JOIDES EXECUTIVE COMMITTEE (EXCOM)

13-14 January, 1999 – Miami, Florida

AGENDA BOOK

Prepared by the JOIDES Office
Woods Hole Oceanographic Institution
MS #22, Woods Hole, MA 02543, USA

MEETING OF THE
JOIDES EXECUTIVE COMMITTEE
AT
THE ROSENSTIEL SCHOOL OF MARINE AND ATMOSPHERIC SCIENCE THE UNIVERSITY OF MIAMI MIAMI, FLORIDA

JANUARY 13-14, 1999

AGENDA BOOK

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 which 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 Memoranda of Understanding (MOU) with the National Science Foundation (NSF) [Australia-Canada-Korea Consortium, European Science Foundation, France, Germany, Japan, and the United Kingdom] and one representative of each of ten US institutions [University of Miami, University of Washington, Oregon State University, University of Hawaii, University of Rhode Island, University of Texas at Austin, University of California at San Diego, Texas A&M University, Woods Hole Oceanographic Institution and Columbia University]. 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 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.
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, 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. 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.
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 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. 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.

Ratified by EXCOM: 12 February, 1997; Adopted by JOI Board of Governors: 13 February, 1997

JOIDES Executive Committee Meeting Participants The Rosenstiel School of Marine and Atmospheric Sciences University of Miami MIAMI, FLORIDA

JANUARY 13-14, 1999

Executive Committee - EXCOM

Helmut Beiersdorf (Chair)	Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, Germany
James Briden	Environmental Change Unit, Oxford University, United Kingdom
Chris Harrison	Rosenstiel School of Marine and Atmospheric Sciences, University of Miami
Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State University
Robert Detrick	Woods Hole Oceanographic Institution
David Prior	College of Geosciences & Maritime Studies, Texas A&M University
Menchu Comas	Instituto Andulaz de Ciencias de la Tierra, University of Granada, Spain
David Feary	Australian Geological Survey Organisation, Australia - Canada-Chinese Taipei - Korea Consortium
Margaret Leinen	Graduate School of Oceanography, University of Rhode Island
John Mutter	Lamont-Doherty Earth Observatory, Columbia University
Arthur Nowell	School of Oceanography, University of Washington
John Orcutt	Scripps Institution of Oceanography, University of California
Paul Stoffa	Institute for Geophysics, University of Texas at Austin
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan
Brian Taylor	School of Ocean and Earth Science and Technology, University of Hawaii

Associate Member Countries Representatives

Catherine Mével	Université Pierre et Marie Curie, Paris
Zhixiong Wang	Marine High Technology Bureau, China

EXCOM Liaisons

Kate Moran	Joint Oceanographic Institutions, Inc.
Jeff Fox	Science Operator (ODP-TAMU)
David Goldberg	Wireline Logging Services (ODP-LDEO)
Donald Heinrichs	National Science Foundation (United States)
Bill Hay	SCICOM Chair, JOIDES Office, GEOMAR
James Watkins	Joint Oceanographic Institutions, Inc.

Guests and Observers

Jack Baldauf	Science Operator (ODP-TAMU)
J. Paul Dauphin	National Science Foundation (United States)
John Farrell	Joint Oceanographic Institutions, Inc.
Masaya Fukuhama	Science and Technology Agency (Japan)
Toshisuke Fujita	JAMSTEC (Japan)
Susan Humphris	Ex-Chairperson EXCOM Committee
Dennis Kent	Rutgers University
Hijimu Kinoshita	JAMSTEC (Japan)
Kazuhiro Kitazawa	JAMSTEC (Japan)
Bruce Malfait	US National Science Foundation
Dietrich Maronde	Deutsche Forschungsgemeinschaft, Bonn, Germany
Masakazu Murakami	Science and Technology Agency (Japan)
Chris Pigram	Australian Geological Survey Organisation,Sydney, Australia
Michael Purdy	National Science Foundation (United States)
Toshio Shimoda	JAMSTEC (Japan)
Joichi Takagi	JAMSTEC (Japan)
Philippe Vidal	CNRS, Paris, France

(additional observers from Ocean and Earth Division, STA Japan are expected)

JOIDES Office

Warner Brückmann	Science Coordinator
Jeff Schuffert	International Liaison

1999 JOIDES Advisory Panels Meeting Schedule

Panel or Committee	Dates	Location
EXCOM	13-14 January 1999	Miami, Florida
SCIMP	18-20 January 1999	Houston, Texas
SSP	13-14 February 1999	Fremantle, Australia
PANCH	23 March 1999	Freiburg, Germany
OPCOM	24-25 March 1999	Freiburg, Germany
SCICOM	25-27 March 1999	Freiburg, Germany
PPSP	15-16 April 1999	San Antonio, TX
SSEPs	May 1999	Seattle, WA
EXCOM	29-30 June 1999	Sydney, Australia
SSP	19-21 July 1999 or 26-28 July 1999	LDEO, Palisades
SCICOM	Summer 1999	University of California, Santa Cruz

ODP Operations Schedule: December 1998- December 2000

Leg	Area	Ports	Cruise Dates	Co-Chief Scientists	Staff Scientis	Staffing	Territorial Permission
183	Kerguelen	Fremantle-Fremantle	13 December 1998-10 February 1999	Dr. Millard F. Coffin Dr. Frederick A. Frey	Dr. Paul Wallace	Underway	Australia, France
184	East Asia Monsoon	Fremantle-Hong Kong	16 February-12 April 1999	Dr. Warren Prell Dr. Pinxian Wang	Dr. Peter Blum	Underway	Multiple
185	Izu-Mariana	Hong Kong-Tokyo	18 April-14 June 1999	Dr. John Ludden Dr. Terry Plank	Dr. Jay Miller	Underway	Japan
186	W. Pacific Seismic Net-Japan Trench	Tokyo-TBN	20 June-14 August 1999	Dr. Kiyoshi Suyehiro Dr. Selwyn Sacks	Dr. Gary Acton	To be determined	Japan
	Dry dock	TBN	18 August-9 October 1999	N/A	N/A	N/A	N/A
186E	HD Engineering Leg	TBN	10 October-9 November 1999				
187	Australia-Antarctic Discordance	Sydney-Fremantle	15 November 1999-7 January 2000	Dr. David Christie TBN	TBN	To be determined	
188	Prydz Bay	Fremantle-Hobart	13 January-6 March 2000	TBN	TBN	To be determined	
189	Southern Gateways	Hobart-Hobart	12 March-1 May 2000	TBN	TBN	To be determined	
189T	Transit	Hobart-Guam	3 May- 16 May 2000	N/A	N/A	To be determined	
190	Nankai	Guam-Tokyo	22 May-13 July 2000	TBN	TBN	To be determined	
191	West Pacific Ion	Tokyo-Guam	19 July-11 August 2000	TBN	TBN	To be determined	
192	Manus Basin	Guam-Guam	17 August-5 October 2000	TBN	TBN	To be determined	
193	Ontong Java	Guam-	11 October-3 December 2000	TBN	TBN	To be determined	

JOIDES EXECUTIVE COMMITTEE MEETING

AT

THE ROSENSTIEL SCHOOL OF MARINE
AND ATMOSPHERIC SCIENCE
UNIVERSITY OF MIAMI
MIAMI, FLORIDA

JANUARY 13-14, 1999

MEETING AGENDA

WEDNESDAY January 13 9:00 am

1. Welcome & Introduction

1.1 Introduction of EXCOM members, liaisons, guests (Beiersdorf)
1.2 Meeting logistics (Harrison)
1.3 Approval of Agenda (Beiersdorf)

2. Minutes and Matters Arising

2.1 Approval of June 1998 EXCOM Minutes (Beiersdorf)

3. NSF/ODP Council Reports

3.1 NSF Management Report (Heinrichs)

4. Country Reports

4.1	ECOD	(Comas)
4.2	France	(Mével)
4.3	Germany	(Beiersdorf)
4.4	Japan	(Taira)
4.5	Pacific Rim Consortium	(Feary)
4.6	PRC (The People's Republic of China)	(Wang)
4.7	UK	(Briden)
4.8	USA	(Heinrichs/Moran)

Coffee 10:00-10:30 am

5. Review Membership Status

5.1 Amendment to the Terms of Reference (Beiersdorf)
5.2 Establishment of Annual Review (Beiersdorf)
5.3 Update on Status of ODP Members

6. **SCICOM Report (Hay)**
   - 6.1 SCICOM Strategy for Prioritization of LRP Themes and Budgetary Decisions
   - 6.2 Selected ODP Achievements for Leg 177 to Leg 181
   - 6.3 Approval of the Integrated Sampling and Publications Policy
   - 6.4 Approval of Student Trainees Program Policy

7. **FY 2000**
   - 7.1 Approval of Science Plan for Legs 188 to 193 (Hay)
   - 7.2 FY 2000 Preliminary Budget (Moran)

Lunch **12:00-1:30 pm**

8. **Management and Operations Reports (Moran, Fox, Goldberg)**
   - 8.1 Approval of Industry Partnerships Strategy
     - 8.1.1 DOE/Gas Hydrates Projects
     - 8.1.2. Status of JOI/JAMSTEC Cooperative Development Project
   - 8.2 Status of Program Reviews (PEC V; Co-Chief Review)
   - 8.3 Status of Revisions to the ODP Policy Manual
   - 8.4 New Partner Recruiting (Brazil, India, South Africa)
   - 8.5 Public Affairs Report

Afternoon Coffee/Tea **3:00-3:30 pm**

8. **Management and Operations Reports (contd.)**
   - 8.6 Status of Major Phase III Technical Development
     - 8.6.1 Microbiology Lab
     - 8.6.2 Active Heave
     - 8.6.3 Hammer Drilling
     - 8.6.4 Measurement-While-Coring
     - 8.6.5 Wireline Tools
   - 8.7 Update on Drydock

9. **Executive Session (if necessary)**

THURSDAY **January 14** **9:00 am**

10. IODP Planning

10.1 EXCOM Letter to IWG Co-chairs (Detrick)

10.2 Establishment of IODP Planning Subcommittee (Beiersdorf)

Coffee **10:00-10:30 am**

10.3 Status of IODP Planning Meetings (Hay)

10.3.1 Technology and Operations Workshop

10.3.2 COMPLEX/Vancouver Meeting

10.4 Status of the OD21 Program (Murakami)

11. Future Meetings and Other Business

11.1 June 1999: Sydney, Australia

11.2 Other Business

Meeting Adjourns **~ Noon**

JOIDES EXECUTIVE COMMITTEE MEETING

AT

THE ROSENSTIEL SCHOOL OF MARINE
AND ATMOSPHERIC SCIENCE
UNIVERSITY OF MIAMI
MIAMI, FLORIDA

JANUARY 13-14, 1999

MEETING AGENDA NOTES

WEDNESDAY **January 13** **9:00 am**

1. Welcome & Introduction

1.1 Introduction of EXCOM members, liaisons, guests (Beiersdorf)
1.2 Meeting logistics (Harrison)
1.3 Approval of Agenda (Beiersdorf)

2. Minutes and Matters Arising

2.1 Approval of January 1998 EXCOM Minutes (Detrick) **TAB A**

EXCOM is asked to approve the June 1998 EXCOM Meeting Minutes.

3. NSF/ODP Council Reports

3.1 NSF Management Report (Heinrichs) **TAB B**

EXCOM is asked to review and comment on the NSF Management Report.

4. Country Reports **TAB C**

4.1	ECOD	(Comas)
4.2	France	(Mével)
4.3	Germany	(Beiersdorf)
4.4	Japan	(Taira)
4.5	Pacific Rim Consortium	(Feary)
4.6	PRC (The People's Republic of China)	(Wang)
4.7	UK	(Briden)
4.8	USA	(Heinrichs/Moran)

EXCOM is asked to review and comment on the Country Reports.

Coffee **10:00-10:30 am**

5. Review Membership Status

5.1 Amendment to the Terms of Reference

EXCOM is asked to approve a revision to the Terms of Reference for the JOIDES Executive Committee as follows:

3. The membership of this committee is composed of one representative of each of the non-US countries or consortia who are Full Members with an active Memorandum of Understanding (MOU) with the National Science Foundation (NSF), and one representative from each of ten US institutions. 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 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.

5.2 Establishment of Annual Review

EXCOM is asked to set up and approve an annual review process of the progress being made towards regaining full membership by those partners whose contribution has fallen below that expected. This is in response to EXCOM Motion 98-2-8

EXCOM Motion 98-2-8

EXCOM urges the ODP Council to maintain the principle of full, equal international membership to the maximum extent. Recognizing that this has not always proved possible, the JOIDES Executive Committee agrees on the following rules for members that have been full contributors in the past, but who have reduced their contribution below the full subscription:

(1) Shipboard participation will be in proportion to their contribution.
(2) Provided that they satisfy the following criteria, they will be permitted to retain their full priviledges on committee and panel membership.
  (a) Contribution must be equal to or greater than 5/6 of full membership.
  (b) They must make a firm commitment to work towards full membership.
  (c) They must make significant progress towards achieving full membership each year. The Executive Committee will review the situation annually.
(3) If these conditions are not met, then the member will be designated as an associate member of the appropriate category.

5.3 Update on status of ODP Members

6. SCICOM Report (Hay) TAB D

6.1 SCICOM Strategy for Prioritzation of LRP Themes and Budgetary Decisions **TAB E**

EXCOM is asked to review and comment on the "Priorization of Scientific and Programmmatic Activities within ODP" prepared by SCICOM in response to EXCOM Motion 98-1-8

EXCOM Motion 98-1-8

Presently determined budgetary constraints through 2003 will negatively impact the delivery of the Long Range Plan. EXCOM asks SCICOM to prioritize future science objectives to maximize the objectives of the Long Range Plan, clearly indicating those which cannot be achieved under existing budget projections. SCICOM should also identify and prioritize changes in program activities, services, equipment needs and technological development. SCICOM is asked to forward its report to EXCOM by September 1998.

6.2 Selected ODP Achievements for Leg 177 to Leg 181

6.3 Approval of the Integrated Sampling and Publications Policy **TAB F**

EXCOM is asked to approve an integrated Sampling and Publications Policy.

6.4 Approval of Student Trainee Program **TAB G**

EXCOM is asked to approve a new program for Student Trainees on board the *JOIDES RESOULUTION.*

7. FY 2000

7.1 Approval of Science Plan for Legs 188 to 193 (Hay) **TAB H**

7.2 FY 2000 Preliminary Budget (Moran)

EXCOM is asked to approve the Scientific Plan for FY 2000 (Legs 187-192) and Leg 193 in FY 2001. Note: EXCOM has already approved Legs 187 and 188 for FY'00.

Lunch **12:00-1:30 pm**

8. Management and Operations Reports (Moran, Fox, Goldberg) **TAB I**

8.1 Approval of Industry Partnerships Strategy

EXCOM is asked to review and approve of the Industry Partnerships Strategy.

8.1.1 DOE/Gas Hydrates Projects

8.1.2. Status of JOI/JAMSTEC Cooperative Development Project

8.2 Status of Program Reviews (PEC V; Co-Chief Review)

8.3 Status of Revisions to the ODP Policy Manual

8.4 New Partner Recruiting (Brazil, India, South Africa)

8.5 Public Affairs Report

Afternoon Coffee/Tea 3:00-3:30 pm

8. Management and Operations Reports (contd.) **TAB I**

8.6 Status of Major Phase III Technical Development

8.6.1 Microbiology Lab

8.6.2 Active Heave

8.6.3 Hammer Drilling

8.6.4 Measurement-While-Coring

8.6.5 Wireline Tools

~~8.7 Status of JOI/JAMSTEC Cooperative Development Project~~ ~~TAB J~~

8.7 ~~8.8~~ Update on Drydock

9. Executive Session (if necessary)

THURSDAY January 14 9:00 am

10. IODP Planning

10.1 EXCOM Letter to IWG Co-chairs (Detrick) **TAB K**

10.2 Establishment of IODP Planning Subcommittee (Beiersdorf)

EXCOM is asked to approve the establishment of an IODP Planning Subcommittee.

Coffee 10:00-10:30 am

10. IODP Planning (Cont.)

10.3 Status of IODP Planning Meetings (Hay)

10.3.1. Technology and Operations Workshop **TAB L**

10.3.2 COMPLEX/Vancouver Meeting **TAB M**

10.4 Status of the OD21 Program (Taira)

11. Future Meetings and Other Business

11.1 June 1999: Sydney, Australia

11.2 Other Business

Meeting Adjourns ~ Noon

MEETING OF THE *JOIDES* EXECUTIVE COMMITTEE AT DEUTSCHE FORSCHUNGSGEMEINSCHAFT (DFG) BONN, GERMANY

JUNE 23 -24, 1998

DRAFT MINUTES

Executive Committee - EXCOM

Helmut Beiersdorf	Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, Germany
James Briden	Environmental Change Unit, Oxford University, United Kingdom
Chris Harrison	Rosenstiel School of Marine and Atmospheric Sciences, University of Miami
Nick Pisias	College of Oceanic & Atmospheric Sciences, Oregon State University
Robert Detrick (Chair)	Woods Hole Oceanographic Institution
Olav Eldholm	University of Oslo, European Science Foundation (Consortium for Ocean Drilling)
David Feary	Australian Geological Survey Organisation, Australia - Canada-Chinese Taipei - Korea Consortium
Margaret Leinen	Graduate School of Oceanography, University of Rhode Island
Catherine Mével	Université Pierre et Marie Curie, Paris
John Mutter	Lamont-Doherty Earth Observatory, Columbia University
John Orcutt	Scripps Institution of Oceanography, University of California
David Prior	College of Geosciences & Maritime Studies, Texas A&M University
Barry Raleigh	School of Ocean and Earth Science and Technology, University of Hawaii
Paul Stoffa	Institute for Geophysics, University of Texas at Austin
Asahiko Taira	Ocean Research Institute, University of Tokyo, Japan

EXCOM Liaisons

Kate Moran	Joint Oceanographic Institutions, Inc.
Jeff Fox	Science Operator (ODP-TAMU)
David Goldberg	Wireline Logging Services (ODP-LDEO)
Donald Heinrichs	National Science Foundation (United States)
Susan Humphris	SCICOM Chair, JOIDES Office, WHOI

Guests and Observers

Jamie Allan	National Science Foundation (United States)
Warner Brückmann	GEOMAR, Kiel, Germany
Paul Dauphin	National Science Foundation (United States)
John Farrell	Joint Oceanographic Institutions, Inc.
Masaya Fukuhama	Ocean and Earth Division, STA (Japan)
Bill Hay	GEOMAR, Kiel, Germany
Shizuo Hoshiba	Ocean and Earth Division, STA (Japan)
Charles Kennel	Scripps Institution of Oceanography, University of California
Hajimu Kinoshita	JAMSTEC (Japan)
Kazuhiro Kitazawa	JAMSTEC (Japan)
Bruce Malfait	US National Science Foundation
Dietrich Maronde	Deutsche Forschungsgemeinschaft, Bonn, Germany
Tsuyoshi Maruyama	Ocean and Earth Division, STA (Japan)
Chris Pigram	Australian Geological Survey Organisation,Sydney, Australia
Michael Purdy	National Science Foundation (United States)
Toshio Shimoda	JAMSTEC (Japan)
Pierre Vidal	CNRS, Paris, France

JOIDES Office

Kathy Ellins	Science Coordinator
Christina Chondrogianni	International Liaison

Apologies

Brent Dalrymple	College of Oceanic & Atmospheric Sciences, Oregon State
Arthur Nowell	School of Oceanography, University of Washington

JOIDES EXECUTIVE COMMITTEE MEETING
AT
DEUTSCHE FORSCHUNGSGEMEINSCHAFT (DFG)
BONN, GERMANY

JUNE 23 -24, 1998

DRAFT MOTIONS

EXCOM Motion 98-2-1

EXCOM approves the Agenda for the June 1998 EXCOM Meeting.

Proposed by Orcutt; seconded by Beiersdorf.
15 in favor;one absent (Nowell).

EXCOM Motion 98-2-2

EXCOM approves the January 1998 EXCOM Meeting Minutes.

Proposed by Raleigh; seconded by Feary
15 in favor; one absent (Nowell).

EXCOM Motion 98-2-3

EXCOM welcomes China to ODP and congratulates all those whose efforts contributed to this achievement. EXCOM looks forward to active and growing involvement of scientists from the People's Republic of China in all aspects of the Program, and the scientific excitement and advances that their involvement will stimulate.

Proposed by Briden; seconded by Leinen.
15 in favor; one absent (Nowell)

EXCOM Motion 98-2-4

It is with great pride and admiration that EXCOM congratulates our colleague, Sir Nicholas Shackleton, on his knighthood. He is the latest Shackleton to be honored for his voyages of discovery. Like his ancestors, Nick Shackleton has mapped new territories: his contributions to the CLIMAP, COHMAP and SPECMAP provided guides for countless geoscientists who followed him along paths of knowledge of the Pleistocene and Holocene. Never to be constrained to "PC" (piston core) subjects, he is truly a man for the ages (including pre-Pleistocene ages, as well as the PAGES and IMAGES). Shackleton has shown his mastery of the nuances of tone and harmony whether the frequencies are in sound or climate. He does his work in a true spirit of generosity, collegiality, and of modesty - he has more clarinets than shoes. We thank him for sharing his wisdom and his wit with us and send our very best wishes for the future.

Proposed by Leinen; seconded by Raleigh
15 in favor; one absent (Nowell).

EXCOM Motion 98-2-5

EXCOM approves the FY 1999 Program Plan.

Proposed by Raleigh; seconded by Stoffa
13 in favor; 2 abstentions (Feary and Pisias - conflicted);one absent (Nowell).

EXCOM Consensus 98-2-6

EXCOM endorses the framework for future budgetary decisions based on a prioritization of themes of the Long Range Plan which was developed by SCICOM in response to EXCOM Motion 98-1-8. EXCOM looks forward to receiving a report from SCICOM upon completion of this task in September of 1998.

One absent (Nowell).

EXCOM Motion 98-2-7

EXCOM endorses the revised policy on Associate Membership levels with corresponding JOIDES panel representation as modified by EXCOM at this meeting, and recommends its adoption to ODP Council.

Proposed by Harrison; seconded by Leinen
14 in favor; one abstention (Mével - France); one absent (Nowell).

ASSOCIATE MEMBERSHIP

Although a policy of full and equal participation remains a goal of ODP, this document identifies degrees of participation in the JOIDES Advisory Structure at reduced membership levels. Membership levels will consist of Full Members and three levels of Associate Membership. Each level has defined degrees of participation in the JOIDES Advisory Structure. Countries and consortia at all levels have the right to observer status on all JOIDES panels and committees, and can participate in their discussions at the discretion of the chair.

Only Full Members of ODP (whether individual countries or consortia) have voting rights in the policy- and scientific-decision making for ODP (i.e. on EXCOM and SCICOM). All other levels of membership do not include representation on EXCOM and SCICOM.

For the purposes of defining the Associate Member levels, the standing Panels and Committees within the JOIDES Advisory Structure are divided into three groups:

Group I (Highest level of advice on ODP science and policy)
EXCOM
SCICOM

Group II (Scientific advice)
ESSEP
ISSEP

Group III (Technical and operational advice)
SCIMP
SSP
TEDCOM
PPSP

Privileges of Different Membership Levels

1.SHIPBOARD PARTICIPATION

Shipboard participation will be directly proportional to the contribution.

2.PARTICIPATION IN THE JOIDES ADVISORY STRUCTURE

Membership Level	Contribution	Privileges
Associate 3	2/3	One member on all Panels of Groups II & III;
Associate 2	1/2	One member on one Panel from Group II; One member on two Panels from Group III;
Associate 1	1/6	One member on one Panel from Group II; One member on one Panel from Group III

EXCOM Motion 98-2-8

EXCOM urges the ODP Council to maintain the principle of full, equal international membership to the maximum extent. Recognizing that this has not always proved possible, the JOIDES Executive Committee agrees on the following rules for members that have been full contributors in the past, but who have reduced their contribution below the full subscription:

(1) Shipboard participation will be in proportion to their contribution
(2) Provided that they satisfy the following criteria, they will be permitted to retain their full privileges on committee and panel membership
(a) Contribution must be equal to or greater than 5/6 of a full membership
(b) They must make a firm commitment to work towards full membership

(c) They must make significant progress towards achieving full membership each year. The Executive Committee will review the situation annually.

(3) If these conditions are not met, then the member will be designated as an associate member of the appropriate category.

Proposed by Harrison; seconded by Prior.
14 in favor; one abstentions (Mével - France); one absent (Nowell).

EXCOM Motion 98-2-9

EXCOM approves the general Four Year Ship Track for the *JOIDES Resolution* set by SCICOM at their March 1998 Meeting (SCICOM Motion 98-1- 11)

Proposed by Feary; seconded by Raleigh.
10 in favor; four abstentions (Pisias,Orcutt,Taira,and Eldholm - conflicted); two absent (Nowell and Harrison).

EXCOM Consensus 98-2-10

The JOIDES Executive Committee welcomes Dr. Kate Moran to her new position as Director of the Ocean Drilling Program at JOI. The future holds great opportunities for ODP as it celebrates its 30th Anniversary and looks forward to new scientific and managerial challenges. Scientifically, the future for ODP has never been brighter with potential new opportunities in understanding the role of fluids in the ocean lithosphere, the extent of the geobiosphere, the long-term history of climate on Earth, and the exploitation of ODP's technology in making global and regional observations at all spatial and temporal scales. We wish Kate our best as she accepts these new responsibilities.

Proposed by Orcutt; seconded by Prior.
One absent (Nowell)

EXCOM Consensus 98-2-11

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

One absent (Nowell)

EXCOM Consensus 98-2-12

EXCOM notes with satisfaction all efforts by Japanese authorities to advance the future of the Ocean Drilling Program, in particular by budgeting for related projects on the development of core sampling systems, development of long-term monitoring systems for legacy holes, and for the development of advanced site survey technology for characterizing the seismogenic zone near Japan.

EXCOM also welcomes the MOU between JOI and JAMSTEC for close cooperation in studying the most favorable manner for ocean drilling operations and in developing borehole measurements and bit technologies. We encourage both organizations to implement the terms of this MOU.

Proposed by Raleigh; seconded by Briden.

One absent (Nowell)

EXCOM Consensus 98-2-13

The JOIDES Executive Committee thanks Professor Nick Pisias for his extraordinary and selfless service to the Ocean Drilling Program. Over the past six months, Nick has provided a steady hand at the helm, instituted a refreshing openness and spirit of team leadership that helped the Program successfully navigate this transitional period. We appreciate the personal sacrifice he made in undertaking this job, which has entailed numerous transcontinental flights, and long periods away from home and soccer games. We wish Nick great success and happiness in his return to Oregon State University and his research, and welcome his future leadership in ODP.

Proposed by Orcutt; seconded by Beiersdorf.
One absent (Nowell).

EXCOM Consensus 98-2-14

The Executive Committee thanks Bob Detrick for his leadership of JOIDES during the past two years. He has given himself selflessly to the promotion of ocean drilling and done an excellent job of leading the Program through challenging times. Although his national and international travel has been demanding, he has continued always in good humor his leadership task.. The Program, thanks to Bob, stands poised for an exciting Phase IV in the next millennium, We wish him great success on his future scientific endeavors and his leadership of the oceanographic scientific community.

Proposed by Orcutt; seconded by Leinen.
One absent (Nowell).

JOIDES EXECUTIVE COMMITTEE MEETING
AT
DEUTSCHE FORSCHUNGSGEMEINSCHAFT (DFG)
BONN, GERMANY

JUNE 23 -24, 1998

DRAFT MINUTES

TUESDAY June 23 8:30 am

1. Welcome & Introduction

1.1 Detrick welcomed all participants to the summer EXCOM meeting and thanked Deitrich Maronde for graciously hosting the meeting. EXCOM members, liaisons, and guests were introduced. Kate Moran, formerly of the Bedford Institute of Oceanography (BIO) in Canada, is the new director of ODP at JOI. Nick Pisias attended the meeting not in his previous capacity as Interim ODP Director, but representing Brent Dalrymple from OSU. Arthur Nowell was absent because, unfortunately, he became ill during his flight to London, and is convalescing in the hospital in London. Since the JOIDES Office will be moving to GEOMAR, Germany in January 1999, Bill Hay and Warner Bruckmann, who will be the Chair of SCICOM and the JOIDES Science Coordinator, were present.

1.2 Meeting logistics

Maronde welcomed all EXCOM, ODP Council and IWG participants to the DFG. Detrick expressed thanks to Maronde for the interesting field trip which explored the surrounding area.

1.3 Approval of Agenda

EXCOM Motion 98-2-1

EXCOM approves the Agenda for the June 1998 EXCOM Meeting.

Proposed by Orcutt; seconded by Beiersdorf.
15 in favor; one absent (Nowell).

2. Minutes and Matters Arising

2.1 Approval of January 1998 EXCOM Minutes (TAB 1)

EXCOM Motion 98-2-2

EXCOM approves the January 1998 EXCOM Meeting Minutes.

Proposed by Raleigh; seconded by Feary
15 in favor; one absent (Nowell).

3. NSF Report

3.1 NSF Management Report (TAB 2)

Heinrichs reported that there was little to add to the report in the Agenda Book. NSF has provided JOI with a target budget of $48.5 million which includes the second increment of $3 million of the total of $6 million promised for the refurbishment of the JR. NSF has approved the appointment of Kate Moran as ODP Director at JOI. He welcomed her on behalf of NSF.

The FY 1999 NSF budget has not yet been finalized.

3.2 Membership (TAB 3)

- China

China signed an MOU in April and Professor Wang of the People's Republic of China will attend the ODP Council session. Heinrich's noted that China is the first Associate Member of ODP.

EXCOM Motion 98-2-3

EXCOM welcomes China to ODP and congratulates all those whose efforts contributed to this achievement. EXCOM looks forward to active and growing involvement of scientists from the People's Republic of China in all aspects of the Program, and the scientific excitement and advances that their involvement will stimulate.

Proposed by Briden; seconded by Leinen.
15 in favor; one absent (Nowell)

4. Country Reports (TAB 4)

4.1 Australia-Canada-Chinese Taipei-Korea

Feary said he wished to emphasize his previous remark that the Asian economic crisis has had a devastating impact on PACRIM. This, in combination with the strength of the US dollar, poses a problem for the consortium. Korea, for example, had previously received approval to increase their contribution from the 1/12 to the 1/6 level. At present, however, they will have to triple their contribution to meet the original 1/12 level.

Larry Mayer has completed his term as Chair of the Canadian Council for ODP. Changes in the Australian ODP structure include the replacement of Bob Carter by Jock Keene as the Secretariat has moved from Townsville to Sydney, Chris Pigram has taken over the duties of Australian ODP Council Chair, and Alexandra Isern will take over as Chair of the Australian ODP Scientific Committee.

Feary mentioned the difficulty of integrating new members into the consortium. It takes awhile for the broad based involvement to be achieved and he urged JOIDES to be sensitive to this as China, the new Associate Member, may be similarly affected.

Discussion:
Fox noted that the steep learning curve cuts both ways as new members become incorporated into ODP. He wondered whether ODP/TAMU could do something to help the process of integration and asked Feary if he had suggestions. Feary recommended being sensitive to the matter and doing all that can be done.

4.2 ECOD
Eldholm reported that the ECOD Management Committee met on June 8. With regards to financing of their membership in ODP, there is a discrepancy of 1-2% in the membership contribution which ECOD is confident can be resolved in the near future. More detailed information will be presented at the Council meeting. A consensus was not reached on the selection of Eldholm's replacement to EXCOM. If this has been resolved, it will also be reported at the Council meeting.

4.3 France
Mével reported that France's contribution will be decreased to between one third and two thirds of a full membership. France will not commit to working towards increasing to a full membership level, nor will any attempt be made to form a consortium. Mevel reported that the responsibility for French membership in ODP will move from IFREMER to CNRS next year. Mével introduced Philip Vidal, Director of CNRS Earth Science Division, who was present as an observer.

4.4 Germany
Beiersdorf reported that Germany has established a working group for scientific drilling in the Eastern Mediterranean as a starting initiative for a larger international project that will include drilling on land, as well as offshore. Germany hopes to attract European and international support for this endeavor which, in its initial phase, will investigate the continent-continent collision in the eastern Mediterranean. The eastern Mediterranean is the only place in the world where you can see continent-continent collision in its final stage. The working group is composed of participants representing the paleoclimate and geophysics communities, and the ICDP, KTB, and ODP groups. Contact with other countries will soon be initiated, particularly with Greece, which is expected to be a strong participant in the effort. The final goal is to drill a seismogenic zone in the eastern Mediterranean - the second such effort prior to IODP (the first will be at a seismogenic zone close to Japan). Germany wants to establish formal links in Europe for the joint planning and use of larger facilities in Europe. This working group is seen as a vehicle for

this type of interaction. Recently, there was a meeting following the annual ODP meeting in Germany in March to explore opportunities in Brussels for additional funding for ODP/IODP-related research. It was learned that there are possibilities to fund science projects as well as technological projects, although technological projects are favored. There is, however, reluctance to fund large scale projects like ODP.

4.5 Japan

Taira reported that the Japanese government has approved a new supplemental budget for 1998 which includes new money for ODP - Japan. These funds will be used for the enhancement of site survey capabilities. Six million dollars has been earmarked for a side scan system, and echo sounder. JAMSTEC has also received a large amount in a supplemental budget for ODP-related activities. Taira added that, contrary to reports in the newspapers, Japan still has a strong commitment to long term investment in science and technology.

4.6 PRC (The People's Republic of China)

4.7 UK

Briden reported that Professor Nick Shackleton has been knighted, and commented on the impact of the second ODP European Forum, which will take place in Edinburgh on September 19-22, on long-term planning for ODP in Europe. He said that the UK marine science community considered what "top of the list" science should be done post-2003. NERC shared this prioritized list at a session at the Lisbon meeting (Third European Conference on Marine Science and Technology) chaired by Christian Patermann. At that meeting, it was revealed, as already mentioned by Beiersdorf, that the various European partners are thinking about the science and technology that can be done within the context of the facilities that might be available in the future, including the Japanese vessel, and new prospects for technology development in the hydrocarbon industry. He said that this thinking will serve as the backdrop for the Edinburgh meeting, which follows on from the Oldenburg meeting two years ago. There will likely be a separate session to talk things through for European EXCOM members and other key individuals in Europe sponsored by EMAPS. Julian Pearce (UK SCICOM member) is urging the European partners to go through a similar exercise to the UK; that is, a prioritization of the science that can be done post-2003.

Discussion:

Eldholm urged EXCOM to take note of the industry/academic-oriented initiatives which could serve as a template for work either within, or in affiliation with, ODP itself. He added that there are very interesting prospects that should be followed up on.

Heinrichs said that the Lisbon conference was the Third MAST Conference. The session Chaired by Christian Patermann focused on potential European contributions to long-term post-2003 scientific ocean drilling. ODP Council and IWG will have a more organized presentation of the outcome of this meeting. Heinrichs stated that while he may have missed some of the nuances of the interaction, it is his impression that the EU would not sponsor a membership in ODP, although there is a desire to fund fixed-term

projects that will contribute to carrying out ODP science. Briden noted that there is a one page official summary of the Lisbon meeting and a paper by Ludden and Wefer. While neither document has been approved by participants yet, and he does not wish to invest them with an authority they do not have, they contain some interesting statements. For example: "Involvement of the European community in ocean drilling in the 21st century must look past its own margins to become global". Briden said the significance of this statement is that it removes limits on the scope of research that can be sponsored by the European community. "The new integrated ODP now being planned will present a new vision of scientific drilling which the EC could be intimately involved in both the planning and the execution. The new program must involve a multi-platform approach to drilling and the costs involved are large, if not prohibitive. Europe will be able to participate in this new exciting global initiative only through a coordinated approach involving industry and academia of its member states." Mével said that she understood that progress has been made with respect to the projects that can be funded. Beiersdorf explained that projects outside of Europe can now be funded, if they are of interest to Europe. This was clear and is the first time that this has been explicitly stated.

EXCOM Motion 98-2-4

It is with great pride and admiration that EXCOM congratulates our colleague, Sir Nicholas Shackleton, on his knighthood. He is the latest Shackleton to be honored for his voyages of discovery. Like his ancestors, Nick Shackleton has mapped new territories: his contributions to the CLIMAP, COHMAP and SPECMAP provided guides for countless geoscientists who followed him along paths of knowledge of the Pleistocene and Holocene. Never to be constrained to "PC" (piston core) subjects, he is truly a man for the ages (including pre-Pleistocene ages, as well as the PAGES and IMAGES). Shackleton has shown his mastery of the nuances of tone and harmony whether the frequencies are in sound or climate. He does his work in a true spirit of generosity, collegiality, and of modesty - he has more clarinets than shoes. We thank him for sharing his wisdom and his wit with us and send our very best wishes for the future.

Proposed by Leinen; seconded by Raleigh
15 in favor; one absent (Nowell).

4.8 USA

Malfait mentioned the uncertainties associated with the FY 99, and to some extent, the FY 98 budgets. ODP at NSF is faced with supporting the mid-life upgrade of the drill ship within the total overall ODP budget. The only place where there are options to manage FY 98 and 99 expenses is the US Science Support Program which supports field programs directly from NSF, as well programs at JOI. NSF is trying to keep US Science Support activity on a reasonable growth curve; that means that over the next year or two there will be a reduction in NSF/ODP-related field programs.

Update on 1998 activities

- All the OSN instruments have been recovered and all ran well for over three months.
- There will be an international meeting in September related to the Margins initiative.

Malfait introduced Jamie Allan, formerly of ODP/TAMU, who will be managing US science participation in ODP.

Regarding post-2003 activities within the US, Pisias added that the COMPOST2 document, and NFS's response to it, will be published in EOS.

5. FY 1999

5.1 Presentation of the final FY 1999 ODP budget (TAB 5)

Pisias said that it was a pleasure to have worked with Goldberg, Fox, and the JOI staff.

Pisias reported that the $900K FY 99 budget deficit, which had existed at the time of January 1998 EXCOM Meeting, was solved for this year and the budget is balanced. To balance the budget, some items were eliminated (i.e. the hammer drills, which SCICOM had indicated were needed). He added that he had also exploited the "tricks of the trade". By extending the existing LDEO contract instead of issuing a new one, for example, some tens of thousands of dollars in overhead were saved. He indicated that Humphris would expand on the summary budget table in the Agenda Book and present SCICOM's prioritization of items/activities, should funds become available (Appendix 1).

Discussion

Orcutt suggested that there was another "sleight of hand" in the budgeting with regard to the microbiology facility. He noted that the $400K figure for this facility had been taken out of the list of X-Base items and placed in a "special category". He asked what the designation, "special category", really meant. Pisias said that this was not the case and explained that the approach being taken by SCICOM with respect to the microbiology facility was a phased approach, initially providing the minimum amount of equipment on the ship. He questioned whether this was the correct approach.

5.2 Impact of the final FY 1999 budget on Program delivery (TAB 6) FY 1999 Science Plan

Humphris reviewed the FY 1999 science plan, previously approved by EXCOM in January 1998.

Next, she traced the evolution of the budget. She showed SCICOM's recommendations of priorities for the X-base budget that were developed at the August 1997 meeting (Agenda Book, Tab 6, p. 2) and compared these to what remained of SCICOM's original recommendations in the final budget (Agenda Book, Tab 6, p. 3). FY 1999 is a year without LWD and ice support and so the FY 1999 TAMU and LDEO leg-based budgets are very cheap. In spite of this, there was a struggle to get many items into the budget. Humphris predicted that problems in future will be more acute. At the March 1998 meeting, SCICOM and OPCOM produced a prioritization by group (Consensus 98-1-3) of items that they would like to see reinstated, should additional funds become available

in FY 1999 (Agenda Book, Tab 6). Many items in the top group are logging tools that will enhance the science of a leg. At the top of the list is the GLT, which was cut from Leg 185. This tool, essential for assessing the downhole geochemical variations, especially in cases where core recovery problems occur, was requested by the Co-Chiefs and the lead proponent for the Izu Mariana program. The sonic tool (WST) is the check shot tool which is very useful for high resolution seismic correlations of sedimentary sequences. Leg 184, East Asian Monsoon, would really benefit from the deployment of the WST. The WST would also be useful for the sedimentary sequences at Kerguelen (Leg 183), but perhaps less so than Leg 184, thus it has slightly lower priority. The VSP would be very helpful in characterizing the area around the two observatory sites planned for Leg 186. It is important to have information about the environment in which long-term observatories are set up. The ARI is an upgrade of a tool that ODP currently uses, the lateral log. SCICOM felt that it would be great to have higher quality data, but this does not appear possible with this budget.

SCICOM also added one operational hammer (hammer drilling system) back into their prioritization scheme because there is a proposal under consideration for which the hammer drilling system would be needed IF this proposal is deemed a high priority for the program by SCICOM in August.

The Microbiology Lab is in a special category. SCICOM has firmly said that they want to do something related to the Deep Biosphere Pilot Project. It presents an opportunity for the Program to make an important contribution to a field in which ODP has not been previously involved. One of the difficulties is how to go about it. SCICOM opted for a phased approach. However, SCICOM has not yet obtained clear estimates of what is needed to begin to tackle this project. The Chair of the Deep Biosphere PPG has been invited to the August 1998 SCICOM meeting to present an assessment of what is really needed. With the present FY 1999 budget, it is not possible to undertake getting a facility on board. Meanwhile, the microbiologists are trying to determine what the contamination and sampling issues are. Without carry forward funds for FY 1999, ODP will not be able to advance this initiative.

The Downhole measurements lab is a big ticket item. The idea was to expand it. SCICOM felt that it would be great to do but the Program does not have the money at present. Downhole measurements are currently carried out, and the Program will have to continue to do things as they are done now. Of the remaining top projects in SCICOM and OPCOM's March 1998 prioritization, CORESEIS and Borehole Stability Project are innovations.

Discussion

Feary asked about the fate of the mirror sites. Humphris said that these have been deferred, although it is recognized that they must be an integral part of an interrelated publications and data distribution policy. SCIMP will examine and address this issue. Maronde indicated that moving forward on the microbiolgy project will serve to broaden the base of support for ODP in Germany.

ODP/TAMU

Fox reported that while all core services will be delivered by ODP/TAMU in FY 1999, there are some consequences which are hard to quantify, but easy to identify (Appendix 2). The range of activities that will be restrained are:

- Leg operations. Fox explained the phenomenon of "leg creep" which has historically affected the budgeting process of legs. As a leg matures and moves beyond the initial budgeting phase, the Co-chiefs get involved and, as a natural consequence of the necessity to refine an experiment, the budget for the leg often grows by $50K to $100K. Leg 180, for example, increased in expense by a quarter of million dollars because of the cost of the hardware (i.e. perforated casing) needed to address a fundamental problem in geoscience. TAMU will not be able to accommodate this type of growth in the future. One way that TAMU is trying to address "leg creep" is by scheduling pre-leg meetings to jump-start the budgeting process for sophisticated programs on the horizon. Proposal 445 (Nankai) is a good example. Although it is not yet scheduled, a subset of the key Nankai proponents met with TAMU representatives at TAMU in May 1998. This will minimize "leg creep" and help TAMU to be able to more realistically estimate the cost of a leg before the proposal, if highly ranked by SCICOM, is considered for scheduling by OPCOM.

- The pace of engineering technology projects is reduced.

- The training of staff has been cut back by about 80% in some of their functional centers. TAMU has historically considered this high priority in order to take advantage of technologies coming on line, and in recognition that such professional enhancement is mutually beneficial to both TAMU and staff.

- The replacement of aging computers and laboratory equipment is far below that considered acceptable. In the past, computers were replaced on the ship once every three years, and in the shore-based facility, once every 5 years. TAMU has fallen away from that replacement rate in the past 4 years and are finding that the ability to catch up in this financial environment is difficult.

- TAMU has reduced the inventory of drilling and lab stack supplies to keep inventories at the very minimum levels that have been historically required. TAMU is depending on a new inventory process that will be more proactive in identifying when things have to be replaced. This is a difficult game to play in the drilling industry because there is so much activity in this type of market that the lead time is measured in years.

- Only essential vacancies are being filled. TAMU is testing to see if it is possible to leave some FTEs open. Fox will only fill a vacant FTE if the "patient" (functional center) appears to be going belly-up!

The consequences of this situation is a reduction in innovation and the ability to respond to scientific opportunities. In addition, there is reduced morale and a general

feeling of frustration among the staff, and a loss of efficiency at some levels. TAMU is currently exposed to major equipment loss and failure, and has reduced its ability to respond. These ongoing consequences have been managed over the last few years, but this will not be possible in the future.

Discussion

Mutter asked if decreased morale causes people to leave, or creates difficulty to recruit good people. Fox responded that decreased morale is seen within the organization itself. With respect to the drilling industry and information services, the job market is robust. There is turnover at TAMU as a consequence of decreased morale and because TAMU cannot compete with the salaries being offered elsewhere.

WLS/LDEO

Goldberg reported that the WLS will also be able to put the FY 1999 budget into action without major negative implications (Appendix 3). Savings are associated with the indirect cost of the logging contract, as explained previously by Pisias, but primarily with respect to salaries. The WLS has been hiring less experienced personnel at lower salaries, although this increases training expenses. As a result, it will not be necessary to downgrade the porosity tool. In addition, WLS is moving forward with plans for modest modification to the DHML on the ship during dry-dock and the development of the software package for the core-log integration. Thus, some innovation is taking place. Goldberg noted that Humphris has pointed out the special deployments tools that were not funded for some legs; however, on the positive side, five specialty tools are funded for FY 1999. On the negative side, there is no backup for the APS and HNGS tools and this poses an operational risk. Overall, LDEO will be fine for FY 1999.

Discussion

Detrick said that EXCOM had delved into this in more detail than in the past, but he felt that it was necessary for the Committee to understand what had been involved in meeting the budget target. The presentations have given a sense of what sacrifices have been made to achieve the target budget - it is beginning to have implications with respect to science delivery in the short term in terms of certain tools not being run on particular legs, and there will be longer term consequences in terms of things like upgrades to the laboratories not taking place, or development projects being curtailed. This is a message that EXCOM needs to be aware of, and that EXCOM must convey to ODP Council (Humphris and Detrick attended the Council meeting). Detrick added that it was worth reiterating the point made by Pisias that some of the savings that have been made in meeting the budget target this year are one-time savings which cannot be reproduced again in the future to deal with anticipated budget shortfalls. Following the break, EXCOM will consider what mechanisms will be in place to make these future decisions.

Orcutt asked what efficiencies have allowed for the reduction in the amount budgeted for repositories. Fox replied that this represented a reduction in the number of FTEs staffing the repository at Scripps. TAMU examined the use of facilities and made the decision to cut the second FTE at Scripps. The individual involved, however, has not lost his/her job, but will sail instead as a shipboard technician. TAMU is continuing to examine

ways of maintaining services at this repository. Pisias pointed out that the ship is going back to the Pacific and there may be renewed interest in samples taken previously.

5.3 Approval of the FY 1999 ODP Program Plan (TAB 7)

Detrick asked EXCOM to formerly approve the budget for the FY 1999 Program Plan. He reminded EXCOM that they had previously approved the science plan for FY 1999 at their January meeting.

EXCOM Motion 98-2-5

EXCOM approves the FY 1999 Program Plan.

Proposed by Raleigh; seconded by Stoffa
13 in favor; 2 abstentions (Feary and Pisias - conflicted);one absent (Nowell).

6. Phase III Issues

6.1 Potential impact of the Phase III Budget projections on program delivery.

Pisias refereed to the figure in the agenda Book. (TAB 8, page 4) and showed an overhead of phase III budget projections (Appendix 4). The projected deficits are primarily linked to the day rate increases. In order to translate the projected deficits into science loss, Pisias, in connection with TAMU, categorized proposals now in system by levels of expense: moderate legs cost up to $200K and very expensive legs cost up to $1 million above a standard level (Appendix 4 - tables that show the cost of the science under consideration). Pisias noted that in FY 1997 the legs scheduled are not super expensive legs. Based on this exercise, Pisias projected that $14 million would be required to accomplish the science in these proposals from now until the end of the Program in 2003, resulting in a problem on the order of $5-7 million to be addressed.

Discussion

Briden noted that there were 27 proposals in the list of proposals analyzed and that this number exceeds the number of proposals that can be drilled in the remaining four years. Consequently, a percentage of the $14 million figure will disappear by time pressure. Pisias replied that Briden was correct that not all 27 proposals considered will translate into legs. In reality, there are only 24 more legs that can be scheduled to be drilled. Briden said that 15% of the $14 million would disappear by time pressure, but he pointed out that 85% is still a large number. Pisias said that he could be off by $2 to $4 million, but it is still a lot of money. He added that there are programs proposed that would be very difficult to carry out without some change in the funding. Detrick said that it was interesting to observe the distribution of legs with respect to the science, and especially noted the predominance of high latitude legs.

6.2 SCICOM response to EXCOM Motion 98-1-8: Procedure to provide a framework, based on a prioritization of themes of the Long Range Plan, for future budgetary decisions.

Detrick summarized EXCOM's charge to SCICOM with the question: "How do we select which components of the science plan can be attacked within the constraints of the current budget projections?"

Humphris described the approach taken by SCICOM at the March 1998 meeting in response to this motion. Rather than prioritizing and then cutting things, SCICOM took a programmatic approach; that is, looked at the scientific priorities and asked the question, "What services or technological developments are needed in order to meet those objectives?". SCICOM identified three different activities required to address the question. First, the solicitation of advice on the prioritization of the science that the Program should accomplish in Phase III. And, given that science, definition of the required technological developments. The SSEPS were tasked with beginning this activity. The second activity is the identification of the services required to achieve these objectives. SCIMP was charged with this activity. The third activity, to be carried out by SCICOM, is a compilation of information provided by the SSEPs and SCIMP, the development of a final framework into which the budgetary projections can be placed, and a prioritization the science to be done. Humphris referred to the flow diagram in the Agenda Book (TAB 8). She outlined the process and activities of the panels and groups charged with specific tasks, and reviewed the timetable. Humphris noted that the scientific prioritization would occur at the same time as the programmatic prioritization, after which the two SCICOM subcommittees would examine the environment and interior themes and integrate all the input prior to the August SCICOM Meeting. Humphris said that it would not be desirable for the Program to settle on doing a little bit less of everything. Instead, she expects that the outcome will be a series of objectives (some of which may be extremely expensive) and a hierarchy for decision-making in the context of different budget scenarios. For example, SCICOM may decide that Antarctic drilling is the highest priority of the Program, of such importance that SCICOM will give up everything to accomplish the task. Or, SCICOM may determine that Antarctic drilling cannot be achieved and will then select from among another category of less expensive high priority scientific objectives. She would like to identify three or four high priority things that ODP will set out to accomplish, depending on the budget situation.

Discussion

Pisias said that SCICOM will have to look at the budget and decide which are the top **priorities**. This should be done once, and not each year. Humphris agreed and said that for themes that involve a lot of expense because of the large technological component (i.e. Antarctic and hard rock drilling), SCICOM will have to determine which of these is their top priority. This will be tough!

Eldholm noted that the need for **ice boats** for high latitude legs was mentioned at the last EXCOM meeting. He asked if it was realistic for ODP to expect to see outside funding for

their acquisition, and inquired about the consequences. Pisias noted that Prydz Bay was put on the schedule on the condition that the proponents could come up an ice boat. If someone else pays for the ice boat, the cost of the Prydz Leg becomes fundamentally different. There is a dilemma to do this within ODP's planning time frame. Fox said that Pisias had identified a key issue, but noted that the proponents are aggressively searching for vessels/ice platforms and there are some potential opportunities that could reduce the cost of ice support for ODP. However, there are problems of timing because, until a leg is scheduled, ODP/TAMU cannot go to an ice ship operator to vigorously engage them in a dialogue and commit to leasing a vessel. SCICOM wants to assess the results of Leg 178 before committing to Prydz Bay as Leg 188. Thus, TAMU is being held hostage by the natural evolutionary process of the Program and the time schedule. Pisias added that there is also a problem with the budgeting process. He added that the Prydz Bay proponents are trying to identify suppliers of vessels and then TAMU will engage them in the dialogue to acquire the vessel. This process commenced in the spring. Humphris told the committee that there is Swedish icebreaker that has been offered as a part of a new proposal currently in the JOIDES system.

Detrick declared that the pursuit of outside funding is an option that ODP must explore. The only way that Antarctic and other expensive highly ranked legs, like Nankai, will be scheduled is if there is some contribution from other countries or geoscience programs that are particularly interested in certain legs. **Expensive legs** are not only going to have to be well-justified but also need to bring funds to the table. This message must be communicated to proponents of proposals in the JOIDES system. Humphris said that all the proponents of the most expensive high ranking proposals are well aware of this issue. This applies especially to the Nankai proponents who have become very aware as a more realistic estimate of the costs of that program has been acquired. Mével reminded EXCOM that many international programs do not have money. Detrick noted that they have contacts and that their endorsement could help proponents to acquire outside funds.

Mutter suggested that the more ODP goes through the exercise of prioritizing and cutting back, the more it allows non-US members to think that they can drop out and it won't matter as NSF will supplement the Program. The problem is that ODP seems to be unable to quantify or discuss the impact of the shrinking budget on the **growth of knowledge**. He indicated that the cost of the Program might be reduced in one way, but in another way, it becomes more expensive because the cost per unit advancement of knowledge actually goes up since a lot less is learned per leg. This process may have turned ODP from a relatively efficient program to a relatively inefficient program in terms of knowledge generation.

Raleigh asked about **contributions from industry.** The oil industry is not spending as much on research as before. Although individual proponents can approach local oil industry companies within their own countries, there might be some advantage in having the heavier weight of EXCOM pursue industry participation and support. Otherwise, ODP will not be doing the kinds of things in which industry is particularly interested. The national contributions might be leveraged because these expensive legs are the ones

that are of interest to industry. JOIDES as a group needs to approach industry, but with some assurances that the national contributions will be enhanced, not replaced, by this source. Detrick said EXCOM has addressed this issue in the past and will consider it again at this EXCOM meeting.

Detrick noted that, with respect to science delivery per leg, certain tools that will increase the scientific benefit of a particular leg will not be run. **SCICOM's task** will be to identify the smaller number of things that can be done well so that the scientific benefit from the legs done will be high. The broad spectrum of goals embodied in the entire set of JOIDES proposals will not be addressable. This is the most difficult thing for SCICOM and the community to deal with because JOIDES is used to feeling that it is possible to do a little bit of everything, while only a subset of goals can be accomplished. The SSEPs have had difficulty in grappling with this. The message for EXCOM to communicate to them is that the science delivery should remain high. Since not everything can be accomplished, EXCOM wants them to recommend what delivery can be cut back to achieve this aim. Humphris reiterated that the approach is to identify the science and then say what services are needed. What should be cut is what is not necessary to address the objectives. This is a huge task for SCICOM to accomplish in one meeting, but the message of what EXCOM has asked SCICOM to do is clear.

