror sites is the responsibility of the Electronic Publications Specialist and the Web Administrator.

Volume Distribution—Under the supervision of the Publications Specialist, the Distribution Specialist manages the storage and distribution of over 54,000 ODP and DSDP publications.

Publication Support—Under the supervision of the Publications Manager, any staff members may be called upon to assist with tasks in this category depending on the nature of the projects.

ORGANIZATIONAL CHART, PUBLICATION SERVICES



Task: 1802, Publications
Subtasks: Publications
Functions: Publication and distribution of leg-related science, coordination of peer-review system, Web administration.

* = part-time positions

January 9, 2003

TASK SUMMARY 1802: PUBLICATION SERVICES

POSITION	DESCRIPTION
Manager of Publication Services (1.00):	Manages and directs all publishing activities. Supervises editing, graphic design, and production work for the *Proceedings of the Ocean Drilling Program* and other ODP publications. Oversees peer-review system for *Scientific Results* volumes, oversees new initiatives related to electronic publishing, Web site administration, and Web publications. Manages administrative and budgetary functions for department. Oversees work on legacy documents.
Publications Specialist (1.00):	Supervises the Distribution Specialist. Provides administrative support to the Manager of Publication Services. Directs volume distribution process; maintains archive of *Proceedings* publications; processes department invoices; monitors equipment inventory; handles special department projects (e.g., DSDP/ODP Citation Database and Cumulative Index); prepares departmental reports on citation statistics; assists with budget preparation; handles editorial proofing.
Distribution Specialist (1.00):	Responsible for data entry and maintenance of Publications database that tracks individual scientists' involvement in the program; copies and distributes Program's informal publications; monitors initial distribution of publications and manages distribution center for Ocean Drilling Program and Deep Sea Drilling Project publications. Purchases departmental supplies. Provides clerical support to Publications Specialist and Manager.
Senior Editor (1.00):	Supervises Editorial Section staff. Supervises editorial work; trains staff; manages workloads. Establishes style guidelines and oversees quality control; works with authors and co-chief scientists. Reviews editorial work and performs editorial duties when needed. Assists in producing, proofing, and approving final products. Edits and proofs other publications and science presentations as needed. Investigates methods to refine electronic publication processes.
Associate Editor (1.00) and Editor (2.00):	Edits, proofs, and prepares scientific manuscripts for *Proceedings* volumes and ODP reports. Manages volume table of contents. Edits other publications and science presentations as needed. Investigates methods to refine editing and proofing processes. Performs Assistant Editor duties as needed.
Assistant Editor (0.50):	Prepares *Initial Reports* volume contents for editing; formats electronic text and table files; verifies completeness of final manuscripts. Provides support for first postcruise meeting. Assists with CD-ROM and Web proofing.
Senior Production Editor (1.00):	Supervises Production Section staff. Supervises production work; trains staff; manages workloads. Manages the preparation and assembly of hardbound books, CD-ROMs, and web publications. Responsible for overseeing quality control. Supervises workflow between ODP and subcontractors and manages subcontractor budget; monitors contracts for services including printing and indexing. Oversees CD manufacturing process. Reviews all Production Section work and performs all Production Editor duties when needed. Provides department with computer hardware and software support. Investigates methods to refine electronic publication processes.
Production Editor III (1.00) and Production Editor II (1.50):	Performs electronic typesetting, page layout, and linking for *Proceedings* volumes; prepares files for CD and Web publication. Coordinates all phases of final production to meet deadlines. Coordinates workflow between ODP and subcontractors as needed. Provides department with computer software support. Investigates methods to refine electronic publication processes.

POSITION	DESCRIPTION
Senior Graphic Designer (1.00):	Supervises Graphic Designer Section staff. Supervises graphic design work; trains staff; manages workloads. Oversees preparation of figures and prime data for *Proceedings* volumes, proofing tasks, and preparation of Web reports. Responsible for overseeing quality control. Performs Graphic Designer duties when needed. Oversees special design projects for the Program. Provides department with computer hardware and software support. Investigates methods to refine electronic publication processes.
Graphic Designer II (2.00) and Graphic Designer I (1.00):	Prepares technical illustrations, prime data, and core photographs for *Proceedings* volumes. Prepares art for other publications and science presentations. Prepares ODP reports for Web publication. Investigates methods to refine electronic publication processes
Senior Publications Coordinator (1.00):	Supervises Publications Coordinator Assistant. Supervises and coordinates peer-review tasks; trains staff. Receives, sends, and tracks all *Scientific Results* manuscripts through scientific and editorial review; tracks journal publications and other "obligation fulfillment" indicators. Acts as central point in communicating with authors, Editorial Review Boards, and reviewers.
Publications Coordinator Assistant (1.00):	Processes manuscripts to be published in the *Scientific Results* volume of the ODP *Proceedings*. Provides office support to supervisor by assisting with publication coordination tasks.
Electronic Publications Specialist (1.00):	Coordinates and produces HTML versions of *Proceedings* volume chapters and assists with production of PDF versions as needed. Responsible for overseeing quality control. Handles special production projects. Investigates methods to refine electronic publication processes. Maintains accessibility to all electronic *Proceedings* materials. Assists with the preparation of subcontract budgets.
WWW Administrator (1.00):	Maintains up-to-date Web site for ODP/TAMU. Standardizes existing material into a uniform style, prepares new material for Web publication, updates changing information, and performs regular checks of site material; trains staff. Responsible for overseeing quality control. Prepares statistics reports. Investigates and uses new technologies to enhance publication of ODP material. Manages Leg Citation lists. Assists with postcruise meetings, editing, proofing, and other Publications tasks as needed.
Total Personnel:	19.00
Also:	
Editorial Review Board Staff Scientist (5 months total)	Part-time positions to handle and complete all duties required by a Leg Project Manager/Staff Scientist on the Editorial Review Board related to the ODP postcruise publications guidelines after staff scientist positions in the Science Services Department are phased out.

ACCOMPLISHMENTS

Since 1998, the Publication Services Department staff has successfully fulfilled ODP's mandate to "reduce budget by $500,000 (25%), increase volume distribution, and produce a CD-ROM product that maximizes electronic publication features, but is also printable." In May 1999, the first new-format *Initial Reports* volume (booklet/CD, Web) was published; in April 2000, the first new-format *Scientific Results* chapter was published on the Web; and in December 2000, the first new-format *Scientific Results* volume booklet/CD was published. Comparing the actual budgets for FY02 vs. FY96, subcontract costs have been reduced by 73% ($546,660) and the total budget has been reduced by 36% ($821,105). The new electronic format allows utilization of features unavailable in printed books, increases the utility of volume material, supports on-screen viewing and printing, significantly increases access to the *Proceedings* publications around the world, and supports links to other Program-related resources and data. Although usage of print and CD products is difficult to monitor, it is evident that the Web publication formats are extremely successful and access to online volumes increases annually. Recently, backed by recommendations from SciMP and JOI, the Publications Department also completed a collaborative effort with the American Geological Institute to produce an online database of ODP- and DSDP-related citations. This database, with over 18,800 citations, provides the scientific community with a valuable online tool for accessing and documenting past research efforts related to ocean drilling. In FY01, the ODP/TAMU Web site had 582,196 visitor sessions (monthly average = 48,516); in FY02 this increased by 31.3% to 764,509 (monthly average = 63,709).

Through October 2002, ODP/TAMU's publication statistics include the following:

- 183 *Proceedings* volumes completed.
- 38 Technical Notes distributed.
- 112 Scientific Prospectus issues and 106 Preliminary Report issues distributed.
- 131,148 pages published for the *Proceedings* volumes.
- Over 240,638 copies of the *Proceedings* volumes; 5,006 copies of the *Initial Reports of the Deep Sea Drilling Project* volumes; and 64,655 copies of the other ODP publications distributed to scientists and libraries in 24 member countries and 58 nonmember countries.
- 2,841 scientists who participated in ODP cruises authored the *Initial Reports* volumes.
- The *Scientific Results* volumes 101–188 contain 2,895 papers authored by 7,574 scientists who were participants in ODP postcruise scientific research. Another 5,348 scientists participated in the peer-review process for these volumes.
- At least 385 papers based on postcruise research—authored by 1,258 scientists—have been submitted to journals and books for Legs 160–193.

The Publication Services Department has produced the following electronic publications and resources:

<u>CD-ROM</u>

- 38 *Initial Reports* volumes (159, 160, and 163–198) and 27 *Scientific Results* volumes (150X, 151, 154–173, 174B, 175, and 180).
- The "Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program"* (indexes from volumes 101–173, 174B, 175–176, 178, and 180).
- Web
- 39 *Initial Reports* volumes (150X supplement and 166–198).
- 39 complete *Scientific Results* volumes (150X, 152–173, 174B, 175–176, 178, and 180), and papers from eight other *Scientific Results* volumes (174A, 177, 179, 181–185).
- 47 Scientific Prospectus issues, 48 Preliminary Report issues, and 12 Technical Notes.
- Leg-related citation lists for Legs 155 through 203. They list papers published in *Initial Reports* and *Scientific Results* volumes as well as in journals and books (709), and include links to abstracts (273) and/or papers whenever permitted.
- Digital versions of color core photo images from Legs 163–198 are accessible in the *Initial Reports* volumes; color digital images of core from Legs 163–205 are accessible from Janus Web.

- The “Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program”* (indexes from volumes 101–173, 174B, 175–176, 178, and 180).
- DSDP and ODP Citation Database (containing over 18,800 citations).
- Author Resources: Sample Distribution, Data Distribution, and Publications Policy; Publication Instructions for ODP Scientists; online manuscript submission and review forms; Citations from the *Proceedings of the Ocean Drilling Program* (a list of approximately 38,000 edited bibliographic citations from *Proceedings* volumes); Electronic Dictionary of Terminology Used in the Ocean Drilling Program; and Site maps of ODP Legs 101–203 and DSDP Legs 1-96.

Between November 2002 and September 2003, ODP/TAMU publication statistics are estimated to increase as follows:

- 198 *Proceedings* volumes will be completed.
- 39 Technical Notes will be distributed.
- 115 Scientific Prospectus issues and 111 Preliminary Report issues will be distributed.
- 147,248 pages will be published for the *Proceedings* volumes.
- Over 264,088 copies of the *Proceedings* volumes, ~5,230 copies of the *Initial Reports of the Deep Sea Drilling Project* volumes, and ~65,730 copies of the other ODP publications will be distributed to scientists and libraries in 24 member countries and ~58 nonmember countries.
- ~3,000 scientists who participated in ODP cruises will have authored the *Initial Reports* volumes.
- The *Scientific Results* volumes 101–195 will contain ~2,980 papers authored by ~7,750 scientists who were participants in ODP postcruise scientific research. Another ~5,480 scientists will have participated in the peer-review process for these volumes.
- At least 550 papers based on postcruise research—authored by ~1,606 scientists—will have been submitted to journals and books for Legs 160–203.

The Publication Services Department projects the following electronic publications and resources will be completed:

<u>CD-ROM</u>

- 44 *Initial Reports* volumes (159, 160, and 163–204) and 36 *Scientific Results* volumes (150X, 151, 154–183, and 185).
- The “Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program”* (indexes from volumes 101–184).
- Web
- 45 *Initial Reports* volumes (150X supplement and 166–204).
- 44 complete *Scientific Results* volumes (150X, 152–184), and papers from eight other *Scientific Results* (through *Scientific Results* Volume 190/196).
- 50 Scientific Prospectus issues, 56 Preliminary Report issues, and +15 Technical Notes.
- Leg-related citation lists for Legs 155 through 210 will be on the Web. They will list papers published in *Initial Reports* and *Scientific Results* volumes as well as in journals and books (~900), and include links to abstracts (~350) and/or papers whenever permitted.
- Digital versions of color core photo images from Legs 163–210 will be accessible in the *Initial Reports* volumes and from Janus Web.

- The "Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program*" (indexes from volumes 101–184).
- DSDP and ODP Citation Database (containing over 19,200 citations).
- Author Resources: Sample Distribution, Data Distribution, and Publications Policy; Publication Instructions for ODP Scientists; online manuscript submission and review forms; Citations from the *Proceedings of the Ocean Drilling Program* (a list of more than 38,000 edited bibliographic citations from *Proceedings* volumes); Electronic Dictionary of Terminology Used in the Ocean Drilling Program; and Site maps of ODP Legs 101–210 and DSDP Legs 1–96.

GOALS

The Publication Services Department will manage, coordinate, and furnish the services, materials, and facilities necessary to support the publications currently required by ODP/TAMU. The Publication Services Department will standardize formats and terminology, prepare archive-quality materials when applicable, and distribute materials in a timely manner. As a professional publishing group, the Department will strive to prepare materials in formats that are required, or requested, by the scientific community.

Specific goals include the following:

- Format materials, copy report, and distribute Hole Summary (Preliminary Summary of Drilling Results) in paper format.
- Edit, produce, and publish the Preliminary Report series in electronic formats (Web: HTML and PDF); provide printed copies as needed.
- Coordinate Scientific *Results* manuscript submission and peer-review process; process and record journal submissions that fulfill ODP obligations; track nonperformers; prepare Leg Citation Publication Lists.
- Edit, produce, and publish *Proceedings of the Ocean Drilling Program* volumes in paper and electronic formats (Web and CD-ROM).
- Edit, produce, and publish new contributions to the Technical Notes series in electronic formats (Web: HTML and PDF).
- Prepare citation reports based on ODP-related publications in journals, books, and *Proceedings of the Ocean Drilling Program* volumes.
- Handle subcontractor liaison responsibilities associated with volume printing, distribution and indexing.
- Prepare and manage annual budgets; process invoices and handle other fiscal tasks; handle property inventory the department.
- Manage storage and facilitate distribution of ODP and DSDP volumes.
- Maintain ODP/TAMU Web site and ongoing commitment to the dissemination of information and the promotion of ODP/TAMU via the Web (including electronic access to ODP/TAMU publications, databases, Program information, and public relations materials). Produce web site statistic reports.
- Archive all volume material: microfiche and microfilm all volume contents; maintain CD-ROM archive and print archive of all *Proceedings* publications; continue to work on development of a sound and reasonable archive plan for electronic publication products. Continue to foster project to digitize printed Program publications.

- Work on the production of an ODP Cumulative Index covering all ODP *Proceedings* volumes.
- Begin to produce legacy documentation outlining the publications generated and procedures used by the department.
- Provide editorial, graphic, and production services to other ODP/TAMU departments to assist with the production of ODP legacy documents.
- Provide graphics services to other ODP departments for talks, papers, posters, etc.
- Supervise/oversee freelance staff scientists.
- The mission statement of the Department has always included the mandate to seek new methods to refine the publication process. ODP/TAMU is committed to conducting ongoing research and development in the field of ODP/TAMU publications. This includes investigation for, and application of, procedures to improve cost effectiveness and maintain quality of the end product in response to the needs of the scientific community. The Department is committed to working with the leaders of the publishing industry, and the scientific community, to facilitate the use of new publishing formats to provide improved dissemination of scientific information and to cut department costs.

418021-01 PUBLICATION SERVICES

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 1,139,480	$ 1,102,846
3500	Travel	6,647	29,599
3600	Training	3,582	10,564
4000	Supplies	15,015	22,490
4765	Software	25,000	32,250
5261	Shipping	24,000	28,750
5370	Telecommunications	7,000	6,850
5550	Services	58,550	50,265
5987	Recruiting	450	-
6509	Subcontracts	323,600	390,000
6820	Maintenance & Repair	15,317	17,036
8510	Library	840	1,849
	TOTAL	**$ 1,619,481**	**$ 1,692,499**

In FY04, the Publication Services Department will produce and distribute three Preliminary Report issues; produce and distribute six *Initial Reports* volumes (Legs 205–210; booklet with CD, and Web version); will coordinate the peer-review process and then produce and distribute papers for 23 *Scientific Results* volumes (Web version); print four *Scientific Results* booklets with CD-ROMs (Legs 187–189 and 191); and will work on the ODP cumulative index. Department staff will host three postcruise meetings (Legs 208–210). In addition, Publication Services will manage the volume warehouse and distribution functions for all DSDP and ODP publications. The department will collect non-*Proceedings* publications; prepare, edit, publish, and update leg-related citation lists; track nonperformers; and evaluate citation data and prepare citation reports. The ODP Web Administrator will continue to evaluate Web site statistics and prepare associated reports, and manage the ODP/TAMU Web site. Department staff will also provide support for the production of non-*Proceedings* graphics, presentations, papers, scientific reports, legacy documents, and the Program Plan.

Overall, the FY04 budget for the Publication Services Department is 4.5% ($73,018) higher than the FY03 Program Plan budget.

***Payroll*—**Payroll costs cover salaries for 18 full-time equivalents (FTEs), 2 part-time employees, and 5 months of salary for freelance staff scientists. An average of a 3.0% payroll increase over FY03 salaries is included for all eligible employees. Payroll costs are 3.2% ($36,634) lower than in the FY03 Program Plan. The cost differential resulted because vacant positions will not be filled in anticipation of the ODP phaseout.

***Travel*—**Travel covers the cost for the Manager to attend an administrative or budget meeting in Washington, DC; two freelance staff scientists to attend second postcruise meetings; four staff members to attend the Council of Science Editors Conference; three staff members to attend the PDF Conference; one staff member to attend the FrameMaker Conference; two staff members to attend the Seybold Publishing Conference; and one staff member to attend the Association of

Science Editors Conference. Staff members intend to present papers at all conferences to showcase the advancements ODP has made in the field of electronic publishing. This is of great value to ODP because it provides a prominent way for ODP to showcase the cutting-edge methods ODP has developed to produce robust electronic publications during the last five years and to market ODP's successes as an electronic publisher to software companies and the scientific publishing industry. It also enables the ODP Publication Services Department to uphold the goal of seeking new methods to refine the publication process through ongoing research and development in the field of electronic scientific publishing. Technical information obtained on these trips will be used to maintain excellence in producing state-of-the-art electronic publishing products, which will be critical to uphold during the last four years of the production of the *Proceedings* series. One person will also attend AGU to represent ODP/TAMU and provide updates on ODP publications to scientists. Costs are 345% ($22,952) higher than in FY03 Program Plan; but only 25.5% ($6,019) higher than the actual costs in FY02. (Note: Severe cuts were made in this section of the budget in FY03 as a means of meeting the mandated budget target.) Overall, the FY04 combined travel and training budget is 11.6% ($4,161) higher than the actual budget in FY02.

Training—Funds are budgeted for three people to attend technical training (e.g., scientific editing or proofreading, etc.); for two people to attend off-campus software training; and for four on-campus software-training classes. Costs are 194.9% ($6,982) higher than in FY03 Program Plan, but 19.9% ($2,627) lower than the actual costs in FY02. (Note: Cuts were made in this section as a means of meeting the mandated budget target for FY03.) Overall, the FY04 combined travel and training budget is 11.6% ($4,161) higher than the actual budget in FY02.

Supplies—Items budgeted in the supplies category support the needs of the day-to-day operations of the department. This includes general office supplies (binders, pens, folders, envelopes, staples, tape, mailing labels, etc.); toner cartridges; paper for printers and copiers; electronic media and other computer supplies (CD-ROMs, tapes and disks, replacement parts for computers, etc.); large boxes for *Proceedings* volume shipments; shelving units for volume warehouse storage; and breakfast and snack food for postcruise meeting participants. Costs in this category are 49.8% ($7,475) higher than in FY03 Program Plan, but 11.6% ($2,960) lower than the actual costs in FY02.

Software—Funds are budgeted to upgrade the software packages used by all Publication Services Department staff members. Upgrades will include system, word processing, page layout, CD-authoring, Web publishing, and spreadsheet programs. Because ODP requires authors to submit their manuscripts electronically for the *Initial Reports* and *Scientific Results* volumes and many ODP authors use the newest software versions, it is necessary for all department staff to have updated versions of the ODP-supported software to work with authors' submissions. Publication Services staff members also prepare material for the Web and need up-to-date web-authoring software to do this. Costs in this category are 29.0% ($7,250) higher than in FY03 Program Plan, but 7.4% ($2,572) lower than the actual costs in FY02.

Shipping—Shipping costs cover postage for regular correspondence and for the distribution of manuscripts worldwide to reviewers and authors during the peer-review process for the *Scientific Results* volume; the distribution of copies of journal submissions to the Editorial Review Board; shipping reports; shipping manuscript galleys to authors for the *Initial Reports* and *Scientific Results* volumes; and sending material to the printing and indexing subcontractors and the CD-ROM manufacturer. Costs in this category are 19.8% ($4,750) higher than in FY03 Program Plan, but 7.7% ($2,385) lower than the actual costs in FY02.

Communications—Rates for phone charge costs are based on FY02 actual cost and are 2.1% ($150) lower than those budgeted in the FY03 Program Plan.

Services—Services funds cover costs for large-format copying; printing letterhead and mailing labels; annual maintenance costs for the ODP and DSDP Web-based citation database supported by AGI and production of the annual database update on CD-ROM; reimbursements for Editorial Review Board members supporting the *Scientific Results* volumes ($500 per person for all but full-time staff scientists); *Initial Reports* and *Scientific Results* volume CD-ROM production (13 CDs; $2,500 per CD); production of microfiche and microfilm copies of the *Initial Reports* and *Scientific Results* volumes for archive purposes; safety deposit box rental for microfiche and microfilm storage; and a cost for ODP general copier usage. Costs in this category are 14.1% ($8,285) lower than those budgeted in the FY03 Program Plan.

Subcontracts—$270,000 is budgeted for subcontractors to index, print, and distribute *Initial Reports* and *Scientific Results* volumes. During FY04 six *Initial Reports* booklets (Legs 205–210) will be printed ($17,000 each) and distributed ($7,000 each); and four *Scientific Results* booklets (Legs 187–189 and 191) will be printed ($17,000 each), indexed (average cost per volume $10,000), and distributed ($7,000 per volume). All price estimates are based on the average size of the new-format *Initial Reports* and *Scientific Results* booklets and *Scientific Results* volume indexes, and the printing, indexing, and distribution subcontract costs for FY04. Revenue from volume sales, estimated at $10,000, is included in the total for this category. Revenue projections have been reduced by 66% from the FY03 Program Plan based on an average annual decline in revenue of 34% between FY00 and FY02. This trend is expected to continue because the cost of newer volumes is 60% less than older volumes, recently published volumes are available for free on the Web, and volume orders for printed books will decrease as the Program phases out. $120,000 is also budgeted for work on the ODP Cumulative Index. Costs in this category are 20.5% ($66,400) higher than those budgeted in the FY03 Program Plan. Contributing factors include the following: subcontract costs are estimated to be higher in the FY04 budget than in the FY03 Program Plan; *Initial Reports* and *Scientific Results* booklets are increasing in size; and revenue projections are 66% ($20,000) lower than in FY03.

Maintenance/Repair—Costs cover maintenance agreements for one high-output digital copier ($12,434), two standard copiers ($4,230), one typewriter ($62), and one forklift used for volume storage and distribution ($310). Costs in this category are 11.2% ($1,719) higher than those budgeted in the FY03 Program Plan.

Library—Costs cover funds for editorial and software/hardware reference books, Council of Science Editors journal, Chemical Abstracts Service Source Index (CASSI) updates used for reference editing, and an editing newsletter. Costs are 120.1% ($1,009) higher than those budgeted in FY03 Program Plan. This increase is because of the renewal of two-year subscriptions that are due in FY04 and also the need for new reference books in FY04.

Administrative Services Department

TAMRF-ODP, as part of the Texas A&M Research Foundation, is committed to providing high-quality administrative services and resources in support of the Ocean Drilling Program at Texas A&M (ODP-TAMU). TAMRF-ODP supplies quality services in contracts, purchasing, fiscal, travel and conference support, and personnel and risk management. These are administered in a cost-effective, timely manner; in compliance with applicable policies, procedures, and regulations.

The Texas A&M Research Foundation (TAMRF) Administration is responsible for oversight and administration of all business affairs of ODP/TAMU. Through mutual agreement, TAMU and TAMRF have waived indirect cost and TAMRF has agreed to administer the business affairs of ODP/TAMU for a small administrative fee and direct charge of costs associated with TAMRF employees assigned to the project. This action on behalf of the institution and the Foundation results in the vast majority (95%) of funds provided being applied to science operations activities. TAMRF Administration's primary function is to provide the following administrative support services to the ODP/TAMU Science Operator to enable them to accomplish their technical objectives within the subcontract terms, applicable federal and state regulations and sound business practices:

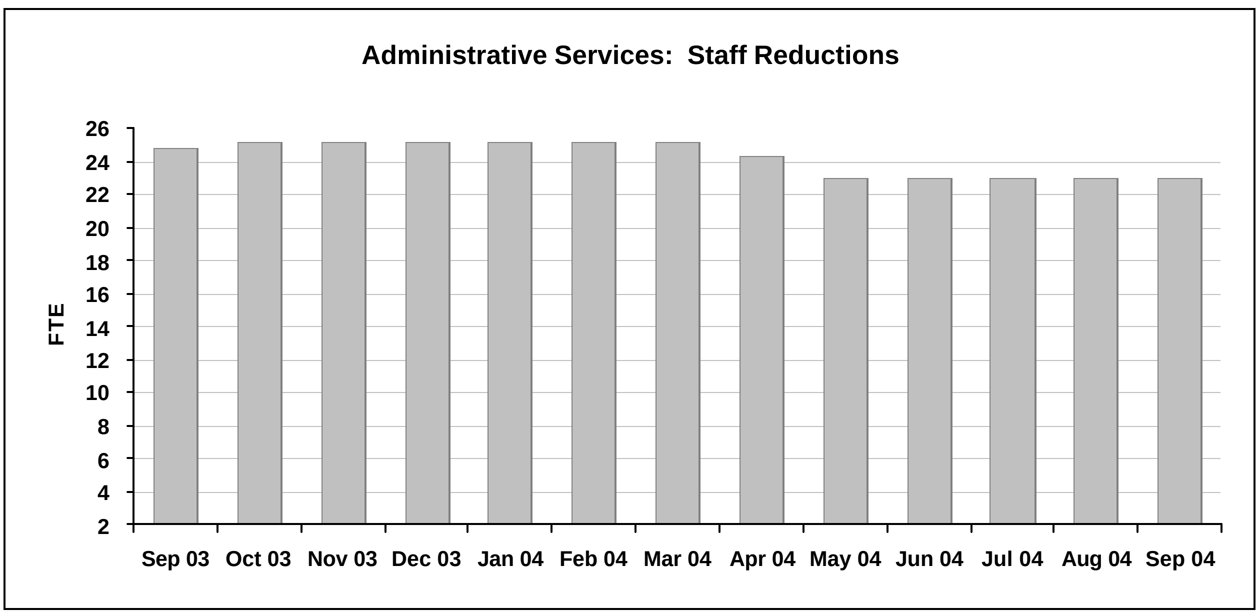
- Coordinate business functions of ODP/TAMU activities to ensure implementation of JOI advice/direction. Provide effective and auditable administrative services at a reasonable cost.
- Manage the ODP/TAMU procurement/property and contract activities through the Department of Contracts and Purchasing/Property to assist the ODP/TAMU staff in meeting their objectives and assure compliance with the specific terms of the contract and applicable government regulations. This includes subcontract negotiations; issuing and monitoring solicitations; advising staff on allowability, regulations, and JOI approval requirements; drillship subcontract activities; administration of explosive licensing; issuing purchase orders, including applicable special terms and conditions; and writing and processing subcontract documents. This includes establishing government property records and coordinating physical inventories.
- Manage all fiscal activities of the subcontract through the Department of Fiscal Affairs, consisting of Accounts Payable/Accounts Receivable, Budget Planning/Analysis, and Payroll. This includes budget monitoring, forecasting, and reporting for 19 separate budgets or cost centers, conducting budget reviews, processing payroll for all employees, maintaining two separate payroll reporting systems, performing all payable and receivable functions, and overseeing external audit activities.

