JOIDES Executive Committee

29-30 January 2001, Kamakura, Japan

Agenda Book

Prepared by the JOIDES Office, RSMAS, 4600 Rickenbacker Causeway, Miami, FL 33149, U.S.A.

JOIDES EXECUTIVE COMMITTEE MEETING

KAMAKURA PRINCE HOTEL
KAMAKURA, JAPAN

29-30 JANUARY 2001

MEETING AGENDA

(as of 3 January 2001)

28 January 2001

ICE BREAKER **18:00-20:00**

29 January 2001 **09:00**

1. Welcome and Introduction		
1.1 Opening Remarks and Introduction of participants	(Harrison)	
1.2 Meeting logistics	(Taira)	
2. Approval of Agenda	(Harrison)	
3. Minutes and Matters Arising		
3.1 Approve June 2000 EXCOM Minutes	(Harrison)	**TAB 1**
4. NSF/ODP Council Reports		**TAB 2**
4.1 NSF management	(Malfait)	
4.2 ODP Council	(Malfait)	
5. Country and Consortium Reports (Read Only)		**TAB 3**
5.1 ECOD	(Comas)	
5.2 France	(Cannat)	
5.3 Germany	(Beiersdorf)	
5.4 Japan	(Taira)	
5.5 Pacific Rim Consortium	(Hiscott)	
5.6 The Peoples Republic of China	(Wang)	
5.7 United Kingdom	(Falvey)	
5.8 U.S.A	(Malfait/Farrell)	

COFFEE BREAK **10:10 – 10:30**

6. Management and Operations Reports

6.1 JOI		TAB 4
6.1.1 Draft Phase Out Plan for ODP Management & Ops. (EC Minutes, 27 June 2000. 00-2-3)	(Farrell)	
6.1.2 PEC-V Report – JOI response (EC Minutes, 27 June 2000. 00-2-6)	(Farrell)	
6.2 JOI/JOIDES. Options for maintenance of ODP database, JANUS database, core repositories and other ODP legacies (EC Minutes, 27 June 2000. 00-2-3)	(Farrell/Becker)	**TAB 5**
6.3 ODP Operations	(Fox)	**TAB 6**
6.4 LDEO Borehole Research Group	(Goldberg)	**TAB 7**
6.5 JOIDES Executive Committee		
6.5.1 Revision of terms of reference	(Harrison)	**TAB 8**
6.5.2 Distribution of agenda book electronically	(Harrison)	

LUNCH BREAK **12:00 – 13:30**

7. Relationships with Other Organizations		**TAB 9**
7.1 International Continental Drilling Program (ICDP)	(Mutter)	
7.2 Industry	(Beiersdorf)	
7.3 Other Scientific Initiatives	(Hay)	
7.4 Distance Learning	(Prior)	

8. IODP Planning		**TAB 10**
8.1 IWG	(Malfait/STA)	
8.2 OD21	(Taira)	
8.3 IPSC	(Taira)	

COFFEE **15:10 – 15:30**

8.4 NSF	(Malfait)
8.5 Europe	(Beiersdorf)
8.6 Others	(Others)
8.7 JOIDES Involvement	(Harrison)

ADJOURN **17:00**

ORI Reception **18:30-21:00**

30 JANUARY 2001 **09:00**

9. SCICOM Report **TAB 11**

9.1 Recent ODP achievements including Legs 190-193 (Becker)
9.2 Ship track for *JOIDES Resolution* through Sept. 2003 (Hay)
9.3 Proposal activity (Hay)
9.4 SCICOM Legacy Report (Becker, Hay)

COFFEE **10:10 – 10:30**

10. FY 2002 Science Plan and Budget **TAB 12**

10.1 FY 2002 Science Plan (Hay)
10.2 FY 2002 Budget (Farrell)

11. Public Affairs

11.1 EXCOM Public Affairs Committee Report
(EC Minutes, 27 June 2000. 00-2-4) (Orcutt)
11.2 JOI Public Affairs Report (Farrell)

12. Future Meetings and Other Business

12.1 June 2001, Oxford, UK (Falvey)
12.2 Other business

ADJOURN **12:00**

OTHER ACTIVITIES

30 January 2001

13:30-18:30
Afternoon Excursion on 30th (13:30-18:30): Mt. Hakone-The Natural History Museum of Kanagawa Prefecture.

18:30-20:30
Informal Sushi Dinner

31 January 2001

09:00-19:00
Kamakura Historic Site Excursion with visit to JAMSTEC

JOIDES EXECUTIVE COMMITTEE MEETING

29-30 January 2001

Kamakura Prince Hotel, Kamakura, Japan

Executive Committee - EXCOM

Chris Harrison (Chair)	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
Helmut Beiersdorf	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
Maria C. Comas	Instituto Andaluz de Ciencias de la Tierra, Universidad de Granada, Spain, (ECOD)
Robert Detrick	Woods Hole Oceanographic Institution, USA
David Falvey	British Geological Survey, United Kingdom
Richard Hiscott	Earth Sciences Dept., Memorial University of Newfoundland, Canada (PacRim)
Dennis Kent	Department of Geological Sciences, Rutgers University, USA
Roger Larson	Graduate School of Oceanography, University of Rhode Island, USA
John Mutter	Lamont-Doherty Earth Observatory, Columbia University, USA
Neil Opdyke	Department of Geological Sciences, University of Florida, USA
John Orcutt	Scripps Institution of Oceanography, University of California, San Diego, USA
David Prior	College of Geosciences, Texas A&M University, USA
Eli Silver	Earth Sciences Department, University of California, Santa Cruz, USA
Paul Stoffa	Institute for Geophysics, University of Texas at Austin, USA
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan

Associate Member Observers

Mathilde Cannat	Laboratoire de Pétrologie, Université Pierre et Marie Curie, Paris, France
Wang Zhixiong	Marine High Technology Bureau, Beijing, China

Guests from JOI BOG

G. Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State University, USA
J. Frederick Grassle	Inst. for Marine & Coastal Studies, Rutgers, The State University, New Brunswick
Arthur Nowell	School of Oceanography, University of Washington, USA
Robert Owen	Department of Geological Sciences, University of Michigan, USA
Barry Raleigh	SOEST, Univ. of Hawaii at Manoa, Honolulu, USA

Liaisons

Keir Becker	Rosenstiel School of Marine & Atmospheric Science, University of Miami, USA
Stephen R. Bohlen	Joint Oceanographic Institutions (JOI), Inc., USA
J. Paul Dauphin	National Science Foundation (NSF), USA
John Farrell	Joint Oceanographic Institutions (JOI), Inc., USA
Jeff Fox	Ocean Drilling Program (ODP), Texas A&M University, USA
David Goldberg	Lamont-Doherty Earth Observatory (LDEO), Columbia University, USA
Bruce Malfait	National Science Foundation (NSF), USA

Guests

John Fogarty	Joint Oceanographic Institutions (JOI), Inc., USA
William Hay	GEOMAR Research Center, University of Kiel, Germany
Yoshiro Miki	Japan Marine Science and Technology Center (JAMSTEC), Japan
Ted Moore	Department of Geological Sciences, University of Michigan, USA

JOIDES Office

Aleksandra Janik	Science Coordinator, RSMAS, University of Miami, USA
Elspeth Urquhart	International Liaison, RSMAS, University of Miami, USA

EXCOM (Kamakura) Meeting Guests

Yoichiro Otsuka	Director, Ocean and Earth Division, Ministry of Education, Culture, Sports, Science and Technology
Eigo Miyazaki	Special Staff, Ocean and Earth Division, Ministry of Education, Culture, Sports, Science and Technology
Masaya Fukuhama	Diputy Director, Ocean and Earth Division, Ministry of Education, Culture, Sports, Science and Technology
Hajimu Kinoshita	Executive Director, Japan Marine Science and Center (JAMSTEC), Japan
Kiyoshi Suyehiro	Director of Deep Sea Research Dept.,Japan Marine Science and Center(JAMSTEC), Japan
Takeo Tanaka	Manager of OD21 Program Dept., Japan Marine Science and Technology Cente(JAMSTEC), Japan
Kazuhiro Kitazawa	Adviser to President, Japan Marine Science and Center (JAMSTEC), Japan
Hiroshi Fujita	Director of OD21 Program Dept., Japan Marine Science and Technology Cente(JAMSTEC), Japan
Minoru Yamakawa	Adviser to Director, Japan Marine Science and Center (JAMSTEC), Japan

Stuff

Masanori Ienaga	Doctor course Student, Ocean Research Institute(ORI) ,The University of Tokyo, Japan
Hiroko Imoto	ODP Program Dept., Japan Marine Science and Technology Cente(JAMSTEC), Japan
Naoko Shiba	Ocean Research Institute(ORI) ,The University of Tokyo, Japan
Setsuko Tanaka	Ocean Research Institute(ORI) ,The University of Tokyo, Japan

EXCOM (Kamakura) Meeting Guests

Yoichiro Otsuka	Director, Ocean and Earth Division, Ministry of Education, Culture, Sports, Science and Technology
Eigo Miyazaki	Special Staff, Ocean and Earth Division, Ministry of Education, Culture, Sports, Science and Technology
Masaya Fukuhama	Diputy Director, Ocean and Earth Division, Ministry of Education, Culture, Sports, Science and Technology
Hajimu Kinoshita	Executive Director, Japan Marine Science and Center (JAMSTEC), Japan
Kiyoshi Suyehiro	Director of Deep Sea Research Dept.,Japan Marine Science and Center(JAMSTEC), Japan
Takeo Tanaka	Manager of OD21 Program Dept., Japan Marine Science and Technology Cente(JAMSTEC), Japan
Kazuhiro Kitazawa	Adviser to President, Japan Marine Science and Center (JAMSTEC), Japan
Hiroshi Fujita	Director of OD21 Program Dept., Japan Marine Science and Technology Cente(JAMSTEC), Japan
Minoru Yamakawa	Adviser to Director, Japan Marine Science and Center (JAMSTEC), Japan

Stuff

Masanori Ienaga	Doctor course Student, Ocean Research Institute(ORI) ,The University of Tokyo, Japan
Hiroko Imoto	ODP Program Dept., Japan Marine Science and Technology Cente(JAMSTEC), Japan
Naoko Shiba	Ocean Research Institute(ORI) ,The University of Tokyo, Japan
Setsuko Tanaka	Ocean Research Institute(ORI) ,The University of Tokyo, Japan

JOIDES EXECUTIVE COMMITTEE MEETING

TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS, USA
27-28 JUNE 2000

SUMMARY OF DRAFT MOTIONS

EXCOM Consensus 00-2-1: EXCOM approves the minutes of the February 2000 EXCOM and SCICOM joint meeting.

EXCOM Motion 00-2-2: EXCOM approves the minutes of its February 2000 meeting.

Harrison moved, Prior seconded; 14 in favor, 1 absent (Raleigh).

EXCOM Motion 00-2-3: EXCOM accepts the Initial Report on ODP-IODP Transition Planning. This report raises a number of important issues and provides a very useful framework for planning the phase-out of ODP and the establishment of IODP. EXCOM thanks John Orcutt, JOI and its subcontractors, and other members of the JOIDES community who assisted in preparing this document. Given the importance of addressing in a timely manner the many unresolved issues related to the ODP-IODP transition, EXCOM requests the following actions.

For review at the January 2001 EXCOM meeting:

- JOI will prepare a draft phase-out plan for ODP management and operations,
- JOI and the JOIDES Science Advisory Structure will develop options for the long-term maintenance of the ODP database, JANUS database, core repositories, and other ODP legacies.

For review at the June 2001 EXCOM meeting:

- SCICOM will develop a draft phase-out plan for the JOIDES Science Advisory Structure,
- JOI will develop a plan for producing an ODP final report, including an outline of the contents of the report, defined writing responsibilities, and a timeline for completing it.

Detrick moved, Orcutt seconded; 14 in favor, 1 absent (Raleigh).

EXCOM Motion 00-2-4: EXCOM recognizes the critical importance of public affairs and information during the coming three-year period and of the contracting of John Fogarty as JOI Public Affairs Counsel. EXCOM will thus reconstitute its Public Affairs Subcommittee. This subcommittee will consist of two U.S. and two non-U.S. EXCOM members, as well as the incoming SCICOM Chair, Keir Becker, and it will receive advice from the JOI Public Affairs Counsel. The Public Affairs Subcommittee will henceforth meet prior to and report at each EXCOM meeting.

Orcutt moved, Falvey seconded; 14 in favor, 1 absent (Raleigh).

EXCOM Motion 00-2-5: EXCOM requests SCICOM to develop an ODP legacy that includes, among other things, the following:

- 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 developments, from TEDCOM with help from LDEO and TAMU,
- a reply to the question "How well did ODP do in answering the questions originally asked?" This study should consider all phases of ODP (*i.e.*, it should extend back to COSOD 1).

EXCOM would like to receive a draft report on the ODP legacy at its June 2001 meeting.

Harrison moved, Comas seconded; 14 in favor, 1 absent (Raleigh).

EXCOM Consensus 00-2-6: EXCOM acknowledges receipt of the Fifth Performance Evaluation Committee (PEC-V) Report and the contractor and subcontractor responses. The PEC-V Report raises many issues that will require careful consideration. EXCOM members should review the report at the earliest opportunity and respond directly to JOI by 1 October 2000. JOI will produce a response for the January 2001 EXCOM meeting.

EXCOM Consensus 00-2-7: EXCOM thanks IPSC for the current version of the IODP Initial Science Plan, for the general principles of IODP management and scientific advice, for the suggestions on industry's role in IODP, and for the proposed plan for the transition from ODP to IODP. EXCOM realizes that various funding agencies must still address important questions regarding participation in the transitional and permanent IODP advisory structures. With that caveat in mind, EXCOM accepts the overall structure of the IPSC report and encourages IPSC to continue focusing these plans in the future.

EXCOM Consensus 00-2-8: EXCOM recognizes the scientific success of Legs 187-189.

EXCOM Motion 00-2-9: EXCOM approves the general operating area for the *JOIDES Resolution* until the end of the program, as outlined in SCICOM Motions 98-1-11 and 99-2-23.

Hiscott moved, Harrison seconded; 15 in favor.

EXCOM Motion 00-2-10: EXCOM endorses SCICOM Motion 00-1-5 regarding forwarding ODP proposals to IODP.

Harrison moved, Larson seconded; 14 in favor, 1 abstained (Falvey).

EXCOM Motion 00-2-11: EXCOM endorses the FY2001 budget and program plan.

Kent moved, Detrick seconded; 14 in favor, 1 absent (Raleigh).

EXCOM Motion 00-2-12: Upon review, EXCOM recognizes that ECOD and the PacRim Consortium have met the following three conditions of membership:

- achieved contributions equal to or greater than 5/6 of a full membership,
- made a firm commitment to work towards full membership,
- made significant progress towards full membership during the past year.

Accordingly, ECOD and the PacRim Consortium qualify for full privileges on committee and panel membership.

Prior moved, Falvey seconded; 12 in favor, 2 abstained (Comas, Hiscott), 1 absent (Raleigh).

EXCOM Consensus 00-2-13: EXCOM expresses strong gratitude to Helmut Beiersdorf at his last meeting as EXCOM Chair. During his tenure, Helmut has successfully steered ODP through a complex period of planning for the transition to IODP. His constructive views and proposals greatly improved the efficiency of the planning process. We all owe Helmut a great debt and hope he will continue his enthusiastic service as the EXCOM member from Germany for the upcoming years.

Presented by Comas

JOIDES EXECUTIVE COMMITTEE MEETING

TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS, USA

27-28 JUNE 2000

DRAFT MINUTES

TUESDAY 27 JUNE

1. Welcome and Introduction

Helmut Beiersdorf called the meeting to order promptly at 9:00 AM. He thanked David Prior and Sandy Samford for the meeting arrangements and JOI for hosting the opening reception. After the participants introduced themselves, Prior briefly explained the meeting logistics.

2. Approval of Agenda

Beiersdorf moved the IWG report forward on the agenda (from Item 8.5 to 8.1) and shifted the other reports under IODP Planning accordingly. He also noted that Eigo Miyazaki would give the OD21 status report instead of Hidekazu Tokuyama. The committee approved the agenda by consensus.

3. Minutes and Matters Arising

Beiersdorf asked for corrections to the minutes of the EXCOM and SCICOM joint meeting and the separate meeting of EXCOM in February 2000. No one requested any changes, and the committee approved the minutes of the joint meeting by consensus and the separate meeting by regular vote.

EXCOM Consensus 00-2-1: EXCOM approves the minutes of the February 2000 EXCOM and SCICOM joint meeting.

EXCOM Motion 00-2-2: EXCOM approves the minutes of its February 2000 meeting.

Harrison moved, Prior seconded; 14 in favor, 1 absent (Raleigh).

4. NSF and ODP Council Reports

Bruce Malfait reported on NSF and ODP Council matters. He noted that program funding for FY2000 included a carry over of $479K from 1999 from testing of the hammer drill. NSF also approved a transfer of almost $500K from lower-priority items to cover rising fuel and travel costs. On membership matters, ECOD and PacRim remain below full membership financially for 2001, with ESF at 99.5% and PacRim at 83.3%. The People's Republic of China will extend its MOU to 2003, and NSF has no active negotiations with additional partners. Malfait mentioned briefly the planned reorganization of JOI, as discussed below, and concluded by showing the agenda for the ODP Council meeting scheduled for Thursday.

5. Country and Consortium Reports

Beiersdorf accepted the country and consortium reports as read and asked for additions from the various representatives. Hiscott clarified that Canada has guaranteed to contribute a full 1/3 membership for the rest of the program. He added that Shiri Srivastava sent a letter to India in May inviting them to join PacRim, but they have not yet responded. Comas announced that Ireland has officially joined ECOD. She added that ESF would contribute 20K euros toward the European initiative on IODP planning and that two ESF representatives attended the recent meeting of the European Standing Committee on Ocean Drilling (ESCOD) in Keyworth, U.K. Beiersdorf congratulated Canada for their membership commitment and ECOD for recruiting Ireland as a new member.

Cannat reported that France has shown a strengthening commitment to IODP and may upgrade to full membership in the new program plus contribute ship time and support for the research structure. She described the European ODP forum in La Grande Motte, France, last April, as a success and added that France would also contribute funding to the European initiative on IODP planning. Cannat noted that ESCOD would meet again in September.

6. Management and Operations Reports

6.1 JOI

6.1.1 JOI restructuring

Raleigh reported briefly on the planned restructuring at JOI, wherein JOI and CORE will separate completely in terms of administrative staffs and presidents as of 1 October 2000, when Admiral Watkins steps down as JOI President. Furthermore, the new president of JOI will also serve as executive director.

6.1.2 Search for new JOI President/Executive Director

Raleigh reported that JOI has advertised the new combined position of president and executive director, with no decision pending on any candidate.

6.1.3 ODP-IODP transition plan

John Orcutt distributed his Initial Report on ODP/IODP Transition Planning to the committee. He identified the main challenges of the transition and outlined the responsibilities of individual organizations. The challenges include phasing out ODP, separating the shared presidency and administrative staff of JOI and CORE, responding to the expected request for proposals (RFP) from NSF to manage the U.S. non-riser vessel, and negotiating an agreement on the structure of IODP among members of the International Working Group (IWG).

Orcutt explained that JOI must develop an ODP phase-out plan and include it in the draft FY2003 program plan, due at NSF in early 2002, before knowing the identity of the successful bidder for the NSF component of IODP. The development of the phase-out plan will constitute a major task for JOI and its subcontractors and must include a comprehensive legacy document describing the accomplishments of ODP. Orcutt noted that the contract for the next JOIDES Office at RSMAS expires at the end of 2002, and JOI must eventually decide whether to extend the contract until the end of the program. The existing contract also stipulates that the next

JOIDES Office must prepare a JOIDES phase-out plan for inclusion in the FY2003 program plan.

TAMU has already compiled an initial draft phase-out plan, based on the assumptions that the last leg will end in a Gulf Coast port on 30 September 2003, many program functions will terminate in 2004, publications will finish in FY2007, and an organization will exist to accept the ODP legacy. Phase-out difficulties would increase for TAMU if IODP phases in late or has a different science operator. After 2004, TAMU would claim the same support as other core repositories. Orcutt recommended that TAMU should continue developing its phase-out plan and assist in developing the ODP legacy report. In addition, LDEO must develop phase-out plans for the Borehole Research Group and the Site Survey Data Bank. Orcutt urged all program entities to assess the potential impact of losing personnel as ODP nears its end and prepare plans to mitigate that impact.

In regard to IODP planning efforts, Orcutt reported that the second draft of the Initial Science Plan has undergone review and IPSC has begun working on the third draft. IPSC has also proposed an IODP science advisory structure, a management structure, and a budget timeline, and it should continue to work with IWG to refine these models. The plan for the interim science advisory structure (iSAS) looks good, though perhaps overly optimistic in its implementation schedule. Orcutt considered it essential to have a common advisory structure for both riser and non-riser drilling. He also stressed the need for more accurate and comprehensive budget estimates for IODP.

Orcutt noted that ODP would schedule the last drilling legs in August 2001, while the NSF schedule calls for awarding a contract for the IODP non-riser vessel by October 2003, modifying and outfitting the vessel during 2004, and initiating field operations at the beginning of FY2005. Orcutt advised that JOIDES should consider how to maintain community involvement in scientific ocean drilling during the transition period. He suggested holding additional meetings like CONCORD and COMPLEX, continuing to accept and evaluate drilling proposals, and involving scientists in the interim IODP advisory structure. Orcutt also noted that although JOIDES established IPSC as a subcommittee of SCICOM and other JOIDES panels such as TEDCOM and SciMP have provided direct advice to IPSC, none of the JOIDES Mandates and Terms of Reference specifically address giving advice to IODP. He suggested that the ODP council and IWG should determine the appropriate role of JOIDES panels and committees in planning the transition to IODP.

Beiersdorf commended Orcutt for producing his report. EXCOM viewed the expected RFP from NSF for the non-riser vessel and the bilateral agreement between NSF and STA concerning the IODP infrastructure as critical factors in developing a transition plan. Beiersdorf noted that it would take time and a dedicated effort to develop the transition plan. Malfait commended TAMU for its initiative in developing a phase-out plan and asked if a timetable exists for the other subcontractors. Farrell replied that JOI and the other subcontractors had not yet constructed such a timetable. Detrick prepared a draft motion focusing on the phase-out issues addressable by JOI or JOIDES. He envisioned an expansion of the efforts already begun by

TAMU to include the other subcontractors and noted that JOI must discuss with NSF the assumptions made by TAMU.

EXCOM Motion 00-2-3: EXCOM accepts the Initial Report on ODP-IODP Transition Planning. This report raises a number of important issues and provides a very useful framework for planning the phase-out of ODP and the establishment of IODP. EXCOM thanks John Orcutt, JOI and its subcontractors, and other members of the JOIDES community who assisted in preparing this document. Given the importance of addressing in a timely manner the many unresolved issues related to the ODP-IODP transition, EXCOM requests the following actions.

For review at the January 2001 EXCOM meeting:

- JOI will prepare a draft phase-out plan for ODP management and operations,
- JOI and the JOIDES Science Advisory Structure will develop options for the long-term maintenance of the ODP database, JANUS database, core repositories, and other ODP legacies.

For review at the June 2001 EXCOM meeting:

- SCICOM will develop a draft phase-out plan for the JOIDES Science Advisory Structure,
- JOI will develop a plan for producing an ODP final report, including an outline of the contents of the report, defined writing responsibilities, and a timeline for completing it.

Detrick moved, Orcutt seconded; 14 in favor, 1 absent (Raleigh).

6.1.4 The JOIDES Office 2001-2002

Farrell outlined the steps taken in selecting the Rosenstiel School of Marine & Atmospheric Sciences (RSMAS) at the University of Miami as the site of the next JOIDES Office. JOI and RSMAS signed a contract in May 2000, the phase-in begins in October 2000, and an International Liaison from the U.K. will work in the office. Farrell confirmed that an option exists for extending the contract with RSMAS through the end of the program.

Beiersdorf wished the next JOIDES Office the best of luck and offered the assistance of the current JOIDES Office in helping them get started.

6.1.5 Public affairs update

Farrell explained the need for public affairs efforts and outlined the strategy that EXCOM endorsed in 1997. He introduced the new ODP public affairs counsel, John Fogarty. Farrell listed several recent activities, including the Capitol Hill Seminar Series, promotional booths at large scientific meetings, and port calls in Hobart and Yokohama. He also noted that a Dallas newspaper reporter received the AGU science journalism award for an article on ODP drilling on Kerguelen Plateau.

For the short-term strategy, TAMU will hire a public information coordinator, and Fogarty will help ODP establish contacts and develop leads for popular press articles. Admiral Watkins will speak at the National Press Club in September, broadcast live by National Public Radio and perhaps C-SPAN. Fogarty added that national and international press organizations would attend the National Press Club lecture. Other plans include sending science writers or editors on

the *JOIDES Resolution*, developing news stories on gas hydrates and microbiology, and continuing with efforts for educational outreach, promotional booths and brochures, and town meetings.

The long-term strategy involves fully implementing the JOI/TAMU memorandum from Admiral Watkins, engaging the EXCOM public affairs subcommittee, developing local press coverage and a program of hometown media interviews, and arranging press meetings with TAMU staff scientists. Farrell also proposed involving the international program offices in the public affairs effort.

Beiersdorf welcomed Fogarty onboard. Fogarty expressed enthusiasm for getting involved and said that he would gladly accept input from individual scientists for getting the message across. He suggested that we need ways to remind people through repetition about the importance of ODP, aiming not only at the public, but also at Congress and the scientific community. Cannat asked whether Fogarty could compile a press book for access on the web. He replied that he would definitely consider that possibility.

Mutter wondered how best to guide and measure the effectiveness of public affairs efforts. Farrell stated that JOI tries to focus its efforts on education. He added that he did not know of any good ways to measure effectiveness, but he had heard positive anecdotes about the Capitol Hill lecture series. Falvey said that indirect feedback can provide a good measure of effectiveness, but without investing more money in public affairs, we have to take our success on faith.

Orcutt presented a draft motion for reviving the public affairs subcommittee of EXCOM. Beiersdorf said that the new subcommittee should include the remaining members of the former subcommittee, himself and Orcutt, plus two additional members. Prior and Falvey volunteered, and Orcutt agreed to act as chair.

EXCOM Motion 00-2-4: EXCOM recognizes the critical importance of public affairs and information during the coming three-year period and of the contracting of John Fogarty as JOI Public Affairs Counsel. EXCOM will thus reconstitute its Public Affairs Subcommittee. This subcommittee will consist of two U.S. and two non-U.S. EXCOM members, as well as the incoming SCICOM Chair, Keir Becker, and it will receive advice from the JOI Public Affairs Counsel. The Public Affairs Subcommittee will henceforth meet prior to and report at each EXCOM meeting.

Orcutt moved, Falvey seconded; 14 in favor, 1 absent (Raleigh).

6.1.6 IWG Support Office status report

Farrell reported that NSF and STA co-sponsor the IWG Support Office established at JOI in November 1999 to assist IWG and IPSC in planning for IODP. He explained that representatives from JOI and JAMSTEC staff the office.

6.1.7 PEC-V Report

Farrell outlined the terms of reference for the Fifth Performance Evaluation Committee (PEC-V) and listed the membership appointed by JOI. He characterized the report as very positive

overall, though it cited a few concerns, including the lack of funds to complete certain goals of the LRP and the lack of a summary of accomplishments. The PEC-V Report also expressed concern over the effect on the scientific community of a potential drilling hiatus between programs and suggested that management arrangements might hinder the transition.

Farrell discussed the response of JOI and the subcontractors to the PEC-V Report and noted that the expected drilling hiatus would probably not exceed 12-18 months. He also said that contracts control most aspects of management. Farrell explained that JOI and TAMU had begun compiling a database of ODP-related scientific papers. This project could form a solid basis for documenting the ODP legacy through products such as a new "Greatest Hits" volume, a series of collected reprints, an accomplishments document comparing results to the LRP, an electronic database for research and educational purposes, and other public affairs documents.

Beiersdorf noted that the JOIDES Terms of Reference obligate EXCOM to request a report on ODP accomplishments. Harrison presented the following motion regarding the ODP legacy.

EXCOM Motion 00-2-5: EXCOM requests SCICOM to develop an ODP legacy that includes, among other things, the following:

- 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 developments, from TEDCOM with help from LDEO and TAMU,
- a reply to the question "How well did ODP do in answering the questions originally asked?" This study should consider all phases of ODP (*i.e.*, it should extend back to COSOD 1).

EXCOM would like to receive a draft report on the ODP legacy at its June 2001 meeting.

Harrison moved, Comas seconded; 14 in favor, 1 absent (Raleigh).

Falvey presented the following response to the PEC-V report.

EXCOM Consensus 00-2-6: EXCOM acknowledges receipt of the Fifth Performance Evaluation Committee (PEC-V) Report and the contractor and subcontractor responses. The PEC-V Report raises many issues that will require careful consideration. EXCOM members should review the report at the earliest opportunity and respond directly to JOI by 1 October 2000. JOI will produce a response for the January 2001 EXCOM meeting.

6.2 ODP Operations

Fox reported on the active-heave-compensation (AHC) project, describing the objectives, long-term goals, and limitations of the system. He showed time-series data comparing the magnitude of drill-string motion with passive and active heave compensation. He also showed data comparing drill-string RPM and torque in both modes. AHC effectively de-couples the drill string from ship heave, but the data collected so far remain insufficient to judge the impact of AHC on core recovery and quality. Fox then discussed some of the remaining issues, including

the hook load problem and the need to change the position of the load pins. ODP engineers continue to improve the interference and chaffing problems with the hydraulic lines suspended in the derrick. Beiersdorf commended TAMU for its progress in heave compensation. Hay added that TEDCOM also felt very pleased with the results.

Fox discussed the deep biosphere program and noted that issues have arisen concerning proprietary rights to biological materials sampled by ODP. Chemical and pharmaceutical industries have already approached ODP informally in that regard. Fox recommended that JOI and TAMU review the existing contractual constraints and develop a draft policy consistent with existing guidelines for EXCOM to review at its next meeting. Malfait noted that the existing contract between NSF and JOI covers patent and data-rights policies and guarantees a royalty-free license to all partners.

6.3 LDEO Borehole Research Group

Goldberg reported that the Borehole Research Group (BRG) completed a number of logging operations since dry-dock, including the ANODRIL/MWD test. He showed weight-on-bit data from Leg 188 and said that Leg 189 used Sagan software for core-log integration, with real-time display of logging data in the sedimentology lab. Goldberg noted that BRG succeeded in logging the reference site on Leg 190 and will use the GR tool on Leg 191. He also mentioned that BRG has started planning for the phase-out in FY2004-2007.

In other activities, the log database now includes all conventional log data available online, an IESX pilot study of seismic-log integration will use data from Legs 194 and 196, and SciMP has begun reviewing the guidelines for submitting digital seismic data. Goldberg added that BRG would continue collaborating with GFZ in Potsdam in FY2000-2001 to link meta-data from the ICDP and ODP log databases. In addition, AAPG has published a Log Image Atlas on CD-ROM including eighteen examples from ODP, and DOSECC has expressed interest in using ODP heave test techniques (*e.g.*, Leg 185) on alternate platforms.

Beiersdorf expressed pleasure on behalf of EXCOM for the work of the Borehole Research Group.

7. Relationships with Other Organizations

7.1 International Continental Scientific Drilling Program (ICDP)

Hay reported on JOIDES relations with ICDP and actions taken in response to EXCOM Consensus 00-1-9. Ulrich Harms of ICDP attended the SSEPs meeting in Cambridge and plans to attend the SCICOM meeting in Halifax. The SCICOM liaison could not attend the ICDP meeting in Merida, Mexico because of illness. TEDCOM met with ICDP officials in May at the GeoForschungsZentrum (GFZ) in Potsdam, Germany. Hay noted that continental drilling has gained momentum since a slow start in the 1970's and 80's. He also said that much of the continental drilling program involves paleoclimatic studies of lake sediments.

Orcutt noted that the SAFOD (San Andreas Fault Observatory at Depth) hole, an ICDP project, has many goals in common with SEIZE and suggested that we could benefit from more communication on that front. Fox noted that SAFOD used language almost identical to ours to

market their program to the same funding agencies. He viewed it as unfortunate that we did not take an integrated approach. Mutter noted that an integrated approach would present a much more powerful stance toward the funding agencies.

7.2 Industry

Hay reviewed the status of JOIDES links to industry, noting that industry scientists comprise 20% of the JOIDES advisory structure, excluding EXCOM. JOI had previously submitted a proposal to the Energy and Geoscience Institute at the University of Utah for migrating data from the South Atlantic region into the JANUS database. This project has since stopped, though EGI has other projects planned or underway for the South Atlantic region. Hay noted that IGCP Project 381 for South Atlantic Mesozoic Correlations and the ODSN project at the University of Bremen had provided similar information at no cost to industry.

Hay reported that industry, government, and academic geologists met in New Orleans on 16 April 2000 under the auspices of the Gulf Coast Section of SEPM, just before the AAPG/SEPM Annual Meetings. This meeting may result in the submission to JOIDES of a major proposal for a joint venture with industry. In addition, the JOI/USSSP workshop "Cooperation in Scientific Drilling" (second Houston workshop), held on 15-16 October 1999, resulted in several new drilling proposals submitted to the program. One proposal raised the possibility that petroleum companies with lease areas offshore Canada might try to count contributions to scientific drilling as part of their government-required expenditures. Hay also found that at least two other active proposals in the JOIDES system involve industry geologists, and many other proposals probably use industry seismic data.

Mutter asked how the proposed scheme would work for offsetting of exploration costs in Canada. Hiscott described it as a slow, delicate process because all companies would have to agree to make a joint request to spend monies on regional geologic studies. Industry executives and government regulators do not yet fully understand the issue, and he doubted that JOIDES would receive a preliminary proposal before next year. Moore also identified this as a delicate problem, but worth working on because it could pay off in terms of developing a general model for how to deal with industry in other countries. Beiersdorf stated that science must clearly drive any industry-academia drilling proposals in ODP and IODP. Mutter added that the pharmaceutical industry has already made advance overtures and we should not overlook the problem of how to address that issue.

8. IODP Planning

8.1 IWG

Purdy listed the IWG membership as of May 2000 and summarized the activities at the previous IWG meeting in February. He highlighted the accomplishment of establishing an international review process for the IODP plan developed by IPSC. IWG also agreed on the documenting principles for establishing IODP, or the precursors to MOUs, in terms of the program, drilling platforms, membership, and implementation. This agreement would aid in identifying the next level of commitment to IWG and IODP. Purdy previewed the agenda of the August IWG meeting in Tokyo. IPSC would give a status report and IWG would review the timelines with

regard to the national budget processes of its members. Purdy expected IWG to approve the terms of reference and membership of the international review committee for the IPSC plan and endorse some or all of the documenting principles.

Falvey asked about the status of the bilateral agreement between NSF and STA/JAMSTEC. Purdy responded that the timetable calls for reaching an agreement by October 2002. Comas noted that the IWG membership shown by Purdy included the European Commission, but the group of twelve countries that submitted a letter of intent could not accept having only one representative on IWG. Purdy replied that IWG would discuss that issue at its next meeting.

8.2 Status of OD21

Miyazaki referred to the formal joint statement issued by the STA minister and NSF director regarding IODP planning. He cited the participation of STA officials at recent IODP planning meetings and noted that the Japanese science advisory committee for OD21 held meetings in February and June 2000.

Miyazaki reported that the construction contract of the riser vessel began in March 2000 with continuing detailed design studies. Sea trials should begin in mid 2003, delivery of the vessel should occur in early 2004, and planning for the shakedown cruise has begun. Larson asked where the riser ship would be built. Miyazaki replied that the hull would be constructed in Okayama and the rest in Nagasaki.

8.3 IPSC activities

Moore encouraged everyone to respond to the CDC report via the questionnaire posted on the IODP website. He reported that the Initial Science Plan has developed mostly on schedule, with the scientific content complete and only a few additional parts needed. The membership of the IODP Science Advisory Structure should reflect the overall balance of membership in the program. Its guiding principles emphasize the need for establishing detailed planning groups well in advance for each riser site.

To foster a closer relationship with industry, the new advisory structure may also include an Industrial Liaison panel that would focus on the oil industry and on gaining access to industry seismic data. Moore cited the past success of ODP in attracting industry scientists to serve on JOIDES advisory panels. As a strategy for IODP, he proposed seeking advice from professional societies and developing industry contacts with upper-level management, grass-roots researchers, and government-lease oversight boards. Upper-level management in industry must endorse the science of IODP and assure company participation. IPSC has made progress on that front through contact with the AAPG corporate liaison committee, and the president of AAPG, Ray Thomasson, reported on IODP to the European Association of Geoscientists and Engineers (EAGE).

Moore then discussed the transition to IODP, noting that the phase-in of the interim advisory structure (iSAS) should begin in late 2001, with the equivalents of SCICOM, SSEPs, and SSP needed for proposal evaluation. He suggested that JOIDES and iSAS panels and committees should hold overlapping meetings during the transition phase. In general, panel membership should change as little as possible such that the overall size of individual panels would remain

near the present level. IWG guidelines would govern representative rights, based on responses to the request for commitment to IODP. Japan and the U.S. would fill, in equal numbers, the panel positions not filled by other program partners.

Beiersdorf said that the work of the advisory system must rest entirely on the goodwill and cooperation of all parties involved. He noted that the current LRP includes a Phase IV, but the funding agencies had decided not to pay for it in ODP. Nonetheless, this plan already has the approval of the ODP Council. Larson proposed approving the IPSC plans and the committee agreed by consensus.

EXCOM Consensus 00-2-7: EXCOM thanks IPSC for the current version of the IODP Initial Science Plan, the general principles of IODP management and scientific advice, the suggestions on industry's role in IODP, and the proposed plan for the transition from ODP to IODP. EXCOM realizes that various funding agencies must still address important questions regarding participation in the transitional and permanent IODP advisory structures. With that caveat in mind, EXCOM accepts the overall structure of the IPSC report and encourages IPSC to continue focusing these plans in the future.

8.4 U.S. NSF plans

Malfait reported that NSF had received the Conceptual Design Committee (CDC) report and forwarded it to IPSC for international comment. He showed a draft model of international arrangements for IODP, with separate MOUs for implementation and participation. Malfait also noted several other items discussed already in other reports.

8.5 European initiative

Falvey described the membership and mandate of the European Science Coordination Group for Ocean Drilling (ESCOD). This group will refine the science issues and priorities for European participation in IODP, using the ODP LRP and the IPSC Science Plan as starting points. ESCOD will also pursue technological options and address other aspects of the new program, and it has taken a solid first step by appointing Alister Skinner as Technical Coordinator. Skinner will consult widely on a range of issues, including technology and relations with European industry, and he will define the options for European contributions to IODP. The current European ODP funding agencies have agreed to support the Technical Coordinator for one year, and ESCOD will submit a proposal to the EC for extended funding. The EC has already agreed to host an ESCOD workshop later this year in Brussels. Falvey described the changing face of European science, noting that the European Union (EU) wishes to get involved in international science, and the European Commission (EC) has the money for international science. Big science such as IODP may require the involvement and support of the EC.

Orcutt inquired about the membership of ESCOD. Falvey explained that it includes the four European EXCOM and SCICOM members plus other invitees. Farrell asked whether ESCOD has any links with IWG and IPSC. Falvey said no, and Beiersdorf noted that the ESCOD members participate in JOIDES but otherwise have no association with IODP. Cannat mentioned that representatives from the European funding agencies have attended most of the ESCOD meetings.

Moore stated that he could not see the scientific community involved in the ESCOD organization. Falvey replied that the report from the ESCOD meeting in Strasbourg addresses science. Moore said that he had heard criticism of that report as a science document. Comas stated that ESCOD has the same science plan as IODP, perhaps with a few different preferences, but the problem for ESCOD centers more on securing funding. Moore asked whether each European country intends to write an accompanying document to the IODP Science Plan, emphasizing particular elements of interest. Beiersdorf expected that to happen and emphasized the consistency between the plans of ESCOD and IODP. He also noted that European industry scientists would want to know about the objectives of the new program before joining any industrial liaison group.

Beiersdorf inquired about plans for community involvement by other international program members. Harrison asked about the possibility of holding a town meeting at a European convention. Beiersdorf suggested as an appropriate venue the next meeting of the European Union of Geosciences (EUG), scheduled for 8-12 April 2001 in Strasbourg, France, and Cannat agreed.

WEDNESDAY 28 JUNE 9:00

9. SCICOM Report

9.1 Achievements on Legs 187-189

Hay reported on the scientific achievements of Legs 187-189.

Leg 187 (Australia-Antarctic Discordance) used shipboard chemistry to distinguish between Indian and Pacific type crust.

Leg 188 (Prydz Bay) identified the onset of glaciation in this sector of East Antarctica as having occurred at the Eocene-Oligocene boundary (34Ma).

Leg 189 (Tasman Rise) documented the final separation of the Tasmanian block from Antarctica as having occurred at 34 Ma.

Hay also reported on recent ODP articles in *Science* and *Nature*.

EXCOM Consensus 00-2-8: EXCOM recognizes the scientific success of Legs 187-189.

9.2 Ship track for *JOIDES Resolution* through September 2003

Hay noted that SCICOM Motions 98-1-11 and 99-2-23 describe the ship track until the end of the program in deliberately vague terms to allow SCICOM maximum freedom in planning, though the latter motion specifies that the *JOIDES Resolution* will spend some time in the Atlantic during 2002.

EXCOM Motion 00-2-9: EXCOM approves the general operating area for the *JOIDES Resolution* until the end of the program, as outlined in SCICOM Motions 98-1-11 and 99-2-23.

Hiscott moved, Harrison seconded; 15 in favor.

9.3 Proposal activity

Hay reported that the JOIDES Office had received a nearly constant number of proposals over each of the past three submission deadlines. Proponents have one more chance to submit a proposal requiring external review and get it on the schedule. Hay asked EXCOM to endorse SCICOM Motion 00-1-5 as follows:

SCICOM Motion 00-1-5: SCICOM recommends that EXCOM make every effort to ensure that active ODP proposals carry forward to IODP, with SSEP groupings and SCICOM rankings clearly reported. SCICOM recommends that these documents form a basis for initial programming in IODP.

Detrick wondered how to encourage people to continue submitting proposals for the next program. Harrison suggested that the *JOIDES Journal* should publicize the opportunity for proponents to continue submitting proposals. Moore identified the most important factor as the need to establish the structure of the new program. Orcutt expressed concern that the timetable for starting the interim advisory committees appears too far in the future to give confidence to proponents. Larson noted the need to establish iSCICOM and iSSEP by the fall of next year. Purdy believed that it would not take long for IWG to settle these issues.

EXCOM Motion 00-2-10: EXCOM endorses SCICOM Motion 00-1-5 regarding forwarding ODP proposals to IODP.

Harrison moved, Larson seconded; 14 in favor, 1 abstained (Falvey).

10. FY2001 Science Plan and Budget

10.1 FY2001 Science Plan

Hay presented the operations schedule through Leg 199 and explained the need to postpone Leg 198 (Gas Hydrates) to a more favorable weather window. He noted that plans are being made to work out the details of this schedule change.

10.2 FY2001 budget

Farrell presented the FY2001 budget and explained the budget process. He noted that 77% of the funding goes to fulfill direct leg-based requirements, and he identified the risks of budgeting fuel at the historical average cost of $200/Mt and of not refurbishing spare drill pipe. Farrell then showed the individual budgets for Legs 192-199 and made a comparison of FY1999-2001 budgets on a programmatic basis. He also noted that the program had received external funding of approximately $500K during FY2000 from JAMSTEC, for development of the advanced diamond core barrel, and from DOE and NSF through the Life in Extreme Environments (LExEn) program. The latter grant made it possible to equip the microbiology laboratory on board the *JOIDES Resolution*.

Kent asked about the details of refurbishment and about contamination of cores using unrefurbished pipe. Fox explained that pipe refurbishment entails cleaning, coating, and inspection for wear and stress, and it requires an investment of $180-200K in pipe worth three to four times that much. He also said that ODP probably would not use the pipe in question before the end of program unless we lose a lot of pipe.

Beiersdorf said that the program might have to reconsider some of the proposed activities if anything unexpected or drastic occurs. Harrison noted that the legs in FY2001 are relatively expensive. Farrell stated that some are more expensive than the recent average, and some less. Fox added that technical innovations and improved capabilities have probably increased the average cost of legs in recent years.

EXCOM Motion 00-2-11: EXCOM endorses the FY2001 budget and program plan.

Kent moved, Detrick seconded; 14 in favor, 1 absent (Raleigh).

11. Review of Membership Status

Beiersdorf noted that ECOD and the PacRim consortium, in response to EXCOM Motions 98-2-8 and 99-1-4, had each submitted a brief report, included in the agenda book, concerning their efforts to return to the financial level of full contributing members.

Comas assured the committee that ECOD would continue trying to obtain the remaining 0.5% of a full contribution for 2001. Hiscott summarized the progress of PacRim. Since last year, when Chinese Taipei cut its contribution to 1/12 membership and Canada faced uncertainty about maintaining its 1/3 membership, Canada has now committed firmly to a 1/3 level and Korea has considered increasing its membership to 1/6.

The committee agreed that ECOD and the PacRim Consortium had clearly demonstrated an effort to achieve full membership.

EXCOM Motion 00-2-12: Upon review, EXCOM recognizes that ECOD and the PacRim Consortium have met the following three conditions of membership:

- achieved contributions equal to or greater than 5/6 of a full membership,
- made a firm commitment to work towards full membership,
- made significant progress towards full membership during the past year.

Accordingly, ECOD and the PacRim Consortium qualify for full privileges on committee and panel membership.

Prior moved, Falvey seconded; 12 in favor, 2 abstained (Comas, Hiscott), 1 absent (Raleigh).

12. Future Meetings and Other Business

12.1 Next Meeting

Japan will host the next EXCOM meeting on 29-30 January 2001 at the Kanaya Hotel in Nikko City. Tokuyama presented a proposed schedule of events. Participants should plan to arrive on 27 January at Narita airport. They will travel to Nikko City by charter bus on 28 January. Participants from abroad will return to Narita airport on 31 January, or they may tour Kamakura and visit JAMSTEC on 31 January - 1 February, staying at the Kamakura Prince Hotel.

12.2 Summer Meeting, 2001

The U.K. will host the next summer EXCOM meeting, tentatively scheduled for 25-26 June 2001, in Oxford. Beiersdorf asked Falvey to contact Jim Briden for details about accommodations. Malfait noted that IWG has no plans to meet in the UK in June. Purdy said

that the date of the IWG meeting had been fixed based on John Lawton's schedule, but the location had not yet been set.

12.3 Other business

EXCOM Consensus 00-2-13: EXCOM expresses strong gratitude to Helmut Beiersdorf at his last meeting as EXCOM Chair. During his tenure, Helmut has successfully steered ODP through a complex period of planning for the transition to IODP. His constructive views and proposals greatly improved the efficiency of the planning process. We all owe Helmut a great debt and hope he will continue his enthusiastic service as the EXCOM member from Germany for the upcoming years.

Presented by Comas

Beiersdorf thanked Prior for the excellent meeting services and reception. The meeting adjourned at 11:35 AM.

ODP MANAGEMENT

The FY 2001 ODP Program Plan (1 October 2000 to 30 September 2001) has been approved at a budget level of $46,122,845. As presented, these funds are expected to cover remaining support for Leg 192, full support for Legs 193 to 198, and initial support for Leg 199 which spans the FY 2001 – FY 2002 transition. The budget has been increased slightly above the original $46.1M target level to provide initial support for planning long-term ODP data archiving and transitioning of the JANUS database system to IODP. Although NSF approved the plan as presented, concerns were raised on the limited funds identified for items such as fuel, drilling supplies inventory, and maintenance of equipment. It is expected that JOI and its contractors will report on the status of funding and problems for drilling operations – particularly the continuing high costs of fuel. To help offset costs of fueling, NSF has directly purchased fuel at three port calls in Guam using funds that would normally flow directly to JOI and then Texas A&M under the prime contract. These direct purchases have saved the Program approximately $150,000 that would have been charged as tax by the government of Guam. Funding of the Program Plan is complete through April, with timely funding of the remaining budget contingent on timely payment of international membership fees. NSF will supply approximately 64% of Program Operations costs for FY 2001 with the remaining 36% to be provided by international contributions.

JOI has submitted data on program operations for FY 2000 that are required by NSF under the Government Performance Results Act. The data show only minimal down time for Program operations. As of late November JOI has failed to provide a revision of the ODP Policy manual, which is required under the terms of the prime contract.

ODP COUNCIL

The ODP Council has not met since College Station in June of 2000. In College Station the Council heard a report from Barry Raleigh on JOI corporate management and changes and discussed events associated with the departure of Kate Moran as ODP Program Director at JOI, as well as the process (now completed successfully) to hire the new JOI President. Other issues discussed included: 1) the status of PACRIM and ESF Consortia; 2) concerns with available funds to meet requirements of the FY 2001 Program Plan; 3) general responses to initial presentation of Program phase-out plans and the PEC V Report; and 4) a presentation on the status of IPSC planning for IODP. In closed session, the Council also reviewed financial audit data for the international contribution account at NSF. The next meeting of the Council will be held in conjunction with the June 2001 EXCOM meeting. Program phase-out (as identified in the JOI plan) will be a primary topic of discussion.

FISCAL YEAR 2001 ODP BUDGET

OCTOBER 1, 2000 $46,122,845

U.S. =	$	29,422,845
INT. =	$	16,700,000

INT.MEMBERS

U.K.	$	2,950,000
GERMANY	$	2,950,000
JAPAN	$	2,950,000
PACRIM	$	2,458,000
ESF	$	2,935,000
FRANCE	$	1,966,000
CHINA	$	491,000

FALL 2000

FUEL AND DAYRATE SHORTFALL = $1,338,527

2000 RESIDUAL FUNDS =	$	706,918
NSF FUEL PURCHASE - NOV	$	469,728
NSF FUEL PURCHASE - MARCH	$	470,000
TOTAL =	$	1,646,646

JANUARY 2001

PROGRAM BUDGET = $ 46,521,644

Division of Ocean Scie[illegible] front office staff

Donald Heinrichs, Interim Division Director
Aliceann Phelps, Administrative Officer
Dottie Cudmore, Financial Operations Specialist
Anne Tenney, Staff Associate
Shannon Hughes, Division Secretary
Elana Khanna, Clerk

Marine Geosciences Section (Donald Heinrichs, Acting Head)

Ocean Drilling Program
- Bruce Malfait, Program Director
- Paul Dauphin, Assoc. Prog Director
- Aprile Roberson, Prog. Assistant
- *Brad Clement, Assoc. Prog Director*
- *Assoc. Prog Director vacancy*

Marine Geology and Geophysics Program
- Bil Haq, Program Director
- Dave Epp, Program Director
- Dick Poore, Program Director
- Rodey Batiza, Program Director
- Lisa Crowder, Science Assistant
- Margaret Weller, Senior Prog Asst

Integrative Programs Section (Michael Reeve, Head)

Kandy Binkley, Asst. Program Director
Holly Smith, Science Asst
Sheryl Miller, Program Asst

Ship Operations Program
- Dolly Dieter, Program Director

Oceanographic Facilities Program
- Linda Goad, Program Director

Oceanographic Instrumentation and Technical Services
- Sandy Shor, Program Director

Oceanographic Technology and Interdisciplinary Coordination Program
- Larry Clark, Acting Program Director
- Lisa Rom, Associate Program Director

Ocean Sciences Education
- Lisa Rom, Assoc. Prog. Director
- *Sue Cook, Assoc. Prog Director*

Oceans Section (Larry Clark, Head)

Biological Oceanography Program
- Phil Taylor, Program Director
- Dave Garrison, Assoc. Program Director
- Kendra Daly, Assoc. Program Director
- Cynthia Suchman, Assoc. Program Director
- Natasha Gray, Science Assistant
- Pam Shaw, Program Assistant

Physical Oceanography Program
- Eric Itsweire, Program Director
- Bill Wiseman, Program Director
- Steve Meacham, Assoc. Program Director
- Jeannie Belsches, Program Assistant

Chemical Oceanography Program
- Don Rice, Program Director
- Simone Metz, Assoc. Program Director
- Peter Milne, Assoc. Program Director
- JoAnn King, Program Assistant

ECOD (July - December 2000)

MANAGEMENT MATTERS

1. EMCO meetings

a) The next 17th EMCO meeting will be held in Venice, Italy, on Friday 6 April 2001. It would be a joint meeting with the ECOD Scientific Committee (ESCO). ECOD country plans for IODP membership are expected being discussed in depth at that meeting. Their continuation or not as such Consortium for IODP participation will also be considered.

2. Activities towards IODP

a) ECOD representative and observers have actively participated in meetings and activities of the European Science Coordination Group for Ocean Drilling (ESCOD). The 12 ECOD countries have signed as contractors the JEODI proposal to the EU. All ECOD countries support the progress of ESCOD towards a full European consortium becoming a strong partner of IODP.
b) The individual countries from the "southern" ECOD group have still to progress with plans for securing participating in IODP, on the basis of their different budgets. Positive answers from all countries are envisaged.
c) The Joint Committee of the Nordic Natural Science Research Councils (NOS-N) about a year ago appointed a working group to evaluate the IODP Initial Science Plan in a Nordic context. The group met in Stockholm 29-30 August 2000. The working group has now published a report that is very positive to Nordic participation in IODP.

SCIENTIFIC MATTERS

1. Meetings / news:

a) The 31st ESCO meeting was held on 27-28 October 2000 in Stockholm. ESCO delegates continue to support a common European approach towards a significant European contribution to IODP. Beside science, ESCO discussed on benefits from the European effort to provide "alternative" fit-to-mission platforms for IODP, and stressed that greater European influence on IODP will enhance participation by European scientists in the future Program.
b) Arctic DPG:
The mandates and the membership list of an Arctic Detailed Planning Group (DPG) were approved by SCICOM 2000-12-05. ECOD plays an active role in this DPG as the chair of the DPG is Jan Backman (Stockholm University) and two of the other delegates are from ECOD countries (Anders Karlqvist, Swedish Polar Institute and Martin Hovland, chair of Arctic PPG).

2. ECOD scientists sailing now/and from June 2000:

- Leg 193, Manus Basin (9 November 2000 - 6 January 2001): Fernando Barriga (Portugal), Terje Bjerkgård (Norway), petrologist/structural geologist; Álvaro M. Pinto (Portugal), petrologist.
- Leg 192, Basement Drilling of the Ontong Java Plateau (10 September - 9 November 2000): Peter Riisager (Denmark), paleomagnetist; Stephanie Ingle (Belgium), igneous petrologist.
- Leg 191, West Pacific Ion / Hammer Drilling Engineering (17 July - 10 September 2000): Rikke Øhlenschlaeger Pedersen (Denmark), paleontologist.
- Leg 190, Nankai I (24 May - 17 July 2000): Mario Sánchez-Gómez (Spain), structural geologist.

3. ECOD scientists invited to sail:

- Leg 194: Flavio Anselmetti, (Switzerland), Pascal Kindler (Switzerland), Stephen Ehrenberg (Norway).
- Leg 195: Massimo d'Antonio (Italy). ESCO anticipate an additional berth.

4. ECOD co-chief invited for upcoming Legs

- Leg 194 (Jan-Mar 01): Flavio Anselmetti, Switzerland.
- Leg 198 (Aug-Oct 01): Isabella Premoli Silva, Italy.

5. ECOD Student Trainees, participation and applications

One student from ECOD (Denmark) was invited to participate to Leg 195. Nineteen student applications have been received at the ESCO Secretariat from Legs 193 to 201.

Menchu Comas, December 2000

ODP Country Report - Germany

Alternative Platforms as "Third Leg of IODP"
The proposal "JOINT EUROPEAN OCEAN DRILLING INITIATIVE (JEODI)" was submitted to the European Commission in September 2000, asking for financial support to the strategic planning of a joint European contribution to IODP. All European members of IWG, are represented in JEODI (BGR represents Germany). The initiative is planned for 3 years and its goal is to develop the management structures of a European component of IODP and to work towards the technological and scientific realisation of alternative platforms for drilling in the new programme. In November 2000 the proposal was endorsed by the EC.
To guarantee the ongoing work of the Technical Coordinator of the European Component of IODP, Dr. A. Skinner (BGS), an interim fund was raised to bridge the interval October 2000 - April 2001 until funding of JEODI will start. This interim fund is provided by UK, France, ECOD and Germany. The German Federal Ministry for Education and Research (BMBF) contributed 30,000 Euro.

The core group of the European Steering Committee on Ocean Drilling (ESCOD) met November 1, 2000, at BGR in Hannover. The group outlined a possible management and funding structure of the European Component of IODP.

Meetings will be held on "Alternate Platforms as a Third Leg of IODP" in Brussels on January 8/9, 2001, and on "Science, Strategies and Alternate Platforms for IODP" in Lisbon in early May 2001. Both meetings will see significant German participation.

German ODP Coordination
On October 1, 2000, Dr. Amelie Winkler took over Dr. Jochen Erbacher's responsibilities of the Scientific Secretary of the German ODP Coordination Bureau at BGR. Dr. Winkler served as Secretary of the European Polar Board before she joined BGR. She is a marine geologist and finished her PhD on "High northern-latitude paleoclimate variability deduced from sedimentology and clay mineralogy of sediments of ODP Leg 151" at GEOMAR/University of Kiel in 1998.

German site survey activities
During the *RV SONNE* expedition SO 149 "Cascadia Basin", a site survey for ODP proposal 545 (Fisher et al.) "Hydrology: Juan de Fuca Ridge" was carried out and led by Dr. V. Spiess (University of Bremen).

Seismic data from the southern Hydrate Ridge collected during the *RV SONNE* expedition SO 150 are now available for detailed planning of ODP Leg 204 "Gas Hydrates" (E. Suess et al.).

For enhancement of the ODP proposal 552 (France-Lanord et al.) "Drilling in the Bengal Fan", acoustic data based on data from *RV SONNE* cruises SO 125 and SO 126 will be interpreted together with data from shelf drilling off Bangladesh by the group of Dr. V. Spiess.

High-resolution seismic data are planned to be collected by *RV METEOR* in the Black Sea (PI V.Spiess; G. Bohrmann) during cruise M52/1. According to previous observations in this area they can be used to prepare drilling proposals around the theme "gas hydrates".

ODP related research funded by Germany

For the regular one-year term starting 1 July 2000 fifty-nine research proposals related to ODP science were funded by DFG. In order to increase the availability of non-German reviewers future requests for funding of research projects by DFG have to be submitted in English.

The next German Annual ODP Meeting will be held in Karlsruhe on February 28 to March 2 and hosted by the Institute of Petrology and Geochemistry at the University of Karlsruhe. As it was always the case: You are invited to join. Information is available from http://www.uni-karlsruhe.de/~odp2001/

Japan Country Report: EXCOM at Kamakura, 2001
Prepared by A. Taira

1. Joides Resolution Portcall

July 19 (Yokohama) Portcall day for high school teachers and students.
400 participants
July 21 (Yokosuka) Portcall day for Yokosuka citizens.
700 participants

Japan ODP office appreciates the effort of TAMU to have arranged two portcall days at different locations.

2. Site Survey Cruise

Second Half, 2000
Japan-France Eastern Nankai 3D seismics (June-July): R/V Nadir
Shinkai 6500 diving (10 dives at ODP Sites 1175,1176 in Nankai Trough in October)
R/V Tansei Maru (Nankai Trough heat flow in June, Kyushu-Palau Ridge arc evolution in November)
R/V Hakuho Maru (Gulf of Aden and Bengal Fan, December to February)

Planned, 2001
JAMSTEC (Japan-France) Eastern Nankai OBS profiling (June-July)
R/V Hakuho Maru, Japan Trench and Japan Sea (June)

2. ODP related symposium

Nankai Trough session at Geological Soc. Japan meeting, September.
Paleoceanography symposium at ORI in January, 2001

3. IODP Related Activity

OD21 vessel under construction at Mitsui Shipbuilding Co. expected to be launched by early 2002. Construction completion by 2004 at Mitsubishi Heavy Industry Co.

Budget request by JAMSTEC for new research institution: Institute for Frontier Research for Earth Evolution (IFREE). IFREE will be composed of four departments (not formal name): (1) Mantle-Core Dynamics, (2) Mantle-Crust Chemical Evolution, (3) Subduction Dynamics and Seismogenic Zone, (4) Environmental Changes and Earth System Evolution. We expect initial 2002 budget of about 9M$ and by 2003, over 30M$.

OD21 Science Advisory Committee was held on Nov.1. The committee will be reformed to be a national committee of larger scale in order to fit with expected IODP science advisory structure by early February, 2001.

PACRIM COUNTRY REPORT FOR JANUARY 2001 EXCOM MEETING

Australia

ODP Australia is designing and printing four educational posters. The first, "Paradise Submerged" is on the ODP drilling of Kerguelen Plateau, and the second "Smokin' Gold" is on the Manus Basin drilling. A glossy brochure is also being printed. The Australian Secretariat has established an ODP speakers' program to raise awareness amongst scientists.

16 ODP-related posters and papers were presented at the recent national meeting, the 15th Australian Geological Convention. An ODP workshop held at this meeting was attended by about 40 people. Dr Jamie Austin made a presentation on IODP, and the following discussion has led to Australian SciCom working on an IODP Science Plan which will be finalised at a workshop in June, 2001.

Dr Jamie Austin also visited Canberra in July, and was successful in raising awareness and communicating the latest developments to Australian geoscientists and policy makers, at a meeting with senior government and academic advisers.

The ship is arriving in Townsville on the 5th January 2001, following the drilling of the polymetallic sulphide Leg 193 in the Manus Basin. AusODP is organising a reception, media conference, scientific talk and ship tours. Manus Basin mineralised cores will be displayed on the ship.

On the 19th November there was a live telephone hook up between Ray Binns (CSIRO) on the ship, and delegates at the 'Volcanic Environments and Massive Sulfide Deposits' conference in Hobart. Ray spoke on the Manus Basin and answered questions. The Secretariat devised an ODP slide show that played during the hook up. The event was described as a highlight by the conference organisers.

The Australian ODP Council and Secretariat are currently working on a strategy to cope with the fact that the Australian dollar is trading at about US 50 cents. We are still actively committed to funding the shortfall in the PACRIM contribution, but because of the current exchange rate it seems unlikely that we will be successful in the short term.

Canada

A national workshop to discuss IODP scientific plans was held 19-20 October in Calgary at the Training Centre of Pan Canadian Petroleum Limited. Attendance from academe, government and industry was 52. Background on IODP planning was provided by the Canadian Secretariat, Kate Moran (for Industry-ODP Liaison Group) and John Farrell (JOI). Three JAMSTEC representatives attended and provided information on OD21 construction and capabilities. Four working groups identified particular Canadian interests and have written position papers complete with specific or generic drilling targets of Canadian interest. The working groups were: (a) paleoenvironment and climate; (b) convergent margins, seismogenic zone and gas hydrates; (c) passive margins and ODP-industry deep transects; (d) oceanic lithosphere, ore deposits, deep-sea observatories and the deep biosphere.

Canada is committed to seek funds for full membership in IODP, and the planning for a mid- to late-2001 application to government agencies is on track. Canada is very keen to see Arctic drilling, perhaps during the drilling gap at the beginning of IODP.

Like Australia, Canada is struggling to maintain its current contribution because of exchange rates. The Canadian dollar is currently trading at or just below 65 cents US.

The Canadian Secretariat hosted a successful SCICOM meeting in Halifax in August.

Korea

1. KODP SciCom representatives had a meeting with Japanese members and discussed about the cooperative work in IODP during the 2nd Korea-Japan Science Forum.
2. KODP SciCom is writing a proposal to drill the Korean continental shelf during the test run period for the riser-type drilling vessel. Task Force Team will discuss about this matter with Japanese scientists in near future.
3. KODP Secretariat homepage is being renewed and will be completed in the next month.
4. KODP Secretariat is still looking for other funding sources.
5. KODP Secretariat newsletter is issued for the first time since Korea joined the ODP. The newsletter is distributed through email to all Korean geoscientists.

Taipei

1. A total of 12 ODP-related research projects are currently supported by the National Science Council of the Republic of China, the total funding is about US$ 350,000.
2. Due to national budgetary deficit, there is no sign for NSC to increase any ODP-related funding in the coming year.
3. A white paper entitled „New Visions of 21st Century Ocean Drilling" (in Chinese) has been published and circulated. This informal publication summarizes the scientific opportunities of future drilling and evaluation of Taiwan's role in participation in future IODP.
4. ODP-related research results by Chinese Taipei ODP Consortium members were presented during 2000 annual national geology and oceanography meetings in March and December, respectively.
5. There will be a JOIDES Resolution port-call at Keelung of after the completion of ODP Leg 195 next May, 2001. Dr. Char-Shine Liu is in charge of planning and coordination of the port-call activities.
6. The 2001 PacRim Meeting will be held during the port-call period. The likely date is May 4 (Friday), 2001.
7. Proposal APL-14 has been approved to be a contingent component in ODP Leg 195. A single site, KS-1, is likely to be drilled at the southern end of Okinawa Trough. The main objective is to obtain high-resolution sedimentary record of the Kuroshio Current of the last 1.5 million years.

UK report to ODP EXCOM

ODP Special Topic Grants

since the last EXCOM meeting: Funding has been awarded to all of the following ODP special topic applications

- **Dr P.A. Wilson (University of Southampton):** "Stability of extreme climates: testing for punctuation of the mid-Cretaceous "greenhouse" by rapid global cooling and submarine erosion (during early Cenomanian Time)"
- **Prof. A.E.S. Kemp & Dr E. Rohling (University of Southampton: "**Origins of the massive Neogene production events in the eastern Equatorial Pacific"
- **Prof. J.G. Fitton (University of Edinburgh) & Dr M.J. Pringle (University of Glasgow):** "Age and duration of magmatism on the Ontong Java Plateau – a test of the plume-head and Iceland models for oceanic large igneous provinces."
- **Dr A.J. Maltman (University College of Wales, Aberystwyth:** "High resolution fluid-flow patterns at the Nankai convergent plate margin"
- **Dr S. Roberts & Dr D. Teagle (University of Southampton):** "Hydrothermal processes in back-arc basins: The hydrothermal anatomy of an active felsic volcanic-hosted hydrothermal systems (PACMANUS) Manus Basin" (funding subject to acquisition of suitable samples on Leg 194)
- **Dr C. Mac Niocaill et al. (University of Oxford):** "The timing and duration of Pleistocene palaeomagnetic excursions a study on ODP leg 166 material."
- **Dr A. J. Morgan & Dr M. Warner (Imperial College**): "ODP at Chicxulub: High resolution 3-D tomographic imaging beneath the peak ring"

In addition Dr Helen Pfuhl (University of Cambridge) is the most recent recipient of a UK post-doc funding award entitled "**Antarctic climate and circum-polar circulation following the opening of the drake passage at ~20 Ma"** to work with Prof. Sir Nick Shackleton.

Applications for further ODP Special Topic grants (closing date December 1 2000) and post-graduate fellowships (closing date September 30 2000) are still under active consideration.

Staffing:

Applications for UK places on forthcoming ODP legs have been at a high level during 2000. This is in significant part due to improved communication with the UK ODP community; in particular email calls for applications for individual legs issued around 6 months prior to the legs. Efforts to maintain an up-to-date database of potentially interested scientists has led to a number of applications from UK Universities with no history of ODP involvement. ODP publications are now also more widely distributed than previously again increasing the impact of the program.

UK ODP Forum

The annual UK ODP forum was held at the Natural History Museum, London on October 18 2000 and attracted around 80 ODP researchers from all parts of the UK. Presentations were made on recent ODP leg science and post-cruise research.

In addition over 20 posters on all aspects of the programme were displayed. The meeting proved a great success.

UK ODP newsletter 26 was published in September 2000 and distributed to the UK ODP community, UK earth science departments and international ODP offices. A particular effort has been made to provide this document to all senior UK scientists with involvement or potential influence on the funding process for IODP.

ODP workshops

UK Scientists have attended both the recent geochemistry workshop where Dr Damon Teagle, University of Southampton acted as a session chair and the Coral Drilling workshop (co-convened by Dr Sandy Tudhope, University of Edinburgh). Attendance of UK scientists at future ODP workshops will be encouraged (within available resources).

IODP

NERC will be receiving a full bid for UK involvement in IODP during Autumn 2001.

Joint European Ocean Drilling Initiative

Following a recommendation from the ESCOD ad-hoc group (European Standing Committee on Ocean Drilling), Ali Skinner (BGS) ODP TEDCOM chair has appointed as European Technical Co-ordinator for the proposed third leg of IODP using Alternate Platforms. He is co-convenor of the "Alternate Drilling Platforms - Europe as the 3rd Leg of IODP" in Brussels and is undertaking an intensive dialogue with European drilling technology companies and platform operators as well as ODP scientists.

