JOIDES Journal

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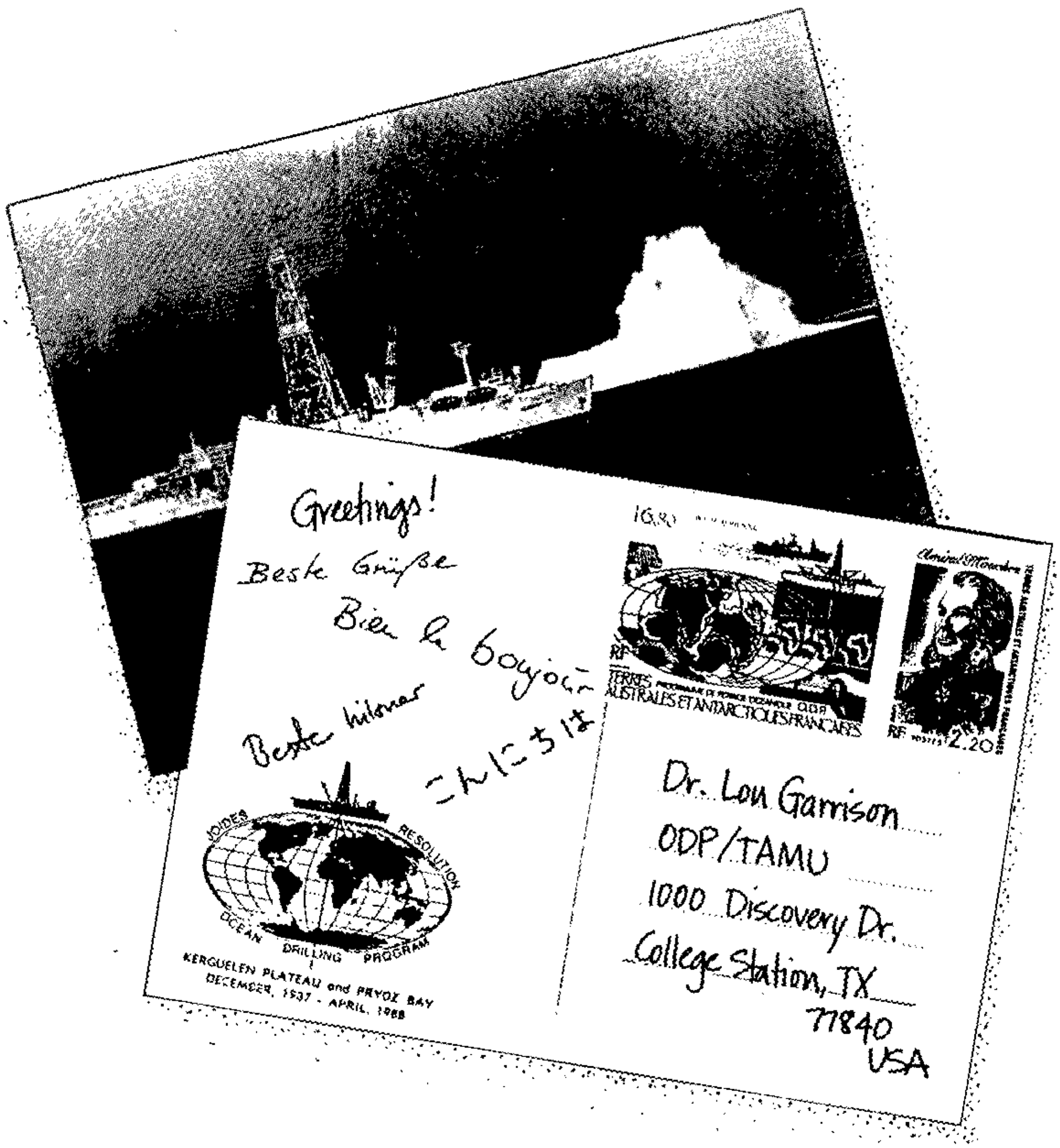

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FOCUS

Again we focus on issues of long-range planning. The Program Plan for fiscal year 1989 has been completed, approved by EXCOM and sent to the U.S. National Science Foundation and the ODP Council.

In preparing this Program Plan, which outlines drilling objectives over the next four years, two important questions arose: How well do the projected budget target accommodate the scientific plans being developed, and where is the "exciting science" being done and being planned for ODP?

With respect to the second question, the most pessimistic would likely say that there hasn't been much excitement and they are not sure where ODP is going. I would have to argue strongly against such a view. Though our initial efforts to effectively drill in young crustal basement rock were hampered by low recovery, the recent success of Leg 118 shows that we have come a long way in developing techniques to solve the problems of ridge crest drilling. Hard rock spud-in is now considered almost routine and the successful recovery of a unique section of basement rocks at the Southwest Indian Ridge (even a paleoceanographer can appreciate the importance of penetrating Layer 3-type oceanic crust) have major implications for ODP. This leg also successfully tested the Navi-drill system.

Leg 118 demonstrated that drilling in fracture zone settings may provide additional strategies for obtaining rocks from deeper levels of the lithosphere. The successful Navi-drill tests suggest that this tool may be one long-awaited solution for recovering alternating hard/soft sequences, which is essential for the success of much of the drilling planned in the Pacific and beyond.

The results from Legs 113, 114 and 119 are still being analyzed, but already we have a new picture of the glacial evolution of the Antarctic continent. The Antarctic ice sheet development has had a profound effect on the earth's climate system. Because of the importance of understanding the history of this feature, ODP committed substantial efforts toward drilling the Prydz Bay transect on Leg 119. Initial results of this leg already have significant implications. Evidence of major ice sheet development in the earliest Oligocene, and maybe as early as 42 million years ago, will require some rethinking by the paleoceanographic community.

These are but a few of the highlights from completed drilling programs. And as for the future? Clearly one of the more important steps for the future of ODP is the JOIDES commitment to engineering development. This commitment includes financial support as well as sufficient access to the ship for drilling and downhole measurements development.

If you look at technology development as an integral part of successful drilling, the engineering tests on Leg 124E next January actually represent the first leg for the East Pacific Rise program planned for 1991-1992. The engineers at ODP will test, for the first time, a high-speed mining coring system from a drillship in deep water. If this system proves successful, we hope to have the capability of drilling half-kilometer holes in young crustal rocks at the East Pacific Rise. The system may have the potential of achieving an important technical goal set by COSOD II-- the ability to drill kilometer deep holes in crustal rock by 1992.

As usual, making these commitments to technical development requires money. The projected budgets for 1991 and 1992 are not promising and what the future brings is uncertain. We can write detailed long-range plans but we need the bucks to back them up. Otherwise, exciting science in ODP may well degenerate to routine drilling or worse. But as PCOM Chairman, and in the true spirit of long-range planning, I only need to worry for another 122 days (and counting).

N. Pisias

Nicklas G. Pisias
Planning Committee Chairman

JOIDES RESOLUTION OPERATIONS SCHEDULE
Legs 122 - 129

LEG	AREA	DEPARTS LOCATION	DEPARTS DATE	ARRIVE DESTINATION	ARRIVE DATE	IN PORT	DAYS AT SEA
122	Exmouth Plateau	Singapore	7/3/88	Singapore	8/28/88	8/21 - 9/1	56
123	Argo Abyssal Plain & Exmouth Plateau	Singapore	9/2/88	Singapore	11/1/88	11/1 - 11/5	60
124	SE Asia Basins	Singapore	11/6/88	Manila	1/4/89	1/4 - 1/8	59
124E	Engineering I	Manila	1/9/89	Guam	2/13/89	2/13 - 2/17	35
125	Bon/Mar	Guam	2/18/89	Tokyo	4/15/89	4/15 - 4/19	56
126	Bon 2	Tokyo	4/20/89	Yokohama	6/15/89	6/15 - 6/19	56
127	Japan Sea I	Yokohama	6/20/89	Hakodate	8/15/89	8/15 - 8/19	56
128	Japan Sea II	Hakodate	8/20/89	Nagasaki	9/30/89		41
	Dry Dock	Nagasaki				9/30 - 10/13	
129	Nankai	Nagasaki	10/14/89	?	12/13/89	12/13 - 12/17	60

(Rev 5/25/88)

LEGS 119 & 120: KERGUELEN PLATEAU AND PRYDZ BAY PROGRAM

Ocean Drilling Program Legs 119 and 120 were planned to study the Late Cretaceous to Holocene paleoceanographic history of the region, the origin and tectonic history of the Kerguelen Plateau, and the nature and age of its basement.

Leg 119 completed a latitudinal transect of 11 sites in the Indian Ocean section of the Southern Ocean, from the Kerguelen Plateau to Prydz Bay, Antarctica (Figure 1). Sediments recovered from Sites 736-738 and 744-746 on the Kerguelen Plateau provide insight into the Tertiary tectonic and oceanographic development of the Kerguelen Plateau region. Of particular importance is the recovery of (1) an undisturbed Cretaceous/Tertiary boundary which occurs in laminated calcareous claystone, (2) a deep-water sedimentary record of glacial-interglacial fluctuations during the last 10 m.y., (3) fossiliferous sediments which allow documenting latitudinal fluctuations in surface watermasses as well as the overall oceanographic setting during the Tertiary, and (4) basalt from the southern Kerguelen Plateau that has an age older than the overlying Turonian (90 Ma) limestone.

A variety of glacial sediment types, including lodgement till and glaciomarine sediments, were recovered from Sites 739-743 located in Prydz Bay. Most of the sediments are mixtures of clay, silt, sand, and gravel-diamictites. Repeated loading of these sediments, possible by ice, is indicated by their partially overconsolidated nature. Diamictites rich in metamorphic gravel and pebbles, derived from basement source areas, are present in thick prograding sequences extending for over 30 km on the Prydz Bay shelf. The drilling results from Prydz Bay provide evidence that ice has been grounded on the continental shelf in Prydz Bay intermittently since earliest Oligocene and possible since late middle Eocene times. Two sedimentary sequences below the glacial sequence were recovered and consist of "red bed" type sediments of continental origin, and laminated silty claystone and sandstone of fluvial and lacustrine origin.

Leg 120 drilled twelve holes at five sites on the Kerguelen Plateau between 54°S and 59°S (Figure 1). Three basement penetrations revealed transitional (T-MORB) type basalt; this is overlain by a mid-Cretaceous (?) non-marine sequence containing weathered volcanics. Upper Cretaceous chalks record subsequent foundering of the Plateau; subsidence continued throughout deposition of the overlying Tertiary pelagic ooze sequence, which also records climatic changes associated with the development of the cryosphere.

The following summaries of Sites 741-746 were received from Leg 119 Co-Chief Scientists John Barron (USGS, Menlo Park, CA) and Birger Larsen (Technical University of Denmark). Site summaries for Sites 736-740 appeared in Vol. XIV, No. 1 of the JOIDES Journal.

Site Summary, Site 741
Latitude: 68° 23.160′ S
Longitude: 76° 23.020′ E
Water Depth: 558.0 m

Site 741 is situated in the inner part of Prydz Bay, on the shelf of East Antarctica. Approximately 100 m of sediments were sampled below a 24-m-thick cover of probably glacial deposits. The sediments are part of an approximately 2-km-thick, slightly tilted sequence resting on the basement of Prydz Bay. The sampled interval is stratigraphically placed at about 1000 m above the stratigraphic level of the top of the pre-glacial sediments in Hole 740A, which is about 600 m above the basement surface. The main objective of coring was to investigate the upper part of the sequence, especially any marine intervals, in order to elucidate (1) the development of the Lambert Graben, a structure that has been linked to the rifting between the Indian subcontinental block and the Antarctic continent; and (2) the unknown pre-glacial conditions of the area.

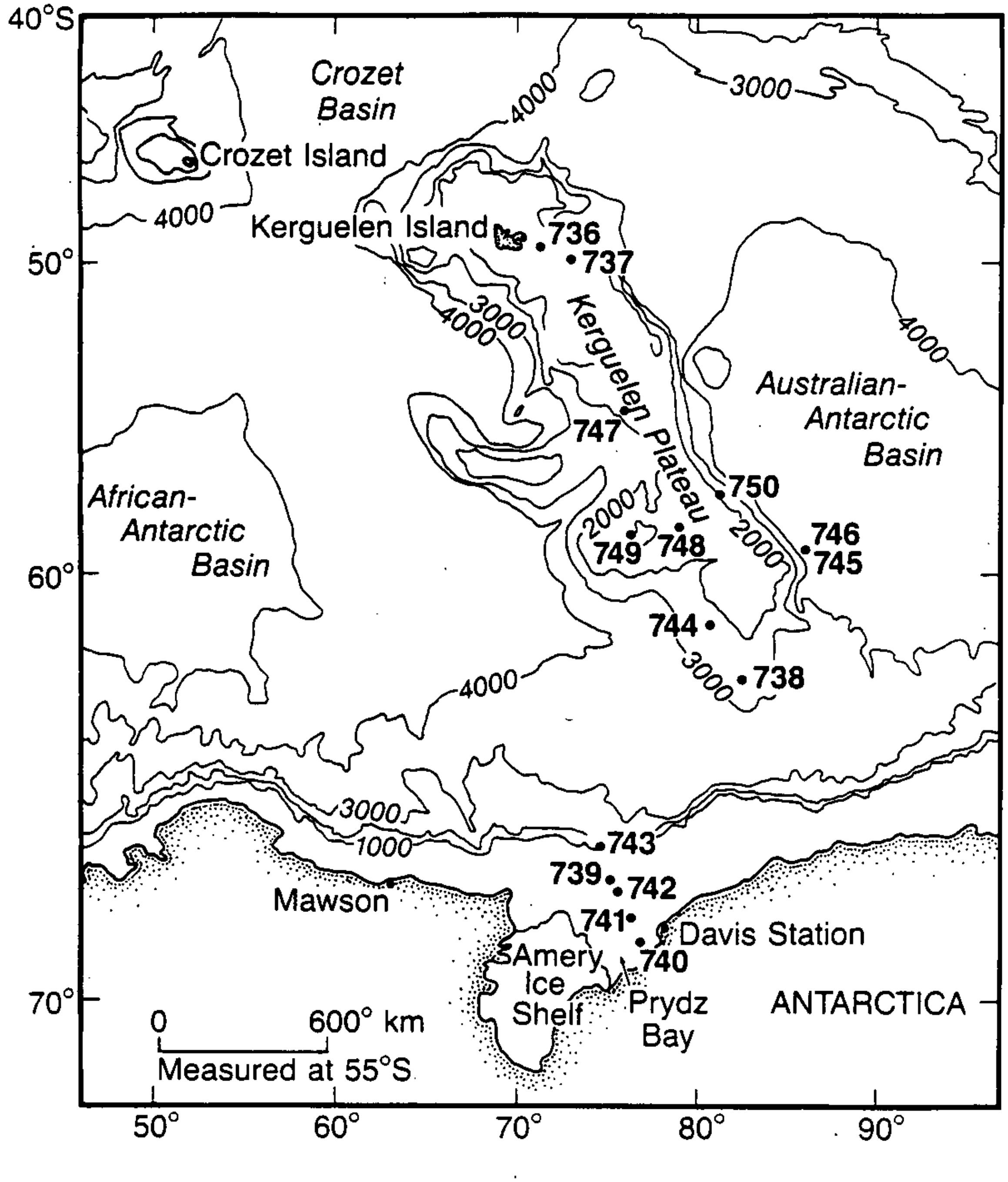


Figure 1. Map of Kerguelen Plateau and Prydz Bay sites drilled on Legs 119 and 120.

Drilling began on January 28. Based on experiences at Site 740, rotary coring was applied. Drilling terminated at a final depth of 128.1 mbsf because no pre-glacial marine sediment was encountered. Recovery was generally poor, averaging 26.3%, but five of fourteen cores had less than 6% recovery. No hydrocarbons significantly above background were detected.

The sediments encountered at Site 741 can be divided into four units.

Unit I is 66 cm thick and consists of olive gray diatom ooze with minor quartz silt, presumably of Holocene age. Unit I shows a sharp color contrast with Unit II.
Unit II (0.66-4.07 mbsf) is a silty clay containing no more than 1% gravel and up to 20% diatoms; the proportion of diatoms decreases with depth.
Unit III (4.07-24.05 mbsf) comprises fragments of gneiss up to 10 cm in diameter. Recovery within this interval is very poor; thus, the overall composition of Unit III is unknown.
Unit IV (24.05-128.1 mbsf) consists mainly of gray sandstone and siltstone with less than 10% clay and minor quartz granules. The unit is characterized by the presence of several fining-upwards sequences and one coarsening-upward sequence, all less than 20 cm thick. Its structure is mainly horizontal lamination and subordinate cross-stratification. Carbonized plant fragments, possibly including remnants of wood, occur throughout most of the unit. Most of the carbonized plant debris is allochthonous. Pyrite and bioturbation are locally developed in parts of this unit. Preliminary age determinations based on pollen analysis suggest that the unit is Eocene but contains reworked Cretaceous material.

The sedimentological character of Unit IV is consistent with deposition on a low-lying, low-relief alluvial plain. There is no evidence of any marine sedimentation from the recovered sequence. The dark, organic-rich sediment and abundant carbonized plant fragments argue for a wet environment characterized by high plant productivity and limited oxidation.

On the basis of the limited data available, Unit III is tentatively interpreted as glacial debris, which is possibly part of the overlying, structureless Unit II. The latter unit is thought to represent a glaciomarine shelf deposit. The uppermost unit was probably deposited during the Holocene when summer ice cover was minimal and the surface water plankton productivity was high relative to the rate of deposition of terrigenous components.

<u>Site Summary, Site 742</u>

Latitude:	67° 32.982′ S
Longitude:	75° 24.270′ E
Water Depth:	416 m

Site 742 is situated at the middle part of the shelf of Prydz Bay, East Antarctica. The site is part of a profile across the shelf consisting of Sites 739-743. The main objective at Site 742 was to characterize and date the sediment section lying stratigraphically between the marine Paleogene glacial sequence recovered at Site 739 (seaward) and the nonmarine Paleogene sequence cored at Site 741 (landward). It was hoped that the onset of glacial conditions in Prydz Bay could be dated and that the pre-glacial environment of the area would be determined.

A seismic survey was run to optimize recovery of the stratigraphic sequence lying between those recovered at Sites 739 and 741. Site 742 was chosen on the seaward side of a small buried rise, about 29 km southeast of Site 739. Rotary drilling of Hole 742A began on 30 January, and continued to 316 mbsf, where operations were suspended due to safety considerations. Though total gas quantities were very low, the low ratio of methane to ethane and the detection of propane indicated the possibility of migration of hydrocarbons from greater depths. Study of seismic profiles led to the inference of faults that might provide a possible pathway for migration. Coring was terminated above the calculated lower boundary of the gas hydrate stability zone; after logging, the hole was filled with cement.

The lithologies encountered were principally of massive diamictite, separable into different units based on degrees of compaction, stratification, directional fabric and special mineral components. At the base (304-316 mbsf), thin units of laminated silty claystone, sorted sandstone and carbonaceous siltstone are interstratified with diamictite and appear to signify non-marine conditions of deposition. The coal, plant and (Cretaceous-Oligocene) spore-pollen detritus appears to be mainly reworked from below. The overlying diamictites (173-304 mbsf) tend to be calcareous due to the presence of detrital micrite; they contain Eocene-Oligocene fossils. A significant stratigraphic break may occur at 173 mbsf, correlated with a change to firm, more gravelly diamictite (173-134 mbsf). Stratified diamictites, a thin diatomite and intraclast breccia are located in a thin unit at 115-134 mbsf, which is marine and dated as late early Pliocene to early late Pliocene. Thick (5.4-115 mbsf), firm and homogeneous diamictite of Pliocene-Quaternary age succeeds. It contains several poorly recovered levels that apparently are concentrations of boulders. A thin, uncompacted, late Quaternary unit of diatomaceous glacial sediment overlies this.

Taken with the results of Sites 739 and 741, Site 742 demonstrates that the onset of glaciation in Prydz Bay coincided closely with the onset of marine conditions there. Glaciation commenced at least by the earliest Oligocene and possibly by the middle to late Eocene. Sedimentation rates appear to have been very high during this interval, so that the thick glaciated sediments of Sites 742 and 739, which underlie the lower Oligocene diatomaceous sediments in Hole 739C (170-310 mbsf there) based on seismic stratigraphy and superposition, need not be much older than those diatomaceous sediments.

Site Summary, Site 743

Latitude: 66° 54.994′ S
Longitude: 74° 41.423′ E
Water depth: 987 m

Site 743 is situated on the upper continental slope of Prydz Bay, East Antarctica, above the water depth where the down-slope morphology is dominated by slumps. This site is part of the profile across the shelf consisting of Sites 739-743. The objectives of the hole were to examine types of sediments and the sedimentary processes on a slope associated with a shelf dominated by glaciogenic sediments, and to ascertain whether Quaternary ice cover reached the edge of the continental shelf.