- Other administrative service functions provided include human resource (HR) administration, insurance and risk management, and travel and conference arrangements. This includes screening, interviewing, counseling employees, assisting employees with compensation and fringe benefit matters, providing training information, maintaining personnel databases, immigration activities, making reservations via an in-house airline computerized reservation system, negotiating with consulate offices, and coordinating CONUS and international meetings.
- Other miscellaneous activities performed by TAMRF Administration and Headquarters include building security, general administration, coordination of the annual Program Plan, and overall supervision of all business activities.

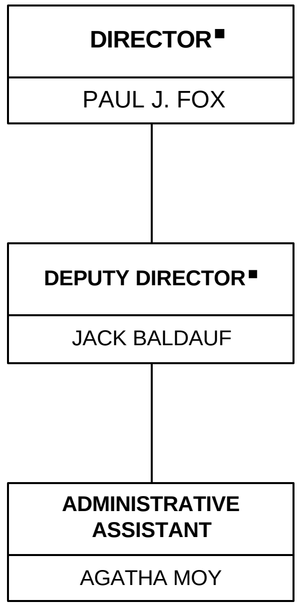
ADMINISTRATIVE SERVICES – PERSONNEL STRUCTURE

Month	FY04
September 03	24.80
October	25.15
November	25.15
December	25.15
January 04	25.15
February	25.15
March	25.15
April	24.35
May	23.00
June	23.00
July	23.00
August	23.00
September	23.00

Full-time equivalents (FTEs) are 2.20 in Headquarters and 22.95 in Administration, for a total of 25.15, at the start of FY04.



ORGANIZATIONAL CHART, HEADQUARTERS

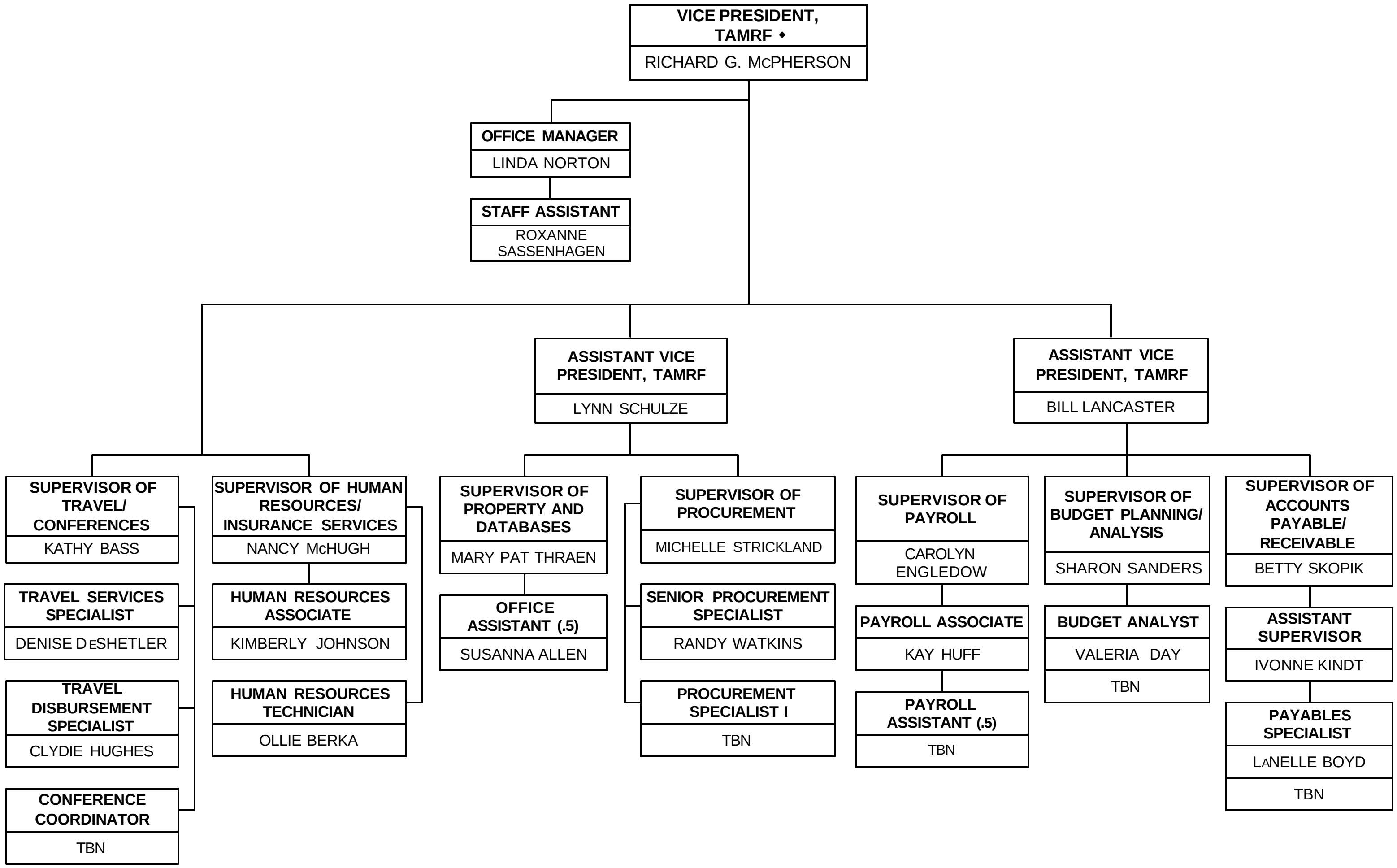


Task: 1801 Headquarters
Subtask: Headquarters
Functions: Oversees all Science Operator tasks; works with Department of State, NSF, and JOI, Inc., on all aspects of the program, including international operating permits, program licenses, strategic planning, and fiscal constraints. Overall scientific and technical guidance is given by Headquarters' participation in JOIDES panels and by communications with Science Advisors and Managers of the various cost centers.

■ Minimum of 50% effort devoted to project.

January 21, 2003

ORGANIZATIONAL CHART, ADMINISTRATIVE SERVICES



Task: 1801 Administration
Subtask: Administration
Functions: Oversees business and administrative activities such as financial services, contracts (compliance, negotiations, subcontracts, purchasing, and property control) and general administrative services (insurance, human resources, and travel). Provides contractual liaison with all subcontractors, including drillship subcontractor.

◆ See Task 1801 for JOI/TAMRF contract percentage effort. All personnel employed by TAMRF.

January 9, 2003

Task Summary 1801: Headquarters/Administrative Services, Subtask: Headquarters

POSITION	DESCRIPTION
Headquarters	
Director (0.50):	Responsible for overseeing all ODP/TAMU functional management operations. (Minimum 50% effort devoted to project.)
Deputy Director (0.70):	(Minimum 70% effort devoted to project.) Assists in overseeing all science operator functional management operations
Administrative Assistant (1.00):	Manages the administrative office functions and provides administrative support to the Director and Deputy Director. Responds to requests for PR materials and responsible for Building Proctor duties and Zone Administrator duties.
Administration*	
Vice President, TAMRF (0.90):	Supervises all business and contract-related functions.
Office Manager (1.00):	Oversees, delegates, and coordinates administrative activities including Standard Operating Procedures, Delegation of Authority, and Program Plan coordination.
Staff Assistant (1.00):	Coordinates various projects, monitors expenditures, maintains databases, and provides administrative support in the areas of office management and program services.
Supervisor of Travel/ Conferences (0.50):	Manages overall operation of travel/conferences branch; oversees negotiations with travel vendors; prepares various travel-related reports, cost analyses, and budget planning data; manages corporate card program; and updates travel policies as required; monitors relocation policy.
Travel Services Specialist (0.40):	Processes travel requests, makes travel arrangements via in-house computerized reservations system adhering to policies and budget constraints. Negotiates with hotels and airlines for group discounts. Processes passport and visa applications; provides travelers with travel advisories when applicable.
Travel Disbursement Specialist (0.50):	Reviews and processes expense accounts for contract/policy compliance; processes travel advances and encumbrances.
Conference Coordinator (0.80):	Issues pre-meeting information to participants for meetings held in the U.S. and foreign cities, coordinates meeting arrangements with JOI for JOIDES groups meeting at ODP; arranges all aspects of meetings held at ODP, adhering to policies and budget constraints; negotiates with hotels/caterers; and serves as backup to the Travel Disbursement Specialist.
Supervisor of Human Resources/ Insurance Services (1.00):	Directs and/or provides liaison with TAMU human resources and insurance activities, including maintaining a drilling-peculiar risk insurance program. Responsible for developing and administering policies/procedures to ensure appropriate personnel/insurance actions and adherence to applicable state/federal laws and regulations.
Human Resources Associate (1.00):	Performs administrative duties in support of human resources/insurance activities. Oversees personnel records and employee benefits.
Human Resources Technician (1.00):	Provides administrative support to Human Resources/Insurance Services, including the areas of physical examinations and employment.

POSITION	DESCRIPTION
Assistant Vice President, TAMRF (1.00):	Responsible for program contract and purchasing/property activities.
Supervisor of Property and Databases (1.00):	Responsible for the daily administration of the property management and oversight activities. Responsible for the supervision of the Office Assistant. Responsible for independent procurement and contract assignments on an as-needed basis and assisting other administrative departments in the management, maintenance and troubleshooting of their internal databases.
Office Assistant (0.50):	Assists Purchasing and Property with data entry into databases. Liquidates invoices. Performs administrative duties in support of the department, including mail distribution and filing.
Procurement Supervisor (1.00):	Responsible for the daily administration of the procurement activities. Responsible for the supervision of two Senior Procurement Specialists. Responsible for independent complex procurement and contract assignments and performs routine property management activities.
Senior Procurement Specialist (1.00):	Provides advanced skills in performing varied and difficult purchasing duties in support of an international research program. Responsible for securing materials and services, both domestic and internationally, for the Ocean Drilling Program in accordance with the ODP/TAMRF procurement policies and resolving procurement problems of a non-routine nature.
Procurement Specialist I (1.00):	Responsible for securing materials and services, both domestic and internationally, for the Ocean Drilling Program in accordance with the ODP/TAMRF procurement policies.
Assistant Vice President, TAMRF (0.90):	Oversees budget preparation and forecasting, payment of invoices, weekly cash requests, payroll activities, and submission of all fiscal reports.
Supervisor of Payroll (1.00):	Responsible for the preparation and maintenance of all payroll records and forecasting of future payroll budgets.
Payroll Associate (1.00):	Assists Payroll Supervisor with preparation of payroll records and forecasts.
Payroll Assistant (0.50):	Provides administrative support to Payroll by maintaining the payroll databases including the salary history; audits time cards/time sheets for the hours worked, and maintains leave records for each employee.
Supervisor of Budget Planning/Analysis (0.85):	Assists departments in preparation of budgets, monitors budgetary compliance, and prepares fiscal activity reports.
Budget Analyst (1.30):	Provides general support to the Budget Planning/Analysis Supervisor, including budget preparation and forecasting. Responsible for verifying accuracy of system budget and expense distribution information and making modifications as required.
Supervisor of Accounts Payable/Accounts Receivable (AP/AR) (0.95):	Responsible for the payment of invoices and fulfilling related contractual financial requirements.
Assistant Supervisor of AP/AR (0.95):	Assists the AP/AR Supervisor in performing Accounts Payable/Accounts Receivable activities.
Payables Specialist (1.90):	Processes invoices and statements from vendors
Total Personnel:	2.20 (Headquarters FTE personnel) 22.95 (Administration FTE personnel) 25.15 FTE Personnel

* Administration personnel are entirely employees of TAMRF.

ACCOMPLISHMENTS

Contracts/Purchasing/Property

- Reorganized purchasing/contracts/property staff to redistribute efforts and responsibilities, which has enabled us to provide better quality services to the program.
- Finalized the disposal of 1,100 items.
- Enhanced the Human Resources database to fulfill TAMU mandated position description form changes.
- Completed internal audit of 80% of procurements.
- Reached agreement with Overseas Drilling Limited regarding permanently mounted vs. non-permanently mounted equipment as it affects demobilization activities.

Fiscal

- Documentation of hiring Foreign Nationals (I-80) was reappropriated by International Services Department to the department level.
- Certification and verification of registration through Student Information Management Systems (SIMS) for graduate assistants.
- Implemented electronic hiring approval process TAMRF.
- Completed internal audit of vouchers to verify accuracy and accountability.
- Assisted all departments by providing current fiscal information pertinent to phaseout.
- Organized and put files in order to fulfill the requirements for a successful final report.

Human Resources

- Received and processed over 824 applications for various vacant positions, prepared and placed over 28 advertisements for vacant positions, and prepared and mailed rejection letters to all concerned applicants.
- Processed over 200 physical examinations for seagoing personnel.
- Held multiple new hire orientation and termination interviews for incoming and outgoing employees, respectively.
- Coordinated the annual health and dental insurance enrollment for all ODP/TAMU and ODP/TAMRF employees.
- Created and revised various ODP/TAMU and ODP/TAMRF policies, including the Physical Exam Policy and Temporary Employment Extension (TEE) Policy.
- Training programs offered during this period included Retirement Planning and Employment Procedures.
- Reviewed and reevaluated various online recruiting options and other recruiting resources available to assist in filling vacant positions during program phaseout.

- Reviewed and evaluated various outplacement service options and selected an outplacement organization to use during program phaseout.
- Revised and updated Human Resources Standard Operating Procedures to include procedures relevant to phaseout.
- Worked with TAMU HR to review and identify tasks required for a smooth and successful closeout of the program in relation to Human Resources. Implemented tasks in accordance with established timeline for the most efficient phaseout.
- Reviewed and reevaluated the professional education requirements for each department during phaseout and assisted the Program and individual departments in obtaining necessary training.
- Revised the Hiring and Termination Guidelines for Supervisors handbook. This guide provides an overview of policies and recommended procedures in the hiring and termination process. Every ODP/TAMU employee who has hiring and termination authority received a copy. On-site training was also provided to introduce the handbook.
- Assisted Science Services and Information Services to develop career ladders for seagoing personnel and obtained appropriate approval through TAMU.
- Cross-trained Human Resources staff on essential branch functions to increase productivity of the Branch.

Travel/Conferences

- Completed updates to the ODP travel policy.
- Substantial cost savings to the Program as a result of an experienced staff that is successful in negotiating with airlines, hotels, and car rental agencies for improved rates and services.
- Provided easier access for travelers to meeting and travel information via the ODP web site.

GOALS

Contracts/Purchasing/Property

- Resolve all outstanding contractual and fiscal issues, if any, with the drillship subcontractor prior to September 2004.
- Continue to provide quality procurement services to the Program staff to assist them in accomplishing their goals and objectives.
- Perform a 100% inventory of all remaining shipboard and shore-based equipment and update all property records accordingly for storage or disposal.
- Organize audit records for easy accessibility for a final closeout audit.

Fiscal

- Provide information on the constantly changing Immigration laws and regulations.
- Implement global Direct Deposit and Hiring Documents.
- Continue vouchers' audit in preparation for final audit.
- Provide assistance to auditors.

- Continue to keep organization in all Budget files to easily obtain information.
- Assist all departments as requested in phaseout activities.

Human Resources

- Develop specialized policies and procedures as closing of the program dictates.
- Have 100% on-time return of performance appraisal and position descriptions during the annual performance review period.
- Review and evaluate the Human Resources link to ODP/TAMU's main Web page, which provides information to employees on policies, insurance, retirement, and training, and includes forms that can be completed online.
- Implement mechanisms to increase employee awareness on retirement, insurance, and employee assistance programs.
- Provide outplacement services to outgoing staff during closeout.
- Provide assistance to the remaining Program staff in identification of qualified temporary employees to replace departing staff during phaseout activities.
- Review and evaluate the changing role of the Human Resources Branch for FY04 in regards to the smooth and efficient closeout of the Ocean Drilling Program.
- Work with ODP/TAMU department managers to reclassify positions as the needs of the program change during closeout.

Travel/Conferences

- Provide full range of travel and conference services to the remaining Program staff.

418011-01 ADMINISTRATIVE SERVICES/HEADQUARTERS

Exp. Cat.	Description	FY03 Program Plan Budget	FY04 Program Plan Budget
2000	Payroll	$ 1,430,672	$ 1,563,001
3500	Travel	62,434	27,000
3580	Travel - Port Calls	12,672	4,475
3600	Training	3,765	-
3720	Business Conferences	600	2,000
4000	Supplies	21,000	18,100
4765	Software	500	-
5070	Insurance	5,700	6,700
5261	Shipping	5,700	7,500
5370	Telecommunications	27,000	32,900
5373	Ship-to-Shore Communications	500	-
5550	Services	13,852	55,700
5569	Other Computing Services	1,100	-
5590	TAMU Computing Services	17,000	17,000
5931	Equipment Rental	1,000	1,000
5987	Recruiting	1,000	-
6820	Maintenance & Repair	6,260	6,000
8510	Library	1,833	2,000
9683	Administrative Costs	240,000	240,000
	TOTAL	**$ 1,852,588**	**$ 1,983,376**

For FY04 cost center 1801-01 includes funds previously allocated to Public Information, 1801-02. That cost center has been eliminated and the functions absorbed by Headquarters. The most significant risks associated with this submission involve the uncertainty surrounding workforce stability and unknown nature of how phaseout will be addressed (i.e., contract extension, new contract, etc.). The uncertainty regarding whether or not TAMU and TAMRF will be the successful bidder for the Integrated Ocean Drilling Program (IODP) makes it difficult to predict the cost in salary and fringe for employees or whether or not temporary employees will be required. In the latter situation, Services funds are expended instead of payroll funds. For the purposes of this submission we assume no turnover of employees in FY04.

***Payroll*—**Funds in this expense category support 25.15 full-time equivalents (FTEs) and six student workers in Headquarters and Administration at the beginning of the fiscal year. During the course of FY04, employees will terminate from their employment as their job function is no longer required. At the end of FY04, 23 FTEs and six student workers will remain. Departing employees will receive a 60-day temporary employment extension (TEE) in connection with termination of the Program. The payroll total breaks down into $1.2 million in regular pay, $.32 million in fringe, $.036 million for TEE and $.021 million for vacation buyout from terminating employees.

***Travel*—**Includes funds for seven, two-day trips to JOI for Headquarters and Administrative personnel; seven days for Headquarters personnel to visit demobilization activities; and miscellaneous travel. Activities are being planned to celebrate the scientific contributions of ODP at the fall meeting of the AGU. The Director and Deputy Director will participate in this activity.

Travel-Port Call—Involves seven days for five Administrative personnel to complete demobilization activities.

Business Conferences—This category funds Program-wide meetings/conferences in, or in close proximity to, College Station and represents a 230% increase, resulting from a perceived need to hold more conferences relating to phaseout.

Supplies—Included in this category is the cost of conference supplies, copy paper, computer supplies of less than $1,000, miscellaneous supplies (e.g., toner, pens, paper, folders, tape, labels, tablets, pencils, etc.) and phone books. Even though there are additional funds requested for demobilization activities, the amount requested is below the three-year average. (Note: This cost center provides supplies for Program-wide activities, not just Headquarters and Administration.)

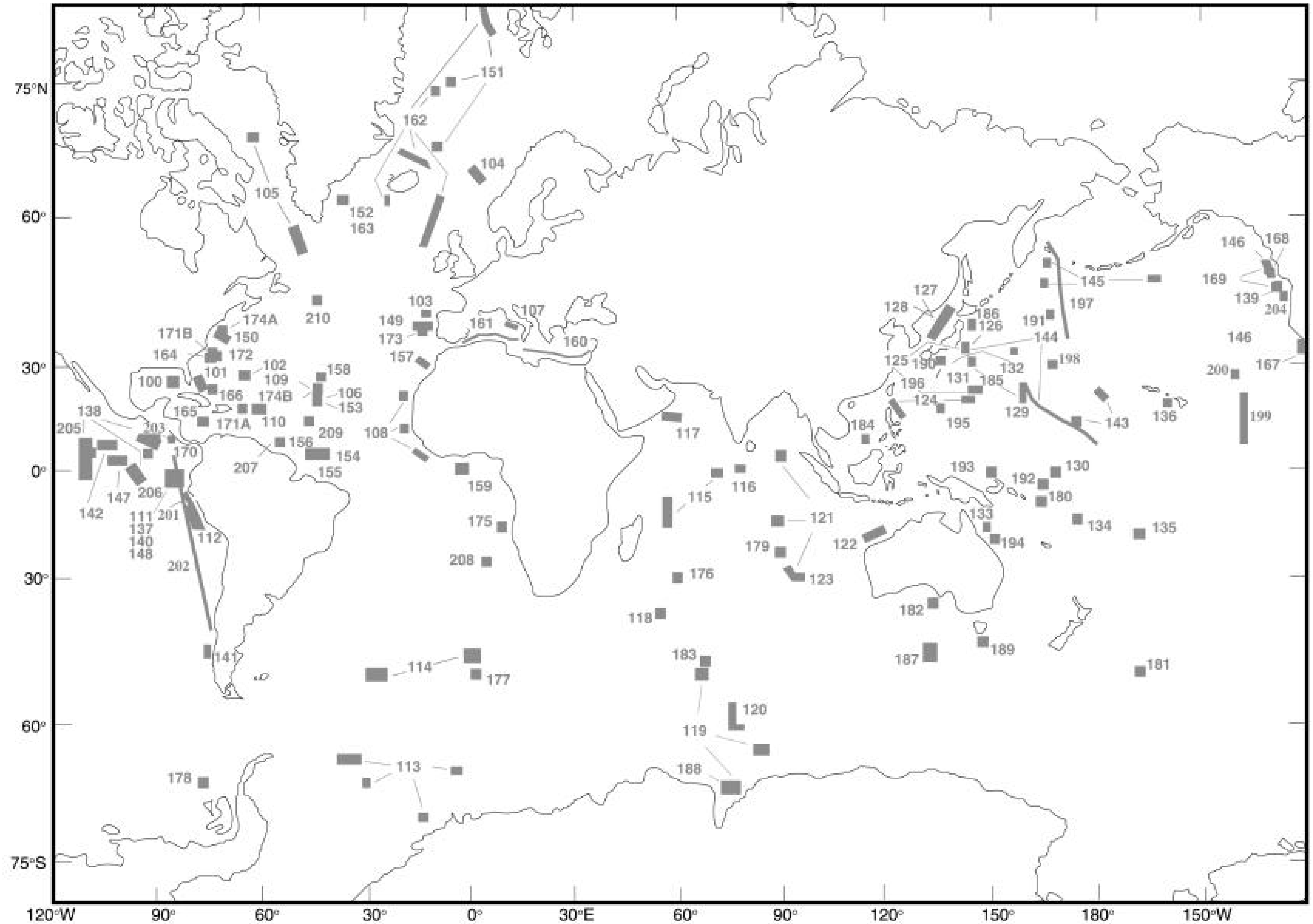
Insurance—The request reflects the Program's portion of Directors and Officers corporate insurance and is an increase based on the percentage of officers at ODP/TAMRF (3) when compared to the total TAMRF officer total.

Telecommunications—Standard long distance and line charges, sending and receiving fax transmissions for Headquarters and Administration, cellular phones and palm pilots for Headquarters are included in this category. The request is greater than FY03 based on an anticipated increase associated with Phaseout requirements.

Services—These funds provide for miscellaneous services (e.g., business cards, letterhead printing, physical plant maintenance, etc.), printing of the annual Program Plan, temporary labor, storage space, CompuServ accounts, library binding, required services at demobilization and outplacement services for terminating employees throughout the Program, not just Headquarters and Administration.

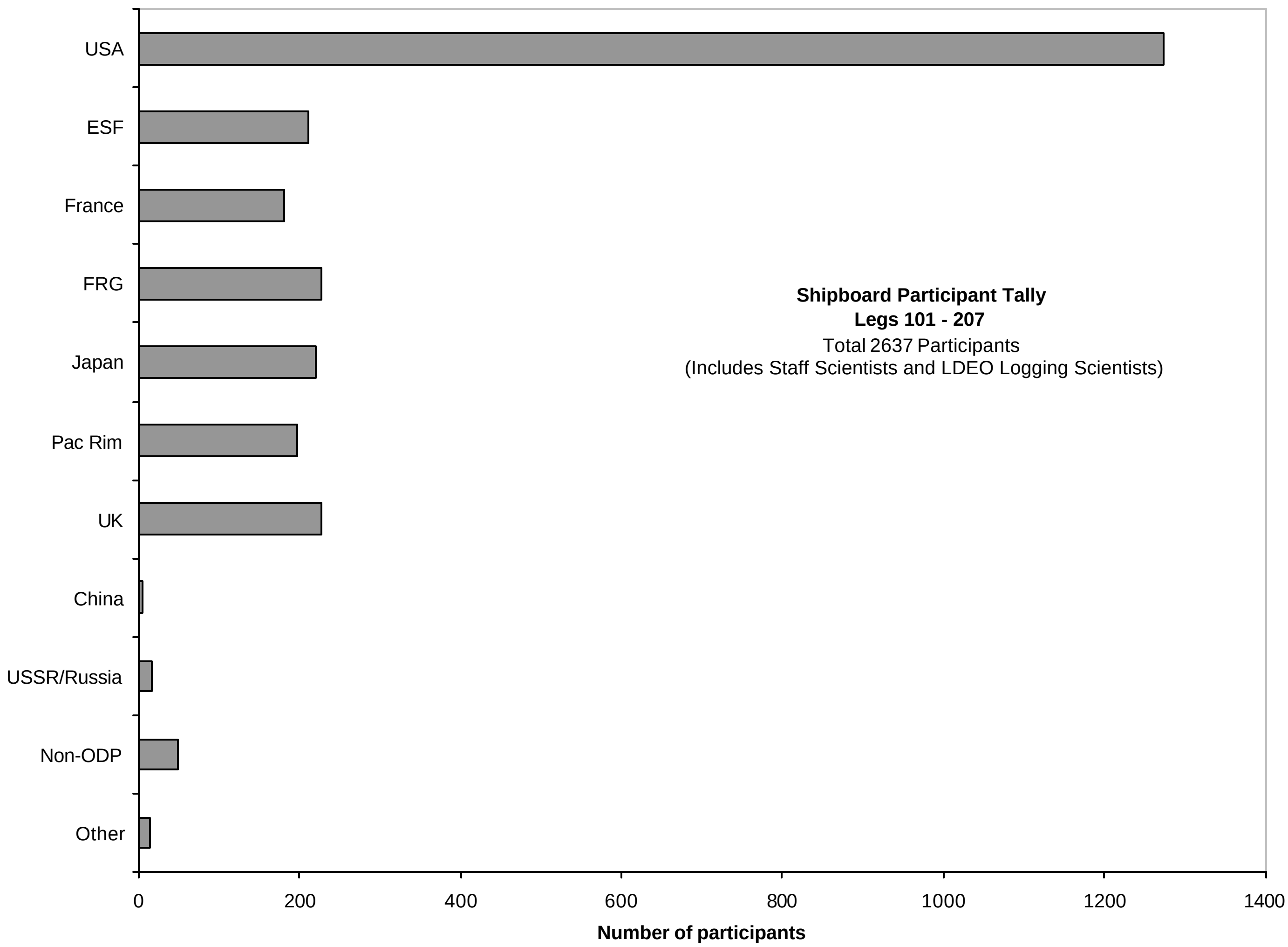
Equipment Rental—This category provides for requirements at the demobilization port.

