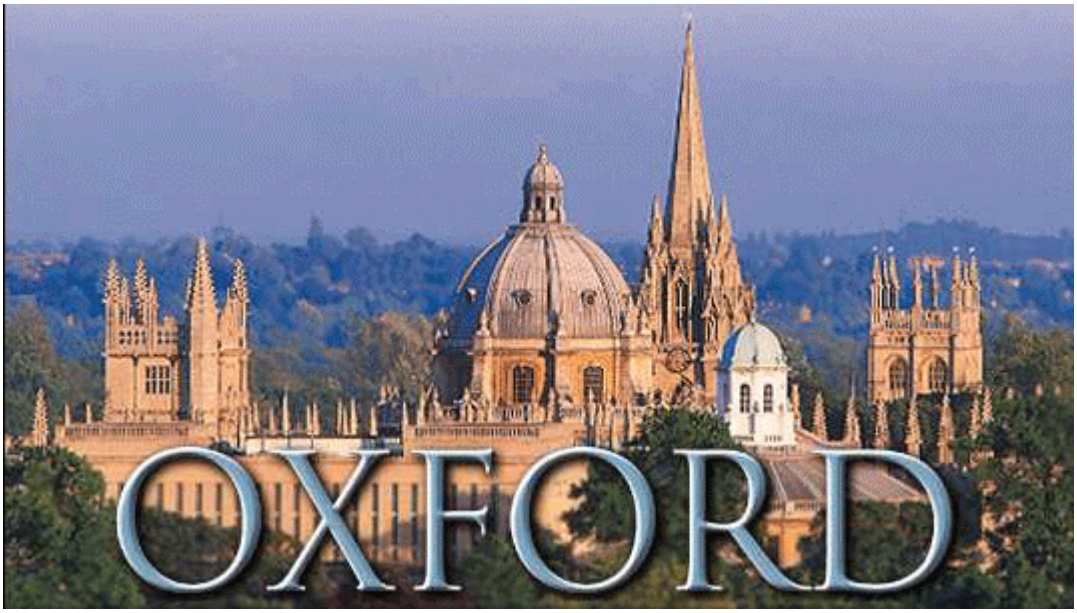
JOIDES EXECUTIVE COMMITTEE
28-29 JUNE 2001
ST. ANNE'S COLLEGE – OXFORD UNIVERSITY



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FINAL VERSION

JOIDES EXECUTIVE COMMITTEE MEETING

ST. ANNE'S COLLEGE
OXFORD UNIVERSITY

28-29 JUNE 2001

MEETING AGENDA

THURSDAY	**28 JUNE**	**9:00 AM**

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1. Welcome and Introduction ***pp. 5-7***
- 1.1 Introduction of participants *pp. 5* (Harrison)
- 1.2 Meeting logistics *pp. 6* (Falvey)
  - 1.2.1 Logistics *pp. 6*
  - 1.2.2 Social events *pp. 7*

2. Approval of Agenda (Harrison)

3. Minutes and Matters Arising ***pp. 7***
- 3.1 Approve Jan. 2001 EXCOM Minutes *pp. 7* (Harrison/Janik)
- 3.2 Electronic approval of minutes (Harrison)

4. Country and Consortium Reports - Read Only ***pp. 8-27***
- 4.1 ECOD *pp. 8* (Comas)
- 4.2 France (Cannat)
- 4.3 Germany *pp. 10* (Beiersdorf)
- 4.4 Japan *pp. 11* (Tokuyama)
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5. Review of Membership Status ***pp. 28-31***
- 5.1 EXCOM motion 98.2.8 *pp. 28* (Harrison)
- 5.2 ECOD *pp. 29* (Comas)
- 5.3 Pacific Rim Consortium *pp. 30* (Hiscott)

COFFEE BREAK **10:10 – 10:30**

6. Management and Operations Reports ***pp. 32-81***
- 6.1 ODP Council Report *pp. 32* (Malfait)
- 6.2 NSF Management Report *pp. 32* (Malfait)

6.3 JOI *pp. 33*

6.3.1 JOI Response to EXCOM Motions *pp. 33* (JOI)

6.3.2 Legacy and other phase out plans *pp. 34* (JOI/SCICOM)

6.3.3 Plan for producing ODP Final Report, including contents, writing responsibilities, and timeline for completion (EXCOM Motion 00-2-3) *pp. 41* (JOI)

6.4 ODP Operations *pp. 42* (Fox)

6.5 LDEO Borehole Research Group *pp. 68* (Goldberg)

6.6 JOIDES *pp. 78*

6.6.1 Revision of EXCOM Terms of Reference *pp. 78* (Harrison/Beiersdorf/Stoffa)

6.6.2 JOIDES EXCOM Public Affairs Subcommittee (Orcutt)

6.6.3 Draft plan for phasing out JOIDES Science Advisory Structure *pp. 80* (Robertson)

LUNCH BREAK **12:00 – 1:15**

7. Relationships with Other Organizations

7.1 ICDP (Mutter et al.)

7.1.1 New Jersey Transect

7.1.2 Lake Malawi

7.2 Industry (Beiersdorf)

7.3 Other organizations

7.4 Distance Learning (Prior)

8. IODP Planning *pp. 82-101*

8.1 IWG *pp. 82*

8.1.1 iSAS Staffing *pp. 83* (Suyehiro /Harrison)

8.2 IPSC activities *pp. 91* (Moore)

8.3 MEXT Report

8.4 JAMSTEC Report and iSAS Office *pp. 100* (Miki/Yamakawa)

COFFEE **3:00 – 3:30PM**

8.5 OD21 Report (Suyehiro)

8.6 European initiative *pp. 81* (Beiersdorf)

8.6.1 APLACON Conference *pp. 81*

8.7 U.S. plans (Malfait)

FRIDAY	**29 JUNE**	**9:00AM**

9. SCICOM Report ***pp. 102-105***

9.1 Achievements on Legs 193-195 *pp. 102*	(Robertson)
9.2 Proposal activity *pp. 104*	(Urquhart)
9.3 SCICOM Motion 01-01-03 *pp. 105*	(Robertson)

COFFEE **10:00 – 10:30AM**

10. FY 2002 Program Plan and Budget ***pp. 106-202*** (JOI)

11. FY 2003 Preview ***pp. 203-206***

11.1 Prospectus for 2003 *pp. 203*	(Janik)
11.2 Arctic Drilling (SCICOM Motion 01-01-06) *pp. 206*	(Robertson/JOI)

12. Future Meetings and Other Business ***pp. 207***

12.1 Santa Cruz	(Silver)
12.2 Europe	(Comas and Knorring)
12.3 Frequency of future meetings	(Harrison)
12.4 Other business	
12.4.1 Long Time Service to JOIDES *pp. 207*	(Harrison)

JOIDES EXCOM - OXFORD UNIVERSITY, 28-29 JUNE 2001

PARTICIPANTS

Executive Committee – EXCOM

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

Associate Member Observers

Mathilde Cannat	Laboratoire de Géosciences Marines, Universite Pierre at Marie Curie, Paris, France
Zhixiong Wang	Marine High-Technology Bureau, Beijing, China

Liaisons

John Farrell	Joint Oceanographic Institutions (JOI), Inc., USA
Jeff Fox	Ocean Drilling Program (ODP), Texas A&M University, USA
Dave Goldberg	Lamont-Doherty Earth Observatory (LDEO), Columbia University, USA
Bruce Malfait	National Science Foundation (NSF), USA
Alastair Robertson	Dpt. of Geology and Geophysics, University of Edinburgh, United Kingdom (SCICOM)

Guests

Stephen Bohlen	Joint Oceanographic Institutions (JOI), Inc., USA
Elizabeth Boston	Natural Sciences and Engineering Research Council of Canada (NSERC), Canada
Jim Briden	Oxford University, UK
J. Paul Dauphin	National Science Foundation (NSF), USA
Nobuhisa Eguchi	Japan Marine and Technology Center (JAMSTEC), iSAS, Japan
Mary von Knorring	Swedish Research Council, Sweden
Yoshiro Miki	Japan Marine and Technology Center (JAMSTEC), Japan
Ted Moore	Dept of Geological Sciences, University of Michigan, USA
Hong Sun	Ministry of Science and Technology, Beijing, China
Kiyoshi Suyehiro	Japan Marine and Technology Center (JAMSTEC), Japan
Mike Tricker	National Environmental Research Council, United Kingdom
Kasey White	Joint Oceanographic Institutions (JOI), Inc., USA
Minoru Yamakawa	Japan Marine and Technology Center (JAMSTEC), iSAS, Japan

Guests from JOI BOG

Alan Mix	College of Oceanic & Atmos. Sci., Oregon State University, USA
Arthur Nowell	School of Oceanography, University of Washington, USA
Robert M. Owen	Dept of Geological Sciences, University of Michigan, USA
Barry C. Raleigh	SOEST, University of Hawaii at Manoa, Honolulu, USA

JOIDES Office

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

1.2 Meeting logistics and social events

1.2.1 Logistics

Meeting Location:
St Anne's College
Woodstock Road
Oxford

From London Heathrow:
Distance from LHR is about 50 miles/80 km. There is a half-hourly coach service by Oxford CityLink as follows: Terminal 4 (British Airways intercontinental, Paris and Amsterdam) from 0540 to 2240; Central Bus Station (for all other flights) from 0500 to 2330. Less frequent service through the night. Journey time 1 hour 10 minutes (plus a further 20 minutes from Terminal 4). The bus station in Oxford (Gloucester Green) is a short taxi ride from St. Anne's College.

From Birmingham Airport:
Most European cities, plus New York are serviced directly – distance is 62 miles/100km. Trains service Oxford approximately hourly (journey 1 hour 5 minutes).

From central London:
Trains run from Paddington station every half hour (journey time 1 hour plus) and coach services are cheap and very frequent (but take 2 hours): Oxford CityLink every 15 minutes from Victoria Coach Station; Marble Arch; Oxford Tube every 12 minutes from Grosvenor Gardens (opposite Victoria Rail Station); Marble Arch.

Car:
The city center is avoided by approaching College from the north on the A4165 Banbury Road or A4144 Woodstock Road, both of which are accessible from the ring road. If using the M40 from the north leave at Junction 9, but from the south-east leave at Junction 8. HOWEVER, on-road parking near College is near impossible, and unauthorized parking in College is prohibited. In some cases a short stay parking permit can be arranged in advance by your host.

Further information can be found at following web address.
http://www.oxfordbus.co.uk/heathrow.html

1.2.2 Social events

27 June (Wednesday) early evening
Ice breaker - to be held in the University Museum of Natural History

29 June (Friday) 1400 hours
Tour of the University for those not occupied in meetings

29 June (Friday evening)
JOI - ODP EXCOM/COUNCIL Dinner at St Anne's College

30 June (Saturday)09:30 - 16.00
A field trip to the Cotswolds will be arranged if there is sufficient demand :
" Geodelights of the Cotswolds"
Location: An opportunity to sample the geological highlights of the Cotswolds and local beverages/food in a traditional Cotswold pub. You will have a chance to see Middle Jurassic marine sediments that are abundantly fossiliferous and take home some souvenirs from your trip. Guaranteed ammonites, beautiful scenery and the enigmatic Chedworth Bun from historic Stow on the Wold, center of the Cotswold Hills.

09.30 Depart Oxford
10.00 Arrive M.C. Cullimore's Dairy Farm Pit. Middle Jurassic Kellaways Formation. Ammonites and Sediments.
11.45 Depart to local hostelry (traditional Cotswolds pub)
13.30 Travel to Swell Wold Quarry, Stow on the Wold, to see the Middle Jurassic Clypeus Grit and collect Chedworth Buns.
15.30 Depart for Oxford

Note: Stout footwear is essential, walking boots or Wellingtons.

3. Minutes and Matters Arising

Minutes from EXCOM Meeting in Kamakura in January 2001 can be accessed at:

http://joides.rsmas.miami.edu/files/excom_01_01_minutes.pdf

4. Country and Consortia Reports (Read Only)

4.1 ECOD

MANAGEMENT MATTERS

1. EMCO meetings

- The 17th ECOD Management Committee (EMCO) meeting was held in Venice - Italy, on April 7 2000, in conjunction with an EMCO/ESCO joint meeting. At this meeting EMCO agreed to meet twice a year from now on, considering urgent needs for planning towards the IODP. EMCO also discussed ESF representation at IODP planning meetings and it was agreed that it would be beneficial if someone from ESF could attend the relevant meetings, in view of the important discussions are currently being held regarding a future single European consortium in IODP.
- The next 18th meeting of EMCO will be held in Genoa, Switzerland, on 29 September 2001, following a joint meeting with the ECOD Scientific Committee (ESCO).

2. EMCO Chairmanship & Vice-Chairmanship

- The term of EMCO Chairperson and the current ECOD representative for EXCOM comes to an end on 30 June 2001. The new EMCO Chair will be Mary von Knorring (Sweden) and she will also represent ECOD on EXCOM. Menchu Comas (Spain) will be the EMCO Vice-Chair and the ECOD EXCOM alternate.

3. Replacement of ESF representative

- The current ESF Scientific Secretary and the ECOD ESF representative, Annette Moth Wiklund, will shortly leave her position at ESF to take up a post at the Swedish Research Council. The ESF is appointing someone to replace her.

4. ECOD Membership Status

- ECOD will contribute 99.5% of a full membership to ODP for the US fiscal year 2002. Item 5.2 of the Agenda accounts for the annual revision of ECOD membership.

5. Activities towards IODP

- ECOD representatives have attended all meetings held in 2001 by the European Steering Committee on Ocean Drilling (ESCOD), and collaborate to the planning for a single European consortium to participate in IODP from 1 October 2003.
- At the last ESCOD meeting (Lisbon 13 May 2001), ECOD representatives participate in the discussion on the "Principles" for Europe to participate in IODP and the creation of an European Consortium for Ocean Research Drilling (Euro-CORD). These Principles and organization are recommended to science funding agencies of each ECOD country as the framework for a pan-European cooperation in IODP.
- Austria is voicing interest in joining ECOD or the future single European consortia for IODP. Austrian representatives have been invited to attend both ECOD and ESCOD meetings as observers, should they so wish.

SCIENTIFIC MATTERS

1. *ESCO meetings*

- The 32nd ECOD Science Committee (ESCO) meeting was held jointly with EMCO on April 6-7, 2001 in Venice, Italy. Next ESCO meeting will be held in Genoa, Switzerland, 28th September 2001.

2. *ESCO Chairmanship & Vice-Chairmanship*

- The term of ESCO Chairperson and the current ECOD representative in SCICOM comes to an end on 30 June 2001. The new ESCO Chair will be Jerome Kenter (Netherlands) and he will also represent

ECOD on SCICOM. Hans Christian Larsen will be the ESCO Vice-Chair and the ECOD SCICOM alternate.

3. ESCO Office

- The ESCO Secretariat will rotate to ECOD "southern countries". From 1st July 2001 the ESCO Office & ESCO Secretariat will be placed at the Free University in Amsterdam (Netherlands). The next ESCO Office Science coordinator will be Sam Purkis.

4. ECOD iSAS representatives

- At the last meeting ESCO nominated their representatives for the iSAS committees and panels. Following EXCOM recommendations, ECOD agreed to nominate their iSAS representatives to serve also parallel JOIDES panels. The following nominations were made for the JOIDES Advisory structure and iSAS panels:
- *Panel Delegate / Alternate:*

SCICOM & iPC: Jeroen Kenter (The Netherlands) / Hans Christian Larsen (Denmark)
TEDCOM: Sigmund Stokka (Norway) / Sergio Persoglia (Italy)
(i)ESSEP: Helmut Weissert (Switzerland) / Nalan Koc (Norway)
(i)ISSEP: Rolf Birger Pedersen (Norway) / Luis Menezes Pinheiro (Portugal)
(i)PPSP: Juanjo Danobeita (Spain) / Birger Larsen (Denmark)
(i)SSP: Annakaisa Korja (Finland) / Luca Gaspeerini (Italy)
(i)SciMP: Leonardo Saniotti (Italy) / Eve Arnold (Sweden).

5. Science meetings

- JEODI, the ESF, and the IGM-Department of Marine Geology (Portugal) co-sponsored the APLACON Conference (Alternate Platforms as Part of the Integrated Ocean Drilling Program-IODP), held 10th-12th May 2001 in Lisbon. Numerous ECOD scientists attended the meeting and participated in preparing scientific themes/ proposals to the IODP for Mission Specific Platforms (MSP). Participation denotes strong interests from ECOD countries in ensuring the MSP capability of IODP.
- The 4th European ODP Forum will be in April 10th-12th 2002 hosted by ECOD. The Tromsø University and the Norwegian Polar Institute (Tromsø, Norway) will organize the meeting. Information is available in:

http://www.ibg.uit.no/geologi/konferanser/ecod2002/

6. ECOD scientists sailing no/and from January 2001:

-Leg 196- Nankai II, May-Jul 2001: Martin Bak Hansen (Denmark)
-Leg 195- Mariana/ W. Pacific ION, Mar-May 2001: Massimo D'Antonio (Italy)
-Leg 194- Marion Plateau, Jan-Mar 2001: Flavio Anselmetti ,co-chief (Switzerland)
Stephen Ehrenberg (Norway), Pascal Kindler (Switzerland)

7. ECOD scientists invited to sail:

- Leg 198 Maria Rose Petrizzo (Italy), Susanne Gylesjö (Sweden)
- Leg 199 Jan Backman (Sweden), Isabella Raffi (Italy)
- Leg 200 No applications from ECOD

8. ECOD co-chief invited for upcoming Legs

- Leg 198 (Aug-Oct 01): Isabella Premoli Silva, Italy

9. *ECOD Student Trainees, participation and applications*.

- Several student trainees have applied to sail. One Danish student, Metter Kristensen, was invited to Leg 195.

4.3 Germany

Alternative Platforms as "Third Leg of IODP"
On invitation of the European Commission (EC) and the European Science Foundation (ESF) a meeting on "Alternate Platforms - Europe as the 3rd leg of IODP" was held in Brussels in January 2001. Twenty two of the in total one hundred participants came from Germany. This conference started the dialog between European scientists and the oil and gas industry as well as the related service companies concerning drilling with alternative platforms in IODP.

A further milestone on an European contribution to IODP was the APLACON (Alternate Platform Conference) in Lisbon in May, 2001. A large German delegation presented drilling proposals which require alternate drilling platforms. Based on the discussed scientific proposals, a science plan for drilling with alternative platforms will be provided by ESCOD in Sept. 2001.

ODP related research funds in Germany
For the regular one-year term starting on first July, 2001 about fifty research proposals related to ODP science will be funded by DFG.

The German annual ODP Meeting was hosted by the Institute of Petrology and Geochemistry at the University of Karlsruhe on February 28 to March 2, 2001. The scientific agenda included 21 oral and 61 poster presentations. 154 scientists attended the meeting. The last day of the meeting was entirely devoted to a discussion of scientific plans and management structures of IODP. The German ODP community enthusiastically welcomed the progress made in IODP planning.

New German JOIDES panel members and alternates
As successor of William Hay, Peter Herzig (University of Freiberg) was nominated as new German SCICOM member. Heinrich Meyer will be succeeded by Sönke Neben (BGR) in the SSP. Christoph Gaedicke (BGR) is nominated as his alternate. The German members of the JOIDES advisory structure agreed to serve also in the Interim Science Advisory Structure for IODP.

German site survey activities
Four legs of RV METEOR expedition 49 in early 2001 were dedicated to a multichannel seismic survey of the Walvis Ridge, the continental margin of the southern Brazil-Falkland Basin, and the Demerara Rise. The surveys aimed at the preparation of proposals to study the Neogene Late Cretaceous paleoceanographic changes by drilling.

4.4 Japan

1. *JOIDES Resolution* Portcall

Following two portcalls are going to be held at Yokohama:

-- July 4th for students and Japan ODP related persons.

-- August 30th for the citizens in Yokohama.

Japan ODP Office appreciates the supports of TAMU to accept two portcalls in 2001 as well as 2000.

2. Site Survey Cruise

2001 schedule

-- JAMSTEC eastern Nankai OBS survey by the framework of Japan-France collaborative project(July to Aug.).

-- JAMSTEC eastern and central Nankai MCS survey (June to July).

-- Shinkai 6500 diving at central (6 dives) and western (1 dive) Nankai(June).

-- Imaging of seismogenic zone at Japan Trench by OBS and detailed surface morphological and sedimentological survey at Toyama Deep Sea Fan, Japan Sea by Wadatsumi deep tow backscattering system using R/V Hakuho Maru (Aug. to Oct.).

-- Japan Sea sapropel cruise by R/V Tansei Maru (Sept. to Oct.).

--Wadatsumi deep tow backscattering survey at Suiyo Seamount, Isu-Ogasawara Arc (Dec.).

2002 schedule

-- R/V Hakuho Maru, Okinawa Trough and Mariana Arc (Oct. to Nov.)

3. ODP related symposium

-- Meeting to make an implementation plan of eastern Nankai OBS cruise by the framework of Japan-France collaborative project (June).

-- Nankai Trough session at Japan Earth and Planetary Science Joint Meeting, June.

4. IODP related activity

-- Workshop which is aimed in preparation for making IODP preliminary proposals was held on 29th March.

-- OD21 Science Advisory Committee was held on 11th May.

4.5 PacRim Report

Australian ODP Country Report – May 2001

The Australian ODP has been severely effected by the continued fall in the Australian dollar. Cash reserves have been used to make up the difference between 2001 grant funding and the subscription fee. The Australian Secretariat is at present finalizing its grant application for 2002. Because of the decline in the Australian dollar, the application includes a request for a 22% increase in funding from the Australian Research Council ($1,130,883 in 2001 cf $1,438,128 in 2002).

The JOIDES Resolution has visited Australia (Townsville) twice in the last year. During both visits students and local scientists and the general public toured the ship. On the final visit in January, a press conference was held on board to publicize the results of Leg 193 which was picked up by the local and national media. A regular newsletter continues to be published.

Australian Participants in 2001

Ray Binns	CSIRO	193	Co-chief scientist
Chris Yeats	CSIRO	193	Sulphide petrologist
Haidi Hancock	James Cook University	198	Sedimentologist (PhD student)
Tracy Frank	University of Queensland	198	Organic geochemist

The next Australian Scientific Committee meeting is being held in Hobart on June 30 to coincide with the COGS Marine Science Conference. One of the main objectives of the meeting is to finalise the Australian Science Plan. Below is the list of current Aus SCICOM members:

Australian ODP Scientific Committee

Scientist	Organisation	Appointed
Dr W Howard (Chair)	Antarctic CRC (paleoceanography/climate)	2000
A/Prof. J. Keene (*ex officio)*	Director, ODP Secretariat, Sydney University	1998
Dr E Baker (*ex officio*)	Science Co-ordinator, Sydney University	1998
Dr J Dickens	James Cook University (gas hydrates,paleoclimates)	1998
Dr K Dadd	Macquarie University (petrology)	1998
Dr Q Li	University of Adelaide (sedimentology)	1998
Dr P Harris	Antartic CRC/AGSO (sediment dynamics)	1999
Dr Peter Hill	AGSO (geophysics, tectonics)	2000
Dr Greg Skilbeck	UTS (stratigraphy)	2000
Dr Tracy Frank	University Queensland (organic geochemistry)	2001
Dr Peter Cawood	Curtin University (tectonics/petrology)	2001
Dr Peter Kershaw	Monash University (fire history)	2001

Canada ODP Country Report – May 2001

Canada ODP Council meetings were held May 28, 2000, October 18, 2000, and 27 May, 2001. SCICOM Canada members were invited to participate in both meetings. Much effort is being dedicated to planning for IODP participation. Mike Enachescu, on behalf of Canada ODP, hosted a recent SSP meeting at the Banff Convention Centre February 25-27, 2001. The Natural Sciences

and Engineering Research Council (NSERC) and Natural Resources Canada (NRCan) hosted the last IWG meeting in Ottawa, June 12-13, 2001.

A proposal outline (letter of intent) has been drafted to secure funding for the basic membership fee of ~$5M. This letter of intent must be submitted by early July, 2001. The organization that will lead the proposal process in Canada is the Atlantic Canada Petroleum Institute (ACPI). ACPI intends to develop oil-industry partnerships in the IODP phase, particularly for development of joint industry-academia proposals for the drilling of passive continental margins.

Shiri Srivastava and Kate Moran attended the January 2001 workshop on alternate platforms, held in Brussels. Shiri gave a presentation of the history of Canadian participation in the ODP, proposed participation in the IODP and Canadian platforms and expertise available for drilling in the ice-covered and shallow water environments. Five Canadians attended the APLACON Conference held on 10 - 12 May 2001 in Lisbon. This meeting addressed science themes that require technologies other than those provided by the Japanese vessel and the JOIDES Resolution replacement. The objective was to define the science programme that will require a third core capability of "Mission Specific Platforms in IODP". Canada has a substantial interest in the use of such platforms for drilling in the Arctic, ice-infested and shallow waters. Attendees were: Shiri Srivastava - Canadian Secretariat Office; Kathy Gillis – University of Victoria; Philip Hill - Université du Québec à Rimouski; Mike Enachescu – Husky Energy; Ingrid Hendy – University of British Columbia.

A special ODP session was held during Geological Association of Canada meeting in St John's 2001 (May 27-30, 2001). The special session was a series of oral presentations describing recent drilling and scientific achievements in the Pacific, a discussion of the major improvements in drilling capabilities, such as riser drilling, which will be available to the marine geoscience community under the new Integrated Ocean Drilling Program, and a summary of research proposals being prepared for the new program. In addition to the Special Session the Secretariat had a booth with promotional material at the conference.

During 2000-01, the Canadian Secretariat sponsored the following talks:

Exploring the subsurface biosphere with ODP drilling/ Exploration de la biosphère subsurface:Résultats du programme ODP by Dr. Kim Juniper (GEOTOP Research Centre at the Université du Québec à Montréal (UQAM)). This talk was presented in Montréal, Ottawa, Québec, and Rimouski.

Drilling of Cool Carbonates off Southwest Australia by Dr. Noel James (Department of Geology, Queens University). The talk was presented in Vancouver, Victoria, Regina, and Edmonton.

KODP Country Report, May 2001

1. KODP SciCom activities

(1) KODP SciCom representatives had a meeting with the Director of Ministry Of Science and Technology (MOST) concerning ODP activities in Korea and an additional funds for scientists who want to do research using ODP core samples. MOST will support a small amount of research funding (about U$ 100,00) for three years from next September.

(2) MOST also wants to know detailed information about IODP, and KODP will submit this report as soon as possible. This report will be used for our government to decide whether Korea should join the IODP.

2. KODP Secretary activities

-- KODP submitted a proposal to be a 1/6 member. The final decision will be made this September. The possibility of acceptance is 50%.
-- KODP is looking for a partner to help prepare a proposal for drilling of the Ulleung basin (Tsushima basin).

Taipei Country Report, May 2001

No official report has been received from Taipei. A very successful port call took place in Keelung after Leg 195, with a number of receptions and tours of the JR for the public. The Vice-President of the country spoke at a major reception and press conference in Keelung, and made encouraging statements regarding the interest of Chinese Taipei in strengthening its involvement in ODP and IODP. The heightened enthusiasm in Taipei is directly attributable to the successful APC coring of a high-resolution paleoceanography site (Site 1202) under the Kuroshio Current near Taiwan.

4.7 United Kingdom

ODP Special Topic Grants

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

-- **Dr TS Brewer and Prof PK Harvey (University of Leicester):** Interpreting the volcanic architecture of selected Emperor Seamounts, and its role testing the motion of the Hawaiian hotspot.

-- **Dr M Kaminski (University College London):** Benthic foraminifera from northern Norwegian Sea: their biostratigraphy and palaeoceanographic significance.

-- **Dr J Thurow (University College London):** Is marine primary productivity sensitive to climate change?

In addition a conditional offer of an ODP Special Fellowship was made to **Bridget Wade (University of Edinburgh)** to research **"**Orbital Cyclicity in Eocene climate and oceanography: Evidence from Ocean Drilling Program Leg 171b (western North Atlantic)."

Applications for a further ODP Special Topic grants have just closed (June 1, 2001) and a further post-graduate fellowships round will take place in the near future (closing date September 30 2001).

Staffing

Applications for UK places on forthcoming ODP legs have been at a high level during 2001.

IODP planning activities

UK scientists have been closely involved in European IODP planning activities for the proposed European third leg of IODP utilising mission specific platforms. A significant UK delegation contributed to the recent APLACON Meeting in Lisbon.

Work will begin on July 1 2001 through the Joint European Drilling Initiative programme at BGS to plan mission specific platform operations. This will take the form of an advancement of initial planning already undertaken using by Ali Skinner BGS the previously announced European Technical Co-ordinator role.

NERC will be hosting an IODP Town meeting at the Geological Society in London on July 2 2001 prior to receiving a full bid for UK involvement in IODP during Autumn 2001.

4.8 U.S.A.

U.S.A. Country Report (Part I) - NSF

Although the FY 2001 NSF budget for NSF has been reduced by 4% from the President's requested level, the overall increase finally approved by Congress (13%) represents the largest increase in the history of the agency. High priority NSF initiatives (Biocomplexity, Information Technology, etc) have seen significant growth at this funding level. The Geosciences Directorate (up 15%) and the Division of Ocean Sciences (up 16%) have increased at a slightly higher rate than the overall Foundation increase, though much of the Directorate and Division increases are tied to the above mentioned cross-Foundation activities. Additional increases within Ocean Sciences have been programmed to offset increased ship costs caused by a larger than normal number of 2001 field programs and increased fuel costs. Research program core funding has increased approximately 4 % across the Division.

Reorganization activities and personnel recruitment continue within the **Division of Ocean Sciences** following re-organization into 3 sections last Fall. The **Ocean Section** composed of Biological Oceanography, Physical Oceanography and Chemical Oceanography is headed by Larry Clark. . The **Integrative Programs Section** includes support for cross-Division activities including ship operations, instrumentation and technical services, Ocean Technology and Interdisciplinary Coordination Program, and education activities and is headed by Mike Reeve. The new third section, the **Marine Geosciences Section** composed of the Marine Geology and Geophysics Program and the Ocean Drilling Program is being overseen by Don Heinrichs on an interim basis until a new section head is hired. Applications are being accepted until the end of June.

Recruitment for the new Division Director is ongoing, with 3 candidates (Jim Yoeder – Rhode Island, Margaret Delaney – Santa Cruz, and Ken Brink – Woods Hole). It is hope that a final selection will have been made by the time of the EXCOM meeting. Don Heinrichs continues to serve interim Division Director (as well as acting head of the Marine Geoscience Section). Within the Ocean Drilling Program, Brad Clement from Florida International University has arrived on a visiting appointment and will have primary responsibility for NSF grants activity. A second visiting scientist/engineer position has been identified for the ODP Program. It is expected that this position will concentrate on IODP planning – specifically with respect to the acquisition of the non-riser drill ship. The position has been open since early November, but no qualified candidate has been located.

Focused NSF funding in support of ODP science is divided between the U.S. Science Support Program (USSSP) administered by JOI ($5.5M in FY 2001) and a separate unsolicited proposal/grant activity administered by NSF ($10M in FY 2001). A separate discussion of USSSP activity can be found in a following report from JOI.

ODP supported field programs for calendar year 2001 include (1) An MCS and OBS study of rifting processes in the Gulf of Aden under the direction of Neil Driscoll (Woods Hole), John Diebold (Lamont) and Brian Taylor (Hawaii); (2) an MCS study of megamullions on the Mid Atlantic Ridge by Brian Tucholke (Woods Hole); (3) a heat flow study of the eastern Cocos plate under the direction of Andy Fisher (University of California at Santa Cruz); (4) an MCS study of the Gulf of Corinth led by Brian Taylor (Hawaii) (6) construction and installation of instrumentation in the corks to be deployed at Nankai under the direction of Keir Becker,

University of Miami, and (7) installation of fly-in corks in eastern Pacific ODP holes. The ODP program is also participating in NSF support for the Margins Initiative. 2002 field programs will include a study of sediment drifts in the North Atlantic (Greg Mountain – LDEO as lead scientist); a study of fluid venting in the Mariana arc (Patty Fryer – HIG as lead scientist); and a VSP experiment on hydrate ridge as part of Resolution drilling on leg 204 (Ingo Pecher and Ann Tehu as lead scientists). Additional proposals for field programs for 2002 (in support of IODP drilling and the MARGINS Program) are under review.

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

JOI/USSSP Program Plans

In February 2001, NSF approved the Year 17 Program Plan for the US Science Support Program (USSSP) for the year beginning March 1, 2001. The program plan budget for the year is $6.1M. A "close-out" report for Year 16 was submitted to NSF in early June. Because the timing and duration of USSSP is linked to ODP, wind-down of USSSP will begin in calendar 2003 and will conclude no later than February 28, 2006. Extension beyond 2003 is necessary to accommodate the conclusion of post-cruise research and other activities, and to enable financial and programmatic closeout.

USSAC writes US-oriented document to complement the IODP ISP

At their late January 2001 meeting, the US Science Advisory Committee (USSAC) heartily endorsed the IODP Planning Subcommittee's (IPSC's) draft Initial Science Plan (ISP) "Earth, Oceans, and Life" for the Integrated Ocean Drilling Program (IODP). The final version of the ISP was published and distributed in May 2001 by the International Working Group Support Office (IWGSO), on behalf of the IWG. This document is available at **http://www.iodp.org/**. JOI/USSSP funds will be used to reprint this document for wider distribution within the US. Since January, USSAC has been engaging the broader US community in planning national participation in IODP. Because the ISP reflects the goals of the international science community, USSAC is developing a US companion document to complement the ISP. This document, tentatively titled "Understanding our Planet through Ocean Drilling" (UPOD) will address how the ISP will meet the future needs of the US community. A first draft of UPOD was presented on December 16th, at an "ODP Town Meeting" at AGU. This spring, the draft document was posted on the JOI website for comment and the opportunity to do so was announced over the JOI listserver. Several responses were received and considered. USSAC and JOI/USSSP staff are currently overseeing the editing and layout of this document. In addition, JOI/USSSP is creating a special folder to hold the ISP, UPOD, and a series of one-page handouts highlighting the successes of the current scientific drilling program. The purpose of this package will be to inform people about the value of IODP for US science. JOI/USSSP has notified the other ODP member offices of these efforts and has offered opportunities for collaboration with the US. A final version of the UPOD will be completed in early June 2001 and will be distributed widely this summer.

USSAC discusses need for a USSSP-successor program for IODP

USSAC has been discussing the possible ways US scientists may participate in IODP and what support will be needed to ensure such. This discussion will be the heart of the agenda at the next USSAC meeting (July 2001, Seattle, Washington). The US will need a successor program to USSSP, to support US participation in IODP.

USSAC membership rotation

The following members will conclude their three-year terms on USSAC on September 30, 2001: John Armentrout, Tim Byrne, Peggy Delaney (Chair), Gregor Eberli, and Mike Underwood. A call for nominations to USSAC appeared in the May 8, 2001 issue of *Eos* and was posted on the JOI/ODP listserver. New USSAC members will be selected and approved by the JOI Board of Governors before October 1, 2001.

USSSP supports planning activities for future scientific ocean drilling

JOI/USSSP continues to provide salary, travel, and other direct and indirect support to Ted Moore, the Chair of SCICOM's Integrated Planning SubCommitee (IPSC), and to his project manager, JoAnne Reuss at the University of Michigan. This support will continue as Moore assumes responsibilities as co-chair of the interim Planning Committee (iPC) within the interim Science Advisory Structure (iSAS) which will operate from the summer of 2001 until the end of September 2003. Moore was selected by the IWG to serve in this capacity. Additional USSSP funds are supporting US participation in IPSC meetings, IPSC Working Group meetings, US participation in other international meetings (see below, for example), and for other long-term planning activities.

US nominations for membership on iSAS panel members were submitted to the IWG for approval in April 2001. Initially, the panels will include an interim Planning Committee (analogous to the JOIDES SCICOM), two interim SSEPs, an interim SCIMP, and an interim SSP. Each panel will have 5 US members.

In support of the Joint European Ocean Drilling Initiative (JEODI, www.jeodi.org) APLACON conference (Alternate Platforms in IODP Conference meeting in Lisbon May 10-12), USSSP paid the travel expenses of 10 (K. Becker, M. Coffin, A. Droxler, C. Escutia, D. Feary, T. Moore, K. Moran, G. Mountain, T. Quinn, and P. Webb) of the 12 (other two were T. Edgar and D. Nielsen) participating US scientists. According to the JEODI web page information, the conference was attended by 117 scientists. The US participants submitted 10 of the 58 abstracts received by the conference organizers. Greg Mountain, who served on the conference's Science Committee, submitted a report on the meeting to the USSAC Chair, Peggy Delaney.

US contribution to the IWG Support Office

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

The IWGSO follows an annual work plan that is approved by NSF and MEXT/JAMSTEC. Among other activities, the IWGSO has: (a) published and distributed IODP promotional brochures in five languages (English, Japanese, German, Chinese, and French); (b) assisted with the logistics (agenda book development and minute taking) at the IWG meetings in the US, Japan, UK, and Canada; (c) assisted with meeting planning and execution for IPSC and their working

groups; (d) assisted with the logistics of an ISP review meeting; (e) promoted IODP at international science meetings; (f) produced and distributed visual and illustrative materials; (g) developed a web page and contact list; (h) printed and distributed the ISP; and (i) coordinated and collaborated with the interim Science Advisory Structure (iSAS) Support Office in Japan. For general inquiries or to request IODP brochures, please contact the IWGSO at iwgso@brook.edu.

Educational CD-ROMs

Five thousand new copies of the popular "Mountains to Monsoons" educational CD-ROM were pressed in May 2001. Because the CD was initially produced in 1996, substantial reprogramming was necessary to ensure that the CD would function on computer operating systems in use in 2001. In addition, for the first time, the companion teacher's manual is included on the CD. The CD, which is distributed for free, is geared toward high school and undergraduate college students. Students participate in a virtual ODP cruise that explores the geologic, climatologic and oceanographic history of the Indian Ocean basin and nearby Himalayan Mountains. Students examine cores in shipboard labs and analyze data with shipboard scientists in an effort to reconstruct the tectonic history and examine the impact of plateau and mountain uplift on climate.

The second interactive educational CD-ROM produced by JOI/USSSP, "Gateways to Glaciation," has now been in distribution for one year. It has been favorably received and reviewed in a variety of publications. A teachers' manual for the CD is available at the JOI web site:

http://www.joi-odp.org

Schlanger Ocean Drilling Fellowship Program

One two-year fellowship was awarded in January 2001 to Kristen Averyt, Stanford University, for "Marine barite as a monitor of seawater Sr/Ca ratios" (DSDP Legs 32, 41, 47, 85, 86 and ODP Legs 123, 171).

JOI received twenty fellowship applications for the April 15, 2001 deadline. These are being evaluated by the USSAC Fellowship Subcommittee. Awards will be made at the July 2001 USSAC meeting.

Internship Program 2000: Legacy Project

Elizabeth "Betsy" Fish, a May 2000 Geosciences graduate of Franklin and Marshall College, joined the ODP/JOI program staff in June 2000 as the second JOI/USSSP Intern. Betsy has continued to work on the bibliographic database project that was started by JOI/USSSP's first intern, Alexandra Williamson. The project's goal is to create an information resource that can be used for a variety of purposes, including: (1) research and education; (2) public affairs; (3) an assessment of ODP against its Long Range Plan (LRP); and (4) support for IODP. After initial assessment, the next step of the project was to create a comprehensive, searchable database, which would include DSDP- and ODP-related Proceedings and non-Proceedings publications. Betsy worked with publications staff at TAMU to create a subset of GeoRef containing DSDP and ODP citations. GeoRef is an electronic database of geoscience publications maintained by the American Geological Institute (AGI). The preliminary GeoRef subset of DSDP and ODP references was posted online last fall, for review by the international ocean drilling community. In January 2001, 973 additional citations contributed by this community were submitted to AGI and are currently under review for inclusion in the revised DSDP/ODP database.

In a collaborative effort between JOI and TAMU, personnel are working to make the DSDP/ODP bibliographic database available to the public in a format that is both web-based and downloadable into a bibliographic software package such as EndNote or ProCite. For an example of the proposed format in which the DSDP/ODP Database will be displayed on the web, please see the Cold Regions Database at **http:// www.coldregions.org/dbtw-wpd/qbeform3.htm**. The initial distribution of the database, both web-based and in a downloadable format, will likely occur in August 2001. This database will be regularly updated and maintained.

Internship Program 2001: Education and Legacy Projects

JOI/USSSP will employ two interns starting in Summer 2001. Both will work on a few education and legacy projects, as well as assist with other JOI/USSSP administrative duties.

Micah Nicolo graduated from Hobart William Smith College in May 2001 with a B.S. in Geoscience and a B.A. in Political Science. He has a strong interest in ODP and plans to pursue a graduate degree in the geosciences. His science background and previous office experience in the Dean's Office at Hobart College make him well suited to the USSSP intern project. The term of Mr. Nicolo's internship is 3 months, beginning June 11, with an option to extend to 6 months if mutually agreed.

Christina Riesselman graduated from University of Nebraska-Lincoln in May 2001 with a B.A. in both Geology and English and a 4.0/4.0 GPA. Ms. Riesselman's skills in geology and writing, as well as her experience as a teaching and research assistant will aid her greatly in working on the JOI/USSSP internship project. The term of Ms. Riesselman's internship is also 3 months, beginning July 30, with an option to extend to 6.

Among other projects, the JOI/USSSP interns will develop a series of downloadable scientific presentations based on talks given by speakers in the JOI/USSAC Distinguished Lecturer Series (DLS). These presentations will be written in a narrative style -- building a story through the use of about ten color slides -- as if someone were giving a talk. These DLS resources will be made available on the JOI website for teachers to download and print for use as classroom teaching materials.

ODP Undergraduate Student Trainee Program

Stan Hammon, an undergraduate at the University of Texas at Dallas, sailed on Leg 195 as an ODP Undergraduate Student Trainee. Mr. Hammon was the second student trainee from the US and the third trainee overall to participate in the program. Jill Ann Gudding, an undergraduate at Michigan State University, has been selected to participate as a Trainee on Leg 197. Ms. Gudding will be the third US Trainee.

US student technicians from MATE sail on the JR

JOI/USSSP continues to explore partnership opportunities with the Marine Advanced Technology Education (MATE) Center (www.marinetech.org), which was established with funding from NSF's Advanced Technological Education Program. Located at Monterey Peninsula College, the MATE Center is a national collaboration of educational institutions and organizations. Two major goals of the MATE Center are to develop and improve degree programs in marine science and technology and to disseminate information about existing programs. To date, two MATE interns have sailed on the *JOIDES Resolution*, successfully serving with as interns/temporary technicians.

These students were Christopher Lernihan, Maine Maritime Academy, on Leg 189 and Gavin Eppard, Monterey Peninsula College, on a leg that sailed last summer.

"Blast from the Past" poster and collaboration with the Carolina Biological Supply Company

In February 2001, JOI printed 3000 additional copies of the "Blast from the Past" educational poster to meet ongoing demand from scientists and educators. Half of the posters were folded to make distribution easier and more economical.

The poster is performing well in field tests for potential inclusion in a curriculum program to be produced by Carolina Biological Supply Company (www.carolina.com). The program, titled "Science and Technology Concepts for Middle School," is being developed by the National Science Resources Center, which is jointly operated by the National Academy of Sciences and the Smithsonian Institution. Panel evaluation of various curriculum components is scheduled for June 12.

The Carolina video team is concluding their efforts on a pilot educational video that features USSAC's Tim Bralower presenting a talk on the Late Paleocene Thermal Maximum as part of the JOI/USSSP Distinguished Lecturer Series. Future collaboration and the taping of additional DLS speakers will depend on the success of this pilot video footage.

JOI/USSSP presence at national meetings

JOI/USSSP will provide information and support staff for scientific ocean drilling booths in the exhibit halls of three major scientific meetings in year 2001. These include the European Union of Geosciences (EUG) (Strasbourg, France, April 6-13, 2001), the International Conference on Paleoceanography (ICP) (Sapporo, Japan, September 16-21, 2001), and the fall meeting of the American Geophysical Union (AGU) (San Francisco, CA, December 10-14, 2001).

USSSP will also sponsor another annual "ODP Town Meeting" during fall AGU. The Town Meeting, which attracts several hundred attendees, has become an important event for it provides an ideal venue for exchanging information about scientific ocean drilling. At the meeting, updates are provided by community leaders on the activities of the ODP and the plans, progress, and timelines for the development of the various elements of the IODP. This event also offers an opportunity for a session of questions and answers.

JOI/USSAC Newsletter

A 16-page winter issue of the *JOI/USSAC Newsletter* was published and distributed in March 2001. It can be viewed on-line, along with past newsletters, at www.joi-odp.org/USSSP. The primary focus of this issue was to announce USSAC's endorsement of the IODP Initial Science Plan and to solicit input from the US ocean drilling community on the endorsement document. The mailing list for the newsletter includes 1981 scientists in the US and 338 non-US scientists. A summer issue is being written.

JOI/USSSP listserver and website

The JOI/USSSP email listserver, launched in May 2000, has now been in operation for a year. It has proven to be an effective way to communicate rapidly with a broad cross section of the US scientific ocean drilling community, and, to a lesser extent, the international community. The list

currently includes 1880 e-mail addresses, up from the original 1350. Most (78%) of the names on the list are US scientists, but the non-US component is growing. Since January, 2001 the listserver has been used to notify the US community about JOI/USSSP internship opportunities, the Schlanger Ocean Drilling Fellowships, the Distinguished Lecturer Series, as well as various workshop and employment opportunities. This spring, several programs (e.g., DLS, internship, fellowship) received significantly more applications than usual, and JOI attributes this to the effectiveness of the listserver. The email list is moderated at JOI to ensure that all the messages are relevant to USSSP, ODP, or other matters relevant to scientific ocean drilling. If you wish to be added to the listserver, or to distribute a message over it, please contact Elizabeth Fish at joi@brook.edu.

The USSSP component of the JOI website (www.joi-org.edu) continues to grow as an important means of providing information to the scientific ocean drilling community. Recent additions to the site include the draft document for US participation in IODP, the 2001-2002 Distinguished Lecturers Series, and the Winter 2000-2001 *JOI/USSAC Newsletter*. Maintaining, updating, and upgrading the website will continue as vital JOI/USSSP activities.

JOI/USSSP Site Augmentation proposals

Bernard Coakley (Tulane University): " Site Augmentation in Support of ODP Proposal #533: Seismic Reflection Data Acquisition over the Lomonosov Ridge", $30,992. Funding to Coakley will partially support the acquisition of multi-channel seismic profiles (and the interpretation of these data) on crossing lines over the proposed site locations in the high Arctic (near Sites LORI 1-3, connecting seismic reflection profiles AWI 91-091 and AWI 91-090) for JOIDES proposal #553 on the Lomonosov Ridge using the Swedish Icebreaker Oden. This survey, which depends on prevailing ice conditions and weather, is scheduled for July 26 to August 21, 2001. Yngve Kristoffersen (Univ. of Bergen) will be the PI for the seismic survey.

Peter deMenocal (LDEO, Columbia University): “Site Augmentation Proposal 575-Full3 Gulf of Aden Drilling: Testing African Climate-Human Evolution Hypothesis”, $30,688. Funding will support the participation (and postcruise research studies) of Peter deMenocal and a US graduate student (Christine Farmer) onboard the *R/V Pelagia* (PI, Prof. Gerold Gannsen; NIOZ, Texel, the Netherlands) during a survey cruise in the Gulf of Aden. This cruise provided additional data in support of site selection for JOIDES proposal #575-Full3; the ship sailed from Dar-es-Salam, Tanzania to Suez, Egypt (April 18 to May 7, 2001).

Results of prior JOI/USSSP Site Augmentation funding

James Zachos (University of California, Santa Cruz): "Early Cenozoic Extreme Climates: The Walvis Ridge Transect", $18,434. As previously reported, funding supported the participation (and postcruise collaborative activities) of James Zachos and a technician onboard the *R/V Meteor* during a seismic survey cruise to the Walvis Ridge (PI, Volkhard Speiss, Univ. of Bremen, Germany). This cruise provided additional data in support of site selection for JOIDES proposal #559-Full; the ship sailed from Cape Town, South Africa to Montevideo, Uruguay (January 4 to February 11, 2001).

Geoff Wheat (University of Alaska, Fairbanks): "Support for Downhole Instruments for Leg 195, Site MAF-4B", $52,207. As previously reported, funding enabled Geoff Wheat to support the preparation and deployment of instruments (e.g., refurbished thermistor string, pressure sensor/data logger package, and a continuous fluid sampler driven by an osmotic pump) needed to

establish a long-term downhole hydrogeologic observatory (CORK) during ODP Leg 195. The CORK was installed at Site 1200 on the knoll of the South Chamorro Seamount, the only known site of active blueschist mud volcanism in the world, where megafaunal assemblages are associated with serpentine/blueschist mud volcanism.

Planning Workshops

No new planning workshops were funded during the period of this report.

A draft report from the "Submerged Coral Drilling" workshop (September 23-25, 2001; St. Petersburg, FL), was submitted to JOI by Terry Quinn and Sandy Tudhope. This report (~75 pages) is being edited and prepared for printing and distribution during the summer.

A draft report from the "Workshop on Opportunities in Geochemistry for Post-2003 Ocean Drilling" (October 12-13, 2000; Tyngsboro, MA) is being prepared for submission to JOI by the workshop convenors (R.W. Murray, D. P. Schrag, and C. G. Wheat). This report should be available this summer.

Post-Cruise scientific research proposals

From January 16, 2001 to May 26, 2001, 30 post-cruise scientific research proposals were formally approved for funding by JOI/USSSP. These proposals were primarily from US participants on ODP Legs 190, 191, and 192.

Leg 190 was the first part of a two-leg program focused on the Nankai accretionary prism. Some of these USSSP proposals seek to understand the composition, origin, and role of fluids in these deforming sediments; to investigate the linkages between microbial activity and porewater geochemisty; to characterize the mechanical state, deformational behavior of sediments and hydrogeology within various zones in the prism; and to integrate drilling results with 3-D seismic reflection data.

Leg 191 USSSP proposals seek to investigate the mineralogy of thin-bedded sedimentary structures using high-resolution spectral gamma-ray logs; to characterize the microbial ecology of deep subsurface environments and explore interrelationships with geochemical factors (e.g., organic carbon flux and fluid chemistry) and sediment permeability; to evaluate the basement geochronology using $^{40}Ar/^{39}Ar$ dating; and to develop an improved understanding of thespatial/temporal distribution of volcanic ashes within this region of the NW Pacific.

Leg 192 USSSP proposals seek to understand the origin (e.g., using isotopic and geochemical characteristics of igneous rocks and volcaniclastic sediment) and structural development (using seismic data and downhole logging results) of the Ontong Java Plateau; to interpret the sedimentary and paleoceanographic history of this region (especially in the Cretaceous); and, to understanding the relative motion of this plateau in the context of the Pacific Plate.

Results symposium

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

The symposium involved 64 participants including Leg 184 scientists (ship and shore), the SCOR working group (Pinxian Wang, Steve Clemens, Luc Beaufort, Pascale Braconnot, Peter Kershaw,

Kuo-Yen Wei, and 4 others), the 8 USSSP invited speakers (details below), and 5 invited speakers from China (Yihui Ding, Tandong, Yao, Zhimin Jian, Xiangjun Sun, and Zhisheng An). All participants submitted abstracts prior to the meeting. These were compiled into a volume titled, "ODP 184 Post-Cruise Meeting and Asian Monsoon Symposium, Program and Abstracts (May 7-11, 2001) Beijing," which was provided to all participants at the meeting.

During the three-day meeting there were 19 oral presentations and poster sessions. The talks integrated the physical oceanography/meteorology with the geological data (ice core, terrestrial, ocean sediments) and modeling efforts. In honor of the symposium, *Marine Geology* has recently approved a special publication of 360 pages titled “Asian Monsoons and Global Linkages on Milankovitch and Sub-Milankovitch Timescales.” The guest editors will be Clemens, Wang, and Prell and the manuscript submission deadline is August 31, 2001. Seven speakers have agreed to contribute manuscripts, the remaining space will be filled by SCOR WG members and Leg 184 contributions.

Supported speakers and topics:

Bin Wang - Variability of the Asian summer-monsoon - Critical roles of the monsoon-ocean interaction

Lonnie Thompson - Tropical ice core records, compelling evidence for asynchronous glaciations on Milankovitch timescales.

Kam-Biu Liu - Century to millennial-scale variability of the Asian monsoons: Evidence from Tibetan ice cores and lake sediments

Gifford Miller - Climate forcing of the australian summer monsoon derived from a 150,000 year record from lake Eyre, and paleoclimate modeling experiments

Chris Charles - Competition between the monsoon and ENSO in a network of Pacific, Indian, and Southeast Asian coral records spanning the last several centuries.

Brad Linsley - Paleoceanography of the Sulu Sea

David Rea - North Pacific deposition of Asian dust: An oceanic record of continental climate

John Kutzbach - Climate model simulations of orbital and tectonic climate variations of the South China Sea

Distinguished Lecturers Series for 2000-01

Over the past academic year (2000-2001) the following DLS lecturers have given talks at the institutions listed below. We note that most lecturers volunteer to give more than the four requested lecturers. We applaud the generosity of the lecturers. The series continues to be popular and successful.

Timothy Bralower, University of North Carolina, Chapel Hill

“It was the Best of Times, it was the Worst of Times”: Biotic Consequences of the Late Paleocene Thermal Maximum”

February 1, 2001	Boston College, Boston, MA
February 16, 2001	Florida International University, Miami, FL
February 27, 2001	Western Washington University, Bellingham, WA

March 1, 2001	Bringham Young University, Provo, UT
March 8, 2001	Elizabeth City State University, Elizabeth City, NC

Eugene Domack, Hamilton College

"Late Quaternary Sedimentation in Antarctica's Palmer Deep"

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

Martin Fisk, Oregon State University

"Microbes beneath the Ocean Floor and the Possibility of Extraterrestrial Life"

September 13, 2000	Vassar College, Poughkeepsie, NY
October 13, 2000	Iowa State University, Ames, IA
October 19, 2000	Muskingum College, New Concord, OH
March 2, 2001	Louisiana State University, Baton Rouge, LA
March 5, 2001	5 Colleges Coastal & Marine Sci. Prog, Northampton, MA
March 6, 2001	University of Rhode Island (paid by URI)
March 7, 2001	National Science Foundation, Arlington, VA

Gary Karner, Lamont-Doherty Earth Observatory

"The Paradox of Low-Angle Crustal Faulting and Rupturing of Continents"

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

Delia Oppo, Woods Hole Oceanographic Institution

"Millennial Scale Climate Variability in the North Atlantic"

March 24, 2001	University of South Florida, St. Petersburg, FL
April 25, 2001	Central Connecticut University, New Britain, CT
October 27, 2000	Middlebury College, Middlebury, VT
November 9, 2000	University of Pennsylvania, Philadelphia, PA

John Tarduno, University of Rochester

"Motion of the Hawaiian Hotspot During Formation of the Emperor Seamounts"

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

Distinguished Lecturers Series for 2001-02

JOI/USSSP received one hundred applications for DLS lecturers this year – the highest number ever. The lecturers and the venues for talks in the 2001-2001 academic year have been identified.

They are listed below and in the attached map. JOI is now working with the speakers and the respective institutions to determine the dates of the individual lectures.

Robert Dunbar, Stanford University:

"Southern Ocean Impacts on Global Climate: Clues from the Antarctic Margin"
Portland State University - Portland, OR
Columbus State University - Columbus, GA
Duke University Marine Lab - Beaufort, NC
SUNY at Albany (co-hosted with RPI) - Albany, NY
SUNY at Stonybrook - Stonybrook, NY

David Hodell, University of Florida

"Late Pleistocene Evolution of the Ocean's Carbonate System: A Serendipitous Result From ODP Leg 177"
Northwestern University - Evanston, IL
University of Nebraska - Lincoln, NE
University of California - Santa Barbara, CA
Woods Hole Oceanographic Institution - WHOI, MA
Salem State University - Salem, MA

Steven Holbrook, University of Wyoming

"Methane Hydrates: Boon or Bane?"
University of Colorado - Boulder, CO
University of Miami - Miami, FL
University of California - Santa Cruz, CA
Texas A&M University - College Station, TX
Montana Tech - Butte, Montana

John Mahoney, University of Hawaii

"The Nature, Origin, and Fate of a Giant Oceanic Plateau: Ontong Java Plateau"
College of Charleston - Charleston, SC
New Mexico State - Las Cruces, NM
University of Texas - Arlington, TX
Trinity University - San Antonio, TX
University of Wyoming - Laramie, WY

Lisa Tauxe, University of California – San Diego

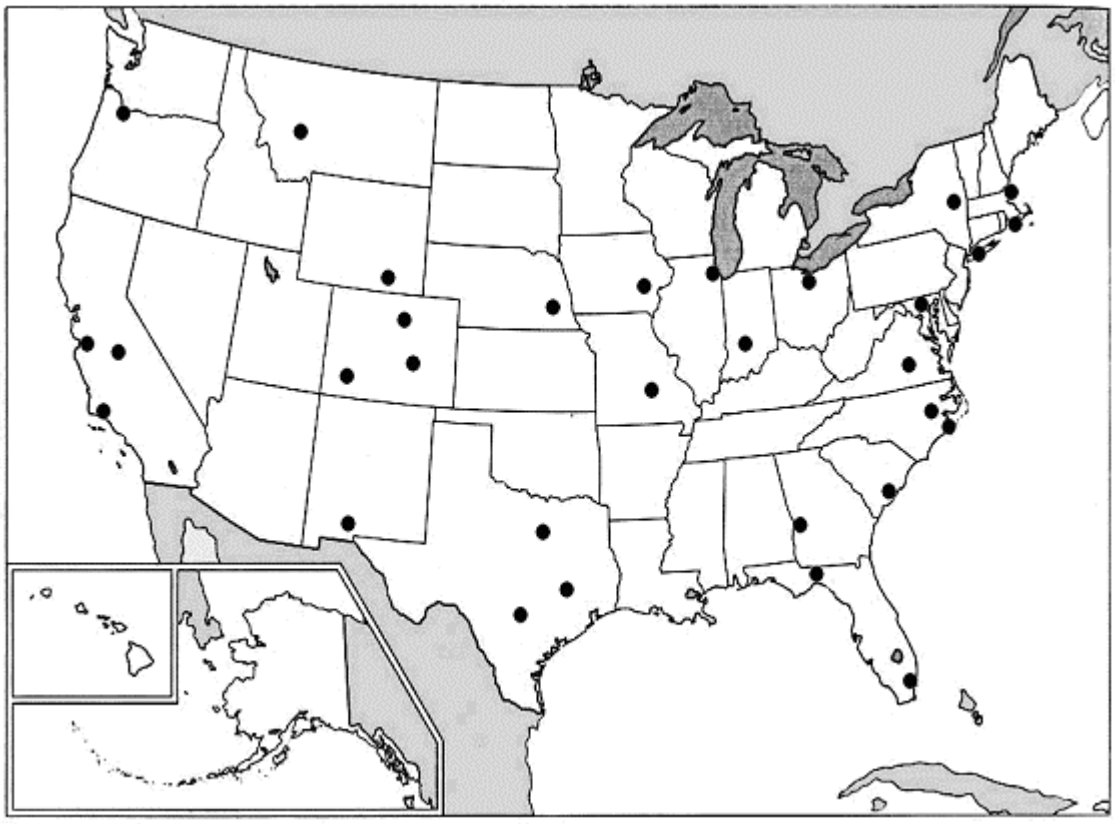
"Hunting the Earth's Magnetic Field"
Florida State University - Tallahassee, FL
Oberlin College - Oberlin, OH
Indiana University - Bloomington, IN
Colorado College - Colorado Springs, CO
Fort Lewis College - Durango, CO

Michael Underwood, University of Missouri

"Subduction Zone Megathrusts: Why Stratigraphy and Sedimentology Matter"
Johns Hopkins University - Baltimore, MD
Virginia Tech - Blackburg, VA
East Carolina University - Greenville, NC
University of Iowa - Iowa City, IA

University of Missouri-Rolla - Rolla, MO
California State University - Fresno, CA

Map showing the locations of the JOI/USSSP DLS presentations in academic year '01-'02



5. Review of Membership Status

5.1 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 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, 1 abstention (Mével), 1 absent (Nowell).