The People's Republic of China

COUNTRY REPORT (February-November 2000)

China ODP Executive Committee

Progress in Leg 184 Studies

From May 16 to 18, the ODP Leg 184 Research Group in China had its annual meeting in the Laboratory of Marine Geology, Tongji University, Shanghai. Nearly thirty scientists and postgraduates from 8 laboratories in the country reported their new results of core analyses. The 5500 m long cores recovered from the South China Sea by Leg 184 have provide with unique opportunities to reconstruct the history of basin evolution and monsoon variations. Chinese marine geologists have given the first priority to the post-cruise studies of Leg 184 material and already obtained encouraging, though preliminary results which were outlined in the fourth issue of the "China ODP Newsletter" published in June. Now their scientific enthusiasm has even further increased. Up to the end of November, for example, the Laboratory at Tongji has completed a total of 5800 isotope analyses for Sites 1147, 1148 and 1143. Over 1000 samples from Site 1144 and 1148 were analyzed and counted for pollen and spores. The yielded long records of isotopic, micropaleontological and palynological data will be important contributions not only to the China Seas, but to the entire Western Pacific.

Currently, the Research Group has focused its attention to certain key sections and key questions, and two members are visiting College Station to take additional samples for further analyses.

Expecting International ODP Meetings in China

Since China joined ODP about two and a half years ago, Chinese scientists are anxious to host international ODP-related meetings in China, in order to promote deep-sea research activities in the country. Now two meetings will take place in China next year: From March 21 to 23, the Tongji University will host the next ODP

Scientific Committee and Operational Committee meeting in Shanghai, the very first ODP business meeting held in China. To meet this event, the Chinese Scientific Committee decided to convene its Third China ODP Symposium from March 19 to 21 at the same venue. This will give an opportunity for Chinese scientists to meet with the international community.

The second meeting in 2001 will be the SCOR/Leg 184 Symposium titled "Asian Monsoons and Global Linkages on Milankovitch and Sub-Milankovitch Timescales", to be held in Beijing from May 7 to 10, followed by a field trip to the Loess Plateau. This will be the Post-Cruise Meeting of Leg 184 jointed with the SCOR/IMAGES Working Group on "Asian Monsoon Evolution in Marine Records" (SEAMONS) meeting. Late in October, Prof.Warren Prell visited Shanghai to discuss with Prof.Wang Pinxian on preparation of the forthcoming meeting. The two Co-Chief Scientists of Leg 184 overviewed the recent progress of postcruise studies and decided to involve a broader circle of scientists in this scintific event.

Towards IODP in the New Century

The Chinese ODP community is looking forward to meeting the new stage of scientific deep-sea drilling, IODP. One of major issues for the Third China ODP Symposium will be preparation for the new century ocean drilling. Recently, a large project has launched to study deep-sea records and deep-sea processes in the Western Pacific Warm Pool. This 5-year project is supported by the national program of major basic research of the Ministry of Science and Technology, including 10 laboratories throughout the country, with Prof.Wang Pinxian as chief scientist. The new project has much broader coverage, ranging from tectonics to deep-sea microbiology, and is expected to promote further involvement of Chinese marine scientists to various fields of international deep-sea studies.

NSF COUNTRY REPORT

Although the FY 2001 budget for NSF has been reduced by 4% from the President's requested level, the overall increase finally approved by Congress (13%) represents the largest increase in the history of the agency. High priority NSF initiatives (Biocomplexity, Information Technology, etc) are likely to see significant growth at this funding level. The Geosciences Directorate and the Division of Ocean Sciences expect to see increases roughly comparable to the overall Foundation increase. Since all the chads are yet to be counted, it's much too early to report on the magnitude of funding increase for the Ocean Drilling Program. Primary arguments during formulation of the 2001 budget were for increases in U.S. scientific research as part of the ODP, and incremental support for drilling related research under the MARGINS initiative.

There have been significant personnel and structural changes internally within the Division of Ocean Science. First, the Division has been re-organized into 3 sections. The first is the **Ocean Section** composed of Biological Oceanography, Physical Oceanography and Chemical Oceanography. The second (and new) section is the **Marine Geosciences Section** composed of the Marine Geology and Geophysics Program and the Ocean Drilling Program. The third section, the **Integrative Programs Section** includes support for cross-Division activities including ship operations, Instrumentation and technical services, Ocean Technology and Interdisciplinary Coordination Program, and education activities. Personnel changes have accompanied this reorganization. Mike Purdy left NSF on 30 November to become the director of the Lamont-Doherty Earth Observatory. Don Heinrichs has emerged from his retirement to assume the position of interim Division Director until a permanent Division Director can be hired. Larry Clark has been appointed the new head of the Ocean Section with Mike Reeve as the head of the Integrative Programs Section. A search will begin after 1 January to fill the new position of head of the Marine Geosciences Section. Within the Ocean Drilling Program, Jamie Allan has departed to Appalachian State University. Negotiations with Jamie's replacement are underway. A second visiting scientist/engineer position has been identified for the ODP Program. It is expected that this position will concentrate on IODP planning – specifically with respect to the acquisition of the non-riser drill ship.

Focused NSF funding in support of ODP science is divided between the U.S. Science Support Program (USSSP) administered by JOI ($6.4M in FY 2000) and a separate unsolicited proposal/grant activity administered by NSF ($9M in FY 2000). A separate discussion of USSSP activity can be found in a separate report from JOI.

Field programs for calendar year 2001 include: (1) an MCS and OBS study of rifting processes in the Gulf of Aden under the direction of Neil Driscoll (Woods Hole), John Diebold (Lamont) and Brian Taylor (Hawaii); (2) an MCS study of megamullions on the Mid Atlantic Ridge by Brian Tucholke (Woods Hole); (3) a heat flow study of the eastern Cocos plate under the direction of Andy Fisher (University of California at Santa Cruz); (4) an MCS study of the Gulf of Corinth led by Brian Taylor (Hawaii); (5) construction and installation of instrumentation in the CORKs to be deployed at Nankai under the direction of Keir Becker, University of Miami; and (6) installation of fly-in CORKs in eastern Pacific ODP holes. Additional proposals for field programs in 2002 (designed for planning IODP drilling) are under review, with others expected for panels in March and May of 2001.

U.S. Country Report (Part II, JOI/USSSP Activities 6/00 to 1/01)

U.S. Science Support Program (USSSP)

The Year 17 Program Plan for the USSSP will be submitted to the U.S. National Science Foundation (NSF) in February 2001 for the cooperative agreement year beginning March 1, 2001. Consistent with the NSF/NSB-approved 6-Year Program Plan, the annual plan will request approximately $6.5M.

A "close-out" report for Year 16 will be submitted to NSF in late spring 2001. As a program, the timing and duration of the USSSP is linked to that of the ODP. Wind-down of USSSP will begin in calendar 2003 and will end no later than February 28, 2006. Extension beyond the end of ODP operations, anticipated to be September 2003, is needed to accommodate the conclusion of post-cruise research and other activities, and to enable financial and programmatic closeout.

U.S. scientists are anticipating national participation in the future Integrated Ocean Drilling Program (IODP), and thus the creation of a successor program to USSSP. As such, the U.S. Science Advisory Committee (USSAC) is beginning to anticipate how U.S. science/scientists may need to be supported in IODP. This activity involves defining a new USSAC/new USSSP. This activity will be a major agenda item in next two USSAC meetings (January 2001, Gainesville, Florida and July 2001, Seattle, Washington).

USSAC writes U.S.-oriented companion document for the international IODP Initial Science Plan

The *Initial Science Plan* (ISP) for the IODP will be published and distributed by the International Working Group Support Office (IWGSO), on behalf of the IWG, in May 2001. A preliminary draft of this document is available at http://www.iodp.org/.

Because the ISP will reflect the goals of the international science community, USSAC is developing a U.S. companion document tentatively titled, "Understanding our planet through ocean drilling, a report from the U.S. Science Advisory Committee." This report, co-edited by Mike Underwood and Jon Martin, will address how the ISP will meet the future needs of the U.S. science community. A first draft was presented on December 16th, at an "ODP Town Meeting" at the AGU conference. A final version will be completed by May 1, in tandem with the ISP, and will be submitted to NSF.

USSSP supports planning activities for future scientific ocean drilling

JOI/USSSP continues to provide salary, travel, and other direct and indirect support to Ted Moore, the Chair of SCICOM's Integrated Planning SubCommitee (IPSC), and to his project manager, JoAnne Reuss at the University of Michigan. Additional USSSP funds are being used to support U.S. participation in IPSC meetings, IPSC Working

Group meetings, US participation in the ESCOD meeting in Brussels (Jan. 9-10, 2001), and for other long-term planning activities.

US contribution to the IWG Support Office

Since November 30, 1999, The IWG Support Office (IWGSO), co-located at JOI, has assisted the International Working Group (IWG) and its designates in their efforts to build a new post-2003 drilling program, the Integrated Ocean Drilling Program (IODP). The US, through the NSF, contributes half of the office's operating costs to JOI through the USSSP cooperative agreement. The other half comes from JAMSTEC, under the auspices of the STA. The IWGSO provides administrative, clerical, and financial support for planning activities and serves as a communication center for coordination among the U.S., Japan, and other potential IODP partners.

The IWGSO follows an annual work plan that is approved by NSF and STA/JAMSTEC. Since June, and among other activities, the IWGSO has: (a) published IODP promotional brochures in four languages; (b) assisted with the logistics (agenda book development and minute taking) at the IWG meetings in Japan and the UK; (c) assisted with meeting planning and execution for IPSC and their working groups; (d) assisted with the logistics of the ISP review meeting; (e) promoted IODP at international science meetings; (f) produced and distributed visual and illustrative materials; and (g) developed a web page and contact list.

The Office is fully staffed with representatives from the United States and Japan, an office manager, administrative assistant and other part-time staff for travel and logistics, contracts, purchasing, and technical needs. Openings in the administrative assistant and technical program associate positions were recently filled. On December 1, 2000, Betsy Fish replaced Trish Kellermann as the IWGSO administrative assistant at a 0.5 FTE level. On November 13, 2000, Robert Wright replaced Tad Gladczenko as the technical program associate at a 0.15 FTE level.

For general inquiries or to request IODP brochures, please contact Jennifer Peterson, IWGSO Manager at iwgso@brook.edu (202-232-3900 x262).

The Conceptual Design Committee (CDC) report

The CDC, a subcommittee of USSAC, and chaired by Peggy Delaney, submitted their report to NSF in March 2000. In turn, and shortly thereafter, NSF forwarded the report to the IWG, which in turn, forwarded it to IPSC to solicit international comment. The CDC report identified the operational and scientific capabilities of a non-riser drilling vessel to meet the objectives of a post-2003 ocean drilling program. NSF has said that it will seek the necessary resources to bring such a vessel to a future program (IODP) as a major capital asset. NSF has stated its plans to fund a conversion or refit of an existing ship, rather than a new build.

IPSC has been soliciting feedback from the international scientific community since March 2000. Both the report and a questionnaire have been available on the USSSP website www.joi-odp.org/usssp/cdc/. The results of the international review were presented to the IWG at their January meeting in Southampton, UK.

COMPLEX report

The report from the May 1999 Conference on Multiple Platform Exploration of the Ocean "COMPLEX" was published and widely distributed by JOI in November 2000. The report, edited by Nick Pisias and Peggy Delaney, was published as a special volume of the *JOIDES Journal* and was bundled and mailed with volume 26, no. 1 of the *JOIDES Journal*, written by the JOIDES Office in GEOMAR. The COMPLEX report focuses on the science that can be accomplished by using a wide variety of scientific, non-riser ocean drilling platforms.

USSAC membership rotation

The following members completed their three-year terms on USSAC on September 30, 2000: Steve Carey, Rick Murray, David Naar, and Lisa Tauxe. Nicholas Christie-Blick resigned from USSAC on March 17, 2000. The new members of USSAC, who began their terms on October 1, 2000, are Barbara Bekins (USGS), Peter deMenocal (LDEO), Jeffrey Gee (Scripps), Warren Prell (Brown), and Carolyn Ruppel (Georgia Tech). Peggy Delaney will continue to serve as the Chair of USSAC until October 1, 2001.

***Blast from the Past* educational poster**

The popularity of the USSSP-funded *Blast from the Past* educational poster continued undiminished after three years of distribution among scientists, educators, and the general public. This poster focuses on the K/T boundary impact event as it is recorded in exquisitely preserved sediment sequences recovered during ODP Leg 171B. This summer, 25,000 posters (with three classroom activities and other resources listed on the back) were reprinted and distributed in a kit developed by the American Geological Institute (AGI) to celebrate Earth Sciences Week, October 8-14, 2000. In addition, demand for the poster was high at the ODP/USSSP exhibit booths JOI organized at the annual Geological Society of America (GSA) meeting, at the fall and spring meetings of the American Geophysical Union (AGU), at the annual meeting of the American Association for the Advancement of Science (AAAS), and at the annual meeting of the American Society for Microbiology. Finally, the posters continue to be distributed via Distinguished Lecturers and upon request from the JOI office.

***Gateways to Glaciation* CD-ROM**

The final version of the *Gateways to Glaciation*, an interactive educational CD-ROM, was released in June 2000. These CD-ROMs have been well received as the successor to JOI/USSSP's first educational CD, *ODP: Mountains to Monsoons*. The *Gateways to Glaciation* CD is freely available from JOI upon request. The CD is geared toward high

school and undergraduate college students. Users participate on a virtual ODP cruise to test the hypothesis that the closing of the Isthmus of Panama triggered the onset of significant Northern Hemisphere glaciation during the Pliocene. Students analyze cores in shipboard labs and analyze data with shipboard scientists.

Along with the *Blast from the Past* poster (mentioned above), 25,000 copies of the CD were distributed in AGI's Earth Science Week kit. In addition, over two thousand copies were distributed nationwide via the Distinguished Lecturer Series, in response to requests received at JOI, at JOIDES and USSAC meetings, and via handouts at the meetings of GSA, AGU, AAAS, and ASM.

A preliminary version of a teachers' manual for the CD is available at the JOI web site (www.joi-odp.org). This manual was written by Carolyn Viscosi-Shirley, of Nashua, New Hampshire, with advice and guidance from Bob Duncan, of Oregon State University.

Schlanger Ocean Drilling Fellowship Program

Two one-year shorebased fellowships were awarded in February 2000. The recipients are:

Aradhna Tripati, University of California, Santa Cruz, for "Tropical Sea Surface Temperature Reconstruction for the Early Paleogene Using Mg/Ca Ratios of Planktonic Foraminifera" (ODP Leg 143, DSDP Legs 22 and 86).

Joan Steurer, University of Missouri, Columbia for "Composition, Intrinsic Shear Strength, Physical Properties, and Texture of Sediment at the Nankai Trough, Leg 190: An Integrated Approach" (ODP Leg 190).

In July 2000, three one-year fellowships were awarded. The recipients are:

Kevin Theissen, Stanford University, "A Pliocene-Quaternary Foraminifer stable isotopic record for Prydz Bay, Antarctica" (Shorebased ODP Leg 188)

Karen McLaughlin, Stanford University for "$\delta^{18}0$ of Phosphate in Organic Matter from Marine Sediments: A Tracer for Paleoenvironmental Conditions" (ODP 167 and 100 for primary analyses. ODP 127, 128, 169S and 159 for comparison).

Thomas Werth, Scripps Institution of Oceanography, "Hunting the Geomagnetic Field" (ODP Legs 138 and 162).

JOI/USSSP Internship Program/Legacy Project

Elizabeth "Betsy" Fish, a May 2000 Geosciences graduate of Franklin and Marshall College, joined the ODP/JOI program staff in June as the second JOI/USSSP Intern. Betsy continued work on the "Legacy Project" that was started by JOI/USSSP's first

intern, Alexandra Williamson. The project's goal is to create an ODP information resource that can be used for a variety of purposes, including: (1) research and education; (2) public relations; (3) an assessment of ODP against its Long Range Plan (LRP); and (4) support for the planned successor to ODP, the Integrated Ocean Drilling Program (IODP). The first step of the Legacy Project was to create a comprehensive, searchable database, which would include DSDP- and ODP-related Proceedings and non-Proceedings publications.

Betsy analyzed the differences between a manual database compiled by the first intern and a GeoRef subset (owned by ODP/TAMU for internal use). GeoRef is an electronic database of geoscience publications maintained by the American Geological Institute (AGI). After hearing Betsy report her findings, USSAC proposed the purchase of a subset of GeoRef—exclusive to ODP-related articles—for public distribution. To make the database as comprehensive as possible, it was posted on the web to allow scientists to search for their publications and submit any missing citations for addition to GeoRef before the final version is purchased. To add citations, please go to http://janusaxp.tamu.edu/predef_queries/general/citation.shtml. Missing submissions are currently being added to GeoRef and the DSDP/ODP database by AGI.

ODP Undergraduate Student Trainee Program

Stan Hammon, an undergraduate at the University of Texas at Dallas, is scheduled to participate on Leg 195 as an ODP Undergraduate Student Trainee. Mr. Hammon will be the second student trainee from the U.S. and the third trainee overall to participate in the program. Two U.S. students were invited to participate on Leg 191, however, one student declined and the second student withdrew shortly before the cruise for medical reasons. This left room for a late applicant, Warna Downey of Dalhousie University, to be the program's second participant overall and the first Canadian trainee.

JOI/USSSP presence at national meetings

JOI/USSSP provided materials and support for scientific ocean drilling booths in the exhibit halls of five major scientific meetings in year 2000. These include the spring and fall meetings of the American Geophysical Union (AGU) (Washington, DC, May 30-June 2, 2000 and San Francisco, CA, December 15-18, 2000), the annual meeting of the Geological Society of America (Reno, NV, November 12-15, 2000), the annual meeting of the American Society of Microbiologists (Los Angeles, CA, May 18-21, 2000), and the annual meeting of the American Association for the Advancement of Science (Washington, DC, February 18-21, 2000). USSAC member and microbiologist, Tommy Phelps, helped JOI staff the ASM booth.

As is becoming tradition, USSSP sponsored an annual "ODP Town Meeting" on December 16, 2000 during the fall AGU meeting. The meeting, which attracts several hundred attendees, has become an important event at AGU for it provides an ideal venue for exchanging information. At the meeting, updates are provided on the activities of the

ODP and the plans, progress, and timelines for the development of the various elements of the IODP. These event offers an opportunity for a lively question and answer session.

JOI/USSAC Newsletter

Spring and fall issues of the newsletter were published and distributed. Both issues can be viewed on-line, along with past newsletters, at www.joi-odp.org. Work on a winter issue of the newsletter is in progress. The newsletter is distributed to nearly 2400 addresses in the U.S. and abroad. In addition to general news about USSSP and ODP, the newsletter has been including updates on the planning process and progress for post-2003 scientific ocean drilling as well as the creation of a legacy for the ODP.

JOI/USSSP listserver

A JOI/USSSP email list was launched in May 2000 to provide rapid communication primarily within the U.S. scientific ocean drilling community. The email list is moderated at JOI to ensure that all the messages are relevant to USSSP, ODP, or other matters relevant to scientific ocean drilling. Since its initiation, the number of list members has remained around 1350. If you wish to distribute a message over the listserver, please send it, along with a brief explanation, to Andrea Johnson at: joilist@brook.edu.

JOI/USSSP website

The USSSP component of the JOI website (www.joi-org.edu) continues to grow as an important means of providing information to the scientific ocean drilling community. Maintaining, updating, and upgrading the website will continue as vital JOI/USSSP activities.

Site Augmentation Proposals

James Zachos (Univ. of California, Santa Cruz): "Early Cenozoic Extreme Climates: The Walvis Ridge Transect", $18,434.

Geoff Wheat (Univ. of Alaska, Fairbanks): "Support for Downhole Instruments for Leg 195, Site MAF-4B", $52,207.

Richard Norris (WHOI): "Multichannel Seismic Reflection Profiling and Swath Bathymetry on Demerara Rise, Western Equatorial Atlantic", $69,507. Awarded, but cancelled. (Funding was returned to JOI due to insurmountable problems related to ship scheduling).

Workshop Proposals Funded

Chuck Nittrouer (Univ. of Washington) and Neal Driscoll (WHOI): "MARGINS: Source to Sink Education and Planning Workshop", $16,000 (co-sponsored with NSF). This workshop was held on September 11-15, 2000 in South Lake Tahoe, CA.

Terrence Quin (Univ. of So. Florida): "An International Workshop on Submerged Coral Drilling", $24,990 (co-sponsored with NSF). This workshop was held on September 23-25, 2000 in St. Petersburg, FL.

Richard Murray (Boston Univ.), Dan Schrag (Harvard Univ.), and Geoff Wheat (Univ. of Alaska, Fairbanks): "Opportunities in Geochemistry for Post-2003 Ocean Drilling", $48,000. This workshop was held on October 12-14, 2000 in Tyngsboro, MA.

Post-Cruise Scientific Research Proposals

From May 31, 2000 to January 15, 2001, 38 post-cruise scientific research proposals were formally approved for funding by JOI as part of the US Science Support Program.

Results Symposium

Steven Clemens (Brown Univ.): "Partial Support for a Combined ODP Leg 184/SCOR Results Symposium: Asian Monsoons and Global Linkages on Milankovitch and SubMilankovitch Timescales", $38,689. This meeting will take place in Beijing, China on May 7-11, 2001.

2000-01 JOI/USSAC Distinguished Lecturer Series

We note that most lecturers volunteer to give more than the "minimum" requested number of lecturers. The series continues to be popular and successful. We applaud the generosity of the lecturers.

Dr. Timothy Bralower, University of North Carolina, Chapel Hill
"It was the Best of Times, It was the Worst of Times": Biotic Consequences of the Late Paleocene Thermal Maximum

February 1, 2001	Boston College, Boston, MA
February 16, 2001	Florida International University, Miami, FL
February 27, 2001	Western Washington University, Bellingham, WA
March 1, 2001	Bringham Young University, Provo, UT
March 2001 (tentative)	Elizabeth City State University, Elizabeth City, NC

Dr. Eugene Domack, Hamilton College
Late Quaternary Sedimentation in Antarctica's Palmer Deep

November 14, 2000	University of Alaska, Fairbanks, AK
November 20, 2000	Northern Illinois University, DeKalb, IL
January 17, 2001	Rice University, Houston, TX
April 9, 2001	Scripps Institution of Oceanography, La Jolla, CA
April 2001 (tentative)	Northwest Missouri State University, Maryville, MO

Dr. Martin Fisk, Oregon State University
Microbes beneath the Ocean Floor and the Possibility of Extraterrestrial Life

September 13, 2000	Vassar College, Poughkeepsie, NY
October 13, 2000	Iowa State University, Ames, IA
October 19, 2000	Muskingum College, New Concord, OH
March 2, 2001	Louisiana State University, Baton Rouge, LA
March 5, 2001	5 Colleges Coastal & Marine Sci. Prog, Northampton, MA
March 6, 2001	University of Rhode Island (paid by URI)

Dr. Gary Karner, Lamont-Doherty Earth Observatory
The Paradox of Low-Angle Crustal Faulting and Rupturing of Continents

October 19, 2000	State University of New York, Binghamton, NY
November 3, 2000	University of North Dakota, Grand Forks, ND
November 9, 2000	Michigan State University, East Lansing, MI
November 16, 2000	St. Louis University, St. Louis, MO
December 7, 2000	New Mexico Tech, Socorro, NM

Dr. Delia Oppo, Woods Hole Oceanographic Institution
Millennial Scale Climate Variability in the North Atlantic

March 24, 2001	University of South Florida, St. Petersburg, FL
TBD	Central Connecticut University, New Britain, CT
October 27, 2000	Middlebury College, Middlebury, VT
November 9, 2000	University of Pennsylvania, Philadelphia, PA

Dr. John Tarduno, University of Rochester
Motion of the Hawaiian Hotspot During Formation of the Emperor Seamounts

September 27, 2000	University of Alaska, Anchorage, AK
October 2, 2000	Franklin and Marshall College, Lancaster, PA
October 6, 2000	University of Rhode Island, Providence, RI
March 16, 2001	University of Akron, Akron, OH
April 4, 2001	Idaho State University, Pocatello, ID
April 10, 2001	University of Wisconsin, River Falls, River Falls, WI

2001-02 JOI/USSAC Distinguished Lecturer Series

Listed below are the six lecturers, their home institutions, and their lecture titles for the 2001-02 series. Applications to host these lectures during the 2001-2002 academic year are due April 6, 2001. JOI expects at least 75 applications.

Dr. Robert Dunbar, Stanford University
Southern Ocean Impacts on Global Climate: Clues from the Antarctic Margin

Dr. David Hodell, University of Florida
Late Pleistocene Evolution of the Ocean's Carbonate System: A Serendipitous Result from ODP Leg 177

Dr. W. Steven Holbrook, University of Wyoming

Methane Hydrates: Boon or Bane?

Dr. John Mahoney, University of Hawaii
The Nature, Origin, and Fate of a Giant Oceanic Plateau: Ontong Java Plateau

Dr. Lisa Tauxe, University of California, San Diego
Hunting the Earth's Magnetic Field

Dr. Michael Underwood, University of Missouri
Subduction Zone Megathrusts: Why Stratigraphy and Sedimentology Matter

JOI's EXCOM Report for 1/01 meeting

A review of activities between July and December 2000

ODP challenges in FY01 and beyond

Based on the outcome of the August SCICOM meeting, changes were proposed for the draft FY01 Program Plan (e.g., expanding the scope of Leg 195 to include Mariana). After review and approval by SCICOM and EXCOM, the FY01 Program Plan was submitted and approved by NSF in September. The approved budget is $46,123K. This is $23K higher than in FY00.

Management is facing an unprecedented situation in that SCICOM ranked number one (out of over 30 proposals) a plan to drill in the high, ice-covered Arctic Ocean. This is the first time in the history of ODP that a proposal requiring alternate platforms has been selected as the top scientific priority, and the first time that a #1-ranked proposal is unscheduled for drilling. To further consider implementing this proposal, JOIDES established an Arctic Detailed Planning Group (DPG) in December. The group has an extensive mandate and a specified membership including logistics and operations experts. The DPG is chaired by Jan Backman, the lead proponent, and the group is holding their first meeting in Stockholm, on Jan. 31 and Feb. 1, 2001.

The most pressing concern currently facing ODP is the unanticipated increase of fuel prices for the *JOIDES Resolution* and the resulting budget impact. ODP Managers are currently considering options to address the projected stresses on the FY01 and the draft FY02 budgets. A status report will be provided at the January 2001 EXCOM meeting.

JOI Reorganization

Since the June 2000 EXCOM meeting, JOI has experienced several transitions and significant changes, but has continued to successfully manage ODP without interruption.

On October 1, the final corporate ties linking JOI and CORE were eliminated. The two companies no longer share presidents, administrative support staff, office space, and property, among other things. The split-out was initiated in June and resulted in only minor perturbations to each corporation. JOI now occupies the 7th floor (Suite 700) of the Brookings Institution annex building in Washington, and CORE occupies the 8th floor (Suite 800). JOI's phone numbers and email addresses remain unchanged.

The leadership of the JOI BoG also changed on October 1. Paul Stoffa and Neil Opdyke replaced Barry Raleigh and Arthur Nowell, respectively, as Chair and Vice Chair. Admiral James Watkins stepped down as JOI President on September 30, 2000. John Orcutt served as interim President from October 1 until November 26th. Steve Bohlen began his tenure as JOI President on November 27th. John Farrell continued as Acting Director of ODP at JOI.

Several vacancies were filled at JOI over the past four months. A Director of Finance and Administration (John Traylor) was hired in September to replace Yan Xing (who departed for CORE) and, in part, Penny Peters (also joining CORE). JOI also hired a Purchasing/Subcontract Specialist (Strat Cavros) to replace Sue Siegel (who joined CORE). In the Finance Department, Derrek Jones replaced Eldon Haymon in October. In the JOIDES Office, the JOI employee, Jeff Schuffert, concluded his tenure as the US liaison in the Kiel office on December 31st. He will be replaced by Elspeth Urquhart, from the UK, and also a JOI employee, as the international liaison to the Miami JOIDES Office. The Technical Program Associate position, open since the departure of Tad Gladczenko in June, was filled by Robert Wright, in November. In HR/Admin., Nicole Eisen was hired in November. In December, the USSSP intern Betsy Fish was hired as an Administrative Assistant, to replace Trish Kellermann. Nine of the current 16 JOI employees have worked at JOI for less than one year, and seven have been employed for less than five months. A few positions remain unfilled.

Update on ODP phase-out planning

In early January, JOI will receive revised phase-out plans from ODP subcontractors providing Science Operations (TAMU), Wireline Logging Services (LDEO-BRG), and Site Survey Data Bank services. These will be combined with a draft phase-out plan from JOI, summarized, and will be presented to EXCOM, for consideration, at the January 2001 meeting.

Update on developing options for long-term maintenance of ODP database, JANUS database, core repositories, and other legacies

At the EXCOM meeting in January, a joint report will be given by JOI and JOIDES that summarizes the following steps taken to meet this goal:

1. Subcontractors have begun to review their data holdings, ranging from computer databases to blueprints.

2. JOI (Frank Rack) organized and ran a meeting at the US National Geophysical Data Center (NGDC) at NOAA, in Boulder on November 2nd, of ODP subcontractor computer database personnel and liaisons from NSF, JOIDES, JOI, and NGDC. The purpose of the meeting was to review the computer databases in the ODP, review requirements for archiving, needs to do so, etc. A smaller, follow-on meeting at TAMU was held on November 27th. Detailed minutes and action items from the first meeting were made available on November 21st. Follow-up continues.

3. Agreements have been reached between JOI and JAMSTEC and between TAMRF and a JAMSTEC subcontractor to begin the process of creating a duplicate of the Janus relational database in Japan. Supplemental funding for this activity has been provided by NSF and JAMSTEC.

4. Options for the maintenance of the core repositories are presented in the TAMU phase-out plan.

5. Creation of the DSDP/ODP bibliographic database is well underway and a detailed report is presented in the Science Operator's report.

PEC-V report and EXCOM response

In response to the June EXCOM consensus 00-2-6, JOI received comments on the PEC-V report (and subcontractor response) from the UK and from France. JOI will present to EXCOM the two responses and a written reply from JOI.

ODP manager meetings

Managers, including senior representatives from NSF, JOI, JOIDES, TAMU, and LDEO continue to meet with regularity to discuss program activities, to make decisions, and to plan. Half-day meetings occur prior to all SCICOM and EXCOM meetings, as well as on an *ad hoc* basis, such as on Sept. 20-21, in Kiel, and at the AGU meeting in San Francisco.

ODP Co-Chief Review

The next co-chief review is scheduled for April 2 and 3, 2001, in Washington DC. JOI will host the meeting, as it has for the last two reviews. Co-chiefs from Legs 181 through 192 have been invited, as have representatives from Science Operations (TAMU), Wireline Logging Services (LDEO-BRG), Site Survey Data Bank, JOIDES (SCICOM Chair), and NSF. An agenda is being prepared and a report on the outcome will be presented to EXCOM at the meeting in Oxford, UK.

External Evaluation of JOIDES drilling proposals

JOI continues to conduct the twice-yearly external evaluation of JOIDES drilling proposals. Based on the last JOIDES SSEPs meeting in November, eleven proposals were selected for evaluation. JOI typically secures four evaluations per proposal.

Public Affairs

John Fogarty, JOI's Public Affairs Counsel, will meet with the EXCOM Public Affairs Subcommittee in January, and will present a report of activities since the last EXCOM meeting and goals for the upcoming year. Recent highlights include:

(a) Significant press on "undersea landslides and tidal waves" based on a paper published in *Science* by Peter Flemings et al., using ODP data. The story ran in the *New York Times*, *Washington Post*, *Philadelphia Inquirer*, *Camden (NJ) Courier Journal*, *Asbury Park (NJ) Press* and on Discovery.Com and CNN. The Associated Press and Reuters also carried stories on the report worldwide.

(b) Admiral Watkin's September 28th luncheon presentation to the National Press Club in Washington, DC, was on National Public Radio, CNN and C-Span both live and on a delayed basis. The event was also webcast on the NPR and C-Span websites. "Gateways to Glaciation" CD-ROM and ODP's "Blast From The Past" poster were distributed before and after the National Press Club luncheon.

(c) Radio interview on Hispanic Radio with TAMU staff scientist, Carlota Escutia.

(d) Japan Leg 190 port call, 500 visitors, public, private, government and media.

(e) Two Reuters stories on ODP and gas hydrates published on Oct. 5th and Oct. 6th worldwide on the Reuter's newswires as well as Reuter's environmental and energy websites.

(f) Dec. 9 *Science News* carried a report on ODP research by John Firth of TAMU and Tim Bralower of UNC Chapel Hill. They reported that the cataclysmic event that wiped out the last dinosaurs also triggered the greatest underwater landslides in history.

(g) *Washington Post*, NSF publications and website and others carried stories on Steve Bohlen's appointment as president of JOI.

(h) ODP and IODP had booths at GSA and AGU. GSA was used to announce Dr. Bohlen's appointment. ODP information was distributed there including ODP's CD-ROM, "Gateways to Glaciation".

(i) At AGU, we made available a loose-leaf book containing 155 abstracts of ODP-papers presented at AGU. We also distributed a press release based on the these abstracts. Four other press releases distributed at AGU covered Steve Bohlen's appointment, the CD-ROM, "Gateways to Glaciation", the ODP/IODP Town meeting (a few reporters attended even though there was a wine and cheese party held in the AGU press room at the same time) and the distance learning program from the *JOIDES Resolution* to Texas class rooms.

(j) Two AGU-sponsored press conferences in the AGU briefing room featured ODP-based research on seismic results and further findings on the demise of the dinosaurs. An impact story about ODP ran in the *San Francisco Chronicle*. Steve Bohlen had interviews/lunch and/or conversations with the following press at AGU: Laura Garwin, *Nature*, Sid Perkins, *Science News*, Usha Lee McFarling, *Los Angeles Timea,* Kenneth Chang, *The New York Times,* Richard Hill, *The Oregonian* and winner of the Perlman award for science writing, Dave Perlman, Science Editor of the *San Francisco Chronicle*. (The Perlman Award is named for him.), Keay Davidson, Science Writer, The *San Francisco Chronicle* (he is also interested in the Arctic drilling proposal), Richard Kerr, *Science*, Christina Reed, *Geotimes*, Robert Cowen, *Christian Science Monitor*, Charles Petit, *U.S. News and World Report*, and Randy

Showstack, *EOS*. In addition, Network of the World (NOW) of the UK interviewed Steve Bohlen and others at AGU for a piece NOW is doing on ODP/IODP. While based in the UK, NOW broadcasts worldwide.

(k) ODP received good play in the UK press, especially *The Times* of London, on ODP-climate change research conducted by Paul Pearson of the University of Bristol. HTV in Great Britain interviewed Pearson about his findings. We also provided videotape of activities on the ship to go with the piece. We will be working to develop a science news feature on climate change.

(l) JOI and TAMU have also been putting more material on our websites and we are attempting to keep the material fresher. We will also be moving to redesign the websites to make them more attractive, informative and user-friendly.

(m) Fogarty arranged to have Bohlen invited to The American Chemical Society's luncheon at the National Press Club honoring Dave Perlman. The luncheon was held before Bohlen joined JOI/ODP and gave him the opportunity to meet many national science reporters. Fogarty will also be working to work media and public appearances into Bohlen's travel schedule.

(n) The Program received local media coverage in Albuquerque, NM about the work of shipboard scientist Harold Tobin on the *JOIDES Resolution* off the coast of Japan. The interviews were conducted after Tobin's return from his two months on the ship.

(o) EXCOM Chair Helmut Beiersdorf gave a 75 minutes public lecture in the evening of June 13, 2000 in Hamburg (Germany) on the occasion of the 67th Session of the Association of Northwest German Geologists. Theme was "Marine Geology - State of the Art and Perspectives" and dealt to great extent with results and plans of ODP. It was well received by the ca 60 people in the audience.

(p) A press release (in Portuguese) from Leg 193 co-chief scientist, Fernando JAS Barriga, to the President of the Portuguese science funding agency (equivalent to the US NSF) was released in early January from the *JOIDES Resolution*.

PEC-V Report: EXCOM member response and JOI reply

Synopsis

In response to June's EXCOM consensus 00-2-6, JOI received comments on the fifth performance evaluation committee (PEC-V) report from UK and French representatives (see Appendices A and B, below). In brief, the UK thought the PEC-V report was "not impressive" and France "fully endorses the British [sic] response."

The two general concerns in the UK report are the "failings of the PEC-V mandate" (specifically the "lack of an international focus"), and a [lack of] "preparation for IODP." Regarding the later, the UK thought that insufficient emphasis was placed on several specific issues including "the uncertainty within ODP contractors…" and "the process for identifying the future director of IODP and the attributes that would be required of that individual." Six additional concerns were also noted.

The French letter, signed by John Ludden, the chairman of ODP-France, and the co-chairman of the newly-formed European Steering Committee on Ocean Drilling (ESCOD), indicates that "PEC-V lacked a sufficiently international focus", and "did not address those [issues] relating to the transition to the proposed IODP program." The French letter closes with this request: "ESCOD therefore wishes that in the event of future PEC evaluations of ODP (or it's successor) that the international membership be given a greater opportunity to directly contribute to the committee's mandate, before the committee begins it's investigations, to ensure that the mandate is truly representative of the issues of importance to the entire membership."

Summary of the JOI reply:

Mandate. The PEC-V mandate was created and endorsed by EXCOM, and ratified by the JOI BoG in June 1998. Representatives from all ODP members were present, and had the opportunity to contribute to the mandate's scope and content. The history of mandate development, as excerpted from EXCOM and JOI BoG minutes, is presented in Appendix C. Membership on PEC-V was internationally balanced, with a non-US chair and vice chair who were primarily responsible for drafting the report.

Lack of preparation for IODP. JOI is the prime contractor to NSF for the ODP. JOI is not associated or affiliated with the proposed Integrated Ocean Drilling Program (IODP) in any scientific, technical, or programmatic manner. ODP performance evaluation is contractually stipulated between JOI and NSF. As such, the focus of all PECs is on the management and performance of the ODP, not on the IODP. JOI has no role in planning the IODP or a programmatic transition to it. In fact, as a potential bidder on components of the IODP, JOI has made every effort to avoid any activity or action that would place itself in a real or perceived conflict of interest in such a bid, in order to avoid even an accusation of an unfair competitive advantage.

Introduction and Background

At the June 2000, the following EXCOM motion related to the PEC-V report was passed:

EXCOM Consensus 00-2-6: EXCOM acknowledges receipt of the Fifth Performance Evaluation Committee (PEC-V) Report and the contractor and subcontractor responses. The PEC-V Report raises many issues that will require careful consideration. EXCOM members should review the report at the earliest opportunity and respond directly to JOI by 1 October 2000. JOI will produce a response for the January 2001 EXCOM meeting.

JOI received written responses from the UK on October 2 and from France on October 13. These are reproduced in Appendices A and B, respectively.

The UK response, from the NERC-mandated UK ODP Steering Committee (Steve Sparks, Chair, David Falvey, Chris Franklin and Andy Kingdon), is divided into two categories, general criticisms, of which there are two, and specific criticisms, of which there are six. The letter response from France, specifically John Ludden, the national ODP Chairman, can be divided into an endorsement of the UK response, and a recommendation that is based on a perceived lack of significant "international focus."

To provide a more meaningful reply to the general and specific criticisms in the UK document, and to the recommendation in the French letter, JOI will first give some introductory and background information. This will focus on the definition and purpose of the ODP performance evaluation, as conducted by Performance Evaluation Committees (PECs), on the specific historical development of the PEC-V mandate, and on EXCOM and JOI BoG's perceptions of PEC-V progress and on the final report, as excerpted from meeting minutes from January 1999 to June 2000.

Performance evaluation as a contractual requirement

The contractual requirement to review the Ocean Drilling Program is stipulated on p. 9 of the ODP contract between JOI Inc. and the US NSF:

"TASK 1 – MANAGEMENT
E. Evaluation – The Contractor shall establish and implement a program review procedure consisting of a panel of experts who will perform a detailed review and report on the management of the program and its performance. This review shall be conducted every three years beginning in FY 1995. The results and report(s) shall be presented to NSF. Implementation of the recommendation(s) of these reviews shall be developed in consultation with the Foundation."

History of how the PEC-V charge (aka mandate) was determined

In brief, a draft mandate was developed in early 1998 by a group that included, among others, the incoming and outgoing EXCOM Chairs (Helmut Beiersdorf and Bob Detrick),

and the interim Director of ODP at JOI (Nick Pisias). This PEC-V activity was initially discussed at the January 1998 meeting, and EXCOM endorsed the draft mandate at their June 1998 meeting. The JOI BoG approved the mandate in June 1998. Appendix C includes excerpts from the minutes of relevant meetings of the JOIDES EXCOM and the JOI Board of Governors, which ratifies the recommendations of EXCOM.

EXCOM and JOI BoG response to PEC-V progress and final report

Appendix D provides excerpts from JOIDES and JOI BoG meetings associated with the progress of the PEC-V and their final report. The PEC-V Vice Chair, Tom Loutit, provided an informal and interim progress report to EXCOM in June 1999. At that time, no concerns were raised about the mandate or a perceived lack of focus on the transition to the IODP.

JOI reply to the UK and French responses:

The UK and French responses to the PEC-V report indicate dissatisfaction with the PEC's mandate and with a lack of emphasis in the report on the perceived needs of ODP management to prepare for, and transition to, the IODP.

Mandate

The PEC-V mandate was drafted by EXCOM. In June 1998, in consensus 98-2-11, the mandate was unanimously endorsed by EXCOM (except for Nowell, who was absent), and EXCOM recommended its adoption by the JOI BoG. The BoG ratified the consensus, and thus the PEC-V mandate, in their follow-on June 1998 meeting, after making one minor modification.

<u>Two specific examples:</u>

The UK provides two specific examples of the mandate's failings: (1) that only one member of the PEC-V visited the JOIDES office in Germany, and (2) in reviewing the Wireline Logging Services (WLS), only the headquarters (LDEO-BRG) was visited, and by only two members. In conducting their review of the ODP, the PEC-V, an international body with four US members and three non-US, including a Japanese Chair and an Australian Vice Chair, decided independently where and when to collect information via site visits. They choose seven formal visits that included international scientific meetings (COMPLEX and JOIDES SSEPs) and subcontractor visits (JOI, JOIDES Office, Science Operations, and the headquarters for Wireline Logging Services). Individually, PEC-V members conversed with or personally met with a wide variety of people affiliated with the ODP from March to July of 1999.

Regarding the visit of only one PEC-V member to the JOIDES office, it may be emphasized that the important aspect of such a visit, namely meeting with and discussing ODP management and performance with JOIDES Office representatives, occurred at a

variety of times and settings, such as at the COMPLEX meeting (Vancouver), at the JOIDES SSEPs meeting (Seattle), as well as at the JOIDES Office in Kiel. The PEC-V apparently considered it unnecessary for all members to travel to the JOIDES Office to meet the three key personnel in that office, the SCICOM Chair (Hay), the Science Coordinator (Brueckmann), and the US liaison to the JOIDES Office (Schuffert). Visiting the physical plant of the JOIDES Office was probably considered immaterial, for it consists of little more than a basic administrative office.

Regarding the second UK example of the mandate's failing, that only the headquarters of the WLS were visited (presumably excluding some or all of the four WLS subcontracting sites), and only by two PEC-V members, again, the PEC, did not consider additional visits necessary or prudent, given their overall responsibility. The PEC was able to obtain the necessary information from sources other than additional site visits. These subcontracts are important to the success of the ODP, and the PEC broadly discussed all WLS operations and met with representatives from some, if not all of their subcontracting organizations at the COMPLEX meeting, at the SSEPs meeting and possibly elsewhere.

Preparation for IODP

From contractual and programmatic points of view, ODP has a distinct beginning and an end, and so too does the role of the ODP prime contractor (JOI) and the subcontractors (TAMU, LDEO, etc.). ODP performance evaluation is contractually stipulated between JOI and NSF, and therefore the focus of PECs is solely on the management and performance of the ODP.

The process of planning a successor program, the IODP, that is currently being conducted by the international scientific community (as spearheaded by IODP Planning Subcommittee, IPSC) and by international funding agency representatives (i.e., the International Working Group, IWG), is not under JOI's preview. As such, it would be inappropriate for JOI to attempt to partake in the IODP planning process, or to prepare a transition to IODP. JOI's responsibilities and contractual scope of work are confined to ODP. JOI is responsible for planning a phase-out of ODP (which is well under way), but not a phase-in to IODP. As a potential bidder on components of the IODP, JOI has made every effort to avoid any activity or action that would place itself in a real or even a perceived conflict of interest in such a bid.

Therefore, it would be inappropriate, and possibly even counter to JOI's interests, for the PEC, and thus JOI, to address, let alone emphasize, issues raised by the UK response, such as "The process for identifying the future director of IODP and the attributes that would be required of that individual." and "The effects of the (apparently inevitable) drilling hiatus on the ODP community."

Because the vast majority of participants in the international JOIDES advisory structure are free and clear of the contractual and programmatic obligations, responsibilities, and authorities that are inherently vested in the prime and subcontracting organizations, these

participants are in a position to offer scientific and technical advice and guidance to funding agency representatives on the formation of the IODP and on the transition from the ODP to the IODP. This has, in fact, been the case.

JOI's reply to the UK's six specific concerns

ISO-9000 status for ODP TAMU, Ocean routing service, Borehole Research Group

No reply necessary.

Shallow water drilling capabilities

The UK expresses concern about the PEC's apparent "lack of vision" in presuming that the *JOIDES Resolution* (JR), rather than alternative platforms, is the best tool for drilling in shallow water. Perhaps this is a misread of the PEC report. On page 12, the PEC wrote, "Taking a different approach, ODP could also identify funds to lease other platforms to achieve some of these shallow water objectives. In the past this has not occurred, but could, in future, depending on annual budget constraints." The remainder of the UK comments, such as the suggestion to lease alternative platforms during the operational hiatus between ODP and IODP, are beyond the scope of the ODP and the PEC mandate.

Site Survey Data Bank (SSDB)

The UK suggests that the PEC-V did not delve sufficiently deeply into the issue of confidentiality of data submitted to the SSDB, particularly digital data. This issue has been addressed over the past two years by the JOIDES SCIMP panel, in consultation with representatives from SSDB and WLS. Commercial software, the GeoQuest IESX seismic interpretation package, part of the GeoFrame software used to process log data, is now available for routine use on the drillship. IESX was successfully initiated during Legs 180, 182, and 188. As noted in the FY01 Program Plan, IESC will also be used on Legs 194 and 196, as part of a larger pilot project. Confidentiality of the seismic data is maintained by password-restricted access to each project. This will significantly improve shipboard use of seismic data and well-to-seismic integration. It should also be a step towards allaying concerns about ensuring data confidentiality.

Internationalisation issues

The UK notes that despite the 10-year old recommendation by the Dorman review to internationalize program operations, the Science Operator (TAMU) has not added non-US components (subcontracts), while the WLS (LDEO-BRG) has. The UK suggests that operations become more international in the IODP. This suggestion is similar to the one made under "Borehole Research Group." Both are beyond the scope of the PEC-V mandate.

Appendix A: UK response to the ODP PEC-V report

The PEC-V report was not impressive. The analysis of ODP seems to be based on limited consideration of easily accessible material with too much time spent examining the minutiae of everyday operations of the Ocean Drilling Program and little thought applied to the real challenges ODP faces in evolving into IODP in under three years. The absence of a discrete section in this report examining the consequences of the transition to IODP highlights this limitation.

Please note that this is a response to the PEC-V report only. Due to the time that has elapsed since the publication of this report, a number of the criticisms contained below, (particularly with respect to post-2003) have been addressed by other fora such as IWG and IPSC. No criticism of these other bodies is intended

The criticisms are divided into two groups, the failure of the PEC-V mandate to address key issues of importance to the programme and specific criticism of the report's findings.

Failings of PEC-V mandate

From the United Kingdom's perspective the most disturbing aspect of the PEC-V investigation of ODP is the lack of an international focus. The mandate for this committee did not allow consideration of a number of critical international issues.

This is best demonstrated by two examples

1. Although a visit was apparently made to Germany to examine the JOIDES office only the German member of the PEC- V committee actually attended this. Yet the JOIDES advisory and oversight function's are the key to much of ODP's success and the office is at the heart of the successful operation of these systems. The failure of the committee to investigate in detail the operation of the office limitations of this committee .
2. This national focus of PEC-V is compounded by the analysis of Wireline Logging Services (WLS) and it's operational lab at the Borehole Research Group (BRG). The Lamont office was the only part of it's operations visited by the PEC-V committee and then only by two members of the group. The comments on the BRG are concerned largely with trivia. With the inherently more international operations that will be required to operate a multi-platform program such as IODP, the BRG could have been seen as a model for how such operations could be undertaken. In this context, the successes and problems of the operation of an international group such as BRG surely deserved greater analysis than the cursory examination provided by PEC-V.

Preparation for IODP

Though alluded to in a number of places throughout the PEC-V report the difficulties created by the transition to the new programme are not examined with sufficient forethought or rigour. The UK is in particular concerned by the lack of emphasis in the report on the following issues.

- The relationship of the current JOIDES advisory structure and it's successor. (Now addressed)
- The uncertainty within ODP contractors created by the upcoming end of programme deadline.
- Maintenance of capability across the transition period of key ODP skill centres (e.g. the Borehole Research Group).
- The process for identifying the future director of IODP and the attributes that would be required of that individual.
- The effects of the (apparently inevitable) drilling hiatus on the ODP community, particularly internationally. (Now only partially addressed by the new structure and continued submission of proposals)

PEC-V represented an opportunity both to review the workings of the current Ocean Drilling Program but also to make recommendations regarding the transition to IODP. The review could have been used as an opportunity to focus the community on the needs for immediate actions and to provide impetus to the process. Although problems with the transition process were identified no clear solutions were suggested shows a lack of foresight on the part of this committee.

Specific criticisms of PEC-V recommendations

ISO-9000 status for ODP TAMU

The UK agrees with ODP-TAMU that the imposition of ISO-9000 rating would be unlikely to significantly benefit the programme but is certain to impose significant additional costs.

- ODP TAMU is already (or at least should be) responsive to the scientific community through the JOIDES advisory structure. If it is felt that it should be made more responsive then a strengthening of the advisory structure would be much more cost effective than the increased workload and cost in attaining ISO-9000.
- In a scientific setting of rapidly changing technology ISO-9000 certification could act as a break on the rate at which innovative techniques / equipment are incorporated into the programme. The rapid implementation for the biosphere lab and ICP show clearly that where the relevant staff within TAMU are convinced of the need for technical innovation staff and resources will be concentrated on enabling this process.
- Shipboard scientists are unlikely to co-operate with any process that mitigates against their ability to alter and adapt shipboard techniques as circumstances dictate (obviously within health and safety constraints). On of the great strengths of ODP has been the willingness of shipboard technicians and scientists to work together to improve the data being acquired during it's acquisition.
- Quality control is also an issue currently under the oversight of the JOIDES advisory structure. This is most cost-effectively dealt with by constant examination of ODP outcomes by the appropriate JOIDES panels of experts and rapid implementation of any recommendations they make by TAMU.

Ocean routing service

This issue is symptomatic of the PEC-V reports concentration on small details and ignoring the major issues affecting ODP. This is an operational decision for SEDCO-FOREX / ODP-TAMU and is best left to those who deal with such issues on an day-to-day basis to define the cost-benefits of the use of such a system.

Shallow water drilling capabilities

The rationale for further adaptation of the *JOIDES Resolution* (JR) for shallow water operation is symptomatic of a lack of vision of PEC-V. The automatic assumption that the JR is always the best tool for all purposes and the most cost-effective solution to each problem is difficult to countenance: the JR is not and has never been intended for all drilling operations in all geographic locations.

The programme should be investigating in much greater detail the possibilities of hiring alternative platforms on a "fit-for-purpose" basis. This approach has been used widely by European institutions involved in ODP and much experience in their use exists. This could be adapted by the programme to provide more cost-effective drilling solutions to shallow water targets than from further alterations to the JR.

Indeed the obvious solution to the community-wide concern over the operational hiatus between DP and IODP would be to use the savings on JR charter to pursue shallow water and Arctic drilling targets using specialist drilling vessels.

Borehole Research Group

- PEC-V make much of a trivial staffing issue (the inclusion of one BRG logging scientist and another from the scientific community which it can only be assumed comes from a complaint about an individual scientist on a particular leg) but little of the important matters of how this international group undertakes it's operations for ODP.
- It can only be assumed therefore that BRG is entirely successful in it's operation. On this basis the logical conclusion is that the consortium of institutions that make up BRG can and should be used as a model for the future structure of other ODP functions (e.g. publications or drilling operations) within IODP.
- The improvements in the accessibility of ODP logging data, both current and historical, is brushed over. The use of modern web communications to achieve this provides a model of how a future, more distributed programme could operate.

Site Survey Data Bank (SSDB)

The PEC-V committee are right to highlight the needs for enhanced funding of site-survey science and the needs for their integration within the drilling program. Yet they have seemed unable to grasp that the site survey data is very largely not the property of the ODP and is deposited by member institutions (from the USA and elsewhere) and also by sympathetic commercial companies. For these companies in particular the security of their data is vital for their continued co-operation. The primary function of the site survey data bank must be to ensure drilling safety. Whilst greater availability of the digital

seismic data is a laudable aim the data held by the SSDB will only increase if companies can be sure that their data confidentiality is respected.

An understanding of issues such as commercial confidentiality are at the basis of any moves towards further industry –academic co-operation. They deserved greater consideration than PEC-V seemed able to provide.

Internationalisation issues

About ten years ago the Dormon review made recommendations for internationalising the service and delivery infrastructure. That led to the US / non-US rotation of the JOIDES office and the addition of non-US components of Wireline Logging Services. There were no changes at ODP-TAMU. The extension of the WLS model to science operations should now be an imperative in the context of IODP.

Appendix B: French response to the ODP PEC-V report

Dr John Farrell
Joint Oceanographic Institutions,
1755 Massachusetts Avenue, NW, Suite 700
Washington, DC 20036-2102;

Friday, 13 October 2000

Dear John,

During the recent meeting of the ESCOD committee, the British representatives presented their response to the PEC-V report. As chairman of ODP-France, I note that ODP-France fully endorses the British response.

As co-chairman of ESCOD, I stress that the committee also had severe reservations about the way in which the PEC reviews have been handled. We made a recommendation which we hope will be taken into account in future reviews of ODP or IODP.

ESCOD considers that PEC-V lacked a sufficiently international focus. ESCOD recognises that PEC-V was bound closely by their mandate and that some of the issues commented upon in the UK response were outside that mandate. However ESCOD is concerned that PEC-V did not address all the issues that were important to ODP at the time that the review was undertaken, in particular those relating to the transition to the proposed IODP program. ESCOD therefore wishes that in the event of future PEC evaluations of ODP (or it's successor) that the international membership be given a greater opportunity to directly contribute to the committee's mandate, before the committee begins it's investigations, to ensure that the mandate is truly representative of the issues of importance to the entire membership.

Please do not hesitate to contact me if you require any clarification of this recommendation.

Yours Sincerely

John Ludden
Co-chair ESCOD
Copy – ESCOD Committee

Appendix C: Creation and endorsement of the PEC-V mandate

•*From the January 1998 EXCOM meeting*

1.3 Approval of Agenda
EXCOM Motion 98-1-1
EXCOM approves the Agenda for the January, 1998 EXCOM Meeting with the addition of the following two items: (1) PEC V under the JOI Management Report, item 8.1.7…

8.1.7 PEC V
The next Co-Chief review, now under the supervision of JOI, will occur at the end of this year, and will serve as the start of the process leading into PEC V. The next task for JOI is to set up the committee. The PEC reports to JOI, and JOI reports the findings of the committee along with their response, to NSF. It is a part of the contract between JOI and NSF. The role of the PEC is to look at the management and operations of the Program. The PEC V report to EXCOM will be a part of the process. Pisias reported that JOI would like PEC V to focus on programmatic aspects/elements of the Program and to provide input on issues such as how to handle the budgetary situation.

Discussion.
Mutter asked why NSF wanted this report and inquired about NSF's response if PEC V reports something problematic. Heinrichs explained that the primary reason is to see that operations and management are carried out in an effective way. JOI develops the PEC mandate in consultation with NSF. In the past, the PECs have had a broad mandate. The PECs were not restricted and had more expansive charges than required by NSF's contract with JOI. Pisias said that with respect to PEC-V, JOI wishes a very focused PEC review, not another management review as these have occurred recently within the Program. Taylor noted that JOI wants a programmatic review, which doesn't sound like management and operations. He acknowledged that there is a mismatch here, but expressed confidence that NSF and JOI would work it out.

•*From the June 1998 EXCOM meeting*

A draft charge was presented by Nick Pisias, JOI's interim Director of ODP, to EXCOM at their June 1998 meeting. The charge (embedded in the "5th ODP Performance Evaluation Committee Terms of Reference") was included in Tab 17 of the agenda book. Also included was background and the action sought of EXCOM. EXCOM was asked to review the charge and make recommendations to JOI BoG. Pisias said that the consensus at the January EXCOM meeting was not to conduct the standard PEC, but focus instead on how the Program is preparing for the future.

The 4-part charge was:

- The progress of the Program toward the achievement of the major scientific goals outlined in the ODP Long Range Plan, and the cost effectiveness and performance of JOI, and its major subcontractors, in achieving these goals.**

- The effectiveness of mechanisms in place for making budgetary decisions in the context of the scientific priorities of the Program and projected budgetary constraints, and the potential of current strategies for seeking additional avenues of funding for the Program.

- The operation of the new JOIDES advisory structure, including proposal evaluation and selection, short- and long-term planning, and provision of technical advice to JOI and its subcontractors.

- The progress of the present Program in preparing for a new scientific ocean drilling program beyond the year 2003.

EXCOM Consensus 98-2-11

EXCOM endorses the charge to PEC V and recommends its adoption by JOI BoG.

One absent (Nowell)

From the June 1998 JOI Board of Governors meeting:

Agenda Item V:Approval of Terms of Reference for the Fifth Performance Evaluation Committee

Governors held a general discussion of the terms of reference and questioned, in detail, specific mechanisms for assessing the achievement of the major scientific goals of the ODP through the PEC V. In terms of the PEC membership, Leinen stressed the importance of individuals from outside of traditional academic circles, arguing that 50% participation from industry and other non-academic representatives would be making a "statement". Governors concluded their discussion with a general consensus that the terms of reference should be edited** by Moran so that the achievements of the ODP are evaluated in light of the Program's Long Range Plan within the fiscal constraints imposed by the overall decline in the Program's budget, in real dollars.

** NB: The Board approved the addition of this sentence to the first charge, "This progress should be evaluated within the context of the budgets available to the drilling program."

Appendix D: PEC-V-related excerpts from EXCOM and BoG minutes, 1/99-6/00

From the January 1999 EXCOM meeting:

8.2.1 Performance Evaluation Committee V
The members of the committee will be Earl Doyle, Hans Dürbaum, Ross Heath (Chair), Dan Karig, Tom Loutit, Nori Nasu, Amos Nur, and Karl Turekian. The committee will have its first meeting in Washington in February 1999, and completion of its study is expected in September 1999.

From the June 1999 EXCOM meeting:

6.7 Status of PEC-V program review
Kate Moran outlined the structure and membership of PEC-V and asked Tom Loutit, a PEC-V member, to give an update on the current status of the review. Loutit explained that he could not yet give a formal report because the review was still in progress, but he could at least offer his own preliminary insight. He described the review committee as a diverse group, without any recent involvement in the program. They noted first that the program had instituted many changes in the last few years, mostly for the good, though of course they saw lots of room for improvement, and any improvements made now could carry forward to post-2003. Their biggest concern was the transition and planning process. It looked like many groups were sitting around waiting for NSF to do something, and that was not the right approach. Things had started to happen, but it looked like the community had not yet clearly communicated the overall game plan or perhaps had not completely defined it in the aftermath of COMPLEX. PEC-V had also tried to determine how well the new advisory structure was working by meeting with various components, and they received over 80 responses to a questionnaire distributed at COMPLEX. Loutit said that concern existed across the community about a perceived gap between EXCOM and the rest of the advisory structure, particularly SCICOM. Helmut Beiersdorf had suggested holding a joint EXCOM/SCICOM meeting, although others had suggested that too many guests and liaisons already attended certain meetings. Briden expressed surprise at the comment about the advisory structure. Loutit responded that PEC-V would evaluate how well the advisory structure had followed the Long Range Plan, and he added that the new LRP for the future program looked pretty generic right now. Loutit also expressed pleasure in the report given earlier that morning by Hay in an effort to generate excitement about current science topics. Beiersdorf said that he had also heard from various sources that EXCOM was too far removed from science, and perhaps we could improve this by having a joint meeting.

From the February 2000 EXCOM meeting:

F.5 Performance Evaluation Committee (PEC-V)

Moran reported that JOI had received the PEC-V report and obtained comments on it from the ODP subcontractors. She planned to present those comments to the JOI BoG this week and seek their approval to submit the overall report to NSF. She then expected to distribute the report to others in JOIDES for comment. Moran said that PEC-V concluded that program management and operations had improved significantly since the previous evaluation. She explained that although the report contains minor detailed recommendations on management, the major concern of PEC-V centers on the prospect of a drilling gap between ODP and IODP.

Beiersdorf said that EXCOM should see the PEC-V report as soon as possible because it might contain suggestions about JOIDES management with respect to planning and policy making. He conceded that EXCOM had to accept the decision not to distribute the full report yet. Moran said that the JOIDES Office had received a copy and could certainly distribute any part of it. Briden questioned the unprecedented route of implementing the report without obtaining advice from the JOIDES advisory structure. He understood the formal reporting requirements, but noted that all previous PEC reports had gone to EXCOM and SCICOM, and he wondered if the JOI BoG felt content that it could do an optimum job without going through that loop. Raleigh did not think they intended to miss that step. Although he had not seen this report, he noted that previous PEC reports typically dealt with subcontractor issues, and JOI had to assemble the comments of the subcontractors to complete the overall report to NSF. Raleigh promised that EXCOM would receive the report before the JOI BoG acts upon it. Pisias reiterated that the JOIDES Office received the report, so the advisory structure should have it. Hay confirmed that the JOIDES Office had received the report and responded to specific questions posed to it by JOI, but had not seen anything further.

Briden said that as he understood it, the report would go to the JOI BoG, they would report to NSF and that would represent the final step. Moran explained that the full report to NSF would include the PEC-V report and the comments from the subcontractors, including the JOIDES Office, but JOI needed approval from the JOI BoG before they could officially send anything on contracts to NSF. Moran believed that the process had proceeded appropriately. Beiersdorf said that EXCOM would have to review the report carefully and make suggestions at the next meeting on how to respond to immediate issues identified by PEC-V concerning the JOIDES advisory structure. Briden asked if that meant that no action would occur until after July. Raleigh replied that action could occur as soon as the BoG had given their approval. Moran said that they could do so at the meeting this week. Raleigh said that the JOI BoG had no problem with the procedure, and he did not know why it appeared that one existed. Beiersdorf read a portion of the executive summary from the PEC-V report that criticized the lack of a document summarizing the overall achievements of the program. He said that EXCOM must prepare to address this serious issue at its next meeting after receiving copies of the full report.

From the February 2000 BoG meeting:

Performance Evaluation Committee's 5th Report

Raleigh discuss the presentation of the PEC-V report at EXCOM and suggested that the EXCOM members be sent the entire report and the responses from JOI and its subcontractors. Nowell asked if the PEC Chair should be invited to the June EXCOM meeting, to present the report. A consensus was not reached on this question.

From the June 2000 EXCOM meeting:

6.1.7 PEC-V Report

Farrell outlined terms of reference for PEC-V and listed the membership appointed by JOI. Overall, the report was very positive. It did, however, cite some concerns: 1) the lack of funds to complete the LRP goals, and 2) the lack of a summary of accomplishments. It also expressed concern over the effect of a potential hiatus in drilling between the programs on the scientific community, and suggested that management arrangements might hinder the transition.

The JOI response outlined solutions to specific shortcomings:

An ODP legacy project should summarize the accomplishments. There should be a database of ODP related scientific papers. Other potential products might include a new "Greatest Hits" volume, a collected reprints series, an accomplishments document comparing results to the LRP, an electronic database as research/educational tool, and public affairs documents.

Farrell noted that any drilling hiatus is unlikely to be greater than 12-18 months. He also noted that management aspects are tied to contracts.

Beiersdorf noted that EXCOM is obligated to request an accomplishments report.

Harrison presented a motion regarding the ODP legacy.

EXCOM Motion 00-2-5: EXCOM requests SCICOM to develop an ODP legacy that includes, among other things, the following:

- 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 developments, from TEDCOM with help from LDEO and TAMU,
- a reply to the question "How well did ODP do in answering the questions originally asked?" This study should consider all phases of ODP (*i.e.*, it should extend back to COSOD 1).

EXCOM would like to receive a draft report on the ODP legacy at its June 2001 meeting.

Harrison moved, Comas seconded; 14 in favor, 1 absent (Raleigh).

Falvey presented a motion for response to PEC-V report:

EXCOM Consensus 00-2-6: EXCOM acknowledges receipt of the Fifth Performance Evaluation Committee (PEC-V) Report and the contractor and subcontractor responses. The PEC-V Report raises many issues that will require careful consideration. EXCOM members should review the report at the earliest opportunity and respond directly to JOI by 1 October 2000. JOI will produce a response for the January 2001 EXCOM meeting.

Costs $K	FY01	FY04	FY05	FY06	FY07
TAMU	$ 38,538	$ 7,733	$ 2,494	$ 1,080	$ 1,096
LDEO	$ 5,268	$ 1,528	$ 379	$ 226	$ 231
JOI/J/DB	$ 2,317	$ 1,220	$ 465	$ 326	$ 270
Total	**$ 46,123**	**$ 10,481**	**$ 3,338**	**$ 1,632**	**$ 1,596**
% decrease/yr		77%	68%	51%	2%

4-year phase out Σ **$ 17,547**

(w/additional TAMRF admin. fee of $500K for two years)

FTEs	FY01	FY04	FY05	FY06	FY07
TAMU	150.0	89.5	23.6	13.0	9.0
LDEO	17.0	9.1	2.4	1.3	1.3
JOI/J/DB	17.4	9.1	3.6	2.4	2.4
Total	**184.4**	**107.8**	**29.6**	**16.7**	**12.6**
% decrease/yr		42%	73%	43%	25%

JOI staff and activity update

- 10/1/00: JOI-CORE split , J. Watkins resigned
- 10/1/00: rotation of BoG Chair & US EXCOM
- 11/27/00: new President, S. Bohlen
- J. Orcutt served as interim President
- Staff changes at JOI
  - 10 of JOI's17 staff have worked < 1 yr.
  - ODP Director & AD (USSSP Dir.) search begins

FY01 ODP program update

- $46.1M plan approved by NSF in Sept. '00
- Legs 192-199
  - Ontong, Manus, Marion, Mariana/WP ION,
  - Nankaii II, Hotspots, Shatsky, Eq. Paleogene
- Focus on legacy & phase-out considerations
- Arctic planning heats up
- JOI hosts co-chief review April 2000
- Fuel price impact

Fuel $, projected impact, resolution

- Short-fall of $1.34M was projected for '01
  - Amount budgeted for fuel is lower than price paid
  - As fuel prices rise, so do day rates
- NSF directly purchased fuel at 3 Guam calls effectively offsetting the projected deficit.

EXCOM motion 00-2-3

For review at the 1/01 meeting:

- JOI will prepare a draft phase-out plan for ODP management and operations
- JOI & JOIDES will develop options for the long-term maintenance of the ODP dbase, Janus, core repositories, and other legacies

ODP phase out instructions/assumptions

- 1st draft of close-out report due at NSF 3/02
- Close all major subcontracts by 9/30/03
- NSF extend prime and subs beyond 9/30/03
- JR ops end before 9/8/03 in U.S. port in GM
- Phase out completed within FY07
- DSDP/ODP carried forward, together (e.g., cores)

Phase out

Helmut's matrix components

- Drillship (and affiliated contracts)
- Equipment (science, drilling, logging, etc.)
- Data bases (and reference centers)
- Core repositories
- Intellectual property rights
- Advisory structure
- Achievements (aka "legacy")

Phase out

Specific impacts I

- Drillship: contract ends in 9/03
  - Demob in <21 days
  - Schlumberger logging contract ends
- Equipment (JR): scientific, drilling, logging
  - offload at GM demob port, assess, inventory
  - package, ship, warehouse until end '04
  - By end of '04, transfer to IODP entity(ies)

Phase out

Specific impacts II

- Janus database: operate, migrate, maintain, transfer
  - Create static archive at NGDC
  - JAMSTEC/TAMU/JOI Janus simulation begins '01
  - TAMU transfers Janus to IODP entity in '04
- Logging database
  - Create static archive at NGDC
  - Maintain dynamic archive & distribute data, LDEO
  - Continued support for log analysis centers, intl'

Phase out

Specific impacts III

- Core repositories
  - Transfer responsibilities to IODP entity in '04
  - TAMU estimates cost of maintenance in '05-'07
  - Consolidation of U.S. repositories?
- Publications
  - Remains at TAMU, concludes in '07
  - IS and Pubs departments combine in '05
  - LDEO continues publishing ODP IR data CD

Phase out

Specific impacts IV

- Advisory structure evolution
  - Arctic PPG/DPG, JOIDES continuation to 10/1/03
  - IODP SAS starts 10/1/03
  - iSAS bridges
- Achievements
  - IR, SR, & other obvious ones
  - Legacy products
    - "Achievements & Opportunities", bibliographic database, Technical Legacy Document, reprint vols., GH, etc.