Briden noted that **ODP Council**, except during the recent renewal period, meets annually. He said he expected ODP Council to be disappointed by the progress reflected in the papers of this EXCOM meeting. He emphasized the importance of conveying to Council the progress that has been made and to explain the timing, in particular, to point out that that SCICOM will report back to EXCOM in September. Previously, some members of ODP Council were impressed that JOIDES was at last getting a grip on the issues. Detrick said that the timing has been driven by wanting to do a thorough job, and works well in terms of the development of the next fiscal year's budget. The output will be available as the budget is developed. Pisias says that the plate that SCICOM has to deal with at two meetings in one year is very full. He added that he thought that it impossible for them to achieve the necessary interaction with the other panels. Humphris explained that there will be only one meeting of the SSEPS during the time required. Eldholm expressed concern that SCICOM might not be able to do the job with two meetings a year and may need more meetings. Humphris disagreed and expressed confidence that SCICOM can handle the task within the necessary time frame.

Leinen said she was pleased that Humphris had turned the focus back from cutting services to **highlighting science**. She emphasized that an important piece of this would be how to struggle with the problem of whether you are prioritizing objectives or themes in the LRP. It unlikely that the prioritization can be done without eliminating further progress on certain elements of the LRP. She noted that there would be much pressure to not eliminate any of those threads of the LRP and it will be a challenging job, but also an opportunity to accent which elements of the LRP ODP will not be able to advance, allowing ODP to focus its activities on trying to find alternative ways to address these.

Detrick will circulate SCICOM's report in late September so that EXCOM can conduct an electronic discussion of their recommendations.

7. Revised EXCOM policy on JOIDES panel representation for Associate Members (TAB 10)

Detrick reported that until 1995, there had been only one class of membership in ODP. In 1995, at the Edinburgh meeting, the ODP Council approved the category of Associate Membership defined in terms of 1/6 levels of a full contribution. China is the first and only Associate member that ODP has attracted to the Program with this policy. It was noted at the last EXCOM meeting that this issue had to be revisited, in part because of the new structure, and also to address the problem of previously Full members who were no longer able to pay a Full membership. The 1995 Associate Membership Policy provides no easy way of dealing with a country that cannot not make a Full membership. Detrick said that the proposed policy under consideration was developed by the JOIDES Office in consultation with JOI and NSF. Detrick reviewed its elements. The goal is a policy that will serve to attract new members to the Program and, at the same time, encourage participating Associate members to upgrade to a Full membership.

The proposed policy defines three levels of Associate Membership and one level of Full Membership. Recognizing that some unanticipated events occur, the policy would allow a Full member to drop down to the Associate level status, but with reduced participation in legs and the JOIDES advisory structure. In brief, the policy attempts to define representation on JOIDES panels/committees, to provide incentives for those members that need to reduce their participation to come back up to Full level, and to attract new members to ODP at the Associate level.

Discussion

MOUs and membership on JOIDES panels. Beiersdorf asked whether different types of MOUs would be required for the different levels of Associate membership. Heinrichs explained that the basic framework of the MOU with China is very similar to the MOU for Full members. The elements pertaining to participation are included in an Annex. Shipboard participation is proportional to the level of contribution. The MOUs themselves do not specify committee membership on JOIDES. In the case of the MOU with China, committee/panel names are indicated in the Annex. Similarly, the Associate membership MOU would need to reference the Annex for the definition of committee participation, in which JOIDES would have a say. Henirichs noted, however, that the Chinese have the right to change the panels in which they participate, although this would require modifying the Annex. Mutter observed that this gives the Associate member the ability to go through all the panels, if they so wish. Raleigh noted that three countries that combined resources to participate at the Associate 2 level (1/2 a Full membership) would each fare better in terms of representations on panels than if they each participated at the 1/6 level. In fact, as a group, they would have a greater representation on panels than each Full member. Pisias noted, however, that the real

benefit for a Full member is greater representation on legs. Beiersdorf asked what the implications of the proposed policy were with respect to the selection of co-chiefs. Heinrichs responded that the MOUs do not provide the details of participation. This is a JOIDES issue. Thus, EXCOM should make the recommendations of what they would like to see with respect to participation.

The right of observers to participate in committee/panel discussions. Mével said that France needs to be able to assure their Ministry of Science that France will be able to participate in committee/panel discussions. She pointed out that the right for observers to participate in discussions that France was seeking was not explicitly stated in the document. Mével said that it was important to state this point explicitly in the policy as observers are not normally allowed to participate in discussions. Raleigh asked if JOIDES meetings were open meetings. Heinrichs indicated that there is no legal right imposed by NSF, no clause saying that the meeting should be open. The level at which observers can participate in JOIDES committee/panel meetings is at the discretion of the chair. Pisias stated that the chair must retain the right to stop participation/discussion, otherwise the Associate member is essentially just like panel members who are representatives of Full members. He also noted that panels can take a meeting into an executive session. Mutter asked if someone from an Associate membership could chair a panel. Heinrichs replied that they could, if they were a member of that panel. The intent of the suggestion made by France is that associate members could be full participants, though not have voting rights. Detrick reminded EXCOM that the policy was not intended to be exclusionary, but an attempt to limit the voting rights. Raleigh observed that being able to participate in discussions is what is important because it allows the participant to influence votes. Mutter suggested that this permitted Associate members to buy their way into influential positions. He added that, if observers are permitted to speak, some Associate members may not consider it really worth the money to participate at a higher level; this does not provide them with an incentive to work towards a Full membership.

Attraction vs. Participation. Mutter noted that ODP wants to attract new members, but not from the present complement of Full members. Associate membership, with scaled participation as a key element, is intended to bring in new members who are unlikely/unable to participate as Full members. "Associate membership", he declared, "is for members whose intellectual contribution is desired, but who cannot make the level of contribution, not for those who chose not participate at a higher level!" Orcutt pointed out that a shrinking budget results in shrinking opportunities and, at the same time, decreases the breadth of members on the EXCOM and other JOIDES panels. A more integrated program is needed if there is to be a scientific ocean drilling program beyond 2003. Orcutt said that he could see the need to limit the current participation but was worried that if participation was limited, then JOIDES would discourage participation in IODP. He noted that Associate membership becomes very attractive if participation on EXCOM is permitted. Heinrichs commented that it was important to retain the fundamental JOIDES structure and honor ODP's commitment to current members. He added that the structure of the future program will be different from the present JOIDES

structure, and what that will be is not yet known. Membership on EXCOM should be as planning needs dictate for ODP. The IWG is the vehicle for post-2003 planning.

Eldholm wondered if Orcutt's concerns could be allayed by inviting Associate members to participate in the IWG. Beiersdorf pointed out that all that is necessary for a country (or consortia) to participate is to simply write a letter of interest to the IWG. Mutter argued that what you need is to encourage scientific participation. Mutter said JOIDES is between a rock and a hard place and queried whether it is actually helpful to have 3 levels of Associate membership. "Associate 3", he added, "is almost too good!" Heinrichs disagreed, saying that he could see benefits to the gradations. Mével said that France has not yet decided at what level they can participate, so it is important for their continued involvement to have different levels available.

Shipboard participation.
Mutter asked if co-chiefs of ODP legs could be from defaulting nations. Detrick replied that being a co-chief is not restricted to Full members. Mutter expressed additional concern that the levels of participation in JOIDES committees/panels defined in the proposed policy did not provide sufficient incentive to encourage Associate members to upgrade to Full membership. Feary said that shipboard participation would to be the real reason for increasing the level of membership. Feary noted that PACRIM, with 11/12 of a Full membership, does not participate fully. He added that the moment the consortium's level of contribution dropped, it was reflected in the shipboard participation. In fact, some scientists from the consortium scheduled to sail on legs were uninvited! Thus, the background section of this agenda item (Agenda Book, TAB 10, p.1) provoked a strong response within the PACRIM consortium. Although Canada has reduced its participation, Australia, Chinese Taipei and Korea, despite difficulty, have met their subscription commitments. For this reason, members of PACRIM felt that the proposed policy unduly and unjustly penalized them, and have suggested that Associate membership be considered separately from the issue of the shortfall of Full members.

Defaulting Full Members. Briden expressed concern regarding the issue of defaulting Full members. He said that the difficulty is that EXCOM may wish that they had established principles in the past. He expressed discomfort with extending the formula set up for Associate Membership to defaulting members. He wants to stick to historical precedents established in the past and to treat the shortfall from Full members as distinct from the Associate membership issue. He said that he preferred EXCOM, guided by certain principles, determine the consequence of the shortfalls of subscriptions. This would involve the degree to which the situation was beyond the direct control of the country (i.e. the fall of the Asian economy). He suggested that a Full member is a Full member! France is a Full member until proved otherwise. Leinen said that she supported Briden's suggestion to separate the two issues and to have principles clearly set forth on paper. This would permit countries to have explicit details of the consequences of an action, which they could then use to leverage their countries' funding agencies. Stoffa agreed with the need to separate exceptional cases and proposed that EXCOM deal with such cases by petition. Detrick agreed that the first issue is the proposed Associate

membership policy, and the second issue is what to do with a members whose level of contribution falls below the Full membership level.

The role of Council. Raleigh said that while he could see the point, he thought the matter was a Council issue. Detrick reminded EXCOM that JOIDES sets up the advisory structure. Heinrichs said that he would like EXCOM's advice. Heinrichs explained to EXCOM that ODP Council is a consultative body which can only accept a document that is acceptable to all participants of the Program. He noted that with respect to the Associate Membership policy, Council is seeking a recommendation from EXCOM. In 1995, Council accepted the Associate membership policy endorsed by EXCOM without modification. If this current policy is a suitable document, then Council will most likely also accept it without modification. Heinrichs further explained that the pre- and post-1995 practice regarding defaulting Full members involved a full discussion of the matter by the ODP Council. Council inquired if the member planned to return to Full membership, and requested an update on progress.

Guidelines. Heinrichs said that he personally felt that it would be useful for ODP Council to have some guidelines from EXCOM, noting that Briden had mentioned (1) the magnitude of the shortfall, and (2) willingness of the defaulting member to return to Full membership as two possible guiding principles. Eldholm said that defaulting members should be asked if they want to drop to Associate member level, or if the solution is being forced on them. They should have one year with the commitment to work towards returning to Full membership status. The consequence that the level of shipboard participation will drop to reflect the level of contribution when any member falls below Full level should also be explicitly stated. Pisias noted that the magnitude of the shortfall would need to be defined, otherwise there could be a case in which the level of contribution of the defaulting member fell below 2/3, but the member continued have the same privileges as a Full member, even though the member was contributing at less than a level 3 Associate member. Leinen noted that NSF can control the level of shipboard participation with the MOUs, and that this change would be reflected immediately. She suggested that one criterion should be that the magnitude is below Full, but above 2/3, and that the intent to work towards full membership should be the second criterion. Detrick suggested that a third criterion could be demonstrated progress towards achieving the goal of returning to Full membership. Heinrichs agreed. He said that Council had reviewed progress on a case by case basis in an informal way. While financial progress did not occur every year, there were demonstrated focused activities towards this end. Briden raised the issue of the tone of the policy. With respect to the Associate Membership policy, EXCOM wished to be encouraging in the tone. In this case, EXCOM does not want to encourage back-sliding by Full members so the tone should be deterrent. He noted that the current French issue was not under consideration here. The French situation had been resolved since France will pay (at maximum) 2/3 of a Full membership.

Advice to JOI. Moran said that she understood JOI's role with respect to the Associate membership issue is to (1) assist consortia in bringing their membership to the Full level, and (2) to develop consortia among the Associate members. She asked for comments.

Following a lively, lengthy discussion, EXCOM modified the wording of the Associate Membership Policy to clearly address entitlements corresponding to the three categories of Associate membership and observer status on JOIDES panels for Associate members, and to emphasize the policy as an incentive for countries to join ODP. In addition, the Framework for a policy regarding members whose contribution falls below the Full membership level, to between 2/3 and Full, emerged. EXCOM agreed that France and PACRIM represent two different situations. France will become an Associate 3. The status of PACRIM will remain the same as it has been in the recent past.

EXCOM Motion 98-2-7

EXCOM endorses the revised policy on Associate Membership levels with corresponding JOIDES panel representation as modified by EXCOM at this meeting, and recommends its adoption to ODP Council.

Proposed by Harrison; seconded by Leinen
14 in favor; one abstention (Mével - France); one absent (Nowell).

ASSOCIATE MEMBERSHIP

Although a policy of full and equal participation remains a goal of ODP, this document identifies degrees of participation in the JOIDES Advisory Structure at reduced membership levels. Membership levels will consist of Full Members and three levels of Associate Membership. Each level has defined degrees of participation in the JOIDES Advisory Structure. Countries and consortia at all levels have the right to observer status on all JOIDES panels and committees, and can participate in their discussions at the discretion of the chair.

Only Full Members of ODP (whether individual countries or consortia) have voting rights in the policy- and scientific-decision making for ODP (i.e. on EXCOM and SCICOM). All other levels of membership do not include representation on EXCOM and SCICOM.

For the purposes of defining the Associate Member levels, the standing Panels and Committees within the JOIDES Advisory Structure are divided into three groups:

Group I (Highest level of advice on ODP science and policy)
EXCOM
SCICOM
Group II (Scientific advice)
ESSEP
ISSEP
Group III (Technical and operational advice)
SCIMP
SSP
TEDCOM

PPSP

Privileges of Different Membership Levels

1.SHIPBOARD PARTICIPATION
Shipboard participation will be directly proportional to the contribution.

2.PARTICIPATION IN THE JOIDES ADVISORY STRUCTURE

Membership Level	Contribution	Privileges
Associate 3	2/3	One member on all Panels of Groups II & III;
Associate 2	1/2	One member on one Panel from Group II; One member on two Panels from Group III;
Associate 1	1/6	One member on one Panel from Group II; One member on one Panel from Group III

EXCOM Motion 98-2-8

EXCOM urges the ODP Council to maintain the principle of full, equal international membership to the maximum extent. Recognizing that this has not always proved possible, the JOIDES Executive Committee agrees on the following rules for members that have been full contributors in the past, but who have reduced their contribution below the full subscription:

(1) Shipboard participation will be in proportion to their contribution

(2) Provided that they satisfy the following criteria, they will be permitted to retain their f ull privileges on committee and panel membership:

(a) Contribution must be equal to, or greater than, 5/6 of a full membership
(b) They must make a firm commitment to work towards full membership
(c) They must make significant progress towards achieving full membership each year. The Executive Committee will review the situation annually.

(3) If these conditions are not met, then the member will be designated as an associate member of the appropriate category.

Proposed by Harrison; seconded by Prior.
14 in favor; one abstentions (Mével - France); one absent (Nowell).

8. SCICOM Report(TAB11)

8.1 EXCOM Approval of the Four Year Ship Track for the *JOIDES Resolution* through FY'01.

SCICOM Motion 98-1-11: In order to fulfill the objectives of the LRP and to respond to existing proposals, SCICOM established that the general ship track for the *JOIDES Resolution* will remain in the Indian and Pacific Oceans through FY'01. SCICOM anticipates that the ship will return to the Atlantic Ocean prior to the end of Phase III.

EXCOM Motion 98-2-9

EXCOM approves the general Four Year Ship Track for the *JOIDES Resolution* set by SCICOM at their March 1998 Meeting (SCICOM Motion 98-1- 11)

Proposed by Feary; seconded by Raleigh.
10 in favor; four abstentions (Pisias,Orcutt,Taira,and Eldholm - conflicted); two absent (Nowell and Harrison).

9. Management and Operations Reports(TAB 12)

9.1 JOI

9.1.1 Leadership changes at JOI/ODP (new Director/new Assistant Director)

Pisias welcomed Kate Moran, the new Director of the Ocean Drilling Program, and Frank Rack, the new Assistant Director (not present). He said that JOI is now staffed with personnel who have significant background in the science of the Program and Kate Moran possess an excellent understanding of industrial relationships. He thanked the staff at JOI and John Farrell, in particular, for their assistance during his tenure as Interim Director.

EXCOM Consensus 98-2-10

The JOIDES Executive Committee welcomes Dr. Kate Moran to her new position as Director of the Ocean Drilling Program at JOI. The future holds great opportunities for ODP as it celebrates its 30th Anniversary and looks forward to new scientific and managerial challenges. Scientifically, the future for ODP has never been brighter with potential new opportunities in understanding the role of fluids in the ocean lithosphere, the extent of the geobiosphere, the long-term history of climate on Earth, and the exploitation of ODP's technology in making global and regional observations at all spatial and temporal scales. We wish Kate our best as she accepts these new responsibilities.

Proposed by Orcutt; seconded by Prior.
One absent (Nowell)

9.1.2 Update for the strategy for international participation in ODP (EXCOM Motion 98-1-7)

JOI has not moved forward in updating this strategy (Appendix 5). However, China is now an Associate member of ODP and South Africa has submitted a proposal to join at

the level of 1/12. Recently, an expression of interest was received from Ireland. Two people from Ireland were invited to this EXCOM meeting, but they were unable to attend.

9.1.3 Update on progress towards mutually beneficial partnerships with industry.
JOI has received a letter from the KDM Institute of Petroleum Exploration in India indicating their desire to purchase ship time on the JR. Pisias replied explaining that ODP does not sell ship time. He provided information about the Program and KDM have written back expressing an interest in joining ODP and inquiring about panels. Effort underway to interest Brazil in membership in ODP are continuing.

Moran endorsed SCICOM's approach to focus on technology and science saying that it would allow JOI to refine and target industry participation (Appendix 6). TAMU is focusing on deep water drilling requirements for industry in the areas of shallow water flow and pore pressure measurements.

Discussion
Mével observed that oil industry companies compete against each other and asked how JOI envisioned collaborating with them. Moran responded that ODP must work with consortia that are defining the group industry problems. JOI will start looking for such **collaborative opportunities** for ODP in the Gulf of Mexico. Prior added that as the industry tries to work in new environments in the Gulf of Mexico, companies are cooperating initially. The old days of locking up the data are being overridden by the need to forge links with people who generate new information. The GEOFORUM consists of approximately 100 representatives from all the major oil companies, and oil service industry. ODP would like to participate in the GEOFORUM meeting in Houston. Leinen suggested that this was an area that should be taken seriously because it could put ODP in partnership with groups that possess tremendous resources. Moran said that because ODP has been doing deep water drilling for 30 years there is the opportunity to form partnerships with oil companies who are interested in exploring for hydrocarbons in deep water. Eldholm said that he thought that ODP was too passive and modest in this respect. Industry in now interested in this knowledge. He suggested that it would be beneficial for ODP to present their results and experience openly, without expectation of immediate financial contribution.

Beiersdorf asked about **TEDCOM's** role. Detrick replied that there may be a role for TEDCOM, but the industry/partnership initiative needs to come out of JOI. Humphris explained that TEDCOM's main role is to advise ODP on technology development, suggest projects for ODP to pursue, and to inform JOIDES on what is happening in industry. She added that there is a cross-over and said that TEDCOM has a role to play. Mutter asked if TEDCOM has been invited to participate before.

Detrick said that JOI was asked to pursue industry collaboration before by EXCOM, but Pisias was unable to do this because of time constraints. EXCOM would like to see a plan from JOI regarding partnerships with industry in January of 1999. Leinen said that, in the past, nothing really happened on different fronts until EXCOM gave the ODP Director a

plan, budget and time. She said there was enough time to open the door to Moran to permit her to develop a plan, evaluate the resources needed, and determine whether JOI also requires professional assistance in this area. Raleigh said that he would like to see a lot of thought go into this initiative. Mutter reiterated that **JOI needs resources, perhaps a full-time employee** (is a professional in the field of academic industry relations), to dedicate to the task.. Leinen said that this is the sense of what she was getting at. It is not what EXCOM should expect the ODP Director to do on the side. Leinen said that what EXCOM is hearing from Moran is that there is the need for her to hire someone for this endeavor.

9.1.4 Gas Hydrates - ODP partnership possibilities (TAB 13)

JOI has recently identified several opportunities for ODP to collaborate in gas hydrate research. Moran provided an update on the Gas Hydrates Bill and congressional hearing at which testimony from Admiral Watkins and selected PPG members was given (Appendix 7). JOI hopes to have NSF named in the mark-up of the bill expected in July. The US Department of Energy has developed a Gas Hydrates Program Plan. JOI solicited input from the ODP community because it is clear that ODP has had a important contribution to the understanding of gas hydrates. Discussions are ongoing between ODP and DOE.

The ODP Gas Hydrates PPG will meet in late June in College Station. JOI has received inquiries from India regarding gas hydrate exploration with the JR. Japan is also very interested in gas hydrates. Next year Japan will drill industry holes for gas hydrate exploration and there is one ODP Proposal (478) in the system with a Japanese lead proponent. The JNOC hopes to collaborate with ODP.

Discussion

At the AAPG meeting, Leg 164 was highlighted in ODP's display and Charlie Paull was there. Fox observed that in spite of the fact that the ODP booth was not well positioned, the gas hydrates exhibit drew people to the booth like iron filings to a magnet. They were interested in gas hydrates not only as a resource, but how the process contributes to our understanding of climate.

Mutter suggested that DOE could fund a leg. Pisias asked how the ODP community would feel if the facility was leased out to an exclusionary group. He asked whether there was a benefit for doing this for KDM in India. Mutter said that other opportunities for funding in addition to NSF should be pursued. Pisias added that ODP has a special day rate and Schumberger might get upset if JOIDES contracted out the vessel for a leg. Heinrichs noted that as the sponsor of the Program, NSF is putting in most of the funding. While NSF would not mind some additional funds coming in, they must be used to support activities that are consistent with the goals of the Program. Stoffa said this is similar to what was said before in Arizona. The issue is the timing and there needs to be a fast track planning process that will permit ODP to respond quickly to industry opportunities, otherwise the Program never responds. Moran observed that gas hydrates provide a promising opportunity for partnerships now. JOI will pursue them and include them in the development of the industry/partnership initiative. Detrick pointed

out that this kind of partnership would involve a very different style of organization and staffing of a leg. It should be made clear that ODP is not trying to sell ship time, but trying to promote technology development as goals for partnerships.

9.1.5 Public Affairs Subcommittee update (TAB 14)

- **30th Anniversary Plans**
- **Recent Port Calls**

Orcutt presented the report. Baker-Masson could not attend because she was in the late stage of her pregnancy (Appendix 8). The Public Affairs effort started two years ago and is progressing well despite a limited budget. He reviewed plans for the 30th anniversary of ocean drilling and upcoming port calls, and recounted the achievements of recent port calls.

Public Affairs mounted an ODP booth at the May 1998 AAPG meeting. Becasue of lack of visibility, it is recommended that the booth be moved from the non-profit division to the commercial section in future years. The primary industry interest was in gas hydrates. There was scant interest in the JANUS and logging displays. There will be an ODP booth at the ICP in Lisbon in August.

Public Affairs has collaborated with Canadian EXPO 98 officials and Robin Riddihough. to produce an interactive ODP video game that will be available at the Canadian pavilion. These may be used as promotional materials for the Year of the Ocean activities and at the AAPG booth next year.

Orcutt praised Baker-Masson, saying that she has done a good job and has developed a strategic plan to reach targeted groups.

Discussion

Detrick inquired how the interaction between the JOI and TAMU was working. Fox said it was working well. Baker-Masson and Woods determine ahead of time who will be responsible for which port call and then work with the on-site country team to prepare for them. Communications have not been as robust as they could have been at times in the past six months, but when you look at the results, it all looks very good. Beiersdorf commented that JOI was able to prepare a German translation of the recent ODP brochure with very short notice so that it was available in time for the EXCOM meeting. An article on paleoclimate in which ODP is featured has appeared in *Der Speigel*.

9.2 ODP/TAMU Management Report (TAB 15)

9.2.1 Update on leg 179 operations.

Fox declared Leg 179, which was beset by significant logistical nightmares, as the "Leg from Hell". He reviewed the entire saga of disasters starting with the failure of the Magna Shipping Company, engaged in January 1998, to transport essential equipment and supplies to Cape Town (Appendix 9). Two shipments were declared on the same bill of lading and ODP/TAMU received verbal confirmation that shipment was sent to Cape Town. In March, TAMU's representative couldn't find the material on dock in Cape

Town. Alas, El Niño winds in South Africa had led to bad weather conditions and disorganization at the docks. Even after the disorganization had been sorted out, TAMU's representative still couldn't locate the shipment, nor obtain verbal confirmation of the shipment being there!. This coincided with Easter Holidays, which closed the port for three days. On Tuesday, TAMU was informed by the shipping agent in South Africa that one of the two containers had not been put on the container vessel bound for Cape Town, and was instead bound for La Spezia, Italy on a vessel that left on April 8. Indeed, the Magna Shipping Company had loaded the shipment without a bill of lading in violation of all shipping practice. When the shipment arrived in La Spezia, it was broken into component parts and air freighted to Réunion island. ODP/TAMU contracted a French shipping company to send the essential components to the JR, and the rest was shipped to Darwin. Unfortunately, the weather conditions were such that the supply ship could not off load in the heavy seas. The bits for the hammer drill system were transferred to the JR by floating them across. TAMU is in discussion with lawyers to find a course of action. The Magma Shipping Company will be asked to reimburse TAMU by about $200K. As a consequence, the multi-varied and multi-faceted planned program could not be satisfactorily carried out. While the hammer was tested, it was not possible to test the hammer casing system. The two ship experiment was not carried out and the strainmeter was not tested. The seismic while drilling experiment was done, and Leg 179 retrieved additional cores of gabbro that have added another dimension to Leg 176 (Hole 735B) results.

9.2.2 Major technology development in ODP Phase III

- **Status of the active heave compensation System**

The Retsco Company was tasked to deliver the Active Heave Compensator based on a competitive bid system. A question arose regarding the rightful ownership of software to be used and so a hold was placed on the project in January of 1998. Retsco delayed responding to TAMU through the spring. The contract was subsequently rebid, and Mike Fredrichs has opened discussions with V Control Flow and Maritime Hydraulics (Appendix 10)

- **Hammer drilling system/Leg 179**

Details regarding the progress made on the hard rock reentry system can be found in Appendix 10. Due to the missing freight, a complete sea test of the hammer drilling system could not be carried out on Leg 179. It was possible to test the standard hammer, however, and the eccentric and concentric retractable bits. The casing running tool was not deployed. During the sea trials, gale force winds and heaves in excess of 4 meters were experienced creating excursions of weight-on-bit that resulted in major problems. Pounding of the hammer on the seafloor resulted in a cracked valve in the hammer, and bending stresses actually scored the hammer. The hammer was lost in the last hole. The retractable bits were not designed to withstand the excessive heaving and bending, and did not survive. TAMU's engineers believe that these problems would not have occurred if the JR had been fitted with the active heave compensator. In spite of the problems, a penetration rate of more than 4 meters per second (comparable to rates on land) was achieved with the hammer. Thus, the test demonstrated that the hammer works well, but design modifications are needed to make the valves and bits more robust. The

engineering changes required to address the problems are straightforward. TAMU will begin the assessment and redesign of the hammer drilling system this summer, and enter into discussions with SDS on a contractual agreement to proceed with this work. Modifications are expected by mid- fall. AMOCO has a test facility in Texas bottomed in granite which is now open to the public. TAMU will explore the possibility of a relationship with AMOCO that will allow them to test engineering developments at the site. Land tests will take place towards the end of this calendar year and then a short sea test will be considered, if it can be accommodated into the ship's schedule. By the end of March 1999, TAMU expects to have advanced the system to that level.

9.2.3 Update on industry cooperative opportunities/joint ventures.

TAMU delivered a presentation about the hammer drilling system at a meeting of the DEA. Drilling Engineering Association, Project 114, involves offering HRRS test reports to participants of TAMU/industry partnership developed in conjunction with JOI. UNOCAL is a subscriber. EXXON, Mobil and ARCO have expressed interest (Appendix 10).

9.2.4 Update on dry-dock

The tasks are outlined in the Agenda Book (TAB 15, p. 3) and Appendix 11. The total estimated cost of the dry-dock activities exceed the $6 million dollars allocated by NSF. This is because all TAMU's estimates are conservative in that costs have been projected at the high end of the spectrum. The engineering specifications (workscopes) have been defined and bids have been received. Currency devaluations in the Asian area have affected this process to the benefit of ODL and TAMU as all the ports in the region are competitive. Initially only Singapore was a possibility.

Discussion

In response to Mével's inquiry regarding potential sites for a second sea trial of the hammer drilling system, Fox identified Kerguelen as a possibility, although the weather constraint is great. TAMU prefers to tackle the hammer drilling heave problem after the active heave compensation has been developed and installed on the ship. Detrick asked if the money for the active heave is still available. Fox replied that there are funds carried forward from FY 97 commingled with some FY 1998 monies. In response to a query from Orcutt, Fox indicated that the NERO hole was completed to a depth of 80 meters into basement with the top 40 meters into basement cased. The hole was not logged because of time. Mével noted the absence of the microbiology lab from the list of dry-dock projects. Fox indicated that ODP has a van which can be outfitted to provide a modest facility initially. A more elaborate facility can be constructed later, perhaps with DOE funds, once the primary components have been satisfactorily identified.

9.3 Wireline Logging Service Report (TAB 16)

Goldberg highlighted two additions to the report in the Agenda Book (Appendix 12). WLS has migrated all the historical conventional data for 277 holes and work has begun on migrating the FMS data. The WLS has lost Carlos Permez from their group at LDEO

and are advertising for a logging scientist at LDEO. This is a Post Doctoral or Associate Scientist position.

9.3.1 Technology Development and Innovations in ODP Phase III

A summary of projects is found in Appendix 13. Some technology development will focus on addressing the heave situation on the ship. The TAP (Temperature and Acceleration Pressure Tool) will replace the Lamont temperature logging tool.

9.3.2 Update on industry cooperative opportunities/joint ventures

The WLS was approached one year ago by AAPG regarding the compilation of an FMS Atlas. The WLS has contributed 15 to 320 images to the atlas, which will be available in print form or CD ROM next calendar year. Preliminary data from the SWD experiment, carried out on Leg 179 in collaboration with WHOI, indicate that the experiment was very successful.

9.3.3 Dry-Dock Plans (DHML)

Dry dock plans include replacing the MAXIS unit with a modular PC-based data acquisition unit and upgrade of the existing space in the DHML.

Discussion

Briden asked about the status of the French group. Goldberg said that there have not been any problems with the relocation or the personnel turnover. The process has proceeded without glitches. Detrick congratulated Goldberg and his group for getting all the historical conventional data for 277 holes up on line.

10. Discussion of the Terms of Reference for PEC V (TAB 17)

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.

EXCOM Consensus 98-2-11

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

One absent (Nowell)

WEDNESDAY June 24 8:30 am

12. Planning for IODP

12.1. EXCOM Letter to IWG and IWG reply (Detrick)

Detrick referenced background in the Agenda Book and reviewed the request conveyed to JOIDES in a letter from the IWG. He outlined his response to the IWG. In April he received a reply from the IWG confirming that they understood the planning activities to be undertaken by JOI (JOIDES).

12.2 IODP Scientific and Technical Planning.

12.2.1 1999 Conference on the Scientific Objectives of Ocean Drilling in the 21st Century (organizing committee and mandate) - response to EXCOM Consensus 98-1-12 (TAB 19).

Humphris reviewed the diagram showing the proposed scientific and technical planning proposed by JOIDES, and approved by EXCOM in January 1998. At their March 1998 meeting, SCICOM set up the mechanism for planning the scientific conference. Letters and advertisements went out calling for brief proposals for post-2003 drilling objectives. SCICOM also set up an executive planning committee of 4 to 6 people who are responsible for issuing a call for abstracts, planning a venue and then inviting others to participate in an organizing committee. This organizing committee will determine the scope of the conference, organize the papers, invite speakers, integrate the final papers and compile the reports. The outcome will be instrumental in developing the RFP for the conceptual design of the second ship for post-2003 scientific ocean drilling. Co-Chairs are Asahiko Taira and Nick Pisias. A call for letters of interest by the first of September has gone out in EOS, GSA Today, Nature, Geotimes, and the JJ. In addition, the JOIDES Office sent the advertisement, along with a letter to every ODP office, and every member of the JOIDES advisory structure. The goal is to get a large number of extended abstracts. The ad was also distributed to a variety of international geoscience initiatives. The date of the conference (which does not yet have a name, but is referred to as the Conference on Ocean Drilling for the 21st Century) will be in late May at the University of British Columbia in Vancouver. The time does not conflict with spring AGU or Memorial Day. JOIDES has received about 15 letters of interest thus far.

Discussion

Prior said that he saw no effort to embrace industry. He urged JOIDES to involve industry in the conference right upfront. Humphris said that she had made a point asking national offices to send her letter to appropriate industries in their countries and their journals. The letter was also distributed to PPSP with a similar request; the conference was advertised at the AAPG meeting. JOI is in the process of modifying the letter to send to the GEOFORUM Group and other similar entities. Leinen suggested including one or two industry members to the organizing committee. Prior said that more than just add-on members was necessary. He said that a message that welcomed industry participation and a mechanism to involve them was necessary. Raleigh concurred. Beirersdorf cautioned that it is important to select people from industry in a way that does not convey a feeling of favoritism to one or another group. Humphris welcomed this input.

12.2.2 Seismogenic Zone Detailed Planning Group - response to EXCOM Consensus 98-1-13 (TAB 20)

In considering planning for drilling the seismogenic zone with a riser drilling vessel, SCICOM recognized that, even though this may be five years off, much site survey work is required. SCICOM felt that there was not sufficient time to put out a major call for ODP preliminary proposals and determined that what was needed instead was to plan an

experiment and simultaneously determine what preliminary work is needed. There are constraints: (1) the experiment needs to be near Japan since it will take place on the first leg of drilling (shake -down) using the new Japanese riser vessel; and (2) the target must be in water depths no greater than in 2500 meters. SCICOM set up a Detailed Planning Group (mandate in the Agenda Book, TAB 20) with core membership of four people who have conducted business by email thus far. The call for Letters of Intent was widely advertised and sent to national community offices. In August, SCICOM will consider the response to this solicitation in order to finalize the DPG membership

Discussion

Eldholm expressed concern about properly identifying the survey requirements for deep drill holes. He noted that the gap between industry and academic capabilities is widening, and inquired whether this aspect is being adequately considered in the planning. He reiterated that there is a need to document industry capability. Humphris responded that this issue has been identified as a real need by SSP. She mentioned the jointly sponsored NSF/JAMSTEC Ewing Cruise (Late summer of 1999) to collect 3-D seismics at the Nankai Trough and indicated that the approach towards data collection is new and different.

12.2.3 Technical and Operations Workshop (fall of 1998) to provide advice on the technical requirements and infra- structure of IODP - response to EXCOM Consensus 98-1-13 (TAB 20)

The goal of a technical and operational planning workshop to take place in the fall of 1998 is to begin to identify the technical and operational issues pertaining to post-2003 drilling. The effort to compile a list of participants is underway. Humphris said she was soliciting participation from PPSP and TEDCOM. In addition, experts at Petrobras have been identified. In Japan, a number planning groups for OD-21 have already been established, one of which is for technical planning. Kensaku Tamaki and Shinichi Takagawa have been identified as liaisons to JOIDES. One possible venue is Houston since industry participation may be enhanced if the meeting is held there. Tokyo has also been suggested, but post-2003 planning meetings have already been held there. Another possibility is to hold the meeting in Rio, Brazil in conjunction with the meeting of the AAPG at which there will be a special session on deep drilling.

Discussion

Beiersdorf recommended involving the KTB representatives. Eldholm noted that the International Lithosphere Group will sponsor an expanded workshop (Chaired by M. Talwani) at the University of Bergen either late in 1998 or in the Spring of 1999. A lot of industry participation is expected. Humphris pointed out to EXCOM that JOIDES assistance with IODP planning is proceeding as requested by the IWG although sources of funding to support these efforts have not yet been identified. Pisias noted that ads alone for the conference and seismogenic DPG call for papers have cost about $10,000. In addition, coordinators for the meeting have not yet been identified. The cost of the fall technical meeting is expected to be about $50 K. Detrick indicated that he had raised this issue in his most recent letter to the IWG, but had received no response.

12.3 Status of Japanese planning for IODP

Maryuyama showed the overhead of the plans and time table for Japanese efforts in moving towards post-2003 scientific ocean drilling (Appendix 14). Strong international commitment is very important in helping Japan to move forward with the implementation of plans. Last summer (1997) the Prime Minister of Japan designated OD-21 as the first "big science " project to be undertaken in the current fiscal climate. Consequently, it is imperative for Japan to complete the necessary preparations before the next assessment in August 1998. Although the budgetary situation is volatile with the value of the yen changing relative to the US dollar, Japan is looking to science and technology to revitalize the economy. These trends will continue for awhile so they need to be carefully monitored. This the Year of the Ocean so Japan (STA/JAMSTEC) is trying to increase public awareness and have produced a brochure in English and Japanese (Appendix 14).

Discussion

Humphris asked for clarification regarding preparations before the next assessment in August 1998. Maruyama said that they are now working on an evaluation, then will submit a budget and an updated proposal. The assessment occurs first in August and then immediately after the proposal is submitted. If accepted, negotiations leading to the issuance of a contract for the construction of a ship will commence. Whether the proposal has been accepted or not will be known in December.

12.4 Joint ODP/JAMSTEC technology development project (EXCOM Motion 98-1-11)

Kinoshita reported that JAMSTEC was awarded a supplementary budget of $20 to $25 million dollars this year to outfit their geophysical vessels with a multi-beam system and to add huge air guns to shoot consecutively. Starting in 1990, the JAMSTEC budget has increased incrementally to develop technology of benefit to ODP. In sum, $40 to 50 million dollars have been awarded to develop three kinds of tools to benefit OD 21 and ODP. ORI has also received a supplemental budget of $6 million for the Haiku Mahru to upgrade its site survey capabilities. JAMSTEC needs assistance from those working for a long time in the field (ODP/TAMU and the drilling industry) to develop the coring and reentry systems. He reported that recent operations to test the Japanese reentry system had been successful. Kinoshita expressed his gratitude to Fox for TAMU's help. He added that JAMSTEC is forging a formal collaboration with ODP/TAMU for joint technology development.

Taira presented the JAMSTEC supplemental budget for development of the Sub-Sea Floor Prototype System (Appendix 15) and explained the nature of the joint technology cooperative agreement between JOI (ODP/TAMU) and JAMSTEC. The Sub-Sea Floor Prototype System will be developed, modified and tested on the JR, and then be available for deployment on the Japanese vessel for IODP. If all goes well, Japan is on target to start new operations by mid-2000. He reviewed the timetable for planning and construction of the riser vessel. Again, if all goes well, the basic design of the drill ship will be approved

next year and construction will start in the year 2000. This will provide 3 years lead to sea trails in 2003, which corresponds with the end ODP.

Discussion

Orcutt asked if the MOU between JOI and JAMSTEC had been signed. Pisias said that it was in its final stages and that he expected it be done by the end of the week. The MOU establishes the structure under which JOI and JAMSTEC will operate and notes the activities that will be done. Beiersdorf asked how this related to the JOIDES structure. Pisias said that the MOU does not mention the JOIDES structure; however, any activity incorporated into the ODP Program Plan must be approved by EXCOM (JOIDES). Humphris pointed out that TEDCOM had endorsed this joint development effort between JAMSTEC and ODP/TAMU, thus the JOIDES structure was involved in the initial development of the agreement.

EXCOM Consensus 98-2-12

EXCOM notes with satisfaction all efforts by Japanese authorities to advance the future of the Ocean Drilling Program, in particular by budgeting for related projects on the development of core sampling systems, development of long-term monitoring systems for legacy holes, and for the development of advanced site survey technology for characterizing the seismogenic zone near Japan. EXCOM also welcomes the MOU between JOI and JAMSTEC for close cooperation in studying the most favorable manner for ocean drilling operations and in developing borehole measurements and bit technologies. We encourage both organizations to implement the terms of this MOU.

Proposed by Raleigh; seconded by Briden.
One absent (Nowell)

12.5 Financial planning for IODP

Purdy listed the IWG members and explained that only those countries that have submitted formal letters of interest are members (Appendix 16). The IWG is planning for a Program, based on the 1996 ODP LRP, with two ships. The projected operational cost ranges between $130 and $150 million. More work is required to refine these estimates and this will be an ongoing effort. A key component of the proposed post-2003 program is that Japan and US will contribute at equal levels. He showed a pie diagram cost sharing model (Appendix 16) and said that the ideal situation would be for a 1/3/1/3//1/3 cost-sharing arrangement with the US and Japan each contributing at a one third level. There would be no objection whatsoever if a consortium of other member nations contributed more than one third. Another scenario envisaged, however, is a cost sharing arrangement with the other member nations contributing at the same level as they are at the present time. This would kick the US involvement to a scary number, but NSF is willing to fight for this. Purdy noted the market concerns, saying that it is hard to predict what the cost of drilling will be in 2003. The IWG is pleased with the progress that Humphris and SCICOM have made. An important target date in the US is November 1998. At this time, NSF will go before the National Science Board and bite

the bullet to reveal plans on how they will go forward with scientific ocean drilling. By this time, NSF will have a new Director in place.

Discussion

Stoffa asked what the estimated $130-150 million included. Purdy replied that this was just for drilling operations and can be considered equivalent to the current $45 million figure that currently runs the drilling program.

13. Future Meetings and Other Business

13.1 US - Miami (January 13-14, 1999)

The next EXCOM meeting will take place in Miami, Florida, January 13 and 14, and will be hosted by Chris Harrison. Harrison promised to organize a one and half day field trip that would allow him to strand the grumpy EXCOM members on a desert island. There will be no castles!

13.2 Australia.

The summer 1999 EXCOM meeting will be in Sydney, Australia during the week of June 29-30. ODP Council and IWG meetings will be held on July 1; JOI BoG will meet on the afternoon of June 30 and/or the morning of July 1, depending on the length of the EXCOM agenda. An optional field trip may be scheduled for Monday June 28.

13.3 Other Business

EXCOM Consensus 98-2-13

The JOIDES Executive Committee thanks Professor Nick Pisias for his extraordinary and selfless service to the Ocean Drilling Program. Over the past six months, Nick has provided a steady hand at the helm, instituted a refreshing openness and spirit of team leadership that helped the Program successfully navigate this transitional period. We appreciate the personal sacrifice he made in undertaking this job, which has entailed numerous transcontinental flights, and long periods away from home and soccer games. We wish Nick great success and happiness in his return to Oregon State University and his research, and welcome his future leadership in ODP.

Proposed by Orcutt; seconded by Beiersdorf.
One absent (Nowell).

EXCOM Consensus 98-2-14

The Executive Committee thanks Bob Detrick for his leadership of JOIDES during the past two years. He has given himself selflessly to the promotion of ocean drilling and done an excellent job of leading the Program through challenging times. Although his national and international travel has been demanding, he has continued always in good humor his leadership task.. The Program, thanks to Bob, stands poised for an exciting Phase IV in the next millennium, We wish him great success on his future scientific endeavors and his leadership of the oceanographic scientific community.

Proposed by Orcutt; seconded by Leinen.
One absent (Nowell).

Detrick expressed his appreciation, and that of EXCOM, to the JOIDES Office at Woods Hole - Susan, Christina and Shirley, and particularly to Kathy who has been the liaison from the JOIDES Office to EXCOM. The next EXCOM meeting will be chaired by Helmut Beiersdorf.

Detrick noted that Mr. Maruyama is moving to a new position. He has been instrumental in moving ODP/OD-21 activities forward for which EXCOM wishes to express its appreciation and to wish him success.

Detrick thanked Deitrich Maronde and to DFG for hosting a well organized meeting, and arranging an enjoyable field trip.

Meeting Adjourned

3.1 NSF MANAGEMENT REPORT

NSF received and approved the 1999 ODP program plan in mid-September. The Plan covers Program operations and management for U.S. fiscal year 1999 (1 October 1998 to 30 September 1999). The 1999 budget was approved at a level of $48.5 million, although some FY 1999 Program activities (such as installation of active heave compensation) are to be financed from residual funds carried forward from FY 1998 funding. JOI and its subcontractors are presently identifying the total level of these residual funds as part of the FY 1998 closeout process. The FY 1999 plan and budget contain a second increment of $3 million to be used for dry-dock activities, with the initial $3 million of funding having been supplied by NSF in 1998 for long-lead-time purchases. The $6 million for ship alterations and system upgrading in dry-dock should ensure an affordable day-rate for operations over the next five years of the Program. The dry-dock activity is presently scheduled for August and September of 1999, although the location of the shipyard to be used is still being determined by Texas A&M and SEDCO. It is expected that NSF will support approximately 65% of the $48.5 million Program costs in FY 1999. A target budget for year 2000 Program operations will be supplied to JOI in January.

Participation levels in 1999 for some ODP partners remain uncertain, though it is hoped that further clarification will be available by the time of the EXCOM meeting. Germany, the United Kingdom, and Japan have committed to full participation ($2.95 million) for fiscal year 1999. The People's Republic of China will continue to participate at a 1/6th-associate level. Efforts continue in the PACRIM consortia (Australia-Canada-Chinese Taipei-Korea Consortium) to secure full membership funding, but formal commitment remains at the 1998 level of 11/12ths. The European Science Foundation has also been unable to secure full FY 1999 membership contributions and has committed to participation at only a 97% level. With the termination of IFREMER as the French JOIDES representative, a draft Memorandum of Understanding (MOU) was forwarded to CNRS representatives in July for participation as an associate member at a 2/3 level. Consideration of the MOU is continuing in France and it is hoped that final agreement will be concluded prior to the EXCOM meeting. It is expected that JOI will report to EXCOM on developments with respect to potential additional new partners in the Program.

Additional recent activities with respect to ODP contract include the following: (1) Continuing evaluation and discussion of proposed changes to the Prime contract with JOI. All issues have been resolved, except those that pertain to personnel salary and approval requirements. It is expected that these issues will be resolved in the near future. (2) Updating of the ODP Policy Manual. JOI is contractually required to maintain a manual of the procedures and policies that guide the operations of the ODP. Now that the JOI office is again fully staffed, JOI has been tasked with revising the existing manual based on recent changes in contractor and JOIDES operations. (3) JOI and NSF have agreed that a modified format should be developed for the bi-monthly ODP reports. JOI

will be developing options for the new report format to allow easier examination of accomplishments and progress against program plan objectives. (4) NSF has worked with both JOI and Texas A&M to develop policies for collaboration with other drilling Programs and has approved agreements for equipment sharing with the International Continental Drilling Program and DOSSEC hole in Hawaii and the Cape Roberts drilling program in Antarctica. (5) The NSF has contracted with a commercial audit firm for a "costs-incurred" audit of Ocean Drilling Program contractor and subcontractors' expenditures for the period 1994-1997. The audit activity is currently in progress and includes on-site examination of financial records and data. A final report from the auditors should be completed by Spring of 1999. Resolution of the audit recommendations by NSF Contracting and ODP Program should be completed by the Summer.

Following discussions at the Bonn IWG meeting, NSF has worked with both JOI and JOIDES representatives to clarify JOIDES plans and procedures for providing assistance to IWG in planning for post-2003 drilling. The JOIDES plan will be presented in the agenda session dealing with IODP planning. It is expected that an update on Japanese planning and status of funding for OD-21 will also be given in the same session. Additionally, discussions have begun with JOI to identify resource constraints and options for the JOIDES planning effort. In late September NSF staff met with Mr. Masakazu Murakami (successor to Mr. Maruyama as Director of the Ocean and Earth Division of STA). In addition to briefing NSF on the status of Japanese financial plans for OD-21, Mr. Murakami stated that he would serve (as did his predecessor) as co-chair of the IWG.

In late November staff of the Geoscience directorate informed the National Science Board (NSB) of NSF of developments in planning for ocean drilling beyond 2003. The information was well received by the NSB and present planning is to keep the Board appraised of important developments in IODP planning.

4.0 COUNTRY REPORTS

4.1	ECOD	(Eldholm)
4.2	France	(Mével)
4.3	Germany	(Beiersdorf)
4.4	Japan	(Taira)
4.5	Pacific Rim Consortium	(Feary)
4.6	PRC (The People's Republic of China)	(Wang)
4.7	UK	(Briden)
4.8	USA	(Heinrichs/Pisias)

Action Sought

EXCOM is asked to review and comment on the Country Reports.

Reports will be "taken as read" with no formal presentation to the committee. It will be assumed all EXCOM members have read these reports. There will be an opportunity for EXCOM members to ask questions of the "presenter" to clarify a particular issue in the report, or to ask for additional information.

4.1 ECOD

MANAGEMENT MATTERS

1. ECOD representatives and meetings

The ECOD Management Committee (EMCO) has elected its new representative to EXCOM. Prof. Dr. Menchu Comas, University of Granada, Spain EMCO delegate, will represent ECOD to EXCOM for the next three years. The upcoming EMCO meeting will be held in Strasbourg, 28 March 1999, and Dr. Moth-Wiklund, Senior Scientific Secretary for Life and Environmental Sciences of the ESF, will host the meeting; on which occasion Prof. Dr. Enric Banda, ESF Secretary General, and Dr. Laurent d'Ozouville, ESF/EMaPS Scientific Secretary, would be invited to attend.

The Secretariat of the ECOD Scientific Committee (ESCO) moved from Switzerland to Sweden 1 July 1998, where it will be for the next three years. ESCO has elected representatives to all JOIDES committees and Program Planning Groups for the next three years.

2. Status of Phase III

Negotiations between the European Science Foundation (ESF) and present ECOD members for the renewal of the ECOD to Phase III have progressed and signed agreements have, at the time of writing, been received from almost all present ECOD members. Before ending 1998 the ESF will sign a new Memorandum of Understanding with the NSF, covering the period October 1998-30 September 2003. Some of the membership fee contribution from the non-Nordic countries to the renewal process for Phase III have been changed: Italy would reduce their participation from 25% to 20%, Portugal had agreed to join at a level of 3%, Spain will increase their participation from 4% to 5.5% from January 1999, and Switzerland was willing to increase their contribution from 10% to 11% but only for one year. Turkey is still in debt to ECOD for 1996 and 1997, and has to pay up this debt before be permitted to join Phase III. Ireland had expressed an interest in joining the ESF Consortium.

3. The ESF Scientific Secretary to ECOD, has prepared a report on ECOD activities for the ESF 26-27 November, 1998 Annual Assembly

RELEVANT INFORMATION ON IODP PLANNING (cfr. letter from EXCOM Chair 4.11.98)

1. Management items

(a) ECOD Scientific and Management Committees has expressed by different means and at several forum its interest to continue to participate into Scientific Ocean Drilling Phase IV - the Integrated Ocean Drilling Program-, and to contribute to the analysis, planning and potential establishment of IPOD. It has been pursued that ECOD representatives were invited to participate in meetings of IWG-IODP.

(b) EMCO perceives at its last meeting (8 June 1998) that it would be premature for ECOD to endorse a firm confirmation of intent to join IODP as different countries represented in ECOD are not ready to commit such a program. It could be claimed that IODP financial contribution as presently envisaged would be prohibitive for most of the ECOD partners, and that a coordinated approach should be done to explore for financial support entailing new found sources further than present ECOD funding agencies.

(c) The European JOIDES Executive (EXCOM) and Scientific (SCICOM) Committee Members, including respective ECOD Members, met in Edinburgh on 24 September 1998 together with the secretary of EMaPS (ESF) and other colleagues. We reviewed progress on developing join European scientific plans and implementation options for scientific drilling after the end of the Ocean Drilling Program, highlighting the degree of common interest with hydrocarbons industry. ECOD Members agree with the general interest in setting up a European Science and Technology Advisory/Working Group to develop initiatives for drilling programs post-2003 at an European level. Prof. Dr. Briden (UK), who chair the meeting, has contacted funding agencies and ODP Council and inform/remind them of plans and the need to set up the aforementioned European

Group. There was a consensus that this Group should be set up to meet soon after the Spring 1999 International Conference in Vancouver.

4. Scientific planning for post-2003 drilling

(a) Numerous ECOD scientists have submitted letters of interest to JOIDES; a total of 14 Statements of Interest to Post-2003 Scientific Ocean Drilling to the Spring 1999 International Conference in Vancouver were sent from ECOD countries. Investigations on global ocean/ climate system; past environmental changes and global carbonate balance; deep biosphere; the global effects of sea-level changes; active deformation, fluid flow and hydrothermal processes at convergent margins; stress and long-term observations in ODP holes and seismic hazard; the nature of the oceanic crust and oceanic plateaus; among others, have been described as relevant themes for future riser-less drilling by ECOD scientists. Furthermore, ECOD scientists are involved in general Statements of Interest from big-science projects just as MARGINS, OCEAN-MARGINS, ANTROSTAT and IMAGES. There is already a lot of interest in future no-riser drilling in European margins -volcanic and non-volcanic rifted continental margins-, and in the Mediterranean convergent margins.

(b) ECOD scientists participate in foregoing initiatives to develop deep-drilling programs post-2003. Some ECOD members have deep-drilling interests in the Mediterranean. ECOD scientists had the occasion to discuss marine (ODP) deep-drilling opportunities in the Eastern Mediterranean at the recent meeting on Chania (Crete) -a Germany initiative- which involved KTB, ICDP, and ODP Groups.

SCIENTIFIC MATTERS

1. Meetings

(a) The Second European Ocean Drilling Forum - EUROFORUM Conference- was held in Edinburgh (UK), 21-22 September 1998. The aims of the meeting was to synthesize important recent results of the ODP, highlighting the European contribution by invited lectures together with poster displays of ocean drilling-related current research in Europe. ECOD participation was active, four invited overview-talks were given by ECOD scientists, and numerous poster were presented from ECOD countries.

(b) The 27th ESCO Meeting was held in Edinburgh (UK) 20 September, 1998; prior the EUROFORUM conference. The prospect of Ocean Drilling after ODP Phase III was on the agenda and there was a consensus among the ESCO Members that ECOD would indicate by means of "Statements of Interest" to the JOIDES Office its interest to continue to participate in Scientific Ocean Drilling into Phase IV of the IODP.

(c) ECOD scientists have also actively participate in the International Conference on Paleoceanography (ICP VI), 23-28 August, 1998 in Lisbon.

(d) The 7tht ECOD Workshop, a meeting organized every two years to bring together ECOD scientists and advanced students interested in marine geology and ODP, will be held in Amsterdam (The Netherlands) 30 September-2 October, 1999. The workshop will be focused in "Non-riser drilling" and ECOD initiatives on scientific objectives/themes for Phases III and IV.

2. ODP Legs

(a) ECOD scientists sailing in 1998 (November-December).

Leg 182: Miriam Andres (Switzerland) and Finn Surlyk (Denmark)
Leg 183: Mai Borre (Denmark) and Dominique Weis (Belgium)

(b) ECOD scientists invited to sail in 1999 (as of November 1998).

Leg 184: Eve Arnold (Sweden) and Federica Tamburini (Switzerland)
Leg 185: Annachiara Bartolini (Switzerland)

(c) Co-Chief

At this stage we do not know of any invitations for ECOD co-chiefs

(d) Temporary Technicians

Leg 182: Nana Quistgaard (Denmark)
Leg 183: Dimitri Damasceno de Oliveira (Belgium)
Numerous ECOD students and young scientist applied for Temporary Technical Support Position for FY99 legs.

(e) The next ESCO meeting will be 12 March, 1999 in Oulo (Finland).

4.2 FRANCE

The ODP budget will be transfered from IFREMER to CNRS, effective Jan 1st, 1999. Following the new policy adopted at the last EXCOM meeting, France is now in the process of signing the MOUs as an Associate Member for 2/3 of a full contribution.

French scientists actively participated in the second European Ocean Drilling Forum in Edimburgh last september. France will organize the third meeting in 2000.