5.2 ECOD

22 May, 2001

Dr. Christopher Harrison
Chair, JOIDES EXCOM
Rosenstiel School of Marine and Atmospheric Sciences
University of Miami
4600 Rickenbacker Causeway
Miami, FL 33149
U.S.A.

Dear Chris,

This letter intends to satisfy Items 2 (a-c) of EXCOM Motion 98-2-8, regarding annual revision of country status for ODP membership.

The ESF-Consortium for Ocean Drilling (ECOD) is meeting these EXCOM requirements as follows:

Item 2 (a) -Contribution must be equal to or greater than 5/6 of full membership:
ECOD contributes at 99.5% of full membership, hence ECOD contribution for current year is greater of 5/6.

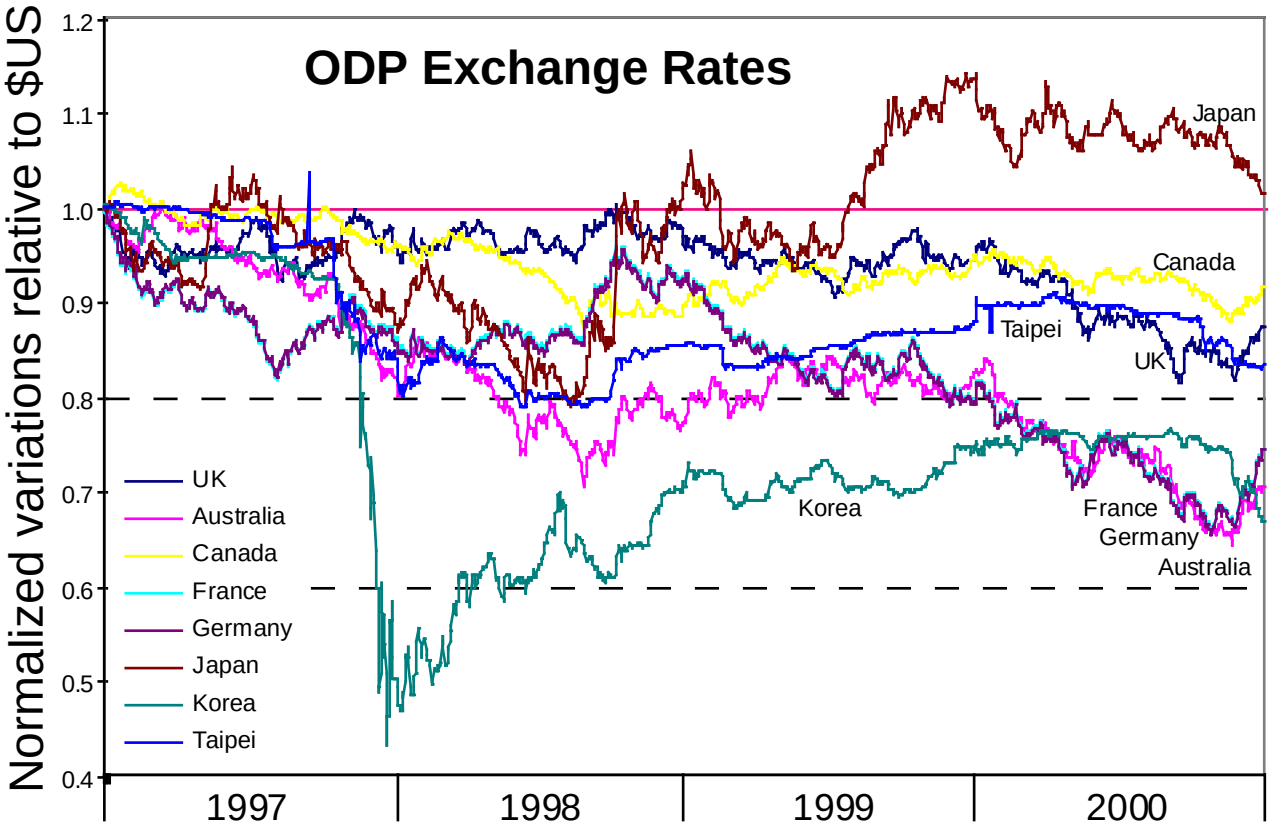
Item 2 (b) -They must make a firm commitment to work towards full membership:
ECOD makes a firm commitment to work towards full membership before ODP end. The status of ECOD membership, individual country's effort towards increasing their quota, and ECOD possibilities to recruit new members are common points of debate at our management meetings. Ongoing contacts with Austria are looking toward this country as a potential new partner to the Consortium. Austrian representatives are being invited to attend EMCO and ESCO meetings as observers, should they so wish.

Item 2 (c) -They must make significant progress towards achieving full membership each year:
This year ECOD had made some progress towards achieving full membership. Their contribution was increased from 99.1 % in 2000 to 99.5 % for year 2001. Furthermore, it is to note that ECOD is paying to ODP significant increased amounts in their own currencies due to a rising US dollar with respect to the Euro. ECOD hopes this circumstance would also be appreciated by the US-ODP community

Sincerely.
Menchu Comas
ECOD EXCOM representative.

5.3 Pacific Rim Consortium

A PacRim Consortium Board meeting was held during the Taipei port call, 4 May, 2001. It was determined that the prospects for increased funding for ODP are slim. Canada and Australia have needed to find additional funds (in their own currencies) to pay their existing 1/3 contributions. Korea ODP has submitted a proposal to be a 1/6 member, for which a final decision will be made this September. All PacRim countries have seen their currencies devalued, relative to the US dollar, particularly since the beginning of 1997. Hence, we are all paying more for our membership, yet are making no headway in improving the level of our partial membership.



The PacRim Secretariat Office will move from Sydney (Australia) to Halifax (Canada) on 1 January, 2002. At that time, PacRim panel assignments will change, so that lead positions will go to Australia for EXCOM and SSP, Canada for SCICOM, TEDCOM, ISSEP and PPSP, Taipei for ESSEP, and Korea for SCIMP. The new PacRim EXCOM member will be Trevor Powell or AGSO.

15 February, 2001

Dr. Christopher Harrison
Chair, JOIDES EXCOM
Rosenstiel School of Marine and Atmospheric Sciences
University of Miami
4600 Rickenbacker Causeway
Miami, FL 33149
U.S.A.

Dear Chris,

With regard to the requirements of EXCOM Motions 98-2-8 and 99-1-4, PacRim continues to meet the financial requirement of 5/6 of a full membership. If you scan the June 2000 and February 2001 PacRim country reports, you will see that efforts are still in progress by Korea to increase funding to a 1/6 level. In Canada, there has been no increase from its 1/3 contribution to membership, but considerable lobbying and letter writing in early 2000 averted a further erosion of funding that seemed inevitable because of a decline in the value of the Canadian dollar relative to the US dollar. Both Australia and Canada are paying significantly increased amounts in their own currencies due to a rising US dollar. I do not think the implications of the strength of the US dollar are appreciated by the US community. Both Canada and Australia have been struggling to maintain their 1/3 level in the face of this problem. Australia has only ever had a 1/3 membership and realistically this is seen as an appropriate level by our colleagues in Australia.

The letter-writing campaign in Canada failed to identify new funding sources, and the present funding agencies are collectively unprepared to add to their contribution (seen from their perspective as already increasing as the US dollar rises). The situation in Australia is much the same. In 2000, overtures were made by PacRim toward India as a potential addition to the consortium, but this has borne no fruit.

Short of finding additional consortium partners at this late stage in ODP, the prospect of exceeding a 5/6 membership before September 2003 seems remote at best. In fact, the focus of discussions with funders in Canada and Australia has now shifted to IODP participation, with its higher membership fee. Likewise, the energies of those scientists in our countries who are committed to scientific ocean drilling must be targeted to the difficult task of securing a high level of IODP involvement. Unfortunately, this makes it difficult to advance a successful case to our funding agencies for additional membership contributions to ODP. Ironically, Canadians are more optimistic about full participation in IODP than augmented funding for ODP because we will have access to funding for new programs that we can't approach for the current program.

To summarize, (1) we have "achieved contributions equal to or greater than 5/6 of a full membership", (2) against a backdrop of a strong US dollar, certain of our consortium partners continue "to work toward full membership" by requesting increased support from funding agencies, but (3) we have not "made significant progress toward full membership during the past year", at least not in terms of US dollar contributions.

Sincerely,

Richard Hiscott
PacRim EXCOM representative

cc. PacRim Secretariat Office (Sydney), T. Powell, E. Boston, R. Riddihough, K-Y Wei, H-C Han, YH Kwak.

6. Management and Operations Reports

6.1 ODP Council

The ODP Council will meet on Saturday, 30 June following the EXCOM meeting. The agenda will include presentations by JOIDES and JOI on: 1) Scientific accomplishments and plans; 2) Program operations; 3) Status of JOIDES membership; 4) Phase-down planning including scientific legacy documentation; and 5) Concluding remarks on the PEC-V report. Additional Council discussions will include member discussions on phase-down planning and its relation to IODP plans which will have been presented at the IWG meeting in Ottawa (12-13 June). Finally, the Council will discuss recent ODP audits.

6.2 NSF Management Report

The FY 2001 ODP Program Plan (1 October 2000 to 30 September 2001) was increased in late December to a level of level of $46,521,644. These funds are expected to support contract operations through leg 198, including initial costs for leg 199 which spans the FY 2001 – FY 2002 transition. The budget has been increased above the original $46.1M target for 2001 to provide initial support for planning long-term ODP data archiving, transitioning of the JANUS data base system to IODP, and to account for increased ODP fuel costs and NSF direct purchase of fuel at recent Guam port calls. Funding of the Program Plan is complete through mid July, with timely funding of the remaining budget contingent on timely payment of international membership fees. Contributions by all partners are expected to be consistent with schedules identified in MOUs, though China has notified NSF of a possible delay in payment due to governmental fiscal reform. NSF will supply approximately 64% of Program Operations costs for FY 2001 with the remaining 36 % to be provided by international contributions.

NSF has provided JOI with a target budget of $46.1 million for FY 2002 operations. Within this budget, fuel for the JOIDES Resolution is to be budgeted at no less than $250/metric ton. If the average cost of fuel exceeds this level during 2002, NSF will be prepared to consider a request for additional resources. EXCOM will review and approve the 2002 Program Plan at this meeting.

The present funding approval from the National Science Board of NSF for the prime contract to JOI will terminate at the end of 2002. NSF has instructed ODP managers to prepare a multiyear Program Plan which will cover the final year of ODP operations (2003) and phase-out of contractor activity (2004-2007). The formal version of this plan will be due at NSF on 1 March 2002, will be merit reviewed in the Spring and considered by the National Science Board in the Summer of 2002. It is expected that the contract phase-down plan will be consistent with the JOIDES recommendations and plans for termination of the ODP. NSF expects the plan to reflect the following considerations:

-- Continuation of the strong scientific program which has characterized the ODP to date, with drilling and logging operations maximizing use of the JOIDES Resolution in 2003, but allowing sufficient time to meet all subcontract requirements (vessel and logging) for complete demobilization prior to the end of FY 2003. A provisional target budget of $45M has been identified for 2003 based on this plan. Initial out-year budgets (2004-2007) have been identified based on JOIDES and contractor planning and will be subject

to yearly re-negotiation.
-- An orderly termination and phase-down of operations, including completion of the legacy documentation identified by JOIDES.
-- Continuation of good business practice in contract and program management that have characterized ODP to date.
-- Continuation of operationally and environmentally safe procedures and practices.
-- Preservation of ODP scientific and physical assets.
-- Orderly phase-down of personnel assets.

To the extent possible it is expected that the responsibility for ODP scientific and physical assets will be transferred to appropriate IODP contractor organizations as required.

6.3 JOI

6.3.1 JOI response to EXCOM Motions

Motion 01-1-4: That the Board ratifies the essence of the following JOIDES EXCOM motion, in draft form, from their January 29-30, 2001 meeting, but adds the following statement in doing so. "Because of limited funds and human resources, JOI will look for cost effective implementation but cannot look at all alternatives or contingencies."

EXCOM Motion 01-1-3: EXCOM acknowledges the initial planning done by JOI and its subcontractors to prepare for the winding down of ODP from FY03 through FY07. EXCOM recognizes that detailed project planning is now needed to ensure that no gaps or overlaps occur during the lead-up to and phase out. EXCOM requests JOI to continue to develop the phase-out project plan, including contingencies and options for most cost-effective implementation, and report again in June 2001.

EXCOM: Falvey moved, Mutter seconded; 14 in favor, 1 absent (Kent).

BoG: Novell moved, Prior seconded; 11 in favor, 2 abstained (Kent, Harrison), 1 absent (Pisias)

Motion 01-1-8: That the Board ratifies the essence of the following JOIDES EXCOM motion, in draft form, from their January 29-30, 2001 meeting, but adds the following statement in doing so, "Because of limited funds and human resources, JOI will develop a budget and a plan to create a new "Greatest Hits" document but will implement the plan only if and when appropriate resources become available."

EXCOM Motion 01-1-8: EXCOM: EXCOM requests that JOI provides necessary support to develop a "Greatest Hits" document during the current calendar year. The JOIDES Office will work with the ODP members in the selection of these topics and oversight will be provided by the JOIDES Public Affairs Committee. The SCICOM Achievements and Opportunities document will be a valuable resource for their effort. The target audience includes the public, Congressmen and Ministers.

EXCOM: Orcutt moved, Prior seconded; 15 in favor

BoG: Orcutt moved, Nowell seconded, 13 in favor, 1 absent (Pisias)

6.3.2 Legacy plans

EXCOM Motion 00-2-5: EXCOM requests SCICOM to develop an ODP legacy that includes, among other things, the following:
* list of ODP's greatest hits,
* database of publications related to ODP results, as already begun by JOI and TAMU,
*written documentation from SCICOM, the SSEPs, and other panels about major ODP-related results, by field, to accompany the list of greatest hits and the publications database,
* a description of major technical developments, from TEDCOM with help from LDEO and TAMU,
* a reply to the question "How well did ODP do in answering the questions originally asked?"

This study should consider all phases of ODP *(i.e.*, it should extend back to COSOD 1). EXCOM would like to receive a draft report on the ODP legacy at its June 2001 meeting.
Harrison moved, Comas seconded; 14 in favor, 1 absent (Raleigh).

EXCOM Motion 01-1-3: EXCOM acknowledges the initial planning done by JOI and its subcontractors to prepare for the winding down of ODP from FY03 through FY07. EXCOM recognizes that detailed project planning is now needed to ensure that no gaps or overlaps occur during the lead-up to and phase-out. EXCOM requests JOI to continue to develop the phase-out project plan, including contingencies and options for most cost-effective implementation, and report again in June 2001.
Falvey moved, Mutter seconded; 14 in favor, 1 absent (Kent).

EXCOM Motion 01-1-4: EXCOM acknowledges preliminary plans made by JOI and its subcontractors for the maintenance of ODP and JANUS databases, core repositories and other ODP legacies after ODP ends. EXCOM recognizes that detailed planning will be a continuing activity as new types of observations and measurements are made, and encourages JOI to develop up-to-date plans for this activity and to make regular reports to EXCOM.
Beiersdorf moved, Detrick seconded; 14 in favor, 1 absent (Kent).

EXCOM Motion 01-1-8: EXCOM: EXCOM requests that JOI provides necessary support to develop a "Greatest Hits" document during the current calendar year. The JOIDES Office will work with the ODP members in the selection of these topics and oversight will be provided by the JOIDES Public Affairs Committee. The SCICOM Achievements and Opportunities document will be a valuable resource for their effort. The target audience includes the public, Congressmen and Ministers.
Orcutt moved, Prior seconded; 15 in favor.

Draft SCICOM Report on the ODP Legacy

Introduction

This is the draft report requested by EXCOM in their Motion 00-2-5 for review at the June 2001 EXCOM meeting.

This report must be considered "draft" or interim for at least two reasons:
(1)The "ODP legacy" will continue to evolve * and cannot be assessed in full * until well after the end of ODP drilling in 2003.
(2) Some of the specific initial steps described in SCICOM or EXCOM motions following on the above motion are on timetables for completion after the June 2001 EXCOM meeting.

Below we summarize progress towards each of the 5 specific requests in the EXCOM Motion 00-2-5 above. But first we review the actions taken at the August 2000 SCICOM and January 2001 EXCOM meeting, to place the progress reports in context.

August 2000 SCICOM Actions

Following EXCOM Motion 00-2-5, there was extensive discussion at the August 2000 SCICOM, at which a plan of response was developed in the following three motions:

SCICOM Motion 00-2-12: SCICOM strongly endorses the activities of TAMU and JOI in assembling a database of publications related to ODP. We further encourage them to make this database searchable (e.g., by index terms, geological age, and geographic region). We recognize the current lack of allocated resources for these activities, and we encourage their financial support.

Miller moved, D'Hondt seconded; 15 in favor.

SCICOM Motion 00-2-13: SCICOM recommends that TEDCOM and SciMP, together with TAMU and LDEO/BRG, prepare a one-page summary for each tool (including drilling, coring, logging, and other measurement tools) developed by or for the ODP community, emphasizing how the tool contributed to the scientific results of the program. These summaries could serve as appendices to operational manuals and as a basis for compiling a technical reference document for the ODP legacy.

Miller moved, Coffin seconded; 15 in favor.

SCICOM Motion 00-2-14: SCICOM endorses the following plan for preparing an ODP legacy document entitled *Achievements and Opportunities of Scientific Ocean Drilling*.

Outline

I. Dynamics of Earth's Environment

A. Earth's Changing Environment
1. Rapid climate change
2. Extreme climates
3. Climate response to orbital forcing
4. Causes and effects of sea-level change
5. 180 million years of ocean history

B. Sediments, Fluids, and Bacteria as Agents of Change
1. Sediment processes and budgets
2. Fluids in sediments and rocks
3. Formation of gas hydrates
4. Deep biosphere

II. Dynamics of Earth's Interior

A. Transfer of Heat and Material from Earth's Interior
1. Mantle and core dynamics
2. Ocean crust and mid-ocean ridge processes
3. Hydrothermal and sulfide mineral processes
4. Subduction factory

B. Lithosphere Deformation and Earthquake Processes
1. Passive continental margins and rift environments
2. Convergent margins and collisional settings
3. Earthquake mechanisms

Contents

Executive summary 5 pages

Short summaries of achievements for sixteen sub-themes 4-5 pages each
- Introduction or statement of scientific issues and challenges 1 page
- Bullets summarizing achievements and opportunities 1-2 pages
- Summary of goals met 1 paragraph
- Summary of future opportunities 1 paragraph

List of greatest hits (from bullets)

Timeline

SCICOM Chair invites Editorial Review Board (ERB)	1 September 2000
ERB and SCICOM Chair invite authors	1 October 2000
Authors and ERB compile bullets and circulate among community	Fall 2000
Authors and ERB compile final bullet list	1 February 2001
ERB provides final bullet list to SCICOM	1 March 2001
Completion of short summaries	1 May 2001
Executive summary and excerpt of greatest hits	1 June 2001

Moore moved, Rea seconded; 14 in favor, 1 abstained (Shipley).

January 2001 EXCOM Action

After presentation of a status report on activities based on the above three SCICOM motions, discussion at the January 2001 EXCOM turned toward the need for timely one-page ODP "Greatest Hits" documentation, as reflected in the following motion:

EXCOM Motion 01-1-8: EXCOM: EXCOM requests that JOI provides necessary support to develop a "Greatest Hits" document during the current calendar year. The JOIDES Office will work with the ODP members in the selection of these topics and oversight will be provided by the JOIDES Public Affairs Committee. The SCICOM Achievements and Opportunities document will be a valuable resource for their effort. The target audience includes the public, Congressmen and Ministers.

Orcutt moved, Prior seconded; 15 in favor.

This motion was modified by the JOI BOG before ratification, reflecting concerns about the budgetary implications for providing the "necessary support."

May 2001 Status Report

The first, third, and fifth items in EXCOM Motion 00-2-5 are inter-related with the SCICOM Achievements and Opportunities document, so first we consider the more specific and independent second and fourth items in the EXCOM motion.

I. "A database of publications related to ODP results"

As noted in EXCOM Motion 00-2-5, this had already been "begun by JOI and TAMU." As noted in SCICOM Motion 00-2-14, SCICOM strongly approved of the effort by JOI and TAMU, but noted that this was moving forwarded without some of the necessary budgetary support. More specifically, the support considered necessary was the funding (order $30k) to make the database widely available and updatable via AGI services. This issue was revisited at the March 2001 SCICOM meeting for possible prioritization if funds become available in the FY2001 or FY2002 budgets. At the time, JOI indicated that they should be able to find the funding within existing budgets, and if not, would revert to SCICOM for prioritization. Hence, the publication database effort should come to full fruition soon, with specific details to be provided in the JOI and TAMU reports.

II. "A description of major technical developments"

SCICOM Motion 00-2-13 requested that TEDCOM and SCIMP work with ODP-TAMU and BRG to produce one-page summaries of major technical achievements, and also noted that these summaries could also be included in the more detailed operational/technical manuals that will also form a key part of the ODP legacy. Hence, two efforts are now underway: a shorter-term effort to produce the one-page documents in 2001, and a longer-term effort by the drilling and wireline contractors to compile full technical documentation by the time ODP ends. The short-term effort was revisited at the March 2001 SCICOM meeting, at the request of TEDCOM, to clarify the timeline and format. Agreement was reached on the format for the one-page summaries and a timeline of six months, with presentation of the one-page summaries for final approval at the August 2001 SCICOM meeting.

III. "Written documentation from SCICOM, the SSEPs, and other panels about major ODP-related results"

III.A "Achievements and Opportunities of Scientific Ocean Drilling"

SCICOM Motion 00-2-14 planned a scholarly effort to summarize the scientific legacy of ODP, in a special issue of JOIDES Journal organized according to the themes set out in the ODP Long-Range Plan. The motion sets out an ambitious timeline intended to culminate in publication of the special issue in June of 2001. As reported at the January 2001 EXCOM and March 2001

SCICOM, the actual implementation schedule has slipped behind, owing largely to delays by the volunteer authors in submitting first their abstracts and currently their initial drafts. Repeated appeals were emailed to authors throughout the spring, and it appears that at least half, hopefully a majority, of the submissions will be in hand by the time of the June 2001 EXCOM meeting. If this is the case, the editorial board and JOIDES Office will make publication of the special issue by early fall a top priority. The following is a more detailed update on the status of the issue as of end of May 2001:

Achievements and Opportunities - Status Report, June 2001 EXCOM
(* = initial draft submitted as of end of May)

Editorial Review Board: W. Hay, K. Becker (overall editors)
L. Peterson, H. Elderfield, C. Mevel, J. Tarduno (section editors)

Authors:
I. Dynamics of Earth's Environment
A. Earth's Changing Environment (L. Peterson)
1. Rapid climate change (J. Kennett and L. Peterson)
2. Extreme climates (D. Kroon)
3. Climate response to orbital forcing (R. Zahn) *
4. Causes and effects of sea-level change (K. Miller)
5. 180 million years of ocean history (T. Bralower) *

B. Sediments, Fluids, and Bacteria as Agents of Change (H. Elderfield)
1. Sediment processes and budgets (D. Piper)
2. Fluids in sediments and rocks (A. Fisher) *
3. Formation of gas hydrates (E. Suess)
4. Deep biosphere (S. D'Hondt)

II. Dynamics of Earth's Interior
A. Transfer of Heat and Material from Earth's Interior (C. Mevel)
1. Mantle and core dynamics (K. Suyehiro)
2. Ocean crust and mid-ocean ridge processes (J. Pearce) *
3. Hydrothermal and sulfide mineral processes (S. Humphris) *
4. Subduction factory (T. Plank)

B. Lithosphere Deformation and Earthquake Processes (J. Tarduno)
1. Passive continental margins and rift environments (H.-C. Larsen) *
2. Convergent margins and collisional settings (C. Moore and E. Silver) *

Production Timeline:

ERB finalized	October, 2000
Authors invited	9 November, 2000
Outline to JOIDES Office	last one submitted February
Draft article submission deadline	7 submitted as of 31 May
Final version	1 August, 2001?
Volume to printer	end of summer?

III.B Other written documentation

Once the "Achievements and Opportunities" document is completed, and probably after the final year of ODP is scheduled in August 2001, SCICOM will be in a position to devote serious effort, along with the SSEPs, in producing or coordinating other written documentation of ODP results. The generic model briefly discussed at SCICOM and SSEPs is thematic volumes, probably produced as special issues of journals or special publications of organizations like AGU and GSA. In fact, there are several notable examples of such thematic volumes already in the works, thanks to the independent effort s of devoted ODP scientists. These include a special GSA publication in 2001 on recent results in ocean crust and ophiolites " Ophiolites and Oceanic Crust: New Insights from Field Studies and the Ocean Drilling Program" edited by Yildirim Dilek, a volume which is strongly dependent on ODP results and specifically cites ODP in the subtitle. Another example is a planned AGU or Cambridge University Press monograph on the hydrogeology of the oceanic lithosphere, organized by Earl Davis and Harry Elderfield , and aimed at publication in 2002. This follows a 1998 workshop co-sponsored by USSSP and ILP, which strongly endorsed the role of ocean drilling in investigating subseafloor hydrogeological processes, and it is likely that the planned monograph will also strongly emphasize ODP results.

At the May 2001 SSEPs meeting, once the final reviews of ODP proposals under consideration for FY2003 scheduling were completed, considerable enthusiasm was expressed for a continuing role of the SSEPs in documenting the ODP legacy, specifically by SSEPs' members organizing thematic volumes. (This contrasts with the report at the January 2001 EXCOM of a more lukewarm reception at the November 2000 SSEPs, when the panels were still in the throes of evaluating the final surge of ODP proposals.) At the November 2001 joint SSEPs/iSSEPs meeting, documenting the ODP legacy by thematic publications will be the principal item for discussion in the JOIDES SSEPs session.

IV. "A list of ODP's greatest hits"

New efforts at producing a list of ODP's greatest hits have been held back by two factors: First, implicit in the SCICOM plan for the Achievements and Opportunities volume is an effort by the editorial board to assemble a list of greatest hits from the thematic contributions. This has been delayed until a majority of the contributions are submitted, but is expected to begin in earnest in June of 2001. Second, the JOI BOG amendment to EXCOM Motion 01-1-8 has impacted JOI's efforts to supply "necessary support" for the requested effort. Nevertheless, there has been progress recently in the form of the most essential "necessary support," i.e., qualified personnel. Elspeth Urquhart, International Liaison in the JOIDES Office and a JOI employee, is now in residence at the JOIDES Office and has taken on the specific assignment outlined in the EXCOM motion. In addition, JOI has now hired a science writer, who will also work on assembling the greatest hits.

And there have been other recent efforts in compiling ODP's greatest hits which can be utilized. Under the JOIDES umbrella, the IPSC working group for the IODP Initial Science Plan compiled a comprehensive list of greatest hits in the ISP. One working plan is to draw on each of these ISP greatest hits, and add one or two compelling illustrative figure(s) and a few key, representative citations, thereby producing one-page "Greatest Hits" as requested in the EXCOM motion. Another plan is to update the collection of still-unpublished one-page abstracts assembled in producing the 1997 USSSP-supported "Greatest Hits" pamphlet. There may still be budgetary issues involved, if publication in glossy paper format is required**.**

V. "How well did ODP do in answering the questions originally asked?"

Again, this effort is partly tied to receipt of contributions to the "Achievements and Opportunities" document. Specifically, it will fall to the editorial board to briefly address this question when synthesizing and summarizing the contributions. Such an effort will begin in June of 2001, when a majority of the contributions will have been received. In this effort, the editorial board will certainly draw on the ODP hits and IODP opportunities highlighted in the IODP ISP. If space limitations in the "Achievements and Opportunities" special issue of JOIDES Journal do not allow this question to be fully addressed, an expanded discussion will be included with any "Greatest Hits" documentation produced in the coming year.

6.3.3 Plan for producing ODP Final Report, including contents, writing responsibilities, and timeline for completion (EXCOM Motion 00-2-3)

EXCOM Motion 00-2-3: EXCOM accepts the Initial Report on ODP-IODP Transition Planning. This report raises a number of important issues and provides a very useful framework for planning the phase-out of ODP and the establishment of IODP. EXCOM thanks John Orcutt, JOI and its subcontractors, and other members of the JOIDES community who assisted in preparing this document. Given the importance of addressing in a timely manner the many unresolved issues related to the ODP-IODP transition, EXCOM requests the following actions.
For review at the January 2001 EXCOM meeting:
-- JOI will prepare a draft phase-out plan for ODP management and operations,
-- JOI and the JOIDES Science Advisory Structure will develop options for the long-term maintenance of the ODP database, JANUS database, core repositories, and other ODP legacies.
For review at the June 2001 EXCOM meeting:
-- SCICOM will develop a draft phase-out plan for the JOIDES Science Advisory Structure,
-- JOI will develop a plan for producing an ODP final report, including an outline of the contents of the report, defined writing responsibilities, and a timeline for completing it.

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

(Please, see 6.6.3 for “Draft plan for phasing out JOIDES Science Advisory Structure”)

6.4 ODP Operations

Review of Activities
December 2000 through May 2001

Executive Overview

The last eight months of operations and service delivery by the Science Operator have been very successful. Although the Program faced a serious financial crisis during the first quarter of FY01 when prices for marine fuel escalated to historically high levels, NSF provided financial relief allowing the Program to proceed with implementation of the FY01 science plan without modification and with great success.

Legs 193, 194 and 196 all presented significant challenges in terms of difficult drilling conditions and/or complex operational requirements. All three legs reached or exceeded their scientific goals. In addition, two new drilling tools were successfully tested on Legs 193 and 194 and the application of these tools in the future will enhance the scientific results on hard rock legs. On Leg 193, the Hard Rock Reentry System (HRRS) was successfully tested at two sites. Not only did these tests demonstrate that this new hydraulically activated hammer system functioned effectively in a deep water marine environment, but the HRRS successfully emplaced two casing strings in unstable formations stabilizing the hole and permitting hole objectives to be met. On Legs 193 and 194, the new Advanced Diamond Core Barrel (ADCB) was deployed for the first time in hostile geologic conditions and successfully increased core recovery rates when compared to our conventional cutting tools, the Extended Core Barrel and the Rotary Core Barrel. Moreover, on Leg 195 the operations team installed a CORK at 266 meters below the sea floor in a serpentinite diapir positioned along the Mariana subduction zone and deployed a seismometer package 580 m below the sea floor in the Philippine Sea. Excellent management of time during these complex installations saved close to 72 hours making it possible to successfully achieve an additional highly ranked paleoceanographic objective in the Okinawa Trough.

In addition to these operational successes there are other indicators that the Program remains vital. Application pressure for scientific births on the ship for upcoming legs remains high. The number of site visitors to the ODP/TAMU web site has increased by 55% in the last year (364% since October 1998) and is now at 50,000 visits/month. Operational innovations on the ship continue to be advanced and include continued improvements made in the microbiology laboratory in preparation for Leg 201 and 204, the implementation of digital photography, and installation of new servers that have increased the speed, versatility and reliability of the shipboard network.

At ODP/TAMU we are witnessing an increase in the rate of staff turnover as staff react to the recognition that ODP will cease operations in September 2003. However, the rate is manageable and our staff remains dedicated to making every attempt to maintain our excellent standard of science service delivery.

Introduction

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

Science Services

Schedule of Science Operations for the *JOIDES Resolution*: January, 2001 – November, 2002

	Leg	Port (Origin)[†]	Dates [▫]	Total Days (port/sea)	Days at Sea (transit/on site)	TAMU Contact	LDEO Contact
194	Marion Plateau	Townsville	6 January - 5 March '01	58 (5/53)	13/40	P. Blum	H. Delius
195	Mariana/West Pacific Ion	Guam	5 March – 3 May '01	59 (5/54)	8/46	C. Richter	S. Barr
196	Nankai II [*]	Keelung	3 May – 2 July '01	60 (5/55)	9/46	A. Klaus	S. Saito
197	Hotspots	Yokohama	2 July – 28 August '01	57 (5/52)	17/35	D. Scholl	F. Einaudi
198	Shatsky Rise	Yokohama	28 August – 24 October '01	57 (5/52)	17/35	M. Malone	TBN
199	Paleogene Pacific	Honolulu	24 October – 17 December '01	54 (5/49)	13/36	C. Escutia	P. Fothergill
200	H_2O Observatory	Honolulu	17 December – 31 January '02	45 (5/40)	12/28	G. Acton	Y. Sun
201	Peru Biosphere	Mazatlan	31 January – 2 April '02	61 (5/56)	21/35	J. Miller	TBN
202	SE Paleoceanography	Valparaiso	2 April – 1 June '02	60 (5/55)	20/35	P. Blum	U. Ninnemann
203	Costa Rica	Panama City	1 June – 31 July '02	60 (5/55)	12/43	A. Klaus	TBN
204	Gas Hydrates[*]	San Francisco	31 July– 28 September '02	59 (5/54)	6/48	C. Richter	D. Goldberg
205	Eq. Pac. ION [¥]	San Francisco	28 September – 3 November '02	36 (5/31)	15/16	G. Acton	TBN

Notes:
[▫] Port call dates have been included in the dates which are listed. For example, Leg 205 begins on 28 September with 5 days of scheduled port call. The scheduled sailing date is 3 October.
[†] Although 5 day port calls are generally scheduled, the ship sails when ready.
* A mid-leg port call will occur for Leg 196 and may occur for Leg 204.
[¥] Leg 205 is tentatively scheduled to end in Panama City.

Updated 30 May 2001

Co-Chief Scientists and Cruise Staffing for Science Operations

Co-Chief Scientists for Legs 196-205:

	Leg	Co-Chief Scientists
196	Nankai II	K. Becker (CORK) H. Mikada (both) J.C. Moore (LWD)
197	Hotspots	J. Tarduno R. Duncan
198	Shatsky	T. Bralower I. Premoli Silva
199	Paleogene	M. Lyle P. Wilson
200	H_2O	R. Stephen J. Kasahara
201	Peru	S. D'Hondt B. Jorgensen
202	SE Paleoceanography	A. Mix R. Tiedemann
203	Costa Rica	J. Morris H. Villinger
204	Gas Hydrates	A. Trehu G. Bohrmann
205	Eq. Pac. ION	J. Orcutt* A. Schultz

* Pending official acceptance.

Scientific Party Staffing:

Staffing for Leg 199 is completed. Staffing for Legs 200 and 201 is in progress.

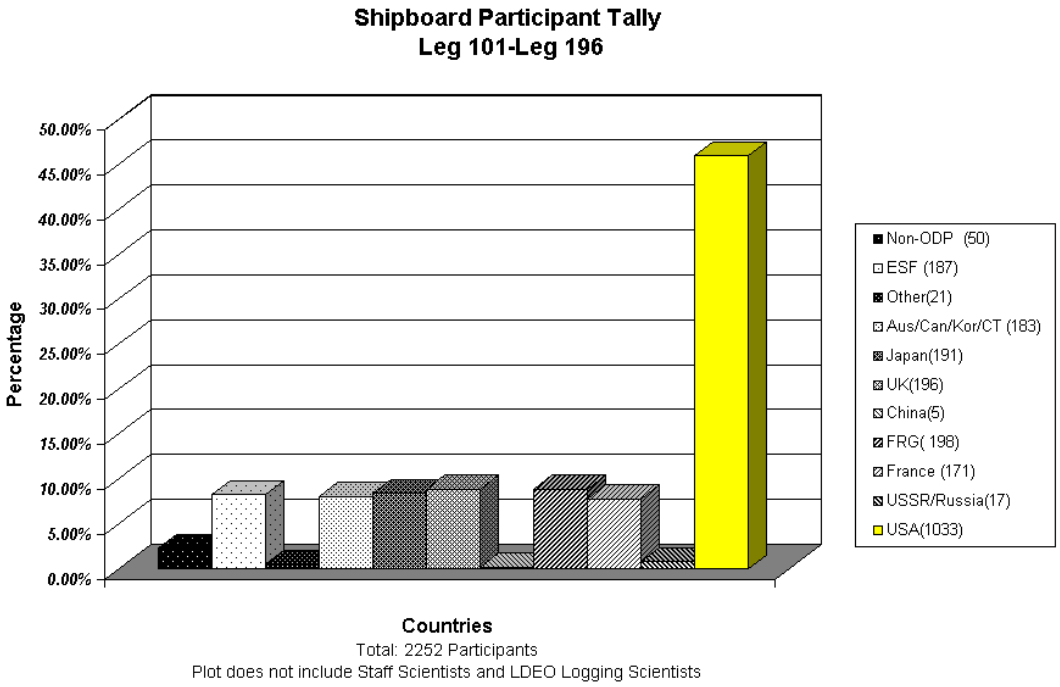
Tabulated below are the numbers of applications on file as of November 30, 2000.

Legs	Total Applicants	U.S. Applicants	U.S. Students	Non-U.S. Applicants	Non-U.S. Students
196	31	10	2	10	9
197	55	20	7	20	8
198	53	15	8	22	8
199	59	24	8	16	11
200	7	2	0	4	1
201	25	9	3	12	1
202	41	16	1	18	6
203	14	3	1	6	4
204	29	4	4	15	6
205	7	3	1	3	0

The numbers of applications for berths on future legs seem to have rebounded and are now moving closer to historic levels of 45-75 per leg. The drop-off in applications noted a year ago seems to have been largely a consequence of earlier uncertainties in the schedule and lack of information readily accessible to the community. Legs 196, 200, 203 and 205 are primarily concerned with implanting downhole instrument packages or CORKs, rather than coring, which likely accounts for the relatively low numbers of applicants for those legs.

Shipboard Participant Tally:

Please reference the table below for a compilation of all sailing participants since Leg 101 through Leg 196.



Status of the Labstack

Microbiology:

Shipboard microbiology lab issues were a topic of discussion at the December SCIMP meeting. Although SciMP acknowledged that there are a number of issues concerning microbiology which remain to be resolved, the only specific action item from the meeting was to assign to David Smith (URI) to investigate issues involving the use of radio isotopes on *JOIDES Resolution*. A report is due at the next SciMP meeting (June 2001).

We expect the next big "push" for microbiology studies within ODP to occur on Leg 201 (Feb.-April, 2002) which is focussed on deep biosphere studies along the Peru margin. The planned use of radioisotopes on Leg 201 will be a new development. We are presently in the process of locating a van suitable for radioisotope use and, in collaboration with David Smith (see above), investigating the issues and protocols involved with such studies. Another concern associated with Leg 201 is the potential very high use (and related high cost) of consumables for both shipboard laboratory work and downhole tracer experiments. We are presently working with the proponents for Leg 201 to better define necessary supply levels, so that FY02 funds can be appropriately allocated. In an effort to support technical requirements associated with microbiology in the most cost effective way possible, technical requirements unique to a microbiology leg will be staffed on a leg specific basis.

Status of Projects

Digital Imaging:

On Leg 194 a high quality Kodak digital camera already owned by ODP/TAMU was set up in the core lab to take close-up images of 20 cm sections of the cores. This proved highly successful and popular with the science party, and each member of the scientific party was able to leave the ship with two CDs containing reduced (jpeg) versions of all the images taken during the leg. (Higher quality (tiff) versions of the images are retained at ODP/TAMU for future reference and possible use in publications.) We expect to continue to use this digital close-up system, unless it becomes clear that the split core imaging system described below can supplant it.

A revised RFQ for a digital core imaging system was prepared and issued in early December. Responses to the revised RFQ were received in early January 2001. Following review of these responses and verification that sufficient funds are available within the current ODP/TAMU budget, a purchase order for a digital imaging system was issued to GeoTek on March 21, 2001. This system will incorporate a linescan camera and have the capability to sequentially scan several core sections at a time. We plan to have the new system installed and operating on the ship by the beginning of Leg 198 (end of August 2001).

A related issue is the development of a system for managing and archiving digital images. The major concern is that digital imaging systems rapidly generate large volumes of data which must be captured and managed systematically if they are to be used for later analysis or publication. Science Services and Information Services are working together to ensure that at least a preliminary system is in place before the Geotek digital imaging system is installed in production mode on *JOIDES Resolution*.

Drilling Services

Summary of Leg Operation: Legs 193, 194, 195

	Leg 193 Manus Basin 9 Nov – 3 Jan '01 Guam – Townsville	**Leg 194 Marion Plateau 3 Jan – 2 Mar '01 Townsville - Guam**	**Leg 195 Mariana – W. Pac ION 2 Mar – 2 May '01 Guam – Keelung**
Transit/Onsite (day)	8.9 / 41.6	10.6 / 42.7	7.8 / 47.7
Sites	4	8	3
Holes	13	16	15
Water Depth (m)	1651 - 1714	315 - 431	1285 - 5721
Deepest Penetr. (m)	387	675	600
Cored Interval (m)	736	4965	1667
Tot. Recov. (m,%)	79 (10.7%)	2055 (41.4%)	1308 (78.5%)
APC Recov. (m,%)	0	997 (100.9%)	603 (104.8%)
XCB Recov. (m,%)	31 (18.3%)	394 (33.7%)	285 (67.1%)
RCB Recov. (m,%)	48 (8.5%)	635 (24.7%)	421 (63.1%)
HYACE		3 (37%)	

Review of Operations

Leg 193 (Manus Basin):

- Delineate PacManus hydrothermal field.
- RCB core 567 m with 8.5% recovery at ROP of 11.4 m/hr.
- ADCB cored 169 m with 18.3% recovery at ROP of 3.0 m/hr.
- Used 260 Fluid Hammer to assist in running 60 m of 13-3/8 in. casing and free-fall HRRS reentry funnel.
- Used 260 Fluid Hammer to install 31 m of 13-3/8 in. casing in bare, sloping, fractured rock with free-fall reentry funnel and initiated RCB coring.
- Hammer drilled at 3.0 m/hr.
- First operational use of ADCB.
- ADCB recovery: 18.3% vs. 8.5% with RCB and 9.6% vs. 2.6% with XCB.
- Used shock sub and circulation sub.
- Severed 2 BHAs in unstable hole (ADCB hole was stable).

Leg 194 (Marion Plateau):

- Added 3 days at beginning of leg to test HYACE - Pressure Core Sampling (H-PCS) tool and HYACE/Fugro Vibracore Sampler (HF-VS)
- 4 runs with HF-VS recovered one pressure core and 4 runs with H-PCS recovered 1 partial unpressured core.
- Cored 16 holes at 8 sites in shallow water (315-430 m water depth).
- Cored 4965 m (41.4% recovery) and drilled 1043 m.
- 2 sites in Australia's Great Barrier Reef.
- 11 incidents of stuck pipe (cost 30.5 hr), and one BHA lost.
- 4 medivacs (3 by helicopter and 1 by boat).

Leg 195 (Mariana / West Pacific ION):

- Installed CORK in South Chamorro serpentine mud volcano near Mariana Trench with 9 thermistors and 2 osmotic samplers.
- Set reentry cone and 24 m of 20 in. casing using motor and underreamer. Set 108 m of 16 in. casing and 203 m of 10-3/4 in. casing with lower 54 m screened. Hole TD = 266 mbsf.
- Installed 4th West Pacific ION instrument string with dual broadband seismometers 68 m into basement.
- Set reentry cone with 39 m of 16 in. casing and 10-3/4 in. casing to 527 mbsf. Hole TD = 580 mbsf.
- Cored 10 APC and 4 XCB holes to 410 m max.
- Cored 2 RCB holes to 147 and 600 m.
- First sea trials of APC-Methane tool (successfully deployed 10 times).

Review of Engineering Development Projects

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

Active Heave Compensator (AHC) Operational Review

Weight-on-Bit Filter:

Because the AHC imparts significant dynamic forces to the derrick-located load cells, there are large variations in WOB indicator used by the driller. These large variations make it more difficult for the driller to effectively control the WOB due to excessive needle bounce. ODP and ODL have agreed to the design and fabrication strategy for the Weight-on-Bit (WOB) Filter. ODP procured the necessary shipboard wiring components, and ODL completed the wiring installation. All major electronic components were procured by ODP. The electrical drawings were completed for the top drive transmitter. The next step will be to finalize the electrical drawings for the drill floor receiver. The mechanical packaging and fabrication will go forward in parallel with the software code development and testing. The target date for the WOB filter installation is Leg 199.

AutoDriller:

After the installation of a WOB filter, the next step needed to improve the control of WOB is an AutoDriller. This system uses the feedback from the WOB Filter to minimize WOB variation. The AutoDriller will consist of a data acquisition system to collect data from the WOB Filter and will transmit data to the AHC program logic controller, which will control the hydraulic cylinders or the draw works brake to minimize the WOB variation. During March 2001, ODP went to the AHC manufacturer to present ODP's need for the Auto Driller. The manufacturer was most receptive. ODP's data and analysis convinced the manufacturer to provide ODP with access to their software and to allow ODP to develop this product under supervision of the manufacturer. The manufacturer has attempted on previous occasions to develop the Auto Driller, but had difficulties because of the lack of data to analyze performance.

A tentative technical agreement was written between ODP and Maritime Hydraulics that basically: 1) gives ODP the rights to the manufacturer's software; 2) allows ODP to integrate computer code to interface with the manufacturer's computer code; 3) has all computer code developed by ODP approved by the manufacturer and their local regulatory bodies; 4) gives the manufacturer ownership of all computer code developed by ODP since the computer code will be used to control the manufacturer's equipment, and the manufacturer inherits all liability related to the equipment due to ownership; and 5) makes the manufacturer responsible for installation of the hardware on the *JR*. This agreement is being reviewed by TAMU before final approval is granted.

AHC Simulator:

A Graduate Assistant Researcher (GAR), under the direction the ODP project engineer, has completed the software code for the drill string model, which is one component of the Simulator Model. Currently, the drill string model is being refined and calibrated with real data obtained during the MWD experiment on Leg 196. The next process to be undertaken is the software simulation of the hydraulic system.

AHC Hydraulic Bundle Update:

Crew suggestions were received regarding strategic placement of valves at the ends of the AHC hydraulic hoses to contain spillage and facilitate inspection or replacement. A rationale was prepared for hose spill containment that emphasized the use of existing valves. Replacement hoses were delivered to the ship along with blind closures and bleeder valves, and new hose spacers will be delivered soon. During the Leg 197 port call, the AHC Control Valve jumper hoses will be measured for spares, and two high-pressure ball valves will be added to facilitate drainage of the AHC Filter System (P1/P2) during filter changes. Spare jumper hoses are scheduled for delivery at the Leg 198 port call.

Moreover, the hose bundle covers have become worn and new specifications have been prepared for lace-on, vinyl impregnated, nylon covers that provide wear resistance and spill containment. These old bundle covers will be replaced with covers made from improved material at the Leg 198/199 port call.

Rig Instrumentation System/Operational Review

The Rig Instrumentation System (RIS) provides for real-time monitoring and electronic storage of drilling parameters and vessel motion. The RIS system is a PC-based data acquisition system with a master computer serving the Driller’s Console and broadcasting the data to remote workstations in the ODP Operation Manager's and ODL Drilling Superintendent’s offices. The RIS system provides algorithms for tracking depth and calculating WOB and ROP. In the last six months two new developments have been achieved with regard to the RIS. First, the driller’s instrumentation console was reconfigured during the Leg 194 port call to improve the driller’s viewing of the AHC display and the analog meters and gages. Second, during the Leg 195/196 port call the RIS was set up for two-way communication with Anadrill’s acquisition system for the MWD/LWD deployment planned for Leg 196. A WITS (Wellsite Information Transfer

Specification) link was installed during this port call. The MWD system, which transmits downhole torque and weight-on-bit information in real-time, was used on Leg 196 to document the reduction of WOB variations by the AHC system. Data sharing and correlation between the RIS and Anadrill systems were integral to the evaluation process. A similar setup was successfully operated during MWD operations on Leg 188. This is a joint ODP project between LDEO and TAMU with a goal to directly measure salient drilling parameters at the bit and correlate these data with measurements made at the rig floor.

Hard Rock Reentry System (HRRS) Project: Field Test Results

The scientific goal of the HRRS is to successfully spud and core holes in unstable surface formations of fractured hard rock and pillow basalt. The project objective was to develop a system that would allow the emplacement of a reentry funnel and surface casing in the seafloor where conventional casing, hard rock guide bases and standard reentry cones were unsuccessful. The HRRS project staff modified existing hammer technology to create downhole fluid hammer drilling technology with a nested drill-in-casing system.

Leg 193 was conducted in the Manus backarc basin of Papua New Guinea. The basin lies within the complex zone of oblique convergence between the Indo-Australian and Pacific plates. This leg was challenging to plan and to execute because of a number of technical considerations such as bare-rock spuds in rugged volcanic terrain, drilling conditions in vitreous and/or altered dacitic lavas, uncertain penetration rates, and unknown bit life estimates. As it turned out, hole conditions were very challenging and new hardware innovations at ODP (i.e., Hard Rock Reentry System and Advanced Diamond Core Barrel) were called upon when conventional ODP technology was not capable of producing the required results.

The fluid hammer was called upon to assist in setting the first string of 13 3/8 in. (339.73 mm) casing into a pre-drilled 14-3/4 in. (374.65 mm) hole. Despite a number of wiper trips and reaming, the hole continued to show signs of bridges that prevented the casing from being run in a conventional manner. The 260 FH was operated with the Dril-Quip CADA running tool to clear a path for the 13 3/8 in. (339.73 mm) casing as it was lowered into the pre-drilled hole. Collapse of the 14-3/4 in. (374.65 mm) hole near completion of the casing installation along with high skin friction resulted in the casing falling short of being landed inside the 16 in. (406.40 mm) casing hanger by 8.2 ft (2.5 m). To utilize this casing string despite being short 8.2 ft (2.5 m), the HRRS reentry funnel was deployed to provide a reentry capability for the 13 3/8-in. (339.73 mm) casing. This was a unique situation as the second reentry funnel was established above the existing reentry cone installed earlier by free-fall deployment. Both a three-level piloted underreamer bit and standard SDS 12-1/4 in. (311.50 mm) bit were used in the deployment of this 60-m string of 13-3/8 in. casing.

The second deployment of the HRRS equipment was performed the way the hardware was designed to be deployed using the appropriate running tool. Approximately 101.68 ft (31 m) of 13 3/8 in. (339.73 mm) casing was drilled into the hard fractured formation with an average ROP of 10.17 ft/hr (3.1 m/hr). The reentry funnel was deployed and the hammer and bit released from the casing hanger running tool assembly exactly as designed.

A considerable amount of information pertaining to the assembly and deployment of the HRRS was gained from the two deployments on Leg 193. We now feel the system is operationally ready to be used on other legs after modifications to some parts of the hardware and bits are completed. SDS is presently modifying the bits while ODP is making the changes to its running tool. All the modifications are minor but should make a significant difference in the performance of the hardware on the next HRRS deployment.

Advanced Diamond Core Barrel (ADCB) Project: Field Test Results

The scientific goal of the Advanced Diamond Core Barrel (ADCB) has been to improve core recovery in fractured hard rock. The ADCB Project goal is to adapt existing mining technology's thin kerf concept and to utilize "off the shelf" hardware, where possible. The resulting thinner kerf bits cut less rock and, in turn, reduce the amount of potential disturbance occurring in the formation while coring. The ADCB Project provides ODP with a "PQ/PQ3" mining style, thin-kerf diamond coring system.

The ADCB was tested on Legs 193 and 194. The ADCB uses a diamond bit and a mining style inner barrel to produce over twice the volume of core over ODP's conventional Rotary Core Barrel (RCB). This was accomplished by using an "off the shelf" inner barrel while operating a smaller outside diameter (OD) bottom hole assembly (BHA). The ADCB uses a BHA with 6-3/4 in. (171.45 mm) drill collars while maintaining the same 4 1/8 in. (104.78 mm) inside diameter (ID) as ODP's conventional tubulars. The ADCB is not intended to replace the RCB, but to serve as an alternate-coring tool where high recovery is required and the time necessary for its operation is taken into account during a leg.

A considerable number of hole stability problems were encountered during Leg 193 when operating the RCB. Two BHAs were lost and the pipe was stuck several times, even at very shallow depths of penetration. Although the ADCB had never been tested at sea, it was decided to deploy the ADCB in these hostile geologic conditions because it was felt that there was a reduced risk that the pipe would get stuck and that recovery would be enhanced. The deployment of the ADCB eliminated stuck hole problems and the system successfully drilled 169 m with 18.3% recovery. This recovery was a considerable improvement over the core recovery rates achieved when using the RCB system in similar hole conditions (8.5%). No major hardware problems were encountered during this first field test and, apart from minor modifications to some components (pins, springs and core catcher), the ADCB system was deemed ready for deployment on future legs.

The ADCB was deployed again on Leg 194 because the reefal carbonate deposits encountered at a number of the sites were hard to recover using XCB and RCB coring technologies. When comparing all the drilling results for ADCB performance on Leg 194, when compared to the performance of the XCB and RCB, the ADCB can be shown to significantly enhance recovery. The ADCB obtained three times better recovery than the XCB for Site 1193 in adjacent holes A and B. When comparing all the cores of the ADCB to the RCB over the same interval in Holes 1193B and C, the ADCB outperformed the RCB with 50% more recovery.

Downhole Measurement Technology

Davis/Villinger Temperature Probe (DVTP):

The purpose of this project is to adopt and support the Davis/Villinger Temperature Probe (DVTP) as an ODP operational tool. All of the existing DVTP documentation has been collected and centralized in DSD's library. All of the drawings, both mechanical and electrical, have been integrated into ODP's drawing system. The overall assembly and the electrical assembly drawings are 80% complete.

A beta version of DVTP software, which is a LabView based communication and data reduction program, is on the ship and has been operational since Leg 190. This program takes the user through all steps of setup, run, and data recovery for the DVTP. The APC Temperature and WSTP tools will be included in an expanded comprehensive version of this software.

ODP is working with Earl Davis of Pacific Geosciences Center, Canada to help integrate the pore pressure measurement into the DVTP tool. The prototype tool, DVTP-P, was deployed on Leg 190 and run 12 times. Preliminary results of the measurements were encouraging. The final report is pending. The tool was shipped back to College Station at the end of Leg 190 for inspection and refurbishment. Significant corrosion was observed in the pressure transducer region. Modifications will be made to alleviate this problem as well as address some assembly difficulties. The DVTP-P hardware was refurbished and sent out on Leg 196 for additional testing.

Two new DVTP's are being procured. The new data loggers, which can be upgraded to handle the pore pressure measurement, have been received. This will provide for two standard DVTPs and two DVTP-Ps. One of the new data loggers was sent out for Leg 195, providing a spare data logger for the two tools on board.

APC-Methane Tool (Temperature, Pressure, Conductivity):

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

The APC-Methane tool has been a collaborative project with Charlie Paull and Bill Ussler of Monterey Bay Aquarium Research Institute (MBARI). The sensor development is being done at MBARI whereas the electronics and packaging are being done at ODP/TAMU. Three prototypes have been manufactured.

The APC-Methane tool prototype was tested for the first time on Leg 195. There were two deployments at Hole 1201B and eight deployments at Hole 1202A. The installation of the APC-Methane tool was done on the rig floor with very little disruption of the operation. The piston rod snubber and piston head body from the APC core barrel assembly were removed and replaced with the APC Methane tool within 3 min. Site 1201 was in deep water, over 5700

meters, and provided a good pressure test for the tool. Including the pressure to fire the APC, the APC Methane tool saw pressures around 11,000 psi. Drilling at Site 1202 was done in the Kuroshio Current, which provided a good vibration test for the tool. During the tool deployment there was strong drill string vibration because of a 2 kt. current and all electronic and mechanical components functioned as designed and without interruption. The raw outputs of three channels (two conductivity and one temperature) were plotted vs. depth and all three sets of data responded as expected. The temperature data tracked the historical pattern of APC Temperature tool deployments. The APC-Methane tool will be tested again on Leg 199 prior to deployment on Leg 201.

Pressure Core Sampler (PCS):

The PCS is a free fall deployed, hydraulically actuated, wireline retrievable, pressure coring tool for retrieving core samples maintained at bottom-hole pressures. Modifications of the tool design are required to improve drilling/coring capabilities and to extend performance, primarily in the rotary coring mode. Initial deployment of the improved tool is targeted for Leg 201.

A Graduate Assistant Researcher has been hired to work on this project under the direction of the downhole tool project engineer. The focus of the modifications will be on improving bit design and core recovery.

Memory Drilling Sensor Sub:

The purpose of this project is to operate a Memory Drilling Sensor Sub (DSS) near the bit. The DSS will provide data to improve the understanding of the dynamic forces at work downhole and to quantify the impact of heave and surface inputs (torque, weight, rpm, and flow rate) on bit performance. The DSS will be an 8-1/4 in. OD memory sub with a 4-1/8 in. through-bore to allow for core retrieval. It will be positioned in the BHA on top of the Outer Core Barrel.

The procurement of the DSS is divided into two parts: downhole electronics and sensor body. The downhole electronics have been sourced. The sensor body will be sourced after competitive bidding among engineering/sensor companies. The sensor body development is in two phases. Phase I is the preliminary design, and Phase II is the final design including delivery of a prototype. The Phase I preliminary design was completed in February. The deliverables of Phase I included a detailed design layout, load and stress analysis, material specifications, expected sensor accuracy, testing and calibration requirements, and an estimate of time and cost to complete Phase II. Phase II work will be competitively bid using the Phase I document as the starting point. A commitment to start on Phase II will not commence until FY02 because of the need to commit limited resources in FY01 to higher priority leg-specific projects (e.g., APC-Methane Tool, DVTP, and PCS).

A commercially operated sensor sub was run on Legs 188 and 196 with an Anadrill MWD system. The Anadrill MWD tool measured weight-on-bit and torque-on-bit and transmitted the data uphole in real time. The test successfully demonstrated the practical application for the DSS, especially when data is transmitted in real time.

Information Services

Status of Migration of Historical ODP Data into the Janus Database

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

(A) All of the MST and Color Reflectance data migration has been completed and some of those migrated data have been checked. Efforts are underway to check all remaining migrated data, consolidate the raw files, merge the data migration code, and complete the project report. The Database Services Group of ISD expects to complete this migration project by August 2001.

(B) The migration of physical properties data began in December 1999. The project includes migrating moisture and density, thermal conductivity, PWS, and shear strength. The group expects to complete this project by June 2002.