Phase out

[Phase out costs, FTE decrease]

- See other overheads, created externally
- 1. Summary finance table
- 2. Cost decrease histogram
- 3. FTE decrease histogram

Options to maintain data: strategy

- Discovery
  - What do we have (data, cores, equip., etc.)?
  - Where, how much, what condition?
- Evaluation (with JOIDES guidance)
  - What relative value? Cost/benefit of maintenance
  - Select physical and digital assets to maintain
  - Determine format
- Implementation
  - Tied to phase-out plans

Activities since last meeting

- New TAMU IS position, 1/2 archive, 1/4 Janus transfer
- 11/2/00 data discovery and archive meeting at NGDC
- 11/27/00 follow-on meeting at TAMU
- 12/00 NGDC rep. provides archive guidance to SCIMP

Goal: initiate discovery phase and begin discussion with NGDC regarding archival of ODP databases

TAMU digital holdings

- JANUS: Oracle relational database - will grow to ~20 Gb.
- ASCII data: shipboard files, VCDs, contrib. data, ~16 Gb.
- Core photos: TIFF format (1200/300 dpi), ~ 2500 Gb.
- JR site survey data: SEG-Y format, ~200 (4/8mm) tapes.
- JR underway geophysics data, ~120 (4/8mm) tapes.
- Engin. drawings: autoCAD documents, ~3000 documents.
- Digital imaging system data: (if deployed), quantity TBD.

TAMU analog holdings

- Photo film: B&W, color (4"x 5") - 115,000 core photos, 70,000 close-ups, 120 - 3" binders of slides.
- Microfilm: prime data, seismic, underway profiles, ~600 rolls.
- Underway paper: 3.5 kHz Profiler records, ~1100 rolls.
- Paper prime data: barrel/paleo sheets, logsheets, ~1000 reams.
- Video: VHS tapes (e.g., bottom surveys), ~35' of shelf space.
- Engineering drawings: unknown quantity.

LDEO/BRG digital holdings

- 4mm DAT tapes: various logs on ~1871 tapes.
- CD-ROM: field, processed data, core-scans, ~70 CDs.
- 9-track tapes: FMS processed data (Leg 128), ~23 tapes.
- TK50 cartridges: FMS data (Leg 134), ~22 cartridges.
- VHS tapes: Borehole Televiewer data, ~27 videotapes.
- Zip disks: Temp., original and processed data, 5 disks.
- On-line log dbase: mostly ASCII files (313 holes), ~16 Gb.

LDEO/BRG analog holdings

- Analog well logs: ODP film + paper records, Legs 101-149. DSDP paper records Legs 1-96.
- Analog well logs: paper records, ODP Legs 149-191.
- Microfiche: FMS data (Legs 126-141), in IR vols. too
- Processing notes: complete inventory pending.

Site Survey Databank

- Currently tracks 13,000 items mostly in analog. The bulk (9185) are multi-channel and single-channel seismic profiles with supporting navigation, sub-bottom profiles, and bathymetry.

- Should the IESX pilot project for managing digital seismic data be succeeded by implementation, anticipate a sig. increase in digital data holdings.

Bibliographic database: update

- Preliminary DSDP/ODP database created
  - based on 20 keywords and GeoRef, put on web
- Community reviews & adds 973 citations
- Citations compiled & sent to AGI (Jan '01)
- AGI is verifying submitted citations and will add to, or modify, database accordingly

Future work

- AGI will create an updated database from GeoRef, incorporating community input
- Revised bibliographic database will be distributed to user community and updated over time. Web-based, CD-ROM, etc.

Technical Legacy Document

- **TAMU & TEDCOM**
- **Purpose**: to catalog tool systems, tech. innovations, review sci. benefit, explain tool ops and functions, consolidate design drawings and specs., provide history of tech. dev., explain operational parameters, performance, and limitations, etc.

Technical Legacy Document

- **Scope**: Coring tools, bits, drill string, reentry and casing systems, downhole tools, hole completion equip. (CORKs, ION), other equip., various design, database, and software documentation, document legacy sites, prepare ops manuals.
- **Timing**: 30% completed by 9/30/03. Remainder to be done in '04.

"Achieve. & Ops of SOD"

- SCICOM-initiated effort
- Becker and Hay managing editors
- Dynamics of Earth's Interior and Environ.
- On schedule for publication in May 2001
- Special edition of the *JOIDES Journal*

FY02 ODP Preview

- Target $46.1M
  - "with the NSF option to increase based on actual fuel costs"
- Legs 200-204
  - H_2O, Peru, SE Paleo., Costa Rica, Gas hydrate
- Last ODP scheduling of JR in Aug. 2001
- Phase-out plan due at NSF March '02
- [Riser ship hull launched 1/02]
- [NSF's non-riser RFP released ~1/02]

ODP DATA
TRANSFER/ARCHIVE PROJECT

MEETING AGENDA
November 2, 2000

I. Opening Remarks - Frank

II. Describe TAMU, LDEO Borehole, and Site Survey data (brief overview by each facility)

   A. Current volume, condition, and format of data
   B. Processing underway & anticipated status by end 2003
      1. Data migration in JANUS
      2. Log processing/format issues?
      3. Site Survey proprietary issues?

III. Build a definition of a data archive for each category in II. (roundtable discussion)

   A. Storage and distribution/access requirements
      1. NSF
      2. JOI

   B. NGDC archive
      1. RDBMS
      2. Flat Files
      3. Analog Data

   C. Any data not to be archived at NGDC?

IV. Possible digital data solutions (roundtable discussion)

   A. RDBMS approach (database technology transfer)
      1. Janus mirror site at NGDC?
      2. Create primary Janus database site at NGDC?

   B. Flat file approach
      1. Extract data from Janus Database?
      2. Create special use files/DVD's?

   C. Borehole data?

D. Site Survey data?

V. Possible analog solutions

VI. Action items and options

Meeting Attendees:

Bruce Malfait (NSF)
Frank R. Rack (JOI)
David Becker (ODP/TAMU)
Layne Westover (ODP/TAMU)
Mary Reagan (LDEO-BRG)
Cristina Broglia (LDEO-BRG)
George Sharman (NOAA/NGDC)
Carla Moore (NOAA/NGDC)
David Divins (NOAA/NGDC)
William Hay (present JOIDES SCICOM Chair, GEOMAR)
Keir Becker (future JOIDES SCICOM Chair, UMiami/RSMAS)

ACTION ITEMS (Summary):

ACTION ITEM 00-data-1: SCIMP and the ODP/TAMU JANUS database group should define the tables, scripts, and applications that need to be developed to meet the needs of the microbiological data acquisition within ODP. Recommendations should describe how to proceed and how these developments should be prioritized within the entire JANUS effort.

ACTION ITEM 00-data-2: The ODP/TAMU Data Librarian should (a) provide an accounting of the present data holdings and (b) provide an estimate of the overall status of data submissions from past ODP participants.

ACTION ITEM 00-data-3: ODP/TAMU should provide information about the status of the core photographs from ODP legs prior to Leg 161 and estimate the scope of the remaining task to scan, quality assure, digitize and store these assets in digital format (e.g., as high-resolution TIFF and low-resolution PDF files).

ACTION ITEM 00-data-4: ODP/TAMU and LDEO should generate inventories of the appropriate ODP and DSDP paper data products that should be scanned and digitized for long-term archive storage under this NOAA program. The appropriate specifications for this scanning process and the prioritization of this activity should be evaluated and prioritized by JOIDES (e.g, SCIMP). These inventories should be provided to NGDC to include in a digitization project proposal, as is determined to be appropriate.

ACTION ITEM 00-data-5: An assessment should be made (by ODP/TAMU and LDEO, with assistance from SSP) of the site survey data that may be duplicated in other databases and/or data centers, and therefore may not need to be archived. In addition, the extent of the JOIDES Resolution site survey and geophysical data not being archived at NGDC should be determined and a process should be set up to remedy this situation, as appropriate.

ACTION ITEM 00-data-6: LDEO should determine the required effort necessary to capture and preserve the complete metadata of the log processing and operations, and to preserve this ("corporate memory") as metadata linked to specific logging runs. This history of data processing is vital to maximizing the value of these data.

ACTION ITEM 00-data-7: ODP/TAMU requests advice from JOIDES (e.g., SCIMP) to define the appropriate archive data formats for JANUS transfer to NGDC.

Response from David Becker (ODP/TAMU): I asked staff about the detailed information regarding ODP data types. The response was clear that an effort is underway and will continue to end of program to add detailed information where needed in the form of additions to the existing user manuals and the Janus data models. Staff noted that as a general rule, the further data are from the "who, what, why, where, and how" of it's collection, the less reliable the data are likely to be. Therefore, one of our priorities is to

try to capture as much information about how the data were collected, processed, etc., and to make that metadata readily available as we migrate data into the database. Essentially, the data formats currently used in the JANUS user manuals will be followed as data is migrated.

ACTION ITEM 00-data-8: JOI will arrange a meeting with ODP/TAMU, NGDC, and SCIMP representatives to discuss data format and data type definition issues.

Note: This meeting will be held in College Station, TX on November 27, 2000. In addition to the ODP/TAMU representatives, Frank Rack (JOI), Tom Janecek (SCIMP) and David Divins (NGDC) will attend this meeting. The outcome of this meeting will be transmitted to SCIMP at their December meeting for further discussion.

ACTION ITEM 00-data-9: All subcontractors (ODP/TAMU, LDEO-BRG, JOIDES SSDB) will develop more complete inventories of data holdings. These inventories will allow the identification of duplicate data assets (e.g., analog vs. digital formats) and will allow the evaluation of potential digital scanning (data rescue) projects.

Response from Dan Quoidbach (SSDB): We will finish the transfer of the old card catalog into the FileMaker database next year. We will then be able to produce inventory reports summarized by data type and by Leg/Proposal Number. However, it will be necessary to check these inventory lists against the actual records to obtain information regarding size of the document and the number of copies and current data quality.

With the end of Leg scheduling after the August 2001 SCICOM meeting, we will begin the transfer of effort from proposal review to close-out tasks.

ACTION ITEM 00-data-10: LDEO-BRG and JOIDES SSDB, with the help of the appropriate JOIDES panels (e.g., SCIMP, and SSP) should determine which data holdings are important, unique, and/or irreplaceable. Which data should be archived and/or improved through reprocessing activities? What are the potential costs of these activities? What is the level of effort that will be required? These activities should include an evaluation of the existing DSDP data holdings and a judgement of whether further data rescue efforts are warranted (if yes, then by whom, and when?). How should this be prioritized?

Response from Dan Quoidbach (SSDB): I will discuss with John Diebold and Tom Janacek a procedure to determine what data are important to archive and what can be discarded. Hopefully SCIMP can discuss this issue at its next meeting. I think the first question that needs to be answered is whether we want to include data for non-drilled proposals. After that we should identify data that are already archived in other public databases and which would not need to be archived at NGDC.

We will also want to decide what the purpose of the archive will be. Will it be just the data needed to document the site locations, as in the shipboard data package, or do we want the full package of materials submitted which may contain reprints, cruise reports,

correspondence and other metadata, as well as any miscellaneous data the Site Survey Panel required to pass their review? A subgroup of SSP might be charged with looking through the older data and determining if the materials are still scientifically useful. They could perform this at their July 2001 meeting which will be held here at LDEO.

ACTION ITEM 00-data-11: Throughout the Ocean Drilling Program, an effort should be made to inventory and evaluate paper record holdings that should be preserved (e.g., smear slide description forms, thin section description forms, VCDs, etc.). The overall inventory of paper record holdings should be communicated to NGDC to see if a proposal to scan and digitize these assets is possible using NOAA funding sources. The goal would be to make these resources more accessable in a digital archive.

ACTION ITEM 00-data-12: JOI will sent out a request to the ODP community to encourage researchers to submit digital copies of data obtained from ODP and DSDP samples (and the appropriate metadata) to the ODP Data Librarian. This is an existing obligation under the ODP sample, data, and publications policy, but this needs to be highlighted in an announcement to the community to preserve the data legacy of the ODP.

FINAL ODP/NGDC DATA TRANSFER/ARCHIVE MEETING MINUTES
(recorded and compiled by Frank Rack with contributions from ODP/TAMU, LDEO/BRG, and NGDC representatives - FINAL version, distributed on November 21, 2000):

George Sharman (NOAA/NGDC) welcomed the meeting participants to the National Geophysical Data Center (NGDC) in Boulder, Colorado and provided an overview of the meeting room facilities and logistics.

Frank Rack (JOI) presented an overview of the meeting objectives and described the rationale for convening a meeting between representatives of the Ocean Drilling Program (ODP), JOIDES, NSF, and the NGDC. The primary motivation for this meeting was to discuss and evaluate various options for the long-term maintenance of the ODP databases, JANUS database, and the contractually-mandated plans for data transfer activities leading up to the close-out of the ODP. A PowerPoint presentation that was prepared for this meeting is included with these minutes as **Appendix 1**.

From the JOIDES perspective, this meeting was called to partially address EXCOM Motion 00-2-3, which requests "JOI and the JOIDES Science Advisory Structure will develop options for the long-term maintenance of the ODP database, JANUS database, core repositories, and other ODP legacies". This meeting also follows upon SCIMP Recommendation 98-2-8, which recommended "that NOAA/NGDC work with JOI to investigate the most efficient way to complete the DSDP/ODP data archiving". In January of 1999, NOAA/NGDC and ODP/TAMU established a preliminary agreement to test JANUS database transfers via 4-mm DAT tapes. By June of 1999, this collaboration had been successful in transferring a copy of the JANUS database tables to NGDC, with updates provided by ODP/TAMU to NGDC roughly twice per year.

One aspect of the ODP to NGDC Data Transfer Project that remains to be addressed is the form and contents of an ODP data archive at NGDC/World Data Center for Marine Geology and Geophysics, Boulder. The NSF Policy for Oceanographic Data (NSF 94-126) provides guidelines to ensure the timely submission of "high quality oceanographic data to the national data centers for secondary use" (see Policy in **Appendix 2**). This NSF policy was established during the 1980's and revised in 1994. NSF may choose to re-examine their oceanographic data policies in the future.

Keir Becker (JOIDES) asked if there were any international requirements with regard to data archiving. Bruce Malfait (NSF) said that NSF is primarily concerned with its national agreement to archive ODP data at a national data center, however, due to the collocated World Data Centers at NGDC, the transfer of these data should also satisfy any international data archive requirements.

The key component of the ODP to NGDC data transfer activity is to determine the definition of an "appropriate" archive, and to determine which data are considered "appropriate" for consideration under this policy.

ODP/TAMU Report

David Becker (ODP/TAMU) presented a overview of the ODP/DSDP data holdings presently identified by the Science Operator (**Appendix 3a**). The JANUS database consists of over 450 data tables inter-linked by the Oracle relational data model that defines the JANUS database. This database is estimated to be about 20 GB in size when the data migration process is completed before the end of ODP. One aspect of the data definition that has not been addressed to date are the needs of the microbiology community, which were not defined when the JANUS data model was constructed. The JANUS data are governed by restricted access during the one-year moratorium period. Can data transfer to NGDC during the moratorium? NGDC can develop policies to allow the transfer of these data to NGDC during the moratorium.

ACTION ITEM 00-data-1: SCIMP and the ODP/TAMU JANUS database group should define the tables, scripts, and applications that need to be developed to meet the needs of the microbiological data acquisition within ODP. Recommendations should describe how to proceed and how these developments should be prioritized within the entire JANUS effort.

An additional pool of primary data are the scientific data files that have been submitted to the ODP Data Librarian, primarily as flat ASCII files. These data holdings are estimated to reach 12 GB by the end of the program. It is suspected that many of the obligated data submissions under the ODP sample, data, and publications policy may still be outstanding.

ACTION ITEM 00-data-2: The ODP/TAMU Data Librarian should (a) provide an accounting of the present data holdings and (b) provide an estimate of the overall status of data submissions from past ODP participants.

There are a variety of additional data holdings (see **Appendix 3a**), many in analog format (e.g., paper, film, and video), which need to be evaluated by the appropriate parties (ODP/TAMU and JOIDES representatives). Some of the issues that need to be addressed are determinations of what data to preserve, e.g., does the program retain all original copies of data, even when these paper copies may be preserved on microfiche, microfilm, or other media? Should paper copies of forms, reports, and assorted intermediate data products (e.g., VCD's, smear slides, thin section descriptions, drilling and operations reports) be digitized if appropriate resources can be identified?

An ODP/TAMU concern is that turnover in personnel is a significant factor in the JANUS data migration activity. At the present time, only one overall FTE is assigned to this task. There are questions about the term of the data processing phase-out activity and the scope of these efforts.

Core photographs at high-resolution formats (1200 dpi) are a significant potential source of digital data (e.g., 2500 GB) in TIFF format. These data are presently stored on a separate hard drive at TAMU. Core photographs from Legs 161 to 187 are available as 300 dpi PDF format documents, but archive core photographs from earlier legs still need to be scanned and saved in digital format.

ACTION ITEM 00-data-3: ODP/TAMU should provide information about the status of the core photographs from ODP legs prior to Leg 161 and estimate the scope of the remaining task to scan, quality assure, digitize and store these assets in digital format (e.g., as high-resolution TIFF and low-resolution PDF files).

Additional information was provided by ODP/TAMU in response to questions raised by the meeting attendees (**Appendix 3b**).

George Sharman (NOAA/NGDC) suggested that there may be available options through specific NOAA internal programs, which would accept proposals to accomplish the systematic scanning and digitization of paper records, if appropriate estimates of these data holdings could be quantified (e.g., DSDP drilling parameters, paper prime data, etc.).

This approach has been utilized in the past to rescue other analog data holdings, such at historic BT profiles, and weather observation sheets. The criteria for this program are that the task be simple, repetitive, and that the scope of the project can be quantified. This NOAA program is a potential source of earmarked funds for data rescue, assuming that the specifications for the data rescue process can be clearly defined. The proposed project could be accomplished by workers located in West Virginia and Kentucky, assuming appropriate levels of programmatic oversight.

ACTION ITEM 00-data-4: ODP/TAMU and LDEO should generate inventories of the appropriate ODP and DSDP paper data products that should be scanned and digitized for long-term archive storage under this NOAA program. The appropriate specifications for this scanning process and the prioritization of this activity should be evaluated and prioritized by JOIDES (e.g, SCIMP). These inventories should be provided to NGDC to include in a digitization project proposal, as is determined to be appropriate.

ACTION ITEM 00-data-5: An assessment should be made (by ODP/TAMU and LDEO, with assistance from SSP) of the site survey data that may be duplicated in other databases and/or data centers, and therefore may not need to be archived. In addition, the extent of the JOIDES Resolution site survey and geophysical data not being archived at NGDC should be determined and a process should be set up to remedy this situation, as appropriate.

The four points emphasized by ODP/TAMU with respect to the question of the condition of ODP-related data are:

(1) Transferability – i.e., all data can be transported to a defined repository.

(2) Readablibility – i.e., all data are in good condition.

(3) Accuracy – i.e., the data uploaded into the JANUS database are error-checked to the extent possible and quality assured to be in the "best" condition.

(4) Accessibility – i.e., all data are under the one year moratorium before transfer to JANUS; this will require the JANUS activity to be preserved through FY2004, at the least.

The important processes for ODP/TAMU data stewardship during the ODP phase-out are: (1) archiving, (2) indexing, and (3) access, i.e, data provided to the community through JANUS database SQL queries.

Meeting notes submitted by David Becker (ODP/TAMU) are included in **Appendix 3c**.

LDEO-BRG Report

Cristina Broglia (LDEO-BRG) presented the status of the ODP Well Log Database (see **Appendix 4**), which includes 313 holes logged, with existing data including field, customer, and processed tapes. The field data are archived in DLIS-LIS format. Digital data are stored primarily on 4mm DAT tapes; a small amount of the processed data (see **Appendix 4**) is saved on TK50 cartridges, 9-track tapes, and Zip disks. In addition to digital data, there are also analog data (Log blueprints and microfiche) and video files.

The keys to understanding the definition of "**field**" data are (1) that the tapes are provided to a client of Schlumberger, and (2) that these tapes include all of the data recorded by the MAXIS system, including lots of engineering information on multiple channels (e.g., all of the data that was acquired during the logging runs).

"**Customer**" data refers to the "standard" user data files, which are a subset of the field dataset.

All field data tapes are in good condition and can be used to create customer tapes as required. There are a number of additional data files, which could be considered as primary data (e.g., preserved on tapes, VHS film, and paper records, including 9-track tapes from DSDP), which need to be evaluated for archive storage, as appropriate.

The archive of DSDP data is an open question. All of the data (92 holes) currently stored on the NGDC CD-ROM are unreadable on any computer platform due to a format problem. A subset of these data (33 holes) is stored in LIS format on 4mm DAT tapes: these data are readable on any computer equipped with the appropriate loading software. An additional investment of time and funds is required to download and convert the remaining data (49 holes) into a usable format and to process all of the DSDP data with the same technique used for ODP data.

Most of the ODP Well Log Database are currently available on-line in specific data formats; additional logs and formats are also available upon request and have been saved on 4mm DAT tapes. Although some metadata documentation is available in digital format, the majority is in analog format.

The LDEO-BRG has developed expertise in understanding the needs and data requirements of the JOIDES scientific community, and these needs have evolved over time. This process has resulted in data formats that best address the scientific needs of the community, and has established the importance of the corporate memory of the logging program. It is very important to keep in mind the value of understanding the processing that the data have undergone prior to storage and/or distribution.

NOAA/NGDC is capable of archiving back-up tapes from the LDEO-BRG, but are not capable of reading original data (DLIS or LIS format).

ACTION ITEM 00-data-6: LDEO should determine the required effort necessary to capture and preserve the complete metadata of the log processing and operations, and to preserve this ("corporate memory") as metadata linked to specific logging runs. This history of data processing is vital to maximizing the value of these data.

JOIDES/ODP Site Survey Data Bank (LDEO) Report

Frank Rack provided a general overview of the JOIDES/ODP Site Survey Data Bank, based primarily on on-line sources of information. Dan Quoidbach (through Mary Reagan) provided a written summary of the data bank holdings (see **Appendix 5**) and a summary of the pertinent issues that should be addressed in the close-out process.

What happens to data from legs that are not scheduled?

The JOIDES Site Survey Panel should be tasked with helping the program evaluate site survey data bank legacy and archive issues (see ACTION ITEM 00-data-10), including who owns the data, what data are proprietary, and what data are held in common with NGDC.

NOAA/NGDC and World Data Center-A for MGG, Boulder Report

George Sharman (NGDC) provided an overview of the National Geophysical Data Center structure and operations (see **Appendix 6**, only hard copy is available at present), including the relevant information technology (IT) infrastructure. George explained the World Data Center structure and their role in data distribution around the world.

NGDC has recently reissued (September, 2000) the DSDP CD-ROM (Legs 1-96) with an HTML interface and tab-delimited text files. This CD-ROM replaces the 1989 DSDP CD-ROM; all 750 copies of the earlier version were distributed.

The majority of the NGDC data holdings (by volume) are DSMP satellite data being archived at NGDC. The tape archive for these satellite data provide NOAA/NGDC with resources and advanced technological capabilities, which include: (1) a robotic tape handling system for the (NARA standard) tape archive, and (2) a fiber optic network backbone deployed by the Boulder Research Area Network (BRAN) between the NOAA/NGDC, UCAR/NCAR, and the Univ. of Colorado.

NGDC have concerns about archive data availability, including the following issues:

(1) Archiving:
- a) completeness
- b) preservation
- c) access
- d) distribution

(2) Metadata
- a) usefulness

(3) Avoiding Disruptive Discontinuities
(e.g., the disruption of data availability during the transition between DSDP and ODP.

NSF Comments

Bruce Malfait explained the NSF perspective on the ODP to IODP transition. There is an ongoing activity to transition the JANUS database as a mirror to JAMSTEC (OD21) so that the appropriate data can be available to the next program (IODP) and the scientific community. It was agreed that "appropriate" data to be archived could be defined by their scientific usefulness.

The specific resources (funds) available for the data transfer activity, under the terms of the NSF data policy, are undefined. For example, individual NSF investigators accomplish this by requesting specific funds in their grants to comply with data requirements; major identified programs have additional responsibilities that are defined by a dialog among the appropriate program managers. The pertinent issues related to the enforcement of data policies are also unclear and will require additional evaluation.

General Discussion

The group moved to a general discussion of database (flat file) export questions and issues to establish a common framework for detailed discussions. Some of these issues relate to the establishment of specific data file definitions and metadata descriptions for JANUS data. Frank felt that the JANUS data file definitions should exist, based on the previous discussions and minutes of the JANUS sub-committee, and the on-line TAMU manuals that describe data fields in JANUS.

What is the definition of an "archive", i.e., the "letter of the law", and the requirements that must be met to comply with the NSF Policy? Is a mirror of the JANUS database at NGDC considered adequate for an "archive"? The general concensus of the NGDC representatives is that a mirror of the JANUS relational database structure is not considered a "true" archive, but could be considered as a first step toward facilitating creation of an archive, as a means of long-term maintenance of access to the JANUS database, and as an off-site "back-up" of the database.

Are flat ASCII downloads of the various JANUS tables sufficient, given the existing definition of the JANUS data model? Are data file definitions required, independent of JANUS (oracle) relationships, to develop metadata descriptions for individual ASCII flat files? ODP/TAMU needs advice from the scientific community (e.g., JOIDES panels) in order to define the appropriate data formats for permanent, software-independent archive by NGDC.

ACTION ITEM 00-data-7: ODP/TAMU requests advice from JOIDES (e.g., SCIMP) to define the appropriate archive data formats for JANUS transfer to NGDC.

ODP/TAMU view the JANUS database as a "living document" with evolving access requirements as each new scientific party collects new data (e.g., moratorium access, post-moratorium access, access to relationships between data files according to the Oracle data model for JANUS). The exisiting JANUS Tables may seem somewhat static, but they are continually evolving as the data migration effort populates the fields defined by the data model.

NGDC cautions that the transfer of data between DSDP and ODP was not smoothly accomplished. When a new program starts up, the focus of the new program is on the new data, not preserving the data from the previous program; therefore, less effort is expended on dealing with legacy issues. The long-term data transfer effort may be resource limited (e.g., not enough personnel, not enough funding).

Documentation of data (i.e., metadata) and capture of "corporate memory", as related to data acquisition, processing, quality assurance, and other activities (i.e., the history of the data collected; database scripts) are vital for the success of data archiving. At some point, it may be necessary to restrict new developments and focus on data documentation projects. Nobody really wants to focus on data documentation because it is a hard and tedious job.

ODP/TAMU is presently moving to Java as the basic programming language and converting older scripts to this language. The generic JANUS data uploader is nearly completed. This script will be able to deal with changes in data acquisition methods and data types (e.g., changes in Labview implementation for various data sources and instruments). The process of data migration into JANUS is ongoing at ODP/TAMU. The changes in data format from leg to leg require the modification of the original data files to

conform with a generic data definition before being uploaded into JANUS using the upload scripts. At present, the equivalent of one (1) FTE is working on the data migration project.

NGDC noted that a relational database is **not** an "archive". NGDC's goals for the archive include (1) ease of transport of data, (2) ease of access to data, and (3) long-term preservation of information. There is a risk that if the Oracle standard goes away or if the software changes significantly at a later date and resources are not available to redesign the system, then the data will be lost unless representative, database-independent ASCII files exist to preserve the archive data. By definition, an official NARA archive can't be software dependent (NARA = National Archives and Records Administration; see: http://www.nara.gov). Relevant portion reproduced in Appendix 7.

A relational database incorporates: (1) a defined data model, (2) defined entity relationships, and (3) pointers to, and among, specific data files.

ODP/TAMU suggests that the export of data from JANUS as stand-alone flat ASCII data files may be difficult, and/or require significant resources. This will require the development of many specific SQL queries, a determination of which data are important to be archived, and a description of specific format for each data type. Redundancy would have to be built into each data table to allow them to stand on their own. Each table currently has a number of dimensions built into it (e.g., site, hole, core, section, interval). There would need to be repetition of data within stand-alone files based on these sample/data descriptions.

Do we need to break the relational database management system (RDBMS) down to it's smallest elements in order to archive them? Can we reduce this complexity by reducing the scope of the data holdings to be archived? We need definitions of archival data types. Therefore, we need a group of people to define these at a selected level (e.g., basic unit of data). Do we want a large number of small data tables, or a smaller number of larger tables? Can we agree that data should be archived by ODP or DSDP 'HOLE', thereby reducing the complexity of the data archiving process while preserving what the community generally needs? What are the risks in this approach?

Long-term maintenance of a mirror site for JANUS at NGDC may facilitate the creation of a true "archive". The group was able to agree that there are three basic options for moving toward a transfer of JANUS data from ODP/TAMU to NGDC:

(1) Transfer the JANUS RDBMS as a mirror to NGDC. The foundation for this process, duplication of the data tables at NGDC, is occurring now, with updates from ODP/TAMU sent to NGDC on a regular basis using 4 mm DAT tapes. To create a true mirror site, access software would also need to be installed at NGDC. This "mirror" approach is not seen as a "archive" by NGDC because there is software dependence to the Oracle data model of JANUS. It is seen as a very desirable step toward maintenance of long-term access to the JANUS database itself. Establishment of a true, functioning

mirror at NGDC could be accomplished in parallel to other database mirrors being constructed in Germany and Japan.

(2) Output flat ASCII data files from JANUS using the RDBMS structure as a "blueprint". This is essentially equivalent to downloading the existing JANUS tables at text files, but the metadata will only exist in the context of the JANUS Oracle data model. It was noted at the meeting that this approach actually archives the database rather than the underlying scientific data. To actually recreate the database from the results of this output may be expensive, perhaps requiring resources equivalent to the original design and implementation of the JANUS database itself.

(3) Output flat ASCII data files from JANUS in a form that is independent of the JANUS Oracle data model. This approach will require extensive documentation of each data file to preserve the relevant metadata (e.g., data definition, data acquisition and processing history, describe relationships with other data files, etc.). This option is thought to be the only approach listed that will create a true long-term archive of the data; however, this approach may also be expensive. An estimate of the level of resources required will need to be determined through futher discussions among the parties involved.

SQL scripts will need to be developed or modified from existing scripts to accomplish the output of data from JANUS in the appropriate data formats prescribed by options 2 or 3. The verification of data and quality control/quality assurance (QA/QC) steps suggest that data should be migrated and/or uploaded into JANUS to standardize the data product(s) before creating the flat ASCII files for transfer to an archive (e.g., NGDC).

ACTION ITEM 00-data-8: JOI will arrange a meeting with ODP/TAMU, NGDC, and SCIMP representatives to discuss data format and data type definition issues. The outcome of this meeting will be transmitted to SCIMP at their December meeting for discussion. This meeting will be held in College Station, TX on November 27, 2000.

ACTION ITEM 00-data-9: All subcontractors (ODP/TAMU, LDEO-BRG, JOIDES SSDB) will develop more complete inventories of data holdings. These inventories will allow the identification of duplicate data assets (e.g., analog vs. digital formats) and will allow the evaluation of potential digital scanning (data rescue) projects.

On-line LDEO-BRG logging data are (generally) already preserved as ASCII flat files and digital GIF format images (e.g., FMS), but the original raw data are not in archive format, but rather exist as DLIS/LIS format files (i.e., log analysis software dependent formats).

There are questions about where to stop and archive data along the processing pathway to make the data available to the community in the best way. What data product(s) should be archived? Where there may be multiple formats of log data there may need to be better inventory control. There are also issues about data visualization and the presentation of data products, since some log interpretation may be visualization-dependent. How does

the program deal with specific user requests when, and if, the corporate memory is lost? How do we capture this information as a program? How does changing user demands influence data access issues?

NGDC is not really capable of dealing with log data in DLIS/LIS format. They can store data tapes in a vault as an "archive", but they can't read or reprocess these data. NGDC is willing to accept a wide range of data, as long as it is fully described. NGDC has not accepted much analog data lately, although they did recently accept the Bruce Heezen library holdings.

LDEO-BRG provides individual customer service(s) by offeringa variety of specialized outputs.. Changes in these specialized outputs are dictated by evolving user needs based on available interpretation software and techniques

Two copies of the log data from each leg are archived. During the six months following the cruise, the second copy is kept on the ship. After that it is stored at LDEO in a separate building.

Seismic log data are saved in DLIS/LIS format. A subset is also available in SEG-Y format. An important note to remember is that there is no one standard SEG-Y format. The SEG-Y format that LDEO-BRG has used for their archive has proven to be widely readable.

It was agreed that LDEO should maintain the log data archive as is being done at present. NGDC is archiving log data through Leg 145 but they can't read these data tapes. Recent log data are also being archived by NGDC on CD-ROMs, but access is not provided, since the more recent LDEO/BRG logging data are available on-line.

Microfilm and/or microfiche copies of paper records exist (e.g., FMS logs).

ACTION ITEM 00-data-10: LDEO-BRG and JOIDES SSDB, with the help of the appropriate JOIDES panels (e.g., SCIMP, and SSP) should determine which data holdings are important, unique, and/or irreplaceable. Which data should be archived and/or improved through reprocessing activities? What are the potential costs of these activities? What is the level of effort that will be required? These activities should include an evaluation of the existing DSDP data holdings and a judgement of whether further data rescue efforts are warranted (if yes, then by whom, and when?). How should this be prioritized?

ACTION ITEM 00-data-11: Throughout the Ocean Drilling Program, an effort should be made to inventory and evaluate paper record holdings that should be preserved (e.g., smear slide description forms, thin section description forms, VCDs, etc.). The overall inventory of paper record holdings should be communicated to NGDC to see if a proposal to scan and digitize these assets is possible using NOAA funding sources. The goal would be to make these resources more accessable in a digital archive.

ACTION ITEM 00-data-12: JOI will sent out a request to the ODP community to encourage researchers to submit digital copies of data obtained from ODP and DSDP samples (and the appropriate metadata) to the ODP Data Librarian. This is an existing obligation under the ODP sample, data, and publications policy, but this needs to be highlighted in an announcement to the community to preserve the data legacy of the ODP.

APPENDIX 2:
Policy for Oceanographic Data, NSF 94-126

Purpose

1. This statement updates and revises 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 the National Science Foundation's (NSF) Division of Ocean Sciences (OCE) in October 1988.

Policy

2. 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 as described below.

Responsibilities of Principal Investigators

3. Principal investigators are required to submit all environmental data collected to the designated national data centers as soon as possible, but no later than two (2) years after the data are collected. Inventories of all marine environmental data collected should be submitted to the designated national data centers within sixty (60) days after the observational period/cruise. For continuing observations, data inventories should be submitted periodically if there is a significant change in location, type or frequency of such observations. Inventory forms (Report of Observations and Samples Collected on Oceanographic Programs, (ROSCOP) and instructions are supplied by the National Oceanic and Atmospheric Administration's (NOAA) National Environmental Satellite Data and Information Service (NESDIS), based on lists of investigators provided to NOAA/NESDIS by funding agencies.

4. Data sets identified for submission to the national data centers must be submitted to the designated center within two (2) years after the observational period. This period may be extended under exceptional circumstances by agreement between the principal investigator and NSF. Data produced by long-term (multi-year) projects are to be submitted annually. Principal investigators working in coordinated programs may (in consultation with their funding agencies) establish more stringent data submission procedures to meet the needs of such programs.

5. NOAA's National Environmental Satellite Data and Information Service staff and program representatives from funding agencies will identify the data sets that are likely to be of high utility and will require their principal investigators to submit these data and related information to the designated center.

6. Funding agencies will apply this policy to their internal ocean data collection and research programs and to their contractors and grantees and will establish procedures to enforce this policy.

7. A list of oceanographic data types and the centers designated to receive them are the following:

7.A. Ocean physical data -temperature, salinity, light transmission or attenuation, currents, waves, pressure, sea level, and sound speed.

Ocean chemistry data -nutrients such as phosphates, nitrates, nitrites and silicates; chemical tracers such as helium, tritium, freon and argon; pollutants such as petroleum hydrocarbons, organochloride and organophosphorus pesticides, polychlorinated biphenyls (PCBs) and heavy metals. Data may represent chemicals in water samples or biota.

Ocean biology data -primary productivity; concentrations of pigments in phytoplankton, such as chlorophyll-a; biomass of phytoplankton, zooplankton, benthos and nekton; and bioluminescence.

National Oceanographic Data Center (NODC)
Data Officer, E/OC
1315 East-West Highway
SSMC3, 4th floor
Silver Spring, Maryland 20910
Phone: (301) 713-3267 x151
Fax: (301) 713-3301

7.B. Surface meteorological data - meteorological data in appropriate World Meteorological Organization formats as part of the Voluntary Observing Ship (VOS) program: air temperature, sea-surface temperature, dew point temperature, pressure, wind speed and direction, wind and swell waves, weather, short- and long-term radiation, visibility, cloud cover and type, and ice accretion.

National Climatic Data Center (NCDC)
Federal Building
151 Patton Avenue
Asheville NC 28801-5001
Phone: (828) 271-4800
Fax: (828) 271-4876

7.C. Geophysical, geological and geochemical data -bathymetry, magnetics, gravity, seismic and other quantitative geophysical data; geological data including station locations, collection/storage locations, preliminary descriptions of seafloor samples

recovered, and all descriptions and analytical data, including geochemistry, derived from sediment and rock samples, including data from the Ocean Drilling Program (ODP).

National Geophysical Data Center (NGDC)
NOAA, Code E/GC
325 Broadway
Boulder, CO 80303-3328
Phone: (303) 497-6338
Fax: (303) 497-6513

7.D. Sea ice and other glaciological data - sea ice, icebergs, ice shelves and associated physical oceanographic and meteorological data.

National Snow & Ice Data Center (NSIDC)
CIRES
Campus Box 449
University of Colorado
Boulder, Colorado 80309
Phone: (303) 492-6199
Fax: (303) 492-2468

7.E. Carbon dioxide data - archival data for the World Ocean Circulation Experiment (WOCE) and the Joint Global Ocean Flux Study (JGOFS) CO2 measurements.

Carbon Dioxide Information Analysis Center (CDIAC)
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, Tennessee 37831-6335
Phone: (423) 574-0390
Fax: (423) 574-2232

8. Data are to be submitted according to formats and via the media designated by the pertinent national data center.

9. Principal investigators and ship-operating institutions are also responsible for meeting all legal requirements for submission of data and research results, which are imposed by foreign governments as a condition of that government's granting research clearances. Each principal investigator and institution must determine their legal obligations in this respect, with the assistance of the Department of State and sponsoring Federal agencies, as necessary.

10. Data-submission policies for U.S. WOCE, U.S. Global Ocean Ecosystems Dynamics (GLOBEC), U.S. JGOFS, Tropical Ocean Global Atmosphere Coupled Ocean-Atmosphere Research Experiment (TOGA COARE) and ODP are the following:

NOTE: The addresses provided (as of September 1994) change frequently. Please check with relevant program managers of the Division of Ocean Sciences if necessary.

10.A. U.S. WOCE

All WOCE data shall be made available no later than two (2) years after collection, unless specifically waived by the international WOCE Scientific Steering Group (SSG). However, several WOCE programs require PIs to submit data collected to a Data Assembly Center (DAC) for the purposes of quality control and data synthesis within shorter time periods. Detailed program requirements for data submission may be found in WOCE Report No.104/93, WOCE Data Management, available from:

U.S. WOCE Office
Texas A&M University
Department of Oceanography
Mail Stop 3146
College Station, TX 77843-3146
Phone: 409-845-1443
Fax: 409-845-0888

10.B. U.S. GLOBEC

In addition to the data submission requirements mentioned in this document, the U.S. GLOBEC Scientific Steering Committee (SSC) requires all principal investigators to submit plans for the collection of data to the U.S. GLOBEC Data Management Office (DMO) at least three (3) months prior to execution of a sampling program. Specifics to be included in the data collection plan are detailed in U.S. GLOBEC Data Policy, Report Number 10, February 1994, available from:

U.S. GLOBEC Scientific Steering Committee Coordinating Office
UMCES/ Chesapeake Biological Laboratory
P.O. Box 38/ One Williams Street
Solomons, MD 20688
Phone: (410) 326-7370
Fax: (410) 326-7341

PIs are responsible for documenting measurement and analysis techniques used to produce data sets and estimating accuracy and precision of these measurements. Specific physical measurements must be acquired along with all biological measurements and must meet pre-defined standards (see Report No. 10). In addition, the report specifies requirements for preservation of biological samples, including for the purpose of subsequent genetic analysis.

Data from measurements which do not involve manual analysis and which would be useful to the scientific community must be submitted by the PI to the DMO within six (6)

months after collection. All other measurements and any standard analyses of these measurements must be available to the community within one (1) year after collection. PIs will submit data either directly to the DMO or by placing it on-line as a U.S. GLOBEC distributed database. Format standards for submission of data and development of the database will be specified by the DMO. The DMO will serve as an intermediate archival location and data source and will transfer data to the NODC and prepare necessary documentation for data collected in foreign waters.

10.C. U.S. JGOFS

U.S. JGOFS chief scientists are required to submit all data to the Data-Management Office (DMO) within one (1) year after the sampling date. However, data derived from long analytical procedures (e.g. 228Ra) which prevent the researcher from being able to readily analyze/publish can be exempted from this one (1) year requirement. In addition, final versions of Basic Core Measurements (i.e. temperature, salinity, dissolved oxygen) must be received by the DMO within six (6) months after the sampling date. Again, some exceptions can be made for data requiring extensive analyses. However, all PIs making core measurements are urged to make their data available as quickly as possible. All data that are submitted to the DMO must be accompanied by detailed documentation of analytical procedures, data format, variables and units. Data may be in ASCII, TEXT or LOTUS (WK1 or WKS) formats. CO2 measurements should be submitted to the WOCE World Hydrographic Programme (WHP). More detailed information on the U.S. JGOFS requirements for data submission are available from:

U.S. JGOFS Data Management Officer
GEOSECS Building
MS 43
Woods Hole Oceanographic Institution
Woods Hole, MA 02543-1535
Phone: (508) 289-2497
Fax: (508) 457-2161

10.D. OCEAN DRILLING PROGRAM

The Ocean Drilling Program supports regional geological and geophysical field studies which can be used to develop mature drilling proposals in the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES) system. The geological and geophysical data from these projects are a primary source of information in planning drilling and should be available for review by the Site Survey and Pollution Prevention and Safety panels of JOIDES. Site survey data requirements for mature drilling proposals are identified in the JOIDES Journal issue titled, "Guide to the Ocean Drilling Program." 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 Ocean Drilling Program Site Survey Data Bank at Lamont-Doherty Earth Observatory, in addition to other data archiving requirements described in this document (7.C.). The address is the following:

ODP Site Survey Data Bank
Lamont-Doherty Earth Observatory
Palisades, New York 10964
Phone: (914) 365-8343
Fax: (914) 365-3182

At the earliest possible date, the chairperson of the JOIDES Site Survey Panel, 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 Ocean Drilling Program also supports more limited data collection activities through the U.S. Science Support Program administered by the Joint Oceanographic Institutions (JOI). Data reporting requirements under this program are the same as those identified above.

11. Federal agencies which engage in and/or fund data collection will promote quality control of ocean data which they and their contractors and grantees collect. Each national data center will:

upon archival of a submitted data set, send to the principal investigator a copy of the data set as archived; monitor submitted data to assure that they are submitted in accordance with these guidelines and in appropriate formats: and report regularly to principal investigators and Federal agencies on the rates of data submission, archiving and usage.

APPENDIX 3a:

ODP TAMU Data Holdings Table

See File (Excel Table): Appendix.3a.TAMU.data.xls

	Digital Data Types	Format	Description	Current / Projected Size
1	JANUS Database	Oracle tables	Oracle Database	10 gb / 20 gb
2	Scientific Data	Mostly ASCII	Raw scientific datafiles collected onboard the JOIDES Resolution (except # 3 and #4); contributed data from scientists' published papers	9 gb / 12 gb
3	Paleontology	Mostly ASCII	Paleontology data hand-entered from Scientific Reports	0.3 gb
4	Visual Core Description	ASCII, VCD, MacDraw, Applecore	Sedimentary and hard rock visual core descriptions, barrel sheets, Applecore, scanned VCDs	3 gb / 4 gb
5	Core Photographs	tiff format	Digitized photographs - 1200 dpi resolution (Legs 161-187 also available through the JANUS database in PDF format at 300 dpi resolution)	510 gb / 2500 gb
6	Seismic Reflection Profile	SEG-Y format	Seismic reflection survey data	150 / 200 4mm and 8mm tapes (9-tracks copied onto 4 or 8 mm)
7	Underway	mgd77 format	Navigation, bathymetry and magnetics	100 / 120 4mm and 8mm tapes
	Analog Data Types	**Format**	**Description**	**Current/Projected Size**
8	Photographic Film	4"x5" film positives, 35mm slides, prints	1 B&W and 1 Color 4"x5" positives for each core (DSDP and ODP); 4"x5" closeups; PR and Historical Documentation 35mm slides	102,000 / 115,000 core photos; 60,000 / 70,000 closeups; 100 / 120 3" binders of slides
9	Microfilm	Microfilm rolls	Prime Data, Seismic profiles, Underway profiles	550 / 600 rolls
10	Underway Paper	Paper rolls	3.5kHz Profiler records	900 / 1100 rolls
11	Paper Prime Data	Paper (letter and legal sizes)	Handwritten barrel sheets, paleontology sheets, and logsheets	900 / 1000 reams
12	Video	VHS tapes	Mostly reentry videos	35 feet of shelf space

APPENDIX 3b:

ODP/TAMU Response to Questions Raised:

Nov. 2, 2000
To: Dr. David Becker and Ms. Carla Moore
NGDC, Fax (303) 497-6513
From: Rakesh Mithral, ODP/TAMU

1. DSDP analog data, including navigation, bathymetry, magnetics, seismic reflection, core logs, smear slides, thin sections, physical properties, chemical properties and GRAPE are available on microfilms. DSDP core photographs and seismic data are available on paper.

2. High resolution (1200 dpi) scanning of core photographs from ODP legs 163 to 190 has been completed. The lower resolution (300 dpi) images are produced at the same time and are made available on the web in pdf format (http://www-odp.tamu.edu/database). The original high-resolution images are available from the ODP Data Librarian (database@odpemail.tamu.edu). We are working on scanning the core photographs from legs older than Leg 163.

3. All 3.5 kHz ODP underway data is available on paper AND on microfilms.

4. The survey and re-entry videos in VHS format are individually labeled. A partial index of all the video is available (Legs 101-153). These videos are rarely requested by the scientific community.

5. All paper prime data, including visual core description, paleontology, thin sections and smear slides is available on paper AND microfilms. An index of paper prime ODP data is available from ODP Legs 133-191.

6. The archiving of photo films and data microfilms need special environments. We keep them in an air-conditioned, Halon fire protected room.

7. The microbiology data requirements have not been defined as yet. Tom Davies of ODP/TAMU is planning a Microbiology user group meeting to discuss the lab and data issues. After the user requirements are defined we will incorporate those data in the ODP database.

APPENDIX 3c:

ODP/TAMU Issues Regarding the Archiving of ODP/DSDP Data at NGDC

For what purpose is the digital archive to be built? This requires a definition to steer the efforts of the project team. It was pointed out that the archive should contain only "appropriate" data. This also requires a tight definition. Is the archive to be defined narrowly as the feds (NGDC) want? Or, is the archive to meet some other purpose in the long run? A general goal was offered: prepare an archive that is user friendly, distributable, and useable.

Who will use the archived digital data? Is the archive to be "used" at all or is it to be stored and used only in the event the alternative RDBMS disappears?

What data format should the digital archive support? This depends on #1 & 2. It was voiced that the archived data need to be "standalone" and able to be stored in ASCII format on a CD. Comment from NGDC (George): The existence of a "software dependence" negates the concept of an archive.

What data needs to be stored in the digital archive? This must be determined by the science community.

What meta data requirements are there? We need to capture "corporate memory" meta data to be able to explain what the data really mean.

What non-digital/analog data needs to be kept? Again, the science community must decide this issue.

How do we deal with moratorium and sensitive or proprietary data? A real problem since NGDC has already stated that anything in its archives is public information.

Options regarding the ODP/DSDP archive include the following:

Build a Janus mirror site at NGDC. Then, build a Janus primary data site at NGDC and archive using existing procedures. Comment from NGDC (Carla): There is no reason why we shouldn't be able to have a "live" Oracle Janus database running at NGDC (as in something like a "mirror site") while we are determining what data to archive and how to archive it.

Create an archive of all Janus tables in ASCII format and document the "road map" to reconstruct the relationships between tables. This will allow the reconstruction of a Janus system within any RDBMS or other data system.

Build an ASCII data archive that uses existing Janus queries to create ASCII tables. Break these tables down into "basic" tables as defined by the science community.

Build an ASCII data archive using new Janus queries to build "basic" tables as defined by the science community.

APPENDIX 4:

ODP LOG DATA ARCHIVE
Total holes: 313 (Legs 101-191)

ODP DIGITAL DATA

1. Archive Medium: 4-mm DAT tapes
a. Resistivity-Density-Porosity-Acoustic-GR-Seismic-Magnetic Logs (Legs 101-188)
Total: 1189 tapes
Field data: 354 tapes (DLIS or LIS format)
Customer data: 445 tapes (DLIS or LIS (326), ASCII (85), SEG-Y (28), Binary (6))
Processed data: 390 tapes (LIS or DLIS)

b. FMS Logs (Legs 126-191)
Total: 618 tapes
Field data: 161 tapes (DLIS or LIS format)
Processed data: 457 tapes (BITMAP, GIF, VMS Backup, TAR, Geoframe Backup)

c. MCS (Legs 102,103, 109, 110, 111)
Total: 11 tapes. Original data, BRG format.

d. BHTV (Legs 118, 121, 136)
Total: 11 tapes. Original data, digitized.

2. Archive Medium: CD-ROM
a. Legs 189-191 (All logs). Field and customer data, DLIS and ASCII format.
Total: 4 CD-ROMS

b. Legs 143-186 (Most logs). Processed data. Also included in ODP IR volumes.
Total: 39 CD-ROMS

c. Core-scan data (Legs 173, 176)
Total: 26 CD-ROMS

3. Archive Medium: 9-track tapes
Data loaded: FMS (Leg 128). Processed data, VMS backup.
Total: 23 tapes

4. Archive medium: TK50 cartridges
FMS (Leg 134). Processed data, VMS backup.
Total: 22 cartridges

5. Archive Medium: VHS tapes
BHTV (Legs 102-104-11-118-121-124-125-127-135-136)
Total: 27 videotapes

6. Archive medium: Zip disks
Temperature (Legs 123-191). Original and processed data, ASCII format.
Total: 5 Zip disks

ODP ANALOG DATA

(1) Analog well logs (film + paper, Legs 101 to 149)
(2) Analog well logs (paper, Legs 149 to 191)
(3) Microfiche (FMS data: Legs 126-141). Also included in ODP IR volumes.
(4) Processing notes (complete inventory pending)

ODP ONLINE LOG DATABASE
Total holes: 313 (Legs 101-191)

Current size of online database: ~16 GB

Data format: mostly ASCII files

Data currently included:
Conventional (resistivity-GR-density-porosity-acoustic) + documentation
Geochemical data + documentation
GHMT (magnetometer) data + documentation
SWF (ASCII or binary format: selected holes only) + documentation
FMS images (GIF format) + documentation
Temperature data (ASCII format) + documentation

DSDP LOG DATA ARCHIVE
Total holes: 82 (Legs 1-96)

DIGITAL DATA

1. Archive Medium: 4-mm DAT tapes
Schlumberger Logs (Legs 48, 50, 51B, 57, 80-84, 87. 89, 95, 96). Customer data, LIS format.

Total: 41 tapes

NOTE: remaining data is on NGDC CD-ROM. Needs appropriate conversion.

2. Archive Medium: VHS tapes
BHTV (Legs 69, 92)
Total: 11 videotapes

ANALOG DATA

Analog well logs (paper, Legs 1 to 96)

APPENDIX 5:

JOIDES/ODP Site Survey Data Bank

The Data Bank currently tracks 13,000 individual items submitted in support of drilling proposals. The bulk of the data fall into the following categories:

Primary Data Type	Number of Items
MCS profiles	3542
SCS profiles	2520
Navigation maps	1917
Sub-bottom Profiles (mostly 3.5 kHz)	1206
Bathymetry (mostly maps)	563
Reprints	516
Geology maps and cross sections	439
Structural Geology maps	358
Bottom Samples (maps and sample descriptions)	313
Swath Bathymetry	256
Seafloor Imagery (video and stills)	244
Magnetic maps	126
Velocity (mostly tabular data)	106
Gravity maps	99
Refraction (sonobuoy and OBS records)	73
Heatflow (maps and tabular data)	65

Most data are analog records on paper or vellum, or are on rolls of microfilm. Seismic data from the late 70's and early 80's tend to be small format (rarely larger than 11" x 17"). Data from the mid-80's and later tend to be large-format seismic lines reproduced on an ozalid machine, engineering xerox, or large plotter. These lines may be few to dozens of feet in length. Sub-bottom profiles are on paper rolls or on microfilm. The quality of the records varies widely and generally lessens with increasing antiquity.

The Data Bank also has digital shotpoint/cdp (common depth point) navigation files, time navigation, and some amount of SEG-Y seismic data to archive. As we are just beginning to deal with digital seismic data in a systematic way, it is difficult to predict the amount of storage that will be needed by the end of the program. In addition, should the IESX pilot project be followed up by a general use of the IESX software for managing digital seismic data by ODP, there will be the issue of storing the IESX project files as well as the original SEG-Y records.

Under current policy, the site survey data are considered to be proprietary to the Ocean Drilling Program. This policy would have to be altered if the archived data are to be considered a resource for the wider science community in the post-ODP period.

APPENDIX 6:

NGDC Notes on Data Archival

To create a permanent archive of scientific data from the Ocean Drilling Program we must work within the constraints of the NARA definition of a data archive (see Appendix 7). Why build a digital archive? To preserve the ability of researchers to access scientific data resulting from the program.

Historically, data have been contained within printed publications meeting the official requirements of an archive. This method of archival meets the need for long-term access to the data in the strictest sense, but does not facilitate scientific use of the data given today's digital technology.

It was in order to facilitate researchers' abilities to use new digital applications to analyze data that the first "digital" drilling databases were created during the Deep Sea Drilling Project. "Prime" data types were carefully defined and documented by the relevant JOIDES panels for conversion to and maintenance in digital form; so they were easily extracted at the end of the project for archival in an officially sanctioned form. During the Ocean Drilling Program, technology again took a leap forward and relational database management was applied to digital data produced by the program, greatly expanding the usefulness of the data, especially to shipboard scientists. The new, very functional JANUS database system cost several million dollars to design and populate.

How do researchers obtain data from the new JANUS database? Post-shipboard use of the JANUS database primarily consists of access through a popular web-based interface to the data. This interface has greatly reduced the number of requests received by the ODP data librarian for custom extractions.

What does the JANUS web interface offer? It offers a set of pre-defined scripts that allow users to subset the database by data type and produce data files for download with a choice of delimiters. Simply put, the web interface offers flat ASCII files for the users to upload into their favorite software applications for further analysis and use.

Why not just use the scripts offered by the current JANUS web interface to produce data files for archival? A data archive should stand on its own as a complete and well-documented set of files. What the current web interface lacks is 1) complete documentation (metadata) about the data files for standalone use, and 2) assurance that all relevant parameters are offered to constitute a full data set for each data type. Basically, the scripts currently offer a best guess as to what a researcher needs for a given data type and assumes that the data librarian is available to answer any questions that may arise or provide custom extractions of necessary auxiliary data and information.

One way to construct a data archive for the ODP is:

1) Create exact definitions of parameters (including necessary documentation and calibration information) for each data type that is considered "prime." Prime meaning a data type that is necessary to constitute a long-term legacy and archive for ODP.
2) Design scripts necessary to enhance the current web-based subsetting and data file creation capabilities to produce standalone, documented data files for each prime data type.

In order to accomplish this, the prime data definitions need to be agreed upon by a scientific panel or body within the JOIDES structure, and the definitions need to be translated technically for application to the appropriate data tables as scripts.

Why should this be done at all?

1) The long-term availability of the JANUS database to create such output on-the-fly is not assured. Just as data from the Deep Sea Drilling Project were not deemed of high enough priority to be fully maintained in the ODP database, so ODP data are not likely to take top priority in the new IODP. Each program is primarily concerned with collecting new, scientifically relevant data and staying abreast of the latest technology in offering the new data to the scientific community.
2) The corporate knowledge necessary to fully document the data will likely be lost at the end of the ODP.
3) Recreation of the JANUS database structure would be prohibitively expensive.
4) Individual scientists using ODP data are not likely to be willing to use a complex data description including over 450 tables and inter-relationships to reconstruct useful data files.

NGDC also views the creation of a complete mirror of the JANUS database at NGDC including access software as a prudent step toward ensuring uninterrupted access to data within the database during the program transition.

Appendix 7: NARA definitions

National Archives and Records Administration
Center for Electronic Records

TRANSFER OF ELECTRONIC RECORDS
(from 36 CFR 1228.270 -- formerly 36 CFR 1228.188)

Transfer media

1. Magnetic tape

Agencies may transfer electronic records to the National Archives on magnetic tape using either open-reel magnetic tape or tape cartridges. Open-reel tape should be on one-half inch 9-track tape reels recorded at 1600 or 6250 bytes per inch and blocked no higher than 32,760 bytes per block. Tape cartridges should be 18-track 3480-class cartridges recorded at 37,871 bpi and blocked at no more than 32,760 bytes per block.

2. Compact-Disk, Read Only Memory (CD-ROM)

CD-ROMs may be used as transfer media for fielded data files or text files if they: conform to the International Standards Organization (ISO) 9660 standard and to the American Standard Code for Information Interchange (ASCII); are not compressed unless NARA has approved the transfer of the compressed form in advance; and are individually addressable. The CD-ROMs may contain software files and temporary records, but permanent records must be in files that contain only permanent records.

Formats

Records shall be in a format that is not dependent on specific hardware or software, written in ASCII or EBCDIC with all extraneous control characters removed (except record length indicators for variable length records, marks delimiting a data element, field, record or file, or Standard Generalized Markup Language tags). Records should not be compressed unless NARA has approved the transfer in the compressed form in advance.

Data files and databases shall be transferred as flat files or as rectangular tables, that is, as two-dimensional arrays, lists or tables. All records in a database or tuples in a relational database should have the same logical format. Each data element within a record should contain only one data value. A record should not contain nested repeating groups of data items.

Documentation in electronic format shall be transferred as separate files, and the transfer format standards for electronic records apply also to files that contain documentation.

For a complete listing of regulations, See: http://www.nara.gov/nara/cfr/cfr.html
For 36 CFR 1228.270, See: http://www.nara.gov/nara/electronic/transfer.html

SCIENCE OPERATOR'S EXCOM REPORT

Review of Activities
June 2000 through December 2000

Executive Overview

In FY00 the Program experienced rising fuel costs, as well as associated accelerated increases in day rates for ship operations, that cumulatively resulted in a deficit in excess of 600 thousand dollars relative to our FY00 PP. We successfully offset this deficit by postponing the replacement of vacant positions, by delaying certain maintenance activities (i.e. the refurbishment of one of our drill strings) and postponing laboratory enhancements (i.e. the purchase of a digital camera for core photography). As of this writing we are only 8 weeks into FY01 and we are already experiencing the deleterious consequences of marine fuel costs that have reached record levels and are $100/metric ton higher than what the Program budgeted for FY01. If fuel costs remain at high levels (i.e. in excess of $280/metric ton), and if day rates continue to increase at an escalated rate, we anticipate a budget deficit in the range of 1 million to 1.3 million dollars. Over the next several weeks ODP Management will investigate a variety of cost saving strategies to offset the fuel-induced deficit in FY01. Strategies presently being implemented are: vacant positions are being closed (i.e. the Public Information FTE at TAMU, two engineering positions) or being left unfilled at this time (i.e. the Assistant Laboratory Officer position); new equipment is not being purchased (i.e. digital camera), and embellishments to scientific operations are not likely to be scheduled (i.e. a measurement while drilling experiment to ascertain weight on bit on Leg196). Additional options are under review by ODP management so that the budgetary erosion caused by escalating fuel can be offset by reduction in programmatic activities. Options being considered will be outlined at EXCOM.

The ODP/TAMU base budget in FY01 (core services, leg related costs and special operations but excluding our subcontract for ship operations) is equal to what we spent for these services in FY91. It is clear that the budget is indeed lean, but our staff remain dedicated to making every attempt to maintain our core service deliverables in the face of these challenging financial circumstances.

Introduction

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

Schedule of Science Operations for the *JOIDES Resolution*: November, 2000 – November, 2002

	Leg	Port (Origin)†	Dates ¤	Total Days (port/sea)	Days at Sea (transit/on site)	TAMU Contact	LDEO Contact
193	Manus Basin	Guam	9 November - 6 January '01	58 (5/53)	9/44	J. Miller	G. Iturrino
194	Marion Plateau	Townsville	6 January - 5 March '01	58 (5/53)	13/40	P. Blum	H. Delius
195	Mariana/West Pacific Ion	Guam	5 March – 3 May '01	59 (5/54)	8/46	C. Richter	V. Louvel
196	Nankai II *	Keelung	3 May – 2 July '01	60 (5/55)	9/46	A. Klaus	S. Saito
197	Hotspots	Yokohama	2 July – 28 August '01	57 (5/52)	17/35	G. Acton	F. Einaudi
198	Shatsky	Yokohama	28 August – 24 October '01	57 (5/52)	17/35	M. Malone	TBN
199	Paleogene	Honolulu	24 October – 17 December '01	54 (5/49)	13/36	C. Escutia	P. Fothergill
200	H_2O	Honolulu	17 December – 7 February '02	52 (5/47)	19/28	P. Wallace	Y. Sun
201	Peru	Panama City	7 February – 8 April '02	60 (5/55)	20/35	J. Miller	TBN
202	SE Paleoceanography	Valparaiso	8 April – 7 June '02	60 (5/55)	20/35	P. Blum	U. Ninnemann
203	Costa Rica	Panama City	7 June – 6 August '02	60 (5/55)	12/43	A. Klaus	TBN
204	Gas Hydrates*	San Francisco	6 August – 4 October '02	59 (5/54)	6/48	C. Richter	D. Goldberg
205	Eq. Pac. ION ¥	San Francisco	4 October – 9 November '02	36 (5/31)	15/16	G. Acton	TBN

Notes:
¤ Port call dates have been included in the dates which are listed. For example, Leg 193 begins on 9 November with 5 days of scheduled port call. The scheduled sailing date is 14 November
† Although 5 day port calls are generally scheduled, the ship sails when ready.
* A mid-leg port call will occur for Leg 196 and may occur for Leg 204.
¥ Leg 205 is tentatively scheduled to end in Panama City.

10 October 2000

Co-Chief Scientists and Cruise Staffing for Science Operations

Co-Chief Scientists for Legs 188-201:

	Leg	Co-Chief Scientists
193	Manus Basin	R. Binns F. Barriga
194	Marion Plateau	F. Anselmetti A. Isern
195	Mariana/W. Pacific Ion	M. Shinohara M. Salisbury
196	Nankai II	K. Becker (CORK) H. Mikada (both) J.C. Moore (LWD)
197	Hotspots	J. Tarduno R. Duncan
198	Shatsky	T. Bralower TBN
199	Paleogene	M. Lyle P. Wilson
200	H_2O	R. Stephen J. Kasahara
201	Peru	S. D'Hondt TBN
202	SE Paleoceanography	A. Mix R. Tiedemann
203	Costa Rica	TBN TBN
204	Gas Hydrates	A. Trehu G. Bohrmann
205	Eq. Pac. ION	TBN TBN

Scientific Party Staffing:

Staffing for legs 194 and 195 is completed. Staffing legs 196 and 197 is in progress.

Tabulated below are the numbers of applications on file as of November 30, 2000.

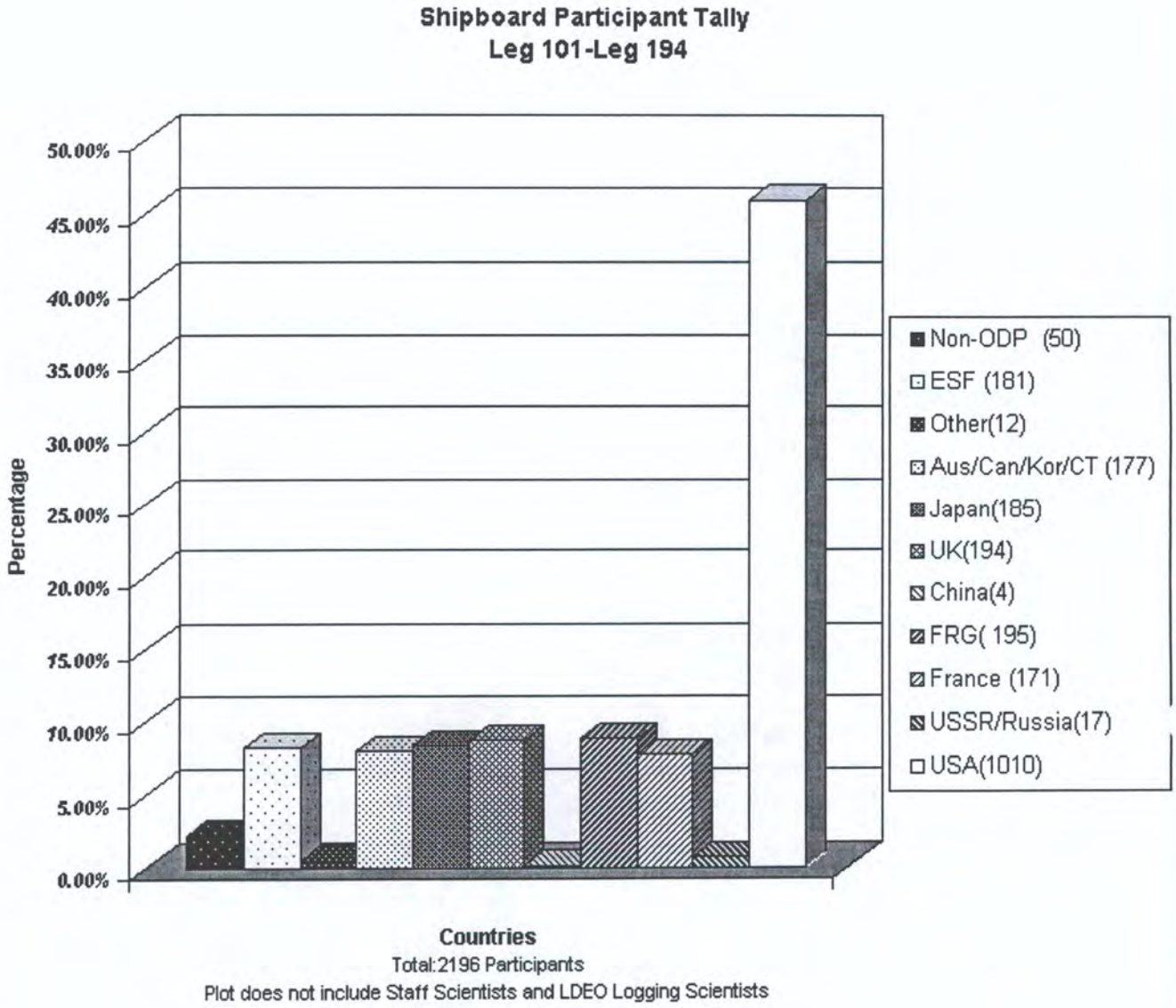
Legs	Total Applicants	U.S. Applicants	U.S. Students	Non-U.S. Applicants	Non-U.S. Students
193	57	7	6	26	18
194	50	18	7	14	11
195	33	10	4	14	5
196	29	7	3	11	8
197	39	14	7	13	5
198	18	3	2	9	4
199	35	10	3	15	7
200	0	0	0	0	0
201	3	2	0	1	0
202	16	4	0	8	4
203	4	1	1	1	1

The numbers of applications for berths on future legs seems to have rebounded and is now moving closer to historic levels of 45-75 per leg. The previously noted drop-off in applications seems to have been largely a consequence of earlier uncertainties in the schedule and lack of information readily accessible to the community. Legs 195, 196 and 200 are primarily concerned with implanting downhole instrument packages, rather than coring, which likely accounts for the relatively low numbers of applicants for those legs.