The response to the call for interest for Scientific Ocean Drilling (in preparation of the COMPLEX meeting next spring) was very good in France. This shows that despite the

uncertainties that accompanied the transition between phase 2 and phase 3, the French scientific community is still willing to have a strong involvement in ocean drilling.

There is a strong interest in the French scientific community in combining onshore and offshore drilling for studying tectonic processes as well as shallow coral reefs. This requests using a platform other than the JOIDES Resolution. Ways of using alternate platforms, as stated in the Long Range Plan, should be explored.

4.3 GERMANY

At its regular session 2-3 November 1998 the "Geokommission" as the prime advisory group of DFG on geoscientific matters has reacted positively once again on recent progress made in planning IODP as far as the ODP Technical and Operations Workshop in Houston and the forthcoming Vancouver conference on non-riser drilling were concerned. For the latter about 25 "Letter Proposals for Drilling" were submitted by German scientists. The "Geokommission" also welcomed the initiative for an onshore-offshore drilling transect in the eastern Mediterranean for a detailed study of exhumation of high-pressure-low-temperature continental crust in relation to collision-subduction processes. This initiative is the result of the "Workshop on Deep Drilling Project in the forearc of the Hellenic Arc" held October 15-19, 1998 in Chania/Crete.and organized jointly by the International Continental Drilling Program (ICDP) and the National Centre for Marine Research in Athens (Greece). The workshop was attended by about 60 scientists from ODP and ICDP communities. They made it clear that the drilling transect could be solve a problem of global significance. At the workshop site survey needs were identified and key persons nominated to co-ordinate the preparatory work for drilling. Although aiming at the broadest international participation possible, the Eastern Mediterranean drilling initiative will have a strong European component, hence will fulfill a request by European agencies funding ODP and interested in IODP for a highly visible European involvement in future scientific drilling programs.

Thirty-five German scientists attended the European Ocean Drilling Forum held 19-22 September 1998 in Edinburgh (UK). The meeting gave another opportunity among European ODP communities to strengthen co-operation and exchange views on their countries' future involvement in ODP and IODP.

The next German Annual ODP Colloquium (Colloquium of the DFG Priority Programme ODP-DSDP) will be held 3-5 March 1999 in Bremerhaven and will be organized jointly by the Alfred-Wegener Institute on Polar and Marine Research and BGR. An attendance of approximately 200 is expected.

4.4 JAPAN

1. ODP Report

In the later half of 1998, ODP related activities in Japan include the followings:

(1) Site Survey

Site survey cruise by R/V Tansei-Maru was conducted in the Kyushu-Palau Ridge area aiming at dredging of igneous rocks which are related to the early phase of the evolution of an oceanic island arc. The Kyushu-Palau ridge and Shikoku Basin area was also extensively covered by multi-channel reflection seismic profiling using R/V Hakurei-Maru. The cruise lasted for two months obtaining more than 5000 miles of reflection lines. Although this survey was not for the purpose of ODP site survey, the date will be available for site evaluation purpose. Funds became available to install new swath mapping systems on R/V Hakuho-Maru. These systems will be used for next year's site survey activity.

(2) Preparation for Leg 186 (Japan Trench)

Leg 186 will drill the forearc margin of the Japan Trench in order to investigate the seismicity and crustal deformation which are related to the Pacific Plate subduction. The plan includes to install borehole broadband seismometers and strainmeters in two holes: each one represents seismically active or inactive region respectively. A comparison of two holes is expected to reveal the relation between strain accumulation process and seismogenesis. In order to achieve this ambitious task, ODP Japan made a large effort to allocate funds (over $ 2.3 million) to construct most comprehensive borehole long-term seismological observatory ever planned in ODP history. The observatory is a joint project between ORI and Carnegie Institute, Washington D.C., US led by K. Suyehiro and S. Sacks.

(3) Nankai Trough Research

Nankai Trough is another important target for the study of forearc evolution and seismogenic zone around Japan. During 1998, various planning was conducted to meet the goals of ODP and IODP drilling proposals in the Nankai Trough including: 2D crustal structure imaging with seismic reflection profiling with an array of 100 OBSs; natural seismicity observation using OBS and optic fiber cable; cooperation with R/V Ewing 3D seismic survey sponsored by NSF (chief proponent, N.Bangs, UTIG), preparation for Advanced CORK design and Shinkai 2000/6500 diving campaign.

For the Eastern Nankai Trough, the drilling proposal by Tokuyama et al. (1998) is under review. We plan to start a new phase of Japan-France KAIKO project in 1999 which will focus Eastern Nankai-Suruga-Sagami Trough seismogenic zones. This program will be coordinated with ODP drilling if the proposal is approved.

(4)Biosphere Research

Japan Research Group of Deep Biosphere led by T. Naganuma started a basic research on the handing, processing and analysis of bacterial community preserved in core samples.

(5)Chosi-Boso Drilling Project
The Chosi-Boso area, about 50 km to the east of Tokyo, exhibits an excellent exposure of Miocene-Pleistocene (3.8 Ma to 0.4 Ma) forearc basin sequence which contains high-resolution records of sedimentation, tectonics, climatic variability, sea level change and volcanic episodes. The sedimentation rate is generally more than 50cm/ky and the record is continuos. ODP Japan started a drilling program (initial hole 250m into hemiplagic sediments and logging) to investigate the nature of high resolution records in forearc setting in order to prepare for the future ODP-IODP study of the same setting.

(6) Logging Research
ORI became a satellite logging research laboratory of BRG of LDEO. We will conduct logging service and research mainly for LWD and active margin study.

2. OD21 Report

OD21 preparation is now at its critical stage: evaluation by the STA's committee and budget proposal. The Evaluation Committee for OD21 project was formed in September and the report became open through JAMSTEC homepage. The committee recognized the importance of OD21 project and recommended strongly the need for international cooperation. Budget proposal for basic design of new drillship will be passed by the Diet in late December, 1998. By the time of EXCOM, January, 1999, we will be able to report the result of the government decision firmly.

Technological development program by JAMSTEC in cooperation with JOI and ODP TAMU is underway. Technological and Operations Workshop held in Houston (November, 1998) was very useful and the following activity (National IODP committee and subcommittee meetings) are now planned during December and January. We will start to develop a plan for domestic research, technological development and logistic support system related to OD21 program.

In February 4-5, an international forum related to coordination of various earth drilling programs will be held in Tokyo. This is the first of this kind to discuss the objectives, plans and coordination among variety of drilling programs proposed.

4.5 PACIFIC RIM CONSORTIUM

Report of the Australia-Canada-Chinese Taipei-Korean ODP Consortium (PACRIM)

AUSTRALIAN REPORT:

Australian ODP activities continue to focus on the $AUD to $US exchange rate, with general relief that it has risen from the depths that coincided with the FY98 payment. We have been extremely happy to observe that, despite the significant increase in $A

necessary to support the program, there is a continued strong commitment from the funding agencies for the remainder of Phase III.

Secretariat

Secretariat activities have been dominated by planning portcall activities, with successful portcalls already completed in Darwin, Sydney, and Fremantle. Further portcalls in Fremantle (twice), Sydney, and Hobart will be invaluable for continuing to maintain a high profile for the program within Australia. The PR assistance provided by TAMU for recent portcalls has been a major factor contributing to their success.

Proposals / Drilling Legs

The scheduling of Legs 189 (Southern Gateways) and 192 (Manus Basin Hydrothermal Systems), in addition to the already scheduled Legs 187 (Australia-Antarctic Discordance) and 188 (Prydz Bay), and completed Legs 181 (Southwest Pacific Gateways) and 182 (Great Australian Bight Cool-water Carbonates), has provided an immense boost to the interest and involvement of Australian geoscientists in the program. The positive effects from this burst of activity will continue for many years as the results become available.

There continues to be great interest in the Marion Plateau sea-level proposal, with its strong support in the external review process and imminent site survey cruise producing the expectation that it's almost mature status provides excellent potential for scheduling.

Phase IV Planning

There continues to be a general commitment to a continuation of the program, but this is tempered by the uncertainty surrounding the financial and scientific structure that will need to be established to support Phase IV activities. The general attitude is that we should "wait and see" what will be required financially, and determine whether there is support for the evolution of the scientific support structure that will be required, before any stronger commitment than a general statement of support can be provided.

CANADIAN REPORT:

Canadian Council Meeting

As noted in the last report, Larry Mayer is nearing the end of his term as Chair of the Canadian Council for ODP. The Nominations Committee has now met, and Rick Hiscott (Memorial University, Newfoundland) will assume the Chair in January. The Canadian Secretariat is also due for rotation on 1st April 1999, from the University of Toronto to an as yet unannounced location. NSERC, with the assistance of the CanadaODP Council, is currently evaluating submitted proposals and the new location should be known by the time of the EXCOM meeting.

Canadian Secretariat

Most Secretariat activities have revolved around support for shipboard scientists (180, 182), and the award of CanadaODP student scholarships to support shipboard scientists from past legs (173, 174A).

General Funding

As with the rest of the Consortium, the exchange rate has been one of the major issues to be addressed, although commitment to continuity of funding for the remaining years of this phase is a relief. Without the exchange rate crisis, it is very likely that Canada would have been able, perhaps in conjunction with our other partners, to fill the vacant 1/12 within the Consortium. Discussions on how this might be achieved, within the present generally positive funding climate, are continuing.

IODP Issues

The general statement of support has already been forwarded to NSF, but until the actual funding levels that will be required become clearer, it is difficult to see any greater statement of commitment being provided.

CHINESE TAIPEI ODP CONSORTIUM:

No report has yet been received from the Chinese Taipei Consortium - a verbal report will be presented at the meeting if no written report is received during the next few days.

KOREAN REPORT:

It will be no surprise to learn that the effects of the economic crisis continue to dominate Korean ODP activities. Approval has finally been obtained for Korea to maintain its 1/12 membership for FY99, but continuation into FY2000 remains uncertain. Continued membership will be decided by the government about the middle of 1999.

The only other Korean ODP activity has been the finalization of the Korean ODP advertising brochure, to publicize the program and Korea's participation amongst universities and industry. This brochure is due to be published next month.

4.6 THE PEOPLE'S REPUBLIC OF CHINA

Ocean Drilling Program is an international partnership of scientists and research institutions organized to explore the evolution and structure of Earth, and many outstanding scientific discoveries have been made through ocean drilling since its implementation. The Chinese geoscience community has noticed its great scientific achievements on earth sciences for a long time and actively urged the relevant Chinese organizations to participate in and contribute to ODP. The Chinese geoscience community has held several workshops on ODP and invited to foreign scientists rigorously involved in ODP to give presentations.

1998 is the first year for the People's Republic of China to cooperate with Ocean Drilling Program with the signature of the Memorandum of Understanding between the National Science Foundation of the United States of America and Marine High Technology Bureau of the Ministry of Science and Technology of the People's Republic of China on the participation of the People's Republic of China in the Ocean Drilling Program as Associate Member, on April 1998. The People's Republic of China will contribute to ODP during the period from December 1, 1997 to September 31,2003, and actively participate in all ODP sponsored activities.

Since the publication of China's participation in ODP, we have received vigorous responses from the geoscience community in China. In order to organize the relevant scientist to participate in Ocean Drilling Program and related scientific studies, the Ministry of Science and Technology was authorized to establish the Chinese ODP management structure. China Executive Committee for ODP and its subordinate Scientific Committee were established after consultation with the relevant governmental agencies and academic organizations. China Executive Committee for ODP is responsible for the coordination and decision-making for important issues involved in ODP, and consists of the senior officials from different governmental departments and related agencies, including Ministry of Science and Technology, Ministry of Education, Ministry of Land Resources, State Oceanic Administration, National Natural Science Foundation, Chinese Academy of Sciences and China National Offshore Oil Corporation and so on. The Science Committee is headed by Dr. Sun Shu, the member of the Chinese Academy of Sciences, and consists of senior scientists with various academic backgrounds from universities and academic institutions.

Two Chinese representatives were appointed for Fiscal Year 1998 on the Science Steering and Evaluation Panel for the Earth's Interior (ISSEP) and the Site Survey Panel (SSP) with the JOIDES Advisory Structure in proportion with the Chinese contribution to ODP.

No ODP drilling activities have ever been implemented in the territory of the People's Republic of China before 1998. We are glad to know that ODP Leg 184, which was proposed by a Chinese scientist group has been accepted and will be implemented from 16 February - 13 April 1999. It is also welcome that Professor Pingxian Wang, Tongji University, has been named co-chief scientist, and several other Chinese scientists will be invited to join the shipboard staff. Leg 184 will help improve our understanding of the link between climate and tectonics. Land-based studies in China and other parts of East Asia have developed a four-stage model of monsoon evolution. The proposed drilling will calibrate the terrestrial record with that of the global ocean. It is suggested that uplift of the (?????) Plateau is responsible for both the late Cenozoic global cooling and for the intensification of the Asian monsoon. Therefore, a comparison between records of monsoons, denudation rates, and climate cooling in the South China Sea will test this hypothesis. Drilling of high-sedimentation rate hemipelagic deposits in the South China Sea will surely provide the proxy records for this context.

Leg 184 is the first ocean drilling cruise implemented in Chinese territory in ODP history, and also provides a good opportunity for the Chinese scientists to fully join in

the shipboard work. Implementation of ODP Leg 184 would surely attract more Chinese geoscientists and institutions to engage in ODP studies and enhance their cooperation with foreign colleagues.

The People's Republic of China has a coastline up to more than 1800 km. There are more than 100 academic institutions involved in oceanic studies, and lots of research results have been obtained in China. The unique geographic location and geologic setting of China provides us excellent opportunities to understand and resolve many important scientific issues faced by the international geoscientific community, such as ocean-land interaction in the Cenozoic paleo-environmental records in Western Pacific and its adjacent seas, evolution of continental margin and formation mechanism of adjacent seas in Western Pacific, and geochemistry and metallogenesis in earth's interior et al. In December 1998, a workshop will be held in Bejing, with an aim to clarify the specific interests of China to ODP and academic priorities under the context of the ODP Long Range Plan (1996).

We will encourage Chinese scientists to actively participate in research works related to ODP activities, and to submit more excellent proposals to ODP together with their international colleagues. We also welcome more ODP cruises to be implemented in the Chinese territory and provide necessary supports for ODP projects.

4.7 United Kingdom

UK Report to EXCOM, January 1999

1. Applications for shipboard places were extremely healthy up to and including Leg 184 (>5 per Leg average), but there are fewer applicants per Leg thereafter (as found globally). Efforts have been made to encourage more participants on these Legs.

2. UK hosted the SSEPs meetings in May (Edinburgh), the SCICOM/OPCOM meetings in August (Durham) and the EuroForum in September (Edinburgh). The Euroforum was well-attended (>150 participants) and has replaced the UK national forum for this year.

3. Julian Pearce (Durham) has rotated off as SCICOM representative, to be replaced by Alistair Robertson (Edinburgh). The SSEP representatives have also rotated off and invitations sent to chosen replacements.

4. Andy Kingdon, British Geological Survey, has taken over the role of UK ODP Programme manager and will service the UK ODP Committee (Chaired by Professor Steve Sparks, Bristol University), the second meeting of which was held in September. New projects are being supported on U-series chronology of TAG hydrothermal system (Mike Bickle, Cambridge), deep circulation changes in the SW Pacific Gateway since the early Oligocene (Nick McCave and Ian Hall, Cambridge) and the plutonic foundation of the Atlantis Bank (Chris Macleod, Cardiff). Ian Parkinson (Open University) has had his

ODP Fellowship on Re-Os isotopes during magma genesis in subduction zones extended.

5. The UK, through the Natural Environment Research Council and its ODP Committee, will continue to participate in IODP discussions and international meetings relating to future ocean drilling plans. A number of UK delegates attended the scientific ocean drilling session at the 3rd European Marine Science and Technology Conference in Lisbon in May, where opportunities for a European ocean drilling focus and possible EU funding of these activities post 2003 were discussed.

6. The meeting of European EXCOM and SCICOM representatives in Edinburgh in September (associated with the European ODP Science Forum) resolved to ask for mandate from European funding agencies of ODP to explore long-term co-operation towards new modes of participation in IODP. It is understood that NERC is in favour of this approach. The European meeting also initiated discussion on future themes/projects of special interest to Europe in IODP, and it is hoped to hold a meeting with industry and other interested parties in the new year.

4.8 USA

U.S. Country Report (Part I)

In a last minute flurry of activity and following several short-term continuing resolutions, the U.S. Congress managed to fund the U.S. Government for operation in fiscal year 1999 (1 October 1998 – 30 September 1999). The NSF funding bill identifies a total appropriation of $3.672 billion, an increase of $234 million (7%) over the 1998 level. For research and related activities the overall increase is expected to be approximately 9% above the FY 1998 level. Although the final funding bill signed by the President eliminated many of the floors, ceilings, and targets identified in House of Representative and Senate considerations, a few items remain, including elimination of construction of the Polar Cap Observatory (Atmospheric Sciences Division) and inclusion of $22 million for Arctic logistics activities (Office of Polar Programs). After consideration of such items, the "general increase" for research activities is likely to be closer to 7%. As this report was being prepared, FY 1999 budget planning had not been completed at the Division or Program level. The NSF EXCOM liaison should be able to provide more detailed information at the Miami meeting concerning overall Ocean Sciences budgets, and funds available to the Ocean Drilling Program.

Focused NSF funding activities in support of U.S. ODP science programs is approximately evenly divided between the US Science Support Program (USSSP) administered by JOI under a cooperative agreement with NSF and a separate unsolicited proposal/grants activity in the Ocean Drilling Program at NSF. FY 1999 funding for USSSP will total approximately $5 million, a reduction from previous years funding reflecting one less leg

of drilling (dry-dock) during the next year. In any given year approximately 60% of USSSP support is directed at US shipboard scientific participation and immediate post-cruise sample and data analyses. A separate report from JOI on USSSP activities and plans can be found on following pages.

Although there is still significant uncertainty in final NSF ODP budget level for 1999 for research grants (hopefully to be clarified prior to the EXCOM meeting), the Program has committed to supporting three major field programs in support of ODP drilling proposals in 1999. Drs. Bangs and Shipley (Univ. of Texas), and Drs. Moore and Moore (Hawaii and UC Santa Cruz) are collaborating with Japanese colleagues on a 3-dimensional seismic reflection and seismicity study of the Nankai Trench. Seismic reflection work is scheduled from the Ewing in summer 1999 to be coordinated with Japanese ocean bottom seismometer studies of the region. A prime objective is to image the transition from aseismic to seismic subduction in the area. The project will also be important in defining drilling targets for planned Resolution drilling, and is a high priority target of the developing MARGINS program in the US. A second major field program is being led by Dr. Fulthorpe (Univ. Texas) to study global and local controls on depositional cyclicity in the Canterbury Basin, New Zealand. A high-resolution seismic reflection program is scheduled from the RV Ewing in late 1999 or early 2000. The final major field program in 1999 is a multichannel reflection and OBS refraction study of the crustal structure of the central Cocos plate in the eastern Pacific. The objective of the project under the direction of Drs. Wilson (Santa Barbara) and Harding (Scripps) is to examine crustal thickness and structure as a function of spreading rate and is in support of recent ODP initiatives and proposals for a deep penetration hole in the region.

Three Alvin submersible programs are also scheduled in summer 1999 to continue US emphasis on borehole observatory science at corked ODP sites. Drs. Carson (Lehigh) and Kastner (Scripps) are continuing a series of experiments on the Oregon margin examining carbon flux and gas hydrate formation. Dr. Kastner is also cooperating with Dr. Wheat (Hawaii) in a study of chemical flux at Juan de Fuca ridge ODP sites. Finally, Dr. Becker (Miami) will continue his collaborative studies with Canadian scientists of hydrothermal circulation in Juan de Fuca ridge ODP holes.

As part of its Long-Range Planning activities, the Division of Ocean Sciences at NSF has sponsored a series of planning workshops to examine future directions in oceanographic research. The report of the FUMAGES (FUture of MArine GEoSciences) workshop has recently been published under the direction of Drs Paul Baker and Marcia McNutt and copies will be available at the EXCOM meeting. An important recommendation in the report is the continuing need for ocean drilling in support of future marine geoscience research, including both sampling and monitoring programs.

In November NSF issued an announcement of opportunity for proposals addressing the objectives of the MARGINS program ( ). The Marine Geology and Geophysics Program and Ocean Drilling Program (in Ocean Sciences Division) and the Continental Dynamics Program (Earth Sciences Division) are cooperating in this initiative and will be receiving proposals on 15 January to initiate funding of MARGINS research proposals. The

planning office for MARGINS is presently located at the University of Hawaii under the direction of Dr. Brian Taylor.

U.S. Country Report (Part II) JOI/USSSP Activities June to December, 1998

JOI activities

• USSSP Contract Year 14 (3/1/98-2/28/99). A "close-out" report for Year 13 was approved by NSF in September 1998

• USSSP Contract Year 15 (3/1/99-2/29/00). A draft program plan for Year 15 was submitted to NSF in December 1998

• US Representative to the JOIDES office selected

Jeffrey Schuffert, a Senior Research Associate at Brown University, accepted the position of US Representative to the JOIDES Office in GEOMAR. Jeff began his two-year appointment on November 30, 1998. In this position, he will provide high-level executive support to Bill Hay, the new SCICOM Chair. Jeff will also attend USSAC meetings as the US representative from/to JOIDES.

• JOI's Governing Board Expands

The JOI Board of Governors grew by one on September 1, 1998, when Rutgers, The State University of New Jersey, became the eleventh member. This expansion, the first in many years, reflects JOI's recognition of the fact that US participation in the ODP has grown significantly beyond its initial ten institutions and that a broad base of US constituency support will be necessary to create and foster a scientific ocean drilling program to succeed the ODP in the year 2003. Discussions by the JOI Board of Governors on further expansion are ongoing.

US involvement in post-2003 planning activities

• "Penn State Planning Retreat", State College, PA, July 1998

A subset of the US Science Advisory Committee and other US scientific leaders from the ocean sciences and marine geology and geophysics communities meet on July 21-22, in State College, Pennsylvania, hosted by USSAC Chair Michael Arthur, to hold a retreat that focused on developing a detailed plan—emphasizing the US role—for a post-2003 scientific ocean drilling program. The report from this retreat, dubbed "The Structure of the US Component of a Future Scientific Ocean Drilling Program" was published in the November 1998 issue of the JOI/USSAC newsletter. This newsletter is available on-line at www.joi-odp.org.

• COMPOST II-related articles in AGU's *Eos*.

Mike Arthur, Chair of the US Science Advisory Committee, and other members of the COMPOS-II Committee (D. Kent, J. Natland, D. Sawyer, and M. Zoback) published a summary article in the August 18, 1998 issue of *Eos* announcing the release of their report containing recommendations for future of scientific ocean drilling. An NSF reaction to this report was published, as a companion piece, by Mike Purdy, Director of the Ocean Sciences Division.

• "COMPLEX" (COnference on Multi-PLatform EXploration), Vancouver, CA, 1999

JOI/USSAC has been assisting JOIDES with efforts to plan this conference. Notices regarding this conference and calling for one-page statements of interest that describe a scientific objective, its importance, and the necessity for drilling, were sent from JOI to over 700 people in the U.S. This conference has been advertised in *Nature*, AGU's *Eos*, *GSA Today*, *Geotimes*, *AAPG Explorer*, the newsletter of the Society of Economic Geologists, and the RIDGE newsletter. This conference will focus on, although not exclusively, the scientific goals of non-riser drilling and will complement the CONCORD conference held July 22-25, 1997, in Tokyo, Japan. Additional calls for participation occurred in Lisbon, this August, at the 6th international conference on paleoceanography. Over 300 "expressions of interest", many from the US, were received by the JOIDES office in response to these calls. A meeting of the COMPLEX organizing committee was held on Nov. 15-16 at Stanford University, and was hosted by Marcia McNutt.

• GSA annual meeting, "Hot Topics At Noon", Toronto, October 1998

A lunch-time forum on the topic "Does Scientific Ocean Drilling Have a Future?", was held on October 28, 1998 at the annual meeting of the Geological Society of American. The panel included M. Arthur, N. Pisias, J. Austin, K. Moran, R. Hyndman, and K. Gillis. The audience consisted of about 200 people. The debate centered on the future of scientific ocean drilling. Past accomplishments were presented, future plans were outlined, and there was significant and positive panel-audience exchange. The following questions were addressed. Are their sufficient compelling problems that can and should be attacked by ocean drilling? What tools and sources of funding are required to solve these problems? Is our understanding of fundamental earth processes only limited by available technology? The panel of ocean scientists will discuss these issues and entertain questions from the audience regarding the future of scientific ocean drilling.

• SOD Technical Workshop, Houston, November 17-18, 1998.

A significant number of participants in this workshop were from US oil, gas, and drilling industries. The WHOI JOIDES office will write and distribute a summary report.

• Fall AGU, Town Meeting, San Francisco, December, 1998

A town meeting on the future of scientific ocean drilling will be held on December 7, 1998 (Moscone Convention Center room 125, 5:30 to 7:30 pm) in conjunction with the Fall AGU meeting in San Francisco. This meeting, sponsored by USSSP, will be an open forum to provide an update on post-2003 planning efforts and to hear community views on these efforts. The panel, chaired by Mike Arthur, will also include K. Moran, N. Pisias, J. Austin, and M. Purdy. Over 200 participants are anticipated.

• ODP booth at Fall AGU meeting, December, 1998

ODP will be sponsoring a booth at the Fall AGU meeting in San Francisco. Representatives from all parts of the ODP community, including JOIDES, JOI, TAMU, and LDEO will staff the booth. The booth will be at locations 208, 210, and 212. It will be open from 8:30 am to 5:00 pm on Dec. 7-10, 1998. The booth will provide information about the Program to the scientific community at large.

Site Augmentation Proposals Funded

• Gerardo Iturrino (LDEO) Assessment of Velocity Anisotropy and Shear Wave Splitting in Hole 735B using the Dipole Shear Sonic Imaging tool (DSI).

• Mike Fuller (U. Hawaii): Investigation of Coring Induced Magnetic Contamination in ODP APC Cores.

• Lloyd Keigwin (WHOI): High Resolution Acoustic Surveys of Drill Sites on the Bermuda Rise and Laurentian Fan.

• John Goff (UTIG): Ultra-High Resolution Swath Mapping, CHIRP Sonar, Bottom Photography and Grab Sampling in Support of a Shallow Water (Jack-Up Drilling) Extension of the Mid-Atlantic Sea Level Transect.

• Detlef Warnke (U Cal. Hayward): Participation on Cruise V5 of Aurora Australis to Wilkes Land in support of a JOIDES drilling proposal.

• Henry Dick (WHOI): A Submersible Investigation of Atlantis Bank, ODP Site 735, Southwest Indian Ocean.

Workshop Proposals Funded

• Yildirim Dilek (Miami Univ., Ohio): Co-sponsor a Geol. Soc. of Am. Penrose Conference, "Ophiolites and Oceanic Crust: New Insights from Field Studies and the Ocean Drilling Program", A. September 13-17, 1998, Tamales Bay, California.

• Julie Morris (Washington Univ., St. Louis): Co-sponsor an international workshop, "Subduction Factory", June 7-9, 1998, La Jolla, California.

• Keir Becker (RSMAS): Co-sponsor a workshop, "Hydrogeology of the Ocean Lithosphere", December 11-13, 1998, Santa Cruz, California.

• Dick Poore (USGS): Co-sponsor a workshop titled, "Marine Isotope Stage 11", December 5, 1998, San Francisco, California.

Post-Cruise Scientific Research Proposals

From May 27 to November 23, 1998, 47 post-cruise scientific research proposals were formally approved for funding by JOI as part of the US Science Support Program. These included 13 proposals from Leg 175, 13 from Leg 17, 12 from Leg 177, and 9 from Leg 178.

JOI/USSAC Newsletter

The July and November 1998 issues of the newsletter were published and distributed. They can be viewed on-line at www.joi-odp.org.

Educational Activities

• Student Trainee Program. USSAC endorsed the concept of a student trainee program and provided JOIDES with suggested edits to the policy.

• JOI/USSAC Ocean Drilling Fellowship Program

As of January 1, 1999 the JOI/USSAC Ocean Drilling Fellowship Program was renamed the "Schlanger Ocean Drilling Fellowship Program" in memory of Seymour Schlanger. Dr. Schlanger was instrumental in establishing the U.S. Science Advisory Committee and the fellowship program.

Fellowships were awarded in July 1997 to:

Peter Selkin, Scripps Institution
"Magnetization and remagnetization of seafloor extrusives: Paleointensity, CRM and VRM experiments" *multiple ODP & DSDP legs* (one year, shorebased).

Deborah Thomas, UNC, Chapel Hill
"Reconstruction of latest Paleocene thermal maximum deep-water circulation from Neodymium isotope records" *DSDP & ODP legs: 68, 74, 80, 113, 143, 165, 171* (one year, shorebased).

Robert Valentine, Washington University, St. Louis

"Crustal Recycling at the Izu-Bonin-Mariana convergent margin: Constraints from B^-,

Li, Be, and Pb isotopes and trace element systematics" *ODP Leg 185* (one year shipboard).

• The Second Educational CD-ROM

Progress is continuing, primarily under the auspices of Ellen Kappel, on the design and implementation of the second ODP-related educational CD-ROM, titled "Gateways to Glaciation". It focuses on the closure of the Isthmus of Panama during the Miocene and Pliocene and on the paleontological, paleoclimatic, and other implications, and the possible link to the initiation of significant Northern Hemisphere glaciation during the Pliocene. A letter contract between JOI and Electronic Learning Facilitators, Inc. of Bethesda, MD, was signed on October 15, 1998, for ELF to produce the CD-ROM program. ELF will develop the program, storyboards, and the alpha, beta and gamma versions of the Windows and Mac CD-ROMs.

• 1998/99 JOI/USSAC Distinguished Lecturer Series

The following institutions were chosen to host Distinguished Lecturers during the academic year. 59 applicants were considered after the May 1 application deadline.

Jim Channell, University of Florida
Geomagnetic paleointensity records from the North Atlantic: applications to stratigraphy and geochronology

- California State University, Hayward, Hayward, CA
- University of Kansas, Lawrence, KS
- Boston University, Boston, MA
- Hamilton College, Clinton, NY

Richard Norris, Woods Hole Oceanographic Institution
Aftermath of the Apocalypse: The K-T extinction and recovery of marine ecosystems

- Texas A&M University, Corpus Christi, Corpus Christi, TX
- University of New Hampshire, Durham, NH
- Michigan Technological University, Houghton, MI
- Valdosta State University, Valdosta, GA
- Beloit College, Beloit, WI

Julie Morris, Washington University
Getting sedimental about subduction

- New Mexico State University, Las Cruces, NM

- University of Nevada, Las Vegas, Las Vegas, NV
- Central Washington University, Ellensburg, WA
- Western Washington University, Bellingham, WA
- Geophysical Society of Alaska, Anchorage, AK

Hilary Clement Olson, University of Texas Institute for Geophysics, Austin
Using sequence biostratigraphy to understand sea-level Change on the New Jersey Margin

- Utah State University, Logan, UT
- University of California, Riverside, Riverside, CA
- Stanford University, Stanford, CA
- Fort Hays State University, Hays, KS

Rick Murray, Boston University
Assessing marine-terrestrial links: The ODP record of Panamanian uplift, Caribbean tectonics, and Andean orogeny

- Carleton College, Northfield, MN
- Fitchburg State College, Fitchburg, MA
- Furman University, Greenville, SC
- Indiana University of Pennsylvania, Indiana, PA
- Virginia Tech University, Blacksburg, VA

Peter deMenocal, Lamont-Doherty Earth Observatory
African climate change and human evolution: constraints from the deep-sea

- Bowdoin College, Brunswick, ME
- Kent State University, Kent, OH
- Southern Illinois University, Carbondale, IL
- University of Illinois at Chicago, Chicago, IL
- Tulane University, New Orleans, LA

- 1999/00 JOI/USSAC Distinguished Lecturer Series

The six lecturers for the 1999/00 Series and their home institutions are listed below.

- Rodey Batiza, University of Hawaii
- Steve D'Hondt, University of Rhode Island
- Jeff Gee, Scripps Institution of Oceanography
- Greg Moore, University of Hawaii
- Christina Ravelo, UC Santa Cruz

- Carolyn Ruppel, Georgia Institute of Technology

Lecture titles and abstracts are forth coming, and a brochure announcing their availability will be published in January, 1999.

SCICOM REPORT

The complete Minutes of the August OPCOM and SCICOM Meetings are available on the JOIDES Office web site at http://www.whoi.edu/joides/. The Motions, Consensus and Action Items from SCICOM and OPCOM are presented here.

SCICOM Meeting Minutes

17 - 19 August 1998

Durham, U.K.

SCICOM Participant List

Members

Gerard Bond	Lamont-Doherty Earth Observatory
Susan E. Humphris (Chair)	Woods Hole Oceanographic Institution
Emily M. Klein	Duke University, Durham
Hermann R. Kudrass	BGR, Germany
Roger Larson	University of Rhode Island
John Ludden	CRPG, Nancy, France
Nils Holm	Stockholm University, Sweden
Kenneth G. Miller	Rutgers, The State University, New Brunswick
Gregory Moore	University of Hawaii
Casey Moore	University of California, Santa Cruz
Jonathan Overpeck	NGDC / NOAA
Julian A. Pearce (Host)	University of Durham, U.K.
Maureen E. Raymo	Massachusetts Institute of Technology
Steve D. Scott	Canadian Secretariat for Ocean Drilling, Toronto
Kensaku Tamaki	Ocean Research Institute, University of Tokyo, Japan
Lisa Tauxe*	Scripps Institution of Oceanography, San Diego

Liaisons

Jack Baldauf	Science Operator (ODP-TAMU)
Dave Goldberg	Wireline Logging Services (ODP-LDEO)
Bruce Malfait	National Science Foundation
Kate Moran	Joint Oceanographic Institutions, Inc.

Guests & Observers

Peter Barker	NERC, U.K. — Leg 178
Warner Brückmann	University of Kiel, Germany *
Joe Cann	University of Leeds, U.K.
Christina Chondrogianni	JOIDES Office, Woods Hole Oceanographic Institution
Tom Davies	ODP-TAMU
Kathy K. Ellins	JOIDES Office, Woods Hole Oceanographic Institution
John Farrell	Joint Oceanographic Institutions, Inc.
Jeff Fox	ODP-TAMU
Bill Hay	University of Kiel, Germany
Dave Hodell	University of Florida, Gainesville
Thomas Janecek	Florida State University (future SCIMP Chair)
Kazu Kitazawa	Japan Marine Science and Technology Center (JAMSTEC)
Ted Moore	University of Michigan (ESSEP Chair)
Daniel Prieur	CNRS, Roscoff, France
Mary Reagan	Wireline Logging Services (ODP-LDEO)
Barbara Romanowicz	University of California (ION Chair)
Shiri Srivastava	Geological Survey of Canada Atlantic (SSP Chair)
Takeo Tanaka	Japan Marine Science and Technology Center (JAMSTEC)
John Tarduno	University of Rochester (ISSEP Chair)
Shirley Waskilewicz	JOIDES Office, Woods Hole Oceanographic Institution

* alternate for Kevin Brown

Summary of Motions & Consensus Items

SCICOM Motion 98-2-1
SCICOM approves the Agenda for the August 1998 meeting in Durham, U.K.

Proposed: S. Scott; Seconded: C. Moore *16 in favor*

SCICOM Motion 98-2-2
SCICOM approves the minutes of the March 1998 meeting held in Boulder, Colorado.

Proposed: S. Scott; Seconded: R. Larson *12 in favor; 4 abstentions*

SCICOM Consensus 98-2-3
SCICOM enthusiastically encourages JOI to continue efforts for establishing a collaborative partnerships between ODP and industry.

SCICOM Motion 98-2-4

SCICOM approves the policy for ODP student participation with the following modifications:

1. The title will be changed to "Student Trainee Program".
2. Each student participant will receive a certificate documenting his/her participation upon completion of the ODP leg.
3. Student staffing will be done in consultation with the Co-Chief Scientists.
4. The trainee program will be implemented so as to ensure that each student receives exposure and/or training in a variety of scientific/technical activities.
5. A limited number of core samples may be made available to Student Trainees for scientific projects. A letter will be required from the trainee's supervisor ensuring that a data report will be completed.

Proposed: G. Bond; Seconded: K. Tamaki *15 in favor; 1 absent*

SCICOM Motion 98-2-5

By a combination of vote and consensus, SCICOM/OPCOM prioritize the following budgetary items should additional funds become available for FY'99:

1. Ship modifications for microbiology lab	$ 30,000
2. Lease of microbiology lab for Leg 185	$ 50,000
3. Microbiological equipment	$ 150 - 180,000
4. Operational hammer	$ 157,000
5. GLT - Leg 185	$ 82,000
6. WST - Leg 183	$ 19,000
7. VSP - Leg 186	$ 45,000
8. ARI - Leg 183, 185, 186	$ 30 - 40,000 per Leg

Other big tickets items (as in SCICOM/OPCOM Consensus 98-1-3)

Downhole Measurements Lab	$ 450 K
Operational Hammer	$ 157 K

Other Items (in no particular order):

Borehole Stability Project	$ 16 K
CORESEIS	$ 27 K
Gas Chromatograph	$ 55 K
XRD	$ 150 K ($ 60 K - used)
Data Migration	$???

The following items were deferred pending further information:

Mirror Web Sites	$ 50 K per site
SSDB Computer Tech	$ 72 K

Proposed: E. Klein; Seconded: C. Moore *15 in favor; 1 absent*

SCICOM Motion 98-2-6

Based on the scientific accomplishments of Leg 178 and recognizing that Antarctic drilling entails high priority science as outlined by the LRP, SCICOM reaffirms the scheduling of Prydz Bay as Leg 188. However, SCICOM is concerned that our ability to complete Leg 188 may be jeopardized by the costs of an ice support vessel. Hence, we strongly encourage ODP, and the proponents, to make every effort to identify an ice support vessel that is affordable to the program

Proposed: K. Miller; Seconded: H. Kudrass 11 in favor; 1 opposed; 3 abstentions; 1 absent

SCICOM Motion 98-2-7

SCICOM recognizes that the scientific objectives of drilling at Nankai are of very high priority and require a 2-leg program. Hence, SCICOM supports a first leg of drilling and coring to be scheduled in FY'00, and a second leg for LWD and CORK emplacement to be scheduled in the following year. The conduct of the second leg will be contingent upon:

1. successful drilling and station-keeping in the current conditions encountered;
2. the timely development o the second generation of CORKS. This requires that time necessary for development by ODP-TAMU engineers be given high priority;
3. evaluation by the JOIDES Advisory Structure (SSEPs, SCIMP and SCICOM) of the detailed scientific plans of the second leg;
4. identification of funds to reduce the cost of the whole Nankai program to be equivalent to the cost of two moderate legs (i.e. $200,000-$300,000 per leg).

Proposed: E. Klein; Seconded: C. Moore 13 in favor; 3 abstentions

SCICOM Motion 98-2-8

SCICOM supports, encourages, and recognizes the scientific importance of innovative programs which incur more than typical leg-related costs (<$300,000). Such expenses could include ice boats, alternate platforms, LWD, and CORKs. However, given the financial constraints under which the ODP operates, proponents or partner programs of such legs are strongly encouraged to seek additional resources to help cover costs in excess of a typical leg. We hope that the opportunity to leverage against ODP's financial and technological resources will provide the international scientific community with exciting new opportunities.

Proposed: M. Raymo; Seconded: K. Miller 13 in favor; 3 abstentions

SCICOM Motion 98-2-9

SCICOM approves the following ranking for programs to be considered for scheduling by OPCOM in FY'00 and beyond:

1. 445 - Nankai
2. 485 - Southern Gateways
3. 431 - W. Pacific Seismic Network (WP-1 and WP-2)
4. 448 - Ontong-Java Plateau
5. 465 - SE Pacific Paleoceanography
6. 479 - PacManus
7. 486 - Paleogene Equatorial Pacific

8. 499 - ION Equatorial Pacific
9. 455 - Laurentide Ice Sheets
10. 500 - H_2O Observatory

SCICOM recommends that Nankai be allocated 2 legs (see Motion 98-2-6) and SE Pacific Paleoceanography and Paleogene Equatorial Pacific be allocated 1.5 legs each. Ontong-Java is approved for 1 leg at this time.

The following proposals ranked below the above proposals and will not go forward to OPCOM:

11. 451 - Tonga
12. 482 - Wilkes Land
13. 450 - Taiwan
14. 463 - Shatsky Rise
15. 489 - Ross Sea

Detailed correspondence will be sent to the proponents by the SCICOM Chair appraising them of their proposal status.

Proposed: J. Overpeck; Seconded: K. Miller *13 in favor; 3 abstentions*

SCICOM Consensus 98-2-10
SCICOM recommends that the JOIDES Office seek permission from proponents to publish abstracts of full proposals on the web.

SCICOM Consensus 98-2-11
In response to a recommendation from the SSEPs, SCICOM expects to replace the Long Term Observatory PPG with a Hydrogeology PPG once it has completed its task. This is expected to occur at the March 1999 meeting.

SCICOM Consensus 98-2-12
Based on the recommendations from SCIMP and the need to ensure effective use of ODP's limited resources, SCICOM recommends the following program areas to be reviewed:

1) public affairs with respect to a consolidation of effort (SCIMP recommendation 98-2-9)
2) overall costs of the current wireline operations (SCIMP recommendation 98-2-10)
3) the staffing levels throughout the ODP organization (SCIMP recommendation 98-2-12).

SCICOM also requests that OPCOM and TEDCOM evaluate the cost benefit and feasibility of engineering projects to determine if they can be accomplished in a realistic time frame to benefit the goals of the LRP (SCIMP recommendation 98-2-11).

SCICOM Motion 98-2-13
SCICOM accepts the revised Integrated Curation and Publication Policy in principle. Several points require clarification, including: (1) the deadline for supplying material for inclusion in the SR for manuscripts rejected in the outside literature; (2) the requirement that authors are obliged to submit data (including that for papers published in the outside literature) for inclusion on the SR CD-ROM; (3) the party responsible for informing non-performers of their status.

Proposed: L. Tauxe; Seconded: G. Moore *15 in favor; 1 absent*

SCICOM Consensus 98-2-14
The field party would like to thank Julian Pearce for his hospitality in Durham, and for arranging a two-day travel through historical periods, starting with Hadrian's Wall at the fringes of the mainly land based Roman Empire, we ended with a visit of James Cook's ship and scientific equipment used for the first ODP-type of global marine scientific investigations.

Proposed: H. Kudrass

SCICOM Consensus 98-2-15
SCICOM bids farewell to four long-term members. We will sincerely miss the good cheer of Julian Pearce, the sage advice of Greg Moore, the stoic pragmatism of Hermann Kudrass, and the ascerbic wit and startling insights of Roger Larson. Our corporate memory will suffer from the loss of these veterans of PCOM. We wish them well.

Proposed: K. Miller

SCICOM Consensus 98-2-16
SCICOM takes this opportunity to applaud and thank Susan Humphris for her leadership of SCICOM and JOIDES over the past two years. Working with foresight, insight and industry, she has kept a steady hand on the science helm while leading us through the peripheral rocks and shoals that often threaten our overall goals. We wish her well in her return to a more normal life as "just" a world-class scientist and look forward to her wisdom during her last year as a regular member of SCICOM. At the same time, we welcome Bill Hay as he takes the SCICOM helm and leads us on in our never-ending voyage of discovery.

Proposed: R. Larson

SCICOM Consensus 98-2-17
SCICOM takes this opportunity to thank the JOIDES Office staff for their excellent and tireless service to JOIDES during their tenure at Woods Hole. In these days of ever-increasing bureaucracy and sometimes decreasing funding, it has been absolutely essential to rely on the professional support of Shirley Waskilewicz, Kathy Ellins, Maria Mutti, and most recently, Christina Chondrogianni. We especially thank Kathy Ellins for her trans-Atlantic service in two JOIDES Offices over the past 4 years. We wish her well in her new position at the University of Texas at Austin where she will have the opportunity to bring civilization from the Atlantic Seaboards to what many still regard as the "wild west".

Proposed: R. Larson

SCICOM Consensus 98-2-18
SCICOM thanks Nick Pisias for his role as Interim Director of JOI. We appreciate the significant investment in time, and the dynamism of Nick during this important transition in the direction of JOI and the renewal of the ODP.

Proposed: J. Ludden

SCICOM Consensus 98-2-19
Occasionally, the stars are in confluence and events transpire as they should. One such time was when Kate Moran accepted the directorship of the Ocean Drilling Program. The entire ODP community rejoices at this decision and no less so the Canadians from whose bosom Kate has sprung. Kate, a dual Canadian-U.S. Citizen, made her career and superb scientific reputation at the Geological Survey of Canada-Atlantic in Dartmouth. There, she was a member of an exceptional group of marine scientists who were the first in the country to grasp the significance of DSDP/ODP. Kate herself established a specialized physical properties lab as part of this pioneering effort. Kate has participated on 7 ODP legs and chaired the former Shipboard Measurements Panel. More recently, Kate has deftly steered JANUS through the shoals to a successful conclusion. Having these credentials, Kate is superbly well equipped to direct the Ocean Drilling Program through to a successful conclusion in 2003 and to lay the groundwork for IODP.

It is moved that a most warm welcome be extended to Kate from SCICOM with our best wishes for a continuation of her string of successes.

Proposed: S. Scott

SCICOM Approval 98-2-20

SCICOM approves by e-mail the schedule for FY'00 (and beyond) as follows:

Leg 188	Dec - Feb	Prydz Bay*
Leg 189	Feb - April	Southern Gateways
	Transit (14 days)	
Leg 190	April - June	Nankai

Leg 191	July	WP-2 Site
Leg 192	July - Sept.	Manus Basin
Leg 193	Sept. Nov.	Ontong-Java

* - contingent on availability of affordable ice support

12 in favor; 2 against; 3 abstentions

Operations Committee (OPCOM) Meeting Minutes

21-22 August, 1998
Durham, U.K.

OPCOM Participant List

Members

Dave Hodell	University of Florida, Gainesville
Susan E. Humphris (Chair)	Woods Hole Oceanographic Institution
J. Casey Moore	University of California, Santa Cruz
Kensaku Tamaki	Ocean Research Institute, University of Tokyo, Japan

Liaisons

Mahlon Ball	US Gological Survey, Denver (PPSP Chair)
Jack Baldauf	Science Operator (ODP-TAMU)
Tom Janecek	Florida State University (SCIMP Chair)
Bruce Malfait	U.S. National Science Foundation
Kate Moran	Joint Oceanographic Institutions, Inc.
Mary Reagan	Wireline Logging Services (ODP-LDEO)
Shiri Srivastava	Geological Survey of Canada Atlantic (SSP Chair)

Guests & Observers

Warner Brückmann	GEOMAR, JOIDES Office Science Coordinator (elect)
Christina Chondrogianni	JOIDES Office, Wooods Hole Oceanographic Institution
Kathy Ellins	JOIDES Office, Woods Hole Oceanographic Institution
John Farrell	Joint Oceanographic Institutions, Inc.
P. Jeff Fox	Science Operator, ODP-TAMU
Dave Goldberg	Wireline Logging Services (ODP-LDEO)
Bill Hay	GEOMAR, SCICOM Chair (elect)

Kate Moran	Geological Survey of Canada Atlantic
Shirley Waskilewicz	JOIDES Office, Woods Hole Oceanographic Institution

Apologies

Robert Carter	University of Townsville, Australia
Jim Natland	University of Miami, RSMAS
Alister Skinner	British Geological Survey, TEDCOM Chair

OPCOM Consensus Items

OPCOM Consensus 98-2-1
OPCOM recommends that future two-ship experiments be proposed in sufficient time to be considered one of the primary objectives of a cruise.

OPCOM Consensus 98-2-2
OPCOM recommends that Leg 185 be extended by 2.2 days to carry out a comparative test of the DCB versus the RCB, which is a programmatic priority of ODP.

OPCOM Consensus 98-2-3
OPCOM endorses another test of the hammer drill system post-dry dock. ODP/TAMU will develop and present schedule for this test to OPCOM. at their March 1999 meeting

OPCOM Consensus 98-2-4:
OPCOM strongly urges that the microbiology contamination and sampling tests take place prior to Leg 184.

OPCOM Consensus 98-2-5
OPCOM endorses SCIMP Recommendation 98-2-3 regarding IR product distribution as follows:

The standard IR product distribution should be a package containing the booklet with the Leg Summary chapter and the volume CD-ROM. After standard distribution is completed, the CD-ROM can be sold without the booklet.

The price of the booklet and CD should be set at $25. In addition, the CD can be distributed without the booklet for a reduced cost of $10.

OPCOM Consensus 98-2-6
OPCOM endorses SCIMP Recommendation 98-2-5 regarding revision of the submission, production, and publication procedures to take advantage of the WWW medium as follows:

1) Allow participants to meet the publication obligation by submitting manuscripts or data reports at any time post cruise and initiate a peer review process upon submission.
2) Once accepted, publish individual papers on WWW.
3) Link all publications to the leg-related citation list on the WWW.
4) Require fulfillment of obligation (deadline for submission) to be 28 months post-cruise for all publications. Allow additional manuscripts and data reports to be submitted after 28 months.
5) Produce and distribute a CD-ROM containing reprints of leg-related SR papers at 48 months post-cruise.
6) Continue to require ERB members to remain active for 48 months postcruise. After this period, have Staff Scientists coordinate the peer-review process of additional data reports.

A proviso needs to be added that deals with those manuscipts that are rejected from the outside literature. They authors should be given six months to submt a report to TAMU for publication as part of the SR.

OPCOM Consensus 98-2-7
OPCOM endorses SCIMP REcommendation 98-2-6 regarding the SR Volume as follows:
1) Writing or coordinating a Leg synthesis paper for publication in the SR volume will be add to the responsibilities of the Co-Chief Scientists
2) A booklet will be published that contains the leg synthesis paper that will accompany the volume reprint series on CD-ROM.
3) JOI and TAMU will determine submission deadline for synthesis paper.

OPCOM Consensus 98-2-8
OPCOM endorses SCIMP Recommendation 98-2-6 that recommends that the Science Operator investigate the costs and tasks involved in compiling and maintaining a comprehensive list of publications resulting from DSDP and ODP research, in order to assess the significance and impact of the scientific drilling program.

OPCOM Consensus 98-2-9
OPCOM encourages the continued investigation by JOI of the NGDC proposal for DSDP/ODP archiving, and also encourages exploration of a wider range of options.

Action Items

Action Item 98-2-1A
Humphris will write a letter to the Head of the German ODP Office explaining the logistical problems on Leg 179 and expressing regret at the cancellation of the two-ship experiment.

Action Item 98-2-2A
Casey and Humphris will communicate with the proponents of Leg 186 pointing out the problem with the current casing requirement, and inquiring about the minimum depth of casing needed to achieve their scientific objectives. Specifically, they will ask if the cruise objectives can be met by casing only 800 meters.

Action Item 98-2-3A
Humphris will contact the Deep Biosphere PPG to solicit a person to sail on the test cruise.

Action Item 98-2-4A
With regard to the FY'00 schedule:

- Humphris will write to the PACMANUS proponents encouraging them to find external funds to cover the excess costs associated with including LWD, to which she will attach a copy of SCICOM Motion 98-2-8.

- Humphris will write to the Tonga proponents telling them that there is a slight chance that Tonga may be in the FY 2000 schedule and explaining why.

Action Item 98-2-5A
With regard to JOI's proposal to reduce the length of ODP legs to 56 days:

- ODP/TAMU will examine the drilling history in order to develop a clearer definition of what will be gained and what will be lost.

- JOI will include Moran's proposal as an agenda item for the fall Co-Chief Scientists Review Meeting.

- JOI, in consultation with ODP/TAMU, will develop a proposal clearly stating the with disadvantages and advantages for presentation to OPCOM, and then SCICOM, in March 1999.

Action Item 98-2-6A
Humphris will write a letter from the JOIDES Office to Dan Quoidbach and his staff recognizing the contribution of the SSDB to the JOIDES Advisory Structure.

Action Item 98-2-7A
ODP-TAMU will look into developing mechanisms to track ODP-related publications and possibly through encouragement of authors to use ODP in the key words. They will report back to SCIMP.

Action 98-2-8A:
LDEO-WLS will investigate the cost implications of making the WST part of the standard logging operations.

Action Item 98-2-9A

- JOI will send letters to the reviewer acknowledging their help, informing them how to find out which proposals got scheduled.

- The JOIDES Office will change the proposal guidelines to indicate that the length of the Proponents' Response Letters has been increased from 2 to 5 pages, including figures and tables.

Action Item 98-2-9A
The JOIDES office will include a statement in the proposal guidelines for proponents directing proponents to contact ODP/TAMU if problems with currents, ice, shallow water, and other hazards are anticipated.

PRIORITIZATION OF SCIENTIFIC AND PROGRAMMATIC ACTIVITIES WITHIN ODP:

A FRAMEWORK FOR BUDGETARY DECISION-MAKING

Prepared for:
JOIDES Executive Committee

Prepared by:
JOIDES Science Committee with Input from the JOIDES Advisory Structure

Distributed: 1 November 1998

TABLE OF CONTENTS

1. INTRODUCTION

The Ocean Drilling Program (ODP) Long Range Plan was published in 1996 and set forth a number of ambitious scientific objectives under two major themes: *Dynamics of Earth's Environment* and *Dynamics of Earth's Interior*. In order to better accomplish the goals outlined in the document, there was a profound reorganization of the JOIDES Advisory Structure to more closely reflect the themes and initiatives of the LRP.

Over the past two years, the Advisory Structure has worked to deliver the 1996 LRP through scheduling drilling legs that address high priority scientific objectives. However, most fiscal projections and ODP membership scenarios predict decreasing (in real terms) funding over the next five years. The impact of the financial constraints became particularly evident in planning for FY'99, when many of the "Special Operating Expenses" associated with the conduct of specialized drilling, coring and logging operations that would have been scientifically beneficial for some technically difficult legs had to be cut in order to meet the budget. In response to this, EXCOM recognized that there would be some difficult decisions that the Program would have to make over the next few years as to where the limited resources should be directed. The decision-making process should be guided by a framework that prioritizes the scientific and programmatic activities to be conducted within ODP over the next few years. This was expressed in an EXCOM Motion passed at the January 1998 meeting:

EXCOM Motion 98-1-8

Presently determined budgetary constraints through 2003 will negatively impact the delivery of the Long Range Plan. EXCOM asks SCICOM to prioritize future science objectives to maximize the objectives of the Long Range Plan, clearly indicating those which cannot be achieved under existing budget projections. SCICOM should also identify and prioritize changes in program activities, services, equipment needs and technological development. SCICOM is asked to forward its report to EXCOM by September 1998.