Please see the information in the graphs below for details of the status of these two data migration projects. The graphs are available on the Internet at:

http://www-odp.tamu.edu/database/migration.htm

MST and Color Reflectance Data Migration:

Start Date: September 1998
Current: April 2001
Target Completion Date: August 2001

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

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

Leg / Data	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101
GRAPE	o	x	x	x	x	X	x	x	x	o	x	x	o	x	x	x	o	x
P-Wave	o	x	x	x	x	X	x	o	x	o	x	o	o	o	o	o	o	o
MagSus	x	x	x	x	x	O	o	x	x	o	o	x	x	x	x	o	o	o
NGR																		1
Color Reflectance																		2

Legend:

x Migration to Janus database completed
o Data not acquired by ODP
1 NGR acquisition started Leg 150
2 Reflectance acquisition started Leg 154
Magsus Leg 104-130 in S1032

Completed = 210 = 100 %
Remaining = 0
Apr. 11, 2001

Physical Properties Data Migration:

Start Date: December 1999
Current: April 2001
Target Completion Date: June 2002

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

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

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

Legend:

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

Completed = 219 = 89%
Remaining = 26
Apr.18, 2001

Mirror Sites

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

Australian mirror site: **http://www.agso.gov.au/odp** (Australian Geological Survey Organisation; site is functional and updated weekly).

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

United Kingdom mirror site: **http://owen.nhm.ac.uk/odp/** (The Natural History Museum, London; this site is functional and updated weekly).

The mirror sites are updated at the end of each week from the main site located at ODP/TAMU and supported by the Information Services Department at: ODP Science Operator. Texas A&M University:

http://www-odp.tamu.edu/isg

Publication Services

Volume Production

All *Proceedings of the Ocean Drilling Program* volumes are produced electronically and distributed in the following formats:

Booklet containing printed table of contents and summary chapter accompanied by a CD-ROM with chapter material in PDF format and selected tabular material in ASCII format;

Web publication with chapter material in both HTML and PDF formats and selected tabular material in ASCII format.

Initial Reports

From December 2000 through May 2001:

The following booklet/CD-ROM sets were distributed: 187 (January 2001); 188 (March 2001); 189 (May 2001).

The following volumes were made available online: 187 (9 January 2001); 188 (5 March 2001); 189 (2 May 2001).

From June 2001 through November 2001:

The following booklet/CD-ROM sets are expected to be distributed: 190 (July 2001); 191 (September 2001); 192 (November 2001).

The following volumes are expected to be available online in PDF format: 190; 191; 192.

Scientific Results

From December 2000 through May 2001:

Publication of online volumes began for volumes: 174B (5 Jan 2001); 175 (10 Jan 2001).

The following booklet/CD-ROM sets were distributed: 170 (Feb 2001); 171A (Dec 2000); 171B (Apr 2001).

From June 2001 through November 2001:

Publication of chapters online will begin for volumes: 176 and 177. Chapters from other volumes will be published after manuscripts have been accepted and processed for publication.

The following booklet/CD-ROM sets are expected to be distributed: 174B (July 2001); 172 and 173 (August 2001); 174A and 175 (September 2001).

ODP *Proceedings* Web Site Statistics:

As of 30 April 2001, there were 28 IR volumes and 28 SR volumes on the ODP/TAMU Web site.

Between November 1999 and April 2001, 13,023 unique users have accessed the IR online volumes (see Table 1). An average of 31 unique users have accessed each IR volume every month. The actual number of unique users per volume per month ranges between 1 (IR 171B, May and September 2000) and 121 (IR 174AXS, July 2000). Overall site access per IR volume increased by 55% during this time period.

Between November 1999 and April 2001, 22,094 unique users have accessed the SR online volumes (see Table 2). An average of 59 unique users have accessed each SR volume every month. The actual number of unique users per volume per month ranges between 1 (SR 174B, December 2000) and 217 (SR 160, November 2000). Overall site access per SR volume increased by 60% during this time period.

Table 1. *Initial Reports* Volumes Web Site User Statistics*

Volume	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00	Nov 00	Dec 00	Jan 01	Feb 01	Mar 01	Apr 01	Web Publication Date
166†	32	41	34	27	44	44	57	44	34	36	44	52	50	50	39	38	48	44	1 Oct 1997
167†	27	20	37	37	36	29	52	38	25	41	45	41	36	33	30	30	37	32	13 Feb 1998
168†	23	19	33	22	26	19	23	32	20	32	35	29	29	28	21	34	18	20	23 Feb 1998
169†	39	33	37	41	39	29	33	27	21	24	35	35	33	32	30	38	25	27	17 Apr 1998
169S†	14	19	25	32	18	16	17	24	20	23	23	26	25	19	18	21	14	13	10 Apr 1998
170†	20	25	27	25	21	23	33	37	28	29	28	34	35	27	27	31	18	25	24 Apr 1998
171A†	22	18	23	23	20	16	20	29	25	26	31	32	34	22	25	24	17	28	26 Jun 1998
171B†	31	20	31	31	31	24	1	30	24	31	1	26	36	19	36	36	25	14	26 Jun 1998
172†	18	19	36	29	26	26	25	25	23	36	43	37	26	26	22	41	28	17	31 Jul 1998
173†	22	19	29	16	18	22	25	31	23	23	31	33	25	37	23	32	18	19	4 Sept 1998
174A†	36	14	21	22	17	25	24	28	28	27	36	31	39	23	26	28	33	40	31 Dec 1998
174B†	17	20	16	16	12	13	18	20	17	16	26	22	20	17	17	25	13	18	31 Dec 1998
174AX†	20	11	25	16	12	14	19	22	17	17	28	32	18	16	17	15	10	11	31 Dec 1998
174AXS**	8	21	32	27	18	17	18	17	121	3	22	27	18	12	14	14	15	28	28 Dec 1998
175†	22	27	29	28	35	25	21	27	26	42	40	50	51	41	44	45	34	32	9 Feb 1999
176**	25	20	18	13	19	25	18	27	26	26	30	33	28	22	25	21	20	13	30 Jun 1999
177**	50	26	33	40	30	24	49	57	52	31	39	46	32	31	27	33	35	22	28 May 1999
178**	29	31	37	39	37	26	38	39	53	52	39	51	29	35	39	36	47	23	31 Aug 1999
179**	36	44	37	36	18	30	27	25	30	19	29	34	39	14	20	18	19	39	23 Jul 1999
180**				38	63	44	46	30	31	29	43	39	49	29	35	41	38	28	4 Feb 2000
181**							42	33	39	36	28	33	38	41	30	21	21	17	12 May 2000
182**							42	38	28	20	32	57	41	27	29	32	13	26	26 May 2000
183**								45	40	23	61	44	32	28	35	31	26	23	9 Jun 2000
184**								42	63	40	60	46	38	28	29	27	32	37	12 Jun 2000
185**											50	112	58	33	33	42	42	46	19 Sept 2000
186**									34	57	86	73	61	46	33	43	24	47	28 Jul 2000
187**															58	60	30	25	9 Jan 2001
188**																	88	97	5 Mar 2001

Notes: * = numbers represent unique computer sessions that originated outside ODP/TAMU to the entry page of a volume; each session may result in multiple page views. Hits to mirror sites are not included. † = volumes in PDF format. ** = volumes in PDF and HTML formats.

Table 2. *Scientific Results* Volumes Web Site User Statistics*

Volume	Nov 99	Dec 99	Jan 00	Feb 00	Mar 00	Apr 00	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00	Nov 00	Dec 00	Jan 01	Feb 01	Mar 01	Apr 01	Web Publication Date
150X†	58	42	63	61	63	57	53	58	40	62	60	64	59	51	61	49	85	59	7 Aug 1998
152†	98	65	75	87	76	64	78	65	47	58	84	102	98	69	92	70	77	66	8 Jul 1998
154†	93	65	82	78	78	80	116	67	46	58	72	78	84	64	58	74	78	72	1 Oct 1997
155†	86	72	101	80	103	66	73	87	53	69	70	100	72	65	81	104	88	104	15 May 1998
156†	59	46	64	55	70	53	49	59	46	55	74	64	71	60	59	50	76	74	21 Aug 1998
157†	98	70	80	79	75	64	62	60	46	45	52	80	70	62	94	69	92	69	14 Aug 1998
158†	66	65	68	65	77	52	71	56	43	50	56	66	80	52	51	56	73	45	15 May 1998
159†	96	73	82	65	62	46	70	64	44	53	74	79	92	72	63	75	95	49	31 Dec 1998
159T†	30	15	26	19	22	20	33	35	21	25	36	38	35	35	40	22	39	18	31 Dec 1998
160†	144	124	118	131	145	97	122	113	94	99	133	163	217	194	159	157	125	106	9 Nov 1998
161†	86	88	88	98	80	68	79	79	65	58	81	89	112	81	79	86	85	92	19 Mar 1999
162**	50	44	47	46	58	37	45	37	25	36	49	34	53	39	51	29	47	26	20 Aug 1999
163**	62	38	68	63	60	51	50	40	29	21	34	36	39	29	28	26	31	24	19 Sept 1999
164**							70	87	48	59	43	48	59	29	56	38	53	53	19 May 2000
165**							34	57	55	34	45	50	60	47	42	37	44	31	26 May 2000
166**							43	90	60	35	47	44	50	36	26	29	29	42	29 May 2000
167†									31	55	68	54	59	47	36	42	51	29	31 Jul 2000
168†										54	71	43	34	34	31	27	34	24	4 Aug 2000
169††						25	62	77	71	61	77	41	58	38	48	37	50	37	15 Apr 2000
169S††										50	46	34	35	20	29	21	29	24	8 Aug 2000
170††								30	41	52	75	64	81	34	46	32	35	27	20 Jun 2000
171A††										49	37	46	35	18	44	33	44	20	2 Aug 2000
171B††									53	72	55	39	45	30	44	60	46	49	4 Jul 2000
172††											84	40	37	38	42	41	35	41	1 Sept 2000
173††												34	31	40	42	33	39	40	2 Oct 2000
174A††											10	48	38	37	28	25	28	29	29 Sept 2000
174B††															32	29	27	25	5 Jan 2001
175††															109	90	114	112	10 Jan 2001

Notes: * = numbers represent unique computer sessions that originated outside ODP/TAMU to the entry page of a volume; each session may result in multiple page views. Hits to mirror sites are not included. † = volumes are in PDF format. ** = volumes in PDF and HTML formats. †† = volume published chapter by chapter in the order of acceptance in PDF and HTML formats; date indicates when first paper was published.

Postcruise publications:

Table 3 reflects the number of ODP-related papers that are projected for, submitted to, in press, or published in the *Scientific Results* volume and books or journals. The data on manuscripts submitted to, in press, or published in books and journals are based on the information ODP receives from the scientific participants from each leg. (There is no guarantee the counts are complete.)

Figure 1 shows the total number of in press and published papers that ODP has been notified of per leg. For Legs 101 through 159, only *Scientific Results* papers were tracked. Beginning with Leg 160, papers published in journals and books were also tracked. All legs through 172 have passed the 4-years postcruise mark. Legs 173 through 182 have passed the 28-month postcruise mark when all SR, journal, and book submissions are due (173 deadline = October 1999; 182 deadline = April 2001).

To date, four new-format SR volumes are complete (169–171B). As of May 2001, 62 *Scientific Results* papers were published on the Web and 53 additional *Scientific Results* papers were in press.

Leg-related Citations:

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

The Publication Services Department began collecting leg-related citations in January 1999. The citation lists now include 449 citations, of which 344 are submitted, in review, in press, or published papers and 105 are conference abstracts. Of the 344 papers, 130 have abstracts reproduced on the ODP/TAMU web site. (ODP requests abstract reprint permission from all publishers.) The numbers of citations listed per leg depend on whether authors notify ODP once their papers have been accepted for publication; whereas the availability of abstracts depends on whether publishers permit their reproduction.

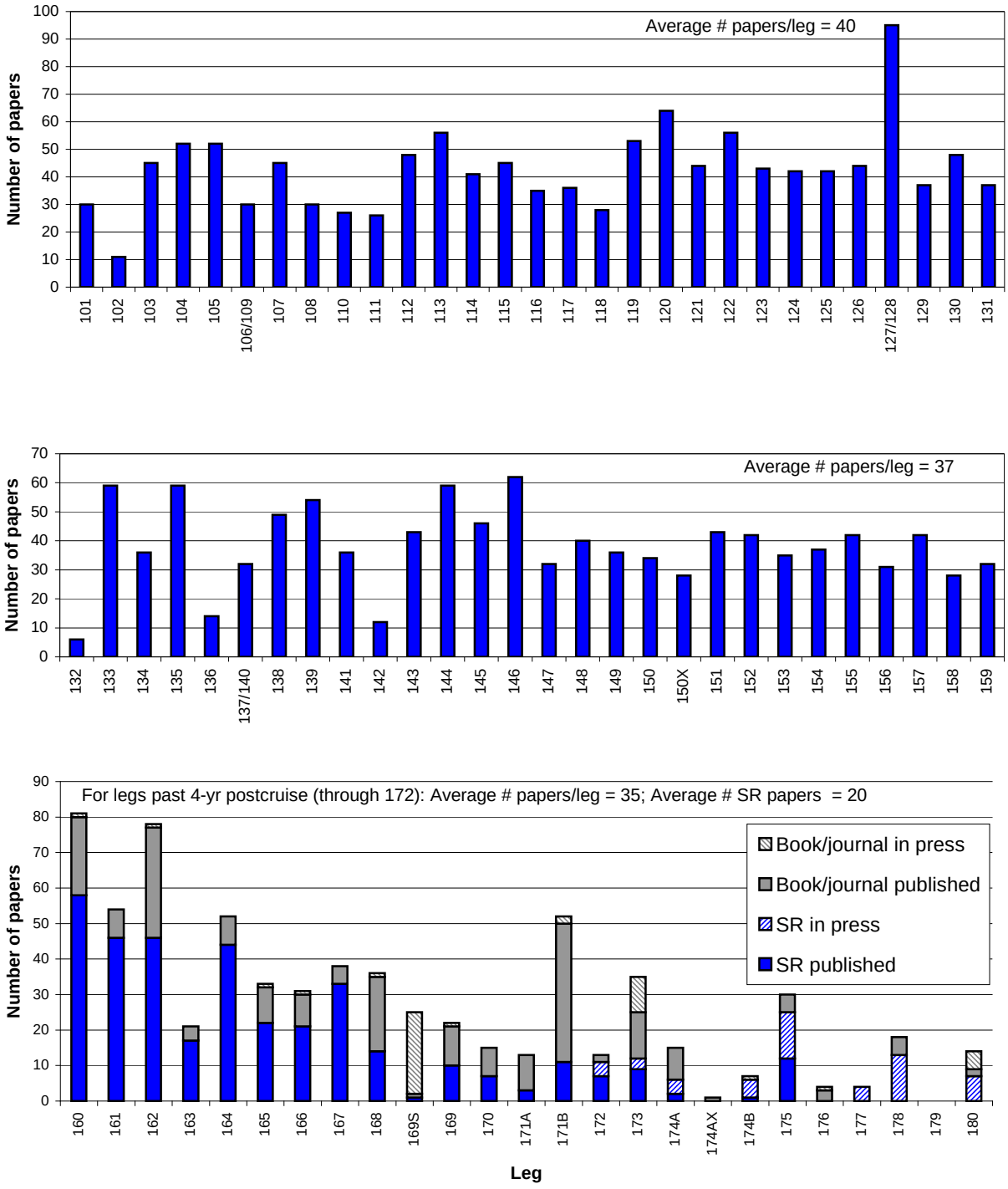
We know the leg citation lists are not complete despite our efforts and those of the Staff Scientists to remind scientific party members of their obligation to submit citations to ODP after their papers have been published. The success of the leg-related citation lists is dependent upon authors submitting all published citations and a reprint of each publication to ODP.

Table 3. Number of ODP-related papers projected, submitted, in press, and published in SR volumes and in books or journals.

	SR Volume				Journal or Book			
Leg	**Projected***	**Submitted**	**In Press**	**Published**	**Projected***	**Submitted†**	**In Press†**	**Published†**
160	62	54	NA	58	0	0	1	22
161	47	46	NA	46	6	1	0	8
162	24	23	NA	46	32	0	1	31
163	22	16	NA	17	4	0	0	4
164	35	43	NA	44	18	0	0	8
165	26	24	NA	22	2	0	1	10
166	28	18	NA	21	7	11	1	9
167	40	33	NA	33	11	0	0	5
168	17	14	NA	14	47	0	1	21
169S	0	1	NA	1	28	0	23	1
169	14	10	NA	10	29	0	1	11
170	6	7	NA	7	15	0	0	8
171A	1	3	NA	3	16	0	0	10
171B	15	10	NA	11	43	1	2	39
172	8	11	4	7	36	0	0	2
173	8	12	3	9	19	1	10	13
174A	8	7	4	2	17	7	0	9
174AX			0			0	0	1
174B	1	2	1	1	5	0	1	0
175	14	26	5	12	24	0	0	5
176	17	13	0	0 (Mar 01)	20	0	0	3
177	7	4	4	4 (May 01)	44	20	0	0
178	8	34	13	13 (Jul 01)	44	1	0	5
179	15	4	0	0 (Sep 01)	8	0	0	0
180	15	24	7	6 (Nov 01)	25	1)	4	2
181	21	6	0	0 (Jan 02)	25	0	0	1
182	13	9	0	0 (Mar 02)	37	3	1	3
183	15	1 (11 Jun 01)	0	0 (May 02)	25	(11 Jun 01)	1	2

Notes: Data updated in May 2001. * = count from table of contents prepared at second postcruise meeting. † = counts reflect the number of papers authors have notified the ODP Senior Publications Coordinator about. NA = not applicable. Dates: Submitted column—date reflects deadline when submissions are due; Published column—dates reflect month when all papers for volume should be accepted.

Figure 1. Number of published and in press papers on record per leg.



***ODP Proceedings* Distribution:**

The Department has sold DSDP and ODP volumes for cumulative revenue of $10,514 between November 2000 and April 2001. This revenue supports a portion of the cost budgeted for the printing and distribution of new volumes.

The Department has continued to distribute free sets of volumes to academic institutions that do not already have accessible sets of DSDP and ODP volumes (institutions pay shipping costs). Between December 2000 and May 2001, 4 institutions (Polish Academy of Science, Poland; Birbal Sahnai Institute of Paleoceanography, India; Norsk Polarinstitute, Norway; and College of Staten Island, New York, USA) were sent 437 ODP and 171 DSDP volumes. Total value for the books in these shipments equals $32,399.

Panel-Related Issues and SCIMP Recommendations

Sample Distribution, Data Distribution, and Publications Policy Revision:

The Sample Distribution, Data Distribution, and Publications Policy was revised in May 2001 as follows:

1) Reference to policy guidelines for Legs 160 through 174 were removed from Section 4.4.b. and Appendixes A and B.
2) The acknowledgement requirements in the publication guidelines were presented in greater detail:

   -- Acknowledge ODP in all publications that result from the data collected from ODP samples using the following wording:

      This research used samples and/or data provided by the Ocean Drilling Program (ODP). ODP is sponsored by the U.S. National Science Foundation (NSF) and participating countries under management of Joint Oceanographic Institutions (JOI), Inc. Funding for this research was provided by _____.

   -- Include the words “Ocean Drilling Program,” “scientific ocean drilling,” and/or “ocean drilling” as key words provided to the journal or book publisher of the manuscript. (This will allow the legacy of ODP to be tracked by bibliographic databases such as GeoRef.)

AGI Database (Rec. 99-2-1):

In June 2001, AGI will begin final production of a Web-based database that contains the ODP- and DSDP-related citations that exist in GeoRef. The database will be formatted so that citations can be downloaded into common bibliographic software such as Endnote. AGI will update the database on a weekly basis from the master GeoRef database contents. The expected release date for the product is late summer.

Hard Rock Core Description Protocols (Rec. 00-3-2):

According to SCICOM Motion 01-01-02, SCICOM did not endorse this recommendation at the March 2001 meeting. No action has been taken by ODP/TAMU except to discuss the issue in greater detail with JOI and the chairs of SciMP.

ODP/TAMU Web Site

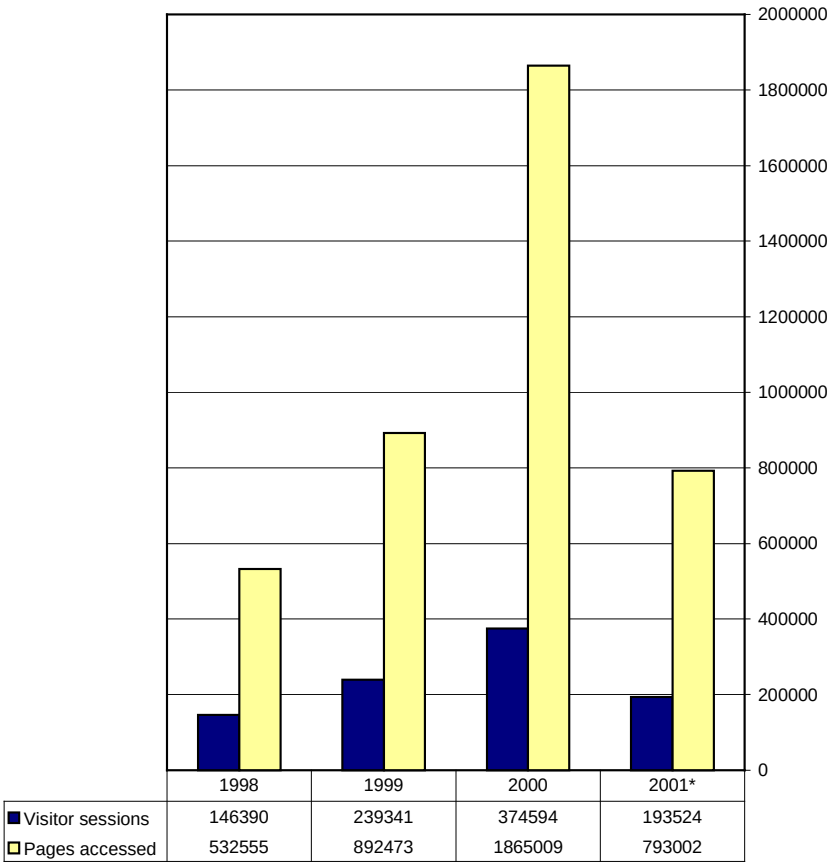
ODP/TAMU Web Site User Statistics:

The number of site visitors (defined as single computers accessing the site) to the ODP/TAMU Web site increased 364% from the beginning of fiscal year 1998 through April of fiscal year 2001 (see Figure 2). During the last year, the number of site visitations has increased by 55% (see Table 4). Figure 3 shows the breakdown by month of total site visitors during this period.

The total number of pages, or files, accessed at the ODP/TAMU Web site during this 3.5 yr period has increased 419% (see Figure 2).

The German mirror site went online in June 2000. Available per site statistics are listed in Table 5. User statistics were not available for June 2000 and November 2000 through April 2001. At this time there are still no user data available from the mirror sites in Australia and the United Kingdom.

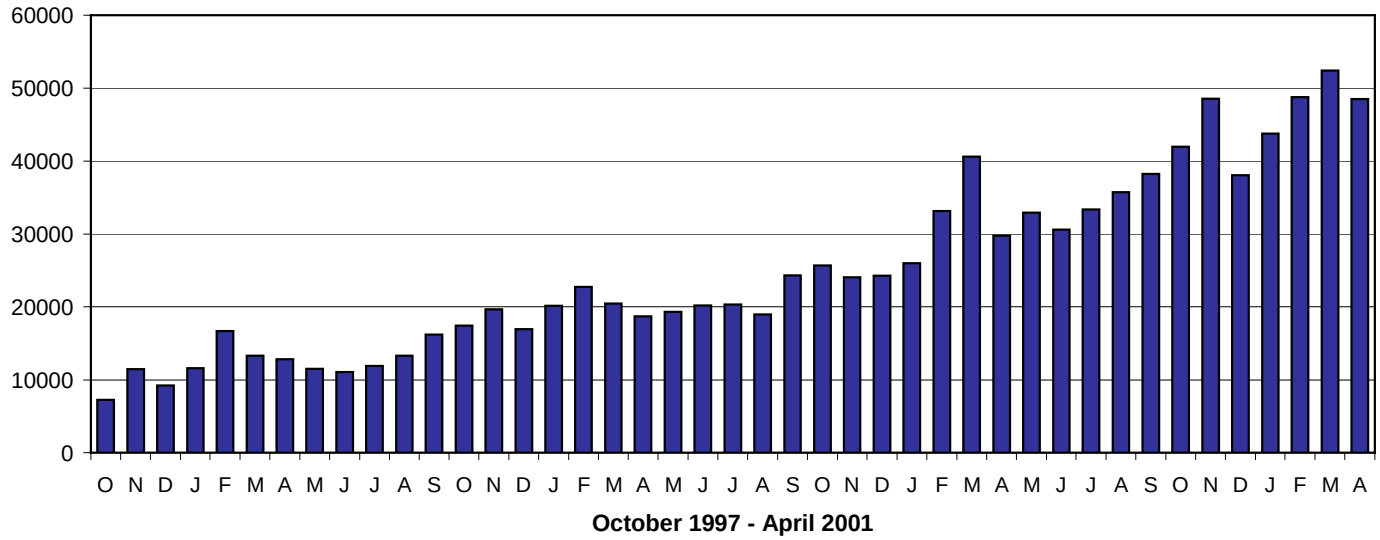
Figure 2. ODP/TAMU Web Statistics by Fiscal Year



	1998	1999	2000	2001*
Visitor sessions	146390	239341	374594	193524
Pages accessed	532555	892473	1865009	793002

Notes: Visitor session = a single computer accessing the Web site; page = a single HTML file. * = Jan–Apr 2001.

Figure 3. ODP/TAMU Web Site Visitor Sessions



Note: Visitor session = a single computer accessing the Web site.

Table 4. Web Statistics for ODP/TAMU Main Entry Points*

	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00	Nov 00	Dec 00	Jan 01	Feb 01	Mar 01	Apr 01
Total for ODP/TAMU site†	**32,920**	**30,623**	**33,370**	**35,744**	**38,229**	**41,962**	**48,562**	**38,038**	**43,777**	**48,762**	**52,448**	**48,537**
Totals for specific pages:												
ODP/TAMU home page	5,749	4,656	4,782	5,016	5,860	7,713	11,319	7,317	9,264	9,657	9,333	8,371
Publication Services**	1,344	1,153	1,266	1,351	1,406	1,540	1,617	1,313	1,548	1,470	1,654	1,621
Cruise information	1,148	967	1,005	986	1,370	1,279	1,467	1,139	1,543	1,468	1,406	1,195
Sample request form	264	227	228	214	256	271	NA	257	269	234	253	259
Operations schedule	756	573	566	699	830	831	768	663	1,056	1,005	951	779
Science & Curation	567	452	457	486	533	589	628	563	570	621	608	555
Cruise participation	362	305	328	349	339	360	351	584	664	587	836	636
Site maps	413	351	408	386	473	472	491	400	450	475	467	426
JOIDES Resolution information	783	603	698	754	806	803	755	863	924	447	478	473
Life onboard *JOIDES Resolution*	387	382	432	392	439	707	504	863	583	805	697	922
Janus database	1,049	921	1,037	1,111	1,022	1,166	1,375	1,108	1,378	1,254	1,273	1,211
Search	823	668	644	597	731	902	967	853	932	898	926	908
Drilling Services	832	552	562	604	801	830	867	819	873	851	825	814
Janus queries† (janusaxp.tamu.edu)	746	804	925	1104	726	867	1356	926	756	588	714	845

Notes: * = numbers represent unique-computer sessions that originate outside ODP/TAMU; each session may result in multiple page views and/or database requests; mirror sites are not included. † = Janus sessions are in addition to those given for the "ODP/TAMU site." ** = see "Volume Production" section for statistics on unique-computer sessions for each volume. NA = not available.

Table 5. Mirror Sites Web User Statistics

	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00	Nov 00	Dec 00	Jan 01	Feb 01	Mar 01	Apr 01
German mirror site* (odp.pangaea.de)	—	NA	178	350	1049	1656	NA	NA	NA	NA	NA	NA

Note: * = German mirror site went online in Jun 2000. NA = data for Jun 2000 and Nov 2000 through Apr 2001 for German site. No data are available for mirror sites in Australia and the United Kingdom.

Public Information

The responsibilities and tasks associated with providing support for port call activities are now handled by Mr. Phil Rumford, Superintendent of the Gulf Coast Repository, and Ms. Agatha Moy, Administrative Assistant in the Director's Office, handles all public information requests.

Port Call Activities

Keelung, Taiwan – Leg 195/196 (2-7 May 2001):

Extensive public information activities took place during the Keelung port call. Colleagues in Taiwan, supported by Mr. Phil Rumford of ODP, carried out an array of activities during port call including extensive coverage by the newspapers and television, a special scientific conference that reviewed the scientific achievements of Leg 195 and that discussed the scientific goals of Leg 196, special tours of the ship by dignitaries, and a day long open house for the public during which time 850 people visited the ship.

Port call activities are planned for both Yokohama port calls. During the first port call in July (Leg 196/197), special tours for dignitaries will be conducted and during the port call in late August (Leg 197/198) a day-long open house for the public is planned.

Public Information Requests:

During the last six months, ODP/TAMU has responded to 28 requests for scientists, news media, television producers, universities, K-12 schools, government administrators and publishers. The material distributed includes: slide sets, B-roll video tapes, ODP video Planet in Motion, and the Cretacious-Tertiary Impact Poster.

6.5 LDEO Borehole Research Group

EXECUTIVE SUMMARY

Cruise Highlights:

Leg 193 Manus Basin
The overall aim of Leg 193 was to determine the subsurface volcanic architecture, structural and hydrologic characteristics, and the deep-seated mineralization and alteration patterns of the Manus hydrothermal field. The Resistivity-at-Bit (RAB) tool was used for the first time in ODP to record total gamma-ray counts and electrical resistivity logs from the seafloor to total depth as well as resistivity images (like FMS images) in these difficult to recover rocks.

Several temperature profiles were obtained during wireline operations, as well as 5 and 7 days later using the UHT-MSM temperature probe. The profiles show an average steady increase in temperature with time and a thermal rebound of approximately 204º C over a seven-day period. Wireline logs provided the opportunity for the first direct correlation between LWD and conventional log data in ODP and show the same range of low resistivity values.

Leg 194 Marion Plateau
The objectives of Leg 194, Marion Plateau, were to study the causes, magnitudes, and effects of sea-level change on continental margin sediments. In addition to the standard logging tool deployment, the third-party MGT was also deployed at two sites (1194 and 1196) recovering high-quality data. This cruise was also the first phase of the IESX pilot study testing the use of this software for shipboard core-log-seismic integration.

Check shot surveys with the WST were carried out at two sites. The check shots in Hole 1195B were completed using the air gun, which provided much improved results over the water gun used at Hole 1194B. Access to the seismic data using the IESX project turned out to be very helpful for horizon correlation between drill sites.

Leg 195 Mariana/W. Pacific Ion
Wireline logging operations using the triple combo and FMS/sonic toolstrings were carried out in Hole 1201D, the pilot hole drilled prior to installation of the seismometer package. The consistency of the logs demonstrates the fairly homogenous and reworked volcaniclastic sediment underlain by a series of low to high-energy turbidite sequences consisting of alternating claystone-rich and coarser sandstone-rich or breccia intervals.

Leg 196 Nankai II
Leg 196 is the second of a two-leg program of drilling, logging, and installing long-term observatories in the Nankai Trough. Leg 196 is focusing on Logging-While-Drilling (LWD) and long-term sub-seafloor monitoring. In addition to deploying the Resistivity-at-Bit (RAB) and Azimuthal Density Neutron (ADN) tools, this leg represented the first deployment of the sonic LWD tool in an ODP hole.

Prior attempts to wireline log at these sites were not highly successful. At the time of this writing, LWD data have been recorded through the frontal thrust of the prism and drilling is progressing well towards the decollment fault zone, currently at the deepest penetration depth using LWD tools in ODP history.

Active Heave Compensation
Measurement-While-Drilling (MWD) equipment was deployed on Leg 196 to collect real-time drilling parameters relating to the performance of the Active Heave Compensation System (AHC). The MWD sub acquires downhole weight-on-bit and torque while instruments at the surface acquires ship heave and calculated weight-on-bit and measured torque. Preliminary results indicate that the AHC dampens the high frequency component of the down hole weight on bit. Comprehensive analysis will follow the completion of the experiment.

Core Barrel Temperature Tool
The Core Barrel Temperature Tool (CBTT) was successfully deployed during Leg 193 successfully demonstrating that fluid temperature could be measured while drilling and the data retrieved on a core barrel.

Seismic Data Integration
The goal of the IESX pilot project is to determine the feasibility of using IESX by the Databank for digital data management, as well as its usefulness as a shipboard tool. The successful first stage of the pilot study during Leg 194 lead to essential at-sea seismic data interpretation and log handling and integration. Use of IESX during the cruise was very successful. IESX proved particularly helpful for going back to the seismic lines and examining reflections in more detail to reassess the interpretation after drilling. Additionally, access to the seismic data was very helpful for the correlation of drill sites by tracing significant horizons for lateral age control.

I. MANAGEMENT

ODP Logging Services provided JOI with the Draft FY 02 Program Plan.

Elaine Downes left LUBR in the middle of November. Janette Thompson assumed the position of Co-ordinator at LUBR

Pat Fothergill left LUBR to take up a post with Schlumberger in Aberdeen. This position has been filled by Brice Rea as of 5/1/01.

Patrick Pinettes (Computer support) and Philippe Gaillot (Logging Scientist) joined the staff at LMF.

Alex Meltser resigned his position at BRG and the opening for his replacement was advertised. It is anticipated that applications will be processed during summer 2001.

II. STANDARD LOGGING OPERATIONS

Leg 193 Manus Basin
The overall aim of Leg 193 was to determine the subsurface volcanic architecture, structural and hydrologic characteristics, and the deep-seated mineralization and alteration patterns of the Manus hydrothermal field. The Resistivity-at-Bit (RAB) tool was used for the first time in ODP in Hole 1188B to record total gamma-ray counts and electrical resistivity logs from the seafloor to total depth as well as resistivity images (like FMS images) in these difficult to recover rocks.

In Hole 1188F the size of the borehole affected the wireline log data quality although FMS images show a high degree of fracturing and brecciation over several large intervals. Several temperature profiles were obtained during wireline operations, as well as 5 and 7 days later using the UHT-

MSM temperature probe. The profiles show an average steady increase in temperature with time and a thermal rebound of approximately 204º C over a seven-day period. The borehole dimensions of Hole 1189B allowed the acquisition of excellent wireline data. FMS images show significant changes with depth in styles of alteration and fracture density. The images also show that the upper part of the borehole contains higher concentration of disseminated conductive minerals than the lower sections.

LWD/RAB operations in Hole 1189C reached a total depth of 166 mbsf. RAB images show many distinctive resistive features that may represent silica replacement alteration or pervasive anhydrite precipitation. Borehole images show that most of Hole 1189C is characterized by subhorizontal and subvertical fracturing as well as alternating numerous resistive and conductive features. Wireline logs provided the opportunity for the first direct correlation between LWD and conventional log data in ODP and show the same range of low resistivity values.

Leg 194 Marion Plateau

The objectives of Leg 194, Marion Plateau, were to study the causes, magnitudes, and effects of sea-level change on continental margin sediments. In addition to the standard logging tool deployment, the third-party MGT was also deployed at two sites (1194 and 1196) recovering high-quality data. This cruise was also the first phase of the IESX pilot study testing the use of this software for shipboard core-log-seismic integration (see Shipboard Log Analysis below for more information).

LDEO deployed the Drill String Acceleration Tool (DSA) in conjunction with HYACE testing at the start of the leg. The DSA, which measures 3-axis acceleration and pressure on the core-barrel, was used several times to monitor the downhole behavior of the HYACE Pressure Core Sampler (H-PCS). The acquired data will be used to examine the conditions surrounding the successes and failures of the HYACE testing.

Check shot surveys with the WST were carried out at two sites. The water gun was used at Hole 1194B and check shots were used to calculate synthetic seismograms. The basement and other reflectors were erroneously detected because of low quality of the signals and difficulty in picking first arrivals. The check shots in Hole 1195B were completed using the air gun, which provided much improved results over the water gun used at Hole 1194B. Synthetic seismograms were successfully created using the IESX software package. Access to the seismic data using the IESX project turned out to be very helpful for horizon correlation between drill sites.

Based on the logs and the FMS images three log units can be distinguished. Each of these units can be interpreted as a phase of platform growth. Within the log units, subunits are recognized which might be related to development of individual platforms. Despite hole condition problems, the log data provide important information on the lithology and architecture of the MP3/MP2 platform edifice, especially in the lower part of the hole where core recovery was low. Two karst holes in Hole 1199A are inferred from the logs, each approximately 10 meter thick. The logs also show significant differences between Site 1199 and Site 1196 especially the gamma ray, while the porosity, density and resistivity log responses are similar. Extremely large gamma ray fluctuations in the top 50 meters are not present in Hole 1196A. If this gamma ray correlation between the two holes is correct, then MP2 is 39.5 m thinner at Site 1199 than at Site 1196. The observed thickness variations in log units strongly suggests large lateral facies heterogeneities and a complicated architecture of the two older platform stages.

Leg 195 Mariana/W. Pacific Ion
Wireline logging operations using the triple combo and FMS/sonic toolstrings were carried out in Hole 1201D, the pilot hole drilled prior to installation of the seismometer package. Two logging units were identified and appear to be relatively homogeneous but include subtle variations which reflect changes in lithology. The log data have good correlation with physical properties measurements made on cores, particularly the discrete sample density and velocity measurements.

The consistency of the logs demonstrates the fairly homogenous and reworked volcaniclastic sediment underlain by a series of low to high-energy turbidite sequences consisting of alternating claystone-rich and coarser sandstone-rich or breccia intervals. Thicker, coarser turbidite packages can be recognized in the log data. These intervals are characterized by higher and more consistent velocity, density, and resistivity values and slightly lower and more consistent natural gamma ray values. The logs show more rapid fluctuations in the interbedded finer-grained units.

Below, in basement, a significant increase in density, resistivity, and velocity values (with a corresponding decrease in porosity values) represent pillow lavas with interpillow breccia layers where recovery was relatively poor (< 23%). Increases in resistivity and decreases in gamma ray values may indicate a trend toward less altered material with depth.

Leg 196 Nankai II
Leg 196 is the second of a two-leg program of drilling, logging, and installing long-term observatories in the Nankai Trough, the type example of a convergent margin accreting a thick section of clastic sediments. The two-leg program was designed to define the interrelationship of the dynamics of deformation and fluid-flow processes in an accretionary prism characterized by thick terrigenous sediments. Leg 196 is focusing on Logging-While-Drilling (LWD) and long-term sub-seafloor monitoring.

Site 1173 is located in the outer margin of the trench fill of the Nankai Trough about 11 km seaward of the deformation front. This site provides reference for the physical and chemical nature of the sediments before they are deformed either by incorporation into the accretionary prism or underthrust beneath the décollement. LWD operations in Hole 1173B resulted in natural gamma, resistivity, photoelectric effect, and density curves of good quality from the seafloor to the basement. Additionally, we acquired resistivity images of the entire borehole which distinguish thin beds, fractures and faults. Sonic data was also successfully acquired and will be evaluated after processing and return to the ship via satellite. This was the first deployment of the sonic LWD tool in an ODP hole. Additional LWD operations were carried out in Hole 1173C to obtain LWD logs from the uppermost section that was cased off in Hole 1173B.

Site 808 is located approximately 8 nmi from Site 1173 on the toe of the accretionary prism where 8 holes have been drilled and cored during Leg 131. Prior attempts to wireline log at these sites were not highly successful. At the time of this writing, LWD data have been recorded through the frontal thrust of the prism and drilling is progressing well towards the décollement fault zone, currently at the deepest penetration depth using LWD tools in ODP history.

III. SPECIALTY TOOLS AND ENGINEERING DEVELOPMENTS

Active Heave Compensation/MWD

Preliminary results of the Leg 185 DSA tool deployment and Leg 188 MWD passive heave tests were analyzed for publication in an *Offshore* editorial article and the *JOIDES Journal*. Preliminary results of the Leg 191 DSA tool deployment were presented at Fall AGU.

Measurement-While-Drilling (MWD) equipment has been deployed on Leg 196 to collect real-time drilling parameters relating to the performance of the Active Heave Compensation System (AHC). At Sites 1173 and 808 Anadrill's MWD tool measured downhole drilling parameters, including downhole weight-on-bit, torque, and bit bounce, and tool stick-slip. These measurements are made using paired strain gauges near the base of the MWD collar. Real-time shipboard observations suggest that the AHC damps high frequency variations in uphole RPM and torque, as well as the high frequency variation in downhole weight-on-bit. The comparison of downhole MWD parameters with the surface information will be analyzed post cruise to evaluate the shipboard heave compensation system and drilling practices.

Core Barrel Temperature Tool

The Core Barrel Temperature Tool (CBTT) was successfully deployed during Leg 193 in Hole 1188A. A total of 2.8 hours of fluid temperature data were acquired with approximately 2 hours acquired while drilling. The CBTT run successfully demonstrated that fluid temperature could be measured while drilling and the data retrieved on a core barrel. Further attempts to deploy the CBTT on Leg 193 were not possible due to the loss of required parts in Hole 1191A. The CBTT has been repaired and is available for future deployments.

Third Party Tool Support

A request for third party tool approvals made by Dr. Johannes Stoll was reviewed by ODP Logging Services for potential deployment of a magnetometer and susceptibility tool during Leg 197. The request is currently undergoing SciMP review. Provided that tool developments remain on schedule, final SciMP approval is expected by the June 2001 meeting.

The multi-sensor gamma ray tool (MGT) was returned to LDEO for repairs after Leg 194. Next target deployment for the MGT is Leg 199, pending SciMP review for certified tool status.

High-T Temperature Tool

The High-T Temperature Tool (HTT) was modified to increase tool weight and to directly connect with the Schlumberger cable head. The tool was shipped to Guam for use on Leg 193, however an electrical short in the cable head severely damaged the tool's onboard electronics and has since been shipped back to LDEO and repaired.

Legacy Project

Inventory and archiving of ODP Logging technical developments continued as per JOIDES recommendation. Digital and paper drawing files were collected and archived for the DSA and CBTT.

High Resolution Depth Counter

Development began in November to improve the third party depth counting system. The project will include new software and improved electronics.

Test Facility
Plans for high-pressure vessel installation of the LDEO test facility were discussed with BRG Engineering group. Results of geological and geophysical characterization of the site were presented at Fall AGU.

IV. SHIPBOARD LOG ANALYSIS

Core/Log Integration Project (CLIP)
Maintenance, user support, and user training is being coordinated by Ulysses Ninnemann (LDEO). Maintenance efforts will focus on keeping Splicer and Sagan current with the Solaris operating system. A mailing list has been established to assist with the general dissemination of CLIP-related information to the community. Users can sign up for this mailing list on the CLIP page of the ODP Logging Services website.

A demonstration of Sagan was given to the SciMP seismic integration subcommittee during their October meeting at Lamont and a review article on the status of CLIP appeared in the *JOIDES Journal*. The latest versions of Sagan and Splicer have been posted on the ODP Logging Services website (http://www.ldeo.columiba.edu/BRG/ODP/).

Seismic Data Integration
ODP Logging Personnel gave a demonstration of the IESX software capabilities to the Site Survey Panel (SSP) on July 24. A discussion of the software followed the presentation and reactions were generally quite positive. In addition, the first meeting of the SciMP detailed planning group for Seismic Integration was hosted by LDEO-BRG in October and evaluation of the IESX pilot study results was discussed.

The goal of the IESX pilot project is to determine the feasibility of using IESX by the Databank for digital data management, as well as its usefulness as a shipboard tool. Unix systems at BRG, the Data Bank, and in the DHML have been upgraded with the latest versions of operating system and software (GeoFrame 3.8). As recommended by SciMP, a second workstation equipped with two monitors was added to the DHML during the Leg 194 port call.

The successful first stage of the IESX pilot study during Leg 194 lead to essential at-sea seismic data interpretation and log handling and integration. Shipboard IESX activities were led by G. Karner (LDEO, core-log-seismic SciMP subcommittee), working with Heike Delius (Logging Staff Scientist) and Gregor Eberli (JOIDES Logging Scientist). Karner reported the results of the test to BRG during and after the leg. These results and additional cost information were provided to the core-log-seismic subcommittee report for SciMP. Use of IESX during the cruise was successful. IESX proved particularly helpful for going back to the seismic lines and examining reflections in more detail to reassess the interpretation after drilling. Additionally, access to the seismic data was helpful for the correlation of drill sites by tracing significant horizons for lateral age control.

The creation of the IESX project for Leg 196 has been completed. This phase of the pilot study includes the first use of 3D survey data. Masanori Ienaga, the Leg 196 JOIDES Logging Scientist received IESX training during his visit to Lamont. He will provide IESX services for Leg 196 operations.

An article on the use of IESX in ODP appeared in the *JOI/USSAC Newsletter*.

V. SHOREBASED LOG ANALYSIS

ODP Processing

The following holes were processed:
Leg 192-Hole 1186A (standard FMS, and temperature processing)
Leg 193- Holes 1188B, 1188F, 1189B, 1189C (standard and FMS processing)
Leg 194- Holes 1194B, 1195B, 1196A, 1198B, 1199A (standard and temperature processing)

Training and Visitors

The following personnel visited the LDEO Log Analysis Center for training or access to software:
Heike Delius - MGT deployment and IESX training in preparation for Leg 194
Philippe Gaillot - operational training prior to sailing on Leg 195
Moe Kyaw Thu - operational training prior to sailing on Leg 198
Masanori Ienaga - IESX training prior to his participation as JOIDES Logging Scientist on Leg 196
Donna Cathro (UTIG) - IESX use
Dave Scholl (USGS) - IESX training prior to participation as Geophysicist on Leg 197
Arno Buysch (U. Aachen) - operational training prior to sailing on Leg 197

VI. DATABASE

The ODP Log Database has been updated through Leg 193 including Schlumberger original and processed data (conventional, geochemical and FMS), specialty tools (borehole televiewer, multi-channel sonic and temperature), borehole images and sonic waveforms.

A meeting was held at NGDC in November to discuss future archiving of the ODP databases. Representatives from JOI, JOIDES, ODP Logging Services, TAMU and NGDC were in attendance. A list of action items was drawn up and the results of the meeting will be presented to EXCOM by JOI.

A representative from ODP Logging Services participated in an NSF/ONR Data Management workshop for MG&G in LaJolla, CA.

Historical Data Migration

The conversion of processed FMS data to Unix-compatible files has been completed for most of the holes from Leg 126 to 186. Due to a variety of problems, the conversion could not be performed for the following 15 holes:
Leg 127: 794B, 796B, and 797C
Leg 128: 798B, 794D, 799A, and 799B
Leg 129: 800A and 802A
Leg 133: 812B and 817D
Leg 141: 859B and 863B
Leg 146: 891C
Leg 147: 894G
The above holes will need to be re-processed.

Beginning with Leg 192 GIF files of FMS data processed using dynamic normalization will be available online in addition to the traditional FMS images processed using static normalization.

All processed temperature data from Legs 123 to Leg 194 are now available online.

Post Cruise Distribution of Log Data

All log data CDs up to and including Leg 188 have been made and sent to Sony. As no logging took place on Leg 187 no data CD for this leg was produced.

VII. PUBLICATIONS AND REPORTS

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6.6 JOIDES

6.6.1 Revision of EXCOM Terms of Reference

JOIDES Executive Committee for the Ocean Drilling Program
Terms of Reference (post-Kamakura)

1. This committee shall formulate scientific and policy recommendations with respect to the Ocean Drilling Program (ODP). It shall conduct the ODP planning, as well as evaluation and assessment of the Program as to its accomplishments as compared to the goals and objectives that have been established. It may be assigned managerial and operational responsibilities for appropriate tasks.

2. The members of this committee shall be representatives of oceanographic and marine research institutions or other organizations ~~which~~ that have a major interest in the study of the sea floor and an adequate capability in terms of scientific human power and facilities to carry out such studies.

3. The membership of this committee is now composed of one representative of each of the ~~six~~ non-US countries or consortia with an active 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]~~ and which have met the criteria for full membership according to the ODP Membership Policy ratified by the JOIDES Executive Committee in June 1998. Presently full members are representatives of Australia - Canada - China Taipei - Korea Consortium, European Consortium for Ocean Drilling - European Science Foundation, Germany, Japan, and the United Kingdom and ten US representatives drawn from the membership of JOI as designated by the JOI Board of Governors. Associate members as defined by the ODP Membership Policy ratified by EXCOM in June, 1990 will have one non-voting participant at EXCOM meetings.

The appointment of additional members will be determined by the JOI Board of Governors on the recommendation of the JOIDES Executive Committee. In the case of representatives of non-US country participants, the existence of a valid MOU with NSF is a prerequisite to membership.

Membership of any member may be canceled by the JOI Board of Governors on the recommendation of the JOIDES Executive Committee or in the event of a non-US country participant ceasing to have a valid MOU in existence. The status of the membership of any member may be reduced from full membership to associate membership in the event that a non-US-country participant has failed to satisfy the criteria for full members according to the ODP Membership Policy ratified by the JOIDES Executive Committee in June 1998.

4. Each institution or organization designated for participation on this Committee by the Board of Governors shall provide one voting member.

5. The Executive Committee shall reach all its decisions by the affirmative vote of at least two-thirds of all members present, including members from at least three non-US members. A quorum shall constitute two-thirds of the Executive Committee. If a member of the Executive Committee is absent from a duly called meeting of the Executive Committee, he or she may designate an alternate with full authority to act for him or her in his or her absence.

6. 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.

Amended 12 March 1990
Amended 2 April 1992
Amended 29 September 1994
Amended 2 February 1995
Amended 6 July 1995
Amended 11 June 1997
Amended 13 November 1998
Amended 13 April 2001

6.6.3 Draft plan for phasing out JOIDES Science Advisory Structure

This report is in formal response to the section of EXCOM Motion 00-2-3 that states:

EXCOM Motion 00-2-3: EXCOM accepts the Initial Report on ODP-IODP Transition Planning. This report raises a number of important issues and provides a very useful framework for planning he phase-out of ODP and the establishment of IODP. EXCOM thanks John Orcutt, JOI and its ubcontractors, and other members of the JOIDES community who assisted in preparing this ocument. Given the importance of addressing in a timely manner the many unresolved issues elated to the ODP-IODP transition, EXCOM requests the following actions.
For review at the January 2001 EXCOM meeting:
- JOI will prepare a draft phase-out plan for ODP management and operations,
- JOI and the JOIDES Science Advisory Structure will develop options for the long-term maintenance of the ODP database, JANUS database, core repositories, and other ODP legacies.

For review at the June 2001 EXCOM meeting:
- ***SCICOM will develop a draft phase-out plan for the JOIDES Science Advisory Structure,***
- JOI will develop a plan for producing an ODP final report, including an outline of the contents of the report, defined writing responsibilities, and a timeline for completing it.

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

This report can be brief because most of the major issues have already been addressed at the August 2000 SCICOM meeting and January 2001 EXCOM meeting, in discussions which culminated in the following two motions:

SCICOM Motion 00-2-15: SCICOM proposes to EXCOM that all committees and panels of the JOIDES Science Advisory Structure remain extant through September 2003. Although the duties of these committees and panels may diminish greatly after September 2001, and some of them may not need to meet in person, the program will continue to require their advice on scientific prioritization (SCICOM, SSEPs), shipboard operations (OPCOM, PPSP, SSP), shipboard measurements (SciMP), and technical developments (TEDCOM). The maintenance of the JOIDES Science Advisory Structure through September 2003 will allow the greatest flexibility in the transition to the interim IODP science advisory structure (iSAS). We foresee that some or all of the JOIDES committees and panels may meet in tandem with their iSAS counterparts.

Miller moved, D'Hondt seconded; 15 in favor.

EXCOM Motion 01-1-7: EXCOM concurs with the SCICOM motion 00-2-15 concerning the terms of office of the current JOIDES advisory panels.

Larson moved, Stoffa seconded; 15 in favor.

The SCICOM motion is quite comprehensive, but there may be a few aspects that remain to be addressed, as follows. The first may warrant an EXCOM statement or action, but the second and third can probably be handled on an ad hoc basis by good communication and collegial negotiation between JOIDES and iSAS offices.

(1) Should any JOIDES panels continue to function after September 30, 2003?
There will certainly be ODP-related functions continuing after September 30, 2003, which implies that some of the advisory functions now embodied in the JOIDES panels should also continue in some form. For example, the ODP scientific legacy will continue to evolve well beyond 2003, as

the samples and logs collected in final legs are analyzed and periodic measurements from long-term observatories are collected. Hence the EXCOM-mandate to SCICOM and the SSEPs to document the ODP legacy will require SCICOM-like and SSEPs-like activities beyond 2003. For another example, questions about ODP publications and core- and data-archiving questions could well arise after 2003, which might require a JOIDES SCIMP-like activity beyond 2003.
There are two obvious solutions to such questions: Either continue certain JOIDES panels after 2003, or incorporate their responsibilities into the mandates for the IODP SAS. The latter possibility requires policy decisions above the level of SCICOM * and perhaps even above the level of EXCOM. At the August 2000 SCICOM discussions, it was noted that it would be appropriate to use JOIDES panels such as SCIMP and TEDCOM for technical advice in IODP planning through 2003, because IODP is equivalent to Phase IV identified in the ODP Long-Range Plan. But it is not clear that the reverse will hold * that IODP MOU's would identify the fulfillment of lingering, but important, ODP matters as legitimate functions of IODP SAS panels. If the funding balance and panel membership for IODP is different than for ODP, will it be questioned whether it is legitimate for IODP panels to advise on ODP phase-out matters? If the IODP SAS cannot incorporate an advisory function on ODP phase-out issues, then some JOIDES panels must continue beyond 2003.
There have been discussions at EXCOM to the effect that EXCOM itself must continue to exist through FY2007, i.e., to the conclusion of ODP phase-out activities. If EXCOM continues to exist * with no formal authority within the IODP SAS * does EXCOM need a continuing JOIDES SCICOM, i.e., a body obligated to provide the scientific advice and action specific to ODP that EXCOM may seek?

(2) Coordination of JOIDES and iSAS panel meetings through 2003
The SCICOM motion notes that some of the JOIDES panels that continue to exist through 2003 may not need to meet in person. This may not be fully consistent with the notion that iSAS panels should meet in conjunction with parallel JOIDES panel meetings, so that existing ODP funding is used to provide support for iSAS panel meetings before there are any formal IODP MOU's. More specifically, in the transition period 2001-2003, the need for certain JOIDES panels to actually meet may taper off, just as the need for the parallel iSAS panels to meet ramps up. The JOIDES SCICOM chair is responsible for approving JOIDES panel meetings, and the approval criteria would be expected to be centered on the ODP needs. During the transition period, are there going to be policy issues in cases for which there is little justification for a JOIDES panel meeting but a strong need for a meeting of the parallel iSAS panel?

(3) For parallel JOIDES and iSAS panels, should there be a common chair?
This will not be the case for SCICOM and iPC, but the question has already arisen for the SSEPs and iSSEPs, driven by the need to name new SSEPs chairs in 2001 (first for ESSEP after May 2001, then for ISSEP after November 2001). In brief discussions at the March 2001 SCICOM, naming a single person to chair both the JOIDES SSEP and corresponding iSAS iSSEP was generally favored. In consultation with the iPC co-chairs, the SCICOM chair and SSEPs chairs have approached a well-qualified and willing candidate to take the chairmanship of ESSEP * someone who is also very interested in chairing the iESSEP and has the support of his national ODP committee to do so. The chair of the OD21 Science Advisory Committee has suggested that the chairs of JOIDES and parallel iSAS panels should be named by independent processes * but that it could be entirely satisfactory if these processes settle on common chairs. The situation will arise again soon when the chairs for JOIDES ISSEP and SSP rotate within the next year, and it might also pertain to the new co-chairs of JOIDES SCIMP when/if an iSAS iSCIMP is formed.

8.1 IODP Planning

8.1 IWG

The most recent meeting of the IWG for IODP occurred in Southampton, United Kingdom, in early January and was reported on at the Kamakura EXCOM meeting in late January. Dr. Purdy co-chaired the Southampton meeting as his last official NSF responsibility and Dr. Margaret Leinen (NSF's Assistant Director for Geosciences) has become the new NSF co-chair of the IWG. Dr. Yoichiro Otsuka (Director of Ocean and Earth Division) of the newly established Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has replaced Dr. Satoshi Tanaka as the Japanese co-chair.

Primary activity at the Southampton meeting included:

- Discussion of review comments on the IPSC IODP science Plan. Following IPSC's submission of the draft initial science plan for the IODP in early October, the IWG commissioned an international panel to review and evaluate the proposed program. The committee met in New York on December 5-6 and was chaired by Seiya Uyeda (Univ. of Tokyo) and Frank Rhodes (Cornell University, and former chair of NSF's National Science Board). Results of the review were reported in Southampton. Overall, the Committee was highly supportive of the Initial Plan, noting that "*the ISP is a bold interdisciplinary and international project of extraordinary importance, high promise and unique significance"*. Primary concerns raised with the Initial Science Plan included: (1) the lack of detail on the integration of mission specific platforms into the plan, (2) need to clarify the strategies to encourage partnerships with other programs and industry, (3) need to clarify the status of required technologies, and (4) further clarification on the cost estimates for the IODP. The committee also identified organizational and implementation concerns which need to be clarified in IWG-IODP planning. Based on these concerns, IPSC modified the Plan prior to publication on 1 May.
- Discussion and acceptance of the basic principles (Platforms, Program, Membership, Implementation, and Management) for the IODP which are available on the IODP web site. The IODP Principles are designed to be the basic definition of the IODP and its ground-rules for operation and will serve as the basis for the formal international agreements. Final consideration of a Management Principle is scheduled for the next IWG meeting in Ottawa on June 12-13, just prior to this EXCOM.

Further considered a key provision of the Implementation Principle which calls for establishing an interim Science Advisory Structure (iSAS) to carry-on the planning initiated by IPSC until the formal IODP Science Advisory Structure is established on 1 October 2003. The iSAS is a joint working group representing JOIDES and OD-21 science advisory committees, with roughly 1/3 Japanese, 1/3 U.S., and 1/3 other membership. JOIDES and OD-21 will cooperate in identifying membership on the committees. The chairs of IPSC and OD-21 scientific advisory committees will co-chair iSAS and its governing interim Planning Committee (iPC) and report directly to the IWG. IPSC had submitted draft terms of reference and operational procedures for this new structure and IWG accepted them in Southampton. The IWG co-chairs have formally requested OD-21 and JOIDES advisory structures to form this new advisory mechanism and a joint recommendation on panel staffing has been received. Further discussion is scheduled for the Ottawa IWG meeting.

The next meeting of the IWG is scheduled for Ottawa, Canada, on June 12-13 immediately preceding the EXCOM meeting. The EXCOM chair (liaison to IWG) and the NSF liaison to EXCOM will be prepared to discuss additional IODP developments at the Oxford meeting.

8.1.1 iSAS Staffing

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26 March 2001

Dear Margaret and Yoichiro

Recently we have been discussing amongst ourselves and with our respective scientific communities (JOIDES and OD21) issues concerning the makeup of the iSAS committees. This letter presents our conclusions so far.

The JOIDES Executive Committee discussed membership in the iSAS and made a recommendation that six members should be nominated by the United States, six nominated by Japan and one each from Australia, Canada, France, Germany, the European consortium and the United Kingdom. In doing this the Executive Committee was strongly of the opinion that all countries with a genuine interest in IODP should be nominated to be on iSAS. This recommendation maintained the participation to be 1/3 from Japan, 1/3 from USA and 1/3 from other countries. If all nominees were chosen it would give a committee of 18 members, perhaps larger than ideal but still close to the size of 15 people currently on the JOIDES Executive and Science Committees.