At the end of November a problem was uncovered with the ODP-TAMU web-based Cruise Application system. The problem has now been fixed, but an unknown number of applications submitted in October or November may have failed to reach us. Notices regarding the problem were immediately distributed via e-mail lists and on the web in order to alert as many potential applicants as possible. The ODP member offices were also advised, and notices placed in upcoming issues of both the USSAC Newsletter and JOIDES Journal. In response to the notices we were advised of several applications which had failed to reach us, and we were able to make the necessary corrections. We are confident that all "missing" applications have now been recovered.

Shipboard Participant Tally:

Please reference the table below for a compilation of all sailing participants since Leg 101 through Leg 190.



Status of the Labstack

Recent modifications:

In addition to relocating the microbiology lab (see below), other changes made in the lab stack during Leg 191 included set up of a new sampling table and drawers, and renovations to counter and desk space in the core lab. These changes will improve the efficiency of core lab operations.

In anticipation of future encounters with H2S, and to enhance the safety of scientists and ODP staff in such situations, we have now improved the exhaust system in the core lab, especially the core splitting room. In collaboration with ODL we have also completed installation of a new breathing air system on the core receiving platform which will permit essential staff to work there in the presence of H2S-laden cores more easily and safely. (When H2S was encountered

on Leg 182, we had to resort to emergency breathing packs which are designed for only brief periods of use and are heavy and cumbersome.)

Microbiology:

At the Yokohama port call (beginning of Leg 191) the XRF was removed from *JOIDES Resolution*. Following this, during Leg 191, the thin section making facilities were moved to space on the new 7th level of the lab stack. The space on the F-deck level vacated by these changes was then converted to a permanent microbiology lab, and the equipment moved down from the temporary quarters on the new 7th level, as recommended by SCIMP. These changes, which were completed before the end of Leg 191, put microbiology, geochemistry and micropaleontology labs in proximity, thus fostering synergy between the different groups of scientists, and from a practical point of view allow for more efficient arrangement of utilities such as gas distribution and exhaust lines.

Since dry dock (late 1999) microbiology has been an important component of Legs 187, 190 and 191, and each case has been very different. Some microbiologists simply want to collect clean samples for future study on shore; others have visions of extensive laboratory research conducted on board ship. We are also seeing an increase in sample requests from microbiologists not sailing on the leg who are potential shore-based leg participants. Now that the basic laboratory is in place and we have some experience behind us, we are working with SCIMP to address these issues and establish more standardized procedures and the base level of support and routine laboratory equipment and supplies which microbiologists can reasonably expect when they sail. This will be the next step towards fully integrating microbiology into ODP seagoing operations.

Status of Projects

Digital Imaging:

An RFQ was submitted in early March, 2000, to vendors of digital core imaging systems so that ODP-TAMU could identify which commercially available RGB line scan digital imaging system should be purchased for use on the *JOIDES Resolution*. In spring 2000 ODP-TAMU received responses from three vendors, however review of these was stopped when it became clear that due to the high price of fuel for the ship funds to purchase a digital imaging system would not be available in FY00.

Since that time, informal discussions have been held with each of the vendors who responded to the original RFQ to see if there are less expensive options which would achieve the SCIMP objectives. Encouraged by the results of these discussions, a revised RFQ has been issued. Review of the responses to the revised RFQ is in progress. The intent is that ODP/TAMU will be in a position to move expeditiously as soon as funds to acquire and install a digital core imaging system become available.

ICP Analyzer:

We continue to gain experience and confidence with the inductively coupled plasma analyzer (ICP) purchased by the U.S. Department of Energy and installed in the chemistry lab at the

beginning of Leg 187. With the removal of the XRF, the ICP is now the principal instrument used to obtain major and trace element data from bulk rock analysis. It is also used for interstitial water analysis. A new technical note for ICP analysis on board the *JOIDES Resolution* has been written and is now posted on the world wide web.7

Drilling Services

Summary of Leg Operation: Legs 190, 191, 192

	Leg 190 **Nankai** **23 May - 16 July '00** **Guam – Yokohoma**	**Leg 191** **W. Pacific ION** **16 July - 8 Sept '00** **Yokohoma – Guam**	**Leg 192** **Ontong Java** **8 Sept – 9 Nov '00** **Guam – Guam**
Transit/Onsite (day)	6.8 / 44.7	17.6 / 30.7	13.2 / 41.8
Sites	6	4	5
Holes	8	18	6
Water Depth (m)	1754 – 4856	970 - 5577	1673 - 3910
Deepest Penetr. (m)	1120	475	1211
Cored Interval (m)	3896	509	1764
Tot. Recov. (m, %)	2625 (67.4%)	363 (71.3%)	898 (50.9%)
APC Recov. (m, %)	685 (95.2%)	296 (102.5%)	0
XCB Recov. (m, %)	913 (85.1%)	17 (63.1%)	0
RCB Recov. (m, %)	1026 (57.2%)	50 (26.0%)	898 (50.9%)

Review of Operations

Leg 190 (Nankai):

- First of 2 legs in Nankai accretionary prism:
  Leg 190 recovered core
  Leg 196 will log same sites and emplace A-CORKs.
- Cored 5 sites in 3022 -- 4850 m water depths.
- XCB core 508.7 m to 734.3 mbsf with 436.0 m recovery (85.7%)
- Drill-In-Casing system with 11-3/4 in. casing to 142.2 m.
- Cored Hole 1174B to 1119.8 mbsf through decollement.

Leg 191 (W. Pacific Ion):

- Cored 509 m (71.3% recovery) at one site in 5566 m water depth.
- Hole 1179E: Set Reentry Cone with 64 m 16 in. and 393 m 10-3/4 in. Drilled to 475 m and installed broadband seismometers (3rd long-term borehole geophysical observatory for the International Ocean Network (ION)).

- In the Fall of 2000, the Jamstec ROV "Kaiko" will connect the observatory to an undersea cable.
- Lost 4.3 days of operating time in a typhoon and medivac.
- A drawworks brake band cracked late in the leg, however, a new brake band was expedited to the ship to allow time for limited hammer drill tests.
- Conducted limited spud tests of the SDS 260 mm downhole fluid hammer and 4 bit designs for Hard Rock Reentry System (HRRS). Washed and hammer drilled to 8 m on volcanic seamounts near Guam with no equipment problems.
- Minimized surface pressure pulsations from the hammer drill using downhole pulsation-dampener sub and improved standpipe support in the derrick.

Leg 192 (Ontong Java):

- Set 2 free fall funnels and 1 reentry cone.
- Cored 5 sites in 1673 – 3910 m water depths.
- Drilled 2383 m sediment.
- RCB cored 907 m sediment (41.5% recovery) and 856 m basement (60.8% recovery). Total recovery 50.9%.
- One BHA was lost when the drilling jars failed.

Review of Engineering Development Projects

The developmental engineering projects that ODP/TAMU is working on can be divided into three categories. The first category includes Actives Heave Compensation (AHC) and the Rig Instrumentation System, two pieces of equipment that were installed in dry dock in the Fall of 1999. These systems are functioning and are now undergoing refinement as they are incorporated into the daily drilling operations of the JR. The second category includes two new drilling technologies that have been under development at ODP/TAMU for a few years. These systems are now operational and are undergoing initial field tests with a goal to enhance scientific returns in geologic environments that have been historically hard to drill. The Hard Rock Re-entry System (HRRS or Hammer Drill) and Advanced Diamond Core Barrell (ADCB) are out on Leg 193 (Manus Basin) and the ADCB will also be deployed on Leg 194 (Marion Plateau). The third category are downhole tool development projects that are currently underway and include: Advanced Piston Core Temperature tool and WSTP, Davis/Villinger Temperature Probe (DVTP), APC Methane Tool and the Memory Drilling Sensor Sub.

Active Heave Compensator (AHC) Operational Review

AHC vs. Passive Heave Compensation (PHC) Performance:

Heave compensation is designed to reduce the effects of ship heave on the drill string, and thus the drill bit.

The PHC provides approximately an 80% reduction in ship heave on drill pipe motion over a 3-meter (10-ft) stroke of the PHC. This efficiency decreases to 50% reduction of heave with a 2-

meter stroke and to virtually 0% reduction of heave with less than a 1-meter stroke. At low sea states the large frictional forces of the rod and piston seals limit the PHC effectiveness.

The AHC was designed and installed to minimize the absolute motion of the drillpipe relative to the seafloor over the full range of sea-states and compensator stroke. The AHC equipment has far exceeded the contract Statement of Work (SOW). The SOW required 90% average efficiency at 4-ft/sec vertical ship velocity. There has never been less than 92% efficiency reported and several occurrences of 96-98% efficiency with 4.3-ft/sec vertical ship velocity. The system is capable of 5-ft/sec vertical ship velocity. The AHC controls the absolute drill string motion to within 4-in. relative to the seabed. This has been demonstrated even with 4 m to 4.5 m of absolute ship motion (approximately 6 m seas). Keep in mind that the best efficiency documented for the Passive Heave Compensator (PHC) is 80%, which would correlate to .72 - .84 m of absolute drill string motion.

Drill String Stiffness

The AHC minimizes drill string motion, but does not change the effect of drill string stiffness on WOB variation.

The drill string stiffness is a function of:

- the bottom hole assembly selected;
- the drill string configuration (5-in. vs. 5 ½-in.); and
- water depth

The drill string stiffness will vary from 20,000 lb./ft. up to 35,000 lb./ft. with decreasing water depth.

Example of Impact of Drill String Stiffness on WOB Variation

The drill string stiffness during hammer drill testing on Leg 191 was approximately 24,000 lb. / ft. This means that for each 1-foot change in drill string stretch, the hookload would change +/- 24,000 lbs. Given that the AHC controls the absolute drill string motion within 4-in., this equates to 8,000-lbs. weight on bit (WOB) variation (+/- 4000-lbs) during the hammer drill tests. This requires that there be more than 4000 lbs. of WOB, or there could be lift-off of the bit from the bottom of the hole. With an average of 2-ft of absolute drill string motion with the PHC, this equates to 48,000-lbs. weight on bit (WOB) variation (+/- 24,000-lbs). This then requires that there be more than 24,000-lbs. WOB, or there could be lift-off of the bit from the bottom of the hole when using the PHC.

Weight Indicator Readings & AHC WOB Bias Force:

The inertial effects of the travelling block have historically imparted a dynamic force into the crown-mounted load cell, which is exhibited by needle bounce on the Martin Decker weight indicator. The inertial effects of the travelling block responding to the ship's motion has been measured as creating a 5,000-10,000 lb. variation in WOB on the Martin Decker gauge. With the addition of the AHC, the AHC dynamic forces required to maintain the 4-in. absolute drill string motion are superimposed at approximately 50 hertz on the Martin Decker (MD) Weight

Indicator. As a result the MD needle bounces around, to the point of being unreadable by the Driller.

AHC WOB Bias Force

Because of the AHC dynamic forces, Maritime Hydraulics (MH) added an algorithm to the operational software to obtain a usable AHC WOB. The algorithm performs a simple average of the AHC hydraulic forces over a 30-second period. The output of this function is the so-called AHC WOB Bias Force, which is updated each second, but exhibits a lag since it is the average over the previous 30-seconds. This is the best approach until the filtered WOB circuit can be implemented.

The Driller creates a quasi-WOB with the AHC by stroking-out (bleeding-off) the PHC while the AHC is in the landing mode. The AHC is designed to minimize the absolute motion of the drill string with the PHC set at a mid-point. When the PHC stokes out the AHC applies a force to lift the drill string back to its set mid-point. This is seen on the AHC driller console as a minus force (bias) or AHC WOB Bias Force. When the Driller does set the drill string down on the seabed, he maintains the AHC WOB Bias Force at zero value with the brake, thereby establishing a WOB equal to the bias force.

If there are motions at the bit that are much slower than the 30-second period the real time conditions at the bit will be averaged and not considered in the calculation by the MH algorithm, which is displayed as the AHC WOB Bias Force.

Weight on Bit Filter

The Active Heave Compensator (AHC) has elevated the need for a reliable and stable hook load measurement. With the addition of AHC and its rapid (20millisec) response the hook load signal from the crown-mounted load cell has become unusable. The driller is unable to effectively control the weight on bit due to excessive gauge needle bounce. The AHC Project Manager sailed on Leg 191 to develop a WOB filter, which can electronically filter the dynamics of the ship and derrick travelling equipment. Sensors were installed on the top-drive and the derrick (travelling block equivalent accelerations) to measure the dynamic forces, and a computer program was written to record, analyze and model the dynamic forces. A beta version of the WOB filter software was developed during Leg 191.

The WOB filter will be implemented during Leg 195 port call. The installation includes permanently mounting a sensor module on the top drive and a sensor module on the drill floor. Both modules consist of acceleration sensors and a controller. A radio transmitter in the top drive module will send acceleration data to the drill floor module, which will process the data and send the filtered data to the two new digital gauges in the console and to Rig Instrumentation System for recording.

Driller's Console

The implementation of the WOB filter is being carried out in conjunction with the installation of instrumented load pins on the hook and reconfiguration of the Driller's console for improved

visibility by the Driller of the AHC driller console. The load pins were installed for Leg 192 to provide a more stable WOB measurement. Because the load pins are mounted at the hook the dynamic effects of the travelling block are reduced compared to the reading from the hydraulic load gauge in the crown (water table). The WOB filter can be applied to either the instrumented load pin signal or the hydraulic load cell signal.

The new Driller console will feature the AHC display in front of the driller for easier viewing and operation. Space has been provided for installing two digitally driven gauges to display filtered hook load and filtered WOB. The console panel will be installed during Leg 194 port call.

Steps to Consider for a Consistent WOB

1. The Driller should set the AHC WOB Bias Force to the Required drilling WOB, as an example:

- Required RCB WOB = 20,000-lbs
- Required HRRS WOB = 10,000-lbs
- Required ADCB WOB = 10,000-lbs

Plus the WOB variation caused by the drill string stiffness as determined from the drill string absolute motion (deviation).

2. The Driller evaluates the drill string absolute motion (deviation) as measured on the driller's AHC console in feet of motion. With a typical:

- drill sting stiffness of 24,000 lbs./ft. and
- 4-in. of absolute motion of the drill sting,
- the bit will see 8,000-lbs. of WOB variation (+/- 4,000-lbs).

Therefore the AHC WOB Bias Force must be greater than the required WOB by 4,000-lbs.

If the AHC WOB Bias Force is set to something less than the WOB Variation as calculated from the drill string stiffness and deviation, then lift-off of the bit is imminent.

For the above examples, this should be interpreted as follows:

- RCB WOB Bias Force = 20,000 +/- 4,000-lbs
- HRRS WOB Bias Force = 10,000 +/- 4,000-lbs
- ADCB WOB Bias Force = 10,000 +/- 4,000-lbs

AHC Hydraulic Umbilical:

Dynamic interference between the new AHC service loops and the existing PHC and top drive service loops caused significant wear within the AHC bundles at several places during Legs 188 through 190, to the extent that the AHC service loop was replaced at the Leg 191 port call. The spare service loops were reconfigured by the ODP Project Engineer to reduce the causes for

wear. The worn bundle was considered to be unsalvageable and discarded at the Leg 191 port call.

The hydraulic umbilical was inspected during Leg 193 and found to be without any similar wear problems.

Rig Instrumentation System

The purpose of the Rig Instrumentation System (RIS) is to improve the quality and quantity of core recovery by virtue of improved decision making with the aid of RIS data. The system was installed during dry dock and displays and records data from the various rig sensors, measurement while drilling (MWD) transmissions, ODP/TAMU measurement systems, and third-party systems. RIS is operating to specification, and its documentation is complete. Hardware is being acquired to allow the driller's RIS screen to be broadcast over the ship's TV network.

The instrumented load pins were installed and functioning properly. The installation was completed during the Leg 192 port call, and RIS was set up to calculate weight on bit (WOB) from the load pin measurement. A meeting was held with M/D Totco to discuss the instrumented load pin reliability problem. A newly installed load pin failed within hours of installation during Leg 190. M/D Totco agreed to supply ODP with the diagnostic procedures to trouble shoot and repair the load pins onboard the ship and to sell spare electronic modules to support the repair effort.

The addition of an Active Heave Compensator (AHC) has increased the need for a stable hook load measurement. The dynamic effect of AHC operation renders the hook load signal from the crown-mounted load cell unreliable. A WOB filter is being developed that can electronically filter the dynamics of the top-drive and AHC. A beta version of the WOB filter software was developed during Leg 191. Implementation of the filter and the addition of a WOB digital meter output will occur during the Leg 195 port call.

The driller's instrumentation panel is being reconfigured to improve the driller's view of the data. The primary change consists of moving the AHC display to the front. The new panels and additional hardware were shipped to the Leg 193 port call for installation during the transit to Townsville at the end of the leg. The WOB meter will be added to the console when the digital filtering scheme is implemented during the Leg 195 port call.

RIS received and recorded real-time transmissions from an MWD tool during Leg 188. An RS422 cable was run between the RIS master computer in the server room to the Schlumberger Anadrill unit in the LDEO Downhole lab. Two-way communication was established using Well Site Information Transfer Standard (WITS) protocol. The WITS link between the RIS and Anadrill data acquisition systems was used while drilling two MWD/logging while drilling (LWD) holes. RIS received the Anadrill rig sensor data (time stamp, hook load, bit position, standpipe pressure, rate of penetration) as well as the sensor data from MWD transmissions (WOB, torque on bit) at a 2-second data rate. RIS sent Anadrill the ship's motion data (heave, roll, and pitch) at a 2-second data rate. This was the first time that MWD was used in an ODP

borehole, and the first time real-time downhole data was displayed alongside real-time surface data in the driller's cabin.

Advanced Diamond Core Barrel (ADCB) Project

The scientific goal of the ADCB was to improve core recovery in fractured hard rock.

The ADCB Project goal was to adapt existing mining technology's thin kerf concept and to utilize "off the shelf" hardware where possible. The resulting thinner kerf bits would cut less rock and in turn reduce the amount of potential disturbance that the formation sees while coring. The ADCB Project will provide ODP with a "PQ" mining style, thin-kerf diamond coring system.

A second land test of the ADCB in early June 2000 allowed all the new components to be tested as a system. The new hardware included the positive indicator latch, shock sub, circulation sub, and split steel liners with the PQ-3 style bits. Forty core runs were made over a 3.5-day test period with an overall core recovery of 86%. All of the hardware operated successfully. Information obtained from this second field test will be incorporated into the Draft ADCB Operations Manual.

The new positive indicator latch worked perfectly every time it was deployed. The compression spring in the latch was operated over the full range of settings to ensure that there were no downside effects from higher-pressure settings. Two miss latches were observed. These were caused by core left in the bottom of the hole and had nothing to do with the performance of the latch.

The Shock sub was operated behind the core barrel during more than half the core runs. We realize that land drilling probably would not demonstrate any significant difference in core recovery whether the sub was in the string or not. Operating with the sub was done to ensure that it could withstand the rigors of actual drilling without any detrimental effect to the coring operations.

Poor hole conditions caused the circulation sub to be tested near the surface only. The circulation sub ports opened as designed when the drill string pressure reached the cracking pressure on both tests. The cracking pressure of the circulation sub was set at the lowest pressure of 850-900 psi. The circulation sub was removed from the drill string after initial tests confirmed it worked as tested in the laboratory.

The split steel liners were run with the PQ-3 bits during the last eight runs and showed improved recovery over runs without the liners with the same PQ-3 bits. Based on the observations, it was recommended that the ADCB be operated in the PQ version with the split steel liners unless friable or granular material was being cored.

The mid-body inner barrel stabilizer could not be used during the land tests. We learned that a retainer ring was needed behind the inner barrel stabilizer to prevent the stabilizer from pulling out of its cavity during inner barrel retrieval. On two occasions, the stabilizer was lifted out of its cavity and rotated inside the outer core. This prevented the inner barrel from landing

correctly. For the remainder of the test program, the inner barrel stabilizer was not used and no detrimental effects were noticed.

The new float valve design was not evaluated during this test. The float valve interfered with the initial make-up of the core barrel when the lower stabilizer did not screw onto the core bit. The ADCB Project Manger learned that the float valve was designed by the vendor for a standard 5-1/2" F.H. connection and not the modified 5-1/2" F.H. connection which is 1 inch longer. A new float valve design will be made and tested on the next deployment of the ADCB.

The ADCB Project Manager assisted the Japan Drilling Company (JDC)/JAMSTEC in a controlled laboratory testing program of the Japanese Small Diameter Rotary Core Barrel (SD-RCB) which is very similar to the ADCB system. This testing program occurred in late September at Terratek's facility in Salt Lake City, Utah. ODP provided the majority of the ADCB hardware to the JDC for this test program. Several tests were performed both under atmospheric and pressure conditions. JDC was very encouraged by the results of the ADCB (SD-RCB) over several of the other coring systems being evaluated. The ODP provided ADCB equipment was shipped directly from Salt Lake City to Guam for the Leg 193.

Based on the testing results, the ADCB Project Manager purchased seven PQ size impregnated bits for testing on Leg 193. These impregnated bits are designed to cut soft, medium and hard formations. The ADCB will be used extensively on Leg 193, if the rate of penetration, core recovery, and bit life meet or exceed the existing RCB system. Other parameters that will effect the ADCB success are the sea states, the operation of the Active Heave Compensator and the ability to maintain a constant Weight-on-Bit.

The ADCB will also be tested on Leg 194 with the PQ-3 style bit. This new bit is a Polycrystalline Diamond Compact (PDC) design that is similar to a JDC bit tested in Salt Lake City. This bit is expected to have higher penetration rates and be more suitable to the formations on Leg 194.

Draft copies of the Phase II Field Report and the ADCB Operations Manual were circulated for comments and review within the department. The Phase II Field Report should be completed in October 2000. The ADCB Operations Manual will be updated during Legs 193/194 and be ready for final review by February of 2001.

As a part of the development vision in the ODP Long Range Plan, the next phase of the ADCB is the development of a retractable bit. This ADCB retractable bit (Retractabit) development phase is dependent upon future funding for this technology. This project has been described as innovative work that could rewrite the chapter on offshore coring tools. However, because of constraints on funding there are no plans to pursue this project.

The ADCB Retractabit will allow:

- Bits to be changed via wireline so that the drill string would not have to be round tripped. This will result in reduced trip time with significant savings as water depths increase.
- Diamond bit selection can be optimized to the lithology (change bit type if different material is encountered throughout the course of a hole)

- Fresh bits may be introduced allowing high ROP to be maintained
- Bits can be checked for wear/damage and prevent running an under-performing bit to total destruction
- Reduced number of pipe trips results in better hole conditions and less time required for re-entries
- Logging may be performed without a round trip of the drill string and the elimination of the costly practice of using mechanical bit releases
- Higher quality logs due to less formation disturbance
- May allow other coring tools to be operated in the same BHA such as the MDCB, APC, and XCB by applying the Retractabit technology to these tools in the future.

The Retractabit program is a natural continuation of the ADCB development program. Successful development and demonstration of the retractable bit will open new doors for science coring for year to come.

Hard Rock Reentry System (HRRS) Project

The scientific goal of the HRRS has been the development of a cased reentry system for unstable surface formations of fractured hard rock and pillow basalt. The objective has been to develop a system that would allow the emplacement of a reentry funnel and surface casing on the seafloor where conventional casing, hard rock guide bases and standard re-entry cones can not be used. The HRRS project goal has been the development of downhole fluid hammer drilling technology with a nested drill-in-casing system.

Land testing of the HRRS prototype bit designs was completed in February 2000. A report was completed in May 2000 that discusses the three land tests on the bits and hardware. The report has been classified as confidential due to confidentiality agreements with the vendors.

To support the sea trails on Leg 191, ODP purchased eight bits based on four different bit types. These bits are a combination of new and refurbished prototype bits. These bits have been developed and improved over the last two years to be more robust than the bits tested on Leg 179. The bits have been redesigned for an improved bare rock spud.

ODP purchased additional support equipment for the Leg 191 sea trials, including bit breakers, stabilizers, hammer components, and various subs. SDS completed machining, inspection and bench testing of the bits and support equipment in June 2000. The HRRS Project Manager witnessed the final assembly of the bits in Australia. The hammer bits, fluid hammers, and ancillary equipment were shipped to Yokohama for Leg 191.

ODP purchased a pulsation sub from Houston Engineers in Houston, Texas. The pulsation sub was completed in June 2000. The ODP Project Manager witnessed the final assembly and testing of the pulsation sub at the Houston Engineers facility.

The HRRS equipment and hardware were ready for Leg 191 sea trials during the last 12.5 days. Unfortunately, the HRRS testing was postponed to the last seven days due to severe weather delays to avoid approaching typhoons, one emergency medical evacuation, and downtime/transit

for drawworks repair parts. With limited time, both the original and alternate HRRS sites at Shatsky Rise were canceled. Two new sites (ROTA-1 and Mariana Back Arc) were selected that were closer to Guam.

Three potential drill sites were identified from a 3.5 kHz seismic survey at ROTA-1. These sites were abandoned after 20 hours because the seismic reflection of a hard bottom turned out to be a soft ash-covered seamount and not hard rock. The soft materials allowed the hammer to penetrate up to nine meters under its own weight without rotation and with a pump jet force of only 100-200 gallons per minute. The soft material would close around the HRRS tools and cause a loss of circulation. The fluid hammer never encountered sufficient hard rock to operate properly in any of the six test holes at ROTA-1.

A second site, Marina Back Arc, was hastily selected with limited information. The 3.5kHz seismic survey data indicated that volcanic lava flows were present at the seafloor. The vibration-isolation television camera confirmed the seafloor hardness during two jet-in tests (without rotation) to a maximum penetration of two meters. After removing the VIT camera, two holes were spud with the dual cam underreamer bit to 5 meters and 3.5 meters with penetration rates of 3.2 and 4.7 meters per hour. The drill string was round tripped to change from the dual cam underreamer bit to the flat-faced underreamer bit. Three holes were spud with the flat-faced underreamer bit to 4.5 meters, 7 meters, and 5 meters with penetration rates varying from 2.7 to 9 meters per hour.

Both sites used less than five days to test the HRRS bit designs. There was insufficient time remaining in the last two days to complete the next step in the HRRS testing program. This step required deploying an umderreamer type bit with the 13-3/8" drill-in casing. The remaining time was insufficient to make up and test the HRRS running tool hardware, space out the casing, perform the drill-in operational test, and retrieve the HRRS tools back on board the drillship. Despite the reduced testing time, the HRRS testing program accomplished the following:

1. The fluid hammer operated and tested successfully in 2880 meters water depth at the Mariana Back Arc site.
2. The fluid hammer operated in conjunction with the Active Heave Compensator.
3. The fluid hammer operated flawlessly and without damaging or breaking any hardware.
4. No new operational problems were noted during the Hammer tests while operating at full flow rates of 400-450 gallons per minute (80-90 pump strokes per minute).
5. The dual-cam and the flat-faced underreamer bits were tested and confirmed to be acceptable for future ODP deep-water operations. Both bits survived without any damage to the bit body, bit arms, and without loosing any tungsten carbide compacts.
6. Bare rock spuds were successfully performed in sea states of 2.5 to 4 meters and penetration rates of 2.7 to 9.0 meters per hour in volcanic lava flows.
7. Supplemental bracing of the standpipe that was installed during dry-dock reduced the harmonic vibrations to an acceptable level.
8. Pulsation Sub was deployed in the BHA to help reduce vibration in the standpipe.
9. The drill crew was trained and was comfortable with the fluid hammer operation.

At the conclusion of Leg 191, many of the test objectives for the HRRS project were not completed. The HRRS is currently available for use on Leg 193 for bare rock spuds in hard

volcanic rocks to drill in a short string of casing. The HRRS equipment was stored in Guam and will be loaded on the drillship for Leg 193.

The future of the HRRS Project is dependent upon the level of funding that is available through the end of the program. Future use of the HRRS technology, casing equipment, bits, and hammer rental could be included in the DSD operating expenses under specific leg costs. At this time, no funding is planned for the HRRS project for the remainder of the ODP Program.

As a part of the vision of the ODP Short Range Plan, the HRRS Project could deploy of a smaller fluid hammer that could offers several new opportunities to increase operational efficiency. The smaller fluid hammer could be used for hole opening operations, drilling instrumented sections such as for ION holes, and assisting in setting conventional casing through deep unstable formations which are susceptible to bridging.

It is also envisioned in the ODP Long Range Plan that a nested casing system would be developed upon the successful demonstration of this technology through Legs 191 and 193. The nested system would allow a smaller second casing to be run independently or nested inside the first casing string.

APC Temperature Tool and WSTP

The purpose of this project is to find alternative support for the APC Temperature tool and WSTP electronics since the original supplier, Adara Systems, discontinued support.

Blue Mountain Instruments (BMI) was selected to provide repair and calibrations services for the APC temperature tool and WSTP data logger. BMI is also compiling all software source code and drawing files (i.e., compiling a technology transfer package) held by Adara Systems, which they will deliver to ODP. A portion of these files has been received.

Six thermistors for the WSTP were purchased and sent to the ship. Instead of purchasing a low temperature and a high temperature thermistor, a single thermistor was bought, which can operate over the full WSTP temperature range by using two calibration coefficients.

Davis/Villinger Temperature Probe (DVTP)

The purpose of this project is to adopt the Davis/Villinger Temperature Probe (DVTP) as an operational ODP tool.

All of the existing DVTP documentation is collected and centralized in DSD's library. Ninety percent of the mechanical and electrical drawings are integrated into ODP's drawing system. The overall assembly and the electrical assembly drawings are 75% complete.

ODP is working with Earl Davis of Pacific Geosciences Center, Canada to help integrate the pore pressure measurement into the DVTP tool. The prototype tool was deployed on Leg 190 and run 12 times. The pressure data response curve appeared to be credible on all but the last two runs, which was attributed to bottom-water infiltration. The final report is pending. The tool

was shipped back to College Station at the end of Leg 190 for inspection and refurbishment. It experienced significant corrosion in the pressure transducer region. Modifications will be made to alleviate this problem as well as address some assembly difficulties. The next leg deployment of the DVTP-P will be determined by science requirements.

A beta version of DVTP Comm, which is a LabView based communication and data reduction program, is on the ship and operational. This program takes the user through all steps of setup, run, and data recovery for the DVTP. A final version of DVTP Comm will be installed at the Leg 194 port call. APC Temperature and WSTP will be included in an expanded, comprehensive version of this software.

Two new DVTP's are being procured. The data loggers for the new tools allow for upgrading so that they can handle the addition of the pore pressure measurement. This will provide for the DVTP stock to have two standard DVTP's and two DVTP's with pore pressure.

APC Methane Tool

The purpose of the project is to monitor the effects of gas loss in cores from the time the core is cut until it reaches the deck. This is done by recording temperature, pressure, and conductivity in the headspace at the top of the core with sensors mounted in the APC piston head. In situ concentrations of methane can then be calculated from the data.

The APC Methane tool is being developed in concert with Charlie Paull and Bill Ussler of Monterey Bay Aquarium Research Institute (MBARI). The sensor development is being done at MBARI, whereas the electronics and packaging is being done at ODP/TAMU.

The ODP/TAMU APC Methane tool development schedule was delayed due to Derryl Schroeder and Mike Friedrich's involvement with commissioning the Rig Instrumentation System and Active Heave Compensator. Because of this delay, the ODP/TAMU engineering group is repackaging the MBARI acquisition electronics, instead of using the ODP DAS (in development) into the APC piston. Prototype testing is targeted for Leg 195 and operational deployment is targeted for Leg 199.

A design review meeting with MBARI was conducted on 29 August, where the mechanical packaging concept for the MBARI acquisition electronics and the sensors was approved. Six modified MBARI acquisition electronics were ordered by ODP. Another design review meeting with MBARI was held on 25 October, where the sensors for the APC piston were selected. MBARI placed orders for six of each thermistor probe, pressure transducer, and conductivity sensor.

Memory Drilling Sensor Sub

The purpose of this project is to operate a Memory Drilling Sensor Sub (DSS) near the bit. The DSS will provide data 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 coring

performance. The DSS will be a short 8-1/4 in OD collar with a 4-1/8 in through-bore to allow for core retrieval. It will be positioned in the BHA on top of the outer core barrel.

A demonstration test of a commercial sensor sub was run using an Anadrill measurement while drilling (MWD) system on Leg 188. The Anadrill MWD tool had weight-on-bit and torque-on-bit sensors. The test successfully demonstrated the practical application of the DSS, especially when data is transmitted in real time.

The procurement of DSS is divided into two parts, (1) downhole electronics and (2) sensor/sensor body. The downhole electronics have been sourced. The sensor/sensor body will be sourced after competitive bidding among engineering/sensor companies. The sensor/sensor body development will be in two phases. Phase I consists of the preliminary design where the fabrication methodology is determined and manufacturing specifications are produced. The deliverables of Phase I will be a detailed design layout, load and stress analysis, material specifications, expected sensor accuracy, testing and calibration requirements, and an estimate of time and cost to complete Phase II. The companies will bid on Phase I work and one will be selected. Phase II will build on the Phase I engineering work and produce the first article for testing. Phase II work will be competitively bid using the Phase I document as the starting point.

Scheduling of this tool was delayed because of the ODP/TAMU project manager's involvement with commissioning the rig instrumentation system.

Information Services

Status of Janus Database

In December, 1999, a Janus review committee prioritized tasks for the programming effort at ODP/TAMU. The results of the committee's work was incorporated into the work schedule of the Programming Services Group of ISD. Considerable progress has been made in completing these prioritized tasks since the committee last met in 1999. Since then, a review process has been underway to revisit the prioritized task list and adjustments to that list will be forthcoming. Additionally, the responsibility for adjusting the task list, including adding new tasks, was delegated to the Lab Working Teams (LWT) at ODP/TAMU. In turn, these teams' requests are considered by management and adjustments to the task list are then made. These adjustments are passed on to the Programming Services Group of ISD for implementation.

The information in the tables below indicate the work currently underway and tasks which have already been completed. Note that tasks identified in the last report as "completed" have been removed from this period's report. Also, all items marked with an asterisk "*" are taken from the task list produced by the original Janus review committee. As each task in the "Tasks in Progress" table are completed, the next higher priority task(s) will be assigned, based on available resources.

Tasks Completed	Area
*Reformat Gas Element Table	Chemistry
*Reformat Gas Element Graphs	Chemistry
*Section Breaks in Net Query	Pmag
*IW Data Upload on PC	Chemistry
*Carbonate Data Upload on PC	Chemistry
*Fix/Create Splice Reports	Misc. Labs
*Implement Updated MAD Application	Phys. Props.
Generic Data Uploader	All
BOL/EOL Synchronizer	ISD
*Correct Gas Upload	Chemistry
*Create Net Query for Zplot	Pmag
*Fix Applecore Batch Export	Phys. Props.
Upgrade "PWS"	Phys. Props.
Automated Color Reflectance	Phys.Props.

Tasks in Progress	Area	Phase	Target Leg
*ICP Data Model; Upload; Data Retrieval	Chemistry	Analysis	TBD
*Scope of Work for Bar Code Implementation	All	Analysis	TBD
*AppleCore Sedimentary Data Uploader	Core Desc.	User Testing	194
*Age-Depth Control Points	Misc. Labs	Development	194
*Implement JRS (JAVA version) on Ship	Curation	User Testing	196
*Fix Slider Entry and Bugs	Core Desc.	Development	194
*MAD Control Measurements	Phys. Props.	User Testing	194
Generic Editor for all of Janus Data	All	Analysis	196
WCMST Control Data	Phys. Props.	Dev. Testing	TBD
NGR Data Transfer	Phys. Props.	Development	194
Deploy, Test PC Version of Coulometer	Chemistry	Development	194
WCMST Threshold Warnings	Phys. Props.	Analysis	TBD

Status of Migration of Historical ODP Data into the Janus Database

The data migration projects (migrating old ODP data: legs 101-170 to the Janus database) have been progressing very well. Two data migration projects are active at this time, (A) MST and Color Reflectance data migration, and (B) Physical Properties and Paleomag data migration.

(A) Ninety five percent of the MST and Color Reflectance data migration has been completed. The remaining five percent requires checking all the migrated data, consolidating the raw files, merging the data migration code, and completing the project report. The Database Services Group of ISD expects to complete this migration project by August 2001.

(B) The migration of physical properties data began in December 1999. The project includes migrating moisture and density (formerly known as "Index Properties"), thermal conductivity, PWS, shear strength, and paleomag. The group expects to complete this project by December 2001.

Please see the information in the graphs below for details of the status of these two data migration projects.

MST and Color Reflectance Data Migration:

Start Date: September 1998
Current: November 2000
Target Completion Date: August 2001

Leg / Data	170	169	168	167	166	165	164	163	162	161	160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145
GRAPE	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	o	x	x	x
P-Wave	x	x	x	x	x	x	x	o	x	x	x	x	x	x	x	x	x	o	x	x	x	x	o	x	x	x
MagSus	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	o	x	x	x
NGR	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	o				1				
Color Reflectance	x	x	x	o	x	x	x	o	o	x	x	x	o	x	x	o	x	2								

Leg / Data	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128	127	126	125	124	123	122	121	120	119
GRAPE	x	x	o	x	o	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x
P-Wave	x	x	o	x	o	x	x		x	x	x	x		x	x					x	x	x	x	x	x	x
MagSus	x	x	o	x	o	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
NGR																										
Color Reflectance																										

Leg / Data	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101
GRAPE	o	x	x	x	x	x	x	x	x	o	x	x	o	x	x	x	o	x
P-Wave	o	x			x	x	x	o	x	o	x	o	o	o	o	o	o	o
MagSus	x	x	x	x	x	o		x	x	o	o	x	x	x	x	o	o	o
NGR																		
Color Reflectance																		2

Legend:
x Migration to Janus database completed
0 Data not acquired by ODP
1 NGR acquisition started
2 Reflectance acquisition started Leg 154
Magsus Leg 101-132 in S1032

Completed = 201 = 95%
Remaining = 10

Physical Properties Data Migration:

Start Date: December 1999
Current: November 2000
Target Completion Date: December 2001

Leg / Data	170	169	168	167	166	165	164	163	162	161	160	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145
Thermcon	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MAD	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
PWS			x	x	x		x		x	x	x	x	x	x	x	x	x	x		x	x		o	x	x	x
Shear Strength		o	x	o	x		x	o	x	o	x	x	o		x	x		o			o		o	o		
Paleomag																										x

Leg / Data	144	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128	127	126	125	124	123	122	121	120	119
Thermcon	x	x	o	x	x	o	x	o	x	x	x	o	o	x	x	x	x	x	x	x	x	x	x	x	x	x
MAD	x		o	x	o	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
PWS	x		o	x	o	x	x	x	x	x	x	x	x		o	x	x	x	x	x	x	x	x	x	x	x
Shear Strength	x	o	o	o	o	o	x		x		x	x	x		o	x		o	x	x	x	x	x		x	x
Paleomag			o			o										x										

Leg / Data	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101
Thermcon	x	x	x	x	x	x	x	x	x	x	x	x	o	x	x	x	o	x
MAD	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	o	x
PWS	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	o	x
Shear Strength	o	x				x	x	x		o	x	x	o	x		x	o	x
Paleomag	x																o	

Legend:
x Migration to Janus database completed
0 Data not acquired by ODP, or Bad files or no data found

Completed = 220 = 71%
Remaining = 92

Mirror Sites

The Publication Services and Information Services Departments completed the work on establishing Web mirror sites that contain all the e-publication products of ODP in Australia, the Federal Republic of Germany, and the United Kingdom. None of these sites mirror the Janus database.

Australian mirror site: http://www.agso.gov.au/odp (Australian Geological Survey Organisation; site is functional and updated weekly).

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]; this site is functional and updated weekly).

United Kingdom mirror site: http://owen.nhm.ac.uk/odp/ (The Natural History Museum, London; this site is functional and updated weekly).

The mirror sites are updated at the end of each week from the main site located at ODP/TAMU and supported by the Information Services Department at: ODP Science Operator: http://www-odp.tamu.edu/isg (Texas A&M University).

Publication Services

Volume Production

From July through November 2000, the following ODP *Proceedings* volumes were produced and distributed:

Initial Reports

Booklet/CD-ROM: 185 (Sep 2000), 186 (Aug 2000)
Web (PDF and HTML): 185* (19 Sep 2000), 186* (28 Jul 2000)

Scientific Results

Booklet/CD-ROM: 167 (Jul 2000), 168/169S (Aug 2000), 169 (Oct 2000)
Web (PDF and HTML)†: 167 (31 Jul 2000), 168 (4 Aug 2000), 169S (8 Aug 2000),169 (15 Apr 2000), 170 (30 Jun 2000), 171A (2 Aug 2000), 171B (4 Jul 2000), 172 (1 Sep 2000), 173 (3 Oct 2000), 174A (29 Sep 2000)

From December 2000 through June 2001, the following ODP *Proceedings* volumes are expected to be produced and distributed:

Initial Reports

Booklet/CD-ROM: 187 (Jan 2001), 188 (Mar 2001), 189 (Jun 2001)
Web (PDF and HTML): 187* (Mar 2000), 188* (May 2001)

Scientific Results

Booklet/CD-ROM: 170 (Feb 2001), 171A (Dec 2000), 171B (Feb 2001), 172 (Apr 2001), 173 (June 2001)
Web (PDF and HTML): 174B (first paper Dec 2000), 175 (first paper anticipated 2001), 176 and beyond: chapters will be published on Web after manuscripts have been accepted and processed for publication.

Update on the New-Format *Proceedings* Publications

It has been 18 months since the first new-format *Initial Reports* (IR) volume was published and eight months since the first *Scientific Results* (SR) paper was published on the Web for Leg 169. The overwhelming feedback we have received about the new publication formats has been positive, although it is clear that some authors will always prefer printed books to electronic publications, especially those who want to compare data from two or more volumes simultaneously.

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* PDF and/or ASCII versions of all materials published on the volume CD-ROM become available initially on the Web; HTML versions of chapters become available as soon as the material is formatted.

† Dates represent the date the first paper in the volume was published on the Web.

The consensus among ODP community scientists is that given the constraints of the ODP Publications mandate and current technology, they are pleased with the cross-media publication formats we have produced. Authors are recognizing that electronic publication formats allow the utilization of publication features unavailable in printed books (e.g., unlimited color figures, video clips, high-resolution color plates, and large data sets). In addition, having the volumes available in cross-media electronic formats has given users much greater flexibility in how they can use the volume material (e.g., copying text, data or figures; searching text; linking to other resources) and transportation and storage of volumes is no longer a problem. The move to electronic publications has also enabled ODP to increase the distribution of the *Proceedings* throughout the world, as online volumes provide readers with 24-hour access to the materials from anywhere in the world where there are Internet services.

To date, three SR volumes are complete on the Web (169, 170, 171A), and the associated booklet/CD-ROM products are being produced or distributed. As of 20 November 2000, 41 papers have been published on the Web for SR volumes 169 through 174A. On average, papers were published 44 months postcruise, or four months before the booklet/CD-ROM was distributed. For the last four volumes in production (171B through 174A), the first papers for each volume were published between 38 and 41 months postcruise, or 7 to 10 months before the distribution date for the booklet/CD-ROM.

ODP *Proceedings* Web Site User Statistics:

There are now 26 IR volumes and 28 SR volumes on the Web. Between November 1999 and October 2000, an average of 31 unique users have accessed each IR volume every month (see Table 1). The actual number of unique users per volume per month ranges between 8 (IR 174AXS, November1999) and 112 (IR 185, October 2000). Overall site access per volume has increased by 60% between November 1999 and October 2000. In November 1999, an average of 12 unique users accessed each IR volume; in October 2000 the average number of unique users increased to 41 per IR volume.

Table 1. *Initial Reports* Volumes Web Site User Statistics*

Volume	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00	Web Publication Date
166†	32	41	34	27	44	44	57	44	34	36	44	52	1 Oct 1997
167†	27	20	37	37	36	29	52	38	25	41	45	41	13 Feb 1998
168†	23	19	33	22	26	19	23	32	20	32	35	29	23 Feb 1998
169†	39	33	37	41	39	29	33	27	21	24	35	35	17 Apr 1998
169S†	14	19	25	32	18	16	17	24	20	23	23	26	10 Apr 1998
170†	20	25	27	25	21	23	33	37	28	29	28	34	24 Apr 1998
171A†	22	18	23	23	20	16	20	29	25	26	31	32	26 June 1998
171B†	31	20	31	31	31	24	1	30	24	31	1	26	26 June 1998
172†	18	19	36	29	26	26	25	25	23	36	43	37	31 July 1998
173†	22	19	29	16	18	22	25	31	23	23	31	33	4 Sept 1998
174A†	36	14	21	22	17	25	24	28	28	27	36	31	31 Dec 1998
174B†	17	20	16	16	12	13	18	20	17	16	26	22	31 Dec 1998
174AX†	20	11	25	16	12	14	19	22	17	17	28	32	31 Dec 1998
174AXS**	8	21	32	27	18	17	18	17	121	3	22	27	28 Dec 1998
175†	22	27	29	28	35	25	21	27	26	42	40	50	9 Feb 1999
176**	25	20	18	13	19	25	18	27	26	26	30	33	30 June 1999
177**	50	26	33	40	30	24	49	57	52	31	39	46	28 May 1999
178**	29	31	37	39	37	26	38	39	53	52	39	51	31 Aug 1999
179**	36	44	37	36	18	30	27	25	30	19	29	34	23 July 1999
180**				38	63	44	46	30	31	29	43	39	4 Feb 2000
181**							42	33	39	36	28	33	12 May 2000

182**							42	38	28	20	32	57	26 May 2000
183**								45	40	23	61	44	9 June 2000
184**								42	63	40	60	46	12 June 2000
185**											50	112	19 September 2000
186**									34	57	86	73	28 July 2000

Notes: * = numbers indicate hits to the entry page of each volume.† = volumes are only in PDF format. ** = volumes posted initially in PDF format and subsequently in HTML format.

Between November 1999 and October 2000, an average of 63 unique users have accessed each SR volume every month (see Table 2). The actual number of unique users per volume per month ranges between 15 (SR 159T, December 1999) and 160 (SR 160, October 2000). Total access to SR volumes increased by 54% between November 1999 and October 2000. However, the average number of unique users per volume decreased during this time because ODP began to publish papers individually beginning with SR 169, and as a result the newer volumes contained fewer chapters because they were not complete (in November 1999, an average of 93 unique users accessed each SR volume; in October 2000 the average number of unique users decreased to 61 per SR volume). Also, some of the first volumes published in the new format contained relatively few chapters (see Table 3).

Table 2. *Scientific Results* Volumes Web Site User Statistics*

Volume	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00	Web Publication Date
150X†	58	42	63	61	63	57	53	58	40	62	60	64	7 Aug 1998
152†	98	65	75	87	76	64	78	65	47	58	84	102	8 July 1998
154†	93	65	82	78	78	80	116	67	46	58	72	78	1 Oct 1997
155†	86	72	101	80	103	66	73	87	53	69	70	100	15 May 1998
156†	59	46	64	55	70	53	49	59	46	55	74	64	21 Aug 1998
157†	98	70	80	79	75	64	62	60	46	45	52	80	14 Aug 1998
158†	66	65	68	65	77	52	71	56	43	50	56	66	15 May 1998
159†	96	73	82	65	62	46	70	64	44	53	74	79	31 Dec 1998
159T†	30	15	26	19	22	20	33	35	21	25	36	38	31 Dec 1998
160†	144	124	118	131	145	97	122	113	94	99	133	163	9 Nov 1998
161†	86	88	88	98	80	68	79	79	65	58	81	89	19 Mar 1999
162**	50	44	47	46	58	37	45	37	25	36	49	34	20 Aug 1999
163**	62	38	68	63	60	51	50	40	29	21	34	36	19 Sept 1999
164							70	87	48	59	43	48	19 May 2000
165							34	57	55	34	45	50	26 May 2000
166							43	90	60	35	47	44	29 May 2000
167									31	55	68	54	31 July 2000
168										54	71	43	4 August 2000
169††						25	62	77	71	61	77	41	15 April 2000
169S††										50	46	34	8 August 2000
170††								30	41	52	75	64	20 June 2000
171A††										49	37	46	2 August 2000
171B††									53	72	55	39	4 July 2000
172††											84	40	1 September 2000
173††												34	2 October 2000
174A††											10	48	29 September 2000

Notes: * = numbers indicate hits to the entry page of each volume. † = volumes are only in PDF format. ** = volumes posted initially in PDF format and subsequently in HTML format. †† = volume will be published chapter by chapter in the order of acceptance in both PDF and HTML formats; date indicates when first paper was published.

Leg-related Citations:

During Legs 160 through 175, authors were permitted to fulfill their ODP publication obligation by either *submitting* a manuscript to a peer-reviewed journal that is published in English, or a paper or data report to the *Scientific Results* (SR) volume. Beginning with Leg 176, authors are

required to *publish* a paper in a journal or book, or a paper or data report in the SR volume. In addition, authors from Legs 160 and beyond are supposed 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 Publications Web site (<http://www-odp.tamu.edu/publications/, click on "Citation List").

The Publication Services Department began collecting leg-related citations in January 1999. The citation lists now include 326 citations, of which 233 are submitted, in review, in press, or published papers and 65 are conference abstracts. Of the 233 papers, 99 have abstracts reproduced on the ODP/TAMU web site. (ODP requests abstract reprint permission from all publishers.) 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 incomplete despite our efforts and those of the Staff Scientists to remind scientific party members of their obligation to submit citations to ODP after their papers have been published. Publication Services has cross-checked the citations they have received with the reprints received by Curation. It has also sent reminders to Co-chiefs and correspondence authors to remind them to submit this important information. The success of the leg-related citation lists is dependent upon authors remembering to fulfill their final obligation requirement and submit all published citations and a reprint of each publication to ODP. Though it does appear that our records are more incomplete for earlier legs than more recent legs, we believe this process does not work well and a comprehensive citations list will be very difficult to maintain for some legs.

Table 3 reflects the number of ODP-related papers that are projected, submitted, or published in the *Scientific Results* volume, and the number of papers that are projected, submitted, or published in books or journals. The data on books and journals are based on the information members of the scientific parties from each leg have submitted to ODP. (There is no guarantee the counts are complete.)

Figure 1 shows the total number of published or in press papers that ODP has been notified of per leg. For Legs 101 through 159, only *Scientific Results* papers were tracked. Beginning with Leg 160, papers published in journals and books were also tracked. All legs through 169 have passed the 4-years postcruise mark. Legs 170 through 179 have passed the 28-month postcruise mark when all SR and book or journal submissions are due (170 deadline = April 1999; 179 deadline = October 2000).

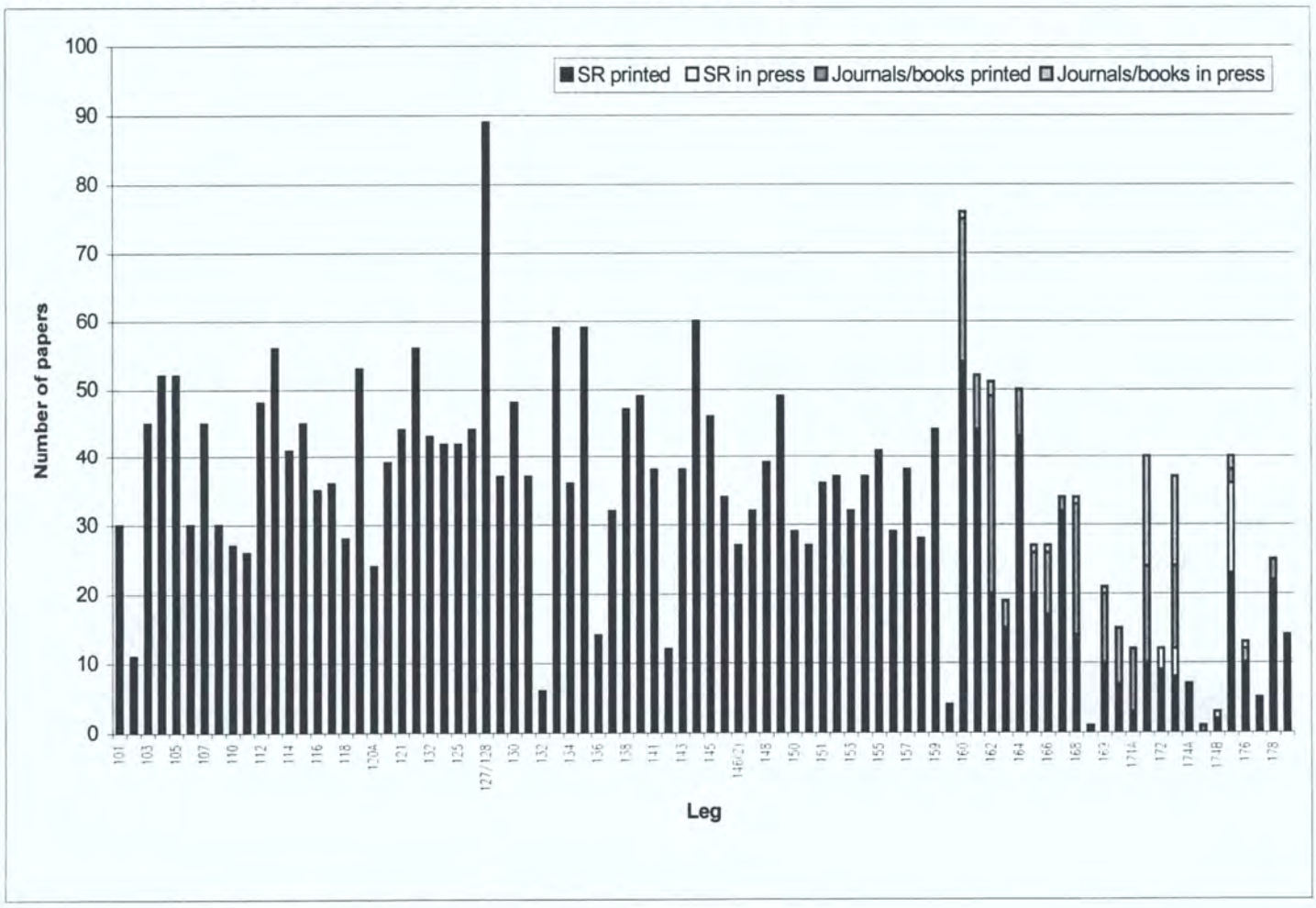
Table 3. Number of ODP-related papers projected, submitted, and published in SR volumes and in books or journals.

Leg	SR Volume			Journal or Book		
	Projected*	Submitted	Published	Projected*	Submitted†	Published†
160	62	54	54	0	2	21
161	47	46	44	6	6	8
162	24	23	20	32	10	29
163	22	16	15	4	5	4
164	35	41	43	18	5	7
165	26	24	20	2	11	6

166	28	18	17	7	9	9
167	40	33	32	11	8	8
168	17	13	14	47	9	19
169S	0	1	1	28	7	0
169	14	10	10	29	7	10
170	6	7	6	15	11	8
171A	1	3	3	16	10	9
171B	15	9	6	43	28	14
172	8	11	4	36	11	1
173	8	12	2	19	10	12
174A	8	6	2	17	13	8
174AX						1
174B	1	1	11 Dec 00	5	2	—
175	14	24	12 Feb 01	24	11	2
176	17	11	9 Apr 01	20	7	2
177	7	4	11 June 01	34/10‡	26	—
178	8	25	6 Aug 01	17/27‡	11	3
179	15	2	8 Oct 01	8	3	—
180	15	11 Dec 00	10 Dec 01	23/2‡	11 Dec 00	2
181	21	12 Feb 01	11 Feb 02	23/2	12 Feb 01	—
182	13	9 Apr 01	8 Apr 02	37	9 Apr 01	3
183	15	11 June 01	10 June 02	18/19‡	11 June 01	1

Notes: Data updated in November 2000. * = count from table of contents prepared at second postcruise meeting. † = "published" and "submitted" counts reflect the number of papers authors have notified the ODP Publications Coordinator about. ‡ = second number indicates papers proposed without a specific venue. — = no information. Dates reflect deadlines when submissions are due.

Figure 1. Number of published and in press papers on record per leg.



***ODP Proceedings* Distribution:**

The Department has sold DSDP and ODP volumes for a cumulative revenue of $11,825 between June 2000 and October 2000. This revenue supports a portion of the cost budgeted for the printing and distribution of new volumes.

The Department has continued to distribute free sets of volumes to academic institutions that do not already have accessible sets of DSDP and ODP volumes (institutions pay shipping costs). Between June 2000 and November 2000, 3 institutions (Broward Community College, USA; University of Miami RSMAS, USA; Appalachian State University, USA) were sent 321 ODP and 165 DSDP volumes. Total value for the books in these shipments equals $13,455.50.

Panel-Related Issues and SCIMP Recommendations

Sample Distribution, Data Distribution, and Publications Policy Revision:

In February 2001, the Sample Distribution, Data Distribution, and Publications Policy will be revised with the following changes.

1) reference to policy guidelines for Legs 160 through 174 will be removed from Section 4.4.b. and Appendixes A and B.
2) specific wording for acknowledging the Ocean Drilling Program in all publications that result from the data collected from ODP samples will be added to Section 4.4.b.i.

AGI Database (Rec. 99-2-1):

On 20 December 1999, the American Geological Institute (AGI) delivered a CD-ROM to ODP/TAMU containing a compiled database of citations to papers published on DSDP/ODP-related research. The database (drawn from the full American Geological Institute GeoRef database) contains over16,000 citations related to research tied to the Ocean Drilling Program and the Deep Sea Drilling Project since 1969. The Publication Services Department has prepared the second portion of a review of the data, which primarily focuses on ODP *Proceedings* and DSDP *Initial Reports* citations (see Publications Appendix.)

In September 2000, staff from the JOI office and ODP Publication Services Department met with AGI staff to develop a plan for updating the DSDP/ODP citations database. In November, the following message was distributed to all leg participants and drilling community members.

> 10 November 2000
>
> Dear ODP Scientist:
> The Ocean Drilling Program (ODP) is creating a bibliographic database of citations related to the ODP and to the Deep Sea Drilling Project (DSDP). This electronic citations database will catalog more than thirty years of scientific ocean drilling and will be made available in 2001 for research, education, and other purposes.
>
> We have created a preliminary database based on a key-word search of GeoRef, the bibliographic database produced by the American Geological Institute (AGI). Although GeoRef is comprehensive, some DSDP- or ODP-related citations may have been missed, possibly because of key word associations. Consequently, we are asking you, the international community of scientists involved in scientific ocean drilling, for your help in making the database as complete as possible.
>
> Please review our preliminary database for any overlooked publications. We are keen to capture publications outside of the ODP *Proceedings* or the DSDP *Initial Reports* volumes, which are already in the master database. Citations contributed by the scientific community will be reviewed by AGI. Citations that are not already in GeoRef will be added, and all submitted citations will be included in the revised DSDP/ODP database.
>
> To participate, go to: http://janusaxp.tamu.edu/predef_queries/general/citation.shtml. Review the preliminary database and complete the online form for any DSDP- or ODP-related citation that has been overlooked. All submissions must be received by 31 December 2000.
>
> Thank you for your assistance.
>
> Ocean Drilling Program

Web Development

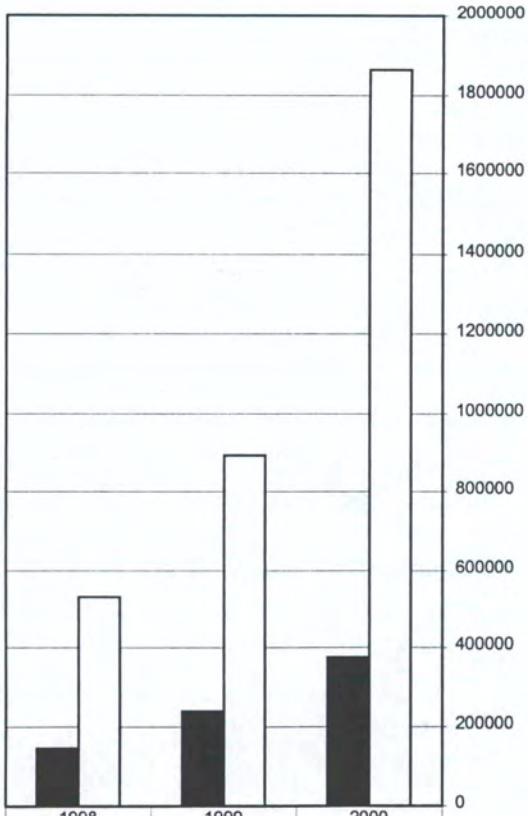
ODP/TAMU Web Site User Statistics:

The number of site visitors (defined as single computers accessing the site) to the ODP/TAMU Web site increased 157% from fiscal year 1998 to fiscal year 2000 (see Figure 2). The total number of pages, or files, accessed at the ODP/TAMU Web site during this three-year period has increased 250% (see Figure 2). Figure 3 shows the breakdown by month of total site visitors during this period.

Overall, the number of unique-computer sessions to the ODP/TAMU Web site pages that are listed below increased 74% between November 1999 and October 2000 (see Table 4). The largest increase was seen at the *JOIDES Resolution* page (170%), followed by increases of 41% and 37% at the Publication Services main page and ODP/TAMU main site page, respectively.

The German mirror site went online in June 2000. User site statistics are listed in Table 5. User statistics are not available yet for the mirror sites in Australia and the United Kingdom.

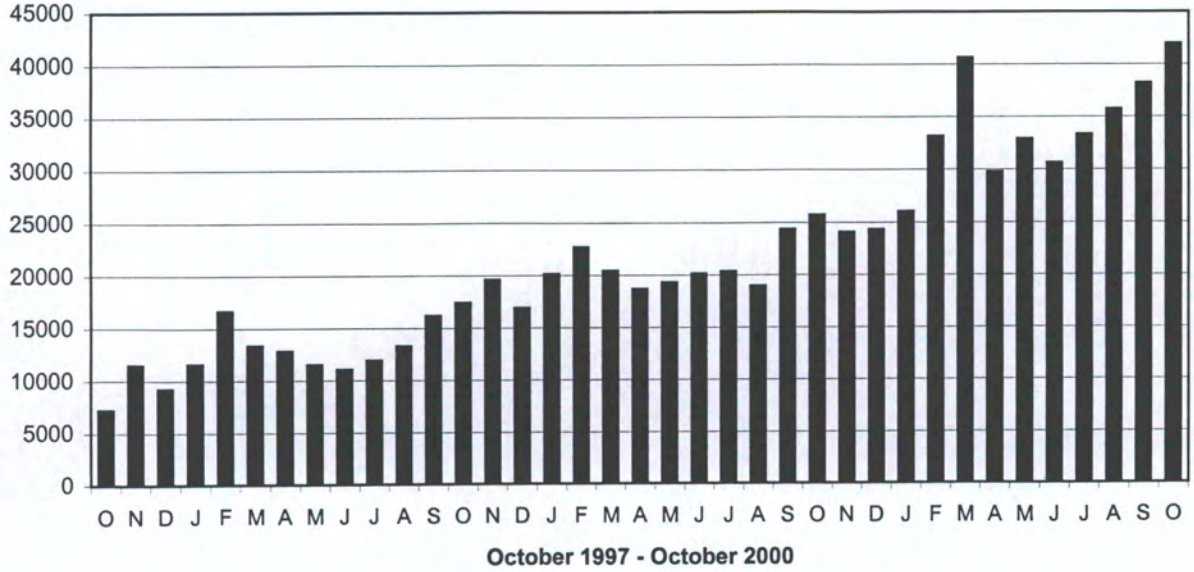
Figure 2. ODP/TAMU Web Statistics by Fiscal Year



	1998	1999	2000
■ Visitor sessions	146390	239341	374594
□ Pages accessed	532555	892473	1865009

Note: Visitor session = a single computer accessing the Web site; page = a single HTML file.

Figure 3. ODP/TAMU Web Site Visitors



Note: Visitor = a single computer accessing the Web site.

Table 4. ODP/TAMU Main Entry Points*

	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00
ODP/TAMU site† www-odp.tamu.edu	24,069	24,309	26,021	33,162	40,643	29,790	32,920	30,623	33,370	35,744	38,229	41,962
ODP/TAMU main page	5,622	4,651	5,900	6,492	6,649	5,271	5,749	4,656	4,782	5,016	5,860	7,713
Publication Services main page**	1,211	973	1,166	1,311	1,380	1,133	1,344	1,153	1,266	1,351	1,406	1,540
Cruise Information	908	749	1,146	1,476	1,380	976	1,148	967	1,005	986	1,370	1,279
Database main page	1,182	1,023	982	1,086	1,180	1,068	1,049	921	1,037	1,111	1,022	1,166
Operations Schedule	640	558	826	711	764	598	756	573	566	699	830	831
Drilling Services main page	755	591	727	825	896	701	832	552	562	604	801	830
JOIDES Resolution	297	282	NA	749	862	680	783	603	698	754	806	803
Search	763	625	791	862	932	738	823	668	644	597	731	902
Science & Curation main page	563	433	567	584	609	484	567	452	457	486	533	589
ODP & DSDP Site Maps	423	348	481	414	417	329	413	351	408	386	473	472
Cruise Participation	311	277	NA	314	388	296	362	305	328	349	339	360
Janus queries† (janusaxp.tamu.edu)	948	866	982	1,186	1,180	891	746	804	925	1104	726	867

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. † = Janus sessions are in addition to those given for the "ODP/TAMU site." ** = see "Update on the New-Format *Proceedings* Publications" section for statistics on unique-computer sessions for each volume. NA = not available.

Table 5. Mirror Sites Web User Statistics

	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00
German mirror site* (odp.pangaea.de)	—	—	—	—	—	—	—	—	178	350	1049	1656

Note: * = German mirror site went online in June 2000. No user statistic data available from mirror sites in Australia and United Kingdom.

Public Information

Aaron Woods, the individual who was responsible for Public Information at ODP/TAMU left the Program in May 2000. Because of budgetary constraints caused by escalating fuel costs in lat FY00, I decided not to fill this position until early FY01. Because the negative consequences of escalating operational costs continue, the decision has been taken that this position will not be filled and the important tasks and responsibilities associated with the position has been re-distributed . Mr. Phil Rumford, Superintendent of the Gulf Coast Repository, will handle port call activities associated with ship tours and public events. Mr. Rumford has already handled one port call activity this past summer in Yokohama and the next one is planned for Keelung, Taipai in May 2001. Ms. Agatha Moy,

Administrative Assistant in the Director's Office is coordinating all requests for ODP/TAMU public information.

Yokohama Port Call (July 2000)

Monday, 17 July:
12:30- 13:10 Press Conference.

Dr. Asahiko Taira (Leg 190 Co-Chief) coordinated the event, Greg Moore (Leg 190 Co-Chief) and Adam Klaus (Leg 190 Staff Scientist) were also present. The conference was a presentation of Leg 190 results to the Tokyo Press Club. Eight visitors including one film crew were in attendance. After the conference the group was a given a 20 minute tour of the core lab and shown a display of Leg 190 cores.

As a result of the conference, the *JOIDES Resolution* made the front page of the following day's Tokyo newspaper (distributed throughout Japan). The article covered Leg 190 results, highlighting the importance of the cruise in the sphere of earthquake research. It notes that one of the drill sites was close to the epicenter of the 1946 earthquake. The article also draws attention to the discovery and recovery of bacteria from some of the deeper core sections.

From 1-2 pm eight JAMSTEC delegates were given a tour of the ship by Kazushi Kuroki. A total of 18 other individuals toured the ship.

Although an invitation was given via the Tokyo University Press Club to members of the international press, none attended the conference.

Tuesday, 18 July:
10:00 - 12:40 A four-man film crew arrived. The film crew was contracted by JAMSTEC to produce a short film entitled "The Making of a Drill Ship". The film will document the production of the new JAMSTEC drilling vessel. Footage shot aboard the *JOIDES Resolution* will be included in the prologue to the film. It is anticipated that the film will be released in 2005.

Five other groups toured the vessel - a total of 47 people. The visitors were teachers and students from Japanese universities.

Wednesday, 19 July:
08:00 ODP Japan /Ocean Research Institute began to set up tents and booths on the dock adjacent to the ship.