As the overconsolidated diamictite, encountered at shelf Sites 739-742, was not expected at Site 743, and in order to obtain undisturbed samples for compaction studies, Hole 743A was spudded with the APC. Slow drilling rates and low core recovery forced a switch to the XCB at 15.8 mbsf. Glacial boulders in a relatively soft clayey matrix impeded core recovery, which averaged 22.4%; of the last eight cores six had less than 9% recovery. The hole was terminated at 98.1 mbsf.

Three lithological units are identified in the recovered sequence. Unit I (0-0.46 mbsf), is moderately well-sorted sand, the upper part of which is mixed with diatom ooze, while the lowermost part contains size sorted foraminifers. Unit II (0.46-15.8 mbsf), is clayey silt with generally up to 1% gravel, interbedded with 1-132 cm-thick layers of sand and gravel. Some of the sand and one silty clay layer contain foraminifers. Unit III (15.8- 98.1 mbsf total depth), although poorly recovered and represented by little more than an assemblage of stones in several core-catchers, appears to be dominated by diamicton with boulders and possibly (unrecovered) sand layers. The diamicton is massive, stiff clayey silt with sand and 5-25% gravel.

All the encountered sediments are normally consolidated, and no sign of ice loading was observed. The diatom and foraminiferal assemblages suggest a Quaternary age for the sequence. No hydrocarbon concentrations above background levels were detected.

The sequence in Hole 743A represents the uppermost and youngest part of the thick prograding unit forming the outer part of the shelf of Prydz Bay, while Hole 739 sampled the innermost part of the prograding unit. Based on these observations, it is likely that deposition of diamiglacier ice seaward of the grounding line near the shelfbreak, is the major contributor to the sedimentation on the slope. The presence of these sediments near the top of the prograding unit, interbedded with Quaternary sand, indicates that the ice cover reached the shelfbreak at least once during this period. The other components of the slope sediment are sand and gravel layers, ranging from well-sorted, clearly transported sand to poorly sorted gravelly sand which probably represents lag deposits. The marine biogenic component of the sediment is small, chiefly diatoms and foraminifers; no mollusks were recovered. It is uncertain whether the sand units represent "interglacial" periods, like the present, where the ice cover is less extensive, or intermittent variations in the currents sweeping the slope.

<u>Site Summary, Site 744</u>

Latitude:	61° 34.656′ S
Longitude:	80° 35.463′ E
Water Depth:	2317.8 m

Site 744 was cored on the southern Kerguelen Plateau in order to recover a more complete Neogene and Oligocene section than was recovered at Site 738. A 176.1 m-thick uppermost Eocene to Quaternary section was cored with a composite recovery of over 95% in three holes at Site 744. The section appears to be an excellent reference section for both calcareous and siliceous microfossils as well as magnetostratigraphy for intermediate water depths in the Southern Indian Ocean.

The upper 23 m of the section is Quaternary to uppermost Miocene diatomaceous ooze with a variable content of carbonate. This is separated by a hiatus, which spans at least the interval from 6.1 to 7.6 Ma, from at least 153 m of uppermost Eocene to upper Miocene nannofossil ooze. This nannofossil ooze contains a minor but well-preserved biosiliceous component in the post-Eocene part of the section.

Biostratigraphy and magnetostratigraphy indicate that the Eocene/Oligocene, Oligocene/Miocene, and possibly the Miocene/Pliocene boundaries are complete at Site 744. Hiatuses or compressed intervals occur in the middle part of the Oligocene (around 32-26 Ma), in the lower Miocene (around 22.5-19 Ma), in the middle Miocene (around 14 to 12 Ma), and in the upper Miocene (around 7.6-6.1 Ma). Southern Ocean microfossil zonations can be applied to the assemblages, but differences between the lowermost Oligocene diatom assemblages of Site 744 and Prydz Bay Site 739 probably reflect a paleogeographic boundary between the two areas.

The sediments at Site 744 were deposited in a pelagic setting; terrestrial influence was minimal. The presence of at least small contents of carbonate throughout indicates that the site has been situated above the carbonate compensation depth since the late Eocene, the oldest sediments recovered. The transition from nannofossil ooze to diatomaceous ooze may signal the northward migration of the Polar Front in the late Miocene. It is interesting that the change toward more siliceous sediments seems to take place during the same late Miocene interval (around 7.6 Ma, coincident with the top of the *Denticulopsis hustedtii* Zone of diatoms) as at Site 737 on the northern Kerguelen Plateau.

Coarse sand grains and gravel chiefly of metamorphic rock types are obvious in uppermost Miocene to Quaternary sediments (to 27.2 mbsf) and less so in the lower Oligocene and upper Eocene. These coarse fractions are thought to represent mostly ice-rafted debris, probably from Antarctica, indicating glacial conditions in the coastal areas as far back as latest Eocene.

<u>Site Summary, Site 745</u>

Latitude:	59° 35.710′ S
Longitude:	85° 51.600′ E
Water Depth:	4082 m

Site 745 (target Site SKP-8A) was drilled near the completion of ODP Leg 119 after cruise drilling objectives on the Kerguelen Plateau and in Prydz Bay had been accomplished. The departure of the ice support vessel <u>Maersk Master</u> and the presence of persistent ice bergs prevented drilling at more southerly sites. The site was chosen to provide a deep-water Neogene reference section which could be compared with the shallow to intermediate water depth sections obtained at Sites 736 to 738 and 744 (631 to 2317.8 m). The site is situated on a large sediment drift at the base of the southeast slope of the southern Kerguelen Plateau.

A 215 m-thick section of uppermost Miocene through Quaternary silty diatom ooze and diatom clay was cored in two holes at Site 745. One lithologic unit consisting of two subunits is recognized. Subunit IA (0-37 mbsf) is dominated by a diatom ooze (70-90% diatoms), sometimes with minor amounts of quartz-feldspar silt, radiolarians or clay. Subunit IB (37-215 mbsf) is characterized by more clearly alternating diatom ooze and diatomaceous clay intervals on a scale of decimeters to a few meters, of which the clay-rich horizons contain <50% diatoms; the silt content in this subunit is also significant. Minor claystone, silt and volcanic ash layers also occur. Scattered granules and small pebbles are disseminated throughout much of the section.

The succession is mixed pelagic-terrigenous. The pelagic component is due to production in the upper part of the water column. The terrigenous quartz-silt component, along with the granules and pebbles is derived from a metamorphic terrain, and some clasts resemble the gneisses found in the Prydz Bay diamictites. They are therefore considered to have been transported to the site by ice-rafting. The ice-rafted component is greatest in lower Pliocene and Quaternary sediments, but is never entirely absent in any part of the sequence. The variation in the content of the fine-grained terrigenous component may reflect variation in bottom current activity or variations in the supply of clay to the deep sea, possibly controlled by changing positions of the Antarctic ice sheet in relation to the shelf edge.

Diatoms and radiolarians are common and generally well-preserved throughout the section, whereas calcareous microfossils are sparse and sporadic. Southern Ocean diatom and radiolarian zonations are readily applicable, and a good magnetostratigraphy identifies the Brunhes, Matuyama, Gauss, and Gilbert polarity chrons as well as the upper two normal events of Chron C3A. As at Sites 737, 738, and 744, the uppermost Miocene (6.1 to 5.1 Ma) contains warm-water diatoms of the genera Nitzschia and Thalassiosira.

Within the Quaternary and upper Pliocene, cycles of more terrigenous-rich sediment alternating with more diatom-rich sediment are common. The diatom *Eucampia antarctica*, shown to be more abundant in South Atlantic sediment during late Quaternary intervals containing increased ice-rafted detritus, appears to be more abundant in the terrigenous-rich intervals at Site 745, implying that these cycles may be caused by glacial-interglacial oscillations.

<u>Site Summary, Site 746</u>
Latitude: 59° 32.8235′ S
Longitude: 85° 51.780′ E
Water Depth: 4059 m

Site 746 was offset 3 miles north of Site 745 and located over a seismically equivalent section, so that the drilling program begun at Site 745 could be continued after a menacing ice berg had disrupted operations at that site. The section from 0-106.8 mbsf was washed at Site 746, a spot core was taken between 106.8 and 116.3 mbsf to establish correlation with Site 745, and continuous coring extended in one hole from 164.8 mbsf to 280.8 mbsf.

The lower Pliocene and upper Miocene mixed biogenic and terrigenous sediments recovered at this site consist of a single lithological unit that can be subdivided into three subunits. Subunit IA is a locally bioturbated clayey diatom ooze and diatomaceous clay and silty clay. Subunit IB is lithologically identical to Subunit IA except for its greater degree of lithification and more pervasive burrowing and bioturbation. Subunit IC is a locally developed nannofossil ooze with minor diatoms. Small clasts, interpreted as dropstones, are randomly dispersed throughout all three subunits by ice rafting. The occurrence of well-sorted silty layers in part of the sequence is attributed to transport and sediment reworking by bottom currents.

The biosiliceous sediment recovered at Site 746 is readily datable by diatoms and radiolarians, but calcareous microfossils are sparse, sporadic, and of little use for biostratigraphy. The Miocene/Pliocene boundary occurs at about 180 mbsf, and is followed down-section by an approximately 20 m-thick interval of uppermost Miocene sediment which contains warmer water diatoms of the genera Thalassiosira and Nitzschia. The same diatoms were also recorded in equivalent uppermost Miocene intervals on the southern (Sites 738 and 744) and the northern Kerguelen Plateau (Site 737). This uppermost Miocene interval is apparently separated by a hiatus, which spans at least the interval between 6.1 and 7.6 Ma, from lower upper Miocene sediments, which contain colder water diatoms.

The following summaries of Sites 747-751 were received from Leg 120 Co-Chief Scientists Roland Schlich (Institut de Physique du Globe, France) and Sherwood W. Wise, Jr. (Florida State University).

<u>Site Summary, Site 747</u>

Latitude	54° 48.68'S
Longitude	76° 47.64'E
Water Depth	1695.0 m

Site 747 (proposed site SKP-1) lies in the transition zone between the northern and southern Kerguelen Plateau approximately 500 km south of the Polar Front (Antarctic Convergence). A 296.5 m-thick lower Santonian through upper Pleistocene pelagic sedimentary section and 53.9 m of underlying basalt were cored in three holes using various combinations of the Advanced Piston Corer (APC), the Extended Core Barrel (XCB), and the Rotary Core Barrel (RCB). Although located beneath the present-day Antarctic Water Mass, the sediments contain carbonate throughout except for predominantly Maestrichtian volcaniclastic sands, breccias and cobbles, which denote a major episode of uplift and erosion of the plateau. Lithologic units are recognized at Site 747 as follows:

Unit I: (0-32.7 mbsf) upper Pleistocene to upper Miocene foraminifer diatom ooze with minor ice-rafted debris and dropstones prevalent only in the upper 20 m, whereas occasional vitric ash layers occur throughout this unit.

Unit II: (32.7-181.45 mbsf) Miocene to lower Paleocene nannofossil ooze and chalk.

Unit III: (181.45-197.20 mbsf) Lower Danian-Maestrichtian multicolored volcaniclastic, polygenetic sand, breccia and cobbles with probably intercalated chalk layers.

Unit IV: (197.20-296.5 mbsf) Maestrichtian to lower Santonian nannofossil chalk and thin nodular chert layers.

Unit V: (296.5-350.5 mbsf) basalt flows composed of variably brecciated, veined, and altered aphyric to sparsely phyric basalts.

The sequence documents a succession of tectonic and paleoceanographic events which highlight the geologic evolution of the Kerguelen Plateau. Vesicular basalt flows deposited in a shallow-water to subaerial environment capped the basement structure of the plateau prior to subsidence and the accumulation of marine sediment, which began at this site by early the Santonian. The oldest sediments recovered are relatively shallow-water glauconitic calcarenites with admixtures of fine volcanic debris eroded from the basement. These are overlain disconformably by deeper water middle Campanian to Maestrichtian chalks with chert stringers and some Inoceramus and pelagic crinoid remains. The succession is interrupted by a series of Maestrichtian debris flows consisting of clay, sand and cobble size clastics and breccias eroded subaerially from volcanic basement during what appears to have been a major uplift event affecting much of the plateau. Debris flows include angular clasts of previously lithified Campanian chalk and chert, indicating substantial faulting of the seafloor. Uppermost Maestrichtian to lowermost Danian sediments are missing, but scattered volcanic debris were shed into the overlying heavily bioturbated Danian chalks. The remaining Paleocene-lower Oligocene section is highly condensed and cut by a least two disconformities where most or all of the upper Paleocene, middle to lower upper Eocene, and a small portion of the upper lower Oligocene are missing. Hardgrounds are developed on two of these surfaces.

Sedimentation rates for the remainder of the Neogene are remarkably constant at about 5 m/m.y. and sedimentation for this interval appears to have been continuous until the late Pleistocene. Although the predominance of biosiliceous ooze throughout the Plio-Pleistocene denotes the presence of the Antarctic Water Mass over this site, several species of both planktonic foraminifers and calcareous nannoplankton lived in the surface waters. The top of the section is dated at 0.35 Ma.

The essentially continuous calcareous upper Oligocene to upper Pleistocene record at a site this far south of the present day Polar Front was unexpected, and this section will serve as an important reference section for an integrated high latitude calcareous and siliceous microfossil biostratigraphy correlated with magnetostratigraphy and lower latitude zonations. A good paleomagnetic polarity record was obtained down to the lower/upper Oligocene contact. Virtually all major events (anomaly correlatives) can be recognized as well as the structure of most of the polarity chrons. Excellent preservation of planktonic and benthic foraminifers should allow a complementary stable isotope record to be established. Also noteworthy is the pristine preservation of the Danian calcareous microfossils. The Cretaceous planktonic foraminifers and calcareous nannofossil assemblages belong to the cool water Austral faunal and Falkland Plateau floral provinces respectively except for the lowest Campanian core, which shows a more temperate influence. Campanian-Maestrichtian sedimentation rates were a relatively high 20 m/m.y.

Based on macroscopic observations, the recovered basement rock consists of approximately 15 separate basalt flows. These separate flows appear compositionally similar and consist of dominantly aphyric, sparsely plagioclase-pyroxene phyric, and olivine-plagioclase phyric basalts. The flows are vesicular, indicating deposition in a shallow-water to subaerial environment. All volcanics exhibit variable degrees of brecciation, veining, and alteration. The alteration minerals consist of zeolites, clays (celadonite and smectites) and calcite fillings in veins, vesicles, and amygdules. Fresh material was recovered from three flows. Trace element chemistry is similar to Transitional Mid-Ocean Ridge Basalt (T-MORB).

The sequence below 90 mbsf was successfully logged despite gale force winds. Resistivity and natural gamma ray logs clearly delimit major altered and less altered zones in the basement complex (which had been cored with only 38% recovery due to high seas). The logs also detected basalt breccia debris flows in the lower Maestrichtian which were not cored or only partially cored during drilling.

An approach site survey along a single channel seismic line located the site close to the intersection of two multichannel seismic lines. Correlation with existing seismic data is excellent. A reflector at 0.24 sec two-way travel time (TWT) probably corresponds to lithologic Unit III, and basement matches a major reflector at 0.35 sec TWT. These results agree well with the logging data.

<u>Site Summary, Site 748</u>
Latitude: 58° 26.45′ S
Longitude: 78° 58.89′ E
Water Depth: 1290 m

Site 748 (proposed Site SKP-3C) is located on the southern Kerguelen Plateau in the western part of the Raggatt Basin, east of Banzare Bank. The site was intended to recover an expanded section of Paleogene and Cretaceous sediments in order to decipher the tectonic and geologic history of this portion of the plateau.

An approach site survey located the site on Rig Seismic MCS line RS02-27 (100.2340). Correlation of the <u>JOIDES Resolution</u> single-channel line with existing data is clear and shows at the site two major reflectors which lie at 0.83 and 0.41 s two-way travel time (TWT) below seafloor. Other reflectors deduced from seismic stratigraphy studies lie at 0.92, 0.61, 0.29, 0.16, and 0.09 s TWT below seafloor.

After APC/XCB coring the upper 215 m of the section until refusal hole was drilled to 550 mbsf with the RCB, at which point a model LH reentry minicone (free-fall funnel) was deployed in order to take advantage of a window of relatively calm weather for that operation. The hole was continued to 742 mbsf, whereupon a successful reentry procedure was conducted to change the bit. The hole was then drilled to a total depth of 935 m, where a failed flapper valve allowed massive backflow of sediments into the BHA, preventing further operations at this site, including logging. Aside from the sediment recovered from the BHA, little material was trapped in cores (ie., in core catcher socks) taken over the basal 27 m of the hole, perhaps due to the malfunction of the flapper valve and/or excessive ship heave. Nevertheless, average core recovery over the last 95 m prior to these problems was 70%. This is the deepest penetration yet achieved via reentry using a minicone.

The following lithostratigraphic units were recognized:

Unit I: (0-15.5 mbsf) Pleistocene-Pliocene diatom ooze with radiolarian- and foraminifer-enriched intervals, dropstones, and ice-rafted debris.
Unit II: (15.5-397.4 mbsf) upper Miocene to upper Paleocene nannofossil ooze, chalk, porcellanite and chert.
Unit III: (397.4-898.8 mbsf) Maestrichtian to at least upper Campanian glauconitic packstone, wackestone, siltstone, claystone, silicified in part.
Unit IV: (898.8-935.0 mbsf) highly altered basalt flow and underlying lithologies, undated.

The basalt cored at 898.8 mbsf has compositional characteristics similar to intraplate, oceanic island alkaline basalt, and is believed to represent the last of a series of basalt flows which, for lack of core recovery, can only be inferred to lie within Subunit IVB. The Unit IV basalts are necessarily younger than those that form the true basement of the Raggatt Basin. These younger flows are strongly weathered, and some appear to be interlayered with siltstone and claystone derived from that weathering; wood fragments, if in place, denote the development of soils and vegetation on some flows. According to regional seismic data, true basement (located at 0.92 s TWT) was not penetrated at this site, but lies some 150-200 m below the total depth of Hole 748C.

Beginning with the basal conglomerate, the first sediments deposited in the basin are glauconitic with up to 0.5% organic matter, denoting a restricted marine environment. No calcareous or siliceous microfossils are preserved, therefore a determination of the age of these sediments must await shore-based palynology study. Nevertheless, an extrapolation of sedimentation rates from the more fossiliferous strata above suggests a late Campanian age, which is consistent with paleomagnetic data (the Cretaceous "quiet zone" was not drilled).

High glauconite contents (up to 20%) characterize the remainder of lithostratigraphic Unit III, as do total organic contents of between 0.2% and 0.6% (maximum 1.0%). These are mostly Type III hydrocarbons composed of terrestrial and highly oxidized marine organic matter. Datable calcareous microfossils appear at 711 mbsf, and are soon followed upcore by a host of invertebrates. Some fossils, such as coralline red algae, serpulid worm tubes, and encrusting bryozoans, indicate periods of quite shallow-water paleodepths (up to inner shelf). The inoceramid remains, which compose up to 80% of some intervals, are exceptionally well-preserved, and should provide reliable isotopic paleotemperature data. Some vertebrate teeth recovered belonged to sharks and possibly to the giant swimming lizard, Mosasaurus.

Productivity and consequently sedimentation rates in this shallow, bank-like environment were quite high, some 60 m/m.y. Siliceous sponges as well as radiolarians, diatoms, and silicoflagellates contributed abundant biogenic silica ultimately responsible for the silicified layers in lithostratigraphic Subunit IIIA. The amount of glauconite produced over the entire 500-m-thick Unit III section is extraordinary, particularly in view of the high sedimentation rate.

Mesozoic calcareous nannofossil and planktonic foraminiferal assemblages have a strong austral affinity, as at Site 747 to the north. Sedimentation was apparently continuous from the late Campanian into the early Maestrichtian, but the middle Maestrichtian is missing (hiatus = 5 m.y.). The uppermost Maestrichtian and Danian are also missing (hiatus = 6 m.y.). This latter gap in the record corresponds to a widespread regional disconformity, noted as the prominent reflector at 0.41 s (TWT) below sea floor on our seismic records, and thought to mark a major tectonic and erosional event that affected much of the plateau (see Site 747 summary). Subsidence of Site 748 following this erosional event was quite rapid, probably as a result of extensional tectonics associated with rifting (77° E Graben).

The upper Paleocene through middle Eocene pelagic carbonate and chert sequence is apparently continuous, and was deposited in deeper waters (similar to present day) as subsidence had far outstripped the relatively high sedimentation rate of 20 m/m.y. Regional seismic analysis shows that the Paleogene depocenter for the basin had shifted considerably toward the east as a consequence of the profound Maestrichtian tectonic event.