The JOIDES Executive Committee did not include China (who is a member of IWG) because there were statements made at the meeting that China is not seeking full membership in IODP. Since the Executive Committee meeting, China has expressed an interest in nominating one person (presumably to the Interim Planning Committee) and one member of the JOIDES Executive Committee has suggested that iSAS be expanded to include China. If this were to be done, the iPC would end up with 19 members, and the ratios would be 32%, 32% and 37%, not far from the recommended percentages. For the other iSAS committees, Australia has nominated only a member for iPC and a member for iISSEP, while China has only nominated one person, so that the size of the other committees will be smaller than iPC.

The OD21 Science Advisory Committee nominated 5 (plus one contingency candidate in case the IWG chairs ask for 6 each) Japanese members to each of the four iSAS committees (one Japanese member of iESSEP is currently located at Woods Hole Oceanographic Institution), in contrast to the suggestion from the JOIDES Executive Committee. The United States Science Advisory Committee originally nominated five people to each of the four iSAS committees, but following on from the JOIDES Executive Committee meeting were asked to nominate an

additional person for each committee. The JOIDES Executive Committee also has preliminary nominations for all committees from Canada, France, Germany, ECOD and the United Kingdom.

We believe that at this stage it is highly advisable to make countries welcome into the IODP system. If we take the example of China, it is certainly true that they could easily join IODP if they choose to do so. They expressed an interest in becoming part of the iSAS structure, despite the fact that the JOIDES Executive Committee did not mention them in its motion.

This shows some significant interest. What is the danger in making China (and Australia) full members of the iPC? In these types of committee it is unusual that things get decided on anything like a close vote. And being made observers presumably gives them the right to speak at the various meetings, so that the benefit of a smaller number of participants is not realized. On the other hand, making them only observers may send the wrong signal to the people making decisions at a higher level. We therefore feel that full iSAS membership should be offered to all of the countries and consortia listed above.

Of greater importance, in our opinion, is the mix of disciplines represented by the nominees to the various committees. This will be an item for discussion between us, Keir Becker and Ted Moore as well as at the OD21 Science Advisory Structure and JOIDES, when we have the complete list of nominees. It is possible that we may suggest some alterations to the mix of disciplines, especially in those new disciplines outlined in the Initial Science Plan for IODP that will require further negotiation with the various countries.

As a result of our discussion we see three possible scenarios for deciding on iPC members. If we stick to case (1) that the smaller iPC the better, then 5:5:5 nomination is appropriate. In case (2) we accept nominations from China and Australia and keep our nomination close to fundamental equal participation, then 6:6:7: would be acceptable. Finally in case (3) we invite China and Australia as regular participants, then 5:5:7 will be realized. Note that chairs are included in these numbers. We prefer case (2) or (3) but realize that you and IWG may have different ideas.

Sincerely

Hajimu Kinoshita
OD21 Science Advisory Committee

Chris Harrison
JOIDES Executive Committee

4 May, 2001

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Re: Recommendations for iSAS staffing

Dear Drs. Leinen and Otsuka,

This letter presents the joint recommendations of JOIDES and OD21 for staffing the interim Planning Committee (iPC), Science Steering and Evaluation Panels (iSSEP's), and Site Survey Panel (iSSP) for the interim Science Advisory Structure (iSAS) for IODP. It is in further response to your late January letter requesting that "JOIDES and the OD21 Science Advisory Committee form iSAS as a joint working group representing the two organizations," following on from the 27 March, 2001, letter to you from Drs. Harrison and Kinoshita. Before listing our nominations for iPC, iSSEPs, and iSSP, we wish to review the process by which we arrived at these nominations – because following an open, consultative process was as important as the particular nominations. Also, there remains an important issue as to the number of iSAS panel members, which probably requires resolution by the IWG itself.

Your January letter was written shortly before the January 29-30 EXCOM meeting in Kamakura, where a motion was unanimously passed that governed the JOIDES response to your request, as follows:

EXCOM Motion 01-1-5: In response to the request from IWG for nominations to iPC and iSAS panels, EXCOM proposes that the distribution of nominations to each panel be as follows:
(1) U.S.A. - 6 nominations, to be determined by USSAC
(2) Japan - 6 nominations, to be determined by OD21 Science Advisory Committee
(3) One nominee each from U.K., France, Germany, Canada, Australia and ECOD, to be determined by appropriate national committees or organizations.
Where possible, EXCOM encourages that individuals be selected who are members of parallel JOIDES panels. Nominations should be provided to the EXCOM chair and the OD21 Science Advisory Committee Chair by March 1, 2001.

Just over two weeks later, the OD21 Science Advisory Committee (SAC) met and came to a somewhat different unanimous consensus, as follows:

OD21 SAC Consensus 01-1-01: In response to the request from IWG for nominations to iPC and iSAS panels, OD21 SAC unanimously proposes as a consensus that the distribution of nominations to each panel (iPC, iESSEP, iISSEP, and iSSP) shall be as follows:
(1) Japan – 5 nominations, to be determined by OD21 SAC nomination WG.
(2) U.S.A. – 5 nominations, to be determined by USSAC.
(3) Five formal nominees from U.K., France, Germany, Canada, Australia, ECOD and China, to be determined by appropriate committees such as iPC or IPSC.
The OD21 SAC asks further that Dr. Suyehiro (JAMSTEC), Dr. Tada (U-Tokyo), Dr. Tatsumi

(JAMSTEC), Dr. Kato (U-Shizuoka), and Dr. Ito (Geological Survey of Japan) to form a nomination working group to work on this issue in collaboration with OD21 SAC chair. Nominations should be provided to the EXCOM chair and the OD21 SAC Chair by March 1, 2001.

The difference between the EXCOM motion and OD21 SAC consensus can be broken down into two issues: whether Japan and US should have 5 or 6 members each, and whether the remaining non-US, non-Japan members should be limited to an equal number of nominations or be allowed more. Implicit in the EXCOM motion is the concept of keeping iSAS membership as open as possible to intended members of IODP, as opposed to restricting it to current JOIDES members. Through much of the JOIDES-OD21 consultative process, there has been ongoing discussion of using the latter, more restrictive qualification, but in the end we have come to agreement that a more open policy toward prospective IODP members will be beneficial. Nevertheless, there remains debate whether US and Japan should each name 5 or 6 members to iPC and the other iSAS panels.

Immediately after the January EXCOM meeting, EXCOM Chairman Chris Harrison wrote to the non-US, non-Japanese ODP committees of the 6 countries/consortia mentioned in (3) of the EXCOM motion, asking for their nominations by March 1, but additional time was requested for internal consultations so the deadline was extended to end of March. All of the nominations were received by mid-April, the last coming from ECOD after a regularly scheduled early April meeting. In addition, early on China (an IWG member) nominated a single person to iSAS, presumably to iPC because he is their named observer on SCICOM.

Hence, the JOIDES call for nominations resulted in 7 non-US, non-Japan nominees for iPC. In combination with the issue about the numbers of US and Japanese nominees, the unresolved issue might be simplified to the question whether iPC membership should be named on a 5-5-7 or 6-6-7 US-Japan-other basis. The 5- or 6- member question has complicated the nomination process within both US and Japan, as follows:

USSAC had actually been consulted at their late January meeting just prior to the Kamakura EXCOM meeting. SCICOM Chairman Keir Becker had attended the first two days of that meeting and presented the expected content of your letter request, with corroboration by Paul Dauphin of NSF, who had attended the mid-January meeting of IWG. At that meeting, USSAC suggested 5 US nominees for each of iPC and the two iSSEPs – 5 because at the time it was understood that iSAS members were to be nominated according to the more restrictive qualification above, which would imply a 5/5/5 distribution of membership on iSAS panels. However, when the EXCOM motion above was passed, the USSAC Chair, Peggy Delaney, consulted further with USSAC via email in March and April to arrive at suggestions for 6th US members for each iSAS panel.

As described in the OD21 SAC consensus above, an OD21 iSAS nomination working group was formed in mid-February and initially nominated 5 Japanese members for each iSAS panel. As the debate about 5 or 6 US and Japanese nominees carried on, the OD21 working group revised their nominations in March to include provisional 6th members for each panel, should a decision ultimately be made for 6 each US and Japanese appointments to each panel.

Throughout the process, there has been open consultation between JOIDES and OD21, by email or in person, represented principally by Chris Harrison (EXCOM Chair), Keir Becker (SCICOM

Chair), Ted Moore (IPSC Chair and iPC Co-Chair designate), and Hajimu Kinoshita (OD21 Chair and iPC Co-Chair designate). Face-to-face meetings have been held in Kyoto in association with the early February IPSC (Becker, Moore, Kinoshita); in Tokyo on March 19 (Becker, Kinoshita, and several other Japanese representatives); in Shanghai on March 22 (Becker and Moore); and in Miami on April 4 (Becker and USSAC Chair Delaney). At all but the first of these meeting, near-final lists were available from Japan, US, and most other countries, but there was still lingering discussion of the issues relating to numbers of panel members.

As important as the matter of number of panel members, the balance of expertise among the nominations also posed a few issues, especially for iPC, but otherwise was reasonable. During late March and April, we attempted to deal with these expertise issues, as the possible US 6th members were nominated and the remaining non-US, non-Japan nominations came in. In general, the Japanese slate for iPC was well balanced, the non-US and non-Japanese nominations were often fixed for other reasons, and USSAC and the USSAC Chair graciously provided just enough flexibility by offering suggestions on how to best address the balance issues with revised slates of U.S. nominees to allow us to arrive at the fairly balanced lists below.

If there are any remaining imbalance issues, we will attempt to deal with them at the time of rotations for iSAS. There will be some rotations during the term of operation of iSAS (June 2001 – October, 2003), because one important principle established in the consultative process was that we should adhere to rotation schedules already established for those iSAS members who are already members of corresponding JOIDES panels. This will hopefully allow adjustments of expertise as needed during iSAS, and, more important, will mitigate against a mass rotation when iSAS transitions into SAS.

In conclusion, the process outlined in EXCOM motion 01-1-5 and OD21 SAC consensus 01-1-01 has been carried out in a consultative, iterative fashion with open input from members of ODP and potential members of IODP. Nearly all of the nominees have already been contacted and have indicated their willingness to serve. Due care has been taken to see that the slates are balanced and representative with respect to the overarching scientific objectives as defined in the IODP Initial Science Plan. We believe that the individuals named are all excellent candidates to serve on iSAS, but we ask your guidance on the one remaining issue: determining whether the US and Japan should each name 5 or 6 members to iPC and other iSAS panels. In the lists of nominated iSAS members below, we have identified the provisional 6th US and Japanese nominees who would actually be named to serve only if you come to an agreement for the larger number of US and Japanese membership.

Sincerely,

Dr. Chris Harrison
Chair, JOIDES EXCOM

Dr. Hajimu Kinoshita
Chair, OD21 SAC

Dr. Keir Becker
Chair, JOIDES SCICOM

Dr. Ted Moore
Chair, IPSC

iPC Nominations (Note that brackets denote provisional 6th US and Japanese nominees to be named only on a final decision for 6-6-7 membership as opposed to 5-5-7 membership.)

Country	Name	Institution	Expertise	SCICOM overlap
USA co-chair	Ted Moore	U Michigan	paleoceanography	[IPSC chair]
USA	Andrew Fisher	UC Santa Cruz	hydrogeology	through 2003
USA	Larry Mayer	U New Hampshire	paleoclimate/sediments	through 2003
USA	Jamie Austin	U Texas	sea level/margin seismics	
USA	Delia Oppo	WHOI	Paleoclimate/high res.	
[USA]	[Greg Moore]	U Hawaii/SOEST	marine seismics	
Australia	Jock Keene	U Sydney	marine geology/geochem.	through 2003
Canada	Matt Salisbury[1]	Dalhousie U	downhole geophysics	
China	Zuyi Zhou	Tongji U	basin development	observer
ECOD	Jeroen Kenter	Vrije U Amsterdam	carbonates/phys. props.	through 2003
France	Philippe Pezard	Montpelier	ocean crust/logging	observer
Germany	Bill Hay -2001	GEOMAR	paleo/sedimentology	through 2001
	Peter Herzig 2002-	Freiburg U	sulfides/hydrothermal	2002-
UK	Alastair Robertson[2]	U Edinburgh	tectonics/struct.geol.	through 2001
Japan co-chair	Hajimu Kinoshita[3]	JAMSTEC	geothermal/geophysics	[OD21 chair]
Japan	Hisao Ito	Geol. Survey Japan	downhole/seismology	
Japan	Kenji Kato	Shinshu U	microbial ecology	
Japan	Yoshiyuki Tatsumi	JAMSTEC/IFREE	petrology	
Japan	Ryuji Tada	U Tokyo	sedimentology	
[Japan]	[Hisatake Okada]	Hokkaido U	paleoceanography	

[1] Shiri Srivastava is alternate
[2] Chris Macleod is alternate
[3] Kiyoshi Suyehiro (JAMSTEC) named alternate co-chair for Hajimu Kinoshita

iESSEP Nominations

Country	Name	Institution	Expertise	JOIDES ESSEP?
USA	Gabe Filippelli	IUPUI	paleoclim./geochem.	as of 2001
USA	John Hayes	WHOI	micro/biogeochem.	through 2003
USA	Lincoln Pratson	Duke U	slope sedimentation	as of mid-2001
USA	Liz Screaton	U Florida	hydrogeology	through 2002
USA	Christina Ravelo	UC Santa Cruz	paleoclimate	
[USA]	[Lee Kump]	Penn. St.	geochem/tectonics	
Australia	no nominee		.	
Canada	Nick Eyles[1]	U of Toronto	continental high-res	
China	no nominee			
ECOD	Helmut Weissert[2]	Switzerland	.	as of 2001
France	Gilbert Camoin**	Noumea	paleo/sedimentology	through 2002
Germany	Hans Brumsack[3]	U Oldenburg	organic geochem.	through 2002
UK	Paul Wilson[4]	U Southampton	paleoceanography.	through 2001
Japan	Ayako Abe	U Tokyo	climate change	
Japan	Kazuto Kodama	Kochi U	paleomagnetism	
Japan	Wonn Soh	JAMSTEC	marine geology	
Japan	Kozo Takahashi	Kyushu U	paleoceanography	
Japan	Hiroyuki Yamamoto	St. Marianna U	microbiology	
Japan	Naohiko Okochi	WHOI	paleoceanography	
[Japan]	[Ayako Abe]	U Tokyo	climate change	

** potential chair (not yet asked)
[1] Phil Hill is alternate.
[2] Nalan Koc, Norway, is alternate
[3] Jurgen Rullkutter is alternate
[4] Jurgen Thurow through 2001

iISSEP Nominations

Country	Name	Institution	Expertise	JOIDES ISSEP?
USA	Tim Byrne **	U Connecticut	convergent margins	after 2001
USA	Donna Blackman	SIO	ocean ridge tectonics	after 2001
USA	Mike Mottl	U Hawaii/SOEST	hydrothermal/geochem.	through 2002
USA	Dave Vanko	U Georgia	alteration/fluids	through 2002
USA	Michelle Kominz	West. Michigan	sea level/tectonics/model	
[USA]	[Mike Steckler[1]]	LDEO	extensional basins	
Australia	Dick Arculus	U Sydney	petrology/conv. tect..	through 2002
Canada	Kathy Gillis[2]	U Victoria	petrology/alteration	
China	no nominee			
ECOD	Rolf B. Pederson[3]	Norway		as of 2001
France	Benoit Ildefonse	U Montpelier	petrology/struct. geol.	through 2002
Germany	Colin Devey[4]	U Bremen	igneous petrology	through 2001
UK	Damon Teagle	Southampton	ocean crust/geochem.	as of 2001
Japan	Juichiro Ashi	U of Tokyo	structural geology	
Japan	Makoto Yamano	U Tokyo/ERI	geothermics	
Japan	Tomochika Tokunaga	U of Tokyo	hydrogeology	
Japan	Norie Fujibayashi	Niigata U	petrology	
Japan	Hitoshi Mikada	JAMSTEC	downhole geophysics	
[Japan]	[Shuichi Kodaira]	JAMSTEC/IFREE	seismology	

** potential chair for both iISSEP and JOIDES ISSEP as of 2001.
[1] Steckler has not yet accepted potential nomination
[2] Keith Louden is alternate
[3] Luis Menezes Pinheiro, Portugal, is alternate
[4] Ulrich Bleil is alternate

iSSP Nominations

Country	Name	Institution	Expertise	JOIDES SSP?
USA	Dave Caress **	MBARI	marine seismics	through 2002
USA	Andre Droxler	Rice U	seismics/carbonates	through 2003
USA	Kirk McIntosh	UTIG	seismics	as of mid 2001
USA	Dave Naar **	U South Florida	seafloor mapping	
USA	Rob Sohn	WHOI	seismics	
[USA]	[Harry Roberts]	LSU		
Australia	no nomination			
Canada	Mike Enachescu[1]	Husky	3-d seismics	
China	no nominee			
ECOD	Annakaisa Korja[2]	Finland		as of mid 2001
France	Silvie LeRoy	U Paris IPG		through 2002
Germany	S. Neben[3]			as of mid 2001
UK	Roger Scrutton			through 2003
Japan	Kyoko Okino	U of Tokyo/ ORI	tectonics	
Japan	Shinichi Kuramoto **	Geol. Survey Japan	geotectonics	up to 2001
Japan	Tetsuro Tsuru	JAMSTEC/IFREE	seismology	
Japan	Noriko Tsumura	Chiba U	seismology	
Japan	Yoshihumi Nogi	NIPR	geomagnetism	
[Japan]	[Jin-Oh Park]	JAMSTEC/IFREE	seismology	

** potential chair for both iSSP and JOIDES SSP as of 2001.
[1] David Mosher (Geological Survey of Canada) is alternate
[2] Luca Gasperini (Italy) is alternate
[3] Christian Gaedecke is alternate

National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230
UNITED STATES OF AMERICA

Ministry of Education, Culture, Sports Science and Technology
3-2-2 Kasumigaseki, Chiyoda-ku
Tokyo, 100-8959, JAPAN

International Working Group for Integrated Ocean Drilling Program

17 May 2001

Dr. Chris Harrison
Chair, JOIDES EXCOM
UNITED STATES OF AMERICA

Dr. Hajimu Kinoshita
Chair, OD21 Science Advisory Committee
JAPAN

Dear Drs. Harrison and Kinoshita:

We write in response to the recommendations in your letters of March 26 and May 4 concerning formation of the interim Science Advisory Structure (iSAS). On behalf of IWG, we thank you for your efforts, and are pleased to receive the positive status report of iSAS formation. We also appreciate your thoughtful recommendations for forming iSAS.

After the January IWG meeting in Southampton, we requested your nominations for membership on iSAS committee/panels from IWG member representatives who were, in principle, seeking full IODP membership. However, a motion about nominations on iSAS committee/panels was adopted at the Kamakura EXCOM meeting.

As discussed in your letter on March 26, we agree that it is important to ensure broad country participation in IODP planning during the interim period. iSAS participation by representatives of potential IWG members may be a very positive motivation for them in considering the IODP official membership. On the other hand, we also recognize that iPC co-chairs wish to somewhat limit committee/panel membership to maximize efficiency in operations.

In order to resolve this conflict, we request your nominations for iSAS membership on committee/panels according to scenario (3) of your letter on March 26. Japan and US are willing to accept this slightly reduced representation to provide for a more efficient operation of the iSAS structure. As identified in scenario (3), we request that China and Australia be invited to regular membership. Then iSAS would consist of 5 members from Japan, 5 members from the United States, and one member each from Australia, Canada, China, France, Germany, ECOD, and the United Kingdom.

However, please note that we do not prefer to increase iSAS membership further. We think that it would be appropriate to regard additional members as observers of committees.

If you have comments, please feel free to contact us. Thank you for forwarding the draft list of nominees of the iSAS committee/panels.

Sincerely,

Margaret Leinen
Co-Chair, IWG
U.S. National Science Foundation

Yoichiro Otsuka
Co-Chair, IWG
Ministry of Education, Culture, Sports, Science and Technology

Cc: Dr. Keir Becker, Chair, JOIDES SCICOM; Dr. Ted Moore, Chair, IPSC

8.2 IPSC activities

National Science Foundation
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Arlington, Virginia 22230
UNITED STATES OF AMERICA

Ministry of Education, Culture, Sports Science and Technology
3-2-2 Kasumigaseki, Chiyoda-ku
Tokyo, 100-8959, JAPAN

International Working Group for Integrated Ocean Drilling Program

12 April 2001

Professor Theodore C. Moore
Chair, IODP Planning Subcommittee
The University of Michigan
Department of Geological Sciences
2534 C.C. Little Building
425 E. University Avenue
Ann Arbor, MI 48109-1063
USA

Dear Ted:

This letter is intended to provide our response to a series of IPSC activities, recommendations and questions that you have raised in letters of March 1 and 8, and your email to us on March 16. We have delayed responding until now, since several of the issues required discussion at our recent meeting in Tokyo. We hope this minor delay has not hindered IPSC in its continuing planning process.

We would first like to thank you and the other members of IPSC for your quick and thoughtful revisions to the IODP Initial Science Plan (ISP) that were requested in our letter of 1 February. As you know, we have circulated the revised ISP to other members of the IWG, have received no additional concerns or requested changes from them, and feel that the document is ready for publication. On behalf of the IWG members we would like to thank you, the other members of IPSC, and the broad international community of earth scientists that participated in preparation of the plan. The ISP identifies a challenging and important scientific agenda for the coming decade. The task for the IWG will now be to translate your plans and recommendations into a coordinated and integrated program of ocean drilling.

We would also like to thank you for your continuing consideration and recommendations on the IODP organizational structure and characteristics required to fully address your scientific recommendations. We have carefully considered these recommendations in constructing our draft plans and principles for IODP organization, operations and management. Significant effort and international agreement remain in resolving many of the administrative and financial challenges which still face us in initiating the IODP. We cannot promise that all of IPSC's detailed recommendations can or will be implemented. But we can promise that the IODP organizational and management structure will be responsive to the needs of the international scientific community in addressing the objectives of the ISP.

In your email of March 16, you identify 3 options for the future of IPSC, its Working Groups, and its remaining responsibilities. With the formation of iSAS and its iPC, we believe that remaining, long-term tasks and activities begun by IPSC could be transferred to the new interim advisory structure, so we do not favor your options B and C. We look forward to iPC recommendations and IWG interaction on issues related to technology and industrial liaison, as well as continuing definition of iSAS structure and panel requirements. We prefer a modification of option A. We do not wish to be in the position of interrupting or canceling short-term plans for meetings or reports that may already be well along in planning or preparation. In general we believe that IWG reliance on IPSC will end this summer with the establishment of iSAS, but would appreciate receiving your detailed thoughts on scheduled and planned activities which need to be completed in this time frame prior to setting a firm termination date for IPSC.

If we can provide any clarification on the above points, please feel free to contact us.

Yours sincerely,

Margaret Leinen
Co-Chair, IWG
U.S. National Science Foundation

Yoichiro Otsuka
Co-Chair, IWG
Ministry of Education, Culture, Sports, Science and Technology

Original IPSC Tasks (from JOIDES EXCOM)

1. Coordinate development of the science plan. *(done)*
2. Assess managerial and financial requirements. *(done)*
3. Design advisory structure. *(done)*
4. Develop plan for transition from ODP to IODP. *(done)*
5. Develop options for technical and operational capabilities required to meet the science plan. *(addressed, but not completed)*
6. Develop strategy to address technical and operational issues. *(addressed, but not completed)*

Specific IPSC Task	Status
Review Lab Needs of OD21 ship	*done* (with SciMP)
ISP Write/Review/Produce	*done*
CDC Evaluation	*done*
Cost Estimates for IODP	*done*
Management Advice	*addressed*
iSAS Structure/Mandates	*addressed*
Populate transition committees	
iPC	OD21/JOIDES (done)
iSSEPs	OD21/JOIDES (done)
iSSP	OD21/JOIDES (done)
iPPSP	OD21/JOIDES, iPC
iSciMP	OD21/JOIDES, iPC
DPG (Riser)	iPC

Initial Science Plan of the Integrated Ocean Drilling Program

Response to IWG charges following
IWG sponsored (Rhodes/Uyeda) Review

1. One – two pages added at the end of each theme discussing the roles of the three types of platforms (riser, non-riser, and "mission-specific") as they might apply to the science discussed in the theme.

2. Added Appendix 1 (2 pages) documenting the consultation with the scientific ocean drilling community in developing this plan.

3. Added Appendix 3 (3 pages) identifying a representative selection of national and international scientific programs and discussing their relationship to the three scientific themes of the IODP Initial Science Plan.

4. "Innovations and Technology Development" section rewritten to clarify which of the identified technologies are proven and which are new or are in a testing phase.

5. More detail added concerning how the cost estimates of the Program were developed and evaluated.

The People that helped make the IODP Initial Science Plan (Sept 1999 – March 2001)

CONCORD Workshop (1997) **174 Scientists from 17 Nations**

COMPLEX Workshop (1999) **428 Scientists from 25 Nations**

Science Planning Working Group

M.F. Coffin, Institute for Geophysics, The University of Texas at Austin, USA, Co-Chair
J.A. McKenzie, Eidgenössische Technische Hochschule, Switzerland, Co-Chair
E. Davis, Pacific Geoscience Centre, Canada
G. Dickens, James Cook University, Australia
K. Ellins, Institute for Geophysics, The University of Texas at Austin, USA
J. Erzinger, GeoForschungsZentrum, Germany
P. Huchon, Géosciences Azur, France
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IPSC

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Hans-Christian Larsen, Director Dansk Lithosphere Centre
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Jörn Thiede, Director Alfred-Wegener Instsute for Polar and Marine Research
Joanne Reuss, IPSC Project Manager, Univ. of Michigan

A Total of well over 600 Scientists
from the International Ocean Drilling Community

Availability of the IODP ISP

One hundred copies of the ISP have been mailed in late April to each of the international ODP Offices. It can also be directly downloaded as a pdf file from the IODP web site:

http://www.iodp.org

IPSC Technical Advice Working Group

Members

Adam T. Bourgoyne, Jr. (Chair), Dean, College of Engineering, Louisiana State Univ. (retired)
Tom Hamilton, VP, Fugro-McClelland Marine Geoscience, Inc.
John Smith, Assistant Professor, LSU Petroleum Engineering Department
Allen Kelly, Manager of Training ,Diamond Offshore
John M. Shaughnessy, Drilling Engineer, BP AMOCO
Clovis Lopes, Petroleum Engineer, Petrobras
Yuichiro Ichikawa, Manager, Japan Drilling Company, Deep-sea Development Division

Consultants:

Bob Herrmann, Deepwater Consultant, BP–AMOCO & ex-Drilling Manager for Discover Seven Seas
Don Remson, Consultant, Rimkus Consultant Group

Report from the Technical Advice Working Group:

Review of OD21 Ship Design
Review of Riser Drilling Costs (Margin and Deep-water Sites)
Review of Availability of "Mission-Specific Platforms"
Review of Riser Site Safety Issues
Update on Development of Deepwater Well Control Technology
Review of Staffing Levels and Management Structure

TAWG Final Report Target Completion Date: August 2001

IPSC Recommendation: Following consultations with JOIDES TEDCOM, iPC should consider the establishment of a *Technical Advice Panel* with rotating panel membership and with reliance on specialty working groups to address specific engineering challenges.

IPSC Industrial Liaison Working Group

Members

John Armentrout, ExxonMobil, retired, (co-Chair)
Kate Moran, Atlantic Canada Petroleum Institute and University of Rhode Island, (co-Chair)
Satoshi Tono (Teikoku Oil Co.)
John Hogg (PanCanadian Oil Co.)
Dave Roberts (BP)
Tony Doré (Statoil)
Alain Mascle (Institut Français du Petrole)
Phil Christie (Schlumberger Research)

Champions (to be contacted by ILWG members)

ExxonMobil, Pinar Yilmaz and Art Green
Anadarko, Mike Cochran
Statoil, John Vollset
AGIP, Maritsio Orlando
Texaco, Marty Perlmutter
Chevron, Nahum Schneidermann
Husky, Michael Enachescu
Shell, Harry Doust
Amarada, Ian Bartholemew
Veritas, Henry Posamentier
Conoco, David Jenkins
Norsk Hydro, Arvide Nottriedt

Planned Activities:

June '01:

Open House at Annual AAPG Meeting (Denver), develop industry "IODP Champions".

Develop "Front End" for the IODP Initial Science Plan that presents the main science themes in the lexicon of industry scientists.

September '01:

Academia-Industry Workshop on Scientific Ocean Drilling (hosted by BP in the UK).

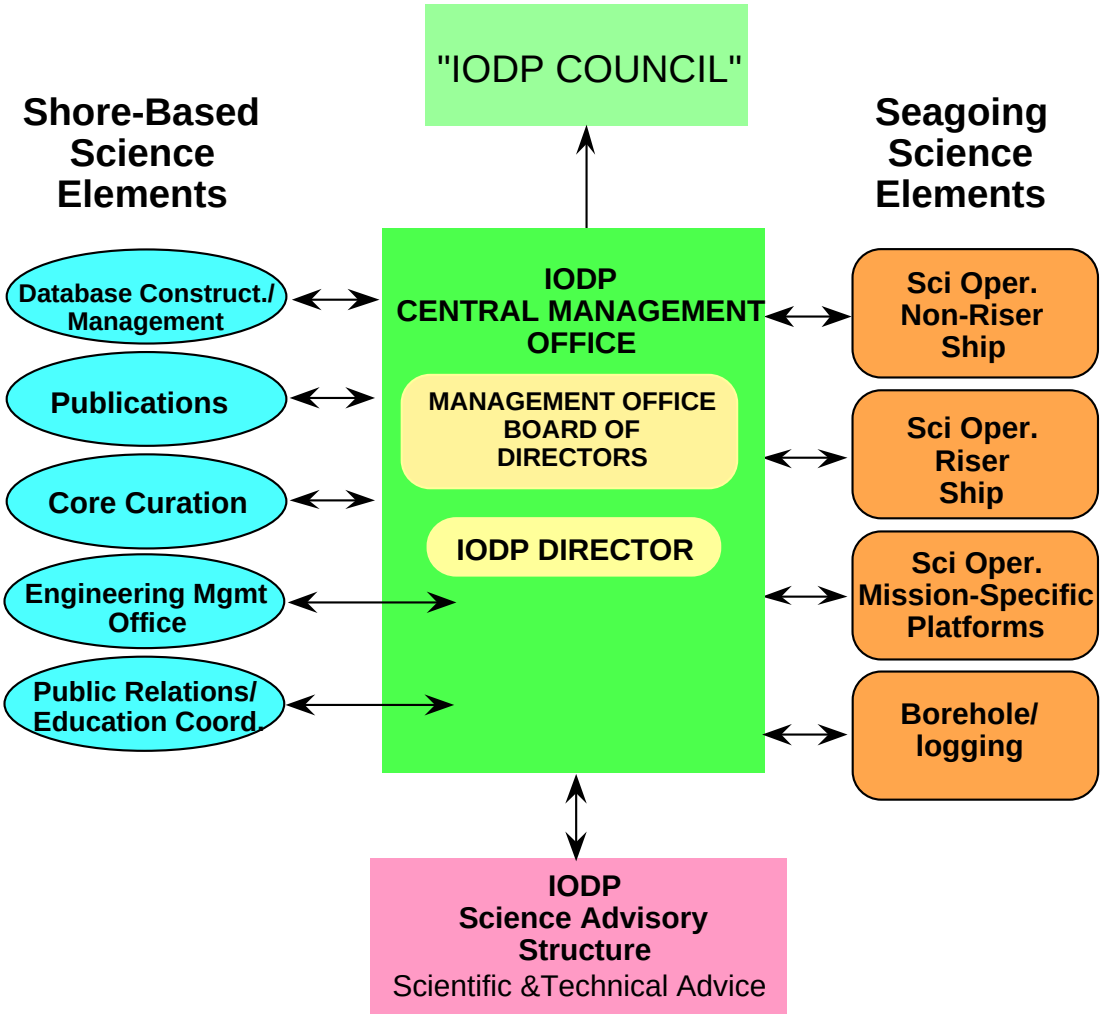
IPSC Recommendation: iPC should consider the establishment of an *Industry Liaison Panel*, composed of Academic and Industry Scientists having a broad range of scientific interests.

Ongoing IPSC Tasks Remaining

1. Assess details of program elements and managerial requirements for IODP:

2. Assess needs for, and means of obtaining:
   a) technical advice;
   b) developing working relationships with offshore industries and industry scientists; and
   c) pollution prevention and safety review of procedures and drilling programs.

A Model for Program Elements of the IODP



↔ Denotes communication exchange between program elements that report to the Central Management Office, which has formal authority over IODP program elements for science operations and which has ultimate responsibility for developing the annual IODP Program Plan

Options for Addressing IPSC Remaining Tasks

Preferred Option:

1. All tasks not completed by IPSC to be passed to iPC as soon as it is formed. The iPC may pursue such tasks, as well as others defined in their mandate, as a body or through the efforts of special working groups. With the approval of JOIDES EXCOM, IPSC ceases to exist with the establishment of the iPC.

Alternative Options:

2. Once iPC is set up, iPC takes charge of the Technical Advice and Industrial Liaison Working Groups of IPSC and directs them in their efforts to pursue remaining IPSC tasks. With the approval of JOIDES EXCOM, IPSC ceases to exist.

3. Once iPC is set up, transfer IPSC and its line of reporting as a subcommittee to the iPC. IPSC continues to pursue its remaining tasks with its working groups and with a target date of completion of summer of 2002.

Tasks to be Taken Up by iPC

Call for IODP Proposals	(drafted)
Letter to Proponents	(drafted)
IODP Sample and data distribution policy	
IODP Guide	(with iSAS Office)
Handbook for Proponents	(with iSAS Office)
Lab. Needs (mission specific plat.)	(with iSciMP)
Riser DPG Mandate	(with working group advice)
Pollution Prevention and Safety Panel Mandate	(with riser DPG, PPSP)
Technical Advice Panel Mandate	(with TAWG, TEDCOM)
Industry Liaison Panel Mandate	(with ILWG)
Riser Site Safety Guidelines	(with iPPSP, riser DPG)
Review Program Elements	(with working group advice)

8.4 JAMSTEC Report and iSAS Office

iSAS Office Update

-- Establishment of the Office

The interim Science Advisory Structure (iSAS) Office was co-located on 7 May 2001 at the headquarters of the Japan Marine Science & Technology Center as agreed at the International Working Group (IWG) Meeting in January 2001, Southampton for supporting the activities of iSAS for IODP.

The iSAS Office will provide administrative support for related issues, such as quality control of research planning made in public science proposals by conducting thorough reviews, while promoting a smooth transition from ODP to IODP during the interim period until 1 October 2003.

We will show important information such as drilling proposal format, IODP/iSAS handbook, as well as each ipanel meeting schedule on our Web Site.

-- Staff

Administrator: Dr. Minoru Yamakawa
Science Coordinator: Dr. Nobuhisa O. Eguchi
Science Coordinator: Dr. Jeffery D. Schuffert
Administrative Staff: Ms. Noriko Tuji

-- Contact information

interim Science Advisory Structure Office (iSAS Office)
2-15 Natsushima, Yokosuka, 237-0061, JAPAN
Tel.: +81-468-67-5562, Fax.: +81-468-66-5351
e-mail: isasoffice@jamstec.go.jp

http://www.isas-office.jp

8. 6 European Initiative

8.6.1 APLACON Conference

APLACON - an International Conference aimed at integrating Alternate Platforms (Mission Specific Platforms) as part of the Integrated Ocean Drilling Program (IODP)

10-12 May 2001, Lisbon, Portugal

http://www.jeodi.org/Lisbon/Lisbon_general.html

9.1 Achievements on Legs 193-195

Leg 193: Anatomy of a Felsic Volcanic-Hosted Hydrothermal System
Eastern Manus Back-Arc Basin

Leg 193 utilized the ODP capabilities for hard-rock reentry, coring, wireline logging, and logging-while-drilling (LWD) to explore the lateral, vertical, and temporal variability of a seafloor hydrothermal system hosted by felsic volcanic rocks in a convergent plate margin setting. Leg 193 successfully intersected an actively forming base metal sulfide system, and its results complement those from previous legs to the TAG hydrothermal mound on the mid-Atlantic Ridge (Leg 158) and sediment-hosted sulfide deposits on the Juan de Fuca Ridge (Legs 138 and 169) in addressing Long-Range Plan objectives relating to hydrothermal processes and sulfide mineralization in the seafloor.

Primary Leg 193 targets included three sites on the crest of Pual Ridge in the Eastern Manus, one each in an area of high-temperature venting (a black smoker chimney field), a field of lower temperature diffuse venting, and at a reference site that, although proximal to a high temperature venting area, showed no surficial evidence of hydrothermal activity. The essential objective was to document the depth dimension of the hydrothermal system responsible for development of massive sulfide chimneys and mounds at the PACMANUS site on the felsic volcanic Pual Ridge. This is essential to understand the interplay between fluid pathways and fluid-wallrock interaction that governs the nature and location of mineral deposition within an environment representing a modern, actively forming analog of the settings of many ore bodies in ancient geological sequences.

The recovered cores and logs allowed shipboard scientists to assess the interplay between magmatic-derived fluids and seawater and to examine fluid pathways with an eye toward establishing a comprehensive chemical and hydrologic model for this system. The intensity, degree, and distribution of alteration facies, and abundance of clay minerals and anhydrite directly address these objectives. However, poor core recovery in the sulfide-rich interval precludes adequate assessment of the dimension of such mineralization. The initial perception is that, despite the pervasive alteration indicative of a long-lived hydrothermal system, Leg 193 sampled the prenatal development of a massive sulfide deposit, which, given continued maturation, could develop into a deposit on the order of those exploited for centuries in ancient ore environments.

The Leg 193 cores also provided a petrogenetic model for the volcanic architecture at Pual Ridge, despite low recovery. The cores define a fresh volcanic cap underlain by pervasively altered volcanic flows and breccias, albeit with short intervals of markedly less intense alteration, which reveal the nature of the growth and evolution of this edifice.

An additional focus of Leg 193 was to delineate the extent to which microbial life flourishes in the subsurface of such a hydrothermal system, contributing to ODP's "Deep Biosphere" pilot project. The nature, extent, and habitat controls of microbial activity in this hydrothermal system were also carefully evaluated. Direct counting and biological tracer analyses indicate the presence of a biomass to >100 m below seafloor. Cultivation experiments indicate that potential microbiological activity persists to much deeper and more harsh environments.

Leg 193 also recorded a number of operational breakthroughs for ODP. These included the first deployment in hard rock of the ADCB and the first application of a hammer drill in a new strategy for hard-rock reentry as well as an innovative adaptation that allowed us to case an existing hole. Others included the first free-fall deployment of a standard reentry cone, enabling a deep hole to be commenced exactly on a small target selected under drill stem video observation, as well as the nesting of a FFF above the reentry cone, allowing dual casing strings to be set after the first one failed to seat properly. On the logging side, Leg 193 marked the first hard-rock application by ODP of LWD technology.

Integration of leg results and post-cruise research is expected to allow direct comparison of the Manus Basin hydrothermal system with not only other active seafloor hydrothermal areas, but with ancient ore deposition environments as well, improving our understanding of these complex systems and underscoring the cumulative ODP success in studying hydrothermal systems in a variety of environments.

Leg 194: Sea-Level Magnitudes and Variations Recorded by Continental Margin Sequences on the Marion Plateau, Northeast Australia

Estimating the amplitude and timing of past eustatic sea level changes is essential both for the establishment of an accurate Phanerozoic sea level curve and for the interpretation of sediment sequences on continental margins. Cretaceous rifting in the western Coral Sea (offshore northeast Australia) formed continental fragments that are now capped by carbonate platforms. The Marion Plateau carbonate platform, which has grown on one of these fragments, provides a natural laboratory to study the causes, magnitudes, and effects of sea-level change on continental margin sediments. One of the fundamental controls on the nature and geometry of continental margin sediment deposition is sea level; however, until now, much of the information on the relationship between sea-level and depositional facies has been qualitative.

During Leg 194, a series of eight sites were drilled through Oligocene-Holocene mixed carbonate and siliciclastic sediments that record the depositional history and past sea level variations of the Marion Plateau, northeast Australia. Seismic sequence stratigraphy provided the geometric framework to locate the drill sites for optimal sampling of highstand and lowstand sequences with geometries that enable quantification of Miocene relative sea level variations.

Lithostratigraphic and biostratigraphic data obtained from the Neogene carbonate platforms of the Marion Plateau during Leg 194 reveal that platform architecture was controlled by a series of complexly related factors including sea level change, bottom-current action, and biological assemblages. An important finding is that the oldest platform phase of the southern carbonate platform developed in a topographic depression as opposed to the more common condition of nucleation on a topographic high. Furthermore, the steep-sided geometry of both Marion Plateau carbonate platforms is typical of tropical to subtropical carbonate platforms.

Basement rocks penetrated at five sites during Leg 194 differ greatly from those previously drilled on the Queensland Plateau. Rather than metasedimentary rocks, highly altered volcanic flows and volcaniclastics were recovered. The lack of deformation in hand samples and thin sections suggests that these volcanics may have formed during the Late Cretaceous-Paleocene rifting along northeastern Australia from the Papuan Plateau and the Lord Howe Rise in the south. High-quality paleomagnetic data collected from these basement volcanics, when compared with the Australian apparent polar wander path, may provide age estimates for both the emplacement of the basalts and the timing of their low-temperature alteration.

In addition to determining sea level magnitudes, and the development of carbonate platforms in a current-dominated environment, the facies changes and the development of sequence stratigraphic units controlled by sea level changes were recorded. The themes of Oligocene-Pliocene third-order sea level fluctuations, together with the role of climatic and paleoceanographic change in the subtropical South Pacific and its influence on carbonate platform development have also been addressed.

9.2 Proposals activity

PROPOSALS, ADDENDA, AND APL'S
RECEIVED FOR MARCH 15, 2001 DEADLINE

ADDENDA/UPDATES

519-Add	Camoin, G.	Sea-Level Rise, S. Pacific	
522-Add2	Wilson, D.	Fast Spreading Pacific	
539-Add	Holbrook, S.	Blake Ridge Hydrates	
559-Add	Zachos, J.	Walvis Ridge	
570-Add	Haymon, R.	East Pacific Rise	
577-Add	Wilson, P.	Demerara Rise	**
584-Add	Rona, P.	TAG II	

** accepted following April-May site survey

REVISED PROPOSALS

592-Pre2	Andriessen, P.	Shallow Water Dogger Bank
586-Full2	Rubenstone, J.	Hawaiian Coral Reefs and Basalts

NEW PROPOSALS

595-Full	Clift, P.	Indus Fan Riser and Non-Riser
596-Pre	Morrissey, T.	Rockall-Hatton Cretaceous Hotspot
597-Pre	Jaeger, J.	S. Alaska High-Resolution Sediments

ANCILLARY PROGRAM LETTERS (new or revised)

APL-15	Tamaki	K.Gulf of Aden, Afar Mantle Plume
APL-19	Garcia, M.	Nu'uanu Landslide, Hawaii (Leg 200)
APL-20	Ranero, C.	Costa Rica Mud Volcanoes (Leg 203)

9.3 SCICOM Motion 01-01-03

TEDCOM RECOMMENDATION # 002-2: TEDCOM recommend to SCICOM that they clearly and formally request from ODP-TAMU and LDEO the information required for Legacy documentation together with the timescale for same. The topic has been discussed at this meeting and pathways outlined following direction given to TEDCOM after the OPCOM meeting at Halifax. This should have been an opportunity to finalize the documentation strategy but ODP-TAMU said that they had been given no direction in this matter. It is up to SCICOM to ensure that this does not happen in future by using formal channels to ensure that requests are made and direction is given.

Baldauf said that ODP already has some materials prepared and they would need about half a year to finalize the technical legacy documentation, unless there are some drastic changes to format.

Skinner explained the desired format would be one page tool summary with a science application on the other side, for which the best figures from existing leg reports could be utilized. For example, for the APC tool it could be a good core photo showing recovery, or for a logging tool it could be a figure with log data. The reference added under the figure, as Mayer pointed out, would allow interested readers to follow up on details.

Fisher wondered who decides what tools are selected for such legacy documentation. Skinner responded that only the tools that take the samples or wireline logs would be included. Janecek added that there is a separate document prepared by SCIMP about laboratory tools.

Some discussion followed after which Becker asked if 6-months timeline was acceptable, and all consented. ODP-TAMU agreed to prepare the draft document for August SCICOM meeting, such that it could be finalized right after the meeting.

Skinner made one comment regarding the other technical legacy - the full documentation to be prepared for the end of ODP. He noted that the existing archive drawings should not be updated to the modern format, but should be included as they are.

TEDCOM RECOMMENDATION # 002-4: TEDCOM recommend to SCICOM that they explore with EXCOM and IPSC a means whereby promising technical developments, which will not be brought to completion within the current Ocean Drilling Program, are nurtured for the future IODP. Annex 4 of this report [TEDCOM minutes] shows the development schedule of equipment projecting well beyond 2003. Clearly this cannot be accommodated within the present program and may be further curtailed if budgetary constraints increase. The committees are aware that IODP have high expectation of 'hitting the ground running' and thus need to explore ways of conserving the developments from this program for tools in the next.

Skinner explained that it is not feasible that all the tools being developed in ODP will come to completion in the current program, but there are a number of promising developments that should not be dropped. TEDCOM recommendation #002-4 is a request to keep those active through the ODP-IODP transition by whatever means possible, especially if they are expected to be operational within the few months of a new program. Examples would be downhole memory subs or ADCB improvement (retractable bits) etc. Skinner added that it should be acknowledged that some staff time will be devoted at TAMU to keep the momentum going. Skinned also acknowledged that this shouldn't involve any additional financial expenses.

Fox mentioned cooperation with an Australian vendor and Schlumberger on hammer drilling improvements, and with Department of Energy on downhole memory tools, as examples of efforts to keep the developments active with help of outside resources.

SCICOM Motion 01-01-03: SCICOM endorses TEDCOM recommendations 002-2 and 002-4.
Robertson moved, D'Hondt seconded, 13 in favor, none opposed, 2 absent.

Executive Summary

Ocean Drilling Program Organization

The Ocean Drilling Program (ODP) is an international partnership of scientists and research institutions organized to explore Earth's history and structure as recorded in the ocean basins. ODP provides sediment and rock samples (cores), shipboard and shore-based facilities for the study of these samples, downhole geophysical and geochemical measurements (logging), and opportunities for special experiments to determine *in situ* conditions beneath the seafloor. ODP studies lead to a better understanding of plate tectonic processes, Earth's crustal structure and composition, environmental conditions in ancient oceans, and climate change.

ODP is funded by the US National Science Foundation (NSF) and by international partners, which currently include: the Australia/Canada/Chinese Taipei/Korea Consortium for Ocean Drilling, the European Science Foundation Consortium for Ocean Drilling (representing twelve countries), France, Germany, Japan, the United Kingdom, and the People's Republic of China. The ODP Council, representing all of these partners, provides a forum for consultation among the NSF and other national funding agencies.

Scientific advice for ODP is provided by the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES), an international organization of advisory committees and panels. The scientific basis and justification for ODP is documented in the report on the Conference on Scientific Ocean Drilling (COSOD) held in November 1981. The COSOD report identified twelve major scientific themes around which JOIDES continues to develop specific drilling plans. The report of a second COSOD meeting (COSOD-II) held in July 1987 provides the framework for scientific ocean drilling through the 1990s. The ODP Long Range Plan (LRP), published by Joint Oceanographic Institutions, Inc. (JOI) in 1990, distills COSOD themes, JOIDES panel white papers, and other scientific and technical advice into a scientific and engineering road map through 2002. The latest ODP Long Range Plan, published in 1996, updates and extends the 1990 Long Range Plan to provide a vision into the twenty-first century.

Overall program management is provided by Joint Oceanographic Institutions (JOI). JOI contracts with Texas A&M Research Foundation (TAMRF) for business services and Texas A&M University (TAMU) to serve as Science Operator and with Lamont-Doherty Earth Observatory (LDEO) to serve as Logging Operator and also to provide Site Survey Data Bank Services. The Science Operator is responsible for operation of the drillship *JOIDES Resolution* and associated activities of cruise staffing, logistics, engineering development and operations, shipboard laboratories, curation and distribution of core samples and data, and publication of scientific results. The Logging Operator is responsible for providing a full suite of geophysical and geochemical logging services, involving acquisition, processing and interpretation of logging measurements. The Site Survey Data Bank prepares safety packages for pre-cruise review of designated sites, and supplies each shipboard scientific party with the geophysical data necessary to properly conduct scheduled drilling cruises. The Data Bank also assists scientists interested in

writing/revising ODP proposals by providing information in regards to scientific problems of interest to the scientific ocean drilling community.

Coordination of the ODP Program Plan

Primary scientific programs are based on proposals submitted by the international science community to the JOIDES Office. The reviews and implementation of these program proposals are completed by various JOIDES advisory panels which make recommendations to the JOIDES Science Committee (SCICOM). From this input, SCICOM writes a science plan and submits it to JOI. JOI prepares the program plan from the science plan with budgetary input from subcontractors. If necessary, JOI organizes a meeting of the JOIDES Budget Committee (BCOM), a subcommittee of the Executive Committee (EXCOM). BCOM includes representatives from EXCOM and SCICOM and acts on their behalf in advising JOI about the degree to which the budget outline meets the stated scientific objectives of ODP for the next fiscal year. The program plan is reviewed by EXCOM and forwarded by JOI to NSF for formal approval.

Highlights FY 00 to 01 (Legs 189-194)

Science Highlights

“Greenhouse to “Icehouse”
Leg 189 results encapsulate the evolution during the Cenozoic of the Antarctic system from "Greenhouse" to "Icehouse." The changes recorded in the cored sequences clearly reflect the evolution of a tightly integrated, and at times dynamically evolving, system involving the lithosphere, hydrosphere, atmosphere, cryosphere, and biosphere.

The Cenozoic Era is unusual in its development of major ice sheets. Progressive cooling at high latitudes during the Cenozoic gradually formed major ice sheets, initially on Antarctica, and later in the Northern Hemisphere. In the early 1970s, a hypothesis was proposed that climatic cooling and an Antarctic cryosphere developed as the Antarctic Circumpolar Current progressively thermally isolated the Antarctic continent. This current resulted from the opening of the Tasmanian Gateway south of Tasmania during the Paleogene and the Drake Passage during the earliest Neogene.

The five Leg 189 drill sites, in 2463m to 3568m water depths, tested the above hypothesis and refined and extended it, greatly improving understanding of Southern Ocean evolution and its relation with Antarctic climatic development. The relatively shallow region off Tasmania is one of the few places where well-preserved and almost-complete marine Cenozoic carbonate-rich sequences can be drilled in present-day latitudes of 40°-50°S, and paleolatitudes of up to 70°S. The broad geological history of all the sites was comparable, although there are important differences among the three sites in the Indian Ocean and the two sites in the Pacific Ocean, as well as from north to south.

Accretionary Prism Coring

Accretionary prisms represent unique, accessible natural laboratories for exploring initial mountain building processes. The geometries and structures of accretionary prisms are relatively simple and have been well imaged seismically. Typically, the materials incorporated within prisms are only moderately altered from their original states, so competing active processes can often be isolated, quantified, and reproduced in the lab.

Six sites along two transects across the Nankai Trough accretionary prism were successfully drilled during Leg 190, satisfying all leg objectives. The Nankai Trough accretionary prism represents an "end-member" prism accreting a thick terrigenous sediment section in a setting with structural simplicity and unparalleled resolution by seismic and other geophysical techniques. Thus, it represents a superb setting to address ODP's Long Range Plan objectives for accretionary prism coring, *in situ* monitoring, and refinement of mechanical and hydrological models. The approach for drilling at the Nankai margin includes sites for coring, *in situ* observation, and long term monitoring to (1) constrain prism hydrology, mechanical properties, and deformational styles; and (2) test existing models for prism evolution.

Leg 190 was the first of a two-leg program concentrating on coring and sampling a transect of sites across the prism within a 3-D seismic survey. One additional site was drilled to the west to compare along-strike variations in accretionary processes. Leg 196 will use logging-while-drilling technology to collect *in situ* physical properties data and will also install advanced circulation obviation retrofit kits for long-term *in situ* monitoring of prism processes including pressure, temperature, fluid geochemistry, and strain.

Installation of a Seismic Observatory and Hammer Drill Testing

ODP Leg 191 had two main goals: (1) to drill and case a borehole at a site in the northwest Pacific Ocean between Japan and Shatsky Rise and install therein a seismic observatory; and (2) to test the drilling and casing emplacement capabilities of the hard rock re-entry system (HRRS or "hammer drill") on a basaltic outcrop atop Shatsky Rise. There were also numerous ancillary scientific goals to be addressed using cores and logs obtained from Leg 191 sites. The seismic observatory was successfully installed at Site 1179 and left ready for activation by a future remotely operated vehicle cruise. The hammer drill tests were less successful owing to typhoons, a medical emergency and a mechanical failure. However, an abbreviated HRRS test was accomplished at a site atop a basaltic volcano in the Mariana Trough (Site 1182).

In drilling for the seismic observatory an excellent set of cores was obtained from Site 1179, which is located on lithosphere of Anomaly M8 age (129 Ma). A 377-m-thick sedimentary column was cored in addition to 98m of basaltic basement (total depth = 475m below seafloor).

The sedimentary column can be divided into four lithologic units. Unit I consists of clay- and radiolarian-bearing diatom ooze of late Miocene to late Pleistocene age. Ash beds are common in this unit, recording volcanic activity from the western Pacific island arcs. Unit II is a clay-rich, diatom-bearing radiolarian ooze of late Miocene age. Unit III contains barren, brown pelagic clay. Unit IV yielded poor recovery with only chert and Early Cretaceous porcellanite fragments from an unknown sedimentary matrix within 93.7m above basement. The upper sedimentary section produced a well-defined magnetic reversal pattern, which shows that sedimentation was low

(1.5m/m.y.) during the mid-Miocene and increased 300-fold (to 40-43m/m.y.) in the Pliocene and Pleistocene. Sedimentation rates derived from biostratigraphy agree with those calculated from magnetostratigraphy. The physical properties of the upper sedimentary section are unusual because porosities are extremely high (often >80%) and bulk densities actually decrease downhole for the first 150m. These characteristics most likely result from an increasing downward abundance of diatom tests, which have low grain densities and contain large amounts of pore space. The 98m igneous section consists of aphyric ocean ridge basalts divided into 48 units based on lithologic differences and cooling boundaries. The section consists of massive flows and pillows with small amounts of interunit sediments and volcanic breccia. The basalts are unusually fresh for Early Cretaceous igneous rock, and alteration is restricted to low-grade zeolite facies at temperatures less than ~10°-30°C.

The World's Largest Volcanic Oceanic Plateau

Volcanic oceanic plateaus are formed by immense volumes of magma emplaced in pre-existing oceanic lithosphere or at spreading centers. Nearly all of the plateaus in the oceans today were formed in the Cretaceous period and may reflect a key mode of mass and energy transfer from the Earth's interior to its surface which differs from the ocean ridge-dominated mode of the Cenozoic.

With a surface area of 1.6 x 106km^2 and a volume of 4-5 x 107km^3, the Ontong Java Plateau is the world's largest volcanic oceanic plateau and may represent the largest magmatic event on Earth in the last 200m.y. During ODP Leg 192 igneous basement and sediment cores were recovered in five widely separated sites in previously unsampled areas across the plateau. Primary objectives of the leg were to determine: (1) the age and duration of emplacement of the plateau; (2) the compositional range of magmatism; and (3) the environment and style of eruption.

The goal of Leg 192 was to sample the acoustic basement of the Ontong Java Plateau at four widely spaced sites, one of which was to be drilled at least 150m and three at least 100m into basement. Shipboard and shore-based studies of the rocks recovered would provide insights into the age and duration of magmatism; the compositional range of the mantle sources; and the processes of magmatic evolution. It was also hoped to evaluate the environment and style of eruption and the association of plateau emplacement with changes in paleoceanographic and paleoclimatic conditions.

Together with previous evidence, results from Leg 192 indicate that most of the Ontong Java Plateau formed well below sea level. The only evidence that a portion of the high plateau was ever at shallow depth is two thin intervals of Aptian vitric tuff above basement at Site 1183 and possibly a vitric tuff just above basement at DSDP Site 289. The mainly submarine emplacement of the plateau most likely accounts for its apparently limited paleoenvironmental effects. However, ferruginous claystone layers above basement at Sites 1183 and 1187 provide evidence for at least local Aptian "dead zones."

The evidence now available from Leg 192, combined with age data for Legs 30 and 130 sites, indicates that an immense part of the high plateau was formed in the ~122-Ma event: with the resolution of existing sampling and ^{40}Ar-^{39}Ar and biostratigraphic ages, the duration of this event could have been as great as ~7 m.y., or much shorter. Importantly, the central region of the main plateau appears to have been largely bypassed by post-122-Ma eruptive episodes. Thus, the ~90-

Ma episode now appears to have been volumetrically minor in relation to the ~122 Ma event, and later episodes have been still less important. This conclusion is one of the major results of Leg 192. In sharp contrast, in the southern and central Kerguelen Plateau and Broken Ridge, substantial volumes of magma appear to have been emplaced over a period of ~30m.y.

First Time Exploration of an Active Submarine Hydrothermal System at a Convergent Plate Margin – "Expecting the Unexpected"

Leg 193 utilized the ODP capabilities for hard-rock reentry, coring, wireline logging, and logging-while-drilling (LWD) to explore the lateral, vertical, and temporal variability of a seafloor hydrothermal system hosted by felsic volcanic rocks in a convergent plate margin setting. Leg 193 successfully intersected an actively forming base metal sulfide system, and its results complement those from previous legs to the TAG hydrothermal mound on the mid-Atlantic Ridge (Leg 158) and sediment-hosted sulfide deposits on the Juan de Fuca Ridge (Legs 138 and 169) in addressing Long-Range Plan objectives relating to hydrothermal processes and sulfide mineralization in the seafloor.

Primary Leg 193 targets included three sites on the crest of Pual Ridge in the Eastern Manus, one each in an area of high-temperature venting (a black smoker chimney field), a field of lower temperature diffuse venting, and at a reference site that, although proximal to a high temperature venting area, showed no surficial evidence of hydrothermal activity. The essential objective was to document the depth dimension of the hydrothermal system responsible for development of massive sulfide chimneys and mounds at the PACMANUS site on the felsic volcanic Pual Ridge. This is essential to understand the interplay between fluid pathways and fluid-wallrock interaction that governs the nature and location of mineral deposition within an environment representing a modern, actively forming analog of the settings of many ore bodies in ancient geological sequences.

The recovered cores and logs allowed shipboard scientists to assess the interplay between magmatic-derived fluids and seawater and to examine fluid pathways with an eye toward establishing a comprehensive chemical and hydrologic model for this system. The intensity, degree, and distribution of alteration facies, and abundance of clay minerals and anhydrite directly address these objectives. However, poor core recovery in the sulfide-rich interval precludes adequate assessment of the dimension of such mineralization. The initial perception is that, despite the pervasive alteration indicative of a long-lived hydrothermal system, Leg 193 sampled the prenatal development of a massive sulfide deposit, which, given continued maturation, could develop into a deposit on the order of those exploited for centuries in ancient ore environments.

The Leg 193 cores also provided a petrogenetic model for the volcanic architecture at Pual Ridge, despite low recovery. The cores define a fresh volcanic cap underlain by pervasively altered volcanic flows and breccias, albeit with short intervals of markedly less intense alteration, which reveal the nature of the growth and evolution of this edifice.