09:30 – 11:00 A four-man film crew from the Tokyo News Station arrived and filmed material for a documentary. Dr. Saito hosted/presented the material. The crew shot footage of the downhole measurements lab, core lab, computer lab, library and galley. Dr. Saito will forward a video copy of the finished documentary to ODP/TAMU.

10:00 – 17:00 Visitors from local schools, the media and invited guests arrived to tour the ship. A shuttle bus ran from Yokohama Station to Daikoku Wharf at approximately 30 minute intervals transporting the visitors. Twenty Japanese Scientists, whom had formerly sailed aboard the JR, acted as tour guides.

Guides were also stationed at various points on the ship to ensure visitors remained on the designated tour route.

The tour route started in the SEDCO lounge, moved via the catwalk to the labstack, up to the DHML, down through the various levels of the labstack, and out to the moon pool. From there it ran back up the starboard stairs, past the hospital, finally returning to the SEDCO lounge.

Poster displays made by ODP/Japan were positioned throughout the labstack detailing the various functions and instrumentation of each lab. Visitors were able to see a drill bit and logging tool (DVTP, FMS) display on the catwalk.

Each tour took approximately 20 minutes. Each group was comprised of 10-15 visitors.

VIPs - Dr. Jeff Fox gave a tour to the NSF Director to Japan, Dr. Blompeid, and his two associates from JAMSTEC.

A total of 354 people visited the ship.

Friday, 21 July:
08:00 – 09:45 Transit from Yokohama to Yokosuka. ODP Japan began setting up booths and a reception area.

10:20 – 11:10 Tours were given to members of the high school band later to play at the welcoming ceremony.

11:30 – 12:00 Welcoming ceremony. The local high school band played. This was followed by speeches from local dignitaries. Drs. Asahiko Taira and Jeff Fox gave speeches on behalf of ODP. Flowers were presented by school children to Drs. Taira and Fox.

12:00 – 19:00 Tour groups comprised of local citizens, school children, and American servicemen and their families (from the local naval base) were shown the ship. The format was the same as for the tours on 19 July with the exception of the logging/coring display that was positioned dockside.

A total of 645 people visited the ship.

Total number of visitors during the port call was 1,072.

Fall 2000 GSA Meeting

ODP/TAMU personnel assisted JOI personnel in the staffing of an ODP booth at the Fall GSA meeting.

Public Information Requests

During the last 6 months we have responded to 20 requests from scientists, news media and the general public regarding ODP promotional material.

Appendix 1

ODP and DSDP Citations Report: Citations from Deep Sea Drilling Project and Ocean Drilling Program Research, 1969–1999

In Part I of this report (issued in the June 2000 EXCOM report), the bulk of the summary focused on the "nonproceedings" citations in the database. "Non-proceedings" citations are defined as citations from all publications other than the publications produced and published directly by DSDP or ODP (*ODP Proceedings* and *DSDP Initial Reports* series publications, and ODP Scientific Prospectus, Preliminary Report, and Technical Note publications; but not the *JOIDES Journal*).

Most of the initial analysis reported in Part I was based on the citation records in the database that contained author affiliation data. Author affiliation data includes the institution and country of contributing authors. Approximately 1800 citations in the database, or ~11%, do not have "author affiliation" data; 97% of these records are "nonproceedings" citations. (AGI did not begin recording author affiliation information until 1975, so this information is absent from many 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.)

Part II of the database analysis that is presented here is focused on all citations in the database, including those without author affiliation data. It also includes data on "program proceedings" citations (see definition of "nonproceedings citations above).

FigureA1 shows the number of citations in serial publications vs. the number of "program proceedings" citations per year, from 1969 through 1999. (Note: "Proceedings" citations only include citations to the printed books, not the citations to CD-ROM materials from 1999.) Table A1 shows a complete listing of the "nonproceedings" serial publication sources listed in the DSDP/ODP database and the number of citations per year, per publication (this includes all database records with and without affiliations).

Figure A1. "Nonproceedings" serial citations vs. "program proceedings" citations, 1969–1999.

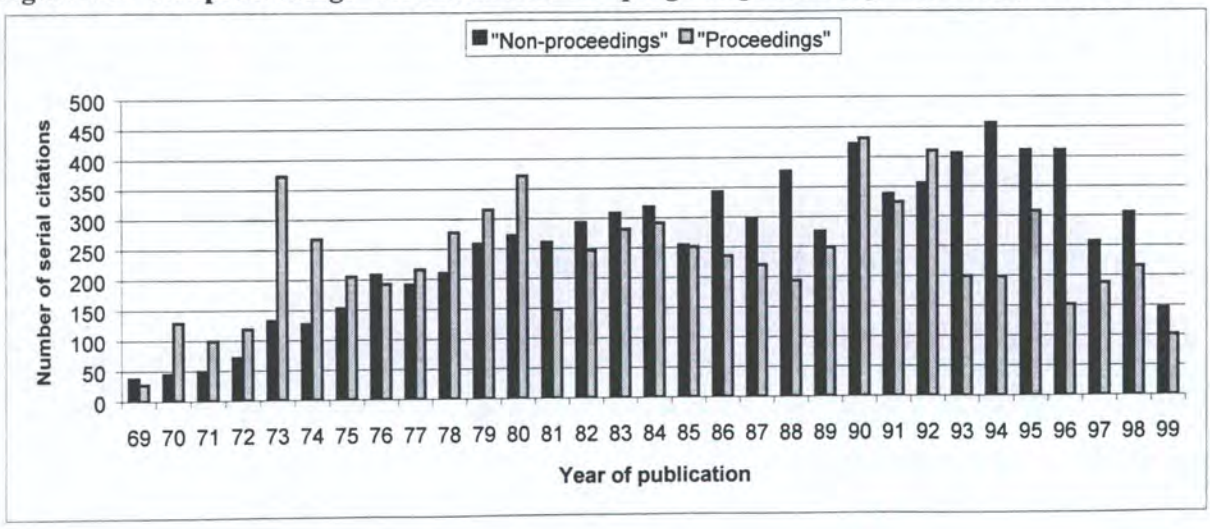


Table A1. All "nonproceedings" publication sources listed in the DSDP/ODP database and the number of citations per year for each publication.

Journal title	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Total
AAAS Publ (Am Assoc Adv Sci)														2	1																	3
AAPG Bulletin	1	3	2	2	8	2	2	5	2	7	26	10	14	11	10	7	14	14	15	17	2	56	18	8	2	3	1	2	4	10	3	281
AAPG Explorer																2		1														3
AAPG Memoir											1			6		1					1		39	2								50
AAPG Studies in Geology													1		1	4				4	2	3			1		1					17
Abhandlunger der Geologischen Bundesanstalt																			3													3
Abs - Geol Soc Australia															1					6		2				1		16	3			29
Abs - Intl Conf Geochron, Cosmochron, Isotope Geology														2																		2
Abs - Intl Conf on Natural Glasses																			1													1
Abs - Intl Palynological Conf												4			2																	6
Abs - Intl Symp on Observation of the Cont Crust through Drilling																	1															1
Abs - Nordic Geol Winter Meeting																														3		3
Abs - Palaeontological Assoc Aston, Ann Conf																					1											1
Abs - SEPM Midyear Meeting																4		19	9	1												33
Abs - Soc Exploration Geophysicists Intl Mtg								1																								1
Abs Gen Mtg Intl Mineral Assoc																										1						1
Abs papers - Pacific Sci Congr											6																					6
Abs papers Submitted to the Lunar and Planetary Science Conf																1			1	4	1	1	3		5			3				19
Abs paps - Am Chem Soc, Natl Mtg																			1													1
Abs paps - Regional Congr Geol, Mineral and Energy Resources of Southeast Asia (GEOSEA)																1																1
Abs/of Reports - Intl Cong Org Geochem			1			2			5																							8
Abs/prog GSA	11	2	7	12	12	32	21	22	22	19	22	32	33	40	49	26	27	14	39	18	34	29	34	24	50	49	37	45	27	29		818
Abs/Prog/Excursion Guide - Intl Workshop on Agglut Foraminifera																		2														2
ACS Symp Sers (Am Chem Soc)																		1				1										2
Acta Botanica Neerlandica																					1											1
Acta Geol Acad Sci Hung Magyar Tudomanyos Akad Foeldtani Koezloenye														1																		1
Acta Micropalaeontologica Sinica Weiti Gushengwu Xuebao																									1							1
Acta Mineralogica-Petrographica (Szedge)																	1															1
Acta Palaeontologica Polonica																						1										1
Acta Universitatis Carolinae. Geologica				1																												1
Actas Cong Latinoamericano Geol																								1								1
Advs Underwater Tech, Ocean Sci & Offshore Engineering																					1											1
AGI Reprint Series							1	1			1																					3
AGSO J Austral Geol & Geophys																										1						1
AGSO Research Newsletter																														1		1
Ameghiniana																		1														1
American Journal of Botany																				1												1

Journal title	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Total
American Journal of Science											1		1	1						1			1								1	6
American Mineralogist											1										1											2
American Scientist										1																						1
Anais da Academia Brasileira de Ciencias								3																						1		4
Anais do Congresso Latino-Americano de Paleontologia													1																			1
Ann Conv & Seminar Expl Geophys												1																				1
Ann des Mines et de la Geologie												1																				1
Ann Geologiques Pays Helleniques. Hors serie.											1		3																			4
Ann Mtg - Israel Geological Soc																				1								1				2
Ann Mtg [Ext] Abs - AAPG/SEPM							3																	7	12	9	6	19	7	9		72
Ann Res Conf. Gulf Coast Sect. SEPM Prog & Abs																11			8	1												20
Ann Rev Earth & Planetary Sci														1																		1
Ann Rpt Director, Geophys Lab, Carnegie Inst																				1												1
Ann Rpt Inst Geosi, Univ Tsukuba																										1						1
Annales - Soc Geologique du Nord															1	1			1	1												4
Annales de l'Institut Oceanographique (Monaco)				1																												1
Annales Geophysicae																														6		6
Annales Geophysicae, Ser B: Terrestrial & Planetary Physics																			1													1
Annales Societatis Geologorum Poloniae																													1			1
Annales Societatis Scientiarum Faroensis, Suppl																2																2
Annals of the S. African Museum																1																1
Antarctic J of the United States				1	1			6			1	5	2	1		4	1		2	2	1	2	1									30
Antarctic Research Series																								1	4				1			6
APEA J (Aus Petro Explor Assoc)																					1											1
Applied Geochemistry																								1								1
Archiwum Mineralogiczne															1																	1
Arctic and Alpine Research																												1				1
ASTM Spec Tech Pub (AM Soc Test & Materials Spec Tech Pub)														1																		1
Ateneo Parmense. Sezione 2: Acta Naturalia													1																			1
Atlantic Geology																					1						1	1				3
Atti della Accademia Nazionale dei Lincei. Rendiconti Lincei. Scienze Fisiche e Naturali																														1		1
AusIMM Bull & Procs (Aus Inst Mining & Metallurgy)																					2											2
Australian J Earth Sciences																										1			1			2
Bacillaria														1	1																	2
Beitraege zur Meerestechnik																			1													1
Berichte - Rpts, Geol-Palaeon Inst und Museum, Christian-Albrechts-Universitaet Kiel																1		1														2
Berichte der Deutschen Mineralogischen Gesellschaft																					1											1
Berichte des Inst fuer Geophysik der Ruhr-Univ, Bochum													1				1															2

Journal title	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Total
Berlinger Geowissen. Abhandlungen, Reihe A: Geol & Palaeontol												7																				7
Bild der Wissenschaft																	1							1								2
BIO Review														1																		1
Biogeograph. & Palynol. Resumes Commun, Assoc des Palynols Langue Francaise, Symp.																							2									2
Biosystems																								1								1
BMR J Australian Geol & Geophys												1	1																			2
BMR Research Newsletter																		1				2										3
BMR, Yrbook Bureau of Mineral Resources, Geology & Geophysics														1																		1
Bochumer Geologischeund Geotechnicshe Arbeiten																				4												4
Boletim de Minas					1																											1
Boletin de Geologia Publicacion Especial				1																												1
Boletin Geologico y Minero						1																										1
Boletin Informativo - Asociacion Venezolana de Geologia, Mineria y Petroleo		4																														4
Boletin Sociedad Geol Mexicana										1																						1
Boll Soc Geologica Italiana																			1													1
Boll Soc Paleontologica Italiana																1				1				2								4
Buletin Persatuan Geologi Malaysia (Bull Geol Soc Malaysia)																								1								1
Bull - Australia, Bur Miner Resour, Geol & Geophys										2																						2
Bull - Australian Soc Explor Geophysicists							1			1																						2
Bull - Corpus Christi Geol Soc		1														1																2
Bull - Dry Valley Drill Proj (DVDP)										1																						1
Bull - Houston Geol Soc		1														1	1															3
Bull - New Mex Bureau Mines & Mineral Resources																					4											4
Bull Bur Recherches Geol & Mins														1																		1
Bull Canadian Petroleum Geology																2																2
Bull de l'Inst de Geologie du Bassin d'Aquitaine							1																1									2
Bull de Mineralogie			1										1																			2
Bull des Centres de Recherches Explor-Prod Elf-Aquit. Memoire.																1																1
Bull des Centres de Recherches Explor-Prod Elf-Aquitaine												1						1			1											3
Bull du Groupe Francais des Argiles							1																									1
Bull du Mus Natl d'Histoire Nat. Sect C: Sci de la Terre: Paleontol, Geol, Mineral.											1																					1
Bull Earthquake Res Inst Tokyo (Daigaku Jishin Kenkyusho Iho)												1																				1
Bull Marine Geol Inst Indonesia																									1							1
Bull Natl Sci Museum Ser. C: Geol and Paleontol								1																								1

Bull Ocean Res Inst, Univ Tokyo																	1															1
Bull S. Carolina Acad of Sciences													2																			2
Bull Seismological Soc America																	1				1										1	3
Bull Soc Geologique de France [Huitieme Ser.]					1	1	2	5	2	10	5	8		6		3	5	1	6	2	1	2	1		1		1			1		64
Bulls Am Paleontology			1	1																												2
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Byulleten' Moskovskogo Obshchestva Ispytateley Prirody, Otdel Geologicheskiy																			1			2	1									4
California Geology				1																												1
Campus Museum Contributions											1																					1
Canadian J Earth Sci - J Canadien des Sciences de la Terre									22		2					1	1		3		1	1	1	1	3		1					37
Carbonates and Evaporites																				1			1									2
Chem Congr of N. Am. Abs paps																				3												3
Chemical Geology								1	2	2		2	3	5	1	1	1	2	1	7		3	1	2	2	3	3	2	1	4	6	55
Chemical Geology; Isotope Geoscience Section																			2			1										3
Chemie der Erde														1	2	1					1	1										6
Chigaku Zasshi (J of Geography)												1			1	1	1	2	1		1		3			1	2		3			17
Chikyu Kagaku (Earch Science)												2					1														1	4
Chikyukagaku (Tokyo) (Geochem)																								1						1		2
Chishitsu Chosajo Geppo (Bull - Japan, Geological Survey)													1			1							1							2		5
Chishitsu News																												1	1			2
Chishitsugaku Ronshu (Mems Geol Soc Japan)										2							3				1											6
Chishitsugaku Zasshi (J Geol Soc Japan)											1				1		2		1								1	1	4			11
Ciencias da Terra										1					1																	2
Circum-Pacific Council for Energy & Mineral Resources, Earth Sci Ser																		1	6			1										8
Clay Minerals																	1											1				2
Clays and Clay Minerals													1					1	1		1					2	1	2				9
Climate Dynamics																					1			1								2
Climatic Change																						1										1
Coll Colloques et Seminaires - Inst Francais du Petrole			1																													1
Coll Reprints - U S Natl Oceanic and Atmos Admin, Atlantic Oceanogr and Meteorolog Labs					2	2																										4
Coll Reprints - Woods Hole Oceanogr Inst			6	2			15																									23
Colloque Intl sur l'Exploitation des Oceans			2																													2
Colloques Internationaux du Centre National de la Recherche Scientifique						1																										1
Comments on Earth Science; Geophysics					1																											1
Compt Rendus Hebd des Seances de l'Acad des Scis, Serie D: Sci Natur [C.R.'Acad Sci., Ser 3]				1	1					1	3	4																				10
Compte Rendu - Congres Intl Stratig & Geologie du Carbonifere (Intl Congress on Carboniferous Stratigraphy and Geology)																	1															1
Compte Rendu Sommaire des Seances de la Soc Geol de France												3																				3

Comptes-Rendus Seances de l'Acad Sci, Ser 2: Mecanique-Physique, Chimie, Sci de l'Univers, Sci de la Terre (several vol title changes)													2	3	3	5	3	8	2	2	11	6	4	1	2		5	3	1	2	2	65
Computers and Geosciences																1			1													2
Conf Clay Mineralogy & Petrology								1																								1
Congr of Intl Union for Quat Res																			12													12
Continental Dynamics																												1				1
Contrib - Hawaii Inst of Geophysics					1	5																										6
Contrib - U C, San Diego, Scripps Inst of Oceanog		1			3	12																										16
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Contribs Mineralogy and Petrology							1		4	1	1	3	2	1		1					1			1		1	3	1		1	2	24
Contribs Ser - Am Assoc Strat Palynologists (AASP)																		1														1
Contribs to Sedimentology																	1															1
Cretaceous Research													1		1		1			1			1		1					2	1	9
Cruise Report - Geol Surv Japan											2							1														3
Cruise Rpt - Inst Oceanograph Sci																					1	1										2
CSPG Reservoir (Canadian Soc Petroleum Geologists)																					1		1									2
Current Activities Forum... Prog/abs (Geol Surv Canada)																													1			1
Daiyonki-Kenkyu (Quaternary Res)																											1		3			4
Deep-Sea Research									2		1			1		1		1			1			1								8
Deltio tes Ellenikes Geologikes Etaireias (Bull Geol Soc of Greece)					3																					1						4
Der Aufschluss												1																				1
Developments in Geotectonics					1															1												2
Devs in Palaeontol & Stratigraphy																				2												2
Dicengxue Zazhi (Journal of Stratigraphy)																	1															1
Die Geowissenschaften (Weinheim, Zeitschrift)																				1	2				2							5
Diqiu Kezue Kihan TAO, Terrestrial, Atmospheric & Oceanic Sciences																							1									1
Dixue Qianyuan (Earth Science Frontiers)																													1	1		2
Dizhen Gongcheng yu Gongchen Zhendong (Earthquake Engineering & Engineering Vibration)																										1						1
Dizhi Keji Qingbao (Geological Sci & Technology Info)																				1		1										2
Dizhi Kexue Scientia Geol Sinica																		1														1
Documents - B.R.G.M.																	1				1											2
Documents des Laboratoires de Geologie, Lyon																								1								1
Documents des Laboratoires de Geologie, Lyon, Hors Serie							1																									1
Doklady Akademii Nauk SSSR							1											1														2
DSIR Bulletin																		3														3
Earth & Planetary Sci Letters					2	1	3	5	8	5	9	4	3	2	5	1		6	11	5	5	4	10	18	14	12	12	13	12	13	7	190
Earth Evolution Sciences														1																		1
Earth in Space																								1								1
Earth Surface Processes and Landforms																													1			1
Earth, Planets and Space																														1	1	2

Earth-Science Reviews												1																				1
Eclogae Geolgicae Helvetiae												1	1	1		2	1						1									7
Economic Geology & the Bull of the Soc of Economic Geologists																							1									1
Economic Geology Res Unit News																												1				1
Endeavour, New Series																													1			1
EOS	2		2	4	40	15	26	36	44	51	22	34	37	42	62	49	37	50	29	83	15	111	19	61	121	159	91	113	45	11	4	1415
Episodes													2		1			1				1										5
Estudios Geologicos (Madrid)											1							1														2
European Geophys Soc, mtg abs					3																											3
Evolutionary Monographs																		1														1
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Exploration Geophysics																									1							1
Explorer (Clevelalnd)																				1												1
Ext abs - Intl Symp Water-Rock Interaction															4			2														6
Facies																	1						1									2
Field Trip Guidebk - Pac Section SEPM																2		2														4
Fisica de la Tierra																												1				1
Forschung (Boppard)																							1									1
Fortschritte der Mineral, Beiheft																		1														1
Fossils											1					2													1			4
Fossils and Strata																													1			1
Frontiers in Sedimentary Geology																							4									4
Geobios																									1	1			1			3
Geochemical Journal														1				1						1	1		1	1				6
Geochemistry International											1	1		1		2	2	2														9
Geochim et Cosmochim Acta		1			1		2	2	2		1	3	3	4	2	3	4	5	3	4	2	2	4	5	4	3	4	3	2	5	3	77
Geodynamics Series														1	4				1											1		7
Geografia Fisica e Dinamica Quaternaria																													1			1
GeoJournal											1																					1
Geokhimiya									1		1	2	1							1					1							7
Geol Greenland Survey Bulletin																													1			1
Geol Jahrbuch. Reihe A: Allgem Regionale Geol BR Deutschland und Nachbargebiete, Tektonik, Stratigraphiek Palaeontologie															1								2									3
Geol Jahrbuch. Reihe B: Regionale Geologie Auslalnd																	1															1
Geol Jahrbuch. Reihe D: Mineral, Petrogr, Geochem, Lagerstaettenkunde												1																				1
Geol Soc New Zealand Misc Publ																3	1			2			1			1						8
Geol Soc Special Publ (London)													1	3	1	6		15	4	3	1	7	2	8	7			8	2	41	2	111
Geolog (Geol Assoc Canada)													1																			1
Geologi																									1		1					2
Geologia Tecnica				1																												1
Geologica Balcanica											1																					1
Geologica Ultraiectina																							1									1
Geological Journal, Spec Issue									1																							1
Geological Magazine											1							1					1			1				1		5
Geologicky Pruzkum		1							1	2	1			1																		6

Geologie en Mijnbouw				1						1																						2
Geologie Mediterraneenne																			2													2
Geologische Rundschau										2			2		1			4			17		1		1	1	1			1		31
Geology (Boulder)					2	6	3		1	1	2	1	1	2	3	4	5	3	1	8	5	4	8	11	9	11	9	20	15	8	13	156
Geology Today																		1												1		2
Geo-Marine Letters																5	1	1		1	5	1	1	1	1		1	2				20
GEOMAR-Report																											1					1
Geomorphology																													1	1		2
Geophys J Royal Astron Soc								1	2	2		2	1	2	4	1	3	2														20
Geophysical Journal International																								2	1	1		3	3	2	3	15
Geophysical Monograph								4				1					3		1		1				6		17	2	2			37
Geophysical Research Letters										1			1				2	1	2	1	1	8	1	10	1	3	9	12	1	3	4	61
Geophysical Surveys						1																										1
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Geophysical Transactions (Geofizikai Kozlemenyek Geofizicheskiy Byulletin')																									1							1
Geophysics		6												1		1	1		1			1							1			12
Geophytology																			1													1
GeoResearch Forum																												1				1
Geos (Ottawa)							1										1							1								3
Geoscience and Man				2																												2
Geoscience Canada																1		1			1	1							3			7
Geoscience Journal												1	1																			2
GeoTech																							1									1
Geotectonics								1																								1
Geothermal Energy						1																										1
Geotimes	11	12	8	11	9	5	11	7	7	7	5	3	7	10	7	4	4	8	9	9	6	5	2	5	4	4	4	1		2	2	189
Giornale de Geologia						1					1		2																1	1		6
Global & Planetary Change																									1		1	1		1		4
Global Giogeochemical Cycles																									1							1
Gondwana Geological Magazine																												1				1
Grondboor en Hamer																		1														1
Grzybowski Foundation Spec Publ																											1		2			3
GSA Bull					5	1	3	5	3	3	3	4	2	6	5		3	2	1	2	1	2		3		3	3		2	2	3	67
GSA Today																							2	1	2		2					7
Haeyang Yon'gu (Ocean Research)																														1		1
Haiyand Dizhi yu Disiji Dizhi (Marine Geology & Quat Geology)																				1					1							2
Hanguk Kukchi Yongu (Korean J Polar Research)																									1							1
Hauptversammlung der Deutschen Geologischen Gesellschaft																												3				3
Heidelberger Geowissenschaftliche Abhandlungen																			3					1								4
HIG (Hawaii Inst Geophysics)									1																							1
Historical Biology																				2	1											3
Hydrobiologia																									2							2
IAGA Bulletin (Intl Assoc Geomagnestim & Aeronomy)																					3											3

Journal title	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Total
INA Newsletter												1					4		3			1				1						10
Indian Colloq Micropalaeo & Strat																					1											1
Indian J of Marine Sciences										1															1				2			4
Indian J of Petroleum Geology																								1								1
Indian Journal of Earth Sciences														1																		1
Indian Journal of Geology																				1	1	1		1								4
Indian Minerals									1																							1
Inst Geol & Nuclear Scis Contrib																											1					1
Interagency Airborne Geosci Wkshp																					1											1
Intl Assoc Sedmintols Reg Mtg.																			2	1												3
Intl Congr Sedimentology (Congres Intl de Sedimentologie)							3			9				20																		32
Intl Geological Congr, Abs (Congres Geolog Intl, Resumes)								10				27									18			54								109
Intl Geology Review												1			1			1			1	2	1									7
Intl J of Coal Geology																														1		1
Intl J Radiation Apps & Instrumenta, Part E, Nclu Geophys																					1											1
Intl Sedimentological Congr (Proc)							2															9										11
Intl Sedimentological Congr Abs																										5						5
Intl Series of Monographs on Earth Sciences				1																												1
Intl Symp Antarctic Earth Sciences																							3						1			4
Intl Symp Borehole Geophys Minls, Geotech, & Groundwater Apps																					1											1
Intl Symp on Ostracoda																						3			3							6
Intl Union Geodesy and Geophys			1																													1
Intl Union Geodesy and Geophys, Gen Assemb											2								6								21					29
Intl Union Geological Sciences														2																		2
Inzhenemaya Geologiya																1																1
IPOD-Japan Basic Data Ser. Ocean Res Inst, Univ of Tokyo											1																					1
Isotope Geoscience																1																1
Isreal J of Earth-Sciences																											2					2
Izvestiya Adademii Nauk SSSR. Ser Geologicheskaya											4							2				1										7
Izvestiya Vysshikh Uchebnykh Zavedeniy. Geologiya i Razvedka											4	1	1																			6
J Acoustical Society of America												3																				3
J African Earth Sciences															1	1				3			1				1			4	1	12
J Colorado-Wyoming Acad Sci																		1														1
J Czech Geol Soc (Casopis Ceske Geolgicke Spolecnosti)																											1					1
J Faculty of Marine Sci & Tech, Tokai University																														1	2	3
J Faculty of Sci, Univ Tokyo, Sec 2: Geol, Miner, Geogr, Geophys																				1												1
J Foraminiferal Research					1	2	1			3		1	1	1		1	3	2	1	1	1		3	2	1	3	1	2	2	1	1	35
J Geodynamics																	1	1													1	3

J Geol Soc Australia					1																											1
J Geol Soc India								1						1	1	1		1					1	3	1		2		1	2		15
J Geol Soc London														3	1	1		1			1	1		1	2	1	4	1	2	1		20
J Geol Soc Philippines																													1			1
J Geological Education								1		1																						2
J Geology											1				1	1		1	1				1		1		1		1			9
J Geomag & Geoelectricity												1			2						3											6
J Geophysical Research					1	1	3	19	4	1	3	4	11	4	6	1	4	5	5	3	4	24	5	5	10	12	9	10	5	14	10	183
J Geoscience Education																													1			1
J Geotechnical Engineering																	1					1										2
J Intl Assoc for Mathematic Geol																	1															1
J Micropalaeontology																	1	3		1		4					2			2		13
J Mining College, Akita Univ, Ser A.: Mining Geology																					1									1		2
J Mississippi Acad of Sciences																														2		2
J Nannoplankton Research																										2	13		4	4	1	24
J Nepal Geological Society																										1						1
J Non-Crystalline Solids																1																1
J Palaeontological Soc of India																				1	1	2										4
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
J Paleontology					1		1	2	3	1	2	1	1	4	1	2	1			2	1		1		2	1	1	3				31
J Petroleum Geology																										1						1
J Petroleum Technology	1						1									2	1	1	1							1						8
J Petrology						1																								2	1	4
J Physics of the Earth																				1												1
J Quaternary Science																										1						1
J Royal Soc New Zealand																			2		1											3
J Sci Hiroshima Univ, Ser C: Geology & Mineralogy																											1					1
J Sedimentary Petrology					2	2		2	4	2	2	1	1	1	2		1		1	1	1		2		1							26
J Sedimentary Research																										1	1	3	2	4	3	14
J Southeast Asian Earth Scis																							1									1
J Structural Geology																				1					1	2	1			2		7
J Tennessee Academay of Sci																							1									1
J Vertebrate Paleontology																									2		1					3
J Volcanology & Geothermal Res										2		1	1						1		1					2		1			1	10
Jahresbericht - Deutsche Forschungsgemeinscaft, Band 2, Programme un Projekte																				1	1											2
Jahresbericht - Kemforschungsanlage Juelich GmbH																	1															1
Jahrestagung der Deutschen Geophysikalischen Gesellschaft e.V.													1	1																		2
JOI/USSAC Newsletter																							2		1			2				5
JOIDES Journal												2		4										1	4	8	7			5		31
Journal of Geophysics Zeitschrift fuer Geophysik						1				1								1														3
Kasan Bull Volcanolog Soc Japan															1			1			5											7
Kompleksnyy Issledovaniya Prirody Okeana							1																									1
KTB Report																			1													1
La Recherche								1				1													1							3

La Vie des Sciences																	1								1							2
Le Courrier du C.N.R.S.														1																		1
Lethaia							1													1			1						2			5
Lithology & Mineral Resources											2		2	2	5	2		1														14
Lithos							1												1							1				1	1	5
Litologiya i Poleznyye Iskopayemyye							2																									2
LPI Contribution											1		3					2		3	1		1			9						20
Lund Publications in Geology																													1			1
Magyar Allami Foldtani Intezet Evkonyve (Annals Hungarian Geol Inst)																			1													1
Marine & Petroleum Geology																2	2	2			1		1		2			2		1		13
Marine Chemistry																			1	1						2			1			5
Marine Geology			2		3		1	2	4	9	5	18	3	5	1	6	1	7	4	3	6	1	13	7	6	6	7	8	6	9	20	163
Marine Geophysical Researches																	1	1		1	4	1	1			2			1			12
Marine Georesources & Geotechn																									1	2		1	1			5
Marine Geothechnology										2									1													3
Marine Micropaleontology								2	1	4	5	3	3	2	8	1	2	5	2	1	3	2	3	15	9	9	8	13	9	9	7	126
Marine Science (Plenum)						4																										4
Maritime Sediments								2																								2
Mathematical Geology																										1			1			2
Maurice Ewing Series									1		46																					47
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Meddelanden fran Stockholms Univ Inst for Geologi och Geokemi																							1									1
Mem - Canadian Soc Petroleum Geologists																				1						1						2
Mem - Congreso Latinoamericano de Paleontologia																1																1
Mem - Geol Soc India													1										1									2
Mem - GSA							1										9	11		1				1	2							25
Mem - Miami Geological Society																			1													1
Mem della Soc Geol Italiana						1		1						1				1					7									11
Mem Geol de l'Univ de Dijon																			1													1
Mem Hors Serie - Soc Geol France							1					1																				2
Mem Natl Inst Polar Res. Spec Iss.											1					1	1															3
Mem Soc Geol France [varies]									1																2	3		1				7
Memoires du B.R.G.M. (Bur. Recherches Geol et Minieres)						3	1																									4
Mems des Sciences de la Terre																														1		1
Messinian Seminar (Seminario sobre el Messinense)									3	4																						7
Meteor-Forschungsergebnisse. Reihe C: Geologie und Geophysik																1																1
Meteoritics														1					1		3					1						6
Meteoritics & Planetary Science																												1		1	2	4
Meteorologiya i Gidrologiya													1																			1
Micropaleontology							1	2	3	2	3	3	3	5	2	7		2	2	1	3	2	2	5	4	2	1	3	2	3		63
Micropaleontology Spec Publ							1																									1
Mineral Resources Bulletin									3																							3
Mineral Resources Devel Series					1									1									1									3

Mineralia Slovaca																								1								1
Mineralogical Magazine													2	1	1											7		1				12
Mitteil aus dem Geol Inst Eidgenoessischen Technischen Hochschule und der Univ Zuerich, Neue Folge											1																					1
Mitteil aus dem Geologisch-Palaeontologischen Inst der Univ Hamburg																		9														9
Mitteilungen - Deutsche Forschungn											1		1																			2
Modern Geology													1			1				1												3
Mosaic (Washington)													1																			1
Moscow Univ Geology Bulletin																1																1
Mus Argentina Ciencias Natur "Bernardino Rivadavia" - Inst Nacional Investig Ciencias Natur, Rev, Geol										1																						1
Nachrichten - Deutsche Geologische Gesellschaft																						13										13
Nanhai Dizhi Yanjiu (Geological Research of South China Sea)																									1							1
NASA Conference Publication															1																	1
NATO ASI Series. Ser C: Math & Physical Sciences																					7	3										10
NATO Conf Ser. IV. Marine Sci												1			4																	5
Nature		1			3	1	10	5	4	8	6	9	8	15	16	5	14	9	11	5	11	6	2	2	9	6	4	7	8	9	2	196
Nature und Museum													1																			1
Nature; Physical Science (London)				1	3																											4
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Naturen																															1	1
Naturwissenschaften						1																										1
Naturwissenschaftliche Rundschau														1						1							1					3
NERC News (Natural Environmental Res Council, UK)																							1	1								2
Neues Jahrbuch fuer Geologie und Palaeontologie. Abhandlungen																									1							1
Neues Jahrbuch fuer Geologie und Palaeontologie. Monatshefte																										1						1
Neues Jahrbuch fuer Mineralogie. Abhandlungen																	1															1
New Zealand Geophysical Soc...Symp, Abs																											1					1
New Zealand J of Geol & Geophys							1		1	1			1	1			1			1		1	1	1				2				12
New Zealand Soil Bur Sci Report											1						1															2
Newslet - Geol Soc N. Zealand		1		2	1	1	1					1			1					1								1		1		11
Newslet - New Concepts in Global Tectonics																													2			2
Newslet Spec Grp Tectonics & Struct Geol, Geol Soc Australia Inc															1																	1
Newsletters on Stratigraphy										1		1			1										1							4
Nippon Kaiyo Gakkai-Shi (J of the Oceanographical Soc of Japan)													1																			1
Norelco Reporter															1																	1
Nova Acta Leopoldina												1																				1
Nuclear Instruments & Methods in Phys Res, Sect B: Beam Interacts w/ Materials and Atoms																1			1													2
Nuclear Tracks & Radiation Measurements																	1															1

Occasional Rept - Univ Waikato, Dept Earth Sci (New Zealand)																									1							1
Ocean Industry	2	1																														3
Ocean Research																1																1
Ocean Science and Engineering																	1	1														2
Oceanologica Acta										1	3	2	13	1	2	1					1	1	2		1							28
Oceanology					1			2	3	1	1	2		1						1	3		1	1			1		2	3	2	25
Oceans	1																			1												2
Oceans (New York)																	9		1													10
Oceanus (Woods Hole)										1	1			1	3			1	1						1							9
Offshore (Conroe)			1												1												1					3
Ofioliti									1							2	1															4
Ohio Journal of Science																1																1
Oil and Gas (Sydney)			1																													1
Oil and Gas Journal	1													2	1			2			1					1	1					9
Open File Report - State of Oregon, Dept Geol Mineral Industries																		1														1
Open-File Rpt - Geol Surv Canada																				1												1
Organic Geochemistry													1		2	9		8		4	1	1		3		3	4	3	2	1		42
Origins of Life & Evol of Bioshpere																						1										1
Pacific Rim Congress																						1										1
Pacific Science											1																					1
Pacrofi																					1											1
Palaeocology of Africa & of the Surrounding Islands [& Antarctica]														1		1			3				1									6
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Palaeogeogr, climatol, ecology									1	1	2		3	4	4	6	2	4	1	2	1	1	3	7	2	14	5	2	6	6	5	82
Palaeontologia Electronica																														1	1	2
Palaeontological Research																														1		1
Palaeontologische Zeitschrift							1	1																								2
Palaeontology																										1	1					2
Palaios																		1		1		1	1	1	3	2	1		1			12
Paleobiology													1		2	1							1			1	1	4		1		12
PaleoBios																							4		3			1				8
Paleoceanography																		6	2	3	6	12	6	6	8	6	8		6	7	7	83
Paleontological Journal																				1												1
Paleopelagos																							1			1						2
Palynology									2	3				1	3	2	1	4		14		2	2	2				7		2		45
Paper - Geol Surv Canada															2		1		3													6
Peoc - SPE/IADC Drilling Conf (Soc Petroleum Engineers)																							1									1
Petros					1																											1
Philos Trans Roy Soc London Ser. A: Math and Physical Sciences												15		2		1	1															19
Phys of the Earth & Planet Interiors									1					3		1			2			2				1			2		2	14
Physics & Chemistry of the Earth											1	6																				7
Physics of the Solid Earth [Izvestiya, Physics of Solid Earth]											1		2	1	1														1			6

Polar Geoscience																														1		1
Polar Record													1								1											2
Polar Research																1																1
Prelim Rpt - Ocean Res Inst, Univ Tokyo																				52												52
Preprints - Offshore Tech Conf									2																							2
Principaux Resultats Scientifiques - Bur de Recherches Geol & Mins																			2	1												3
Priroda	1									2	2					3				1										1		10
Proc - Geoscience Info Soc														1																		1
Proc - Intl Clay Conference																	1															1
Proc - Intl Conf on Port and Ocean Engineering under Arctic Conditions																	1															1
Proc - N. Am Paleontologic Conv														2				2														4
Proc - Offshore Technology Conf										1	2			1	2	1	1	1	1	1	1	2	1	1			1		2	1		20
Proc - Planktonic Confr			6																													6
Proc - Soc Potroleum Engineers of AIME. California Regional Mtg																	1															1
Proc - World Petroleum Congr (Actes et Documents - Congres Mondial du Petrole)			1				2																									3
Proc ... Seminar on Petroliferous Basins of India																									1							1
Proc Biological Soc Wash (DC)		1																														1
Proc Conf Civil Engineering in the Oceans							1																									1
Proc Congr - Reg Commit on Mediter Neogene Strat, Intl Union of Geol Sciences								1																								1
Proc Indian Acad Sci: Earth & Planetary Sciences																								1		1		1				3
Proc Intl CODATA Conf									3																							3
Proc Intl Conf Basement Tectonics																				2												2
Proc Intl Congr of Speleology																													1			1
Proc Intl Diatom Symposium																		1				1										2
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Proc Intl Mtg Organic Geochem															9																	9
Proc Intl Symp on Ostracods														1																		1
Proc Intl Symp on Shallow Tethys																							1									1
Proc Intl Symp Water-Rock Interact												1												3								4
Proc Koninklijke Nederlandse Akademie van Wetenschap., Ser B: Palaeo, Geol, Phys, Chem, [Anthro]				1												1					1											3
Proc Lunar & Planetary Sci Conf																					1				1							2
Proc Natil Sci Council, Rep China, Part A: Physical Sci & Engineering																			1													1
Proc Nebraska Acad Sciences & Affiliated Societies																												1		1		2
Proc NIPR Symp on Antarctic Geosci (Natl Inst Polar Res) Tokyo																						2										2
Proc of the Ussher Society																	1			1	2											4
Proc Pacific Science Congr			2																													2
Proc Royal Soc Edinburgh. Sect. B: Biological Sciences				1																												1

Proc Session of the Committee Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas (CCOP)																	1														1
Proc Symp on Geol of Bahamas																		1													1
Proc…Intl Geological Congress [Rept…Session]														3	19												1	2			25
Proc…N. Am Rock Mech Symp																											1				1
Proces-Verbaux - Intl Assoc Physical Sci of the Ocean											2								1												3
Procs Ann Res Conf, Gulf Coast Sect, SEPM Foundation																					1										1
Prog Rpt - Natl Sci Foundation													4																		4
Prog/Abs - Am Assoc Strat Palynologists (AASP)																		4	13		1										18
Prog/Abs - Am Quat Assoc Conf													1							1							1				3
Prog/Abs - Ann Clay Minerals Conf								2				1			1					2	1		2								9
Prog/Abs - Geol Assoc Canada; Mineral Assoc of Canada; Canadian Geophys Union, Joint Ann Mtg (GAC/MAC/CGU)								22							1	1	8	10	2	21	3	16	7	2		10	14					117
Prog/Abs; Biennial Pan-Am Conf on Res on Fluid Inclusions																										1					1
Progress in Oceanography																											1				1
Przeglad Geologiczny																								2							2
Pubblicazione - Milan, Universita, Instituto di Geologia e Paleontologia				9	1	1																									11
Publ - Earth Sciences Centre																											1		1		2
Publ - Soc Geologique du Nord														1																	1
Publ Occasionnelle - Centre Intl Pour la Formation et les Echanges Geologiques																				1											1
Pubs Centre Natl pour l'Exploit des Oceans. Ser. Rapports Scientifiques et Techniques													1																		1
Pubs Series - Australasian Inst Mining and Metallurgy																											1	1			2
Quarterly of the Colorado School of Mines				1																											1
Quaternary International																										1			1		2
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Quaternary Newsletter																					3		1									4
Quaternary Research (New York)									1			1					1										1	1			2	7
Quaternary Science Reviews																			1			1	4		1	1			1	4		13
Radiocarbon																												2		1		3
Rapport - Groenlands Geologiske Undersoengelse (Rpt - Geological Survey of Greenland)																									1			1				2
Rapports et Proc Verbaux des Reunions - Comm Intl pour l'Explor Scientif de la Mer Mediterranee					4				4									2														10
Rapports et Proc-Verbaux des Reunions - Counseil Intl pour l'Exploration de la Mer														1																		1
Recent Researches in Geology																				2												2
Record - New Zealand Geol Surv																			1													1
Records Geol Surv New S. Wales					1																											1
Report on the Conf on Scientific Ocean Drilling (COSOD)																			1													1

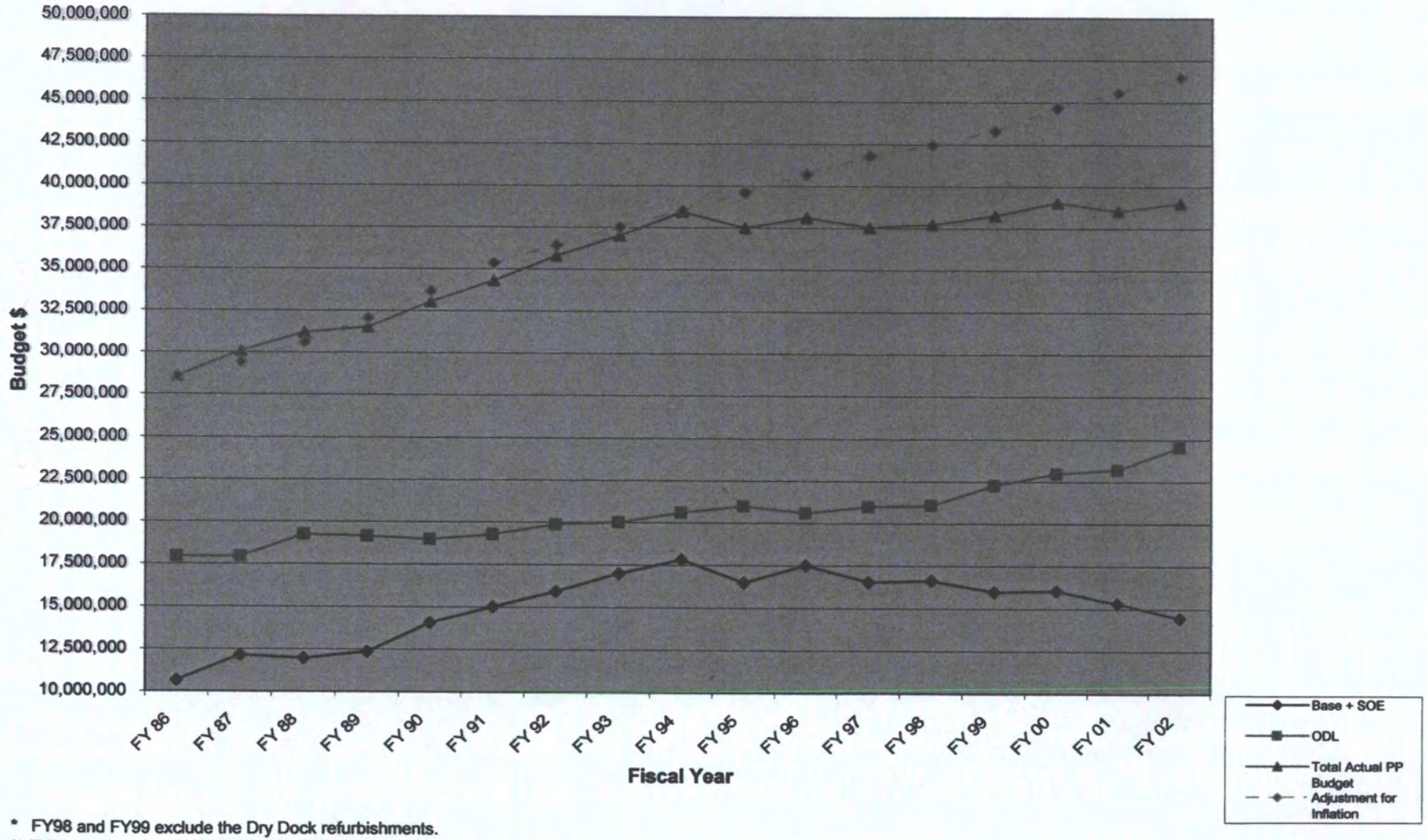
Journal title	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Total
Rept - Dept Mines & Energy (Halifax)																					1											1
Rept NZGS (New Zealand Geol Surv)													1																			1
Rept: AGSO Bulletin																													1			1
Rept: Circum-Pacific Map Series																															1	1
Rept: Curr Res - Geol Surv Canada																											1					1
Rept: SAND (Sandia Natl Lab, NM)																			3													3
Repts Faculty Sci, Shizuoka Univ																						1									1	2
Res Repts - Natl Geogr Society											1				1																	2
Reunion Ann des Sci de al Terre					1	4		3										2				2		3				3				18
Rev de Geologie Dynamique et de Geographie Physique												2				1																3
Rev l'Inst Francais du Petrole [& Ann des Combustibles Liquides]											1	1			2						1											5
Rev Palaeobotany & Palynology										1											1	1			1	2		1	1		1	9
Reviews of Geophysics																			1		1								1	1		4
Revista Brasileira de Geociencias																				1												1
Revista Espanola de Micropaleo				1		1		1	1	1		2				1	1	1	2		2	1		1	1	1	2	1				21
Revista Espanola de Paleo																					1		1									2
Revista Geologica de Chile																								4								4
Revista Soc Geologica de Espana																						1										1
Revs Geophys and Space Physics							1									1																2
Revue de Micropaleontologie			1					1	1				1	1		1				1			2									9
Revue de Paleobiologie																1	1															2
Rivista Italiana di Paleontologia e Stratigrafia				2	2	3	2		1		2	1		1										1						1		16
Rock Magnetism & Paleogeophys							1				2				1	1			1	1		1	4	2								14
Rock Mechs & Rock Engineering																											1					1
Russian Geology and Geophysics																									1							1
S. African Journal of Science																		1														1
S. Pacific Marine Geological Notes																					1											1
Schriften Naturwissenschaftlichen Vereins fuer Schleswig-Holstein														1																		1
Schweizerische Mineral Petrograph Mitteil Bull Suisse de Mineral et Petrographie											1																					1
Sci of the Total Environment																1																1
Sci Rpts Kanazawa University																									1							1
Sci Rpts Niigata Univ, Ser E, (Geol)																													1			1
Sci Rpts Tohoku Univ. Ser 2: Geol Tohoku Daigaku Rika Hokoku. Dai 2: Shu Chishitsugaku																2				1												3
Science	1	4	1	1	3	1	3	2	1	3	3	2	4	3	2	4	2	2	2			2	2	1	3	1	4	7		5	3	72
Science J. (London)		1																														1
Science News (Washington)							4	1																								5
Science, Progres, Decouverte				1																												1
Sciences de la Terre					1																											1
Sciences Geologique (Bulletin)															1																	1
Scientific Drilling																						4	3			1	2					10
Scripps Inst of Oceanography								1																								1
Scripta Geologica																											1					1
Sea Frontiers/Sea Secrets																		1														1

Sea Technology																1					1											2
Sedimentary Basins of the World																									2							2
Sedimentary Geology											3					1		7		1		1		1	2	2	1	1	3	2	2	27
Sedimentology				1			1	1	1		2		1		3			1					1		1		2			1		16
SEG Abs (Soc Explor Geophys)																			2													2
Seismological Research Letters																					1											1
Sekiyu Gijutsu Kyokaishi (J Japanese Assoc Petroleum Tech)													1						2	1		2		1			1					8
SEPM Reprint Series								1																								1
SEPM Short Course																3																3
Shigen Chishitsu (J Soc Resource Geology)																								1			1					2
Shiyou Yu Tianranqi Dizhi (Oil & Gas Geology)																								1								1
Short Course Notes - Geol Assoc Canada														2																		2
Show and Tell Messinian Seminar								8																								8
Skrifter - Norsk Polarinstitutt											2																					2
Slovensky Kras												1																				1
Soil Mechs & Foundation Engineer.																					1											1
Sonderforschungsbereich 313 "Sedimentation im Europaeischen Nordmeer"																		1			1											2
Southeast Asia Pet. Explor. Soc.						1																										1
Sovetskaya Geologiya																						1	1									2
Soviet Antarctic Expedition, Inf Bull							1																									1
Spec Paper - Geol Soc America													1	5						2		2		1			1	6			4	22
Spec Publ - Geochemical Society																							1									1
Spec Publ - Geol Soc Australia																							1									1
Spec Publ - Soc Econ Paleon Mineralogists (SEPM) [Soc Sedimentary Geol] [3 titles]						1							26				1						2				6		1	2		39
Spec Publ - The Paleontologic Soc																												5				5
Spec Publ European Assoc Petroleum Geoscientists																									1	1						2
Spec Publ of the Intl Assoc of Sedimentologists						6				1								1							2	2						12
Spec Publs - Cushman Foundation for Foraminiferal Research												1							1	1	1											4
Spec Rpt - Geotherm Resources Council															1																	1
Stanford U. Publs. Geological Sci.										9								1														10
Stero-Atlas of Ostracod Shells																									2	1		1				4
Stockholm Contribs in Geology											2	1												1								4
Strata. Actes du Lab de Geol Sed et Paleontol de l'Univ Paul-Savatier, Toulouse, Ser 1: Communications																				1												1
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Stratigrafiya, Geologicheskaya Korrelyatsiya																											1					1
Studi Geologici Camerti. Vol Spec																											2					2
Studia Geologica Salmanticensia																		1	1													2
Studies in Geology (Knoxville)																			1													1
Surveys in Geophysics																		1														1
Syllogeus - Natl Mus Natural Sci														1																		1
Systematic Zoology																1																1
Tech Bull - U.N., Econ & Social Commiss. Asia & Pacific (ESCAP), Committ. Co-ordination of Joint Prospecting for Mineral Resources in S. Pacific Offshore Areas.												1																				1

Tech Prog/Abs Papers - European Assoc Exploration Geophysicists																					1	1										2
Tech Rpt - Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary																											1					1
Tech Rpt - Marine Geosci Unit, Joint Geol Surv/Univ Cape Town													1																			1
Tech Rpt - Woods Hole Oceanographic Institution																	1				1											2
Tech Rpt ISEI, Series A (Inst Study Earth's Interior, Okayama Univ)																					2		1									3
Tectonics													1									1		1	1							4
Tectonophysics					1					1	2				2	4	1	1	2	1			2	2	1	2	2	3	3	4		34
Terra Abstracts																							29		18		3					50
Terra Antartica																										1				2		3
Terra Cognita													8			1																9
Terra Nostra (Bonn)																											14					14
Terra Nova. The European J of Geosciences																							1	1	2	1				1		6
Tertiary Research																						1										1
Thalassografika													1																			1
The Canadian Mineralogist								1												1				1								3
The Edinburgh Geologist																	1					1										2
The J Alabama Academy of Sci																	1					1					2					4
The J Geol Soc Jamaica																												1				1
The Log Analyst																						1	6									7
The Palaeobotanist								1																								1
The Paleontological Soc Papers																														1		1
The Sciences (New York)																									1							1
Tikhookeanskaya Geologiya (Pacific Geology)																	2															2
Trans - Gulf Coast Assoc Geological Societies					1		1			1	1						2	1	1	2			1									11
Trans (Doklady) USSR Acad Sciences: Earth Sci Sections						1				2	1							4			1					1	1					11
Trans Caribbean Geological Conf Memorias - Conf Geologica del Caribe				5																		1										6
Trans CIBCASIO (mtg)								1																								1
Trans CWLS Formation Evaluation Symp (Canadian Well Log Soc)																	1															1
Trans Latin Am Geologiacl Conf																	2															2
Trans R Soc Edinburgh: Earth Sci																						2										2
Trans SPWLA Ann Logging Symp																1	2	1				1					1			1		7
Trans/Proc Palaeontol Soc of Japan; New Series								1					1									1				1	2					6
Travaux du CRM Jean Cuvillier													2																			2
Travaux et Docs de Geographie Tropicale															1																	1
Journal title	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**Total**
Travaux et Docs de l'ORSTOM														1																		1
Trudy - Geol Inst, Akad Nauk SSSR														1	16	8	9	1														35
Trudy - Naucno-Issledovatel'skij Inst Geologii Arktiki													1																			1
Trudy - Vsesoyuznyy Ordena Lenina Nauchno-Issledovatel'skiy Geologicheskiy Institut im A. P. Karpinskogo, Novaya Seriya							1																									1
Trudy Inst Geologii I Geofiziki (Novosibirsk)																								1								1

Trudy Inst Okeanologiy im. P.P. Shirshova																	3															3
Tulane Studies Geology and Paleontology	2																															2
Tulsa Geological Soc Digest			1																													1
Umschau in Wissenschaft und Technik		1											3																			4
USGS Bulletin																		1								1					1	3
USGS Circular Report								1												1				1		11						14
USGS Digital Data Series																										1						1
USGS Open File Report									4	1										1		2	3	8	2	11	1	2			1	36
USGS Prof Paper	3													1	3																	7
Utrecht Micropaleo Bulls															1																	1
Verhandlungen der Naturfor-schenden Gesellschaft in Basel						1																										1
Vestnik Akademii Nauk SSSR																						1										1
Vestnik Moskovskogo Univ, Ser 5: Geografiya																1																1
Voporsy Mikropaleontologii															1																	1
Warta Geologi (Newsl Geol Soc Malaysia)																								3								3
WAT on Earth (Univ Waterloo)																								1								1
Water Resources Research																											1					1
Water Spectrum												1																				1
World and Regional Geology																													4			4
World Data Center A for Marine Geology & Geophysics, Rept MGG																15			1													16
World Oil		2	1	1	1			1																								6
Xiandai Dizhi (Geoscience)																								1						1		2
Yanjiu Baogao - Guoli Tawan Daxue Lixueyuan Haiyang Yanjiusuo Acta Oceanographica Taiwanica											1																					1
Yanshi Zuebao Acta Petrologica Sinica																							1									1
Year Book - Carnegie Inst of Wash					1		1		1																	1						4
Yearbook - Lamont-Doherty Geol Observatory Columbia Univ														1					1													2
Zeitschrift der Deutschen Geologischen Gesellschaft																		1		1												2
Zeitschrift fuer Angewandte Geologie				1																												1
Zeitschrift fuer Geol Wissenschaft														1																		1
Zeitschrift fuer Gletscherkunde und Glazialgeologie																						1										1
Zentralblatt fuer Geol & Palaeo, Teil I: Allglemeine, Angewandte, Regionale und Historishe Geologie																								1								1
Zhizn' Zemli																						1										1
Zhongguo Diqiu Huaxue Xuebao (Chinese Journal of Geochemistry)																												1				1
Zitteliana													2												1							3
Totals	**37**	**44**	**49**	**71**	**133**	**127**	**153**	**208**	**191**	**210**	**258**	**272**	**260**	**293**	**308**	**318**	**254**	**343**	**297**	**377**	**275**	**422**	**338**	**356**	**406**	**456**	**410**	**410**	**256**	**305**	**146**	**7983**

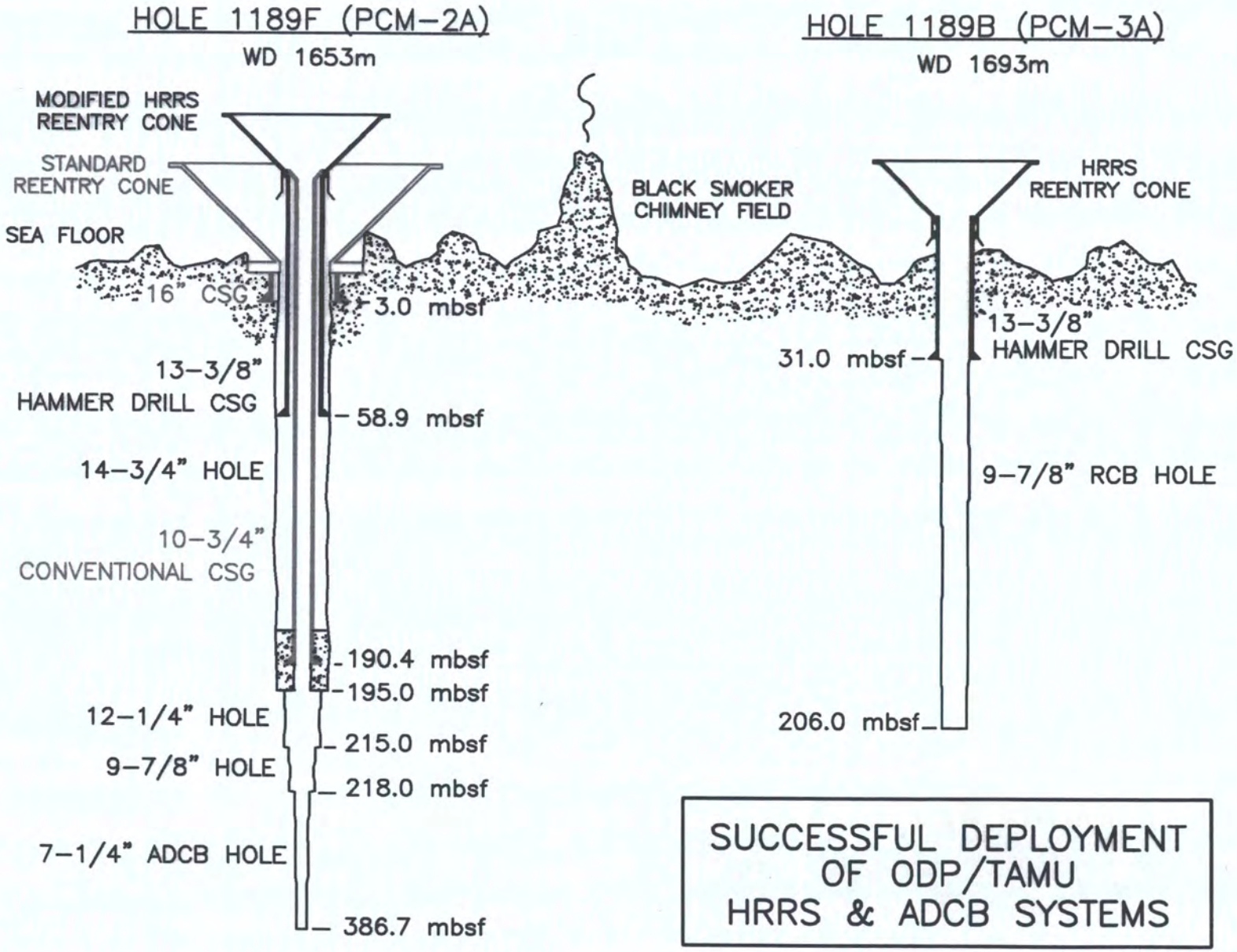
Program Plan (PP) Budgets FY86 - Proposed FY02



* FY98 and FY99 exclude the Dry Dock refurbishments.

** FY86 - Proposed FY02 adjusted for increase in CPI-U in previous fiscal year.

LEG 193 – MANUS BASIN



SUCCESSFUL DEPLOYMENT OF ODP/TAMU HRRS & ADCB SYSTEMS

ADCB Deployment Leg 193 & 194

- Leg 193 Hole 1188F
  - Cored 218-386.7 mbsf with **18.3% Recovery vs. 8.5% with RCB**
  - Depth objectives of leg did not allow ADCB core recovery to be optimized
  - Larger core diameter well received by science party
  - Surface pump pressure indication of core blockage when operated at designed flow rates
- Leg 194 Hole 1193B
  - Cored 51.3-133.3 mbsf with 10.4% recovery vs. XCB @ 3.3%
- Areas for Improvement
  - Core Catchers
  - ADCB Rate of Penetration Averaged 2.8 m/hr with half cores on hole 1188F

Leg	Leg Name	Co-Chiefs
194	Marion Plateau	Alexandra Isern, Flavio Anselmetti
195	Mariana/W. Pacific Ion	Masanao Shinohara, Matt Salisbury
196	Nankai II	Keir Becker, Hitoshi Mikada, Casey Moore
197	Hotspots	John Tarduno, Robert Duncan
198	Shatsky	Tim Bralower, Isabella Premoli Silva
199	Paleogene	Mitch Lyle, Paul Wilson
200	H20	Ralph Stephen, Junzo Kasahara
201	Peru Microbiology	Steven D'Hondt, and TBD
202	SE Paleoceanography	Alan Mix, Ralf Tiedemann
203	Costa Rica	Julie Morris, and TBD
204	Gas Hydrates	Anne Trehu, Gerhard Bohrmann
205	Eq. Pacific Ion	John Orcutt, and TBD

Current Activities

Leg 191:
High-resolution GR tool test successful

Leg 193:
LWD/RAB tool successful
Multiple downhole logs recorded T >300°C

Leg 194:
HYACE tool tested with DSA-core accelerometer
IESX data projects completed for seismic grid

Leg 196:
MWD/RAB/ISONIC tools planned
Supplemental support from JAMSTEC ($193K)

SPRING 2001 AGU MEETING
V03 ADVANCES IN SUBSURFACE SAMPLING AND BOREHOLE MEASUREMENT

Co-Convenors: Donald Thomas (University of Hawaii & DOSECC), Allan Sattler (Sandia National Laboratory), and Dave Goldberg (Lamont Doherty Earth Observatory)

During the last several years the technology for acquiring subsurface samples and for characterizing and monitoring subsurface conditions has undergone a number of significant advances. For example, these new technologies have enabled us to expand the temporal spectrum of observations with real-time, continuous monitoring of borehole conditions in the short term and greatly extended shallow water sediment records over the longer term. We can now access and recover samples from extreme environments to depths of >6 km and conduct geophysical surveys at substantially higher temperatures than were possible even a decade ago. These technologies have not only made it possible to greatly expand the breadth of our analysis of regional and planetary processes they have also increased our awareness of the ability of specialized technologies to provide us with access to environments that were heretofore inaccessible. This special session invites submissions on state-of-the-art technologies for borehole sampling, measurement, and monitoring as well as papers by those whose research programs require significant advances of currently available technology in order to monitor or sample challenging subsurface environments.

Executive Summary

Cruise Highlights:

Leg 190 Nankai I
Leg 190 was the first of a two-leg program designed to sample a transect of sites across the Nankai Trough accretionary prism (SW Japan). The main logging effort of this program will take place on Leg 196 in 2001 using logging-while-drilling (LWD) technology, however, wireline logs were acquired at Site 1173 to tie the core and LWD to seismics

Leg 191 W. Pacific Ion
The main scientific goal of Leg 191 was to drill and case a borehole at a site in the northwest Pacific Ocean between Japan and Shatsky Rise and install a seismic observatory. In addition to the standard Triple Combo toolstring, the newly developed 3rd party Multisensor Gamma Ray (MGT) tool was successfully deployed for the first time. The high-resolution natural radioactivity data are well correlated to the HNGS downhole measurements and to the MST core measurements, particularly in shallow ash layers.

Leg 192 Ontong Java
The primary objectives of Leg 192 were to determine the age and emplacement of the Ontong Java plateau, the range and diversity of magmation, and the environment and study of eruption. High-quality logs were acquired in igneous basement and in parts of the cored sedimentary interval at 1186A, where core recovery was very low. The sharp boundary between sediments and basement is well defined, particularly on the FMS logs, which also enables pillows and massive flows within the igneous basement to be distinguished.

Leg 193 Manus Basin
The overall aim of Leg 193 is to determine the subsurface volcanic architecture, structural and hydrologic characteristics, and the deep-seated mineralization and alteration patterns of the Manus hydrothermal field. The Resistivity-at-Bit (RAB) tool was used for the first time in ODP in Hole 1188B to record total gamma-ray counts and electrical resistivity logs as well as resistivity images (like FMS images) in these difficult to recover rocks.

Active Heave Compensation
The Drill String Acceleration (DSA) tool was deployed during Leg 191 on three APC cores using a new high-pressure transducer. The data acquired are presently being processed at BRG.

Large Diameter Tool Project
A conceptual design for a large diameter logging tool was developed for the Schlumberger MDT tool (a fluid sampling tool) using ODP style packers and a logging cable "wet-connect". Considering overall program priorities, OPCOM decided to place further developments of this project on hold, pending future funding.

Core Barrel Temperature Tool
The core barrel fluid temperature tool (CBTT) was modified from the DSA to measure borehole temperatures while coring. The tool was successfully deployed at Site PCM-2A

in Hole 1188A, and although the measured fluid temperature was low, the CBTT will be capable of measuring in up to 250° C environments in the future

Seismic Data Integration

Phase 1 of the IESX pilot study will deploy new hardware and software during Leg 194; Phase 2 will augment these exercises during Leg 196. The first meeting of the SciMP subcommittee on seismic integration was hosted at LDEO in October and evaluation of the IESX pilot study results was discussed. Future plans concern the feasibility of IESX for seismic data management by the Site Survey Databank.

I. MANAGEMENT

The French subcontract for logging services moved to the Univ. of Montpellier from CEREGE in October. Dr. Philippe Pezard (Univ. of Montpelier) will fill the position of chief scientist of this group since Veronique Louvel will not be making the move. Contract activities are in progress and will continue through the umbrella NEB organization.

ODP Logging Services sent the FY 00 Close-Out Report to JOI.

II. STANDARD LOGGING OPERATIONS

Leg 190 Nankai I

Leg 190 was the first of a two-leg program designed to sample a transect of sites across the Nankai Trough accretionary prism (SW Japan) within a three-dimensional (3-D) seismic survey. One additional site was drilled to the west of the main transect to compare along-strike variations in accretionary processes. The main logging effort of this program will take place on Leg 196 in 2001 using logging-while-drilling (LWD) technology to collect further in situ physical properties data at most of the same sites. Therefore, wireline logging on Leg 190 was only performed at Site 1173, the Eastern (Muroto) Transect reference site.

Even though LWD is planned for Site 1173 on Leg 196, wireline logging was considered important and in particular the velocity log is desirable because it is required to convert the 3-D seismic data to depth. As expected, logging Site 1173 was technically challenging. A highlight was the acquisition of a high-quality shear travel time sonic log with the new DSI-2 low-frequency source, despite the very low formation shear velocities (300-700 m/s). Having both shear and compressional velocity logs permits calculation of Vp/Vs or Poisson's ratio, useful for interpreting important petrophysical properties. Overall, the logging data expand upon core-based observations and provide in situ data at Site 1173.

Leg 191 W. Pacific Ion

The main scientific goal of Leg 191 was to drill and case a borehole at a site in the northwest Pacific Ocean between Japan and Shatsky Rise and install a seismic observatory. Logging operations at Hole 1179D consisted of the Triple Combo and the 3rd party Multisensor Gamma Ray (MGT) tools. Large hole size degraded data quality for some of the logs. Electrical and natural radioactivity provided the best results. Lithologic changes as describe in Holes 1179C and D are clearly recorded by these downhole measurements.

During the leg, the newly developed 3rd party Multisensor Gamma Ray (MGT) tool was successfully deployed for the first. The high-resolution MGT data are well correlated to the HNGS downhole measurements and to the MST core measurements. These correlations are well expressed in the upper logged interval with several ash layers detected from tools.

The Drill String Acceleration (DSA) tool was deployed during Leg 191 on three APC cores using a new high-pressure transducer. The data acquired are presently being processed at BRG.