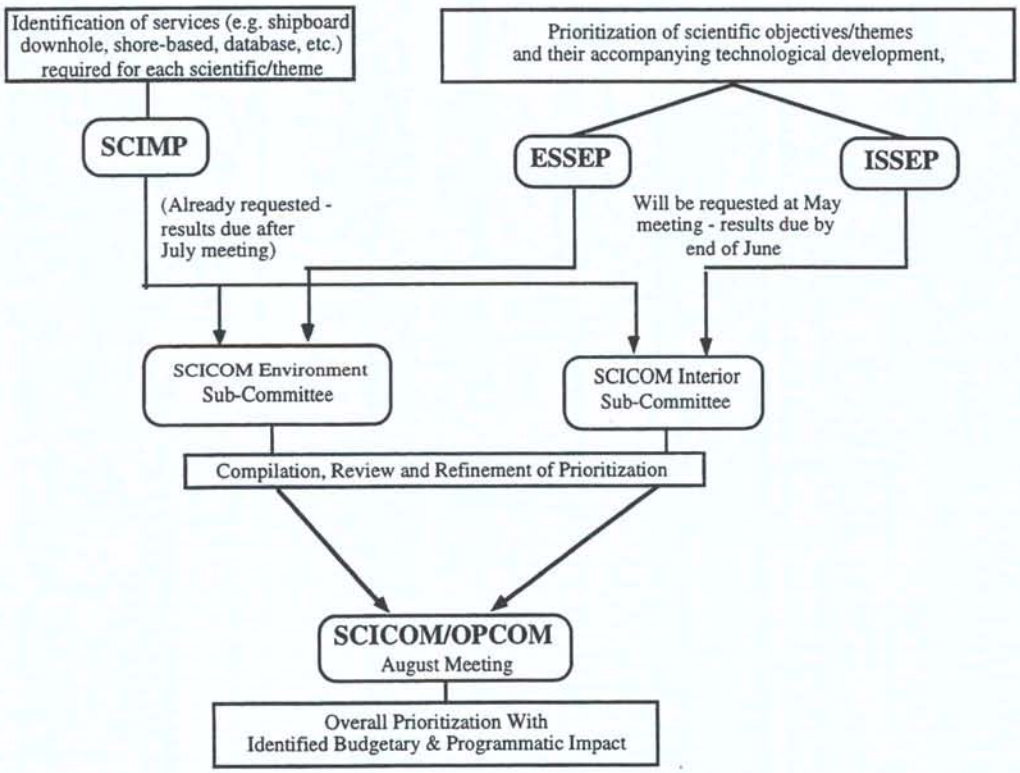
At their March meeting, SCICOM adopted a programmatic approach to addressing this issue that consisted of three activities:

- prioritization of scientific objectives/themes for Phase III by the Science Steering and Evaluation Panels (SSEPs), with input from the Program Planning Groups (PPGs).
- identification of services (i.e. shipboard, downhole, shore-based, database, etc.) required for the accomplishment of LRP scientific themes by the Scientific Measurements Panel (SCIMP).
- compilation of a prioritized list of scientific objectives/themes for Phase III, and their accompanying technological development, as well as recommendations related to shipboard, downhole and database services by Sub-Committees of SCICOM.

All of this information was presented to SCICOM at the August meeting, and a prioritization developed.

SCICOM Consensus 98-1-4
In response to EXCOM Motion 98-1-8, SCICOM adopts the following procedure to provide a framework based on a prioritization of themes of the Long Range Plan for future budgetary decisions:

Mechanism for Producing a Programmatic Framework for Budgetary Decisions



This document provides a summary of the overall programmatic prioritizations, together with the reports that were taken into consideration in making the decisions. It is important to note that this document is based on projections of scientific accomplishment and technological progress as seen in 1998. The prioritizaton will evolve over the next few years as proposal pressure (the major driving force for ODP science) changes and as scientific understanding advances. The priorities should be revisited using the expertise of the entire JOIDES review structure.

2. SCIENTIFIC PRIORITIZATION WITHIN THE MAJOR THEMES OF THE ODP LONG RANGE PLAN

Each of the Scientific Steering and Evaluation Panels produced documents that provided the foundation for prioritization and justification of scientific objectives within the ODP Long Range Plan by the SCICOM Sub-Committees. These documents are presented in Appendices I and II, and portions have been extracted to justify the overall scientific program prioritization in the next section. The two SCICOM Sub-Committees carried out the prioritization process differently. Individuals sub-themes within the *Dynamics of Earth's Environment* theme were ranked individually, with highest priority being placed on

themes of greatest societal relevance. Prioritization of scientific objectives within the *Dynamics of Earth's Interior* theme was accomplished by grouping sub-themes into priority levels, rather than rankings, taking into account what could be achieved by the end of ODP, as well as what preliminary drilling is required to prepare for the post-2003 drilling program. The SCICOM Sub-Committees produced the following prioritizations:

Dynamics of Earth's Environment: Prioritization of Scientific Themes by SCICOM Sub-Committee

Priority	Subtheme
Themes within Dynamics of Earth's Environment	
1.	Oceanographic and climatic variability on Milankovitch time scales, with special emphasis on Arctic drilling
2.	Decadal to millenial-scale climate variability
3.	Extreme warm climates
4.	Understanding history and effects of sea level
5.	Exploring the link between climate and tectonics
Themes Partly Overlapping with Dynamics of Earth's Interior	
1.	Deep biosphere
2.	Gas hydrates
NR	Long-term observatories
NR	Fluid flow
NR	Carbon cycling

NR = Not ranked either because they address goals more relevant to Earth's Interior themes (fluid flow and observatories) or because of insufficient information available to rank (carbon cycling)

Dynamics of Earth's Interior: Prioritization of Scientific Themes by SCICOM Sub-Committee

Top Priority	Subtheme
•	Understanding active deformation and fluid flow at convergent margins
•	Hydrothermal processes at convergent margins
•	An intact section of oceanic crust

High Priority	Subtheme
•	Seismological observatories at ION sites
•	Emplacement of oceanic Large Igneous Provinces (LIPs)
•	The plutonic foundations of the oceanic lithosphere

Moderate Priority	Subtheme
•	Mass balances at convergent margins
•	Rifting initiation and extensional margins

3. OVERALL PROGRAMMATIC PRIORITIZATION OF SCIENTIFIC OBJECTIVES

Integration of the priorities within major scientific themes into an overall Program prioritization was completed at the August SCICOM meeting with two goals in mind:

- By the end of ODP, the Program needs to be able to identify specific scientific objectives of the Long Range Plan that have been met.

- By the end of ODP, the Program needs be positioned both from a scientific and technological standpoint, to justify and move into a new scientific drilling program post-2003?

Clearly, different themes within the Long Range Plan are in varying stages of achievement. For example, by the end of the Program, ODP will have recovered a global array of records that will allow evaluation of climatic variability on Milankovitch time scales -- a major objective of the ODP Long Range Plan. Conversely, drilling an intact section with complete penetration of the oceanic crust is unlikely in the next five years. However, it is very important that preliminary drilling and technology development continue so that the Program is positioned to accomplish this goal in a new program that includes riser drilling capabilities.

SCICOM decided to divide all the themes into two groups, indicating their overall scientific priority. This resulted in a mix of projects in both groups, some of which will accomplish the scientific objectives before the end of ODP, and others for which progress may be made, but which will not be accomplished until the new drilling program

GROUP I (in no particular order):

- Oceanographic and Climatic Variability on Milankovitch Time Scales (with emphasis on Arctic drilling)
- Decadal to Millenial-Scale Climate Variability
- Gas Hydrates
- Hydrogeology -- Hydrothermal Systems
- Deep Biosphere
- Seismogenic Zone Preparatory Drilling and In Situ Monitoring
- Section of the Oceanic Crust
- Extreme Warm Climate
- ION Observatory Sites
- Large Igneous Provinces

GROUP II (in no particular order):

- Plutonic Sections of Oceanic Lithosphere
- Climate-Tectonic Links
- History and Effects of Sea Level
- Mass Balances at Subduction Zones
- Rifting Initiation & Extensional Margins

Each of these groups contains scientific projects which range in cost from that of a "standard" leg (as defined by ODP for budgeting purposes) to very expensive legs that involve high Special Operating Expenses (e.g. extensive casing, Logging-While-Drilling,

ice-support vessels, advanced CORKs). In defining a framework for budgetary decision-making, it is those projects that require resources considerably beyond those expected for a routine drilling, coring and logging leg that must be prioritized. Scheduling of legs with low SOEs can proceed through the current system of an annual ranking of scientific priority.

Approximate costs of legs associated with all of the LRP scientific objectives were estimated from consideration of the costs of (i) legs scheduled for the years FY'97-FY'99; (ii) proposals included in the FY'00 Prospectus; and (iii) examples of proposals that address important themes not covered in the previous two categories (Appendix III).

A complete listing of the final programmatic prioritization of scientific themes, together with the cost estimates and technological requirements is shown in Table 1. Those legs for which costs were "standard" or "moderate" (up to $250K above a standard leg) were not prioritized within each group, but maintain their prioritization within their scientific themes, as defined in the previous section.

GROUP I

Within Group I, five scientific themes were not prioritized as their costs fall in the "standard" to "moderate" category. The two paleoclimate themes -- **Oceanographic and Climatic Variability on Milankovitch Time Scales** and **Extreme Warm Climates** -- require standard coring and logging. The exception to this is the high priority placed on initiation of **Arctic drilling** during the next five years. At a time of budgetary shortfalls, it may seem inappropriate to argue for ODP to begin to explore the Arctic proper, particularly in Phase III. The cost of drilling in the Arctic is high, and ODP will be unable to embark on this project without the development of partnerships with other programs (e.g. NAD). ODP offers engineering, archiving, publication, and logging expertise that can be used to support ongoing efforts (e.g., NAD, others) to drill the Arctic at minimal costs to the program (for an example, see ODP Legs 150X and 174AX which offered significant enhancement to the program at minimal costs). The inclusion of Arctic drilling in Group I and as the highest priority for the *Dynamics of Earth's Environment* theme is an indication that, if such partnerships can be developed, and the costs to ODP reduced to those of a "standard to moderate" leg, then Arctic drilling would be a very high priority for ODP before the end of the program. ODP can and must continue to be a leader in ocean drilling, and this must include deep involvement with Arctic drilling.

The topic of the **Deep Biosphere** captures the imagination of all geoscientists, and widens the scientific communities that ODP serves to a broad spectrum of scientists (biologist, biochemists, etc.) outside of geosciences. Hence, it is one of the Program's top priorities, and requires that the immediate development of a microbiology facility is the first priority for SOE funding. Estimates for an equipped, containerized facility are ~$350K; thereafter, the inclusion of microbiological work on drilling legs should not provide a significant added expense.

Mantle Dynamics is the final Group I scientific theme that has not been prioritized. ODP is exploring this through two major strategies that have been itemized separately as they require different approaches. The sites drilled for the **International Ocean Network** often require reentry cones and specialty logging, and hence can be "moderate" in cost. However, they are critical to imaging the deep mantle and constraining mantle tomographic models which is fundamental to our understanding of how the Earth works. In addition, this is an area where ODP is successfully achieving its aim of fostering links

Table 1. OVERALL SCIENTIFIC PROGRAMMATIC PRIORITIZATION WITH ACCOMPANYING TECHNOLOGICAL DEVELOPMENT AND RESOURCE REQUIREMENTS

GROUP I

Prioritization of Scientific Themes Likely to be Affected by Budgetary Constraints

Priority	Scientific Theme	Cost*	Technological Developments	Additional Resources
1	Seismogenic Zone Preparatory Drilling and In Situ Monitoring	H-E	Advanced CORKs	Multiple Casing; LWD
2	Decadal to Millenial-Scale Climate Variability	S-E		Shallow Water Platform (for reef drilling)
3	Gas Hydrates	H-E	Pressurized Coring & Extraction Technique	LWD
4	Section of the Oceanic Crust	H-E	Hammer Drill-In Casing; Diamond Drilling; Core Orientation	Multiple Casing; LWD
5	Hydrogeology -- Hydrothermal Systems	H-E	Hammer Drill-In Casing; Diamond Drilling; High Temperature Logging Tools; Advanced CORKs	LWD

Scientific Themes Unlikely to be Affected by Budgetary Constraints

Dynamics of Earth's Environment				
•	Oceanographic & Climatic Variability on Milankovitch Time Scales	S**	--	--
•	Deep Biosphere	S-M	Advanced CORKs	Microbiological Lab
•	Extreme Warm Climates	S	--	--
Dynamics of Earth's Interior				
	ION Sites	S-M	--	Reentry Sites; Specialty Logging
	Large Igneous Provinces (LIPs)	S-M	--	Specialty Logging

Table 1 (contd.)

GROUP II

Prioritization of Scientific Themes Likely to be Affected by Budgetary Constraints

Priority	Scientific Theme	Cost	Technological Developments	Additional Resources
1	Plutonic Sections of Oceanic Lithosphere	M-E	Core Orientation Method	Multiple Casing; Specialty Logging
2	Mass Balances at Subduction Zones	M-H	Advanced CORKs	Specialty Logging;
3	Rifting Initiation and Extensional Margins	H-E		Multiple/ Perforated Casing; Specialty Logging/ LWD

Scientific Themes Unlikely to be Affected by Budgetary Constraints

•	Understanding History and Effects of Sea Level Change	S-M**	--	Specialty Logging
•	Climate and Tectonics Links	S	--	--

Note:

* - Costs above a typical leg: standard (S) = ≤$90K, moderate (M)= <$250K, high (H)= $250-500K and expensive (E)= >$500K.

** - High latitude drilling for climate or sea level themes will require ice support vessels (Antarctic and Arctic) and possibly an ice-class drilling platform (Arctic). These would place such legs in the E-VE category and they would be seriously impacted by budgetary constraints.

with other communities. SCICOM puts a very high priority on drilling the six high priority oceanic sites identified by ION by the end of the Program.

The other approach is through exploration of **Large Igneous Provinces**, which are now recognized not only as prime targets for understanding mantle dynamics, but also for investigating the global response (environmental impact) of this huge outpouring of magma. Significant progress can be made with current drilling and logging technology in determining the formation and evolution of these large features and, before the end of ODP, two of the world's largest LIPs will have been drilled. Deep drilling on these structures will await a vessel with riser capabilities.

Five scientific themes that fall within the "high - expensive" category (that spans legs with costs >$250K above a standard leg) were prioritized:

Seismogenic Zone Preparatory Drilling and In Situ Monitoring

The highest priority in this category is seismogenic zone drilling. Substantial progress has to be made in understanding processes of active deformation and fluid flow while laying the foundations for future deep (riser-based) drilling. The Conference on Cooperative Ocean Riser Drilling (CONCORD) identified the study of a seismogenic zone in the Western Pacific as the first project for the riser drilling vessel. Hence, it is imperative that preparatory work be accomplished over the next five years. In order to understand the role of fluids in all aspects of deformation, studies in these environments are likely to require extensive casing, LWD, emplacement of advanced CORKs (which must have a high priority in terms of technological development within ODP), and *in situ* monitoring of seismic zones at active margins.

Decadal to Millenial-Scale Climate Variability

Drilling to address very high-resolution climate variability is the second highest priority within the "high - expensive" category. It is very relevant to society and is a topic in which ODP is already demonstrating a leadership role through drilling open ocean sediment drifts and marginal settings, such as the Cariaco and Santa Barbara Basin. Such studies range from standard to high in terms of cost, depending on the approach that is taken. In areas of rapid sedimentation in deep water, high-resolution records can be obtained on "standard" cost legs. However, very-high resolution (up to millenial scale) paleoceanographic and paleoclimatological studies require drilling on coral atolls and terraces in water depths shallower than possible with the *JOIDES Resolution*. The technological capabilities already exist; however, the costs of drilling in shallow water with supplementary platforms is high, and it is unlikely that funds will be available to support direct drilling costs in Phase III. However, as for Arctic drilling, costs to ODP may be kept to a minimum if it offers engineering, archiving, publication, and logging expertise to support ongoing efforts. By placing it has a high priority, SCICOM is indicating that if partnerships could be developed that would reduce the costs to ODP to those of a standard - moderate leg, then these studies would have a very high priority.

Gas Hydrates

ODP is already playing a leadership role in investigating the distribution, mechanism of formation, and migration paths of gas hydrates, and continuing to investigate this poorly understood global carbon reservoir is of great scientific importance, as well as being an area of potential interest to industry. The costs of legs are likely to be high due to the need for LWD. In addition, some technological innovations are required, including the development of pressure core samplers and systems for gas extraction. With the surge of interest in, and funding for, gas hydrate reservoirs, ODP must seize the opportunities that are opening up, and stand ready to place high priority on gas hydrate studies.

Intact Section of the Oceanic Crust

Recovery of a complete section of the oceanic crust has been a goal of scientific ocean drilling for over forty years, and it remains a very high priority. A major factor has been the need to develop the technology to drill and then stabilize a hole through the highly fractured upper layers of the crust. The best opportunity for making a significant contribution toward the goal of a complete penetration of *in situ* oceanic crust may be in an ultra-fast spreading environment, where models predict that the gabbroic rocks are located at shallow depths. Although the goal of a complete penetration is unlikely to be achieved by the end of ODP, it is critical that technological developments (e.g. hammer drill-in casing, etc.) to overcome the formation problems continue in order that recovery of an intact oceanic crustal section is a realistic goal for the next drilling program.

Ocean Crust: Hydrothermal Processes

Drilling a hydrothermal system in an arc or back-arc setting will greatly enhance attempts to understand the nature and origin of world class ore deposits. Such drilling is considered a high priority to complement the already successful legs in a volcanic-hosted (TAG hydrothermal field) and a sediment-hosted (Middle Valley) massive sulfide deposit. Development of technology to drill in unstable formations, as well as construction of high-temperature logging tools is required for future drilling of these systems. In addition, this drilling will position the program to attempt a deep hole into a hydrothermal reaction zone once riser drilling becomes available.

GROUP II

Of the five scientific themes listed in Group II, two were not prioritized. The costs of drilling legs to study **Climate-Tectonic Links** are not likely to be considerably greater than a "standard" leg. **Sea Level** studies in water deep enough for the *JOIDES Resolution* to operate can be completed at "moderate" costs and require only some specialty logging. However, drilling on the continental shelf would require the use of a supplementary platform, which is likely to be prohibitively expensive without the development of partnerships with other programs. Antarctic drilling requires the use of ice support vessels, which places such legs in the "very expensive" category. In Phase III and previously, ODP has made a major commitment to explore the Antarctic. While SCICOM has endorsed efforts to support the scheduled Leg 188 with an ice boat (SCICOM Motion 98-2-6), it also has encouraged proponents or others to seek additional resources to support costs that exceed normal leg expenditures (SCICOM Motion 98-2-8 - this is discussed in the next section). This may affect our ability to drill Antarctic targets in Phase III other than those currently scheduled. and hence ODP's ability to drill in these environments may be severely impacted due to budgetary constraints.

Two scientific themes fall within the more expensive categories and have been prioritized:

Plutonic Sections of Oceanic Lithosphere

Within Group II, continuing to drill plutonic sections of the oceanic lithosphere that are exposed at shallow depths is the higher priority of the two high cost programs. This topic falls into Group II only relative to recovery of an intact section, which is higher priority. ODP has already demonstrated that the plutonic foundations of oceanic crust can be drilled with current technology where it is tectonically exposed at shallow depths. Studies of Hole 735B are revolutionizing the way in which we view oceanic crustal architecture, but additional sites are required to determine how representative the recovered section is of mid-ocean ridge lower crust. Although these studies can be conducted with current technology, scientific objectives of a deep hole would require multiple casing and possibly

specialty logging, thereby increasing the cost. In addition, development of a core orientation method would greatly enhance the scientific value of the cores.

Mass Balances at Subduction Zones

Understanding the "Subduction Factory" and associated geochemical fluxes is key to investigations of recycling of material between the Earth's surface and interior. By 2003, ODP will have conducted studies at the Izu-Mariana convergent margin and will have sufficient information to conduct the first quantitative assessment of geochemical mass balances during the subduction process. However, it would be advantageous to complement the Izu-Mariana program with drilling at another subduction zone before 2003 in order to locate appropriate areas for more advanced mass balance studies in the post-2003 period.

Rifting and Extensional Margins

As with convergent boundaries, there is a need to prepare for post-2003 programs that address the processes of the initiation of rifting and continental breakup . However, these legs often require deep drilling and complicated casing operations, specialized logging, and installation of CORKs. A preliminary transect drilled with current technology would provide the opportunity to select a deep-penetration site for post-2003 drilling.

4. IMPACT OF BUDGETARY CONSTRAINTS ON ACCOMPLISHMENT OF SCIENTIFIC THEMES OF THE ODP LONG RANGE PLAN

The framework presented in Table 1 provides an overview of the sequence in which scientific themes of the Long Range Plan would be eliminated in an ever-tightening budget situation. SCICOM has recognized that accomplishments of high priority objectives that require very expensive legs could be ameliorated if resources could be leveraged from other international programs interested in participating in ocean drilling. Hence, in order to state the critical nature of the issue, as well as to encourage proponents, ODP member countries and consortia, and other international initiatives to seek other resources, SCICOM passed the following motion at its August meeting:

SCICOM Motion 98-2-8

SCICOM supports, encourages, and recognizes the scientific importance of innovative programs which incur more than typical leg-related costs (<$300,000). Such expenses could include ice boats, alternate platforms, LWD, and CORKs. However, given the financial constraints under which the ODP operates, proponents or partner programs of such legs are strongly encouraged to seek additional resources to help cover costs in excess of a typical leg.

We hope that the opportunity to leverage against ODP's financial and technological resources will provide the international scientific community with exciting new opportunities.

It is very difficult to devise a scenario of scientific themes that will be cut or seriously impacted as the budget decreases (in real terms) because so much of what can be done in a given year depends on what proposals are in the system, the combination of legs that are under consideration for scheduling and their relative costs, as well as the geographic location of the ship. In addition, it is impossible to free up any significant funds by not using the *JOIDES Resolution* for a leg, since ODP is required to pay for it year round.

Hence, the following list provides an attempt to demonstrate how the framework would identify the sequence of themes that would be affected based on the assumptions that (i) the vessel maintains its standard schedule of six legs per year, and (ii) that no other resources are available to the Program. In addition, it is assumed that funds will be identified in FY'99 for some type of microbiological facility on the vessel.

Sequence of Scientific Themes Affected with Increasing Budgetary Constraints

(assuming no other resources)

1) **Elimination of the Possibility of Accomplishing Objectives that Require the Use of Supplementary Platforms:** this would mean that:
   - "Understanding the History and Effects of Sea Level Change" studies would be limited to legs with the *JOIDES Resolution* with no shallow water drilling
   - "Oceanographic and Climatic Variability on Milankovitch Time Scales" studies would complete global arrays, but there would be no Arctic drilling.

2) **Elimination of Programs that Require Ice Support Vessels:** the planned series of Antarctic legs as put forward by ANTOSTRAT and prioritized by the JOIDES Antarctic Detailed Planning Group would end with only two (out of a proposed five) legs having been completed.

3) **Rifting Initiation and Extensional Margins**: Leg 180 in the Woodlark Basin was the most recent leg addressing this issue, and there is currently a highly rated program to drill the North Atlantic Rifted Margin. This project had the added benefit of drilling a hole that would test the depth capabilities of the *JOIDES Resolution* as recommended in EXCOM Motion 97-1-17. Due to its location, the North Atlantic leg is not likely to occur until 2002-2003; however, its high cost might result in its elimination due to the lower priority of this scientific theme.

4) **Mass Balances at Subduction Zones:** Leg 185 would be the last leg to address this theme in the Program.

5) **Plutonic Sections of the Oceanic Lithosphere**: there is currently a highly rated proposal to drill a deep hole at Site 735 that has the potential to determine the nature of the crust-mantle boundary, as well as obtain sections of the oceanic lithosphere never before recovered. This is likely to be very expensive because of the multiple casing that is required. Budgetary constraints may dictate that further progress on obtaining plutonic sections concentrate on offset sections where the plutonic foundations are exposed and progress can be made with shallow "standard" drilling.

6) **Hydrothermal Systems**: Leg 192 is currently scheduled to drill Manus Basin, and the proponents have been informed of SCICOM Motion 98-2-8. If cuts have to be made, then it is likely that LWD will not be affordable. Previous experience has demonstrated that standard logging in a massive sulfide deposit with standard techniques is extremely difficult due to the unstable lithology. Given also the poor recovery in these formations, the absence of a logging program will severely impact the scientific objectives related to understanding the subsurface nature of the deposit.

None of these cuts impacts the level of technology development that must continue since it is the highest priority science (e.g. seismogenic zones, gas hydrates, and a section of the oceanic crust) to which much of the effort is directed. Should significant cuts in

technological development become necessary to reduce the budget, then developments related to penetration of unstable formations would have to be suspended. This would mean the elimination of any plans to conduct preliminary holes related to an intact section of the oceanic crust, and would only serve to delay the development of this technology until the next Program. Advances in understanding crustal architecture would then be limited to collection of offset sections in areas where different crustal layers are exposed. In addition, the planned hydrothermal drilling would be seriously impacted by the lack of hammer drill-in casing techniques.

5. PRIORITIZATION OF OTHER SERVICES WITHIN ODP

ODP has a responsibility to ensure that the services it provides are essential to accomplishment of the Long Range Plan, and that they are provided in the most cost effective manner. It is critical that the infrastructure of the Program is fully justified and is optimally configured before the scientific goals of the Program are compromised. Based on input from SCIMP, who evaluated the impact of eight services on the Long Range Plan, SCICOM recommended that there be a review of staffing and configuration in three areas.

SCICOM Consensus 98-2-12
Based on the recommendations from SCIMP and the need to ensure effective use of ODP's limited resources, SCICOM recommends the following program areas to be reviewed:
1) public affairs with respect to a consolidation of effort (SCIMP recommendation 98-2-9)
2) overall costs of the current wireline operations (SCIMP recommendation 98-2-10)
3) the staffing levels throughout the ODP organization (SCIMP recommendation 98-2-12).

SCICOM also requests that OPCOM and TEDCOM evaluate the cost benefit and feasibility of engineering projects to determine if they can be accomplished in a realistic time frame to benefit the goals of the LRP (SCIMP recommendation 98-2-11).

For other areas of ODP, SCIMP tabulated what *specific* shipboard and shore-based services are absolutely essential to accomplish each scientific objective in the Long Range Plan, and what services augment the science but are not absolutely necessary (see Appendix IV). They found that while all basic services were considered essential or useful, it may be possible to make savings in specific areas of the program.

1) Laboratories

Obtaining cores and providing the basic measurements necessary to characterize the cores is the most essential aspect of the Program. Each of the six shipboard laboratories (Chemistry/X-ray, Physical Properties, Core Description, Underway Geophysics, Paleomagnetics, and Paleontology) is essential for at least one of the themes of the Long Range Plan, and it is not cost effective to install or remove equipment depending on the nature of each Leg. Some savings can be made by deferral of capital upgrades, but this amount is not large as the need for equipment replacement in the near future is not significant. Furthermore, a reduction in shipboard laboratories or services is considered counterproductive because the savings are small considering the loss of primary data and its effect on the international scientific constituency.

2) Publications

Publication of the record of each cruise and description of the data collected are an essential product of the Program; hence, the Initial Results Volume should be retained. However, the Scientific Results volume, which is rapidly changing in nature, is considered useful, but not essential, to ODP. Its elimination would result in publications being widely

scattered in the literature, and also possible loss of data generated during shore-based work that does not reach the open literature. However, in difficult financial times, elimination of this product could provide significant savings.

3) Information Services

Information Services includes data capture, database maintenance, data migration, computers and computer networks, and core photography. One of the most essential services is data capture since the cruise data represent the legacy of the Program. Maintenance of a relational database and data migration into the database are very useful, but not essential to the success of the Long Range Plan. However, these aspects of Information Services provides access to ODP data for the international community so are considered extremely important to the dissemination of the results of the Program.

4) Repositories

It is essential to provide a controlled environment for at least the short-term (~ 5 years) safe storage of ODP cores. ODP-TAMU studies have shown that the majority of sampling takes place within a few years of core collection, and that older cores are rarely sampled. Hence, the cost of retaining more than one or two active repositories needs to be carefully evaluated relative to the usage by the scientific community.

5) Public Affairs

A concerted public affairs effort is important to keep the scientific community and general public informed about the results and advances of ODP, and to keep a visible profile in all member countries. This is particularly true as momentum builds towards a new and more expensive program of ocean drilling post-2003. However, it is unclear that this function, which is conducted by offices both at ODP-TAMU and at JOI is optimally configured at the present time.

6) Wireline Services

Downhole logging is essential to the success of many objectives in the LRP, and is currently a great strength of ODP. However, better scrutinization and justification of the logging programs recommended for each drilling leg could result in some minor cost savings. For example, additional tools are often added to routine paleoceanographic legs which may offer an enhancement, but may not be essential.

7) Drilling Services

Engineering development represents a large portion of the ODP budget, and hence is an area where costs could be significantly reduced. However, as was pointed out in the previous section, the impact of doing so would be greatest on achieving the scientific themes under *Dynamics of Earth's Interior*. The loss of advancements in technology that would allow better drilling and recovery in hard rock would result in ODP losing a large part of its scientific constituency at a time when the community needs to rally in support for continuation of scientific ocean drilling. In addition, some level of innovation must be maintained to demonstrate its continued vitality at the Program nears its end. However, it is also important that engineering development proceed in the most cost- and time-efficient fashion. Hence, SCICOM has requested an evaluation of the cost benefit and feasibility of engineering projects to determine if they can be accomplished in a realistic time frame to benefit the goals of the LRP.

8) Personnel

ODP also has a responsibility to assess the level of personnel within the entire organization to ensure the most effective use of ODP's limited resources.

6. CONCLUSION

ODP is faced with a difficult period as it attempts to meet the goals of the LRP and plan for the future post-2003 within the framework of a decreasing (in real dollars) budget. However, SCICOM views the future as filled with opportunities to do innovative and top priority science. These opportunities will require us to be equally innovative in raising funds or developing partnerships outside the Program in order that we maintain ODP's scientific excellence and leadership role in scientific ocean drilling.

Appendix I

Progress and Priorities: The Ocean Drilling Program Years 2000 - 2003

Themes addressing Dynamics of the Earth's Environment

Theme 1, "Understanding the Earth's Changing Climate"

This is the broadest of the themes considered by the ESSEP and includes several objectives, or sub-themes, that share the basic goal of gaining a better understanding of how the global climate system works. These objectives (oceanographic and climatic variability on the Milankovitch time scales; high resolution climate variability; extreme warm climates; and exploring the link between climate and tectonics) are grouped and discussed separately.

Oceanographic and climatic variability on the Milankovitch time scales. Of all the thematic interests of the ESSEP, perhaps the most progress has been made toward developing our understanding of "Milankovitch" scale (10^4 - 10^6 year) climate variations in the Pliocene - Pleistocene. This progress has been achieved by the well-planned development of a global array of sites that can monitor the longer term variability of the major surface and deep ocean currents in dynamic parts of the oceanic circulation system. These currents and associated water masses absorb and release gases, and distribute heat, nutrients, and other chemical species in the global ocean. They have a profound impact on both global climate and the large scale patterns of biological productivity.

The drilling legs that have helped establish this global array date back to the scientific drilling community's invention of the hydraulic piston coring device (first used extensively on DSDP Leg 85) and to the development of coring and logging strategies that insured complete recovery of the sedimentary record (first used on ODP Leg 138). This new coring tool has been used in the recovery of relatively undisturbed sedimentary sections that contain a pristine record of climatic and oceanographic variability. More than a decade of Ocean Drilling Program efforts have gone into building this array. Recent additions to the suite of sites needed to constrain global climate change on these time scales include: 1) Transects of the highly productive western boundary currents (Leg 167, The California margin and Leg 175, The Benguela Current); 2) A transect of the open ocean frontal region in the Southern Ocean (Leg 177, Southern Ocean transect), another region of very high biologic productivity; 3) Relatively high resolution records of deep, intermediate, and surface water variability contained in sediment drift deposits that have been constructed by the deep water part of the global "conveyor belt" (Legs 162, 172, North Atlantic sediment drifts and Leg 178, Antarctic Peninsula); and 4) Long-term development and timing of Northern Hemisphere glaciation (Legs 151, 162, 163, North Atlantic gateways).

As part of this overall strategy for developing a global array of sites and transects in climatically and oceanographically sensitive areas, there are several scheduled or highly ranked ODP legs that also fall into the categories listed above: 1) 465, SE Pacific Paleoceanography along the Peru-Chile western boundary current; 2) Leg 181, Southwest Pacific Gateway, and 3) Leg 188, Prydz Bay.

Recently drilled Leg 178 (Antarctic Peninsula) and scheduled Leg 188 (Prydz Bay) are part of a suite of full proposals (including 455, Laurentide Ice Sheet; 482, Wilkes Land; 489, Ross Sea; and 503, Weddell Sea) that seek to elucidate the development of the Cenozoic Ice Age and reveal the climatic variability associated with the development of the large Northern and Southern Hemisphere ice sheets. Proposal 455 has been reviewed and

ranked highly; other Antarctic proposals (482, Wilkes Land, and 489, Ross Sea) have been reviewed and passed on to SCICOM for ranking. Proposal 503 (Weddell Sea) is undergoing external review now. In addition there are several promising pre-proposals and active full proposals which target climatically sensitive areas - such as 477, Sea of Okhotsk and Bering Sea, and 513 Scott Plateau.

Considering the recently drilled sites and potential future drilling legs, by 2003 we will have accomplished one major goal of the LRP in obtaining this global array of moderately high resolution Pliocene - Pleistocene sites. A glaring gap in this array, addressed by a recent pre-proposal (533), is the Arctic Ocean.

In many cases, however, we have traded higher time resolution for total length of record. The result has been that most of the sites that we have drilled to date do not extend back into the Miocene or older periods. Thus we do not have a good global array of sites in sections as old as, or older than, the middle Miocene, the time of major growth in the Antarctic Ice sheets. We have obtained the first tantalizing glimpses of the real possibilities of developing a similar framework for these older intervals from data obtained by Leg 154 (Ceara Rise), Leg 165 (Caribbean), and 171 (Blake Nose).

We can evaluate the climatic impact, the variability, and the course of evolution of the Northern Hemisphere ice sheets; however, we cannot yet do the same for the global climate change associated with the development of the large continental ice sheets of East and West Antarctica. Scheduled legs and proposals now being considered for drilling in the higher southern latitudes will be a step in the direction of filling this gap. Given the successful completion of a substantial portion of these high southern latitude legs, we should be able to delineate the glaciation of Antarctica as it relates to the history of global cooling through the Cenozoic, and to describe the nature of climate variability that accompanies this long-term cooling trend.

High resolution climate variability. Extremely high resolution (10^0 - 10^2 year) records of climate change that extend back several thousand years are being derived from a few recently drilled sites: Leg 169S, Saanich Inlet; Leg 167, The California Margin; Leg 172, NW Atlantic sediment drifts; Leg 178; Antarctic Peninsula (Palmer Deep), and Leg 165; Caribbean Sea (Cariaco Basin). These records provide key ties to other high resolution records of climate variability (such as coral records in tropical oceans, cores from lakes and intertidal swamps, and tree ring and ice cores records on land), and they will expand the global network of such records. A few other such ultra-high resolution records are expected to be obtained if some currently ranked proposals can be scheduled for drilling (e.g., Saguenay Fjord site in Proposal 455); however, we are far from having the geographical coverage of the types of records that are needed to characterize the global nature of short-term climatic variability and the mechanisms of rapid climate change. These types of sites are widely scattered, but require only a short amount of drilling time; thus, we are open to their consideration as "targets of opportunity" as the drilling ship moves through the global ocean. We continue to consider the study of ultra-high resolution climate change to be a high priority.

If a handful of these sites are drilled by 2003, we will be in an excellent position to re-define our objectives for drilling beyond 2003 by identifying specific regions or environments to target. For the next 4 years, there is a great need to expand our knowledge of rapid climate change worldwide.

Extreme warm climates. Only one recent cruise, Leg 171C - Blake Plateau, has focused exclusively on extreme warm climates. While exciting data on Paleogene climates were also collected on Leg 165 (Caribbean paleoceanography), we are only beginning to meet our objective of understanding the climatic and oceanographic dynamics of a "hothouse" world - a world that approaches (and perhaps exceeds) the future greenhouse impact predicted by global climate modelers. Earlier ODP Legs (113, 114, 119) defined the "hot

house" world by documenting the high temperatures in the Southern Oceans before the late Eocene establishment of ice sheets. Results of ODP Legs 142 and 143 (atolls in the Pacific) have presented the enigmatic picture of a hothouse world in which coral reefs died as the Pacific plate on which they rode approached the equatorial region, a region where reefs thrive today! At present the data gleaned from DSDP and ODP sites have posed more questions than they have provided answers. These data have painted a startling picture of a very different ocean with warm polar regions, low pole to equator thermal gradients, periods having depth zones extremely low in oxygen, and periods of extremely high sea level and ice-free poles. We now have indications of short-term (10^3 years) climatic instability in an ice-free world during the Late Paleocene Thermal Maximum, and have started to look into evidence that gas hydrate instability may have been directly linked to climate instability.

The scant sedimentary records that we have also suggests that the hothouse world of the early Paleogene and Cretaceous may have been fundamentally different in terms of both deep and shallow circulation of the oceans, and deep ocean biota must have been profoundly different before the development of the cryosphere. The mathematical models of atmospheric circulation that are tuned to modern conditions have a difficult time emulating all aspects of these very warm climates.

There have been two JOI-USSAC funded workshops and one workshop of the Marine Earth Systems History Committee which have helped define the problems and the key sampling regions needed to establish an array of sites to constrain the global nature of these extremely warm periods of the Paleogene and Cretaceous. There are, as yet, only a few full proposals in the system that would help to address the problem of understanding extreme warm climates and be the first steps towards collecting such a global array of sites. Proposal 486, Paleogene Equatorial Pacific Transect (ranked and ready for scheduling) would provide the first cross section of a major ocean current system as it existed at the peak of the Paleogene warm interval. Full Proposals 534, Cretaceous and Paleogene Shatsky Rise depth transect and 503, Weddell Sea, would provide high and low latitude Cretaceous sections, with 534 providing a depth transect in sediments that have not been deeply buried. Both of these proposals are being sent out for external review. Full proposal 513, The Scott Plateau, could also provide Paleogene and Cretaceous sections that have not been deeply buried, and Proposal 524, The Oceanic Mesozoic Section targets one of oldest oceanic sections still lying on oceanic crust. The drilling of at least some of these legs is critical to addressing the LRP objective of gaining a better understanding the extreme warm climates. The Extreme Climate PPG will provide help in developing strategies, and more drilling proposals, that address the gaps in our understanding of the processes that create and control very warm climates. It is clear that we need to provide more constraints on the oceanic and climatic character of the hothouse world in order to set the stage for the next phase of drilling.

<u>Exploring the link between climate and tectonics</u>. Thus far, no legs in the past decade of the Program have been focused specifically on the link between climate and tectonics We have, however, learned something of the timing of enhanced river-borne and airborne sedimentation in the oceans that are likely to be related to the uplift of major orogens and the climatic changes that they may have induced. Compilations of drilling data from the Indian Ocean have given an approximate timing for the uplift of the Himalayas; however, both the recovery and the dating of many of these rather few sections are inadequate for gaining a detailed timing of this history. Drilling in the region of upwelling induced by Indian monsoonal circulation has given us a very reasonable picture of the changing impact of Himalayan and Tibetan uplift on local climate, whereas, eolian debris blown downstream from the Tibetan Plateau in the Westerlies offers clues to the drying of the Asian continent. Airborne dust delivery to the North Pacific (ODP Leg 145 and other sites) seems to indicate that the aridity of the Asian continent started to increase a million years

before the onset of Northern Hemisphere glaciation and that there was an enigmatic pulse of aridity (high dust flux) some four to five million years before that. It has been proposed that the uplift of the Tibetan Plateau has led directly to the global climatic deterioration of the late Neogene and much of the impetus for the development of this hypothesis has come from Sr-isotope data derived from DSDP and ODP sites. However, we have only this vague outline of the ties between tectonics and climate. The details of both links and timing need further exploration.

We must also consider the north-south spine of American mountains and the uplift of the Colorado Plateau and Alto Plano that affect zonal atmospheric circulation in both hemispheres . The timing of the orogenies on the western side of the Americas is known in general terms from studies on land and from earlier drilling legs. For example, sites on the Ceara Rise in the equatorial Atlantic (ODP Leg 154) have given an indication of the timing of the latest Andean orogeny on the far side of the South American continent. However, we have yet to tie the detailed timing of episodes of uplift to the changes in atmospheric and oceanic circulation.

There is another important aspect of the tectonic impact on climate and ocean circulation - one that has fascinated us since the beginnings of the new plate tectonics paradigm and the creation of paleoceanography as a science. That is the impact of the opening and closing of oceanic gateways on ocean circulation, climate, and the transport of heat, salt, and moisture. Through the continued detailed studies of plate tectonics we have gained a clearer understanding of the manner in which these gateways changed and of their approximate timing of change.

With our enhanced ability to recover complete sections and acquire detailed logs, we are now in a position to explore the precise links between the stages of change in these gateways and the impact that they have had on circulation. For example, comparisons of data from ODP Leg 138 with that of Leg 154 (Ceara Rise) and Leg 165 (Caribbean) is in progress, and is expected to throw additional light on whether the closing of the Panamanian Gateway led to, or delayed, the Northern Hemisphere glaciation. Similarly, scheduled Leg 182 (Great Australian Bight) may be expected to give new insight on he separation of Australia and Antarctica, and Proposal 485, The Southern Gateway between Australia and Antarctic (recently sent to SCICOM for ranking), proposes to establish the link between ocean circulation and tectonics as the Tasmin Rise cleared the coast of Antarctica. As a complement to this work, Full Proposal 513, The Scott Plateau: Evolution of Indonesian Throughflow (now in rewrite stage), would have the opportunity to document the oceanographic and climatic impact of the northward drift of the Australian Plate and its gradual restriction of the Indo-Pacific gateway. In a similar way Proposal 465 (see above) will explore the "upstream" impact of the opening of the Drake Passage on the Peru-Chile Current system.

The Climate and Tectonics PPG have yet to report from their first meeting; however, there is one program critical to this sub-theme that has already been scheduled as Leg 184, East Asian Monsoon History, and another full proposal that is in rewrite stage (521, Himalayan uplift and the history of the Indian monsoon recorded in the Indus Fan). Together these studies will help to resolve the tectonic influence on the monsoon development in Asia and India. In addition, ODP Leg 167 (California Margin) together with Proposal 465 (SE Pacific Paleoceanography, ranked and ready to be scheduled) will explore the links between climate changes as seen in the western boundary currents of the Pacific and the impact of American orogenies

From these studies and those carried out under the first sub-theme discussed in this section, we are developing a detailed knowledge of the character and timing of climate change in the late Neogene; and from our progress in establishing an orbitally tuned time scale, we are now capable of making measurements of fluxes and rates of change with a precision never before achieved. What remains is the development of a history of tectonic activity (collision, uplift, rifting, extrusions, and volcanism) of comparable precision that can be directly linked to our developing history of climate.

In summary, much progress has been made towards achieving our goals as laid out in the LRP, particularly with respect to Late Neogene climate variability. However, we have yet to extend this detailed record beyond the late Neogene in a global array of sites. We will continue to take advantage of targets of opportunity that will give us a record of annual to decadal resolution; however, we will not have a global array of such sites by 2003. There are several scheduled legs, and mature proposals, as well as promising new full and pre- proposals which focus on elements of our other top priorities. In order to both achieve some progress towards our goals and to position ourselves well for the next phase of drilling it is of great importance that we undertake some of the drilling programs that address the sub-themes of Extreme Warm Climates and Climate and Tectonics. Finally, there are other environments that are of critical importance, which cannot be easily accessed with our present drilling platform, such as the Arctic Ocean and shallow water systems. This limitation has impacted our ability to achieve our LRP goals in both the Understanding Climate and Sea Level themes of the LRP.

Theme 2, "Understanding History and Effects of Sea Level"

Documenting and understanding the timing, magnitudes, and impact of sea level changes on the architecture and facies of sediments that surround our shorelines is an important and challenging goal of the ODP Long Range Plan. The processes of sea level change are poorly understood, both in regards to controls and mechanisms; yet, the impact of fluctuating sea level on the largest centers of sediment deposition and on the reservoirs of much of the world's hydrocarbon resources is profound. Studying sea level pushes the limits of our ability to: drill and recover the appropriate sections, date and estimate the paleo-water depth of the sections that we do recover, and disentangle the interplay among sediment supply, sea level, and tectonics on preserved stratigraphic sections.

To date we have drilled two primary transects that address the sea level theme:

1) A series of sites across the Northern Hemisphere, siliciclastic passive margin (New Jersey: Legs 150/150X, and 174A/174AX) that have targeted the late Paleogene-Neogene. These sites have been drilled both with the *JOIDES Resolution* and with shore-based drilling rigs on the adjacent coastal plain. Recovered sections have been dated using biostratigraphy, magnetostratigraphy, and strontium-isotope stratigraphy. Follow-on studies have made approximations of the magnitude of sea level change associated with sequence and systems tract boundaries identified seismically and in the drilled sections. Downhole measurements have also played a critical role by serving as proxies for sedimentary cyclicity in unrecovered parts of the drilled sections.

2) A series of sites across a Northern Hemisphere shallow-water carbonate platform (Great Bahama Bank), targeting the late Paleogene-Neogene. These sites have also been drilled both with the *JOIDES Resolution* (Leg 166) and with a shallow-water jack-up rig on the platform top. Recovered sections have also been dated using biostratigraphy, magnetostratigraphy, and strontium-isotope stratigraphy. Logs have provided crucial information on sedimentary cyclicity.

The contrast of the clastic and carbonate settings has been important because the impact of sea level fluctuations on the two regimes is markedly different. Still, the dates associated with presumed sea level falls on and adjacent to the Bahama Banks are nearly all within the error of measurement of the falls detected on the New Jersey margin.

The efforts required to field these two programs have been massive. First, they have required the raising of funds independent of the Drilling Program to pay for shore-based drilling and offshore seismic surveys. Second, they have required the cooperation and participation of scientists not routinely associated with the Drilling Program. Third, additional grid-type seismic surveys have been necessary to satisfy site-specific safety concerns; and in some cases, drilling sites for which these concerns could not be met have

had to be abandoned. Safety and drilling restrictions have become more stringent, and it has only been through the dogged perseverance of the proponents and previous JOIDES thematic panels that these transects were ever drilled.

Although all the studies of these transects are not complete, we can say that the timing of sea level falls for the late Paleogene and Neogene appear to be similar in both clastic and carbonate settings of the western North Atlantic. Sea level fluctuations recorded in marginal settings can also be related to significant changes in the marine oxygen isotope record of ice volume change; however, the record at continental margins may be overprinted by successive sea level fluctuations closely spaced in time.

One leg has been scheduled (Great Australian Bight, Leg 182) that will target a temperate carbonate passive margin and sample both the Paleogene and the Neogene. While the number and location of sites scheduled for this leg will not permit a detailed reconstruction of sea level fluctuations through this entire time interval, it will provide a check (across a younger margin in an entirely different ocean) on the timing of some of the major presumed sea level changes seen in the North Atlantic. ODP Leg 182 will also provide insights into the sedimentary response to sea level change on a margin in a quite different depositional setting from the New Jersey and Bahamas Bank transects.

There are also a few active Full Proposals that offer transects crossing a Southern Hemisphere shallow-water carbonate-platform (Marion Plateau, Proposal 510, now in external review), a Southern Hemisphere siliciclastic passive margin (Canterbury Basin, Proposal 511, now being revised), and a mid-plate carbonate atoll chain in the Indian Ocean (Maldives Islands, Proposal 514, now being revised). In addition, there is a proposal for drilling in the Mediterranean Sea which focuses on the interplay between tectonics and sediment source during Pliocene - Pleistocene sea level fluctuations and their effects on the sedimentary architecture of deltaic and fan deposits. (Proposal 467, Rhone/Var Fans, now being revised). Included in this report as Appendix 1 is a "primer" for proponents wishing to submit a sea-level proposal (also available at www.whoi.edu/joides/)

If all of these scheduled and proposed legs were successfully completed, we would have a viable global array of transects that would address many of the goals of the LRP sea level theme. This is highly unlikely to happen prior to 2003; however, it is important that we make progress towards these goals. We should position ourselves to be ready to address some of the more difficult objectives embodied in this theme - such as: 1) what were the timing and magnitudes of global sea level changes in the Paleogene; 2) how does this history fit with the late Neogene model of ice-cap control on sea level changes; and 3) what are the rates, magnitudes, and regional distributions of tectonic changes that alter any eustatic signal preserved in the continental margin sedimentary successions?

We should also be ready to make the case for enhanced technical capabilities to address these questions in the next phase of drilling. Some parts of both the drilled and proposed transects (those sites in water depths <75 m) will never be drilled by the *JOIDES Resolution*.; yet, in many instances, drilling in shallow water will be required to reach crucial Paleogene sea-level targets. Therefore, alternate drilling platforms will be necessary. The Shallow Water PPG should provide advice on this issue. Additional community input should also be provided by the International Sea-Level Workshop, planning for which has been initiated by SCICOM.

Theme 3, Sediments, Fluids, & Bacteria as Agents of Change

This is another very broad theme within the ESSEP mandate with distinct overlaps with the interests of the ISSEP. However, under this flag we can integrate our shared interests in the Deep Biosphere, Gas Hydrates, and Long-term Observatories - all of which are represented by active PPGs. The Deep Biosphere PPG is making the prudent first steps in developing a microbiology program by participating in scheduled legs (*e.g.* Leg 180,

Woodlark Basin) and evaluating contamination problems. The SSEPs support the early development of a ship-board microbiology laboratory in order to make progress in this area of the theme prior to 2003. The Gas Hydrate PPG is similarly starting to develop drilling programs, with Pre-proposal 539 (Carolina Rise and the Blake Ridge Collapse Structure) aimed at determining the amount, distribution, source, and fate of oceanic gas hydrate. The Long-term Observatories PPG has made great strides in developing preliminary designs of advanced CORKs with multi-packer capabilities that will provide radically new information about the hydrogeology of the ocean crust. The SSEPs recommend that the Ocean Drilling Program support the design and deployment of these new CORKs immediately as an important start toward understanding flow in the ocean crust. Ultimately, the integration of deep biosphere, gas hydrate, and fluid flow objectives offer new intriguing scientific opportunities.

Investigations into fluid flow processes below the ocean floor figure prominently in the LRP. The plan mentions many aspects of fluid flow that need to be better constrained, including the driving forces, the rates of flow, and the effects of flow and chemical transport. There is almost certainly an interplay between fluid flows and the microbiologic ecosystem in the Earth's crust; however, this aspect of our investigations must await a more detailed program plan from the Deep Biosphere PPG. Some clearer insights into the nature of crustal fluid flow and the crustal biota are likely to be developed through the use of the new multi-packer CORKs, but interpretations of these new data will require advancements in numerical modeling and a refined understanding of natural chemical variation of pore waters. The SSEPs believe that the role of ocean drilling in these interpretations will be enhanced through development of a new PPG with a goal of introducing and linking the broad hydrogeologic scientific community to ocean drilling technologies and capabilities.

Fluid flow objectives have been accomplished in recent legs at mid-ocean ridges, active margins, passive margins, and carbonate platforms. Investigations of flow in and near mid-ocean ridges are more advanced than elsewhere in the oceans because of the dramatic discovery in the mid-1970's of hydrothermal systems. The Ocean Drilling Program has played a critical role in understanding flow at this tectonic settings through work on a number of drilling Legs, including Juan de Fuca Ridge (168), Sedimented Ridges II (169), and the Mid-Atlantic Ridge CORK and TAG legs (174B and 158). Results from the installation of 10 corks have illuminated the driving forces and scale of circulation in ridge flanks, and the nature of subsurface flow systems below young and old hydrothermal sulfide mounds. Pre-proposal 516 intends to look at the flow regime in an off-axis setting of the Costa Rica rift (Sites 504B/846A) and employ the advanced CORK (multi-packer) design to better constrain the nature of fluid flow in the crust. Future work will focus on identifying the three dimensional heterogeneity of the flow systems and understanding role of fluids in transporting heat and solutes in this environment.

Recent drilling legs at active margins include Cascadia (146), Costa Rica (170), and Barbados (171A). These legs have revealed that fluids are transported out of the margin from areas of deep-seated reactions. In addition, there are three CORK installations at active margins: two at Barbados and one at Cascadia. Attempts to understand the diagenetic and metamorphic controls on fluid chemistry, fluid pressures, permeabilities, and driving forces for the flow are making progress as the drilling and CORK data from several margins are compared. Proposed Legs that address these aspects of fluid flow include Proposal 445 (Nankai Trough, ranked and ready for scheduling) and the associated Pre-proposal 517 which proposes to install CORKs in the west Nankai study area. Full Proposals 478 (East Nankai) and 355 (Peru Margin) are strongly focused on fluid flow in a convergent margin settings where gas hydrates also play an important role. These proposals are now being revised. Finally, Pre-proposal 537 (Costa Rica Margin) intends to penetrate a section that encounters the seismogenic zone. If successful, the potential roles of fluids and dehydration reactions in such a setting would be of particular interest to ESSEP.

In the next few years, we will use the data from relatively shallow sites near the toes of active thrust complexes to help formulate testable conceptual and numerical models of the material properties and fluid pressures in the seismogenic zone. Meaningful progress toward the goal of understanding earthquake cycles will require iterative combinations of modeling and empirical calibration of those models by drilling. Incremental progress in both concept and technology will leave the program poised to target riser-supported drilling into a seismogenic zone in the post-2003 program. Such a clearly identified problem is encouraging interdisciplinary collaborations between hydrologists, geochemists, seismologists, and marine geophysicists in order to formulate testable hypotheses.

Recently completed and scheduled drilling legs to passive margins and carbonate platforms include Blake Ridge (164), Bahamas (166), New Jersey Margin (Leg 174a) and Great Australian Bight (182). Leg 164 used the pressure core sampler to provide the first quantification of gas hydrate in continental margin sediment. Legs 166 and 174a have illustrated the potential significance of active fluid exchange between ocean water and sediments of carbonate banks and passive continental margins, but because few legs have focused on the hydrogeology of these margins, the magnitude and effects of the exchange is poorly quantified. In these legs, the fluid flow objectives were secondary and usually were added in response to panel feedback. This highlights a major problem with hydrology goals in the program. There are few trained hydrogeologists who work in the sub-seafloor environment. Frequently, proponents comment that they have difficulty identifying a hydrogeologist who can be added to the program. This occurs in spite of the agreement by all concerned that fluids clearly affect the sediments and many of the processes observed during the drilling. This problem is likely to continue because the panel commonly identifies possible fluid flow objectives as add-ons to existing proposals with other primary goals, rather than evaluating proposals that have a true focus on fluid flow objectives in bank and passive margin settings.