An additional focus of Leg 193 was to delineate the extent to which microbial life flourishes in the subsurface of such a hydrothermal system, contributing to ODP's "Deep Biosphere" pilot project. The nature, extent, and habitat controls of microbial activity in this hydrothermal system were also carefully evaluated. Direct counting and biological tracer analyses indicate the presence of a

biomass to >100m below seafloor. Cultivation experiments indicate that potential microbiological activity persists to much deeper and more harsh environments.

Leg 193 also recorded a number of operational breakthroughs for ODP. These included the first deployment in hard rock of the Advanced Diamond Core Barrel (ADCB) and the first application of a hammer drill in a new strategy for hard-rock reentry as well as an innovative adaptation that allowed us to case an existing hole. Others included the first free-fall deployment of a standard reentry cone, enabling a deep hole to be commenced exactly on a small target selected under drill stem video observation, as well as the nesting of a FFF above the reentry cone, allowing dual casing strings to be set after the first one failed to seat properly. On the logging side, Leg 193 marked the first hard-rock application by ODP of LWD technology.

Integration of leg results and postcruise research is expected to allow direct comparison of the Manus Basin hydrothermal system with not only other active seafloor hydrothermal areas, but with ancient ore deposition environments as well, improving our understanding of these complex systems and underscoring the cumulative ODP success in studying hydrothermal systems in a variety of environments.

Leg 194 – Marion Plateau

Cretaceous rifting in the western Coral Sea (offshore northeast Australia) formed continental fragments that are now capped by carbonate platforms. The Marion Plateau carbonate platform, which has grown on one of these fragments, provides a natural laboratory to study the causes, magnitudes, and effects of sea-level change on continental margin sediments. One of the fundamental controls on the nature and geometry of continental margin sediment deposition is sea level; however, much of the information on the relationship between sea-level and depositional facies is qualitative. Leg 194 coring provided a superb and unique opportunity to determine the absolute magnitude of the major Cenozoic sea-level falls.

The drilling strategy applied on Leg 194 utilized the stratigraphic relationship between a lower to middle Miocene second-order highstand carbonate platform complex and an upper Miocene second order lowstand platform complex to establish the magnitude of the middle Miocene N12-N14 sea level fall. An important characteristic of this platform relationship is that the proposed sites are essentially located along a single strike line without intervening structural elements. Thus, subsidence of the platform will have affected all sites equally, enabling determination of the true amplitude of the sea-level fall that caused a shift in the locus of carbonate platform deposition.

The carbonate platforms and adjacent slopes of the Marion Plateau also preserve a superb record of third-order sea-level variations within a mixed carbonate-siliciclastic depositional environment. High-resolution seismic data collected for the Leg 194 site surveys provide quasi-3-D images of Oligocene-Pliocene depositional geometries. The correlation of these seismic images with drill core and logging data will provide a synoptic view of depositional processes in a mixed carbonate-siliciclastic carbonate platform setting.

Measuring the amplitude and timing of eustatic sea-level fluctuations is essential both to establish an accurate eustatic sea-level curve for the Phanerozoic and for the accurate interpretation of sediment sequences on continental margins. Several attempts have been made to determine the

amplitude of glacioeustatic fluctuations, however these analyses yield a wide range of results, and although the different independent data sets often agree with regard to the timing of sea-level events, significant differences between estimates for the magnitude of sea-level fluctuations remain. The establishment of a eustatic sea-level curve has major implications for global stratigraphic correlation and basin analysis, and defining the amplitude of such a curve remains one of the major challenges in sea-level research. The excellent record of Miocene sea-level fluctuations preserved in the carbonate platforms of the Marion Plateau, southern Coral Sea, provides an ideal opportunity to test sea-level models and quantify the magnitude of eustatic variations.

Carbonate platforms and their slopes are sensitive indicators of sea-level variations, as they predominantly record growth during sea-level highstands and shutdown during sea-level lowstands. Sampling through carbonate platforms records sea-level effects in a "dipstick" fashion. On the other hand, sediments on platform margins and slopes record sea-level variations as alternations of shallowing and deepening sequences. The geometric relationships between the carbonate platforms and adjacent slope sediments of the Marion Plateau have been clearly imaged by seismic data, enabling the correlation and dating of sediment sequences. The information recovered from Leg 194 sites provides an independent basis for development and assessment of the global sea-level curve.

Other Highlights

ODP Phase-out Planning and 5-yr Program Plan Development
In early January 2001, JOI received revised phase-out plans from ODP subcontractors. These were combined with a draft phase-out plan from JOI, summarized, and presented to EXCOM at their January 2001 meeting. Refinement of phase-out planning continues, and updates will be provided to EXCOM.

A mature phase-out plan, with an accompanying budget, will be presented to NSF in March 2002, as part of the draft 5-year ODP Program Plan for the years 2003 to 2007. Drilling operations will end no later than August or September 2003, but wind-down activities, such as post-cruise publication of initial reports and scientific results, will continue into FY07, when the ODP contract between NSF and JOI will likely conclude.

ODP Legacy Project
The ODP “Legacy Project” was initiated by JOI, JOIDES, TAMU, BRG and others in June 2000 as a program-wide effort to compile the scientific, engineering, and technological accomplishments of ODP and DSDP and present them in a variety of formats. These include a searchable and comprehensive bibliographic database of DSDP and ODP citations, engineering blue prints and one-page summaries of technological developments, collected scientific reprint volumes, and special publications, such as the JOIDES “*Achievements and Opportunities of Scientific Ocean Drillin*g.”

Upon its completion in FY01, the DSDP/ODP database will be freely available on the web, and it will be maintained and updated on a regularly scheduled basis. The long-term goal is to provide a

web database from which scientists can download citations into personal bibliographic databases, such as Endnote®, making it more useful and powerful for research and educational purposes.

ODP Databases and their Archival and/or Transfer

JOI and its subcontractors have been reviewing, program-wide, the various DSDP and ODP databases, in preparation for ODP phase-out, and in light of archiving and/or transfer of these data to a successor program. JOI's representative on this initiative has been Frank Rack. Progress reports on this initiative have been presented regularly to EXCOM. In FY01 two data transfer meetings were held (with representative from NSF, JOI, SCICOM, TAMU, SCIMP and NGDC) to begin to develop and evaluate options for the long-term maintenance of these resources.

Rack reported to a National Academy of Sciences, Board on Earth Sciences and Resources, Committee on the Preservation of Geoscience Data and Collections in April 2001 about ODP database and curatorial issues. He was also one of the speakers at the MG&G Database Management Workshop held in San Diego in May 2001. The workshop focused on developing a coordinated data management strategy for the MG&G community.

Arctic Drilling in ODP: Use of Mission-Specific Platforms

As a program, ODP is facing a unique and challenging opportunity by considering a proposal to conduct scientific ocean drilling in the high Arctic Ocean. SCICOM, at their August 2000 meeting, selected as their top priority a plan to drill in the ice-covered Arctic, where the JOIDES Resolution cannot operate because of ice conditions. This is the first time in the history of ODP that a proposal requiring an alternate platforms has been selected as the top scientific priority, and the first time that a #1-ranked proposal remains unscheduled for drilling. At the March 2001 OPCOM and SCICOM meetings, JOIDES reaffirmed their strong support to see this proposal implemented as a drilling expedition in ODP.

At the OPCOM meeting last August, there was consensus among panel members, "that budgetary constraints and the considerably technical difficulties of Arctic drilling would preclude OPCOM from scheduling proposal 533-Full2 (Arctic Ocean) in FY 2002." To further consider this proposal, SCICOM, in August, called for the creation of an Arctic Detailed Planning Group (DPG). This group was established in December 2000. The group has an extensive mandate given by SCICOM and a specified membership including logistics and operations experts. The DPG is chaired by Jan Backman, the lead proponent, and the group held their first meeting in Stockholm, on Jan. 31 and February 1, 2001. On March 5, the DPG submitted to JOIDES a comprehensive draft of their report. This report was presented to both OPCOM and SCICOM for their consideration, and on March 22, Dave Rea, the SCICOM liaison to the DPG, presented a status report on the DPG's progress to SCICOM, at their meeting in Shanghai.

The preliminary DPG report has investigated the following 15 topics, as assigned in the mandate that was given to them by SCICOM:

-- Suitable drilling platforms and define the type and configuration of the drilling rig and drilling equipment
-- Optimal weather window and precise length of time needed to meet the proposed science objectives

-- Required number, type, and cruise configuration of support icebreakers
-- Ice management plan for all phases of the project, including drilling and transits
-- Communication plan, compatible with existing ODP operations
-- Contingency plans
-- Safety, liability, and insurance issues
-- Environmental impact statements
-- Advantages and disadvantages of conducting the program under the auspices of ODP
-- Procedures for core handling and curation, shipboard data capture, and database systems, or: Laboratories in an Alternate Platform Environment
-- Detailed cost estimates of full mobilization and any resources required from the ODP science operators
-- External funding sources and strategy to seek support
-- Factors that could limit the ability to complete one or more of the proposed science objectives.
-- Propose a project management structure for achieving Proposal 533
-- Timeline needed to steer Proposal 533 into fruition.

Based on the information collected to date, and expert opinions of ice breaker captains and others, logistical and operational factors that will be encountered in conducting such an expedition do not appear to be insurmountable, although considerable planning remains to be done.

To help offset the cost of such an expedition, the Swedish government has offered to contribute approximately $900K worth of time of the *Oden* ice breaker, as one of the support vessels in the "Arctic Armada."

After considering the preliminary written report and the presentation by Dave Rea OPCOM and SCICOM issued the following consensus statement: *OPCOM Consensus 01-1-4 on Arctic drilling and the initial report of the Arctic DPG [as modified slightly by SCICOM]:* "OPCOM reaffirms that JOIDES desires Arctic drilling to be part of the program, and confirms that the initial draft of the Arctic DPG report demonstrates that the Lomonosov Ridge program is technically feasible. Thus, ODP management should continue to investigate the costs of Arctic drilling and the means to meet these costs. The current cost estimate of over $6M probably cannot be accommodated within the ODP budget, but ODP management should investigate how much of the program resources could be dedicated to Arctic drilling. We ask that the DPG continue its excellent progress toward a final report at the August 2001 SCICOM/OPCOM meetings, and we encourage the proponents and the community to pursue funding from non-ODP sources. We ask that JOI evaluate, with the help of ODP contractors, to what degree ODP resources might be used to support Arctic drilling, and be prepared to report at the August, 2001 SCICOM/OPCOM meetings."

In support of the DPG's efforts, and at their request (with the approval of SCICOM/OPCOM Chair), JOI let three subcontracts in April to: (1) evaluate and recommend modifications of the *M/V Botnica* for use as a drilling platform for Proposal 533; (2) develop an ice and weather monitoring plan for ODP Proposal 533; and (3) to evaluate and recommend drilling systems, sampling tools, and logging tools required for each of the three Lomonosov Ridge platform options. The work from these subcontracts will be completed by June 17, 2001.

Given the long lead-time required to plan and implement this proposal as an ODP drilling expedition, JOI, in anticipation of the final DPG report, has built into its FY02 budget a request for $200,000 to cover the salary and fringe benefits of a Arctic Project Manager; funds for materials services and supplies; communication and shipping; travel; other direct costs and contractual services; and affiliated overhead costs. If SCICOM/OPCOM recommends scheduling an Arctic leg as an ODP leg, using mission-specific platforms, because the JOIDES Resolution is incapable of operating in the high Arctic, then this Manager, working at JOI and on behalf of JOI, as the prime contractor, will lead the coordination efforts of all involved – proponents, scientific community, ODP-TAMU, ODP-BRG, and other subcontractors, such as vessel operators, drilling operators, etc. to assure that the logistical and operational aspects have been examined and assessed and that a highly detailed and comprehensive plan for this project is developed and brought forward. This individual, on behalf of JOI, will also attempt to secure and coordinate needed funds and in-kind contributions external to ODP.

The DPG's next meeting will be held in Washington, DC on June 18-19 and their final report will be presented to SCICOM at their August meeting in 2001. JOI and its contractors will continue to evaluate the degree to which ODP resources could be used to support Arctic drilling and JOI will report its findings at the August SCICOM/OPCOM meetings.

Active Heave Compensator (AHC)

During FY01, the AHC has been fully operational and achieving 90-98% efficiency. Its operating limits are <4.3-ft/sec vertical velocity of the ship when heaving and <15-ft stroke of the Passive Heave Compensator. The AHC is used routinely during all XCB and RCB coring and drilling operations, and is utilized for soft landings of CORK, ACORK and ION packages. Because it minimizes drill string motion to less than 6-in. absolute at the seafloor, it has been used very successfully during cementing of the seismometer packages in the borehole on Legs 191 and 195. Both drill crews have become familiar and comfortable with the use and operation of the AHC. The driller console has been modified to move the AHC driller console in front of the driller. The AHC umbilical clash interference in the derrick and with the racked top drive have been resolved. A solution has been identified to resolve the rapid fluctuations on the Martin Decker weight indicator when the AHC is operating by installing a real time Weight on Bit filter with electronic gauges in front of the driller. This enhancement will allow the driller to more accurately and easily control the weight on bit at the surface, thereby improving the control of drilling parameters at the bit. Installation is planned for late FY01 or early FY02.

Rig Instrumentation System

The Rig Instrumentation System (RIS) which provides real-time monitoring and electronic storage of drilling parameters and vessel motion was installed during drydock and became fully operational on Leg 189 (mid FY00). The RIS is a PC-based data acquisition system with a master computer serving the Driller's Console and broadcasting drilling parameters to remote workstations in the ODP Operation Manager's and ODL Drilling Superintendent's offices. The RIS system provides algorithms for tracking depth and calculating weight on bit and rate of penetration. The driller's instrumentation console was reconfigured during Leg 194 port call to improve the driller's viewing of the Active Heave Compensator (AHC) display and the analog meters and gages. The RIS screen is now being broadcast over the ship's TV network so that real-

time drilling information is available throughout the ship. With these enhancements, the RIS is now considered fully operational.

Hard Rock Reentry System

The HRRS system was developed to provide the ODP with the ability to establish a re-entry casing on sloped and fractured hard rock outcrops on the seafloor. The system uses a down hole fluid hammer developed by SDS Digger Corporation of Canning Vale, Western Australia. The hammer, along with a bit, is used to advance the hole while casing is installed simultaneously. Presently, 13 3/8-in. casing is being used in the prototype development program. On Leg 191 a major 10-day test of the HRRS system was planned, but inclement weather and a medical evacuation resulted in a significant amount of lost time for the engineering test and the plans for the test of the fluid hammer and bits had to be adjusted to fit into a reduced operational window of only 48 hours. The time was sufficient to establish that the fluid hammer worked well at 2880-meter water depth successfully creating a borehole in hard rock. New bit designs were tested and performed very well with rates of penetration in volcanic rock ranging from 2.7 to 9 m/hr. Moreover, upon recovery the bits exhibited little wear. A programmatic decision was made to make the HRRS available for Leg 193 because this leg, located in the Manus Basin, was faced with technical challenges such as bare rock spuds in rugged volcanic terrain and uncertain drilling conditions characterized by a heterogeneous mixture of extrusive lavas and hydrothermal deposits. The HRRS system was tested at two locations during the leg. Both applications successfully resulted in the installation of casing strings with the fluid hammer and the bits performing very well.

A considerable amount of information was gained on Legs 191 and 193 pertaining to the assembly and deployment of the HRRS. Much of this information will be used to make small improvements in the hardware enabling the HRRS to become an operational tool for the hard rock deployments.

Advanced Diamond Core Barrel (ADCB)

The ADCB provides ODP with a mining style, relatively thin-kerf diamond coring system. The ADCB uses a 7-1/4 in. diamond bit, 6-3/4 in. drill collars, and a mining-style inner core barrel to cut a 44% larger core than the RCB (3.345 in. vs. 2.312 in.). The ADCB diamond bit drills a 36% smaller borehole (7.25 in. vs. 9.875 in.).

In late FY00, the ADCB system was fully tested in two quarry tests. The system performed so well that a decision was taken to make the equipment available to assist in achieving leg-related scientific objectives. On Leg 193, the ADCB was used to reach depth objectives in unstable sulfide mound debris because the slick bottom hole assembly minimized the risk of stuck pipe. The ADCB cored 168.9 m with 18.3% recovery vs. 8.5% recovery for the RCB over a comparable interval (218.0-386.7 mbsf). On Leg 194, the ADCB cored 42.6 m in carbonates with 10.4% recovery vs. 3.3% recovery with the XCB over a comparable interval (51.3-133.3 mbsf). In another comparison, the ADCB recovered 15.2% vs. 11.5% for the RCB. Borehole instability was a problem on Leg 193 and during the first part of Leg 194 when XCB and RCB coring took place with the standard ODP BHA. In these conditions, the drill string became stuck numerous times, and three BHAs were lost. No problems were noted when using the slick walled 6-3/4 in. BHA in conjunction with the ADCB. The initial postcruise analysis of the ADCB sea trials indicates that only a few small items such as load pins and springs needed replacing and that the tool is ready for deployment.

Borehole Completions

There has been significant activity on borehole completions since Leg 186, the ODP's first major installation of a geophysical package. The scientific community has various goals related to enhanced long-term downhole measurements and sampling in permanently monitored boreholes. This includes temperature monitoring and fluid sampling over the length of the borehole and in isolated zones. It also includes the installation in the borehole of permanent geophysical packages, which can include seismometers, strain-meters, and tilt-meters.

A significant element of the completion is the third party equipment supplied by the principal investigators, which includes both the downhole instrumentation and the associated seafloor data loggers and battery power supplies. A key objective of the completions design is to ensure access to the data loggers at the wellhead using oceanographic vessels equipped with submersibles or remotely operated vehicles. This allows frequent recovery of fluid samples and recorded data without using the *JOIDES Resolution*.

The AHC played a critical role in the installation of borehole completions on Leg 191 and 195 as it minimizes drillstring motion from the ship's heave thereby minimizing downhole equipment movements during landing in the wellhead, creating a soft landing, and during cementing of seismic equipment in the borehole.

Borehole completions fit into the following three categories:

CORKS

A CORK normally consists of a reentry system and two casing strings, 16-in. and 10 ¾-in. plus the CORK hanger and ROV platform at the seabed. The CORK can either have an open wellbore below the 10 ¾-in. casing or several joints of slotted casing at the bottom. On Leg 195 at the Chammoro Seamount site, a CORK with slotted casing and a thermistor string was successfully installed in 2950 meters of water.

ACORK

The ACORK is designed to isolate individual zones for long-term hydrological and geochemical sampling. This is accomplished using 10 ¾-in. casing and an open hole packer system. The ACORK also requires a reentry system and 20-in. surface casing to stabilize the surface formations and allow access for reentry. The borehole is then cored or logged with LWD tools to its target depth. Information obtained by the LWD is used to determine the setting depth for individual screens and packers that isolate up to six zones for direct pressure measurements and sampling. The cored borehole is then opened to 17 ½-in. with a pilot bit and hole opener. Once the hole is established, then the installation of the ACORK components begins. Casing (10 ¾-in.) is installed with screens across the target intervals, isolated by open hole packers. Each interval is accessed for pressure monitoring and fluid sampling via gravel-packed screened ports and small diameter lines connected to the seafloor landing module or ACORK head. The hydraulic lines from the screened intervals terminate at the seafloor, allowing for the collection of fluids, or for pumping/flow tests at the isolated intervals. Long-term data loggers are installed on the ACORK head with underwater mateable connections for periodic data downloading and reprogramming via a submersible or remotely operated vehicle.

Leg 196 (Nankai Trough) is the first leg where an ACORK will be installed. The engineering and procurement of equipment had to start in late FY00 in order to finalize the installation design and the placement of orders for ACORK equipment that required six to seven months to manufacture. On this leg, six screens and five packers will be installed in Hole 808. In Hole 1173 it is planned to install five screens and four packers.

Instrument Hanger/Geophysical Instrument Installation

An instrument hanger for geophysical instrument completion normally consists of a reentry system and two casing strings, 16-in. and 10 ¾-in., plus the instrument hanger and ROV platform at the seabed. The instrument hanger can be used to install a seismometer package in 4 ½-in casing from the JR, or for subsequent deployment of independent sensor strings that do not require hydraulic access to the formation, including thermistor cables, hydrophones, etc. The instrument hanger can be equipped with pressure tight penetrations for cables that connect to data loggers.

The Program successfully installed two long-term borehole geophysical observatories in late FY01 and FY02. One was installed on Leg 191 in 5700 meters of water at site WP-2A located in the Northwest Pacific. At this site, two three-component broadband seismometers were installed at a depth of 467.2 mbsf or 96.2 meters into basaltic basement. On Leg 195, a seismometer installation was established in 5658 meter of water in the Philippine Sea. This geophysical package was emplaced 568.4 meter below the sea floor or 56 meters into basement.

Shipboard Lab Improvements

A number of analytical processes use gases. Because of space limitations, gases for laboratory use are stored in the hold with only limited working supplies kept in the labs. Both ICP and microbiology use large quantities of various gases, especially nitrogen and argon. Thus gas consumption and the frequency with which lab supplies need to be replenished have increased dramatically since late 1999. To avoid frequently having to maneuver heavy gas bottles to and from the hold, with the attendant risk of accident or injury to personnel, we have purchased a nitrogen generator and, during Leg 194 a system of piping and manifolds was installed linking the gas bottle storage area in the hold to the labs. This greatly simplifies the task of ensuring necessary gas supplies to the lab.

Shipboard Microbiology Facilities

During the dry dock period at the end of FY99, the temporary microbiology van was removed from the ship and additional permanent laboratory space added to the lab. stack. Initially this new space was devoted to microbiology but, following the recommendations of JOIDES SCIMP, the microbiology facilities were relocated to the forecastle deck in space formerly used for the XRF and thin section making. (Thin section making has been moved to the new space on the upper level of the lab stack.) The microbiology facility was completed with the installation of the final items of equipment acquired by Woods Hole Oceanographic Institution under a separate grant from the NSF LExEn Program, and made available to ODP. These lab changes were accomplished during Leg 191. The new configuration places the microbiology lab adjacent to the chemistry lab, and facilitates synergy between the two disciplines which have strongly overlapping interests.

Digital Imaging of Cores
Following a strong recommendation from JOIDES, in early FY01 we re-evaluated options for installing a core digital imaging capability separate from the split core MST, which remains in service for color spectrophotometry and magnetic susceptibility measurements. Budgetary constraints precluded proceeding with this activity during FY00, but a reassessment identified a lower cost option which was ordered in mid FY01 and plans are in place to install the digital imaging track in late FY01. (Routine wet-chemical photography of the cores will continue both as back up for the digital system and for comparison purpose.)

Independently of the digital core imaging capability, during Leg 194 a high resolution digital camera already owned by ODP was set up in the core lab to enable scientists to take close-up images of features of the cores. These images provide working copies which can be immediately used by shipboard scientists to prepare core descriptions.

Repository Activities
The cores collected by ocean drilling are one of the enduring legacies of the program. The four ODP repositories now house close to 300 km of core material which is available for study by scientists worldwide. During FY00, 12 km of new core material were received, with a similar amount projected for both FY01 and FY02. Providing samples from ODP cores for subsequent research projects is a function of the repository staff. In FY00 a total of more than 70,000 samples were taken. For FY01 and FY02, sampling activity is expected to rise to approximately 85-90,000 samples each year. At present more than half of the sampling activity occurs at the Gulf Coast Repository, which is the one actively receiving new core material.

Data Migration
During FY01, significant progress continues to be made on the data migration project. First, migration and verification of the following data were completed for all ODP legs where data were collected (Leg 101 – present): GRAPE, Pwave, Magnetic Susceptibility, NGR, and Color Reflectance. Second, migration of Thermal Conductivity, Moisture & Density, PWS and Shear Strength data are underway and targeted for completion in June 2002.

Publications
To date (Spring 2001), ODP/TAMU's publication list includes the following: 166 Proceedings volumes completed; Four Initial Reports volumes in production; Six *Scientific Results* volumes in production; 34 Technical Notes distributed; and 100 Scientific Prospectus issues and 95 Preliminary Report issues in distribution.

<u>Publication Services statistics:</u>

-- 116,242 pages have been published for the *Proceedings* volumes.

-- Over 217,362 copies of the *Proceedings* volumes, 4,647 copies of the *Initial Reports of the Deep Sea Drilling Project* volumes, and 61,264 copies of the other ODP publications have been distributed to scientists and libraries in 24 member countries and 58 non-member countries.

-- 2,329 scientists who participated in ODP cruises authored the *Initial Reports* volumes.

-- The *Scientific Results* volumes 101–180 contain 2,719 papers authored by 6,408 scientists who were participants in ODP postcruise scientific research. Another 5,009 scientists participated in

the peer-review process for these volumes.

-- At least 268 papers based on postcruise research—authored by 815 scientists—have been submitted to journals and books for Legs 161–185.

-- 33 *Initial Reports* volumes (138, 151, 153, 156–160, 163–187) and 26 *Scientific Results* volumes (130, 138, 144, 146 [1 and 2], 150X, 151, 154–171A) have been published on CD-ROM.

-- 29 *Initial Reports* volumes (150X supplement, 166–187) and 28 *Scientific Results* volumes (150X, 152-175) have been published on the Web.

-- 36 Scientific Prospectus issues, 37 Preliminary Report issues, and 10 Technical Notes are available on the Web.

-- Leg-related citation lists for Legs 155 and beyond are on the Web. They list papers published in *Initial Reports and Scientific Results* volumes as well as in journals and books, and include links to abstracts and/or papers whenever permitted.

-- Color core photo images from Legs 163–187 are accessible in the *Initial Reports* volumes on CD-ROM and the Web (and from JANUS Web). The "ODP Technical Video (Editions 1 and 2)," contains color digital images of the archive halves of cores from DSDP Legs 1–96 and ODP Legs 100–146, and is available on laser videodisc.

-- The "Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program"* (indexes from volumes 101–171A) is available on CD-ROM and the Web. The "Cumulative Index of the *Initial Reports* of the Deep Sea Drilling Project" is available in print and CD-ROM format.

-- The following resources are also available on the Web: Sample Distribution, Data Distribution, and Publications Policy, Publication Instructions for ODP Scientists, Citations from the *Proceedings of the Ocean Drilling Program* (a list of about 35,000 edited bibliographic citations from *Proceedings* volumes), Electronic Dictionary of Terminology Used in the Ocean Drilling Program, and Site maps of ODP Legs 101–187 and DSDP Legs 1-96.

During Leg 188, the Measurement-While-Drilling (MWD) pulser tool was deployed for the first time in ODP and provided information on the efficiency of the passive heave compensation system. A second deployment of this tool is planned for Leg 196 to evaluate the active heave compensation system.

Resistivity-at-Bit (RAB)

The Resistivity-at-Bit (RAB) tool was used for the first time in ODP during Leg 193 (Manus Basin) to record total gamma-ray counts and electrical resistivity logs from the seafloor to total depth, as well as resistivity images (like FMS images) in these difficult-to-recover rocks. This was the first deployment by ODP of LWD equipment in a hard-rock environment.

IESX pilot study

Further development and implementation of the IESX software, which allows enhanced core-log-seismic integrations is requested herein. Funds would be allocated to the Site Survey Data Bank (SSDB), which has primary responsibility for providing this service. IESX enables ODP scientists to integrate and manipulate seismic survey data with log and core data on the drillship and at the SSDB. Use of IESX, a module of the Geoframe system software, was funded in FY01 plan as a pilot project. The software was used successfully on Leg 194, particularly for seismic interpretation and site location, and IESX was also critical to the success of Leg 196. IESX

software is available for use by the JOIDES community at the LDEO Site Survey Data Bank, BRG, and at each of the international log analysis centers. Further development and implementation of IESX is proposed in this plan with the intention of providing it as standard service within FY02. This development is consistent with the recommendations of the JOIDES Scientific Measurements Panel, and OPCOM. Greater capability in FY02 will enable enhanced training for seagoing seismic integrators from the international scientific community, as well as better data loading and quality control on all digital seismic data received for scheduled legs.

MGT tool

A third-party MGT tool was deployed for its first trials during Legs 191 and 194 in series with a standard ODP-Schlumberger tool string. The MGT increases the vertical resolution of downhole gamma ray log data by a factor or 3-4 over conventional Schlumberger tools used in the ODP and minimizes the additional required rig time for another log. High-resolution MGT logs improve the correlation with core data and the resolution of thin-bedded sediment cycles.

JOIDES

The years 2000-2001 marked significant JOIDES transitions in two ways: First, the JOIDES Office rotated at the end of 2000 from GEOMAR in Germany to the Rosenstiel School of Marine and Atmospheric Sciences at the University of Miami. Second, in 2001 planning for IODP is shifting from being coordinated by a JOIDES subcommittee (IODP Planning SubCommittee) into an interim Science Advisory Structure (iSAS) a joint working group of JOIDES and OD-21.

Starting in 2000, EXCOM and SCICOM have been seriously addressing ODP phase-down issues, as embodied in several EXCOM motions requiring action by JOI, SCICOM, and other JOIDES panels. In response, SCICOM endorsed ODP-TAMU and JOI activities in assembling a database of ODP publications and requested that TEDCOM and SCIMP work with ODP-TAMU and LDEO-BRG in preparing one-page technical summaries of important ODP tools. To document the scientific ODP legacy, SCICOM formulated plans for an ODP legacy document entitled Achievements and Opportunities of Scientific Ocean Drilling, intended as a special issue of JOIDES Journal in 2001, about 100 pages long and centered on 16 4-page contributions following the themes highlighted in the ODP Long-Range Plan. SCICOM also advised EXCOM that all JOIDES panels should remain in existence through the end of ODP operations in 2003, some possibly to meet in tandem with iSAS panels as the latter phase in.

The proposals considered by SCICOM in 2000-2001 are notable for many reasons, one being the increasing presence of programs requiring “mission-specific” platforms other than the JOIDES Resolution. In August 2000, two such programs were among the top-rated group forwarded to OPCOM for possible scheduling, including the top-ranked program for drilling on Lomonosov Ridge in the Arctic, but they were not scheduled for FY2002 because of the additional program costs. There were also doubts about the technical feasibility of drilling in the Arctic, so recommended formation of an Arctic DPG; this DPG is mandated to make a final report to the August 2001, SCICOM meeting when the final year of ODP scheduling would be determined from a prospectus that will include 5 programs requiring mission-specific platforms. The last fact is probably indicative of the growing interest of the scientific community in the range of drilling assets proposed for the follow-on Integrated Ocean Drilling Program.

From 1999-2001, scientific planning for IODP has been the focus of a special JOIDES panel, the IODP Planning SubCommittee (IPSC). At the request of IWG, IPSC was formed as a "subcommittee of SCICOM, reporting to EXCOM through SCICOM." Among the accomplishments of IPSC and its working groups are:

-- Production of an Initial Science Plan for IODP, now set for publication in May of 2001 after multiple rounds of drafts and highly positive reviews by distinguished panels;
-- Planning for establishment of an interim Science Advisory Structure (iSAS) for IODP scientific planning during the transition period of 2001-2003, parallel in many way to the JOIDES Advisory Structure and now approved by IWG to phase in during 2001;
-- Providing knowledgeable, thoughtful advice on IODP management, technical requirements, and opportunities for expanding the IODP cooperation with industry.

The job done by IPSC has been lauded by both EXCOM and SCICOM, and IPSC will probably phase out as a JOIDES subcommittee in 2001, subject to EXCOM discussion at its June, 2001 meeting.

FY 2002 Science Plan Summary (Legs 198-205)

The following is a summary of the scientific objectives of each leg scheduled for FY 2002.

The JOIDES Science Committee (SCICOM) considered 33 proposals and two Ancillary Program Letters (APLs) during its August 2000 meeting. The number of available leg slots, approximately four, was relatively small because the summer 1999 SCICOM/OPCOM had scheduled well into FY2002.

One proposal (highly ranked and subject of a previous SCICOM motion) was forwarded directly to OPCOM prior to the SCICOM ranking, and then the 12 highest-ranked programs, plus APL-10 and APL-14 were also forwarded to OPCOM for possible scheduling. These included two programs that require alternate platforms to drill, which OPCOM excluded from consideration for FY2002 because of the additional program costs involved. OPCOM then recommended scheduling the 4 top-ranked programs in the Pacific, deferring several highly ranked Atlantic programs and one highly ranked eastern Pacific proposal until consideration in August of 2001 for FY2003.

The OPCOM-recommended schedule was subsequently endorsed by SCICOM, with some important implications: First, some rearranging of the schedule for FY2001 was required, along with subsequent EXCOM approval by email of the revised FY2001 program. Second, the FY2002 schedule actually ran about 1 month into FY2002, and leaves one calendar month in FY2002 to fulfill the 1999 SCICOM Motion 99-2-23 , that the JOIDES Resolution would be drilling in the Atlantic by the end of calendar year 2002. In light of that 1999 motion, 16 of the 30 ranked but unscheduled JOIDES Resolution programs – those that lie outside a region of likely FY2003 operations in the Atlantic or easternmost equatorial Pacific - were removed from further ODP consideration and recommended for forwarding to IODP.

EXCOM approved the following sequence of Legs for FY 2002 and the beginning of FY 2003: Leg 198: Shatsky Rise; Leg 199: Paleogene Pacific; Leg 200: H2O Observatory; Leg 201: Peru Biosphere; Leg 202: SE Pacific Paleoceanography; Leg 203: Costa Rica; Leg 204: Hydrate Ridge; Leg 205: Equatorial Pacific ION

In accordance with the goals of the Long-Range Plan fundamental scientific problems, identified under two major themes, i.e. Dynamics of the Earth's Environment and Dynamics of the Earth's Interior, are addressed by the FY 2002 drilling schedule in the following way.

Dynamics of the Earth's Environment:

Leg 198 (Shatsky Rise) constitutes a depth transect designed to characterize changes in the nature of surface and deep waters through the Cretaceous and Paleogene, including the frequency, amplitude, and forcing of warm climate intervals, documentation of latitudinal and vertical gradients of temperature, and changes in the sources of deep water, vertical ocean structure, oxygenation, and corrosiveness with respect to carbonate through time.

Leg 199 (Paleogene Pacific) will collect a transect of Paleogene sediments in the eastern Pacific Ocean. The transect is to be centered on the approximate positions of the equator at 50-60 Ma and at 35-40 Ma. The main objective of the drilling will be a detailed investigation of the oceanographic consequences of the long term cooling since the beginning of the Eocene.

Leg 201 (Peru Biosphere) drilling is aimed at documenting how supplies of organic carbon and electron acceptors shape the distribution and activity of microbial communities buried in deep-sea sediments. The *JOIDES Resolution* will drill a series of sites along the Peru Margin and in the eastern equatorial Pacific.

Leg 202 (SE Pacific Paleoceanography) aims to assess changes in surface intermediate, deep and bottom water mass interaction between the South Pacific and the Southern Ocean.. The JOIDES Resolution will core Neogene and older sediments in latitudinal and depth transects on the Cocos, Carnegie, Nazca and Chile Rises in the Southeast Pacific.

Dynamics of the Earth's Interior

Leg 200 (H2O Observatory) a re-entry hole will be drilled at the Hawaii-2 Observatory (H2O) site in the Eastern Pacific and prepared for emplacement of a seismometer and related equipment

Leg 203 (Costa Rica) will test existing models and develop an understanding of the processes associated with the seismogenic zone and with the workings of the subduction factory. Two sites are to be drilled a short distance into basement close to the deep penetration basement site, to determine the fluid flow direction within the basement.

Leg 204 (Hydrate Ridge) will drill three holes, 400-700m in depth, accompanied by comprehensive biological and geochemical sampling and by a suite of *in situ* measurements to address specific objectives.

Leg 205 (Equatorial Pacific ION) will drill a hole to be cased, cemented and fitted with a re-entry cone in the equatorial western Pacific to support a site selected by the International Ocean Network (ION) and the Ocean Seismic Network (OSN) for long-term geophysical observatories.

Leg 198: Shatsky Rise

Shatsky Rise has been the target of three deep Sea Drilling Legs, but most sites were spot cored or plagued by low recovery, especially in the Cretaceous where chert provided a significant problem. Previous drilling was centered on the southern part of Shatsky Rise. The proposed drilling leg includes sites in the central and northern part of Shatsky Rise, where the stratigraphy is less well known but where the reflectors are only poorly developed, indicating that chert layers are thinner or absent. The major objectives are: (1) to test hypotheses proposed for the Late Paleocene Thermal Maximum: that it resulted from massive outgassing associated with rifted margin volcanism or sudden dissociation of methane clathrates on the continental shelves and slopes, or both; (2) to assess regional/global circulation changes during the late Paleocene-early Eocene; (3) to enhance knowledge of how global ocean chemistry or circulation evolved in response to high-latitude cooling and glaciation during the Eocene to Oligocene transition from a "greenhouse" to an "ice-house" world; (4) to better understand the long-term cooling history of the Cretaceous; (5) to investigate the "cool tropics paradox" to determine whether the apparent cool tropical temperatures of the Maastrichtian are real or the result of diagenetic alteration; (6) to correlate early and mid-Cretaceous faunal diversification events from the Atlantic with, as yet undocumented, events in the Pacific; (7) to document the subsidence history of Shatsky Rise; (8) to determine a maximum age for Shatsky Rise.

The drilling strategy includes multiple XCB coring and PDC-bit rotary coring which will increase recovery in cherty intervals. In intervals of poor core recovery, FMS and Gamma Ray logs will help determine the stratigraphic extent of diagnostic sediments such as black shales.

Leg 199: Equatorial Pacific Paleogene Transect

The complex system of equatorial currents is one of the most persistent and clear traces of wind-driven circulation in the oceans. The unequal hemispheric thermal gradients in the modern oceans have pushed the Inter-Tropical Convergence Zone (ITCZ) north of the equator and given rise to a narrow band of equatorial upwelling. This zone of upwelling and high productivity results in a high flux of biogenic debris within 1.5°-22° of the geographic equator, with peak values restricted to an even narrower zone. In the Pacific Ocean the rain of this debris has built, over geologic time, a mound of almost pure calcareous and siliceous sediments stretching along the equatorial region and reaching a thickness of over 500 m. Plate motions have carried this mound of biogenic sediment steadily northward, such that its thickest part lies several degrees north of the equator. Moreover, sediments deposited a few tens of millions of years ago have moved completely out of the region of high sediment flux. This movement into regions of very low sediment accumulation (or even erosion) puts Paleogene equatorial sediments within easy reach of APC/XCB drilling technology. Most of these sediments have never experienced strong burial diagenesis, and time intervals notorious for extensive chert formation (e.g., the middle Eocene) are thus more likely to contain only easily cored oozes.

Leg 199 will use APC/XCB technology to drill a series of holes into Paleogene sediments in the eastern Pacific Ocean, centered on approximate positions of the equator at 35-40 Ma and at 50-60 Ma. This study will focus on the oceanographic consequences of the long-term cooling since the

beginning of the Eocene. It will also address 1) the long-term history of the intensity of atmospheric circulation, 2) the latitudinal movement of the ITCZ, and 3) the history of hydrothermal activity during the Eocene and how it might relate to warm climates or chert formation. Earlier results from DSDP rotary coring indicate that many of the planned boreholes should encounter a hiatus or radiolarian-ooze/red-clay interval from the Holocene until about the middle Miocene. Lower Neogene and Paleogene calcareous oozes should occur below the carbonate-poor interval and permit detailed reconstructions of Eocene sea-surface temperature (SST) gradients and equatorial circulation and productivity. Northern sites in the proposed transect may contain only clays above the calcareous lower Eocene sediments. These sections are critical to mapping the movement of the ITCZ through time and to relating the extremely warm interval of the early Eocene to the history of hydrothermal activity. The southern sites are critical to mapping circulation changes during the rapid Eocene-Oligocene transition in calcareous sections.

Leg 200: H_2O Observatory

Leg 200 (H2O Observatory) will drill a re-entry hole at the Hawaii-2 Observatory (H2O) site in the Eastern Pacific in preparation for emplacement of a seismometer and related equipment. The H2O long term observatory site satisfies three scientific objectives of crustal drilling: (1) it is on fast spread Pacific crust, which represents one endmember for models of crustal generation and evolution; (2) it is located in one of the high priority regions for the Ocean Seismic Network; and (3) its proximity to the Hawaii-2 cable and H2O Observatory make it a unique site for real time, continuous monitoring of geophysical and geochemical experiments in the crust. Ideally the hole will penetrate about 300 m into basement to acquire good quality basalt samples for geochemical studies, adequate penetration into layer 2 for paleomagnetic analyses, and good hole conditions for *in situ* experiments. This is a multi-disciplinary proposal which represents the interests of the of the JOI/IRIS Steering Committee for the Scientific use of Submarine cables, the Ocean Seismic Network (OSN) and the International Ocean Network (ION) groups, the Borehole Observatories, laboratories, and Experiments (BOREHOLE) group, and the oceanic lithospheric processes community.

Leg 201: Peru Biosphere

This leg of the Ocean Drilling Program will investigate the nature and extent of microbial activity in deeply buried sediments in several environments. Three fundamental questions will be addressed:

-- Do different microbial communities populate different sedimentary geochemical regimes, or do these communities differ only in degree and kinds of community activity?
-- How does the flow of electron acceptors through deeply buried sediments affect microbial communities and sediment geochemistry?
-- To what extent do paleoceanographic conditions as preserved in deeply buried ocean sediments affect microbial communities currently inhabiting this part of the Earth's biosphere?

Sampling and research will be carried out to determine if deeply buried microbes migrate to follow concentrations of electron acceptors, to what extent they switch from one electron acceptor to another, or if they activate and deactivate as chemical fronts migrate past. Additionally, although methane in marine sediments constitutes one of the largest carbon reservoirs near the Earth's

surface, the phylogenic affinities and community structure of methanogenic microbes in deeply buried sub-seafloor sediments is unknown. All of the proposed sites have been occupied by previous DSDP or ODP expeditions, and the results of this earlier research indicates the sites selected are uniquely suited to this investigation. The eastern equatorial Pacific sites show the occurrence of stable high methane and sulfate concentrations over a thick stratigraphic interval in disagreement with standard models. The Peru margin sites show a pronounced brine incursion that penetrates the methanogenic zone at depth and reverses the vertical sequence of electron acceptor availability in the sediments. These sites are also relatively close to sediments rich in dissolved methane, hydrate-rich sediments, and normal marine sediments for comparison.

Leg 202: S.E. Pacific Paleoceanography

Leg 202 will core Neogene and older sediments in latitudinal and depth transects of topographic rises in the Southeast Pacific (Cocos, Carnegie, Nazca and Chile Rises). The primary objective is to assess changes in surface intermediate, deep and bottom water mass interaction between the South Pacific and the Southern Ocean. The subsurface flows, important elements of the global thermohaline circulation influence the heat, salt, oxygen and nutrient balances of the whole Pacific Ocean and may trigger global climate feedback associated with heat transport and the carbon cycle. The longitudinal spread of the proposed transects along the Peru-Chile Current will facilitate the study of the northward advection of cold upper-ocean water and upwelling of subsurface water along the eastern boundary. This study will test hypotheses on 1) global thermohaline circulation and the linkage of global oceans through the Antarctic, 2) the interaction of the eastern boundary with equatorial currents and its role in the long-term oceanic carbon dioxode balance, 3) the role of biological productivity on modifying subsurface watermasses near the eastern boundary, 4) mechanisms of southern hemisphere wind changes (as reflected in boundary current advection) to changing glacial, orbital and greenhouse gas forcing, 5) the response of the ocean to the opening and closing of tectonic gateways such as the Drake Passage and the Panama Isthmus and the uplift of the Andes Mountains.

The depth transects in the S.E. Pacific will complement those in the Western and North Pacific and will allow assembly of a detailed depth-latitude-time reconstruction of subsurface watermasses of the whole Pacific. They will complement existing and planned Atlantic depth transects to form a first-order global view of Neogene evolution of thermohaline circulation. The latitudinal transect will add significant South Pacific data to studies of hemispheric thermal gradients during anomalously warm episodes of Neogene and Paleogene time.

Leg 203: Costa Rica Subduction

The overall aim of the drilling program at the Costa Rica Trench is to test existing models based partly on Leg 170 coring results and to develop an understanding of the processes associated with the seismogenic zone and with the workings of the subduction factory. The focus of the leg is to investigate the hydrology, sediment dynamics, and geochemistry of this presently non-accretionary subduction margin by recovering oceanic basement rocks in a lower plate reference site and by monitoring fluid flow, temperature, and geochemistry there and at one or two other sites through the décollement. These sites were previously cored and studied with logging-while-drilling (LWD) during Leg 170, which provided evidence for several distinct hydrological regimes through the section. Leg 203 program will build on these results and emphasize (a) coring the deepest sediments and oceanic basement and (b) installation of CORK observatories for long-term hydrogeological investigations.

At the reference Site 1139, located about 2 km seaward of the toe of the prism, a modified single-seal CORK will be installed to study fluid flow processes in basement and sample the basement fluids. The oceanic crust in this region is notable for some of the lowest heat flow measured anywhere in the ocean floor, strongly suggesting an active fluid flow system in oceanic crust. At Site 1140, located about 2 km landward of the toe of the prism, a multi-seal Advanced CORK (ACORK) is planned to isolate processes and sample fluids from 4 hydrologically distinct regimes: subducting oceanic basement, underthrust hemipelagic sediments, décollement, and an out-of-sequence thrust. If time and funds allow, a modified single-seal CORK is also planned to monitor and sample fluids at the décollement at Site 1143, about a km seaward of Site 1140.

Leg 204: Hydrate Ridge

Gas hydrates in sediments are a matter of considerable interest because of their potential as seals over hydrocarbon reservoirs, their significance as a possible resource, their role in slope stability and their potential for causing catastrophic changes in atmospheric methane and climate change.

Seismic data across Hydrate Ridge, off Oregon, show systematic variations in stratigraphic and BSR reflectivity that appear to be indicative of the impact of tectonic activity on the evolution of the hydrate/gas system of the Oregon margin. These patterns are especially well defined on the southern part of Hydrate Ridge, where grab sampling in 1996 revealed the presence of massive hydrate deposits near the sea-floor.

Leg 204 will drill three holes, 400-700 m in depth, accompanied by comprehensive biological and geochemical sampling and by a suite of in situ measurements, to address the following specific objectives: 1) Compare the source region for gas and the physical and chemical mechanisms of hydrate formation in two distinctly different sedimentary and tectonic environments: 2) Calibrate estimates of hydrate volumes and underlying free gas content determined with geophysical remote sensing techniques; 3) Test, using geochemical tracers, physical properties measurements, and microstructural analysis, whether variations in BSR and subBSR reflectivity observed in seismic data result from tectonically induced hydrate destabilization, as inferred from seismic reflection data; 4) Develop an understanding of the geochemical effects of hydrate formation; 5) Determine the porosity and shear strength of hydrated and underlying sediments; 6) Quantify the distribution of methanogenic and methanotropic bacteria in the sediments.

Leg 205: Equatorial Pacific ION

A cased, cemented hole will be drilled and fitted with a re-entry cone in the equatorial western Pacific to support a site selected by the International Ocean network (ION) and the Ocean Seismic Network (OSN) for long-term geophysical observatories. The installation will be done using wireline re-entry some time after the drillship leaves the site. The proposed drill site is on fast-spreading ocean lithosphere with an age of 10-12 Ma and is, potentially, a site for a reference hole. The site will, at minimum, include a broadband, triaxial borehole seismometer (e.g. Teledyne-BrownKS-54000-IRIS), a triaxial, high frequency seismometer, and a broadband hydrophone suspended in the water column near the SOFAR channel. The observatory will be attached to a buoy and satellite communications will return data daily to established data centers (SIO Data Collection Center and thence to the IRIS Data Management Center). The full data streams (high frequency channels in particular) will be retrieved annually when the buoy is serviced, possibly in conjunction with the extensive oceanographic TOGA-TAO arrays in the same area.

Table ES-1: Ship Schedule for Legs 191 - 205 (FY 01 - FY 02)

	Leg	Port (Origin)[◊]	Dates [¤]
191	W. Pacific Ion/HD Eng.	Yokohama	17 July - 10 September
192	Ontong Java	Guam	10 September - 9 November
193	Manus Basin	Guam	9 November - 6 January '01
194	Marion Plateau	Townsville	6 January - 5 March
195	Mariana/West Pacific Ion	Guam	5 March – 3 May
196	Nankai II [*]	Keelung	3 May – 2 July
197	Hotspots	Yokohama	2 July – 28 August
198	Shatsky	Yokohama	28 August – 24 October
199	Paleogene	Honolulu	24 October - 17 December
200	H_2O	Honolulu	17 December – 31 January '02
201	Peru	Mazatlan	31 January – 2 April
202	SE Paleoceanography	Valparaiso	2 April – 1 June
203	Costa Rica	Panama City	1 June – 31 July
204	Gas Hydrates [*]	San Francisco	31 July – 28 September
205	Eq. Pac. Ion [Δ]	San Francisco	28 September – 3November

Notes:

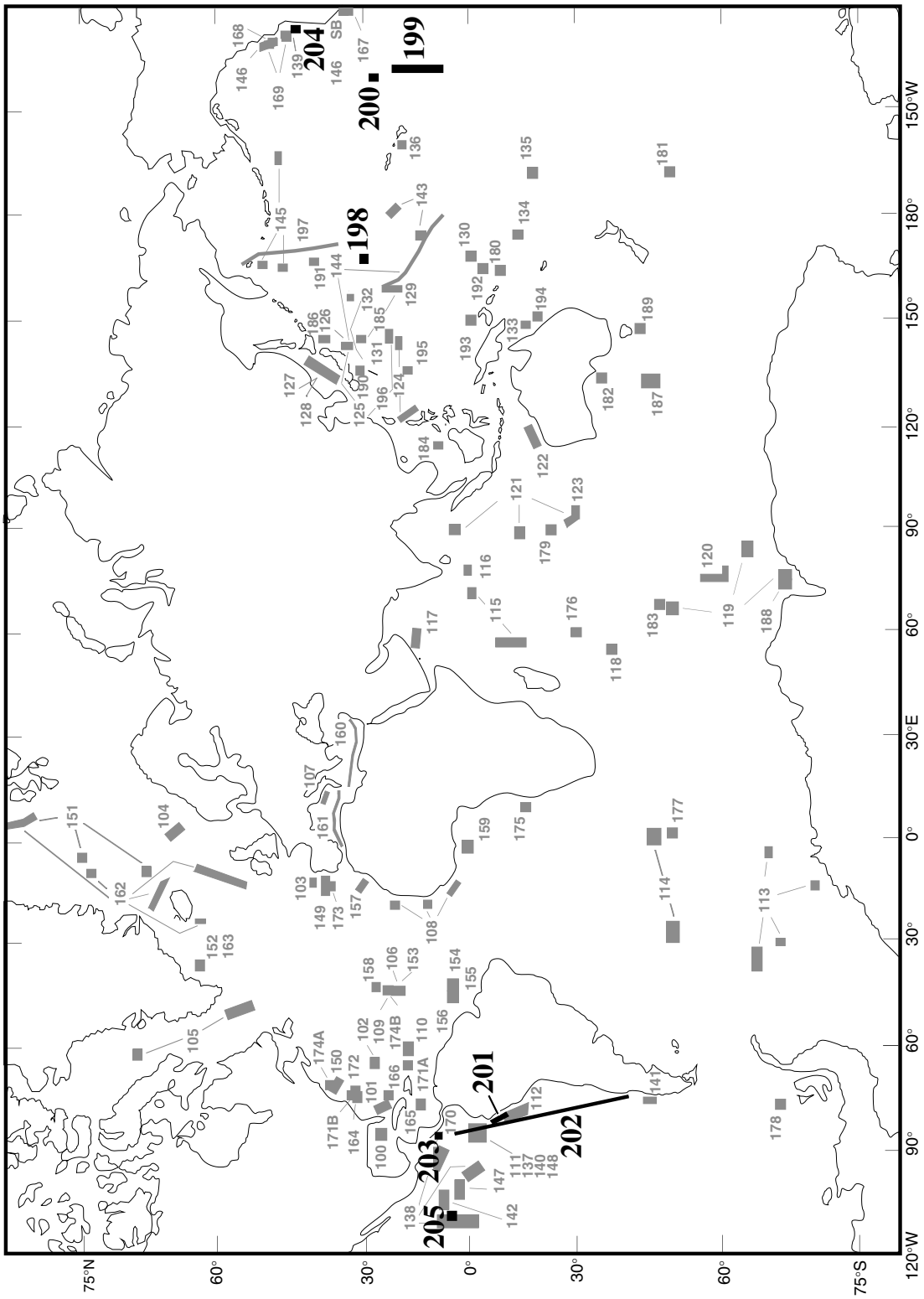
[¤] Port call dates have been included in the dates which are listed. For example, Leg 205 begins on 28 September with 5 days of scheduled port call. The scheduled sailing date is 3 October.

[◊] Although 5 day port calls are generally scheduled, the ship sails when ready.

* A mid-leg port call will occur for Leg 196 and may occur for Leg 204.

[Δ] Leg 205 is tentatively scheduled to end in Panama City.

Figure ES-1: Drilling locations through Leg 205. FY 2002 locations are shown in bold.



Budget Overview

The Program Plan budget requests $46.2 M (Table ES-2) to meet the high-priority science and engineering needs identified by the JOIDES advisory structure that can be accomplished by using the research vessel *JOIDES Resolution*.

Once the scientific needs affiliated with this vessel are identified, the budgeting process begins by determining the leg-based scientific and operational requirements, including the costs of ship operation, drilling and down-hole operations, logging science, and laboratory needs, among others. Consistent with the Program-wide move towards project-based management, and identification of research legs as "projects," the majority (greater than 83%) of the science and logging operational budgets have been allocated to, and apportioned within, leg-based budgets. Detailed budgets for Legs 198 through 205 are presented in the "Program Plan" section. Note that the major portion of Legs 198 and 205 are scheduled to occur in FY01 and FY03, respectively, but that a fraction of the science operator's costs for these legs will be incurred in FY02, and are thus budgeted herein.

The second step in the budget process is assessing Program needs that are not directly affiliated with legs, such as services in science, technical support, operations, publications, information, management, administration, logging, JOIDES advisory, public affairs, and technical and engineering development projects. These funds, together with associated leg-based funds are incorporated into the department-based budgets presented in Table ES-2.

The third step in the process, which maintains scientific and technical innovation in the Program, is to allocate $0.92M in the FY02 budget for high priority science and engineering needs. Expenditures against these needs are referred to as "special operating expenses" (SOEs). In addition, and in support of FY02 Legs 200 (H2O) and 203 (Costa Rica), an additional $0.81M was expended in FY01, with cost savings identified in the FY01 budget, to purchase equipment that requires a long lead time. As such, a total of $1.73M will be spent on SOEs affiliated with FY02 operations. This is $0.37M less than was allocated in the FY01 budget.

For Leg 200, which is to be drilled on fast spread Pacific crust, and where an Ocean Seismic Network broad-band seismometer will be emplaced, $106K will be used to purchase a triple casing configuration and casing hangers because of the possibility of encountering a chert layer, shallow in the sedimentary section, and to lease specialty logging tools that will characterize *in situ* formation properties. For Leg 203, over $600K will be expended on Advanced CORKs and on affiliated hardware. This scientific initiative, highlighted in the 1996 ODP Long Range Plan, will enable scientists to establish multiple, isolated zones within the drill hole for hydrogeological investigation, monitoring, and characterization of the processes that epitomize the dynamics of a convergent margin. Another $112K will be spent on a new CTV cable and on a drill collar replacement. Special drilling equipment will consume another $650K of FY02 funds. Finally, the remaining $268K will be used for logging-while-drilling on the Costa Rica leg, where the challenging environment will likely preclude high recovery of cores and the use of standard logging operations.

In FY02, the Program will see no significant increase in funding above the FY01 or the FY00 level. Standard increases in fixed costs (such as *JOIDES Resolution* leasing expenses) and in

inflation, reduce the Program's base budget for scientific research. As explained in Program Plans from the last several years, the ODP contractor and subcontractors have adapted to a flat, or near flat funding scenario by implementing a series of steps to optimize program delivery and cost effectiveness. This year, in addition to these measures, the Program managers intend to deliver the highest priority JOIDES science that can be accomplished on the *JOIDES Resolution* by assuming additional risk, by not filling positions that were identified for new projects, and by cutting lower priority science that would be accomplished if funds were available.

Regarding risk, the managers of the program and NSF agreed in January 2001 that the FY02 Program Plan will budget fuel at $250/metric ton, which is $50 higher than last year's price of $200/MT, the historical average over the previous several years. In FY01, the Program paid an average of $312/MT of fuel at the first four ports of call (Legs 193 through 196). If the average cost of fuel exceeds $250/MT during 2002, NSF has indicated that they would be prepared to consider a request for additional resources.

In an attempt to offset flat funding, the Program has sought funds from external source, as in years past. In April 2001, JOI submitted a proposal to the US Department of Energy solicitation on "Methane Hydrates." The proposal, titled "*In-Situ* Sampling and Characterization of Naturally Occurring Marine Methane Hydrate using the *D/V JOIDES Resolution*," requested funding of about $1M to support upgrades to downhole tools used by ODP for characterizing gas hydrates (e.g., Pressure Core Sampler (PCS), ODP memory tools), and new equipment that could be used for this purpose (e.g., G/GI seismic guns, infrared thermal imaging system, PCS gas manifold system, modifications to the FUGRO piezoprobe tool). If funded, these activities would support characterization efforts on ODP Legs 201 and 204, as well as any future legs scheduled after the SCICOM meeting in August. As in FY01, the Program will continue to realize ~$80K of cost savings through a new Schlumberger/GeoQuest university software license program. ODP has not seen a substantive increase in funding from existing or new partners in more than eight years.

The top priority science, based on SCICOM's ranking in August 2000, is a proposal (Lomonosov Ridge, 533 full-2) to drill the high Arctic, which requires vessels other than the *JOIDES Resolution*. The Arctic proposal will not be implemented in FY02. However, consistent with a recommendation from the JOIDES Arctic Detailed Planning Group, JOI requests funds ($200K) to hire an Arctic Project Manager to continue logistical and operational planning efforts for an ODP Arctic expedition. Other direct costs, such as travel, communication, supplies, and small subcontracts are included in this line item expense. If SCICOM and EXCOM sustain this proposal as a top priority for ODP, then in-depth technical planning must begin in FY02. ODP program managers will complement the efforts of the project manager by coordinating efforts of the proponents and scientific community members, and of the science and logging operators to develop a sound and comprehensive strategy for executing an Arctic expedition.

Table ES-19 summarizes the FY01 budget and compares it to the approved FY01 and 00 budgets. The ODP budget is divided into three major categories: Science Operations (TAMU), Logging Services (LDEO), and Prime Contractor (JOI/JOIDES) Services budget includes the LDEO Borehole Research Group, international processing centers, and the subcontractor (Schlumberger Offshore Services). The Prime Contractor (JOI/JOIDES) includes program management at JOI, advisory services of the JOIDES Office, the ODP Site Survey Data Bank at LDEO, and

miscellaneous costs such as printing and distribution of the JOIDES Journal and providing Panel Chair Support. Table ES-3 lists the Special Operating Expenses. Additional details are provided in the program plan section of this document and in the TAMU and LDEO appendices.