Maintenance & Repair—Funds for service agreements on business machines (copiers, fax machines, calculators, typewriters, etc.) and parts replacement are contained in this category.



A location map of ODP Drilling Sites

SHIPBOARD PARTICIPANT TALLY – LEGS 101-207



SUMMARY OF OCEAN DRILLING PROGRAM LEGS AND SITES COMPLETED TO DATE

LEG	CRUISE DATES	SITE	AREA OF OPERATION	STAFF SCIENTIST	CO-CHIEF SCIENTISTS
100	JAN 11-29,1985	625	Gulf of Mexico	Robert B. Kidd	Philip D. Rabinowitz Louis E. Garrison
101	JAN 29-MAR 14, 1985	626-636	N. Atlantic Ocean	Amanda A. Palmer	James A. Austin Wolfgang Schlager
102	MAR 14-APR 11, 1985	418	N. Atlantic Ocean	Christian A. Auroux	Matthew H. Salisbury James H. Scott
Transit	APR 11-APR 25, 1985	FROM VIRGINIA TO AZORES ISLAND			
103	APR 25-JUN 19, 1985	637-641	N. Atlantic Ocean	Audrey W. Meyer	Gilbert Boillot Edward L. Winterer
104	JUN 19-AUG 23, 1985	642-644	Norwegian Sea	Elliott Taylor	Olav Eldholm Jorn Thiede
105	AUG 23-OCT 27, 1985	645, 646-647	Baffin Bay, Labrador Sea	Bradford M. Clement	Michael A. Arthur Surat Srivastava
106	OCT 27-DEC 26, 1985	648-649	N. Atlantic Ocean	Andrew C. Adamson	Jose Honnorez Robert S. Detrick, Jr.
107	DEC 26,1985-FEB-18,1986	650-656	Tyrrhenian Sea	Christian A. Auroux	Kim A. Kastens Jean Mascle
108	FEB 18-APR 17, 1986	657-661, 662-663, 664-668	N. and S. Atlantic Ocean	Jack G. Baldauf	William Ruddiman Michael Sarnthein
109	APR 17-JUN 19, 1986	395, 648, 669-670	N. Atlantic Ocean	Andrew C. Adamson	Wilfred B. Bryan Thierry Juteau
110	JUN 19-AUG 16, 1986	671-676	N. Atlantic Ocean	Elliott Taylor	Casey Moore Alain Mascle
111	AUG 16-OCT 20, 1986	504, 677-678	N. Pacific Ocean	Russell B. Merrill	Keir Becker Hitoshi Sakai
112	OCT 20-DEC 25, 1986	679-688	S. Pacific Ocean	Kay C. Emeis	Roland Von Huene Erwin Suess
113	DEC 25,1986-MAR 11, 1987	689-697	Weddell Sea	Suzanne B. O'Connell	James P. Kennett Peter F. Barker
114	MAR 11-MAY13, 1987	698-704	S. Atlantic Ocean	Bradford M. Clement	Paul F. Ciesielski Yngve Kristoffersen
115	MAY 13-JUL 02, 1987	705-712, 713-716	S. and N. Indian Ocean	Andrew H. Mcdonald	Jan Backman Robert A. Duncan
116	JUL 02-AUG 19, 1987	717-719	S. Indian Ocean	Christian A. Auroux	James Cochran Dorrik A. Stow
117	AUG 19-OCT 18, 1987	720-731	Arabian Sea	Kay C. Emeis	Warren L. Prell Nobuaki Niitsuma
118	OCT 18-DEC 14, 1987	732-735	S. Indian Ocean	Andrew C. Adamson	Paul T. Robinson Richard P. Von Herzen
119	DEC 14,1987-FEB 21, 1988	736-746	S. Antarctic Ocean	Jack G. Baldauf	John A. Barron Birger Larsen
120	FEB 21-APR 30,1988	747-751	S. Indian Ocean	Amanda A. Palmer	Roland Schlich Sherwood W. Wise, Jr.
121	APR 30-JUN 28, 1988	752-757, 758	S. and N. Indian Ocean	Elliott Taylor	Jeffrey K. Weissel John W. Peirce
122	JUN 28-AUG 28, 1988	759-764	S. Indian Ocean	Suzanne B. O'Connell	Ulrich Von Rad Bilal U. Haq
123	AUG 28-NOV 01, 1988	765-766	S. Indian Ocean	Andrew C. Adamson	Felix Gradstein John Ludden
124	NOV 01,1988-JAN 04, 1989	767-771	N. Pacific Ocean	Marta Von Breymann	Eli Silver Claude Rangin
124E	JAN 04-FEB 16, 1989	772-775, 776-777	Philippine Sea and N. Pacific Ocean	William Rose	None

LEG	CRUISE DATES	SITE	AREA OF OPERATION	STAFF SCIENTIST	CO-CHIEF SCIENTISTS
125	FEB 16-APR 18, 1989	778-786	N. Pacific Ocean	Laura Stokking	Patricia Fryer Julian Pearce
126	APRIL 18-JUN 19, 1989	787-793	N. Pacific Ocean	Thomas Janecek	Kantaro Fujioka Brian Taylor
127	JUN 19-AUG 21, 1989	794-797	Japan Sea	James Allan	Kenneth Pisciotto Kensaku Tamaki
128	AUG 21-NOV 20, 1989	794, 798-799	Japan Sea	Marta Von Breymann	Kiyoshi Suyehiro James C. Ingle, Jr.
NOTE: LEG 128 INCLUDES DRY DOCK and TRANSITS					
129	NOV 20,1989-JAN 19, 1990	800-802	N. Pacific Ocean	Andrew Fisher	Roger Larson Yves P. Lancelot
130	JAN 19-MAR 27, 1990	803-807	N. Pacific Ocean	Thomas Janecek	Wolfgang Berger Loren Kroenke
131	MAR 27-JUN 02, 1990	808	N. Pacific Ocean	John Firth	Asahiko Taira Ian Hill
132	JUN 02-AUG 04, 1990	808-810	N. Pacific Ocean	Frank Rack	James H. Natland
133	AUG 04-OCT 11, 1990	811-826	S. Pacific Ocean	Amanda P. Julson	Peter J. Davies Judith A. Mckenzie
134	OCT 11-DEC 17, 1990	827-833	S. Pacific Ocean	Laura Stokking	Jean-Yves Collot Gary Greene
135	DEC 17,1990-FEB 28, 1991	834-841	S. Pacific Ocean	James Allan	James Hawkins Lindsay Parson
136	FEB 28-MAR 20, 1991	842-843	N. Pacific Ocean	John Firth	Adam Dziewonski Roy Wilkens
137	MAR 20-MAY 01, 1991	504	N. Pacific Ocean	Anne Graham	Keir Becker Glen Foss
138	MAY 01-JUL 04, 1991	844-854	N. and S. Pacific Ocean	Thomas Janecek	Nick Pisias Larry Mayer
139	JUL 04-SEP 11, 1991	855-858	N. Pacific Ocean	Andrew Fisher	Earl Davis Mike Mottl
140	SEP 11-NOV 12, 1991	504	N. Pacific Ocean	Laura Stokking	Henry Dick Jorg Erzinger
141	NOV 12,1991-JAN 12, 1992	859-863	S. Pacific Ocean	Robert Musgrave	Jan Behrmann Stephen Lewis
142	JAN 12-MAR 18, 1992	864	N. Pacific Ocean	James Allan	Rodey Batiza
143	MAR 18-MAY 19, 1992	670, 865-870	N. Pacific Ocean	John Firth	Edward Winterer William Sager
144	MAY 19-JUL 20, 1992	800-801, 871-880	N. Pacific Ocean	Frank Rack	Janet Haggerty Isabella Premoli-Silva
145	JUL 20-SEP 20, 1992	881-887	N. Pacific Ocean	Thomas Janecek	David Rea Ivan Basov
146	SEP 20-NOV 22, 1992	888-893	N. Pacific Ocean	Robert Musgrave	Bobb Carson Graham Westbrook
147	NOV 22,1992-JAN 21, 1993	894-895, 896	N. Pacific Ocean	James Allan	Kathryn Gillis Catherine Mevel
148	JAN 21-MAR 10, 1993	504	N. Pacific Ocean	Laura Stokking	Hajimu Kinoshita Jeffery Alt
Transit	MAR 10-MAR 28, 1993 PANAMA TO AZORES				
149	MAR 28-MAY 25, 1993	897-901	N. Atlantic Ocean	Adam Klaus	Dale Sawyer Robert Whitmarsh
150	MAY 25-JUL 24, 1993	902-906	N. Atlantic Ocean	Peter Blum	Gregory Mountain Kenneth Miller
151	JUL 24-SEP 24, 1993	907-909, 910-911, 912-913	Nordic Seas and Arctic Ocean	John Firth	Annik Myhre Jorn Thiede
152	SEP 24-NOV 22, 1993	914-919	N. Atlantic Ocean	Peter Clift	Hans Christian Larsen Andrew Saunders
153	NOV 22,1993-JAN 24, 1994	920-924	N. Atlantic Ocean	D. Jay Miller	Jeffrey Karson Mathilde Cannat

LEG	CRUISE DATES	SITE	AREA OF OPERATION	STAFF SCIENTIST	CO-CHIEF SCIENTISTS
154	JAN 24-MAR 25, 1994	925-929	N. Atlantic Ocean	Carl Richter	William Curry Nicholas Shackleton
155	MAR 25-MAY 24, 1994	930-946	N. Atlantic Ocean	Adam Klaus	Roger Flood David Piper
156	MAY 24-JUL 24, 1994	947-949	N. Atlantic Ocean	Peter Blum	Thomas Shipley Yujiro Ogawa
157	JUL 24-SEP 23, 1994	950-954, 956	N. Atlantic Ocean	John Firth	Hans-Ulrich Schmincke Philip Weaver
158	SEP 23-NOV 22, 1994	957	N. Atlantic Ocean	D. Jay Miller	Susan Humphris Peter Herzig
Drydock: NOV 22-DEC 23, 1994					
Transit	DEC 23,1994-JAN 03, 1995	958	N. Atlantic Ocean	-	-
159	JAN 03-MAR 02, 1995	959-962	N. Atlantic Ocean	Peter Clift	Jean Mascle G. Pat Lohmann
160	MAR 02-MAY 03, 1995	963-973	Mediterranean Sea	Carl Richter	Kay-Christian Emeis Alastair Robertson
161	MAY 03-JUL 02, 1995	974-979	Mediterranean Sea	Adam Klaus	Maria Comas Rainer Zahn
162	JUL 02-SEPT 03, 1995	980-984, 985-986, 987, 907	N. Atlantic Ocean, Norwegian Sea, Greenland Sea	Peter Blum	Eystein Jansen Maureen Raymo
163	SEPT 03-OCT 07, 1995	988-990	N. Atlantic Ocean	James Allan	Hans-Christian Larsen Robert Duncan
Dock	OCT 07-OCT 31, 1995 LEG 163 ENDED PREMATURELY TO MAKE REPAIRS FROM STORM DAMAGE				
164	OCT 31-DEC 19, 1995	991-997	N. Atlantic Ocean	Paul Wallace	Ryo Matsumoto Charles Paull
165	DEC 19,1995-FEB 17, 1996	998-1002	Caribbean Sea	Gary Acton	Mark Leckie Haraldur Sigurdsson
166	FEB 17-APR 10, 1996	1003-1009	N. Atlantic Ocean	Mitchell Malone	Gregor Eberli Peter Swart
Transit: APR 10-APR 19, 1996 PANAMA CANAL TO ACAPULCO					
167	APR 19-JUN 16, 1996	1010-1022	N. Pacific Ocean	Carl Richter	Itaru Koizumi Mitchell Lyle
168	JUN 16-AUG 15, 1996	1023-1032	N. Pacific Ocean	John Firth	Earl Davis Andrew Fisher
169S	AUG 15-AUG 21, 1996	1033-1034	Saanich Inlet	John Firth	Brian Bornhold
169	AUG 21-OCT 15, 1996	858G, 856H, 857D, 1035-1038	N. Pacific Ocean	D. Jay Miller	Yves Fouquet Robert Zierenberg
170	OCT 15-DEC 17, 1996	1039-1043	N. Pacific Ocean	Peter Blum	Gaku Kimura Eli Silver
Transit	DEC 17-DEC 21, 1996 PANAMA CANAL				
171A	DEC 21,1996-JAN 08, 1997	1044-1048	N. Atlantic Ocean	Adam Klaus	Casey Moore
171B	JAN 08-FEB 14, 1997	1049-1053	N. Atlantic Ocean	Adam Klaus	Dick Kroon Richard Norris
172	FEB 14-APR 15, 1997	1054-1064	N. Atlantic Ocean	Gary Acton	Lloyd Keigwin Domenico Rio
173	APR 15-JUN 15, 1997	1065-1070	N. Atlantic Ocean	Paul Wallace	Marie-Odile Beslier Robert B. Whitmarsh
174A	JUN 15-JUL 19, 1997	1071-1073	N. Atlantic Ocean	Mitchell Malone	James Austin Nicholas Christie-Blick
174B	JUL 19-AUG 09, 1997	395A 1074	N. Atlantic Ocean	Mitchell Malone	Keir Becker
175	AUG 09-OCT 08, 1997	1075-1087	S. Atlantic Ocean	Carl Richter	Wolfgang Berger Gerold Wefer
176	OCT 08-DEC 09, 1997	735B	Indian Ocean	D. Jay Miller	Henry Dick James Natland

LEG	CRUISE DATES	SITE	AREA OF OPERATION	STAFF SCIENTIST	CO-CHIEF SCIENTISTS
177	DEC 09, 1997-FEB 05, 1998	1088-1094	Southern Ocean	Peter Blum	Rainer Gersonde David A. Hodell
178	FEB 05-APR 09, 1998	1095-1103	Southern Ocean	Gary Acton	Peter Barker Angelo Camerlenghi
179	APR 09-JUN 07, 1998	1104-1107	Indian Ocean	D. Jay Miller	John F. Casey
180	JUN 07-AUG 11, 1998	1108-1118	S. Pacific Ocean	Adam Klaus	Phillippe Huchon Brian Taylor
181	AUG 11-OCT 08, 1998	1119-1125	S. Pacific Ocean	Carl Richter	Robert Carter I. N. McCave
182	OCT 08-DEC 08, 1998	1126-1134	S. Pacific Ocean	Mitchell Malone	David Feary Albert C. Hine
183	DEC 08, 1998-FEB 11, 1999	1135-1142	S. Indian Ocean	Paul Wallace	Millard Coffin Frederick Frey
184	FEB 11, 1999-APR 12, 1999	1143-1148	S. China Sea	Peter Blum	Pinxian Wang Warren Prell
185	APR 12, 1999-JUN 14, 1999	801C & 1149	Pacific Ocean	Carlota Escutia	Terry Plank John Ludden
186	JUN 14, 1999-AUG 14, 1999	1150-1151	Pacific Ocean	Gary D. Acton	Kiyoshi Suyehiro Selwyn Sacks
Transit: AUG 14,1999-SEP 01, 1999 YOKOHAMA TO SINGAPORE					
Drydock SEP 01, 1999-OCT 27, 1999					
Transit OCT 27, 1999-NOV 16, 1999 SINGAPORE TO FREEMANTLE					
187	NOV 16, 1999-JAN 10,2000	1152-1164	Pacific/Indian Oceans	D. Jay Miller	David M. Christie Rolf-Birger Pederson
188	JAN 10, 2000 -MAR 11, 2000	1165-1167	Southern Ocean	Carl Richter	Alan K Cooper Phillip E O'Brien
189	MAR 11, 2000-MAY 11, 2000	1168-1172	Pacific Ocean	Mitchell Malone	Neville F Exon James P Kennett
190	MAY 11,2000-JULY 17, 2000	1173-1178	Pacific Ocean	Adam Klaus	Gregory F Moore Asahiko Taira
191	JULY 17, 2000-SEPT 10, 2000	1179-1182	Pacific Ocean	Carlota Escutia	Toshihiko Kanazawa William Sager
192	SEPT 10, 2000-NOV 7, 2000	1183-1187	Pacific Ocean	Paul Wallace	J. Godfrey Fitton John J. Mahoney
193	NOV 7, 2000-JAN 3, 2001	1188-1191	Pacific Ocean	D. Jay Miller	Fernando Barriga Ray Binns
194	JAN 3, 2001-MAR 2, 2001	1192-1199	Coral Sea	Peter Blum	Flavio Anselmetti Alexandra Isern
195	MAR 2, 2001-MAY 2, 2001	1200-1202	Philippine Sea & E. China Sea	Carl Richter	Matthew Salisbury Masano Shinohara
196	MAY 2, 2001-JUL 1, 2001	808 & 1173	Pacific Ocean	Adam Klaus	Keir Becker Histoshi Mikada J. Casey Moore
197	JUL 1, 2001-AUG 27, 2001	1203-1206	Pacific Ocean	David Scholl	Robert Duncan John A. Tarduno
198	AUG 27, 2001-OCT 23, 2001	1207-1214	Pacific Ocean	Mitchel Malone	Timothy Bralower Isabella Premoli-Silva
199	OCT 23, 2001-DEC 16, 2001	1215-1222	Pacific Ocean	Thomas Janecek	Mitchell Lyle Paul Wilson
200	DEC 16, 2001-JAN 27, 2002	1223-1224	Pacific Ocean	Gary D. Acton	Junzo Kasahara Ralph Stephen
201	JAN 27, 2002-MAR 29, 2002	1225-1231	Pacific Ocean	D. Jay Miller	Steven D'Hondt Bo Jorgensen
202	MAR 29, 2002-MAY 30, 2002	1232-1242	Pacific Ocean	Peter Blum	Alan Mix Ralf Tiedemann
203	MAY 30,2002-JUL 7, 2002	12431	Pacific Ocean	Thomas Davies	John Orcutt Adam Schultz

LEG	CRUISE DATES	SITE	AREA OF OPERATION	STAFF SCIENTIST	CO-CHIEF SCIENTISTS
204	JUL 7, 2002-SEP 2, 2002	1244-1252	Pacific Ocean	Frank Rack	Gerhard Bohrmann
					Annie Trehu
205	SEP 2, 2002-NOV 6, 2002	1253-1255	Pacific Ocean	Adam Klaus	Julie Morris
					Heinrich Villinger

ODP OPERATIONS SUMMARY: 1985–2003

Leg No.	Operation Area	No. of Sites	No. of Holes	Meters Cored	Meters Recovered	Recovery	Deepest Penetration (Meters)	Maximum Water Depth (Meters)	Number of Reentries
100	Gulf of Mexico	1	3	325	281	87%	235	900	1
101	Bahamas	11	19	2977	1429	48%	535	3581	0
102	Western Atlantic	1	1	0	0	0%	0	5505	2
103	Galicia Bank	5	14	1460	594	41%	547	5321	0
104	Norwegian Sea	3	8	2419	1695	70%	1229	2780	11
105	Labrador Sea/Baffin	3	11	2960	1884	64%	1147	3870	3
106	Mid-Atlantic Ridge	2	12	92	12	13%	33	3529	18
107	Tyrrhenian Sea	7	11	3297	1908	58%	721	3606	0
108	Northwest Africa	12	27	4244	3843	91%	381	4750	0
109	Mid-Atlantic Ridge	4	5	102	12	12%	93	4494	27
110	Lesser Antilles	6	10	2404	1898	79%	691	5018	0
111	Panama Basin	3	5	641	428	67%	1562	3474	21
112	Peru Margin	10	27	4710	2666	57%	779	5093	0
113	Weddell Sea	9	22	3361	1944	58%	646	4665	0
114	South Atlantic	7	12	3602	2297	64%	672	4637	0
115	Mascarene Plateau	12	22	3955	3075	78%	353	4440	0
116	Bengal Fan	3	10	2299	992	43%	961	4747	0
117	Oman Margin	12	25	5847	4367	75%	994	4045	0
118	SW Indian Ridge	4	20	780	447	57%	501	5219	15
119	Prydz Bay	11	22	3652	2102	58%	716	4093	2
120	S. Kerguelen	5	12	2140	1082	51%	935	2041	2
121	Broken Ridge	7	17	2722	1824	67%	677	2937	3
122	Exmouth Plateau	6	15	3911	2446	63%	1037	2710	3
123	Argo Abyssal Plain	2	5	1793	1080	60%	1195	5758	1
124	SE Asia Basins	5	13	3115	2122	68%	1271	4916	1
124E	Luzon Strait	6	15	264	156	59%	532	5811	0
125	Bon/Mar	9	15	2917	1019	35%	829	4912	1
126	Bon/Mar II	7	19	4737	2128	45%	1682	3269	3
127	Japan Sea I	4	10	2917	1655	57%	903	3311	2
128	Japan Sea II	3	9	2044	1548	76%	1083	2820	0
129	Old Pacific Crust	3	5	1708	469	27%	594	5980	4
130	Ontong Java Plateau	5	16	5889	4822	82%	1528	3873	5
131	Nankai Trough	1	7	1463	736	50%	1327	4696	6
132	West/Central Pacific	3	11	205	165	80%	325	4682	28
133	N/E Australia	16	36	7973	5505	69%	1011	1650	0
134	Vanuatu	7	16	4831	2044	42%	1107	3101	0
135	Lau Basin	8	18	3356	1249	37%	834	4814	3
136	OSN-1	2	6	129	66	51%	764	4441	5
137	Hole 504B	1	1	49	9	18%	1622	3475	16
138	Eastern Pacific	11	42	5542	5537	100%	394	3873	0
139	Juan de Fuca Ridge	4	23	2656	933	35%	936	2457	13
140	Hole 504B	1	1	379	48	13%	2000	3474	21

Leg No.	Operation Area	No. of Sites	No. of Holes	Meters Cored	Meters Recovered	Recovery	Deepest Penetration (Meters)	Maximum Water Depth (Meters)	Number of Reentries
141	Chile Triple Junction	5	13	2515	1019	41%	743	2760	1
142	East Pacific Rise	1	3	2	0.5	25%	15	2583	35
143	Atolls and Guyots I	6	12	3995	1076	27%	1744	4838	3
144	Atolls and Guyots II	11	21	3205	1088	34%	910	5685	4
145	North Pacific Transect	7	25	5015	4322	86%	930	5726	1
146	Cascadia Margin	7	20	2266	1190	53%	600	2675	11
147	Hess Deep	2	13	487	123	25%	155	3874	21
148	Hole 504B	2	2	385	81	21%	2111	3474	18
149	Iberian Abyssal Plain	5	10	2687	1532	57%	838	5331	0
150	New Jersey Margin	5	11	4602	4035	88%	1150	2709	2
151	N. Atlantic/Arctic Ocean	7	18	4211	3005	71%	1062	3330	0
152	East Greenland Margin	6	13	2906	1257	43%	1310	2100	8
153	MAR/Kane F.Z.	5	15	798	261	33%	201	3343	1
154	Ceara Rise	5	19	6161	5808	94%	930	4369	1
155	Amazon Fan	17	36	5117	4053	79%	434	4148	0
156	North Barbados Ridge	3	8	469	267	57%	592	5024	23
157	VICAP-MAP	7	12	4091	3090	76%	1159	5449	0
158	TAG	1	17	436	55	13%	126	3657	0
Transit		1	2	143	142	100%	133	3789	0
159	Eq. Atlantic Transform	4	13	3167	1878	59%	1159	4657	2
160	Mediterranean I	11	48	4802	3362	70%	600	3942	0
161	Mediterranean II	6	16	4591	3875	84%	929	3470	2
162	N. Atlantic/Arctic II	9	30	7708	6731	87%	965	2799	0
163	SE Greenland	3	4	294	205	70%	325	542	5
164	Gas Hydrates	7	17	2786	1974	71%	751	2810	0
165	Caribbean Ocean History	5	13	4178	3359	80%	1066	3260	5
166	Bahamas	7	17	5255	2934	56%	1300	658	1
167	California Margin	13	52	7710	7502	97%	449	4215	0
168	Juan de Fuca	10	19	2071	1571	76%	595	2614	21
169	Sedimented Ridges	7	25	3267	1204	37%	546	3302	11
169S	Saanitch Inlet	2	9	642	657	103%	118	229	0
170	Costa Rica	5	17	2052	1464	71%	665	4353	1
171A	Barbados-LWD	5	5	0	0	0	832	5056	0
171B	Blake Nose	5	16	366	360	98%	685	2671	0
172	NW Atlantic Sediment	11	42	5689	5765	101%	418	5568	0
173	Iberia	6	6	1182	453	38%	959	5075	1
174A	New Jersey Shelf	3	12	1544	947	61%	664	639	5
174B	CORK Hole 395A	2	2	70	66	96%	70	4483	2
175	Benguela	13	40	8210	8003	98%	605	2996	0
176	Hole 735B	1	1	1003	866	86%	1003	721	31
177	S. Ocean Paleoceanography	7	31	4989	4046	81%	598	4624	0
178	Antarctic Pennisula	9	23	2924	1807	62%	608	3853	3
179	NERO/Hammer Drill	4	12	143	118	83	494	1648	5
180	Woodlark Basin	11	23	3912	1968	50%	927	3246	0
181	SW Pacific Gateways	7	21	4196	3625	86%	633	4492	0
182	Great Australian Bight	9	27	5754	3580	62%	617	3875	0

Leg No.	Operation Area	No. of Sites	No. of Holes	Meters Cored	Meters Recovered	Recovery	Deepest Penetration (Meters)	Maximum Water Depth (Meters)	Number of Reentries
183	Kerguelen	8	8	3154	1528	49%	843	2394	0
184	E. Asia Monsoon	6	17	5761	5463	95%	607	3309	
185	Izu-Mariana	2	6	1060	407	38%	445	5818	6
186	W, Pacific Seismic Net	2	8	2427	1742	72%	1182	2681	21
187	AAD	13	23	617	137	22%	407	5736	0
188	Prydz Bay	3	7	1852	971	52%	999	3568	2
189	Southern Gateways	5	16	5117	4539	89%	959	3568	0
190	Nankai	6	8	3896	2625	67%	1120	4791	1
191	W. Pacific ION/HRRS	4	18	509	363	71%	475	5566	4
192	Ontong Java	5	6	1764	898	51%	1211	3899	5
193	Manus Basin	4	13	736	79	11%	387	1703	19
194	Marion Plateau	8	16	4965	2055	41	675	420	4
195	Mariana/W. Philippine	3	15	1667	1308	79	600	5710	12
196	Nankai II	2	2	20	5	27	1058	4791	8
197	Hawaiian Hotspots	4	5	1481	753	51	955	2594	3
198	Shatsky Rise	8	16	3946	2914	74	623	3883	0
199	Paleogene Pacific	8	21	2465	2197	89	277	5396	0
200	H2O	2	7	289	100	35	175	4981	9
201	Peru Biosphere	7	33	3179	2839	89	422	5087	0
202	SE Paleoceanography	11	38	7080	7081	100	515	4079	0
203	Eq. Pacific ION	1	2	93	28	30	224	3871	6
204	Gas Hydrates	1	45	3675	3068	84	540	1039	0
205	Costa Rica	3	5	405	281	69	600	4376	19
TOTALS:		**652**	**1744**	**304,021**	**210,622.50**				

APPENDIX II - TASK SUMMARY

SCIENCE OPERATOR

SUMMARY BUDGET FOR FY04†

Headquarters/Administrative Services	$1.983
Publication Services	1.692
Drilling Services	2.139
Science Services	2.450
Information Services	1.732
Total	$9.996

ODP KEY PERSONNEL

Director:	Paul J. Fox
Deputy Director:	Jack Baldauf
Vice President/TAMRF:	Richard McPherson
Manager of Drilling Services:	Brian Jonasson
Manager of Science Services:	Thomas Davies
Manager of Publication Services:	Ann Klaus
Manager of Information Services:	David Becker

HEADQUARTERS

- Oversight of all Science Operator functions
- Liaison with JOI, JOIDES, Texas A&M University, and subcontractors
- Coordinate activities with scientists and community
- Provide public information concerning ODP and the Science Operator

ADMINISTRATIVE SERVICES

- Provide administrative services to the Science Operator
- Oversight of and administration of business affairs
- Manage all fiscal activities of the Program
- Manage the procurement/ property and contract activities
- Enforce subcontracts and purchase orders

FY04 Budget:
$1.983

DRILLING SERVICES

- Provide material services in support of ODP activities
- Perform engineering development function
- Provide demobilization material services
- Provide program-wide support in electronics/electrical engineering
- Develop new technology to support scientific and operational needs of program
- Act as liaison with JOIDES and industry
- Produce Drilling Services legacy documentation
- Provide centralized shipping and receiving service
- Coordinate procurement of supplies and equipment

FY04 Budget:
$2.139

SCIENCE SERVICES

- Coordinate postcruise meetings and publications
- Provide Science Services legacy documentation
- Provide technical, curatorial, and science support on shore
- Maintain shore-based laboratories
- Operate four core repositories
- Provide continuous maintenance for cores
- Oversight of program sampling procedures and recordkeeping
- Service sample requests

FY04 Budget:
$2.450

INFORMATION SERVICES

- Provide computer services to the Science Operator
- Manage computer systems
- Archiving services
- Editorial/quality control of data

FY04 Budget:
$1.732

PUBLICATION SERVICES

- Publish informal and formal publications of the Program

FY04 Budget:
$1.692

†: *All dollar values are shown as millions and totals are rounded.*

APPENDIX III – OCEAN DRILLING PROGRAM LEGACY INFORMATION

The Ocean Drilling Program (ODP) has identified the following legacy documentation developed over the course of operations spanning Legs 101 through 210. The documents cover a wide spectrum of information, providing information on tools developed and used throughout the Program, improvements to tools, complete details on tool functions, laboratory manuals (i.e., cookbooks), technical notes, laboratory standard operating procedures, instrument manuals, sample records, curatorial notebooks, special core information (i.e., cores designated as permanent archives, on loan to museums, cores with educational purposes, etc.), business function standard operating procedures, Information Services policies and Janus database documentation.