The panel believes a PPG emphasizing hydrogeology of the ocean crust is needed in order to foster hydrogeologic and related goals of the Ocean Drilling Program. This new PPG is particularly needed because a strong emphasis in the LRP is to integrate fluid flow with other processes. These processes include diagenesis, microbial growth, heat transport, seismogenic zone processes, and gas hydrate formation. Because these processes operate on different time scales, integration of different types of real-time measurements and geochemical proxies will be challenging. This integrative approach, moreover, requires formulation of conceptual and numerical models and drilling plans on a level that is difficult to obtain without greater involvement of hydrologists in the program. The newly-formed PPG would help plan the comprehensive study of physical and chemical hydrogeology of the ocean crust and integrate the study of fluid flow with other processes. It would identify methods of approach to hydrologic problems in various seafloor environments and recruit hydrologists to participate directly in the ODP. Another role of the PPG would be to identify specific hydrologic data to be collected during site surveys that could aid in the refinement and testing of models of fluid flow addressed in the drilling plan. As a part of this effort, the PPG might evaluate emerging technologies for seafloor piezometers, seepage meters, and fluid sampling and clarify their role in enhancing hydrologic site survey data. A third role for the PPG would be to identify methods for investigating flow systems with components in three dimensions. We feel that the formation of such a PPG is a critical element needed to derive the maximum benefit from proposed pre-2003 ODP Legs as well as to position ourselves well for post -2003 drilling with a strong and integrated approach to hydrogeologic studies.

Appendix II

ISSEP Priorities:

Themes addressing Dynamics of the Earth's Interior

July, 1998

Preface

The following is a summary of ISSEP priorities for programs needed to achieve goals of the ODP Long Range Plan (LRP). These priorities are based on panel discussions during the May 1998 ISSEP-ESSEP joint meeting. Comments from the PPGs were also considered. Additional panel comments will be included in the ISSEP report at the August 1998 SCICOM meeting.

As in most documents discussing priorities, the chances that the text below might be misinterpreted are reasonably high. Therefore, a few explanations and caveats should be considered. This effort was made by ISSEP in response to a request by SCICOM, which was in turn asked by EXCOM for scientific program priorities. As a guide, ISSEP started by considering the potential number of 2-month legs remaining through 2003. We were influenced most by the programs that we saw as having a high chance of reaching the mature-proposal stage in this time frame (i.e. projects for which we had already received pre-proposals or full proposals). Nevertheless, a few areas were identified where our panel will solicit the development of new or revised work to complement efforts in progress. The panel recognized that proposal pressure and competition, hallmarks of a healthy program, must be maintained. Therefore, the discussion below contains more programs than can be drilled-- ISSEP feels that the list is not excessively long and that competition between proposals (ultimately decided on by SCICOM), will will result in a final drilling program of highest quality.

ISSEP was convinced that even considering the constraints imposed by a now-limited number of legs, substantial progress can be made in the themes outlined in the long range plan. The panel, both alone and in our joint discussions with ESSEP, felt no need to exclude high priority programs to ensure overall progress.

I. LRP Theme: Exploring the transfer of heat and material to and from the Earth's interior

A. Mantle Dynamics

ISSEP recognizes the following priorities in this sub-theme: the start of an investigation of large igneous provinces by drilling surveys on the giant plateaus (Kerguelen and Ontong Java), the study of large scale mantle flow through drilling-based studies and by the establishment of borehole seismological observatories, and the study of mass balances (see below).

Rationale: ISSEP recognizes that in addition to scheduled work on Kerguelen plateau, drilling on the largest oceanic plateau, Ontong Java, is of highest priority to address

problems raised by the formation of these huge oceanic features. We have started an effort to study mantle flow in other ways, through the Australian-Antarctic Discordance leg, and other efforts may develop to address mantle flow through sample-based programs. Finally, the panel feels that priority should be given to the establishment of borehole seismological observatories that are needed to constrain mantle tomographic models. Many of these programs are new efforts for ocean drilling. The involvement of new scientific communities is viewed by ISSEP as important for the future of ocean drilling.

B. Ocean Crust

ISSEP recognizes the following priorities in this sub-theme: the preparation for complete penetration of in situ oceanic crust, drilling of the plutonic foundations of ocean crust exposed at shallow depths, an investigation of the importance of detachment faults in the formation of oceanic crust and the study of a hydrothermal system in a convergent setting. ISSEP also noted that efforts to study the hydrogeology of ocean crust (also of interest to ESSEP) should be given priority. With new CORK developments, some of these efforts may need reduced (or no) JR drilling time.

Rationale: ISSEP feels that it is important to start the process for the complete penetration of in situ oceanic crust, which is a long standing goal of ocean drilling. The best change of making a significant contribution toward this goal prior to 2003 may be in an ultra-high spreading environment where models predict a shallower depth to gabbroic rocks. Significant progress can also be made by drilling the plutonic foundations of ocean crust where tectonically exposed at shallow depths. Prior drilling (Hole 735B) has clearly demonstrated that progress can be made using existing technologies in some of these environments, while in others (for example, Hess Deep) continued developments will be needed. The panel felt that an initial investigation of the importance of detachment faulting in oceanic crust should be attempted prior to 2003. Such a study will be of great interest to scientific communities not associated previously with ocean drilling. Finally, ISSEP felt that the drilling of a hydrothermal system in a convergent (arc or backarc) setting should be completed prior to 2003. This effort is needed to complement prior legs devoted to the study of hydrothermal systems at divergent settings, and to understand the origin of world class sulfide mineral deposits. The panel noted that these studies may require continued developments in high-temperature down-hole tools.

C. Mass Balances

ISSEP recognizes the following priorities in this sub-theme: the need to complement work planned in the Izu-Marianas with additional efforts to study mass balances and the behavior of volatile elements at convergent margins.

Rationale: The priority of mass balances studies is established in the LRP, but ODP's entry into these studies is still relatively new. Therefore, ISSEP feels it would be advantageous to complement the planned drilling program in the Izu-Mariana area with drilling elsewhere (e.g. in a setting where sediments add a larger component to subducted materials) so we can proceed with more advanced studies after 2003. We note that many aspects of these studies are closely related other LRP themes and sub-themes. In particular, there are linkages with the sub-theme of mantle dynamics (including the role of volatiles during subduction) and LRP Theme II, Investigating deformation of the lithosphere and earthquakes processes (see below). The panel plans to solicit proposals in this area.

II. LRP Theme: Investigating deformation of the lithosphere and earthquake processes

As in theme I, the objectives of this the are best discussed in terms of the relevant sub-themes. Two of the ODP LRP initiatives (Initiative II, the in situ monitoring of geologic processes, and Initiative III, Exploring the deep structure of continental margins and oceanic crust), are also addressed by these sub-themes.

A. Convergent Boundaries

ISSEP recognizes the following priorities in this sub-theme: efforts to understand earthquake processes from core and fluid-base sampling programs and by the insitu monitoring of active seismic zones, and efforts to understand processes of active deformation.

Rationale: Substantial progress should be made in drilling convergent margins in preparation for post-2003 riser drilling. The CONCORD planning effort identified study of the seismogenic zone as highest priority, with the western Pacific identified as the first study area. ISSEP sees our goals and those of CONCORD as complementary. The JR can drill shallow faults and sample deeply sourced fluids from the seismogenic zone, and can constrain physical properties up dip from the seismogenic zone. Substantial progress can be made in both understanding processes of deformation and in laying the foundations for future deep (riser-based) drilling in the same JR drilling program. ISSEP recognizes that to understand the role of fluids in all aspects of deformation, priority should be given to CORK development. Finally, ISSEP recognizes the priority of insitu earthquake monitoring efforts, similar to those planned for the Japanese Trench, at convergent margins.

B. Extensional Boundaries

ISSEP recognizes the following priorities in this sub-theme: the need to address processes of continental breakup in an effort that builds on the results of recent drilling.

Rationale: Substantial efforts have been made to address these questions in previous drilling legs. ISSEP feels it is time to build on these results in a program that includes deeper objectives. An effort involving a transect suitable for choosing a deep penetration site would be desirable. The deep site should be within the limitations of the JR, allowing the community to evaluate and design future post-2003 projects. The panel has seen proposals that could fill part of such a program; we hope to solicit additional proposals in this area.

Notes on Technology Development

The following issues were noted by ISSEP and passed on to SCIMP for their consideration. These applications are grouped by LRP sub-theme:

IA. Mantle Dynamics
-Possible deep drilling on large igneous province.

IB. Ocean Crust

-Active heave compensation (Hess Deep-type environment)
-Hammer in drilling and casing (Hess Deep-type environment)
-Core orientation: important for many projects, but the highest priority sites for drilling ocean crust formed at ultrafast spreading centers have near equatorial paleolatitudes. Therefore to obtain magnetic information (needed to address question ranging from tectonics to the sources of marine magnetic anomalies), oriented hard rock cores would be highly desirable.
-High Temperature Tools (Hydrothermal system in convergent setting)

IC. Mass Balances
-Multi-packer CORK developments

IIA. Convergent boundaries
-Multi-packer CORK developments

IIB. Extensional Boundaries
-Possible deep margin drilling.

Appendix III: Costs of Legs for 3 Years of Drilling + Logging

(revised 23 July 1998)

Standard (S): cost of a standard leg
High (H): $250-500K above a standard leg
Very Expensive (VE): >$1M above a standard leg
Moderate (M): up to $250K above the cost of a standard leg
Expensive (E): $500-$1M above a standard leg

		Standard	Moderate	High	Exp	V. Exp
FY'00						
Leg 187	Australia-Antarctic Discordance	X				
FY'99						
Leg 186	W. Pacific Seismic Network - Japan Trench				X	
Leg 185	Izu-Mariana Mass Flux			X		
Leg 184	East Asia Monsoon	X				
Leg 183	Kerguelen		X			
Leg 182	Great Australian Bight	X				
FY'98						
Leg 181	SW Pacific Gateways	X				
Leg 180	Woodlark Basin				X	
Leg 179	Engineering/ NERO			X**		
Leg 178	W. Antarctic Peninsula					X
Leg 177	S. Ocean Paleoceanography	X				
Leg 176	Return to Hole 735B		X			
FY'97						
Leg 175	Benguela Current	X				
Leg 174B	CORK Hole 395A		X			
Leg 174A	New Jersey Transect				X	
Leg 173	Iberia Margin		X			
Leg 172	NW Atlantic Sediment Drifts	X				
Leg 171B	Blake Nose	X				
Leg 171A	Barbados LWD				X	
Leg 170	Costa Rica				X	

* All Expensive and Very Expensive Legs resulted from either an ice support vessel or LWD.
** Includes engineering development leading up to the Leg; actual Leg costs were Moderate.

Projects and their Costs

Standard (S): cost of a standard leg
High (H): $250-500K above a standard leg
Very Expensive (VE): >$1M above a standard leg
Moderate (M): up to $250K above the cost of a standard leg
Expensive (E): $500-$1M above a standard leg

Proposals Included in the FY'00 Prospectus

431(B)	W. Pac. Seismic Network (W. Pacific and Philippine Sea sites)	2 Reentry Sites	M
445	Nankai -I		S*
517	Nankai CORKS - II	Drill-In Casing, LWD, CORKs II	VE*
448	Ontong-Java Plateau	Logging: Bit Release + Tools	M
450	Taiwan Arc - Continent Collision	3 Reentry Sites,LWD	E
451	Tonga Forearc	Logging: Bit Release + Tools	M
455	Laurentide Ice Sheet Outlet		S
463	Shatsky LIP	1 Reentry Site	M
465	SE Pacific Paleoceanography Transect		S
479	PacManus hydrothermal system	HRGB or Hammer Drill, Hi T Tools	H
482	Wilkes Land, Antarctica	Logging: Bit Release + Tools, Ice Support Vessel	VE
485	Southern Gateway: Australia - Antarctica	Logging: Bit Release + Tools	M
486	Paleogene Equatorial Pacific	MDCB	S
489	Ross Sea, Antarctica	Bit Release for Logging, Ice Support Vessel	VE
490	Prydz Bay, Antarctica	Bit Release for Logging, Ice Support Vessel	VE
499	ION, Equatorial Pacific Site	1 Reentry Site	M
500	ION, H2O Site	1 Reentry Site	M
504	N. Atlantic Rifted Margin - Deep Hole	Multiple Casing	E-VE

Proposals Selected for External Review at Recent SSEPs Meetings

503	Weddell Sea, Antarctica	Ice Support Vessel	VE
510	Marion Plateau - Sea Level		S
534	Shatsky Rise - Extreme Warmth		S

Examples of Other Highly Regarded Proposals Within Important Themes

Testing the Depth Capabilities of the JR *(EXCOM Motion 97-1-17)*

504	N. Atlantic Rifted Margin (Given Above)	Multiple Casing	E-VE
521	Indus Fan	Multiple Casing	E-VE
524	Somali Basin	Multiple Casing	E-VE
535	Deep Hole at 735B	HRB, Multiple Casing	E-VE

Gas Hydrates

355	Peru Margin		S-M
478	E. Nankai		S-M
539	Blake Plateau		S-M

Appendix IV

PROGRAMMATIC PRIORITIZATION OF SERVICES

Scientific Measurements Panel

SciMP assessed the impact of eight services on the Long Range Plan and looked for potential economies within these services. SciMP prioritized these shipboard and shore-based services as either essential or useful to fulfilling the objectives of the Long Range Plan. SciMP found that while all basic services were considered essential or useful, it may be possible to make savings in specific areas of the program as summarized below:

1. Laboratories

First and foremost, SciMP believes that obtaining cores and providing the basic measurements necessary to characterize the cores is the most essential aspect of the program. Along these lines, SciMP looked at six laboratories on the ship (Chemistry/X-ray, Physical Properties, Core Description, Underway Geophysics, Paleomagnetics, and Paleontology). Equipment and services within the various laboratories were rated as essential or useful to the Long Range Plan. After detailed examination of the these laboratories SciMP came to the following consensus.

CONSENSUS 98-2-1
Having examined shipboard laboratory equipment and the importance of shipboard measurements to the LRP, SciMP considers most current equipment to be essential and sees few cost savings. Some savings can be made by deferral of capital upgrades, but this amount is not large as the need for equipment replacement in the near future is not significant. Furthermore, a reduction in shipboard laboratories or services is considered counterproductive because the savings are small considering the loss of primary data and its effect on the international scientific constituency.

A) Chemistry/X-Ray

Long Range Plan initiative or objective	Chemical / X-Ray Measurements Essential to Complete Objective (see key below)	Chemical / X-Ray Measurements Useful to Complete Objective (see key below)
Environment		
Climate Change	1 - 8, 10 -12	9, 13
Causes and effects of sea level change	1 - 8, 10 -12	9, 13
Sediments, fluids, bacteria, as agents of change (gas hydrates, carbon cycle, fluid flow)	1 - 8, 10 -12	9, 13
Earth's deep biosphere	1 - 8, 10 -12	9, 13
Interior		
Transfer of heat and material to and from the Earth's interior	1 - 8, 10 - 13	9
Investigating deformation of the lithosphere and earthquake processes	1 - 8, 12	9 - 11, 13
Safety	1	2 - 8, 10

Key to Chemical / X-Ray Measurements

#	Chemical / X-Ray Measurement
1	NGA and HP5890 (Gas Chromatography)
2	Carlo Erba C-H-N-S
3	Rock Eval
4	Carver Presses / Motors and IW Squeezer Apparatus
5	Dionex Analyses
6	Hamilton Microdiluter and Titrations
7	Spectrophotometer
8	Alkalinity - pH Titration
9	Atomic Absorption Spectrophotometer
10	Freeze - Dryer
11	Coulometer
12	X-Ray Diffraction
13	X-Ray Fluorescence

The following text is intended to justify the prioritization given in the included table, in which the instrumentation in the chemistry and X-ray laboratories is classified as either "essential" or "useful" to the Scientific Themes outlined in the Long Range Plan (LRP).

Specific Points to Consider

1. In addition to the "significance to the LRP" issue, the chemistry laboratory has the added and unique role of monitoring gas safety. This, of course, is an extremely significant role.

2. The prioritizations were identified keeping in mind the needs of shipboard scientists who are not at well-instrumented departments (either in the US or not), and how the LRP would be affected by certain parameters not being measured at all when such persons sail. Because the cost of many of the chemistry / X-ray apparatus precludes many shore-based facilities from having them, many of the measurements would not be made in a timely fashion (i.e., within the moratorium, and soon thereafter) OR at all, and thus the LRP would be strongly affected. This is most relevant when assessing the XRD and XRF devices.

3. While not intuitively obvious, the wet chemistry lab has proven "useful to the LRP" for safety on many occasions. Most recently, for example, Dr. M. Malone (ODP Staff Scientist) reported that on Leg 174A there was a situation of pressurized water shooting out the drill hole (to a maximum height of 1/2-way up the derrick) and maintaining such flow for about an hour or so. While the drillers were justifiably concerned that an over-pressurized formation had been breached, the chemistry lab was able to show that the fluid was drilling fluid (i.e., seawater) that had been vigorously pumped downhole to keep the drilling viable. Were the chemistry lab not able to prove this, drilling would have been halted, and much science would have not have been achieved, to the detriment of the LRP.

4. It is worth noting that the chemists through the years have been aggressive in voluntarily removing and updating instrumentation so that (a) essentially useless instruments have been removed already (e.g., the Geofina) and (b) those instruments that are on board are relatively state of the art (except of course for the XRD and XRF) and so are used heavily (e.g., the Dionex systems). Thus, with the exception of the AA spectrometer, each instrument is listed at least once in the "essential" category.

5. Financial savings of any realistic level can only be had in the general area of "capital replacement", and only for the AA spectrometer, XRD, and XRF. Every effort should be made to maintain these current instruments, however, because there is likely to be a

significant loss of morale and "constituency" were they merely turned off while in operating condition.

6. Capital replacement of the XRD is likely to be on the order of $50-60K, not the $150-$200K value that has entered the JOI panel discussions. This is a significant point to consider, and is due to the developments in the field of low-power XRD.

B) Physical Properties

Long Range Plan initiative or objective	Physical property measurements which are essential to complete the objective (see key below)	Physical property measurements which would be useful to complete the objective (see key below)
Environment		
Climate Change	1, 2, 4, 7, 11	3, 5
Causes and effects of sea level change	1, 2, 3, 4, 6, 7, 11	5, 8, 10, 12
Sediments, fluids, bacteria, as agents of change (gas hydrates, carbon cycle, fluid flow)	1, 2, 3, 4, 6, 7, 9, 11	5, 8, 10, 12
Earth's deep biosphere	1, 2, 4, 11	5, 7, 9
Interior		
Transfer of heat and material to and from the Earth's interior	2,5,6, 7, 9,11	8
Investigating deformation of the lithosphere and earthquake processes	2,5,6, 7, 9,11	8

Key to physical property measurements listed on the table above

#	Physical property measurement	% Impact on LRP*
1	Whole core MST-GRAPE (gamma-ray attenuation porosity evaluator)	80
2	Whole core MST-magnetic susceptibility	100
3	Whole core MST-compressional wave (P-wave logger)	50
4	Whole core MST-natural gamma radiation	80
5	Split core MST-magnetic susceptibility point counter	60
6	Split core MST-compressional wave (DSV1, DSV2, DSV3)	60
7	Split core color reflectance	90
8	Split core digital imaging	30
9	Thermal conductivity	50
10	Undrained shear strength (vane shear)	20
11	Index properties (bulk density, grain density, water content, porosity, dry density)	100
12	Resistivity (not commonly measured)	10

* Calculated assuming:
1. for every two Environment legs one Interior leg is drilled
2. Items which were considered essential were weighted 2 times more than those which were considered to be "useful".

The above assessment of the impact of physical property measurements on the implementation of the long range plan was calculated in the following manner:

- In general, the legs drilled in a given year are 2 to 1 in favour of legs whose mandate falls under the Environment SSEP as opposed to the Interior SSEP. As a result, physical property measurements commonly needed on "Environment-type legs" were weighted two times more than those for "Interior-type" legs. If the two divisions

are considered equally, the % impact values change to those seen in the third column on the second table.

- When calculating the impact on the Long Range Plan of each of the measurements, those which were considered "essential" were weighted two times more than those considered "useful".

The rationale used to determine whether a measurement was essential, useful, or not needed was whether the lack of this measurement would greatly impact the scientific outcome of an average leg falling under the main headings contained in the Long Range Plan (column 1 first table). For example, the inability to collect GRAPE data during a paleoceanography leg would hinder ability to correlate data within and between sites whereas the inability to measure thermal conductivity would be likely to have little effect on the scientific outcomes of the cruise.

C) Core Description

All the basic facets of core description on board ship are essential if ODP is to be successful in attaining of the goals of the LRP:

(1) Core description itself has to be done onboard ship, without question. This aspect overrides everything else (except collection of the core material itself. Not only does knowledge of cores lithology impact directly upon operational strategies during the cruise, but it is unlikely that the same level and expenditure undertaken by shipboard scientists could be duplicated by scientists onshore if they were to have to study them post-cruise. Some physico-chemical changes in the cores are inevitable in transport and storage, so for this reason, too, they need to be studied immediately.

(2) Dedicated data entry packages such as AppleCore and others created within the JANUS applications are extremely useful. Although individual software packages on their own are not essential to the goals of the LRP, some form of electronic data entry and management system is vital if full use of the shipboard data is to be made both during and after the cruise, and for efficient data archival and dissemination. (The merits of the JANUS program as a whole are dealt with elsewhere.)

(3) Film-based photography for core archival purposes onboard ship is essential, but only until the viability of digital imaging has been demonstrated and all storage/archival issues dealt with. After this time the ship-based and shore-based film photography will become non-essential. We suggest that line-scanning digital photography of the archive halves of the cores on the split-core multi-sensor track (probably at 300dpi) is the most appropriate method by which this should be carried out.

(4) The shipboard thin section laboratory is certainly useful, though only essential on a small number of legs. The micropaleontology laboratory is essential to all legs on which sediment is recovered. The microscope laboratory is essential to the vast majority of cruises.

D) Paleomagnetics

Long Rang Plan Objective	Essential Paleomagnetic Measurement	Useful Paleomagnetic Measurements
Environment		
Climate change	1	3,4,5,6,7
Causes and effects of sea level change	1	3,4,5,6,7
Sediments, fluids, bacteria as agents of change (gas hydrates, carbon cycle, fluid flow)		1,3,45,6,7
Earth's deep biosphere		1,3,4,5,6,7
Interior		
Transfer of heat and material to and from the Earth's interior	1	3,4,5,6,7
Investigating deformation of the lithosphere and earthquake processes		1,3,4,5,6,7

No.	Paleomagnetic Measurement	% Impact LRP
1	Whole core paleomagnetism (2G 750R cryogenic magnetometer)	65
2	Discrete sample paleomagnetism (Molspin spinner magnetometer)	0
3	Disc. sample magnetic cleaning (Schonstedt GSD-1 AF demag.)	50
4	Disc. sample magnetic cleaning (Schonstedt TSD-1 thermal demag.)	50
5	Disc. sample IRM acquisition (ASC IM-10 pulse magnetizer)	50
6	Disc. sample ARM acquisition (Dtech PARM)	50
7	Disc. sample mag. susceptibility & AMS (Kappabridge KLY-2)	50
8	Ambient magnetic field (Schonstedt 3-axis fluxgate)	0
9	Disc. sample mag. susceptibility (Bartington MS-2)	0

Explanatory Notes:
The 2G pass-through cryogenic magnetometer is used on nearly every leg to make measurements of core archive half sections as well as discrete samples taken from the working half. Using a conservative view of what "essential" means to the given themes, this instrument is shown as essential in only half of the theme areas. It is useful in all others. Most of the ancillary equipment are inexpensive to operate but are useful to paleomagnetists attempting to learn the nature of the magnetism they are studying; therefore removing these equipment will save no funds. Many of these ancillary measurements are for discrete samples and as such they are not absolutely necessary to derive a magnetic stratigraphy or susceptibility stratigraphy. Nevertheless, without such measurements, listed here as "useful," the primary measurements are of reduced value. Pieces of equipment numbers 2 and 9 are "backup" equipment. The Molspin is used for making discrete sample paleomagnetic measurements, but is almost entirely redundant with the cryogenic. It may be useful for some extremely magnetic rock samples that might cause trouble with the sensitive cryogenic. The Bartington susceptibility meter is the original "pass through" susceptibility meter used on the MST. Finally, the fluxgate magnetometer is used by paleomagnetists to examine ambient fields on the ship; such measurements are rarely published, but allow the scientist to look for magnetic fields that might be affecting samples.

E) Underway Geophysics

Long Rang Plan Objective	*Essential Underway Measurements	¶Useful Underway Measurements
Environment		
Climate change	1,2,3,4	
Causes and effects of sea level change	1,2,3,4	
Sediments, fluids, bacteria as agents of change (gas hydrates, carbon cycle, fluid flow)	1,2,3,4	
Earth's deep biosphere	2,3	1,4
Interior		
Transfer of heat and material to and from the Earth's interior	2,3	1,4
Investigating deformation of the lithosphere and earthquake processes	2,3	1,4

* "essential" is defined as "essential to locate site relative to site survey data"

¶ "useful" is defined as "necessary to provide geologic context for site"

No.	Underway Geophysics Measurement	% Impact
1	Seismic reflection profiles	80
2	Bathymetry echosounders	100
3	Navigation systems	100
4	Image production (plotters)	75
5	Magnetic anomaly profiles	0

Key to underway geophysics data equipment

No.	Underway Geophysics Equipment	Data Type
3	SSI 80-cu. in. water guns	1
2	Hamco 200-cu. in. water guns	1
1	SSI 400-cu. in. water gun	1
1	Bolt 120-1000-cu. in air gun	1
1	ITI 6-channel, 6 phone, solid streamer	1
1	ITI 6-channel, 30 phone, solid streamer	1
2	Teledyne single-channel, 60 phone, streamers	1
1	3.5 kHz EDO transciever w/10kW transducer	2
1	12 kHz PTR 105B transceiver w/EDO 323B transducer	2
2	CESP-III correlators (~20db S/N improvement)	1,2
1	Ashtech GC24 (GPS+Glonass)	3
2	Omistar dGPS capable receivers	3
1	Winfrog GPS navigation software	3
1	UNIX seismic data acquisition software	1
4	EPC Model 9802 thermal plotters	1,2
1	HP DesignJet 36" color plotter	1,3
1	Geometrics towed proton precession magnetometer	5

Explanatory Notes:
The underway geophysics (UWG) lab cannot be fairly compared to other shipboard laboratories that produce primary data. The purpose of the UWG lab is to locate sites relative to site survey data and to provide geologic context, especially for those sites not well documented by site survey data. In a perfect world, site survey data are dense, navigation accurate, and no problems are encountered so that all the ship need do is drive to a position and drill. In reality, it is often necessary to verify that the ship is at a particular site by comparison of underway data (seismic reflection, bathymetry, and echosounder records) with site survey data. In addition, it is often necessary to use the UWG to

document alternate sites when problems are encountered at primary sites. For these reasons, the ratings "essential" and "useful" here are relative to what is needed to verify a site (essential) and document it (useful).

Equipment Status:
Within most data type classes there is redundant equipment. This is normal for UWG data collection because of differing needs for different lithologies and the necessity of spares for towed equipment. Under seismic reflection equipment there are seismic guns and streamers. ODP has a total of 7 guns. Three are 80-cu. in. waterguns, which are the most used. The larger guns are useful if more energy is needed, for deep seismic penetration. The largest is energetic enough for VSP work. Probably not all of these guns are necessary. At a minimum, the 3 small water guns should be maintained so that two are working at a time and a third is available for a spare. The program also owns 4 streamers. This is also more than necessary. The program could get by with one good working streamer and a back up. The echosounding equipment is at a minimum (the two CESP correlators work with the two echosounders). It might be possible to operate with only one echosounder, but once again it is helpful to have two so that one is working. There are situations where one will not give as good or appropriate records as the other even though both are nominally working. The Ashtech GPS receiver is essential and as more site positioning accuracy is needed, and more data are positioned by dGPS, the two Omnistar receivers will also be essential (one for back up). Having 4 EPC recorders is also essential because two are needed for the echosounders and one is needed for the seismic reflection record. It is useful to have one as a back up or as a second seismic reflection recorder. The HP plotter is non-essential, but useful for making plots while at sea.

Cost Implications:
Most of the equipment in this list are low cost to operate once purchased. The most expensive items are the towed items, which often require significant maintenance costs. Air and water guns have moving parts and so they are usually the most expensive to maintain. Reducing the number of guns might save the costs of spares. Likewise, streamers can be expensive to repair, although their failures are often catastrophic (the whole thing or a significant piece are lost), so the costs come in replacement. The other towed instrument is the proton precession magnetometer. It is a robust piece of equipment and the operating cost is likely to be low unless the tow cable is lost.

F) Paleontology

Long Range Plan Objective	Essential	Useful
Environment		
Climate Change	1,2	
Causes and Effects of sea level change	1,2	
Sediments, fluids, bacteria	1,2	
Earth's deep biosphere	1,2	
Interior		
Transfer of heat and material		1,2
Investigating deformation of the lithosphere and earthquake processes		1,2

1. Prepare samples
2. Provide biostratigraphic ages and age models, enter data into Janus system

2. Publications

SciMP believes that publications are an essential product of the program and the ODP-TAMU Publications department has responded well to changing priorities. Of the publications produced within ODPTAMU, SciMP feels the Initial Reports volume is essential as a record of the cruise and a description of the data and came to the following consensus:

CONSENSUS 98-2-2:
It is the consensus of SciMP that the following ranking of ODP publications best serves the goals of the Long Range Plan.

Ranking:
1. IR - essential
2. WWW publications - very useful but not essential
3. SR - useful but not essential

3. Information Services

Under the heading of Information Services, SciMP evaluated the following services: data capture, database maintenance, data migration, computers and computer networks, and core photography. Appendix 98-2-6 contains detailed information on some of these services with respect to their utility for fulfilling the Long Range Plan.

CONSENSUS 98-2-3:
SciMP believes that data capture is one of the most essential services of the Ocean Drilling Program. Maintenance of a relational database and data migration in the database are very useful but not essential to the success of the LRP.

Current core photographic services are essential until digital imaging becomes a suitable replacement.

Computers and networks are essential in collecting the primary data. Continued network and storage upgrades are essential to the success of the LRP.

Long Range Plan Objective	Essential	Useful
Environment		
Climate Change	1,2	3,4,5
Causes and Effects of sea level change	1,2	3,4,5
Sediments, fluids, bacteria	1,2	3,4,5
Earth's deep biosphere	1,2	3,4,5
Interior		
Transfer of heat and material	1,2	3,4,5
Investigating deformation of the lithosphere and earthquake processes	1,2	3,4,5

1. Janus maintenance (data capture)
2. Complete Janus development (data capture)
3. Data migration (ingest old shipboard data into Janus)
4. Scientific results data (design relational database model and ingest old and new data)

5. Permanent archive of ODP data.

4 Repositories

SciMP believes it is essential to provide a controlled environment for at least the short-term (~ 5 years) safe storage of ODP cores. ODP-TAMU studies have shown that the majority of sampling takes place within a few years of core collection. With this fact in mind, SciMP has come to the following consensus about the ODP/DSDP repositories:

CONSENSUS 98-2-4
SciMP has determined that of the four repositories one is essential and the three remaining are useful but not essential to the goals of the LRP.

5 Public Affairs

SciMP believes that it is important to keep the scientific community and general public informed about the results and advances of Ocean Drilling. However, SciMP is concerned with apparent redundancies in public affair services between JOI and TAMU/ODP.

RECOMMENDATION 98-2-9:
The SciMP suggests a consolidation of resources relating to public affairs.

6 Wireline Services

SciMP recognizes that down-hole logging is essential to the success of the LRP and feels that wireline services are currently a great strength of the program. The present level of logging is the minimum that must be maintained (See Appendix 98-2-6). Moreover, we feel that it would be in the best interest of the program to include more specialty tools in logging operations. Of concern to SciMP is that the current types of logs being acquired are quite basic for the infrastructure that currently exists.

RECOMMENDATION 98-2-10:
SciMP feels that the overall cost of logging operations is high in relation to the basic types of logs being routinely collected. Therefore, SciMP recommends that OPCOM request JOI to evaluate the cost efficiency of current wireline operations.

Long Range Plan objective	Essential log	Useful log
Environment:		
Climate change	1, 2, 3, 4, 5, 7, 8, 15	8A, 10, 13, 14, 16
Causes and effects of sea level change	1, 2, 3, 4, 5, 7, 8, 15	8A 10, 13, 14, 16
Sediments, fluids, bacteria as agents of change (gas hydrates, carbon cycle, fluid flow, etc)	2, 3, 4, 5, 6, 7, 8, 15	1, 8A, 10, 13, 14, 16
Earth's deep biosphere	1, 2, 3, 4, 5, 6	10, 13, 15
Interior:		
Transfer of heat and material to and from the Earth's interior	1, 2, 3, 5, 6, 7, 8, 8A,12, 15	9, 10, 11, 13

Investigating deformation of the lithosphere and earthquake processes	2, 3, 5, 6, 7, 8, 8A, 11, 12, 15	1, 9, 10, 13

Log #	Standard Suite of Logging Tools	% Impact
1	Natural gamma	85
2	Density	100
3	Caliper	100
4	Induction resistivity	80
5	Porosity (APS)	100
6	Temperature	60
7	FMS (formation microscanner)	80
8	Sonic	90
8A	Sonic (Shear)	50
	Specialty Tools (require additional funds)	
9	ARI (azimuthal resistivity)	15
10	GLT (geochemical tool)	50
11	BHTV (acoustic televiewer)	15
12	DLL (dual lateral log)	20
13	VSP	50
14	GHMT (magnetic tool)	30
15	WST (well seismic tool)	90
16	LWD	30

7 Drilling Services

SciMP has prioritized several large FY99 engineering projects in terms of the Long Range Plan (see Appendix 98-2-6). Most of these projects were viewed to be useful but not essential to the success of the LRP. Considering that engineering development is a significant portion of the budget, SciMP recommends the following:

RECOMMENDATION 98-2-11:
SciMP recommends OPCOM and TEDCOM evaluate the cost-benefit and feasibility of engineering projects to determine if they can be accomplished in a realistic time frame in order to benefit the LRP.

Long Range Plan objectives	Drilling Services which are essential to complete the objective (see key below)	Drilling Services which would be useful to complete the objective (see key below)
Environment		
Climate Change	–	1,3,4
Causes and effects of sea level change	–	1,3,4
Sediments, fluids, bacteria, as agents of change (gas hydrates, carbon cycle, fluid flow)	–	3,4
Earth's deep biosphere	–	3,4
Interior		
Transfer of heat and material to and from the Earth's interior	2,3,4	1
Investigating deformation of the lithosphere and earthquake processes	1,3,4	–

1 - Diamond Coring; 2 - Auxiliary Hammer; 3 - Measurement While Coring;
4 - Active Heave Compensation

8 Personnel

It is the consensus of SciMP that the ratio of personnel to the scientific product produced by ODP is high.

RECOMMENDATION 98-2-12:
SciMP recommends that OPCOM advise JOI to initiate an evaluation of the present staffing throughout the ODP organization.

SAMPLING DISTRIBUTION AND PUBLICATIONS POLICY

Background

Previous versions of the Sample Distribution Policy and Publications Policy have been published as separate documents. However, since the receipt of ODP Samples places obligations on scientists to submit papers or data to ODP, an integrated policy was considered to be appropriate.

At its August 1998 meeting, SCICOM accepted in principle a new integrated Policy with some clarifications.

SCICOM Motion 98-2-13
SCICOM accepts the revised Integrated Curation and Publication Policy in principle. Several points require clarification, including: (1) the deadline for supplying material for inclusion in the SR for manuscripts rejected in the outside literature; (2) the requirement that authors are obliged to submit data (including that for papers published in the outside literature) for inclusion on the SR CD-ROM; (3) the party responsible for informing non-performers of their status.

The required clarifications have now been completed, and EXCOM is asked to approved the new integrated Sample Distribution and Publications Policy

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Sample Distribution amd Publications Policy

This policy will be periodically updated. The most current version will be made available through the World Wide Web (WWW) on the ODP website. The URL for this website is: http://www-odp.tamu.edu/

1. Introduction:

The international Ocean Drilling Program (ODP) collects and analyzes marine cores of rocks and sediments from the global ocean recovered by the research vessel JOIDES Resolution. These cores, as well as those from the Deep Sea Drilling Project (DSDP), are stored in four repositories located in the United States and Germany. This document outlines the policy and the procedures for distributing ODP and DSDP samples and data to research scientists, curators, and educators. In addition, this document outlines the publications policy of the ODP.

At the end of each drilling leg, the ODP publishes a set of two volumes known as the *Proceedings of the Ocean Drilling Program*, which consist of an Initial Reports (IR) volume and a Scientific Results (SR) volume. The Initial Reports (IR) volume is prepared

by the shipboard scientific party and contains the scientific and engineering results from each ODP leg. The Scientific Results (SR) volume contains peer-reviewed papers prepared by individual scientists that present the results of their post-cruise scientific research from a drilling leg. In order to fulfill their obligation to ODP, scientists are given the option of publishing their post-cruise results in either the Scientific Results volume, or in an appropriate peer-reviewed scientific journal that publishes in english.

The IR and SR volumes are currently published electronically on CD-ROM and are available on the World Wide Web (WWW).

2. General Provisions:

The primary intention of this policy is to achieve maximum scientific return in a responsive and flexible manner.

ODP and DSDP samples are given or loaned to people in the following four categories:

(1) scientists who participate on specific drilling legs as shipboard or shorebased members of a "scientific party" that has been formally approved by the ODP, and whose requests have been approved by the Sample Allocation Committee (see: 3a. Curatorial Responsibilities);

(2) scientists who wish to conduct research on ODP or DSDP materials, and publish the results, but who are not necessarily associated with a specific leg;

(3) curators of museums and collections; and

(4) educators.

The specific objectives of ODP's sample distribution policy are to: (1) insure availability of samples to scientific party members so that they can fulfill the objectives of the drilling leg and their responsibilities to the ODP; (2) encourage scientific analyses over a wide range of research disciplines by providing samples to the scientific community; and (3) preserve core material as an archive for future description and observations, for non-destructive analyses, and for sampling.

The aim of ODP's sample distribution policy, for both leg-specific and post-moratorium requests, is to provide samples for research efforts of a two to three year duration.

This policy is divided into two parts, reflecting the duality of ODP's shipboard and shorebased research. The first part pertains to the previously defined "scientific party" that participates on a specified leg (also see: 5. Moratorium Sampling). The second part relates to other sample requesters, such as scientists not necessarily associated with a particular leg, curators, and educators (also see: 6. Post-moratorium Sampling).

Within the "moratorium" of each leg, which extends from the time the leg begins (i.e., the ship sails) to 12 months after it ends (i.e., the ship returns to port), only members of the scientific party (including approved shorebased researchers) are permitted to receive core samples and associated data.

Sample requests from scientists not formally associated with the scientific party will be considered after the moratorium has expired.

3. Program Responsibilities:

3a.) Curatorial Responsibilities:

The responsibility and authority for making decisions regarding the distribution of DSDP/ODP samples, as per this policy, lies with the Sample Allocation Committee (SAC), and the Curatorial Advisory Board (CAB).

The ODP Curator maintains a record of all distributed samples, both on board ship and from the repositories. This record, which includes the recipients, the nature of the proposed research, and the status of the request, is available to investigators upon request.

For each drilling leg, a Sample Allocation Committee (SAC) is constituted, comprising the Co-Chief Scientists, the ODP Staff Scientist, and the ODP Curator or Curatorial Representative. During the leg, the Curator's authority and responsibilities to the SAC may be ceded to the shipboard Curatorial Representative.

Because the Sample Allocation Committee (SAC) best understands the scientific needs of their leg, this group establishes leg-specific sampling policy and makes decisions on leg-specific sample requests received before the leg sails, during the leg, and within the moratorium, but not after. Approval of such sample requests requires endorsement by a majority of the SAC. In the event of an evenly divided vote, a decision will be made by the ODP Curator. If so desired, the sample requester may choose to appeal the SAC's decision to the Curatorial Advisory Board (CAB).

The Curatorial Advisory Board (CAB) is a standing body that consists of the ODP Deputy Director of Services, the Manager of Science Services, and two members of the scientific community (selected by the JOIDES Scientific Measurements Panel) who will serve four-year terms that overlap by two years. Every effort will be made to insure that CAB membership represents as wide a variety of scientific disciplines as possible.

The Curatorial Advisory Board (CAB) acts as an "appeal board" vested with the authority to make final decisions regarding sample distribution if and when significant conflicts or differences of opinion arise among any combination of the ODP Curator, the sample requester, and the Sample Allocation Committee (SAC). In the case of an equally split vote among the four CAB members, the final authority rests with the ODP Deputy Director of Services. The CAB is also responsible for reviewing and approving requests to

sample the "permanent archive" (defined below), and requests for loans of core material for public display. To insure prompt decisions, CAB members will communicate via teleconferencing or e-mail. The existing Curatorial Advisory Board members are listed in Table A.1, below.

Table A.1. Curatorial Advisory Board Members

CAB Board Member	Contact Information
Dr. Christopher MacLeod	E-mail: macleod@cardiff.ac.uk Phone: 44(1222)874 830, ext. 5181; Fax: 44(1222)874 326 Dept. of Earth Sciences, University of Wales of Cardiff, PO Box 914, Cardiff CF1 3YE, United Kingdom
Dr. Richard W. Murray	E-mail: rickm@bu.edu Phone: 617-353-6532; Fax: 617-353-3290 Department of Earth Sciences, Boston University, 675 Commonwealth Avenue, Boston, MA 02215 USA
Dr. Jack Baldauf	E-mail: Jack_Baldauf@odp.tamu.edu Phone: 409-845-9297 Deputy Director, Ocean Drilling Program, 1000 Discovery Drive, College Station, TX 77845 USA
Dr. Tom Davies	E-mail: Tom_Davies@odp.tamu.edu Phone: 409-862-2283 Manager of Science Services, Ocean Drilling Program, 1000 Discovery Drive, College Station, TX 77845 USA

3b.) Publications Responsibilities:

The Initial Reports (IR) volume is prepared by the shipboard scientific party during the leg. A representative group of 6 to 10 individuals meets 3 to 5 months postcruise to complete the final editing of the Initial Reports volume. Following the final editing, the Initial Reports volume is published 1 year after the end of the cruise.

The Scientific Results (SR) volume is published 4 years after the end of the cruise. It contains peer-reviewed papers presenting the results of post-cruise research relating to each leg. Contributions to the SR volume are managed by an Editorial Review Board (ERB).

Authors who wish to submit manuscripts to the outside literature during the 12 month post-cruise moratorium must receive, in writing, prior approval from a majority of the scientific party. Authors must submit a copy of the manuscript to the ODP Staff Scientist at the same time that they initially submit the manuscript to an outside journal. The ODP Staff Scientist will circulate the manuscript among the scientific party and will notify the authors of the approval (or disapproval) of the scientific party. Any disputes arising from this process may be taken to the Curatorial Advisory Board (CAB; see 3a: Curatorial Responsibilities).

Editorial Review Board (ERB):

An Editorial Review Board (ERB) is established for every leg. The Board is comprised of up to four persons: two Co-Chief Scientists for the leg, the ODP Staff Scientist, and an external scientist/specialist. The external scientist/specialist is selected by the other members of the ERB. The need for external ERB members should be determined on a leg-by-leg basis, based on the leg workload and Co-Chief/Staff Scientist's expertise.

The primary purpose of the Editorial Review Board (ERB) is to maintain an independent and effective peer-review system for the publication of leg results. The ERB is responsible for:

(i) Ensuring that all manuscripts are of reviewable quality before they are sent out for review. Upon submission, the ODP Staff Scientist will check all manuscripts to ensure that they are complete and of reviewable quality. Manuscripts that do not meet ODP's standards will be returned to the author and will not go through the review process unless they are revised to meet ODP standards before the submission deadline.

(ii) Coordinating the peer-review process for each manuscript.

(iii) Reviewing each paper for proper citation of site summaries and site chapters and for proper use of data and conclusions from other members of the scientific party.

(iv) Collecting manuscript reviews and making the final decision on manuscript acceptance or rejection of articles submitted for the SR volume.

The ERB compiles and approves a final table of contents for the SR volume, which links ODP sample or data requests to specific manuscripts titles at the science (2nd) postcruise meeting.

The Editorial Review Board (ERB) will remain active for 42 months post-cruise. The handling of additional contributions to the SR volume after 42 months post-cruise will be coordinated by the ODP Staff Scientist for the leg.

It is the responsibility of the Co-Chief Scientist(s) from each leg to write, or coordinate, a Leg Synthesis paper to be published in the Scientific Results (SR) volume.

The ODP Staff Scientist is responsible for maintaining a record of the submissions of manuscripts and postcruise data by leg scientists, to the ODP.

4. Terminology and Curatorial Requirements:

In this section, ODP-related curatorial terms, concepts and requirements are defined and explained.

4.1 Unique and Non-unique Intervals

A cored interval is designated "unique" if it has been recovered only once at a drill site. The most common occurrence of a unique interval is one that results when only one hole is drilled at a site. If the cored interval is recovered from two or more holes, then the interval is considered "non unique".

A critical exception to this definition occurs when drilling into igneous basement rocks, metamorphic rocks, or ore deposits. Every hole drilled into these lithologies is considered unique because of their inherent lateral heterogeneity.

Lithostratigraphic analysis of advanced piston cores from multiple holes drilled at one site may reveal that short (generally less than two meter) sedimentary intervals are commonly missing between successive cores from any one drill hole, even where nominal recovery approaches 100%. These missing intervals can be ignored when considering whether or not an interval is unique.

4.2 Archive and Working Halves

By tradition, and by shipboard procedure, drill cores are split into halves. One becomes the "working half" and the other becomes the "archive half". Prior to 1997, the sample distribution policy stipulated that the archive was preserved (unsampled) and conserved in the repository, available only for non-destructive examination and analysis. Samples for destructive analyses were taken exclusively from the working half. Since 1997, the entire working half has been available for sampling. The procedure of splitting cores into working and archive halves will continue, for practical and database purposes, but the concept and definition of an archive half has now been expanded and modified. This will enhance scientific flexibility by enabling greater access to important and often coveted material.

4.3 Permanent Archive

Archive core earmarked "permanent" is material that is initially preserved unsampled and is conserved in the core repositories for subsequent non-destructive examination and analysis. A fundamental provision of this policy is that a "minimum permanent archive" will be established for each ODP drill site. In "unique intervals", this minimum permanent archive will consist of at least one half of each core, excluding whole-round samples (e.g., for interstitial pore water analysis). If so desired, the Sample Allocation Committee (SAC) may choose to designate more, but not less than this amount as the permanent archive. In "non-unique intervals", the permanent archive will consist of at least one half of one set of cores that span the entire drilled sequence, again, excluding whole-rounds samples. The permanent archive is intended for science needs that may arise five years or more after drilling is completed.

In practice, if holes are cored continuously, the minimum permanent archive may consist of one half of each core taken from the deepest hole drilled at a site. As such, the archive halves of cores from additional holes drilled to equal or shallower depths, which contain replicate copies of stratigraphic intervals constituting the minimum permanent archive, need not be designated as permanent archive, but can be, if so desired by the SAC. If not deemed permanent archive, they are "temporary archive".

4.4 Temporary Archive

Cores taken from non-unique intervals that are not part of the "minimum permanent archive" will be split into working and archive halves just like all other ODP cores. These archives halves, however, will be considered "temporary archives", unless stipulated otherwise by the Sample Allocation Committee (SAC) in the Sample Strategy. These halves may be sampled and treated as working halves when either the working halves have been depleted by sampling, or when pristine, undisturbed material is needed for special sampling needs, such as U-channels or slab samples.

4.5 Critical Intervals

Critical intervals are defined as lithologic spans that are of such scientific interest that there is extremely high sampling demand for them. These intervals may vary from thin, discrete horizons to thick units, extending over an entire core or more. Examples include, but are not limited to: décollements, sediment-basement contacts, igneous contacts, impact/tektite horizons, gas hydrates, marker ash horizons, scaly fabric, magnetic reversals, and particular biostratigraphic levels. The Sample Allocation Committee (SAC) is responsible for anticipating the recovery of critical intervals and for developing a strategy for sampling and/or conserving them. For post-moratorium sampling, the ODP Curator will work with investigators to ensure that previously-defined critical intervals are sampled only when necessary.

4.6 Non-destructive Analyses

Requests to perform non-destructive analyses on cores (e.g., descriptions, imaging, x-ray) should be submitted to the ODP Curator through the standard ODP Sample Request Form. Investigators who carry out non destructive analyses incur the same obligations as those who request samples (see Sections 5.4 and 6.2 of this policy).

5. Moratorium Sampling:

5.1 Leg-Specific Sampling Strategy

Leg-specific sampling, both shipboard and shorebased, will follow a "Sampling Strategy" established by the Sample Allocation Committee (see Appendix A). The strategy will integrate and coordinate the programs for drilling, sampling, and downhole measurement in order to best meet scientific needs. By necessity, the strategy will evolve over the course of leg planning, the leg itself (e.g., depending on drilling results), and in the post-

cruise moratorium. All sampling plans should be carefully considered in the strategy. Whenever possible, sampling should be deferred to a coordinated shorebased sampling effort (commonly referred to as a "sampling party") in order to sample more efficiently, and with the perspective gained from having completed the leg. This will insure the best possible use of the core and distribution of samples. Shorebased sampling will be particularly appropriate for legs where many samples will be needed, such as those focusing on paleoceanographic objectives. Travel funds have been specifically allocated for this purpose in some ODP member countries.

5.2 Requests from Scientific Party Members

Scientific party members are requested to submit sample requests to the ODP Curator (see address provided below) no later than three months prior to the start of the leg. This will provide sufficient lead time for planning. The sample requests will be reviewed by the Sample Allocation Committee (SAC) and approval will be based on compatibility with the Sampling Strategy. In cases where a sample request is considered incompatible, the SAC may: (1) recommend modifications to the request, (2) modify the Sampling Strategy, or (3) reject the request if the other options are inappropriate.

Sample requests submitted at sea or during the moratorium will also be considered by the Sample Allocation Committee (SAC).

Sample request approval requires endorsement by a majority of the SAC. In the event of an evenly divided vote, a decision will be made by the ODP Curator. If so desired, the sample requester may choose to appeal the SAC's decision to the CAB. If a conflict arises over the allocation of samples, shipboard scientific party members have priority over shorebased members.

An ODP Sample Request Form is included in Appendix B. Appendix C contains guidelines to assist the requester in estimating sample volumes.

5.3 Samples for Routine Shipboard Analyses

Data produced from samples taken for routine shipboard analyses (e.g., index properties, interstitial (pore) water whole rounds, thin sections, smear slides, x-ray diffraction and x-ray fluorescence samples, paleontology core-catcher samples) are available to the entire shipboard party and approved shorebased participants during the moratorium. Unless requested, these samples, and/or their residues, are shipped to the appropriate core repository at the end of the cruise. If scientific party members want these materials for post-cruise research, they are available through the normal sample request procedure. Shipboard thin sections and smear slides are also sent to the repository, post-cruise, where they are catalogued before being made available for short-term (less than one year) loan to scientific party members upon request.

An ODP Sample Request Form is included in Appendix B. Appendix C contains guidelines to assist the requester in estimating sample volumes.

5.4 Responsibilities

Scientists who receive samples or conduct non-destructive analyses within the 12-month moratorium must:

(1) Fulfill their publication obligation to the Ocean Drilling Program by either:

(a) Publishing a paper in a peer-reviewed scientific journal that publishes in english, or

(b) Publishing a paper or a data report in the Scientific Results (SR) volume.

Authors must submit their initial manuscripts by the specialty paper submission deadline, which is 28 months post-cruise.

Until the Scientific Results (SR) volume closes, an author who submits a manuscript to an outside journal must simultaneously submit a copy of the manuscript to the ODP Staff Scientist, who is a member of the Editorial Review Board (ERB). If the ERB determines that there is improper usage of the data and conclusions of other members of the Scientific Party, or failure to properly cite the Initial Reports volume, the ERB will contact the author and the journal editor with a recommendation that the manuscript be withdrawn or suitably modified. Any disputes arising from this activity will be addressed by the Curatorial Advisory Board (CAB).

If a manuscript submitted to a peer-reviewed scientific journal is rejected by the journal, then the author must contribute a manuscript or a data report to the SR volume before it closes in order to fulfill their publication obligation to the ODP.

Authors who choose to submit a paper to the SR volume will be required to meet the ODP submission deadlines. As of November 25, 1998, these deadlines are:

Initial submission, specialty papers:	28 months postcruise
Revised submission, specialty papers:	34 months postcruise
Initial submission, synthesis papers:	35 months postcruise
Revised submission, synthesis papers:	40 months postcruise

The SR volume will be produced and distributed 48 months postcruise.

(2) Acknowledge the international Ocean Drilling Program (ODP) in all publications that result from the use of data collected from ODP samples.

(3) Submit one reprinted copy of all published works derived from the ODP samples to:

ODP Curator
Ocean Drilling Program

1000 Discovery Drive
College Station, TX 77845-9547 U.S.A.

The reprints will be entered into an on-line bibliographic database.

(4) Submit all final analytical and/or descriptive data obtained from the samples to the ODP Curator, as soon as the data have been published, or within five years after receiving samples, whichever comes first. Data, preferably in electronic format, should be submitted to the following address:

ODP Curator
Ocean Drilling Program
1000 Discovery Drive
College Station, TX 77845-9547 U.S.A.

Investigators should be aware that they may have other data obligations under the U.S. National Science Foundation's Ocean Science Data Policy or under relevant policies of other funding agencies that require submission of data to national data centers.

(5) Return all unused samples to the appropriate core repository no later than five years post-cruise. Residues from processed samples need not be returned.

(6) Comply with all written collaborative agreements identified in the leg sampling plan.

If a scientist is unable to fulfill their obligations to the Ocean Drilling Program (as described above), then a letter of explanation must be submitted to the ODP Curator (see address above). Failure to meet these responsibilities will result in the rejection of future sample requests and may influence participation on future legs.

6. Post-moratorium Sampling:

6.1 Introduction

Post-moratorium sampling is supervised by the ODP Curator and the Curatorial Advisory Board (CAB). Core material recovered during a leg is available to the broader science community for sampling beginning 12 months after a cruise has ended.

Samples will be provided to any scientist, curator, or educator who has the resources to complete a scientific investigation, or prepare materials for curatorial or educational purposes. The sample requester must independently secure funds for sample-related research activities. Requests for samples should be submitted to the ODP Curator.

Approval of sample requests will be based on the availability of material and the length of time it will take the investigator to complete the proposed project. Typical studies will take two to three years, but a longer duration will be considered under certain

circumstances. If a sample requester disagrees with the ODP Curator's decision, the requester can appeal to the Curatorial Advisory Board (CAB).

An ODP Sample Request Form is included in Appendix B. Appendix C contains general guidelines to assist the requester in estimating sample volumes.

6.2 Responsibilities

Scientists who receive samples or conduct non-destructive analyses after the 12-month moratorium must:

(1) Fulfill their publication obligation to the Ocean Drilling Program by either:

(a) Publishing a paper in a peer-reviewed scientific journal that publishes in english, or

(b) Submit a progress report to the ODP Curator outlining the status of the samples and/or the data no later than 36 months after receiving them.

(2) Acknowledge the international ODP, DSDP and others as appropriate in all publications that use data collected from ODP or DSDP samples.

(3) Submit one reprinted copy of all published works derived from the ODP samples to:

ODP Curator
Ocean Drilling Program
1000 Discovery Drive
College Station, TX 77845-9547 U.S.A.

The reprints will be entered into an on-line bibliographic database.