100% recovery in the upper 180 m of the section in Hole 748B provides an excellent Neogene calcareous-biosiliceous section with good paleomagnetic control which complements that obtained at Site 747. The main elements of the magnetic polarity record from anomaly correlatives 1 to 18 (Pleistocene to late Eocene) have been recognized. Both upper and lower epoch boundaries of the thick (65-70 m) Oligocene section are clearly defined by bio- and magnetostratigraphy (anomaly correlatives 6C and 13). A striking occurrence of angular quartz sand and micas in the lower Oligocene appears to be ice rafted; if so, this may correspond to early Oligocene glacial events documented in Prydz Bay by Leg 119 drilling. Two minor hiatuses are present in the Oligocene, and parts of the lower and middle Miocene are missing (hiatus = 5-6 my). A minor late Pliocene hiatus has been detected (2.2 to 3.1 Ma) and the Pleistocene is condensed and discontinuous.

This site, in conjunction with others cored on the plateau, will be valuable for paleoceanographic studies. Taking the Neogene together with the Paleogene and Cretaceous sequences, we have an essentially complete record of the events which highlight the evolution of the Raggatt Basin on the southern Kerguelen Plateau.

Site Summary, Site 749
Latitude: 58° 43.03′ S
Longitude: 76° 24.45′ E
Water Depth: 1069.5 m

Site 749 (proposed Site SKP-4A) is located on the western flank of the Banzare Bank, on the Southern Kerguelen Plateau. The Banzare Bank corresponds to a smooth basement rise which crests east of the site at a water depth of about 700 m. The sediments gradually thin toward the top of the Bank where several faults cut the basement structure. The site was intended to recover extensive basement rocks from the Southern Kerguelen Plateau with basement penetration of at least 200 m.

Basement at this site corresponds to a very strong reflector. An approach site survey located the site on *Marion Dufresne* MCS line MD47-13 (shot point 5670) where the basement reflector lies at about 0.24 s two-way travel time below seafloor. Downslope the sediments thicken in all directions, especially by toplap. Thus, the oldest sediment cored at this site will not correspond to the age of basement.

The upper 43.8 m of section was APC-cored with 100% recovery. Middle Eocene chert stringers were encountered at that depth, reducing APC/XCB recovery to 26% over the next 80 m. A change to the RCB yielded only 7% recovery through chert, chalk and ooze to the basement contact at 202 mbsf. After obtaining 5 m of basalt in the next core, the succeeding two cores were essentially empty, and a model LH minicone was deployed to allow the hole to be reentered after a bit change. This was the first use of a free-fall minicone for a dedicated basement site.

Inspection of the BHA on deck showed that severe pounding of the bit against hard bottom in high seas at this shallow site had resulted in a badly worn bit and a broken flapper valve. The latter had precluded any recovery in the last two cores. A decision was made to core without a flapper valve, and to institute a weighted mud program to prevent backflow of cuttings into the BHA. After a successful (16 minute) re-entry, this procedure worked beyond expectations as the next two cores produced 17.83 m of basalt at a recovery rate of 94%. As the last core was being cut, a medical emergency terminated operations at this site, and <u>JOIDES Resolution</u> was put on course for Fremantle, Australia. The ship arrived at Fremantle on 5 April.

The following lithologic units were recognized at this site:

Unit I: (0-0.24 mbsf) lower Pleistocene (and upper Pliocene?) diatom ooze with foraminifers and ice-rafted debris; disconformity at base.
Unit II: (0.24-202 mbsf) upper Oligocene to lower Eocene nannofossil ooze with chert, chalk and porcellanite.
Unit III: (202-249.5 mbsf) Clinopyroxene, plagioclase phyric basalt.

The 23.1 m of basalt recovered consists of 5 flows and 1 dike. Most flows have altered and vesicular tops but grade to fresh and more massive basalt toward the interior of the flow. The basalts are either quartz or olivine normative tholeiites, and range in Mg# from 46.5 to 57.5. The high Mg# basalt contains olivine and plagioclase (An60-80) phenocrysts. All other basalts have plagioclase (An50-60) as the main phenocryst phase, together with occasional clinopyroxene. The groundmass phases consist of plagioclase (An40-50), clinopyroxene, and Fe-Ti oxides.

These basalts are more depleted in incompatible trace elements than those from the previous Leg 120 sites, although basalts from Holes 747C and 749C have similar Zr/Nb and P/Y ratios. Both Site 747 and 749 basalts are slightly more enriched in incompatible elements than normal Mid-Ocean Ridge Basalt (MORB), and are compositionally similar to transitional basalt (T-MORB). Based on major and trace element chemistry, Site 749 basalts are similar to the Nauru Ba plateau basalts (DSDP Leg 89). In contrast to basalts from Site 747, basalts from Site 749 do not form a coherent group or trend on key variation diagrams. This indicates the basalts from Site 749 cannot be related to each other by simple fractional crystallization or partial melting alone.

The alteration occurs in the groundmass, amygdules, veins, and as replacement of plagioclase phenocrysts. The alteration assemblage consists of laumontite (and stilbite), interlayered smectite, calcite, and occasional quartz, which is diagnostic of the high-temperature zeolite facies (100° to 200° C). This alteration assemblage at Site 749 is not observed at normal mid-ocean ridge segments, but does occur in places associated with a high heatflow such as Iceland. The shallow depth of this alteration zone combined with its relative high temperature indicates a high paleo-heat flow.

The oldest sediments above basement are dated at 54-55 Ma. Benthic foraminifers indicate that the paleodepth at this site has been virtually constant (between 1000 and 1500 m) since the early Eocene. Sedimentation rates, however, vary considerably, being inferred as high as 70 m/m.y. for the lower and lower middle Eocene, then dropping to a minimum of 7 m/m.y. for the middle to upper middle Eocene and 3.6 m/m.y. for the upper Eocene and Oligocene. The abnormally high sedimentation rate for the lower and lower middle Eocene may be attributable to constant syn-sedimentary scouring and redeposition of pelagic oozes, particularly from exposed basement surfaces, thereby contributing to a type of sediment "drift" deposit at this site.

Preliminary general conclusions concerning basalts drilled during Leg 120 are the following:

(1) Basalts at each site have a distinct mineralogy, [illegible]

phenocryst phases; Site 748 - olivine and plagioclase as phenocrysts, and analcite in the groundmass; Site 749 - plagioclase as the major phenocryst phase.

(2) Basalts at each site have distinctly different chemical characteristics, varying from Ocean Island Basalt (Site 748) to T-MORB transitional basalts (Sites 747 and 749).

(3) The observed intersite variations cannot be explained by simple processes (fractional crystallization or partial melting) alone.

Site Summary, Site 750
Latitude: 57° 35.54′ S
Longitude: 81° 14.42 E
Water Depth: 2030.5 m

Site 750 (proposed Site SKP-3D) is located on the southern Kerguelen Plateau in the eastern part of the Raggatt Basin, west of the deep Labuan Basin, approximately 900 km south of the present-day Polar Front. The primary objective was to recover an expanded Cretaceous section reflecting the early tectonic and depositional history of the Southern Kerguelen Plateau. A second objective was to obtain basement samples from the Raggatt Basin in a zone of dipping reflectors.

Beginning with this site on April 14, 1988, JOIDES Resolution resumed operations on the Southern Kerguelen Plateau following an unscheduled port call to Fremantle, Australia, requiring a transit of 17 days and 4400 nmi. The site was approved during the transit as a substitute for Site SKP-3B, and is located 18 km east on the same seismic line. The basement reflector at Site 750 lies at about 0.69 s two-way travel time (TWT) below the seafloor, and three major seismic reflectors can be traced at 0.59, 0.46, and 0.31 s TWT.

Hole 750A was wash- and interval-cored using a rotary bit through middle and lower Eocene ooze, chalk and chert to 297.5 mbsf; below 143 mbsf the combination of chert and heavy seas had their usual deleterious effect on core recovery, which was only 3% for the 3 rotary cores taken. After a 24-hour weather delay, continuous coring through Paleocene-Maestrichtian chalk to 423.3 mbsf yielded a nearly complete but drilling-disturbed Cretaceous/Tertiary boundary sequence at 348 mbsf; recovery was 47%. The hole was terminated at 460.5 mbsf by total bit failure (disintegration) after only 5 1/2 hours of rotation, whereupon a successful logging run was made using a combination of seismic stratigraphy tools; a second run in rough seas using lithodensity tools was foiled by damage to the cable head. Operations were suspended on April 18 with hopes of reoccupying the site following drilling at Site 751 (prospective Site SKP-2C) located 46 nmi to the west.

As it developed, the site was reoccupied on April 20, and Hole 750B was washed using the RCB to 450 mbsf, taking only one wash core on the way. After pulling a second wash barrel, the hole was continued with rotary or wash cores taken every 10-30 m through cherty Cretaceous chalk and limestone with the intention of maintaining a rate of progress of at least 10 m/hr. This rate was deemed necessary to reach basement before drilling time for the leg expired if the single bit were to survive to the projected total depth. Drilling with a hard formation bit slowed considerably when the formation changed from marine limestone to terrestrial clay below 624 mbsf; however, a velocity inversion at that point decreased considerably the predicted depth to basement, which was encountered at 675.5 mbsf. Thereafter a series of thick basalt flows was drilled with 67% recovery to a total depth of 709.7 mbsf.

The following lithologic units were recognized:

Unit I: (0-0.37 mbsf) Plio-Pleistocene diatom ooze and lag deposit. Repeated within the first core by a double punch of the drillstring, this unit contains diatoms and foraminifers of early Pleistocene and middle Pliocene age. The lag contains sand and ice-rafted pebbles with heavy manganese coatings; a disconformity occurs at the base.

Unit II: (0.37-357 mbsf) middle Eocene to Paleocene nannofossil ooze, chalk, and chert.

Unit III: (357-623.5 mbsf) Maestrichtian to Turonian (Cenomanian?) nannofossil chalk, chert, and intermittently silicified limestone.

Unit IV: (623.5-675.5 mbsf) undated red to dark gray brown silty claystone with charcoal and minor conglomerate. This unit consists of a broad range of waterlain terrigenous claystone and siltstone, with some sandy or conglomeratic intervals. Carbonized wood fragments from land plants are abundant as are coarse, authigeneic siderite and pyrite grains and concretions. Where first sampled, this unit consists of massive, plastic reddish brown, silty claystone composed primarily of kaolinite, but with up to 25% siderite (as coarse authigenic grains), 20% opaques, 6% pyrite, and 20% altered grains that may be derived from basalt. The next core yielded a much darker, grayish brown clayey siltstone, which is more fissile and richer in organic matter (up to 7%). A highly colorful, 25-cm-thick soft pebble conglomerate and sand displays grading, cross-stratification and small-scale current bedding. Incorporated among the rounded to subrounded, 0.5 to 3 mm silt- and claystone ferruginous grains are numerous large (cm-scale) pieces of carbonized wood. Wood fragments are also enclosed within siderite-cemented claystone and a siderite concretion at the base of the unit.

Unit V: (675.5-709.7 mbsf) Basalt flows composed of moderately to highly altered plagioclase-clinopyroxene phyric basalt. At least 4 flows were recovered, of which the third flow represents the majority of the recovery, being a 11.5-m massive basalt flow. The lower 2 flows are separated by a chilled margin and are overlain by highly altered volcanics. The flows are restricted in composition to olivine-hypersthene normative tholeiites. The secondary mineral assemblage consists of smectite and calcite with minor quartz and occasional zeolite (chabazite).

The three major seismic reflectors observed at Site 750 above basement at 0.31, 0.46, and 0.59 s TWT are related to major changes in the lithology, physical properties, and logging data. The reflector at 0.31 s TWT can be correlated with the boundary between Subunits IIA and IIB (317.2 mbsf). The seismic reflectors at 0.46 and 0.59 s TWT must be correlated with the top of Subunit IIIB (450 mbsf) and the top of Subunit IIIC (594.6 mbsf), respectively. On the basis of these correlations the calculated mean velocities for each lithologic unit or subunit are in agreement with the measured compressional wave velocities. A clear but unusual velocity inversion is observed between 600 mbsf and the top of the basalt unit at 675.5 mbsf. A similar inversion was recorded at Site 748 in the western Raggatt Basin.

Both the basement and the sedimentary rocks drilled at this site provide interesting contrasts with those sampled elsewhere on the Kerguelen Plateau during this leg. In terms of incompatible trace element abundances, basalts from Site 750 are the most depleted, thereby extending the array defined by samples from Sites 747 and 749. They also show slight differences in incompatible element ratios, possibly indicating differences in source characteristics. Nevertheless, Site 750 basement is transitional in characteristics between normal Indian Ocean MORB and Kerguelen Island and Heard Island OIB lavas. The secondary mineral assemblage at this site indicates low-temperature alteration (<50° C), as opposed to the higher temperature regimes defined at Sites 747 and 749. The alteration occurred under oxidizing conditions, and the basalts were erupted in a subaerial or shallow subaqueous environment.

Following the emplacement of the uppermost basalts at this site, a considerable portion of the southern Kerguelen volcanic edifice was emergent and subject to intense weathering in a warm temperate or subtropical climate (in marked contrast to that in this region today). Rainfall was sufficient to weather volcanics to kaolinitic clays. The actual source rock may not have been entirely the T-MORB basalts drilled at this site, but rather alkaline basalts located elsewhere in the rather extensive watershed (perhaps similar in composition to those drilled at Site 748). The kaolinites accumulated in well-vegetated or forested, subaqueous or subaerial environments, perhaps on marshy flood plains. The soft pebble conglomerate probably denotes fluvial conditions, and the authigenic siderite crystals are characteristic of coal swamps. The numerous large pieces of charcoal (up to 5 cm) and high organic carbon contents of up to 7% further suggest a terrestrial setting. These sediments are visually similar but mineralogically different from those penetrated but poorly sampled in Lithologic Unit IV at Site 748.

Foundering of this portion of the Kerguelen platform occurred by Cenomanian time. The oldest recovered chalks contain evidence of redeposition of inner shelf faunas into a deeper water environment. By the late Campanian, the subsidence had carried the site to upper slope depths; sedimentation rates increased considerably and surface temperatures cooled, so that planktonic foraminiferal assemblages changed from transitional to austral in character. Only in the late Maestrichtian do the foraminiferal and nannofossil assemblages lose their strong austral affinities, apparently indicating a progressive warming leading to the close of the Cretaceous Period. By then the site had deepened to perhaps bathyal depths. Conditions at this site during the deposition of these Upper Cretaceous chalks were consistently open marine, in strong contrast to the restricted Turonian-Coniacian glauconitic siltstones and shallow-water glauconitic bioclastics that characterized the western Raggatt Basin (Site 748). Nor is there evidence of the Maestrichtian-lower Danian debris flows encountered at Site 747 to the north. The western Raggatt basin stood structurally higher than the eastern portion of the basin throughout the Late Cretaceous, subsiding rapidly only at the end of the Maestrichtian, and Site 748 remains 740 m shallower than Site 750 today. These different histories are well reflected in our sedimentologic and seismic stratigraphic records.

Surprisingly high sedimentation rates of 11 m/m.y. characterize the Danian, which spans 40 m of section at Site 750. Danian benthic foraminiferal faunas are similar to those of the upper Maestrichtian; by then, the paleodepth of the site was approaching those of the present day. Sedimentation rates increased to about 30 m/m.y. during the late early and late middle Eocene. Except for the thin Pliocene-Pleistocene veneer and lag deposit, the rest of the Cenozoic is missing at this site.

<u>Site Summary, Site 751</u>
Latitude: 57° 43.56′ S
Longitude: 79° 48.89′ E
Water Depth: 1633.8 m

Site 751 (proposed Site SKP-2C) is located in the central part of the Raggatt Basin on the Southern Kerguelen Plateau, and was intended to recover a high-resolution Neogene and Paleogene stratigraphic section deposited above the calcium carbonate compensation depth and well south of the present day Polar Front, which lies 900 km to the north. This site is a key component of a latitudinal paleoceanography transect across the plateau. The <u>Marion Dufresne</u> MCS line MD47-05 shows a thick sedimentary cover of at least 2500 m at this locality. Due to time constraints imposed by an unexpected mid-cruise round trip between the Kerguelen Plateau and Fremantle, Australia, drilling at Site 751 was limited to the Neogene objective, which comprises a seismic sequence of 0.24 s two-way travel time (TWT).

A 166.2-m section of upper Pleistocene through middle lower Miocene mixed biosiliceous and calcareous ooze was APC-cored with 98% recovery. An unusual finding was an exceptionally young (early Pliocene age) porcellanite bed encountered in Core 120-751A-2H. Operations in high seas were terminated when the APC piston rod failed during pullout, leaving the core barrel and the last core stuck in the hole. The following lithologic units were recognized at this site:

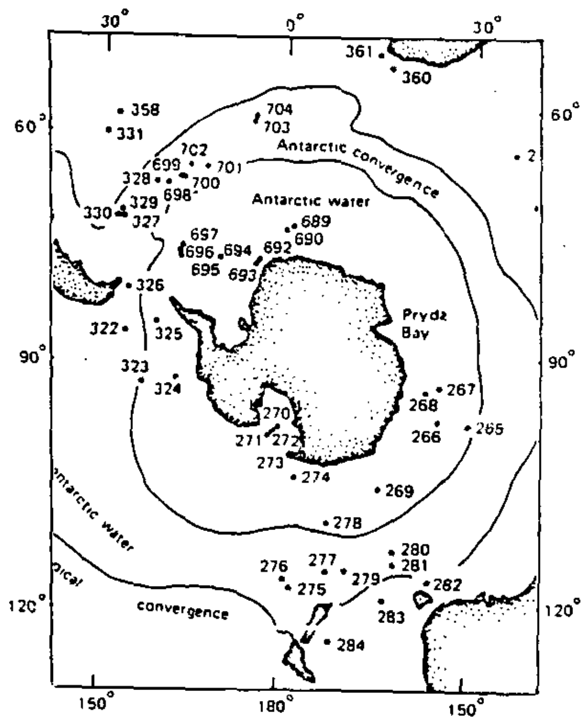
Unit I: (0-40.1 mbsf) upper Pleistocene (>0.2 Ma) to lower Pliocene diatom ooze with minor ice-rafted debris, foraminifers, volcanic ash and porcellanite. The carbonate content ranges from 0-70% whereas foraminifers range from 3-25% near the top to rare near the bottom of the unit. Ice-rafted debris is scattered in minor abundance throughout the unit, mostly as sand-sized specks. The predominantly milky white porcellanite, disturbed by drilling, fills the top 44 cm of Core 120-751A-3H and contains some burrow-like casts. Two vitric ash layers are present in the lower Pliocene sediments.

Unit II: (40.1-166.2 mbsf) upper Miocene to lower Miocene diatom nannofossil ooze. Although nannofossils predominate, diatoms occur in equal or greater abundance in many intervals; foraminifers, radiolarians and silicoflagellates are rare or in trace amounts. Faint green cm-scale diatom enriched laminae occur between 88 and 104 mbsf.

The lower Pliocene through lower Miocene represents an expanded section with sedimentation rates of 15-20 m/m.y., whereas much lower rates of about 3 m/m.y. characterize the abbreviated upper Pliocene-Pleistocene section. As many as four hiatuses have been detected. The most extensive of these can be correlated across the Raggatt Basin, and spans the interval from about 12.5 to 16 Ma in the middle Miocene. A second represents about 3.5 m.y. between 9.5 and 6 Ma in the late Miocene. A third short hiatus represents about 0.4 m.y. between 4.8 and 5.2 Ma, whereas a fourth spans an interval of some 0.3 m.y. between 1.9 and 2.2 Ma in the late Pliocene. Magnetostratigraphic data are of mixed quality, but key polarity reversals are identified in the early Pliocene to late Miocene (anomaly correlatives 3, 3A, 4 and 5) and early Miocene (anomaly correlatives 5C through 6).

High biogenic silica contents in Lithologic Unit I yielded low bulk densities and high porosity values relative to Unit II. Compressional wave velocity values, however, were generally higher above 45 mbsf than below this level in the nannofossil ooze (1560 m/s above vs 1505 m/s below). The corresponding seismic data do not indicate a correlation of lithologic subdivisions or identified hiatuses with specific reflectors. From the compressional wave velocity measurements, however, it is anticipated that the first reflector at 0.24 s TWT lies just below the bottom of the hole at about 185 m and may correspond to the Oligocene/Miocene contact. If so, sedimentation rates would suggest that a disconformity could be expected at this point.