Table ES-2: Budgets for FY 00, FY 01, & FY 02 ($K)

TAMU	FY 00	FY01	FY02
Science Services	4,388	4,374	4,227
Drilling Services	5,039	4,181	3,508
Information Services	2,411	2,500	2,412
Publications	1,756	1,776	1,645
Headquarters/Administration	1,854	1,920	1,858
Ship Operations	23,592	23,787	24,863
TOTAL TAMU	**39,040**	**38,538**	**38,513**
LDEO	**5,044**	**5,268**	**5,168**
JOI/JOIDES	**2,016**	**2,317**	**2,517**
GRAND TOTAL ODP BUDGET	**46,100**	**46,123**	**46,198**

Table ES-3: Summary of FY 01 Special Operating Expenses

TAMU *	**$1,461,000****
LDEO ***	**$268,074**
Total TAMU and LDEO SOE	**$1,729,074**

* TAMU's SOEs are incorporated into their leg-based and departmental budgets.

**Some of TAMU's leg related special operating expenses for FY02 activities were expensed in FY01 to purchase long lead time equipment.

***For more details on LDEO's SOEs see page L-16 of the LDEO Program Plan, Appendix B.

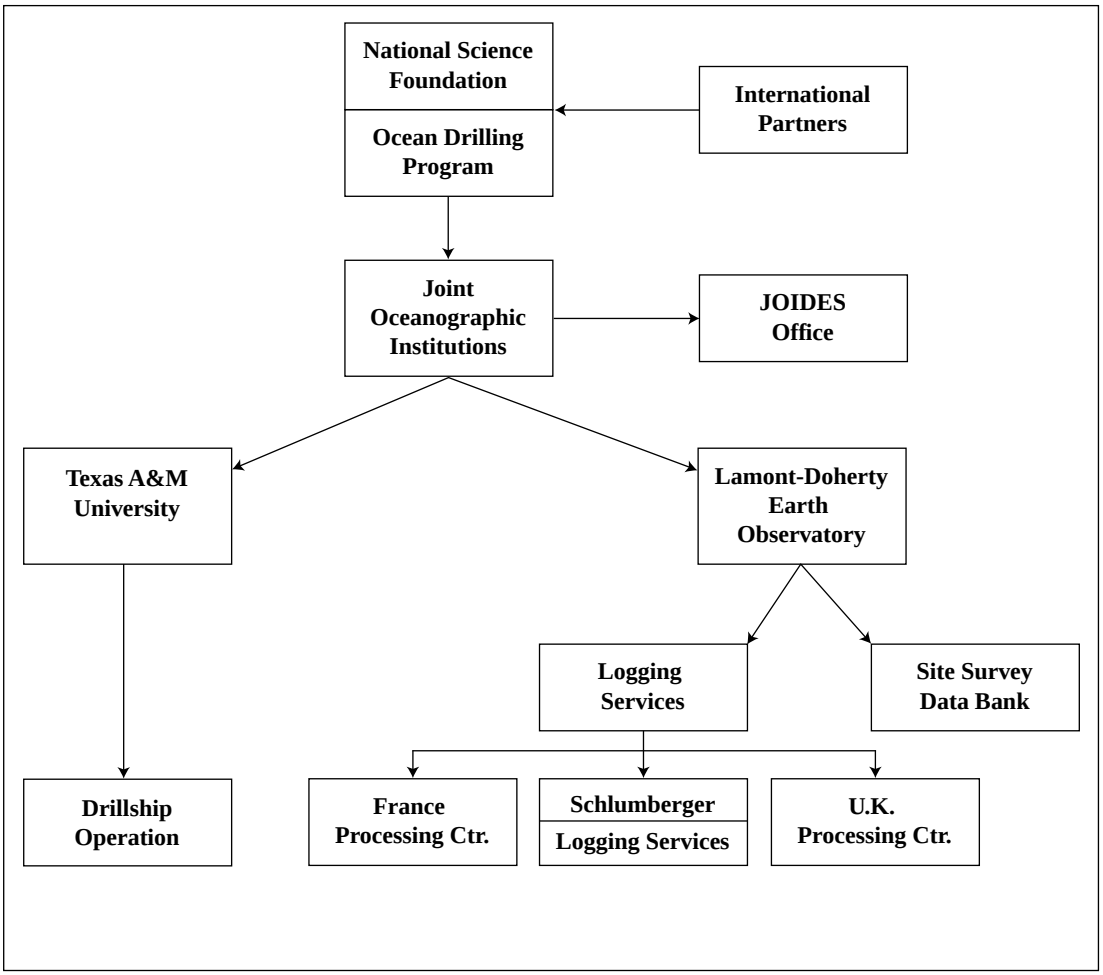
Ocean Drilling Program Organization

Organizational Framework

The Ocean Drilling Program (ODP) is funded by the US National Science Foundation (NSF) using commingled funds from the US and the international partners, that currently include the Australia-Canada-Chinese Taipei-Korea Consortium, the European Science Foundation Consortium for Ocean Drilling, Germany, Japan, the United Kingdom, the People's Republic of China and France. The ODP Council provides a forum for consultation between the NSF and the international funding agencies.

The technical management relationship for ODP consists of four basic components: the overall Program Manager, Joint Oceanographic Institutions (JOI); the scientific advisory structure, Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES); the Science Operator Texas A&M University (TAMU); and the Logging Services Operator, Lamont-Doherty Earth Observatory (LDEO). The management relationships among these components are illustrated in Figure PP-1.

Figure PP-1: ODP Management Structure



In considering the organization of ODP, it is important to bear in mind that not only are the organizational components physically separated, but also that the program organization cuts across institutional lines. For example, LDEO houses parts of three different ODP organizational components (i.e., logging services, ODP Site Survey Data Bank and the TAMU-operated ODP East Coast Core Repository).

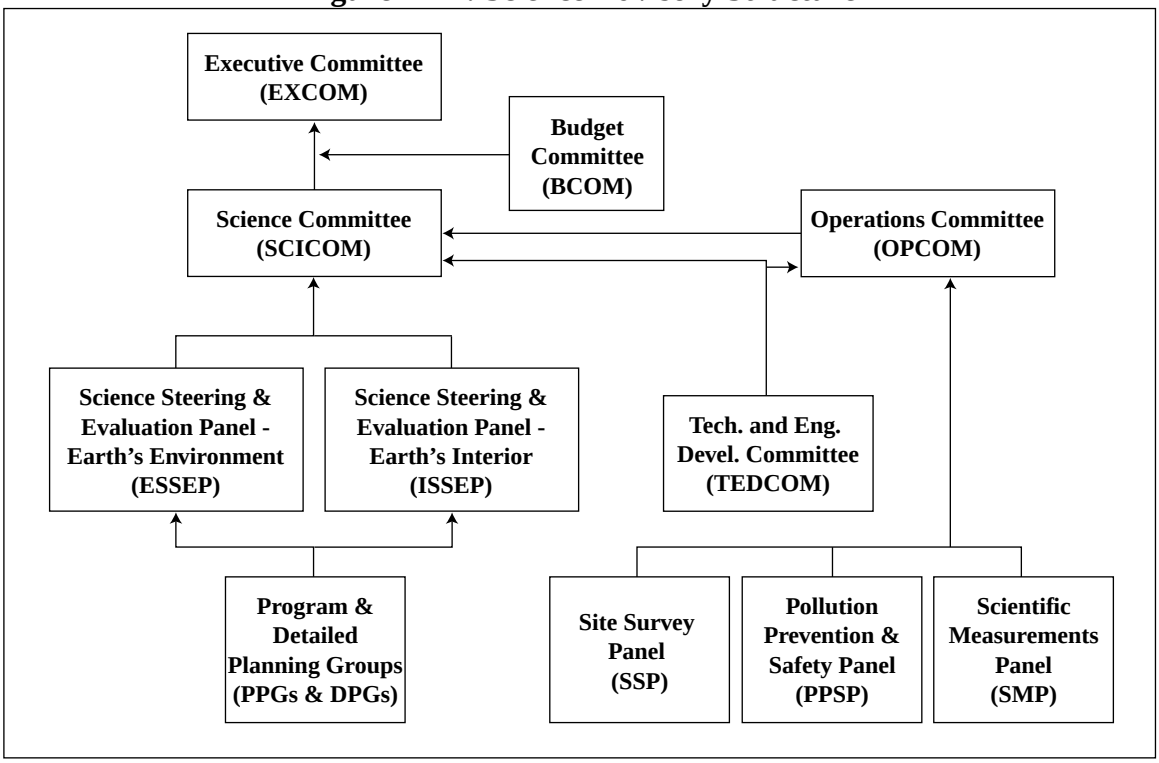
Program Manager

ODP is managed by JOI as the prime contractor to NSF. JOI is a consortium of fourteen major US oceanographic institutions (in legal terms, a not-for-profit corporation), which provides management support to large multi-institutional scientific research programs such as the ODP. JOI is located in Washington, DC. The FY02 staffing level is planned to be 20, of which approximately 8.49 Full Time Equivalents (FTE) will be directly charged to ODP, including one FTE offsite JOI employee who works as a liaison in the JOIDES Office and one temporary new position of Arctic Project Manager. JOI provides scientific, contractual, management and fiscal links between NSF and the various operational and advisory components of ODP.

Scientific Advisory Structure

The scientific objectives of ODP are established by JOIDES panels, international groups of scientists drawn from the JOI institutions, other US institutions, and representatives of the non-US partners. JOIDES panels provide planning and program advice to JOI with regard to scientific goals and objectives, facilities, scientific personnel, and operating procedures. ODP national organizations appoint panel members, and over 200 scientists from the international geoscience community are represented on these panels (see Figure PP-2).

Figure PP-2: Science Advisory Structure



The JOIDES advisory structure and activities are coordinated by the SCICOM chair and the JOIDES Office. The JOIDES Office typically consists of four people (one of whom is the SCICOM Chair), and provides support for the JOIDES Executive and Science Committees and for the science advisory services structure. The office and the personnel rotate every two years between the U.S. and non-U.S. ODP members. Any U.S. institution, with the exception of the ODP subcontractors, Texas A&M University and Columbia University, is able to bid to host the JOIDES Office when the office rotates to the U.S. The JOIDES Office has been located at the University of Miami since January 2001.

Science Operator

Texas A&M University (TAMU), located in College Station, Texas, serves as Science Operator for ODP through a contract between JOI and the Texas A&M Research Foundation (TAMRF). As Science Operator, TAMU is responsible for implementing science and operations, including managing the operation of the *JOIDES Resolution* (owned and operated by Overseas Drilling, Ltd. [ODL]); engineering development and improvement of drilling technology; selecting scientists for the shipboard scientific parties; designing, furnishing, staffing and maintaining shipboard laboratories; curation and distribution of all core samples and core-related data; publishing scientific results; and working with JOI to provide public information about ODP. TAMU has facilities that serve as a repository for ODP cores from the Pacific and Indian Oceans. In addition, TAMU is responsible for core repositories at LDEO for Atlantic, Mediterranean, and Caribbean cores through Leg 150; at Bremen, Germany for Atlantic, Mediterranean and Caribbean cores from Leg 151 onward; and at Scripps Institution of Oceanography, which houses previously-collected DSDP cores from the Pacific and Indian Oceans. The general organization of the Science Operator is shown in Figure PP-3 and is detailed in Appendix A (TAMU section) of this Program Plan. The TAMU staff staffing level is planned to be 142.75 FTEs in FY02.

Logging Services

Lamont-Doherty Earth Observatory (LDEO), located in Palisades, New York, and affiliated with Columbia University, provides, through its Borehole Research Group, a full suite of geophysical and geochemical services which involve the acquisition, processing and presentation of *in situ* borehole logging measurements. LDEO is charged with providing state-of-the-art “oil industry” logging customized to the scientific needs of ODP, plus certain specialty logs. LDEO also provides interpretation and dissemination services to ODP scientists.

The organization of the ODP logging services operation is shown in Figure PP-4 and is detailed in Appendix B (LDEO section) of this Program Plan. A log analysis center operated by the Borehole Research Group at LDEO with additional processing centers in France, United Kingdom, Germany and Japan, has computer processing, log analysis and interpretation services for post-cruise use by ODP scientists. LDEO also contracts for basic oil-field type logging services from Schlumberger Offshore Services. The Logging Services staff is planned to be 17.21 FTEs in FY02.

ODP Site Survey Data Bank

The ODP Site Survey Data Bank, formerly the IPOD Data Bank, is located at LDEO. It has served the JOIDES community since 1985 by cataloging, collecting, and distributing site survey and other geophysical data to various panels and individuals associated with scientific ocean drilling. The Data Bank staff is planned to be 3.5 FTEs in FY02.

Figure PP-3: ODP Program Manager Organization

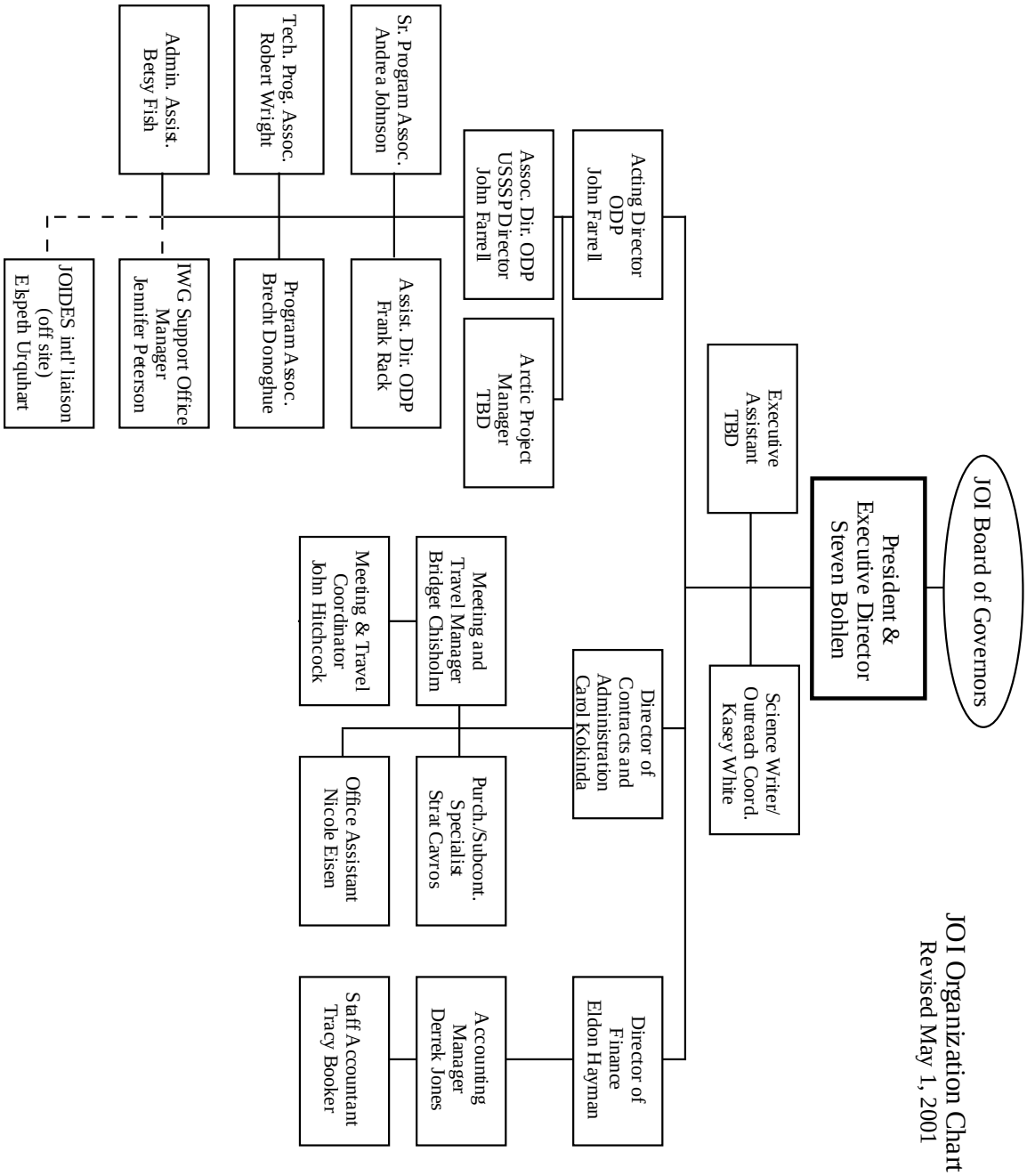
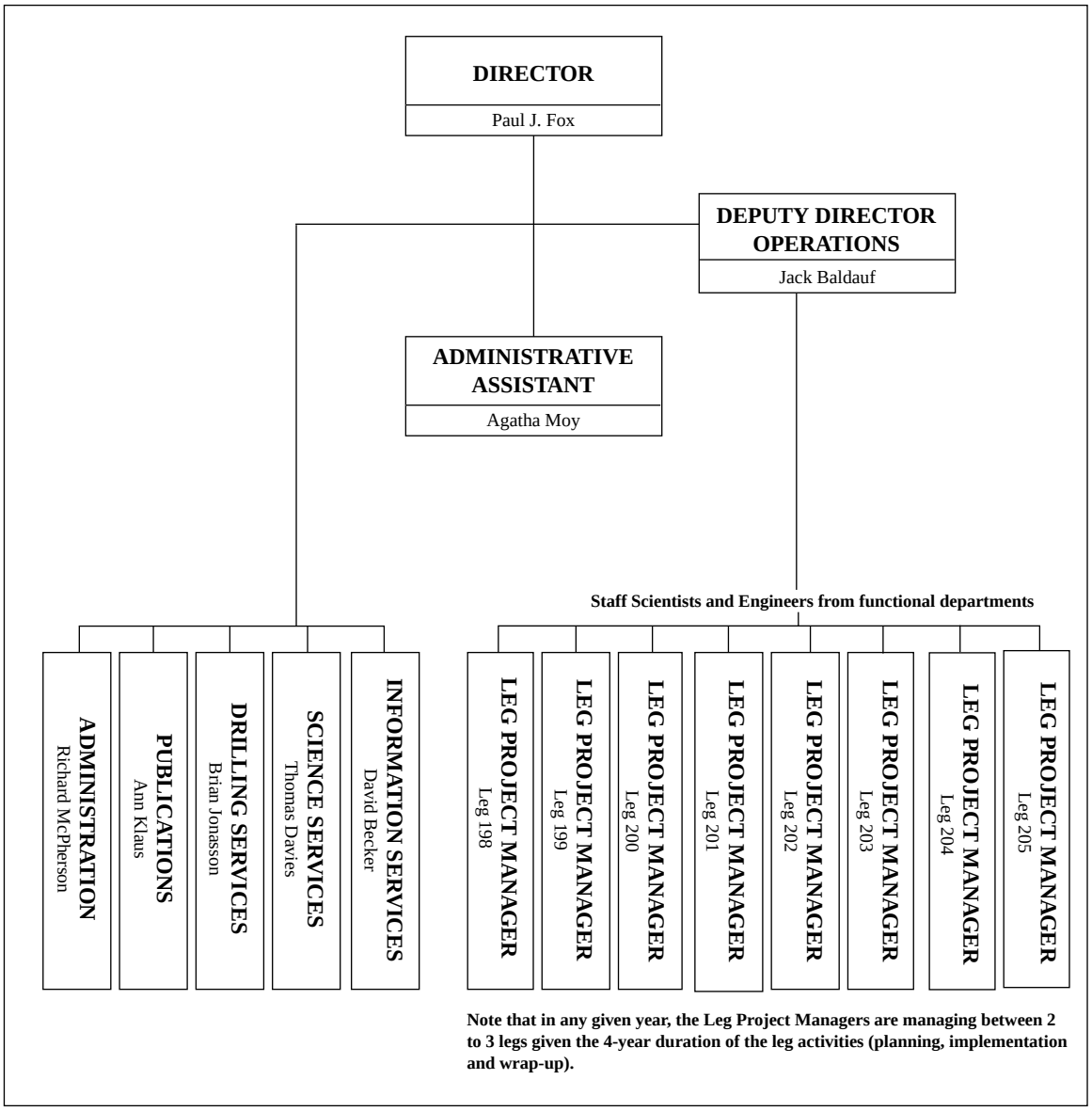
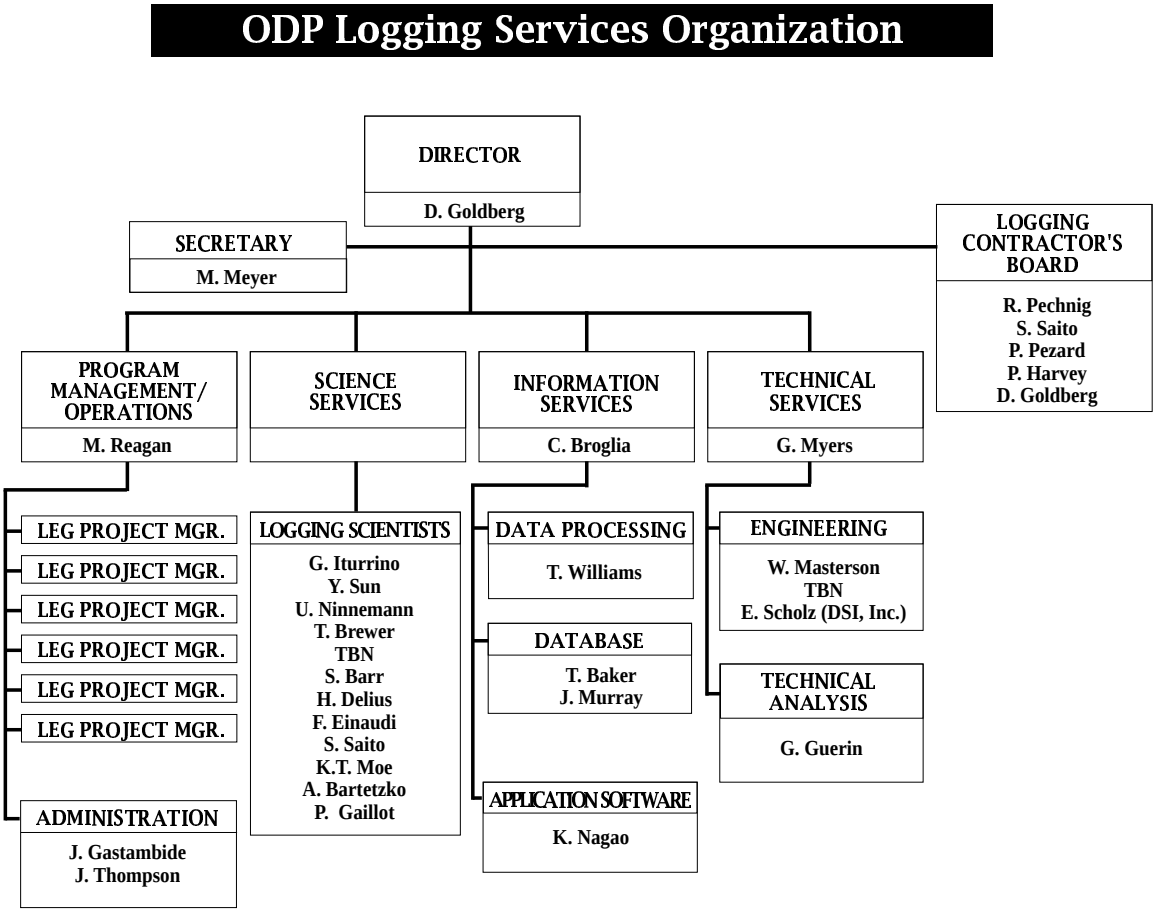


Figure PP-4: ODP Science Operator Organization*



*All business services are provided by the Texas A&M Research Foundation.

Figure PP-5: ODP Logging Services Organization



Program Summary

The operational phase of ODP began in January 1985 with the completion of the shakedown cruise (Leg 100) and acceptance of the *JOIDES Resolution.* As of May 2001, 94 operational cruises will have been completed (Legs 101-194) and Leg 195 will be underway. Table PP-1 summarizes the FY 01-02 schedule of the *JOIDES Resolution*; (Figure ES-1 shows the location of all ODP operations through Leg 205). Initial description of the cruises and scientific results can be found in the "Preliminary Reports" available on the World Wide Web (www-odp.tamu.edu/publications). For each leg, the Science Operator publishes detailed descriptions of the drilling results and scientific accomplishments in the "Initial Reports" (printed 10-12 months post-cruise) and the "Scientific Results" (printed 36 to 48 months post-cruise) volumes of the *Proceedings of the Ocean Drilling Program*.

The *JOIDES Resolution* has now drilled in the Atlantic, Pacific, Indian, and Southern Oceans, including high-latitude zones bordering East and West Antarctica and Greenland, and the Mediterranean, Caribbean, Weddell, Sulu, Celebes, Philippine, South China and Japan Seas, in search of answers to important scientific problems designated by JOIDES. As of Leg 193, the *JOIDES Resolution* has revisited, drilled and cored 1542 holes at 582 sites and retrieved 191,347 meters of cored material, and has logged 321 holes. As of Leg 193, 2329 shipboard scientists from around the world have participated in cruises. Scientists have taken over 1,632,000 individual samples to their home institutions for further study.

Table PP-1: Ship Schedule for Legs 191 - 205 (FY 01 - FY 02)

Leg		Port (Origin)[◊]	Dates [¤]
191	W. Pac. Ion/HD Eng.	Yokohama	17 July - 10 September
192	Ontong Java	Guam	10 September - 9 November
193	Manus Basin	Guam	9 November - 6 January '01
194	Marion Plateau	Townsville	6 January - 5 March
195	Mariana/W. Pacific Ion	Guam	5 March – 3 May
196	Nankai II [*]	Keelung	3 May – 2 July
197	Hotspots	Yokohama	2 July – 28 August
198	Shatsky	Yokohama	28 August – 24 October
199	Paleogene	Honolulu	24 October - 17 December
200	H_2O	Honolulu	17 December – 31 January '02
201	Peru	Mazatlan	31 January – 2 April
202	SE Paleoceanography	Valparaiso	2 April – 1 June
203	Costa Rica	Panama City	1 June – 31 July
204	Gas Hydrates [*]	San Francisco	31 July – 28 September
205	Eq. Pac. Ion [Δ]	San Francisco	28 September – 3November

Notes:

[¤] Port call dates have been included in the dates which are listed. For example, Leg 205 begins on 28 September with 5 days of scheduled port call. The scheduled sailing date is 3 October.

[◊] Although 5 day port calls are generally scheduled, the ship sails when ready.

* A mid-leg port call will occur for Leg 196 and may occur for Leg 204.

[Δ] Leg 205 is tentatively scheduled to end in Panama City.

Scientific Accomplishments during FY 2001

This section provides a brief account of the scientific accomplishments of Legs 189-194 and identifies how each addresses some of the major themes and initiatives of the ODP Long Range Plan (LRP). In this period, the JOIDES Resolution first cored for paleoceanographic objectives in the Southern Ocean off the Tasmanian coast and then, after an 11 day transit sailed from Guam to the Nankai Trough on Leg 190. This leg was the first of a two-leg program concentrating on coring and sampling a transect of sites across the Nankai Trough accretionary prism. From July to September 2000 Leg 191 emplaced a seismic observatory at Site 1179 in the northwest Pacific Ocean between Japan and Shatsky Rise and tested the drilling and casing capabilities of the hard rock re-entry system. The following leg, Leg 192 drilled five sites on the Ontong-Java Plateau and made significant contributions to the LRP themes. The program continued in the south western Pacific Ocean with Leg 193 drilling in the Manus basin and Leg 194 on the Marion Plateau.

Leg 189: Southern Gateways

Drilling during Leg 189 was conducted to test the hypothesis formulated during DSDP Leg 29 that initial development and evolution of Antarctica cryosphere during the middle and late Cenozoic resulted from thermal isolation of the Antarctic by the development of the Antarctic Circumpolar Current and the Southern Ocean.

The area between Australia's southernmost prolongation (Tasmania and the South Tasman Rise [STR]) and Antarctica is a key to understanding global Cenozoic changes in climate and current patterns, involving 1) The breakup of Gondwana between 130 and 30 Ma; 2) The drifting of Australia northward from Antarctica; 3) Initiation in the Paleogene to early Neogene of the Antarctic Circumpolar Current and the meridional expansion of the Southern Ocean with concomitant thermal isolation of the Antarctic continent and development of its cryosphere during the Paleogene and Neogene; and 4) The effects these processes have had on global cooling, climatic variability, and biotic evolution.

The Tasmanian region lay within the continent of Gondwana until breakup started during the Late Cretaceous Rifting related to the separation of Antarctica and Australia may have started as early as the Late Jurassic, and by the Early Cretaceous there was a well-developed east west rift system along the southern margin of Australia that passed north of Tasmania through the Bass Strait.

The four major sites drilled during Leg 189 penetrated to middle Eocene or even Upper Cretaceous sediments, thus providing a climatic and paleoceanographic record for the last 40 to 70 m.y., depending on the site. The sediment sequences reveal a remarkably coherent regional picture reflecting major paleoceanographic changes, especially during the mid- to late Paleogene and continuing into the Neogene, resulting from critical plate tectonic changes related to final separation of the South Tasman Rise from East Antarctica.

The sites cored during Leg 189 also provide high-quality paleoclimatic and paleoceanographic properly documented. However, two giant piston cores taken on the STR (*Marion Dufresne,* 1997) provide excellent records back to 900 ka including this transition. Sedimentation rates were up to 2.2 cm/ky. The STR Ocean Drilling Program (ODP) sites will add to this record and complement subantarctic South Atlantic transect sites (Leg 177) in documenting this transition.

Major questions addressed during Leg 189 include the following:

1. How did the Antarctic Circumpolar Current develop, and what were the roles of the opening of the Tasmanian Gateway (~34 Ma) and Drake Passage (~20 Ma)?
2. When did the Tasmanian Seaway open to shallow water, and how did this affect east west biogeographic differences, isotopic differences relating to changing climatic regimes, and geochemical differences?
3. When did the seaway open to deep waters, and how did this affect surface- and deep water circulation?
4. How is circum-Antarctic circulation related to changes in Antarctic climate?
5. How did the East Antarctic cryosphere develop in this part of Antarctica, and how does it compare to other sectors?
6. What was the nature of the adjacent Antarctic climate in the Greenhouse period during the middle to late Eocene?
7. How did sedimentary facies change as the Tasmanian region moved northward, circum-Antarctic circulation became important, and upwelling commenced?
8. How did Antarctic surface waters develop in terms of temperature, the thermocline, and oceanic fronts?
9. How did intermediate waters evolve during the Neogene, and how was this evolution tied to Antarctic cryosphere development?
10. How did Australia's climate change as the continent moved northward?
11. How were changes in the marine biota tied to changes in the oceanographic system?

An understanding of Cenozoic climate evolution has required better knowledge of the timing, nature, and responses of the opening of the Tasmanian Seaway during the Paleogene. Early ocean drilling in the Tasmanian Seaway (Deep Sea Drilling Project [DSDP] Leg 29) provided a basic framework of paleoenvironmental changes associated with its opening but was of insufficient quality and resolution to fully test the hypothesis of potential relationships among the development of plate tectonics, circumpolar circulation and global climate. Until now, the timing of events has remained insufficiently constrained.

The opening of the Tasmanian Gateway between Australia and Antarctica and the only other important constriction in the establishment of the Antarctic Circumpolar Current, the Drake Passage, had enormous consequences for global climate. These consequences came in part by isolating Antarctica from warm gyral surface circulation of the Southern Hemisphere oceans and also by providing the necessary conduits that eventually led to ocean conveyor circulation between the Atlantic and Pacific Oceans. Both factors, in conjunction with positive feedbacks and other changes in the global system, have been crucial in the development of the polar cryosphere, initially in Antarctica during the Paleogene and early Neogene and later in the Northern Hemisphere during the late Neogene. Furthermore, the continued expansion of the Southern Ocean during the Cenozoic, because of the northward flight of Australia from Antarctica, has clearly led to further evolution of Earth's environmental system and of oceanic biogeographic patterns.

This leg addresses a major theme of the Long Range Plan, that of climate change and the results essentially encapsulate the evolution during the Cenozoic of the Antarctic system from “Greenhouse to Ice-House.” The changes recorded in the cored sequences from Leg 189 clearly

reflect evolution of a tightly integrated, and at times dynamically evolving, system involving the lithosphere, hydrosphere, atmosphere, cryosphere, and biosphere.

Leg 190: Nankai Trough

The Japanese Island arc system is surrounded by deep trenches, subduction boundaries of the Pacific and Philippine Sea plates. The Nankai Trough is the subducting plate boundary between the Shikoku Basin and the southwest Japan arc (Eurasian plate). The Shikoku Basin is part of the Philippine Sea plate, which is subducting to the northwest under southwest Japan at a rate of 2 - 4 cm/yr, slightly oblique to the plate margin. Active sediment accretion is presently taking place at the Nankai Trough.

The Nankai Trough accretionary prism represents an "end-member" prism accreting a thick terrigenous sediment section in a setting with structural simplicity and unparalleled resolution by seismic and other geophysical techniques. It, thus, represents a superb setting to address ODP's Long Range Plan objectives for accretionary prism coring, *in situ* monitoring, and refinement of mechanical and hydrological models. The approach for drilling at the Nankai margin included sites for coring, *in situ* observation, and long term monitoring to (1) constrain prism hydrology, mechanical properties, and deformational styles and (2) test existing models for prism evolution.

Leg 190 was the first of a two-leg program concentrating on coring and sampling a transect of sites across the prism within a three-dimensional (3 D) seismic survey. One additional site was drilled to the west to compare along-strike variations in accretionary processes. Leg 196, in 2001, will use logging-while-drilling technology to collect *in situ* physical properties data and will also install advanced circulation obviation retrofit kits for long-term *in situ* monitoring of prism processes including pressure, temperature, fluid geochemistry, and strain.

During Leg 190 six sites were successfully cored, meeting most of the leg objectives and also revealing some surprising new findings. It was demonstrated that there is a large contrast among the various properties, including the lithologic and geochemical (including microbial activity) character of the incoming sequences at the Muroto and Ashizuri Transects. In spite of such contrast, it is apparent that the décollement at both transects stays at the level of an almost identical horizon (6 - 7 Ma). The accretionary history of the Nankai Trough prism was also documented for the first time and revealed a phenomenally rapid rate of growth of the prism during the Pleistocene. Results from Leg 190 will provide a basic framework for further mechanical, hydrogeological, and geochemical studies of this accretionary prism.

Leg 190 results will also be useful for understanding the tectonics of accretionary prism evolution providing a link between prism-toe processes and highly deformed accretionary complexes, which are the dominant components of orogenic belts.

Leg 191: Western Pacific Seismic Network

Ocean Drilling Program Leg 191 had two main goals: (1) to drill and case a borehole at a site in the northwest Pacific Ocean between Japan and Shatsky Rise and install therein a seismic observatory; and (2) to test the drilling and casing emplacement capabilities of the hard rock

reentry system (HRRS or "hammer drill") on a basaltic outcrop atop Shatsky Rise. There were also numerous ancillary scientific goals to be addressed using cores and logs obtained from Leg 191 sites.

The scientific importance of establishing long-term geophysical stations at deep ocean sites has been acknowledged by the earth science and ODP communities and is detailed in various reports. The objective is to understand the processes driving Earth's dynamical systems from a regional to global scale by imaging the Earth's interior with seismic waves. Unfortunately, few seismometers are located on the 71% of the Earth's surface covered by oceans. The asymmetry and nonuniformity of seismic station distribution makes high-resolution imaging of some parts of the mantle nearly impossible. Many new ocean-bottom seismometers, whose locations have been carefully selected to optimize imaging are needed to accomplish the goals of international geoscience programs that use earthquake data

Aside from plugging an important gap in the global seismic array, the Site 1179 observatory will produce high-quality digital seismic data. Tests with other borehole seismometers show that the background noise level for oceanic borehole instruments is much less than most land counterparts. Recent studies that exploit high-quality digital seismic data obtained on land have shown exciting new results pertaining to mantle flow. In the western Pacific, for example, there exists a strong l = 2 (angular order) pattern of deep (>550 km) high-velocity anomalies from waveform inversions of R2, G1, G2, X1, and X2 surface waves. This suggests a complex interaction of subducting slabs with the surrounding mantle, including the 670-km discontinuity in the region.

The seismic observatory was successfully installed at Site 1179 and left ready for activation by a future remotely operated vehicle cruise. The hammer drill tests were less successful owing to typhoons, a medical emergency and a mechanical failure. However, eventually, an abbreviated HRRS test was accomplished at a site atop a basaltic volcano in the Mariana Trough (Site 1182).

In drilling for the seismic observatory an excellent set of cores was obtained from Site 1179, which is located on lithosphere of Anomaly M8 age (129 Ma). A 377-m-thick sedimentary column was cored in addition to 98 m of basaltic basement (total depth = 475 meters below seafloor).

The sedimentary column can be divided into four lithologic units. Unit I consists of clay- and radiolarian-bearing diatom ooze of late Miocene to late Pleistocene age. Ash beds are common in this unit, recording volcanic activity from the western Pacific island arcs. Unit II is a clay-rich, diatom-bearing radiolarian ooze of late Miocene age. Unit III contains barren, brown pelagic clay. Unit IV yielded poor recovery with only chert and Early Cretaceous porcellanite fragments from an unknown sedimentary matrix within 93.7 m above basement. The upper sedimentary section produced a well-defined magnetic reversal pattern, which shows that sedimentation was low (1.5 m/m.y.) during the mid-Miocene and increased 300-fold (to 40-43 m/m.y.) in the Pliocene and Pleistocene. Sedimentation rates derived from biostratigraphy are in good agreement with those calculated from magnetostratigraphy. The physical properties of the upper sedimentary section are unusual because porosities are extremely high (often >80%) and bulk densities actually decrease downhole for the first 150 m. These characteristics probably result from an increasing downward abundance of diatom tests, which have low grain densities and contain large amounts of pore space. The 98-m igneous section consists of aphyric ocean ridge basalts divided into 48 units based on lithologic differences and cooling boundaries. The section consists of massive flows and pillows with small amounts of interunit sediments and volcanic breccia. The basalts are unusually

fresh for Early Cretaceous igneous rock, and alteration is restricted to low-grade zeolite facies at temperatures less than ~10°-30°C.

Leg 192: Ontong-Java Plateau

With a surface area of 1.6 x 106 km^2 and a volume of 4-5 x 107 km^3, the Ontong Java Plateau is the world's largest volcanic oceanic plateau and may represent the largest magmatic event on Earth in the last 200 m.y. During Ocean Drilling Program (ODP) Leg 192 recovery included igneous basement and sediment cores in five widely separated sites in previously unsampled areas across the plateau.

Primary objectives of the leg were to determine (1) the age and duration of emplacement of the plateau, (2) the compositional range of magmatism, and (3) the environment and style of eruption.

Volcanic oceanic plateaus are formed by immense volumes of magma emplaced in pre existing oceanic lithosphere or at spreading centers. Nearly all of the plateaus in the oceans today were formed in the Cretaceous period and may reflect a major mode of mass and energy transfer from the Earth's interior to its surface that was different from the ocean ridge-dominated mode of the Cenozoic. Since the mid-1980s, oceanic plateaus have been recognized as the counterparts of continental flood basalt provinces and associated thick volcanic sequences at many passive continental margins, collectively termed large igneous provinces (LIPs).

For many continental LIPs and at least some volcanic passive margins, eruption indeed probably occurred rapidly, but continental lithospheric contamination usually has overprinted the sublithospheric mantle-source signature. Most oceanic LIPs formed in locations remote from any continental lithosphere, but comparable data on eruption ages and source composition are lacking because very few basement sites have yet been sampled. Because of the thick sediments that blanket oceanic plateaus, drilling is generally the only way to sample basement crust effectively.

The climatic, oceanographic, and associated biospheric effects of plateau emplacement are poorly known but appear to have been very significant in some cases. After emplacement, plateaus appear to have important effects on subduction patterns, plate motions, continental growth, and crustal evolution. Large oceanic plateaus, in particular, tend to resist subduction and thus may form an important early stage in the growth of continents.

The Ontong Java Plateau in the western Pacific is the largest volcanic oceanic plateau in the world, with a crustal volume of ~5 x 107 $km^{3.}$. If the great bulk of this plateau formed in a single, geologically brief magmatic episode, then the rate at which it was emplaced would have rivaled the entire magma production rate of the global midocean-ridge system at the time. The plateau would then represent the largest igneous event of the last 200 m.y. Although sampled in only a few locations, the basement of the Ontong Java Plateau was already the best sampled of any Pacific plateau before Leg 192, with drill holes at Deep Sea Drilling Project (DSDP) Site 289 (9-m basement penetration) and Ocean Drilling Program (ODP) Sites 803 (26 m) and 807 (149 m). In contrast to other Pacific plateaus, slivers of the southern edge of the Ontong Java Plateau are exposed above sea level in the eastern Solomon Islands.

Despite the considerable geodynamic significance of large igneous provinces, relatively little is known about the composition and origin of large oceanic plateaus. The Ontong Java Plateau's enormous size and thick blanket of marine sediments constitute particularly formidable obstacles to systematic sampling of basement crust. Four sites were selected that would cover as much as possible of the history of major, but previously unsampled, parts of the plateau.

Acoustic basement at the four Leg 192 Sites drilled on the main or high plateau consists of pillow and/or massive basalt flows with rare, thin sedimentary interbeds. Biostratigraphic evidence indicates that basement ages at Sites 1183, 1186, and 1187 are Aptian. At Site 1185, two groups of basalt are present; the lower group is Aptian, whereas the age of the upper group is estimated only loosely as latest Cenomanian to Albian. These results, together with data from Deep Sea Drilling Project (DSDP) Site 289 and ODP Site 807, demonstrate that the great bulk of the high plateau formed in a single episode in the early Aptian. Later volcanic events, including the ~90-Ma event recorded at Site 803 and in the eastern Solomon Islands, appear to have been volumetrically minor on the high plateau and mainly confined to its margins. One of these late-stage events is recorded in the fifth site, Site 1184, on the plateau's eastern lobe or salient, where we cored 338 m of a middle Eocene basaltic volcaniclastic sequence.

The basalt at Sites 1183 and 1186 and that making up the lower group of lava flows at Site 1185 are closely similar in composition and belong to the remarkably homogeneous Kwaimbaita magma type found at Site 807 and in the eastern Solomons. Thus, much of the high plateau's upper crust seems to consist of Kwaimbaita-type basalt. The Eocene volcaniclastic rocks of Site 1184 also have a Kwaimbaita-like bulk composition. No flows of Singgalo-type basalt, which overlies Kwaimbaita-type lavas at Site 807 and on the island of Malaita, were encountered. An exciting discovery of Leg 192 was that basement at Site 1187 and the upper group of flows at Site 1185 are composed of a high-MgO (8-10 wt%), incompatible element-poor (e.g., TiO_2 = 0.72-0.77 wt%; Zr = 36-43 ppm) type of basalt not found previously on the plateau. These rocks appear to represent very high total fractions of partial melting of their mantle source, and their presence in >100-m-thick lava piles at two sites 146 km apart suggests that such basalt is voluminous on the eastern edge of the high plateau.

Emplacement of lavas at all four high-plateau sites was entirely submarine. The shallowest estimated Aptian water depth for basement is several hundred meters, at Site 1183 on the broad dome of the plateau. Together with previous evidence, our results indicate that most of the Ontong Java Plateau formed well below sea level. The only evidence that a portion of the high plateau was ever at shallow depth is two thin intervals of Aptian vitric tuff above basement at Site 1183 and possibly a vitric tuff just above basement at DSDP Site 289. The mainly submarine emplacement of the plateau probably accounts for its apparently limited paleoenvironmental effects. However, ferruginous claystone layers above basement at Sites 1183 and 1187 provide evidence for at least local Aptian "dead zones."

Leg 193: Manus Basin

The PACMANUS (Papua New Guinea-Australia-Canada-Manus) hydrothermal site in the Manus backarc basin of Papua New Guinea is notable for its distinctly siliceous volcanic host rock (dacite) and for the fact that its massive sulfide chimneys are particularly rich in copper and gold relative to those at typical basalt-hosted hydrothermal fields in midocean and backarc spreading centers. Its geological and tectonic setting at a convergent margin is effectively destined to become

continental crust—hence it is a closer analog of ancient ore body environments than other modern hydrothermal fields.

The region that includes the Manus Basin is a highly mineralized sector of the Earth's crust. Notable hydrothermal ore deposits of Neogene to Quaternary age in Papua New Guinea include the Panguna porphyry copper-gold deposit on Bougainville Island, the Ladolam epithermal gold deposit in the Tabar-Lihir-Tanga-Feni island chain north of New Britain, and, on the mainland, the Porgera polygenetic gold deposit and the Ok Tedi and Grasberg porphyry copper-gold deposits. The occurrence of these ore deposits in conjunction with modern mineralizing systems in the same region, i.e. PACMANUS, suggests an underlying cause.

Felsic volcanic sequences and their associated intrusive rocks, presumed to have erupted in convergent margin or what are broadly called island arc settings, are recognized as especially prospective for a variety of valuable hydrothermal ore deposits. These range from massive sulfide deposits rich in both base and precious metals to deep-seated porphyry copper gold deposits. Understanding how such ore bodies were created in the past, by deciphering the interplay between igneous, structural, hydrothermal, and hydrologic processes in a close modern analog of such a setting, will improve recognition of signals of economic potential in ancient sequences.

The overall aims of Leg 193 were to delineate the subsurface volcanic architecture, the structural and hydrologic characteristics, the deep-seated mineralization and alteration patterns, and the microbial activity of the PACMANUS hydrothermal field. Primary Leg 193 targets included three sites on the crest of Pual Ridge in the Eastern Manus, one each in an area of high-temperature venting (a black smoker chimney field), a field of lower temperature diffuse venting, and at a reference site that, although proximal to a high temperature venting area, showed no surficial evidence of hydrothermal activity. The essential objective was to document the depth dimension of the hydrothermal system responsible for development of massive sulfide chimneys and mounds at the PACMANUS site on the felsic volcanic Pual Ridge. This is essential to understand the interplay between fluid pathways and fluid-wallrock interaction that governs the nature and location of mineral deposition within an environment representing a modern, actively forming analog of the settings of many ore bodies in ancient geological sequences.

The recovered cores and logs allowed shipboard scientists to assess the interplay between magmatic-derived fluids and seawater and to examine fluid pathways with an eye toward establishing a comprehensive chemical and hydrologic model for this system. The intensity, degree, and distribution of alteration facies, and abundance of clay minerals and anhydrite directly address these objectives. However, poor core recovery in the sulfide-rich interval precludes adequate assessment of the dimension of such mineralization. The initial perception is that, despite the pervasive alteration indicative of a long-lived hydrothermal system, Leg 193 sampled the prenatal development of a massive sulfide deposit, which, given continued maturation, could develop into a deposit on the order of those exploited for centuries in ancient ore environments.

In addition the cores from this leg provide a petrogenetic model for the volcanic architecture at Pual Ridge, despite low recovery. The cores define a fresh volcanic cap underlain by pervasively altered volcanic flows and breccias, albeit with short intervals of markedly less intense alteration, which reveal the nature of the growth and evolution of this edifice.

Leg 193 also recorded a number of operational breakthroughs for ODP. These included the first deployment in hard rock of the ADCB and the first application of a hammer drill in a new strategy for hard-rock reentry as well as an innovative adaptation that allowed us to case an existing hole. Others included the first free-fall deployment of a standard reentry cone, enabling a deep hole to be commenced exactly on a small target selected under drill stem video observation, as well as the nesting of a Free Fall Funnel (FFF) above the reentry cone, allowing dual casing strings to be set after the first one failed to seat properly. On the logging side, Leg 193 marked the first hard-rock application by ODP of LWD technology.

Data acquired on the physical properties of rocks cored at the PACMANUS site is expected to enhance modeling of future marine geophysical surveys in island arc and convergent margin terrains. An additional focus of Leg 193 was to delineate the extent to which microbial life flourishes in the subsurface of such a hydrothermal system, contributing to ODP's "Deep Biosphere" pilot project. The nature, extent, and habitat controls of microbial activity in this hydrothermal system were also carefully evaluated. Direct counting and biological tracer analyses indicate the presence of a biomass to >100 m below seafloor. Cultivation experiments indicate that potential microbiological activity persists to much deeper and more harsh environments.

Integration of leg results from PACMANUS, with other active seafloor hydrothermal areas is expected to allow direct comparison between systems in significantly different settings. For example, Leg 193 is concerned with investigation of an active felsic-hosted convergent margin hydrothermal system . Results can be compared with hydrothermal activity hosted by mafic volcanic rocks and sediments on divergent margins (seafloor spreading axes) previously drilled during Ocean Drilling Program (ODP) Leg 158 to the TAG hydrothermal area on the Mid-Atlantic Ridge and with Legs 139 and 169 in the northeast Pacific, respectively. The differences are important in understanding chemical and energy fluxes in the global ocean, as well as for understanding ancient ore deposition. The results from Leg 193 will make a significant contribution to the cumulative ODP success in studying hydrothermal systems in a variety of environments.

Leg 194: Marion Plateau

Estimating the amplitude and timing of past eustatic sea level changes is essential both for the establishment of an accurate Phanerozoic sea level curve and for the interpretation of sediment sequences on continental margins. Cretaceous rifting in the western Coral Sea (offshore northeast Australia) formed continental fragments that are now capped by carbonate platforms. The Marion Plateau carbonate platform, which has grown on one of these fragments, provides a natural laboratory to study the causes, magnitudes, and effects of sea-level change on continental margin sediments. One of the fundamental controls on the nature and geometry of continental margin sediment deposition is sea level; however, until now, much of the information on the relationship between sea-level and depositional facies has been qualitative.

During Leg 194, a series of eight sites were drilled through Oligocene-Holocene mixed carbonate and siliciclastic sediments that record the depositional history and past sea level variations of the Marion Plateau, northeast Australia. Seismic sequence stratigraphy provided the geometric framework to locate the drill sites for optimal sampling of highstand and lowstand sequences with geometries that enable quantification of Miocene relative sea level variations.

Lithostratigraphic and biostratigraphic data obtained from the Neogene carbonate platforms of the Marion Plateau during Leg 194 reveal that platform architecture was controlled by a series of complexly related factors including sea level change, bottom-current action, and biological assemblages. An important finding is that the oldest platform phase of the southern carbonate platform developed in a topographic depression as opposed to the more common condition of nucleation on a topographic high. Furthermore, the steep-sided geometry of both Marion Plateau carbonate platforms is typical of tropical to subtropical carbonate platforms.

Another important finding of Leg 194 is that unlike other carbonate systems, the morphologies of which are predominantly controlled by wind direction, the carbonate platform architecture observed on the Marion Plateau was strongly influenced by high-energy currents near the seafloor, similar to those that exist on the modern Marion Plateau. These currents inhibit sedimentation in the upcurrent position and form wide low-angle clinoforms in the downcurrent position, resulting in an asymmetric platform shape.

The mechanisms and causes of fluid flow within pure carbonate and mixed siliciclastic/carbonate depositional environments, is a theme also addressed during Leg 194. Pore waters sampled provide clear evidence that seawater is circulating through the proximal sediments on the Marion Plateau even though they are overlain by ~200 m of hemipelagic deposits. By inference, seawater is probably also circulating through the platform. Similarly, pore water samples from directly above and below the carbonate platform facies at Site 1193 show elemental concentrations close to seawater in composition, suggesting seawater circulation.

Basement rocks penetrated at five sites during Leg 194 differ greatly from those previously drilled on the Queensland Plateau. Rather than metasedimentary rocks, highly altered volcanic flows and volcaniclastics were recovered. The lack of deformation in hand samples and thin sections suggests that these volcanics may have formed during the Late Cretaceous-Paleocene rifting along northeastern Australia from the Papuan Plateau and the Lord Howe Rise in the south. High-quality paleomagnetic data collected from these basement volcanics, when compared with the Australian apparent polar wander path, may provide age estimates for both the emplacement of the basalts and the timing of their low-temperature alteration.

In addition to determining sea level magnitudes, and the development of carbonate platforms in a current-dominated environment, the facies changes and the development of sequence stratigraphic units controlled by sea level changes were recorded. The themes of Oligocene-Pliocene third-order sea level fluctuations, together with the role of climatic and paleoceanographic change in the subtropical South Pacific and its influence on carbonate platform development have also been addressed.

Table PP-2: Correspondence of FY2000-01 Legs to Scientific Themes, Special Initiatives and Pilot Projects of the 1996 Long Range Plan

DYNAMICS OF THE EARTH'S ENVIRONMENT	LEGS	DYNAMICS OF THE EARTH'S INTERIOR	LEGS
Understanding the Earth's changing climate	**189** **192** **194**	Exploring the transfer of heat and materials to and from the Earth's interior	**190** **192** **193**
Causes and effects of sea-level changes	**189** **194**	Investigating deformation of the lithosphere and earthquake processes	**190** **191** **192**
Sediments, fluids and bacteria as agents of change	**193**		
Pilot Project: Earth's Deep Biosphere	**190** **193**	*Initiative II: In situ monitoring of geological processes*	**191**

Status of the FY 2001 Drilling Program (Legs 195-198)

At the time of preparation of this document **Leg 195, (Mariana/W. Pacific ION)**) is underway in the Phillipine Sea. Operations during Leg 195 concentrated on installing downhole instrumentation for two long term observatories, one in the forearc of the Mariana subduction system, and the second in the middle of the Philippine plate. Both sites were cored to characterize the encountered materials (sediments, mud flows, and volcanics) and to achieve additional scientific objectives.

ODP Leg 195 consists of two science segments. The first segment was devoted to coring and setting a long-term observatory at the summit of South Chamorro Seamount (Site MAF-4B), which is a serpentine mud volcano on the forearc of the Mariana subduction system. The second segment was devoted to coring and casing a hole on the Philippine Sea abyssal seafloor (Site WP-1B) coupled with the installation of a broadband seismometer for a long-term subseafloor borehole observatory.

Drilling at the South Chamorro Seamount will (1) examine the processes of mass transport and geochemical cycling in the subduction zones and forearcs of nonaccretionary convergent margins; (2) ascertain the spatial variability of slab-related fluids within the forearc environment as a means of tracing dehydration, decarbonation, and water/rock reactions in subduction and supra-subduction zone environments; (3) study the metamorphic and tectonic history of nonaccretionary forearc regions; (4) investigate the physical properties of the subduction zone as controls over dehydration reactions and seismicity; and (5) investigate biological activity associated with subduction zone material from great depth.

The seismic observatory in the Philippine Sea is an important component of the International Ocean Network seismometer net. By filling a large gap in the global station grid, the observatory will help increase the resolution of global tomographic studies, which have revolutionized understanding of mantle dynamics and structure. Moreover, the observatory will allow more precise study of the seismic structure of the crust and upper mantle of the Philippine plate, as well as better resolution of earthquake locations and mechanisms in the northwest Pacific subduction zone.

Drilling at Site WP-1B will also provide more precise basement age constraints for models of backarc spreading in the Philippine Sea as well as high-quality sediment sections that may be used to reconstruct the history of microplate motion, climate change, aeolian transport, and arc volcanism in the region.

Leg 196 (Nankai Trough II) scheduled to start on 3rd May 2001 will address the important scientific problems given high priority in the current Ocean Drilling Program (ODP) JOIDES Long-Range Plan (LRP) (1996) to further the understanding of deformational and fluid-flow processes at convergent plate margins. Objectives include addressing "key questions, such as 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 of the prism" and in understanding "the fluid-linked diagenetic and tectonic processes in the rapidly deforming geochemical factory of the accretionary wedge."

Leg 196 is the second of a two-leg program of drilling, logging, and installing long-term observatories in the Nankai Trough, the type example of a convergent margin accreting a thick section of clastic sediments. The two-leg program was designed to define the interrelationship of the dynamics of deformation and fluid-flow processes in an accretionary prism characterized by thick terrigenous sediments. As described elsewhere in this document, Leg 190 investigation focused on coring at sites in undeformed to highly deformed zones along two transects across the Nankai Trough to investigate variability in deformational and hydrologic character. In 2001, Leg 196 research will first conduct logging-while-drilling (LWD) activities through the sediment section at three sites previously cored on the Muroto Transect during Legs 131 and 190: Sites 808 and 1174 near the deformation front at the toe of the prism and Site 1173, a reference site about 12 km seaward. In concert with measurements made during Leg 190, the Leg 196 LWD data will document how physical properties change during accretion and provide critical information on stress, pore pressures, and permeability.

During Leg 196, two holes at Sites 808 and 1173 will be sealed with multipacker advanced circulation obviation retrofit kits (ACORKs) for long-term monitoring of fluid-flow and tectonic processes. Instrumenting the two holes with ACORKs will begin a long-term program of observation of seismicity, fluid-flow parameters, and fluid geochemistry at the Nankai Trough, a program that will involve future revisits by manned and unmanned submersibles.

Leg 197 (Hawaiian Hotspot & Emperor Seamounts) will test the hypothesis of southward motion of the Hawaiian hotspot by drilling 5 seamounts of the Emperor chain. The drilling is to achieve moderate penetrations of the basement for the purpose of obtaining samples suitable for determining radiometric age and paleomagnetic paleolatitude.

Assuming a fixed-hotspot frame of reference, the bend in the Hawaiian-Emperor chain has often been cited as the best example of a change in direction of plate motion relative to deep mantle. Alternatively, the hotspots might be moving relative to each other, in which case the bend may record a change in the motion of the Hawaiian hotspot relative to the Pacific plate. Four lines of inquiry support the latter view: 1) global plate motions predicted using relative plate motion data, 2) spreading rate data from the North Pacific basin, 3) mantle flow modeling utilizing geoid and seismic tomographic constraints, and 4) new paleomagnetic data from the Emperor chain. The best available paleomagnetic data suggest that Pacific hotspots may have moved at rates comparable to those of lithospheric plates in Late Cretaceous to early Tertiary times (81-43 Ma). If correct, this requires a major change in how we view mantle dynamics and the history of plate motions.

The testing of the hypothesis of southward motion of the Hawaiian hotspot will be achieved by drilling 5 seamounts of the Emperor trend. The principal objectives are to obtain moderate penetrations of the basement (150-250 m) to obtain samples suitable for radiometric age and paleomagnetic paleolatitude determinations. A comparison of these dated paleolatitude values versus fixed- and moving-hotspot predictions form the basis of the proposed test. This sampling strategy will also allow us to address important geomagnetic questions that require paleomagnetic data from the Pacific plate, including the history of the time-average field and its paleointensity.

The data will place fundamental constraints on the Late Cretaceous to early Tertiary motion of the Pacific plate. An improved picture of this motion history is needed if proxy climatic data from previous and future drill sites are to be used to define past latitudinal gradients.

Leg 198 (Shatsky Rise) will consist of a depth transect on Shatsky Rise to address the causes and consequences of global warmth in the Cretaceous and Paleogene. Shatsky Rise, a medium-sized Large Igneous Province in the west-central Pacific, contains sediments of Cretaceous and Paleogene age at relatively shallow burial depth. As a result, sediments of both ages can be reached readily through drilling, and fossil materials are sufficiently well preserved for stable isotopic and trace elemental analyses, and for faunal and floral assemblage studies.

The mid-Cretaceous (Barremian-Turonian) and early Paleogene were characterized by some of the most equable climates of the Phanerozoic, and are among the best known ancient "greenhouse" climate intervals. In addition, these intervals contain some of the most abrupt and transient climatic changes in the geologic record, including the latest Paleocene thermal maximum, the mid-Maastrichtian deep-water event, and the early Aptian Oceanic Anoxic Event. These transitions involved dramatic changes in oceanic circulation, geochemical cycling, and marine biotas. The proposed drilling plan is designed to address the long-term climatic transition into and out of "greenhouse" climate as well as the abrupt climatic events.

The depth transect has been designed to characterize changes in the nature of surface and deep waters through time, including vertical gradients of temperature, oxygenation, and corrosiveness. Combined with the results of previous and future legs, the proposed drilling will help determine: (1) the frequency, amplitude, and forcing of climate change in warm intervals, (2) latitudinal thermal gradients in discreet mid-Cretaceous to Paleogene time slices, and (3) changes in the sources of deep water and vertical ocean structure through time.