(4) Submit all final analytical and/or descriptive data obtained from the samples to the ODP Curator, as soon as the data have been published, or within five years after receiving samples, whichever comes first. Data, preferably in electronic format, should be submitted to the following address:

ODP Curator
Ocean Drilling Program
1000 Discovery Drive
College Station, TX 77845-9547 U.S.A.

Investigators should be aware that they may have other data obligations under the U.S. National Science Foundation's Ocean Science Data Policy or under relevant policies of other funding agencies that require submission of data to national data centers.

(5) Return all unused samples to the appropriate core repository no later than five years post cruise. Residues from processed samples need not be returned.

Failure to meet these responsibilities will result in the rejection of future sample requests and may influence participation on future legs.

6.3 Curatorial Duties

The ODP Curator will receive post-moratorium sample requests and will evaluate them for completeness and for adherence to the provisions in this policy. If questions arise, the ODP Curator will consult with the requester. If a sample requester disagrees with the ODP Curator's final decision on a sample request, and wishes to appeal the decision, the ODP Curator will forward the request to the Curatorial Advisory Board (CAB) for resolution.

When considering a sample request, the ODP Curator will ascertain whether the requested material is available in the working half or the temporary archive half of the core. If not available, the ODP Curator will consult with the requester to determine if the range of the sought interval(s) or the sample spacing within the interval(s) may be modified. If the request cannot be modified because of scientific requirements, a request to sample the permanent archive can be considered (see 6.4 Permanent Archive Sampling).

To assist the sample requester, the ODP Curator can provide relevant information on previous sample requests and resultant studies on the core interval in question. The ODP Curator can also provide advice and guidance to the requester when considering sample volumes and frequencies (see Appendix C).

6.4 Archive Sampling

Sampling of the permanent archive is feasible five years post cruise if the working and/or the temporary archive halves of the core have been depleted, as judged by the ODP Curator.

As with all requests, those to sample the permanent archive should be sent to the ODP Curator, who will forward them to the Curatorial Advisory Board (CAB), after preliminary review. The CAB will evaluate the request based on its scientific merit and on the extent to which the working half is depleted. If necessary, the CAB may also consult with members of the original Sample Allocation Committee (SAC) who were responsible for establishing the permanent archive being considered for sampling. The Curatorial Advisory Board (CAB) will strive to maintain a representative continuous section of core material for archival purposes whenever possible.

6.5 Educational Sampling

Cores can be viewed, described, and sampled for teaching and educational purposes. Core materials that are abundant in the collection, and thus not in demand for research purposes, are available to educators for sampling. Sample requests (made using the

Sample Request Form, see: Appendix B) are approved by the ODP Curator if the request does not deplete the working and/or the temporary archive halves of the core. Educators who receive samples or conduct non-destructive analyses do not incur the same obligations as researchers to publish or provide data to ODP.

6.6 Requests for Public Display Material

Core material is available for public display, such as in museums or at professional scientific meetings. Requests to borrow cores may be submitted to the ODP Curator, and the requests should: (1) include a description of the public display, including the location and purpose; (2) indicate the duration of the display and how the curatorial state of the cores will be maintained; and (3) identify the person(s) responsible for overseeing the cores.

All public displays of ODP/DSDP material will include a notice that properly credits the ODP and support by the National Science Foundation and its international parters.

Requests will be reviewed by the ODP Curator and possibly the Curatorial Advisory Board (CAB), and will be forwarded to Joint Oceanographic Institutions, Inc. (JOI) as appropriate. A loan agreement will be required for long-term loans (two weeks or more). The Curator will provide details about the loan agreement upon request.

Appendix A: Leg-specific Sampling Strategy: Guidelines and Examples

Guidelines:

Development of the leg-specific Sampling Strategy begins in the initial stages of leg planning, when ODP drilling proposals are written and submitted to JOIDES. At this stage, proponents will develop a draft Sampling Strategy that will fulfill the scientific objectives of the leg.

Once a proposal has been scheduled by JOIDES for drilling, the Sample Allocation Committee (SAC) will write a formal, leg-specific Sampling Strategy for publication in the ODP Scientific Prospectus. The Prospectus will be reviewed by the ODP Director and the Deputy Director of Operations prior to publication. This gives them an opportunity to advise on sampling issues pertaining to the broader (non-leg-specific) community. The Sampling Strategy will meet the specific objectives of the leg. The Strategy will define the minimum permanent archive and any supplements to it that the SAC deems necessary. The Strategy will also become the basis of the shipboard and moratorium "sampling plan".

A successful Strategy will:

(1) define the amount of core material available to the scientific party for sampling by deciding if (and when) more than a minimum permanent archive is needed;

(2) anticipate and possibly define limits on the volume and frequency of shipboard sampling for routine analyses, pilot studies, and low-resolution studies;

(3) estimate the sampling volume and frequency that is needed to meet the objectives of the leg, as per scientific sub-discipline and request type;

(4) anticipate the recovery of critical intervals and develop a protocol for sampling and/or preserving them;

(5) decide where and when sampling will occur. SACs are strongly encouraged to defer large-volume and high-frequency sampling to post cruise "sampling parties" at ODP core repositories;

(6) determine special sampling methods and needs (e.g., Pressure Core Sampler, microbiology, whole rounds);

(7) consider any special core storage or shipping needs (e.g., plastic wrap, freezing sections); and

(8) identify disciplines/personnel needed for shorebased sampling.

Needs

Detailed sampling will be necessary to achieve the scientific objectives. Large-volume samples may be required.

Sampling Timetable

High-resolution sampling of cores from a given site will proceed after a composite sampling splice has been constructed from cores from the two or more holes drilled at that site. The splice will be constructed and distributed to the scientific party after the site has been drilled, but in advance of post-cruise sampling, in order to facilitate planning and scientific collaboration. Requests to sample shipboard, for pilot studies or for projects requiring lower stratigraphic resolution, will be considered by the Sample Allocation Committee (SAC).

General Sampling Procedures

Investigators should try to avoid sampling the center of the working and the temporary halves of the core. Sample plugs (e.g., plastic vials of 5 and 10 cc) and paleomagnetic cubes should be taken as close to the edges of the core as possible. Samples may also be parceled out with the "scoop" tool, which inherently takes samples from the edges of the core. Large samples taken with the "cookie-cutter" tool, often for lamina-scale studies, will be shared equally among the interested scientific party members.

Critical Intervals

Marker beds of volcanic ash layers or major transitions from oxic to anoxic layers may be encountered. They will be considered "critical intervals", and as such will not be sampled onboard the ship. Requests to sample these intervals will be evaluated by the Sample Allocation Committee (SAC) and sampling will occur at the post-cruise "sampling party" at the repository.

Permanent Archive

The permanent archive will be the ODP-defined "minimum permanent archive".

Temporary Archive

Once the working halves of the cores have been depleted, the temporary archive will be accessible for sampling. When possible, one quarter of the core should be preserved by sampling off-center.

Appendix B: ODP Sample Request Form

An electronic version of the ODP Sample Request Form is available on the WWW. (URL: http://www-odp.tamu.edu/curation/subsfrm.htm)

Appendix C - Typical Sample Volumes

The following volumes are guidelines, not limits.

Thin Section Billets	10cc, up to 50cc for large grained plutonic rocks
Alkenone (Uk37)	5cc
X-ray diffraction	5cc
X-ray fluorescence	20cc (sediments), 20-50cc (igneous/sulfides - varies depending on grainsize and homogeneity of rock)
Carbonate	2cc
Paleomag	7cc cubes, 12cc minicores
Moisture and Density	10-20cc
Grain Size	10-20cc depending upon coarseness
Planktonic Foraminifers	10cc
Benthic Foraminifers	10-20cc
Nannofossils	2cc
Diatoms	5-10cc
Radiolarians	10cc
Palynology	10-15cc
Organic Samples	20cc
Interstitial Porewaters	5 cm whole rounds, up to 10-20 cm, based on water content
Inorganic Geochemistry	10cc
Organic Geochemistry	10cc
Sedimentology	10-20cc
Slabs (for laminae studies)	25-50cc, depending on slab length
Slabs (large grained plutonic rocks)	50-100cc, often shared by scientists for multiple analyses
Stable isotopes (C, O)	10-20cc

STUDENT TRAINEE PROGRAM

Background

The concept of a Student Trainee Program grew out of some earlier discussions at SCICOM regarding the need for additional help on some cruises. At the SCICOM Meeting in March 1998, there was a SOE in the budget for additional technical support for high recovery legs, and McKenzie had guaranteed the technical support by sending students for these legs. However, high recovery legs require individuals with expertise, and this is now budgeted as part of the ODP-TAMU budgeting process. The issue of taking students to sea to gain some experience was considered an excellent opportunity for ODP to contribute toward the educational experience of students, and hence this has now been pursued independent of the technical support issue.

At its August 1998 meeting, SCICOM approved a new program for Student Trainees with some modifications:

SCICOM Motion 98-2-4

SCICOM approves the policy for ODP student participation with the following modifications:

1. The title will be changed to "Student Trainee Program".
2. Each student participant will receive a certificate documenting his/her participation upon completion of the ODP leg.
3. Student staffing will be done in consultation with the Co-Chief Scientists.
4. The trainee program will be implemented so as to ensure that each student receives exposure and/or training in a variety of scientific/technical activities.
5. A limited number of core samples may be made available to Student Trainees for scientific projects. A letter will be required from the trainee's supervisor ensuring that a data report will be completed.

These modifications have now been made, and EXCOM is asked to approve this new Program.

Student Trainee Program

The Ocean Drilling Student Trainee Program provides students with a unique educational opportunity to participate in a scientific cruise on board the research vessel *JOIDES Resolution*. The *JOIDES Resolution* can accommodate a maximum scientific and technical crew of 50, the composition of which varies depending on the objectives of a particular cruise. Occasionally, berths become available for Student Trainees, providing them with unique opportunities for scientific growth and career development.

The intent of the Student Trainee Program is to provide undergraduates with hands-on experience and training in the wide variety of scientific and technical activities that occur on the ship. Shipboard activities of the Student Trainee will be defined by the designated Shipboard Mentor, in consultation with the Co-Chief Scientists, the Lab Officer, and the Trainee. Specific duties will depend on the Trainee's background, experience, and interests, but may include assisting the shipboard scientists in the various labs, and helping with processing of cores and scientific analyses.

Shipboard opportunities for Trainees will be limited, but will be accessible to all members of the Ocean Drilling Program. At least three openings a year are anticipated. Calls for student applications to the Program will be issued by the ODP Member Country/Consortium Offices when opportunities are announced by ODP-TAMU. Nominations of students to participate in the Program will be forwarded from the ODP Member Country/Consortium to ODP-TAMU, who will have final authority in Trainee selection. Trainees will participate on an opportunity basis and will not displace the scientific, technical or engineering personnel required to meet the scientific objectives or the high priority engineering activities planned for a cruise. The provision of students to the Student Trainee Program should not be viewed as mandatory, but rather as an opportunity.

Science Operator's (ODP-TAMU) Responsibilities

- With as much lead time as possible, the availability of Student Trainee positions will be announced: (1) on ODP-TAMU's WWW page and over their "Open Distribution" list server; (2) to the JOIDES office for publication in the *JOIDES Journal*; and (3) directly to ODP Member Country/Consortium Offices for follow-on announcement via newsletter, list servers, etc. The Science Operator will be responsible for maintaining the Student Trainee Program application form, and for making it available on their WWW site, and as paper copies upon request.
- The Science Operator will process and evaluate only those Student Trainee Program applications that have been forwarded from the ODP Member Offices.
- On the basis of space availability, the Science Operator will aim to identify three Student Trainee positions annually.
- The Science Operator, in consultation with the Co-Chief Scientist, will make the final section of students for the Trainee positions. The decision will be based on balancing applicant merit against the scientific requirements of the leg. Final selection of individuals to fill these positions is the sole responsibility of the Science Operator.
- The Science Operator, in collaboration with the Co-Chief Scientists, will select a member of the shipboard scientific party to act as the Shipboard Mentor for the student during the cruise.
- The Science Operator will assist with the Trainees' hotel and airline reservations, as well as with acquisition of visas if necessary. Student Trainees will be expected to stay at the same hotel as the scientific and technical staff.
- The Shipboard Lab Officer will participate in defining the tasks to be assigned to the student in consultation with the Shipboard Mentor and the Co-Chief Scientists.
- Upon completion of the cruise, the Science Operator will provide the Student Trainee with a certificate documenting his/her participation in the Ocean Drilling Student Trainee Program.

ODP Members' Responsibilities

- ODP Member Offices will coordinate the advertisement of student trainee positions, and process all applications.
- ODP Member Offices will submit a letter of endorsement with each student application they forward to ODP-TAMU for consideration.
- Each ODP member may submit applications from more than one student for consideration per leg to sail in a Student Trainee position.
- All applications must be received at ODP-TAMU no later than 6 months prior to the beginning of the requested Leg.

- ODP Members are responsible for providing all travel expenses for the student. This includes flights, visas, medical exam costs, lodging and meals in the port call both before and after the leg.
- ODP Members are solely responsible for determining if, and how, students will be compensated for participating in the Trainee Program. Some members may choose to compensate student trainees in different ways (e.g. salary, course credits, etc.); others may choose not to compensate them at all. Under either circumstance, the availability, level, and type of compensation should be clearly understood by the student prior to acceptance of the position to prevent misunderstanding. The Trainee must be informed that he/she will be working with paid ODP scientists and technicians.

Student Trainee's Responsibilities

- Applicants for the Student Trainee Program must submit a completed application form to their ODP Office. This must include a letter from their primary academic adviser(s) documenting the student's academic status and accomplishments, and explaining why the student should be considered for participation.
- The successful applicant will undergo a pre-participation medical physical examination (consistent with ODP-TAMU policy), and the results will be forwarded to the ODP-TAMU Personnel Supervisor by a specified date.
- The Student Trainee will be expected to participate in the work schedule (referred to as the "watch system") adhered to by scientists and technicians, and to carry out the tasks assigned to him/her by the Shipboard Mentor.
- Student Trainees are expected to participate in the science of the leg, and to attend scientific meetings.
- Student Trainees must provide their own steel-toed safety shoes to be available on day one of the port call.
- Student Trainee's are eligible to request a limited number of shipboard core samples for scientific projects, the results will be included in the leg publications. The Trainee's sample request must be supported by a letter from his/her supervisor ensuring that necessary facilities will be available to allow the student to complete the work, and to meet publication requirements.

Shipboard Mentor's Responsibilities

- The Shipboard Mentor will be responsible for advising the Student Trainee during the cruise, and ensuring that the student is exposed to a variety of scientific and technical activities.
- At the beginning of the cruise, the Shipboard Mentor will meet with the Co-Chief Scientists and Lab Officer to define the program of activities for the Student Trainee.
- The Shipboard Mentor will monitor the progress of the Trainee during the cruise, and will be readily available to assist with any concerns or problems.
- The Shipboard Mentor will write a short evaluation of the student and submit it to ODP-TAMU, who will then submit copies to the nominating ODP Member Office and to the Trainee's academic supervisor.

SCIENCE PLAN FOR LEGS 187 - 191 (FY'00) AND LEGS 192-193 (FY'01)

1. THE SCIENCE PLANNING PROCESS

1.1. The ODP Long Range Plan

In 1996, ODP published a Long Range Plan that outlines new directions for scientific ocean drilling into the next century. The Long Range Plan identifies a range of fundamental scientific problems that are grouped into two major research themes: Dynamics of Earth's Environment, and Dynamics of Earth's Interior. Within these themes, three frontier initiatives are emphasized that capitalize on new drilling and logging technologies and on advances in scientific techniques and conceptual frameworks: (1) Understanding natural climate variability and the causes of rapid climate change, (2) *In situ* monitoring of geological processes, and (3) Exploring the deep structure of continental margins and oceanic crust. ODP will also begin a pilot project to explore the nature and extent of Earth's Deep Biosphere.

These initiatives directly address many aspects of our changing planet that are of relevance to society, including natural resources, global environmental change, risks from earthquakes, volcanoes, and sea-level rise, and the capacity of Earth to sustain life. The pursuit of these initiatives complements and extends other scientific challenges that ODP will address, and gives the Program the flexibility to pursue new challenges as they emerge.

1.2 SCICOM/OPCOM Development of the Science Plan

At its August 1998 Meeting, SCICOM reviewed all externally evaluated proposals. Following presentation and detailed discussion of each proposal, SCICOM ranked them in terms of their scientific priority (regardless of geographic location). The resulting rankings are contained in SCICOM Motion 98-2-9.

SCICOM Motion 98-2-9
SCICOM approves the following ranking for programs to be considered for scheduling by OPCOM in FY'00 and beyond:

1. 445 - Nankai
2. 485 - Southern Gateways
3. 431 - W. Pacific Seismic Network (WP-1 and WP-2)
4. 448 - Ontong-Java Plateau
5. 465 - SE Pacific Paleoceanography
6. 479 - PacManus
7. 486 - Paleogene Equatorial Pacific
8. 499 - ION Equatorial Pacific
9. 455 - Laurentide Ice Sheets
10. 500 - H_2O Observatory

SCICOM recommends that Nankai be allocated 2 legs (see Motion 98-2-6) and SE Pacific Paleoceanography and Paleogene Equatorial Pacific be allocated 1.5 legs each. Ontong-Java is approved for 1 leg at this time.

The following proposals ranked below the above proposals and will not go forward to OPCOM:

11. 451 - Tonga
12. 482 - Wilkes Land
13. 450 - Taiwan
14. 463 - Shatsky Rise
15. 489 - Ross Sea

Detailed correspondence will be sent to the proponents by the SCICOM Chair appraising them of their proposal status.

The top 10 proposals were then sent to OPCOM for possible scheduling. The OPCOM Meeting directly followed the SCICOM Meeting. OPCOM was tasked to develop a schedule based on the top 10 ranked proposals for four to six legs to follow Leg 188. The following issues were examined: SCICOM ranking, site survey readiness, potential safety and pollution considerations, technological considerations (core recovery, enhancements to the standard set of logging tools, use of re-entry cones, and casing), operational considerations (weather - typhoons, ice cover, currents, and transit times between potential drilling sites), research clearance issues, post-Leg 163 heave restrictions in shallow water, and budgetary constraints.

OPCOM devised a drilling schedule for Legs 188 to 193 which was subsequently approved by SCICOM (SCICOM Motion 98-2-20) in an e-mail vote in late August 1998.

SCICOM Approval 98-2-20

SCICOM approves by e-mail the schedule for FY'00 (and beyond) as follows:

Leg 188	Dec - Feb	Prydz Bay*
Leg 189	Feb - April	Southern Gateways
	Transit (14 days)	
Leg 190	April - June	Nankai
Leg 191	July	WP-2 Site
Leg 192	July - Sept.	Manus Basin
Leg 193	Sept. Nov.	Ontong-Java

* - contingent on availability of affordable ice support

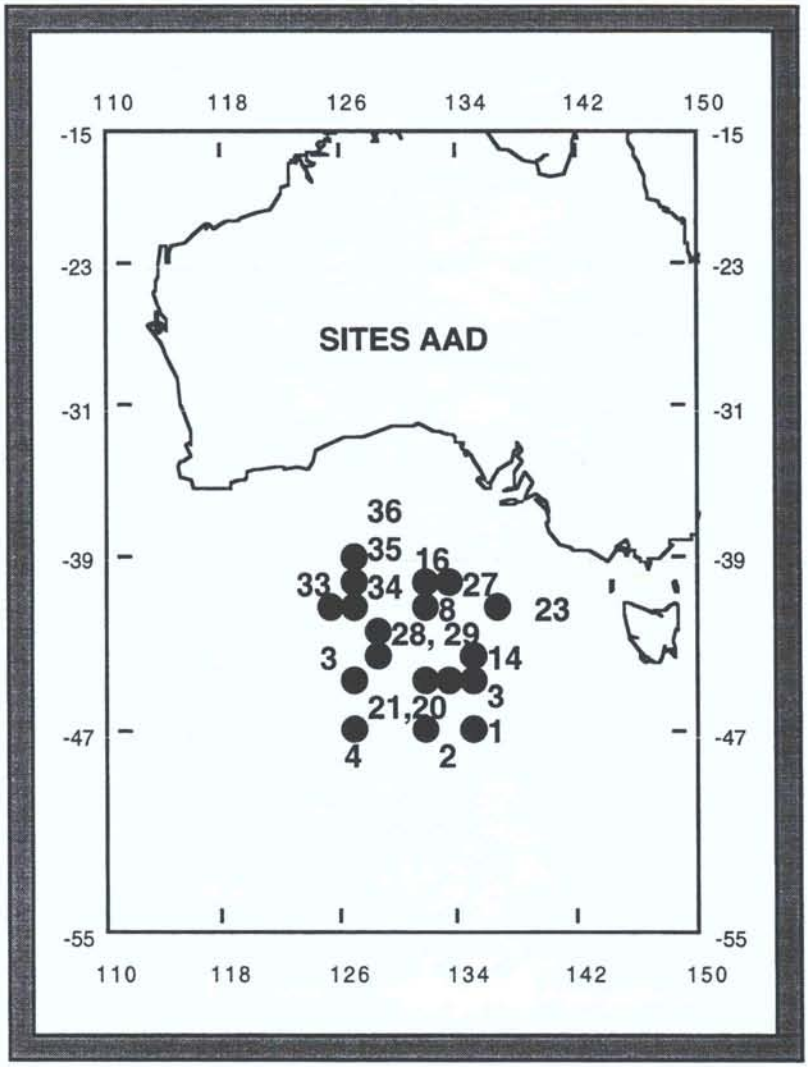
13. Relevance of Scheduled Legs to the ODP Long Range Plan

In January 1998, EXCOM approved the scheduling of Legs 187 and 188 in FY'00 with the contingencies as proposed by SCICOM. The correspondence of Legs 187-193 to the scientific themes and special initiative of the 1996 ODP Long Range Plan is as followes.

Dynamics of Earth's Environment	***Legs***	***Dynamics of Earth's Interior***	***Legs***
Understanding Earth's Changing Climate	188, 189	Exploring the Transfer of Heat & Materials To & From the Earth's Interior	187, 192, 193
Causes and Effects of Sea Level Change	188	Investigating the Deformation of the Lithosphere & Earthquake Processes	190, 191
Sediments, Fluids and Bacteria as Agents of Change	192		
Initiative I: Natural Climate Variability & the Causes of Rapid Climate Change		Initiative II: In Situ Monitoring of Geological Processes	191
Pilot Project: Earth's Deep Biosphere	192	Initiative III: Exploring the Deep Structure of Continental Margins and Oceanic Crust	

2. FY'00 SCHEDULED LEG DESCRIPTIONS (LEGS 187-191)

LEG 187	**Australia-Antarctic Discordance**
Proposal	**426-Rev3**
Title	**Mantle reservoirs and mantle migration associated with Australian-Antarctic rifting**
Proponents	**D. Christie, D. Pyle, A. Crawford, & B.P West**



LEG 187: AUSTRALIA-ANTARCTIC DISCORDANCE

BRIEF DESCRIPTION

Leg 187 will investigate relationships among ocean crustal composition, mantle composition, spreading and magma supply rates in an area where a major geochemical anomaly suggests unusual mantle dynamics and profound differences in magma supply. It has been known for some time that lavas erupted along the mid-ocean ridge in the Indian Ocean are isotopically and geochemically distinct from those erupting along the mid-ocean ridge in the Pacific Ocean. The boundary between these two mantle sources is very sharp and occurs in about 25 km at the Australian Antarctic Discordance (AAD).

The AAD, centered on the Southeast Indian Ridge between Australia and Antarctica, is an anomalously deep (4-5 km) region within the global mid-ocean ridge spreading system. It is underlain by unusually cold mantle, and its eastern boundary coincides with an abrupt change from smooth axial ridge morphology and abyssal topography (characteristics usually associated with fast-spreading centers) to the east, to a chaotic terrain of deep valleys and rough topography that seems to be dominated by tectonics. The junction between these two morphologies appears to be V-shaped off-axis, suggesting that the boundary has migrated westward over the last 3-4 Ma, and that there has been re-establishment of normal accretionary processes and the introduction of a persistent stable magma supply into the AAD.

The relationship of the Indian-Pacific isotopic boundary to the geophysical, morphological and petrological features of the AAD is unclear. At the present time, it appears that the morphologic and geochemical boundaries coincide. Based on modeling of mantle flow, two hypotheses have been put forward. The first is that the Indian-Pacific mantle boundary has been associated throughout its history with the depth anomaly. If this is the case, the depth anomaly has been created and maintained by an imbalance in the volumes of flow of the Indian mantle (from west to east) and Pacific mantle (from east to west). The second hypothesis is that the mantle boundary has arrived beneath the AAD only recently. If this is the case, the depth anomaly was created and initially maintained by opposing flows of Indian mantle. Later, the Pacific mantle was entrained into the westward flow, creating a Pacific mantle front that migrated towards the depth anomaly. These two models can be tested by investigating the geochemistry and isotopic signatures of older crustal material to trace the history of the mantle boundary.

Hence, Leg 187 will identify the Indian-Pacific isotopic boundary and determine its configuration out to at least 30 Ma through a systematic off-axis sampling program. Additional geophysical objectives will focus mainly on understanding the mantle dynamics of the region, and their relation to the anomalous processes within the AAD. Identification of the off-axis position of the isotope boundary will permit the refinement of the 3-D mantle flow models, providing more precise constraints on mantle dynamics, including interactions among mantle temperature gradients, viscosity, flow velocities and flow patterns throughout the region.

DRILLING PLAN

The configuration of the Indian-Pacific isotopic boundary will be determined by a well-planned inventory of the chemical and isotopic compositions of basalts, and hence of inferred mantle compositions, both on and off axis to the north and east of the AAD. The near-axis (0-5 Ma) component of this sampling strategy carried out during 1996 identified the trace of a migrating boundary within the AAD from 0-4 Ma. Leg 187 will extend the program of sampling to older crust by drilling approximately eight to ten single-bit holes

50-100 meters into igneous basement, primarily along two isochrons (15 and 30 Ma). The eighteen potential sites (Table 9) are intended to cover the range of possible locations of the isotopic boundary, and all have been approved for drilling by SSP and PPSP. The goal is to use a reactive drilling strategy in which the drilling plan responds to the chemical data from each hole as it is drilled. ICP-MS analyses of previously collected samples show that, compared to Indian-type samples, Pacific-type samples from this region are (with rare exceptions) markedly depleted in Ba relative to other highly incompatible trace elements. Thus, ratios such as Ba/Rb, Ba/Nb and Ba/Zr, if precisely measured, will accurately reflect source differences (Indian vs. Pacific mantle). A DCP plasma spectrometer (for the measurement of Ba/Zr and Ba/Rb) will be installed on board the *JOIDES Resolution* and used in conjunction with the shipboard AA instrument (Ba and Rb measurements) to determine, within a few hours, whether recovered basalts are of 'Indian' or 'Pacific' origin. This reactive drilling strategy will guide the selection of sites to be drilled during the cruise. The array of drill sites has been designed to cover possible configurations of the isotopic boundary and to distinguish between the competing hypotheses concerning the nature and extent of mantle migration.

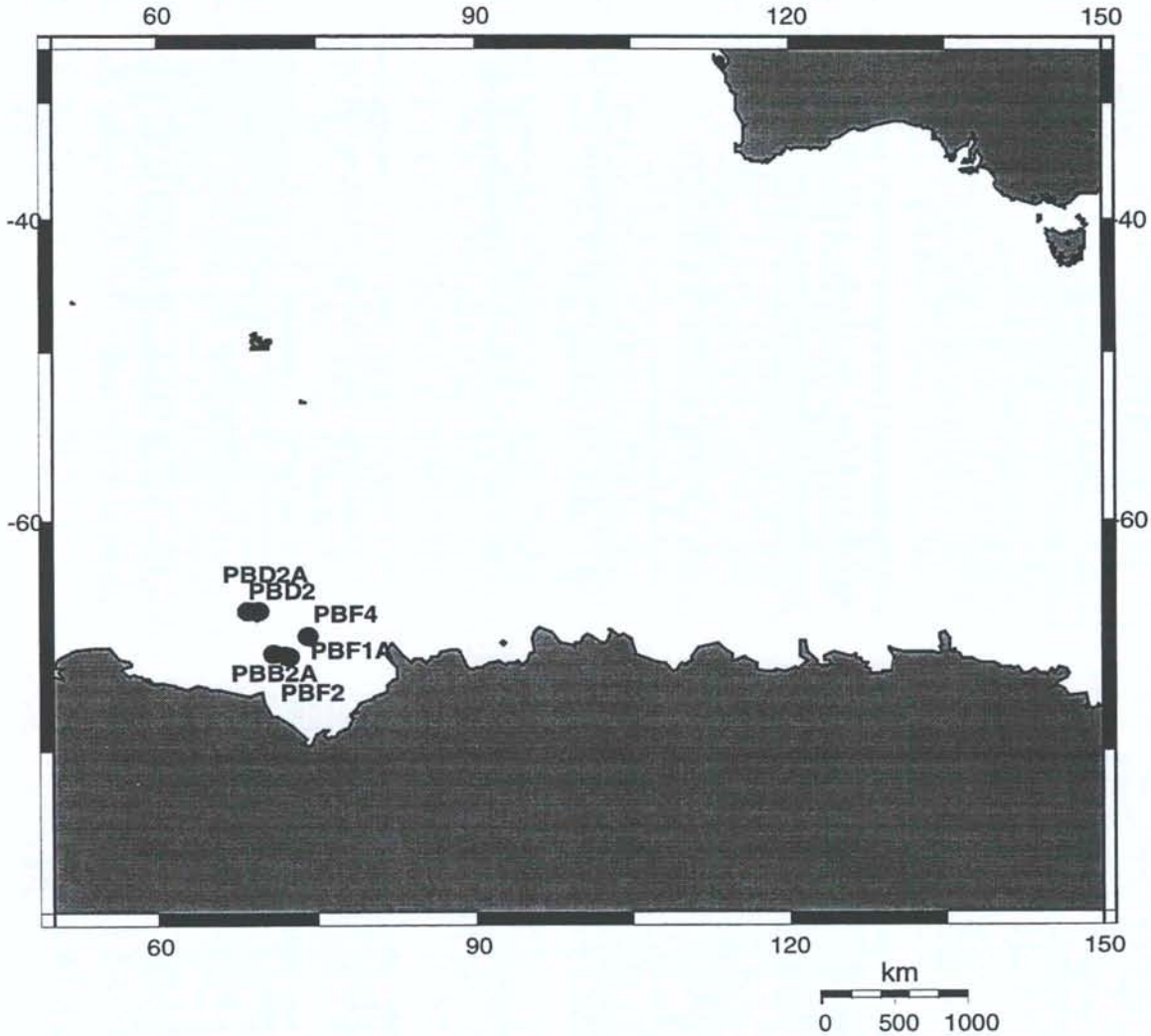
Approved Site Locations for Leg 187

Site Name	Latitude	Longitude	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
AAD-1B	46°20.6'N	134°59.8' E	4200	100-200	50	150-250
AAD-2B	45°57.4'S	130°00.0' E	4500	150-250	50	200-300
AAD-3B	44°25.5'S	126°54.5' E	4350	150-250	50	200-300
AAD-4C	47°32.7'S	130°00.0'E	4050	150	50	200
AAD-8C	41°16.3'S	129°48.9'E	5550	100	50	150
AAD-13B	45°01.2'S	135°00.2'E	4575	200	50	250
AAD-14C	44°01.3'S	134°59.9'E	4700	100	50	150
AAD-16	41°28.4'S	131°19.5'E	5700	200	50	250
AAD-20	45°45.2'S	134°59.9'E	4275	100-200	50	150-250
AAD-21	45°27.9'S	134°59.9'E	4575	100-200	50	150-250
AAD-23	42°33.2'S	135°00.1'E	4950	100-200	50	150-250
AAD-27	41°18.6'S	127°57.1'E	5100	100-200	50	150-250
AAD-28	43°15.3'S	128°52.1'E	5100	100-200	50	150-250
AAD-29	43°56.9'S	128°49.7'E	5100	100-200	50	150-250
AAD-33	43°44.9'S	127°44.9'E	4800	100-200	50	150-250
AAD-34	42°44.2'S	127°53.2'E	4875	100-200	50	150-250
AAD-35	41°57.5'S	127°59.7'E	5000	200	50	250
AAD-36	41°52.7'S	127°00.1'E	5000	100	50	150

LOGGING PROGRAM

There will be no logging program on this Leg.

LEG 188	**Antarctic Glacial History: Prydz Bay**
Proposal	**490-Rev**
Title	**Glacial History and Paleoceanography: Prydz Bay-Cooperation Sea, Antarctica**
Proponents	**P.E. O'Brien, G. Leitchenov, B. Kuvaas, T. Ishihara, P.T. Harris, and A K. Cooper**



BRIEF DESCRIPTION

The Antarctic ice sheet is a key component of the world's climatic system and has a major influence on global sea levels. At present, knowledge of the history of the Antarctic ice sheet is fragmentary making it impossible to predict whether the present ice sheet will grow or diminish with global warming. A precise date for the onset of Antarctic glaciation has not yet been determined, and there is much controversy over the stability of the East Antarctic ice sheet, particularly during the Pliocene. In order to gain a better understanding of role of the Antarctic ice sheet in global climate change and to test models of ice sheet

behavior, knowledge of the linkages between the behavior of the Southern Ocean, the ice sheet and the atmosphere is essential. To this end, ODP plans to conduct a series of Antarctic drilling legs based on a multi-leg approach developed by the ODP Antarctic Detailed Planning Group in 1996.

Leg 188, the second leg in this multi-leg approach, will drill Cenozoic sedimentary sequences in Prydz Bay, Antarctica, and on the adjacent continental slope and rise, known as the Cooperation Sea, to obtain a detailed history of ice sheet growth and decay, and Southern Ocean climate. Specifically, Leg 188 aims to (1) link events in the East Antarctic Ice Sheet with changes in the Southern Ocean by drilling sediment drifts on the continental rise equivalent to the Prydz Bay continental slope, particularly the Prydz Channel trough mouth fan; (2) recover a record of Plio-Pleistocene ice advances and interglacial deposits from the Antarctic continental slope by penetrating sequences in other trough mouth fans built by advances of the Lambert Glacier-Amery Ice Shelf; (3) date the earliest evidence of glacial activity in Prydz Bay; and (4) obtain information about the Paleogene environment of Antarctica.

Prydz Bay is located on the East Antarctic coast. A fault-bounded structure, the Lambert Graben, extends inland from Prydz Bay to the Prince Charles Mountains and is occupied by the Amery Ice Shelf-Lambert Glacier ice drainage system, which drains about 22% of the East Antarctic ice sheet. Included in its drainage basin are the Gamburtsev Subglacial Highlands, which may have been the nucleus of the earliest Antarctic glaciation. It is postulated that Lambert Graben may contain the earliest Cenozoic glacial sediments. The Lambert Glacier responds to fluctuations of the interior of the East Antarctic Ice-sheet which are reflected in the sediments and sedimentary rocks of Prydz Bay. During Cenozoic glacial episodes, the Lambert Glacier advanced to the shelf edge, extending it by progradation, and then constructing a large trough mouth fan on the continental slope on the western side of Prydz Bay. This and other trough mouth fans built on the continental slope by large ice streams may contain the most complete records of glacial history of any sedimentary sequences on the east Antarctic margin. The continental rise adjacent to Prydz Bay is characterized by large sediment drifts which were deposited by turbidity currents from the continental shelf, and deep currents in the Southern Ocean. Seismic horizons can be mapped from the slope to the rise allowing the relationships between slope and rise deposition to be determined. Drilling these sediment drifts will yield a high resolution picture of changes in paleoceanography that can be correlated with changes in East Antarctic Ice Sheet, and complement the ODP data base from other parts of the world (ODP Legs 155, 162, and 172).

Leg 188 is planned as a sequel to Leg 178 which drilled on the Pacific margin of Antarctica in early 1998. **ODP will proceed with Leg 188 only if an affordable ice support vessel can be found.**

DRILLING PLAN

Leg 188 will drill a transect of holes from the continental rise into Prydz Bay to provide insights into the behavior of the East Antarctic Ice Sheet and its interaction with the Southern Ocean. The Prydz Bay continental slope and rise are underlain by thick (over 6,000 m) post-early Cretaceous sediments. A major seismic unconformity within these sediments separates a lower homogeneous part of the section from an upper, heterogeneous one characterized by a variety of well-stratified seismic facies. Thick, prograding foresets were produced above this unconformity right across Prydz Bay, commencing in late Oligocene times. This transition possibly corresponds to the time when the grounded ice sheet started to carry large amounts of glacial sediments to the shelf edge, which were redistributed by slope processes. Another major unconformity rests above the first and

represents the base of deposits containing abundant, well stratified sediment drift facies. Sediment drifts in Prydz Bay are elongated ridges aligned along the margins of deep channels, others have no clear correlation with channels but all of them are elongate approximately orthogonal to the continental margin. The features and seismic pattern of sediment drift suggest that they have been deposited as a result of the interaction of downslope mass flow and strong bottom, contour currents. Leg 188 will also drill in the Prydz Channel, a transverse channel that cuts across Prydz Bay. Such channels are underlain by thinner topset sediments than other parts of the shelf as a consequence of having being excavated by fast flowing ice streams. Thus, by drilling through them, access to older sedimentary sections is possible.

Proposed Site Locations for Leg 188

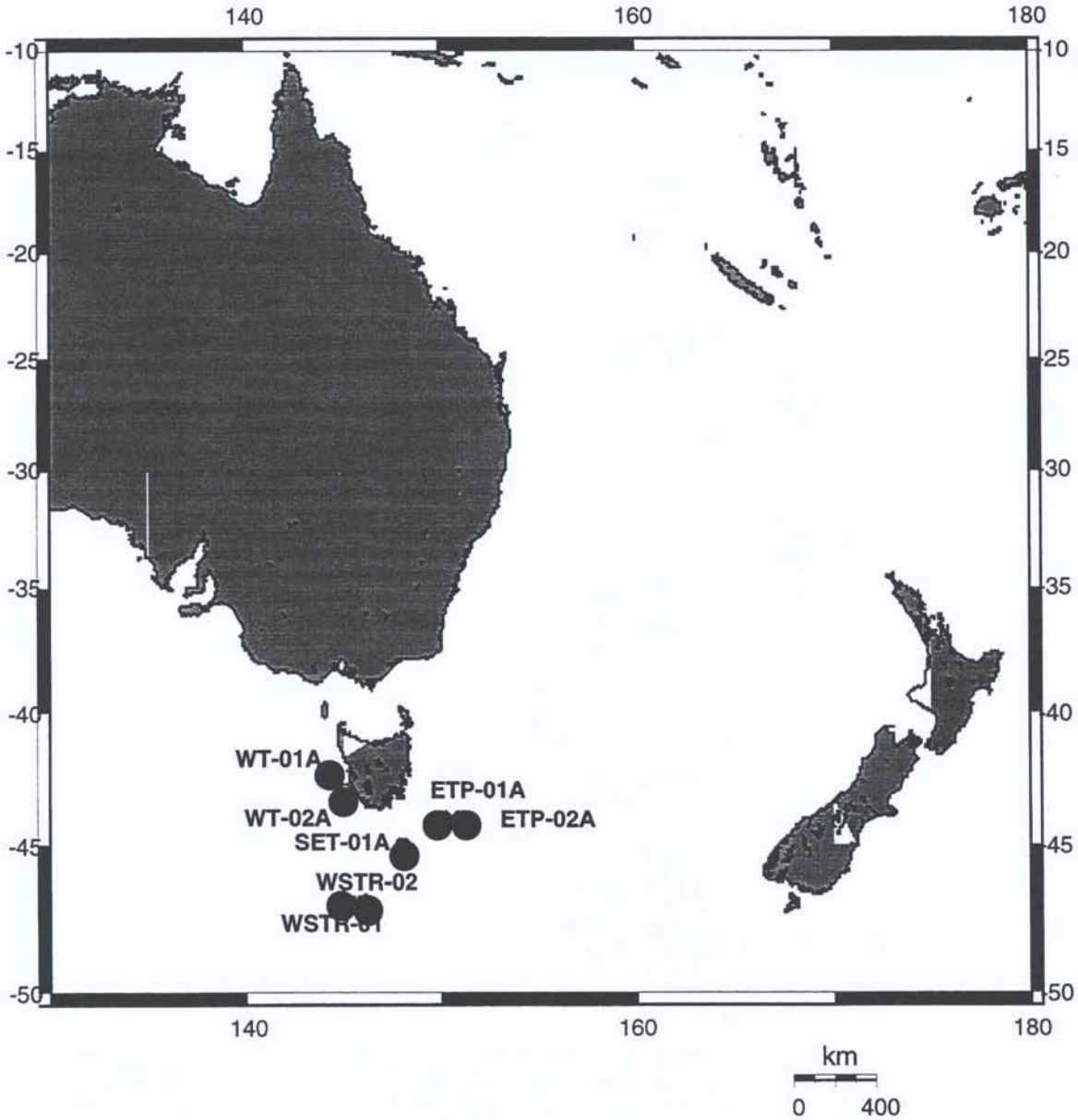
Site Name	Latitude	Longitude	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
PBF2	66°30.8'S	71°41.3'E	1312	550	0	550
PBD2A	66°20.2'S	71°40.4'E	2010	720	0	720
PBF1A	66°23.3'S	71°38.3'E	1890	730	0	730
PBF4	65°49.2'S	74°30.9'E	2745	934	0	934
PBD2	64°36.2'S	69°20.4'E	3075	1100	0	1100
PBD2A	64°33.6'S	68°44.3'E	3262	1500	0	1500

LOGGING PROGRAM

The regional and global objectives of drilling at Prydz Bay can be addressed by establishing a detailed high-resolution lithostratigraphy which can be obtained from a combination of standard geophysical (sonic, density, porosity, resistivity and gamma ray) data with the FMS records. Logging will contribute to the effort by identifying both cyclical lithologic variations and lithological responses to climatic transitions, and by providing important inter-site correlation. Ice rafted debris and turbiditic deposits can be delineated by their physical properties, notably gamma ray and magnetic susceptibility, and by the FMS imagery. The GHMT (magnetic susceptibility and total magnetic field) is strongly recommended in this high latitude environment in order to allow for the construction of a depth/time tie through the detection of reversals of the paleomagnetic field, especially for sites located on the continental rise. This is the only means to provide a continuous dating of the cored interval and thus a precise determination of the sedimentation rates. The establishment of synthetic seismograms from WST as well as density and acoustic data is useful to the lateral extrapolation of results derived from drilling. The correlation of sediment core properties to log data can provide depth ties to resolve the undistorted depth of sedimentary layers from individual cores.

Core recovery is a major concern on the continental shelf due to the potential occurrence of intervals containing coarse grained till deposits. Poor borehole stability in this environment may severely degrade the quality of most downhole measurements and in extreme cases completely preclude the deployment of wireline logging tools. In contrast, core recovery in fine grained sediments drilled on the continental rise is likely to be good (e.g., Leg 178). LWD provides measurements immediately after the hole is drilled and prior to severe borehole degradation. Use of the CDR tool (LWD) alone at the shelf and slope sites, in conjunction with wireline logging as conditions permit, will enable the lithology-sensitive logs to be acquired in almost all conditions at relatively low cost. The CDR tool measures natural gamma ray, resistivity, and caliper logs without nuclear sources. In the event that the drill string is at risk, the CDR data can be retrieved by wireline upload.

LEG 189	**Southern Gateways**
Proposal	**485-Full3**
Title	**The 'Southern Gateway' between Australia and Antactica: A proposal for ODP Paleoclimatic, Paleoceanographic and Transform Margin Drilling**
Proponents	**N.F. Exon, W.R. Howard, J.P. Kennett, P.J. Hill, J. Mascle, J.-Y. Royer, G.C.H. Chaproniere, and S. Shafik**



BRIEF DESCRIPTION

The area between Australia's southernmost prolongation and Antarctica is key to understanding global climate and ocean circulation changes in the Cenozoic Era. During this time, progressive cooling at high latitudes led to the development of the polar cryosphere, initially on Antarctica and later in the northern hemisphere. It has been proposed that climatic cooling and cryospheric development resulted from plate tectonic changes that progressively and thermally isolated the Antarctic continent as the Circumpolar Current developed.

The opening of the Tasmanian Seaway between Australia and Antarctica in the Paleogene and the Drake Passage in the late Paleogene to early Neogene had enormous consequences for global climate, in part by isolating Antarctica from the warm gyral surface circulation of the southern hemisphere oceans and providing the necessary conduits that eventually led to ocean conveyor circulation between the Atlantic and Pacific Oceans. It also impacted Circumpolar circulation because the Tasmanian Seaway continued to expand during the Cenozoic with northward migration of Australia and expansion of the Drake Passage.

It is likely that these paleoceanographic changes played a fundamental role in the evolution of Cenozoic climate, associated paleoenvironmental changes such as sea level, and in terrestrial and biotic evolution. Thus, the opening of the Tasmanian Seaway appears to have been vital in the development of Cenozoic global evolution of the Earth's system. Early ocean drilling (DSDP Leg 29) provided a basic framework of paleoenvironmental changes associated with the opening of the Tasmanian Seaway, yet the information obtained during Leg 29, nearly 25 years ago, is of insufficient quality and resolution to fully test the hypothesis of potential relations between the development of plate tectonics, Circumpolar circulation and global climate. The timing of events remains insufficiently constrained.

This proposal targets a suite of new sites designed to provide a quantum jump in the understanding of Circum-Polar oceanographic and climatic evolution. For example, the relatively shallow region off Tasmania is one of the few places where well preserved and almost complete marine Middle Eocene to Recent carbonate-rich sequences can be drilled in present-day latitudes of 40-50°S, and paleo-latitudes of up to 70°S.

The drilling program will document the paleoceanographic and paleoclimatic changes associated with the Paleogene marine rifting history and Neogene drifting history of this key southern area. The five proposed high-resolution paleoceanographic priority sites amount to 3365 m penetration, in water depths of 1460-3570 m. They will address Middle Eocene/Quaternary climatic variations related to: the Eocene Gondwanan rifting phase, the Middle Eocene onset of Circum-Antarctic surface water circulation (40 Ma & 70°S), the mid-Oligocene breakthrough of deep water (30 Ma & 60°S), and Australia's motion northward thereafter. The sites will allow documentation of latitudinal variations in chemistry and thermal history of water masses in high southern latitudes, and longitudinal differences caused by the shallow ridge between the Indian and Pacific Oceans through the Miocene.

DRILLING PLAN

Leg 189 will drill five primary sites (with three alternates) in the Southern Ocean to study the Cenozoic evolution of the Tasmanian Seaway. The sites lie off western Tasmania (WT-01A), on the South Tasman Rise (STR-01A, WSTR-01A, WSTR-02A), and on the East Tasman Plateau (ETP-02A). The first four sites form a north-south transect that extends from north of the Subtropical Convergence nearly to the Polar Front. This transect will

help to constrain glacial-interglacial changes in the Southern Ocean thermal field. The last site adds the possibility to monitor paleoceanographic changes near the confluence of the East Australia Current and the Subtropical Convergence.

Four of the sites will also form an east-west transect and provide insight on the lessening influence of the South Tasman Rise as a barrier between Indian and Pacific Ocean microfossil assemblages.

The drilling strategy calls for triple APC/XCB coring to about 200 m at all sites, with continued XCB coring to about 500 m in the first hole. RCB coring will proceed to target depth in the third hole at each site, after washing to within 50 m of the maximum XCB depth. Re-entry with a mini cone may prove necessary at WT-01A

Site Name	Latitude	Longitude	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
WT-01A	-42°-37'S	144°-24.5'E	2500	880	0	880
WSTR-01A	-47°-03'S	145°-15'E	3570	580	0	580
WSTR-02A	-47°-08.5'S	146°-03'E	2730	580	0	580
STR-01A	-47°-51'S	247°-52'E	1460	600	0	600
ETP-02A	-43°-57.6'S	149°-55.7'E	2625	725	0	725
WT-02A	-43°-43.5'S	145°-02'E	2920	855	0	855
SET-01A	-45°-18.5'S	147°-55'E	4055	500	0	500
ETP-01A	-43°-54.6'S	150°-54.6'E	2800	615	0	615

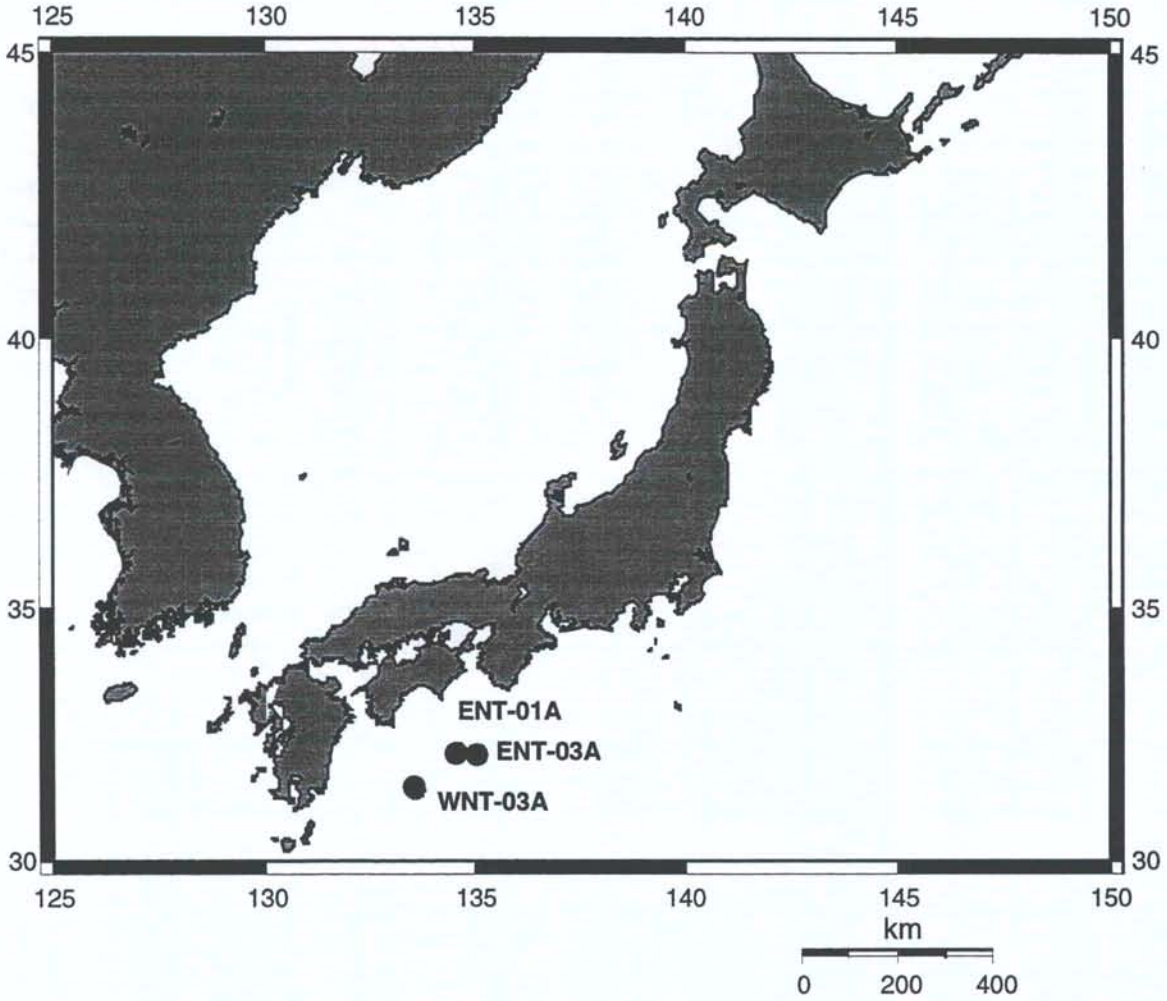
LOGGING PROGRAM

Downhole logs are particularly useful to measure *in-situ* properties where there is no core recovery, or where XCB core recovery is biscuity. Logs also provide a key link between core and seismic section: sonic velocity logs and WST check shot surveys enable depth to travel-time conversion, and synthetic seismograms may be directly compared to seismic section.

Standard logs will be particularly important when dealing with cyclic sediments in particular, glauconitic sediment can be identified in gamma and PEF logs. The FMS images allow bedding, turbidites, faults, clasts, nodules, and bioturbated beds in the Eocene deltaic sediment to be observed.

The total magnetic field, in tandem with the magnetic susceptibility, provides a downhole magnetic polarity stratigraphy. The present Earth's field at the sites will be strong enough to be in the range of the magnetic field sensor, and there should be a strong borehole anomaly (sites are well clear of the +/- 35° inclination zone). The sites have moved about 20° northward since the middle Eocene, but this should not prevent a full polarity stratigraphy from being obtained using the GHMT.

LEG 190	**Nankai Trough**
Proposal	**445-Rev2**
Title	**Deformation and Fluid Flow Processes in the Nankai Trough Accretionary Prism**
Proponents	**G.F. Moore, J. Morgan, B. Bekins, W. Brückmann, T. Byrne, D.E. Karig, M. Kastner, A. Taira, H. Tokuyama and H. Tobin**



BRIEF DESCRIPTION

Accretionary prisms represent unique and accessible natural laboratories for exploring the complex interplay of deformational, diagenetic, and hydrologic processes in initial mountain building processes. Some of the key questions relate to the distribution of deformation throughout an accretionary prism, the controls on what material is accreted and what is subducted, and the role of fluids and fluid flow in deformation in the prism. The Nankai Trough has been designated as the type example of a convergent margin accreting a thick section of clastic sediments. With unparalleled seismic resolution and structural simplicity, and data from three previous DSDP/ODP drilling legs, the Nankai accretionary

prism is ideal for the development of rigorous mechanical and hydrologic models of fluid-linked diagenetic and tectonic processes in the rapidly deforming accretionary wedge.

Leg 190 will be the first in a two-leg program focused at the Nankai Trough. The first leg will consist of drilling and coring at three primary sites to compare two parts of the Nankai Trough with different wedge tapers and structural geometries. This will be followed by a second leg of logging-while-drilling (LWD) at four sites, and the emplacement of CORKs at three of these sites. Downhole monitoring by instrument packages sealed with CORKs should provide a continuous long-term record of fluid pressure and temperature, and the option of subsequent fluid sampling and permeability determinations with a submersible. This plan is dependent on the development of a new generation of CORKs that will allow multiple horizons to be hydrologically isolated and monitored. SCICOM has stated that the scheduling of the second Leg in the following year is contingent upon the successful development of the new CORKs. Other contingencies include: successful drilling and station-keeping in the current conditions encountered; evaluation by the JOIDES Advisory Structure (SSEPs, SCIMP and SCICOM) of the detailed scientific plans of the second leg; and identification of funds to reduce the cost to ODP of the whole Nankai program.

DRILLING PLAN

The drilling plan includes eastern and western transects to compare differences in structural styles. The drilling plan has been refined from the original proposal 445 that included two drilling legs. Leg 190 will drill and core three sites, while the logging-while-drilling (LWD) program (at four sites) and the CORK program (at three of the LWD sites) will be deferred to a second Leg to be scheduled after evaluation of the Leg 190 results.