Leg 192 Ontong Java
The primary objectives of Leg 192 were to determine the age and emplacement of the Ontong Java plateau, the range and diversity of magmation, and the environment and study of eruption. Site 1186, on the eastern slope of the main Ontong Java Plateau replaced the planned site on Stewart Arch that had to be cancelled for clearance reasons. The very different volcanic stratigraphy at Sites 1183 and 1185, particularly our discovery of high-MgO basalt of probable latest Cenomanian to Albian age at Site 1185, highlighted the importance of a site at a location intermediate between the crest and eastern edge of the main plateau.

Hole 1186A was logged with a single pass of the Triple Combo tool string and two passes of the FMS/Sonic tool string. High-quality logs were acquired in igneous basement and in parts of the cored sedimentary interval at 1186A. The logs are particularly useful in the sedimentary section where core recovery was very low. Interbedded cherts and limestone show up clearly on the FMS, density, and porosity logs. This thick chert layer, initially thought to be a volcanic sill, has a marked signature on the resistivity logs, the others probably being too thin to be well resolved by the medium and deep induction. The Aptian-Albian limestones appear to be thinly and regularly bedded on the FMS logs. The sharp boundary between sediments and basement is well-defined on conductivity, porosity, density, and particularly the FMS logs. Using these same logs, we can distinguish between pillows and massive flows within the igneous basement.

Leg 193 Manus Basin
The overall aim of Leg 193 is to determine the subsurface volcanic architecture, structural and hydrologic characteristics, and the deep-seated mineralization and alteration patterns of the Manus hydrothermal field. The Resistivity-at-Bit (RAB) tool was used for the first time in ODP in Hole 1188B to record total gamma-ray counts and electrical resistivity logs as well as resistivity images (like FMS images) in these difficult to recover rocks.

The ship proceeded to Hole 1191A (Satanic Mills area). Unfortunately while drilling this hole, the mechanized bit release failed the bit, core barrel, and DSA pressure case were lost. The loss of the pressure case precludes any further use of the core barrel temperature tool (CBTT). Operations on Leg 193 are ongoing.

III. SPECIALTY TOOLS AND ENGINEERING DEVELOPMENTS

Active Heave Compensation
The Drill String Acceleration (DSA) tool was deployed during Leg 191 on three APC cores using a new high-pressure transducer. The data acquired are presently being processed at BRG.

Large Diameter Tool Project
A conceptual design for a large diameter logging tool was developed for the Schlumberger MDT tool (a fluid sampling tool) using ODP style packers and a logging

cable "wet-connect". Considering overall program priorities, OPCOM decided to place further developments of this project on hold, pending future funding.

MWD Project

Greg Myers and Dave Goldberg completed analysis of MWD data from Leg 188 to evaluate drill string motion at two sites. The preliminary results will be published, in collaboration with TAMU drilling services, in the *JOIDES Journal*. The repetition of the Leg 188 MWD experiment to evaluate the new AHC has been recommended by JOIDES, if resources are available.

Core Barrel Temperature Tool

The core barrel fluid temperature tool (CBTT) was modified from the DSA to measure borehole temperatures while coring. The tool was successfully deployed at Site PCM-2A in hole 1188A, and although the measured fluid temperature was low, the CBTT will be capable of measuring in up to 250° C environments in the future.

A total of 2.8 hours of fluid temperature data were acquired with approximately 2 hours acquired while drilling at Site 1188. Further attempts to deploy the CBTT were not possible due to the core barrel in Hole 1191A.

Third Party Tool Support
The third party Multisensor High-Resolution Gamma tool (MGT) was successfully deployed on Leg 191. The acquired data are presently being processed. An initial analysis shows that the high-resolution data are of excellent quality.

IV. SHIPBOARD LOG ANALYSIS

Core/Log Integration Project (CLIP)
The development phase of CLIP has been completed. Work continues on the user guide. Copies of both the Splicer and Sagan modules are available for download from the ODP Logging Services website (http://www.ldeo.columiba.edu/BRG/ODP/). An article on CLIP will appear in the next issue of the *JOIDES Journal*.

Seismic Data Integration
ODP Logging Personnel gave a demonstration of the IESX software capabilities to the Site Survey Panel (SSP) on July 24. A discussion of the software followed the presentation and reactions were generally quite positive.

The first meeting of the SciMP detailed planning group for Seismic Integration was hosted by LDEO-BRG in October and evaluation of the IESX pilot study results was discussed.

The IESX pilot study is nearing the end of its first phase. The goal of the project is to determine the feasibility of using IESX by the Databank for digital data management, as well as its usefulness as a shipboard tool. Unix systems at BRG, the Data Bank, and in the DHML have been upgraded with the latest versions of operating system and software (GeoFrame 3.8). A second workstation equipped with two monitors will be added to the DHML during the Leg 194 port call. All seismic data for the Marion Plateau have been received and loaded into an IESX project on this workstation. The second phase of this pilot study involves a similar exercise using Leg 196 digital data. An article on the use of IESX in ODP will appear in the next issue of the *JOI/USSAC Newsletter*.

Test Facility
Construction of the LDEO test facility continued. The hole was logged and work was completed on the geological and geophysical characterization of the site. The facility will be available for testing of ODP and 3rd party tools in FY 01.

V. SHOREBASED LOG ANALYSIS

ODP Conventional Date

The following holes were processed and prepared for inclusion in the database at LDEO-BRG:
Leg 190 - Hole 1173A
Leg 191 - Hole 1179D
Leg 192 - Hole 1186A

FMS Processing

The following holes were processed at the LMF processing center:
Leg 189 - Hole 1170D
Leg 190 - Hole 1173A (2 passes)
Leg 192 - Hole 1186A

GHMT Processing

The following holes were processed at the LMF processing center:
Leg 189 - Holes 1168A, 1170D, 1172D

Training and Visitors

The following personnel visited the LDEO Log analysis Center for training or access to software:
Anne Bartetzko - training in preparation for her participation as a logging scientist on Leg 193.
Rob Pockalny - GeoFrame software for Leg 185 FMS data analysis.
Mike Coffin - Leg 192 JOIDES Logger for IESX training.
Dave Feary - GeoFrame and IESX software use.
Alex Isern - GeoFrame and IESX software use.

VI. DATABASE

The ODP Log Database has been updated through Leg 192 including Schlumberger original and processed data (conventional, geochemical and FMS), specialty tools (borehole televiewer, multi-channel sonic and temperature), borehole images and sonic waveforms.

A meeting was held at NGDC in November to discuss future archiving of the ODP databases. Representatives from JOI, JOIDES, ODP Logging Services, TAMU and NGDC were in attendance. A list of action items was drawn up and the results of the meeting will be presented to EXCOM by JOI.

Post Cruise Distribution of Log Data

All log data CDs up to and including Leg 186 have been made and sent to Sony. As no logging took place on Leg 187, there will be no data CD produced. The Leg 188 log data CD is scheduled for publication in March 2001.

VII. PUBLICATIONS AND REPORTS

AAPG/Datapages, "Borehole Image Atlas", CD-ROM, including 18 digital log examples from the ODP Logging Services scientists.

Burgdorff, K., and D. Goldberg, 2000, Feasibility study for CO_2 sequestration in a natural olivine-diabase aquifer: preliminary site characterization in the Palisades sill, NY, Trans. Am. Geophys. Union, EOS suppl., in press.

Guerin, G., D. Goldberg, A. Meltser, and ODP Leg 191 Shipboard party, 2000, Initial evaluation of drilling dynamics on the *JOIDES Resolution*: measurements of downhole bit motion while coring, Trans. Am. Geophys. Union, EOS suppl., in press.

Kroon, D., Williams, T., Pirmez, C., Spezzaferri, S., Sato, T., Wright, J.D., Coupled Early Pliocene – Middle Miocene bio-cyclostratigraphy of Site 1006 reveals orbitally induced cyclicity patterns of Great Bahama Bank production. In: Proc. ODP Sci. Res. Vol. 166, p155-166, 2000. eds. Swart, P.K., Eberli, G.P., Malone, M.J., Sarg, J.F.

Louvel, V. and Galbrun, B., Magnetic Polarity Sequences from Downhole Measurements in ODP Holes 998B and 1001A, Leg 165, Caribbean Sea, accepted in Marine Geophysical Research.

TERMS OF REFERENCE

JOIDES Executive Committee for the Ocean Drilling Program

1. This committee shall formulate scientific and policy recommendations with respect to the Ocean Drilling Program (ODP). It shall conduct the ODP planning, as well as evaluation and assessment of the Program as to its accomplishments as compared to the goals and objectives which have been established. It may be assigned managerial and operational responsibilities for appropriate tasks.

2. The members of this committee shall be 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 in terms of scientific human power and facilities to carry out such studies.

3. The membership of this committee is now composed of one representative of each of the ~~six~~ non-US countries or consortia with an active Memorandum of Understanding (MOU) with the National Science Foundation (NSF) and which meet the criteria for full membership according to the ODP Membership Policy ratified by the JOIDES Executive Committee in June 1998. Presently full members are representatives of Australia - Canada - China Taipei - Korea Consortium, European Consortium for Ocean Drilling - European Science Foundation, ~~France~~, Germany, Japan, and the United Kingdom and one representative of each of ten US institutions [Columbia University; Rutgers University; Texas A&M University; University of California, San Diego; University of California Santa Cruz; University of Florida; University of Miami; University of Rhode Island; University of Texas at Austin; Woods Hole Oceanographic Institution]. Associate members are France and Peoples Republic of China.

The appointment of additional members will be determined by the JOI Board of Governors on the recommendation of the JOIDES Executive Committee. In the case of representatives of non-US country participants, the existence of a valid MOU with NSF is a prerequisite to membership.

Membership of any member may be canceled by the JOI Board of Governors on the recommendation of the JOIDES Executive Committee or in the event of a non-US country participant ceasing to have a valid MOU in existence or in the event that a non-US country participant has failed to reach the criteria for full members according to the ODP Membership Policy ratified by the JOIDES Executive Committee in June 1998.

~~4. Each institution or organization designated for participation on this committee by the Board of Governors shall provide one voting member.~~

~~5~~4. The Executive Committee shall reach all its decisions by the affirmative vote of at least two-thirds of all members present, including members from at least three non-US members. A quorum shall constitute two-thirds of the Executive Committee. If a member of the Executive Committee is absent from a duly called meeting of the Executive Committee, he or she may designate an alternate with full authority to act for him or her in his or her absence.

~~6~~5. The Executive Committee may establish subcommittees for cognizance of certain components of the Ocean Drilling Program. Areas of cognizance and the Terms of Reference for each subcommittee shall be defined by the Executive Committee. In particular a Science Committee ~~and a Budget Committee~~ shall be established. If deemed necessary by the Chair of the Executive Committee a

Budget Committee consisting of members from the Science Committee and the Executive Committee shall be established.

~~7~~6. The Committee, and all subcommittees thereto, shall keep written records of their proceedings.

~~8~~7. Members of this Committee, and members of subcommittees duly appointed thereby, while acting within the Terms of Reference, shall be indemnified, and held harmless by the corporation from and against any and all liabilities, damages and demands, losses, costs and expenses arising from acts or omission related to performance as committee members.

~~9~~8. These Terms of Reference, upon ratification by members of the existing JOIDES Executive Committee and adoption by JOI, Inc. will supersede all previous JOIDES agreements.

The Chair of EXCOM rotates with the JOIDES Office among the JOIDES institutions, excluding the Science Operator and Wireline Logging Service Operator institutions. The term of office is usually two years.

Amended 12 March 1990
Amended 2 April 1992
Amended 29 September 1994
Amended 2 February 1995
Amended 6 July 1995
Amended 11 June 1997
Amended 13 November 1998
Amended 29 January 2001

TERMS OF REFERENCE

JOIDES Executive Commitee for the Ocean Drilling Program

1. This committee shall formulate scientific and policy recommendations with respect to the Ocean Drilling Program (ODP). It shall conduct the 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.

2. The members of this committee shall be 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 in terms of scientific human power and facilities to carry out such studies.

3. The membership of this committee is now composed of one representative of each of the non-US countries or consortia with an active Memorandum of Understanding (MOU) with the National Science Foundation (NSF) and which meet the criteria for full membership according to the ODP Membership Policy ratified by the JOIDES Executive Committee in June 1998. Presently full members are representatives of Australia - Canada - China Taipei - Korea Consortium, Europe an Consortium for Ocean Drilling - European Science Foundation, Germany, Japan, and the United Kingdom and ten US representatives drawn from the membership of JOI as designated by the JOI Board of Governors. Associate members as defined by the ODP Membership Policy ratified by EXCOM in June, 1990 will have one non-voting participant at EXCOM meetings.

The appointment of additional members will be determined by the JOI Board of Governors on the recommendation of the JOIDES Excutive Committee. In the case of representatives of non-US country participants, the existence of a valid MOU with NSF is a prerequisite to membership.

Membership of any member may be canceled by the JOI Board of Governors on the recommendation of the JOIDES Excutive Committee or in the event of a non-US country participant ceasing to have a valid MOU in existence or in the event that a non-US country participant has failed to reach the criteria for full members according to the ODP Membership Policy ratified by the by the JOIDES Executive Committee in June 1998.

4. Each institution or organization designated for participation on this committee by the Board of Governors shall provide one voting member.

5. The Executive Committee shall reach all its decisions by the affirmative vote of at least two-thirds of all members present, including members from at least three non-US members. A quorum shall constitute two-thirds of the Executive Committee. If a member of the Executive Committee is absent from a duly called meeting of the Executive committee, he or she may designate an alternate with full authority to act for him or her in his or her absence.

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7. The committee, and all subcommittees thereto, shall keep written records of their proceedings.

8. Members of this Committee, and members of subcommittees duly appointed

thereby, while acting within the Terms of Reference, shall be indemnified, and held harmless be the corporation from and against any and all liabilities, damages and demands, losses, costs and expenses arising from acts or omission related to performance as committee members

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Amended 2 April 1992
Amended 29 September 1994
Amended 2 February 1995
Amended 6 July 1995
Amended 11 June 1997
Amended 13 November 1998
Amended 29 January 2001

Distance Learning Pilot Project

Deliverables

- Hardware and software for 15-20 Texas rural school districts
- 5-day Intensive training in technology and Earth Science
- Eight web-based teaching modules
- Seven broadcasts during Leg 194 by a middle school teacher

Broadcasts

- Teacher: Ms Joan Linsley (retired, Houston district)
- 20-minute broadcasts including science, interviews, questions
- Teacher presentation is sent live, via satellite to TAMU, graphics added, and the program is circulated via web
- Student participate via ask a question
- Distribution of live broadcast limited, archived broadcast is available to all interested within 24 hours

Web Site

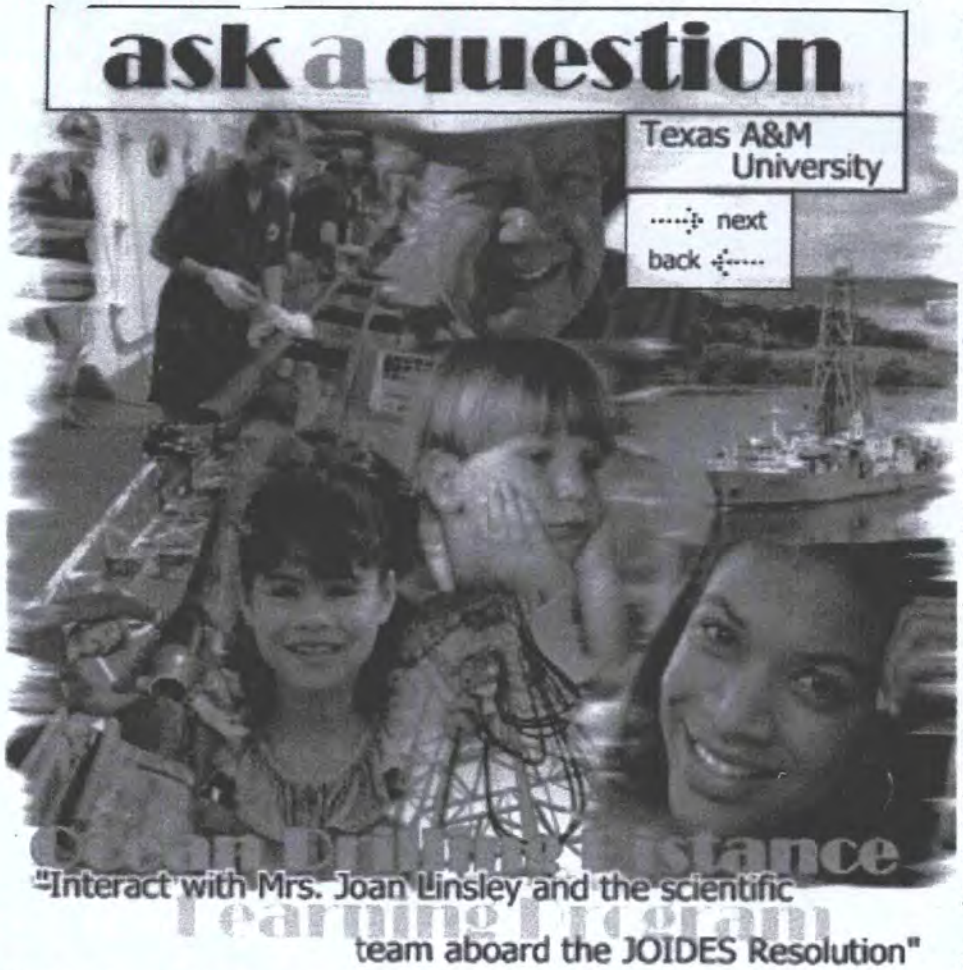
http://oceandrilling.coe.tamu.edu

Support

- TAMU College of Geoscience, TAMU College of Education, TAMU, Texas School Districts, Texas Rural Systemic Initiative, ODP, and University of Texas
- Total $450-500K (external to ODP)

Auxiliary Benefits

- Improves IS support by providing system managers access to shorebased and/or shorebased resources



Question: How is elevation calculated?
Name: Shawana, Mr. Bledsoe's 8th grade science class
School: Marlin Jr. High, Marlin, Texas
Response: Until recently, elevation was measured using either a barometer or an altimeter. The barometer converts atmospheric pressure into elevation. The relationship is linear, so thinner the atmosphere, the higher the elevation. The altimeter first calculates the time it takes for the signal to leave the instrument, travel to the ground, and return to the instrument (a plane, for example). This time is multiplied by the speed of sound in the air to get the total distance that the signal traveled. We then divide the total distance in half to get the distance to the ground. With the invention of satellites, however, you can use a GPS (Global Positioning System) receiver that calculates your position based on signals sent from several satellites orbiting Earth. This system also has the advantage of giving a highly accurate position in longitude and latitude in addition to elevation. Most planes, ships, boats, and even many cars now carry GPS receivers. To measure bathymetry, or the depth of the surface below sea level, we use the same process as the altimeter, but we use sonar signals instead of radio waves (which don't travel as well in water).

Question: Are you on or near an abyssal plain?
Name: Ms. Ann Linsley's class
School: Houston, Texas
Response: We actually are on a plateau, but there is an abyssal plain to the east of this plateau off its margin. An abyssal plain is a flat region of the deep ocean floor, usually at the base of a continental rise. It is formed by the deposition of turbidity-current and pelagic sediments that obscure the pre-existing topography.

Question: Do the core samples show fault lines?
Name: Ms. Ann Linsley's class
School: Houston, Texas
Response: We do not anticipate any fault lines showing in these core samples because we believe this is a very stable area with no signs of tectonic activity. If we were in an tectonically active area, fault lines could be seen in the core sample.

Question: What is the size of the core samples?
Name: Ms. Ann Linsley's class
School: Houston, Texas
Response: A core sample is 9.5 meters long when it comes on to the floor. On the deck this is cut into 1.5 meter sections, capped, and labeled. It is cut simply for the ease of handling. After some tests are run, the core is sliced in half lengthwise, leaving a "working half" from which samples may be taken and materials disturbed. The other half is the "archive half" which can have only non-disturbing tests run on it.

College of Geosciences

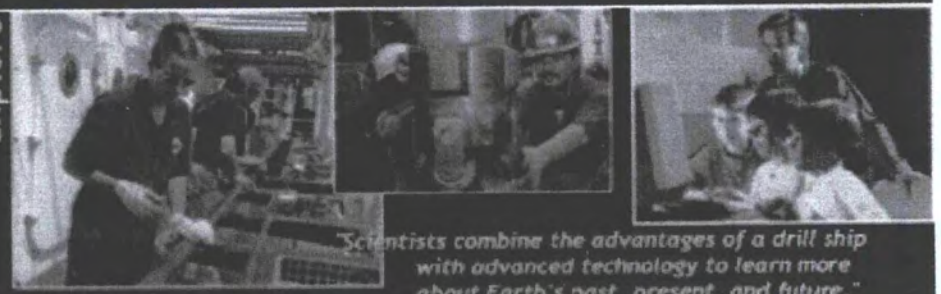
Texas A&M University

Ocean Drilling Distance Learning Program

MIDDLE SCHOOL EARTH SCIENCE

College of Education

explore



"Scientists combine the advantages of a drill ship with advanced technology to learn more about Earth's past, present, and future."

Ship to Shore Broadcasts, Schedule and Resource Center

Date	Topic	Resources
17 January 2001	Program Introduction - Leg194	| Teacher Orientation Page | Student Journal Activity Sheet | Student Activity Answer Hints | View Archived Broadcast | View PowerPoint Slides | Ask a Question Response Page
24 January 2001	Shipboard Laboratories	| Teacher Orientation Page | View PowerPoint Slides | View Archived Broadcast | Ask a Question Response Page
31 January 2001	Sediments- Types and Distribution	| Teacher Orientation Page | View PowerPoint Slides | View Live Broadcast | Ask a Question Response Page
7 February 2001	Geological Time	| Teacher Orientation Page | View Live Broadcast | Ask a Question Response Page

14 February 2001	**Tools Used in Research "Sound"**	| Teacher Orientation Page | View Live Broadcast | Ask a Question Response Page
21 February 2001	**Sea Level**	| Teacher Orientation Page | View Live Broadcast | Ask a Question Response Page
28 February 2001	**Bringing it All Together-Wrap Up**	| Teacher Orientation Page | View Live Broadcast | Ask a Question Response Page

IWG PLANNING

The most recent meeting of the IWG for IODP occurred in Tokyo at the end of August. The minutes of that meeting are available at http://www.iodp.org. Primary results of the meeting included:

- Selection of members for committee to review the IODP Science Plan produced by IPSC. Committee to meet in New York on December 5-6 and to be chaired by Seiya Uyeda (Univ. of Tokyo) and Frank Rhodes (Cornell University). Committee will report its findings to the next IWG meeting scheduled for Southampton in mid January, immediately preceding the EXCOM meeting.
- Discussion of draft basic principles (Platforms, Program, Membership, Implementation) for the IODP with acceptance of the Implementation Principle which calls for establishing an interim Science Advisory Structure (iSAS) to carry-on the planning initiated by IPSC until the formal IODP Science Advisory Structure is established on 1 October 2003. The iSAS is to be viewed as a joint working group of JOIDES and OD-21 science advisory committees, with roughly 1/3 Japanese, 1/3 U.S., and 1/3 other membership. JOIDES and OD-21 will cooperate in identifying membership on the committees. The chairs of IPSC and OD-21 scientific advisory committees will co-chair iSAS and report to the IWG. IPSC has been requested to draft the terms of reference for this new structure and report them to the IWG meeting in January. It is expected that a formal letter of request to JOIDES, and additional information on timing and procedures, will be available in time for discussion at the January EXCOM meeting.
- IWG members have been requested to supply comments on the IODP principles with further discussion scheduled for Southampton.

The next meeting of the IWG is scheduled for Southampton, England on January 16-17. Results of that meeting should be available for the EXCOM meeting.

Report from IWG Meeting
Southampton UK 16-17 January 2001
Prepared by C Harrison, liaison to JOIDES Executive Committee

1. There was considerable discussion from various countries and consortia about how they are getting on in applying for membership in the IODP. There were two pleasant surprises. One was that the Canadian member of the committee said that there was a possibility that Canada might become a full member. There are new funds in Canada for international scientific programs, and the availability of these funds makes it possible for Canada to become a member of IODP. The second surprise was that the Nordic consortium also expressed some interest in becoming a full member of IODP.
2. There was some discussion of the Interim Science Advisory Structure (ISAS) for IODP. This was prepared by IPSC and is in the Agenda package. The ISAS is modeled closely on the current JOIDES advisory structure. Instead of a Science Committee, IPSC recommends an Interim Planning Committee reporting to IWG. IPSC does not recommend the establishment of a separate Executive Committee. Because of the different mix of funding, the membership of the ISAS committees will be different from the JOIDES committees, the suggestion being that the membership is divided up into 1/3 Japanese, 1/3 US and 1/3 other countries. Collaboration between ISAS and JOIDES committees is maintained by some common membership, and common meeting locations with one meeting occurring immediately after the other. JOIDES is asked to make recommendations on membership of ISAS committees in collaboration with OD21 Science Advisory Committee. The ISAS will not make drilling recommendations but will tend to the proposal acceptance and review process. Drilling plans will be made when the IODP advisory structure is established.
3. There was some discussion about the review of the IODP Initial Science Plan (review cttee shown on overhead). Review was highly laudatory ("The ISP … is a bold project of extraordinary importance, high promise and unique significance." "…the present proposal is of such fundamental scientific importance and impact, technical timeliness and broad social benefit to justify a major increase in funding support ….") Comments of the committee included the suggestion that there be more discussion of mission-specific platforms. The committee also suggested that there be an appendix outlining some national and international programs with which IODP might have a synergistic relationship. A third major suggestion was that the importance of developing partnerships be emphasized. There were several other less important suggestions. IWG has asked IPSC to make changes to the ISP dealing with these suggestions before the final ISP is printed on 1 May 2001.
4. There was also considerable discussion about the Principles documents (final versions of Principles documents handed out in Kamakura, except for Management Structure principles which is still in draft form). Highlights include the decision that the membership contribution will be $5M/year with a commitment for 10 years. Program costs are divided into Platform Operations Costs (POCs) and Science Operation Costs (SOCs). Mission specific POCs will be the responsibility of the member(s) providing the platform. Mission specific SOCs will be the responsibility of all the members of IODP. Of direct concern to JOIDES EC is the IODP Implementation Principles (the top two sheets of the package handed out), which describes the ISAS.

IODP IMPLEMENTATION PRINCIPLES

SCHEDULE

1. IODP will begin officially on 1 October 2003. Membership and Program implementation will be effective from this date.

2. The first year of the program will be spent in detailed planning activities and preparing for drilling operations (engineering development, detailed site surveys, etc.). 2005 will begin operation of the non-riser vessel. 2006 will begin operation of the riser vessel.

INTERIM SCIENCE ADVISORY STRUCTURE (ISAS)

1. An Interim Science Advisory Structure (ISAS) for IODP will be organized beginning in June 2001 and will exist until 1 October 2003. ISAS will be a joint working group representing JOIDES and the OD21 Science Advisory Committee. The purpose of ISAS is to continue scientific planning for IODP.

2. Membership on ISAS committees will be nominated by JOIDES and the OD21 Science Advisory Committee. Representation on the committees and panels of ISAS is expected to be proportional to the optimal international participation in IODP (1/3 Japan, 1/3 United States, 1/3 other IWG members). It is expected that JOIDES and the OD21 Science Advisory Committee will confer and consider appropriate disciplinary balance and expertise in making their nominations.

3. An Interim Planning Committee (IPC) will serve as the highest level committee and management authority for the ISAS and is expected to oversee and implement ISAS activity. Representation on IPC will be chosen from IWG members who are, in principle, seeking full IODP membership. The IPC will be responsible to the IWG for its guidance and direction and will report to the IWG. IPC will be co-chaired by the chairs of IPSC and the OD21 Science Advisory Committee.

4. IPC will encourage the international community to submit drilling proposals for IODP. The proposals will be examined and reviewed by ISAS, but final evaluation, ranking and scheduling will be conducted by the formal IODP Science Advisory Committee which will be established on 1 October 2003.

5. IWG will request IPSC to provide recommendations on the necessary committees and panels for ISAS, a schedule for their creation, and panel mandates by 1 January 2001.

6. ISAS committees are expected to meet in conjunction with their equivalent JOIDES committee.

IODP PROGRAM PRINCIPLES

1. The IODP is a scientific research program with objectives identified in the IODP Science Plan. The results of the Program's scientific and engineering activities will be openly available.

2. The IODP is based on international cooperation and sharing of financial and intellectual resources.

3. Membership in the IODP is available to government and/or national agencies (or their representatives) which have an interest and capability in geoscience research.

4. The IODP will be guided by a science advisory structure, composed of scientists and engineers representing IODP members. The IODP science advisory structure will establish the appropriate panels to provide advice to IODP management on platforms and science operations.

5. The operation of two ocean drilling vessels (riser capable vessel and non-riser vessel) presently constitutes the core capability of the IODP.

6. The IODP will seek substantive cooperation with other earth and ocean sciences programs and initiatives.

7. Program costs will be determined by the IODP Lead Agencies (presently NSF and MEXT). The Lead Agencies will contribute equally to Program costs. Program costs are composed of platform operations costs and science operations costs[1]. Platform operations costs of the two primary vessels are to be the responsibility of MEXT and NSF. Mission specific platform operation costs will be the responsibility of the member(s)

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[1] Platform Operations Costs will support the basic operation of the vessel as a drillship, and will include, for example: (1) costs of the drilling and ship's crew, (2) catering services, (3) fuel, vessel supplies and other related consumables, (4) berthage and port call costs, (5) disposal of wastes, (6) crew travel, (7) inspections and insurance, (8) drilling equipment, supplies, and related consumables, (9) administration and management costs of the platform operators.
Science Operation Costs will provide for those activities onboard program platforms necessary to the proper conduct of the scientific research program and those shore-based activities required to properly maintain and distribute samples and data, support seagoing activities, and administer and manage the program. These costs will include, for example: (1) technical services, (2) computer capability, (3) data storage and distribution, (4) description, archiving, and distribution of data and samples, (5) deployment of a standard suite of logging tools, (6) development of new drilling tools and techniques required by IODP research, (7) program publications, (8) costs of consumables (exclusive of those identified under platform operations costs), (9) costs required for administration and management, including the Central Management Office, (10) engineering or geophysical surveys required for hole design or evaluation of drilling safety during final site selection.

providing the platform. Members in the IODP (including MEXT and NSF) will contribute financially to support of the science operations costs.

8. Support of scientific research and development costs for shore-based analysis and research on IODP samples and data, and for non-routine downhole measurements, are the responsibility of member countries/agencies. Support of geophysical and geological research to prepare drilling proposals or identify drilling targets are also the responsibility of member countries/agencies.

IODP MEMBERSHIP PRINCIPLES

1. Membership in the IODP is available to government and/or national agencies (or their representatives) which have an interest and capability in geoscience research.

2. Membership will be secured through signing of a memorandum of understanding between the government and/or national agency (or representative) and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the National Science Foundation (NSF).

3. Lead Agencies of the IODP, (presently MEXT and NSF), will have equal membership rights and responsibilities. Lead agencies will contribute core capabilities to the Program. Lead agencies will contribute equally to total Program costs.

4. An IODP Council will provide governmental oversight for all IODP activity. All countries, as well as member organizations representing countries, participating in the IODP will be represented on the Council.

5. Members will have the right to: (1) participate in all drilling cruises, (2) be represented on all planning and advisory panels, (3) be represented on IWG or its successor, (4) have access to data, samples, scientific and technical results. (5) submit proposals to the advisory structure for drilling or engineering developments in support of IODP science, (6) etc.

6. Members will have the responsibility to: (1) actively participate in all aspects of the IODP, (2) ensure publication and sharing of scientific results, (3) participate in providing data and proposals for planning of drilling programs, (4) etc.

7. Based on present projection of total annual Program costs ($130-140M) for a two drilling vessel program, the financial contribution for membership in the IODP will be $5 million/year. Financial contributions from international partners will be commingled to support science operations costs. This contribution will entitle a member to one participation unit, with one participation unit equivalent to one member per panel and two scientific participants per "cruise leg," or equivalent. More than two participants on a cruise leg may be acceptable as offset by reduced participation in other legs. A member may acquire additional participation units through a corresponding increase in financial contribution, and/or

long-term provision of mission specific platforms. It is understood that the Lead Agencies will contribute equally to total Program cost and acquire additional participation units necessary to fully support the program. When the Program is established, associate membership status will be considered.

8. Membership will be based on a 10-year commitment, in principle, to IODP participation.

IODP PRINCIPLES ON DRILLING PLATFORMS

1. The operation of two drilling vessels (riser capable vessel and non-riser vessel) presently constitutes the core capability of the IODP. The riser capable platform will be made available by MEXT and will be owned and operated by JAMSTEC, and the non-riser platform by the NSF.

2. Legal and financial responsibility including mobilization and platform operation costs for the riser capable vessel will reside with Japan and for the non-riser vessel with the United States.

3. Access to mission specific platforms (beyond the two primary vessels) will be required to meet specific objectives identified by the science advisory structure, but resources to support these activities have not been identified at this time.

4. Legal and financial responsibility, including mobilization and platform operation costs of mission specific platforms, is to reside with the organization(s) or country (ies) which make the decision to offer this additional capability to the Program. Provision of such a capability will not be considered a contribution in lieu of annual IODP membership contribution.

5. IODP commingled program funds will be used to support costs of science operations on IODP drilling platforms.

6. International participation in the science and operations of all IODP drilling platforms will be consistent with IODP program procedures.

Draft

IODP PRINCIPLE ON MANAGEMENT STRUCTURE

1. A Central Management Office (CMO) will develop and manage the implementation plans for the IODP science program. The CMO will have a formal arrangement with IODP Lead Agencies for this activity and will operate in the best interest of the IODP and all member organizations, without preference.

2. The principal tasksof the CMO are to receive advice on priorities and plans from the IODP Science Advisory Structure, to receive plans, which are responsive to this advice from the IODP implementing organizations, and to submit an annual IODP plan to the Lead Agencies. The CMO will negotiate with the implementing organizations and the Science Advisory Structure to produce an annual IODP plan, which is consistent with budget guidance from the Lead Agencies.

3. Implementing organizations will have primary responsibility for the management of the Program's facilities and operational capabilities as identified in the annual plan. JAMSTEC will carry-out the role of the implementing organization for operation of the riser platform. NSF will determine the implementing organization for the non-riser platform. Other implementing organizations may be established as appropriate and required, and those organizations supported by science operations costs will be selected by processes agreed to by the CMO and IWG.

4. The annual IODP plan will include presentation of science operations costs and platform operations costs.

5. The annual IODP Plan will be approved by the executive committee of the Science Advisory Structure (which represents all international members) prior to its consideration by the Lead Agencies.

6. Significant changes in the annual plan will be approved by the CMO and the Lead Agencies prior to implementation.

7. NSF will provide commingled funds to the CMO, which in turn will provide funds to implementing organizations for science operation costs through appropriate formal arrangements.

8. An IODP Council will provide governmental oversight for all IODP activity. All countries, or member organizations representing countries, participating in the IODP will be represented on the Council.

IODP OVERARCHING PROGRAMS

Positions within IODP Management Office

Engineering Management

Job Description: Maintain contact with engineering operations on IODP platforms. Identify drilling and sampling problems in scientific ocean drilling that require an engineering solution. Keep abreast of engineering developments in the drilling industry. Seek advice from the drilling industry on solutions to scientific ocean drilling problems. Develop RFPs for engineering development projects approved by IODP. Administer the allocation and deployment to science operators of third-party and program-owned downhole tools and measurement devises.

Scientific Advice and Guidance: IODP/Industry Panel

Education/Public Relations

Job Description: Maintain an active public relations effort, including establishing contacts and news outlets with the international press and broadcast media. Conduct public education and outreach efforts associated with ongoing IODP scientific programs. Facilitate, through liaison among educators and the IODP scientific operators and subcontractors, the development and execution of educational programs that make use of IODP facilities.

Scientific Advice and Guidance: liaison with IODP SAS and with IODP science and platform operators

Subcontracted IODP Service Functions

Core Repository--Core Curation, Storage, Processing, and Sampling

Job Description: Oversee operation of all IODP core repositories and ensure uniformity of archiving and sampling procedures consistent with IODP policies. Fulfill in a timely manner requests for sample material to carry out scientific research in accordance with IODP policy.

Scientific Advice and Guidance: IODP Panel (SciMP)

Database Development/Information Services

Job Description: Develop and maintain a relational database containing all data produced in association with IODP operations. This database should also incorporate all data produced and archived by ODP and DSDP, including all published data on DSDP, ODP, and IODP samples, as well as data derived from measurement devises and observatories located in IODP drill holes. A bibliographic database should be part of this effort.

Scientific Advice and Guidance: IODP Panel (SciMP)

The following responsibilities should be part of the Information Services group of the platform operators:

Create linked ship and shore data collection, maintenance, and handling processes, including databases.

Software development; maintain software licenses.

Publications

Job Description: Assemble, edit, and produce a coherent and continuing series of scientific and data publications that report the results of scientific ocean drilling for all IODP drilling components.

Scientific Advice and Guidance: SAS Working Group (?Panel)

Downhole logging and tools

Job Description: Provide state-of-the-art "oil industry" logging capabilities and specialty logs customized to the needs of IODP scientists. Provide downhole logging operations, as well as log data processing, distribution, and database services for IODP.

Scientific Advice and Guidance: IODP Panel (SciMP)

Proposed Interim Science Advisory Structure (iSAS) for the Transition to IODP

The Interim Science Advisory Structure for the IODP

The interim Science Advisory Structure (iSAS) is a joint working group representing JOIDES and the OD21 Science Advisory Committee. The functions of iSAS are: 1) to plan for the Integrated Ocean Drilling Program (IODP); 2) to facilitate the transition from the Ocean Drilling Program (ODP) into the IODP; 3) to make recommendations on the science advisory structure for IODP; 4) to develop guidelines related to evaluations of science proposals, site surveys and form of drilling proposals submitted to IODP; and 5) to examine, review and nurture potential drilling proposals for IODP. Final recommendations for the scientific drilling program of IODP will be developed once IODP begins in 2003.

The iSAS committees, working groups, and panels will report and direct their advice through the interim Planning Committee (iPC) to the International Working Group (IWG) of IODP. Representation on most iSAS panels and committees will be proportional to the optimal international participation in IODP (1/3 Japan, 1/3 United States, 1/3 other IWG members. Members of iSAS committees and panels will be nominated by JOIDES and the OD21 Science Advisory Committee. For the iPC, it is expected that JOIDES will chose representatives from its full members. To the extent possible, it is expected that JOIDES nominations will be consistent with the membership on corresponding JOIDES panels and committees. JOIDES and the OD21 Advisory Committee will confer and consider appropriate disciplinary balance and expertise in making their nominations to IWG. The term of membership on iSAS panels and committees will be until 1 October 2003 (unless replaced before that time by the IWG member nations they represent). The iSAS is open to suggestions and proposals from the entire scientific community, and its plans will be open to continued review and discussion.

1. Interim Planning Committee

1.1 General Purpose. The Interim Planning Committee (iPC) will be responsible to the International Working Group (IWG) of IODP for its guidance and direction. The iPC reports to the IWG, provides advice to IWG, facilitates the establishment of the IODP Science Advisory Structure, develops guidelines for evaluations on science proposals for IODP, and continues scientific planning for IODP. More specifically, the iPC is responsible for:

- ¥ custody and initial implementation of the IODP Initial Science Plan;
- ¥ categorizing of mature drilling proposals (*i.e.,* proposals having been grouped by the iSSEPs , undergone external review, and judged to be complete by iPC) that address the scientific themes and initiatives of the IODP Initial Science Plan
- ¥ advising how these proposals might be most effectively mapped into a drilling plan based on the IODP multiple platform concept;
- ¥ carrying out science planning, over the 2-year period of ODP to IODP transition;

- fostering communications among and between the international community, the JOIDES and OD21 Science advisory structures, and the IWG.

1.2 Mandate. iPC will encourage the international community to submit drilling proposals for IODP, and will foster the further development of those proposals. Proposals submitted to JOIDES that remain unscheduled in ODP by September of 2001 will be forwarded to the iSAS Support Office. The Co-Chairs of iPC will contact proponents of these proposals requesting from them a statement of intent regarding submittal of their proposal to IODP, as well as any modifications or amendments they wish to make in their proposals that help focus the proposed drilling on important scientific objectives of the IODP Initial Science Plan.

In addition, iPC may assign special tasks to iSAS panels and planning groups. The iPC Co-Chairs convene the iSAS panel meetings and approve the meeting dates, locations, and agendas of all the iSAS science advisory committees, panels, and groups. iPC, through the iPC Support Office, assigns proposals for review to iSAS Science Steering and Evaluation Panels (iSSEPs) and, if relevant, to the three service panels - the interim Scientific Measurement Panel (iSciMP), Site Survey Panel (iSSP), and Pollution Prevention and Safety Panel (iPPSP). After proposals are reviewed by the panels and judged to be complete, with well-documented scientific objectives and drilling plans, they are considered to be mature and sent out for external (mail) review. After external reviews of these proposals are received, the iPC discusses the iSSEP comments and external reviews of each proposal and categorizes the scientific objectives of the proposals within the major thematic areas of the IODP Initial Science Plan. The iPC then categorizes all proposals based on their scientific merit and provides an assessment of their technical requirements and feasibility within the IODP multiple platform program. The final evaluation and ranking of these proposals will be carried out by the IODP Science Advisory Structure when it is established.

The iPC reviews the interim advisory structure in the light of developments in IODP planning, and recommends to IWG changes in the panel structure and mandates for IODP Science Advisory Structure. Much of the work of iPC is carried out by the commissioning of reports from other interim science advisory panels, including Detailed Planning Groups, *ad hoc* working groups, *ad hoc* subcommittees of its own membership, and its Co-Chairs.

1.3 Structure. iPC is empowered, with the approval of IWG, to modify the iSAS structure as appropriate to the definition and accomplishment of assigned tasks. Communication with the panels and active iPPGs and iDPGs is maintained by having their chairs meet with the iPC annually, and by assigning iPC members as liaison members to its panels and planning groups. Where counsel and communication are deemed important, other individuals may be asked *ad hoc* to meet with the iPC or its panels.

1.4 Meetings. iPC meets at least twice a year, normally right before or after the meeting of JOIDES SCICOM.

1.5 Membership. iPC will consist of approximately fifteen to eighteen members. All appointees to iPC shall satisfy the fundamental criteria of having the ability and commitment to provide mature and expert scientific direction to IODP planning. If members of the iPC miss two meetings in succession, the iPC Co-Chairs will discuss the problem of iSAS representation with the appropriate country representative on IWG.

1.6 Liaison. The Co-Chairs of IWG, or nominees thereof, are liaisons to the iPC. The iPC Co-Chairs are liaisons to IWG.

1.7 Procedure of Decision Making. Decisions concerning substantive issues (e.g. the categorization of mature proposals) are made through consensus among members present.

1.8 Co-Chairs . The iPC will be co-chaired by the chair of IPSC and the designated iPC representative from the OD21 Science Advisory Committee.

2. Interim Science Steering and Evaluation Panels

2.1 General Purpose: The Interim Science Steering and Evaluation Panels (iSSEPs) interact with proponents (and interim Program Planning Groups, as necessary) during the ODP-IODP transition (2001-2003), in order to nurture submitted drilling proposals to maturity, make an initial assessment (in cooperation with the iPC) about the suitability of proposals for a particular drilling platform or technology, and recommend mature proposals for external comment.

• <u>Environmental Change, Processes and Effects iSSEP: Areas of Interest</u>

The interests of this iSSEP are explained in detail in the Initial Science Plan of IODP. Within the context of this plan, important thematic areas of investigation addressed by proposals that will be considered by this panel include:

- internal and external forcing of environmental change
- environmental change induced by internal and external processes
- extreme climates and rapid climate change initiatives
- the deep biosphere and the sub-seafloor ocean
- gas hydrates

• <u>Solid Earth Cycles and Geodynamics iSSEP: Areas of Interest</u>

The interests of this iSSEP are explained in detail in the Initial Science Plan of IODP. Within the context of this plan, important thematic areas of investigation addressed by proposals that will be considered by this panel include:

- formation of rifted continental margins, oceanic LIPs and oceanic

lithosphere
- the dynamics, processes, and record of the solid Earth and fluid movement therein.
- recycling of oceanic lithosphere and formation of crust
- the seismogenic zone
- the deep biosphere and the sub-seafloor ocean

2.2 Mandate. Each iSSEP reports to the iPC and will respond directly to requests from the iPC. Each iSSEP will be responsible for:

- examining and reviewing drilling proposals and determining whether they address important scientific problems that are related to the scientific themes outlined in the Initial Science Plan of IODP.
- nurturing to maturity, and examining and reviewing the scientific merits of these drilling proposals, by interaction with proponents and Program Planning Groups (as necessary);
- providing proponents, and iPC with written reviews and comments on the proposals through the iSAS Support Office;
- selecting proposals for external comment, suggesting appropriate reviewers, and providing iPC with external comments and a written review and summary of those comments;
- advising iPC on initiatives and themes that need further development (through the formation of interim Program Planning Groups, as necessary);
- facilitating communications among iPC, interim Program Planning Groups, and proponents.

2.3 Meetings. The iSSEPs will meet approximately twice per year, normally right before or after their counterparts in JOIDES. The iSSEPs will have overlapping sessions, as overlap in thematic coverage is expected to continue to evolve. The iPC Co-Chairs will approve iSSEPs agendas and meeting dates, and locations (normally in consultation with JOIDES).

2.4 Membership. The iSSEPs will consist of approximately fifteen to eighteen members each. The iPC, in consultation with JOIDES and OD21 Science Advisory Committee, will advise on membership replacement (if vacancies occur), based upon maintaining scientific balance and breadth of expertise. Members of the iSSEPs will not be members of any interim Program Planning Group. With the approval of the iPC Co-Chairs, guests may be invited to iSSEPs meetings on an *ad hoc* basis to help with examinations and reviews of proposals.

2.5 Liaisons. The Chairs of the iSSEPs are liaisons to the iPC and will meet with the iPC. The iSSEPs chairs will assign liaisons from their membership to the active iPPGs, as appropriate. The iPPG Chairs will normally meet with the iSSEPs at least once per year.

2.6 Chairs The iSSEP Chairs are appointed by iPC.

3. Interim Detailed Planning Groups

3.1 General Purpose. Interim Detailed Planning Groups (iDPGs) are usually short-lived planning groups that may be created by iPC for more intensive study of certain aspects of scientific or technical planning that may arise.

3.2 Mandate. iDPGs will be created by iPC with individual mandates that may be either scientifically or technologically based. iDPGs will provide written reports to iPC. Example tasks for iDPGs include: advising on specific technological issues; translating mature IODP science proposals into concrete drilling plans; advising on regional and site surveys needed for future drilling; preparing drilling prospectuses which synthesize all thematic and site survey input, and the detailed planning of all riser sites. The iDPGs associated with planning of riser sites will be longer lived and will maintain close communication with the iPC, the iSSEPs, the iSSP, the iPPSP and the science operators throughout their multi-year planning process.

When their mandates involve scientific planning (such as for riser sites) or the integration of scientific proposals, the iDPG should establish liaisons and confer with the iSSEPs. The iDPGs reports to iPC should pass through the iSSEPs and other appropriate iSAS panels for comment.

3.3 Meetings. iDPGs meet at the request of iPC as required. Meeting dates, locations and agendas will be approved by the iPC Co-Chairs. iDPGs will be disbanded once their task is completed.

3.4 Membership. Members of iDPGs will be appointed by iPC for their expertise and experience with respect to the assigned iDPG mandate. Members may be recommended by the iSSEPs. Each member of IWG will have the right of representation. The size of the iDPG should be commensurate with the charge of the group; a maximum number of 16 members is suggested.

3.5 Liaison. The iPC appoints a liaison to each standing iDPG, and when appropriate, requests that liaisons from the science operators be assigned to the iDPGs.

3.6 Chair. The iDPG Chair will be appointed by iPC.

4. Interim Program Planning Groups

4.1 General Purpose. Interim Program Planning Groups (iPPGs) are small focused planning groups formed by iPC when there is a need to plan drilling programs to achieve the goals of the IODP Initial Science Plan. Calls for the establishment of an iPPG may arise from either the iSSEPs or from the iPC membership.

4.2 Mandate. The iPPGs will advise upon drilling strategies and proposals for major scientific objectives that are not adequately covered by existing drilling strategies or proposals. Drilling proposals arising from iPPG meetings must be submitted to the iSAS Support Office by individual proponents or groups of proponents. The iPPGs will report directly to the appropriate iSSEP in the interim Science Advisory Structure as directed by iPC.

4.3 Meetings. These will be on an as-required basis, determined by iPC and approved by the iPC Co-Chairs, who will also approve dates, locations, and agendas.

4.4 Membership. Members of iPPGs will be focused groups of specialists and proponents, chosen by iPC through consultation with the iSSEPs. Each member of IWG will have the right of representation. A maximum number of 16 members is suggested. The number of iPPGs will be determined by iPC's need to fulfill the IODP Initial Science Plan objectives, subject to budgetary constraints.

4.5 Liaison. The iPC establishes liaison with iPPGs by the appointment of liaisons. A liaison from the appropriate iSSEP will also be established. The iPC may ask that liaisons to iPPGs be established when appropriate to help foster communication between the IODP and other major geoscience initiatives.

4.6 Chair. The iPPG Chairs are appointed by iPC.

Service Panels

Service Panels provide advice and services to the iSAS. The Service Panels can respond to specific requests from the iPC, but in all cases, must report on these requests through the iPC. The Service Panels, beyond their help to the iSAS, are not directly involved with selection of drilling targets or definition of cruise objectives.

5. Interim Site Survey Panel

5.1 General Purpose. The general purpose of the interim Site Survey Panel (iSSP) is to provide information and advice to the iPC on the adequacy of, and need for, site surveys in relation to proposed drilling targets.

5.2 Mandate. The interim Site Survey Panel (iSSP) is mandated to:

- Review site survey data packages prepared by the IODP Site Survey Data Bank and to make recommendation as to their adequacy to the iPC in light of the needs defined in mature proposals of the interim Science Steering and Evaluation Panels, interim Program

Planning Groups and interim Detailed Planning Groups;

- Identify data gaps in proposed future drilling areas and recommend appropriate action to ensure that either:
  (1) sufficient site survey information is available to pinpoint specific drilling targets and interpret drilling results; or
  (2) sites will not be drilled until specific information has been reviewed.
- Provide guidelines for proponents and panels regarding required site survey data and examine the opportunities and requirements for the use of new technologies for surveying potential drill sites;
- Promote international cooperation and coordination of site surveys for the benefit of the IODP, particularly between participating IODP partners' survey activities;
- Promote the submission of all data used for planning drilling targets to the IODP Data Bank.
- Interface with the JOIDES Site Survey Panel to assure a smooth transfer of site survey data from ODP to IODP*.

5.3 Meetings. iSSP will normally meet right before or after the JOIDES SSP meeting or as requested by iPC. One meeting will usually be at the location of the JOIDES Site Survey Data Bank.

5.4 Membership. The iSSP is composed of 15 to 18 Members. It will be made up of experts who can provide advice on the site survey requirements of proposed drill sites. The membership will have an equal number of appointees from Japan and the US, with at least one appointee from each of the other IWG members. The iPC, in consultation with JOIDES and the OD21 Science Advisory Committee, will advise on membership replacement (if vacancies occur), based upon maintaining scientific balance and breadth of expertise.

5.5 Liaison. The Panel maintains liaison with the IODP Site Survey Data Bank Manager, and the iPC Support Office, each of which sends representatives to iSSP meetings. iSSP maintains liaisons to the iSSEPs.

5.6 Chair. The iSSP Chair is appointed by iPC.

**Note: IODP Site Survey Data Bank represents a function for IODP data repository to be defined by IWG.*

6. Interim Pollution Prevention and Safety Panel

6.1 General Purpose. The general purpose of the interim Pollution Prevention and Safety Panel (iPPSP) is to provide independent advice to the iPC with regard to safety and pollution hazards that may exist because of general and specific geologic circumstances of proposed drill sites, and advice on what drilling technology should be applied in order

to avoid drilling hazards.

6.2 Mandate. This panel will review all drilling proposed in IODP and advise on safety requirements and appropriate technology needed to meet these requirements. All drilling operations involve the chance of accident or pollution. The principal geologic safety and pollution hazard in ocean drilling is the possible release of substantial quantities of high-pressure fluids and volatiles including hydrocarbons from subsurface reservoir strata. However, the riser capability of the IODP will permit application of blow out prevention (BOP) technology to mitigate this hazard in a number of geological environments. In other environments, such as most of the deep-sea regions, the risk of hydrocarbon release can be reduced or eliminated by careful planning and proper site surveys.

Those who develop IODP drilling plans and select drilling sites are initially responsible to carefully assess sites in terms of safety and indicate the appropriate mode of drilling for each site. The iPPSP independently reviews each site to determine if and how drilling operations can be conducted safely.

The preliminary site survey information and the operational plan are examined for each site. Advice is communicated in the form of:

1. site approval, for riser/BOP or non-riser drilling,
2. lack of approval, or
3. technical advice for relocation or amendment

Approval is based on the judgment of the Panel that a proposed site can be safely drilled in light of the available technology, information, and planning.

6.3 Meetings. The panel will usually meet twice a year, and will normally meet right before or after of the JOIDES PPSP meeting, as approved by the iPC Co-Chairs.

6.4 Membership. Members of the iPPSP are specialists who can provide expert advice on the safe drilling of proposed drill sites, including sites in hydrocarbon prone areas. Members of the iPPSP are primarily selected on the basis of this specific expertise, with a view toward a fair representation of IWG members as a second priority. Membership is determined by iPC based on nominations from IWG countries. Panel membership, not to exceed 15, should be maintained as small as is allowed by the range of expertise necessary to meet mandate requirements.

6.5 Liaison. The iPPSP maintains liaison with the interim Site Survey Panel, and a designated iSSP member attends its meetings. Representatives from the main drilling operators will also be invited to attend the meetings. The iPC Co-Chairs or a designate from iPC attends as a liaison.

6.6 Chair. The Chair is appointed by iPC.

7. Interim Scientific Measurements Panel

7.1 General Purpose. The interim Scientific Measurements Panel (iSciMP) will contribute information and advice to the IODP community through the iPC with regard to the handling of IODP data and information, on methods and techniques of IODP measurements, on laboratory design, portable laboratory needs and downhole measurements and experiments.

7.2 Mandate. iSciMP will provide advice on IODP information related to scientific measurements made onboard the riser and non-riser ships and on "as-needed" platforms, within and around boreholes, and on samples collected by IODP and associated programs. Its specific mandates are to develop guidelines concerning said measurements and to furnish advice about scientific measurements which will assist iPC in developing recommendations to IWG regarding equipment and measurement procedures in IODP.

Specific responsibilities for the panel are publications, databases, curation, computers, shipboard equipment usage and needs, measurement calibrations and standards, and borehole measurements, equipment, usage, and needs.

iSciMP recommendations will be sent to iPC.

7.3 Meetings. The panel will usually meet twice a year, and will normally meet right before or after the JOIDES SciMP meeting. Agendas are approved by the iPC Co-Chairs.

7.4 Membership. iSciMP will consist of fifteen to eighteen members. The iPC, in consultation with JOIDES and OD21, will advise on membership replacement (if vacancies occur), based upon maintaining breadth of expertise. Members should have expertise representing the three core areas of the panel mandate covering information handling, downhole measurements, and shipboard measurements. With iPC approval, the panel may bring in additional information about its mandate issues by setting up *ad hoc* advisory committees whose lifetimes are mandated by iPC.

7.5 Liaison. The iSciMP will have liaisons from iPC. Liaisons to other iSAS advisory bodies may be sought with the approval of iPC. Representatives from the main drilling operators will also be invited to attend the meetings.

7.6 Chair. The Chair will be appointed by iPC.

Conflict of Interest Statement for iSAS

- Any panel or committee member involved in the review of a proposal is asked to reveal to the panel or committee Chairs any interests, affiliations, or relationships that might affect his or her review at the outset of deliberations on that proposal. Those are then taken into account by the panel in making decisions or recommendations based on the review process. In each case, the chair will assess the degree of conflict, and determine the process for dealing with it.

- If any member of a panel or committee, particularly iSSEPs members, is a proponent of drilling sites or programs, the proposal must be reviewed independently by the iSSEPs without substantive input from that panel member. He/she is not to be involved in any substantive advisory role or in grouping of the proposal by the iSSEPs.

- If an iPC member is a proponent for drilling sites or programs, the proposal must be reviewed independently by iPC without substantive input from that panel member. He/she is not to be involved in any substantive advisory role or in any categorization of that proposal at iPC meetings. The process by which the conflict was dealt with must be made an explicit part of the minutes for the meeting in question.

- Panels are charged with recording in their minutes any information on potential conflict of interest and moves they have made to avoid such. They are also charged with clearly defining their decision making and recommendation procedures and to have these reviewed by iPC.

Draft 2001 Time Table for iSAS implementation

Jan '01

Approval of draft iSAS Panel Mandates by IWG

February '01 – March '01

JOIDES and OD21 advisory structure nominate members for following committees and panels:

iPC
iESSEP
iISSEPs
iSSP

IWG sets up iSAS Support Office

April '01

IWG approves iSAS nominees, iSSEPs, iSSP, and iPC membership established

May '01

iSSEPs members attend JOIDES SSEPs meeting as observers

July '01

iSSP members attend JOIDES SSP meeting as observers

August '01

iPC members attend JOIDES SCICOM/OPCOM meeting as observers
iPC/IPSC develop mandate for interim Pollution Prevention and Safety Panel and discuss needs and mandates for new Industry/Technology liaison panel
Nominate iPPSP members

November '01

Joint meeting of iSSEPs and SSEPs
Establish iPPSP, members attend JOIDES PPSP meeting as observers.

December '01

iPC establish first riser iDPG.

Draft Duties of iSAS Support Office

A. Support all iSAS panel-based activities

1. Provide administrative support to iPC
2. Handle the logistics for all iSAS meetings, including travel, scheduling, and on-site arrangements.
3. Establish an IODP web page for posting of IODP panel, committee, working group, detailed planning group, and program planning group information and minutes.

B. Keep track of the IODP proposal review process

1. Receive and distribute IODP drilling proposals to iSAS panel members.
2. Insure timely communications between proponents and the iSAS during the proposal review process.
3. Develop and provide proposal review forms for iSSEPs and iPC.
4. Request and obtain anonymous external reviews for proposals that are judged to be ready for outside review by the iSSEPs.

C. Develop and publish a newsletter containing news of IODP planning and development.

D. Maintain close communication among JOIDES and JOI Offices, the IWG Support Office, and the OD21 Office.

E. Develop annual budgets and maintain a budget office for oversight of funds necessary to run iSAS activities.

The iSAS Proposal Process

I. Existing (undrilled) ODP Proposals

Upon the formation of iSAS, the Co-Chairs of the iPC will communicate with lead proponents of all proposals in the JOIDES system that are not scheduled for drilling by September 2001. The proponents will be requested to evaluate their drilling objectives in light of the IODP Initial Science Plan and to send to the iSAS Support Office any revisions, amendments or addenda they wish to make in their proposal. The receipt of a response from proposal proponents should include a statement regarding their desire for their proposal to be (or not to be) considered for drilling in the IODP. Upon receipt of a positive response from proposal proponents, their proposal, along with any additions or revisions, will be logged by the iSAS Support Office and sent to the iSSEPs for consideration.

II. Preliminary Proposals

New ideas for scientific ocean drilling can first be submitted as Preliminary Proposals to the iSAS Support Office by the **15 March or 1 October** deadline. In some cases, a new idea can by-pass the Preliminary Proposal stage, and be submitted immediately as a Full Proposal. However, it must meet all Full Proposal formatting requirements and meet the criteria necessary to be selected for external evaluation.
Sources of "Preliminary Proposals" may be:

*individual scientists or groups of scientists;
*national/international scientific groups (independent of scientific ocean drilling);
*iSAS Program Planning Groups (iPPGs).

In each case, the individuals who are submitting the Preliminary Proposal must be named, and a contact proponent must be clearly identified. Preliminary proposals will be no more than **10 pages** long and must adhere to the content and format requirements listed in Appendix. Preliminary proposals will be reviewed by the appropriate iSSEP(s) with respect to the fundamental scientific advances that the proposed drilling might make; its relevance to the IODP Initial Science Plan; and the appropriateness of the geographic location and proposed sections drilled to address the scientific objectives of the proposal.

Written reviews will be returned to the contact proponents with one of the following recommendations:

1. The proposal does not address high-priority goals of the IODP Initial Science Plan, or is of low scientific interest.
2. Some specific additional information is needed to evaluate the proposal adequately (e.g. insufficient data to examine and review 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.

3. The proposal addresses objectives for which other proposals exist. The panel(s) refers the preliminary proposal to a iPPG, or recommends that the proponents collaborate.
4. The proposal is of high priority, but could be improved and made more relevant. In this case, the appropriate iSSEP may nurture a proposal (possibly through a watchdog system) and request a revised Preliminary Proposal.
5. The proposal is of high interest and well justified. The panel(s) recommends the development of a Full Proposal.

III. Full Proposals

Full proposal submittal may follow pre-proposal evaluation and recommendations of the iSSEPs, or may be submitted directly without going through the pre-proposal process. Full proposals will be submitted to the iSAS Support Office by the **15 March** or **1 October** deadline. Sources for these proposals will be proponent scientists, including the proponent(s) of the Preliminary proposal(s), and may include members of a iPPG or iDPG (for those proposals referred to such Groups), or others that are added to address issues raised by the panels.

Full proposals will be no more than **25 pages** long and must adhere to the content and format requirements listed in Appendix I.
Full proposals will be reviewed by the appropriate iSSEP(s) to examine whether they meet the criteria necessary to be sent out for external comment. These criteria are:

1. The proposal addresses a scientific problem that is identified as a high priority in the IODP Initial Science Plan.
2. There is clear justification that drilling is the best way to achieve the scientific objectives being addressed.
3. 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) will recommend to the iSAS Support Office that external comments be acquired. The iSSEP(s) will provide a list of qualified reviewers for each proposal that they recommend be sent out for external comment. These will 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.

If it is determined that the above criteria, are not met, the panel will advise the proponents (through the iSAS Support Office) as to which criteria are not met, and recommend the revisions necessary for further consideration.

IV. The External Comment Process

The iSAS Support Office will be responsible for managing the acquisition of external comments. The iSAS Support Office will take recommendations of potential reviewers from both the Panels and the proponents. The iSAS Support Office will select and contact individuals to provide external comments, will be the recipients of those comments (3-4 per proposal dealt with electronically), and will then remove any identification from the comments before passing them back to the proponents and the appropriate iSSEPs.

Individuals will be asked to comment on the following:

*Please review critically the importance of the scientific problem addressed in the proposal and its likely impact on understanding Earth's history and/or Earth's processes.
*Please identify and review the scientific objectives and/or testable hypotheses that will be addressed by the proposed drilling.
*Is the general location selected appropriate to address the scientific problems and hypotheses posed?
*What is the likelihood that the sections drilled will contribute significantly to the solution of the stated scientific problem?

The ocean drilling proposals differ in many ways from other science proposals. In particular, because a team of scientists is involved in planning and executing a drilling leg, scientists other than those listed as proponents will be involved with the project. With this in mind, please comment on the competence (e.g., research capability and research record) of the proponents, if you feel that it is particularly relevant to the review of the science contained in the proposal. Please explain why you feel that it is relevant.

V. Examination and Review by iSSEPs - and Recommendations to the iPC

The anonymous external comments will be sent to proponents by the iSAS Support Office to allow them an opportunity to respond in a short letter (to be as brief as possible, but not to exceed 5 pages, including Figs. and Tables). The anonymous external comments, together with the proponents' response, will then be reviewed by the iSSEP(s) at their next meeting. Information on site survey readiness will also be provided by the iSSP liaison(s) to the iSSEP(s).

For each reviewed proposal, a package will be assembled for the iPC that contains:

*The iSSEP(s) review(s) of the proposal;
*The external comments received from anonymous reviewers;
*The proponents' response to the external comments;
*An assessment by the iSSEP(s) as to the priority of the drilling program in the context of the overall achievement of the IODP Initial Science Plan (or how the proposal addresses an exceptional scientific opportunity).

The iPC will take all this information into consideration when grouping the proposals into categories.

VI. Review and Categorizing of Proposals by iPC

Each proposal received from the iSSEPs will be assigned one or more iPC member as 'watchdogs'. Their responsibility will be to carefully prepare and give a presentation at iPC meetings of the key elements of their assigned proposals and to lead the iPC discussion of these proposals. Proposals will be discussed at iPC in thematic-based groups and categorizing of these proposals will be carried out within each of the themes identified in the IODP Initial Science Plan. The number of categories used will be determined by the iPC. Placement of the proposals in these categories will be determined by a show of hands of the iPC members present and non-conflicted. The iPC will place into the highest category those proposals that are judged to:

* address important aspects of the IODP Initial Science Plan,
* show a clearly defined strategy for addressing the scientific questions posed, and
*have a high probability of success.

After all proposals have been discussed and categorized within the IODP themes, the iPC will conduct a global scientific categorizing of all proposals considered.

All proposals received by the iSAS will be forwarded to the IODP science advisory structure once it is formed.

VII. Ancillary Programs Letters

Ancillary Program Letters are aimed at specific IODP cruises as "add-ons" to those cruises. No Ancillary Program letters will be considered until after the start of IODP.

Appendix I. Draft Proposal Content and Format Guidelines
(to be reviewed and approved by iPC after iSAS formation)

FORMATTING REQUIREMENTS

All Preliminary and Full Proposals must adhere to the following formatting requirements. Failure to do so (or exceeding the page limits) will result in the proposals being returned to the proponents:

*Abstract - 400 words

*Font size - 12 point, 1 1/2 spacing
*Margins - one inch all around
*proposals must be stapled, not bound.

Figures - black and white or grayscale. Figures must be page-sized. **No color figures and no large foldouts, please.**
Site Description Forms may be obtained from the iSAS Support Office web site, or a copy may be printed in PDF. To print in PDF, you must have Adobe Acrobat Reader installed.

SUBMITTING PROPOSALS

Proposals may be submitted in one (or both) of the following ways:

*ten (10) copies of Proposal/Figures/Forms are to be sent to the iSAS Support Office.
*one PDF-File including all text, figures and Site Description Forms to the iSAS Support Office.
NOTE: Please specify the platform used to produce the PDF-file and please make sure, the file actually prints using Acrobat Reader 4.0 available at www.adobe.com. **If we can't print your proposal, we will regard it as not submitted in time!**

Regardless of the option chosen above, an electronic version of the abstract is required to be sent to the iSAS Support Office on disk or by email in RTF-format (Rich Text Format - most word processors export this).

PRELIMINARY PROPOSALS

Preliminary Proposals may be no more than 10 pages (including Abstract, Figures, and References, but not including Site Summary Sheets) and should contain the following:

1. Clearly-stated scientific goals, and how they relate to high priority scientific objectives within the IODP Initial Science Plan (or how they move beyond the IODP Initial Science Plan, or open up new fields of study). A description of relationship to other global geoscience programs (if any) should be included.
2. Justification of the need for drilling to accomplish the objectives.
3. Brief description of proposed sites, penetration depths, expected lithologies, etc..
4. Brief description of available site survey data.
5. A well-defined drilling and logging/downhole measurements strategy and explanation as to how it addresses the scientific goals of the project.
6. For each proposed drillsite, a Revised Summary Form with only page one completed. Site location names must conform with the Site designation policy.

FULL PROPOSALS

Full Proposals may be no more than 25 pages (including Abstract, Figures, and References, but not including Site Summary Sheets and Proponents' Background Information) and should contain the following:

1. Clearly-stated scientific goals, and how they relate to high priority scientific objectives within the IODP Initial Science Plan (or how they move beyond the LRP, or open up new fields of study); A description of relationship to other global geoscience programs (if any) should also be included.
2. Justification of the need for drilling to accomplish the objectives.
3. Detailed drilling and logging/downhole measurement strategies and how these relate to the scientific objectives of the project.
4. Detailed estimates of drilling and logging times are required.
5. A description of available site survey data and a discussion of the relation of drilling targets to pertinent site-survey data; a description of site survey information that is still required and the plans for its acquisition.
6. A description of all anticipated logistical requirements, including any unusual logistical problems or potential hazards (e.g., currents, sea-ice, shallow water, hydrocarbons, special tool requirements, alternative "as-needed" platforms, etc.).
7. Complete Site Summary Forms for each proposed drill site. Site location names must conform to the ODP drilling site designation policy.
8. Discussion of the expected scientific outcome, of drilling and what studies will remain to be done at completion;
9. A list of at least five (5) individuals qualified to provide comment on the scientific aspects of the proposed drilling program.
10. Information on the scientific background and relevant publications of proponents. This information may be in the form of: 1) a two page curriculum vitae and relevant publication for one or more (not to exceed 4) proponents; or 2) a combined summary (not to exceed two pages) of the background of the individuals and/or groups submitting the proposal.