Shatsky Rise has been the target of three Deep Sea Drilling Project legs, but most sites were spot-cored or plagued by low recovery, especially in the Cretaceous. Previous drilling was centered on the southern part of Shatsky Rise. Leg 198 includes sites on the central and northern parts of the rise where the stratigraphy is less well known. Chert provides a significant recovery problem in the Cretaceous, thus an attempt has been made to position sites at locations with poorly developed reflectors. In addition, the drilling strategy includes multiple XCB coring and PDC-bit rotary coring, which will increase recovery in cherty intervals. In intervals of poor core recovery, FMS and gamma-ray logs will help determine the stratigraphic extent of diagnostic sediments such as black shale.

FY 2002 Drilling Program Development

At its August 2000 meeting in Halifax, SCICOM considered a total of 33 proposals that had been either carried forward from the August 1999 meeting or forwarded to SCICOM since then by the SSEPs. SCICOM also considered 4 APL's forwarded by the SSEPs. As always, the proposals were evaluated in relationship to the scientific objectives and priorities of ODP as expressed in the ODP Long-Range Plan (LRP). The LRP identifies fundamental scientific problems to be addressed by ODP under two primary themes: Dynamics of Earth's Environment and Dynamics of Earth's Interior. Approximately 4 leg slots were available for scheduling, a number that was relatively small because the summer 1999 SCICOM/OPCOM had scheduled well into FY2002.

After presentation and review of the 33 proposals and 4 APL's, SCICOM chose which of these proposals should comprise the pool of programs for an integrated global ranking. SCICOM first excluded Proposal 499-Rev (Equatorial Pacific ION) from ranking and forwarded it directly to OPCOM for possible scheduling, as stipulated in SCICOM Motion 99-2-22.

SCICOM Motion 99-2-22: SCICOM recognizes the importance of completing the high-priority ION sites and thus intends to schedule Proposal 499-Rev before the end of the current program. SCICOM will forward this proposal to OPCOM for possible scheduling at the August 2000 meeting.

SCICOM then decided not to rank Proposal 478-Full4 (Eastern Nankai Subduction Processes) and Proposal 520-Full3 (Kyushu-Palau Ridge) because the proponents of these two proposals had not responded to previous comments and requests of SCICOM and the SSEPs.

SCICOM then voted by closed ballot to establish a global scientific ranking for the thirty remaining drilling proposals, as summarized below.

Rank	Proposal	
1	533-Full2	Arctic Ocean
2	534-Full	Shatsky Rise
3	525-Full	MAR Peridotite
4	571-Full	Peru Biosphere
5	505-Full3	Marianas Conv. Margin
6	455-Rev3	Laurentide Ice Sheet
7	482-Full3	Wilkes Land
8	544-Full2	Costa Rica
9	559-Full	Walvis Ridge
10	564-Full	New Jersey Shelf
11	539-Full2	Blake Hydrates
12	512-Full2	Core Complex
13	522-Full2	Fast Spreading
14	577-Full	Demerara Rise
15	549-Full2	Arabian Sea OMZ
16	560-Full	Woodlark Basin
17	514-Full4	Maldives
18	537-Full3	Protoseismogenic Zone
19	551-Full	Hess Deep

20	489-Full2	Ross Sea
21	545-Full2	Juan de Fuca Fluid Flow
22	519-Full2	Sea-Level Rise S Pac.
23	553-Full	Cascadia Margin
24	570-Full	East Pacific Rise
25	555-Full2	Crete
26	566-Full3	Nankai Hydrates
27	477-Full2	Okhotsk and Bering Seas
28	535-Full2	735-Deep, Slow Spreading
29	521-Full5	Indus Fan
30	503-Full2	Weddell Basin

In addition to Proposal 499-Rev, SCICOM agreed by consensus to forward the top twelve ranked drilling proposals as well as APL-10 and APL-14 to OPCOM for possible scheduling.

SCICOM Consensus 00-2-3: SCICOM decides to forward the top twelve ranked drilling proposals plus APL-10 and APL-14 to OPCOM for possible scheduling.

Before evaluating possible scheduling options OPCOM discussed the two highly ranked proposals which required alternate or mission-specific platforms to drill: 533-Full2 (Arctic Ocean) and 564-Full (New Jersey Shelf). There was a general agreement that the funds necessary to implement either of these proposals would not be available without drastic cutbacks in JOIDES Resolution operations in FY 2002, so OPCOM decided not to pursue these two proposals any further. OPCOM then recommended scheduling the 4 top-ranked programs in the Pacific, deferring several highly ranked Atlantic programs and one highly ranked eastern Pacific proposal until consideration in August of 2001 for FY2003. The OPCOM-recommended schedule was subsequently endorsed by SCICOM.

SCICOM Motion 00-2-11: SCICOM approves the following operations schedule for 2001 and 2002, contingent upon the proponents of Proposal 499-Rev informing us of the expected timeline for installing the ION observatory.

Leg Proposal

195 431-Rev Western Pacific ION
" 505-Full3 Mariana Convergent Margin (South Chamorro Seamount mini-leg)
196 517-Full Nankai II
197 523-Full Hawaiian Hotspot-Emperor Seamounts
198 534-Full Shatsky Rise
199 486-Rev2 Paleogene Equatorial Pacific Transect
200 500-Full2 H2O Observatory
201 571-Full Peru Margin Deep Biosphere
202 465---- Southeast Pacific Paleoceanography
203 544-Full2 Costa Rica Subduction Zone
204 546-Full Hydrate Ridge
205 499-Rev Equatorial Pacific ION

This schedule had some important implications, as follow: First, some rearranging of the schedule for FY2001 was required, along with subsequent EXCOM approval by email of the revised FY2001 program. Second, the FY2002 schedule actually ran about 1 month into FY2003, and

leaves one calendar month in FY2003 to fulfill a 1999 SCICOM motion that the JOIDES Resolution would be drilling in the Atlantic by the end of calendar year 2002.

SCICOM Motion 99-2-23: SCICOM resolves that the JOIDES Resolution will operate in the Atlantic Ocean during at least part of 2002.

In light of that 1999 motion, 16 of the 30 ranked but unscheduled JOIDES Resolution programs – those that lie outside a region of likely FY2003 operations in the Atlantic or easternmost equatorial Pacific - were removed from further ODP consideration and recommended for forwarding to IODP.

At its January 2001 meeting in Kamakura, Japan, EXCOM approved the FY2002 Science Plan.

EXCOM Motion 01-1-9: EXCOM approves the FY02 Science Plan.

The scheduling decisions described above left one important dilemma: that the top-ranked program for drilling on Lomonosov Ridge in the Arctic requires an alternate platform and couldn't be scheduled for FY2002 because of the additional program costs involved as well as doubts about its technical feasibility. To address these issues, SCICOM recommended formation of an Arctic DPG, on a schedule to make a final report to the August 2001 SCICOM meeting when the final year of ODP scheduling will be determined.

SCICOM Motion 00-2-5: SCICOM establishes a detailed planning group (DPG) to investigate the logistical, technological, and budgetary requirements for Arctic drilling related to Proposal 533-Full2. The DPG will prepare a report on these issues for SCICOM to review in August 2001.

The relation of the legs scheduled for FY 2002 to the major themes of the Long Range Plan is as follows:

Dynamics of the Earth's Environment:

The Shatsky Rise drilling will provide a depth transect designed to characterize changes in the nature of the surface and deep waters through the Cretaceous and paleogene, including the frequency, amplitude and forcing of warm climate intervals, documentation of latitudinal and vertical gradients of temperature and changes in the source of deep water, vertical ocean structure, oxygenation, and corrosiveness with respect to carbonate through time.

The Paleogene Equatorial Pacific Leg, will collect a transect of Paleogene sediments in the eastern Pacific Ocean. The transect is to be centered on the approximate positions of the equator at 50-60 Ma and at 35-40 Ma. The main objective of the drilling will be a detailed investigation of the oceanographic consequences of the long term cooling since the beginning of the Eocene. Three related questions will also be addressed by this transect: 1) what has been the long-term history of the intensity of atmospheric circulation; 2) what has been the latitudinal movement of the intertropical convergence zone (ITCZ) - a key indicator of the relative temperature gradients in the northern and southern hemispheres; and 3) what has been the history of hydrothermal activity during the Eocene and how might it relate to either warm climates or chert formation?

The Deep Biosphere will be sampled in the eastern equatorial Pacific, Leg 201. The nature and extent of microbial activity in deeply buried marine sediments remain poorly known. For example, the standard paradigm assumes that where sufficient organic carbon is available, the stratigraphic sequence of microbial activities is controlled by the energy efficiency of the available electron acceptors. That model reasonably explains the vertical succession of electron acceptors in many sediments. However, the effect of that chemical succession on microbial communities has been little explored; we do not yet know the extent to which deeply buried microbes (1) migrate to follow concentrations of electron acceptors, (2) switch from one electron acceptor to another, or (3) turn on and off as chemical fronts migrate past them. Furthermore, the factors that cause exceptions to the standard paradigm remain unknown. Finally, although methane in marine sediments constitutes one of the largest carbon reservoirs near the Earth's surface, the phylogenetic affinities and community structure of the microbes that consume methane in deeply buried marine sediments remain unknown. Leg 201 will address these mysteries.

The primary objective of Leg 202, Southeast Pacific Paleoceanographic Depth Transect, is to assess changes in surface intermediate-, deep-, and bottom-water mass interaction between the south Pacific and the Southern Ocean. The subsurface flows, important elements of the global thermohaline circulation, influence the heat, salt, oxygen, and nutrient balances of the whole Pacific Ocean and may trigger global climate feedback associated with heat transport and the carbon cycle. The longitudinal spread of the proposed transects along the Peru-Chile Current will facilitate the study of the northward advection of cold upper-ocean water and upwelling of subsurface water along the eastern boundary. These depth transects in the southeast Pacific will complement those in the western and northern Pacific and will allow assembly of a detailed depth-latitude-time reconstruction of subsurface water masses of the whole Pacific. They will complement existing and planned Atlantic depth transects to form a first-order global view of Neogene evolution of thermohaline circulation.

Drilling at two sites off Costa Rica will focus on the investigation of the hydrology, sediment dynamics and geochemistry of this margin by recovering oceanic basement rocks in a lower plate reference site and by monitoring fluid flow, temperature, and geochemistry.

Gas hydrates in sediments are a matter of considerable interest because of their potential as seals over hydrocarbon reservoirs, their significance as possible resources, their role in slope stability and their potential for causing catastrophic changes in atmospheric methane and climate change. Leg 204 will address a number of specific objectives related to these interests by drilling three holes and conducting comprehensive biological and geochemical sampling and by compiling a suite of *in situ* measurements.

Dynamics of the Earth’s Interior:

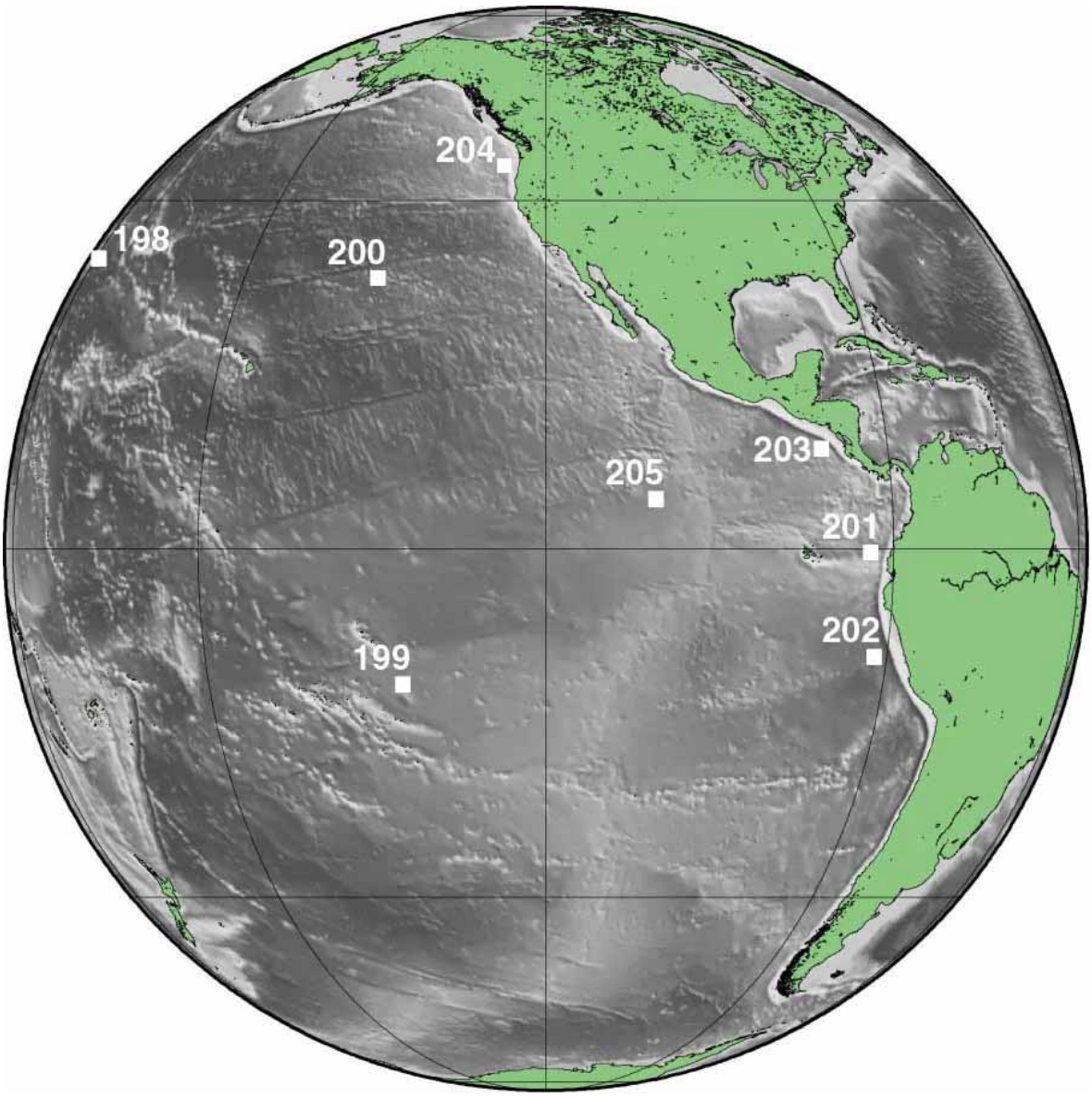
The H2O long term observatory site satisfies three scientific objectives of crustal drilling: (1) it is on fast spread Pacific crust, which represents one endmember for models of crustal generation and evolution; (2) it is located in one of the high priority regions for the Ocean Seismic Network; and (3) its proximity to the Hawaii-2 cable and H2O observatory make it a unique site for real time, continuous monitoring of geophysical and geochemical experiments in the crust

The overall aim of the drilling program at the Costa Rica Trench is to test existing models based partly on Leg 170 coring results and to develop an understanding of the processes associated with

the seismogenic zone and with the workings of the subduction factory. The focus of the leg is to investigate the hydrology, sediment dynamics, and geochemistry of this presently non-accretionary subduction margin by recovering oceanic basement rocks in a lower plate reference site and by monitoring fluid flow, temperature, and geochemistry there and at one or two other sites through the décollement. These sites were previously cored and studied with logging-while-drilling (LWD) during Leg 170, which provided evidence for several distinct hydrological regimes through the section. Leg 203 program will build on these results and emphasize (a) coring the deepest sediments and oceanic basement and (b) installation of CORK observatories for long-term hydrogeological investigations.

FY 2001 Drilling Leg Descriptions

Figure PP-6: FY 2001 Drilling Leg Locations (Legs 198-205)



Leg 198 carries over from FY 2001 into FY 2002. It was included in the FY 2001 Program Plan, and the information below is repeated for completeness

Leg 198	**Shatsky Rise**
Proposal	**534**
Title	**Exploring Extreme Warmth in the Cretaceous and Paleogene: A Depth Transect on Shatsky Rise, Central Pacific**
Proponents	**T.J. Bralower and J.C. Zachos**

Leg 198 will consist of a depth transect on Shatsky Rise to address the causes and consequences of global warmth in the Cretaceous and Paleogene. Shatsky Rise, a medium-sized Large Igneous Province in the west-central Pacific, contains sediments of Cretaceous and Paleogene age at relatively shallow burial depth. As a result, sediments of both ages can be reached readily through drilling, and fossil materials are sufficiently well preserved for stable isotopic and trace elemental analyses, and for faunal and floral assemblage studies.

The mid-Cretaceous (Barremian-Turonian) and early Paleogene were characterized by some of the most equable climates of the Phanerozoic, and are among the best known ancient "greenhouse" climate intervals. In addition, these intervals contain some of the most abrupt and transient climatic changes in the geologic record, including the latest Paleocene thermal maximum, the mid-Maastrichtian deep-water event, and the early Aptian Oceanic Anoxic Event. These transitions involved dramatic changes in oceanic circulation, geochemical cycling, and marine biotas. The proposed drilling plan is designed to address the long-term climatic transition into and out of "greenhouse" climate as well as the abrupt climatic events.

The depth transect has been designed to characterize changes in the nature of surface and deep waters through time, including vertical gradients of temperature, oxygenation, and corrosiveness. Combined with the results of previous and future legs, the proposed drilling will help determine: (1) the frequency, amplitude, and forcing of climate change in warm intervals, (2) latitudinal thermal gradients in discreet mid-Cretaceous to Paleogene time slices, and (3) changes in the sources of deep water and vertical ocean structure through time.

Shatsky Rise has been the target of three Deep Sea Drilling Project legs, but most sites were spot-cored or plagued by low recovery, especially in the Cretaceous. Previous drilling was centered on the southern part of Shatsky Rise. Leg 198 includes sites on the central and northern parts of the rise where the stratigraphy is less well known. Chert provides a significant recovery problem in the Cretaceous, thus we have attempted to position sites at locations with poorly developed reflectors.

Drilling Plan

The proposed drilling program includes a total of five sites, SHAT-1, -2, -3, -4, and 5. SHAT-1, -2 and –3 are located on the southern high of Shatsky Rise, SHAT-4 on the central, and SHAT-5 on the northern high. Paleogene sediments will be recovered at all five sites. Upper (Coniacian-Maastrichtian) and mid (Barremian-Cenomanian) Cretaceous sediments will be drilled at four sites, and pre-Barremian sediments and basement at one site (SHAT-3). The five sites provide a depth transect between 2450 and 3900m (current depths) for the Paleogene and mid-Cretaceous, and 2450 to 3300 m for the Upper Cretaceous. In addition the five sites will provide a transect of nearly 8 degrees latitude.

In addition, the drilling strategy includes multiple XCB coring and PDC-bit rotary coring, which will increase recovery in cherty intervals. In intervals of poor core recovery, FMS and gamma-ray logs will help determine the stratigraphic extent of diagnostic sediments such as black shale.

Logging Plan

Because sediments in this area commonly have abundant chert layers, recovery is expected to be difficult and a high value is placed on logging to recover information on the geographic extent of important formations such as Cretaceous black shales.

The traditional logs such as gamma, density, porosity and resistivity should provide important information about climate cyclicity because of the strong lithologic variability expected in these sediments. These logs will be useful for regional correlations, while the FMS will provide similar capabilities at much higher resolution. The GHMT will provide an *in situ* magnetostratigraphy as well as downhole susceptibility for core-log integration. The 3rd party high-resolution gamma tool might also be useful in achieving the objectives of this leg.

Table PP-3: Leg 198 Drill Site Locations

Site Name	Latitude (°N)	Longitude (°E)	Water Depth (m)	Total mbsf (m)
SHAT-1	32°39.099'N	158°30.357'E	2418	200
SHAT-2B	32°6.865'N	158°3.030'E	2782	700
SHAT-3	31°34.641'N	157°17.862'E	3881	210
SHAT-4	36°7.629'N	158°12.094'E	3318	200
SHAT-5C	37°46.92'N	162°45.31'E	3123	555

Figure PP–7: Leg 198 Drill Site Locations

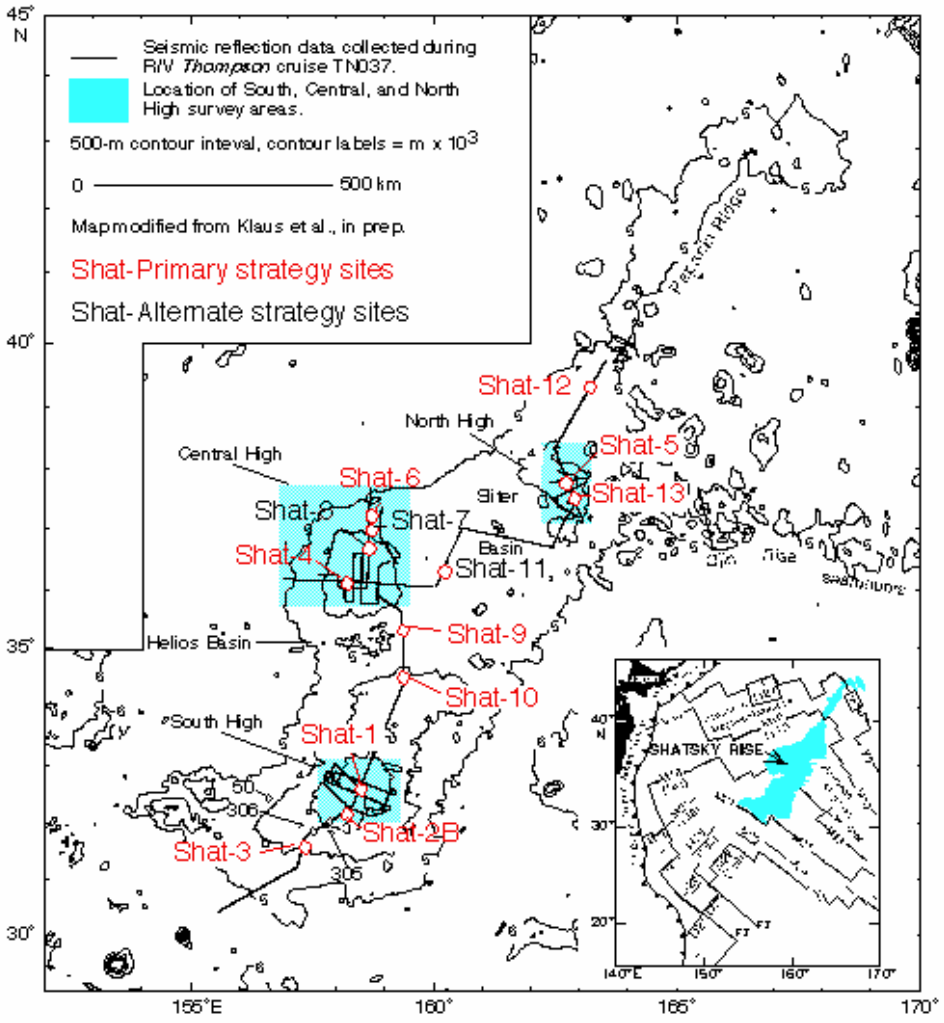


Table PP-4: Leg 198 Budget *

Expense Category	Description	TAMU**	LDEO
2000	Payroll/Salary	112,749	***
3500	Travel	1,976	***
3533	Drilling Clearances	-	***
3580	Travel to/from Port	940	***
3600	Training	-	***
3750	Travel - ODL	92,542	***
3760	Per Diem	28,416	***
4000	Supplies	806	***
4750	Fuel	-	***
5070	Insurance	37,282	***
5261	Shipping	16,095	***
5370	Communications	2,200	***
5373	Ship-to-Shore Communications	1,992	***
5550	Services	1,642	***
5590	Computing Services	860	***
5931	Equipment Rental	-	***
5981	Other Expenses – ODL	70,359	***
6820	Repairs & Maintenance	-	***
7040	Day Rates	17,663	***
7090	Port Calls	-	***
8400	Equipment	-	***
	Logging Operations		***
	Sub Total	**$385,522**	***
	Logging Deployment SOE		***
	Grand Total	**$385,522**	***

* Refer to pages PP-64 for a glossary of expense category terms

** Part of the ODP-TAMU Leg 198 budget was included in the ODP FY01 Program Plan.

***Specific details about the ODP-LDEO Leg 198 budget was included in the ODP FY01 Program Plan.

Leg 199	**Paleogene Pacific**
Proposal	**486**
Title	**Paleogene Equatorial Pacific Transect**
Proponents	**M. Lyle, D.K. Rea, T.C. Moore, and L.D. Stott**

The complex system of equatorial currents is one of the most persistent and clear traces of wind-driven circulation in the oceans. In the Neogene, the unequal hemispheric thermal gradients have pushed the Intertropical Convergence Zone (ITCZ) north of the equator and given rise to a narrow band of equatorial upwelling as well as an equatorially assymetric zonal current system. The high productivity associated with the equatorial upwelling results in a high rain of biogenic debris to the seafloor within 1.5°-2° of the geographic equator, with peak values restricted to an even narrower zone. In the Pacific Ocean, this biogenic rain has built a mound over geologic time of almost pure calcareous and siliceous sediments stretching along the equatorial region and reaching a thickness of over 500 m.

The central equatorial Pacific is unique in the world's oceans because the path of plate motion carries this linear trace of equatorial upwelling and productivity northward with time. There are two clear implications of this northward plate motion: (1) the thickest part of the equatorial mound of biogenic sediment is displaced several degrees to the north of the equator and (2) sediments deposited a few tens of millions of years ago have moved completely out of the region of high sediment flux. This movement into regions of very low sediment accumulation (or even erosion) puts Paleogene equatorial sediments within the reach of the Ocean Drilling Program's (ODP) advanced piston corer (APC)/extended core barrel (XCB) technology. For the most part, the sediments have never been subject to strong burial diagenesis and can be cored easily with little disturbance by APC. Time intervals notorious for extensive chert formation (e.g., the middle Eocene) are more likely to contain only oozes because they have never been deeply buried.

The Paleogene Equatorial transect will study the evolution of the equatorial Pacific current and wind system as the Earth went from maximum Cenozoic warmth to initial Antarctic glaciations. The drilling program will be primarily devoted to a transect along 56- to 57-Ma crust, old enough to capture the late Paleocene thermal maximum event in the basal, more carbonate-rich sediments. One drill site (Site PAT-8C) will also be drilled on 40 Ma crust to collect a near-equatorial sediment sequence from the middle Eocene through the late Eocene transition to glacial conditions in Antarctica. If the plate tectonic model we used for paleopositions is approximately correct, Site PAT-8C was at the equator at 40 Ma.

Because the Pacific plate drifts north with time out of the high productivity equatorial region, Paleogene equatorial sediments are overlain by a thin Neogene section of red clays. The youngest biogenic sediments to be drilled will be early Miocene in age. The lack of Neogene sedimentation minimizes burial diagenesis; essentially the entire Paleogene sediment section should be recoverable by advanced piston coring.
The Leg 199 transect extends from a paleolatitude of about 11°N to about 5°S and encompasses anomalously thick early Eocene sediments deposited as much as 8° north of the Paleocene equator. The transect will collect continuous sediment sequences to document the evolution of the equatorial current system, equatorial surface-water and deep-water temperature variations, wind

patterns, and productivity in the late Paleocene and early Eocene. In addition, one site will specifically be drilled to study the changes in equatorial circulation associated with the transition from the late Eocene to the early Oligocene to the ice-house world.

Leg 199 drilling will accomplish, in addition to its primary objectives, the following goals:

1. Collection of continuous sequences of Paleogene sediment to improve Paleogene biostratigraphy and to tie this stratigraphy to paleomagnetic chronostratigraphy;
2. Better constraints on the late Paleocene and early Eocene equatorial position using paleomagnetic and micropaleontologic indicators;
3. Linkage of seismic stratigraphy from the site survey to sediment chronostratigraphy to extend the Neogene equatorial Pacific seismic stratigraphy (Mayer et al., 1985, 1986; Bloomer et al., 1995) back in time;
4. Locate the transition between Asian and American dust sources to understand the primary structure of the Paleogene wind field;
5. Provide primary geochemical information needed to understand the widespread formation of Eocene cherts;
6. Provide important data to make an early Paleogene mass balance of carbonate and opal burial and to track the Eocene movement of the carbonate compensation depth (CCD) in detail; and
7. Collect basal hydrothermal sediment sections for study of hydrothermal activity in the early Paleogene.

Drilling Plan

The eight high-priority sites are summarized in following table and shown in the following figure. Additionally there is another high-priority site, Site PAT-13C, that will be drilled during Leg 200 if time becomes available. The proposed drilling program consists of two northwest to southeast transects. The western transect includes the following proposed sites, from north to south: Sites PAT-15D, PAT-12C, PAT-10B, PAT-9D, and PAT-17C. The eastern transect includes proposed sites, from north to south: Sites PAT-26, PAT-19A, and PAT-8C. The proposed transects are designed to provide a reconstruction of Paleogene paleoceanography and paleoclimatology by coring and logging a late Paleocene-early Eocene latitudinal transect across the equator and a depth transect at the equator during the middle to late Eocene.

Logging Plan

Downhole logging provides continuous measurements of geophysical parameters, which can be used to assess the physical, chemical, and structural characteristics of the formation. Where core recovery is poor, downhole logs are often the most reliable source of information; where core recovery is good, log data can be correlated with core data to produce more detailed and emphatic results.

During Leg 199, a great deal of information will be obtained from the *in situ* downhole physical property data. Density measurements will be crucial for calculating acoustic impedence values, and neutron porosity data will be particularly valuable for identifying intervals of high-porosity radiolarion ooze. Density and porosity results may also be useful for delineating the extent of hydrothermal activity toward the base of the sedimentary section, which will be characterized by

high concentrations of iron and manganese. The downhole natural gamma-ray and density values will be correlated with comparable analyses from the multisensor track (MST), which will enable the precise depth matching of cored sections.

A major objective of logging during Leg 199 will be to use the downhole sonic data in conjunction with the density results, and check shot surveys where necessary, to obtain a velocity profile, a time/depth model, and synthetic seismograms. These results will be compared with the regional seismic sections to interpret the origin and geological significance of the major reflectors.

Downhole measurements, in particular taken by the Formation MicroScannner (FMS) and the new high-resolution (~0.1 m) Lamont Multisensor Gamma tool (MGT), will be useful for cyclostratigraphic analysis of continuous Paleogene sequences. Logs will also be invaluable for determining the position of chert layers, which are likely to occur in the lower part of the boreholes and will be difficult to recover in the core. Chert horizons show up exceptionally well as resistive stripes on FMS images.

The plan is to run the triple combo, MGT, and FMS-sonic toolstrings at the three deepest penetration sites: PAT-8C, PAT-17C, and PAT-9D. Time permitting, these toolstrings will also be run at Site PAT-26 (~0.8 days). There is also the possibility that check shot data will be acquired at some of the deeper logged sites, with the priorities being Sites PAT-8C (~0.6 days) and PAT-17C (~0.6 days). Less extensive logging operations may be performed at some of the shallower sites.

Table PP-5: Leg 199 Drill Site Locations

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Total mbsf (m)
PAT-15D	26°02'N	147°5'W	5359	124
PAT-26	21°27'N	139°29'W	5081	201
PAT-19A	16°52'N	138°06'W	5291	178
PAT-8C	8°53'N	135°22'W	4817	284
PAT-17C	7°48'N	142°01'W	5039	295
PAT-9D	10°11'N	142°46'W	5184	233
PAT-10B	12°02'N	143°45'W	5147	181
PAT-12C	13°49'N	143°53'W	4965	152

Figure PP-8: Leg 199 Drill Site Locations

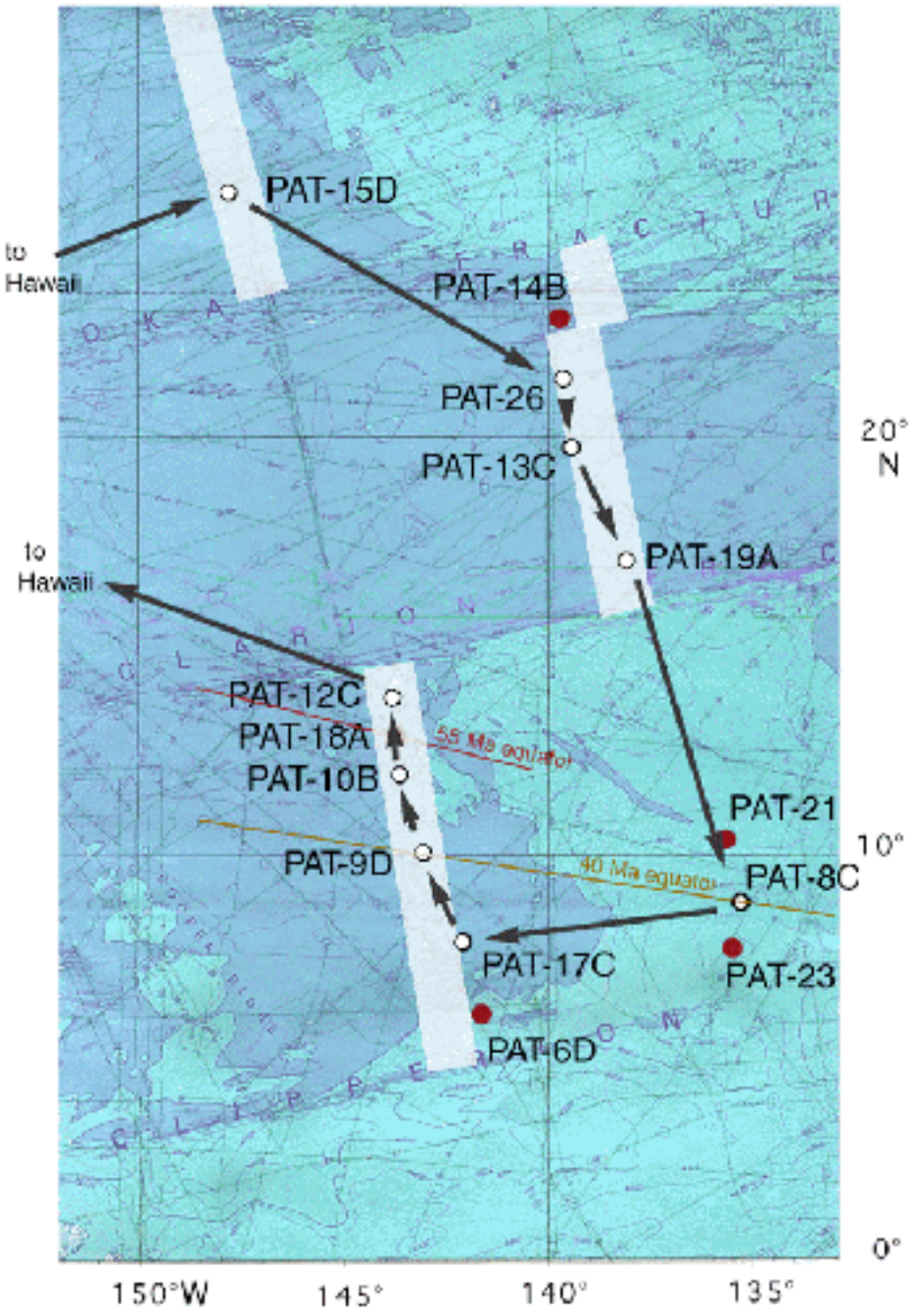


Table PP-6: Leg 199 Budget

Expense Category	Description	TAMU*	LDEO
2000	Payroll/Salary	426,664	36,422
3500	Travel	4,329	6,510
3533	Drilling Clearances	-	-
3580	Travel to/from Port	21,331	4,512
3600	Training	-	-
3750	Travel - ODL	172,329	-
3760	Per Diem	58,703	1,775
4000	Supplies	1,775	3,418
4750	Fuel	287,500	-
5070	Insurance	83,886	25,151
5261	Shipping	26,507	19,244
5370	Communications	6,178	-
5373	Ship-to-Shore Communications	5,769	1,742
5550	Services	11,079	-
5590	Computing Services	1,885	-
5931	Equipment Rental	-	-
5981	Other Expenses – ODL	158,300	-
6820	Repairs & Maintenance		9,832
7040	Day Rates	-	323,622
7090	Port Calls	2,419,348	-
8400	Equipment	138,548	1,835
	Logging Operations	-	62,740
	Sub Total	**$3,824,131**	**$496,801**
	Logging Deployment SOE *		0
	Grand Total	**$3,824,131**	**$496,801**

* Part of the ODP-TAMU Leg 199 budget was included in the ODP FY01 Program Plan.

Leg 200	**H_2O Observatory**
Proposal	**500-Full2**
Title	**Drilling Fast Spread Pacific Crust at the H2O Long Term Seafloor Observatory**
Proponents	**R.A. Stephen, J.H.Natland, R. Butler, K. Becker, A.D. Chase and F.K. Duennebier**

The goal of this leg is to drill one reentry hole at the Hawaii-2 Observatory (H2O) site in the Eastern Pacific. The H2O long term observatory site satisfies three scientific objectives of crustal drilling: (1) it is on fast spread Pacific crust, which represents one endmember for models of crustal generation and evolution; (2) it is located in one of the high priority regions for the Ocean Seismic Network; and (3) its proximity to the Hawaii-2 cable and H2O observatory make it a unique site for real time, continuous monitoring of geophysical and geochemical experiments in the crust. Ideally the hole will penetrate about 400 m into basement to acquire good quality basalt samples for geochemical studies, adequate penetration into layer 2 for paleomagnetic analyses, and good hole conditions for *in situ* experiments. This is a multi-disciplinary proposal which represents the interests of the of the JOI/IRIS Steering Committee for the Scientific use of Submarine cables, the Ocean Seismic Network (OSN) and the International Ocean Network (ION) groups, the Borehole Observatories, laboratories, and Experiments (BOREHOLE) group, and the oceanic lithospheric processes community.

Drilling Plan

The primary objective of Leg 200 is to establish a cased reentry hole penetrating well into oceanic crust at the H2O site, for subsequent emplacement of an Ocean Seismic Network broad-band seismometer and other possible instruments by wireline reentry. The main technical requirements include installing well-cemented casing completely through about 75 m of sediments and into uppermost basement, with target of 300-400 m of basement penetration. The installation will be more complex than the “standard” ODP reentry cone installation for basement penetration, because of the likely presence of chert above basement. This requires planning for deployment of a triple-casing string, to ensure adequate penetration and cementing of the inner casing string in uppermost basement. If chert is not encountered, the installation might be reduced to a dual-casing string, with potential time savings. According to an OPCOM motion, if sufficient time is saved, the first priority for that time would be to core an additional site from the Leg 199 transect.

Logging Plan

The downhole logging measurements are essential to provide and document in-situ formation properties for the proposed drilled site and the H2O observatory. These properties include density, porosity, resistivity, temperature, K, Th, U contents, elastic properties, and hole condition related estimates. The logging program will include the standard geophysical string (Triple Combo), the Formation MicroScanner and Sonic string (FMS/Sonic), Well Seismic Tool (WST), and Borehole Compensated Sonic string (BHC). Temperature logs will be emphasized for identification of permeable zones and inflow/outflow from both drilling-induced and natural fractures in the holes.

The high-resolution (cm-scale) FMS image log can help to identify large and small-scale lithological units and tectonic features (presence of fractures and faults, their orientations and their degree of alteration). Comparison of fractures detected from these log images could provide information on the lateral extension of the fracture system beyond the borehole, and the significance of borehole-induced features versus natural fractures. The FMS caliper log could also used for hole size estimation. The DSI tool provides both compressional and shear wave data.

WST (or WST-3 if available) will be used to provide normal incident VSP data for the proposed objectives. However, its deployment depends upon the time constraints and the hole penetration. BHC sonic log will be used for the cased interval of basement to obtain the acoustic properties of the formation through casing and cement.

Table PP-7: Leg 200 Drill Site Locations

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Total mbsf (m)
H2O-1	27°53.9'N	141°59.5'W	5000	475
H2O-2	27°52.0’N	141°59.8’W	5000	475
H2O-3	27°52.4’N	141°59.1’W	5000	475
H2O-4	27°53.3’N	142°00.5’W	5000	475

Figure PP-9: Leg 200 Drill Site Locations

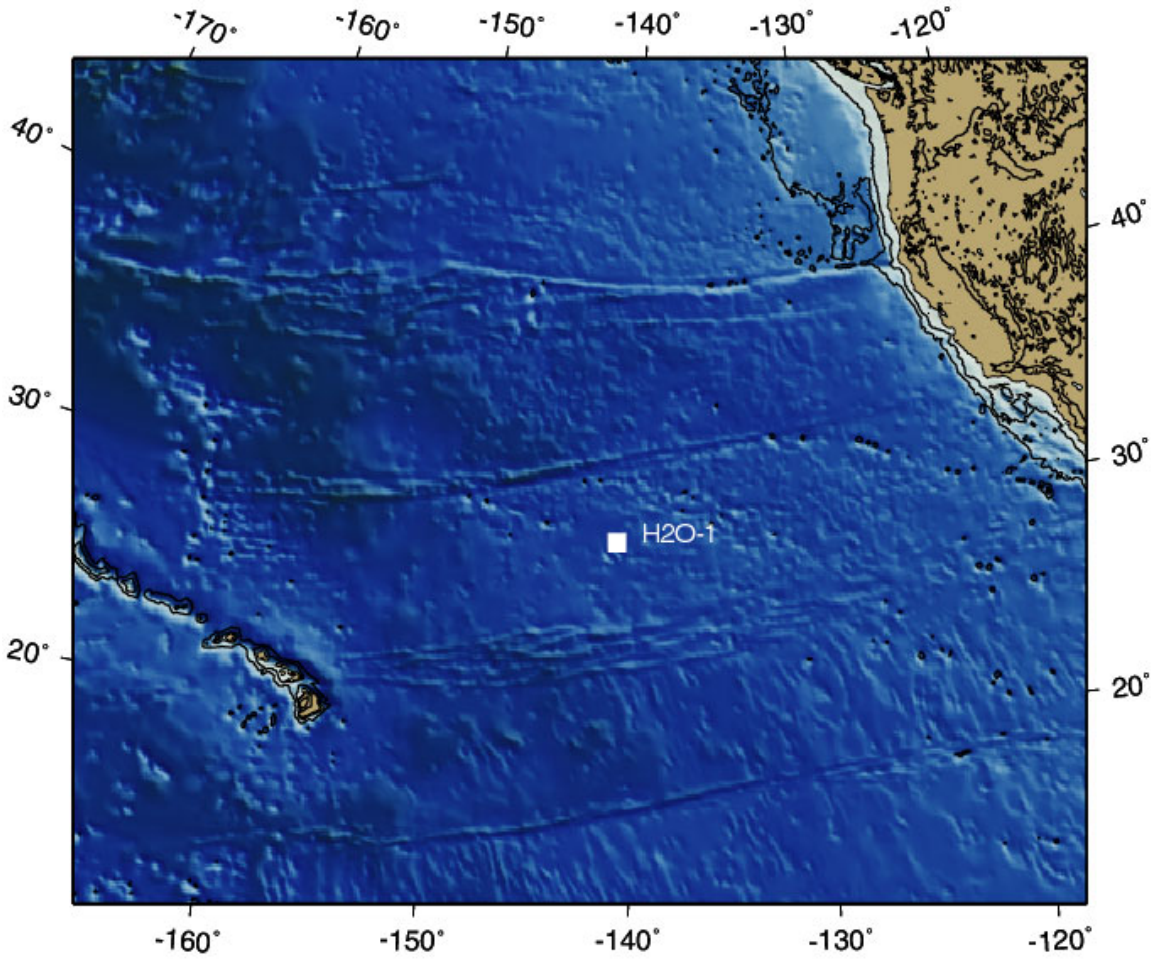


Table PP-8: Leg 200 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	403,752	17,899
3500	Travel	6,371	5,425
3533	Drilling Clearances	-	-
3580	Travel to/from Port	55,655	2,500
3600	Training	1,184	-
3750	Travel - ODL	166,062	-
3760	Per Diem	56,335	1,479
4000	Supplies	150,527	2,848
4750	Fuel	287,500	-
5070	Insurance	81,878	20,959
5261	Shipping	56,698	16,037
5370	Communications	6,069	-
5373	Ship-to-Shore Communications	5,532	1,586
5550	Services	17,430	-
5590	Computing Services	1,817	-
5931	Equipment Rental	81,300	-
5981	Other Expenses – ODL	152,438	-
6820	Repairs & Maintenance	9,300	8,193
7040	Day Rates	2,664,253	269,685
7090	Port Calls	138,548	-
8400	Equipment	1,500	1,529
	Logging Operations		41,817
	Sub Total	**$4,344,149**	**$389,957**
	Logging Deployment SOE		12,493
	Grand Total	**$4,344,149**	**$402,450**

Leg 201	**Peru Biosphere**
Proposal	**571-Full**
Title	**Controls on Microbial Communities in Deeply Buried Sediments, Eastern Equatorial Pacific and Peru Margin**
Proponents	**S. D'Hondt, A. Teske, K.-U. Hinrichs, R.W. Murray, S. Rutherford, D.C. Smith**

In order to document how supplies of organic carbon and electron acceptors shape the distribution and activity of microbial communities buried in deep-sea sediments, we propose that the JOIDES Resolution drill a series of sites along the Peru Margin and in the eastern equatorial Pacific. This project would address fundamental questions about the deeply buried biosphere, including: (1) Are different sedimentary geochemical regimes characterized by different microbial communitiesÑor merely by different degrees and kinds of community activity? (2) How does the flow of electron acceptors through deep sediments affect community structure and sediment chemistry? (3) To what extent do past oceanographic conditions affect microbial communities now buried in deep-sea sediments?

The nature and extent of microbial activity in deeply buried marine sediments remain poorly known. For example, the standard paradigm assumes that where sufficient organic carbon is available, the stratigraphic sequence of microbial activities is controlled by the energy efficiency of the available electron acceptors. That model reasonably explains the vertical succession of electron acceptors in many sediments. However, the effect of that chemical succession on microbial communities has been little explored; we do not yet know the extent to which deeply buried microbes (1) migrate to follow concentrations of electron acceptors, (2) switch from one electron acceptor to another, or (3) turn on and off as chemical fronts migrate past them. Furthermore, the factors that cause exceptions to the standard paradigm remain unknown. Finally, although methane in marine sediments constitutes one of the largest carbon reservoirs near the Earth's surface, the phylogenetic affinities and community structure of the microbes that consume methane in deeply buried marine sediments remain unknown. The proposed expedition will address these mysteries.

Several characteristics of Peru Margin and eastern equatorial Pacific sediments render them uniquely well-suited for this project. These characteristics include: (1) a pronounced brine incursion that penetrates the methanogenic zone at depth and reverses the vertical sequence of electron acceptor availability in Peru Margin sediments, (2) violation of the standard model by co-occurrence of stable high methane and sulfate concentrations over a long stratigraphic interval in some eastern equatorial Pacific sediments, and (3) relatively close geographic proximity of sites with sediments rich in dissolved methane, hydrate-rich sediments, and normal marine sediments. The first and second of these characteristics are presently only known to occur in the Peru Margin and the eastern equatorial Pacific, respectively.

Drilling Plan

Leg 201 will core a series of triple APC/XCB holes at eight sites in water depths of 426 to 5,070 m. No logs will be run, but heavy use is possible for Adara heat flow, PCS, HYACE, DVTP, WST and biological sampling tools. Shallow water rules apply to one site, and three sites are in deep water. The estimated cored interval is 6,171 m with 5,023 m recovery. Alternating layers of hard authegenic carbonate and hydrate in soft gassy sediment could reduce recovery.

Leg 201 operations will be conducted from 31 January to 2 April 2002. The leg is primarily an APC/XCB/PCS/HYACE coring leg. Expected high core recovery may result in above average supplies consumption. Because no specific requirements have been identified, no money is budgeted at this time for a possible radioisotope van. An engineering van will be required for handling PCS cores in hydrate.

Logging Plan

The objectives of this leg are to drill in the Peru margin and the eastern equatorial Pacific and to use the new microbiology laboratory on board the *JOIDES Resolution* to answer three fundamental questions: (1) are different sedimentary geochemical regimes characterized by different microbial communities, or merely by different degrees kinds of community activity? (2) How does the flow of electron acceptors through deep sediments affect community structure and sediment chemistry? (3) To what extent do past oceanographic conditions affect microbial communities now buried in deep-sea sediments? This is the first ODP proposal to focus exclusively on the deep biosphere. A minimum logging plan (three holes) could be done with a total of about 2.0 days.

The resistivity, porosity and temperature gradient logs will enable an assessment of the depth extent of high porosity/flow zones for the deep brine incursion. Comparison of these logs between the sites will allow some parameterization of the horizontal flow gradient. Site PRU-4A is located in a zone of gas hydrate stability down to >600m. Intervals containing hydrate are best characterized *in situ* by increases in resistivity and velocity (Vp and Vs) logs, and perhaps decreases in the density log. These may be the only direct indicators of the presence of hydrate. Past logging at ODP Site 685 indicated that hydrate was disseminated, rather than massive, making it even more difficult to recover.

Due to an obstruction, logging at Site 685 was terminated at 289 mbsf. The tools used also pre-dated the latest logging technologies. In particular, the FMS was not available at that time and the current sonic tool has been considerably improved since Leg 112. The FMS will be valuable for locating areas of small discontinuous hydrate masses and analyzing the fabric of hydrate-bearing sediments. Core recovery was poor at Site 685, so that logs will certainly be valuable to interpolate physical properties between recovered sections. Furthermore, even if this hole does not extend through the base of the gas hydrate stability zone, the presence of free gas below can be determined ahead of the bit with a VSP experiment. Hence, the WST tool should be used for a vertical incident VSP at this site to tie the borehole data to seismics.

Table PP-9: Leg 201 Drill Site Location

Site Name	Latitude (°S)	Longitude (°W)	Water Depth (m)	Total mbsf (m)
PRB-1A D	9°0.6'S	83°31.8'W	4487	155
PRB-2A D	12°1.2'S	81°34.8'W	4827	124
PRU-02A	11°3.9'S	78°16.3'W	252.5	300
PRU-01A	10°59'S	77°59' W	150.5	300
PRU-03A	8°59'S	79°54.6'W	426	160
PRU-04A	9°6.6'S	80°34.8'W	5070	300
EQP-1A O	3°5.7'S	90°49.2'W	3314	400
EQP-2A O	2°46.2'S	110°34.2'W	3780	318

Figure PP-10: Leg 201 Drill Site Location

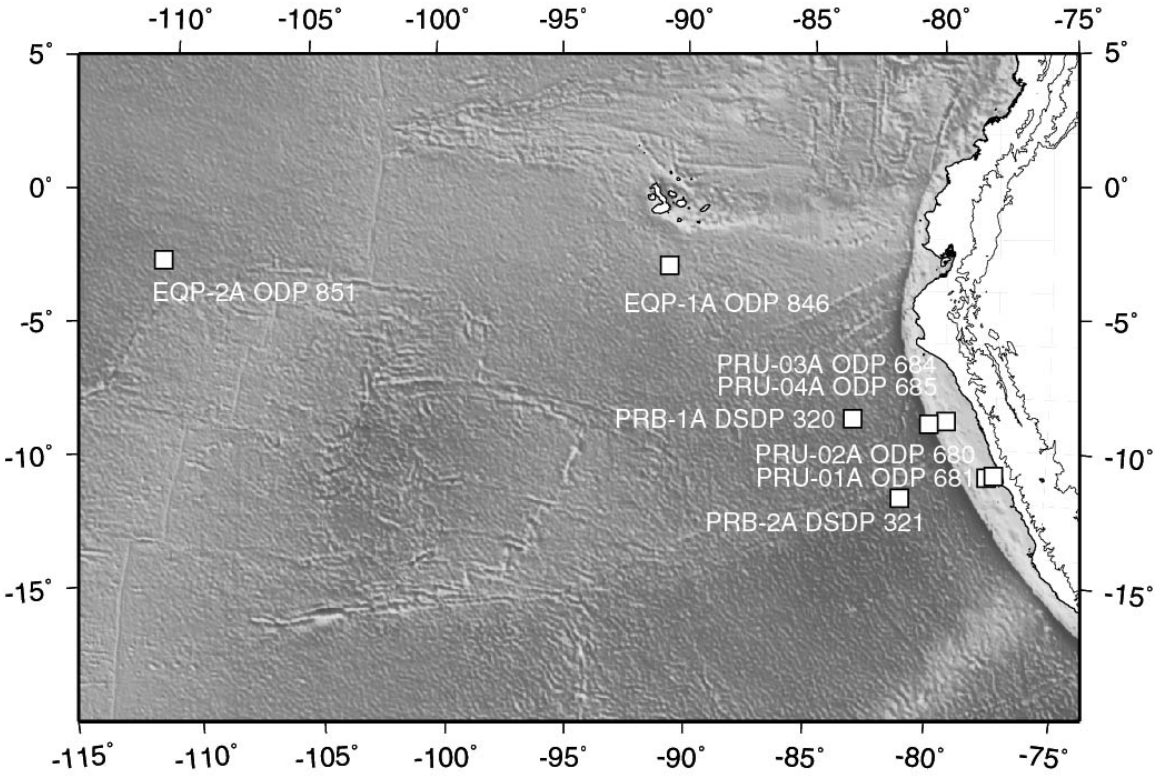


Table PP-10: Leg 201 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	489,442	15,504
3500	Travel	7,012	7,353
3533	Drilling Clearances	6,000	-
3580	Travel to/from Port	58,369	2,500
3600	Training	2,434	-
3750	Travel - ODL	217,312	-
3760	Per Diem	65,808	2,005
4000	Supplies	154,003	3,861
4750	Fuel	287,500	-
5070	Insurance	94,305	28,411
5261	Shipping	47,530	21,739
5370	Communications	6,512	-
5373	Ship-to-Shore Communications	6,284	2,068
5550	Services	10,598	-
5590	Computing Services	2,096	-
5931	Equipment Rental	400	-
5981	Other Expenses – ODL	175,890	-
6820	Repairs & Maintenance	10,300	11,106
7040	Day Rates	3,077,959	365,573
7090	Port Calls	187,990	-
8400	Equipment	1,500	2,072
	Logging Operations		41,797
	Sub Total	**$4,909,244**	**$503,992**
	Logging Deployment SOE		0
	Grand Total	**$4,909,244**	**$503,992**

Leg 202	**SE Paleoceanography**
Proposal	**465**
Title	**Southeast Pacific Paleoceanographic Depth Transects**
Proponents	**A.C. Mix, N.G. Pisias, L.A. Mayer**

Leg 202 will drill Neogene and older sediments in latitudinal and depth transects of topographic rises in the southeast Pacific (Cocos, Carnegie, Nazca, and Chile Rises). The primary objective is to assess changes in surface intermediate-, deep-, and bottom-water mass interaction between the south Pacific and the Southern Ocean. The subsurface flows, important elements of the global thermohaline circulation, influence the heat, salt, oxygen, and nutrient balances of the whole Pacific Ocean and may trigger global climate feedback associated with heat transport and the carbon cycle. The longitudinal spread of the proposed transects along the Peru-Chile Current will facilitate the study of the northward advection of cold upper-ocean water and upwelling of subsurface water along the eastern boundary. This study will test hypotheses on (1) global thermohaline circulation and the linkage of global oceans through the Antarctic, (2) the interaction of the eastern boundary with equatorial currents and its role in the long-term oceanic carbon dioxide balance, (3) the role of biological productivity on modifying subsurface water masses near the eastern boundary, (4) mechanisms of Southern Hemisphere wind changes (as reflected in boundary current advection) to changing glacial, orbital, and greenhouse gas forcing, and (5) the response of the ocean to the opening and closing of tectonic gateways such as the Drake Passage and the Panama Isthmus and the uplift of the Andes Mountains.

The depth transects in the southeast Pacific will complement those in the western and northern Pacific and will allow assembly of a detailed depth-latitude-time reconstruction of subsurface water masses of the whole Pacific. They will complement existing and planned Atlantic depth transects to form a first-order global view of Neogene evolution of thermohaline circulation. The latitudinal transect will add significant South Pacific data to studies of hemispheric thermal gradients during anomalously warm episodes of Neogene and Paleogene time. They will complement and extend land-based studies of the pole-equator-pole (PEP-1) study of IGBP/PAGES. In addition to addressing goals expressed by JOIDES, these transects are consistent with goals of the MESH Program Plan (MESH, 1994), and the international IMAGES Program Plan (IMAGES, 1994).

Drilling Plan

Leg 202 will core a series of triple APC holes at nine sites in 1,330 to 4,000 m water depth. No logs are planned. The estimated cored interval is 5,910 m with 100% recovery.
Leg 202 operations will be conducted from 2 April to 1 June 2002. Leg 202 leg-specific drilling/equipment costs are budgeted at $54,575. XCB cutting shoes and core barrel components may have higher than normal use due to chert. The leg is primarily an APC/XCB/MDCB coring leg in 1,330 to 4,000 m water depth. Expected high core recovery may result in above average supplies consumption. This is reflected in above average science costs for this leg.

Logging Plan

Standard logging tools should be run during this leg. The drilling seeks to answer questions about high-resolution climate changes occurring in the Southern Hemisphere and make terrestrial-marine climate links between South America and regional oceanographic currents and wind fields. Such changes will drive lithologic variability in both the biogenic components (silica to carbonate cycles) as well as the amount and type of terrigenous material, all of which can be documented by standard logging techniques. In addition, crucial to the success of this leg will be recovery of continuous sediment sections. Recent paleoceanographic legs with similar high-resolution goals have demonstrated the importance of core-log integration in developing a reliable composite section. The high-resolution natural gamma tool (MGT) would allow more detailed core-log and site-site integration in addition to providing high-resolution (orbital-suborbital scale) proxy records for terrestrial input.