Site ENT03A will be drilled through the proto-thrust zone of incipient deformation and fluid flow. It will penetrate the complete sedimentary section into basement. A high priority is to sample pore fluids in great detail across the décollement and major structural discontinuities. Site ENT01A is a reference site for Site ENT03A to be drilled to basement seaward of the décollement tip to provide baseline physical properties and fluid flow measurements. Site WNT03A is a proto-thrust zone site to explore conditions of initial deformation (ductile strain and seismic discontinuities) and the nature of the décollement in comparison with the Eastern Nankai Trough transect.

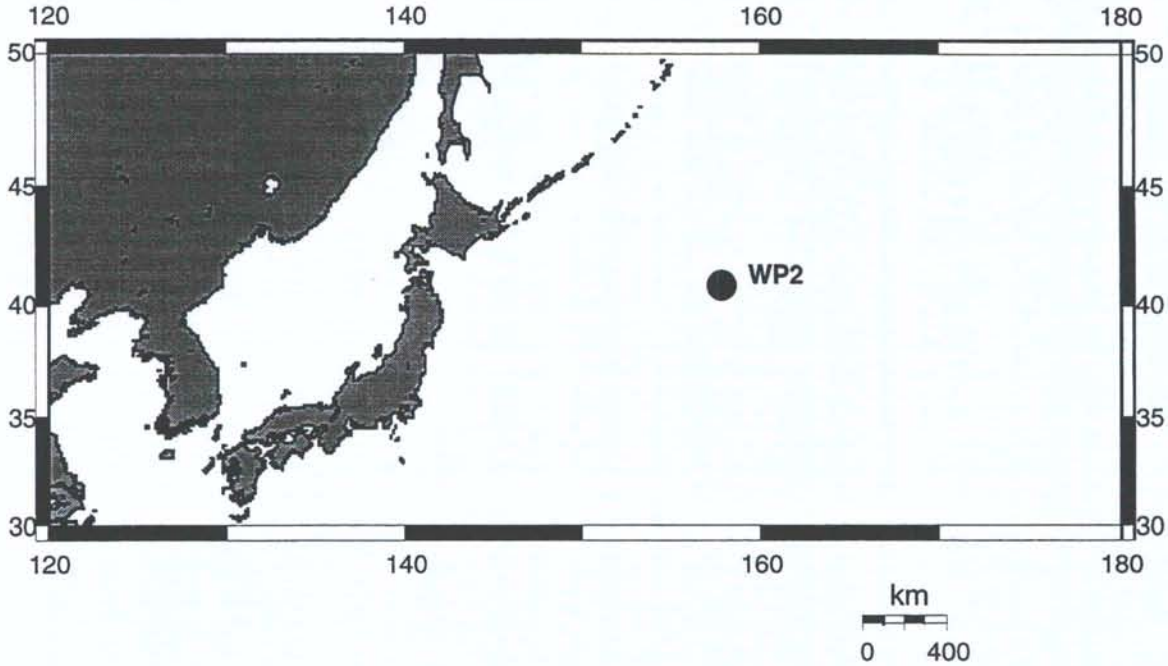
Proposed Site Locations for Leg 190

Site Name	Latitude	Longitude	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
ENT-01A	32°15.25'N	135°01.1'E	4780	750	50	800
ENT-03A	32°20.30'N;	134°57.25'E	4710	1000	0	1000
WNT-03A	31°48.55'N;	133°53.10'E	4710	2500	0	1250

LOGGING PROGRAM

Most of the logging will occur during the second Leg to Nankai when there will be extensive Logging While Drilling (LWD) and other activities, including a VSP. However, a small suite of downhole logs may be run to characterize the holes immediately after drilling..

LEG 191	**Western Pacific Seismic Network**
Proposal	**431B-Full, 431-Add4**
Title	**Western Pacific Geophysical Network: Subducting Plates into Mantle**
Proponents	**K. Suyehiro, H. Fujimoto, T. Kanazawa, J. Kasahara, H. Kinoshita, Y. Fukao, H. Fujioka, T. Matsumoto, S. Sacks, A. Linde, A. Hasegawa and I. Kawasaki**



BRIEF DESCRIPTION

The International Ocean Network (ION) was officially founded in 1993 in recognition by the geoscience community that there is a critical need for permanent observatories in the deep ocean to fulfill two major scientific goals: (1) a uniform coverage of global terrestrial processes; and (2) long-term monitoring of active processes. One of the first activities of ION was to develop a map of the coverage provided by existing seismic stations and to identify the squares (2000 km x 2000 km) with no permanent stations. They represent oceanic areas with no island sites that can be used for installation of observatories. Among the 20 squares, ION identified a priority list of 6 sites that (i) most meet the goals of the scientific program by improving the global coverage, and/or (ii) allow better monitoring of subduction zones in the W. Pacific.

The Western Pacific area is the best suited region on earth to address the dynamics of the subducting plates, formation and evolution of island arcs and marginal seas, and their relation to mantle convection. Regional geophysical network has been expanding in the land area over the years constituting one of the most densely stationed networks over Japan and to a lesser extent in eastern Asia. Leg 191 will drill a site in the Western Pacific (WP-2A) that is located to provide a downhole seismometer installation in one of the high priority areas identified by ION. In addition, it will also provide unique seismic

observations on the seawater side of the Japan Trench. Installation of the broadband seismometer is expected to be carried out using the Japanese ROV *Kaiko*.

DRILLING PLAN

Site WP-2A will be located at 42°N 160°E in a water depth of 5700 m. The sediment thickness is ~300 m and it is proposed to drill about 100 m into basement.

Proposed site Location for Leg 191

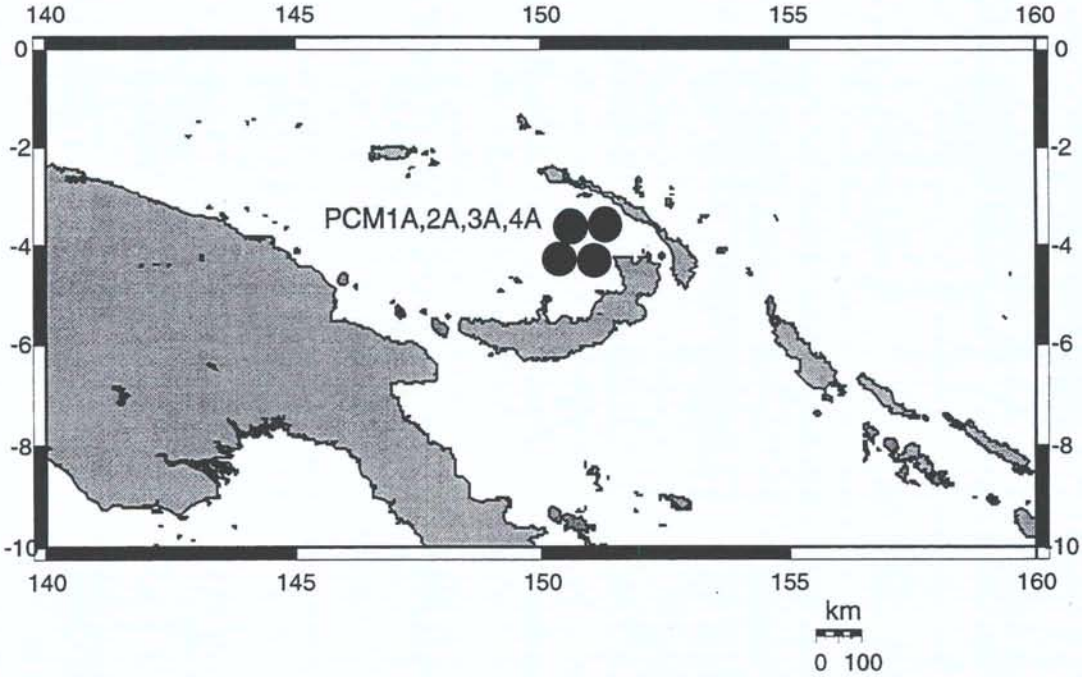
Site Name	Latitude	Longitude	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
WP-2A	42°N	160°E	5700	300	100	400

LOGGING PROGRAM

The logging program is designed to measure physical properties, anisotropy, and hole shape -- objectives that are quite similar to the pilot site OSN-1 drilled during Leg 136. An azimuthal resistivity tool (ARI) is planned to measure resistivity anisotropy at approximately 1 m resolution, complementing the high-resolution FMS images. Standard geophysical logs will be used to measure physical properties; hole volume can be estimated with high accuracy using a BHTV log in the basement intervals. This will significantly improve grouting procedures for the strain sensor and emplacement of the seismometer. High-resolution temperature logs should be used to identify permeable zones and inflow-outflow from both drilling-induced and natural fractures in the holes.

3. FY'01 SCHEDULED LEG DESCRIPTIONS (LEGS 192 &193)

LEG 192	**PACMANUS Hydrothermal System**
Proposal	**479Full2**
Title	**Anatomy of an Active Hydrothermal System within Felsic Volcanic Rocks at a Convergent Margin: Eastern Manus Back-Arc Basin, W. Pacific**
Proponents	**R.A. Binns and S.D. Scott**



BRIEF DESCRIPTION

A long-standing objective of ODP has been to drill active hydrothermal systems in order to understand the nature of subsurface water-rock reactions, and to determine the three-dimensional architecture and hydrologic characteristics of hydrothermal deposits and their host rocks. Such knowledge is vital to developing rigorous concepts about the genesis of massive sulfide deposits and associated ores in ancient marine sequences, and thereby creating a new science base for mineral exploration on the continents. Important scientific objectives have already been met by Legs 106 and Leg 158 in volcanic-hosted deposits on the Mid-Atlantic Ridge, and Legs 138 and 169 in sediment-hosted deposits on the Juan de Fuca Ridge. A missing, but economically very important, category is the felsic volcanic-hosted polymetallic massive sulfides and related stockworks which are abundant in the ancient geological record, ranging in age from Tertiary (e.g. Kuroko, Japan) through the Paleozoic (e.g. the ore deposits of western Tasmania) to Archean (e.g. Noranda and Kidd Creek, Canada). These types of deposits formed at (probably) convergent continental margins rather than at mid-ocean ridges, and many represent multi-billion dollar resources. Knowledge of fundamental processes such as fluid-rock interactions, hydrodynamics and

structural/tectonic controls on fluid pathways, and metal and fluid sources are key to understanding chemical fluxes and ore deposition.

The Manus Basin in the Bismarck Sea north of Papua, New Guinea is a small, rapidly-expanding (~10 cm/yr) back-arc basin set between opposed fossil and active subduction zones. The PACMANUS hydrothermal field lies near the crest (1655-1750 m water depth) of high-standing Pual Ridge, a 40 km-long neovolcanic ridge of dacite/rhyodacite with basal andesite. The hydrothermal field includes two focused, high-temperature "smoker" sites with Cu-Au-rich sulfide deposits, and a field of diffuse, lower temperature venting through intensely altered dacite, for which modeling indicates significant subsurface mineralization. No thick mounds of massive sulfide, like those at TAG drilled on Leg 158, have yet been identified at this site. Temperatures up to 268°C have been measured, but temperatures exceeding 350°C subsurface are implied by observational and mineralogical evidence of phase separation. End-member fluids are very acidic (pH 2.5-3.5), show high K/Ca ratios reflecting equilibration with dacite wallrocks, are high in Mn and Fe relative to mid-ocean ridge hydrothermal fluids, and have variable salinities. Volatile compositions denote significant contribution of the hydrothermal fluids from arc-type magmatic sources. In addition, PACMANUS is the richest field in terms of ore grades of any currently known in today's oceans and, if subhalative ore formation is indeed more characteristic in convergent margin settings, then the chimneys may not reflect the size of the entire hydrothermal system. Hence, drilling at PACMANUS may not only provide important new insight into the formation of mineral deposits in convergent margin settings, but may also have important mineral exploration implications.

DRILLING PLAN

Rough volcanic topography or close-packed chimneys render most parts of the PACMANUS site unsuitable for bare-rock drilling with current technology. However, it is hoped that the hammer drill-in casing system will be operational for this leg. A particular effort has been made to identify flat areas suitable as drill sites which also satisfy science requirements.

The drilling strategy includes three holes at the PACMANUS discharge site and one at the foot of Pual Ridge where subsurface faulting is expected to create the most likely site for recharge of the hydrothermal system. Two of the discharge sites will provide a comparison of alteration, mineralization and fluid pathways beneath a zone of focused high temperature venting (Site PCM-3A) with that beneath a zone of diffuse venting (Site PCM-2A). The third hole in the discharge area (Site PCM-1A) will provide an unaltered "reference" volcanic section to comparison with the altered sections from the other two holes. Site PCM-4A will be located among the andesitic sheet flows flooring the valley SE of PACMANUS and is placed to investigate the recharge zone as well as intersect an inferred low-angle extensional fault at 250 mbsf.

Proposed Site Locations for Leg 192

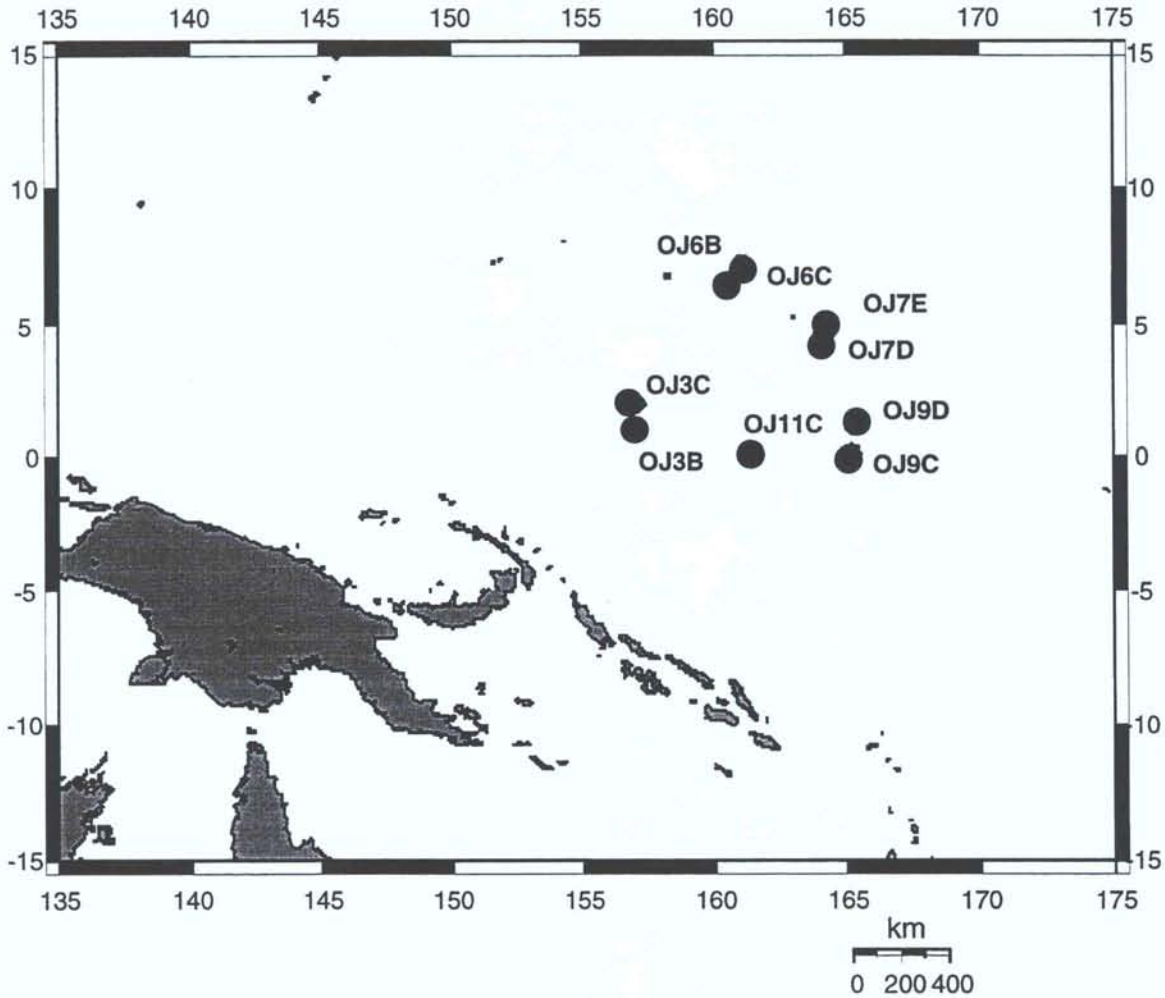
Site Name	Latitude	Longitude	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
PCM-1A	3°-43.293'S	151°40.583'E	1720	0	700	700
PCM-2A	30°-43.69'S	151°40.20'E	1655	0	500	500
PCM-3A	3°-43.23'S	151°40.52'E	1696	0	300	300
PCM-4A	3°-44.45'S	151°40.76'E	2139	0	350	350

LOGGING PROGRAM

The strategy that ODP has adopted and used in high-temperature (>165°C) holes in the past (i.e. TAG site, Juan de Fuca ridge, 504B) is that the "hole cooling during drilling" will sufficiently depress borehole temperatures into the sustainable range such that most of the standard tool suite can be used. Using the side-entry sub (with some extra time) allows for hole cooling by pumping during logging operations. Standard logging tools can be run reliably to about 160°C. Third-party memory temperature tools are available for use at elevated borehole temperatures.

In the case that hole conditions are as poor as the ODP drilling experience at TAG, a few wireline measurements would be reliable, perhaps resistivity and gamma ray only. Because the drill pipe is typically kept 70-90 meters into the seafloor during logging operations and since key mineralization zones are shallow, the most critical intervals could not be logged with wireline tools. Alternatively, the currently available LWD tools allow for natural gamma, density, resistivity, porosity, borehole images, and possibly sonic logs to be recorded right from the mudline to TD with minimal hole degradation. Borehole images and ephemeral properties (fluid flow and density effects), as well as engineering measurements made "while-drilling" can be acquired. The temperature limit for LWD tools is 150°C, but pumping while drilling with LWD should cool the hole continuously and significantly more than during wireline logging.

LEG 193	**Ontong-Java Plateau**
Proposal	**448-Full4**
Title	**Assessing the Origins, Age, and Post-Emplacement History of the Ontong Java Plateau through Basement Drilling Origin/Post-Emplacement Hist. of Ontong Java Plateau**
Proponents	**LW. Kroenke, J. Mahoney, A.D. Saunders, G. Ito, P. Wessel and D. Bercovici, T.Gladczako, O. Eldholm, L. Abrams, R. Larson, M. Coffin and A. Taira**



BRIEF DESCRIPTION

The importance of oceanic volcanic plateaus has become widely appreciated by the earth science community in the last several years. Many of these large igneous provinces (LIPs) represent immense volumes of magma erupted on the seafloor in fairly short time periods, and emplacement rates of the largest ones may have approached the entire magma production rate of the global mid-ocean ridge system. In fact, the Alaska-sized Ontong-Java Plateau in the western Pacific may represent the largest igneous event of the last 200

my. The construction of LIPs, and their effects on subduction patterns, continental growth and crust evolution, ocean circulation, and global climate are only beginning to be understood, but are clearly very significant in some cases.

The Ontong-Java Plateau is the world's largest plateau and thus an end-member of this class of features. It consists of two main parts: the main or high plateau and the smaller eastern lobe, which together encompass an area of more than 1.6×10^6 km^2. It was formed in an intraoceanic environment far from continental landmasses, although the details of its original tectonic setting are poorly known.

Leg 193 is the first in a proposed two-leg program aimed at understanding the formation of the Ontong-Java Plateau. A transect of drill hoes into basement across the Ontong-Java Plateau will be drilled to determine: 1) the age and duration of emplacement of the plateau; 2) range and diversity of magmatism; 3) environments of eruption and post-emplacement vertical tectonic history of the plateau; 4) effects of rift-related tectonism; and 5) paleogeography of the plateau (paleolatitude of the OJP at the times of emplacement).

DRILLING PLAN

Nine to ten sites (including a reference site off the plateau) over two legs are proposed to form a transect across the Plateau. The priorities of the sites to be drilled during a first leg of drilling has yet to be determined.

Proposed Site Locations for Leg 193

Site Name	Latitude	Longitude	Water Depth (m)	Sediment (m)	Basement (m)	Total mbsf (m)
OJ3B	1°-10.62'S	157 00.89'E	1800	1000	200	1200
OJ6B	7°-28.224'S	161 05.993'E	1860	590	200	790
OJ7E	4°-56.2177'S	164 09.295'E	1635	1305	200	1505
OJ7D	4°-56.9583'S	164 16.2656	2003	1200	200	1400
OJ9D	1°-25.31'S	165 28.146'E	4442	800	100	900
OJ6C	7°-13.044'S	161 17.531'E	1705	630	200	830
OJ11C	0°-21.4569'S	161 40.064'E	3915	330	200	530
OJ3C	2°-05.3266'S	157 00.749'E	1590	900	200	1100
OJ9C	0°-17.196'S	165 18.132'E	4396	1000	100	1100

LOGGING PLAN

The tectonic, structural and geochemical objectives of this oceanic plateau study will particularly benefit from logging data. As the main aim of this proposal is to obtain a spatial coverage of basement compositional variations, of age and paleodepth of both the main body of the plateau and its eastern salient, standard geophysical logs will be run on each hole, as well as the Formation MicroScanner (FMS) for structural and tectonic purposes.

While the recording of in-situ physical properties data is essential to core-log integration studies, the conventional logs are also useful to provide a continuous lithological and acoustic characterization of penetrated structures and to determine the lithostratigraphy of the logged sequence (e.g., the presence and thickness of lava flows and massive units).

The FMS images will contribute to a detailed description of tectonic features by a clear identification of the succession of basement units. The FMS electrical images will give the necessary high-resolution (cm-scale) for accurate description of tectonic features, in terms of lithological boundaries, bedding attitude (dip and strike), presence of fractures and faults and their spatial orientation, and degree of alteration of basement features. Detailed comparison of spatially-oriented FMS images with core images (slabbed and/or circumferential core scans) should be useful for core orientation and analysis of structural and magnetic measurements on core. The Azimuthal Resistivity Imager (ARI) should be used to measure resistivity and resistivity anisotropy, with deep penetration into the formation, complementing the FMS images. The proponents have requested the geochemical logging tool (GLT), if available for use.

Detailed information on the velocity structure of the plateau will be necessary for correlation between borehole data and seismic reflection data and to understand the regional distribution of igneous activity. Sonic logs calibrated with WST check shot surveys should provide for precise determination of the velocity structure at the OJP drill sites.

ODP Management and Operations Report EXCOM January 1999

Executive Summary

Highlights of Program activities over the past six months include: completion of Legs 180 and 181, setting the FY'00 ship schedule based on the August 98 SCICOM/OPCOM recommendation, development of a preliminary budget for FY'00, a Co-Chief Scientist Review, development of an ODP partnership strategy, and increased post-2003 planning. Other activities include the development of a Program-wide web presence, a new Program logo, port call support, and internationalization. One activity that has escalated in the past six months is support for post-2003 planning. Due to its potential impact on existing Program Management and Operations, the Program contractors support the creation of a new committee for post-2003 planning within the JOIDES structure. A new activity is ODP's partnership strategy that includes collaborative industry projects. EXCOM is asked to provide guidance on identifying industry contacts for specific projects under this new strategy.

Management

Program management has continued since the last EXCOM following many of the procedures initiated by the Interim Director, Dr. Nick Pisias. On approximately a bi-weekly cycle, the prime contractor and subcontractors (JOI, TAMU, LDEO/BRG, JOIDES Office) meet by conference call to review management issues and actions. In addition, in September, the contractors and subcontractors met with NSF's ODP Director (Dr. Bruce Malfait) for a two day retreat to discuss program-wide management issues. This meeting was very productive and it was agreed to schedule another meeting in 6 months.

A **Co-chief Scientist Review Meeting** was held on October 1-2 in Washington. This meeting brought together co-chiefs from Legs 170 through 180. Although this meeting represented a very long time period, the discussions were productive. No major management problems were identified, but the group emphasized the need to increase the program's flexibility to meet science objectives, to identify co-chief scientists as early as possible in the planning cycle, and to provide for lab space on the ship that can be used for leg-specific science needs. It was agreed that these reviews should be held every 18 months rather than every 24 months. The next review will be scheduled for Spring '00.

The members of fifth **Performance Evaluation Committee** were selected. An update of the committee's schedule will be presented.

ODP Partnership Strategy has been developed that includes several target groups ranging from industry to other large science programs. The initial efforts for partnership with industry have been directed toward the offshore oil industry who are working in deep water. A description of the strategy and the first joint project will be presented. JOI is

also hosting an ODP - Industry Workshop in late spring to identify deep water scientific targets of mutual benefits to industry and to high priority objectives in ODP's Long Range Plan. Please be prepared to provide suggestions of industry participants for this meeting.

Partnerships with other agencies are also part of the strategy. Specifically, we are discussing joint projects with the U.S. Dept. of Energy (DOE) in the research areas of gas hydrate and the deep biosphere. Although the gas hydrate bill (S.1418, Methane Hydrate Research and Development Act) died in the house at the conclusion of the 105th U.S. Congress, DOE has continued its efforts and completed their program plan, " A Strategy for **Methane Hydrates Research** & Development". Through input from JOIDES and JOI, ODP was included in this strategic plan and was also targeted for future funding. JOI is continuing discussions with DOE for potential joint funding of shipboard laboratory facilities.

JAMSTEC, TAMU and JOI met at College Station on 13 and 16 November to define the activities of the first engineering development project under the newly-signed **JAMSTEC/JOI Memorandum of Agreement** (MOA). The first MOA project is the development of a new diamond core barrel that can be used by ODP and OD21. Testing of the first prototype is slated for Legs 185 and 186.

Active recruitment of new members into the Program has continued for **Brazil** and **India**. In November, ODP had a strong presence at the international AAPG meeting in Rio de Janeiro. ODP supported Dr. Jamie Austin's trip to the meeting where he presented a poster on the results of Leg 174A. He also organized meetings with key individuals from the Brazilian Navy and Hydrographic service. Following inquiries from the Oil and Natural Gas Company of India, JOI asked Dr. Asish Basu (Univ. of Rochester) to assist us in our recruitment efforts in India. Dr. Basu met with ONGC and other Indian academics. Based on his meetings, he reported that there is strong interest in India to join the Program as a member. We have also continued communciations with individuals from Ireland and in South Africa (Dr. John Compton) for Consortium and Associate Memberships, respectively. An update of these activities with our plans for follow-up in India and Brazil will be presented.

In September, representatives from all areas of ODP met to reevaluate the structure and design of the **Program's web sites**. The primary goals were (1) to create an integrated site that scientific community members could navigate around seamlessly, (2) to streamline the content at each site to eliminate duplication, (3) to develop an efficient system for updating information and lists, and (4) to design a new "entry point," or front page for the Program's site. In addition to achieving these goals, the committee designed a new ODP logo that will be integrated in all portions of the ODP web site and on all Program letterhead, business cards, etc. The new entry point for the Ocean Drilling Program web site will open in early 1999 at http://www.oceandrilling.org. In addition, the representatives evaluated and selected a new **Program Logo**.

Public Affairs support for **port call** activities included Sydney, Australia (Aug.98) and Wellington, New Zealand (Oct. 98). Plans are underway to support an industry-focused port call in Fremantle (Dec. 98). The Sydney port call events were led by the Australian national ODP Office with strong support from ODP. A series of port call events successfully heightened awareness of ODP in Australia:

- A news conference was held aboard the ship. Dr. Brian Taylor, Dr. Bob Carter and Dr. Nick McCave delivered presentations on the subjects of Leg 180 results and Leg 181 objectives. Overall, there was extensive TV, radio and print coverage.
- More than 100 invited guests attended a VIP event which included ship tours and a reception at Garden Island Harbor. Reception speakers included: Dr. Jock Keene, Director of ODP/Australia; US Ambassador Genta Hawkins Holmes; AGSO Director Neil Williams and Dr. Kate Moran, Director of ODP.
- A science conference was held at the University of Sydney, in conjunction with ship tours for 450 members of the science and engineering community and university students.
- 500 high school students from the area toured the ship. Teachers were given "Blast from the Past" posters and copies of the "Mountains to Monsoons" CD-ROM to support their geoscience curriculum.

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•ODP supported the US Embassy and Australian national ODP Office at the Wellington Port Call that included a news conference, a VIP event, ship tours and a science conference held at the Royal Society. Dr. Bob Carter, Dr. Nick McCave, Dr. Lionel Carter and Dr. David Feary all gave presentations at the science conference. ODP received media coverage by both national television stations on the evening news, national radio and daily newspapers in Wellington and Auckland. During the port call, ODP representatives met with Paul Hargreaves, National Institute of Water & Atmospheric Research Ltd. for preliminary discussion on the possibility of New Zealand joining the Aus/Can/Korea/Chinese Taipei consortium.

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•In commemoration of the **30th Anniversary** of scientific ocean drilling, an **ODP calendar** was produced. Five thousand calendars were printed and distributed to member countries, JOI institutions, US Capitol Hill, member country embassies in DC, industry, funders and media. Also commemorating the 30th anniversary, ODP is in the process of organizing an event which will include an educational presentation and reception. The outreach event will be targeted to policy makers and other science leaders in the DC area. Tentatively, the event will be hosted at a member country embassy in the spring.

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•ODP organized a booth for the **6th International Conference on Paleoceanography** held this past August in Lisbon. The booth highlighted ODP research related to paleoceanography and was used as a vehicle to recruit scientists to ODP and encourage submission of white papers for the COMPLEX meeting. ODP organized a booth for the **American Geophysical Union (AGU) Fall Meeting** with special emphasis paid to the 30th Anniversary and post-2003 planning. A media tip sheet was developed to publicize the special union session. ODP supplied materials for distribution at the **GSA Fall Meeting Hot Topics at Noon session** (organized by USSAC and focused on planning

activities for a new drilling program) and at the **International AAPG Meeting** in Rio de Janeiro.

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•Some ODP Media highlights over the past 5 months are listed below. Copies of news articles will be available at the EXCOM meeting

- Damon Shorter, science writer for the Australian Broadcast Corporation (ABC), boarded the JR near the coast of Papua New Guinea and sailed for the remainder of the leg 180. Shorter filed daily reports that were posted on the ABC website (http://www.abc.net.au/science) covering ODP science, drilling and ship operations. The 76 page report contains information aimed at secondary and university students. It will remain on the website for one year.
- In collaboration with Woods Hole Oceanographic Institutions, a film crew boarded the JR during the transit to Sydney to collect footage for a television documentary program about science at sea. The film crew remained aboard the ship for the remaining transit time into Sydney. The documentary is part of a series being produced by WHOI.
- *Voyage of Discovery, Mysteries Resolved: A research ship plying the oceans of the Earth has unlocked the secrets of the seabed*, The Bulletin (Australian), June 30
- *Extremophiles: Life on the Edge*, National Public Radio, Talk of the Nation, Aug. 14
- *A Volcanic Blast Shocked the Sea*, Washington Post, Sept. 9
- *Exploring the Earth's Crust*, Engineers Australia, Sept. 1998
- *Scientists Learn from Mud*, The Evening Post (New Zealand), Oct. 9
- *Ocean Drilling Floats Ambitious Plans for Growth*, SCIENCE, Nov. 13
- *Life Flourishes Deep Below the Sea - Digging Into the Earth's Crust Nets Key Scientific Discoveries*, Philadelphia Inquirer from Knight Ridder news service, Nov. 21.

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•Recent changes in **Program personnel** include the following:

- Jeff Schuffert from Brown University was hired as the U.S. Liaison to the new JOIDES Office at GEOMAR.
- Walt Masterson from IRIS was hired to fill the vacant Engineering Assistant position at BRG.
- Ulysses Ninnemann from SIO was selected for the open Logging Scientist position at BRG.
- Ted Baker was hired to fill the open Database/Systems administrator position at BRG.
- Florence Einaudi and Karine Perrot replaced Christine Lauer-Leredde and Andrè Revil, respectively, as logging scientists at Aix-en-Provence.

Science Planning

Following the last SCICOM meeting where the FY '00 schedule was determined, a preliminary budget was estimated. Using the estimated target budget from NSF, this preliminary budget evaluation suggests that the science needs of the selected legs in the FY'00 schedule can be completed if we can identify an ice picket boat for Leg 188, Prydz

Bay at an economical price (c. $900k). TAMU and LDEO are reviewing the details of the science requirements for each leg and are currently preparing their budgets.

Based on the SCICOM recommendation for the FY'00 schedule of legs, the ship's schedule was updated (Table 1). Table 1 is a summary of the planning for Legs 184 - 192. Staffing through Leg 184 is complete, with just a few positions remaining to be filled on Leg 185. Leg 185 will be the first leg where we will be able to conduct contamination tests essential for the deep biosphere initiative. Staff Scientists and Operations Managers for Legs 186 through 192 have been designated and staffing for Leg 186 is in progress. Staffing for Legs 187 and beyond is awaiting appointment of Co-Chief Scientists before proceeding. An update on the budget and staffing will be presented.

With the continued help of all ODP members, a proper balance of scientists from participating countries has been maintained (Figure 1).

Table 1. Summary of Leg 184 - 192 Leg Planning Activities

Leg	Area	Ports	Cruise Dates	Co-Chief Scientists	Staff Scientist	Staffing	Territory
184	East Asia Monsoon	Fremantle-Hong Kong	February-April 1999	Dr. Warren Prell Dr. Pinxian Wang	Dr. Peter Blum	Completed	Multiple
185	Izu-Mariana	Hong Kong-Tokyo	April-June 1999	Dr. John Ludden Dr. Terry Plank	Dr. Carlota Escutia	Underway	Japan
186	W. Pacific Seismic Net-Japan Trench	Tokyo-TBN	June-August 1999	Dr. Kiyoshi Suyehiro Dr. I. Selwyn Sacks	Dr. Gary Acton	To be determined	Japan
	Dry dock	TBN	August-October 1999	N/A	N/A	N/A	N/A
186 E	HD Engineering Leg	TBN-Sydney	October-November 1999	TBN	TBN	To be determined	Papua New Guinea
187	Australia-Antarctic Discordance	Sydney-Fremantle	November '99-January 2000	Dr. David Christie TBN	Dr. Jay Miller	To be determined	International
188	Prydz Bay	Fremantle-Hobart	January-March 2000	TBN	Dr. Carl Richter	To be determined	Antarctic Treaty
189	Southern Gateways	Hobart-Guam	March-May 2000	TBN	Dr. Mitch Malone	To be determined	Australia
190	Nankai	Guam-Tokyo	May-July 2000	TBN	Dr. Adam Klaus	To be determined	Japan
191	W. Pacific Ion	Tokyo-Guam	July-August 2000	TBN	Dr. Carlota Escutia	To be determined	International
192	Manus Basin	Guam-Guam	August-October 2000	TBN	Dr. Jay Miller	To be determined	Papua New Guinea

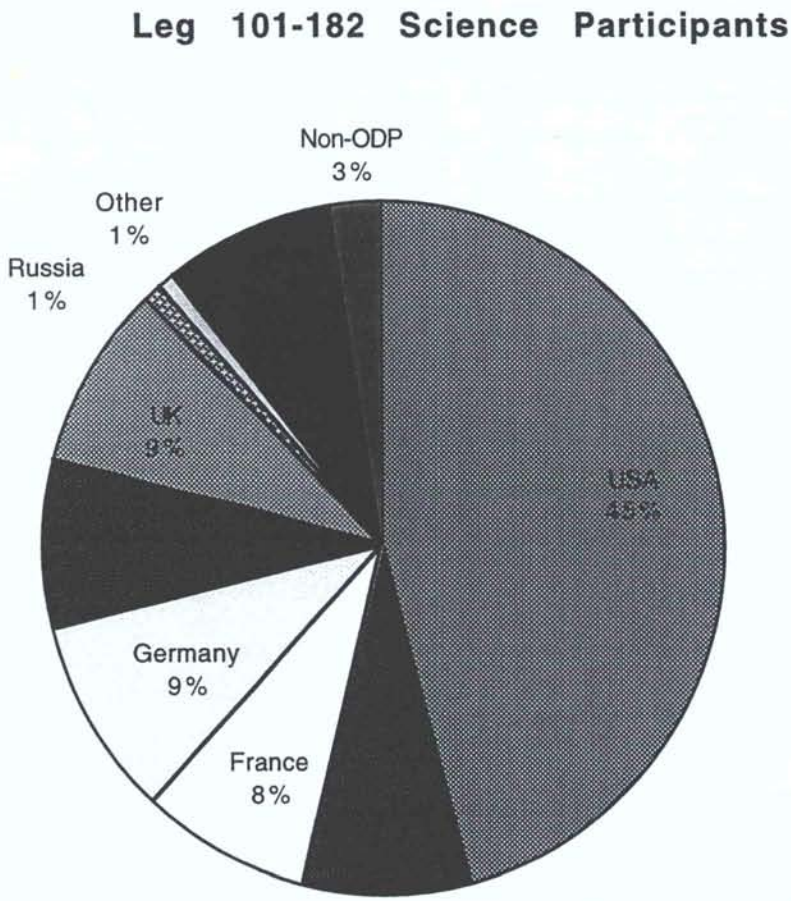

Figure 1. Summary of science party participation by membership from Legs 101 to 182.

Science Operations

Leg 179 -Ninetyeast Ridge Observatory Project and Hammer Drill-In Casing Test

Leg 179 revisited the Southwest Indian Ridge Site 735 to conduct experiments with the hammer drill-in casing and science operations, as time permitted. Results of the hammer drill tests and coring were reported at the last EXCOM meeting. With several additional days on site, Hole 1105A was drilled and logged. After reaching a depth of 158 meters below seafloor at Hole 1105A, four toolstrings were deployed. The Formation Microscanner (FMS) acquired exceptionally high quality data. FMS images of Hole 1105A show layers of resistive rock with 1 to 6 m thick conductive material occurring at irregular intervals. The conductive areas correlate quite well with the oxide and olivine oxide gabbro lithologic units defined in the core description. Conversely, the resistive intervals

correspond to gabbro and olivine-bearing gabbro. The log data were particularly useful in identifying in_situ features. Temperature measurements indicate an increasing hydrothermal gradient of 11C/100 m with perturbations likely occurring as a result of drilling mud pumped downhole. As the borehole equilibrated to hydrostatic pressure and normalized temperature, water flowing from zones of secondary porosity (fracture) may have altered the temperature of the borehole fluid. _The most notable example occurs over a 2 - m thick zone at 102-104 mbsf which represents a 0.61 C increase in borehole fluid temperature. Other in situ measurements at this interval confirm the existence of an enlarged borehole, increased porosity, lower velocity zone. The FMS log indicates fractures and only pebble or gravel-sized material were recovered over this interval.

The first ODP Seismic-While-Drilling pilot sensor experiments were conducted at Site 735 and at NERO. Preliminary data analysis shows considerable success in recording the drill pipe acceleration signal under various drilling conditions. Post-cruise analysis of the data will be done to correlate with the seafloor OBS data recorded at both sites and to evaluate future technology developments for active heave compensation and measurement-while-coring.

Leg 180 -Woodlark Basin

The objectives of Leg 180 were to determine the sedimentology, biostratigraphy, and vertical motion history of the syn-rift sediments on the hanging wall margin to the Moresby low-angle normal fault. The nature of the forearc basin sequence beneath the rift onset angular unconformity was thwarted by the unexpected presence of an undrillable conglomerate of dolerite and basalt cobbles in an altered clayey silty matrix.

A total of 11 sites were drilled during this leg. The primary drilling objective of a deep triple-cased reentry hole across the low angle fault was not achieved due to hydrocarbon shows at this site. However, the fault zone was penetrated and successfully sampled at a location where the fault outcropped near the seabed. Unstable sediments were encountered at alternate locations, again preventing installation of a reentry hole. At other sites, 3900 m of sediment was recovered cored with an average recovery of 50%. The sediment record provides a detailed record of the tectonic history of the region. Overall, the drilling conditions were difficult due to the unstable formations in the region. Although there were frequent stuck pipe incidents, no drill pipe or BHAs were lost.

Although drilling was difficult and sampling resulted in low recovery, the logging program was very successful. Sites 1109, 1114, 1115, and 1118 were all logged with Triple Combo and FMS/Sonic toolstrings, and vertical seismic profiles were obtained at Sites 1118 (complete), 1109 and 1115 (partial), making this one of the most successful logging legs to date. The logs offer significant aid in the effort to correlate the drilled sequences between holes. For instance, layers identified in Hole 1118A showing low gamma ray, low porosity, and high sonic velocity appear as thinner

(compacted) intervals in Hole 1109D, and can be correlated with a prominent seismic reflector. Clay indicators in the corresponding sedimentary units may explain these differences. Hole 1115C was successfully logged above 784 mbsf with Triple Combo and FMS/Sonic toolstrings across a major regional unconformity that is also observed in Hole 1109D. The well seismic tool was used to record check shots near the base of the hole, allowing depth correlation with seismic reflection lines and better migration of existing multichannel seismic data.

Leg 181 Southwest Pacific Gateways

The focus of Leg 181 drilling was the study of the Cenozoic history and evolution of circulation through the Southwest Pacific Gateway, specifically the Antarctic Circumpolar/Deep Western Boundary Current system. Seven sites were selected that spanned water depth and latitudinal transects. Rough sea conditions dominated during the entire leg resulting in 4 days of waiting on weather and the shut down of operations at one site. Drilling was successful at all of the remaining sites with an average of over 85% recovery. Although many unexpected hiatuses were found within the drift sequences, the sediment records recovered will provide the first paleoceanographic record for this major circulation system. In addition to good core recovery, the logging program was also successful. Four sites were logged and early interpretation show sediment cyclicity, relating to glacial/interglacial climate change. In addition, a critical correlation was made between core and log-based magnetic susceptibility to position missing sections of core. Sonic velocity data were used to calculate the depth to major seismic reflectors and identify target horizons.

Leg 182 Great Australian Bight

At the time of this report, the *JOIDES Resolution* is currently drilling south of Australia to study a Cenozoic cool-water carbonate platform. Operations got off to a late start due to bad weather resulting in delays leaving port in Wellington. A report on the operations from this leg will be presented.

Facilities and Technology

The Program has undertaken an integrated technology development strategy focused on better recovery of core under a range of challenging environmental conditions. The acquisition of an Active Heave Compensation system forms the foundation of this strategy and will improve ODP's operational capabilities. The development of the Hard Rock Reentry System and the Advanced Diamond Core Project are initiatives that will allow us to make hole and/or recover core in hard rock and fractured formations where the Program has historically had problems. ODP is also initiating a project to develop a measurement-while-coring (MWC) capability that has the potential to provide near real-time measurement of drilling parameters for improved operations and measurements related to specific science objectives (e.g. seismic-while-drilling).

Installation of **Active Heave Compensation** is planned for the 1999 Dry Dock. An acceptable bid is being reviewed for award by January of 1999. An active heave compensator is seen as the first step in improving downhole tool performance and in extending the operational weather window aboard the *JOIDES Resolution* for all tools. The development plan is to install a hydraulic power assist system on the existing passive compensator that will monitor ship heave and compensator displacement as

input to a servo-system that will reduce the effect of ship heave on the drill string. It is anticipated that significant reduction of vertical motion in heavier seas will: eliminate hammer drill lift off; reduce hole swabbing deterioration; improve multiple packer emplacement in deep holes; extend tool life by reducing bit bounce or torque shock; improve operation of existing RCB and XCB bits; and reduce weight-on-bit variation to accrue the benefits of diamond bit tools.

During the first four months of 1999, a simulation program will be used to model drill string motion to compare active heave compensation with passive in terms of weight on bit control. ODP is investigating the installation of low-friction seals on the passive heave compensator so that the responsiveness of the AHC can be enhanced under certain conditions (i.e., drill off in calm seas).

Drilling and coring operations in fractured hard rock must overcome many challenges not confronted in piston coring operations. One of these is the establishment of a reentry hole on sloping hard rock. The ideal system should be capable of (1) initiating a hole on sloping hard rock, (2) then concurrently deepening the hole while stabilizing the upper part of the hole with casing, and (3) withdrawing the bit through the casing string, leaving behind a funnel for future reentries. To accomplish this, a **hammer drill** is under development as part of a **hard rock reentry system (HRRS).** The hammer drill uses a retractable or ring type bit to cut a hole with a greater diameter than the casing. After the hole is established, the casing string can be cemented in place, and coring can then proceed. Subsequent casing strings could be installed by reaming the existing cored hole to open it up for casing installation. This secondary casing string, if employed might use a smaller HRRS or possibly a conventional underreamer type bit once the hole has been established.

Leg 179 tests were designed to evaluate the overall HRRS concept under real marine conditions. The preliminary assessment of the Leg 179 HRRS test results indicate that the hammer drill itself shows great promise of being able to penetrate subsea hard rock environments at a fast rate (approximately 6 m/hr) but additional tests of the HRRS are warranted for further evaluation of the complete system (hammer, bits, drill-in casing).

A number of hammer bit manufacturing companies have been contacted to work with ODP in developing bits for the hammer drill selected (manufactured by SDS). The bits deployed on Leg 179 resulted in overloading of the tungsten carbide buttons on the underreaming arms and thus rendered the bits ineffective to cut an over-size hole necessary to install the casing. SDS has indicated they will provide two new concepts. In addition, SDS indicated they may offer some possible modifications to the remaining bits used on Leg 179 to reduce the susceptibility to overloading the buttons on the wings. Two other bit manufacturing companies are interested in the project. However, licensing agreements with the SDS Hammer has complicated negotiations with the other companies.

On-land bit testing is tentatively scheduled for early Feb. 1999 in the same quarry where earlier tests were performed in April of 1997. SDS has obtained a new drilling rig, which

has the capacity to handle 20-30 meters of the size of drill collars necessary to be run with the 10.223" OD hammer. The Haliburton HT-400 pumping system has been reworked to provide continuous flow for operation of the hammer. The rig is fully instrumented so that all parameters can be monitored during hammer testing. Based on the results of the land tests and bit selection, the HRRS will be tested on Leg 186E at Manus Basin high priority sites.

The existing Diamond Core Barrel (DCB) provides the user with an alternative method to the Rotary Core Barrel (RCB) system for obtaining hard rock cores. The DCB was developed in 1990 but has seen limited use. The DCB uses the same inner barrel as the RCB but is packaged inside 6 3/4" Drill Collars. It was recognized that a thinner kerf on the bit would provide a longer bit life. This new project centers around making these improvements to the existing DCB system. This new core barrel development is named the **Advanced Diamond Core Barrel (ADCB).** It is a three phase program to improve diamond-coring techniques for the Ocean Drilling Program and OD21 (under joint development with JAMSTEC) . Expectations of the ADCB include: (1) improved core quality, hole stability and core recovery; and (2) reduced hole disturbance (i.e. cleaner hole) that will reduce the risk of sticking, improve logging, and reduce cuttings. The development program includes a thorough test of the existing ODP hardware before modifications begin on the new system. This will allow a benchmark to be set so that tangible results can be compared to track improvements in the system. The three phases of the ADCB project include: Leg 185 DCB evaluation; development and land testing of the ADCB in the spring of 1999 and sea trials in October 1999; and development of the retractable-bit after successful testing of the ADCB.

The **Measurement-While-Coring** project will implement and modify existing measurement while drilling technology into ODP. The overall development plan for the MWC system consists of 1) a retrievable downhole telemetry tool with a surface data acquisition/processor system, 2) a downhole sensor sub, and 3) a wet-mateable datalink between the telemetry tool and sensor sub. The current plan is to proceed in a step-wise fashion using existing technology and collaborating with industry for telemetry tool technology to serve as a "proof of concept". The current development schedule includes a drillstring heave test, scheduled for Leg 185, and a test using the MWD technology that will be onboard the JR during Leg 192. An update of the proposed development schedule will be presented.

The **Drill String Acceleration tool (DSA)** is being developed to measure the effectiveness of the passive heave compensator and to provide baseline data for evaluation of the active heave compensation. This memory tool is also part of the "proof of concept" of the MWC project. The primary purpose of the tool is to measure and record the drill bit acceleration and vibration signals by instrumenting a core barrel with accelerometers and other sensors. The design will provide for enough internal memory to continuously record high volumes of data for at least 1-2 hr. per deployment. Future expansion of this design is under discussion. DSA target deployment is Leg 185. A meeting between LDEO and TAMU engineers was held November 12th at LDEO to conduct a design review of the DSA and to discuss new

developments in FY 99 plans for active heave and MWC. Measuring uphole and downhole acceleration during Leg 185 in a joint experiment were set in motion, and utilizing off-the-shelf MWD tools to measure weight-on-bit during 1999 was discussed.

Pressure testing of two **Temperature and Acceleration Pressure Tool (TAP)** tools built to replace the TLT tools was successfully completed at WHOI. One tool was shipped to Wellington for deployment on Leg 182. Final machining of parts for the second tool will be completed and assembled at LDEO by December 1998.

A major ODP project, which culminates in October 1999 when the *JOIDES Resolution* leaves dry dock, is a major phase of refurbishment and enhancement of the ship's systems and the laboratory complex. Planning for this project and procurement of long lead time equipment has been going on during the last fiscal year. **The Dry Dock Project** is on schedule.

The ship is scheduled to go into dry dock at the end of Leg 186 (mid August) and is scheduled to be finished, including sea trials, 42 days later. The bid documents were sent out to seven shipyards on November 20, 1998. All the shipyards are located in the Western Pacific, the prospective bidders have been invited to inspect the ship in Fremantle in early December. Sealed bids are due back on February 15, 1999.

Engineers at Overseas Drilling Limited are planning the upgrades and enhancements to the *JOIDES Resolution*. The final project list (see Table 2) is an outgrowth of a deliberative process involving ODL and ODP and represents a mix between major capital equipment enhancements (e.g. Automatic Station Keeping System and Data Management System) and extensive refurbishments of existing equipment. The projects are designed to contribute to any one or all of the following: safety, capability, efficiency and habitability. As part of the renewal of the 1999-2003 operations contract extension, NSF has contributed $6,000,000 US. Approximately 50% of this amount has been encumbered and ODL has maximized the return of this investment in the ship's capability by carrying out as many projects as possible during port calls and during scientific legs. By written agreement, ODL is responsible for any costs incurred above $6,000,000 US.

In FY99 ODP has budgeted and planned for improvements and upgrades to the **Laboratory Stack**. Discussions and the planning process has identified a list of projects (Table 3). The list of projects to be considered will cost in aggregate more than there are funds available. Costs for the proposed projects will be determined through the dry dock bid process. Once these costs are known and all potential funds are identified (FY99 cost-savings and external funding), the projects slated for completion will be selected. Currently, the highest priority project among this list is the addition of an 8th floor laboratory to enhance the Program's capability to pursue the **Deep Biosphere** initiative, to implement more advanced downhole measurements (e.g. CORK tools), and to analyze gas hydrates shipboard. ODP contracted Ocean Design Associates, Inc. in FY98 to assess stability and structural design issues related to the Lab Stack and the addition of

an 8th level. Based on Ocean Design's stability and station-keeping assessment, and from discussions they had with the American Bureau of Shipping, there is no stability problem with adding an 8th level to the lab stack. In addition, structural assessment indicates there are no problems, or need for structural reinforcement, with adding a microbiology van to the roof of the Lab Stack or with stacking the core liner boxes two high, from either a stability or structural viewpoint.

For the **Downhole Measurements Lab**, plans are underway to install a fan-coil air-conditioner, upgrade the existing workspace, instrument the rig-floor to record drilling parameters, and to replace the Schlumberger MAXIS system with the latest-generation data acquisition cab. Vendor selection is currently in progress.

Table 2. *JOIDES Resolution* Upgrades (ODL). Final shipyard projects will be determined once cost estimates are received from the shipyards. In an effort to reduce costs ODL has commenced completion of tasks not requiring shipyard services.

Group	Budget Current	Budget Encumb.	Budget Expend.	Budget Available
10100 Hull	$333,500	$0	$0	$333,500
10200 Tanks & Voids	$128,875	$59,740	$42,391	$69,135
10300 Tank Cleaning & Gas Freeing	$218,000	$15,545	$44,051	$202,455
20100 Salt Water System	$343,035	$121,734	$99,040	$221,301
20200 Bilge System	$17,975	$9,898	$9,080	$8,077
30100 Accommodation	$465,256	$70,038	$68,421	$395,218
30200 Laundry	$28,000	$0	$0	$28,000
30300 Galley	$11,352	$18,072	$7,352	$6,720
30400 HVAC	$48,158	$3,946	$3,946	$44,212
40100 Shafts	$169,300	$33,817	$1,609	$135,483
40200 Rudder & Steering Gear	$87,000	$0	$0	$87,000
40300 Thrusters	$316,080	$27,468	$280	$288,612
50100 ASK	$1,347,396	$1,291,233	$6,337	$56,163
60100 DMS	$909,099	$727,571	$8,728	$181,528
60200 Switchboard	$45,000	$0	$0	$45,000
60400 Main Generators	$174,155	$100,479	$14,090	$73,676
60500 Thyrigs	$17,162	$17,162	$4,438	$0
60300 DC Motors	$22,778	$13,278	$13,278	$9,500
70100 Drilling Equipment	$293,424	$262,872	$196,524	$30,552
80100 Cranes	$260,960	$137,905	$70,648	$123,055
80200 Lifesaving & Fire fighting	$110,000	$0	$0	$110,000
80300 Mooring	$30,000	$5,700	$5,700	$24,300
80400 Communications	$79,870	$78,870	$58,870	$1,000
80500 Environment	$50,000	$0	$0	$50,000
80600 Lab stack	$21,563	$1,107	$2,188	$20,456
90100 General Service	$332,200	$6,264	$2,833	$325,936
90200 QA/QC & Testing	$58,000	$0	$0	$58,000
90300 Maintaining Class	$80,000	$619	$619	$79,381
90400 Other	$89,260	$47,654	$47,654	$41,606
Total	**$6,087,398**	**$3,050,973**	**$708,075**	**$3,036,425**

Table 3. *JOIDES Resolution* upgrades (TAMU). Actual projects will be determined February 1999 upon receipt of shipyard quotes and a prioritization process based on costs and funds available.

Group	Required Dry Dock	Cost Est.*	FY99 Program Plan Budget
90901 Sonar Dome	Yes	$44,000	
90902 Aft Transducers	No	$5,500	
90903 Main Deck Access	Yes	?	
90904 Casing Hold Lift	Yes	$55,000	
90905 Core Lab Modifications	Partial	$75,000	
90906 Fantail Maintenance	Partial	?	
90907 Fume Hoods	Partial	$33,000	
90908 Cabinets and Countertops	Yes	$11,000	
90909 Reefer Conversion	No	$22,638	
90911 Doppler Sonar	No	$0	
90912 Casing Hold Storage Decks	Yes	$49,500	
90913 Microbiology Van	Yes	$25,000	
90914 Forward Drill Collar Rack	Yes	?	
90919 Lab Stack Foundation	Yes	?	
90920 Core Lab Doors	Yes	?	
90921 Core Lab Ventilation	Yes	?	
90923 HVAC Cleaning	Partial	?	
90924 CATWALK Replacement	Partial	?	
Total		**$320,638**	**$309,042**
Under Discussion			
90915 Library Conversion	Partial	?	
90916 Lab Stack 8th level (full)	Yes	?	
90917 Lab Stack 8th level (shell)	Yes	?	
90918 Lab Stack 8th level (partial)	Yes	?	
90922 Bridge Deck Offices	Partial	?	
90926 Tween Deck Stores to Office	Partial	?	
90927 Store Room to Library	Partial	?	
90928 Store Room to Conference	Partial	?	