The legacy documents listed below are segregated into operations, engineering tools, and miscellaneous. These documents will be produced and organized into an integrated whole by 30 September 2004.

OPERATIONS

Staffing

- Cruise staffing database (Crew & Cruise): For each leg, and listing of all participants will be provided (Note: While the database can be exported to ASCII files, the relationships between tables will be lost. The exported text files can be loaded into other database systems.)

Leg Operations

- Scientific Proposal: Original scientific proposal, addenda, updates and revisions for each leg.
- Project A information: An operations-based evaluation of a scientific proposal for feasibility, operations and time estimates, a rough materials list, and a cost for budgeting purposes.
- Leg Prospectus: Prepared by ODP Publication Services based on results of precruise meeting.
- Project B: An evaluation of the revised science plan based on the PPSP review, precruise, meeting, and a prospectus-based operations plan.
- Clearance Documentation: Details requirements for clearances and efforts to secure approval.
- Time Estimator: Visual Fox Pro based coring/operations time estimator program used for Project A and B estimates.
- Participant Information Packages: Contains all information provided to participants (e.g., Science Services information, travel requirements, physical requirements, visa issues, port call locations, etc.).
- Coring Data: Data summary prepared by Core Technicians for each hole, containing record of depths, core recovery, operating parameters, tool configuration, equipment used (core catchers, shear pins, etc.), failure/problems for each coring system (APC, XCB, RCB, PCS, MDCB and ADCB, etc.).
- PDR/Final Position: Site location information, final statistical GPS site coordinates, etc.

- Leg Operations Report: Prepared by ODP Operations Manager, step-by-step summary of leg activities from port call to port call, with detailed time breakdown, coring/recovery record, bit record, final position/water depth record, reentry/casing /instrument installations, etc.
- Leg Engineering Report: Prepared by ODP engineer, details equipment tests, modifications, failures, results, operating parameters, and suggestions.
- Martin Decker Record: Automatic 8-pen recorder on the drill floor, records drilling operating parameters vs. time (i.e., depth, pump pressure and rate, hook weight, torque, etc.).

Curation

- Curatorial Notebooks: Reports of all curatorial and sampling activities on the *JOIDES Resolution*.
- Sample Records: Records of each sample request and its disposition, including lists of sample provided.
- Special cores: Records of designated permanent archives (and samples from these), cores on loan to museums, cores used for educational purposes, etc.

Labstack Procedures

The instruments used on board the JOIDES Resolution will be grouped by the lab in which they are used. Each instrument will have the following:

- Operation Manuals (Cookbooks): Detailed step-by-step records of standard laboratory procedures for each measurement made on board the *JOIDES Resolution*.
- Instrument Manuals: Manufacturer provided detailed operation and maintenance instructions for each instrument used on the *JOIDES Resolution*.
- Maintenance Manuals: Maintenance and upkeep performed during the analysis of samples, including detailed instructions, with pictures, of the connections for all the analytical instruments, if applicable. This includes gas lines, power cables, data connections, vent lines, hoods etc.
- Status of the equipment: Information about the age of the equipment, condition, software, upgrades, etc.
- Components needed for each system: All the components that are necessary to make each system usable. This includes hardware, software, peripherals, spare parts and consumables.
- Cost of Operation: What supplies are needed for the analysis of samples by each instrument. A breakdown of the supplies that are needed, the cost and the number of samples that are run. The final number may vary with the type of material (hard rock or sediment) and may be expressed as cost per sample, or cost per meter of recovery.
- Cost of Maintenance: A review of standard costs for maintenance for each instrument (based on historical average).

The following is a list of the shipboard instruments, sorted by lab:

- Lab: Chemistry
  - -Barnstead Water System
  - -Cahn Balance
  - -Carver Presses
  - -CNS Elemental Analyzer
  - -Coulometer
  - -Dionex Ion Chromatograph
  - -Freeze Dryer
  - -Gas Chromatograph #3
  - -Gas Chromatograph/Mass Spectrometer
  - -Hydrogen Generators
  - -Inductively Coupled Plasma Spectrometer (ICP)
  - -IW Squeezers
  - -NGA-Gas Chromatograph #1
  - -Rock Eval
  - -Scientech Weighing Station
  - -Titration System
  - -UV-vis Spectrophotometer

- Lab: Electronic Support
  - -Audio / Video Systems
  - -Copiers
  - -Imarsat B
  - -Test Equipment
  - -Weather System

- Lab: Fantail
  - -BOLT A/G P1500
  - -Booms
  - -Gun Lubrication Pump
  - -Hydraulic System
  - -Line Pullers
  - -Magnetometer
  - -Seismic Streamers
  - -SSI P400 W/G
  - -SSI P80 W/G
  - -Winches

- Lab: METS/Safety
  - -2S Monitoring Equipment And Breathing Apparatus
  - -Kevlar Protective Gear

- Lab: Microbiology
  - -PFT Tracer Injection System
  - -Gas Chromatograph/Electron Capture Detector
  - -Total Organic Carbon Analyzer

- Lab: Microscope
  - -Axiophot
  - -Axioplan
  - -Axioskop
  - -Color/B&W Printers
  - -Objectives
  - -Photo Camera
  - -Photoscope III
  - -Video Monitor
  - -Zeiss Standard Microscopes
  - -Zeiss SV-11's
  - -Zeiss SV-8's

- Lab: Paleomagnetics
  - -Cryo-Magnetometer
  - -DTech 2000 Demagnetizer
  - -Haskris Water Chiller
  - -Kappabridge
  - -Minolta Spectrophotometer
  - -Molspin
  - -Pulse Magnetizer
  - -Tensor Tools
  - -TSD-1
  - -Auxiliary Equipment

- Lab: Paleontology
  - -Centrifuges
  - -Chemical Hoods
  - -Drying Equipment/Sieves
  - -Sonic And Shaker Baths

- Lab: Photography
  - -Core Camera 4x5
  - -Enlarger
  - -Film Dryer
  - -Hasselblad Camera
  - -Kreonite B&W processor
  - -Kreonite Film Sink
  - -Kreonite Film Sink
  - -Metz Strobes
  - -Nikon Camera F3
  - -Nikon Camera F4
  - -Nikon Camera F5
  - -Polaroid MP4
  - -Wing-Lynch

- Lab: Physical Properties
  - -Digital Imaging System (DIS)

-Archive Multi Sensor Track (AMST): Color Reflectance
-Archive Multi Sensor Track (AMST): Imaging Camera
-Archive Multi Sensor Track (AMST): Point Susceptibility
-Archive Multi Sensor Track (AMST): Track System
-Discrete: Digital Sonic Velocity (DSV)
-Discrete: Hamilton Frame
-Discrete: Shear Vane
-Discrete: Track System
-Discrete: W-K Resistivity
-Multi Sensor Track (MST): GRAPE
-Multi Sensor Track (MST): Natural Gamma
-Multi Sensor Track (MST): P-wave
-Multi Sensor Track (MST): Susceptibility
-Multi Sensor Track (MST): Track System
-Ovens
-Pycnometers
-Thermcon
-Weighing Station

- Lab: Thin Section
  -Hot Plates And Ovens
  -Lap Wheel
  -Logitech LP30
  -Logitech PMA
  -PetroThin

- Lab: Underway Geophysics
  -12 kHz EPC Recorder
  -3.5 kHz EPC Recorder
  -Analog #1 EPC Recorder
  -Analog #2 EPC Recorder
  -Datum Clock
  -GPS/GLONASS Ashtech Receiver
  -GPS: Omnistar
  -Gun Trigger System
  -Gyro Repeater
  -H.P. Plotter
  -Navigation System
  -PDR Depth Cursor
  -Sun Workstation-Hess
  -Sun Workstation-Ross

- Lab: X-ray
  -Freeze Dryer
  -Grinders
  -Ovens And Furnaces
  -Radiation Detector
  -Tokyo Scientific 2100 Bead Maker

-Weighing Station
-X-press Press
-Xray Defractometer (XRD)

Standard Operating Procedures (SOPs): Brief, itemized list of tasks associated with each laboratory or group of related instruments, in order.

End of Leg Reports in the LO Notebooks: Reports of the status/problems/activities in each laboratory on the *JOIDES Resolution.*

ENGINEERING TOOLS

Tool Operation Manuals

These manuals provide complete details on tool function, preparation, service, assembly/ disassembly/testing, service specifications, maintenance and storage, parts, dimensions/ specifications, deployment history, failure reports, abandoned concepts, proposed improvements, and references.

- Advanced Piston Corer (APC)
- Extended Core Barrel (XCB)
- Rotary Core Barrel (RCB)
- Pressure Core Sampler (PCS) And Pressure Core Barrel (PCB)
- Motor Driven Core Barrel (MDCB) And Navidrill
- Advanced Diamond Core Barrel (ADCB), Diamond Bits And Diamond Core Barrel (DCB)
- Core Bits, APC/XCB/RCB Roller Cone And PDC Bits.
- Underreamers, Bi-Center Reamers And Mud Motors (UR & MM)
- Mechanical Bit Release (MBR) And Hydraulic Bit Release (HBR)
- Free Fall Funnel (FFF)
- Reentry Cone Casing (RECC)
- Drill-In-Casing (DIC)
- Hard Rock Reentry System (HRRS) And Hammer Drill (HD)
- APC Temperature (APC-T)
- APC Methane (APC-M)
- TAM Straddle Packer, Go-Devils, Press/Temp, Flow Packers And Flow Meters
- Davis-Villinger Temperature Probe With Pressure (DVTPP)
- Interstitial Water Sampler (IWS), Fissler Water Sampler (FWS), And Water Sampler With Temperature And Pressure (WSTP)
- Downhole Sensor Sub (DSS)
- Circulation Obviation Retrofit Kit (CORK)

- Advanced CORK (A-CORK)
- Conical Side Entry Sub (CSES) And Side Entry Sub (SES)
- Rig Instrumentation System (RIS) And Weight On Bit (WOB) Filter
- Passive Heave Compensator (PHC) And Active Heave Compensator (AHC) And WOB

Technical Notes

These Technical Notes (TN) will provide the history of a tool or systems technical development, discuss important technical innovations and scientific benefits, review tool operations and function (i.e., operational procedures, operating parameters, performance, and limitations), and cover drilling equipment problems. Technical Notes also will consolidate the design drawings and specifications and review deployment with other tool systems. Those TNs that are numbered are TNs that have already been written but require revision. In addition, there many new tools for which TNs need to be produced.

- TN #10: A Guide to ODP Tools For Downhole Measurements
- TN #13: Stone Soup (acronyms used in the ODP)
- TN#14: A Guide To Formation Testing Using ODP Drill String
- TN#16: Hydrogen Sulfide High-Temperature Drilling
- TN#17: The Design and Preparation Of Wireline PCS
- TN#19: Revised Hydrogen Sulfide Drilling Contingency Plan
- TN#21: Design And Operation Of A Drill-in-Casing System
- TN#22: Safety And Procedures Aboard The Sedco/BP 471 (*JOIDES Resolution*)
- TN#23: Design And Operation Of A Wireline Retrievable MDCB
- Packers (Flow Meters)
- Advanced Piston Corer (APC)
- Extended Core Barrel (XCB)
- Rotary Core Barrel (RCB)
- Pressure Core Sampler (PCS) And Pressure Core Barrel (PCB)
- Motor Driven Core Barrel (MDCB) And Navidrill
- Advanced Diamond Core Barrel (ADCB) And Diamond Bits And Diamond Core Barrel (DCB)
- Core Bits, APC/XCB/RCB Roller Cone And PDC Bits
- Lockable Flapper Valve (LFV)
- Bottom Hole Assembly (BHA)
- Drill String
- Mechanical Bit Release (MBR) And Hydraulic Bit Release (HBR)
- Free Fall Funnel (FFF)

- Reentry Cone Casing (RECC)
- Drill-In-Casing (DIC)
- Hard Rock Reentry System (HRRS) And Hammer Drill (HD)
- APC Temperature (APC-T), APC Methane Tool (APC-M)
- Packer (Flow Meter)
- Davis-Villinger Temperature Probe With Pressure (DVTPP)
- Interstitial Water Sampler (IWS), Fissler Water Sampler (FWS) And Water Sampler With Temperature And Pressure (WSTP)
- Downhole Sensor Sub (DSS)
- Circulation Obviation Retrofit Kit (CORK)
- Advanced CORK (A-CORK)
- Coring Wireline
- VIT With TV And Sonar
- Conical Side Entry Sub (CSES) And Side Entry Sub (SES)
- Rig Instrumentation System (RIS) And Weight On Bit (WOB) Filter
- Beacons
- Passive Heave Compensator (PHC) And Active Heave Compensator (AHC)
- Regulated Power And Power Factor Correction
- Hard Rock Base (HRB) And Mini Guide Base
- Hard Rock Orientation (HRO) And Sonic Core Monitor (SCM)
- Positive Displacement Coring Motor (PDCM) And Navidrill
- Vibratory Percussion Corer (VPC)
- XCB Flow Control
- Fishing Tools
- HYACE Rotary Corer (HRC) And Fugro Pressure Corer (FPC)
- Tri-Cone Retractable Bit

Material Services

- Parts Database: FoxPro database that provides a list of all ODP tool parts, assembly drawings, and specifications by unique part number.
- Inventory Control and Reorder System: ODP materials inventory control (updated by usage and physical counts) and parts reorder alert system.

Other

- Legacy Holes And Equipment: List of all holes with reentry structures and casing, including details of the equipment and casing, any hole problems, legs, and a map showing location.

- Historical Data: Operations reports, coring records, and other information from sites cored previously by DSDP.
- Drill String Simulator Software: Program simulates loading under dynamic heave conditions for various drill string designs.

Engineering Tool Overviews

In response to recommendations from the user community, ODP/TAMU engineering staff have started to produce short two-page overviews of drilling tools. To date, 15 overviews have been created (ACORK, ADCB, APC, BIH, CORK, DIC, DVTP, FFF, PCS, PHC & AHC, RCB, RECC, Ship, XCB) and there are 16 more that we presently planned. These are: APCT, APCM, BHA, Core Bits, CSES, Drill String & Simulator, DSS, HRSS/HD, IWS, including WSTP and FWS, LFV, MBR, MDCB, Packers and Flow Meters, RIS & WOB Filter, UR and Bi-Center Reamers, VIT-TV & Sonar.

Engineering Odds And Ends

These are existing engineering documents that have historical significance and these will be catalogued and archived in an organized file. These products are:

- Equipment Failure And Test Records
- DSD Safety Manual
- TEDCOM Presentations
- Core Tech Bulletins
- Operations Bulletins
- Leg Papers (Pre And Post Leg)
- DSDP Historical Papers
- DSDP Tech Notes
- Prospectus And Preliminary Reports
- Core Tech Core Data
- Obsolete Equipment Tool Drawings
- ODP Auto CAD Database

MISCELLANEOUS

Information Services

The Information Services Group will prepare the following legacy documents.

- Department Level
  - Supported Software Policy
  - Communications Policy
  - Third-Party Software Development Policy

- Database Group
  - Version Control And Testing Policy
  - Sample Data Publication Policy (JOI/ODP Joint Effort)
  - Computer Programs, Data, And Documentation

- Janus Database Documentation
  - Meta Data Files
  - Flat (ASCII Data) With Table Locations And Attribute Names
  - Attribute Tables
  - Entity Relationship Diagrams (Janus Data Model)

- Network/Systems Group
  - Backup Policy For The Ship
  - Backup Policy For Shore
  - MCS Duties Document
  - Procedures To Send/Receive E-mail Between Ship And Shore
  - Systems Manuals And Documentation

Publication Services

A list of legacy documents will be provided in future Program Plans as the final Initial Results and Scientific Results volumes near completion. (Note: The last year of Publication Services regarding the production of ODP products is FY07)

Administrative Services

Standard Operating Procedures (SOP): Ten SOPs were developed to provide information and instructions on how to administer the business services associated with the Science Operator (Texas A&M University (TAMU)) and the business/compliance arm (Texas A&M Research Foundation (TAMRF)) of the Program. These SOPs involved Human Resources/Insurance Services, Travel/Conferences, Property, Procurement, Budgets, Accounts Payable, Accounts Receivable, Payroll, Administering USSSP Funding, and Writing, Revising & Archiving SOPs. These documents are not public documents; however, requests for copies can be made by contacting the President, TAMRF.

Crisis Management Plan (CMP): An institutional specific, CMP is available on request from the Dean of Geosciences, TAMU.

APPENDIX IV – LEG ACCOMPLISHMENTS

The consistent, flexible, and detailed leg planning provided before and during the cruise by DOT, the problem solving and imaginative development of new coring and drilling tools by DET, the creative interaction between DOT and DET personnel before and during cruises, the flexibility and problem solving by the Operations Managers during the cruise, and the consistent and timely purchasing and shipping of equipment and supplies by MST have all been instrumental in successfully achieving the leg scientific objectives, setting new records, and accomplishing many "firsts."

Leg No.	**Operation Area**	**Accomplishments***
171A	Barbados-LWD	LWD only, no coring, at five sites across dJcollement with excellent results. Hole 1085 achieved first successful penetration of negative polarity reflection of dJcollement zone.
171B	Blake Nose	Five K/T boundary sections were recovered at three sites. Site 1049 cores contained impact ejecta from K/T meteorite. The Janus database was successfully implemented.
172	NW Atlantic Sediment	All major objectives were met with high recovery (5765 m). Cored 11 sites and collected expanded sections ideally suited for high-resolution paleoceanographic studies. The deep-sea sediments contain the most detailed and complete record of Earth's magnetic field variability for last 1.2 m.y. ever recovered.
173	Iberia	Investigated mechanisms of thinning and breakup of continental lithosphere and early stages of oceanic crust formation. Six holes were drilled recovering sediment and basement (38% basement). Basement consisted of pegmatitic gabbro overlying serpentizined periodite, which was contrary to expectation of finding upper oceanic crust. Operations were conducted in water depths >4500 m.
174A	New Jersey Shelf	First integration of geophysics, logging, and core data. Operations conducted successfully at three sites in shallow water to 99 m. Wireline and LWD logs run in unstable sands.
174B	CORK Hole 395A	Returned to DSDP Hole 395A, which was open to seawater flow for ~21 years, and sealed hole with CORK installation. Objectives are to monitor fluid pressure, fluid flow, and permeability. Used DVTP temperature tool to obtain a temperature log over depth in a flowing hole.
175	Benguela	Highest core recovery record (8003 m at 97%) for paleoceanographic and paleoclimatologic study of Benguela current and upwelling off western coast of Africa.
176	Hole 735B	Deepened gabbro legacy Hole 735B from 500 to 1508 mbsf. Evidence of large-scale ductile deformation. Highest RCB recovery (866 m at 86%) ever. Hole lost when drill pipe failed during pipe trip to log.
177	S. Ocean Paleoceanography	Ultra high resolution core with essentially complete composite core sections at five of seven sites to study paleoclimate.
178	Antarctic Peninsula	High-latitude Antarctic leg. Icebergs and heave affected operations. Ultra high resolution sediments recovered from Palmer Basin to compare with ice cores and similar basins.
179	NERO/Hammer Drill	Tested new fluid-powered hammer drill. Set International Ocean Network (ION) reentry cone and casing at Ninety East Ridge (Indian Ocean) for later installation of an observatory.
180	Woodlark Basin	Reentry installations not deployed under difficult drilling conditions and numerous stuck pipe incidents. Successful wireline logs across fault zone. Deepest (800 mbsf) microbial samples ever recovered by ODP.
181	SW Pacific Gateways	Cored sites around New Zealand to determine paleoceanography of AAIW. Shallow water to 407 m at two sites. Cored 4 km under difficult high-latitude operating conditions.
182	Great Australian Bight	Paleoclimatological work and cold-water carbonates. Core recovery of 3.5 km despite chert, weather, and high H_2S (158K ppm). Shallow water at five sites to 214 m WD.

Leg No.	Operation Area	Accomplishments*
		Tested nonmagnetic APC shoe and inner barrel.
183	Kerguelen	Investigated mantle processes that form large igneous provinces (LIP). Cored six LIP sites to basement, and recovered 386 m (50%) of basement. Tested Whirl-packs for delivery of tracers for microbiological studies.
184	E. Asian Monsoon	Studied variability and evolution of E. Asian monsoon during late Cenzoic. Improved knowledge of links between climate and tectonics. High recovery (5462 m at 95%). Van installed on laboratory stack for microbiology studies. Tested Russian bits. Good results.
185	Izu-Mariana	Investigated sediment subduction along Mariana and Izu-Bonin arc to characterize chemical fluxes during alteration of oceanic crust. Deepest water depth (5879 m). Deepened legacy Hole 801C to 341 mbsf. First microbiological studies on ship.
186	W Pacific Net	First installation of two permanent long-term borehole geophysical observatories with strainmeters, tiltmeters, and seismometers in ION holes east of Japan. First 20-in casing jetted-in to 58 m with reentry cone. Record casing depths for 16 in (534 m) and 10¾ in (1068 m).
	Dry Dock	Installed active heave compensator (AHC) & Fusion RIS. Seventh deck work expanded downhole tools laboratory and added microbiology laboratory and conference room.
187	Australia-Antarctic	Determined configuration of isotopic boundary between Indian and Pacific Ocean magma types. “Reactive” drilling strategy based on first time use of ICP-AES. First operational leg for AHC and RIS. Drill string length exceeded 5800 m at three holes.
188	Prydz Bay	Dedicated MWD/LWD hole obtained good data. First time data link with RIS. First high-latitude leg without ice picket boat. First direct sampling of sediment fans common on upper continental slope around Antarctica. Record Antarctic depth 999 mbsf. Operations in static temperatures to –7.5°C (–28°C chill factor).
189	S. Gateway	Paleoclimatologic and paleoceanographic study to test hypothesis that Antarctic glacial evolution resulted from isolation of Antarctica by Circum-Antarctic Current.
190	Nankai	Defined interrelations of the dynamics of deformation and fluid flow in accretionary prism. Record drill-in-casing depth of 142 mbsf with 11¾-in casing. Cored to 1120 mbsf through dJcollement. Installed instrumented load pins in traveling block to more accurately measure drill string weight.
191	W. Pacific ION	Set reentry cone and casing, drilled to 475 mbsf, and installed instrument hanger borehole completion with seismometers. Successful test of fluid hammer, bits, and pulsation sub for hard rock reentry system (HRRS). AHC improved seismometer installation process.
192	Ontong Java	Sampled basaltic basement to determine age and duration of emplacement of the plateau. Set reentry cone with 16-in casing. Recovered 898 m of basement (51% recovery).
193	Manus Basin	First use of HRRS: used fluid hammer as underreamer to install 13?-in casing. First free-fall deployment of reentry cone. First use of advanced diamond core barrel (ADCB). HRRS and ADCB critical tools to achieve science because of unstable upper hole conditions.
194	Marion Plateau	First test of HYACE/Fugro tools. ADCB deployed on 58 runs because of unstable hole conditions and poor core recovery.
195	W. Pacific ION	Installed reentry cone with 20-in and 16-in casing, and installed first CORK in serpentine mud volcano. Deepest water (5721 m) for an ION site. First test of APC methane tool.
196	Nankai II	Record LWD hole to 1057 mbsf. Longest string of 20 in (156 m) drilled-in with an underreamer and mud motor. Installed first ACORKs (two) with multiple packers and screens to isolate multiple sedimentary zones to measure fluid pressure. Record six screens on one hole.
197	Hawaiian Hotspots	Preliminary paleolatitude data established Hawaii hotspot moved rapidly southward during Late Cretaceous to early Tertiary. Recovered 626 m basement (52% recovery).
198	Shatsky Rise	Recovered complete Berriasian to Holocene sediment section and the first igneous rocks from Shatsky Rise. Recovered 2914 m core (73.9%).

Leg No.	Operation Area	Accomplishments*
199	Paleogene Pacific	A transect along 56- to 57-Ma crust, extending from a paleolatitude of ~4°N–~4°S to encompass a relatively thick lower Eocene sediment section. Recovered 2197 m of sediment and basement (89.1% recovery) despite Eocene chert.
200	H2O observatory	Sampled the upper oceanic crust at the Hawaii-2 observatory site and established a cased reentry hole extending 30 m into basement. Recovered cores of the Nuuanu Landslide deposits that were derived from the Hawaiian Islands. Many intense storms, lost 6.1 days waiting on weather.
201	Peru biosphere	First leg dedicated to the study of life deep beneath the seafloor. Sites represent the general range of subsurface sediment environments, water depths, ages and subsurface temperatures. Microbial abundances found to be much higher in sediments buried on the continental shelf of Peru than in sediments of the open Pacific Ocean. Pushed APC to limit. Operations also included 17 runs with PCS, 7 runs with Fugro Pressure Corer.
202	SE Pacific paleoceanography	Recovered 7082 m of core from 11 sites to provide a new view of Southern Hemisphere and tropical climate variability and biogeochemical systems across a broad range of spatial and temporal scales along the western margin of S. America.
203	Eq. Pacific Ion	Drilled a cased reentry hole in 10-12 Ma crust in the eastern equatorial Pacific, to be occupied by a future Dynamics of Earth and Ocean Systems (DEOS) multidisciplinary observatory.
204	Gas Hydrates	Investigated the distribution and concentration of gas hydrates off the Oregon continental margin. Tools used included LWD, pressure core sampling, and infrared thermal imaging of the cores, and linear X-ray. Recovered and archived 85 m of core samples under near in situ pressures and temperatures. Successfully tested Fugro pressure corer, HYACE rotary corer, Fugro piezoprobe, LDEO drill string acceleration tool, resistivity at bit tool, APC temperature and methane tools. Transferred 42 personnel in 9 rendezvous (7 helicopter and 2 boat).
205	Costa Rica	Cored the lowermost sediments and uppermost igneous rocks of the subducting plate off Costa Rica to determine its igneous and alteration history and better constrain input to the subduction factory. Installed two reentry cones with downhole instrument hangers and osmosamplers for long-term geochemical observatories: one in basement of the downgoing plate and one in the plate boundary fault (decollement). Each of these will sample formation fluids/gases and monitor formation pressure and temperature. Samples and data will be recovered ~1 year after installation.
206	Fast spreading crust	Established a cased reentry hole to 752 mbsf (extending 502 m into 15 Ma, fast-spreading crust) on the flank of the East Pacific Rise. First ocean drilling use of bi-centered reamer for opening the hole.