USSAC CONCEPTUAL DESIGN COMMITTEE (CDC) REPORT
Responses from Ocean Drilling Scientists

IPSC Report to the National Science Foundation

Overview of CDC

The U.S. National Science Foundation (NSF) has indicated that it would seek the necessary resources to bring a non-riser vessel of the *JOIDES Resolution* class but with significantly enhanced capabilities for the future ocean drilling program (IODP). In response to a charge from NSF, the United States Science Advisory Committee (USSAC) formed the Conceptual Design Committee (CDC) to formulate the conceptual design characteristics of a single, non-riser drilling vessel, optimally configured to address the widest possible range of non-riser scientific drilling objectives. In March 2000, the group submitted a final report to NSF outlining their definition of the performance specifications for the non-riser vessel. The CDC Report to NSF provides recommendations on the types and amount of on-board scientific measurement capabilities, the results of a survey of drilling vessels suitable for modification and conversion, basic screening criteria for narrowing the list of potential platforms, and initial guidance on how screening criteria might be applied in selecting a non-riser platform.

CDC Questionnaire

Once the CDC Report was submitted and approved, the National Science Foundation requested that IPSC coordinate efforts to obtain systematic input from the scientific community on the strategies used by CDC, and the recommendations of the CDC Report. CDC Chair Peggy Delaney and IPSC Chair Ted Moore together developed a survey-type questionnaire designed to elicit broad input on key design issues. It consisted of 35 check-off questions about target sections, vessel characteristics, drilling technology, hole characteristics, and coring/sampling/logging tools. Respondents were asked to indicate whether specific items were "Essential," "Important" "Nice, if possible," or "Not Important." Additionally, four open-ended questions requested comments and opinions on the completeness of target sections, IODP's biggest challenges, and recommendations for downhole logging. (see Appendix 1 for details of questions.)

The Questionnaire was designed to be completed and submitted in electronic form, either directly on the Web or via return e-mail. IPSC sent the Questionnaire to representatives from member ODP offices, requesting that ODP representatives discuss the CDC at scientific meetings in their countries, and urge their constituents to respond. IPSC also sent the Questionnaire via e-mail to over 800 ocean drilling scientists, from a list compiled from the JOIDES Directory, COMPLEX attendees, JAMSTEC scientists, and a variety of IPSC e-mail lists. As of November 30, 2000 IPSC has received responses from over 100 scientists from ten countries. (See Appendix 2 for overview of responses, Appendix 3 for written comments, and Appendix 4 for list of respondents.)

Summary of Responses to Specific Questions

Target Sections

An overwhelming majority (64 of 75) responded that the target sections were described completely or adequately. There were, however, quite a few comments about how target sections were specified. Some respondents felt that although the target sections were adequately described, the way they were

categorized was inadequate. For example, some felt that the target sections reflected particular physical environments, rather than processes. Others felt that gas hydrates and deep biosphere should not be separate targets.

Vessel Characteristics

Ship characteristics can generally be divided into operational capability, laboratory facilities, and living conditions. Generally, responses to living conditions, such as number of persons per cabin and number of persons per head/shower indicated that the desirability of generous facilities ranged from "Essential" to "Nice," with a modal response of "Important." Living conditions generally were viewed as being not as important as operating facilities.

There was a wider range in variety of responses to dimensions of operating capabilities, such as weather and sea conditions, water depth, and drill string length. This seems to reflect concern over what operating capability should be reserved for the riser vessel and alternate or "as-needed" drilling platforms, and what capability should be the province of the non-riser vessel. However, very few respondents indicated that these ranges of capability were "Not Important."

Laboratory facilities and core storage containers on deck also generated a range of responses between "Essential" and "Nice," with few indicating that these facilities were "Not Important." Respondents felt that the following were either "Essential" or "Important:"

- 1800 m2 of interior lab space
- mud storage
- geophysics doghouse

Well Control

There seemed to be some disagreement on the definition of "well control," and when it would be needed on the non-riser vessel. Although a majority responded that well control <500m and >500m of water was either "Essential," "Important," or "Nice," over twenty respondents felt that both were "Not Important." The number of locations for well control in <500m of water ranged from "all" to "less than 2/leg," while most respondents indicated less than ten locations. Respondents' time frame for number of locations is assumed to be 2003-2013, though this was not specified. For well control in water >500m, locations ranged from "several" to 50, with most suggesting around 10.

Hole Dimensions/Characteristics

These questions resulted in the smallest range of responses, with most respondents indicating that maximizing sample volume and hole stability, minimizing contamination and disturbance, use of downhole measurement tools, and compatibility of tools were all "Important." The questions that generated the most "Neutral" responses were sample volume and cross-platform compatibility of tools.

Coring/Sampling/Downhole Logging

Continuous coring/sampling and high recovery were overwhelmingly regarding as "Essential," while oriented cores and the ability to shift from APC/XCP to RCB without tripping the pipe was regarded as "Important" or "Nice to have." Very few felt that directional drilling was "Essential" or "Important."

Coring Systems

The vast majority indicated that APC, XCB, and RCB were "Essential." Pressure core sampling, diamond coring, and vibra/hammer coring elicited quite a range of responses between "Essential" and Nice," with few indicating these were "Not Important." Vibra/hammer coring generated the most "Not Important" and "Don't know" responses.

Summary of Questionnaire Comments

IPSC members were gratified to see that a large number of respondents took the time to include detailed comments attached to specific questions, as well as general comments regarding IODP challenges and downhole logging recommendations. Complete texts of comments by topic are included in Appendix 3.

IODP's Biggest Challenges

By far the most common concern expressed was maintaining high sample recovery and hole stability in all types of lithologies and physical environments. This was mentioned by a majority of those who commented at all. Almost as commonly expressed, as IODP's biggest challenge, was the need to minimize contamination of samples and disturbance of cores. The range of concern expressed about these two considerations was remarkably consistent.

As can be seen in Appendix 3, there were an additional 18 items listed as challenges for IODP. The capacity to drill deep holes was the most commonly cited concern. Other examples of comments on "biggest challenges" included drilling in hard/soft lithologies, increased core diameter, retrieval of cores under *in situ* conditions of pressure, temperature, etc., and drilling in sediments with a high likelihood of hydrocarbons.

Downhole Logging

Those that did express opinions in this area (of which there were many) were consistently in favor of downhole logging as standard practice in most drilling situations. Comments indicated the importance of maintaining state-of-the-art, accurate measurement tools, consistency in logging between platforms, and the need for tools that measure magnetic as well as physical properties and geochemistry.

Additional Comments

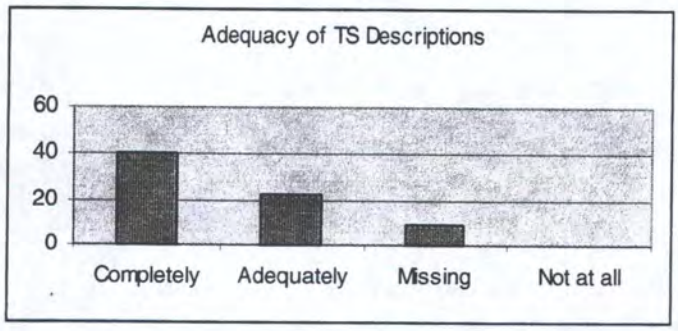
General comments about non-riser ship capability reiterated that operational capability should take precedence over "creature comforts," and that capacity generally around 50% greater than the current drillship would be adequate. Several mentioned the need for gym/recreational facilities. A fairly wide variety of specific observations regarding ship design and capability, such as handling larger cores, staff changeover, the desirability of partnering with the riser ship and alternate platforms on some projects, can be seen in the detailed comments included in Appendix 3.

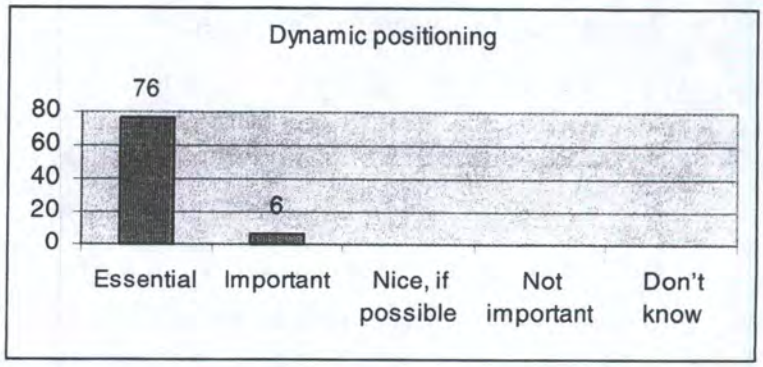
Appendix 1 – List of topics and blank questionnaire.
Appendix 2 – Overview of response data (table and bar graphs).
Appendix 3 – Summary of comments by topic.
Appendix 4 – List of questionnaire respondents.
Appendix 5 – Blank Questionnaire

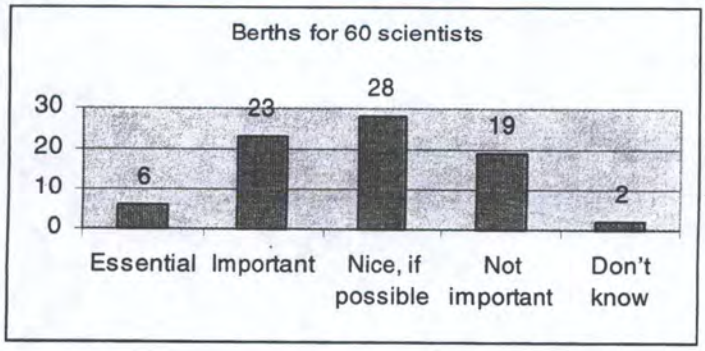
Appendix 2 - CDC Questionnaire Responses

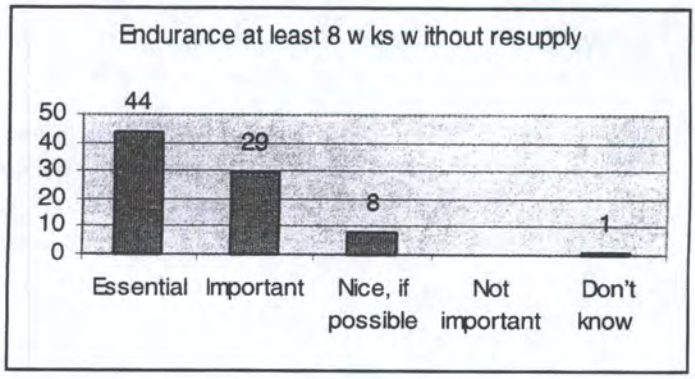
N=101 as of Jan. 2, 2001 (89 separate and 12 in summary narrative)

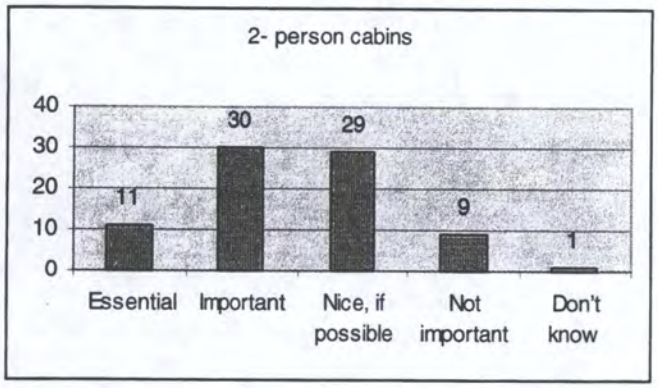
VESSEL CHARACTERISTICS

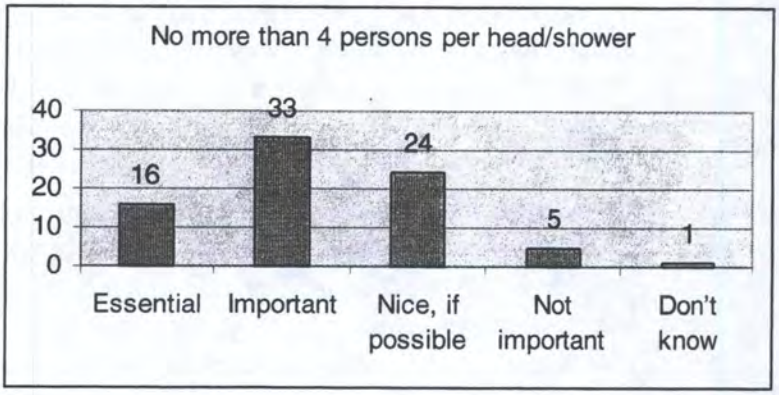


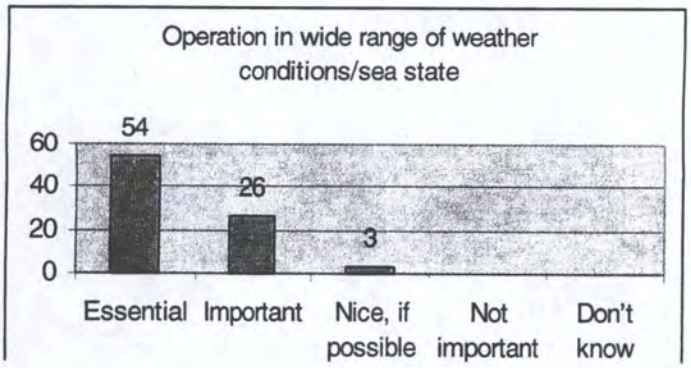


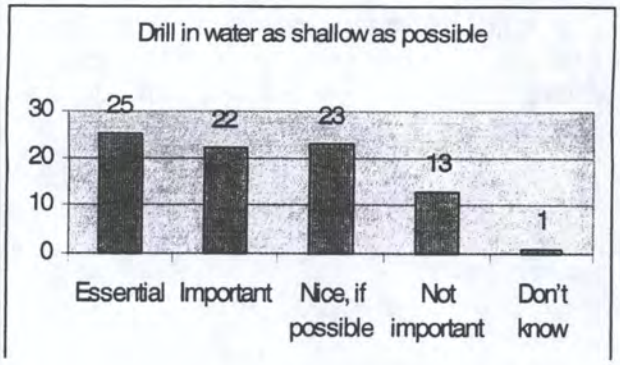


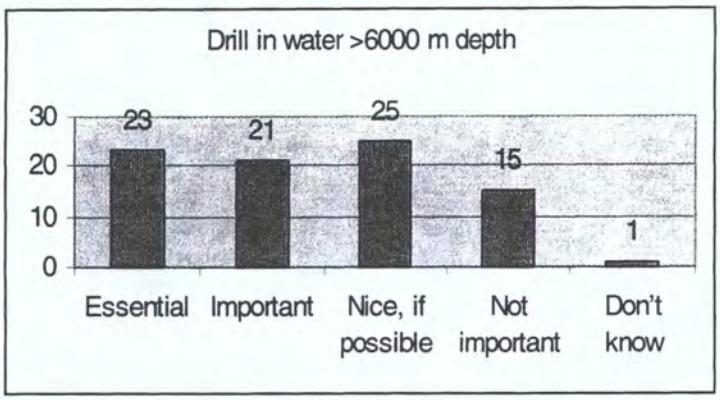


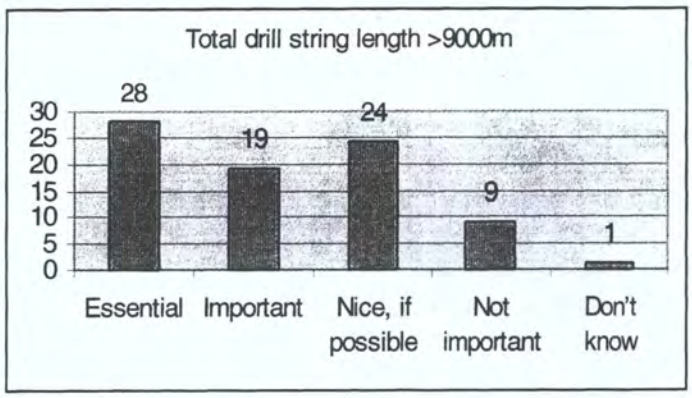


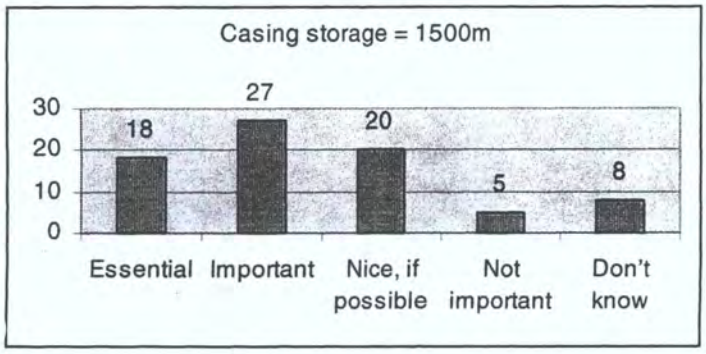


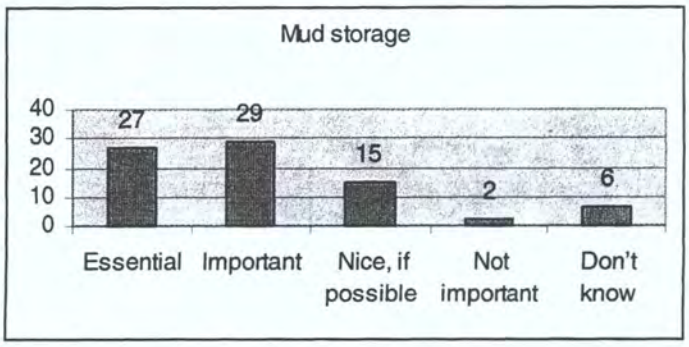


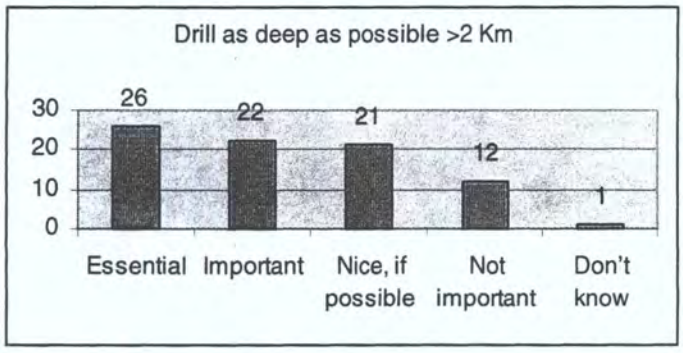


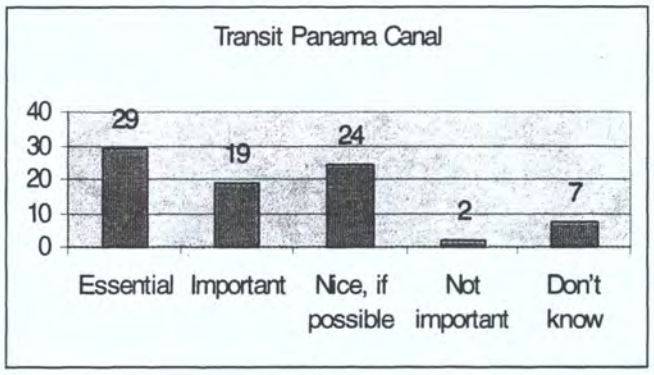

Drill in water >6000 m depth
30
20
10
0
23
21
25
15
1
Essential
Important
Nice, if possible
Not important
Don't know


Total drill string length >9000m
30
25
20
15
10
5
0
28
19
24
9
1
Essential
Important
Nice, if possible
Not important
Don't know

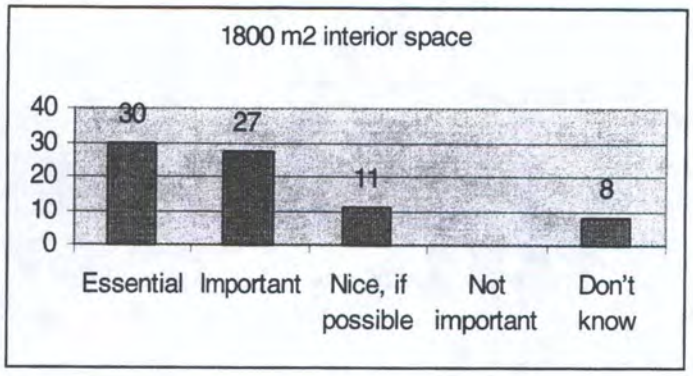

Casing storage = 1500m
30
20
10
0
18
27
20
5
8
Essential
Important
Nice, if possible
Not important
Don't know

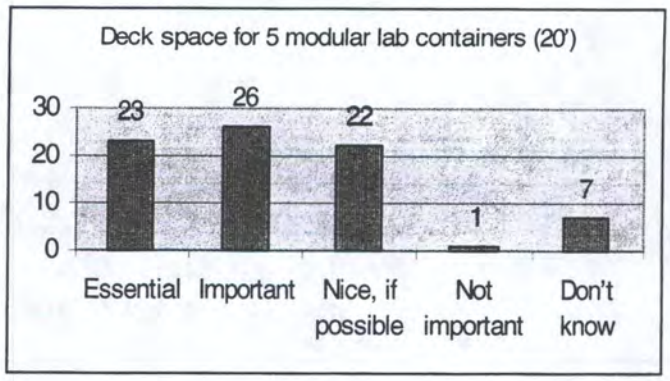

Mud storage
40
30
20
10
0
27
29
15
2
6
Essential
Important
Nice, if possible
Not important
Don't know

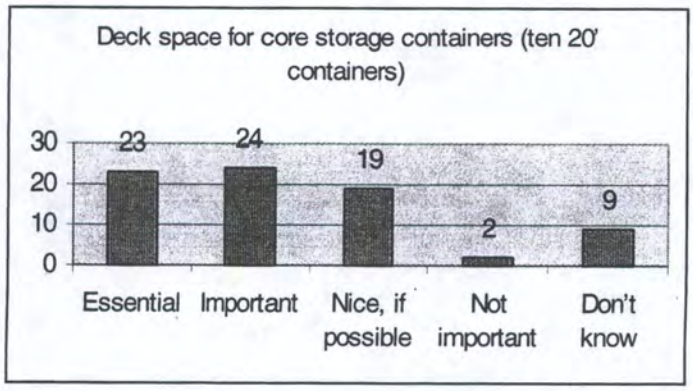

Drill as deep as possible >2 Km
30
20
10
0
26
22
21
12
1
Essential
Important
Nice, if possible
Not important
Don't know

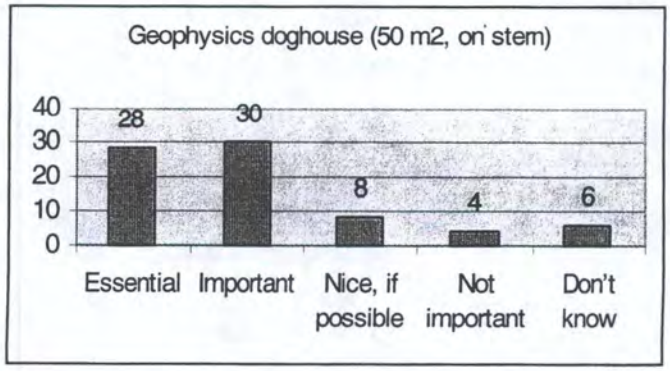

Transit Panama Canal
40
30
20
10
0
29
19
24
2
7
Essential
Important
Nice, if possible
Not important
Don't know

LAB SPACE

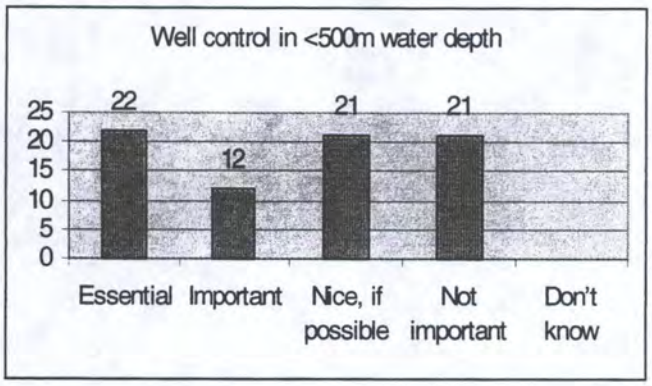


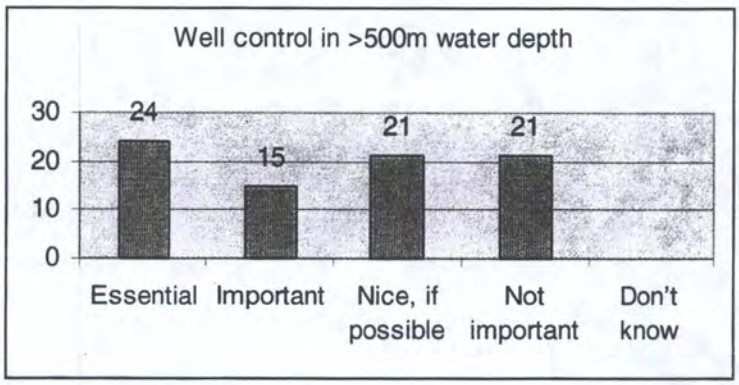




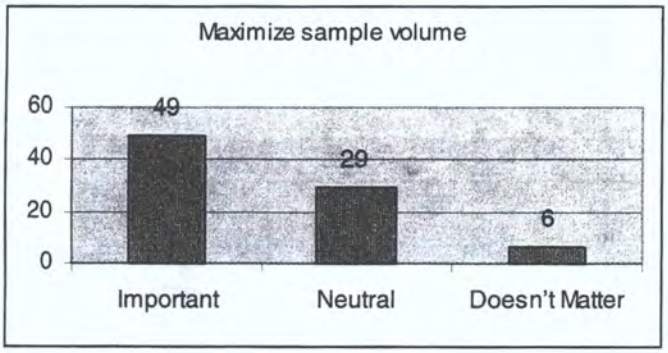


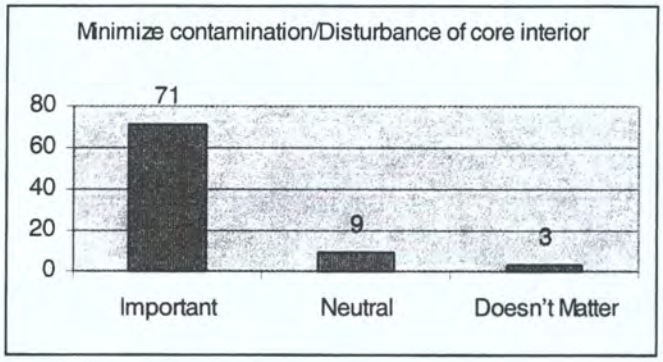
WELL CONTROL

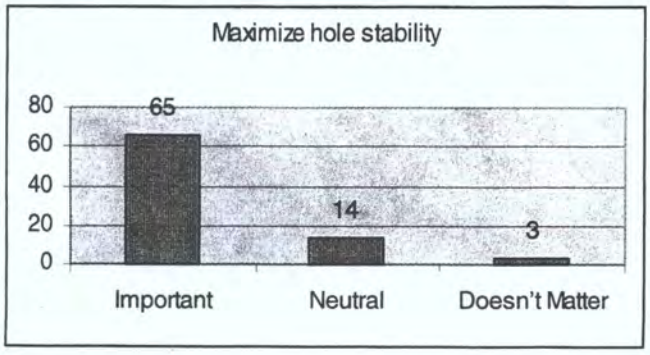


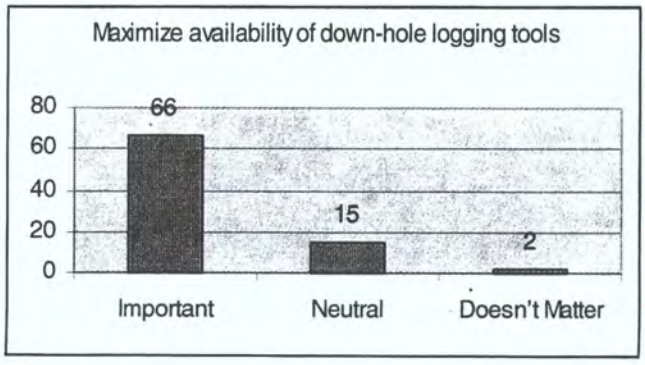


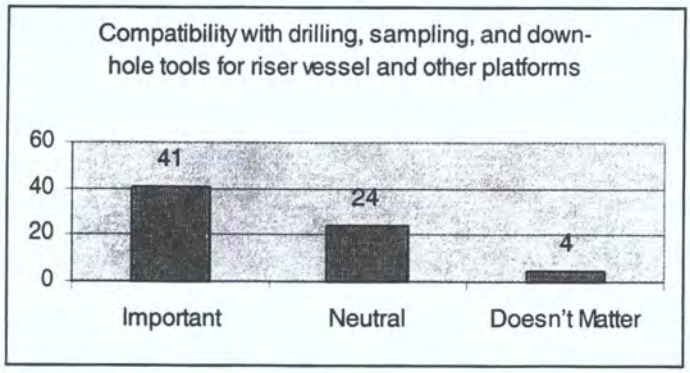
HOLE DIMENSIONS



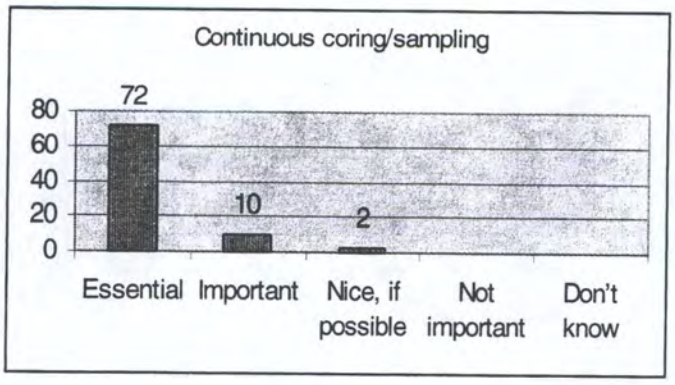


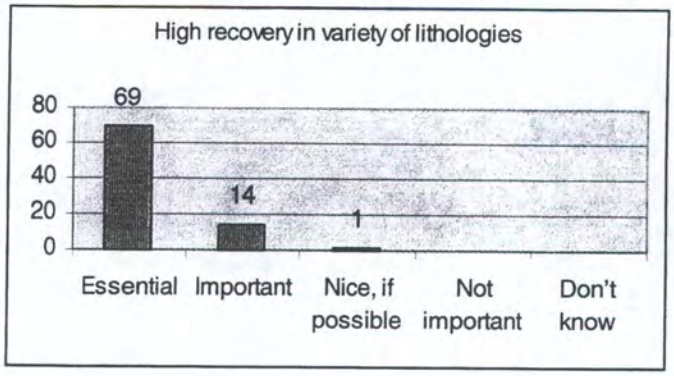


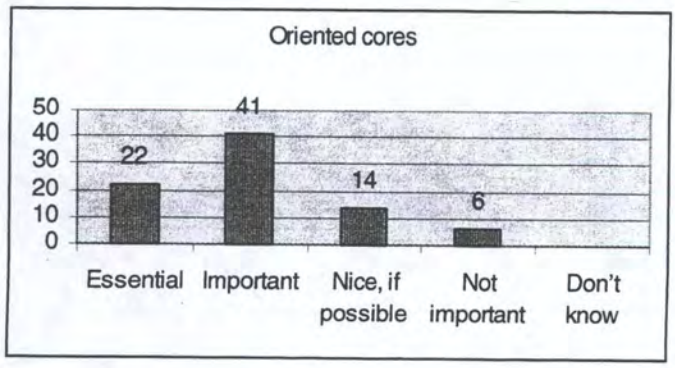


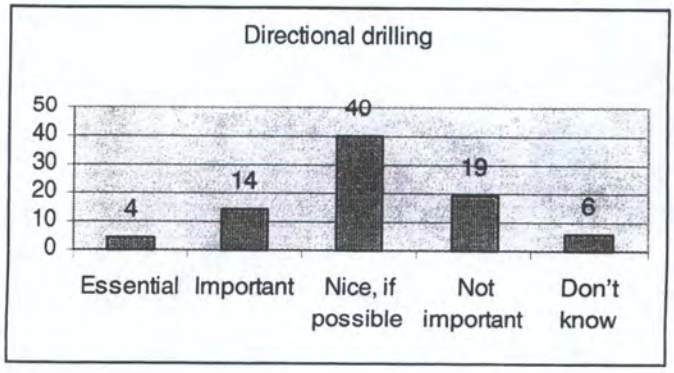


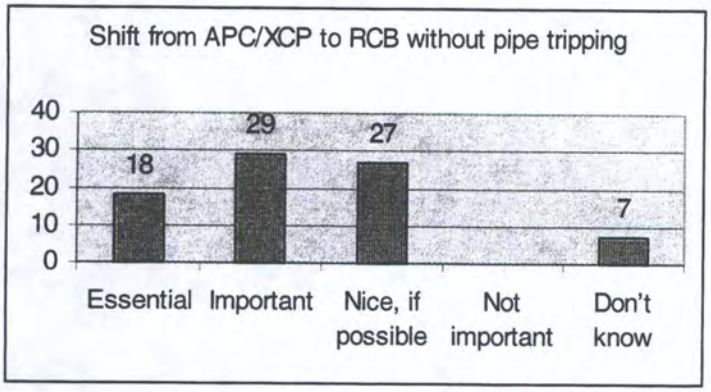
CORING/SAMPLING/DOWNHOLE LOGGING



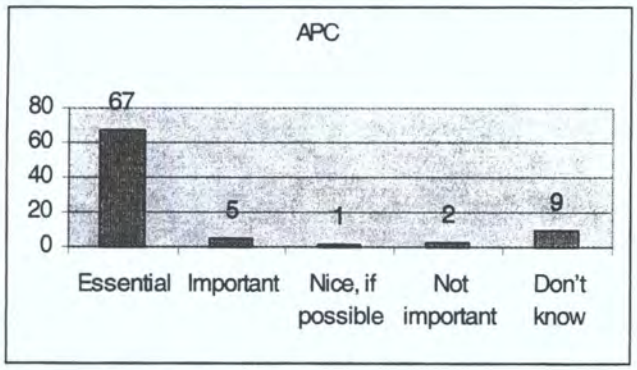


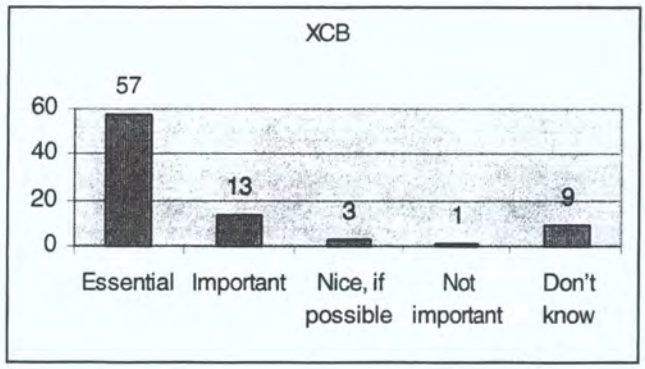


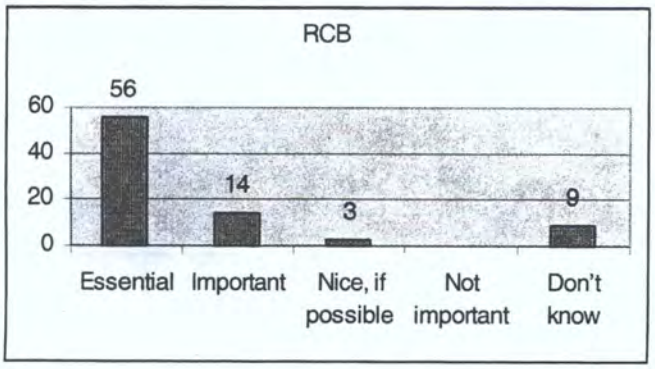


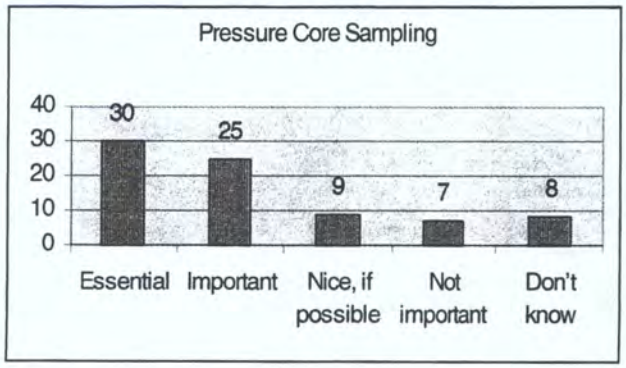


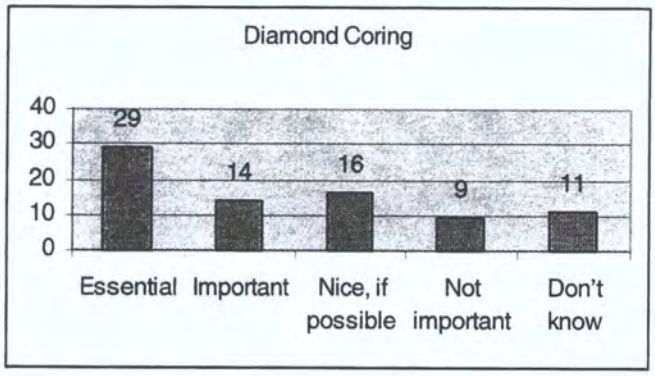
CORING SYSTEMS

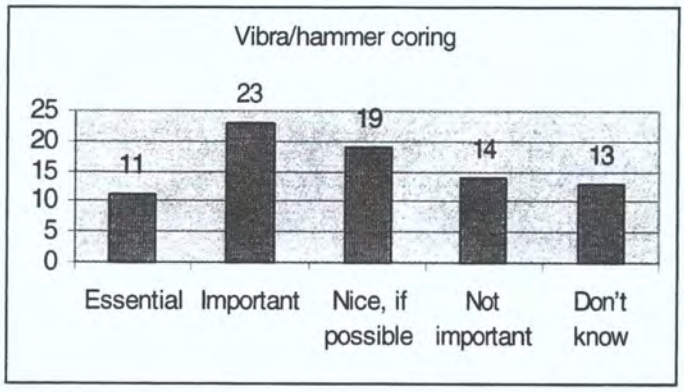












Appendix 2 - Summary Tally

TARGET SECTIONS--Adequacy of descriptions

	Completely	Adequately	Missing	Not at all		TOTALS
Adequacy of descriptions	41	23	11			75

VESSEL CHARACTERISTICS

	Essential	Important	Nice, if possible	Not important	Don't know	
Dynamic positioning	81	6				87
Berths for 60 scientists	6	25	31	19	2	83
Endurance at least 8 wks without resupply	45	32	9		1	87
2- person cabins	12	31	32	9	1	85
No more than 4 persons per head/shower	17	36	25	5	1	84
Operation in wide range of weather conditions/sea state	57	28	3			88
Drill in water as shallow as possible	26	24	24	14	1	89
Drill in water >6000 m depth	26	21	27	15	1	90
Total drill string length >9000m	31	20	24	10	1	86
Casing storage = 1500m	21	28	21	5	8	83
Mud storage	31	29	16	2	6	84
Drill as deep as possible >2 Km	29	23	21	13	1	87
Transit Panama Canal	30	21	25	3	7	86

LAB SPACE

1800 m2 interior space	31	31	11		8	81
Deck space for 5 modular lab containers (20')	24	28	24	1	7	84
Deck space for core storage containers (ten 20' containers)	23	26	22	2	9	82
Geophysics doghouse (50 m2, on stern)	30	30	10	5	6	81

WELL CONTROL

	Essential	Important	Nice	Not Imp.	Don't know	
Well control in <500m water depth	22	13	22	23		80
Well control in >500m water depth	25	16	21	21		83

HOLE DIMENSIONS

CHARACTERISTIC	Important	Neutral	Doesn't Matter			
Maximize sample volume	51	30	7			88
Minimize contamination/Disturbance of core interior	73	10	4			87
Maximize hole stability	68	15	3			86
Maximize availability of down-hole logging tools	68	16	2			86
Compatibility with drilling, sampling, and down-hole tools for riser vessel and other platforms	44	25	4			73

CORING/SAMPLING/DOWNHOLE LOGGING

Recommended Capability	Essential	Important	Nice, if possible	Not important	Don't know	
Continuous coring/sampling	75	11	2	1		89
High recovery in variety of lithologies	72	15	2			89
Oriented cores	22	42	16	7		87
Directional drilling	4	15	42	21	6	88
Shift from APC/XCP to RCB without pipe tripping	20	29	28	2	7	86
CORING SYSTEMS						
APC	70	6	2	2	9	89
XCB	60	14	4	1	9	88
RCB	59	14	4	1	9	87
Pressure Core Sampling	30	27	10	9	8	84
Diamond Coring	29	15	16	12	11	83
Vibra/hammer coring	11	25	20	16	13	85

International Review Committee
for the
IODP Initial Science Plan

Tarrytown, New York
December 5-6, 2000

ISP Reviewers:

Dr. Frank Rhodes	Cornell University, USA, (Co-Chair)
Dr. Seiya Uyeda	Institute of Physical and Chemical Research (RIKEN), Japan (Co-Chair)
Dr. Gordon Greve	Exploration Geophysicist, AMOCO (Ret.), USA
Dr. Yoshihide Kozai	Gunma Astronomical Observatory, Japan
Dr. Alfred Kröner	University of Mainz, Germany
Professor John Lowe	University of London, UK
Dr. Malcolm Walter	Macquarie University, Australia

The Review Committee met on December 5-6 in Tarrytown, New York to review the Initial Science Plan (ISP). The Committee's report on the ISP will be sent to the IWG members in late December 2000.

OD21 Related Budget for FY2001
(Government Draft Budget)

Total budget requests : US$ 81.6M (US$ 62M) (US$1 = JP¥115)

- **Ship construction※** **US$ 56.5M (US$ 58M)**
  including costs to begin construction of remaining ship parts
- **Operation Preparation US$ 6.5M (US$ 1.8M)**
  including costs for pre-drilling survey of shake down cruise, onboard database system
- **Program Planning US$ 2.2M (US$ 1.7M)**
  including costs for support of iSAS activities
- **Solid Earth Research Program US$ 9.5M (-)**
- **Extremophiles Research Program US$ 6.9M (-)**

➢ *All costs for ship construction will be underwritten after the approval by Japanese Diet in March.*

➢ *In order to accelerate the ship construction, Supplementary Budget (US$ 95M) has been approved for ship construction in December, 2000. Half of the total construction budget has already been allocated.*

Budget for Construction of Riser Drillship

(US$ million, based upon $1=115yen)

	1999	2000	2001	2002	2003	2004
	Ship Design and Construction					Sea Trial Drilling Trial
1. Basic Design Ship Hull	←		121			→
2. On Board Drilling Unit Well Control System Electric System	23 ←	→ ←	220			→
3. Research Utilities Other Equipment Riser Pipe			←	129 Under Request (Government Draft Budget)		→

Total Budget : approx. US$500M

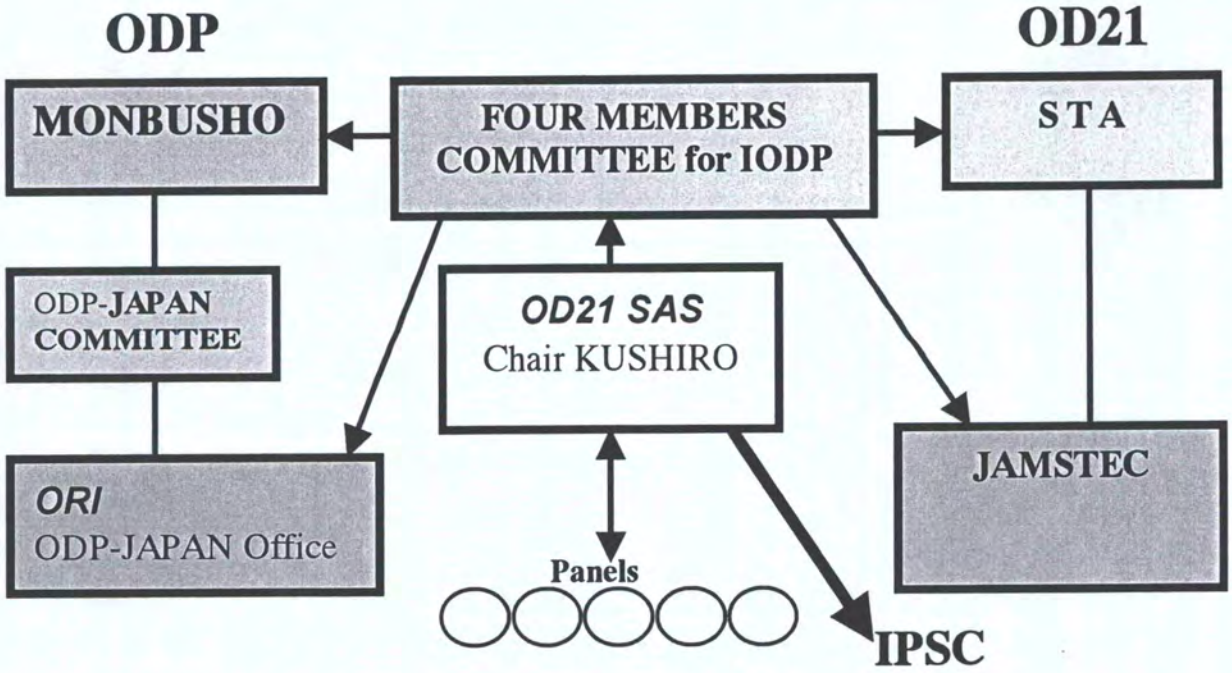
Draft Schedule of Ship construction

Year	Month	Item
1999	1	
	2	
	3	Construction Contract
2000	4	Detail Design
	5	
	6	
	7	
	8	
	9	Procurement
	10	
	11	
	12	
	1	
	2	
	3	
2001	4	Start of Construction
	5	
	6	
	7	Construction in Dock
	8	
	9	
	10	
	11	
	12	
	1	Launching
	2	
	3	
2002	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	1	Outfitting
	2	
	3	
2003	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	End of Outfitting
	1	
	2	Trial of Equipment
	3	
2004	4	Sea Trial
	5	
	6	
	7	Delivery
	8	
	9	
	10	
	11	
	12	
	1	
	2	
	3	
2005	4	Shake Down
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	1	
	2	
	3	
2006	4	Drilling for Science
	5	
	6	

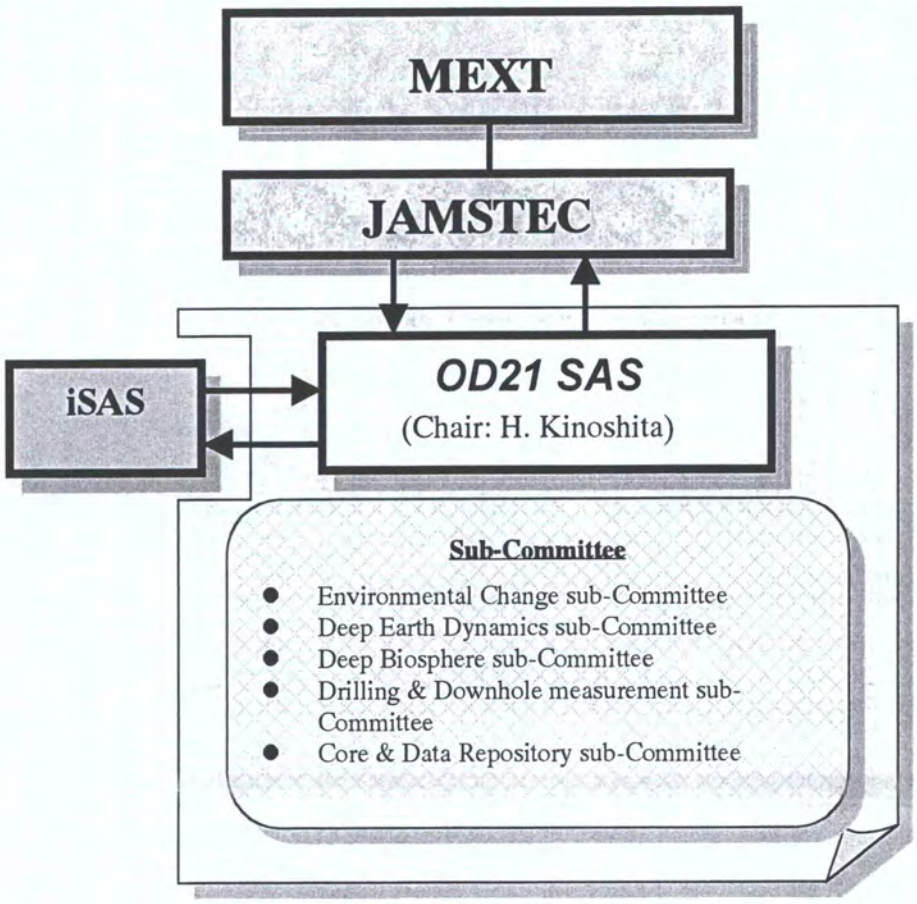
Ship construction is on schedule as planned.

Science Advisory Structure in Japan for IODP

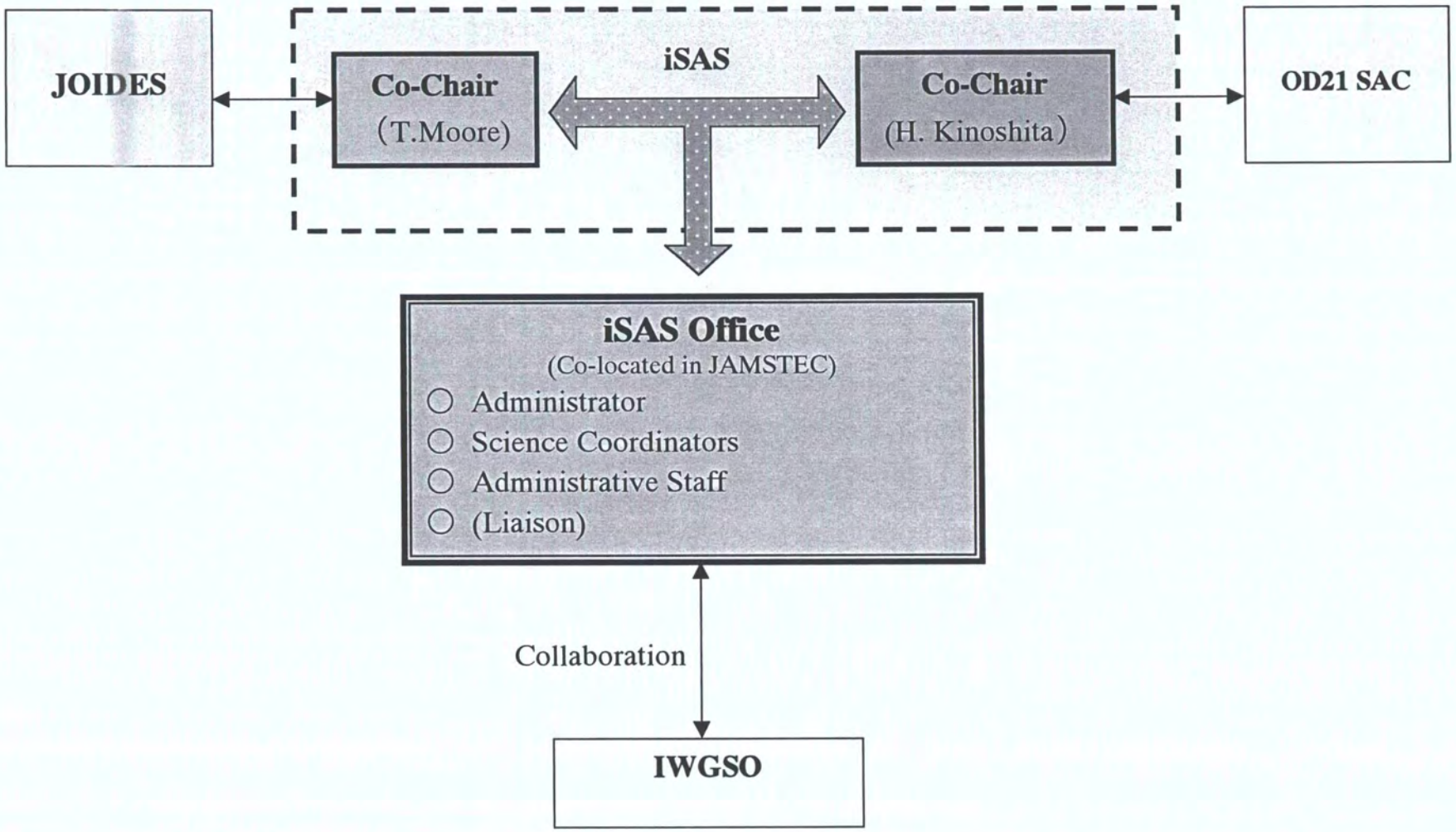
April 1998～Dec.2000



January 2001～



iSAS OFFICE (DRAFT)



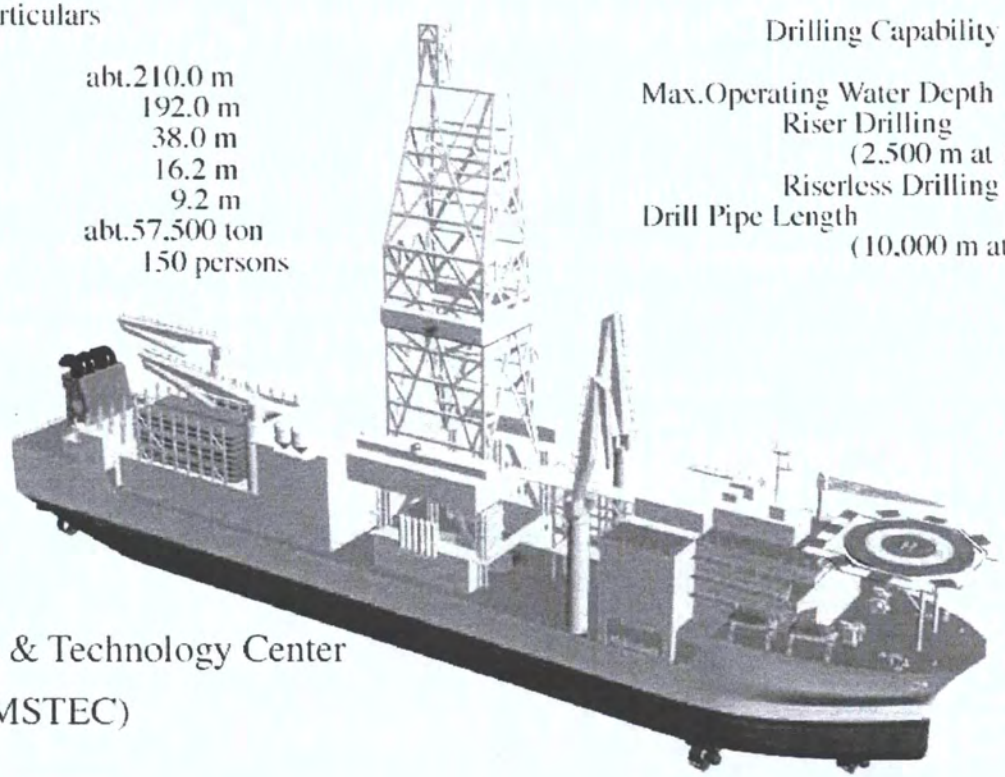
Deep-Sea Scientific Drilling Vessel

Principal Particulars

Length Overall	abt.210.0 m
Length (bpp)	192.0 m
Breadth (mld)	38.0 m
Depth (mld)	16.2 m
Draught (mld)	9.2 m
Gross Tonnage	abt.57,500 ton
Max.Complement	150 persons

Drilling Capability

Max.Operating Water Depth	
Riser Drilling	4,000 m
(2,500 m at 1st stage)	
Riserless Drilling	7,000 m
Drill Pipe Length	12,000 m
(10,000 m at 1st stage)	



Japan Marine Science & Technology Center

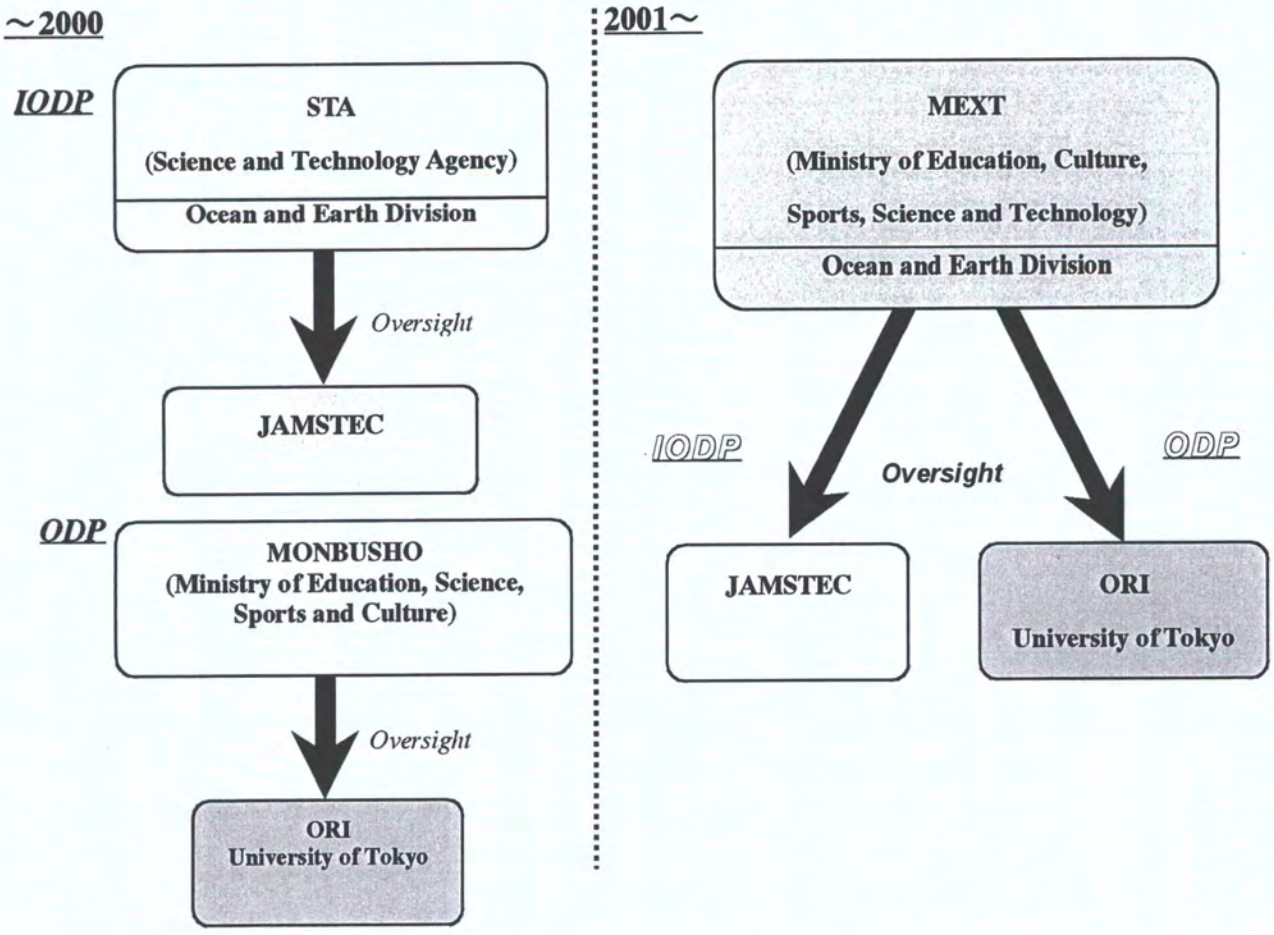
(JAMSTEC)

Country Report

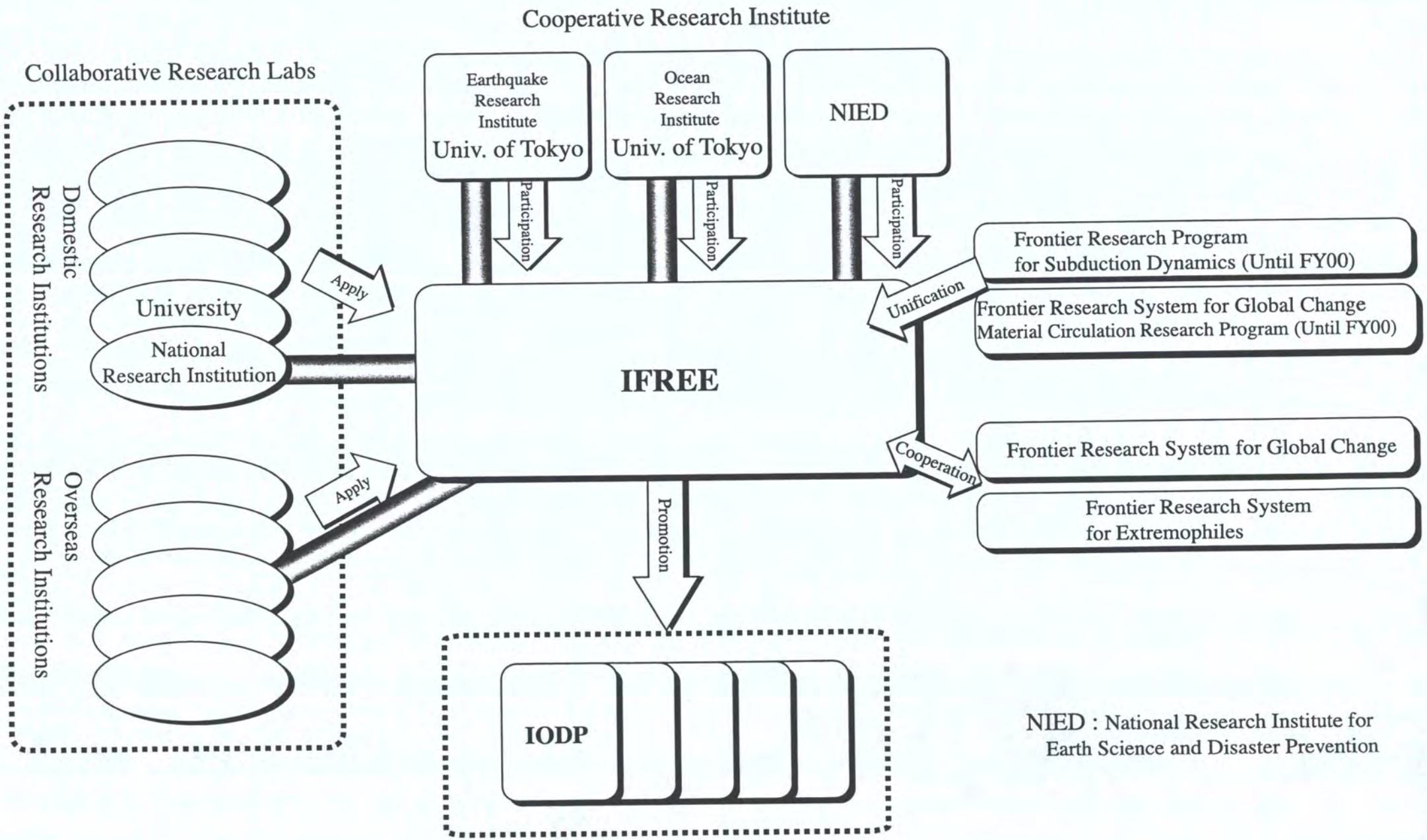
(JAPAN)

Reorganization of Government of Japan

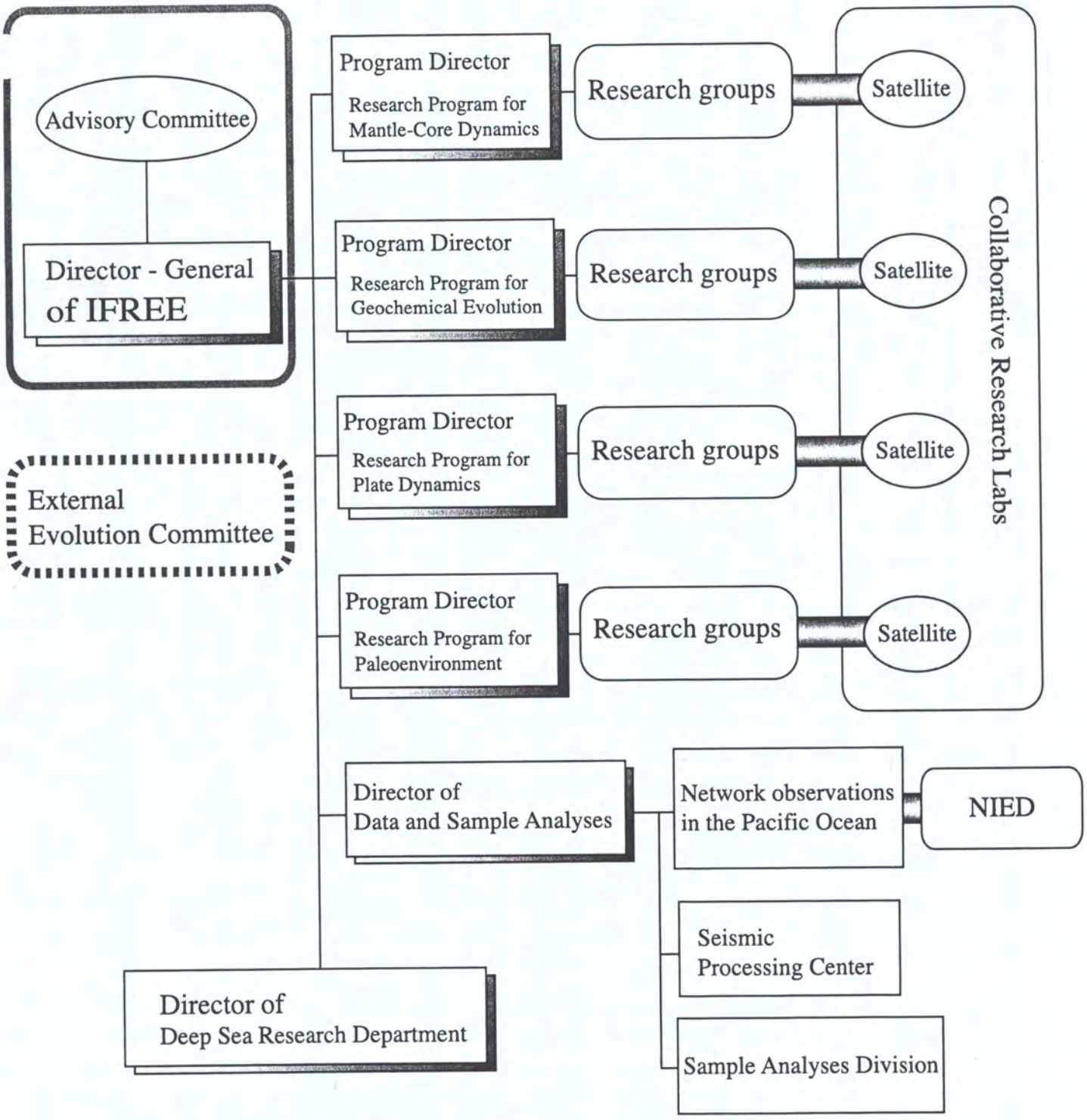
Modification of Framework on Scientific Ocean Drilling



Relations between IFREE and other Research Centers

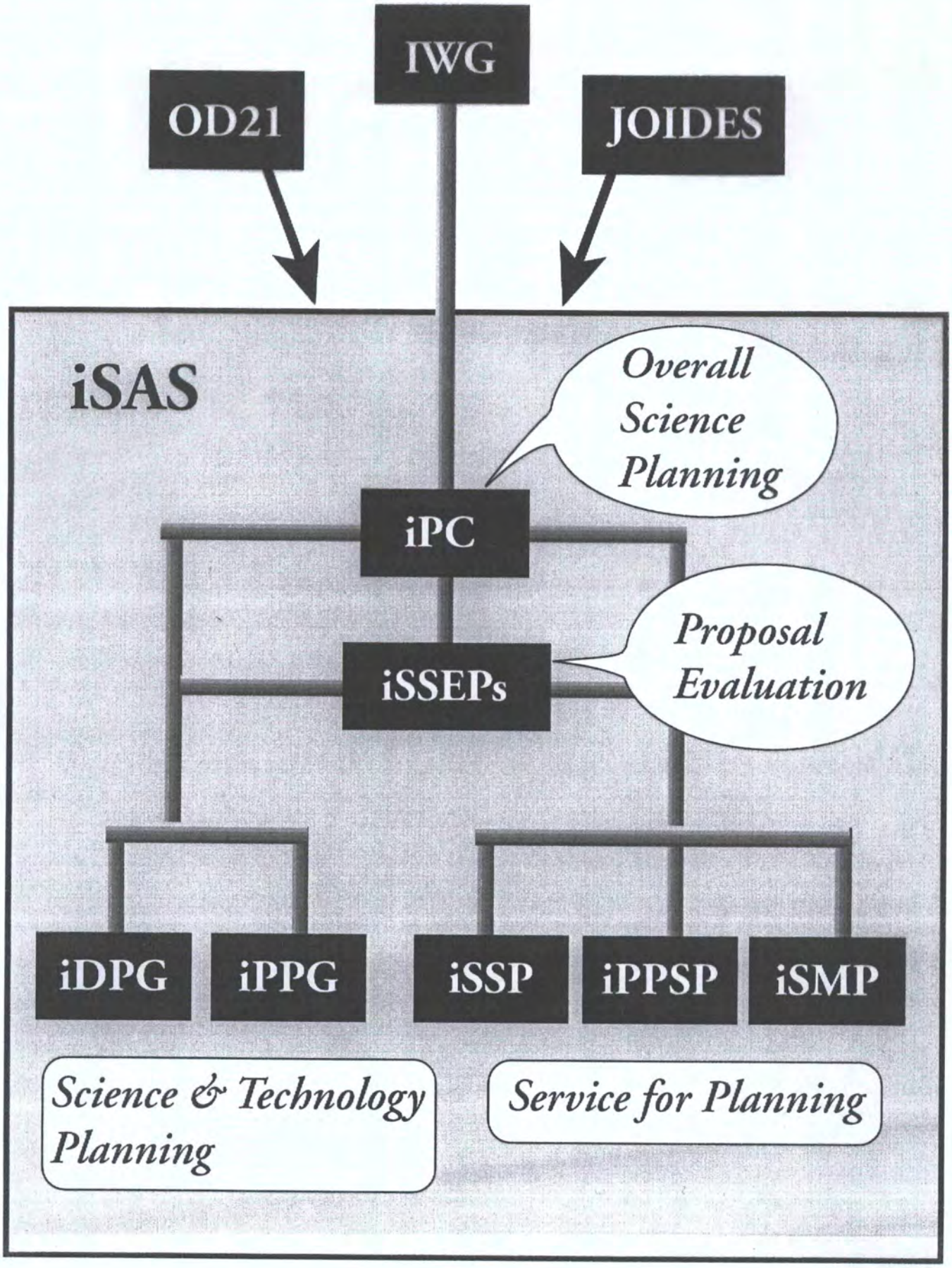


NIED : National Research Institute for Earth Science and Disaster Prevention



NIED : National Research Institute for Earth Science and Disaster Prevention

Interim Science Advisory Structure (iSAS)



Draft 2001 Time Table for iSAS implementation

Jan '01

- Approval of draft iSAS Panel Mandates by IWG

February '01 – March '01

- JOIDES and OD21 advisory structure nominate members for following committees and panels:

  iPC
  iESSEP
  iISSEP
  iSSP

April – May '01

- iSAS Support Office established.
- JOIDES and OD21 consult with IWG regarding iSAS panel and committee membership.