The relatively high carbonate contents and high sedimentation rates for the Miocene at this site, plus the co-occurrence of siliceous and calcareous microfossil groups is unique for these high southern latitudes and will make this and other Leg 120 sites on the Kerguelen Plateau important reference sections for stable isotope and biomagnetostratigraphic studies. Changing microfossil assemblage compositions within each group indicate repeated fluctuations of major water mass properties over the site and should provide important paleobiogeographic and paleoceanographic records for this region. The most striking feature of this record is the rapid meter-scale alternations in microfossil assemblage characteristics, physical and sedimentologic properties which indicate that this site may be capturing some of the high-frequency paleoclimatic variability observed in other parts of the world ocean.



LEG 119 BIOLOGICAL PROGRAMS

The following report was received from Greta A. Fryxell and Sung-Ho Kang (Texas A&M University and Leg 119 Shipboard Scientific Party), who conducted biological studies aboard the Maersk Master.

Phytoplankton and sediment trap collections augmented cores drilled from the Kerguelen Plateau and Prydz Bay, thus allowing Quaternary sediment assemblages to be compared with those from the austral summer living community. Most of the diatom-dominated collections were made from the ice support vessel, Maersk Master. When ice conditions allowed, the Master was able to move a few kilometers from the drillship to carry out deployment and recovery of sediment trap arrays, temperature and salinity profiling, light penetration measurements, phytoplankton net tows, and water sampling.

In the absence of the Master, phytoplankton was collected on the drillship while on site by deploying a fine-meshed (20 micron) hand net in the effluent of the thrusters off the stern of JOIDES Resolution. Under way, phytoplankton was abundant enough that buckets of water could be collected and filtered through the net to provide small samples of phytoplankton from the north-south transect. Comparison of the living diatom-dominated flora with sediments retrieved by drilling will provide comparative time scales to aid in solving problems dealing with how life has evolved in this stressful environment and how organisms have adapted to changes in that environment through time.

In Prydz Bay, one objective of the biological study was to quantfy the composition, abundance, and distribution of the phytoplankton species in order to compare different depths, drill sites, and one drill site over a time series. Sea-water sampling depths were decided upon from the data from a conductivity, temperature, and depth recorder (SEACAT). In the bay, the surface water was mixed down to around 20 m during the period of study, and the euphotic zone was between 10-20 m.

Surface and subsurface sampling were conducted at Sites 739-743. Water samples were used for quantitative phytoplankton permanent mounts, chlorophyll and pigment studies, nutrient analyses, and live samples.

In order to investigate the changes of horizontal and vertical phytoplankton distribution near drill sites, sediment traps as well as horizontal and vertical net hauls were deployed. The net tows and hauls will provide estimates of the rate of spatial and temporal changes of the larger cell-sized fraction of phytoplankton populations through the 5 Prydz Bay drill sites. A bucket sample, taken before Prydz Bay was cleared of ice by a gale, indicated that phytoplankton was not abundant and was dominated at that time by small, ice-related diatoms similar to those found in some brown sea-ice samples taken during the occupation of the drill sites. However, long, healthy chains were noted 10 days later, with many species of Chaetoceros. During the occupation of the bay, resting spores were seen to form, and intact resting spores of Chaetoceros were found in fecal pellets. Preliminary shipboard observations indicated that one species was forming resting spores below 100 m, but the resting spores were found in fecal pellets throughout the water column. It may well be that vertical migration may transport previously grazed deep flora into surface layers before fecal matter is released into the water column.

The occupation of drill sites allowed a biological time series for studies related to the geological objectives of Leg 119. The sites just north of the Antarctic Convergence Zone (AACZ) on the northern Kerguelen Plateau, well south of the AACZ on the southern Kerguelen Plateau, and across the continental shelf into Prydz Bay provided a rare opportunity for comparison of living phytoplankton and Quaternary sediments in three related habitats.

LEG 121: BROKEN RIDGE AND NINETYEAST RIDGE PROGRAM

Leg 121 departed Fremantle, Australia on 6 May 1988 and is scheduled to end in Singapore on 28 June 1988. Co-chiefs for the cruise are J.Peirce (Petro Canada) and J.Weissel (LDGO). ODP Staff Scientist is E.Taylor. By the time of distribution of this JOIDES Journal, Leg 121 will be completed. A summary of the Leg 121 prospectus appears below. A detailed scientific prospectus as well as comprehensive report on preliminary scientific results can be obtained from ODP/Texas A&M University.

INTRODUCTION

Drilling during this leg will cover two different morphological features in the Indian Ocean: (a) Broken Ridge in the SE Indian Ocean, a complementary feature to the Kerguelen Plateau [which had been drilled during Legs 119/120] and (b) Ninetyeast Ridge, an impressive N-S stretching lineament, reaching some 5000 km to the north before it is buried by the sediments of the Bengal Fan.

Figure 1 shows the location of both ridges and the planned drilling locations. The planned order of the drillsites for the program is shown in Table 1.

BROKEN RIDGE

The general objective of drilling Broken Ridge is to study rifting mechanisms. In particular, drilling results are intended to relate the age of tilting of the syn-rift and pre-rift sediments to the known age of initiation of sea-floor spreading between the southern margin of Broken Ridge and the Kerguelen Plateau. These objectives complement the tectonic objectives of ODP Legs 119 and 120.

A N-S transect of four holes (BR-1 through BR-4) across the crestal region of Broken Ridge is planned.

By drilling this transect of holes, most of the dipping and truncated sequence will be sampled in single-bit holes at sites located to ensure some over-lap of section. From the presence or absence of reworked limestone and chert detritus, drilling aims to establish whether the section is completely pre-rift, or if it includes syn-rift (the middle 'highly reflective' unit and the upper 'transparent' unit of seismic profiles across the ridge), and even post-rift sections as well. Drilling at proposed site BR-3 will also verify that shallow-water lagoonal deposits overlying the erosional unconformity are middle Eocene, roughly equivalent in age to the oldest magnetic lineation observed between Broken Ridge and the Kerguelen Plateau.

NINETYEAST RIDGE

The general objectives of the second part of Leg 121 are to study the geochemical relationships in space and time between the Ninetyeast Ridge and the Kerguelen hotspot, to derive a detailed northward motion curve for India, thereby providing further insight into the tectonic mechanisms of the Himalayan Orogeny, and to provide a north-south paleontological and paleoclimatological transect of the eastern Indian Ocean at depths shallower than the carbonate compensation depth. These objectives complement the objectives of ODP Legs 115, 116, 117, 119, and 120.

Three sites are planned: NER-5 close to the southern end, NER-2 at the central part of the ridge, and NER-1 at the northern Ninetyeast Ridge.

Drilling at the Ninetyeast Ridge will help to answer some important questions:

- Is there a systematic variation in age and isotopic character between basement sites on the Ninetyeast Ridge?
- Does the Ninetyeast Ridge contain an unusually high proportion of relatively evolved basement rocks ?
- Can the composition on the basement lavas be related to that of the overlying pyroclastic rocks ?
- Was the slowing of the northward motion of the Indian plate coinci-

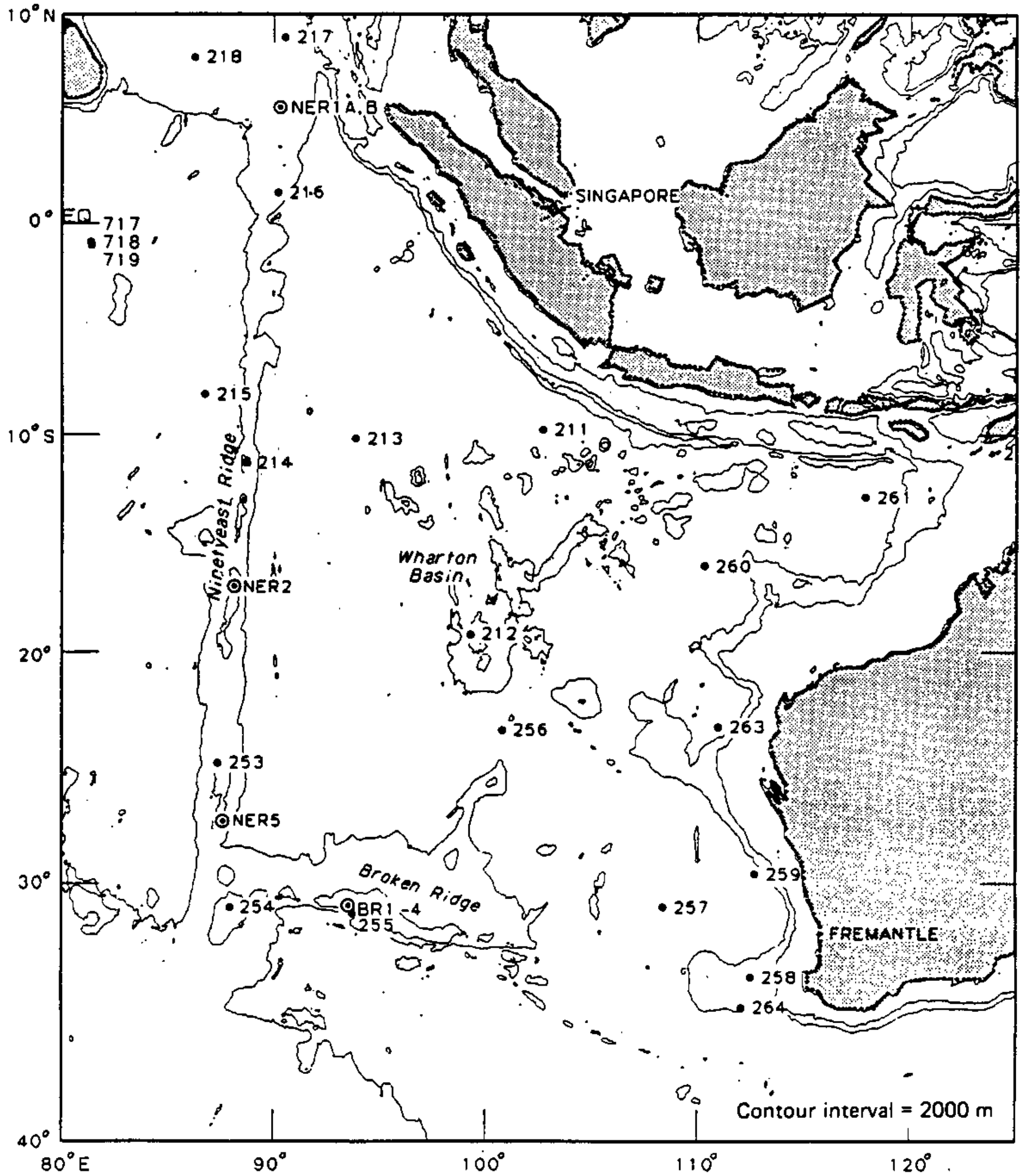


Figure 1. Location map of the eastern Indian Ocean, showing previous DSDP sites, ODP Leg 116 sites, and sites proposed for drilling on ODP Leg 121.

dent with the onset of the extrusion of continental blocks resulting in the widespread deformation of SE Asia? Or was the slowing related to the onset of continental subduction?
- Was the slowing really abrupt or did it take place over some 10 my?
- When did the great deserts of Australia and Africa evolve?
- Given that atmospheric circulation responds to the pole-to-equator temperature gradient, how does the eolian record compare with the oxygen isotope record of ice volume?
- How have the zonal wind belts migrated north and south through time?
- What is the record in the Southern Hemisphere of the big changes in atmospheric circulation in the early Eocene (which have been recorded at Northern Hemisphere locations)?
- Does the onset of glaciation in the Northern Hemisphere have any effect on the circulation of the Southern Hemisphere?

During this leg testing of the Navi-drill (NCB) will be conducted during basement drilling at the Ninetyeast Ridge sites. Furthermore, by imaging borehole breakouts with the televiewer at the northern Ninetyeast Ridge site, some understanding of stress distribution within this oceanic plate will be gained.

Table 1. BROKEN RIDGE & NINETYEAST RIDGE DRILL SITES

SITE	LOCATION	WATER DEPTH	PENETRATION (m)	PRIORITY	DRILL TIME	LOG TIME	TOTAL	CUM	COMMENTS
Broken Ridge Sites									
BR-1	30°50'S/93°35'E	1178	450	1	2.6	1.4	4.0	8.5	APC/XCB/NCB
BR-2	30°53'S/93°34'E	1074	450	1	2.4	1.4	3.8	12.3	APC/XCB
BR-3	30°56'S/93°34'E	1057	450	1	2.1	1.2	3.3	15.6	APC/XCB
BR-4	31°01'S/93°33'E	1056	450	2	2.4	1.5	3.9	19.5	RCB
Transit: 1.5 days								21.0	
Ninetyeast Ridge Sites									
NER-5	27°22'S/87°37'E	1510	250+	3	2.9	1.1	4.0	25.0	(SNR-4) 50 bsmt RCB
Transit: 2.7 days								27.7	
NER-2	17°05'S/88°07'E	1676	340	1	4.7	1.6	6.3	34.0	(CNR-2) APC/XCB/NCB + 100 m RCB in bsmt
Transit: 5.7 days								39.7	
NER-1A	05°39'N/90°02'E	2830	425	1	2.3	1.5	3.8	43.5	(NNER-9) APC/XCB/NCB
NER-1B	05°22'N/90°23'E	3040	285+	1	3.5	1.5	5.0	48.5	(NNER-10) 50 bsmt RCB
Transit to Singapore: 3.7 days								52.2	
					22.9	11.2	34.1		
Transit							18.1		
Engineering (NCB test + multishot tool calibration)							0.8		
TOTAL TIME							53.0	53.0	

Notes: 1. Transit times calculated at 10.5 kts. Includes 0.6 day allowance for magnetic profiles east of Ninetyeast Ridge.
2. Logging times include Seismic Strat., Lithoporosity and Geochemical combination runs at each site plus BHTV at NER-2. Hole conditioning time of 8 hrs/hole assumed.

LEGS 122 AND 123: ARGO ABYSSAL PLAIN AND EXMOUTH PLATEAU PROGRAMS

A major, integrated scientific effort to drill a complete Exmouth-Argo transect is the goal of ODP Legs 122 and 123. Extensive interaction between both scientific parties is critical to the success of the cruises. Co-chiefs for Leg 122 are U.von Rad (Bundesanstalt fur Geowissenschaften und Rohstoffe) and B.Haq (National Science Foundation) and ODP/TAMU Staff Scientist is S.O'Connell. Co-chiefs for Leg 123 are F.Gradstein (Bedford Inst. of Oceanography) and J.Ludden (U.of Montreal) with A.Adamson as the ODP/TAMU Staff Scientist.

Dates and ports for both legs are listed in the Ship Operations schedule in this issue of the JOIDES Journal (p.2). A complete prospectus of both legs, published as one report, is available from ODP/Texas A&M University. An excerpt of the prospectus appears below.

INTRODUCTION

Northwestern Australia from the Exmouth Plateau to the Scott Plateau forms one of the oldest oceanic margins in the world (155 Ma), with a relatively low sediment influx and a large biogenic component. It is an ideal margin for comprehensive and integrated sedimentologic, biostratigraphic, paleobathymetric, and subsidence studies. Two ODP legs are planned in this area: Leg 122, to drill a transect of three or four sites across the Exmouth Plateau, and Leg 123, to drill one site on the northern Exmouth Plateau and one site on the Argo Abyssal Plain (Figure 1).

The Exmouth Plateau off northwestern Australia is about 600 km long and 300-400 km wide with water depths ranging from 800 to 4000 m. The plateau consists of rifted and deeply subsided continental crust covered by a Phanerozoic sedimentary sequence about 10 km thick. It is separated from the Northwest Shelf by the Kangaroo Syncline, and is bound to the north, west and south by Jurassic oceanic crust of the Argo, Gascoyne and Cuvier abyssal plains. The Canning and Carnarvon Basin sediments extend over the plateau from the east and abut the Pilbara Precambrian block (Exon and Willcox, 1978, 1980; Exon et al., 1982; Exon and Williamson, 1986).

The Argo Abyssal Plain is an extremely flat, about 5.7 km deep, abyssal plain located north of the Exmouth and Wombat plateaus and west of the Rowley Shoals and Scott Plateau. It is underlain by the oldest (Late Jurassic M-26) oceanic crust known in the Indian Ocean, crust that is slowly being consumed by the convergence of Australia and the Sunda arc.

The Exmouth Plateau-Argo Abyssal Plain transect will be the first Mesozoic, sediment-starved passive margin to be studied since 1985 when JOIDES Resolution drilled the Galicia margin on Leg 103. Australian margins are characterized by large marginal plateaus with broad continent/ocean transitions and a different paleogeographic, tectonic and climatic setting.

Drilling the Exmouth Plateau-Argo Abyssal Plain transect on Legs 122 and 123 will allow: (1) comparison of tectonic and seismic sequences with Atlantic passive margins, (2) improvement of the accuracy of the Mesozoic geological time scale, and (3) characterization of old ocean crust prior to subduction under the Sunda arc.

Exmouth Plateau can serve as an ideal model for an old (120-150 Ma), sediment-starved (less than 1-2 km of post-breakup sediments) passive continental margin with a broad ocean/continent transition. The margin, because of its relatively thin sediment cover, is well suited to study the early-rift, breakup, juvenile and mature ocean paleoenvironmental and geodynamic evolution. The unusually wide marginal plateau between the shelf and the oldest Indian Ocean crust allows study of the structural development of the ocean/continent transition and testing of various tectonic models by geophysical methods and core analysis. The continental margin has drifted about 10° northward since Jurassic time (Johnson et al.,

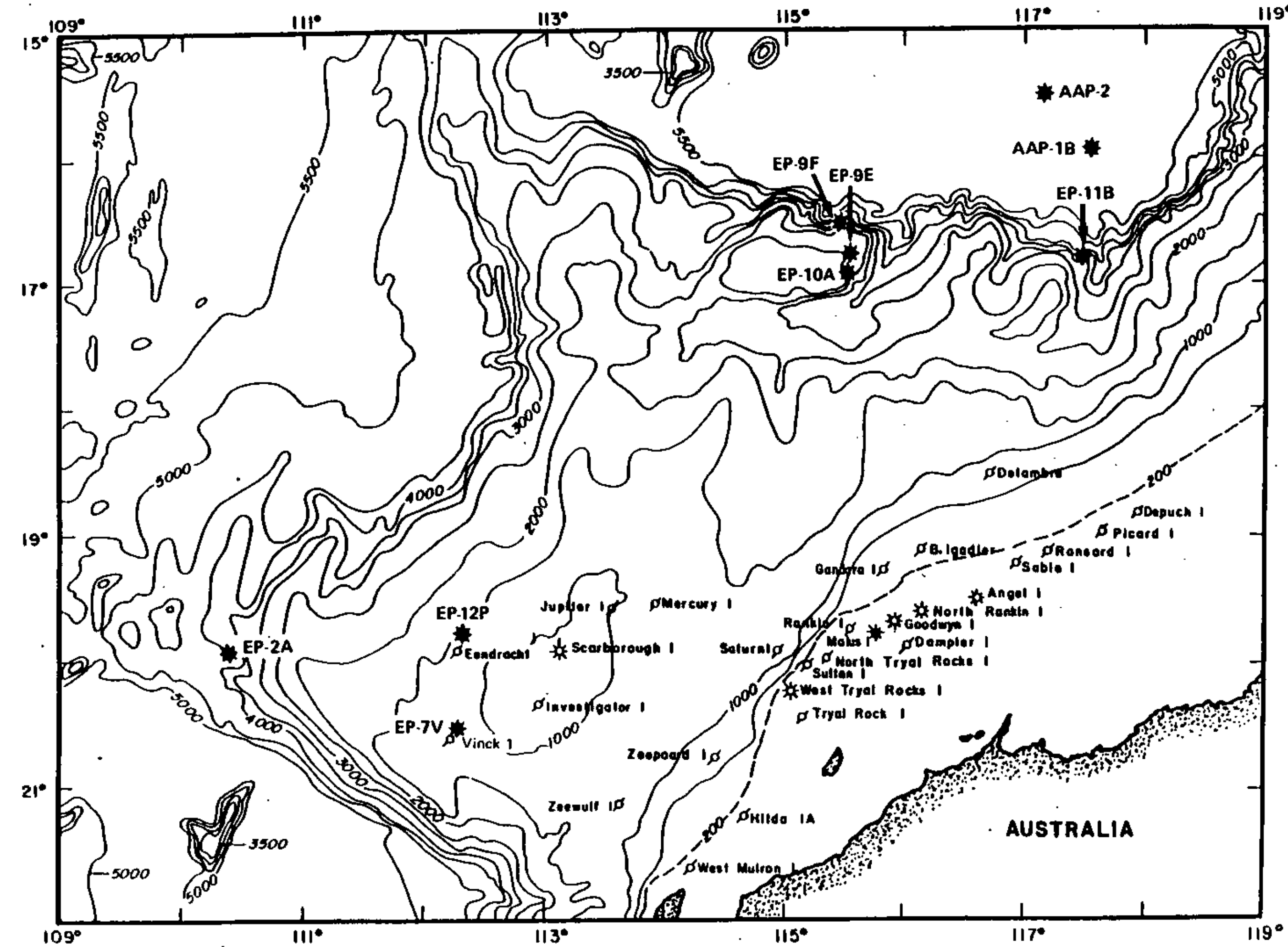


Figure 1. Bathymetric map (in meters) of Exmouth Plateau and vicinity with location of planned ODP sites (bold stars) and commercial wells (open circles, modified from Exon, BMR unpublished data).