*For statistics on core recovery for each leg, see the ODP Operations Summary table.

DRAFT

OCEAN DRILLING PROGRAM

FY04 Program Plan
for
ODP Logging Services

For Time Period
1 October 2003 to 30 September 2004

During FY 04, activities at LDEO-BRG and its subcontractors will focus on the completion of demobilization of the equipment from the drillship, the demobilization of shorebased facilities, and completion of the log data processing and distribution tasks for recently completed ODP legs. One of the main achievements of the Ocean Drilling Program has been to make an unprecedented amount of data readily available and easily analyzed. A limited number of activities proposed during the phase out period will be continued in order to insure ongoing access to software and data. A summary of the required tasks is given below.

General Operations

During FY 04, the emphasis will be on management of ship and shore lab demobilization activities and phasing out/downsizing of subcontracts. Efforts will also focus on the completion of legacy documents and activities as well as preparations for the final reports that will be required at the end of the phase out period.

Demobilization of the logging facilities on the *JOIDES Resolution* will take place in September 2003. The technical staff at LDEO-BRG will be involved in equipment inventory, storage, and transfer after demobilization of the *JOIDES Resolution* through FY 04. Funds are also budgeted for the completion and finalization of documentation related to downhole tools (including machine drawings, schematics, operations manuals, software, and performance reports) and the maintenance/refurbishment of equipment as appropriate. Demobilization activities also include the inventory, service and storage (or disposal) of computer equipment and other property at each of the ODP Logging Services offices.

Publication of the last *ODP Initial Reports* Data CD will occur on or before 9/30/04. Based on the current schedule of CD production, there will be six CDs produced during FY 04. Logging Staff Scientists at LDEO-BRG and its subcontractors will retain partial support after their final cruise. Salary support for sea-going logging scientists is budgeted for the completion of post-cruise activities and attendance at the first post-cruise meetings, as well as the travel funds to attend these meetings. All cruise-related activities are expected to be completed by the end of FY 04. This will allow time to complete contractual requirements, log processing and database archiving, and leg summary reports. Logging Staff Scientists will not be retained beyond FY 04 for work related to the *ODP Scientific Results* volumes.

Based on historical experience, six months of support of the data processing group will be required to complete the IR data plots and the six remaining data CDs. One month is needed to complete the log processing and 2 months for data archiving and distribution for the final ODP legs.

Other Activities

The activities listed below are included in the FY 04 Program Plan budget. Project-specific budgets are also provided.

Database Archiving/Distribution
The Ocean Drilling Program has collected and archived an unprecedented amount of log data that is readily accessible to the scientific community. Maintenance of the ODP Log Database will continue through FY 07. Staff and hardware necessary for this activity will remain at LDEO-BRG. A limited personnel and computer services budget is required to provide services associated with insuring the integrity of the data and security of the database, monitoring database performance and utilization, distributing data not available online, and assisting users with data handling and usage questions. Data access and handling issues related to the site survey seismic data must also be maintained as the drilling community continues to improve its use of and access to digital seismic data for drilling-related planning as well as post-cruise science. This function will continue to be jointly supported by LDEO-BRG and the LDEO-SSDB.

Our list of data holdings also includes shipboard operations reports. They are not currently part of the online log database, but are an important legacy of the program as noted by NSF in its review of the FY 03-07 Program Plan. As most of these reports are in analog format and contain varying levels of detail, approximately 3.5 man-months would be needed in FY 04 to organize this information into a standard format and convert it from analog to digital. The digital files would then be included in the documentation files in the ODP Log Database.

Log Analysis Centers
Having the means to integrate core, log, and seismic data is a critical function associated with ODP scientific research. The GeoFrame/IESX data processing and interpretation package provides this capability at the five shore-based facilities, among several other University-based locations, that are affiliated with ODP logging services: Columbia University (USA), University of Leicester (UK), University of Aachen (Germany), University of Montpellier (France), and University of Tokyo (Japan). Usage of these systems is stead at all five locations, both prior to and after ODP legs.

Log analysis centers will be maintained through FY 07 in order to provide access to processing, interpretation, and core-log-seismic integration capabilities. Borehole image log interpretation, in particular, requires this specialized software to take full advantage of the data. One month per year of personnel time at each center is budgeted for a log analyst/technical support. An additional month is budgeted at LDEO to provide oversight of all the centers. Funds are budgeted at each center to cover the cost of GeoFrame/IESX maintenance.

DSDP Processing/Archiving
Processing and archiving of digital DSDP log data will occur in FY 04. The majority of these data are only available in LIS format, which requires specialized software to read and process, limiting its usefulness and accessibility in its present form by the scientific community. Translation to ASCII format will also allow DSDP data to be merged with the ODP log database and interpreted using more common software packages.

A total of 91 holes were logged during DSDP, of which 83 are available digitally. Approximately 6.5 months of effort are required to process these data and prepare it for archiving. Following processing, data will be available online in ASCII format, which will make it compatible with the ODP log database and substantially increase the global coverage of these digital data sets.

Operations reports are not readily available for DSDP holes. However, it is possible to recover some of this information from the original volumes and processing notes. It is unlikely these will provide the same level of detail that is available for ODP operations, but the information could still prove useful. We estimate an additional six man-months would be needed to fully document operations at the 82 logged DSDP holes.

Budget Justification

Actual/projected costs from FY 02-03 were used as the basis for all budgets. The LDEO budget for FY04 is presented in Table 1. The FY03 budget is also included.

Table 1 FY 04 SUMMARY

		FY 03	**FY 04**
A.	PERSONNEL (LDEO)	$705,990	$501,508
B.	FRINGE BENEFITS	$181,236	$131,749
	SEA PAY	$9,400	$0
	TOTAL SALARIES AND FRINGE	**$896,626**	**$633,257**
C.	PERMANENT EQUIPMENT	$23,000	$0
D.	MATERIALS AND SUPPLIES	$53,100	$14,000
E.	TRAVEL	$80,200	$37,000
F.	COMMUNICATIONS AND SHIPPING		$40,000
G.	TOTAL OTHER COSTS	$59,685	$30,889
H.	COMPUTER SERVICES	$25,000	$9,588
	LDEO DIRECT COSTS TOTAL	**$1,177,611**	**$746,034**
	(MODIFIED DIRECT COSTS)	$1,119,884	$736,446
I.	LDEO INDIRECT COSTS @ 53%	$593,539	$390,316
	LDEO BASE BUDGET TOTAL	**$1,771,150**	**$1,136,350**
J.	DOWNHOLE TOOL INSURANCE	$223,000	$0
K.	SUBCONTRACTS		
	SCHLUMBERGER	$2,379,137	$0
	LGHF	$181,283	$61,186
	UNIVERSITY OF LEICSTER	$246,852	$60,170
	UNIVERSITY OF AACHEN	$55,120	$24,195
	OCEAN RESEARCH INSTITUTE	$58,870	$25,210
	TAMRF	$37,000	$0
	DOWNHOLE SYSTEMS	$16,790	$0
	SPECIAL OPERATING EXPENSES	$458,127	$0
	TOTAL	**$5,427,329**	**$1,325,471**

Personnel

The Table 2 outlines the distribution of personnel support at LDEO for the completion of required tasks in FY 04:

Table 2 FY 04 LDEO Man Months	Months	FTE
Administration/Management	31.50	2.63
Ship and shore lab demobilization	29.25	2.44
Post-cruise processing/publication	19.25	1.60
Database archiving/distribution	8.00	0.67
Log analysis center	2.00	0.17
DSDP reprocessing/archiving	12.50	1.04
	102.50	**8.54**

Note: Personnel support in the out years will decrease significantly with the completion of the post-cruise processing/publication and DSDP reprocessing/archiving tasks and the near-completion of the shorebased lab demobilization.

Permanent Equipment

No additional permanent equipment purchases are budgeted for the phase out.

Materials and Supplies

Costs in this category include shipping, engineering, and general office supplies.

Travel

Travel expenses include trips to JOI and TAMU, as well as meetings associated with final subcontract issues. Travel costs will also be incurred for the final co-chief review meeting. In addition, funds are budgeted to cover the first post-cruise meetings remaining in FY 04 and for participation in science and technical meetings associated with legacy activities.

Communications and Shipping

Communication costs include phone and fax to and from JOI, TAMU, JOIDES, subcontractors, and vendors. Shipping costs are associated with sending equipment back from subcontractors and delivering all necessary equipment to JOI, NSF, or other locations as directed.

Other Costs

CD-ROM publication expenses include charges for mastering, duplication, and packaging for inclusion in the *ODP Initial Reports* volumes and are based on estimates provided by current vendors. The final six CD-ROMs will be completed during FY 04. Funds are also budgeted in this category for expenses associated with engineering services related to the maintenance, refurbishment, and documentation of logging tools and equipment.

Computer Service
Repair, upgrade, and backup of Sun Microsystems hardware and software will be covered under the LDEO network subscription and is projected to be $9,588 for FY 04. This rate is based on the number and types of workstations needed for phase-out operations at BRG.

Indirect Costs
Indirect costs (53%) are assessed on all charges except LDEO Computer Services.

Laboratoire de Géophysique et Hydrodynamique en Forage (LGHF), France
The FY 04 budget includes funds for the completion of leg-based activities (e.g., editing of Initial Reports), assisting with the preparation of the final report, and activities related to the closing-out of this subcontract.

Funds are also provided in the LGHF budget for the maintenance of a log analysis center. The budget will cover one month of salary support and funds for the maintenance of the GeoFrame/IESX software.

University of Leicester, United Kingdom
The FY 04 budget includes funds for the completion of leg-based activities (e.g., editing of Initial Reports), assisting with the preparation of the final report, and activities related to the closing-out of this subcontract.

Funds are also provided in the LUBR budget for the maintenance of a log analysis center. The budget will cover one month of salary support and funds for the maintenance of the GeoFrame/IESX software.

University of Aachen, Germany
The FY 04 budget includes funds for the completion of leg-based activities (e.g., editing of Initial Reports), assisting with the preparation of the final report, and activities related to the closing-out of this subcontract.

Funds are also provided for the maintenance of a log analysis center. The budget will cover one month of salary support and funds for the maintenance of the GeoFrame/IESX software.

Ocean Research Institute, Japan
The FY 04 budget includes funds for the completion of leg-based activities (e.g., editing of Initial Reports), assisting with the preparation of the final report, and activities related to the closing-out of this subcontract.

Funds are also provided for the maintenance of a log analysis center. The budget will cover one month of salary support and funds for the maintenance of the GeoFrame/IESX software.

9. LEGACY Plans

9.2 SCICOM Report (Becker)

JOIDES SCIENCE COMMITTEE
26 August, 2002
Hosted by Ghent University at Het Pand, Ghent, Belgium

The full version of the minutes of the Science Committee Meeting on August 26 2002, Ghent, Belgium can be found at <http://joides.rsmas.miami.edu/files/scicom_02_02.pdf>

MOTION AND CONSENUS ITEMS

Executive Summary

SCICOM Motion 02-02-01: SCICOM approves the meeting agenda.

Fryer moved, Rea seconded, all in favor.

SCICOM Motion 02-02-02: SCICOM approves the minutes of its March 2002 meeting in Yokohama.

Mayer moved, Sager seconded, 14 in favor, none opposed, 1 abstention (Brumsack).

SCICOM Consensus 02-02-03: SCICOM accepts the following SCIMP recommendations:
SCIMP recommendation 02-1-1 concerning the guidelines for digital seismic data submission
SCIMP recommendation 02-1-2 concerning the JANUS data model
SCIMP recommendation 02-1-3 concerning the petrologic results compiled by Kurnosov et al.
SCIMP recommendation 02-1-4 concerning metadata documentation in JANUS
SCIMP recommendation 02-1-5 concerning the FMS and digital line scan images
SCIMP recommendation 02-1-6 concerning conducting any future business only by email.

Preface to SCICOM Motion 02-2-4:
SCICOM applauds the proponents' vision and is excited by the opportunities presented by a test hole connected to a high-bandwidth, high-power cable. This represents a tremendous opportunity. However, SCICOM believes that there are scientific and technical issues that need review
and discussion prior to a commitment to establishing such a test site. These issues include:
1) Is there a community consensus on the optimal technical requirements for such a site?

Issues include hole diameter, seafloor landing structure, hole depths, and casing strategy.
2) How do the environmental and geological characteristics limit or enhance the prospects for instrument tests that might be done in the hole? Issues include porosity, formation pressures, lithologies, hydrocarbon potential, and so on.
3) How is community access to the site to be managed? Issues include interactions with MBARI and management of permitting issues within the sanctuary.
4) Should planning for the drilling operations include time for logging of the formation to establish adequate baseline characterization?

SCICOM Motion 02-02-04: SCICOM strongly encourages the proponents of APL-22 to submit a pre-proposal to the IODP interim Science Advisory Structure for a test hole in Monterey Bay as part of the MARS facility.

Bloomer moved, Austin seconded, all in favor.

SCICOM Consensus 02-02-05: SCICOM thanks Jean-Pierre Henriet and Marc Faure of Ghent University for wonderful arrangements in hosting this meeting in such a quintessentially European location. SCICOM also sincerely thanks ECOD and ODP-France for financial cosupport for the meeting arrangements.

JOIDES SCIENCE COMMITTEE
March 17 2003
Austin, Texas

The full version of the draft minutes of the Science Committee Meeting on March 17 2003, Austin Texas can be found at http://joides.rsmas.miami.edu/files/SCICOM_Austin_draftminutes.pdf

Executive Summary

DRAFT MOTION AND CONSENUS ITEMS

SCICOM Motion 01-03-1: SCICOM approves the meeting agenda.

Prell moved, Mayer seconded, 13 in favor, 1 absent (Herzig).

SCICOM Motion 01-03-2: SCICOM approves the minutes of its August 2002 meeting in Ghent.

Austin moved, MacLeod seconded, 13 in favor, 1 absent (Herzig).

SCICOM Motion 01-03-3: That the current motion be tabled until it was rewritten. [That revised motion was subsequently adopted as SCICOM Motion 01-03-5.]

Moore moved, Austin seconded, 13 in favor, 1 absent (Herzig).

SCICOM Consensus 01-03-4: SCICOM recommends that, within IODP, PPGs be used only when carefully justified. PPGs should be given clear and specific mandates, with definition of timelines, oversight, reporting and review responsibilities, and expected products.

SCICOM Motion 01-03-5:
SCICOM acknowledges documentation provided by the following PPGs and participants in their meetings:

- Architecture of Oceanic Lithosphere
- Climate and Tectonics
- Deep Biosphere
- Gas Hydrates
- Shallow Water Systems

including reports, meeting minutes, publications and white papers.
Although the PPG process did not function in all cases as originally conceived (for a variety of reasons) SCICOM recognizes that the efforts of PPG participants helped advance important science in the last phases of ODP.

Fisher moved, Austin seconded, 13 in favor, 1 absent (Herzig)

SCICOM Consensus 01-03-6: The compilation of SCICOM members' contributions assessing how well ODP has done as a scientific program will be forwarded to EXCOM for potential input to PEC VI.

SCICOM Consensus 01-03-7:
The Ocean Drilling Program, its predecessor the Deep Sea Drilling Project, and its successor the Integrated Ocean Drilling Program, stand as probably the finest examples in science of how nations can cooperate to achieve a greater good than any could achieve alone. Since the first hole was drilled in January of 1985, the Ocean Drilling Program has been supported by the governments of over twenty nations. The Program has seen the end of the Cold War, the waxing and waning of geopolitical strife in all corners of the world, and innumerable changes of administrations. Through it all, the Program has continued to put a ship to sea six times a year with a contingent of scientists, students, crew, and staff who left politics and national identity on the beach. By the time the last hole is drilled in September of 2003, the Program will have drilled over 1700 holes, recovered over 215 km of core, and sailed over 2700 scientists from more than 40 nations.

The Ocean Drilling Program has provided scientific advances in solid Earth science, oceanography, paleoclimatology, and numerous other disciplines. The work of the Program has provided fundamentally new understandings of modern Earth processes and has provided the baseline against which much of geology interprets the past. The Program is recognized for the high quality of the science that it has produced over the past 18 years. That science has only been possible because of the efforts of a very large number of people. SCICOM wishes to acknowledge the efforts of those people and to thank them on behalf of the entire Earth science community.

The quality of the science that has been done owes much to the people who have written proposals, both those that have gone on to be drilled and those that have not. The exchange of ideas, the fertilization of one idea by another and the constant push of new ideas, approaches, and techniques have kept the Program vital. The greatest thanks need to go to the proponents who provided the raw material for the scientific ideas that guided the drilling.

Those myriad ideas for good science through drilling would never have come to fruition without the considerable efforts of the members of the scientific community who staffed the scientific advisory structure of the Program. The advisory panels reviewed ideas, nurtured them, questioned them, improved them, assembled site survey data for them, reviewed their safety and ultimately championed them for one of the very few available legs aboard *D/V JOIDES Resolution*. The advisory panels, in turn, only worked because there were people willing to give significant time and energy to leading and serving on those panels. SCICOM offers our heartfelt thanks to all of the hundreds of panelists and panel chairs who have staffed (in alphabetical order) ARP, BCOM, CEPAC, DBRP, DMP, EDRC, ESSEP, EXCOM, IHP, IOP, IPSC, ISSEP, LITHP, OHP, OPCOM, PANCH, PCOM, PPSP, TECP, TEDCOM, SCICOM, SCIMP, SGPP, SOHP, SMP, SOP, SSP, WPAC, DPGs, PPGs, WGs and PECs over the years. You all know who you are.

The best ideas in the world would not have done us any good unless someone managed the money, staffed the ship, arranged the travel, ordered the pipe, collected and sampled the core, built the instruments, curated the core, cooked the food, edited the publications, did the laundry, managed the computer network and on and on and on. The Program has been very fortunate to have had contractors, operators, and partners who were professional in all senses of the word. SCICOM expresses our deep appreciation, on behalf of present and past participants in the Program, to all of the staff and the leadership (past and present) of the Joint Oceanographic Institutions, Inc. office; the Ocean Drilling Program at Texas A & M University; the Borehole Research Group at Lamont-Doherty, Leicester, Montpellier, Aachen, and Tokyo; the Site Survey Data Bank at Lamont-Doherty Earth Observatory; the core repositories at College Station, Scripps, Lamont-Doherty, and Bremen; and the ship, drilling, and catering crews of the SEDCO/BP 471; We thank Texas A&M University in particular for the commitment the university made to the program at its inception and the facilities they have provided at College Station that have served so many scientists so well.

We recognize that none of this would have happened without money. While the money comes ultimately from governments, we all know that our governments are actually, in the end, run by people. SCICOM wishes to express our thanks to those people who have worked so hard over the years to secure funding for the program and to the agencies represented on the ODP Council that have provided that funding, including United States National Science Foundation; Natural Sciences and Engineering Research Council and Natural Resources Canada; the Australian Department of Primary Industries and Energy; National Taiwan University; the Korean Institute for Geology, Mining, and Minerals; the

European Science Foundation representing Belgium, Denmark, Finland, Greece (1986-1995), Iceland, Ireland (since 1999), Italy, the Netherlands, Norway, Portugal (since 1998), Spain, Sweden, Switzerland, and Turkey (1986-1998); the Federal Republic of Germany's Deutsche Forschungsgemeinschaft; Institut Francais de Recherche pour l'Exploitation de la Mer and Institute National des Sciences de l'Univers-Centre National de la Recherche Scientifique; Japan's Ocean Research Institute, the University of Tokyo and Ministry of Education, Culture, Sports, Science and Technology; the Marine High-Technology Bureau of the State Science and Technology Commission of the People's Republic of China; the Natural Environment Research Council of the United Kingdom; and, in 1991-1992, the Institute of Lithosphere of the Soviet Union.

Finally, SCICOM wishes to thank those individuals, from many nations, who have worked so hard to see that there is a successor to the Ocean Drilling Program. We wish our colleagues in the Integrated Ocean Drilling Program planning structure, and the next generation of marine scientists, the same good fortune we have had to participate in one of the great endeavors of modern science and to experience the joy of discovery afforded by the ability to sample and monitor the ocean floor.

Presented by Jamie Austin, Sherman Bloomer, Larry Mayer, Dave Rea

SCICOM Consensus 1-03-8: SCICOM wishes to thank Keir Becker for his leadership of SCICOM and the JOIDES Office in their last incarnations. Keir's thoughtful, thorough, and calm approach has been invaluable to the Program in the complex transition from one program to another. We've all been fortunate to work with him.

There once was a man from Miami
Whose leadership skills were uncanny
He loved CORKs oh so fine,
In boreholes and wine
And made SCICOM work like a family.

Presented by Fisher and Bloomer

SCICOM Consensus 1-03-9: Little that happens on the ODP stage would happen without those working hard behind the scenes; and given that these critical contributions to the success of our program are rarely recognized, SCICOM offers a consensus expressing its profound thanks to the staff of the JOIDES Office this one in Miami and all of its predecessors.

Presented by Rea

SCICOM Consensus 1-03-10: SCICOM sends Paul Dauphin into retirement reluctantly, but with its heartfelt thanks for a job well done. He loves the scientific ocean drilling community and has worked tirelessly for many years to assure its success. Catch us some fish in that lake of yours, Paul, but be sure to throw them back.

Presented by Austin

SCICOM Consensus 1-03-11: SCICOM thanks Jamie Austin, Nancy Hard, Kathy Ellins and the Institute for Geophysics of the University of Texas for hosting its historic final meeting so graciously in the heart of Texas.

Presented by Becker

SCICOM Motion 1-03-12: SCICOM adjourns its final meeting.

Austin moved, Mayer seconded, 13 in favor, 1 absent (Herzig)

How well have we done? – input for EXCOM/PEC VI

Introduction

How Well Did ODP do?

Draft Contributions from SCICOM to EXCOM, for Possible Use by PEC-VI

Background

At its June, 2000 meeting, EXCOM Motion 00-2-5 was passed asking SCICOM to "develop an ODP legacy that includes…

- a list of ODP's greatest hits
- a database of publications related to ODP results, as already begun by JOI and TAMU,
- written documentation from SCICOM, the SSEPs, and other panels about major ODP-related results, by field, to accompany the list of greatest hits and the publications database,
- a description of major technical tool developments, from TEDCOM with help from LDEO and TAMU,
- a reply to the question "How well to ODP do in answering the questions originally asked?" This study should consider all phases of ODP (i.e., it should extend back to COSOD I)."

In reviewing progress at the June 2002 EXCOM meeting, the SCICOM chairman noted that the first four had essentially been accomplished with such activities as

- completion of the second volume of ODP "Greatest Hits" (printed January 2003)
- completion of the ODP publication database and on-line access
- publication of both the "Major Achievements of Scientific Ocean Drilling" (MASOD) section in the IODP Initial Science Plan and the special issue of JOIDES Journal entitled "Achievements and Opportunities of Scientific Ocean Drilling" (A&O)
- completion of the technical tool summary sheets by TAMU and LDEO with TEDCOM review.

However, he also noted that SCICOM hadn't fully addressed the last part of the EXCOM request yet, partly because so many important drilling legs remained to be drilled or their results fully assessed. He presented his own personal views on that aspect in two overheads, one on "How Well Have We Done?" and "For what goals might the program have done better and why?" and a second on how his own fields of expertise (submarine hydrogeology and subseafloor observatories) would be different if there had not been an Ocean Drilling Program. In discussion, he agreed to ask all SCICOM members to present their own versions of these two overheads, and compile them for review at the June 2003 EXCOM meeting, followed by forwarding to the sixth Performance Evaluation Committee (PEC VI) if deemed appropriate by EXCOM.

The main purpose of this document is to collate those contributions from SCICOM members, as brought to the August 2002 SCICOM meeting. Each SCICOM member took a slightly different slant on the request, but each response is useful and interesting, so they are presented here with very little editing. Three SCICOM members provided unexpected auxiliary material, two in terms of "grades" for ODP's accomplishments against the themes and objectives outlined in COSOD, COSOD II, and the 1990 or 1996 Long-Range Plans (LRP), one in terms of spreadsheets tallying specific leg accomplishments against these objectives. These additional contributions are presented after the other SCICOM member contributions. A final contribution is a summary of goals of COSOD I, COSOD II, and the 1996 LRP prepared by the SCICOM chair.

In addition, in discussion at the June 2002 EXCOM and ODP Council meetings, it was noted that this approach of mapping accomplishments against goals doesn't really assess the true scientific impact of ODP (even though it fits the format prescribed in the EXCOM 2000 motion above). Therefore, the SCICOM chair also asked SCICOM members to assess whether the scientific impact of ODP was well represented in the achievements documented in MASOD and A&O. For the most part, the answer to this question is in the affirmative, because of the comprehensive efforts made by (1) the Scientific Planning Working Group who assisted the IODP Planning SubCommittee (IPSC) in compiling the IODP ISP, and (2) (a) SCICOM in organizing A&O to span all the major themes of ODP and (b) the volunteer A&O authors who summarized accomplishments in those themes so well. Nevertheless, concentrated work in some initiatives is occurring near the end of ODP (e.g., 4 Extreme Climates legs in the last 3 years), and scientific impact of these initiatives remains to be fully assessed. Some SCICOM members contributed updated views of the most important scientific contributions of ODP, and those are summarized in this document as well. But for the most part, SCICOM stands by MASOD and A&O as the best current representation of the scientific impact of ODP. (MASOD is included as an appendix to this compilation.)

SCICOM Members represented in this compilation and the identifying codes listed on their contributions are as follows:

Jamie Austin (USA)	JA
Keir Becker (USA)	KB
Sherm Bloomer (USA)	SB
Steven D'Hondt (USA)	SD
Andy Fisher (USA)	AF
Teruaki Ishii (Japan)	TI
Patricia Fryer (USA)	PF
Chris Macleod (UK)	CM
Larry Mayer (USA)	LM
Delia Oppo (USA)	DO
Dave Rea (USA)	DR
Matt Salisbury (PacRim)	MS
Will Sager (USA)	WS

JA-1

What important scientific objectives has ODP addressed well? How has scientific progress within ODP set the stage for IODP?

• COSOD-I: 8. Global mass balancing of sediments, 9. History of ocean circulation, 10. Response of atmosphere and oceans to variations of planetary orbits; COSOD-II: Global array of full Neogene sections/orbitally driven oscillations; 1996 LRP: Earth's changing climate – spatial and depth transects.