May '01

- Nominated iSSEPs members attend JOIDES SSEPs meeting as observers

June '01

- Official start of iSAS, Panel membership established
- Public Call for IODP proposals.

July '01

- iSSP members attend JOIDES SSP meeting as observers

August '01

- First Official Meeting of iPC.
- iPC members attend JOIDES SCICOM/OPCOM meeting as observers
- iPC/IPSC develop mandate for interim Pollution Prevention and Safety Panel and discuss needs and mandates for new Industry/Technology liaison panel
- Nominate iPPSP members

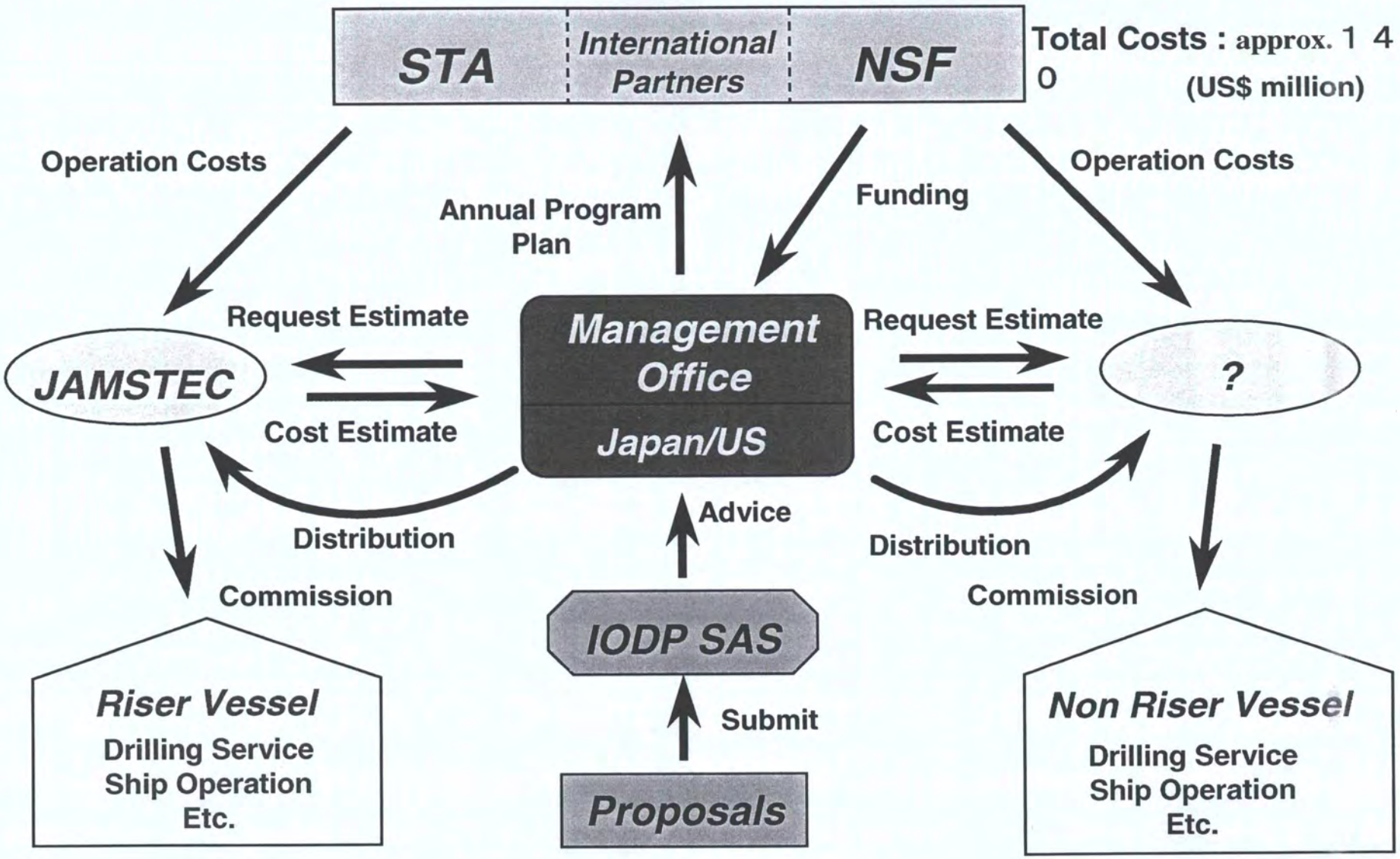
November '01

- Joint meeting of iSSEPs and SSEPs
- Establish iPPSP, members attend JOIDES PPSP meeting as observers.

December '01

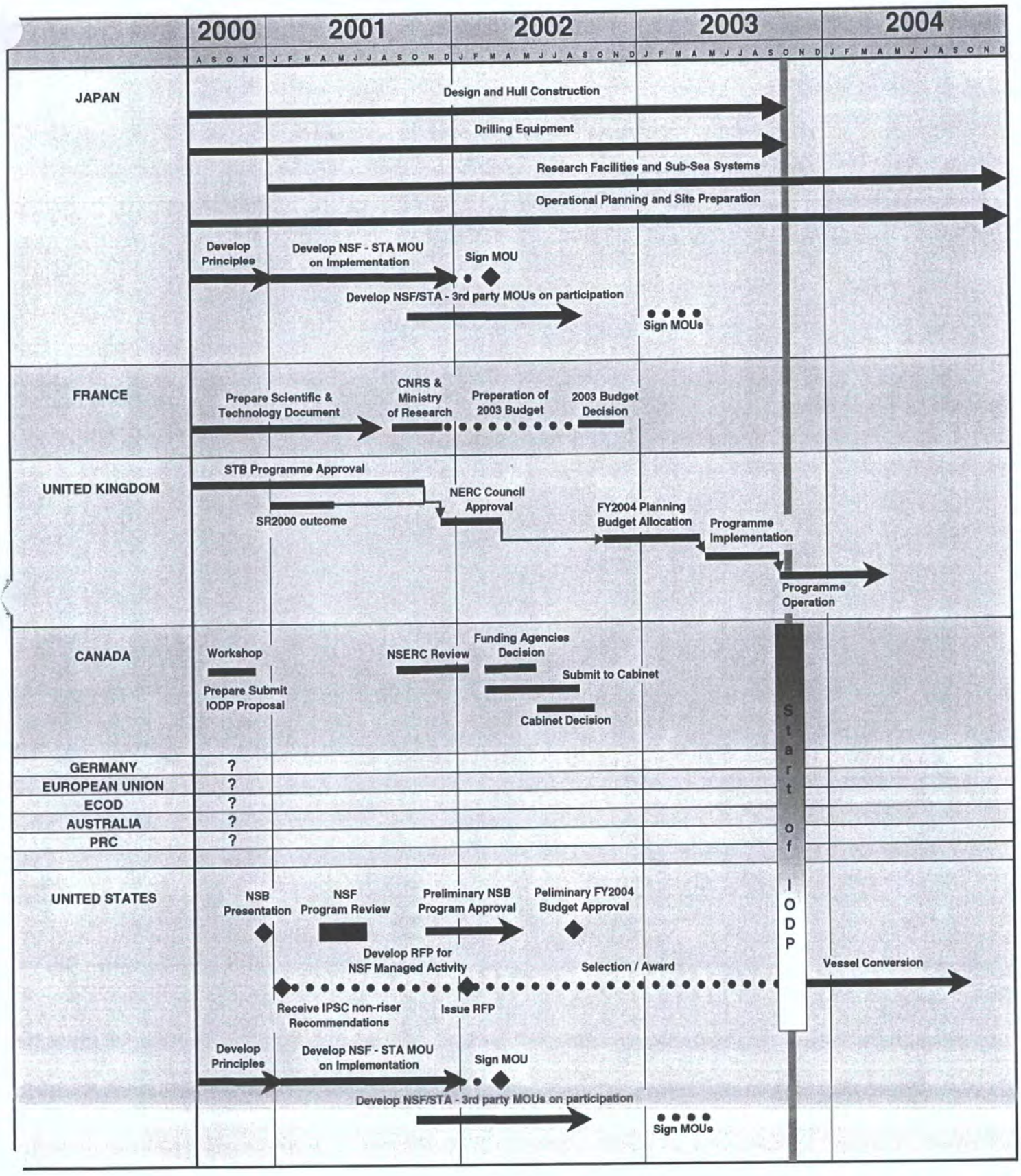
- iPC establish first riser iDPG.

Outline of IODP Structure : Management and Money Flow (Preliminary Draft)



IODP COUNTRY PLANNING

(DRAFT)



Basic Functions and Characteristics of Management Office
(Preliminary Draft)

Functions

- to receive advice from the science advisory structure on the priority of science proposals
- to ask implementing organizations to estimate costs for conducting science programs
- to negotiate with implementing organizations and to receive the advice from the science advisory structure for making affordable science plan
- to make a set of annual science plan under the agreement of NSF and STA
- to transfer resources to the implementing organizations with appropriate arrangements

Characteristics

- neutrality
- independence
- legal entity

Others

- Responsibilities to finalize program plans will reside with implementing organizations

Alternate Platform Drilling Conference APLACON - MAY 10 – 12 in Lisbon

February 2001 - International call for proposals to define drilling targets

Scientific objectives of Alternate Platform drilling targets

Integration of Alternate Platforms in multi-leg multi-platform operations as part of major international geoscience programmes

Information will be available by the end of January on all ODP and IODP planning group www sites

Sponsored by ESCOD-JEODI and the ESF

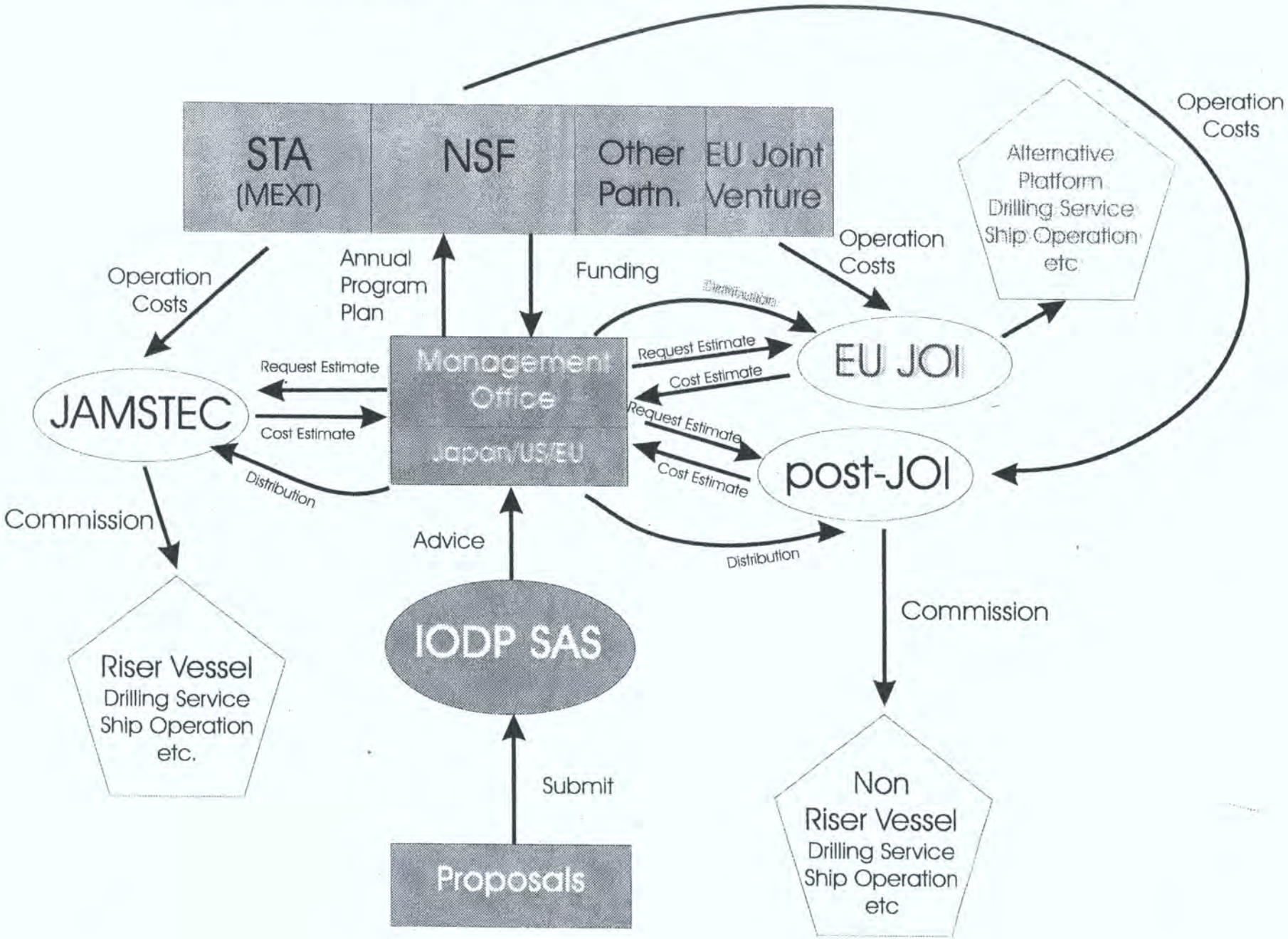
Conclusion:

For almost every drilling target introduced at the workshop, industry can provide appropriate technology.

Alternate Platform Drilling Conference APLACON in Lisbon (Portugal), 10 - 12 May 2001

will focus on drilling proposals to be drilled with alternate platforms as part of the IODP science.

IODP "Third Leg" - The European Component



Alternate Platforms as the Third Leg of IODP

Workshop in Brussels/Belgium 8&9 January 2001

Initiative: European Steering Committee on Ocean Drilling

Hosts: ESF & EC

Convenors: A.Skinner & J.Kenter

Attendance: 90 - 100 (50% Industry, 50 % Academia and Funding Agencies from EU mainly, also Canada, Japan, U.S.A.)

Workshop centered around scientific talks on IODP goals which require the use of drilling platforms other then the Japanese and U.S. ships.

Arctic Drilling

Shallow Water Drilling (seismic stratigraphy, reef drilling)

Gas Hydrates

High-resolution Climatic History

Deep Biosphere

Mineral Deposits

Sedimentary Models of Deep Sea Fans

Each set of talks was followed by discussions on applicable technologies.

Joint European Ocean Drilling Initiative -JEODI

- Milestones 2001 - 2002

- *Early 2002*
- Document defining Integration with international and European programmes
- Present integrated science and technical plan to individual funding agencies
- Define management structure for Europe in New International programme

- *By September 2002*
- Implement management plan for Europe
- Prepare new EC bid for participation in the Integrated Ocean Drilling Programme

Joint European Ocean Drilling Initiative

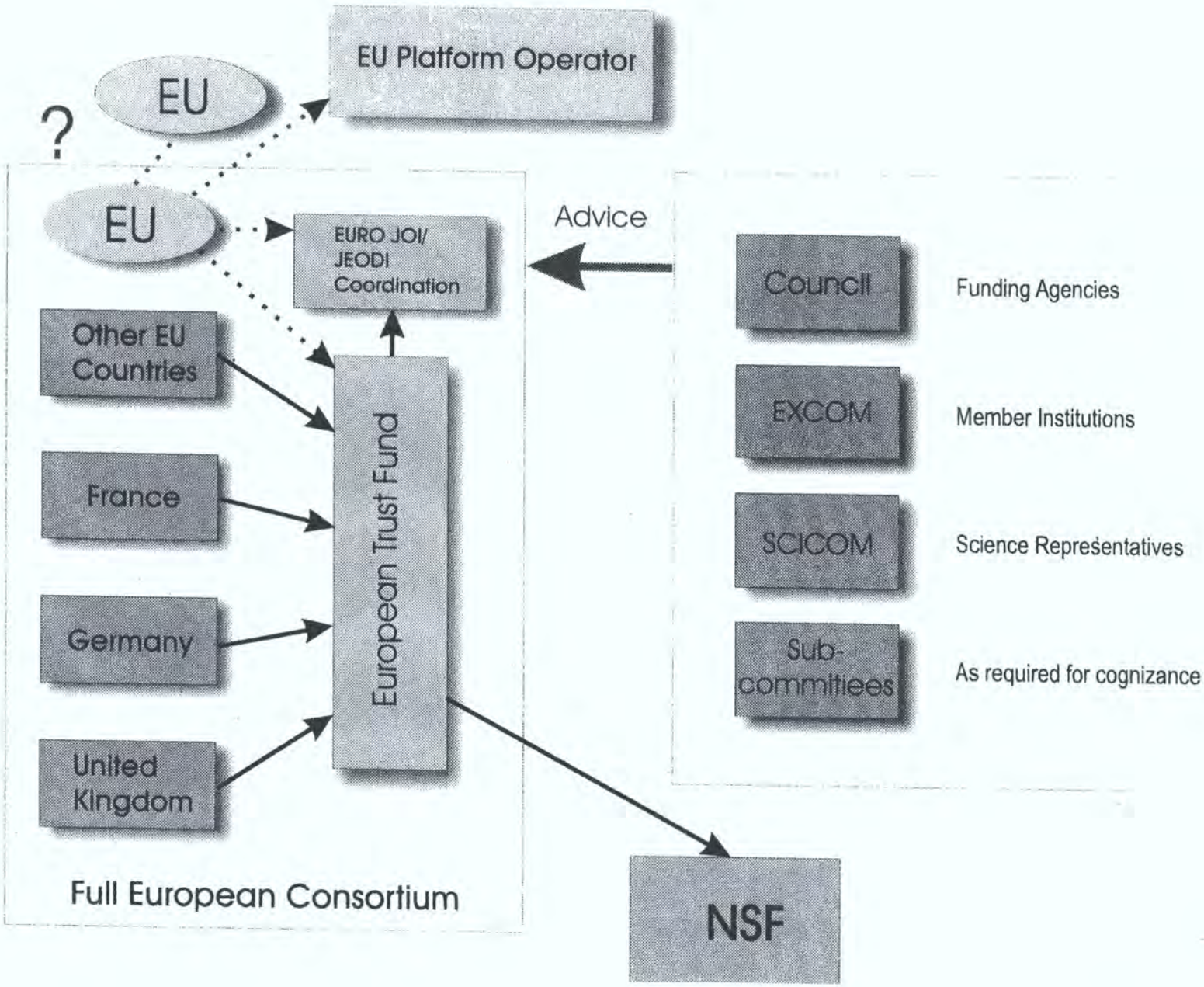
JEODI

is a network project related to IODP Science in Europe.

It will work at connecting all relevant entities and the scientific communities in Europe in order to ensure maximum influence on IODP planning and implementation as well as to assure scientific and technological returns from IODP in the best interest of Europe.

In particular JEODI will link European technological capabilities with European scientific requirements (e.g. shallow water, Arctic drilling) and in turn aim at an significant increase in the quality of the IODP scientific drilling activities.

The European IODP Component



Components of ESCOD

Council	Funding Agencies *Overall Control*
EXCOM SCICOM	Member Institutions *Policy Matters* Science Representatives *Science Planning*
Sub-committees	As required for cognizance

EXCOM SCICOM = ESCOD

Achievements and Opportunities - SCICOM Motion, August 2000

SCICOM Motion 00-2-14: SCICOM endorses the following plan for preparing an ODP legacy document entitled *Achievements and Opportunities of Scientific Ocean Drilling*.

Outline

I. Dynamics of Earth s Environment

- A. Earth s Changing Environment
  1. Rapid climate change
  2. Extreme climates
  3. Climate response to orbital forcing
  4. Causes and effects of sea-level change
  5. 180 million years of ocean history
- B. Sediments, Fluids, and Bacteria as Agents of Change
  1. Sediment processes and budgets
  2. Fluids in sediments and rocks
  3. Formation of gas hydrates
  4. Deep biosphere

II. Dynamics of Earth s Interior

- A. Transfer of Heat and Material from Earth s Interior
  1. Mantle and core dynamics
  2. Ocean crust and mid-ocean ridge processes
  3. Hydrothermal and sulfide mineral processes
  4. Subduction factory
- B. Lithosphere Deformation and Earthquake Processes
  1. Passive continental margins and rift environments
  2. Convergent margins and collisional settings
  3. Earthquake mechanisms

Contents

Executive summary	5 pages
Short summaries of achievements for sixteen sub-themes	4-5 pages each
Introduction or statement of scientific issues and challenges	1 page
Bullets summarizing achievements and opportunities	1-2 pages
Summary of goals met	1 paragraph
Summary of future opportunities	1 paragraph
List of greatest hits (from bullets)	

Timeline

SCICOM Chair invites Editorial Review Board (ERB)	1 September 2000
ERB and SCICOM Chair invite authors	1 October 2000
Authors and ERB compile bullets and circulate among community	Fall 2000
Authors and ERB compile final bullet list	1 February 2001
ERB provides final bullet list to SCICOM	1 March 2001
Completion of short summaries	1 May 2001
Executive summary and excerpt of greatest hits	1 June 2001

Achievements and Opportunities - Status Report, January 2001 EXCOM

Editorial Review Board: W. Hay, K. Becker (overall editors)
L. Peterson, H. Elderfield, C. Mevel, J. Tarduno (section editors)

Authors:

I. Dynamics of Earth's Environment

A. Earth's Changing Environment (**L. Peterson**)
1. Rapid climate change (**J. Kennett/L. Peterson**)
2. Extreme climates (**D. Kroon**)
3. Climate response to orbital forcing (**R. Zahn**)
4. Causes and effects of sea-level change (**K. Miller**)
5. 180 million years of ocean history (**T. Bralower**)

B. Sediments, Fluids, and Bacteria as Agents of Change (**H. Elderfield**)
1. Sediment processes and budgets (**D. Piper**)
2. Fluids in sediments and rocks (**A. Fisher**)
3. Formation of gas hydrates (**E. Suess**)
4. Deep biosphere (**S. D'Hondt**)

II. Dynamics of Earth's Interior

A. Transfer of Heat and Material from Earth's Interior (**C. Mevel**)
1. Mantle and core dynamics (**K. Suyehiro**)
2. Ocean crust and mid-ocean ridge processes (**J. Pearce**)
3. Hydrothermal and sulfide mineral processes (**S. Humphris**)
4. Subduction factory (**T. Plank**)

B. Lithosphere Deformation and Earthquake Processes (**J. Tarduno**)
1. Passive continental margins and rift environments (**H.-C. Larsen**)
2. Convergent margins and collisional settings (**C. Moore**)
3. Earthquake mechanisms (?)

Production Timeline:

ERB finalized	October, 2000
Authors invited	9 November, 2000
Outline to JOIDES Office (11 of 15 submitted)	December, 2000
Draft article submission deadline	1 March, 2001
Final version	1 May, 2001
Volume to printer	end of June [mid-July?]

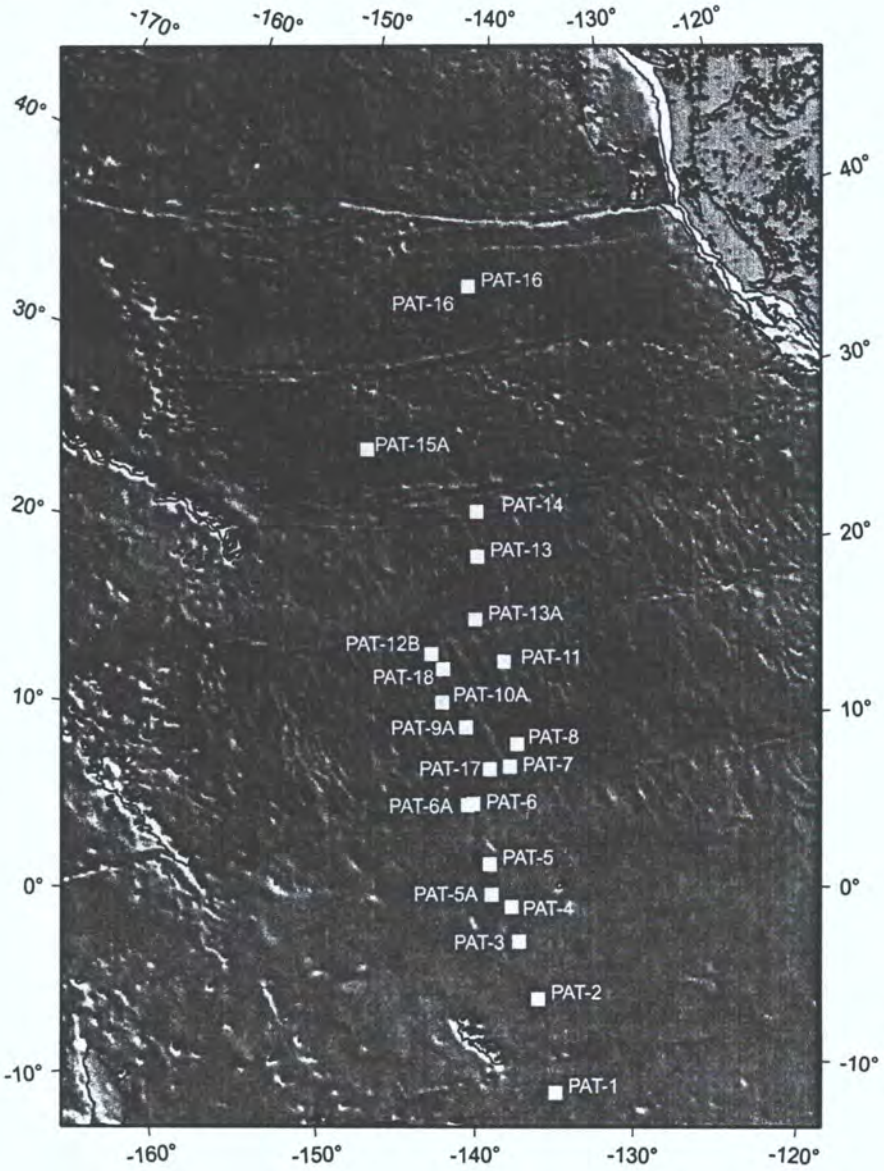
THE JOIDES SCIENCE PROGRAM FOR FY 2002

The science program for FY 2002, approved by JOIDES SCICOM at its August 2000 meeting, is proposed to JOIDES EXCOM at its January 2001 meeting for its approval. The dates shown for the legs correspond to current planning, but are subject to change.

Leg 199	**Paleogene Equatorial Pacific Transect**
Proposal	**486**
Title	**Paleogene Equatorial Pacific Transect**
Proponents	**M. Lyle, D.K. Rea, T.C. Moore and L.D. Stott**

(24 October – 17 December 2001)

Note: This Leg, although part of the FY 2002 Program, entails expenditures in FY 2001, and has accordingly already been approved as part of the 2001 Program Plan



The complex system of equatorial currents is one of the most persistent and clear traces of wind-driven circulation in the oceans. The modern unequal hemispheric thermal gradients have pushed the Intertropical Convergence Zone (ITCZ) north of the equator and given rise to an asymmetrical narrow band of equatorial upwelling. This zone of upwelling and high productivity results in a high flux of biogenic debris within 1.5°–2° of the geographic equator, with peak values restricted to an even narrower zone. In the Pacific Ocean the rain of this debris has built, over geologic time, a mound of almost pure calcareous and siliceous sediments stretching along the equatorial region and reaching a thickness of over 500 m.

The central equatorial Pacific is unique among the world's oceans in that the path of plate motions carries this linear trace of equatorial upwelling and productivity northward with time. There are two clear impacts of this northward plate motion: 1) the thickest part of the equatorial mound of biogenic sediment is displaced several degrees to the north of the equator and 2) sediments deposited a few tens of millions of years ago have moved completely out of the region of high sediment flux. This movement into regions of very low sediment accumulation (or even erosion) puts Paleogene equatorial sediments within the reach of the Ocean Drilling Program's APC/XCB technology. For the most part the sediments have never been subject to strong burial diagenesis and can be cored easily with little disturbance. Time intervals notorious for extensive chert formation (e.g. the middle Eocene) are more likely to contain only oozes because they have never been buried deeply.

Over the last decade APC/XCB technology has been used to recover continuous Neogene sediment sections from the equatorial Pacific and to trace the variations in equatorial upwelling and biogenic flux during the transition from a one-pole ice age to a two-pole ice age. They have revealed intervals of very high flux rates linked with oceanographic and climatic change. The completely recovered Neogene sections have also been used to integrate biostratigraphy and paleomagnetic stratigraphy and have permitted the establishment of an orbitally tuned time scale back to 14 Ma. Leg 199 will take this coring technology back to the early Paleogene section, the time of the "hot house world."

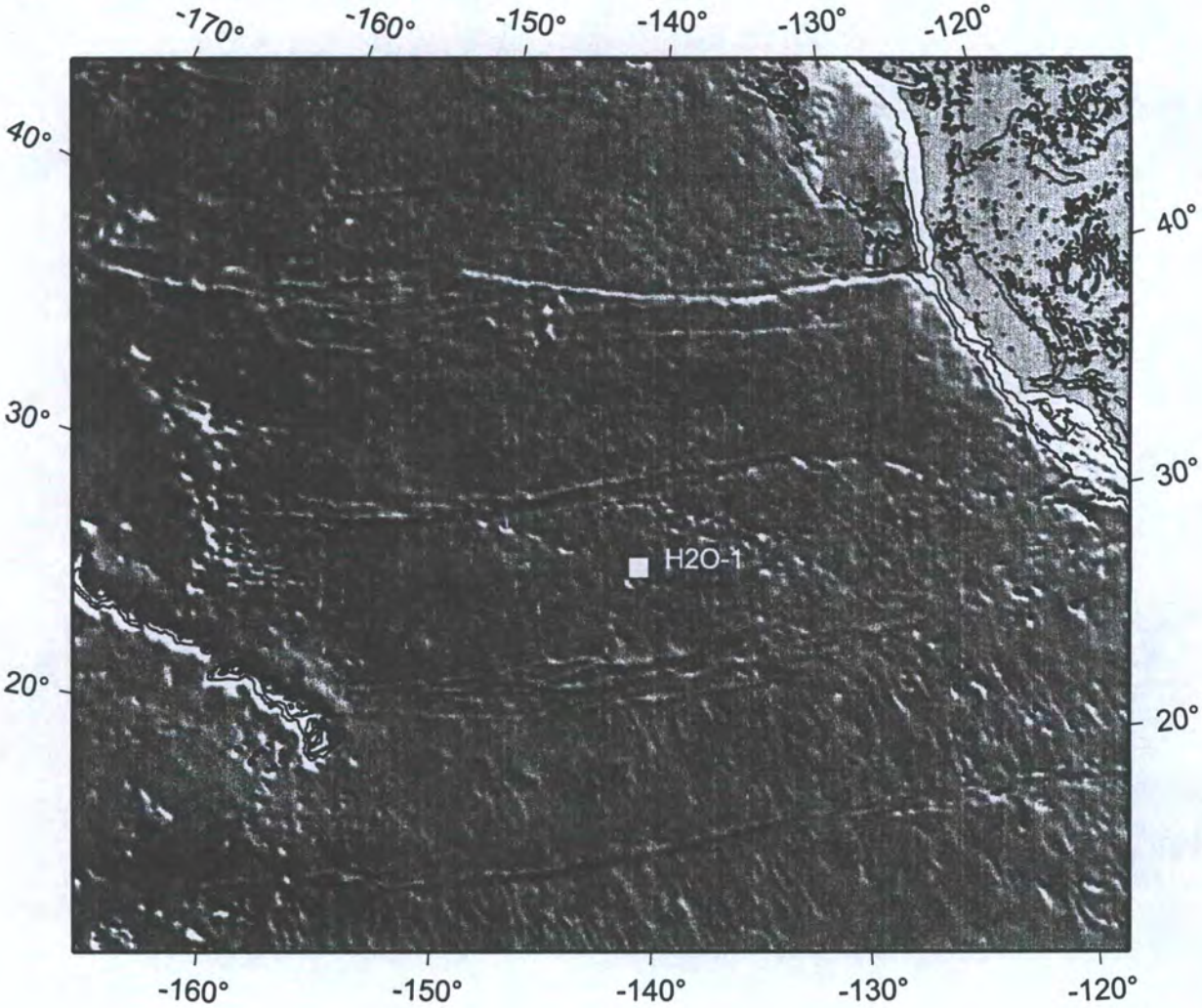
Leg 199 will collect a transect of Paleogene sediments in the eastern Pacific Ocean. The transect is to be centered on the approximate positions of the equator at 50-60 Ma and at 35-40 Ma. The main objective of the drilling will be a detailed investigation of the oceanographic consequences of the long term cooling since the beginning of the Eocene. Three related questions will also be addressed by this transect: 1) what has been the long-term history of the intensity of atmospheric circulation; 2) what has been the latitudinal movement of the intertropical convergence zone (ITCZ) - a key indicator of the relative temperature gradients in the northern and southern hemispheres; and 3) what has been the history of hydrothermal activity during the Eocene and how might it relate to either warm climates or chert formation? From earlier DSDP rotary coring it is predicted that many of the planned drill sites should have a hiatus or a radiolarian ooze/red clay interval from the Holocene until about the middle Miocene. Below the carbonate-poor interval, there will be lower Neogene and Paleogene calcareous oozes that will permit detailed reconstructions of Eocene sea surface temperature (SST) gradients and equatorial circulation and productivity. Northern sites in the proposed transect may contain only clays above the calcareous lower Eocene sediments. These sections are critical to mapping the movement of the ITCZ through time and to relating the extremely warm interval of the early Eocene to the history of hydrothermal activity. The southern sites are critical to mapping circulation changes during the rapid Eocene - Oligocene transition in calcareous sections.

Table 1: Leg 199 site locations

Site Name	Latitude	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
PAT-1	12°30'S	134°55'	4540	90	0	90
PAT-2	6°47'S	136°00'	4310	100	0	100
PAT-3	3°20'S	137°12'	4470	210	0	210
PAT-4	1°15'S	137°40'	4230	290	0	290
PAT-5	1°20'N	139°00'	4300	440	0	440
PAT-6	4°55'N	140°00'	4390	430	0	430
PAT-7	7°09'N	137°45'	4730	280	0	280
PAT-8	8°30'N	137°20'	4800	250	0	250
PAT-11	13°30'N	138°10'	4720	200	0	200
PAT-13	19°48'N	139°54'	5337	130	0	130
PAT-14	22°30'N	140°00'	5000	100	0	100
PAT-16	36°00'	141°00'	5100	60	0	60
PAT-5A	00°30'N	138°54'	4400	0	410	410
PAT-6A	4°50'N	140°20'	4480	0	420	420
PAT-9A	9°30'N	140°30'	4950	100	5	105
PAT-10A	11°00'N	142°00'	5050	100	5	105
PAT-12B	13°53'N	142°43'	5100	90	5	95
PAT-13A	16°00'N	140°00'	5400	5	95	100
PAT-15A	25°55'N	147°31'	5200	70	5	75
PAT-16	36°00'N	141°00'	5100	60	5	65
PAT-17	7°00'N	139°30'	5020	200	5	205
PAT-18	13°00'N	142°30'	4950	150	5	155

Leg 200	**H2O Seafloor Observatory**
Proposal	**500**
Title	**Drilling Fast Spread Pacific Crust at the H2O Long Term Seafloor Observatory**
Proponents	**R.A. Stephen, J.H. Natland, R. Butler, K. Becker, A.D. Chave and F. K. Duennebier**

(17 December 2001 – 7 February 2002)



This is a multi-disciplinary proposal, which represents the interests of the Ocean Seismic Network (OSN) and International Ocean Network (ION) groups, the Borehole Observatories, Laboratories, and Experiments (BOREHOLE) group, and the oceanic lithospheric processes community

A re-entry hole will be drilled at the Hawaii-2 Observatory (H2O) site in the Eastern Pacific and prepared for emplacement of a seismometer and related equipment. The H2O long term observatory site satisfies three scientific objectives of crustal drilling: a) it is on fast spread Pacific crust which represents one end-member for models of crustal generation and evolution; b) it is located in one of

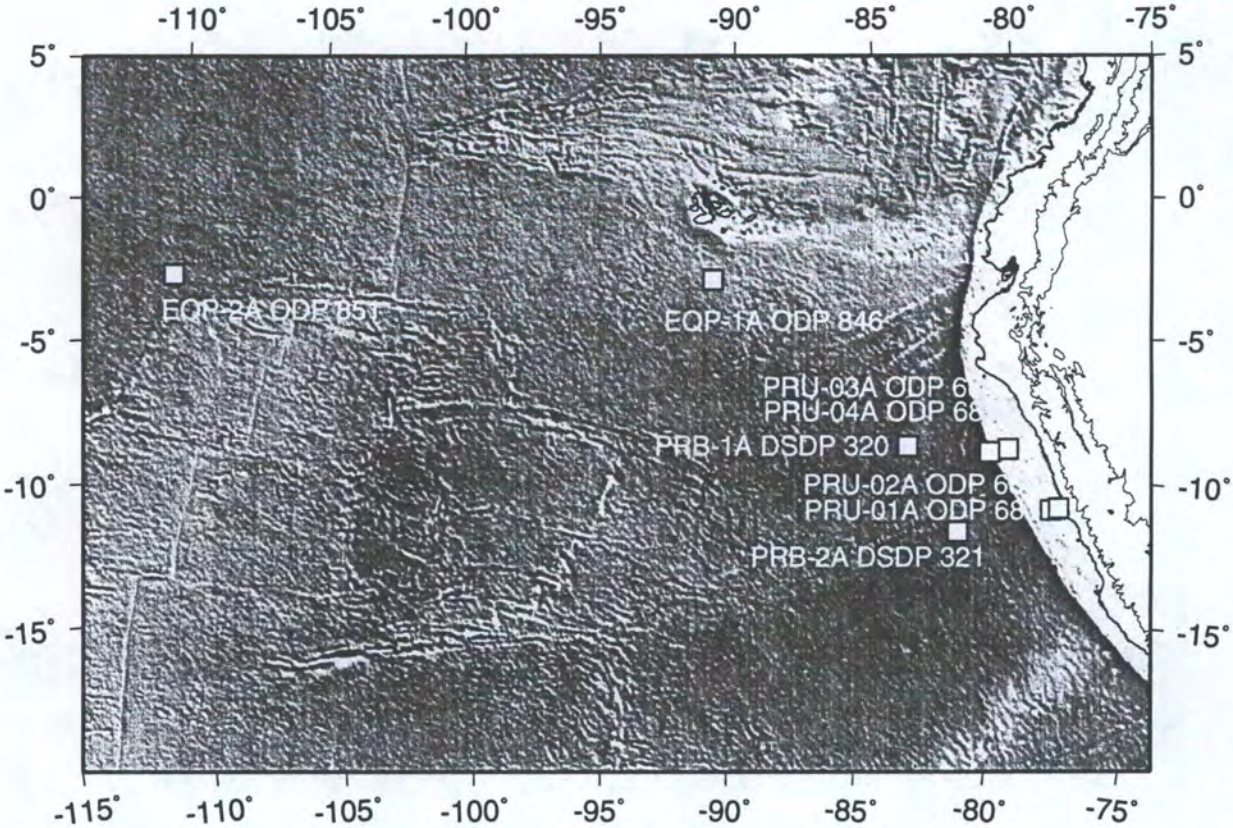
the high priority regions for the Ocean Seismic Network; and c) its proximity to the Hawaii-2 cable and H2O observatory make it a unique site for real time, continuous monitoring of geophysical and geochemical experiments in the crust.

Table 2: Leg 200 site location

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
OSN-2	5,29	110,08	3860	116	110	226

Leg 201	**Peru Margin Microbiology**
Proposal	**571**
Title	**Controls on Microbial Communities in Deeply Buried Sediments**
Proponents	**S. D'Hondt, A. Teske, K.-U. Hinrichs, R.W. Murray, S. Rutherford, D.C. Smith**

(7 February – 8 April 2002)



The goal of this leg is to document how supplies of organic carbon and electron acceptors shape the distribution and activity of microbial communities buried in deep-sea sediments. The JOIDES Resolution will drill a series of sites along the Peru Margin and in the eastern equatorial Pacific. This project will address fundamental questions about the deeply buried biosphere, including: (1) are different sedimentary geochemical regimes characterized by different microbial communities, or merely by different degrees and kinds of community activity? (2) How does the flow of electron acceptors through deep sediments affect community structure and sediment chemistry? (3) To what extent do past oceanographic conditions affect microbial communities now buried in deep-sea sediments?

The nature and extent of microbial activity in deeply buried marine sediments remain poorly known. The standard paradigm assumes that where sufficient organic carbon is available, the stratigraphic sequence of microbial activities is controlled by the energy efficiency of the available electron

acceptors. This model reasonably explains the vertical succession of electron acceptors in many types of sediment. However, the effect of that chemical succession on microbial communities has been little explored; we do not yet know the extent to which deeply buried microbes (1) migrate to follow concentrations of electron acceptors, (2) switch from one electron acceptor to another, or (3) turn on and off as chemical fronts migrate past them. Furthermore, the factors that cause exceptions to the standard paradigm remain unknown. Finally, although methane in marine sediments constitutes one of the largest carbon reservoirs near the Earth's surface, the phylogenetic affinities and community structure of the microbes that consume methane in deeply buried marine sediments remain unknown.

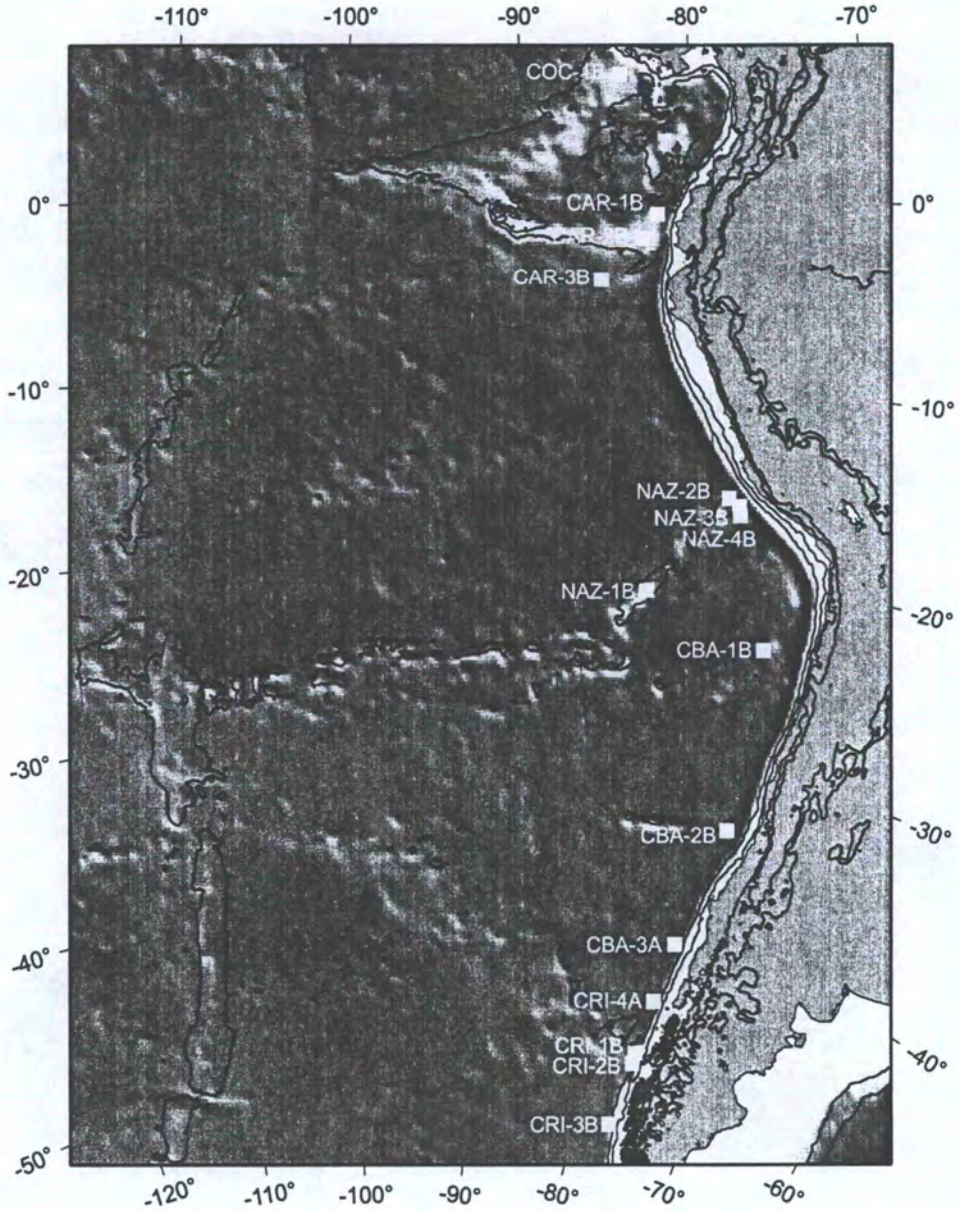
Several characteristics of Peru Margin and eastern equatorial Pacific sediments render them uniquely well suited for this investigation. These characteristics include: (1) a pronounced brine incursion that penetrates the methanogenic zone at depth and reverses the vertical sequence of electron acceptor availability in Peru Margin sediments, (2) violation of the standard model by co-occurrence of stable high methane and sulfate concentrations over a long stratigraphic interval in some eastern equatorial Pacific sediments, and (3) relatively close geographic proximity of sites with sediments rich in dissolved methane, hydrate-rich sediments, and normal marine sediments. The first and second of these characteristics are presently only known to occur in the Peru Margin and the eastern equatorial Pacific, respectively.

Table 3: Leg 201 site locations

Site Name	Latitude (°S)	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
EQP-1A ODP 846	3,10	90,82	3314	418	400	400
EQP-2A ODP 851	2,77	110,57	3780	318	318	318
PRB-1A DSDP 320	9,01	83,53	4487	155	155	155
PRB-2A DSDP 321	12,02	81,58	4827	124	124	124
PRU-01A ODP 681	10,98	77,98	1505	2500	300	300
PRU-02A ODP 680	11,07	78,27	2525	2100	300	300
PRU-03A ODP 684	8,98	79,91	426	160	160	160
PRU-04A ODP 685	9,11	80,58	5070	0	300	300

Leg 202	**SE Pacific Paleoceanography**
Proposal	**465**
Title	**Southeast Pacific Paleoceanographic Depth Transects**
Proponents	**A.C. Mix N.G. Pisias L.A. Mayer**

(8 April – 7 June 2002)



The objective of this program is to assess changes in surface intermediate, deep and bottom water mass interaction between the South Pacific and the Southern Ocean. The subsurface flows, important elements of the global thermohaline circulation influence the heat, salt, oxygen and nutrient balances of the whole Pacific Ocean and may trigger global climate feedback associated with heat transport and the carbon cycle. The JOIDES Resolution will core Neogene and older

sediments in latitudinal and depth transects on the Cocos, Carnegie, Nazca and Chile Rises in the Southeast Pacific. The latitudinal spread of the proposed transects along the Peru-Chile Current will facilitate the study of the northward advection of cold upper-ocean water and upwelling of subsurface water along the eastern boundary. This study will test hypotheses on 1) global thermohaline circulation and the linkage of global oceans through the Antarctic, 2) the interaction of the eastern boundary current system with equatorial currents and its role in the long-term oceanic carbon dioxide balance, 3) the role of biological productivity on modifying subsurface water masses near the eastern boundary, 4) mechanisms of southern hemisphere wind changes (as reflected in boundary current advection) to changing glacial, orbital and greenhouse gas forcing, 5) the response of the ocean to the opening and closing of tectonic gateways such as the Drake Passage and the Panama Isthmus and the uplift of the Andes Mountains.

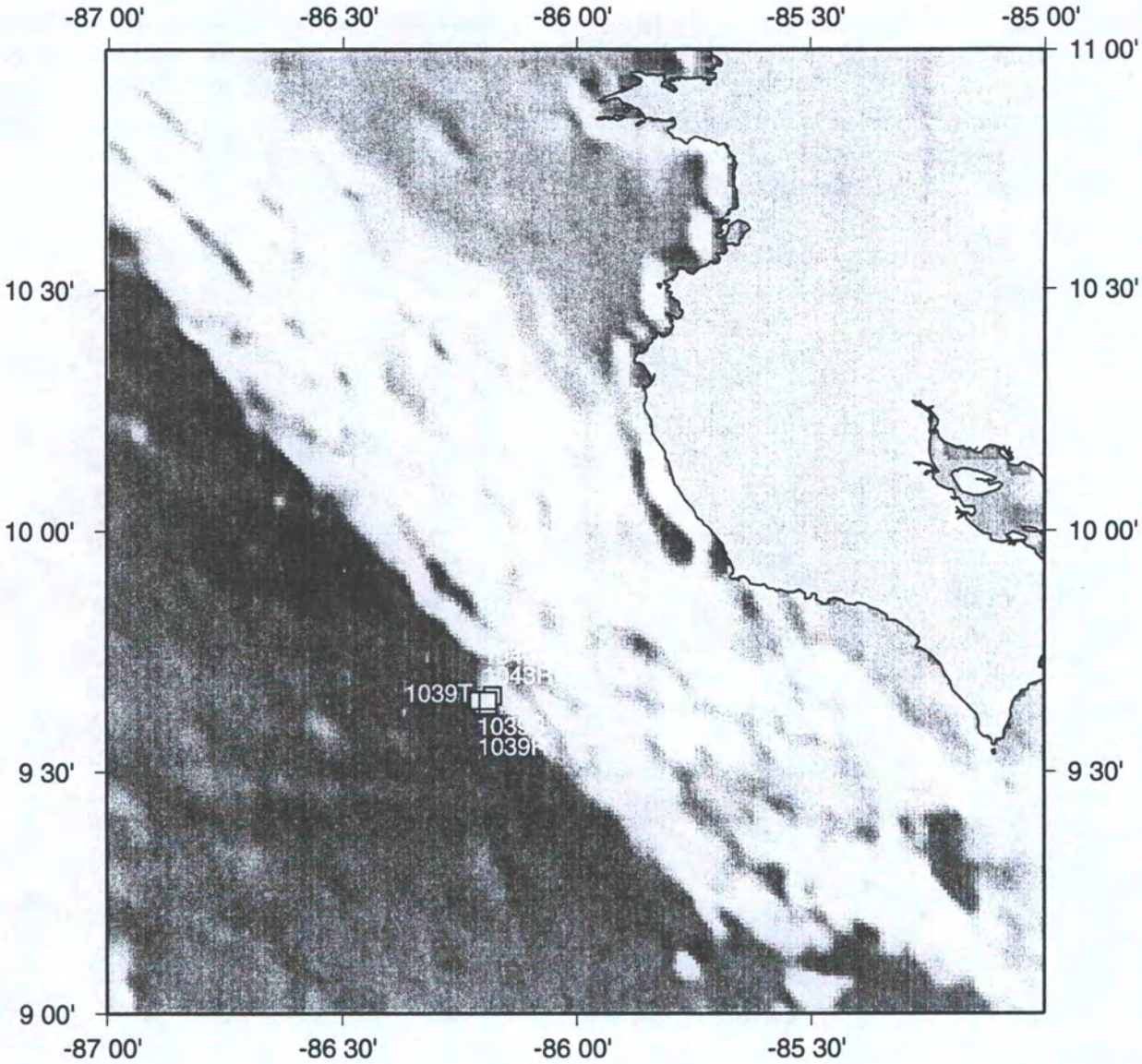
The depth transects in the S.E. Pacific will complement those in the Western and North Pacific and will allow assembly of a detailed depth-latitude-time reconstruction of subsurface water masses of the whole Pacific. They will complement existing and planned Atlantic depth transects to form a first-order global view of Neogene evolution of thermohaline circulation. The latitudinal transect will add significant South Pacific data to studies of hemispheric thermal gradients during anomalously warm episodes of Neogene and Paleogene time.

Table 4: Leg 202 site locations

Site Name	Latitude (°S)	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
CAR-1A	0,08	81,15	1300	200	200	200
CAR-2A	2,05	82,07	2000	200	200	200
CAR-3A	4,03	85,05	3800	300	300	300
CBA-1A	23,00	73,13	3500	500	500	500
CBA-2A	33,00	74,00	3500	500	500	500
COC-1A	7,13	83,13	900	250	250	250
CR1-3A	50,00	77,00	4000	500	500	500
CRI-1A	46,07	76,10	3000	60	60	60
CRI-2A	46,15	77,03	3500	150	150	150
NAZ-1A	21,10	81,08	1200	200	200	200
NAZ-2A	16,08	77,05	2400	300	300	300
NAZ-3A	16,15	76,10	3600	400	400	400
NAZ-4A	17,05	76,00	4300	500	500	500

Leg 203	**Costa Rica Margin**
Proposal	**544**
Title	**Fluid Flow, Seismic Cycling, and Pressure-Temperature Characteristics of the Costa Rica Subduction Zone**
Proponents	**E. Silver, M. Kastner, J. Morris, K. McIntosh, T. Plank, D. Saffer**

(7 June – 6 August 2002)



The geochemical and microbial processing of sediments and pore fluids as they become accreted, compressed, and subducted along an active margin results in one of the Earth's major geochemical fluxes into and out of the ocean. Because of the major changes that take place and because of the

large masses of material involved, the term "Subduction Factory" has been coined to describe these processes.

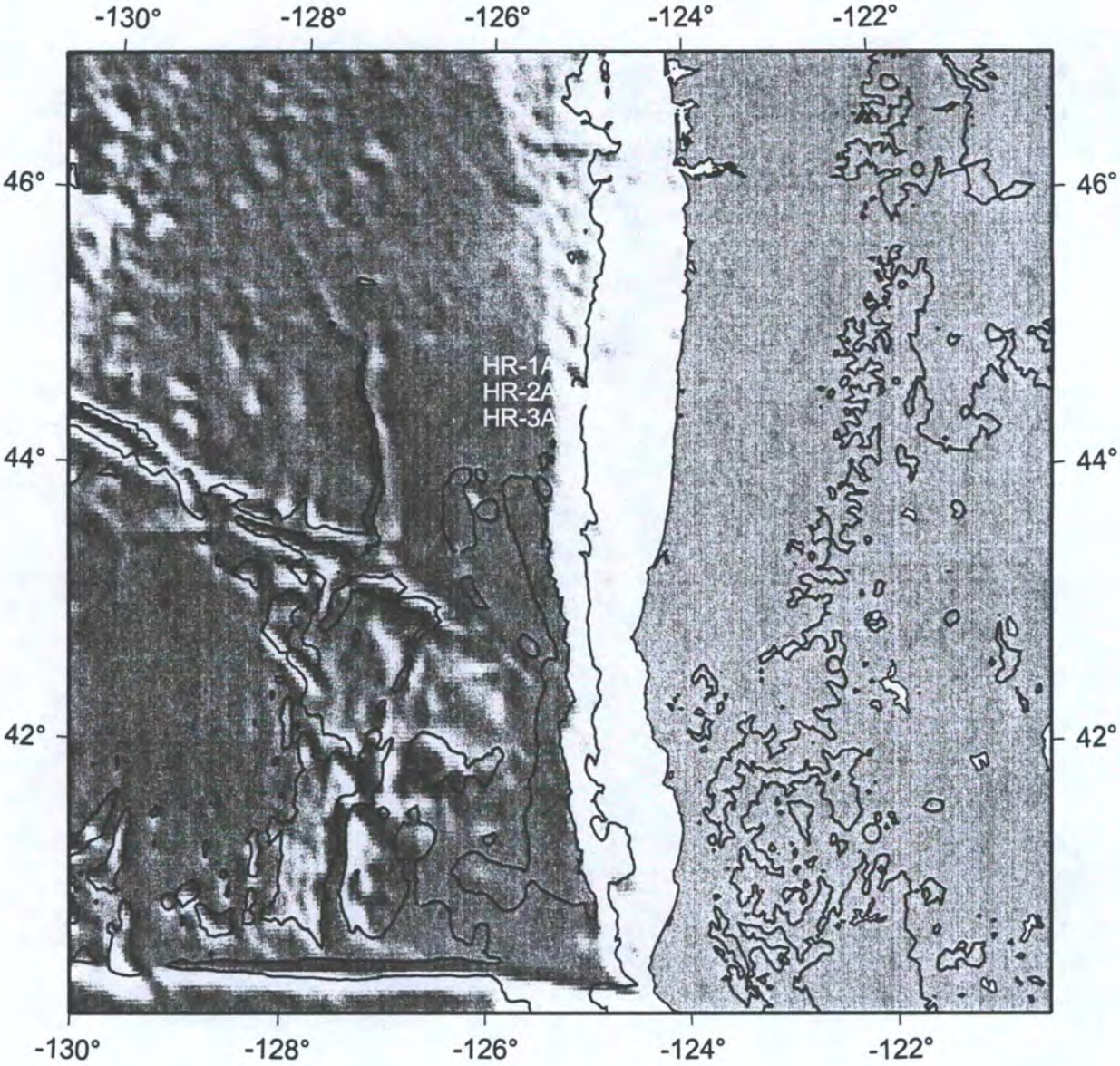
The drilling program off Costa Rica will test existing models and develop an understanding of the processes associated with the seismogenic zone and with the workings of the subduction factory. The focus is to investigate the hydrology, sediment dynamics, and geochemistry of this margin by recovering oceanic basement rocks in a lower plate reference site and to use CORK emplacements to monitor fluid flow, temperature, and geochemistry there and at two sites through the decollement. Two sites are to be drilled a short distance into basement close to the deep penetration basement site, to determine the fluid flow direction within the basement.

Table 5: Leg 203 site locations

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
1039R	9,64	86,20	4350	400	400	700
1039S	9,64	86,19	4350	400	400	450
1039T	9,65	86,21	4350	400	400	450
1040R	9,66	86,18	4189	650	650	800
1043R	9,65	86,19	4310	500	200	200

Leg 204	**Hydrate Ridge**
Proposal	**546**
Title	**Drilling Hydrates on Hydrate Ridge, Offshore Oregon**
Proponents	**A. Trehu, M. Torres, S. Giovannoni, C. Goldfinger, E. Suess, K. Brown, M. Kastner, N. Bangs and D. Hammond**

(6 August – 4 October 2002)



Gas hydrates in sediments are a matter of considerable interest because of their potential as seals over hydrocarbon reservoirs, their significance as a possible resource, their role in slope stability and their potential for causing catastrophic changes in atmospheric methane and climate change.

Seismic data across Hydrate Ridge, off Oregon, show systematic variations in stratigraphic and reflectivity of the Bottom Simulating Reflectors (BSRs) that appear to be indicative of the impact of tectonic activity on the evolution of the hydrate/gas system of the Oregon margin. These patterns are especially well defined on the southern part of Hydrate Ridge, where grab sampling in 1996 revealed the presence of massive hydrate deposits near the seafloor.

Leg 204 will drill three holes, 400-700 m in depth, accompanied by comprehensive biological and geochemical sampling and by a suite of in situ measurements, to address the following specific objectives:

1) Compare the source region for gas and the physical and chemical mechanisms of hydrate formation in two distinctly different sedimentary and tectonic environments: (a) the older sediments of the accretionary complex, where massive hydrates and associated authigenic carbonate are found near the seafloor and methane may originate in underthrust sediments, and (b) the younger, well-stratified sediments of the adjacent, rapidly-filling slope basin, where seismic reflectivity indicates deeply buried hydrate and/or free gas but no significant hydrate and/or carbonate accumulations near the seafloor. Here the gas source is likely to be more local.

2) Calibrate estimates of hydrate volumes and underlying free gas content determined with geophysical remote sensing techniques. A better understanding of these properties is needed to map hydrate distribution regionally between drill sites, permitting us to evaluate the future economic potential of gas hydrates in subduction zone environments.

3) Test, using geochemical tracers, physical properties measurements, and microstructural analysis, whether variations in BSR and subBSR reflectivity observed in seismic data result from tectonically induced hydrate destabilization, as inferred from seismic reflection data.

4) Develop an understanding of the geochemical effects of hydrate formation in order to identify paleo-proxies for methane release that can be used to integrate the geologic data into climate models and understand the possible role of massive, catastrophic hydrate destabilization on global change.

5) Determine the porosity and shear strength of hydrated and underlying sediments in order to evaluate the relationship between hydrates, fluid flow and slope stability.

6) Quantify the distribution of methanogenic and methanotrophic bacteria in the sediments in order to evaluate their contribution to hydrate formation and destruction and related sediment diagenesis

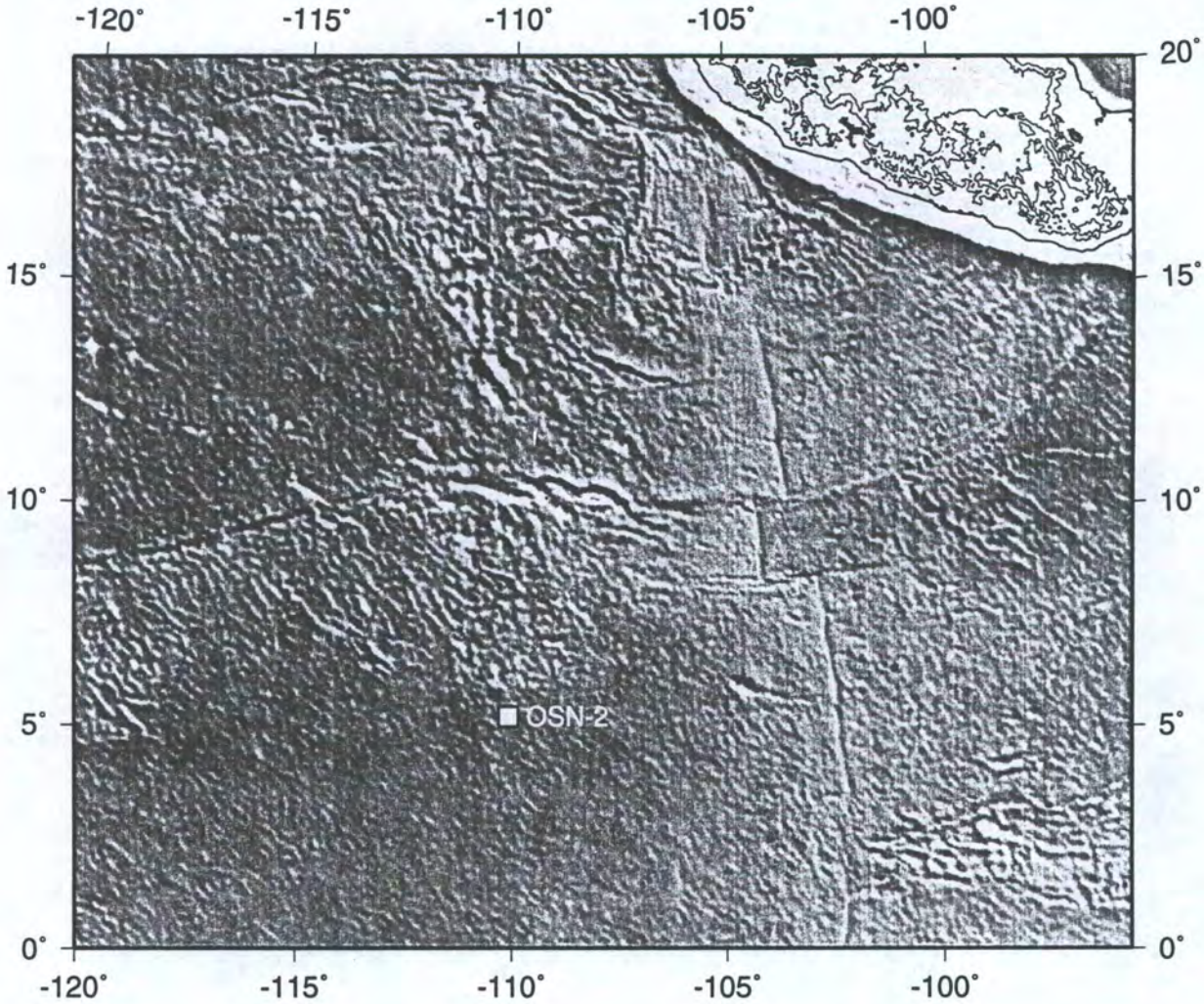
Table 6: Leg 204 site locations

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
HR-1A	44°35.2'	125°07.0'	900	700	0	700
HR-2A	44°35.15'	125°03.85'	1220	600	0	600
HR-3A	44°35.25'	125°09.95'	1000	600	0	600

Leg 205	**Equatorial Pacific ION**
Proposal	**499**
Title	**Equatorial Pacific Site for the International Ocean Network**
Proponents	**J.A. Orcutt, A. Dziewonski, B. Romanowicz, and F. Vernon**

(4 October – 9 November 2002)

Note: Although the drilling of this Leg will be part of the FY 2003 Program, preparation for the leg entails expenditures in FY 2002, and it is accordingly included here for approval as part of the 2002 Program Plan



Leg 205 will emplace another sea-floor seismic observatory for the International Ocean Network (ION).

A cased, cemented hole is to be drilled and fitted with a re-entry cone in the equatorial western Pacific to support a site selected by the International Ocean network (ION) and the Ocean Seismic Network (OSN) for long-term geophysical observatories.

The installation will be done using wireline re-entry and does not require installation by the drilling ship. The proposed drill site is on fast-spreading ocean lithosphere with an age of 10-12 Ma and is, potentially, a site for a reference hole. The site will, at minimum, include a broadband, triaxial borehole seismometer (Teledyne-BrownKS-54000-IRIS), a triaxial, high frequency seismometer, and a broadband hydrophone suspended in the water column near the SOFAR channel. The observatory will be attached to a buoy and satellite communications based on INMARSAT-B, at this point in time, will return data daily to established data centers (SIO Data Collection Center and thence to the IRIS Data Management Center). The full data streams (high frequency channels in particular) will be retrieved annually when the buoy is serviced, possibly in conjunction with the extensive oceanographic TOGA-TAU arrays in the same area.

Table 7: Leg 205 site location

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
OSN-2	5,29	110,08	3860	116	110	226