1980) and is associated with a continent which has shed very little terrigenous material. This and the paleo-waterdepths (10-4000 m) make it a prime target for detailed studies of biostratigraphy, sediment facies, paleoenvironment and stratigraphic evolution owing to subsidence and sea level fluctuations during the entire period from the Late Triassic through the Quaternary.

This prospectus was compiled using the drilling proposals by von Rad, Exon, Symonds and Willcox (1984, ODP proposal 121/B); Arthur (SOHP deep stratigraphic test proposal, 1985, ODP proposal 211/B); von Rad, Exon Williamson and Boyd (1986, ODP proposal 121/B revised); Gradstein (1986, ODP proposal 240/B); and Mutter and Larson (1987 ODP proposal 288/B); and Langmuir and Natland (ODP proposal 267/F, 1986). The pre-site survey information in the cruise reports of R/V Sonne cruise SO-8 (von Stackelberg et al., 1980) and Rig Seismic cruises 55 and 56 (Falvey and Williamson, 1986; Exon and Williamson, 1986) were used extensively.

BACKGROUND

Tectonic and Stratigraphic Background

The present structural configuration of the Exmouth Plateau region was initiated in Triassic to Middle Jurassic time by rifting between northwest Australia, India and possibly South Tibet. The western margin has a normal rifted structure. The southern margin has a transform dominated structure. The complex northern rifted and sheared margin contains at least one crustal block of post-breakup igneous origin.

The northern margin of the plateau formed in Callovian to Oxfordian time (160-150 Ma), when seafloor spreading commenced in the Argo Abyssal Plain (at or slightly before anomaly M-25 time). Steady subsidence along the incipient northern margin, north of an east-west hinge line, allowed several thousand meters of Lower and Middle Jurassic carbonates and coal measures to accumulate before breakup (Exon et al., 1982). Breakup occurred along a series of rifted and sheared margin segments, the tectonic setting being further complicated by northeast-trending Callovian horsts and grabens. The horsts were reduced in Late Jurassic and Early Cretaceous time, and the whole northern margin was covered by a few hundred meters of Upper Cretaceous and Cenozoic pelagic carbonates, as it subsided to its present depth of 2000-5000 m.

Throughout the Jurassic, pre-breakup rift tectonics affected the entire northeast-trending western margin of the Exmouth Plateau (Falvey and Mutter, 1981). Breakup occurred in the Neocomian, approximately 110 Ma, as "Greater India" moved to the northwest and seafloor spreading anomalies started to form in the Gascoyne Abyssal Plain (Exon et al., 1982).

Paleogeographic Evolution

The sediments beneath Exmouth Plateau have been deposited in an extension of the Carnarvon Basin, which formed a north-facing Tethyan embayment in Gondwana and received detrital sediments from the south until Early Cretaceous time. In the central plateau region, at least 3000 m of mainly paralic and shallow-marine detrital sediments were deposited from Permian to Middle Jurassic times. After the Late Triassic rifting, about 1000 m of shallow-marine and deltaic detrital sediments, derived from the south and east, covered the Late Jurassic and Early Cretaceous block-faulted surface. About 200 m of hemipelagic shallow-marine sediment was deposited in the middle Cretaceous, followed by 500-1000 m of Late Cretaceous to Cenozoic eupelagic carbonate sediment. The Exmouth Plateau Arch and Kangaroo Syncline probably warped to their present form during the Miocene (Exon and Willcox, 1978, 1980), by which time the central plateau had subsided to bathyal depths (Barber, 1982).

The northern Exmouth Plateau experienced a similar post-Cretaceous to Cenozoic evolution to that of the central plateau. However, 1-3 km thick Lower Jurassic shelf carbonate and middle Jurassic coal measure sequences were deposited north of the "North Exmouth hingeline" during a time when the central Exmouth Plateau area was being eroded. The breakup at about

150 Ma (Callovian-Oxfordian) on the northern margin was about 40 m.y. earlier than at the central plateau.

A break-up triple junction, postulated between greater India, south Tibet-Burma and northwestern Australia, including Timor, led to a young oceanic graben that had subsided to abyssal (ca. 2.5 km) depth in (?)Callovian and Oxfordian time, when oceanic spreading started. Until the middle Cretaceous, over 500 m of calcareous claystone accumulated, presumably derived from the southeast during continued oceanic subsidence. Since then, over 400 m of zeolitic clay, siliceous clay and calcareous ooze turbidites have been deposited on the sediment-starved abyssal plain. Convergence of "Sundaland" and Australia led to collision in the late Neogene and to consumption of the Argo ocean floor under the Sunda arc.

DRILLING OBJECTIVES OF LEGS 122 & 123

During Legs 122 and 123, a depth transect of five to seven holes from the central Exmouth Plateau (water depth 1354 m) to the Argo Abyssal Plain (water depth 5740 m) will be drilled (Table 1). The following is a list of the major objectives to be addressed at these sites:

1. To understand the Late Triassic-Jurassic pre- and syn-rift history and the rift-drift transition in a starved passive continental margin setting (EP7V, EP10A, EP9E, EP12P, EP2A).

2. To determine the geochemical and physical characteristics of the oldest Jurassic Indian Ocean crust (AAP1B) and the bulk geochemical composition as a reference section for understanding global geochemical fluxes at subduction zones.

3. To study the Late Jurassic-Early Cretaceous to Cenozoic post-breakup development of sedimentation and paleoenvironment from a juvenile to a mature ocean (EP7V, EP12P, EP2A, EP9E, AAP1B).

4. To study the temporal and spatial distribution of Jurassic, Cretaceous and Tertiary sequence stratigraphies in order to evaluate the effects of basin subsidence, sediment input, and sea level changes in an almost complete, undisturbed, classic passive margin section (EP7V, EP10A, EP12P, EP9E).

5. To refine the Mesozoic geological time scale (magneto-bio-chemo-stratigraphy) (EP7V, EP12P, EP10A, AAP1B, AAP2).

6. To investigate Middle Jurassic and middle Cretaceous anoxic sedimentation in terrigenous, shallow-water marine and deep-marine environments (EP7V, EP12P, EP2A, EP9E, EP10A, AAP1B, AAP2).

7. To document Cretaceous/Tertiary boundary stratigraphy (EP7V, EP12P, EP9E).

8. To completely log AAP1B, including standard Schlumberger logs and hydrofracture, VSP, BHTV, and magnetic susceptibility experiments.

LOGGING PROGRAM

Leg 122

Our understanding of the early sedimentation, subsidence history, testing of the global sea-level curve, and the cyclicity of sedimentation at proposed Exmouth Plateau sites will be greatly improved by collecting Schlumberger log data. Measurement of continuous downhole porosity and mineralogy for backstripping studies and for estimation of paleodepth will require running the lithoporosity and geochemical combination tools. Investigating sedimentation history, in particular the development of the breakup unconformity in the young Tethys Ocean, will require an accurate seismic-stratigraphic correlation, necessitating use of the seismic stratigraphic log combination. High vertical resolution microresitivity tools in this combination will also yield finer resolution of Milankovitch cycles in the sedimentary sequence.

Leg 123

The major focus of logging as well as drilling on Leg 123, will be at proposed site AAP1B on the Argo Abyssal Plain. Most of the objectives at this site can be addressed by logging with

Table 1. ARGO ABYSSAL PLAIN & EXMOUTH PLATEAU DRILL SITES

SITE	LOCATION	WATER DEPTH (m)	DRILL DEPTH (m)	DRILL TIME (days)	LOG TIME (days)	TOTAL
Leg 122 Sites						
EP2A	19°56'S/110°27'E	4050	800*	10.3	1.4	11.7
EP7V	20°35'S/112°13'E	1373	1125	9.7	2.1**	11.8
EP10A***	16°56'S/115°33'E 16°57'S/115°33'E	2050	1300	12.8	3.0	15.8
EP12P	19°51'S/112°15'E	1354	940	9.4	1.5	10.9
EP11B (Alt)	16°49'S/117°29'E	3360	1200	10.1	1.8	11.9
Leg 123 Sites						
EP9E or EP9F	16°46'S/115°31'E 16°34'S/115°28'E	2000 2700	1000 800	9.3 9.3	1.7 1.7	11.0 11.0
AAP1B	15°58'S/117°34'E	5740	1200+	32.9	7.5	40.4
AAP2++ (Alt)	15°42'S/117°20'E	5700	1000	16.0	4.8	20.8

* Includes 50 m of basalt

** One logging run when drilling reaches about 600 m and the standard three runs at the completion of drilling

*** There are two possible scenarios for drilling this site:
a) Drill one hole to 1300 m on top of plateau, or
b) Recover same section by drilling a series of holes down the side of the plateau

\+ Includes 300 m of basalt

++ Time calculation based on washing the upper 200 m five tool combinations, plus a vertical seismic profile. For subsidence studies and the sedimentation history of the deep basin, the lithoporosity and geochemical combinations will allow porosity and mineralogy information to be extracted. The petrology of the crust will also be addressed with these tools. A televiewer/magnetometer log would measure the fracture network and magnetic reversal history of old oceanic crust. Hydrofracture experiments will allow us to determine stress directions in this complex area. The influence of structure in the crust (and indurated sediments) on local hydrothermal cells could be studied with respect to the temperature gradient in the well, measured during one of the Schlumberger standard logging runs. Finally, as a primary objective of the site is stratigraphy, data collected from the seismic stratigraphy combination tool will be applied directly to the correlation of sedimentary sequences and seismic profiles.

At proposed site EP9E on the Wombat Plateau, also scheduled for drilling on Leg 123, the three standard Schlumberger tool combinations will be run.

SITE OBJECTIVES

Site EP2A

EP2A is located at the foot of the western escarpment of the Exmouth Plateau and is underlain by either oldest Gascoyne Abyssal Plain oceanic crust or by "transitional" crust, i.e., continental crust alternating with volcanic flows and sills extruded or intruded during breakup, when magmatic underplating and upwelling of the asthenosphere occurred owing to the extreme thinning of the continental crust to 20 km (Mutter et al., in press). At EP2A we should be able to learn more about "transitional" type basement and to test stretching and subsidence models for rifting and the subsequent evolution leading to marginal plateau formation. We can also study the nature of the prebreakup facies (sediments and/or volcanics), the paleobathymetric evolution and the transition of the rift stage into a juvenile ocean stage in a setting close to the ocean/continent boundary.

Site EP7V

EP7V is the primary site on top of Exmouth Plateau. It will provide an almost complete, condensed (Lower Cretaceous to Neogene) section and a test of the Cretaceous global sea level curve in the classic type section of the Barrow Delta (Erskine, in press). The overlying middle to Upper Cretaceous strata are important for understanding the differential subsidence history between the plateau and the outer margin (depth transect). Tectonically, the deeper structure of this site is characterized by "thin-skinned" extension during very slow subsidence (Mutter et al., in press). At proposed sites EP7V and EP12P on the central Exmouth Plateau, we have the opportunity to study the thick, northward prograding Barrow Delta (latest Jurassic to Valanginian)--a typical "Wealden-type" facies--and the overlying, condensed, marginal- marine Hauterivian to early Aptian sequence. "Breakup" (i.e., onset of seafloor spreading in the nearby Gascoyne and Curvier abyssal plains) in the area is probably not indicated by an unconformity, but by a distinct facies change toward more pelagic sedimentation, the "juvenile ocean stage."

Site EP9E

EP9E is located on the top of the Wombat Plateau, a sub-plateau of the northern Exmouth Plateau that already experienced breakup in Callovian time and block faulting in Late Cretaceous time. It serves as a companion site to EP10A which will sample the older section of the plateau. At EP9E we expect to core Lower Cretaceous through Cenozoic sediments which show excellent onlap sequence and megasequence boundaries. Together with EP10A, this site will detail the dynamic stratigraphic evolution of this margin as a function of classic passive margin extensional factors and assist in explaining sequence stratigraphy and time scale studies.

Site EP10A

EP10A is located on the top of the Wombat Plateau. It provides the best opportunity to sample Upper Triassic to Jurassic (to lowermost Cretaceous) pre- and syn-rift sediments, as well as to study the early post-breakup history. The upper part of this section (Lower Cretaceous to Neogene) will be recovered at companion site EP9E). Dredge data from the nearby escarpment indicate that much of the sequence is shallow marine and will provide an excellent record of rift-stage sedimentation, Tethyan faunas, and eustatic sea level fluctuations of the Late Triassic to Jurassic (von Stackelberg et al., 1980; von Rad et al., in press). Proposed sites EP10A and EP9E are also important for the determination of the tectonic evolution, subsidence history, and paleoenvironmental development during the early stages of margin deformation and for the correlation of these properties with Leg 123 proposed site AAP1B in the Argo Abyssal Plain.

Site EP11B

EP11B is located on a spur between the deeply incised Swan and Cygnet submarine canyons, about 200 km east of Site EP10A. It is an alternate to Site EP10A with a similar stratigraphic section and identical objectives.

Site EP12P

EP12P is located on the outer part of the central plateau north of Site EP7V and close to industry well Eendracht-1. The main objectives are: (1) correlation of Cretaceous-Tertiary global chronostratigraphy and sea-level curve with Site EP7V, (2) evolution from a Lower Cretaceous syn-rift to an Upper Cretaceous to Tertiary post-breakup facies, and (3) timing, duration and amount of subsidence and deformation of the outer plateau margin in a region where the whole crust was deformed by brittle failure (Mutter et al., in press).

Site AAP1B

AAP1B is in the oldest (southeastern) part of the Argo Abyssal Plain at a water depth of 5740 m. The site will core 400 m of Cenozoic and Upper Cretaceous abyssal sediment before penetrating 500 m of Lower Cretaceous to Upper Jurassic calcareous claystone, marlstone, and limestone, and about 300 m of old ocean crust. The objectives for this site are: (1) Mesozoic magneto-biostratigraphy and the standard geologic time scale, (2) Mesozoic deep-water paleoecology and paleocirculation, (3) rhythmic sedimentation in pelagic environments, and (4) subsidence history of the ocean basin relative to the adjacent passive margin. It will serve also as a global geochemical reference hole in oceanic crust for investigating magmatic processes at plate margins.

Site AAP2

AAP2, also in the southwestern part of the Argo Abyssal Plain, is located slightly northwest of proposed site AAP1B. Its objectives are similar to those of Site AAP1B and it will provide an overlapping section for high-resolution stratigraphy and dating of M-24/M-25.

OPERATIONS PLAN

Leg 122

Leg 122 will drill proposed site EP10A' first. There are two scenarios for drilling this site: (1) drill the primary EP10A' site to 1300 m (Triassic) using a free-fall cone; (2) if the Triassic objectives are not reached at that hole, JOIDES Resolution, after logging, will move downslope along seismic line 56/013 and continue drilling. The new site will be located to intersect slightly above the oldest interval recovered at the previous hole. Additional sites will be drilled in this manner until the complete section is recovered. If no gas is recovered at the EP10A sites, a seismic survey of EP9E will then be made and faxed to ODP Headquarters for evaluation of potential safety hazards by the JOIDES Safety Panel (PPSP).

EP2A will be drilled next. A total penetration of 800 m (including 50 m of basement) is planned using the APC and the rotary core barrel (RCB), followed by standard Schlumberger logging. After drilling EP2A, the decision of which site to drill next (EP12P or EP7V) will be made at sea.

EP12P, in response to PPSP concerns, is located approximately 3 km downdip from Eendracht-1, a dry industry well at shotpoint 2500 on ...

79B-1425. Logs, operations information, cuttings and sidewall cores from this well will be available on the ship. After JOIDES Resolution makes a crossing seismic line over the site, we will APC the upper 200 m. After a round-trip of the pipe, the upper part of the hole, already cored, will be washed. The remainder of the hole will be RCB-cored to 940 mbsf (about 50 m above the Dingo Claystone). Standard Schlumberger logging (three runs) will follow.

The preliminary location of Site EP7V is at shotpoint 3508 on seismic line X78-272. EP7V, also in response to Safety Panel concerns, is located 1 km east of Vinck-1, another dry industry well. EP7V is currently located on a structural high. However, well logs from Vinck-1 show that the high-porosity target horizons contained water rather than gas. For safety purposes, the Leg 122 Co-Chief Scientists and Operations Superintendent are to identify a local low using the seismic system aboard JOIDES Resolution, thus assuring that the site drilled is located low relative to the Windalia Radiolarite. This will be done by having the ship pass over the Vinck well. As an additional safety measure, to assure that EP7V is structurally equivalent to the Vinck-1 well and therefore that the Windalia Radiolarite is a wet reservoir, we will APC/XCB (extended core barrel) the hole to between 550 and 600 m. At this depth, the seismic-stratigraphy tool (gamma ray and velocity) will be run. If the shipboard Petroleum Geologist thinks that the stratigraphic datums vary 10 m or less between the two holes, drilling will proceed to 1125 mbsf about 160 m above the Dingo Claystone. If a larger variation should occur, the remainder of the Schlumberger logging suite will be run and the hole terminated.

Leg 123

Leg 123 will first drill proposed site EP9E (if it was surveyed during Leg 122; EP9F will be drilled if EP9E was not surveyed), using the APC in the upper 200 m, and the RCB to a total depth of 1000 m. Standard Schlumberger logs will be run.

The remainder of the leg will be spent at proposed site AAP1B. The upper section will be cored with the APC. A reentry cone will then be set and the RCB will be used to reach 1200 m, which includes 300 m of basement. At the conclusion of drilling an expanded downhole measurements program will be run, including logging, the borehole televiewer (BHTV), hydrofracture and magnetic susceptibility measurements, and a vertical seismic profile (VSP). Proposed site AAP2 is an alternate to AAP1B.

REFERENCES

Barber, P.M., 1982. Paleotectonic evolution and hydrocarbon genesis of the central Exmouth Plateau. APEA J., 22(1):131-144.

Erskine, R., in press. The Exmouth Plateau. In: Bally, A.W. (ed.), Atlas of seismic stratigraphy, AAPG Stud. Geol., 27.

Exon, N.F., von Rad, U., and von Stackelberg, U., 1982. The geological development of the passive margins of the Exmouth Plateau off northwest Australia. Mar. Geol., 47:131-152.

Exon, N.F., and Willcox, J.B., 1978. Geology and petroleum potential of the Exmouth Plateau area off Western Australia. AAPG Bull., 62(1):40-72.

Exon, N.F., and Willcox, J.B., 1980. The Exmouth Plateau: Stratigraphy, Structure and Petroleum Potential. BRM Australia Bull., 199:52.

Exon, N.F., and Williamson, P.E., 1986. Exmouth Plateau: sedimentary basin framework. Rig Seismic Cruise 56 (April/May 1986). Int. Postcruise Rep., BMR, 57.

Falvey, D.A., and Mutter, J.C., 1981. Regional plate tectonics and the evolution of Australia's continental margins. BMR J. Australian Geol. Geophys., 6:1-29.

Falvey, D.A., and Williamson, P.E., 1986. Exmouth Plateau: Deep seismic structure. Rig Seismic Cruise Report 55, Int. Postcruise Rep., BMR, 48.

Johnson, B.D., Powell, C.McA., and Veevers, J.J., 1980. Early spreading history of the Indian Ocean between India and Australia. Earth Planet. Sci. Lett., 47:131-143.

Mutter, J.C., Larson, R.L., and the NW Australia Study Group, in press. Extension of the Exmouth Plateau: deep seismic reflection/refraction evidence for simple and pure shear mechanisms. Geology, 16.

von Rad, U., Schott, M., Exon, N.F., and Thurow, J., in press. Petrography and microfacies of Mesozoic sediments and volcanic rocks, dredged from the northern Exmouth Plateau during rig Seismic-56 Cruise (1986). BMR J. Earth Sci.

von Stackelberg, U., Exon, N.F., von Rad, U., Quilty, P., Shafik, S., Beiersdorf, H., Seibertz, E., and Veevers, J.J., 1980. Geology of the Exmouth and Wallaby Plateaus off northwest Australia: sampling of seismic sequences. BMR J. Australian Geol. Geophys., 5:113-140.

WIRELINE SERVICES CONTRACTOR REPORT

The Leg 119 report below was prepared by Gilles Ollier from IFREMER (Institut francais de recherche pour l'exploitation de la mer), Lamont logging representative on Leg 119. For further information, contact the Borehole Research Group, Lamont-Doherty Geological Observatory, Palisades, NY 10964.