- **Paleoceanographic transects (latitudinal, water mass): e.g, 138 (Eastern Eq. Pacific Neogene), 145 (N. Pacific), 167 (CA Current), 175 (Benguela Current), 199 (Pacific Paleogene), 202 (SE Pacific)**
- **Gateways: e.g., 151/162 (N. Atlantic Arctic), 181 (SW Pacific), 189 (Tasmania)**
- **IODP: continue "continuous [non-riser] coring" globally.**

• COSOD-I: 4. Dynamics of forearc evolution; COSOD-II: Fluids in subduction settings (experiment: fluid flow and the cycle of deformation and seismicity in a subduction zone); 1996 LRP: Convergent margin fault processes; in situ monitoring of geological processes.

- **Barbados: e.g., 110, 156, 171A**
- **Costa Rica: e.g., 170, 205,…(IODP: Subduction Factory)**
- **Nankai Trough: e.g., 131, 190, 196, …(IODP: Seismogenic Zone).**

• COSOD-I: 11. Patterns of evolution of microorganisms; COSOD-II: Evolutionary processes in oceanic communities; 1996 LRP: Pilot project: Earth's deep biosphere.

- **Sampling the subsurface biosphere: e.g., 112/201 (Peru margin),…(IODP: Deep Biosphere).**

• COSOD-I: 2. Circulation, chemistry and dynamics of hydrothermal systems; COSOD-II: Hydrothermal circulation; 1996 LRP: Hydrothermal processes and sulfide mineralization.

- **Hydrothermal circulation at/near ridge crests: e.g., 139/169 (SRI and II), 158 (TAG), 193 (Pac-Manus)**
- **IODP: a prime example of observatory-based, process-oriented science, one possible IODP focus.**

• COSOD-I: 2. "natural laboratories"; COSOD-II: global seismic observatories; 1996 LRP: Mantle dynamics – LIPs, global seismic observatories.

- **ION activities: e.g., 136 (OSN-1), 179 (NERO), 186 (W. Pacific), 191 (NW Pacific), 195 (W. Pacific/Mariana), 200 (H2O), 203 (E Eq. Pacific)**
- **IODP: more of the same; increase integration with such liaison programs.**

JA-2

In what areas of scientific endeavor could ODP have done a better job? How will IODP make our (drilling and coring) lives better?

• COSOD-I: 6. Reponse of marine sedimentation to fluctuations in sea level; COSOD-II: Changes in the global environment (experiment: Amplitude and Timing of Changes in Cenozoic Sea Level); 1996 LRP: Causes and effects of sea level change.

- **Atolls and guyots – the “dipstick” approach: e.g., 143/144. Science hampered by poor pre-drilling seismic imaging, poor core recovery, diagenetic overprinting of recovered samples.**
- **IODP needs: better geophysical surveys, tools to recover interbedded hard/soft lithologies, MSP’s?**

• COSOD-I: 3. Early rifting history of passive continental margins; COSOD-II: Conjugate passive margin drilling; 1996 LRP: Extensional margin drilling.

- **Conjugate margin transects: Old N. Atlantic – 103/149/173 (Iberia) + 210 (Newfoundland); young W. Pacific – 180 (Woodlark Basin). Long-term community interest evident, but inability to drill deeply (and safely) and unwillingness to commit adequate drilling time has hurt the scientific goal of accessing early rift deposits and geologic history.**
- **IODP: riser capability, MSP’s (?), community commitment! Also need to address other younger basins for processes – e.g., Gulf of CA, Red Sea, Adriatic.**

• COSOD-I: 1. Processes of magma generation and crustal construction at mid-ocean ridges. 2. “Natural laboratories” – arrays of holes, at least one deep; COSOD-II: Mantle-crust interactions (total crustal sections), stress and deformation of the lithosphere - world stress map (oceanic sites); 1996 LRP: Drilling in zero-age crust, complete crustal sections.

- **Zero-age ocean crust drilling: 106/109 (MAR), 118/176 (SW Indian Ridge), 142 (EPR), 153 (MARK) has been for the most part unsuccessful.**
- **Hole 504B deep penetration a serendipitous result, but a good example of community resolve.**
- **One example of designed full-penetration hole – 206 (E. Pacific)**
- **A combination of imperfect engineering (hard-rock spud-in, hard-rock guide base/reentry system, DCS system [!], hammer drill-in casing) and loss of community resolve over time has hurt this science.**
- **IODP: Will we do better?**

Selected ODP achievements that are near and dear to my heart, and how we can capitalize on ODP progress made within those themes in IODP:

• COSOD-I: 6. Reponse of marine sedimentation to fluctuations in sea level; COSOD-II: Changes in the global environment (experiment: Amplitude and Timing of Changes in Cenozoic Sea Level); 1996 LRP: Causes and effects of sea level change.
Continental margin transects/global coverage/variety of sediment types:

- **"Mid-Atlantic" U.S. (siliciclastic), e.g., 150 (slope), 174A (shelf), 174AX (coastal plain),…(IODP: NJ inner shelf MSP?)**
- **Bahamas/Australia (carbonates), e.g., 166 (tropical bank flank), 182 (cool-water temperate), 133/194 (tropical platform),…(IODP: Tahiti/Great Barrier Reef MSP?)**
- **We proved we could drill and core in these shelfal/platform environments safely. We showed that both local and eustatic base-level indicators exist and can be tracked. We learned how complicated the experimental plan must be.**
- **IODP: use MSP's when appropriate, develop coring tools that can recover sands better (VPC?), maintain the global focus.**

• COSOD-I: 3. Early rifting history of passive continental margins; COSOD-II: Conjugate passive margin drilling; 1996 LRP: Extensional margin drilling.

- **Volcanic passive margins – e.g., 104 (Voring Plateau), 152/163 (E. Greenland)**
- **We dated these volcanic accumulations (basalts and intercalated sediments) and assessed their paleoenvironments. In the process, we shifted the entire dialog about how continents rift and drift.**

KB-1

How Well Have We Done?

For many goals of COSOD, COSOD II, and the Long-Range Plan, the program has done quite well, both in following the scientific plan and delivering results! A few good examples include:

- Paleoceanography and paleoclimate
    - High-resolution Neogene
    - Cretaceous/Paleogene "extreme climates"
- Subduction zone concerted drilling in 5 example settings
- Atlantic conjugate margin studies
- In situ monitoring of geological processes
    - ION global seismic observatories – 7 sites
    - CORK hydrogeological observatories – 18 sites

For what goals might the program have done better and why?

Global stress mapping – lack of proposals independent of ION sites

Deep penetration - lack of JOIDES (and community?) resolve for multi-leg commitment??

Full crustal penetration a high priority since COSOD I
Phase III drilling to 2-4 km at several sites promised in LRP
(504B was a DSDP/Phase I/II fortuitous accomplishment)
Special call for proposals issued, but first concerted steps being taken only during final year of Phase III

Zero-age drilling – realities of technological development

Mission-specific platform drilling, primarily for climate and sea-level studies – budgetary realities

While ODP has not fulfilled these expectations, the entire ODP community has made an important contribution – laying the groundwork for addressing most of them in IODP!

Subseafloor observatory science:
Where would it be without ODP?

- Almost nowhere, except for a few initial seismic efforts during DSDP or the potential of utilizing existing DSDP reentry holes for observatories
- Establishing borehole observatories is an important ODP contribution, both in hydrogeological studies and future global seismic studies
- ODP borehole observatory contribution has also been important factor within initiative for seafloor observatories

Submarine hydrogeology: Where would it be without ODP?

DSDP contributions include:

- Initial drilling in important crustal hydrogeological reference sites (504B, 395A, 417D/418A)
- Establishing basic crustal permeability/porosity model from 504B and 395A
- Important initial hydrogeological models on ridge flanks

ODP contributions include:

- Deep drilling in 504B, establishing other important sites for expanded global coverage in both ocean crust and subduction settings
- Significantly expanded global permeability dataset, indicating age variation and scale effects in highly permeable ocean crust
- Significantly expanded global dataset of alteration results, leading to better understanding of global fluxes
- Renewed modeling efforts based on realistic permeability structure
- Focus on subduction hydrogeology with indications of episodic fluid flow related to tectonics
- Important initial demonstrations of other fluid flow regimes: continental margins (NJ shelf), carbonate banks
- CORK observatories: time-series determinations of in-situ state and hydrogeological processes

Much work remains to be done, and ODP has set the stage for more sophisticated submarine hydrogeology studies in IODP.

How well do we do on fundamental scientific advances?
Area: Heat and Mass Transfer

Fundamental contributions:

- The program moved to provide **time** and **geologic** constraints on oceanic studies (FMS, magnetics, 3rd dimension)
- Provided the best constrained modern analogs for interpretation of the geologic record

Hits:

- Architecture of the ocean crust
- Chemical mass balance consequences of ocean crust formation and alteration
- Mantle dynamics – particularly the stability of the Hawaiian hotspot study (197)
- Dynamics and complexity of convergent margins – probably the most important contribution to land geology and geologic history interpretation
- The recognition of links…extinctions, volcanism, climate, circulation

Misses:

- Didn't take enough advantage of the ability to orient core and do structural and paleomag – plate reconstruction constraints
- Never really figured out how the drill could be used in complex active tectonic areas – transforms, detachments
- Didn't always attack the problems with the right tool
- The failure to do deep penetration and zero-age drilling was not, in my opinion, a major scientific failure in our studies of the oceanic crust

How well did we do in our operational goals in COSOD I and II and the LRP?
Area: Heat and Mass Transfer

With a couple exceptions, the goals of COSOD I and II can be mapped in the themes of the LRP.

Hits:

- Ocean ridge construction, even without zero-age or deep penetration
- Subduction system dynamics and evolution: arc, forearc, backarc
- Mantle dynamics – LIPs (though we struggled), seismic observatories, Hawaiian hotspot drilling
- Subduction zone fluid dynamics and balance: accretionary prisms and forearcs
- Hydrothermal circulation: particularly sediment-buried, off-axis, and even bare-rock, given the tremendous technical difficulties

Misses:

- Deep crustal penetration to total crustal penetration – 504B our best effort; also deep holes in hydrothermal areas and continental margins
- Zero age drilling – though we may ask what the essential goals are now
- World stress map
- Magnetic field history (COSOD I) – incremental additions
- Translational margin studies and active tectonic processes: simple not amenable to drilling strategies

Scientific Achievements of ODP SD-1

1. ODP has delivered tremendous understanding of natural climate and ocean variability.

ODP has greatly advanced understanding of:

natural climate variability,
the interplay between ocean and climate,
the interplay between climate and planetary orbits,
high-resolution (Mikankovitch-based) geologic timescales,
and rapid climate change.

2. ODP has greatly helped to pave the way for a real understanding of subsurface life.

Without ODP, we would have little recognition of life beneath the seafloor.

What has the program done well? SD-2

It has greatly improved understanding of <u>Changes in the Global Environment</u>

<u>Categories of success:</u>

Response of atmosphere and oceans to variations of planetary orbits (COSOD / COSOD II)

Understanding natural climate variability and the causes of rapid climate change (1996 LRP Initiative)

Amplitude and Timing of Changes in Cenozoic Global Sealevel

passive margin stratigraphy (COSOD II "Illustrative" Experiment

isotopic global ice volume estimates (COSOD II "Illustrative" Experiment)

It has improved understanding of <u>Sediments, fluids, and bacteria as agents of change</u>

<u>An example of success:</u>

Pilot Project: Earth's deep biosphere (1996 LRP Initiative)

What goals might the program have met better?

ODP could have better improved our understanding of the biological history of the ocean, and its relationship to Earth's environmental history:

<u>Examples of success:</u>

Understanding of Paleocene/Eocene boundary event

Improved understanding of biological response to K/T impact

<u>Examples of under-achieved objectives:</u>

1. *Patterns of evolution of microorganisms* (COSOD)
2. *Long-term records in Jurassic/Cretaceous sections* (COSOD II)

Why? Lack of proposal pressure (1,2)? Lack of integration with related proposals (1)? Lack of commitment to deep penetration (2)?

What ODP has done well…

- documentation of variations in Earth's past climate, identification of possible "causes"
- evaluation of structures and links to hydrogeology, lithology, tectonics, magmatism at active margins
- elucidation of sediment, climate response to changes in sea level, occurrence of gas hydrates
- investigation of tectonics, composition, history of rifted margins (volcanic, nonvolcanic)
- quantification of <u>shallow</u> hydrogeologic crustal conditions, initial development of borehole laboratories

What could have been done better…

- focus more on *process* rather than *product*
- follow through *<u>after</u>* drilling to evaluate whether individual programs were successful, problem was solvable, etc.

Achievements in Marine Hydrogeology…

- Ridge crests: Middle Valley, TAG
- Ridge flanks: Costa Rica Rift, Mid-Atlantic Ridge, Juan de Fuca Ridge, EPR flank
- Passive margins: New Jersey, Bahamas, Australia
- Active margins: Barbados, Nankai, Peru, Mariana Forearc, Costa Rica
- Overall: direct testing of properties, installation of observatories to monitor related processes, documentation of scales (spatial, temporal) of fluid flow and related processes

But for the Ocean Drilling Program…

- we might still think that fluids circulate to depths of several kilometers throughout most of the crust,
- we would not know how transient many hydrogeologic processes are within the seafloor,
- we woul dhave much less understanding of development and evolution of ore deposits, and
- we would not know the magnitude of hydrogeologic driving forces, the enormous scales of flow, or relations between flow and tides or earthquakes.

PF-1

What we have done well?

- Drilling variety of environments
- Deep Earth Biosphere –archea in serp mud volcanoes
- Exploring transfer of heat and materials from interior of earth in subduction zones to the sea
- Reference centers
- Innovations in seafloor observatories

What we could have done better?

- Riser drilling - never did it
- Legacy data still will need to be transitioned (esp. paleontology)
- JANUS database – costly cumbersome, might better have been kept in academia
- Could have drilled into active subduction zone of a nonaccretionary convergent margin for investigating earthquake processes and cycling of constituents during subduction (would have utilized the stated max capability of ODP drilling)
- Establishing more observatories (ALL "Futures" documents state that monitoring will be key)
- Reorganization of the program was a major hiccup (change is good in and of itself)
- Abolishing of publication was a bold step, but has led to a loss of continuity and readership.

• PF-2

Scientific Achievements

Initiative II In situ monitoring of geologic processes:
fluid flow in the lithosphere, geochemical fluxes:

- Recycling of slab constituents at convergent plate margins is accomplished in large part via fluid flux. Drilling on numerous accretionary convergent margins showed that both diffuse and channelized flow is a major factor in the recycling of Leg125 demonstrated active fluid egress at serpentine seamounts on the Mariana system.
- Drilling on Leg 195 placed a perforated casing in a hole in the conduit region of a serpentine mud volcano and instrumented (thermistor string, pressure sensor and osmo-sampler) and CORKed the hole recovery will take place in Spring 2003.

Initiative III Exploring the deep crustal structure of Continental margins and oceanic crust: to penetrate hitherto inaccessible regions beneath the seafloor - to explore the underlying processes that form continents, rifts, oceanic crust, and economic sources, and to test models of active processes occurring at convergent margins.

- 103, 147, 173 (Iberia) transition from continent to ocean lithosphere and the serpentinization and emplacement of serpentine serpentinization process and exposure by faulting.
- amagmatic ridge segments 37, 45, 82, 109, 153 mantle character and serpentinization process serpentinization process and exposure by faulting.
- Hess Deep: mantle near fast spreading ridges nature of diking serpentinization process and exposure by faulting.
- Non-accretionary convergent margins drilling.
- first evidence of blueschist in situ and first evidence of direct transport of slab-derived fluids to seafloor (cycling of constituents in subduction factory).

How the field would be different if there had been no drilling:

- No idea of magnitude of the serpentinization process (back to Hess hypothesis of serpentinized mantle throughout the oceans (not so)).
- No stratigraphic control over the relationships among peridotite bodies in the continent-ocean transition zone, along amagmatic sections of mid-ocean ridges, and at the crust mantlke boundary region of fast-spreading ridges.
- Would still be a controversy over diapiric vs fault emplacement of serpentinite at the edges of continents, in amagmatic spreading segments and fracture zones - the stratigraphy provides the answer.
- No way to prove the serpentine mud volcanoes of convergent margins are just that and that the associated pore fluids are slab-derived.
- No proof that blueschist does form in convergent margins.

Comparative studies on the geological cross-section of the oceanic crust down to mantle peridotite.

---ophiolite problem---

In-situ and semi-in-situ geological cross sections on the seafloor.

preserved clear exposure of outcrop
stratification
geological background

Petrogenesis of ophiolites (associated effusive rocks), mantle peridotites

Combination of:

dredge hauls, ODP cores, submersible observations

A. Serpentinite seamounts in the Izu-Ogasawara-Mariana forearc
(dismembered ophiolites)
(modern view of the Cyprus ophiolite

B. Tonga forearc, Yap Trench inner wall
(modern analogue of the Oman Semail ophiolite)

C. Southern Mariana Trench inner wall

D. Parece Vela Basin mega-mullion

E. Tectonic window

F. Mariana Trough cliff

How Well Have We Done? *CM-1*

What we have done well
(or what could not have been done without ODP)

- **palaeoclimate/palaeoceanography**
  primary tool in the field, directly responsible for progression in methodologies and hence stimulating massive progress in studying ocean history
- **deep biosphere**
  serendipitous discovery of deep biosphere one of major achievements of ODP;
  N.B. broad implications not only for science but also for biotechnology industry
- **gas hydrates**
  ODP has been a prime tool with which to investigate gas hydrates, not only for scientific aspects but also in the potential as a natural resource and societal relevance
- **convergent margin processes**
  insights into origin and dynamics of intra-oceanic forearcs and (early) arc volcanism
  subduction factory : consideration of fluxes and quantification of processes
- **mid-ocean ridge processes**
  providing the direct evidence that challenges the Penrose layer-cake paradigm
  starting to demonstrate the profound control spreading rate plays in processes of crustal generation
- **methodologies**
  training of young/non-U.S. scientists and exposure to the cutting edge
  establishment of consistent and methodical procedures for dealing with core etc.
  rigour of publication procedures and schedules to maximise scientific returns (N.B. high rate of output compared to publications arising from many conventional cruises)
- **keeping all sections of the community happy**
  one of the principal successes of ODP has been to maintain the adaptibility of a single platform so as to be able to do a huge range of scientific experiments, (for the most part) uniting a highly diverse marine geological community
  maintaining this breadth is key to the success of IODP and any other future programme

What we could have done better

- **mid-ocean ridge processes**
  not enough legs scheduled to address even basic first-order questions posed in the Long Range Plan etc.
  little attempt to start natural laboratory experiments
- **technology development**
  lots of money spent by ODP/TAMU on schemes that never delivered, or else were axed or capped, e.g. diamond coring, hard-rock core orientation etc
  insufficient notice taken by ODP engineers of developments outside Gulf of Mexico???

Achievements of ODP *CM-2*

Mid-Ocean Ridge Processes

- ***challenging the consensus paradigm for ocean crust formation of the 1970s—80s(—90s): the regular layer cake (Penrose) crustal structure independent of spreading rate***

- ***direct equation of seismic layering with (ophiolite-based) lithostratigraphy***

- ***fundamental differences in crustal construction between slow- and fast-spreading ridges***

- ***small-scale heterogeneity of magmatic processes in lower crust at slow-spreading ridge (Hole 735B) — completely unlike ophiolite layered plutonic sections***

- ***complexity of hydrogeology***

- ***critical inter-relationships between tectonic, magmatic & hydrothermal (& biological) processes at all stages***

HOW WELL HAVE THE DRILLING PROGRAMS DONE?

CRUSTAL OBJECTIVES: Magma Generation and Crustal Construction Total Crustal Sections (Deep Crustal Sections) Zero Age Crust	WE HAVE FAILED (technology and spirit)
Hydrated Mantle LIPs	SOME SUCCESS (blessing of soft rocks)
HYDROTHERMAL SYSTEMS	VERY SUCCESSFUL (technology-enabled: CORKs)
TECTONIC OBJECTIVES:	
World Stress Map	FAILED – lack of interest
Dynamics of Forearc Evolution Fluids and Deformation in Subduction Settings Circulation in Continental Margins Seismicity and Fault Processes	VERY SUCCESSFUL combination of technology (need more), strong community, and commitment
GAS HYDRATES	VERY SUCCESSFUL Convergence of technology, commitment, and willingness to take risks

Conjugate Margin Studies Early Rifting History	MODERATELY SUCCESSFUL Limited by need for deeper drilling and commitment to longer time at hole
PALEOCEANOGRAPHIC PROCESSES: History of Ocean Circulation Response to Orbital Forcing Patterns of Evolution Natural Climate Variability at a Range of Scales and Biogeochemical Cycles Linkages to Tectonic Events	VERY SUCCESSFUL Have established global stratigraphies and new tools for resolving very high-resolution variability… Have established global linkages, lead and lags that provide direct insight into working climate systems
OLDER SECTIONS and EVENTS (K/T, anoxic, impact, etc)	MODERATELY SUCCESSFUL – getting better as recovery improves…still lacking proper tools and commitment
GLOBAL SEALEVEL HISTORY	BARELY SUCCESSFUL – lack of appropriate tools (and perhaps testable models) – need for mission specific platforms
UNEXPECTED SURPRISES	VERY SUCCESSFUL – deep biosphere, global correlations, dessication of Med, etc.

A DAY-TO-DAY DEMONSTRATION THAT A WELL-RUN INTERNATIONAL COLLABORATIVE SCIENTIFIC PROGRAM CAN BE A REMARKABLE SUCCESS

SCIENTIFIC ACHIEVEMENTS IN MY FIELD

WHAT IS MY FIELD???

GEOPHYSICAL PALEOCEANOGRAPHY???

Paleoceanography would be a very different field without the drilling programs (if it would exist at all). Our view of Earth history would be constrained to small high-resolution snippets of very recent history or very low-resolution records of the long-term history of ocean and climate conditions. The drilling program has allowed us to obtain a global picture of oceanographic and climatic changes at scales ranging from decadal to 100's of thousands of years. The program has fostered the development of a number of new tools that allow for the global correlation of a range of paleoceanographic proxies and in doing so has established new approaches to refining very high-resolution stratigraphic control that has produced new, global time-scales that have revolutionized our ability to understand the spatial and temporal linkages between components of the earth/ocean system. The continuous recovery offered by the drilling programs has also revolutionized our ability to use seismic data to extrapolate beyond and interpolate between drill holes. Given that industry holes tend to sample only a small percentage of the drilled section, the ODP approach, in combination with detailed laboratory logging and sampling, has provided unprecedented insight into the relationship between the seismic and the geologic record – particularly with respect to paleoceanographic change.

DO-1

How Well Have We Done?

High-resolution Neogene Paleoceanography and Paleoclimate:

Multiple offset holes and MST techniques have improved ability to acquire continuous sections. With 4 holes, continuous sections and sampling higher volume is possible (critical for high-resolution).

How could we have done better?

A minimum of 4 holes at each site should routine, allowing high-volume sampling of continuous sections.

More high-resolution (centennial-millenial) sites,
better spatial coverage, especially in tropics/subtropics.
Longer well-resolved, multiple proxy records (also requires better funding to work on existing material).

Technical needs:
- Improved MST/color scanner
- Improved/standardized digital camera
- Larger sed. lab, more lab facilities for shipboard analysis and sampling

Where would the science be without ODP?

No ODP ⇒ no long cores
Either poorly resolved (low sed rate) long records or well resolved short records

⇒ no high-resolution studies spanning several years glacial cycles;
aliasing

⇒ no knowledge of millennial-scale variability during previous interglacial,
last glacial in some locations

⇒ poor documentation of 40k-100k yr transition

⇒ poor documentation of ocean-cryosphere interactions

⇒ poor understanding of climate variability during altered boundary conditions
(e.g., tectonic and glacial)

Paleoceanographic Contributions that Required Scientific Drilling:

- Spatial and depth transects spanning continuously several Myr to address questions about evolution of Earth's climate with respect to changing boundary conditions. The roles of insolation, tectonics, deep ocean circulation, biogeochemical cycling. Evolution from 40kyr – 100 kyr cycles. High to low latitude linkages.

Legs 130 (OJP), 154 (Ceara Rise), 108 (E trop. Atl.), 114 (SubAA S. Atl.), 138 (ETP), 145 (N Pac.), 152/162* (N Atl.), 165* (Carib.), 167* (Calif. Margin), 172* (Bermuda Rise; BBOR), 175 (Benguela), 177* (S. Oc. Paleo.), 178 (AA), 181 (SW Pac.), 184* (SCS, 202* (SE Pac.)

*Has or will provide important insights on shorter time scales – characterize millennial variability during earlier time intervals.

- Mean ocean $\delta^{18}O$ change since the LGM was ~1‰ (Schrag et al., 1993, Leg 154, confirmed and refined on subsequent legs)
- Extending records from ultra-high-deposition-rate sites beyond that possible with piston cores, e.g., reaching the LGM, capturing a full glacial cycle (e.g., Leg 165 – 1002, Cariaco Basin, Leg 167 – 893, Santa Barbara Basin; Leg 178 – 1098, Palmer Deep)
- North Atlantic millennial scale climate variability during earlier peak interglacials (e.g., MIS 11), was persistently greater during glacial than interglacial times and occurred in the 40 kyr world (Leg 162)

For What Goals Might the Program Have Done Better and Why?

Understanding natural climate variability and the causes of rapid climate change (1996 ODP LRP Initiative):
Only a handful of ultra-high-resolution sites, records tend not to be very long (e.g., safety issues at SBB). Takes a long time to generate data at high resolution, funding is a problem. Few low latitude sites capture centennial-millennial resolution.

Achievements in the Field of Sediments and Ocean History

Essentially the entire pre-Quaternary aspect of paleoceanography, and much of the Quaternary science as well, would not be possible without DSDP, ODP, and the HPC-APC-XCB technology. This ranks with the strikingly clear demonstration of plate tectonics as the two greatest successes of the entire program.

It's hard to know where to start:

Orbital control of pelagic and hemipelagic sedimentation, thus paleoproductivity, oceanic and atmospheric circulation, climate, etc.

Millennial scale variability of ocean-wide, likely world-wide, climatic and oceanic processes

Tectonic control of longer term climate and oceanic changes
- Cenozoic climate, warm to cool – in steps

Oceanic record of continental variability, the land-sea links

Carbon cycles and paleo-CO_2
- Ocean anoxic events and broader implications thereof
- Sapropels
- Gas hydrates
- Estimates of past CO_2 concentrations

The nature and rate of evolution of the major microfossil groups

Geochronology in general

Sea level, passive margin architecture, ice volume

The reality of the deep biosphere

Understanding what really happened at the K/T and P/E boundaries and other boundary "events" – E/O, Cen/Tur, etc.

Resolving the atolls and guyots quandary

How Well Have We Done?

Success Stories

Ocean Crust

- Upper ocean crust revealed
- Porosity, fluid circulation in crust
- Massive sulphides (TAG, JdeF)

Paleoenvironment/Climate

- Orbital forcing
- Onset of glaciation
- Greenhouse / icehouse
- K/T

Margins

- Conjugate margins (eastern 1/2 N. Atl.)
- Convergent margin fluids
- Clathrate story

Special Bonus! - Connectivity

Technology

- Complete, undisturbed sediments
- Seismic observatories
- Packer technology
- Logging

Bummers

- Deep crustal penetration (technology)
- Zero-age crust (technology)

Jury's still out

- Seismic observatories (not much data yet)
- Conjugate margins (western 1/2 N. Atlantic undrilled)

Ocean Crust Achievements

- Upper 1/3 of ophiolite model confirmed
- Layer 2/3 ≠ petrologic boundary
- Porosity, permeability "gradient"
- Long-range hydraulic connectivity\
- Massive sulphides in situ

Without ODP:

- we would still be debating the validity of the ophiolite model,
- we would have no quantitative models of the hydrologic regime of oceanic crust,
- and we would have no way of sampling massive sulphides in-situ for comparison with on-land deposits.