* Cost estimates are based on an internal estimate and more accurate numbers and prioritization await the bidders response.

Data and Publications

The Janus Phase I project, completed under contract with Tracor, officially ended in September 1998 and the final data model, database management scripts and Janus maintenance manual were delivered to ODP/TAMU. Over the past two years, since the initial deployment of Janus, the quality of data has consistently improved. The new data received from the ship after each leg is entered in to the central database at College Station and becomes available on the web within two weeks of the end of the leg. The Janus database now contains data from Legs 171 through 181 data -- Legs 171 through 175 are public and available on the web, Legs 176 through 181 are in moratorium available only to the participating scientists. The beginning-of-leg (BOL) and end-of-leg

(EOL) database procedures during the port calls have also consistently improved since Leg 171 and are now routine.

The Visual Core Description (VCD) application which will contain hardrock support is the final project to be completed under Phase I - it is planned for deployment on Leg 184. An initial release of VCD which supports sediments has been in use for several leg. Problems have occurred with the uploading of the VCD data, but these problems are currently in the process of being resolved. Tracor has completed all of their work on the VCD import/export functions and these are currently in the process of being tested. AppleCore, which is the final piece of VCD, has been delayed. Currently the delivery of the final version of AppleCore is planned for mid-December.

Janus Phase II, the incorporation of digital images for sediment and hard rock core description is still under development.

Reports and query capabilities continue to be added to the Janus Web application. An application was developed to provide a spreadsheet-type input form for use by paleontologists who requested this addition to the Janus Paleo program. It has been used on the past two legs and feedback will be used for further developments.

The **Core-Log Integration Program** (CLIP), a program that uses outputs from Janus, continues to be developed. Efforts have recently focused on preparation of the Sagan software module for deployment during Leg 182. Coding efforts developed the ability to link core and log depths at decimeter resolution. Sagan can now perform all three of the main core-log correlation options: (1) raw core mbsf to mld; (2) composite (Splicer output) core to mld; and (3) single spliced core record to mld. An optimal correlation can be defined using multiple datasets from multiple holes. The result is a color coded image map showing stretch/compression and log offset values where the core-log correlations are highest.

Migration of pre-Leg 171 core data is underway. Multi-Sensor Track data from Legs 101 through 170 are currently being migrated to the Janus database.

The ODP **Log Database** was updated through Leg 181, including Schlumberger original and processed data (conventional, geochemical, and FMS), specialty tools (borehole televiewer, multichannel sonic, and temperature), borehole images, and sonic waveforms. On-line conventional data for both wireline and Logging-While-Drilling (LWD) now exists for all legs, along with any available Initial Reports plots, processing documentation, and file dictionary relative to each hole. Proprietary data (moratorium) now include Legs 176 through 181. All processed GHMT data are currently being formatted for inclusion in the on-line database.

After three years of **Publication** analysis and evaluation, last December the Program successfully brought to a close plans for reformatting the *Proceedings* volumes. During 1998 the Publication Services department began development of the new electronic format for the *Initial Reports* volumes. Beginning with Leg 176, all IR volumes will be

published with a spiral-bound, hard cover booklet that contains one chapter summarizing the leg, a user guide, and a CD-ROM. The CD-ROM will include the leg summary chapter, all other volume chapters, visual core descriptions, digital core images, and smear-slide and thin-section tables.

On the CD-ROM, all volume material will be in PDF format. The CD will also contain a copy of Adobe Acrobat Reader, the software used for viewing the PDF files. This material will be accessible on Mac, PC and Unix computers. In addition, many CDs will contain data sets in ASCII format and some will contain supplementary files, such as QuickTime movies.

The volume format is designed so that it can be viewed on screen, but also printed. The volume files are set up with active links from text to figures and tables within a chapter, from chapter-to-chapter, or from chapter to ASCII data sets. Core photos are represented as 300 dpi color digital images. (Higher-resolution versions of the core images are available via the ODP Data Librarian for members of the scientific community who wish to use the images for research.)

The first volumes published in the new format, *Initial Reports* Volumes 176, 177, and 178, will be distributed in early 1999. Shortly after the distribution of these volumes in the booklet/CD format, they will also be published on the Internet. Volume production and distribution from June through December 1998 is listed below. Other Program science publications are also listed.

Initial Reports
Book and CD-ROM (PDF version): 172, 173, 174A, 174AX, 174B, 175
WWW (PDF version): 171, 172, 173
The log data CD-ROMs for Legs 172-175 were completed and sent to Friesen Printers for distribution.

Scientific Results
Book and CD-ROM (PDF version): 159, 159T, 160
WWW (PDF version): 156, 157, 159, 159T, 160

Publications
Brewer, T. S., Lovell, M. A., Harvey, P. K., Williamson, G. & Haggas, S. 1998. Ocean floor volcanism: constraints from core-log data. In: Core-Log Integration (edited by Harvey, P. K. & Lovell, M. A.) Special Publication No. 136. Geological Society of London, 341-362.

Calvert, S., Samworth, R., Lovell, M. A., Harvey, P. K. & Hook, J. 1998. Porosity Determination in Horizontal Wells. 39th Annual Symposium of the Society of Professional Well Log Analysts, Keystone, Co. Paper BBB, 14p.

Harvey, P. K. & Lovell, M. A. (Editors) 1998. Core-Log Integration. Special Publication of the Geological Society of London. No. 136, 400pp.

Harvey, P. K., Brewer, T. S., Lovell, M. A. & Kerr, S. A. 1998. The estimation of modal mineralogy: a problem of accuracy in core-log calibration. In: Core-Log Integration (edited by Harvey, P. K. & Lovell, M. A.) Special Publication No. 136. Geological Society of London, 25-38.

Jackson, P. D., Harvey, P. K., Lovell, M. A., D., G., Williams, C. G. & Flint, R. 1998. Some effects of fine scale structure seen in micro-resistivity images of core on downhole resistivity data. In: Core-Log Integration (edited by Harvey, P. K. & Lovell, M. A.) Special Publication No. 136. Geological Society of London, 261-272.

Jackson, P. D., Lovell, M. A., Harvey, P. K., Williams, C. G., Flint, R., Williamson, G. & Gunn, D. 1998. Improved Characterization of Fine Scale Structure: Integration of Downhole and Core Electrical Image Data. Society of Core Analysts (SCA 98), The Hague, 10p.

Lauer-Leredde, C., Pezard, P.A. and Dekeyser, Y., FICUS 1998, a new in-situ probe for resistivity measurements in unconsolidated marine sediments, Marine Geophysical Researches, in press.

Lovell, M. A., Harvey, P. K., Brewer, T. S., Jackson, P. D. & Williamson, G. 1998. Interpretation of geological data: integration or calibration. In: Core-Log Integration (edited by Harvey, P. K. & Lovell, M. A.) Special Publication No. 136. Geological Society of London, 39-52.

Lovell, M. A., Jackson, P. D., Harvey, P. K., Williams, C. G., Flint, R., Williamson, G. & Gunn, D. A. 1998. Electrical resistivity measurements on unconsolidated core. Society of Core Analysts (SCA 98), The Hague, 10p.

Sun, Y.F. and Goldberg, D., 1998, Hydrocarbon signatures from high-resolution attenuation profiles, SEG 68th Annual International Meeting of Society of Exploration Geophysicists, Expanded Abstracts, 996-999.

OCEAN DRILLING PROGRAM
PROGRAM MANAGER

Dr. Hajima Kinoshita
Director, Deep Sea Research Department
Japan Marine Science and Technology Center
2-15 Natsushima-cho Yokosuka-shi 237-0061
Japan

November 5, 1998

Dear Dr. Kinoshita:

JOI is pleased to begin working with JAMSTEC under our new and innovative Memorandum of Agreement (MOA) for mutually-beneficial technology development. JOI is looking forward to successful collaboration with JAMSTEC during Phase III of the Ocean Drilling Program (ODP) and in the new post-2003 scientific drilling program.

I am writing today to clarify the process by which JAMSTEC and JOI will jointly develop the first tool under our MOA, the new advanced Diamond Core Barrel (DCB). It is clear that this development will benefit both ODP for use on the *JOIDES Resolution* and JAMSTEC for use on your new riser drillship, scheduled for completion after 2003.

The first step in this process is communication exchange related to the details of the tool's design. A key part of this communication comes from TAMU engineers who provide to JAMSTEC engineers the detailed specifications of all of the components in the new DCB. The JAMSTEC engineers review these specifications and provide comments to TAMU. Dr. Fox, Director of Ocean Drilling Program Science Operations, has informed me that TAMU and JAMSTEC are in the final stages of this first step.

After the designs of the components are finalized, the second step is fabrication. I understand that JAMSTEC will select a Japanese company as the prime contractor to manage the fabrication of the DCB components, as specified. Your Japanese prime contractor will then subcontract to companies, recommended by TAMU and JAMSTEC engineers for fabrication of each component.

The final step is testing of the new tool. Based on the tool completion schedule, JOI/ODP will provide shiptime on the *JOIDES Resolution* for tests in appropriate rock-types. We will endeavor to secure space onboard should JAMSTEC wish to send engineers for these tests. Results of the tests will likely identify modifications to the design that should be completed in the same manner as the prototype tool.

At the upcoming meeting in College Station, Texas on November 16, 1998 it is most important that we finalize plans related to the second step, the selection of companies to construct the DCB components. As well, at this meeting, I anticipate that we will be able to define a fabrication and

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testing schedule. It is important to know this schedule so that we can begin to incorporate the needed tests into the *JOIDES Resolution's* ship schedule; a process that requires detailed discussions with the international advisory committees of the ODP, in particular the JOIDES Science and Operations Committees.

I look forward to working with you toward a successful completion of the DCB project, which will set the course for many future collaborations.

Sincerely,

Kathryn Moran

Dr. Kathryn Moran
Director, Ocean Drilling Programs

cc: Dr. P.J. Fox
Dr. D. Goldberg
Dr. W. Hay
Dr. S. Humphris
Dr. B. Malfait
Dr. S. Takagawa

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November 9, 1998

Dr. G. Michael Purdy, Co-Chair,
IWG Working Group
Director, Division of Ocean Sciences
National Science Foundation

Mr. Masakazu Murakami, Co-Chair
IWG Working Group
Director, Ocean and Earth Division
Science and Technology Agency

Dear Sirs:

Over the past several weeks, representatives from JOIDES, JOI, and NSF have had informal discussions regarding the request from the IWG to JOIDES to provide scientific, technical, managerial, and budgetary information for post-2003 planning of a scientific ocean drilling program. As indicated in a prior letter to the IWG Co-Chairs, we have been considering several aspects derived from this request, such as the timing and structure of the planning effort, the need to establish a clearly defined leader for this effort, and the potential to overburden the current leadership of the Program which is already fully committed and engaged with running the existing ODP.

As a result of these discussions, we plan to formally propose to the JOIDES EXCOM at its January meeting the creation of an IODP Planning Sub-Committee (IPSC). A draft mandate for the IPSC is attached, although it may be modified based on discussions at EXCOM. We will propose that the IPSC be responsible for defining and overseeing the scientific, technical, operational and budgetary planning for IODP. The IPSC will report through SCICOM to EXCOM and the IWG. The IPSC will consist of four to six members selected by SCICOM in consultation with EXCOM and IWG. It will include representatives from countries who have made a commitment to scientific ocean drilling post-2003 through their membership on the IWG, as well as a representative from ocean drilling-related industry. The Chair of this group will be an individual who does not have a concurrent leadership role in the JOIDES structure, but would be expected to have a detailed knowledge of ODP and the goals of the IODP. In recognition of the effort required to lead such a planning effort, it is expected that salary support will be made available to the Chair of the IPSC. The IPSC will be expected to work with the SCICOM Chair, and to meet with SCICOM as necessary to coordinate planning for IODP with ongoing ODP activities and plans. It is expected that both the JOIDES Office and JOI will provide needed assistance to IPSC in implementing its planning process, although as discussed below, resources presently available will not be sufficient for the magnitude of the planning effort which will be required. The IPSC will have the authority to recommend the formation of other working groups and to seek advice from others as needed.

The ODP presently has only limited resources available for the long-term planning activities of IODP. In FY 1999, post-2003 planning will begin to increase substantially, including a Technology and Operations Workshop in mid-November and the large (c. 300 attendees) COMPLEX (Conference on Multi-PLatform EXploration) meeting in late May. Continued development of the recommendations from these meetings, as well as the initial activities of the IPSC, including developing conceptual designs for a non-riser vessel and initial planning activities for a post-2003 international scientific conference (ICOSOD) scheduled for FY00

will substantially exceed the resources allocated for long-term ODP planning activities in previous years, and staff time at JOI available to support these activities. As the IODP planning effort accelerates in the coming years these costs can be expected to increase. We would like to continue to explore with you mechanisms to provide financial support for these important planning activities.

A new drilling program with the scope of what is envisioned for IODP will require a major planning effort over several years. We think the creation of this IODP Planning Sub-Committee will provide a clear focus and leadership for planning within JOIDES. If given the resources required to do its job, the IPSC will provide JOIDES and the IWG with the scientific, technical, management and budgetary information needed to establish a successful new program of scientific ocean drilling beyond 2003.

Sincerely,

Robert S. Detrick

Helmut Beiersdorf

Susan E. Humphris

William Hay

Kathryn Moran

Cc: JOIDES EXCOM
JOIDES SCICOM
Admiral J. D. Watkins, President of JOI
B. Malfait, NSF
D. Heinrichs, NSF

JOIDES IODP Planning Sub-Committee Mandate

OVERALL GOAL

The IODP Planning Sub-Committee (IPSC) is a sub-committee of SCICOM responsible for defining the scientific, technical, operational and budgetary requirements of the IODP for the new drilling program that will succeed ODP. The IPSC will report through SCICOM to EXCOM and the IWG. It will have the authority to recommend the formation of other working groups and seek advice from others as needed.

MANDATE

1. Develop a strategy for detailed planning activities that will address key areas of scientific objectives, technical and operational issues, and the financial and management requirements for the new drilling program in a timely fashion.

2. Oversee the implementation and evolution of the strategy as the planning progresses.

3. Maintain close working relationships with SCICOM and, in particular with the SCICOM Chair, and meet with SCICOM as necessary to coordinate planning for IODP with on-going activities.

MEMBERSHIP

The IPSC will consist of 4-6 members selected by SCICOM in consultation with EXCOM and IWG. It will include representatives from countries/consortia who have a commitment to scientific ocean drilling post-2003 through their membership on IWG, as well as a representative from industry. The term of service will be three years.

Objective:

Strategy for detailed IODP planning

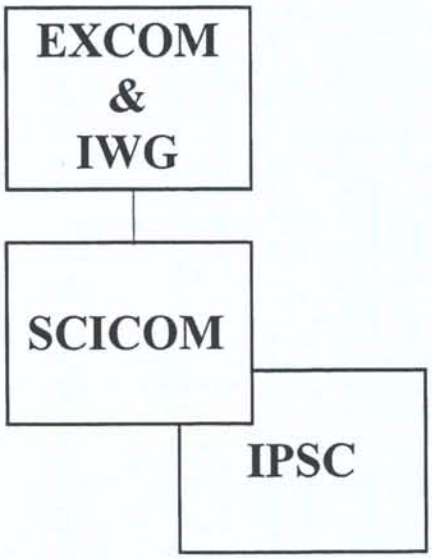
Proposed Solution:

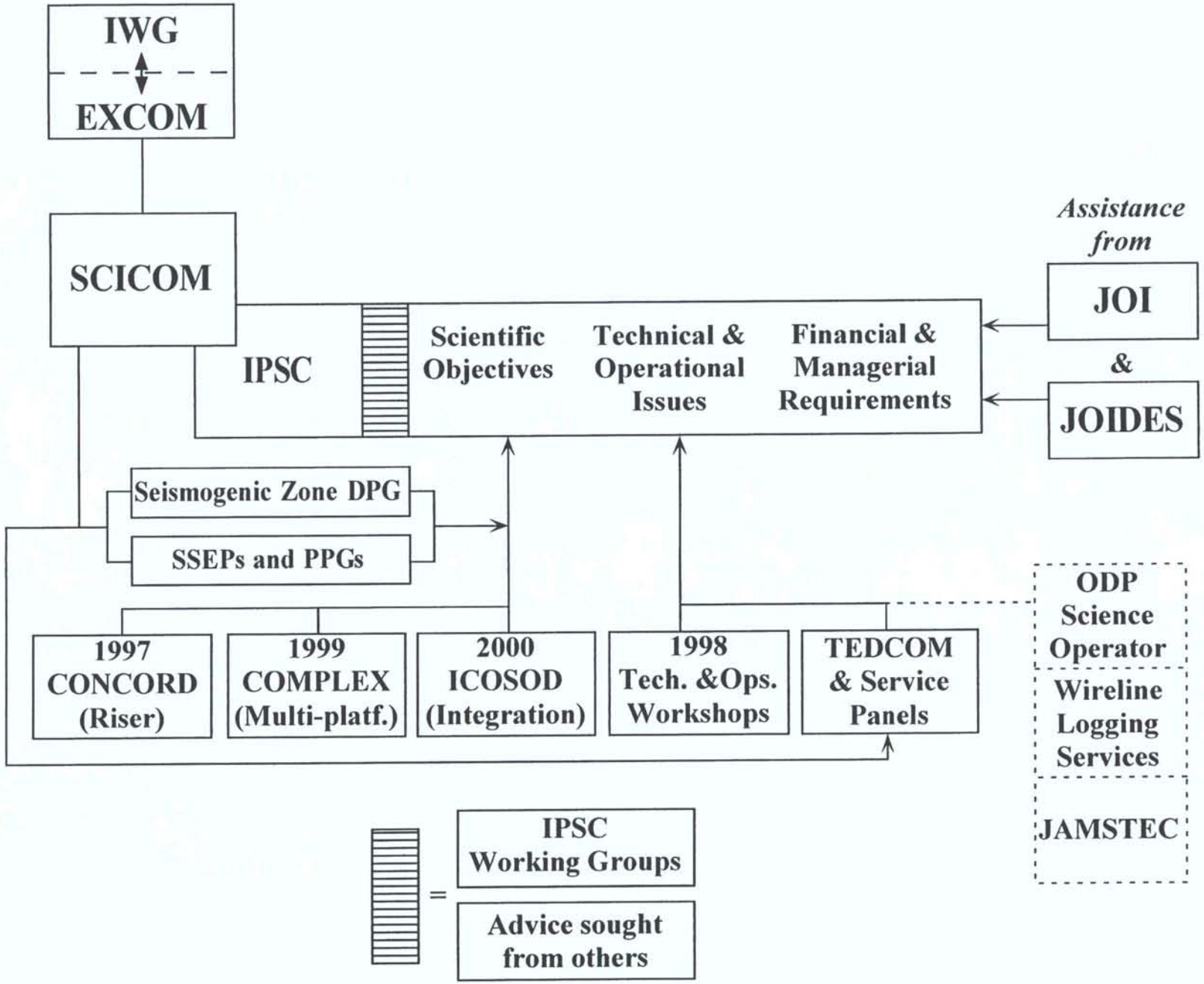
IODP Planning Subcommittee (IPSC)

THEMES OF CONCERN

Scientific Objectives	Technical and Operational Issues	Financial and Managerial Requirements

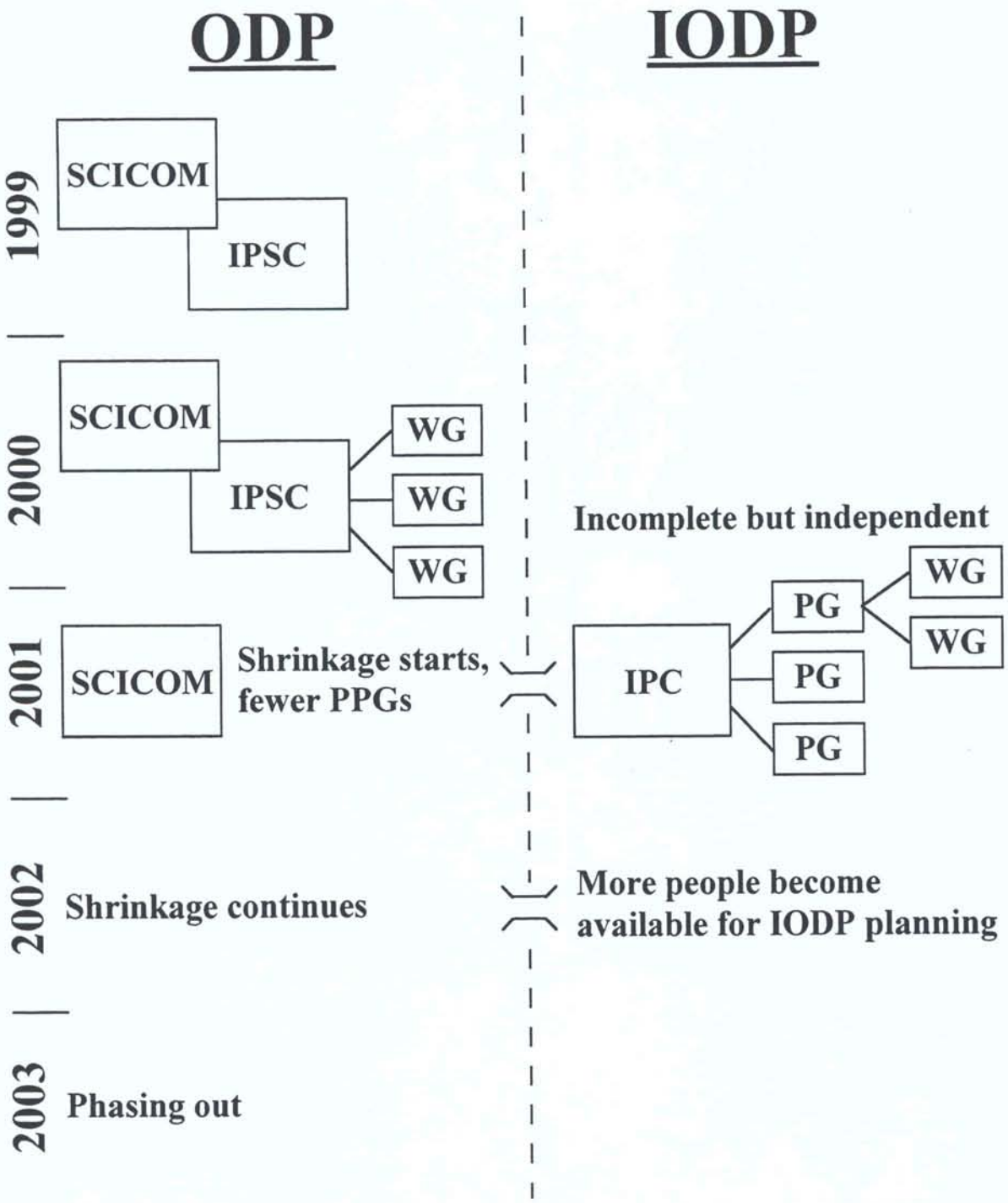
Affiliation:




IWG
EXCOM
SCICOM
IPSC
Scientific Objectives
Technical & Operational Issues
Financial & Managerial Requirements
Assistance from
JOI
&
JOIDES
Seismogenic Zone DPG
SSEPs and PPGs
1997 CONCORD (Riser)
1999 COMPLEX (Multi-platf.)
2000 ICOSOD (Integration)
1998 Tech. &Ops. Workshops
TEDCOM & Service Panels
ODP Science Operator
Wireline Logging Services
JAMSTEC
=
IPSC Working Groups
Advice sought from others

Proposed tasks for IPSC

- Coordinate development of science plan.
- Develop options for technical and operational capabilities required to meet science plan.
- Develop strategy to address technical and operational issues identified at Houston.
- Assess financial and managerial requirements for different options.
- Design advisory structure according to input from conferences, workshops, and other sources (SSEPs, PPGs, etc.).
- Develop detailed plan for transition from ODP to IODP.


ODP
IODP
1999
SCICOM
IPSC
2000
SCICOM
IPSC
WG
WG
WG
Incomplete but independent
2001
SCICOM
Shrinkage starts, fewer PPGs
IPC
PG
PG
PG
WG
WG
2002
Shrinkage continues
More people become available for IODP planning
2003
Phasing out

Ocean Drilling Program Technical & Operations Workshop:

Planning for a New Era of Scientific Ocean Drilling

A Report of a Meeting Held:

17-18 November 1998

Houston, Texas

DRAFT

A. Introduction

The Ocean Drilling Program (ODP) is an international partnership of scientists, engineers and research institutions organized to explore Earth's history and structure as recorded in the ocean basins. It is funded by the US National Science Foundation and by international partners, including: the Australia/ Canada/ Chinese Taipei / Korea Consortium; the European Science Foundation; France, Germany; Japan; the United Kingdom; and the People's Republic of China. The ODP, which is scheduled to end in 2003, is the successor to the Deep Sea Drilling Project begun in 1968. Between them, a total of 30 years of scientific ocean drilling (using first the *Glomar Challenger* and now the *JOIDES Resolution*) has been accomplished to date.

ODP is now beginning the planning process for a new program of scientific ocean drilling that will begin in the year 2003. At the 1987 COSOD II meeting, the desire for riser drilling to allow deeper penetration was identified, and JAMSTEC and STA began pursuing the possibility of building a drillship with deep-water riser capabilities. The new multi-platform program is currently envisaged as operating two major vessels: a large drilling ship with riser capabilities, which the Japanese are proposing to construct and then operate for the new scientific ocean drilling program (IODP); and a second, non-riser drilling vessel, the specifications of which will be determined based on scientific objectives of the new drilling program that will be defined at a Conference in May 1999. On occasion, it is expected that the new program might also need to lease other types of platforms (e.g. jack-up rigs, seabed drills, etc.) for specific projects. The new program will require a plan for operation of the two primary vessels globally (and often separated geographically), as well as provision of scientific analytical facilities for initial work on the cores collected by both vessels.

Since 1995, there has been close integration of the Japanese plans for "Ocean Drilling in the 21st Century (OD-21) with preparations by ODP for continued international ocean drilling beyond 2003. In January 1997, NSF, STA/JAMSTEC and MONBUSHO agreed on a framework for a post-2003 drilling program, and an International Working Group (IWG) of representatives from interested countries was set up to begin preparations. The IWG requested assistance from the JOIDES Advisory Structure in initiating scientific, technological and management planning for the new program (currently referred to as the Integrated Ocean Drilling Program - IODP). The Technical and Operations Workshop held in Houston, Texas on 17-18 November 1998 was the first step in addressing the technical and infrastructure issues to be faced in preparing for the new IODP.

B. Purpose and Objectives of the Workshop

Based on the recognition that many rapid advances are being made by the exploration industry in the development of deep-water drilling capabilities, ODP brought together a group of industry representatives to obtain advice on the most effective mechanisms to determine the technical requirements and infrastructure of the proposed new program for scientific ocean drilling (IODP). The goals of the Technical and Operations Workshop were:

- to identify the most important technical and infrastructure issues which must be addressed in planning for a new program
- to suggest the most effective mechanisms by which these questions can be addressed.

The IWG specifically requested that the following major components be addressed during the Workshop:

- The definition and development of required technical capabilities of a deep-water riser (well-control) system and drillship

- The definition and development of required technical capabilities of the potential non-riser platform(s)

- The definition of technical and staffing requirements to support the science operations, data management systems, repositories, etc. for an integrated program with riser and non-riser platforms.

The Agenda for the meeting is listed in Appendix I. In order to familiarize the participants with the current Ocean Drilling Program (ODP), and the planning that is underway for IODP and the Japanese OD21 Program, the meeting started each day with a series of short (10-15 minute) briefings. Day 1 was devoted to technological issues related to drilling operations and downhole measurements and sampling; Day 2 focused on logistical and operations issues, and the provision of scientific and engineering services to a multi-platform program. Minutes from the presentations on the current status of ODP are not included in this report as the information is readily available. Minutes from the presentations on planning for a post-2003 drilling program are included, as well as from the general discussion topics during the plenary sessions. The general discussion on Management and Infrastructure issues also resulted in one recommendation that is presented at the end of Section E.

Four Working Groups met separately (two per day) in order to facilitate discussion. **The recommendations and action items from each of the four Working Groups are presented in Section F.**

Approximately 50 individuals participated in the Workshop over the course of the two days, and are listed in Appendix II. They included broad representation from the oil industry and service companies, and expertise in logging and geotechnical measurements. In addition, JOIDES representation included members from the Science Committee, Operations Committee, the Technology and Engineering Development Committee, and the Scientific Measurements Panel, and representatives from the Japanese OD21 Program. Other representatives were present from the National Science Foundation, JOI, ODP-TAMU, and ODP-WLS. The meeting was Chaired by Dr. Susan Humphris (Chair, JOIDES Science Committee) and Dr. Kensaku Tamaki (Chair, OD21 Technical Operations Planning Group and Member, JOIDES Science Committee).

C. Status of Planning for a Post-2003 Scientific Drilling Program

1. Planning Activities for IODP (S. Humphris)

The status of the planning effort for IODP in the three major areas -- scientific, technical and financial -- shows a range in progress to present. Perhaps the most advanced has been the work already done in identifying scientific goals for IODP. In 1997, the Conference on Cooperative Ocean Riser Drilling (CONCORD) was held in Tokyo, Japan. about 150 Earth scientists and engineers from 17 countries participated in the meeting, the goal of which was to define how riser-supported drilling in the ocean basins would address high priority scientific objectives in the various themes of the ODP Long Range Plan. One of the key recommendations in terms of planning for the first scientific drilling with a riser vessel was the identification of a seismogenic zone as the first priority. The JOIDES Advisory Structure then constituted a small Detailed Planning Group to begin the planning for such a drilling program, and a call for letters of interest that described projects or experiments that would form part of the overall effort was sent out internationally. On the basis of the responses, the Detailed Planning Group was enlarged to cover all the themes of interest, and their first meeting will be in early December.

A second conference that will be complementary to CONCORD is planned for May 1999 in Vancouver, BC. This meeting is envisaged to bring 200-300 international scientists together to define the scientific objectives of the future ocean drilling program. An Organizing Group was set up, and a call for letters of interest was set out, to which there were over 250 responses. The Organizing Group has now set up a structure for the meeting based on the responses, and the details of the meeting will be advertised shortly.

Technical planning is less well advanced in terms of IODP, although planning for the riser ship is well underway, there having been a Workshop in Yokohama on Riser Technology in 1996. The current Workshop represents the first attempt to begin to define the technical and operational issues that a multi-platform program will face.

Financial planning is also underway through an *ad hoc* committee that has met once to assess preliminary estimates on the cost of running the proposed program. Currently, it is estimated that IODP will cost $120-130M annually to operate. Various scenarios exist for funding arrangements, but it is envisaged that Japan and the US will be equal partners in the arrangement.

2. Status Report of the Japanese OD-21 Program (K. Tamaki, T. Tanaka)

Background

The construction of the Japanese riser drillship represents the culmination of nine years' of effort by STA/JAMSTEC. In 1990, the National Advisory Council for Ocean Development initiated this effort that has resulted in total expenses of $10M over nine years.

In terms of background, this effort was included in the Japanese Government's Science and Technology Basic Plan , and it stressed the need for international cooperation. Two areas of justification were:

- societal needs:
  - global environment
  - earthquake hazards
  - understanding the ocean floor
  - developing ocean technology
  - first Moho drilling
  - the contribution of Japan to basic scientific research

The organizations within Japan that are supporting the effort include STA and Monbusho, JAMSTEC and ORI, University of Tokyo, and the National IODP Steering Committee.

Several conditions have been enunciated for this effort:

- it must be an international program and promote international cooperation
- financially, it must be operated by international efforts; i.e. the ship will be constructed using Japanese funds with "in-kind" contributions from international partners, but operations must be through international efforts.

Present Status

1. JAMSTEC has submitted the OD21 Program Plan Budget to the Ministry of Finance via STA that includes:
   - basic design and the start of fabrication (FY'99)
   - sea trials (October 2003)
   - start of experimental operations in the Western Pacific (April 2004)

2. Concomitantly, the External Pre-Program Evaluation Committee (set up on the recommendation of the Council for Science and Technology) is now evaluating the OD21 Program Plan. Their report is expected to be finalized shortly.

3. Many related scientific societies in Japan have express support for OD21.

3. Plans and Specifications for the Riser Drillship (S. Takagawa)

The following requirements have been defined for the riser drillship:
- global operations
- the conduct of long-term(many months) drilling legs with support capabilities
- ship design should be capable of 4000 m riser drilling in the future
- the coring systems must be compatible with the present ODP
- zero discharge of waster materials
- a large science lab with more flexibility than the *JOIDES Resolution*.

Design options under consideration include:
- 21″ riser versus 16″ riser. The original plan called for a 16″ riser; however, the petroleum industry is now developing a 21″ riser
- hydraulic ram type rig versus draw-works
- hydraulic direct riser tensioner versus wire type riser tensioner.

The current design specifications are as follows:

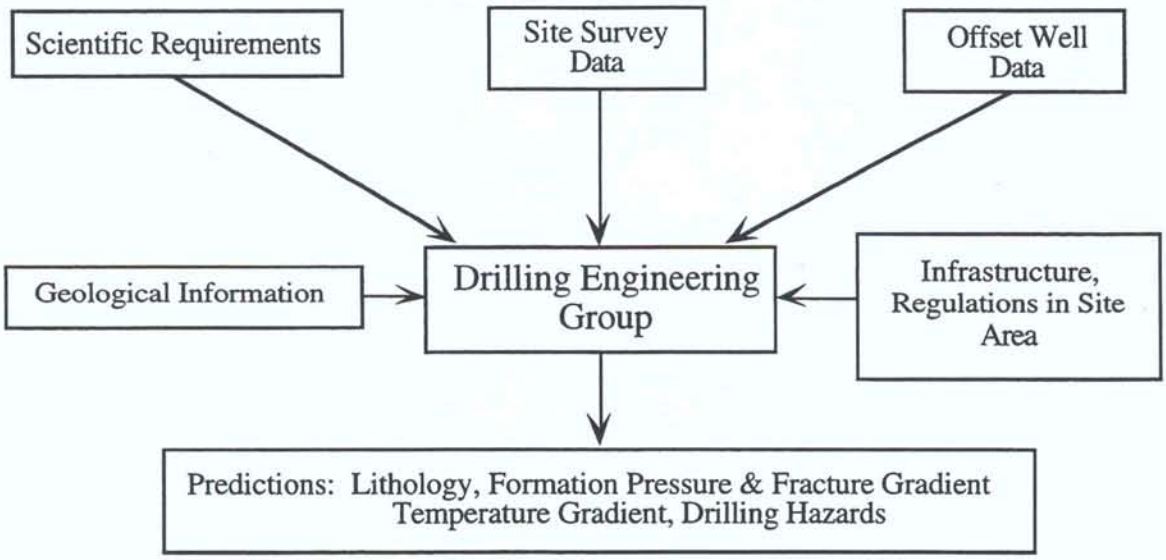
Length:	~190m
Gross Tonnage:	30,000 tons
Riser Length:	2500 m (to be increased to 4000 m)
Drillstring Length:	10,000 m
Accommodation:	150 people

During the basic design stage of the vessel, the various comments raised by international experts will be taken into account.

Engineers are also studying the possibility of developing a riser angle monitoring system.

4. Preliminary Model for Procedures for the Riser Drillship (S. Uetake)

Planning to drill a deep riser hole is very complex, and requires considerable pre-drilling analysis. The preliminary model that is being used is as follows:



D. New Developments in Deep Water Riser Drilling Technology: How Do They Relate to IODP (General Discussion)

Historically, ODP has been conducting riserless drilling whereas industry has been using risers for many years. Industry currently has 36 riser vessels either in operation or under construction for deep water drilling, although not to depths as great as planned by IODP. However, it appears that ODP and industry are about to change positions in terms of drilling techniques, with ODP moving toward riser drilling and some companies and industry consortia considering riserless drilling as exploration moves into deeper water. The problems with riser drilling in deeper water depths include the decrease in the window between pore pressure and fracture gradient in which to operate; the load on the ship; the huge volumes of mud; required pumping rates; and bottom currents.

There are currently two development projects underway for riserless drilling. The Joint Industry Project, which involves 8 oil companies, expects to get rid of risers and have a riserless system ready for testing by 2001. Shell is also working on a riserless project, but no details of its scope or direction are available.

Another advantage of riserless drilling is that it may allow refit of current vessels that can currently operate in 1000 ft of water so that they can work in much greater depths. Riserless systems are being designed for 10,000 ft. of water at present. The maximum

depth of water in which riser drilling is currently underway with Conoco drilling in 7700 ft. of water.

Industry is also moving towards larger diameter drillpipe because this can handle heavier weights. The use of composite materials is also being investigated, although this is very preliminary work. In addition, there are some new approaches to casing that ODP might wish to consider in their long-term plans.

E. Management and Infrastructure Issues (General Discussion)

Industry has gone to out-sourcing many of its tasks to take advantage of the core competencies of companies that offer consolidation of services. IODP should consider working through companies that provide the services required rather than setting up a whole infrastructure to do everything within the Program. There is also an effort towards integration of activities so that logistics, services, etc. are better coordinated.

The scientific advice should be aimed at the overall program so there should be one body that provides this.

Action Item:

1. **Conduct a feasibility study to identify the options for technology organization management.** Several of the Management Schools (e.g. Sloan School, Wharton School) specialize in management of technology-based organizations and may be able to assist with this activity.

F. Working Group Reports

1. Drilling Operations Working Group

Mr. Matsuoka present the preliminary drilling plans for the riser drillship. The general discussion considered several areas of technological development including riser types, casing designs and setting procedures, drill bit and BHA needs, and drilling muds. The Group confirmed that riser drilling in 2500 m water is possible and is currently being done (although not on a routine basis); however, they also recognized that there are many limitations to extending riser drilling to greater water. The considerable interest and activity within industry at present to extend drilling to greater water depths using other technology suggests that such capabilities are likely to be developed within the next few years.

Recommendations:

1. Given that there are major advances currently underway in riserless drilling, and that there are new approaches to casing , ODP needs to stay informed and retain the flexibility to be responsive to the changes in technology over the next few years.

2. IODP should plan to be aligned with industry as it moves to 6 5/8" drillpipe.

Action Items:

1. Better define the scientific goals so that the capabilities optimal for IODP can be assessed. This will be addressed by the 1999 COMPLEX conference in Vancouver, Canada.

2. Revise the example boreholes used in the 1995 Engineering Conference in Japan, and convene a small group of industry representatives to assess the IODP needs in light of current technology. One approach would be to hold a 1-day forum in conjunction with the 1999 May Offshore Technology Conference (OTC), which would allow the results to be available for the Vancouver meeting.

3. Ensure industry participation in the Vancouver Conference.

4. Work with industry to develop safety policies and procedures for IODP drilling on <u>any</u> platform. Industry would likely be willing to share their safety policies with ODP.

5. Continue to hold Technical and Operations Workshops on a periodic basis as planning progresses. Industry is willing to provide advice and update ODP on technological developments as planning proceeds.

2. Downhole Measurements and Sampling Working Group

Platforms that might to be used during IODP include:
- riser-type vessel
- *JOIDES Resolution* type vessel
- Shallow water platforms for drilling in <100 m
- Seafloor drilling systems
- Vessels of opportunity
- Platforms for drilling in ice-covered areas.

The Working Group reviewed all the sampling and logging tools available to determine whether they would be compatible with operations from all the likely platforms, and also whether tools are available for sampling and logging in all types of lithologies that IODP is likely to encounter. Currently, ODP is restricted to a tool

diameter of <4", so IODP should move towards larger diameter drillpipe to stay compatible with industry.

There are **no** fundamental problems in using all available downhole and sampling tools on any likely IODP platform.

Recommendations:

1. ODP should remain informed about advances in downhole measurements and sampling in industry so that tools developed by industry that have scientific applications can be used by IODP.

2. The design of any sampling equipment should ensure that the physical sample size is compatible with downstream processing.

3. Satellite ship-to-shore transmission of logging data should be used for quality control and near real-time analysis.

4. LWD/MWD should be used in any unstable formations.

5. Drilling mechanics measurements should be used to reduce the risk of sticking and other hazards. Such measurements might include annular pressure, downhole torque measurements, etc.)

Action Items:

1. Technological development are required in the following areas:
   - drilling and *in situ* measurements in unconsolidated sands
   - pressure-temperature measurements for *in situ* sampling
   - collection of microbiological samples
   - collection of pore fluids

2. ODP should work with industry on technological developments of mutual interest (e.g. SWD)

3. Evaluate the scientific application of "fly-in" ROV and towed vehicle technology for post-drilling logging (although this does not preclude the need for logging holes immediately after drilling).

4. Evaluate the scientific need for deviated wells.

3. Operational and Logistical Procedures Working Group

Mr. Uetake presented some planning that is underway within OD21 for supplying and changing the crew of the riser vessel. The fuel consumption of the new drillship is

estimated to be 85 tons/day during transit, and 75 tons/day during drilling operations. If the OD21 vessel is to be operated at the same location for many months, it will need support vessels. There is currently no single supply boat that can refuel the riser ship's consumption when the distance between the drilling site and shore becomes great, and so there are preliminary plans to prepare two support vessels: one is a supply vessel that would be modified to fit the OD21 specific supply needs (especially for fuel/bulk material supply), and the other is a passenger vessel with small free deck space especially built for personnel to be comfortable and safe for transfers. When the ship is close to shore, it may also be possible to transfer personnel by helicopter.

The Working Group considered several aspects of operations. A risk analysis is required of the supply and personnel change issues that will take into account logistics, safety, and cost. It may be that staffing requirements and regulations may drive the supply ship schedule. It was also noted that the consistency of science and drilling results may be impacted by rotation of staff. It may also prove to be the most cost effective (but not the most time effective) for the riser ship to act as its own supply vessel, particularly if operations are going to be truly global.

The site survey requirements will be extremely complex and will need a geophysical department to deal with the high resolution surveys. The completion of a single riser hole by industry (including site surveys) costs $30-40M. Although acknowledging that it is difficult to translate costs for charter vessels to the new riser drillship, the Working Group estimated that operations may cost between $100-150M per year (including all related costs; e.g. geophysical surveys).

Recommendations:

1. The design of the new drillship needs to have the flexibility to handle both riser and riserless technology.

2. There needs to be a formal process of FEL (front-end loading) and project life cycle management to ensure a stable and cost-effective organization.

3. There needs to be stable long-term management of the program operations.

4. IODP should develop a portfolio of proposals for drillships of opportunity. As projects are selected for drilling, each should go through the full preparations so that they are ready when the drilling opportunity presents itself.

Cruise Lead Times

5. The current 2-year planning cycle (from scheduling to drilling) will need be extended to 5 years for IODP, particularly for the projects using the riser ship.

6. The planning process must integrate multiple platforms into the preparations for riser sites for such activities as shallow surveys, pilot holes, and other work.

7. Drilling permits (where required) will need to be obtained as early as possible (i.e. at least 2 years before spud date.

8. Procurement of supplies and services must begin more than 1 year before legs are scheduled.

Optimal Cruise Length

9. Flexibility in cruise length depending on the project needs to be preserved.

Site Survey Requirements

10. The key drivers in determining site survey requirements must be safety, environment, and scientific objectives.

11. A two-stage process will be required for the riser vessel:
    - proponents conduct the site survey work sufficient to justify the project
    - IODP conducts the detailed pre-drilling surveys required for technical and safety reasons for riser drilling

12. An integrated geophysical site characterization using multiple methods will be required in order to understand the site in both geophysical and geotechnical terms.

13. Consistent, full-time support for site survey work will be required as an integral part of IODP.

Staffing and Scheduling

14. Personnel logistics must be coordinated with the following taken into consideration:
    - regulations (work period allowed)
    - safety
    - transfer capability
    - travel from shore to home

Action Items:

1. Evaluate the infrastructure required for 5-year planning and site characterization/survey work.

2. Conduct a technical and economic feasibility study for cruise length that includes:
    - supply vessel requirements
    - personnel, staffing and people transfer
    - distance from port
    - weather and sea state considerations
    - regulations dictating maximum days at sea in the country operating the vessel.

3. Conduct a full feasibility analysis to determine the supply ship needs as a function of drilling location and time on drilling site. Multiple supply platforms need to be evaluated including:
   - one supply ship and a helicopter for personnel
   - one supply ship (including personnel) and a fuel tanker
   - use of the riser ship as the supply ship (i.e. leaving and returning to location)
   - mother-daughter docking capability or ship-to-ship transfer capability.

4. ODP staff should participate in industry drilling on riser ships in order to begin to gain some experience in the operations.

4. Scientific And Engineering Services Working Group

The Working Group considered the issues related to provision of scientific and engineering services within a multi-platform program including: science facilities, shipboard and shore-based facilities; core transportation and core repositories. They also discussed the use of seabed drills and cores, and geotechnical tools as other engineering services that might be required to meet IODP science needs. A clear conclusion was that as many processes and systems as possible should be common to all platforms in order to be cost efficient and optimize flexibility.

It appears that a multi-platform program will best be served by a shore-based central facility for core analyses. However, some analyses are needed on board for (1) safety, (2) real-time drilling decisions; and (3) to capture ephemeral properties. Several analytical requirements were identified for riser and non-riser platforms:

Riser	Non-Riser
Mud logging	Organic Chemistry
MST	MST
Cryogenic magnetometer	Cryogenic magnetometer
Biostratigraphy	Biostratigraphy
Biology	Biology

and concluded that it might be possible to complete these studies without splitting the core.

An issue that needs to be considered for a scientific program that might have scientists that are not ship-based is the method by which interactions between scientists and the development of a team spirit can be achieved. The scientists working on the core may in fact be a "virtual" team.

Recommendations:

1. A small, centralized management team to oversee provision of scientific and engineering services to all platforms within IODP is recommended.

2. A multi-platform program will best be served by shore- based central facilities for core analyses and transportation of cores to that facility, rather than full scientific parties and facilities on each platform..

3. If the scientific party working on the core is completely or dominantly shore-based, there need to be mechanisms in place that will facilitate team building and interaction between the scientists.

4. Methods for core storage and transportation that provide temperature, humidity and gas controlled environments are essential. Logistically, a core storage facility on deck that would easily be transportable is recommended.

5. Geotechnical surveys need to be incorporated into the site survey process, particularly for the riser vessel.

6. Engineering developments within the Program should utilize off-the-shelf industry equipment whenever possible.

Action Items:

1. In order to determine the shipboard lab facilities required on each platform, conduct an analysis of the critical measurements and sample analyses that must be conducted on board a drilling platform for reasons of (1) safety, (2) real-time drilling decisions, and (3) capture of ephemeral properties.

2. Evaluate the types of shore-based facilities required, and determine the optimal way to provide them (i.e. by discipline, by region, etc.).

3. Evaluate the costs relative to international needs of a centralized core repository.

4. An operational disaster plan needs to be developed that will apply to all IODP platforms. ODP should investigate linking up with Minerals Management Services to determine how to deal with this issue, as industry has not yet dealt with this extensively.

Appendix I

AGENDA: 17 November

A. Introduction and Welcome (S. Humphris and K. Tamaki, Co-Chairs)

B. Self-Introduction of Participants

C. Purpose, Objectives and Organization of the Workshop (S. Humphris)

D. The Current Status of ODP

1. The Current Ocean Drilling Program: Its Goals and Infrastructure (K. Moran)
2. Operations Within the Current ODP:
   - Drilling Operations.. (J. Fox)
   - Logging Operations.. (D. Goldberg)

Coffee Break

E. Planning for a Post-2003 Scientific Drilling Program

1. Planning Activities for the Post-2003 Program (IODP) (S. Humphris)
2. Status Report of the Japanese OD-21 Program (K. Tamaki/T. Tanaka)
3. Plans and Specifications for the Riser Drillship (S. Takagawa)

F. General Discussion

1. New Developments in Deep Water Riser Drilling Technology -- How Do They Relate to Plans for IODP?

Lunch

G. Issues Related to Drilling Requirements for Each Vessel

(Break into Groups for Specific Discussions)

Group A: Drilling Operations

1. Preliminary Drilling Plans for the Riser Drillship (H. Matsuoka)
2. General Discussion of Issues to be Considered for a Multi-Platform Program, and Identification of Sources of Advice:
   - (i) Riser Types
   - (ii) Casing Designs/ Setting Procedures
   - (ii) Bit/BHA Needs
   - (iii) Drill Mud -- Types, Pressures, Capacities, Handling, Supply

3. Efficiencies that can be Achieved, and Overlap of Technical Needs, for a Multi-Platform Program

Group B: Logging and Sampling Operations

1. General Discussion of Issues to be Considered for a Multi-Platform Program, and Identification of Sources of Advice:
   - (i) Sampling Tools
   - (ii) Downhole Tools
   - (ii) Logging Tools, LWD and MWD
2. Efficiencies that can be Achieved, and Overlap of Technical Needs, for a Multi-Platform Program

Coffee Break

H. Reports from Working Groups

1. Recommendations of Drilling Technologies and Operations Group A Chair
2. Recommendations on Downhole Measurements and Sampling Group B Chair

I. Discussion and Summary of Recommendations

Adjourn

AGENDA: 18 November

J. Introduction and Objectives of Day 2 of the Workshop S. Humphris

K. Operational Procedures and Provision of Scientific/Engineering Services

1. Current Procedures within ODP (T. Davies/ B. Jonasson)
2. Preliminary Model for Procedures for the Riser Drillship (S. Uetake)

Coffee Break

M. Discussion of Provision of Scientific/Engineering Services

(Break into Groups for Specific Discussions)

Group C: Optimal Operational Procedures

1. General Discussion of Issues to be Considered for a Multi-Platform Program,

and Identification of Sources of Advice:

(i) Cruise Lead Times

(ii) Optimal "Cruise" Lengths

(iii) Site Survey Requirements

(iv) Supply Ship Needs

(v) Staffing/ Scheduling

Group D: Provision of Scientific and Engineering Services

1. General Discussion of Scientific Services for a Multi-Platform Program, and Identification of Sources of Advice:

   (i) Science Facilities

   (ii) Shipboard Facilities and/or Shore based Facilities

   (iii) Transportation of Cores

   (iv) Core Repositories

2. General Discussion of Other Engineering Services to Meet Post-2003 Science Needs, and Identification of Sources of Advice

   (i) Seabed Drills and Cores

   (ii) Geotechnical Tools

Lunch

N. Reports from Working Groups

1. Recommendations of Optimal Operational Procedures — Group C Chair
2. Recommendations on Provision of Scientific Services — Group D Chair

O. Discussion of Recommendations

Coffee Break

P. Discussion of Other Technical and Infrastructure Issues Related to an Integrated Multi-Platform Program

Q. Summary of Recommendations, Needed Advice and Suggested Timelines and Mechanisms to Meet the Technical and Operational Needs by 2003 — Co-Chairs

Adjourn

Appendix II

List of Participants

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To: JOIDES EXCOM
From: Nick Pisias
Re: Status of COMPLEX

I thought it might be useful to provide a short status report on the planning of the COMPLEX meeting to be held in Vancouver B.C. Canada in May.

The Organizing Committee (OC) recieved over 225 statements of interest from the international community. More than 250 people authored these papers.

In early November, the OC met at Stanford University to structure the meeting. Attached is the draft meeting schedule. The white papers were organized into 14 main sessions. The OC then identified people who would be invited to chair these sessions. Because the session sizes varied we invited from 2 to 4 individuals to chair the sessions. The people contacted for these sessions is also attached. In this attachment (complex.emails) we have an impressive list of international scientists. Names followed by question marks have not responded to my invitation.

To give you an idea of the structure of the meeting I am attaching the letter of invitation to session chairs (invitationletter.txt). This shows the draft outline we will use in producing the final report.

The organizing committee plans to invite the first authors of all papers of interest. This is about 220 individuals. We have asked that session chairs examine the list of people assigned to their sessions and suggest any key individuals they feels should also invite. At three a session, this would add about 42 people, bringing the meeting to about 260.

My suggestion to the national committees supporting ODP is that they might also suggest a few additional people to add to the list. Assumming that this is no more than 40 people the meeting would be about 300 attending. I don't think we should go much bigger than that number.

It is important that we get the initial invitations out given that May is approaching far faster than we might think. I also want to visit the meeting site to be sure that we have sufficient rooms for the primary sessions and any break-out meetings that will be taking place.

The white papers are on an FTP server here at OSU. If you are interested in looking at the papers set your web browser to:

ftp://ftp.oce.orst.edu
click on the DATA directory then the directory "pisias". The session white papers are in MS-Word for Mac's. I have been able to read with both my Mac's and Pc's.

If you have any questions please pass them on to me or the others on the OC.

Sincerely,

Nick Pisias

COMPLEX

Conference on Multiple Platform E›

When & Where

May 25-28, 1999
University of British Columbia
Vancouver, BC, Canada

Organizing Committee

Co-chairs: Nick Pisias
Asahiko Paira

Members: Okada Hisatake
Marcia McNutt
Larry Mayer
Rainer Zahn

Focus

Discuss, review and develop high priority scientific objectives that require a non-riser drillship (e.g. *JOIDES Resolution*) and other platforms. The outcome of this meeting will be used with the CONCORD results as the foundation for the first long-range plan of a new program, post-2003.

Schedule

26 May

8:30-10:00 **Plenary Session:** COMPLEX Goals

10:15-6:00 **Theme Sessions:**

1. Understanding Extreme Climates
2. Documenting Climate Variability
3. Constructing the Lithosphere
4. Subduction Factory and Convergent Margin Processes
5. Geological Processes Related to Rifting

Evening Enabling and New Technologies

27 May

8:30-10:00 **Plenary Session:** Reports from Theme Sessions 1-5

10:15-6:00 **Theme Sessions**

6. Climate Forcing on Long Time Scales – Tectonics and Climate
7. Climate Forcing on Long Time Scales – External and Internal Mechanisms
8. Evolution of the Crust and Lithosphere
9. Seismogenic Zone
10. Basin and Passive Margin Evolution

28 May

8:30-10:00 **Plenary Session:** Reports from Theme Sessions 6-10

10:15-12:30 **Theme Sessions**

11. Dynamics of the Earth's Interior
12. Catastrophic Events
13. Understanding the Earth's Biosphere
14. Gas Hydrates

2:00-3:30 **Plenary Session:** Reports from Theme Sessions 11-14

3:30-5:00 Preparation of Theme Reports

29 May

8:30-10:00 Finalization of Theme Reports

10:00-12:00 **Final Plenary Session:** Priorities and Wrap-Up

COMPLEX

COMPLEX Organizing Committee and Session Chairs

Organizing Committee
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Session 2: Documenting Climate Variability
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Session 3: Constructing the Lithosphere
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Session 4: Subduction Factory and Convergent Margin Processes
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Session 5: Geological Processes related to Rifting
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Session 6: Climate Forcing on long time scales - Tectonic and Climate
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Session 7: Climate Forcing on short time scales - External and Internal Mechanisms
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Session 8: Evolution of the Crust and Lithosphere
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Session 9: Seismogenic Zones
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Session 10: Basin and Passive Margin Evolution
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Session 11: Dynamics of the Earth's Interior
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Session 12: Catastrophic Events
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Session 13: Understanding the Earth's Biosphere
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Session 14: Gas Hydrates
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