LEG 119: LOGS HELP INTERPRET GEOLOGIC AND GLACIAL HISTORY

Leg Objectives and Logging Operations

The main objectives of Leg 119 were to document the sedimentological and tectonic history of the Kerguelen plateau and to determine the age and the extent of glacial events in the Prydz Bay area (continental shelf of Antarctica).

Logging operations were completed at Site 737 on the Northern Kerguelen Plateau, at Site 738 on the Southern Kerguelen Plateau and at Sites 739 and 742 in the Prydz Bay area. The logging time required for these four logging operations was about 3.2 days, and thus represents approximately 10% of the time spent on drilling these sites.

At each site, a synthetic seismogram was computed from the sonic and density logs allowing correlations of the reflectors identified on the seismic lines with the logging and lithologic boundaries encountered in the holes. The logs were also used in the Prydz Bay area to improve the lithological interpretations from the cores, to identify over-compacted, ice-loaded units and to define the boundaries between the lithologic units.

Northern Kerguelen Plateau Site

Site 737 penetrated a 715.5 m thick Middle Eocene through Lower Pliocene-Quaternary section consisting of four upper diatom and diatom-nannofossil ooze units overlying two lower calcareous claystone and clayey limestone units. The logs show that the diatoms strongly influence the compaction of the sediments at Site 737. As long as diatoms are present in the sediments (lithologic units 1 to 4) the formations do not compact; when the diatoms disappear, the formations begin to compact (lithologic units 5 to 6). The delay in the compaction of the sediments with diatoms is probably due to large porous skeletons (high surface to volume ratio) that form an internal structure resistant to the overburden load. The synthetic seismogram computed at Site 737 is in good agreement with the reflector identified on the seismic records. For example, one of the main reflectors is known in the Northern Kerguelen Plateau area as seismic discordance "A" (Munschy and Schlich, 1987). This reflector was correlated to one of the largest reflection events on the log-derived synthetic seismogram from Site 737. This reflector is located at the boundary between lithologic units 4 and 5 and corresponds to a hiatus between the upper Oligocene and the Middle Miocene from 15 to 23 Ma.

Southern Kerguelen Plateau Site

Site 738 documents a 490m thick Turonian through Quaternary carbonate sedimentary section overlying 43m of basaltic breccia and altered basalt. At this site, a good example of a diagenetic front was identified on the logs at 250 mbsf. This depth corresponds to the boundary between nannofossil oozes and chalk. The logs (resistivity, sonic, density, porosity) show that when the oozes are transformed into chalk, the porosity stops decreasing with increasing burial depth and remains constant throughout the upper part of the chalk unit. The porosity starts to decrease again only 100m below the diagenetic front. The transformation of nannofossil oozes into chalk corresponds to a cementation process which prevents further compaction until the overburden load reaches the weight needed to break the carbonate cement bridges. This diagenetic effect seems to be only an early step in the diagenetic process at Site 738 because water content (from the physical properties) and porosity (from the logs) are still high in the lower part of the chalk unit (porosities around 50%).

Prydz Bay Sites

The sediments encountered at Sites 739 and 742 correspond to an unsorted mixture of clay, silt, sand, gravel and occasional stones of glacio-marine origin (diamictites). The sediments were deposited at Prydz Bay by a glacial complex, the ice front of which was beyond that of the present day by at least 300km. The main log characteristic of these glacial sediments is their low porosity: at 30 m below sea-floor at both Site 739 and 742, the porosity is only about 25%. An initial low porosity of these deposits, due to their detrital origin, might be one explanation which could account for part of their average low porosity. But the successive loading of the sedimentary section by a thick ice sheet during the latest glacial periods is an important additional factor required to explain the actual low porosities of the diamictites. The logs in the Prydz Bay area attest to the existence of at least one over-compacted unit recognized at both Site 739 and 742. As evidence of the existence of an over-compacted unit between 110 mbsf and 175 mbsf at Site 739, consider that the glacial sediments porosity is only 9% at 110 mbsf. Over-compaction of the diamictites is likely due to one or several glacial erosional events as shown in Figure 1: a glacier erodes the top of a unit already compacted, bringing the sediments to an abnormally shallow burial depth, then a new unit with a normal compaction trend is deposited on the over-compacted section. This explains the abrupt change of porosity between the two units. In the Prydz Bay sites, the logs were used to improve the lithologic descriptions from the cores at poorly recovered intervals . For example, several peaks on the logs corresponding to porous and permeable layers (see spontaneous potential log, Figure 1) were interpreted as interbedded sand or gravel layers.

In summary, the logs were used very successfully to integrate core results with seismic reflectors, lithology and glacial history in Leg 119 holes.

REFERENCES

Munschy, M., and Schlich, R., 1987. Structure and evolution of the Kerguelen-Heard Plateau (Indian Ocean) deduced from seismic stratigraphy. Mar. Geol., 76:131-152

At Last...

JOI/USSAC SPONSORED LOGGING SCHOOLS

The Borehole Research Group of Lamont-Doherty Geological Observatory will present Logging Schools at the following dates and locations. For further information contact Robin Smith, JOI, Inc., 1755 Massachusetts Ave., NW, Washington, DC 20036, Tel: (202) 232-3900, Telemail: R.Smith.JOI.

GSA Annual Meeting
Saturday, October 29, 1988
Denver, Colorado

AGU Annual Meeting
Sunday & Monday, December 6-7, 1988
San Francisco, California

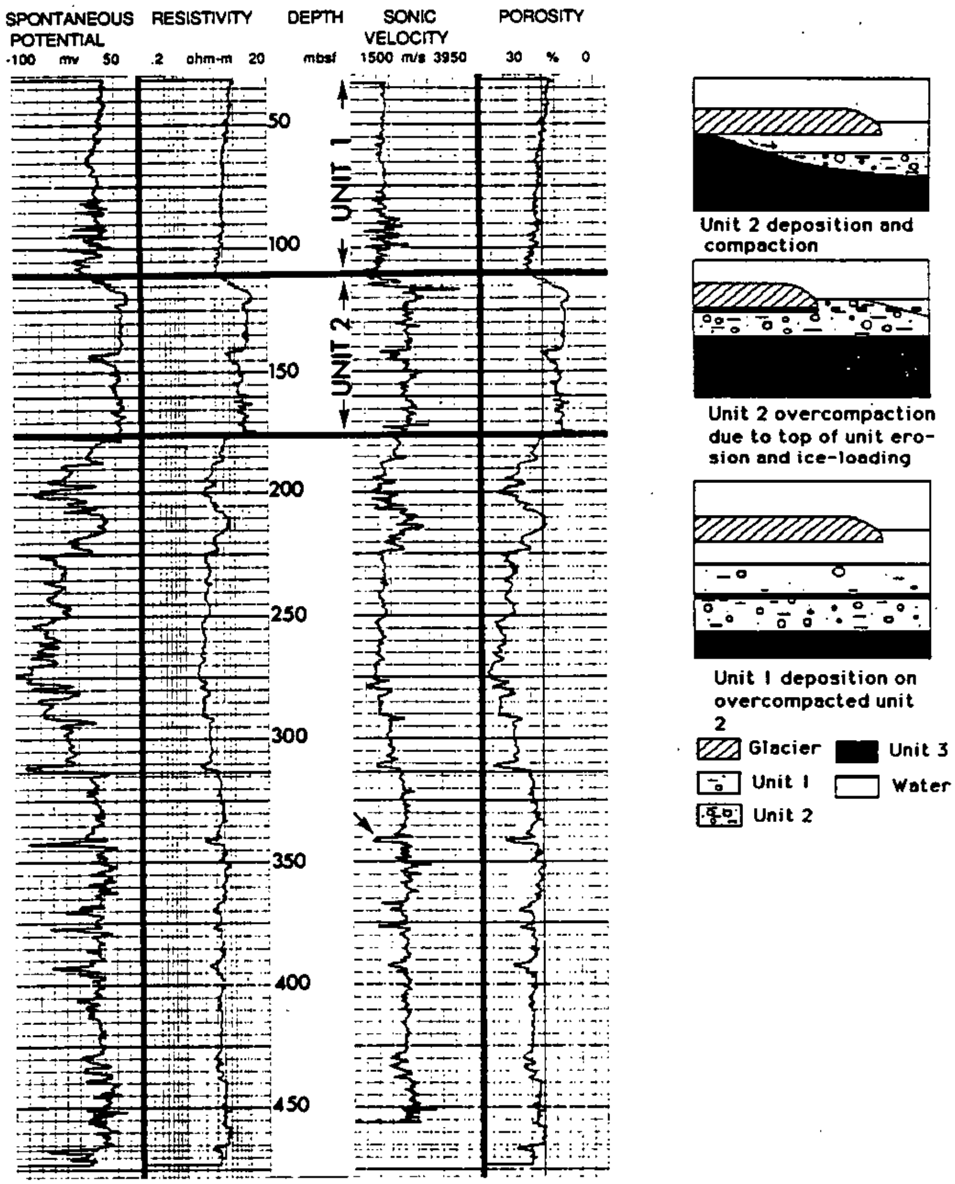


Figure 1. At Prydz Bay Site 739, the Sp, Sonic Resistivity and Porosity logs show an abrupt change at the boundary between glacial sedimentary units 1 and 2 due to a tremendous change of the porosity value. Unit 2 is interpreted as an overcompacted unit resulting from several erosion and ice-loading events. Below 300 mbsf, several thin (3m) porous and permeable layers at poor recovery intervals correspond to sand or gravel lithology (black arrow).

ODP SITE SURVEY DATABANK REPORT

The JOIDES/ODP Databank received the following data between February 1, 1988 and April 30, 1988. For additional information on the ODP Databank, please contact Carl Brenner at Lamont-Doherty Geological Observatory, Columbia University, Palisades, NY 10964.

- From J.Curray, SIO: First set of seismic profiles collected during CONRAD 2705 ODP site survey, North Ninetyeast Ridge.
- From E.Silver, UCSC: Additional seismic profiles documenting proposed Banda Sea drill sites.
- From K.Lighty, ODP/TAMU: Digital tape of navigation merged with underway geophysics, ODP Legs 111-113.
- From K.Hinz, BGR: Selected MCS profiles documenting proposed Sulu Sea drill sites.
- From N.Driscoll and J.Weissel, LDGO: Processed MCS profiles from CONRAD 2708 documenting proposed Leg 121 Broken Ridge drill sites; bathymetry, structure and isopach maps, also from Broken Ridge area.

ODP ENGINEERING/OPERATIONS REPORT

The Leg 118 assembly and deployment of the hard-rock guidebase was accomplished in 1.5 days versus the 3.0 days required during Leg 106. After the initial Leg 118 HRB assembly, ODP's Engineering/Operations staff made several modifications that not only saved ship time but also made the entire operation safer. We may be able to further reduce the assembly time of the HRB in the moonpool prior to deployment.

ODP's engineers currently envision an HRB that will be essentially a standard reentry cone converted to an HRB by the assembly of four corner boxed segments. Although that development is only in embryonic stages, it would mean that in the future a separate HRB would not need to be built when drilling is planned for a bare-rock location. Also, this HRB would be much smaller and therefore a more economical structure. The Colmek TV system has proven that the size of the structure on the seafloor is not as critical to easy reentry as once thought.

PLANNING COMMITTEE REPORT

The Planning Committee met 19-22 April 1988 in College Station, Texas. An update on Western Pacific Planning, a preliminary view of Central and Eastern Pacific planning, as well as directions for long-term ODP planning appear separately in this issue. Other highlights of the meeting are summarized below.

FY89-92 PROGRAM PLAN AND BUDGET

A four-year ODP Program Plan will be ready for the May EXCOM meeting and will be presented to the U.S. Science Board in August. For this report, the Budget Committee (BCOM) made recommendations which have exceeded the NSF target figures for FY91 and 92 by 2.6% each year. An increase in the international partner contribution may be necessary to achieve BCOM's recommendations. The NSF target budgets supplied to JOI, Inc. are: $36 M for FY89, $38.M for FY90, $39 M for FY91 and $40 M for FY92.

For the FY89 budget, PCOM made recommendations for approximately $335K of uncommitted Special Operation Expenses (SOE) for the following priority projects: rental of the diamond coring system for Leg 124E ($290K) and a VAX enhancement for processing the new formation microscanner data ($45K).

LEG 124E

TAMU engineers presented an update on plans for the engineering development leg, currently scheduled to begin in January of 1989. Shallow water testing of the high-speed diamond coring system, as well as Navi-drill, XCB, and pressure core sampler are planned, among other tests. In addition, a dedicated hole for testing logging tools will be drilled.

PCOM recommended that 35 days be scheduled for Leg 124E. PCOM asked that adequate time be set aside for testing techniques to improve recovery in alternating hard/soft sequences in a deep water setting. PCOM recommended that this test be carried out by reoccupying DSDP Site 452A in the westernmost Mariana Basin, or an equivalent site, as chert sequences were drilled there. PCOM recognized the initiative shown by the TAMU engineering group on the mining-type diamond coring system, and supports this potentially important development for ODP.

Staffing for Leg 124E will include a scientific advisory party of 4 to 6 members to work with the engineering crew. ODP is looking for scientists with prior shipboard experience (especially with ODP) to describe core and core physical properties. A detailed prospectus of Leg 124E will be presented to PCOM at its August meeting.

JOIDES ADVISORY STRUCTURE CHANGES

At the December PCOM meeting, a subcommittee of PCOM members and R.Heath (EXCOM) met to outline a JOIDES advisory structure that would be more responsive to thematic rather than regional drilling.

M.Langseth, subcommittee member, presented the subcommittee's findings at this meeting. The group recommended that the new structure should be:

1) responsive to COSOD I...n;
2) accomplish thematic objectives;
3) offer fair treatment of proposals;
4) accomplish long-range planning (10 years); and
5) provide the best technical advice for PCOM.

The proposed structure includes four thematic panels, with SOHP being split into a diagenesis and sediment processes panel and a paleoenvironment and biological evolution panel. An additional technical panel for shipboard measurements is recommended as well as better liaison between site survey and safety panels.

Also recommended are detailed planning groups, ad hoc finite-lifetime panels appointed by PCOM. These groups would develop short-term schedules and would supercede the current regional panels. The recent East Pacific Rise Working

Group was recognized as a possible model of how these detailed planning groups would function.

PCOM accepted the recommendations of the subcommittee as a framework for developing a new panel structure. PCOM members were assigned to revise mandates for those panels affected by the proposed changes: Sediment Processes and Diagenesis (M.Kastner, A.Taira); Ocean Paleoenvironment/ Biology (G.Brass., S.Gartner); Tectonics Panel (D.Cowan, B.Tucholke); Lithosphere Panel (J.Malpas, T.Francis); and Shipboard Measurements Panel (M.Langseth, M.Leinen). These mandates and further recommendations for JOIDES panel structure will be discussed at the August PCOM meeting.

COSOD II REVIEW

X.LePichon, COSOD II Steering Committee Chairman, was an invited guest to this PCOM meeting. LePichon reviewed his impressions of the COSOD II conference and report, which included the following:

* The twenty years of success of ocean drilling, based on sound management and extension to the international community, may be jeopardized without evidence of continued progress.

* Need to involve Lesser Developed Countries in ODP - how to include the scientific contributions of countries not able to join ODP.

* Need to open the program to new scientific constituencies such as global seismic networks and global change programs.

* Need for new technologies as stated in the COSOD II chapter on technology.

* Need to make ODP an experiment-oriented program.

LePichon advocated setting up short-lived working groups to design drilling experiments and have more outside review of them. He recommended that before 1992, ODP should develop a technology outline, possibly funded by a separate budget, and identify one experiment (e.g EPR) which demonstrates that the program is moving into a new mode.

PCOM's extensive discussions of the impact of COSOD II resulted in a summary document which pointed to some potential conflicts in the COSOD II recommendations which must be balanced through the planning process.

The summary noted that one of the strengths of the drilling program is that it provides an important facility for a wide range of ocean research. COSOD II has recommended that specific drilling experiments (such as drilling hydrothermal systems on an unsedimented ridge) be identified and a specific amount of drilling effort be assigned. While completing important specific experiments is desirable, to concentrate significant drilling or engineering efforts to any one experiment has the potential of reducing the number of constituencies interested in ocean drilling. Also, to plan around experiments requires a significant amount of lead time to define the drilling experiment, fund and plan cruises for supporting geophysical data, outline requests for proposals and advertise these to the community.

An example of how an experimentally-oriented program might work is the planned East Pacific Rise drilling, an important COSOD I, COSOD II and JOIDES drilling target on an unsedimented ocean ridge. To implement an EPR drilling program, JOIDES has supported, within a very limited engineering budget, development and testing of mining-type coring systems for drilling in this environment. Dedicated technology development legs like 124E will further this goal.

In recognition of LePichon's leadership in organizing COSOD II and for the European Science Foundation's role in coordinating the conference and final report, PCOM unanimously passed the following motion:

> The JOIDES Planning Committee expressed its thanks to those responsible for the success of the Second Conference on Scientific Ocean Drilling and, in particular, for the energetic leadership of Xavier LePichon, its Chairman. We are also very grateful to the

European Science Foundation for the publication of the report. The Planning Committee, in constructing its long-range plans, will rely on the guidance and advice so ably presented in the COSOD II report.

OTHER PCOM ACTIONS

* PCOM agreed that for APC/XCB holes planned deeper than 750m, TAMU and L-DGO will schedule time for two-stage logging. This will ensure that logs are obtained from the upper 750m interval if hole conditions deteriorate in deeper section.

* PCOM commended DMP on its first draft of policies for use of third-party tools in ODP. These tools include downhole instruments under development such as GEOPROPS as well as those already used routinely by ODP such as the USGS magnetic susceptibility tool.

* The East Pacific Rise Working Group (with slightly changed membership) will meet once more to discuss strategies for sedimented ridge crest drilling. A new working group on accretionary prisms will be established by the August PCOM meeting, with membership drawn from PCOM suggestions and members of JOIDES panels.

During Leg 120 operations at Site 749, ODP Operations Superintendent, Lamar Hayes, suffered a heart attack and died at sea. The JOIDES Planning Committee acknowledged its debt to Lamar for his dedication to the Ocean Drilling Program and its sympathy to Lamar's family and friends. The PCOM motion below was written by Roger Larson, and affirmed by the entire Planning Committee:

> The JOIDES Planning Committee acknowledges the debt and gratitude that the scientific ocean drilling community owes to ODP Operations Superintendent, Lamar Hayes, who died at sea aboard the JOIDES RESOLUTION on March 27, 1988. Lamar first joined the Deep Sea Drilling Project in August, 1970, and sailed with many of us on Glomar Challenger between Legs 18 and 35, and more recently on the JOIDES RESOLUTION. From his earliest days with DSDP, Lamar served as a leader, teacher, mediator and father to those around him. For those of us who do science at sea in what is often a hostile and unforgiving environment, the presence of even one of these personages for advice and console is a rare and welcome sight. These memories of Lamar form the basis of our gratitude. The debt we owe him is to continue our conduct of the Ocean Drilling Program in a manner befitting of that memory. Whether grappling with complex planning decisions in committee or with a difficult and remote site at sea, we should seek to bring to bear all of the technical and scientific expertise, coupled with the sensitivity and good humor, that Lamar always brought to the job.

EXECUTIVE COMMITTEE REPORT

The JOIDES Executive Committee met in Washington, DC on 25-26 May 1988. A joint meeting with the ODP Council was held the first day and a half, chaired by D.Heinrichs (NSF) and Douglas Caldwell (EXCOM Chairman), followed by a half-day session for EXCOM business. Separate JOI Board of Governors and ODP Council sessions were held on 27 May. Highlights of the joint meeting and EXCOM business session appear below.

LONG-RANGE PLANNING

EXCOM accepted the NSF charge for a post-1993 ODP long-range planning document, which will encompass about 10 years of planning. EXCOM agreed that the plan should:

1) Be founded on a description of current ODP achievements and those expected by 1993; include possible "practical spin-offs" (e.g. technology developments); and identify the COSOD II objectives which have been achieved thus far.
2) Address scientific recommendations/priorities of COSOD II.
3) Address additional (non COSOD II) objectives.
4) Address technical/logistical constraints.
5) Identify priorities, implementation schedule and budget requirements.
6) Indicate earliest significant budget impact in the 1993 time frame.

EXCOM requested that the document also include:

1) An outline of scientific objectives at different levels of effort: a) "steady-state" program; b) program with moderate increase (10%); and c) program with significant increase of about 50% as outlined by COSOD II.

2) After scientific priorities are defined, discuss technologies needed for the program, including the use of alternate platforms.