How ODP Has Advanced Research in My Fields

Paleomagnetism: History of Earth s Magnetic Field Focus

- Largest number of paleomagnetists working on single program
- But paleomag was prime focus of only one leg
- Has had large impact, mainly by providing high-resolution records
- ODP has not revolutionized field, but without ODP progress would be slower, especially in high-resolution records
- Note: Magnetic susceptibility (environmental magnetism) has become paleoceanographic mainstay

Marine Geophysics

- ODP is the ground truth for many marine geophysics studies
- But very broad area, so impact diffuse
- Without ODP, we would know a lot less about marine geology

Gas Hydrate: LRP Theme

- ODP major impact on study of marine hydrate
- Without ODP, little progress on marine hydrates, BSR s
- Work mostly incomplete
    - Blake Ridge done and disseminated
    - Hydrate Ridge done summer 2002
    - Petroleum basin - problems interfacing with industry

Plate Tectonics / Geodynamics

- Not a focus area — many aspects of PT/G investigated as processes
- Like MGG, ODP collects critical data for many studies, diffuse impact
- ION observatories — huge ODP investment, but payoff still unclear
- Hotspot motions — Leg 197 and potential future legs
- Plate motions — ODP data play important role
- Without ODP, progress much slower in many areas

Shelf/Continental Margin Sedimentary Structure & Stability

- ODP provides data from deep margins
- But not many projects focusing on margins
- ODP has not been able to drill shelves effectively

WS- Scores

Theme	Score	Comment
COSOD-I		
Environmental Changes — Tectonic Driver	2	Few attempts to address; tends to be local
Environmental Changes — Orbital Driver	8	One of best ODP efforts; many legs targeting Neogene wiggles
Solid Earth Geochemical Cycles	4	Few done in much detail; W. Pac. Subduction factory
Total Crustal Sections	1	None complete; Hole 504B best effort
Hydothermal Fluid Circulation	6	Sedimented ridges
Fluids in Subduction Settings	8	Costa Rica, Nankai, Peru, Barbados
Fluid Circulation in Continental Margins	5	Few attempts; New Jersey
World Stress Map — Ocean Sites	2	A few measurements here and there; little synthesis, no master plan
Neogene Evolutionary Processes	5	Follows Neogene paleoceanography, but impact not evident
Evolutionary Effects of Catastrophic Events	4	K/T only effort? Most of focus on K/T elsewhere
Evolutionary Records in Jurassic/Cretaceous	4	A few attempts; Atolls & Guyots
COSOD-II		
Amplitude & Timing of Eustatic Sea Level	7	A few notable studies: New Jersey, Atolls & Guyots; Bahamas; many lessor efforts; lacks systematic approach
Deep Crustal Penetration	5	Hole 504B; 735B, not much else
Fluid Flow & Deformation/Seismicity	1	Not well addressed; SEIZE (Nankai) will go there
K/T Boundary	3	Some successes: Legs 165; 198; no systematic approach
LRP-96		
High Resolution Climate Changes	6	Milankovitch cycles well studied; Piecemeal at shorter wavelength
Sediments, Fluids, Bacteria as Agents of Change	2	Only now beginning; Leg 201
Gas Hydrate	5	Getting there but approach still filling out; Blake Ridge (mature), other sites immature or not done
LIPs	5	Limited approach; OJP and Kerguelen only, one leg apiece (182,192)
Global Seismic Networks	8	Large investment in holes: Legs 136, 179, 186, 191, 195, 200, 203; not much data yet
Transect through Ocean Crust	1	Only a few attempts: Leg 147, 176, Hole 504B, 206, but no systematic approach
LRP-96 Big Themes		
Understanding Natural Climate Variability and Causes of Rapid Climate Change	7	Natural climate variability widely investigated, one of big contributions of ODP; Causes less well understood
In Situ Monitoring of Geological Processes	3	Many CORKS, ACORKS, but lack of systematic approach; many CORK installations piggy-back on other programs; problem with US infrastructure
Margins and Oceanic Crust	3	Some starts, but not much deep drilling; awaits riser ship

DR-2 - Scores

Objectives Outlined in 1990 Long Range Plan

Objective	Grade	MASOD#
• Structure and composition of the crust and u per ntle		
1. Exploring the structure and composition of the lower oceanic crust and upper mantle	C	22,26
2. Magmatic processes associated with crustal accretion	C+	22
3. Intraplate volcanism	A-	21,25
4. Magmatism and geochemical fluxes at convergent margins	B+	24
• Dynamics, kinematics, and deformation of the hosphere		18
1. Dynamics of the oceanic crust and upper mantle	C-	18
2. Plate kinematics	C	15.25
3. Deformation processes at divergent margins	A-	19,20
4. Deformation processes at convergent margins	A-	3,24
5. Intraplate deformation	C	
. Fluid circulation in the lithosphere		
1. Hydrothermal processes associated with crustal accretion	B	4,23
2. Fluid processes at plate margins	B	3,9
• Cause and effect of oceanic and climatic variability		5
1. Short period climate change	A	6,8
2. Longer period changes	B	12,15,16
3. History of sea level	B+	14
4. Carbon cycle and paleoproductivity	A/B	2,9,10
5. Evolutionary biology	A-	7,9,13

Other MASOD not parsed:

Deep biosphere - #1
Methane hydrates - #2
Deep sea sands - #11
Carbonate platforms - # 17

Major Achievements of Scientific Ocean Drilling

The Deep Biosphere & the Subseafloor Ocean

- **Extensive Microbial Populations Beneath the Deep Seafloor.** Sampling deep within the marine sedimentary section and in basaltic crust has revealed what appears to be a diverse and often very active microbial ecosystem. Recent sampling efforts have demonstrated that uncontaminated samples of these microbes can be recovered for laboratory study.

- **Frozen Methane Reservoir Beneath the Seafloor.** Extensive reservoirs of gas hydrates beneath the seafloor have been sampled by ocean drilling, providing valuable information regarding their possible impacts on the global carbon budget, submarine slope stability and their resource potential. Currently, only ODP technology is capable of retrieving and maintaining gas hydrates samples from the subseafloor marine environment at *in situ* pressures.

- **Fluid Pressure and Discharge along Main Thrust Fault Zones.** Drilling through the décollement and related thrust faults at convergent plate boundaries has confirmed three-dimensional seismic observations that fluids actively flow along the slip zone. These fluids have distinctive geochemical signatures and are likely involved in the mechanics of thrust faulting (Figure 3).

- **Hydrothermal Fluid Flux in the Upper Oceanic Crust.** Drilling of marine sedimentary and crustal sections is beginning to determine the sources, pathways, compositions and fluxes of fluids associated with mineralization within active submarine hydrothermal systems, and the influence of fluid circulation on ocean chemistry, crustal alteration and the crustal biosphere.

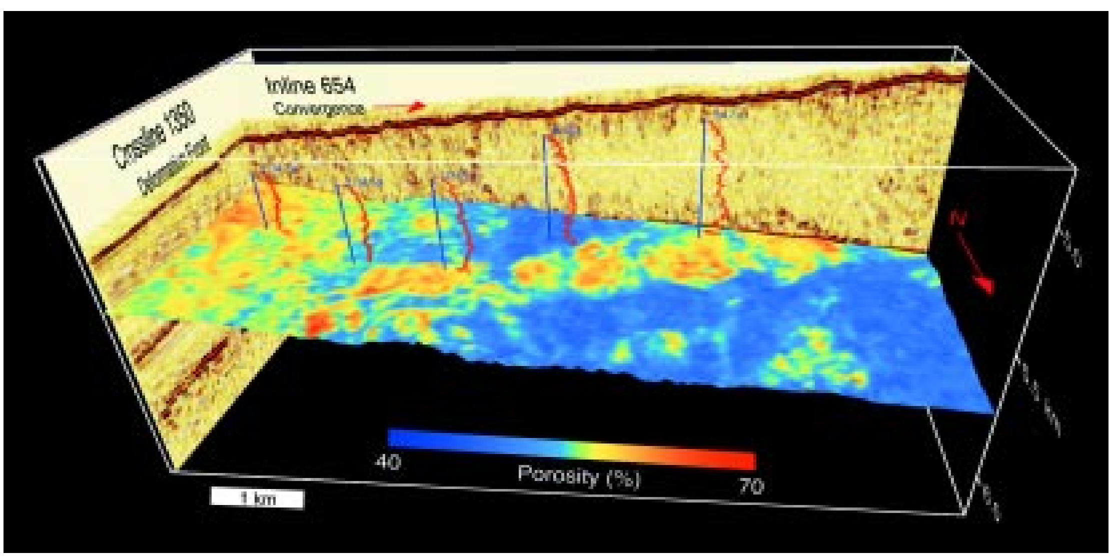


Figure 3. A perspective view of the Barbados Ridge three-dimensional seismic reflection data volume acquired in 1992. Crossline and inline profiles are shown on the east and south faces of the volume. The décollement surface at the base of the accretionary wedge is also shown, with colors representing porosity estimated from the seismic reflection data and calibrated with ODP Legs 156 and 171A logging-while-drilling logs. Vertical black lines are boreholes and red lines are corresponding density logs. High porosities, and presumably high fluid pressures, extend from the deformation front along a semi-continuous, NE trending zone interpreted to be a major fluid conduit. Figure reprinted from Bangs, N. L., T. H. Shipley, J. C. Moore, and G. F. Moore, *Jour. of Geophys. Res.*, 104, 20,399-20,414, 1999, Plate 4, p. 20,412.)

Figure 4. Beginning with the early days of DSDP, the recovery of core sample material has been a critical aspect of scientific ocean drilling. The recovery of a geologic section that is as complete as possible sets scientific ocean drilling apart from drilling conducted by the hydrocarbon exploration industry, and has resulted in the continued improvement of sampling and measurement technologies. In the early days of scientific ocean drilling, core assessment was almost exclusively based on visual inspection and discrete samples. As more advanced technologies have become available, we have progressed through hand-held devices for optical scanning and measurement of core sample properties (left) toward more sophisticated, continuous digital scans of the cores. In IODP this trend will continue, with more complete and detailed quantitative descriptions of the physical and chemical properties of cored materials. Photo courtesy of the Ocean Drilling Program.

Environmental Change, Processes and Effects

- **Development of the Field of Paleoceanography.** The near-global network of continuous stratigraphic sections obtained by ocean drilling is the foundation of the field of paleoceanography. Paleoceanographers study changes in the life, chemistry and surface, intermediate and deep circulation of the oceans through time. Paleoceanography provides the reference frame for nearly all other investigations of global environmental change (Figure 4).

- **Orbital Variability during the Cenozoic.** By linking the record of climatic variation preserved in deep-sea sediments to calculated variations in Earth's orbital parameters, scientists have demonstrated the role of orbital variability in driving climate change.

- **Development of High-Resolution Chronology.** Complete recovery of fossiliferous marine sedimentary sections has greatly facilitated linking Earth's geomagnetic polarity reversal history to evolutionary biotic changes and to the isotopic composition of the global ocean. Also of great significance is the orbitally tuned determination of time within marine sections, which has resulted in a greatly refined calibration of the Geomagnetic Polarity Time Scale back to 30 Ma. This newly calibrated, globally applicable time scale is crucial for determining rates of processes operating in every aspect of the terrestrial and marine geosciences.

- **Ocean Circulation Changes on Decadal to Millennial Time Scales.** The record preserved in marine sediments and recovered by ocean drilling has clearly demonstrated that deep- and surface-ocean circulation is variable on decadal to millennial time scales, confirming results from ice cores. This body of marine-based data has provided the evidence linking ocean-atmosphere-cryosphere interactions in and around the high-latitude North Atlantic to instabilities in thermohaline circulation, which propagates abrupt climate change to the farthest reaches of the globe.

- **Ocean Biogeochemical Cycles.** The concept of Earth System Science has evolved with detailed analyses of the relatively complete deep-sea sedimentary sections recovered by ocean drilling. These studies have revealed major changes in biogeochemical cycling through time, especially in the complex carbon cycle, resulting from evolutionary changes in the biota, tectonic changes, changes in climate, variations in seafloor hydrothermal activity and major alterations in ocean circulation.

- **Global Oceanic Anoxic Events.** Deep-sea sediments exhibit specific times when the surface water productivity of large areas of the ocean was unusually high. At these times, the global ocean developed zones of depleted oxygen content, and vast amounts of organic carbon were incorporated and preserved in marine sediments as black shales. Scientific ocean drilling has provided insights into oceanic anoxic events, which are a key to understanding short- and long-term perturbations in global climate and carbon cycling, as well as the timing of significant petroleum source-rock deposition (Figure 5).

- **Vast Sand Deposits in Deep Water.** Drilling has confirmed that the construction of deep-water fan systems, such as that off the Amazon River, are controlled largely by changes in sea level. The hydrocarbon industry is intensively exploring deep-water sand "plays" contained in the these fan systems for their proven economic potential.

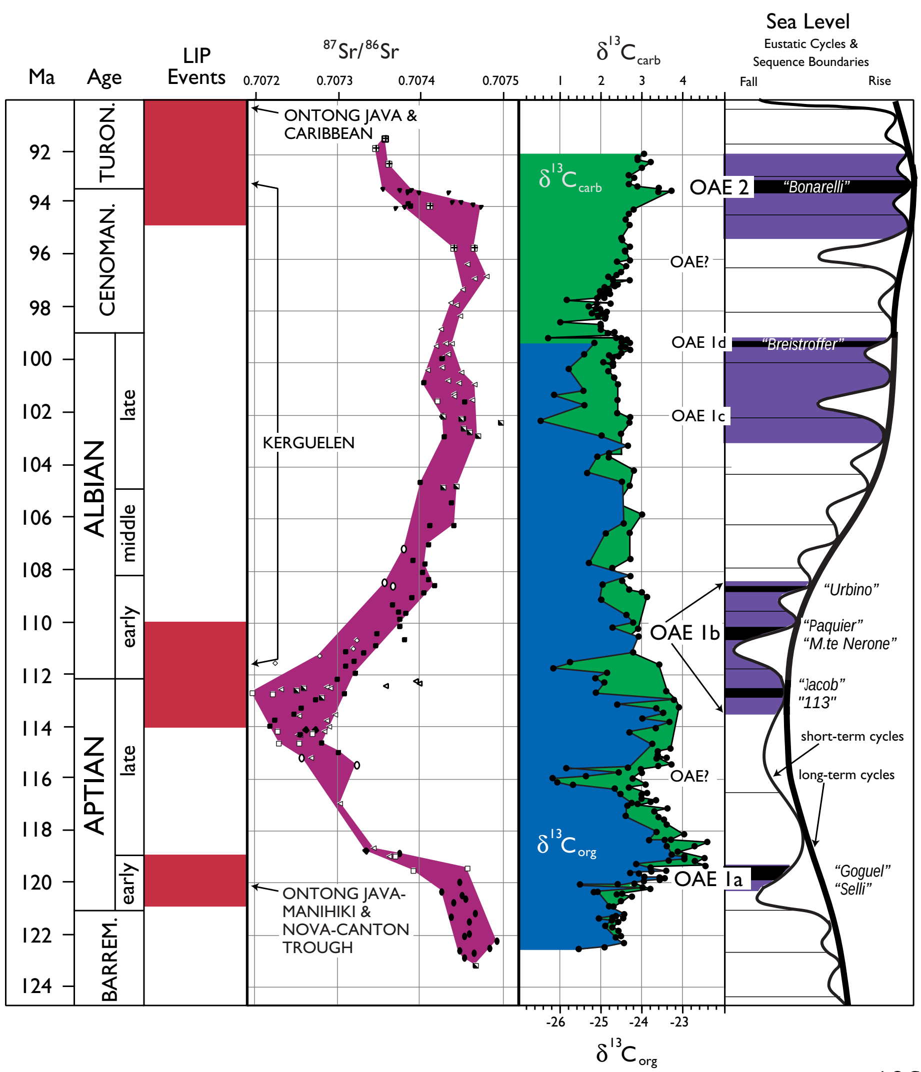


Figure 5. The mid-Cretaceous record of major black shales and Oceanic Anoxic Events (OAEs) in the context of the carbon isotopic record, changing global sea level and seawater chemistry, and emplacement history of Large Igneous Provinces (LIPs). Data are from both land-based sections and DSDP/ODP deep-sea cores. Organic matter production and preservation during the mid-Cretaceous appears to be closely related to submarine volcanism and hydrothermal activity, which may have stimulated productivity through the input of nutrients, particularly trace elements such as iron. Increased hydrothermal output during LIP emplacement may thus be linked to the three major OAEs. As a result of ocean drilling, the chrono-stratigraphic and biostratigraphic control on deep-sea sections has greatly improved, enabling better temporal resolution of geological processes. Figure compiled by Mark Leckie, University of Massachusetts, Amherst.

- **Timing of Ice-Sheet Development in Antarctica and the Arctic.** Drilling has revealed that Earth's entry into its current Ice Age extended over 50 m.y. and involved a complex history of uni-polar, then bi-polar, ice-sheet buildup. Ice streams reached the Antarctic seas as early as 40 Ma, but major ice-sheet formation on Antarctica apparently did not occur until some 25 m.y. later. Northern hemisphere ice sheets did not begin to develop until sometime after 15 Ma, and major northern hemisphere continental glaciations did not start until after 4 Ma. This extended period of climate change appears to have occurred in relatively rapid steps, each associated with major tectonic changes that affected both atmospheric and oceanic circulation.

- **Impact Events and Biological Evolution.** Drilling has established the global effects of a major bolide collision with Earth at approximately 65 Ma, including the extinction of as much as 90 percent of all planktonic organisms, and the subsequent repopulation of plankton in the global oceans from a few surviving species (Figure 6).

- **Sea-Level Change and Global Ice Volume.** Marine sediments recovered from shallow water areas have shown that important global sea-level change have occurred synchronously through at least the past 25 m.y., and that these changes can be matched to oxygen isotope records of climate produced from the deep sea. The new understanding of global eustacy has become a primary interpretative tool in unraveling the history of continental margin growth and in the search for hydrocarbons in margin settings.

- **Uplift of the Himalayas and the Tibetan Plateau.** Drilling in both the Indian and Pacific Oceans has helped to establish the timing of the Tibetan Plateau uplift, and to determine change in coastal upwelling, carbon sequestration, and regional and global climate associated with this tectonic event. Drilling results have shown that the onset and development of both the Indian and Asian monsoons are the result of climate change associated with this uplift.

- **Desiccation of the Mediterranean Ocean Basin.** Drilling demonstrated that the deep Mediterranean basins were sites of salt deposition as recently as ~5 Ma when flow into the basin was restricted and the level of the waters within the basin fell hundreds of meters through evaporation.

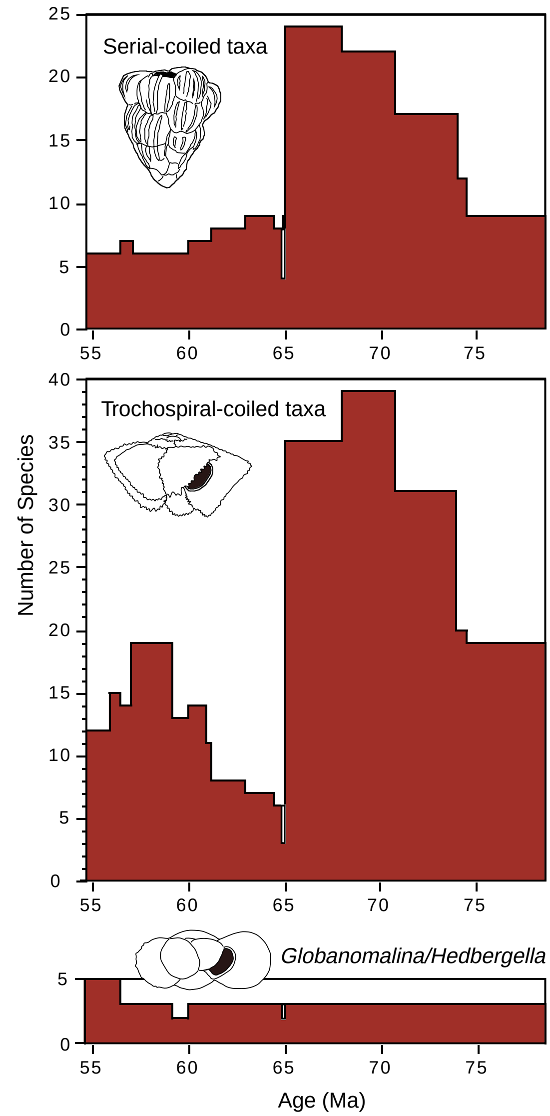


Figure 6. Species diversity across the Cretaceous-Tertiary boundary for three large groups of planktic foraminifera. Diversity increases rapidly during the ~5-10 m.y. before the boundary then plummets at the extinction. There is a modest rebound of diversity in the first 5 m.y. of the Paleocene. Species diversity reaches late Cretaceous values about 10-15 m.y. after the impact and mass extinction. Figure courtesy of Richard Norris, Woods Hole Oceanographic Institution.

- **Environmental Controls on Growth and Demise of Carbonate Platforms.** Drilling has illuminated the development and abrupt demise of large carbonate platforms along with their response to changing climate, sea level, oceanic circulation and gradual movement of the lithospheric plates.

Solid Earth Cycles & Geodynamics

- **Validation of Plate Tectonic Theory.** Dating of igneous basement rocks and overlying sediments recovered by scientific ocean drilling has demonstrated that the age of the oceanic crust increases systematically away from ridge crests, validating a fundamental prediction of plate tectonic theory.

- **Non-volcanic Passive Margin Evolution and Alpine Geology.** Drilling results and seismic data from the Iberian passive rifted margin have facilitated the development of new rifting and extensional deformation models of the continental crust where there is little attendant volcanism. These models imply nearly amagmatic thinning of the crust, with attendant widespread exposure of mantle rocks, a very different process than occurs on magma-rich margins. Rifted margin structure and stratigraphy strikingly similar to those found on the western Iberian margin have been identified in the Alps.

- **Large Igneous Provinces Associated with Continental Breakup: Volcanic Margins.** Drilling has established that seaward-dipping reflections identified on multichannel seismic reflection data from many passive continental margins consist of vast subaerial outpourings of lavas rapidly emplaced during the time of final continental separation and the initial formation of ocean basins. In some instances, enhanced melt production can be related to mantle plume heads thousands of kilometers wide, but other instances appear unrelated to known plumes (Figure 7).

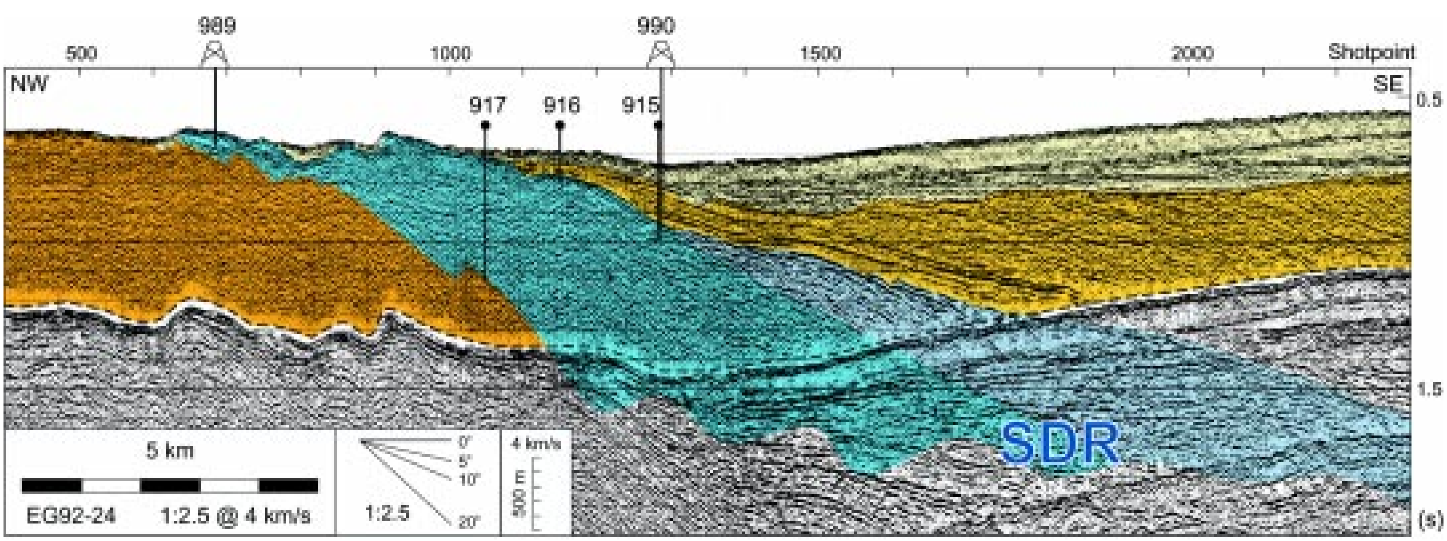


Figure 7. High-resolution seismic image of the inner part of the seaward-dipping reflections (blue) on the SE Greenland Margin. Subaerially emplaced basalts were recovered in five holes drilled during ODP Legs 152 and 163. The entire volcanic sequence was penetrated by Hole 917, bottoming in pre-breakup age sediments (orange). The average P-wave velocity of the basalt pile is 4 km/s, giving a 2.5 times vertical exaggeration of the profile. Figure courtesy of Sverre Planke, Volcanic Basin Petroleum Research, and is based on Planke, S., and E. Alvestad, 1999, Seismic volcanostratigraphy of the extrusive breakup complexes in the northeast Atlantic: Implications from ODP/DSDP drilling, *ODP Sci. Res.*, 163, 3-16.

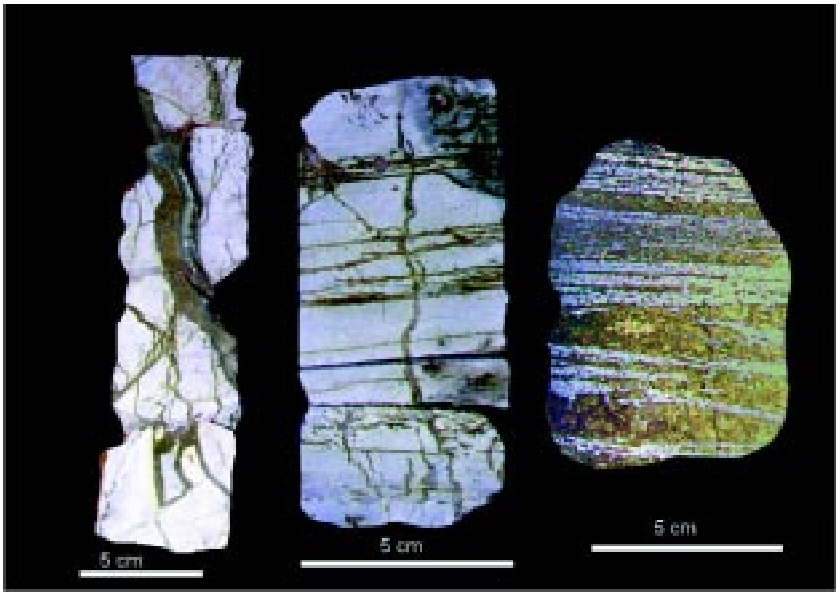


Figure 8. ODP cores recovered in a sedimented ridge crest in the Northeast Pacific Ocean are examples of feeder zone and deep copper zone mineralization below the Bent Hill massive sulfide deposit. Left: predominantly vertical crack-seal veins filled with pyrrhotite and Cu-Fe sulfide in altered turbiditic mudstone (856H 24R-1 50-70 cm, 134 mbsf). This style of mineralization is characteristic of the upper feeder zone underlying the center of the hydrothermal upflow zone. Center: less intense feeder zone mineralization underlying the south flank of the Bent Hill massive sulfide deposit. Mineralization consists of simple vertical and horizontal veins filled with pyrrhotite, sphalerite and Cu-Fe sulfide in graded fine sand to silt turbidites. Mineralization also occurs as subhorizontal replacement and disseminations along bedding planes (1035F 12R-2 43-55 cm, 112 mbsf). Right: Deep copper zone mineralization in cross-laminated turbiditic sandstone. Replacement of rock by Cu-Fe sulfide mimics original cross lamination; the matrix is extensively recrystallized to silver-gray colored chlorite and quartz (856H 31R-1, 99-107 cm, 202 mbsf). (Photo courtesy of Robert Zierenberg, University of California, Davis.)