Table PP-11: Leg 202 Drill Site Location

Site Name	Latitude (°N & °S)	Longitude (°W)	Water Depth (m)	Total mbsf (m)
SEPAC-05A	46°19.02'S	76°32.28W	2825	350
SEPAC-19A	41°0.00'S	74°27W	851	80
SEPAC-10A	40°28.98'S	75°54.96W	3858	350
SEPAC-09A	39°53.28'S	75°53.28W	4087	500
SEPAC-13A	TBD	TBD	TBD	200
SEPAC-14A	36°10.32'S	73°34.32W	509	200
NAZCA-10A	21°21.54S	81°26.16W	1323	250
NAZCA-14A	17°2.1S	76°6.54W	2930	350
NAZCA-16A	16°8.04S	76°58.623W	2244	350
NAZCA-17A	16°0.42S	76°22.68W	3228	300
CAR-2C	1°53.406S	82°46.914W	2223	500
CAR-1C	0°40.319S	82°4.853W	1423	550
PAN-2	0°1.312N	86°42.334W	2941	300
COC-3A	4°37.089N	86°42.334W	919	150
COC-2A	5°50.566N	86°26.667W	2042	450
COC-4A	7°51.352N	83°36.402W	1370	250

Figure PP-11: Leg 202 Drill Site Location

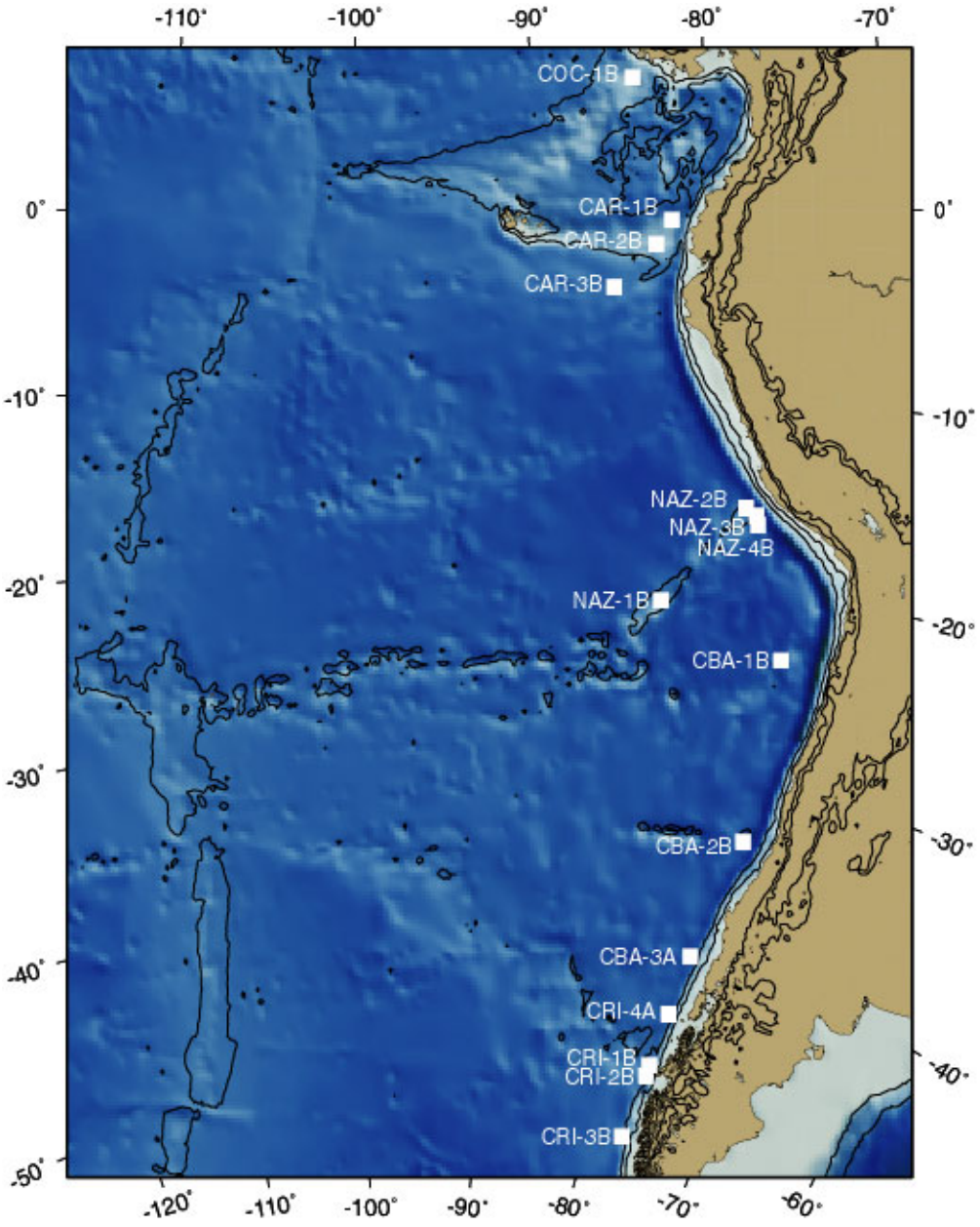


Table PP-12: Leg 202 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	445,062	16,234
3500	Travel	7,012	7,233
3533	Drilling Clearances	6,000	-
3580	Travel to/from Port	80,340	2,500
3600	Training	1,184	-
3750	Travel - ODL	219,540	-
3760	Per Diem	65,808	1,973
4000	Supplies	178,259	3,797
4750	Fuel	287,500	-
5070	Insurance	94,305	27,945
5261	Shipping	70,030	21,383
5370	Communications	6,512	-
5373	Ship-to-Shore Communications	6,284	2,038
5550	Services	17,978	-
5590	Computing Services	2,096	-
5931	Equipment Rental	400	-
5981	Other Expenses – ODL	175,890	-
6820	Repairs & Maintenance	9,300	10,924
7040	Day Rates	3,077,959	359,580
7090	Port Calls	168,392	-
8400	Equipment	1,500	2,038
	Logging Operations		42,686
	Sub Total	**$4,921,351**	**$498,331**
	Logging Deployment SOE		0
	Grand Total	**$4,921,351**	**$498,331**

Leg 203	**Costa Rica**
Proposal	**544-Full2**
Title	**Fluid Flow, Seismic Cycling, and Pressure-Temperature Characteristics of the Costa Rica Subduction Zone**
Proponents	**E. Silver, M. Kastner, J. Morris, K. McIntosh, T. Plank, D. Saffer**

The overall aim of the drilling program at the Costa Rica Trench is investigate the effects of active fluid flow within the convergent margin processes associated with the seismogenic zone and with the workings of the subduction factory. The focus of the leg is to investigate the hydrology, sediment dynamics, and geochemistry of this presently non-accretionary subduction margin by recovering oceanic basement rocks in a lower plate reference site and by monitoring fluid flow, temperature, and geochemistry there and at one or two other sites through the décollement. These sites were previously cored and studied with logging-while-drilling (LWD) during Leg 170, which provided evidence for several distinct hydrological regimes through the section. Leg 203 program will build on these results and emphasize (a) coring the deepest sediments and oceanic basement and (b) installation of CORK observatories for long-term hydrogeological investigations.

At the reference Site 1139, located about 2 km seaward of the toe of the prism, a modified single-seal CORK will be installed to study fluid flow processes in basement and sample the basement fluids. The oceanic crust in this region is notable for some of the lowest heat flow measured anywhere in the ocean floor, strongly suggesting an
active fluid flow system in oceanic crust. At Site 1140, located about 2 km landward of the toe of the prism, a multi-seal Advanced CORK (ACORK) is planned to isolate processes and sample fluids from 4 hydrologically distinct regimes: subducting oceanic basement, underthrust hemipelagic sediments, décollement, and an out-of-sequence thrust. If time and funds allow, a modified single-seal CORK is also planned to monitor and sample fluids at the décollement at Site 1143, about a km seaward of Site 1140.

Drilling Plan

The two primary sites will be adjacent to sites cored on Leg 170 in 4,207 to 4,368 m water depth. Hole 1039 will be RCB cored ~350 to 650 mbsf. A reentry cone will be set with 16 in casing and 10¾-in casing. A modified CORK, with 4½-in casing to TD will be deployed with a packer near the bottom to isolate the basement section and will include third party osmosamplers, pressure samplers and perhaps temperature sensors. An ROV platform will also be deployed.

A reentry cone with 20 in casing will be deployed at site 1040 and cores will be taken from 600 to 800 mbsf. An ACORK, using 10¾-in casing, with at least four packers and four screens, will be installed. This ACORK will include third party supplied pressure and water samplers.

Leg operations will be conducted from 1 June to 31 July 2002. The cored interval is 500m. Packers and a DVTP deployment may be used at each of the sites.

Logging Plan

The objective of this cruise is to develop an understanding of the impact of hydrologic processes associated with the seismogenic zone and with the workings of the subduction factory. The focus is to investigate the hydrology, sediment dynamics, and geochemistry of this margin by recovering oceanic basement rocks in a lower plate reference site and by monitoring fluid flow, temperature, and geochemistry there and at two sites through the décollement.

During Leg 170 LWD porosity, resistivity, density and gamma-ray data were obtained in Sites 1039, 1040, and 1043. However, there are no image data for structural analyses, sonic data for the integration and correlation of core/log/seismic data, or geochemical data, for obtaining complete downhole profiles in the basement where the core recovery decreased considerably. Therefore, a set of wireline logs should be obtained, especially in holes in which deeper penetrations than at Leg 170 sites are planned, for the purposed of correlating the physical and chemical properties to the previously obtained LWD data. This would also aid in the analysis of fracture patterns, fracture density, and deformation of the sedimentary cover as well as preferential local stress directions and their relationship to the regional stresses associated with the subduction zone. Sonic data from the DSI would also allow the core/log/seismic data to be integrated to refine interpretations regarding the subduction factory and the seismogenic zone.

Table PP-13: Leg 203 Site Locations

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Total mbsf (m)
1039R	9°38.5'N	86°12'W	4350	700
1040R	9°39.7'N	86°10.7'W	4189	800
1043R	9°39.2'N	86°11.1'W	4310	200

Figure PP-12: Leg 203 Drill Site Locations

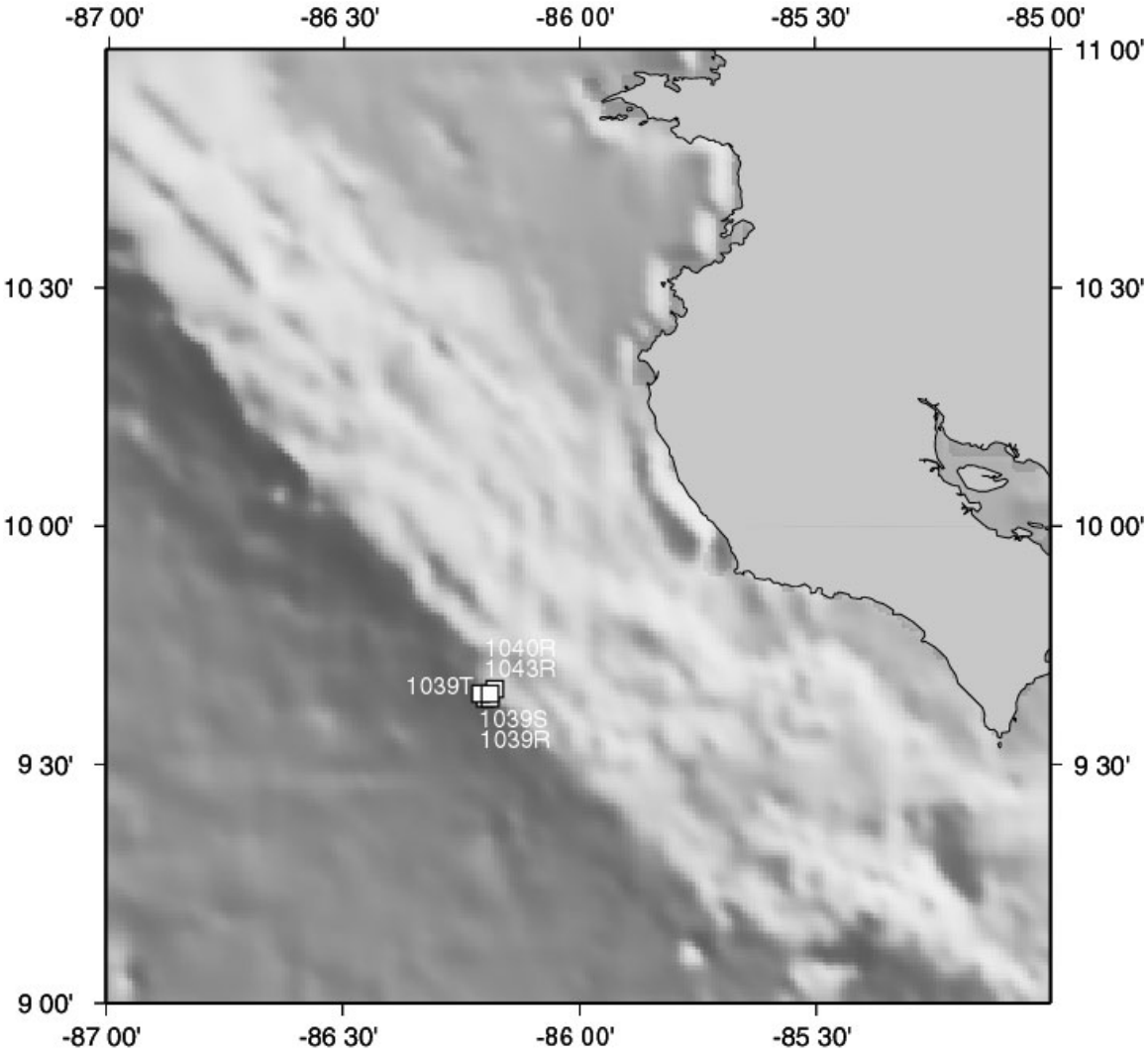


Table PP-14: Leg 203 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	489,086	17,551
3500	Travel	7,012	7,233
3533	Drilling Clearances	6,000	-
3580	Travel to/from Port	53,241	2,500
3600	Training	1,184	-
3750	Travel - ODL	167,507	-
3760	Per Diem	65,808	1,973
4000	Supplies	190,045	3,797
4750	Fuel	287,500	-
5070	Insurance	94,305	27,945
5261	Shipping	103,730	21,383
5370	Communications	6,512	-
5373	Ship-to-Shore Communications	6,285	2,038
5550	Services	10,598	-
5590	Computing Services	2,096	-
5931	Equipment Rental	400	-
5981	Other Expenses – ODL	175,890	-
6820	Repairs & Maintenance	9,300	10,924
7040	Day Rates	3,130,764	359,580
7090	Port Calls	187,990	-
8400	Equipment	1,500	2,038
	Logging Operations		38,084
	Sub Total	**$4,996,753**	**$495,046**
	Logging Deployment SOE		0
	Grand Total	**$4,996,753**	**$495,046**

Leg 204	**Gas Hydrates**
Proposal	**546-Full**
Title	**Drilling Hydrates on Hydrate Ridge, Offshore Oregon**
Proponents	**A. Trehu, M. Torres, S. Giovannoni, C. Goldfinger, E. Suess, K. Brown, M. Kastner, N. Bangs, D. Hammond**

Gas hydrates in sediments are a matter of considerable interest because of their potential as seals over hydrocarbon reservoirs, their significance as a possible resource, their role in slope stability and their potential for causing catastrophic changes in atmospheric methane and climate change.

Seismic data across Hydrate Ridge, off Oregon, show systematic variations in stratigraphic and reflectivity of the Bottom Simulating Reflectors (BSRs) that appear to be indicative of the impact of tectonic activity on the evolution of the hydrate/gas system of the Oregon margin. These patterns are especially well defined on the southern part of Hydrate Ridge, where grab sampling in 1996 revealed the presence of massive hydrate deposits near the seafloor.

Leg 204 will drill three holes, 400-700 m in depth, accompanied by comprehensive biological and geochemical sampling and by a suite of *in situ* measurements, to address the following specific objectives:

1) Compare the source region for gas and the physical and chemical mechanisms of hydrate formation in two distinctly different sedimentary and tectonic environments: (a) the older sediments of the accretionary complex, where massive hydrates and associated authigenic carbonate are found near the seafloor and methane may originate in underthrust sediments, and (b) the younger, well-stratified sediments of the adjacent, rapidly-filling slope basin, where seismic reflectivity indicates deeply buried hydrate and/or free gas but no significant hydrate and/or carbonate accumulations near the seafloor. Here the gas source is likely to be more local.
2) Calibrate estimates of hydrate volumes and underlying free gas content determined with geophysical remote sensing techniques. A better understanding of these properties is needed to map hydrate distribution regionally between drill sites, permitting us to evaluate the future economic potential of gas hydrates in subduction zone environments.
3) Test, using geochemical tracers, physical properties measurements, and microstructural analysis, whether variations in BSR and subBSR reflectivity observed in seismic data result from tectonically induced hydrate destabilization, as inferred from seismic reflection data.
4) Develop an understanding of the geochemical effects of hydrate formation in order to identify paleo-proxies for methane release that can be used to integrate the geologic data into climate models and understand the possible role of massive, catastrophic hydrate destabilization on global change.
5) Determine the porosity and shear strength of hydrated and underlying sediments in order to evaluate the relationship between hydrates, fluid flow and slope stability.
6) Quantify the distribution of methanogenic and methanotropic bacteria in the sediments in order to evaluate their contribution to hydrate formation and destruction and related sediment diagenesis.

Drilling Plan

Three 400-700 m deep drill holes are proposed along with an extensive downhole measurement program. These activities are to: 1) calibrate estimates of hydrate and free gas volumes with remote sensing techniques, 2) measure *in situ* physical and seismic properties and correlate variations with the BSR and sub-BSR reflectivity, and 3) estimate the porosity and shear strength of hydrate-bearing and underlying sediments to evaluate slope stability and fluid flow effects.

Logging Plan

Wireline logging tools, VSP, pressure core sampling, and LWD are proposed during a mini-leg to determine the formation mechanisms of the shallow, massive Hydrate Ridge. State-of-the-art LWD tools are to be used to measure high-quality porosity and density (ADN). Standard wireline logging tools should also be deployed. The laterolog (DLL) may only be needed in the unlikely event that the bulk resistivity is extremely high. Previously measured resistivities at nearby Site 889 and Site 890 were <1.0 ohm and <2.5 ohm, respectively, and therefore the standard induction resistivity tool (DITE) should provide adequate results. Both P&S velocity measurements are required to achieve the proposed objectives and the standard DSI tool should be used. The 3-component VSP tool is also needed to record the proposed offset VSP experiments.

Table PP-15: Leg 204 Drill Site Locations

Site Name	Latitude (°N)	Longitude (°E)	Water Depth (m)	Total mbsf (m)
HR-1A	44°35.2'N	125°07.0'W	900	700
HR-2A	44°35.15'N	125°03.85'W	1220	600
HR-3A	44°35.25'N	125°09.95'W	1000	600

Figure PP-13: Leg 204 Drill Site Locations

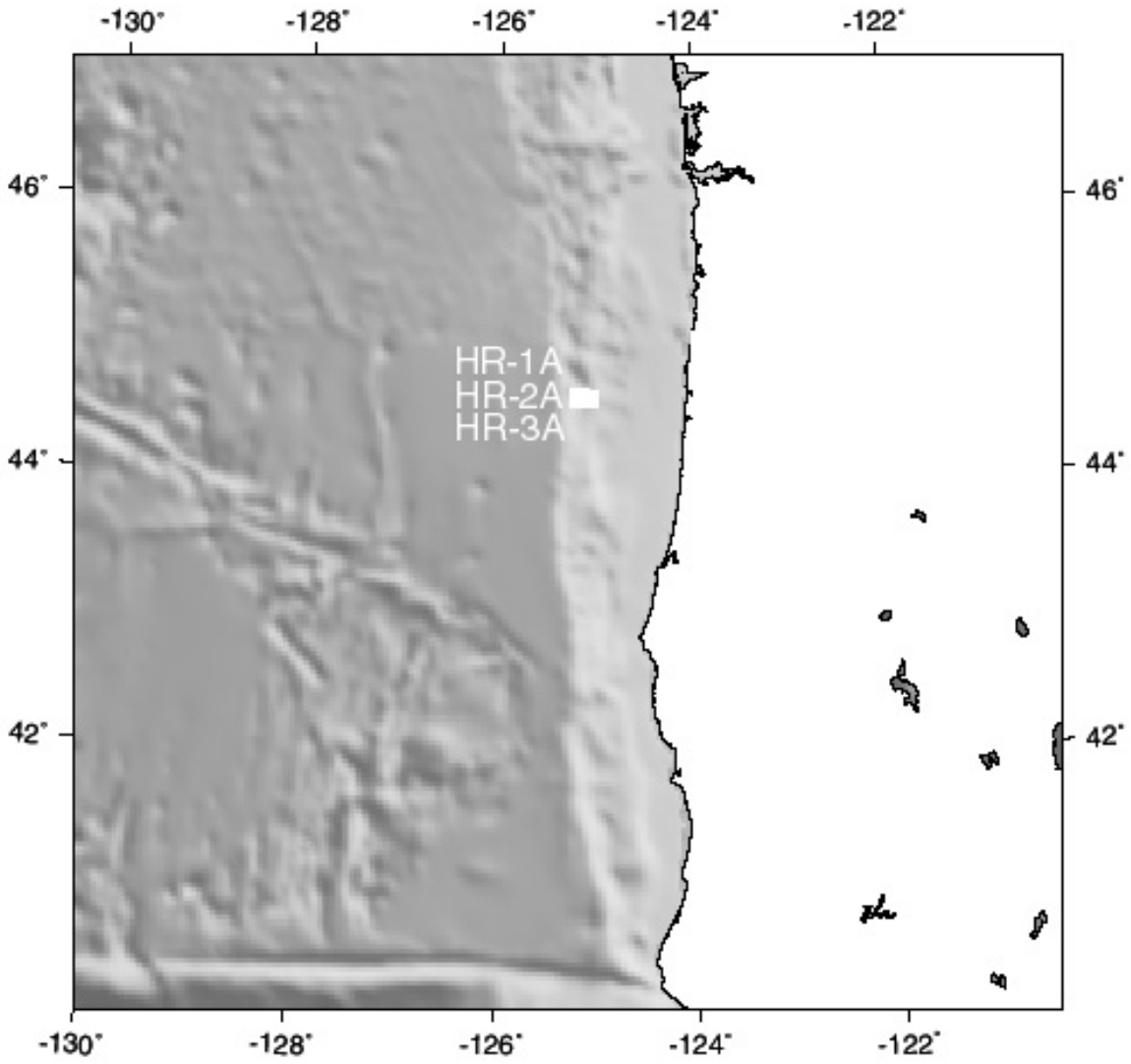


Table PP-16: Leg 204 Budget

Expense Category	Description	TAMU	LDEO
2000	Payroll/Salary	454,718	42,196
3500	Travel	6,611	7,112
3533	Drilling Clearances	6,000	-
3580	Travel to/from Port	45,813	5,000
3600	Training	1,184	-
3750	Travel - ODL	143,416	-
3760	Per Diem	59,887	1,940
4000	Supplies	413,953	3,734
4750	Fuel	287,500	-
5070	Insurance	86,539	27,479
5261	Shipping	75,659	21,026
5370	Communications	6,235	-
5373	Ship-to-Shore Communications	5,939	2,008
5550	Services	10,255	-
5590	Computing Services	1,921	-
5931	Equipment Rental	400	-
5981	Other Expenses – ODL	161,233	-
6820	Repairs & Maintenance	10,300	10,742
7040	Day Rates	3,110,390	353,587
7090	Port Calls	137,850	-
8400	Equipment	1,500	2,004
	Logging Operations		83,709
	Sub Total	**$5,027,303**	**$560,540**
	Logging Deployment SOE *		255,581
	Grand Total	**$5,027,303**	**$816,121**

* Mini-leg deployment

Leg 205	**Equatorial Pacific ION Observatory**
Proposal	**499-Rev**
Title	**Equatorial Pacific Site for the International Ocean Network**
Proponents	**J.A. Orcutt, A. Dziewonski, B. Romanowicz, F. Vernon**

A single site will be drilled in the equatorial Pacific to establish a borehole that will serve as a site for a future International Ocean Network (ION) and Ocean Seismic Network (OSN) observatory. The site (5°17.57'N, 110°4.58'W), which will be located in ~10-12 m.y. old lithosphere of Pacific Plate, was chosen to fill a large gap in seismic coverage in the region between Central America and the Pacific Islands. During Leg 205, the site will first be cored and then a second hole will be drilled, have a reentry cone set, and be cased into basement. The boreholes will penetrate through about 120 m of sediment and extend into the basement by about 100-150 m. Installation of the borehole instruments will be done using wireline reentry after Leg 205 has ended. Instrumentation will include a broadband triaxial borehole seismometer and a triaxial high-frequency seismometer, both of which will reside in basement portion of the borehole, and a broadband hydrophone, which will be suspended in the water column near the SOFAR channel. The observatory will be attached to a buoy that will provide power, data storage, and satellite communication capabilities, making it possible to return data daily to established data centers.

The observatory will be part of a global network that will resolve mantle and core structure, particularly anisotropy and lateral heterogeneities that may exist in these regions, and will aid in mapping the core-mantle boundary, a region that is probably the birth place of hotspots and the resting place of subducted slabs. The observatory will also improve the detection threshold for earthquakes occurring in the region. A secondary goal will be to recover and characterize the physical properties and geochemistry of an igneous basement section that was formed by super fast seafloor spreading (141 mm/yr full spreading rate).

Drilling Plan

The main purpose of Leg 205 is to establish a cased reentry hole into the oceanic crust at the drilling site, for subsequent emplacement of an Ocean Seismic Network broad-band seismometer by wireline reentry. The main technical requirements include installing well-cemented casing completely through about 115 m of sediments and into uppermost basement, with up to 100 m of open hole in basement below. This is envisioned as a relatively “standard” ODP reentry cone installation for basement penetration and will probably involve the routine procedures for establishing such a hole, as follows: pilot hole in sediments with jet-in test to determine depth of 16” casing, wash-in installation of 16” casing, installation and cementing of second casing string into basement, and finally coring into basement to total depth proposed as about 225 mbsf.

Table PP-17: Leg 205 Drill Site Locations

Site Name	Latitude (°N)	Longitude (°W)	Water Depth (m)	Total mbsf (m)
OSN-2	5°17.56'N	110°4.579'W	3860	226

Figure PP-14: Leg 205 Drill Site Locations

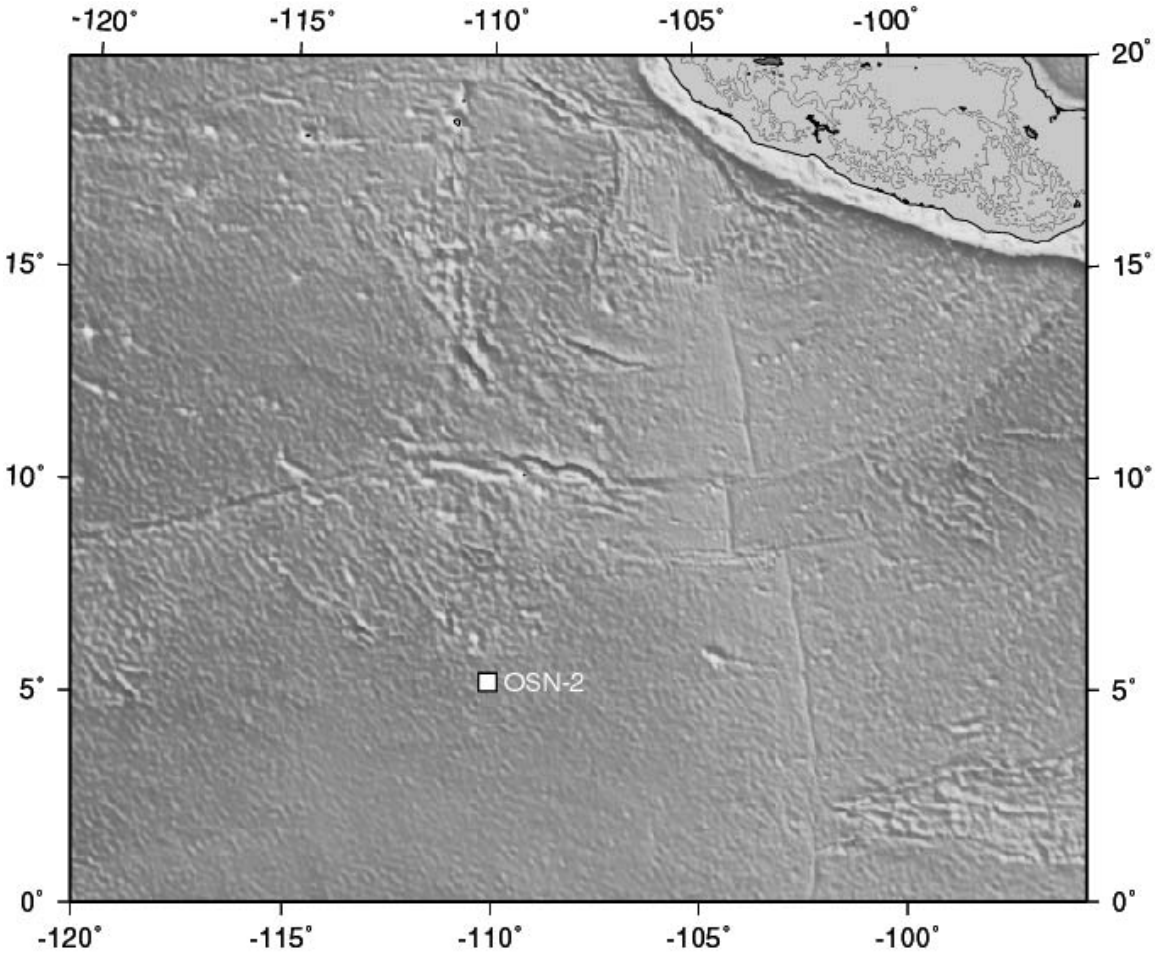


Table PP-18: Leg 205 Budget

Expense Category	Description	TAMU*	LDEO
2000	Payroll/Salary	-	**
3500	Travel	-	**
3533	Drilling Clearances	-	**
3580	Travel to/from Port	43,960	**
3600	Training	-	**
3750	Travel - ODL	79,612	**
3760	Per Diem	618	**
4000	Supplies	154,053	**
4750	Fuel	287,500	**
5070	Insurance	-	**
5261	Shipping	22,039	**
5370	Communications	800	**
5373	Ship-to-Shore Communications	-	**
5550	Services	-	**
5590	Computing Services	-	**
5931	Equipment Rental	-	**
5981	Other Expenses – ODL	-	**
6820	Repairs & Maintenance	8,000	**
7040	Day Rates	937,377	**
7090	Port Calls	115,000	**
8400	Equipment	-	**
	Logging Operations		
	Sub Total	**$1,648,959**	**
	Logging Deployment SOE		**
	Grand Total	**$1,648,959**	**

*Part of the ODP-TAMU Leg 205 budget will be included in the ODP FY03 Program Plan.

**Specific details about the ODP-LDEO Leg 205 budget will be included in the ODP FY03 Program Plan.

Glossary of Expense Categories

TAMU

Payroll—This category contains salary, fringe and sea pay directly associated with specific legs, along with pro rata amounts of the same items for employee efforts in support of leg activities.

Travel—Travel in support of leg activities (e.g., postcruise travel), exclusive of port call travel, are contained in this expense category.

Travel to/from Port Call—Funds in this category support travel to and from the ship at port calls for all seagoing personnel and other Program employees attending port call. All funds are leg-specific.

Training—This category contains funds that support training of the shipboard staff and other Program employees who receive specific training (e.g., Labview, Novell, etc.) that supports shipboard activities. The costs are both leg-specific and pro rata.

Travel—ODL funds are budgeted for rotation of the ODL, SOS and Catermar staff for each leg. The amounts depicted for each leg are leg-specific.

Per Diem—This category reflects catering charges for 45 personnel per month based on the most recent averages of shipboard participants. This category does not include ODL, SOS or Catermar personnel, as they are accounted for in the day rate.

Supplies**—**In this category are leg-specific supplies (e.g., drilling supplies, laboratory supplies, core liners, etc.), safety equipment for the ship and personnel and departmental pro rata expenses associated with the annual cost of supporting the science plan at sea.

Fuel—Fuel is budgeted for seven refuelings (8050 metric tons) at an average cost of $250 per metric ton. Each leg is budgeted at 1,150 metric tons.

Insurance (Ship Ops-ODL/ODP)—Funds in these categories are to reimburse ODL for Hull & Machinery and Removal of Wreck coverage and the ODP/TAMRF Marine Package insurance (refer to Appendix III).

Shipping—The majority of costs contained in this category are leg-specific costs and involve shipment of equipment and supplies to and from the ship. There is a small amount of funds associated with shipment/mailing of items in support of leg activities throughout the year.

Communications—This expense is associated with shore-based cost incurred in support of leg activities. Some costs are leg-specific, while others are incurred in support of multiple legs.

Ship-to-Shore Communications—Satellite and regular communications charges between the *JOIDES Resolution* and shore-based personnel are included in this category.

Services—In this category are costs associated with temporary employees hired through companies/corporations, drill pipe maintenance, wireline severing charges, shipboard maintenance service calls, transfer fees, weather reports, and physical examinations for seagoing personnel.

TAMU Computing Services—The pro rata cost associated with computing services reimbursed to TAMU in support of ship operations is included in this expense category.

Equipment Rental—Rental of third party drilling equipment (e.g., underreamers, drilling jars, etc.) makes up this category.

Other Expenses-ODL—In these expense categories (1806-01/1806-02) the annual payment of $1,000,000 to ODL (1806-01), the cost of medical evacuation (1806-02) and operation of the waste management system (1806-02) are covered by these funds.

Repairs & Maintenance—Funds contained in this category are for repairing drilling, coring, operations, and laboratory equipment for the ship.

Day Rates—Covers the cost of staffing the ship to include the sailing crew, drilling personnel, and catering personnel. It does not cover the cost of ODP/TAMU's crew or the scientists on board the ship. The day rate varies according to the mode of the ship which is generally operating, standby, or cruising. While it is a fixed rate per day, the day rate is adjusted for changes in the Consumer Price Index-Urban (CPI-U) and Employment Cost Index (ECI). When the cumulative change in the CPI-U and ECI (since the last increase) equals or exceeds 2%, the day rates will be adjusted by the percentage change. The adjustment takes effect at the beginning of the month following the increase and cannot occur more frequently than every six months.

Port Calls—Locations have a definite effect on the cost of port calls which covers agents' expenses and freight associated with resupplying the ship. During each port call, cores and equipment are off-loaded from the previous cruise and supplies are loaded for the upcoming leg. ODL is reimbursed for port agent charges and the shipment of food and related supplies. Shipment of cores, drilling equipment, and laboratory supplies is arranged and paid by ODP/TAMU and paid for by ODP/ TAMRF. Similarly, ODP/TAMRF purchases all drilling equipment and laboratory supplies necessary for meeting the objectives of the leg. These costs are covered in other areas, not Ship Operations.

Equipment—Includes costs associated directly with equipment (computer, scientific, and drilling) intended solely for use on the ship over a period of time greater than one leg, equipment purchased for a specific leg and pro rata cost of shore-based equipment used partially to support leg activities.

LDEO

Salary—Leg-based salaries include fringe and sea pay for logging scientists during the cruise. Salaries for pre- and post-cruise work are not included. Salaries for shorebased processing and other technical support are also not included.

Travel to/from Port Call—Travel of sea-going personnel to and from the drillship. It does not cover portcall travel for technical or management personnel or the pre- and post-cruise travel associated with the cruise (e.g., pre-cruise meetings).

Travel—Schlumberger funds are budgeted for rotation of the logging engineers for each cruise and for port call maintenance travel by Schlumberger technicians. Travel funds are also reflect prorated travel costs for the mechanic that is shared by ODL, TAMU, and the logging program.

Per Diem—This category reflects prorated catering charges for the mechanic that is shared by ODL, TAMU, and the logging program.

Supplies—The cost of replenishing supplies for the Downhole Measurements Lab and for upgrades/additions to the software for this lab.

Insurance—Insurance for standard logging tools during below-the-keel deployments.

Shipping—The costs for routine shipments to and from the ship.

Ship-to-Shore Communications—The costs for phone and fax communication to the ship, as well as satellite transmission of data.

Repairs and Maintenance—Upgrade, modifications, and repair of non-Schlumberger tools and data acquisition systems.

Day Rates—Covers the costs associated with the leasing of standard tools and the associated engineering support services.

Equipment—Prorated costs of computer, scientific, and engineering equipment for use on the ship over a period of time greater than one leg.

Other Expenses — Logging—Covers computer service charges and indirect costs associated with leg operations.

Logging Operations — Covers computer service charges and indirect costs associated with leg operations.

Logging Deployment SOE —- Covers the leasing, shipping, and insurance expenses associated with the deployment of special tools.

Budget Overview

The Program Plan budget requests $46.2 M (Table PP-19) to meet the high-priority science and engineering needs identified by the JOIDES advisory structure that can be accomplished by using the research vessel *JOIDES Resolution*.

Once the scientific needs affiliated with this vessel are identified, the budgeting process begins by determining the leg-based scientific and operational requirements, including the costs of ship operation, drilling and down-hole operations, logging science, and laboratory needs, among others. Consistent with the Program-wide move towards project-based management, and identification of research legs as "projects," the majority (greater than 83%) of the science and logging operational budgets have been allocated to, and apportioned within, leg-based budgets. Detailed budgets for Legs 198 through 205 are presented in the "Program Plan" section. Note that the major portion of Legs 198 and 205 are scheduled to occur in FY01 and FY03, respectively, but that a fraction of the science operator's costs for these legs will be incurred in FY02, and are thus budgeted herein.

The second step in the budget process is assessing Program needs that are not directly affiliated with legs, such as services in science, technical support, operations, publications, information, management, administration, logging, JOIDES advisory, public affairs, and technical and engineering development projects. These funds, together with associated leg-based funds are incorporated into the department-based budgets presented in Table ES-2.

The third step in the process, which maintains scientific and technical innovation in the Program, is to allocate $0.92M in the FY02 budget for high priority science and engineering needs. Expenditures against these needs are referred to as "special operating expenses" (SOEs). In addition, and in support of FY02 Legs 200 (H2O) and 203 (Costa Rica), an additional $0.81M was expended in FY01, with cost savings identified in the FY01 budget, to purchase equipment that requires a long lead time. As such, a total of $1.73M will be spent on SOEs affiliated with FY02 operations. This is $0.37M less than was allocated in the FY01 budget.

For Leg 200, which is to be drilled on fast spread Pacific crust, and where an Ocean Seismic Network broad-band seismometer will be emplaced, $106K will be used to purchase a triple casing configuration and casing hangers because of the possibility of encountering a chert layer, shallow in the sedimentary section, and to lease specialty logging tools that will characterize *in situ* formation properties. For Leg 203, over $600K will be expended on Advanced CORKs and on affiliated hardware. This scientific initiative, highlighted in the 1996 ODP Long Range Plan, will enable scientists to establish multiple, isolated zones within the drill hole for hydrogeological investigation, monitoring, and characterization of the processes that epitomize the dynamics of a convergent margin. Another $112K will be spent on a new CTV cable and on a drill collar replacement. Special drilling equipment will consume another $650K of FY02 funds. Finally, the remaining $268K will be used for logging-while-drilling on the Costa Rica leg, where the challenging environment will likely preclude high recovery of cores and the use of standard logging operations.

In FY02, the Program will see no significant increase in funding above the FY01 or the FY00 level. Standard increases in fixed costs (such as *JOIDES Resolution* leasing expenses) and in inflation, reduce the Program's base budget for scientific research. As explained in Program Plans

from the last several years, the ODP contractor and subcontractors have adapted to a flat, or near flat funding scenario by implementing a series of steps to optimize program delivery and cost effectiveness. This year, in addition to these measures, the Program managers intend to deliver the highest priority JOIDES science that can be accomplished on the *JOIDES Resolution* by assuming additional risk, by not filling positions that were identified for new projects, and by cutting lower priority science that would be accomplished if funds were available.

Regarding risk, the managers of the program and NSF agreed in January 2001 that the FY02 Program Plan will budget fuel at $250/metric ton, which is $50 higher than last year's price of $200/MT, the historical average over the previous several years. In FY01, the Program paid an average of $312/MT of fuel at the first four ports of call (Legs 193 through 196). If the average cost of fuel exceeds $250/MT during 2002, NSF has indicated that they would be prepared to consider a request for additional resources.

In an attempt to offset flat funding, the Program has sought funds from external source, as in years past. In April 2001, JOI submitted a proposal to the US Department of Energy solicitation on "Methane Hydrates." The proposal, titled "*In-Situ* Sampling and Characterization of Naturally Occurring Marine Methane Hydrate using the *D/V JOIDES Resolution*," requested funding of about $1M to support upgrades to downhole tools used by ODP for characterizing gas hydrates (e.g., Pressure Core Sampler (PCS), ODP memory tools), and new equipment that could be used for this purpose (e.g., G/GI seismic guns, infrared thermal imaging system, PCS gas manifold system, modifications to the FUGRO piezoprobe tool). If funded, these activities would support characterization efforts on ODP Legs 201 and 204, as well as any future legs scheduled after the SCICOM meeting in August. As in FY01, the Program will continue to realize ~$80K of cost savings through a new Schlumberger/GeoQuest university software license program. ODP has not seen a substantive increase in funding from existing or new partners in more than eight years.

The top priority science, based on SCICOM's ranking in August 2000, is a proposal (Lomonosov Ridge, 533 full-2) to drill the high Arctic, which requires vessels other than the *JOIDES Resolution*. The Arctic proposal will not be implemented in FY02. However, consistent with a recommendation from the JOIDES Arctic Detailed Planning Group, JOI requests funds ($200K) to hire an Arctic Project Manager to continue logistical and operational planning efforts for an ODP Arctic expedition. Other direct costs, such as travel, communication, supplies, and small subcontracts are included in this line item expense. If SCICOM and EXCOM sustain this proposal as a top priority for ODP, then in-depth technical planning must begin in FY02. ODP program managers will complement the efforts of the project manager by coordinating efforts of the proponents and scientific community members, and of the science and logging operators to develop a sound and comprehensive strategy for executing an Arctic expedition.

Table PP-19 summarizes the FY01 budget and compares it to the approved FY01 and 00 budgets. The ODP budget is divided into three major categories: Science Operations (TAMU), Logging Services (LDEO), and Prime Contractor (JOI/JOIDES) Services budget includes the LDEO Borehole Research Group, international processing centers, and the subcontractor (Schlumberger Offshore Services). The Prime Contractor (JOI/JOIDES) includes program management at JOI, advisory services of the JOIDES Office, the ODP Site Survey Data Bank at LDEO, and miscellaneous costs such as printing and distribution of the JOIDES Journal and providing Panel Chair Support.

Table PP-20 lists the Special Operating Expenses. Additional details are provided in the program plan section of this document and in the TAMU and LDEO appendices.

Table PP-19: Budgets for FY 00, FY 01, & FY 02 ($K)

TAMU	FY 00	FY01	FY02
Science Services	4,388	4,374	4,227
Drilling Services	5,039	4,181	3,508
Information Services	2,411	2,500	2,412
Publications	1,756	1,776	1,645
Headquarters/Administration	1,854	1,920	1,858
Ship Operations	23,592	23,787	24,863
TOTAL TAMU	**39,040**	**38,538**	**38,513**
LDEO	**5,044**	**5,268**	**5,168**
JOI/JOIDES	**2,016**	**2,317**	**2,517**
GRAND TOTAL ODP BUDGET	**46,100**	**46,123**	**46,198**

Table PP-20: FTE Comparisons for FY 00 - FY 02

	FY00	FY01	FY02
TAMU			
Headquarters/Administration	28.42	27.20	24.80
Publications	24.00	25.00	23.00
Drilling and Engineering	21.50	19.50	19.20
Science Services	47.00	52.00	49.50
Information Services	25.50	26.25	26.25
Total	**146.42**	**149.95**	**142.75**
LDEO			
Borehole Research Group	11.58	11.58	12.58
NEB-LMF	2.45	2.45	1.58
University of Leicester	2.05	2.05	2.05
University of Aachen	.42	.50	.50
Ocean Research Institute	.34	.50	.50
Total	**16.84**	**17.08**	**17.21**
JOI/JOIDES			
JOI Direct	7.66	7.49	8.49
JOIDES Office (RSMAS)	2.75	2.75	2.75
ODP Data Bank	3.25	3.50	4.00
Total	**13.66**	**13.74**	**15.24**
Total	**176.92**	**180.77**	**175.20**

TAMU Projects

Downhole Measurements Technology

Purpose: The purpose of this project is to provide centralized support for ODP/TAMU downhole measurement tools, as well as develop and acquire new measurement tools for improved science.

Objective: A major part of this effort is to create a commonality in data acquisition and support software for all downhole measurement tools. This will be applied to current operational tools, third party tools and future tools. A Service Center has been set up to provide centralized documentation control, inventory control, technical support, and orderly implementation of upgrades and changes. The five tools included in this project are the APC Temperature tool, the WSTP, the DVTP, the APC Methane tool, the Drilling Sensor Sub (DSS) and the Pressure Core Sampler (PCS).

Schedule:

The Service Center was established in FY00 and began the task of standardizing hardware, software and calibration procedures for downhole measurement tools. The development of the Downhole Data Acquisition System electronics has been delayed due to leg-related downhole tool priorities. The LabView version of DVTP communication software was released in FY01. A beta version of LabView software for the APC Temperature tool was also deployed in FY01. Software for the WSTP, APC Methane tool and DSS will be written in FY02. A prototype pore pressure measurement capability was added to the standard DVTP tool in FY00 and modified for routine use in FY01. Two new DVTP's with upgraded electronics with the pore pressure measurement will be added in FY02. The APC Methane tool was tested in FY01 on Leg 195. It will be deployed on Legs 199, 201 and 204 in FY02. The design of the DSS was begun in FY01 and will be fabricated and tested in FY02. It is targeted for deployment on Leg 204. The PCS bit will be redesigned in FY01 for improved rotary coring and recovery. The improved tool will be deployed in FY02 on Legs 201 and 204.

Pending TEDCOM endorsement, a Retrievable Memory Module (RMM) will be designed in FY02 to provide an inductive/electromagnetic coupling, i.e., a datalink, to retrieve data from the DSS. ODP and LDEO will jointly work on this project to ensure that the project is successfully implemented. The RMM will require that a companion datalink be designed and built into the DSS. The RMM will be deployed with the inner core barrel and mate up with the DSS on landing in the BHA. While coring the DSS will transmit the drilling data to the RMM. After the core is cut, the RMM will be retrieved with the core and its data downloaded on the surface. Completion of this step will allow retrieval and analysis of DSS data after each core is cut instead of having to wait until the BHA is tripped out of the hole. This project will only move forward if time and resources permit after all leg priorities related to downhole measurement technology have been addressed.

Project	FY01	FY02
Service Center & Rig Instrumentation	Driller's console reconfigured	Standardize temperature calibration procedures for all tools.
APC Temperature Tool	Beta version of LabView communication software deployed	LabView Communication software released
WSTP		Beta version of LabView communication software deployed
DVTP	1. LabView Communication software released 2. Acquired two upgraded electronics 3. Redesigned pore pressure prototype for routine use	1. Build two new DVTP's with pore pressure 2. Run on Leg 201
APC Methane Tool	Successfully tested prototype on Leg 195	Run on Legs 199, 201 and 204
Pressure Core Sampler (PCS)	1. Redesigned bit 2. Implemented general design improvements	1. Bench test improvements 2. Upgrade tools 3. Run on Legs 201 and 204
Drilling Sensor Sub (DSS), Memory	1. Phase I preliminary design complete 2. Place order for Phase II final design and prototype	1. Field test prototype (land rig) 2. Run on Leg 204
Retrievable Memory Module (RMM) with Datalink		Phase I preliminary design

Cost:

Project	FY01	FY02 Proposed
Service Center & RIS	$20,000	$5,000
DVTP	$4,000	$43,000
APC Methane Tool	$31,000	$3,000
Drilling Sensor Sub, Memory	$100,000	$74,000
Pressure Core Sampler (PCS)	$15,000	$45,000
Retrievable Memory Module with Datalink		
Total	$170,000	$170,000

Staffing:

Staffing for these projects is lean, but is sufficient to achieve FY02 projected goals. Only two FTE's, one Development Engineer and one Electrical Design Technician, are handling the daily requirements of the Downhole Tool Service Center, as well as advancing the new downhole tool development efforts. In order to enhance programmatic capability and progress on tool development, a Graduate Assistant Researcher (part time) is working under the guidance of the Development Engineer on the PCS project and a student worker (part time) is working under the direction of the Electrical Design Technician for the Service Center. In addition, the Department's

Mechanical Design Technician is available for AutoCAD work when this kind of support is required. The allocation of effort on the FY02 downhole tool projects is based on programmatically-defined priorities and, as such, the maintenance and refurbishment of tools used frequently (i.e., APC, WSTP and DVTP) are a number one priority. Moreover, the enhancement of leg-essential tools (i.e., APC Methane Tool and PCS) are also a number one priority for FY02. The development of the DSS and the RMM are very important in the campaign to define and understand drilling conditions at the bit (i.e., torque, weight on bit, RPM) and how these parameters are linked to surface conditions. This information is critical to the realization of a long term goal to better control these parameters from the sea surface and, thereby, recover better core and to make hole faster. Because these important projects are not specific to a scheduled leg, these projects will be a lower priority in terms of resource allocation. We anticipate that we will meet all our projected goals in FY02, assuming the unanticipated higher priority programmatic needs do not emerge necessitating a re-prioritization.

Enhanced Deep Biosphere Studies

Although the enhanced laboratory requirements have yet to be defined, there are two legs sailing during FY02, Legs 201 and 204, that will have strong emphasis on microbiological studies. Leg 201 will be a concerted effort to sample the deep biosphere on the Peru margin, and to relate microbiological studies to sub sea floor fluid movements and geochemistry. Fortunately on this leg *JOIDES Resolution* will be re-occupying sites previously occupied for basic geological and geochemical studies, so microbiological studies and sampling needs should not conflict with the needs for fundamental geological characterisation of the region. Drilling on Hydrate Ridge off northern Oregon, on Leg 204, will be devoted to to sampling gas hydrates, and associated bacteria, and to characterize the environment in which these phenomena are found. It will call for use of the pressure core barrel to obtain samples at close to *in situ* conditions, and because of the extremely high interest in this leg, will likely involve a significantly larger than usual science team.

On both of these cruises there will likely be strong interest in radio isotope studies. The experimental protocols and the practical issues associated with conducting these studies on *JOIDES Resolution* have yet to be addressed, either internally at ODP/TAMU or at an advisory level by JOIDES. It is too early to identify the specific requirements for these legs in terms of cost or staffing needs, it is not premature to identify these legs as new project-based activities.

LDEO Projects

Drillstring Measurement System (DMS) - LDEO/TAMU Collaboration

The Drillstring Measurement System (DMS) project is currently pending TEDCOM review. The project consists of two collaboratively engineered devices – the Downhole Sensor Sub (DSS) and the core barrel Retrievable Memory Module (CB-RMM) – that interface downhole to exchange data and provide near real-time engineering measurements made in the drill collar. The DSS portion of the project will be undertaken by TAMU. LDEO will develop the CB-RMM retrieval data link system to convey data between the drill collar sensors in the DSS and the rig floor. Using LDEO,s proven core barrel measurement design (e.g. DSA tool), an inductive coupling loop "modem" will be packaged in a pressure case and chassis fastened to the top of a APC, XCB, RCB or HYACE core barrel to exchange information with the DSS. The CB-RMM tool will record data from the DSS as drilling occurs though the inductive coupling loop. The CB-RMM and core barrel will be returned to the rig floor using conventional wireline coring techniques for removal of core and retrieval of the data. This system will not require any additional rig time to acquire these downhole data.

The DMS project will be undertaken pending TEDCOM review of the overall project (timeline, budget, and milestones) and the availability of time and resources.

11. FY 2003 Preview

11.1 Prospectus for 2003

Preliminary ODP Prospectus for FY2003

(**MSP** = Mission-Specific Platform)

(***** = outside area of FY2003 JR operations)

A. Proposals Carried Over From FY2002 Prospectus and Ranking

1	533-Full2	Backman	Lomonosov Ridge, Arctic	**MSP**
3	525-Full	Keleman	MAR Peridotite	
6	455-Rev3	Piper	Laurentide Ice Sheet	
9	559-Full	Zachos	Walvis Ridge	
10	564-Full	Miller	New Jersey Shelf	**MSP**
11	539-Full2	Holbrook	Blake Gas Hydrates	
12	512-Full2	Blackman	Core Complex	
13	522-Full2	Wilson, D.	Fast Spreading Crust	
14	577-Full	Wilson, P.	Demerara Rise	
22	519-Full2	Camoin	Sea-Level Rise S. Pac.	**MSP**

B. Proposals Externally Reviewed After 2000 SSEPs Meetings

561-Full2	Duncan	Caribbean LIP	
584-Full	Rona	TAG Hydrothermal II	
543-Full2	Harris	CORK Hole 642E	
547-Full3	Fisk	Oceanic Subsurface Biosphere	*****
548-Full2	Morgan	Chicxulub: K/T Impact	**MSP**
554-Full4	Kennicutt	GoM Gas Hydrates	
557-Full2	Andreassen	Storrega Slide Gas Hydrates	
572-Full2	Channell	N. Atl. Late Neogene; Distal LISO	
573-Full2	Henriet	Carbonate Mounds, Porcupine Basin	
575-Full3	deMenocal	Gulf of Aden African Climate	*****
581-Add	Droxler	Late Pleistocene Drowned Reefs	**MSP**
589-Full2	Flemings	GoM Overpressures	
594-Full	Tucholke	Newfoundland Margin	

C. Possible Ancillary Program Letters, depending on May, 2001 SSEPs

APL-15	Tamaki	Gulf of Aden Basement	*****
APL-19	Garcia	Nu'uanu Landslide	(Leg 200)
APL-20	Canero	Costa Rica Mud Volcanoes	(Leg 203)
APL-17	Piper	Sotian Margin Cenozoic	

FY2003 Prospectus - Discussion Issues

The FY2003 prospectus contains 10 proposals forwarded from the August 2000 SCICOM meeting, 13 proposals identified by the SSEPs for external review in the year since the August 2000 SCICOM, and 4 current APLs. At the August 2001 SCICOM, these proposals will be evaluated as strictly as possible according the procedures for defining the pool to be ranked and then conducting the ranking, as set out previously by EXCOM. A few matters should be pointed out, as follows:

Conflicts of interest:
In contrast to the multiple conflicts and voting alternates at the August 2000 SCICOM, there is only one serious conflict for the August 2001 SCICOM. That is a US member, who is active proponent of one of the proposals carried over from the August 2000 SCICOM/OPCOM, and the USSAC chair has been asked to name a voting alternate. Initial indications are that that alternate may well be the OPCOM member who has acted as alternate at the previous two SCICOM meetings and whose expertise is consistent with that of the conflicted SCICOM member. In accordance with the 1997 and 1998 EXCOM motions concerning conflicts of interest and the annual global rankings, the conflicted member will be allowed to participate in general discussions but not the review of proposals and ranking.
On the other hand, several of the intended iPC observers are proponents of proposals to be considered. The intent is to apply the same conflict rules for observers as for SCICOM members: they must be excluded from the entire process of proposal review and ranking.

Restricted session for proposal review and ranking:
At the August 2000 SCICOM meeting, the proposal review and global ranking sessions were restricted to SCICOM and OPCOM members, SSEPs and service panel chairs, and essential agency and contractor liaisons. By that precedent, non-essential observers should be excluded for those sessions at the August 2001 SCICOM meeting. However, a primary reason for iPC observers to attend the August meeting is to witness the proposal review process, both to understand the process and to familiarize themselves with proposals that would be forwarded to IODP if left unscheduled in ODP. Hence, the initial plan is to allow iPC observers who are otherwise unconflicted to witness the proposal review and ranking sessions as silent observers.

Geographical limitations on FY2003 JOIDES Resolution operations:
The arena for FY2003 JOIDES Resolution operation is constrained by (a) SCICOM Motion 99-2-23:

SCICOM Motion 99-2-23
SCICOM resolves that the *JOIDES Resolution* will operate in the Atlantic Ocean during at least part of 2002.
Moore proposed, Holm seconded, 9 in favor, 1 opposed (Tamaki), 3 abstain (Brown, Robertson, Zachos), 2 absent (Bond, Coffin).

which specifies that the JOIDES Resolution will be drilling in the Atlantic Ocean by end of CY2002 and (b) the contractual requirement for demobilization in a US Gulf Coast port in

September of 2003. At the August 2000 SCICOM, it was recognized that these constraints essentially defined an arena for FY2003 JOIDES Resolution operations that encompasses the Atlantic Ocean and the equatorial eastern Pacific Ocean in close reach of the Panama Canal. Accordingly, for those JOIDES Resolution proposals that (a) were considered but left unscheduled at the August 2000 SCICOM and (b) lie outside this zone of operations, the proponents were informed that their proposals would no longer be considered for ODP scheduling and would be forwarded to IODP. There are two important implications:

-- Given the geographically restricted zone of JOIDES Resolution operations, it will not be possible to term the ranking for FY2003 a truly "global" ranking as specified in the previous EXCOM motion governing the ranking procedure.
-- The prospectus contains two JOIDES Resolution proposals forwarded by the SSEPs since August 2000 that lie outside the arena for operations defined after the August 2000 SCICOM. In August 2001, SCICOM will have to decide whether or not to include these in the pool of proposals to be ranked for FY2003. According to the proposal review and ranking process defined in the Guide to ODP and by a 1998 EXCOM motion, the proponents of these two proposals are entitled to a SCICOM review and comments, but SCICOM may elect not to include them in the pool of proposals to be ranked. The proponents may also feel that they are entitled to a global ranking at SCICOM, but the FY2003 ranking is already defined as something other than a global ranking.

Previously highly-ranked proposals:
The prospectus contains three proposals that have been very highly ranked in global rankings at previous SCICOM meetings - probably highly enough to have been scheduled if not for geographic or financial constraints. In two cases, these very high rankings occurred at more than one previous SCICOM meeting. A 1999 SCICOM motion allows for SCICOM not to continually re-rank such proposals when they lie outside the likely geographic zone of operations. But for FY2003, these proposals do lie in the likely zone of operations, and it will be clearer in OPCOM scheduling deliberations if these proposals are re-ranked within the full pool of proposals to be considered for FY2003.

Mission-specific platforms:
The FY2003 prospectus includes 5 programs that require mission-specific platforms (MSPs). Of these, one was the highest-rated program from the August 2000 global scientific rankings, another was ranked high enough to also forward to OPCOM in August 2000, and another was the only newly reviewed proposal to receive top-priority scientific grouping by both SSEPs in May 2001. In its scientific evaluation, SCICOM should consider these MSP proposals on equal scientific basis with the others. In other words, SCICOM will evaluate the MSP proposals primarily on scientific merit as defined in the Long-Range Plan, under the assumption that there are no programmatic barriers to scheduling mission-specific programs if resources can be allocated.

11.2 Arctic Drilling (SCICOM Motion 01-01-06)

SCICOM Motion 01-01-06:SCICOM confirms the OPCOM Consensus [with slight re-wording] on Arctic drilling and the initial report of the Arctic DPG.

D Hondt moved, Rea seconded, 12 in favor, none opposed, 1 abstention, 2 absent.

OPCOM Consensus on Arctic drilling and the initial report of the Arctic DPG [as modified by SCICOM]: OPCOM reaffirms that JOIDES desires Arctic drilling to be part of the program, and confirms that the initial draft of the Arctic DPG report demonstrates that the Lomonosov Ridge program is technically feasible. Thus, ODP management should continue to investigate the costs of Arctic drilling and the means to meet these costs. The current cost estimate of order $6M probably cannot be accommodated within the ODP budget, but ODP management should investigate how much program resources could be dedicated to Arctic drilling. We ask that the DPG continue its excellent progress toward a final report at the August 2001 SCICOM/OPCOM meetings, and we encourage the proponents and the community to pursue funding from non-ODP sources. We ask that JOI Inc. evaluate, with the help of ODP contractors, to what degree ODP resources might be used to support Arctic drilling, and be prepared to report at the August, 2001 SCICOM/OPCOM meetings.

Notes about review and prioritization of ODP proposals:

Each year at its August meeting the JOIDES Science Committee ranks the global set of proposals. The highest set of proposals is then sent to JOIDES OPCOM for placement into the ship's schedule for the next but one fiscal year (i.e. in August 2000 the OPCOM proposed the schedule for FY 2002 or 1 October 2001- 30 Sept 2002). Sometimes, when a proposal has been ranked highly by SCICOM for a number of times and not drilled because of location, it is forwarded to OPCOM without a further ranking by SCICOM.

12.4.1 Long Time Service to *JOIDES*

SCICOM Consensus 01-01-09: SCICOM expresses its thanks to Mahlon Ball for his countless years of service as Chair of the JOIDES Pollution Prevention and Safety Panel.
His stewardship has helped to ensure that ODP operations have remained environmentally solid and free of safety problems associated with hydrocarbons and other potential hazards while enabling frontier science objectives to be explored. We wish him well in his future endeavors.