JOIDES ADVISORY STRUCTURE

EXCOM approved, in principle, the changes to the JOIDES advisory structure as recommended by the JOIDES Subcommittee for review of the panel structure (see PCOM report this issue for details). EXCOM emphasized the need for the *ad hoc* Detailed Planning Groups to act as regional as well as thematic planning groups. EXCOM supported the inclusion of regional expertise on appropriate JOIDES panels and planning groups since regional panels, except those still actively planning for Pacific drilling, will be disbanded under the new structure.

ODP PROGRAM PLAN AND BUDGET

EXCOM reviewed the ODP Program Plan and Budget (for FY89-92), and heard reports from NSF, JOI, the ODP subcontractors, the PCOM Chairman and J.Briden (for the Budget Committee) on science planning and program budgeting. For FY89, BCOM recommended that part of the 4% Special Operating Expenses (SOE), previously set aside for technology development and special purchases, be used to cover a considerable portion of ODP's standard operating expenses. At BCOM's recommendation, EXCOM reaffirmed the priority of maintaining the 4% SOE within the budget of ODP for future fiscal years. EXCOM approved the FY89 budget allocations as proposed by BCOM and also approved the ODP FY89 Program Plan and Budget ($36M).

BCOM's budget recommendations for FY91 and FY92 exceeded the NSF target figures in order to achieve the scientific objectives outlined in the extended four-year program plan. For FY91 and FY92, BCOM has recommended budgets of $40M and $42M respectively, whereas NSF targets for those years are $39M and $40M. EXCOM endorsed BCOM's budget projections of funds necessary to maintain a constant level of effort for ODP through 1992 and requested that NSF reconsider its budget projections accordingly.

LESSER DEVELOPED COUNTRIES IN ODP

The Subcommittee (Baker, Duerbaum and Stel) for advising EXCOM on ways to include scientists from Lesser Developed Countries (LDCs) formulated a plan, which recommended a $50K per annum funding level, to support two LDC scientists a year for shipboard or shorebased work. Although EXCOM was supportive of including these scientists, funding such a program was deferred. EXCOM has asked that current participation in ODP by LDC scientists be documented and other sources of funding explored since monies for technology development are critical for the next few years of ODP science.

The Executive Committee will meet next in Edinburgh, Scotland, UK on 13-15 September 1988.

COSOD II FINAL REPORT AVAILABLE

The Report of the Second Conference on Scientific Ocean Drilling (COSOD II) is now available. The prime objective of the Conference, held 6-8 July 1987 in Strasbourg, was to make recommendations for future scientific and technological objectives for the Ocean Drilling Program. Copies can be ordered from the following offices:

Canada

Dr. William Collins
Canadian ODP Secretariat
Centre for Earth Resources Research
Memorial University
St. Johns, Newfoundland A1B 3X5

Federal Republic of Germany

Dr.Hans J.Duerbaum
Bundesanstalt fur Geowissenschaften und Rohstoffe
Postfach 510153
D-3000 Hannover 51

France

Mme.Martine Cheminee
Universite Pierre et Marie Curie
4 Place Jussieu (Tour 26)
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Japan

Dr.Takahisa Nemoto
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United Kingdom

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USA and Latin America

Ms. Robin Smith
Joint Oceanographic Institutions, Inc.
1755 Massachusetts Ave., NW
Suite 800
Washington, DC 20036

All Other Countries

Dr.G.Bernard Munsch
European Science Foundation
1 Quai Lezay-Marnesia
F-67000 Strasbourg, France

UPDATED WESTERN PACIFIC SCIENCE PLAN

In the last two issues of the JOIDES Journal a tentative science plan for drilling in the Western Pacific was presented. Below is an update of this plan, based on the results of the PCOM meeting held in April 1988. See the JOIDES Resolution Operations Schedule (p.2) for leg dates and ports of call.

FY89 DRILLING PROGRAMS

For FY89, programs have been scheduled in the following order to improve weather windows and provide additional time for developing the Nankai Trough drilling program.

1. Southeast Asia Basins
2. Engineering Leg in Philippine Sea
3. Bonins-Marianas
4. Bonin II
5. Japan Sea I
6. Japan Sea II

LEG 124: SOUTHEAST ASIA BASINS

Leg 124 has been extended to 60 days in order to reach the prime objective of drilling basement in the SE Asia basins region (Banda-Sulu-Celebes and South China Sea area).

Due to additional site survey data in the Banda area and clearance aspects of the SCS basin, planned sites have been modified (Table 1). The first three are the primary sites, with SUL-4 and SCS-10 as alternate sites.

LEG 124E: ENGINEERING DEVELOPMENT LEG

See PCOM report (p.35) for details on the 35-day engineering test leg in the Philippines Sea/Mariana Basin area.

LEG 125: BONIN AND MARIANA DIAPIRS

Two sites are planned on Conical Seamount (MAR-3 and MAR-3A) plus two sites of the Bonin transect (BON-6 and BON-7). A 56-day leg is planned, with 21 operational days set aside for completion of Site BON-6.

LEG 126: BONIN TRANSECT

Four sites are planned (BON-1, BON-2, BON-5 and BON-5A) which will complete the Bonin arc transect begun on Leg 125. Additional site survey information on possible high temperatures at Site BON-1 must be reviewed. A 56-day leg is planned.

LEG 127: JAPAN SEA I

No changes have been made to this 54-day program. Due to potential safety problems at Site J1D, an early safety review by PPSP has been advised.

LEG 128: JAPAN SEA II

Drilling of Sites J2A and JS2 is scheduled for 30 days. The drilling plan recommended by WPAC calls for a return to Site J-1B (Leg 127) to deploy a Japanese downhole seismometer experiment.

FY90 DRILLING PROGRAMS

For FY90 the following programs are being reviewed. (Note: In order to develop the FY90 Program Plan, PCOM will outline a firm drilling plan at its December 1988 meeting):

- Nankai Trough (scheduled as Leg 129)
- Geochemical Reference Program
- NE Australian Margin
- Vanuatu Collision Processes
- Lau/Tonga Back-arc Basin

Leg 129: Nankai Trough

This 60-day leg has been rescheduled for October 1989 to better avoid the typhoon season. An extensive logging and downhole measurement program of about 10 days has been defined including the GEOPROPS tool, if it is available in time.

Additional geotechnical/hydrogeological programs for Nankai have not been scheduled at this time. TECP and SOHP are to review proposals on fluids and accretionary prism problems, including those for Nankai. A working group has been suggested to review these and other accretionary prism problems (e.g., Cascadia Margin) to suggest an optimal drilling strategy.

Geochemical Reference Program

These programs seek to understand the geochemistry of volcanic arc magmas in relation to subducting sediments and crustal rocks. PCOM and TECP have reviewed possible combinations of reference hole programs with M-series dating and pre-70 MA plate motion studies for the Central and Eastern Pacific programs as well. Several sites have been suggested by LITHP and/or TECP for Western Pacific drilling (Table 2) but are still under consideration by PCOM. A first-look effort for these studies will require 1.5 to 2 legs.

Additional FY90 Programs

No appreciable changes have been made to the NE Australia Margin, Vanuatu, or Lau Basin programs. Due to a lack of JOIDES thematic panel support, the South China Sea Margin program is no longer scheduled for the Western Pacific drilling program.

Site	Location	Water Depth	Penetration	Basement	Comments
BNDA-2	4.9°S/124.9°E	4800	>800	20	Stratigraphy, bsmt. age
CS-1	4.7°S/123.5°E	4900	750	50	Stratigraphy, bsmt. age
SUL-5 (or equiv)		4600	1060	50	Stratigraphy, bsmt. age
SUL-4 (or equiv)		3300?			Paleoceanography
SCS-10 (equiv of SCS-9, but moved slightly eastward)					

Table 1. Proposed Drill Sites for Leg 124

Site	Location	Water Depth	Penetration	Basement	Target
LITHP					
MAR-4	18°N/149°E	5500	600?	100	Near 452
MAR-5	19°N/149°E	5500	900?	100	Flank Seamount
MAR-6	(see above)	?	200?	100?	Summit Seamount
A2-2	32.9°N/145.6°E	5750	900	200(min)	Anomaly M-18
JJ-5	17.2°N/158.5°E	5675	1050	500	Jurassic Quiet Zone
TECP					
A2-1	32.6°N/144.7°E	5725	925	500	Anomaly M-18
A2-3	33.2°N/146.7°E	5825	975	500	Anomaly M-18
JJ-5	17.2°N/158.5°E	5675	1050	500	Jurassic Quiet Zone
JJ-3	20.5°N/153.4°E	5650	1050	500	Jurassic Anomaly M-38

Table 2. Recommended Sites for Geochemical Reference Program

PRELIMINARY CENTRAL & EASTERN PACIFIC SCIENCE PLAN

BACKGROUND

The JOIDES Planning Committee has recommended approximately eighteen months of drilling in the Central and Eastern Pacific Ocean. Several factors impacted the planning of a drilling campaign in this region:

* Some CEPAC programs, (East Pacific Rise and 504B) require multiple legs and evaluation of drilling and engineering results between drilling efforts.

* Some lithosphere objectives can be scheduled best in the CEPAC area and must be balanced against tectonics objectives, which are heavily represented in the WPAC program.

* Post-1992 plans for the drillship must be decided upon no later than the December, 1988 PCOM meeting.

PCOM had previously reviewed the first CEPAC prospectus in which the six top priority programs of the thematic panels were outlined. Approximately 18 months of drilling plans were drawn up by PCOM, with an attempt to balance thematic objectives in the area. The tentative program appears in Table 1 along with relevant proposals. PCOM assigned watchdogs to monitor each of these programs.

This tentative program was sent back to the thematic panels for additional input and the Central and Eastern Pacific Panel was asked to develop it in a second prospectus. The CEPAC programs listed in the abstract below will be used to further develop a drilling plan and schedule for the area. As was done for the Western Pacific drilling schedule, adequate back-up programs will be carried through the planning stages in case site survey, safety or clearances deficiencies impact any program.

PCOM REVIEW OF CEPAC PROGRAM

At the April PCOM meeting, PCOM reviewed the responses of the thematic panels to the tentative program. Each panel identified core programs for priority drilling (Table 2) and presented by the PCOM liaisons to those panels. The PCOM watchdogs for specific CEPAC programs also reviewed the scientific objectives and potential problems with these programs. In discussions on these core programs, PCOM concerns included:

* Note of LITHP's suggestion to spend one-half leg for engineering efforts to condition the hole and test recovery at 504B to see if continued drilling there is advisable.

* Request to LITHP to re-evaluate objectives for hotspot drilling at Loihi (can they be accomplished through dredging and land-based studies?) and whether these objectives can be combined with other atoll/guyot drilling. Therefore, the plans for atoll drilling relating to global sea level response should be carefully reviewed.

* Positive response to the Neogene paleoceanographic transects, but a recognition that Mesozoic paleo-oceanographic objectives should not be overlooked since climate dynamics varied greatly during the Mesozoic.

* Biostratigraphic resolution for the lithospheric flexure program must still be demonstrated.

* Scheduling drilling at accretionary prisms such as the Cascadia Margin may depend on the results from the WPAC Nankai Program. The proposed working group on accretionary prisms may help to further define these programs' objectives.

* TECP themes such as M-series dating and drilling pre-70 Ma crust overlap with other thematic programs for CEPAC (e.g., geochemical reference holes).

PRELIMINARY CEPAC PROSPECTUS

At its March 1988 meeting, the Central and Eastern Pacific Panel met to review the thematic priorities

<u>LITHP Thematic Priorities for the Central and Eastern Pacific</u>

1. Structure of Lower Oceanic Crust
2. Magmatic & Hydrothermal Processes at Sediment-free Ridge Crests
3. Magmatic & Hydrothermal Processes at Sedimented Ridge Crests
4. Early Magmatic Evolution of Hot-Spot Volcanism
5. Crustal Structure and Magmatic Evolution of Oceanic Plateaus
6. Composition & Magnetization of Old Pacific Crust

<u>SOHP Thematic Priorities for the Central and Eastern Pacific</u>

1. Neogene Paleoenvironment (high-resolution history)
2. Mesozoic-Paleogene Paleoceanography (high and low latitudes)
3. Atolls & Guyots (sea level and subsidence history)
4. Anoxic Events (Cretaceous)
5. Old Pacific Crust (Cretaceous open ocean)
6. Metallogenesis & Diagenesis
7. Fans & Sedimentary Processes

<u>TECP Thematic Priorities for the Central and Eastern Pacific</u>

* M-Series Dating/Calibration of Anomalies in Old Oceanic Crust
* Flexure of Oceanic Lithosphere
* Ridge Trench Interaction
* Pre-70 MA Absolute Plate Motion
* Deformation in Accretionary Prisms

Table 1. Top thematic panel drilling priorities for the Central & Eastern Pacific Ocean as forwarded to the December 1987 Planning Committee meeting. All but TECP themes are in priority order

forwarded by the three thematic panels. CEPAC will meet again 18-19 July 1988 to refine the prospectus and respond to PCOM's final instructions for the document.

Chairman D.Rea assigned CEPAC members to act as watchdogs for thematic drilling priorities, review proposals relating to them, contact proponents if additional site information is needed, and identify technological needs for the programs. CEPAC also identified those programs responsive to COSOD II recommendations.

Below, by thematic program, is an abstract of the current CEPAC prospectus. A detailed drilling prospectus will be available in late summer of 1988. Further information on CEPAC developments will appear in the October 1988 JOIDES Journal.

Fast-spreading Ridge Crests, East Pacific Rise

Drilling at the crest of the East Pacific Rise, where sea-floor spreading is rapid and hydrothermal activity is very active, is proposed to address crustal generation and hydrothermal processes. These questions include the nature of the axial magma chamber as defined by its strong seismic reflector, alteration of crust by hydrothermal processes, composition and relative emplacement chronology of young oceanic crust, "ground-truthing" intra-crustal seismic reflectors, and allowing placement of in-situ, long-term monitoring devices. Details of the EPR program are being prepared by the EPR working group of LITHP.

This program is among the highest priority objectives of LITHP and COSOD II, Working Group III.

Young Hotspot Volcanism

The purpose of this drilling program is to establish the nature of the early eruptive products of hotspot volcanos . This information is needed to test a variety of hypotheses regarding the mantle sources of hot spot volcanos as well as fundamental aspects of their origin and evolution. Currently these questions may be best approached at Loihi seamount off Hawaii, whose youth and modest size make it an inviting target. Drilling here will help elucidate thermal and chemical interaction between the asthenosphere and lithosphere during incipient volcanism, magma ascent mechanics and eruption dynamics, and, a bonus at Loihi , a shallow hydrothermal system where boiling occurs.

This program is among the high priority objectives of LITHP and COSOD II, Working Group II.

Lower Oceanic Crust, Penetration of Layer 3

The lithologic and petrologic interpretation of oceanic layer 3 is based almost entirely on indirect evidence. The single best opportunity to penetrate through the sheeted dike layer and sample the underlying material is at Site 504B, drilled during ODP Legs 106 and 109. VSP data suggest that the transition from dikes to gabbros occurs a few hundred meters below the present TD. This location is remarkably well-documented , but will require some site preparation to deviate around the junk in the hole and repair some casing.

Penetration of layer 3 has always been the top priority of LITHP and more recently, of COSOD I, Working Group II.

M-series Dating Geochemical Reference Holes

It is possible to combine several objectives of CEPAC drilling into one package with the goal of determining the maximum amount of information about a very old portion of the Pacific Ocean. The goal of this program is to determine the stratigraphic and paleoceanographic record of the upper Jurassic and early Cretaceous global ocean, the chronology and importance of Cretaceous off-axis volcanism, the nature and composition of the oldest basaltic basement, and the age and paleolatitude of the crust. Significant crustal penetration, along with the supra-crustal sediments, will allow the formulation of the input portions of subduction zone geochemical mass balances.

LITHP

A core program has been defined covering four themes with approximately 6.5 legs required for drilling:

Deep Crustal Drilling:	Deepen 504B	1.5 legs
Magmatic/hydrothermal processes at fast-spreading, sediment free ridge crests:	EPR	2 legs
Magmatic/hydrothermal processes at sedimented ridge crests:	JdF/Escanaba	2 legs
Young hot spot volcanism:	Loihi	1 leg

4 hard-rock guidebases will be required for CEPAC drilling (including engineering test legs).

SOHP

The following is a minimum CEPAC program covering SOHP's four top-ranked themes. Approximately 4.5 legs are required.

Neogene paleoceanography (at least three transects required):

a. W-Equatorial transect	proposal 142/E
b. E-Equatorial transect	proposal 221/E
c. N-Pacific transect	Sites Meiji 1 and 2 (259/E) NW-1, 3 and 4 (199/E) PM-1A (247/E)
Mesozoic-Paleogene paleoceanography & sea level atolls and guyots:	Sites OS-3 (260/D) Allison, Menard, Wilde Guyots (203/E) Sylvania, Harrie Guyots (202/E) Enewetak (202/E) (SHAT-1 and SHAT-3, see below)
Anoxic events:	Sites SHAT-1 and SHAT-3 (253/E)

TECP

Top-ranked TECP themes for inclusion in a CEPAC drilling program:

1. M-Series Dating (combined with Geochemical Reference Sites)
2. Lithosphere Flexure (Hawaiian moat preferred)
3. Ridge-trench Interaction (Chile T-junction)
4. Pre-70 MA Plate Motions (combined with Geochemical Reference Sites)
5. Deformation in Accretionary Prisms (Oregon margin)

Table 2. Thematic panel priorities for CEPAC drilling as presented at the April 1988 Planning Committee meeting.

This program is a high priority of all thematic panels and of COSOD II, Working Groups I and V.

Ridge-trench Interactions

The interaction of spreading centers and subduction zones has determined the character of the edges of continents throughout the history of the Pacific Basin. This program will determine the important effects of this interaction at a site of ongoing collision, the Chile Ridge-Trench-Trench triple junction. Drilling will investigate: the nature and extent of rapid vertical motions near the triple junction, the elevated thermal gradients and associated metamorphism, anomalous near-trench volcanism, and tectonic erosion of the trench slope. Recent surveys assure high-quality MCS and Seabeam data for choosing the final sites.

This program has remained among the highest priorities of TECP and is also of interest to COSOD II Working Group IV.

Sediment-covered Ridge Crests

Drilling on the axis of spreading centers where sediments cover and seal the hydrothermal circulation cells will allow investigation of: the nature of high-temperature fluids in zero- age crust and the overlying sediment column, how sediment cover influences fluid circulation and chemistry, thermally-induced diagenesis of organic and inorganic sedimentary materials , and questions of metallogenesis and sulfide emplacement. The hot, altered basaltic crust beneath the sediments should be much more readily drillable than basalts at bare-rock locations elsewhere. Open boreholes are natural sites for long-term monitoring devices. Several good regions for this drilling program exist in the Gorda-Juan de Fuca region. Final proposals may await efforts by a LITHP working group on sedimented ridges. The data base for this program is exceptional.

This program has always been among the highest priorities of LITHP and is an important goal of COSOD II, Working Group III.

Accretionary Processes at the Cascadia Margin

Several processes important to our understanding of accretionary margins can be examined along the Cascadia convergent plate boundary. Drilling offshore from Vancouver Island and from Oregon should reveal the physical and geochemical aspects of prism deformation and of materials transported landward below the main decollement. The transport paths of fluids as they escape from actively dewatering subduction complexes can be investigated. It is possible to tie some drillsites to deep continental reflection profiles, extending them seaward across the entire convergent plate boundary. Subsequent monitoring of these boreholes will permit long-term study of this potentially high-risk seismic zone.

This program is among the high priorities of TECP and COSOD II Working Groups III and IV. The dewatering aspects have been endorsed by SOHP.

Western Equatorial Pacific Depth Transect

This program will permit detailed analyses to determine the paleoceanography of past western Pacific deep water masses and their influence on the preservation of calcareous sediments. Various questions to be pursued by this program include the dating and oceanic nature of seismic reflectors, variability of vertical gradients within past water masses, the response of the Pacific water masses to the changing Cenozoic environment, especially the changing configuration of oceanic gateways and the build-up of ice in polar regions. This program is sited on the Ontong-Java Plateau which has migrated from higher southern latitudes to its present site, so older sediments will provide a history of southern hemisphere paleoenvironment. A hole drilled into basement will reveal the age and nature of that material, not yet penetrated. This program will complete a series of equatorial depth transects, one in each ocean.

This program is a high priority of SOHP and of COSOD II Working Group I.

Basement objectives are included in the LITHP concern for the nature of oceanic plateaus and the TECP priority of determining pre-70 Ma plate motions. Depth transects are a high priority of COSOD II, Working Group I.