- **Large Igneous Provinces: Origin of Oceanic Plateaus.** Drilling of two oceanic plateaus, which reach diameters of 2000 km and crustal thicknesses of 35 km, has established that their uppermost crust consists of basaltic lava flows with individual thicknesses of up to a few tens of meters. Major portions of these two plateaus were emplaced in geologically short time spans of a few million years or less, and may be the product of rising mantle plume "heads." Accretion of such plateaus to continental margins constitutes a form of continental growth by a mechanism not predicted by standard plate tectonic theory.

- **The Oceanic Crust.** To date, knowledge of the oceanic crust and shallow mantle has been largely restricted to geophysical observations, seafloor dredge samples and ophiolite studies. Limited ODP drilling into the oceanic mantle and principal crustal layers partly confirms models derived from these earlier studies, but also reveals major discrepancies that will change the estimates of the flux of heat and mass between mantle, crust and oceans over the last 250 million years. ODP drilling results have also challenged the assumption, critical to estimating the composition and volume of the oceanic crust, that seismic structure and igneous stratigraphy can be directly correlated.

- **Massive Sulfide Deposits.** Drilling into two actively forming volcanic- and sediment-hosted metal sulfide deposits sites has established that seafloor sulfide deposits are direct analogs with on-land massive sulfide deposits, in terms of ore-forming process, and with respect to size and grade of mineralizations. New insights gained by ocean drilling may aid in land-based mineral exploration (Figure 8).

- **Convergent Margin Tectonics and Subduction Recycling.** Strikingly different styles of convergent margin tectonics have been imaged by seismic data and constrained by scientific drilling, ranging from dominantly accretion to the overriding plate, to subduction of most trench sediment, to erosion at the base of the overriding plate. Drilling of down-going slabs and comparison with arc magmatism have provided the beginning of a quantitative understanding of subduction recycling.

- **Hot Spot Tracks on the Oceanic Crust.** Dating of sediment and basaltic rock recovered by drilling has documented a systematic age progression along several seafloor volcanic chains or ridges, verifying the hypothesis that these features were formed by relatively stable hot spots beneath the moving lithosphere. These drilling samples also provide the main observational evidence that hot spots are generated by deep mantle plumes. In addition, this work has helped establish the absolute movement of lithospheric plates with respect to the lower mantle. Paleomagnetic data from drilled seamounts demonstrate the motion of Atlantic versus Pacific hot spots with respect to each other.

- **Hydrated Mantle in Many Tectonic Environments.** Unexpected mantle-derived serpentinites at shallow crustal levels have been documented by drilling in a variety of tectonic settings from rifted continental margins to fore-arcs to spreading ridges. These results indicate that upper mantle alteration is much more pervasive than previously believed (Figure 9).

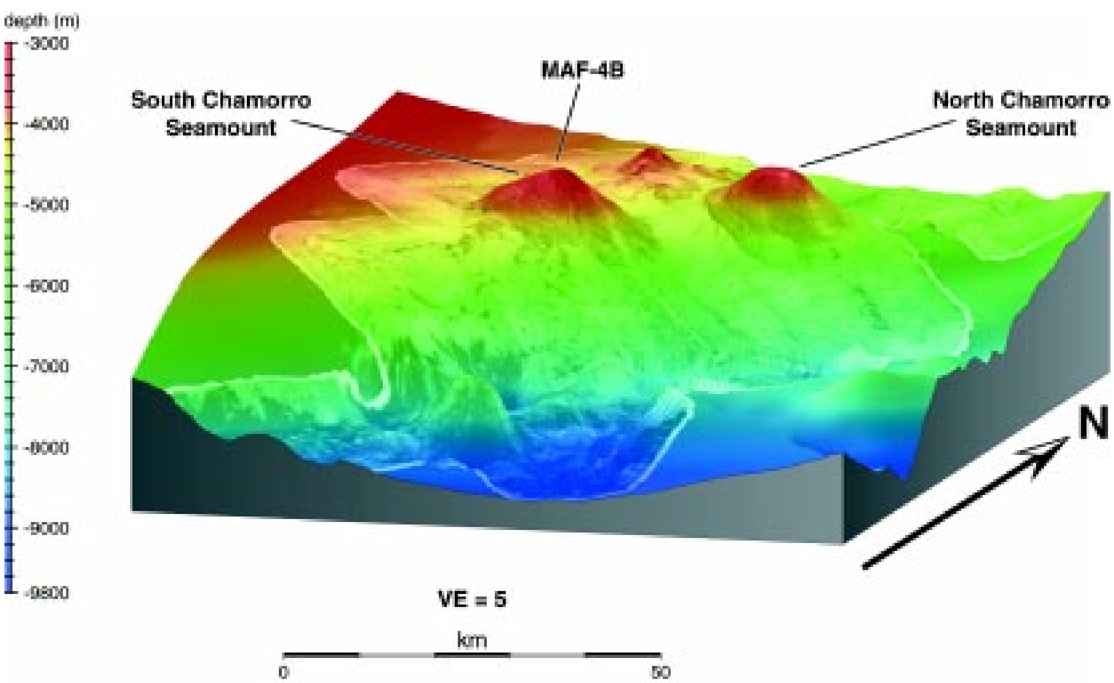
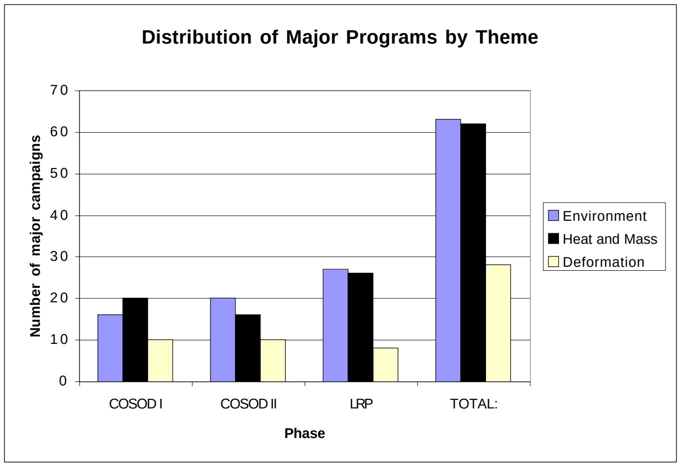


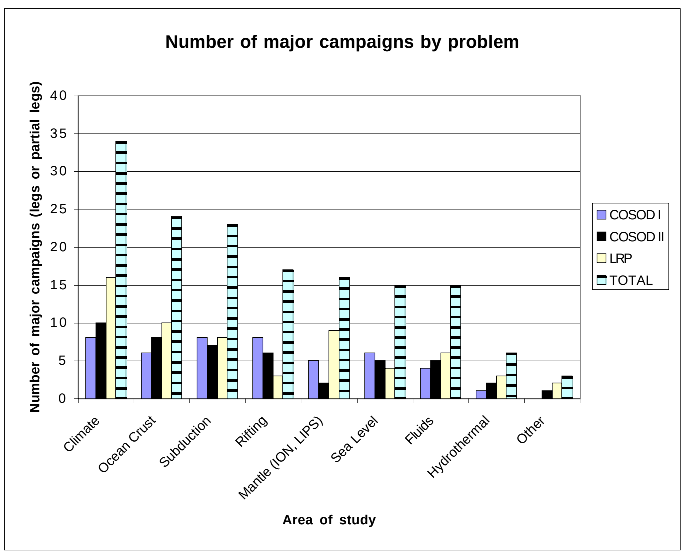
Figure 9. This side-scan sonar image, draped on bathymetry, shows several southern Mariana seamounts that are approximately 20 km in diameter and 2 km high. Most seamounts are basaltic volcanoes, however, ODP drilling along western Pacific forearcs has shown that edifices similar to ones shown in this image are mud volcanoes composed of fine-grained serpentine muds, fragments of serpentinized mantle derived from the overriding plate, and metamorphosed basalts from the subducted slab — materials derived from depths of up to 29 km. Pore fluids in cores from the active conduits have slab-derived geochemical signatures and support communities of organisms. The seamount in the foreground is currently active, and will be drilled by ODP in 2001; MAF-4B is one proposed drillsite. Figure courtesy of Patricia Fryer and Nathan Becker, University of Hawaii.

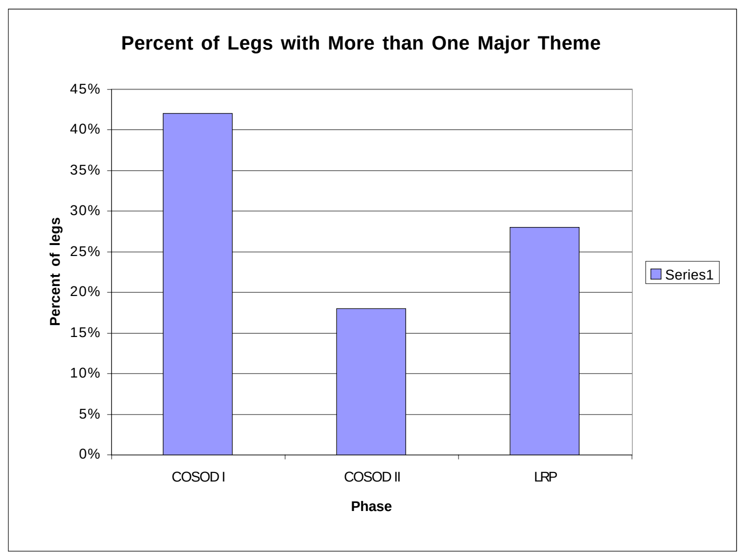
Some comparisons:
A "campaign" is a leg or a major theme of a leg; hence there are more "campaigns" counted per major phase of the program than there were legs
Legs or major parts of legs devoted to:

COSOD I	COSOD II	LRP
31 legs	38 legs	46 legs



	Environment	Heat and Mass	Deformation					
COSOD I	16	20	10					
COSOD II	20	16	10					
LRP	27	26	8					
TOTAL:	63	62	28					
	Climate	Ocean Crust	Subduction	Rifting	Mantle (ION, LIPS)	Sea Level	Fluids	Hydrothermal
COSOD I	8	6	8	8	5	6	4	1
COSOD II	10	8	7	6	2	5	5	2
LRP	16	10	8	3	9	4	6	3
TOTAL	34	24	23	17	16	15	15	6
Percent of legs with more than one major theme								
COSOD I	42%							
COSOD II	18%							
LRP	28%							





Areas of focus for ODP Legs, using the ODP LRP themes and initiatives

	SCIENTIFIC THEMES: Earth's Environment				Heat and Mass Transfer				Deformation/Earthquakes					INITIATIVES			
	Changing Climate	Sea Level	Sediments and fluids (gas hydrates, C cycle)	Deep Biosphere	Mantle Dynamics	Oceanic Crust	Hydrothermal Processes	Subduction zone mass blaance	Extensional boundaries	Translational Boundaries	Convergent boundaries and fluids	Earthquake mechanisms	Number of major thems in leg	natural Climate Variability and Rapid Climate Change	In-situ monitoring	Deep sturcutre of continental margins and crust	
Leg 100, Site 625: Gulf of Mexico																	
Leg 101, Sites 626-636: Bahamas		1	1										2				
Leg 102, Site 418: Bermuda Rise						1							1				
Leg 103, Sites 637-641: Galicia Margin									1				1				
Leg 104, Sites 642-644: Norwegian Sea									1				1				
Leg 105, Sites 645-647: Baffin Bay and Labrador Sea	1								1				2	1			
Leg 106, Sites 648-649: Mid-Atlantic Ridge						1							1				
Leg 107, Sites 650-656: Tyrrhenian Sea			1					1	1				3				
Leg 108, Sites 657-668: Eastern Tropical Atlantic	1												1	1			
Leg 109, Sites 669-670,395,648: Mid-Atlantic Ridge						1							1				
Leg 110, Sites 671-676: Northern Barbados Ridge											1		1				
Leg 111, Sites 677-678,504: Costa Rica Rift						1							1			1	
Leg 112, Sites 679-688: Peru Continental Margin								1			1		2				
Leg 113, Sites 689-697: Weddell Sea, Antarctica	1												1	1			
Leg 114, Sites 698-704: Subantarctic South Atlantic	1												1	1			
Leg 115, Sites 705-716: Mascarene Plateau					1								1				
Leg 116, Sites 717-719: Distal Bengal Fan	1	1											2				
Leg 117, Sites 720-731: Oman Margin	1												1	1			
Leg 118, Sites 732-735: Southwest Indian Ridge						1							1			1	
Leg 119, Sites 736-746: Kerguelen Plateau and Prydz Bay	1				1				1				3				
Leg 120, Sites 747-751: Central Kerguelen Plateau	1				1				1				3				
Leg 121, Sites 752-758: Broken Ridge and Ninetyeast Ridge					1								1				
Leg 122, Sites 759-764: Exmouth Plateau		1							1				2				
Leg 123, Sites 765-766: Argo Abyssal Plain and Exmouth		1							1				2				
Leg 124, Sites 767-771: Celebes and Sulu Seas								1					1				
Leg 124E, Sites 772-777: Philippine Sea/Engineering Tests								1					1				
Leg 125, Sites 778-786: Bonin/Mariana Region								1					1				
Leg 126, Sites 787-793: Izu-Bonin Arc-Trench System								1					1				
Leg 127, Sites 794-797: Japan Sea		1						1					2				
Leg 128, Sites 798-799,794: Japan Sea		1						1					2				
Leg 129, Sites 800-802: Old Pacific Crust						1	1						2				
Leg 130, Sites 803-807: Ontong Java Plateau	1				1								2	1			
Total in Area:	9	6	2	0	5	6	1	8	8	0	2	0	31	6	0	2	
Total in Theme:	17				20				10				42%	8			

	SCIENTIFIC THEMES													INITIATIVES			
	Earth's Environment				Heat and Mass Transfer				Deformation/Earthquakes								
	Changing Climate	Sea Level	Sediments and fluids (gas hydrates, C cycle)	Deep Biosphere	Mantle Dynamics	Oceanic Crust	Hydrothermal Processes	Subduction zone mass blaance	Extensional boundaries	Translational Boundaries	Convergent boundaries and fluids	Earthquake mechanisms	Number of major thems in leg	natural Climate Variability and Rapid Climate Change	In-situ monitoring	Deep sturcutre of continental margins and crust	
Leg 131, Site 808: Nankai Trough											1		1				
Leg 132, Sites 809-810: Western and Central Pacific						1							1				
Leg 133, Sites 811-826: Northeast Australian Margin		1							1				2				
Leg 134, Sites 827-833: Vanuatu, New Hebrides								1					1				
Leg 135, Sites 834-841: Lau Basin								1					1				
Leg 136, Sites 842-843: Hawaiian Arch					1								1		1		
Leg 137, Site 504: Costa Rica Rift						1							1			1	
Leg 138, Sites 844-854: Eastern Equatorial Pacific	1												1	1			
Leg 139, Sites 855-858: Middle Valley, Juan de Fuca Ridge							1						1				
Leg 140, Site 504: Costa Rica Rift						1							1			1	
Leg 141, Sites 859-863: Chile Triple Junction								1					1				
Leg 142, Site 864: East Pacific Rise/Engineering Tests						1							1				
Leg 143, Sites 865-870: Northwest Pacific Atolls and Guyots		1											1				
Leg 144, Sites 871-880,801: Northwest Pacific Atolls and		1											1				
Leg 145, Sites 881-887: North Pacific Transect	1												1	1			
Leg 146, Sites 888-893,857: Cascadia Margin			1								1		2				
Leg 147, Sites 894-895: Hess Deep Rift Valley						1							1				
Leg 148, Sites 896,504: Costa Rica Rift						1							1			1	
Leg 149, Sites 897-901: Iberia Abyssal Plain									1				1				
Leg 150, Sites 902-906: New Jersey Sea-Level Transect		1											1				
Leg 150X: New Jersey Coastal Plain		1											1				
Leg 151, Sites 907-913: North Atlantic-Arctic Gateways I	1												1				
Leg 152, Sites 914-919: East Greenland Margin									1				1	1			
Leg 153, Sites 920-924: Mid-Atlantic Ridge/Kane Fracture						1							1				
Leg 154, Sites 925-929: Ceara Rise	1												1	1			
Leg 155, Sites 930-946: Amazon Deep-Sea Fan	1												1	1			
Leg 156, Sites 947-949: Barbados Ridge Accretionary Prism								1			1		2		1		
Leg 157, Sites 950-956: Gran Canaria and Madeira Abyssal					1	1							2				
Leg 158, Site 957: TAG Hydrothermal Mound							1						1				
Leg 159T, Site 958: Eastern Canary Basin													0				
Leg 159, Sites 959-962: Cote D'Ivoire-Ghana Transform										1			1				
>Leg 160, Sites 963-973: Mediterranean I	1		1						1				3				
>Leg 161, Sites 974-979: Mediterranean II	1		1						1				3				
Leg 162, Sites 980-987: North Atlantic-Arctic Gateways II	1												1	1			
Leg 163, Sites 988-990: Southeast Greenland Margin									1				1				
Leg 164, Sites 991-997: Blake Ridge and Carolina Rise			1										1				
Leg 165, Sites 998-1002: Caribbean Ocean History	1		1										2				

	SCIENTIFIC THEMES													INITIATIVES			
	Earth's Environment				Heat and Mass Transfer				Deformation/Earthquakes								
	Changing Climate	Sea Level	Sediments and fluids (gas hydrates, C cycle)	Deep Biosphere	Mantle Dynamics	Oceanic Crust	Hydrothermal Processes	Subduction zone mass blaance	Extensional boundaries	Translational Boundaries	Convergent boundaries and fluids	Earthquake mechanisms	Number of major thems in leg	natural Climate Variability and Rapid Climate Change	In-situ monitoring	Deep sturcutre of continental margins and crust	
Leg 166, Sites 1003-1009, Bahamas Transect	1												1				
Total in Area:	10	5	5	0	2	8	2	4	6	1	3	0	38	6	2	3	
Total in Theme:	20				16				10				18%				
167 Ca margin	1												1	1			
168 E. Juan de Fuca hydrothermal							1						1		1		
169 Sed. Ridges II			1			1	1						3		1		
170 Costa Rica			1								1		2				
171A Barbados LWD			1								1		2				
171B Blake Nose	1												1	1			
172 NW Atlantic Sed Drifts	1												1	1			
173 Return to Iberia									1				1				
174 NJ Margin		1											1				
174B CORK 395A						1							1		1		
175 Benguela Current	1												1	1			
176 Return to 735B						1							1			1	
177 S. Ocean Paeloeoceanography	1												1	1			
178 Ant. Glacial History and Sea Level Change	1	1											2				
179 Hammer Drilling and NERO					1	1							2		1		
180 Woodlark Basin									1				1				
181 SW Pacific Gateways	1												1	1			
182 Aus. Bight-Cool Water Carbonates	1	1											2				
183 Kerguelen Plateau					1	1							2				
184 South China Sea	1												1	1			
185 Izu-Mariana Mass Balance						1		1					2				
186 W. Pac. Observatory-Japn Trench												1	1		1		
187 AAD-Mantle Reservoirs					1	1							2				
188 Prydz Bay	1												1	1			
189 Southern Gateways	1												1	1			
190 Nankai I			1								1		2				
191 W. Pacific ION, Engineering					1								1		1		
192 Ontong Java Plateau					1	1							2				
193 Manus Basin							1						1				
194 Marion Plateau		1											1				

	SCIENTIFIC THEMES													INITIATIVES			
	Earth's Environment				Heat and Mass Transfer				Deformation/Earthquakes								
	Changing Climate	Sea Level	Sediments and fluids (gas hydrates, C cycle)	Deep Biosphere	Mantle Dynamics	Oceanic Crust	Hydrothermal Processes	Subduction zone mass blaance	Extensional boundaries	Translational Boundaries	Convergent boundaries and fluids	Earthquake mechanisms	Number of major thems in leg	natural Climate Variability and Rapid Climate Change	In-situ monitoring	Deep sturcutre of continental margins and crust	
195 W. Pacific ION and Serp. Smt.					1			1					2		1		
196 Nankai II LWD, CORK			1					1			1		3				
197 Hotspots motion					1								1				
198 K-Paleogene Shatsky Rise	1												1	1			
199 Paleogene Equatorial Transect	1												1				
200 H2O Observatory					1								1		1		
201 Peru Margin Microbial				1									1				
Leg 202 SE Pac. Paleooceanography	1												1				
Leg 203 ION Equatorial Site					1								1		1		
Leg 204 Cascadia Gas hydrates			1										1				
Leg 205 Costa Rica Mass Balance								1					1		1		
Leg 206 Fast spreading crust						1							1			1	
Leg 207 Demerara Rise	1												1				
Leg 208 Walvis Ridge	1												1				
Leg 209 MAR Peridotite						1							1				
Leg 210 Newfoundland Margin									1				1			1	
Total in Area:	16	4	6	1	9	10	3	4	3	0	4	1	46	10	10	3	0
Total in Theme:	27				26				8				28%	23			
45																	

Major themes and Directions of the Ocean Drilling Program 1981 to 2003

ODP Long Range Plan Themes	LRP Focus Areas	COSOD II	COSOD I
Earth's Environment	Changing Climate	Orbitally driven oscillations (*global ice volume estimate from isotopes experiment*)	Ocean-atmosphere links to planetary forcing
		Global array of full Neogene sections	Ocean circulation history
		Long term records in Jurassic/ Cretaceous sections	
	Sea Level	Tecontically driven global changes (sea level) *(atoll carbonate record, passive margin stratigraphy experiment*)	Sedimentation response to sea level
			Mass balancing of sediments
	Sediments and fluids (gas hydrates, C cycle)	Fluides in Subduction settings (*instrumentation at decollement; 3-4 km penetration*)	Sedimentation in oxygen deficient oceans
		Circulation in continental margins	
	Deep Biosphere		
Heat and Mass Transfer	Mantle Dynamics	Global seismic observatories	
	Oceanic Crust	Solid earth geochemical cycles	Mid-ocean ridge construction
		Total crustal sections (*3 km hole to layer 3; 3 km hole in lower crust exposure*)	
	Hydrothermal Processes	Hydrothermal circulations	Dynamics o fhydrothermal systems
	Subduction zone mass blaance	Solid earth geochemical cycles	Volcanic arc history and structure
		Fluides in Subduction settings (*instrumentation at decollement; 3-4 km penetration*)	Forearc eveoluiton
Deformation/Earthquakes	Extensional boundaries	Conjugate passive margin drilling	Passive margin rifting
		Circulation in continental margins	
	Translational Boundaries		
	Convergent boundaries and fluids	Fluides in Subduction settings (*instrumentation at decollement; 3-4 km penetration*)	
	Earthquake mechanisms		
Initiatives:	Natural Climate Variabiity and Rapid Climate Change	Effects of environmental "catastropes" (K/T extinctions) (K-T gradient studies)	Microorganism evolution (not sure where this should fit)
	In-situ monitoring	Global seismic observatories	
	Deep structure of continental margins and crust	Total crustal sections (*3 km hole to layer 3; 3 km hole in lower crust exposure*)	
		World stress map--oceanic sites (*few hole pattern in one plate*)	
		Process-driven studies (hard to classify these)	
			Earth's magentic field history

COSOD (1981) – 12 (equal) top priority scientific objectives

Origin and Evolution of Oceanic Crust

1. Processes of magma generation and crustal construction at mid-ocean ridges
2. Configuration, chemistry and dynamics of hydrothermal systems "Natural laboratories" – arrays of holes, at least one deep

Tectonic Evolution of Continental Margins and Oceanic Crust

3. Early rifting history of passive continental margins
4. Dynamics of forearc evolution
5. Structure and volcanic history of island arcs

Origin and Evolution of Marine Sedimentary Sequences

6. Response of marine sedimentation to fluctuations in sea level
7. Sedimentation in oxygen-deficient oceans
8. Global mass balancing of sediments

Causes of Long-Term Changes in the Atmosphere, Oceans, Cryosphere, Biosphere, and Magnetic Field

9. History of ocean circulation
10. Response of atmosphere and oceans to variations of planetary orbits
11. Patterns of evolution of microorganisms
12. History of the earth's magnetic field

COSOD II (1987) – Working Groups and Drilling Objectives

Changes in the Global Environment (includes sea level)

Tectonically driven changes
Orbitally driven oscillations

Mantle-Crust Interactions

Solid Earth geochemical cycles
Total crustal sections
Process-driven studies

Fluid Circulation in the Crust and the Global Geochemical Budget

Hydrothermal circulation
Fluids in subduction settings
Circulation in continental margins

Stress and Deformation of the Lithosphere

World stress map – oceanic sites
Global seismic observatories
Conjugate passive margin drilling

Evolutionary Processes in Oceanic Communities

Global array of full Neogene sections
Effects of environmental "catastrophes" (e.g., K/T extinctions)
Long-term records in Jurassic/Cretaceous sections

COSOD II – 5 "Illustrative" Drilling Experiments

Amplitude and Timing of Changes in Cenozoic Global Sealevel

- atoll carbonate record
- passive margin stratigraphy
- global ice volume estimated from isotopic

Deep Crustal Section

- 3 km hole through layer 2 to top of layer 3
- similar depth hole in tectonic exposure of lower crust/mantle

Fluid Flow and the Cycle of Deformation and Seismicity in a Subduction Zone

- natural laboratory at selected subduction margin with permanently instrumented holes through decollement
- later, add 3-4 km deep penetration

Stress Pattern within an Oceanic Plate

- a few holes to establish stress pattern in example plate

Cretaceous/Tertiary Boundary

- global high-resolution records "along environmental and biogeographic gradients"

1996 ODP Long-Range Plan – Themes

Dynamics of Earth's Environment

Earth's changing climate
- High-resolution sites
- Spatial and depth transects

Causes and effects of sea-level change
- Siliciclastic passive margin sections
- Carbonate reefs and platforms deposited at sea level
- Pelagic carbonate oozes

Sediments, fluids, and bacteria as agents of change
- Carbon cycle – sites of strong perturbations
- Gas hydrates
- Fluid fluxes in representative tectonic settings
- Pilot Project: Earth's deep biosphere

Dynamics of Earth's Interior

Transfer of heat and materials to/from Earth's interior
- Mantle dynamics – LIPS, Global seismic observatories
- Oceanic crust
  - Tectonic exposures of lower crust and mantle
  - [DCS] drilling in zero-age crust
  - Complete crustal sections
- Hydrothermal processes and sulfide mineralization
- Mass balance and temporal variability at subduction zones

Deformation of lithosphere and earthquake processes
- Extensional margin drilling
- Convergent margin fault processes
- Earthquake mechanisms at subduction settings

1996 ODP Long-Range Plan – 3 Initiatives

I. Understanding natural climate variability and the causes of rapid climate change

II. In situ monitoring of geological processes

III. Exploring deep structure of continental margins and oceanic crust