Eastern Equatorial Pacific Latitudinal Transect

This program will involve a detailed paleoceanographic study of the Neogene equatorial circulation patterns in the Eastern Pacific. Two transects, with sites at different depths as well as different latitudes, will resolve questions of: evolution of equatorial circulation through the middle and late Cenozoic, whether paleoclimatic changes are hemispherically symmetrical or asymmetrical, the nature of equatorial circulation when trans-Panamanian oceanographic interaction was unhindered, was becoming restricted and closed off, and the nature of orbital modulation of climate during different stages of Neogene polar ice volume increase. Aspects of sea-surface productivity, water-mass variability, and deep water dissolution will be important components of this program as is the ultimate comparison of this effort to similar ones in other oceans.

This program is a high priority of SOHP and of COSOD II, Working Group I with their emphasis on transects.

North Pacific Paleoceanographic Transects

This drilling program will generate high-resolution sedimentary records of past surface and bottom water processes in the high latitude of the North Pacific and determine how those processes relate to the prevailing climatic and tectonic regimes. Specific questions to be approached include:

1) how the North Pacific interacts with global circulation patterns;

2) when did Pacific Deep Water or Common Water first enter the region;

3) was the North Pacific a locus of deep water formation during the Cenozoic;

4) what is the Neogene record of surface circulation and how does it change with polar cooling;

5) what are the details of the Miocene calcareous to siliceous shift in biological productivity and the ancillary increasing provinciality of life forms; and

6) the use of the terrigenous component to link oceanic records to those eolian, hemipelagic and ice-rafting records of continental climate.

Many North Pacific sites can be located to reveal aspects of pre-70 Ma plate configurations.

This program is a high priority of SOHP and of COSOD II Working Groups I and V; the paleoplate aspect is a high priority of TECP.

Flexure of the Lithosphere

This program will investigate the rheology of oceanic lithosphere by determining its flexural response to the application of a known load. Volcanic island chains provide huge loads that cause adjacent depressions (moats) and peripheral rises (arches). Further, lithospheric reheating and possibly thinning occurs. This program will resolve the details of the loading history and the flexural response to it in a region that is geophysically very well constrained.

This program has always been among the highest priorities of TECP and now of COSOD II Working Group IV.

Vertical Motions of Carbonate Banks and Sea Level History

The stratigraphy, age, and diagenetic history of atolls and guyots and their archipelagic aprons, when combined with information on the depth, age and paleolatitude of the underlying volcanic edifice, will allow us to analyze the Paleogene and Cretaceous paleoceanography of the southwestern Pacific, the history of seamount subsidence and of changes in sea level over a wide region. We will approach questions of why atolls drown and establish independent sea level determinations away from the ambiguities of passive margin seismic stratigraphy.

This program is a high priority of SOHP, and COSOD II Working Group I. The nature of the volcanic edifices is of interest to LITHP and the paleo-location data are among the priorities of TECP.

Anoxic Events in the Mesozoic Global Ocean

The intent of this program is to define the time-stratigraphic distribution of Cretaceous and Jurassic organic-carbon rich strata in the low latitudes of the very large, pelagic Pacific Ocean. Drilling a depth transect on Shatsky Rise will allow determination of vertical water-mass relationships of these black layers, their dating will permit determination of their synchroneity (or non-synchroneity) with better known occurrences in the marginal seas of the proto-Atlantic. The composition, age and paleolatitude of the basement material will be determined by drilling into basement at least one of these sites.

This program is of high priority to SOHP and to COSOD II Working Group I. The nature of plateau basement is of interest to LITHP and age and paleo-latitude information is important to TECP.

Bering Sea Paleoenvironment

High latitude paleoceanography is a primary goal of this program. The Mesozoic age of the floor of the Bering Sea provides an opportunity to sample the highest-latitude paleo-locations in the entire North Pacific, to understand the nature of the Cretaceous warm interval in the northern hemisphere, the areal extent of anoxic conditions, and the evolution of sub-polar climates. Additionally, there is an opportunity to achieve a high-resolution record of the Neogene paleoclimatology of the Bering Sea. Those records will allow resolution of the details of high-latitude evolution of sedimentation patterns and of the organisms contributing to the sediments. Hemipelagic and ice-rafted materials provide a direct link to continental climates of northwestern North America. The age and paleolatitude information of the Sounder Ridge site will allow differentiation between the two hypotheses for the evolution of north Pacific plate configurations and the origin of the Bering Sea proper.

This program is a priority of SOHP, and the pre-70 Ma plate motion aspects are among the highest priorities of TECP. High-latitude drilling was among the recommendations of COSOD II, Working Groups I and V.

LONG-RANGE PLANNING FOR ODP

INTRODUCTION

Both the JOIDES Science Advisory Structure and the scientific direction of ODP are currently under intense review by the JOIDES community. The timing for such review is appropriate because:

1) A change in the mandate of PCOM requires science planning four years in advance of the JOIDES Resolution;

2) A four-year ODP Program Plan and Budget is now necessary for NSF funding and U.S. Science Board review;

3) The JOIDES thematic panels are taking leadership in directing ODP away from "reconnaissance" drilling and toward thematic drilling;

4) COSOD II has provided a scientific blueprint for the 1990s, with an emphasis on increased technology effort;

5) International Memoranda of Understanding will be renewed in 1992 and funding agencies are examining continued commitments to ODP; and

6) The JOIDES Resolution will have completed a circumnavigation from the Atlantic to the Central and Eastern Pacific Ocean by 1992, and plans for future campaigns must be advertised to the community.

Consequently, NSF has requested that JOIDES provide a long-range planning document to outline the implementation of priority scientific objectives for the Ocean Drilling Program for 1993 and beyond.

PCOM recently discussed two important aspects of long-range planning:

1) How to define the scientific goals of ODP, and
2) How to refine the panel structure so that a ODP is responsive to COSOD input, accomplishes thematic objectives yet remains proposal-driven, treats these proposals objectively, and accomplishes long-range scientific and technical planning.

SCIENTIFIC GOALS OF ODP

The Planning Committee's mandate makes provisions that PCOM regularly convene conferences, attended by a broad representation of the geoscience community, for developing a long-range planning framework for ODP. The most recent of these, the second Conference on Scientific Ocean Drilling (COSOD II) was held in July, 1987, and the report has been distributed.

The challenge for PCOM is to take the scientific direction from COSOD and translate it into an achievable drilling program. The implementation of these plans involves budget and logistics considerations as well as monitoring progress on essential technology development. COSOD II science represents a distillation of past drilling results, latest theory and newest technology into ambitious drilling experiments. The report outlines a long-term program for refining our knowledge of global systems. [See Planning Committee report in this issue for additional information on COSOD II.]

COSOD II, which provides a framework for viewing the earth as a set of intersecting circulation systems, will of course be a major contribution to long-range plans for ODP. PCOM discussions of COSOD II during the April meeting pointed to a number of overlaps in objectives, due in part to the organization of the COSOD II Working Groups (WG) themselves.

For instance, the scientific objectives of WG I (Global Environmental Changes) and WG V (Evolution and Extinction of Oceanic Biota) were seen as complementary; priority programs such as paleoceanographic transects can accomplish dual objectives. Similarly, the global stress mapping project (WG IV) can utilize holes drilled primarily for other lithospheric objectives in addition to strategically placed holes for measurement of specific stress regimes.

The COSOD II scientific objectives were divided by PCOM into generic sets of processes in an effort to overcome the somewhat artificial boundaries of the COSOD II Working Groups:

* Paleoceanographic Processes (e.g. paleoclimate, paleobiology, paleochemistry etc.)

* Processes at Ridge Crests (e.g. formation of oceanic crust, hydrothermal circulation)

* Processes at Convergent Margins (e.g. crust-mantle interactions, fluids in accretionary prisms)

* Processes at Passive Margins (e.g. tectonic processes on passive margins, sedimentation response to sea level)

* Intra-ocean Plate Processes (e.g. stress mapping, intraplate volcanism, geochemical mapping, complete crustal sections, alteration of the oceanic crust etc.)

These groupings were identified as a starting point for organizing the long-range planning document and are still being refined.

Long-range Planning Document

At the April 1988 PCOM meeting, NSF provided PCOM with the requirements for a long-range planning document which must be available for NSF review by early 1989. This document, which will cover post-1992 ODP activities, will be used to negotiate new Memoranda of Understanding and evaluate funding levels. [See the EXCOM report p.38 for a preliminary outline of the long-range document.]

The necessity of providing a long-range planning document gives JOIDES the opportunity to assess many of the fundamental directions of science planning for ODP.

Schedule for Long-range Plan

As part of the long-range planning process and production of a long-range document, the JOIDES thematic panels have been asked to draft "white papers" which detail global thematic problems. They will be the beginning of a JOIDES synthesis of the input to the Ocean Drilling Program and, along with COSOD II, define the drilling strategies to direct the program. The white papers will define the "state of intellectual maturity" of each program and how drilling adds to our fundamental understanding of global processes.

By August 1988, the thematic panels will have completed drafts of the white papers for distribution to the Planning Committee. These must include a long-range implementation plan, with potential areas for drilling and estimates of drilling effort required, including technological needs. Technical developments include drilling developments as well as those for downhole measurements and instrumentation. Brief outlines of the priorities identified by the thematic panels for their white papers appear in Table 1.

During the fall of 1988, the thematic panels will again meet and refine their white papers and implementation plans. Initial cost estimates for drilling and other technologies should be available from TAMU, LDGO and other sources. This is especially important because PCOM recognized that achieving COSOD II objectives would ideally require a 50% increase in the level of funding effort above the present levels after 1993, and a minimum acceptable level would require a 10% increase.

A first draft of the long-range plan is scheduled for completion in early November. It will contain PCOM's integration of the thematic panels' implementation plan into a coherent planning strategy. At its Annual Meeting in November, PCOM will consider the draft Long-Range Plan and prepare a final set of issues to send to the thematic panels. In winter of 1989, a final draft will be prepared after the thematic panels' meetings. Following one more PCOM review at the April 1989 meeting, the final draft of the Long-Range Plan will be presented to EXCOM and the ODP Council.

Lithosphere Panel White Paper

LITHP completed a White Paper (published in summary in JOIDES Journal, Vol. XIV, No. 2) prior to COSOD II. LITHP drilling priorities will be reevaluated in light of COSOD II recommendations, and with continued development of crustal drilling technology.

I. Long-term Drilling Priorities

- Deep crustal drilling into oceanic layer 3
- Establishing a suite of holes to investigate magmatic and hydrothermal processes at mid-ocean ridges

II. Shorter-term Drilling Objectives

Young oceanic rifts, a sedimented ridge crest, hydrothermal system, fracture zone, near-axis seamount and hotspot drilling, flexural moats, oceanic plateaus, old oceanic crust, and drilling intraoceanic convergent margin transects, including reference holes.

LITHP advocates a hybrid drilling strategy which would include these short-term (and currently more technically feasible) objectives, coupled with a parallel engineering development effort to achieve longer-term goals, as most productive for ODP.

Sediments and Ocean History White Paper

SOHP will meet during the summer of 1988 to expand this outline of global thematic priorities:

- Neogene Paleoceanography (short period changes including Arctic and Southern Oceans)
- History of sea level
- Longer period changes (pre-Neogene paleoenvironment)
- Paleo-upwelling and productivity
- Diagenesis and paleochemistry
- Depositional manifestations of continental uplift and erosion

Tectonics Panel White Paper

TECP will also meet during the summer of 1988 to complete their White Paper.

- Kinematics of present and past plate motion
- Dynamics of the lithosphere
    a. Interplate stresses and driving forces
    b. Plate boundary stresses and deformation
- Structure of deep crust and mantle
- Processes leading to development of rifted continental margins
- Processes at convergent plate boundaries

Table 1. Overview of JOIDES Thematic Panel White Papers

JOIDES ADVISORY STRUCTURE

As noted in the introduction, the second challenge for PCOM is to define a JOIDES panel and committee structure that is responsive to long-range scientific planning. The programs being forwarded by the current thematic panels and COSOD II cross the boundaries of regional ocean planning. New downhole developments and shipboard measurements will extend the information gained from ODP boreholes and core, and this expertise must be represented on the panels as well.

A JOIDES Subcommittee on the Advisory Structure has recommended a flow of science planning responsive to COSOD I, II and beyond which was endorsed by PCOM. For a comprehensive long-range plan, PCOM, along with the thematic panels, should identify major themes, regions which satisfy these themes, and needed technology. The Subcommittee recommended that long-range plan should be published widely to the scientific community.

Under the new structure (see PCOM report, this issue), the thematic panels are to review and respond to drilling proposals and integrate them into the long-range plan. Proposed detailed planning groups, in part a replacement to the current regional panels, will construct short-term drilling schedules, which will be evaluated by the thematic panels and forwarded to PCOM for final review.

At its August meeting, PCOM will begin to implement this revised panel structure. Recommendations for new panel mandates will be reviewed as well as recommendations for membership. A transition period will be necessary, especially for regional panels that are actively involved in planning (WPAC and CEPAC). PCOM has recently approved formation of working groups (accretionary prism drilling and sedimented ridge drilling) that will operate much like detailed planning groups, which may ease the transition to thematic and experiment-oriented drilling programs.

NEW DIRECTIONS FOR ODP

A comprehensive long-range document will aid decisions for future funding commitments for ODP. By examining in detail the many scientific and technological requirements of a COSOD II-responsive program, JOIDES has the opportunity to draft an exciting agenda for the future of ocean drilling.

With the introduction of new drilling techniques, wireline re-entry capabilites, downhole instrumentation, and process-oriented drilling experiments, the pioneering work of DSDP can continue with an ODP emphasis on global processes. DSDP's legacy was the confirmation of key tenets in the plate tectonics theory. ODP's contributions may well include an improved understanding of global system interactions, with studies that cross disciplines and involve a wider segment of the scientific community. The cooperation needed among JOIDES, JOI, Inc., the ODP science subcontractors, national funding agencies and the scientific community to produce a long-range planning document will hopefully reflect the broad support needed to implement ODP science beyond 1992.

PROPOSALS RECEIVED BY THE JOIDES OFFICE

Ref. No.	Theme/Area	Author(s)	Date Rec'd.
	ATLANTIC OCEAN		
1/A	Pre-mid Cret. History, SE Gulf of Mexico	(Phair & Buffler)	12/82
5/A	Struct. & Sed. Carbonate Platforms	(Mullins, et al)	7/83
6/A	Labrador Sea, Ocean Crust & Paleocean.	(Gradstein, et al)	5/84*
7/A	Gulf of Mexico & Yucatan	(Buffler, et al)	8/83
9/A	Pre-Messinian Hist. of Mediterranean	(Hsu, et al)	1/84
10/A	Cenozoic Circulation off NW Africa	(Sarnthein, et al)	4/85*
11/A	Porto & Virgo Seamounts, Iberian Margin	(Kidd, et al)	1/84
12/A	Tyrrhenian Back-arc Basin Transect	(Cita & Malinverno)	1/84
15/A	Formation of Atlantic Ocean	(Herbin)	1/84
16/A	Atlantic-Mediterranean Relationship	(Faugeres)	1/84
17/A	Gorringe Bank, Deep Crust & Mantle	(Mevel)	1/84
18/A	Off Galicia Bank	(Mauffret, et al)	6/84*
19/A	Eleuthera Fan, Bahamas	(Ravenne & Le Quellec)	1/84
20/A	Subduction Collision: Outer Hellenic Arc	(J.Mascle)	1/84
21/A	Thyrrenian Basin: Rift, Stretch, Accretion	(Rehault & Fabbri)	7/85*
22/A	Rhone Deep Sea Fan	(Bellaiche, et al)	1/84
23/A	Carribean Basins	(A.Mascle & Biju-Duval)	1/84
24/A	Barbados Transects	(A.Mascle & Biju-Duval)	1/84
32/A	Yucatan Basin	(Rosencrantz & Bowland)	1/84
33/A	Mediterranean Drilling [same as 9/A]	(Hsu)	
35/A	Barbados Ridge Accretionary Complex	(Westbrook)	2/84
36/A	Norwegian Sea	(Hinz & NOR-WG)	5/84*
38/A	Gulf of Mexico (DeSoto Canyon)	(Kennett & T.Moore)	2/84
39/A	Cape Verde Drilling	(Hill)	2/84
40/A	Logging Site 534 (Blake-Bahamas Basins)	(Sheridan, et al)	2/84
41/A	N Barbados Forearc: Struct. & Hydrology	(C.Moore)	3/84
45/A	Equatorian Atlantic: Paleoenvironment	(Ruddiman)	3/84
58/A	W Baffin Bay	(Grant & Jansen)	3/84
59/A	Cont. Margin Instability Testing	(Weaver & Kidd)	8/84*
60/A	Newfoundland Basin: E Canadian Margin	(Masson)	4/84
63/A	Madeira Abyssal Plain [idea proposal]	(Duin, et al)	6/84
64/A	Site NJ-6	(Poag)	6/84
68/A	Deep Basins of Mediterranean	(Montadert)	7/84
72/A	Two-leg Transect, Lesser Antilles Forearc	(Speed, et al)	7/84
74/A	Cont. Margin of Morocco, NW Africa	(Winterer & Hinz)	8/84
81/A	Ionian Sea Transect, Mediterranean	(Hieke & Makris)	9/84
85/A	Margin of Morocco, NW Africa	(Hayes, et al)	9/84
122/A	Kane Fracture Zone	(Karson)	12/84
125/A	Bare-rock Drilling, Mid-Atlantic Ridge	(Bryan, et al)	1/85
204/A	Florida Escarpment Transect	(Paull, et al)	10/86*
205/A	Bahamas: Carb. Fans, Escarp. Erosion, Roots	(Schlager, et al)	12/85
254/A	NW Africa: Black Shales in Pelagic Realm	(Parrish & Tucholke)	8/86
255/A	Black Shales in Gulf of Guinea	(Herbin & Zimmerman)	8/86
264/A	Montagnais Impact Struct., Scotia Shelf	(Grieve, et al/ Jansa & Pe-Piper)	12/86
276/A	Equatorial Atlantic Transform Margins	(J.Mascle)	4/87

Ref. No.	Theme/Area	Author(s)	Date Rec'd.
	INDIAN OCEAN		
30/B	Davie Ridge & Malagasy Margin	(Clocchiatti, et al)	8/85*
31/B	Red Sea, Paleoenvironmental History	(Guennoc)	1/84
44/B	Andaman Sea: Tectonic Evolution	(Peltzer, et al)	3/84
55/B	Makran Forearc, Pakistan	(Leggett)	3/84
56/B	Intraplate Deformation	(Weissel, et al)	10/84*
57/B	Deformation of African-Arabian Margin	(Stein)	10/84*
61/B	Madagscar & E Africa Conjugate Margins	(Coffin & Matthias)	10/84*
62/B	Davie Fracture Zone	(Coffin, et al)	12/84*
65/B	S Australian Margin: Magnetic Quiet Zone	(Mutter & Cande)	10/84*
77/B	Seychelles Bank & Amirante Trough	(Mart)	8/84
78/B	Indus Fan	(Kolla)	8/84
79/B	Tethyan Stratigraphy & Oceanic Crust	(Coffin & Chanell)	10/84*
86/B	Red Sea	(Bonatti)	9/85*
87/B	Carlsberg Ridge/Arabian Sea: Basalt Obj.	(Natland)	10/84
88/B	Chagos-Laccadive-Mascarene Volc. Lineament	(Duncan, et al)	5/85*
89/B	SWIR, Mantle Heterogeneity	(Dick & Natland)	5/86*
90/B	SE Indian Ridge Transect	(Duncan)	10/84
91/B	SE Indian Ocean Oceanic Crust	(Langmuir)	10/84
92/B	Crozet Basin, Seismic Observatory	(Butler & Brocher)	8/85*
93/B	W Arabian Sea: Upwelling, Salinity, etc.	(Prell)	10/84
94/B	Owen Ridge: History of Upwelling	(Prell)	10/84
95/B	Asian Monsoon, Bay of Bengal	(Cullen & Prell)	10/84
96/B	Bengal Fan (Indus & Ganges Fans)	(Klein)	10/84
97/B	90°E Ridge: High Res. Drilling Transect	(Peterson)	7/85*
98/B	History of Atm. Circ. (Australian Desert)	(Rea)	10/84
99/B	Agulhas Basin Paleocean. Climate Dynamics	(Coulbourn)	10/84
100/B	SE Indian Ridge Transect: Strat. Section	(Hays & Lazarus)	10/84
101/B	Ridge Crest Hydrothermal Activity	(Owen & Rea)	10/84
102/B	Somali Basin	(Matthias)	10/84
103/B	Laxmi Ridge, NW Indian Ocean	(Heirtzler)	10/84
104/B	90°E Ridge Transect	(Curray & Duncan)	10/84
105/B	Timor, Arc-continent Collision	(Karig)	10/84
106/B	Broken Ridge	(Curray, et al)	10/84
107/B	SE Indian Ridge: Stress in Ocean Lithosph.	(Forsyth)	10/84
112/B	Lithosphere Targets	(SOP -Kennett)	10/84
113/B	Agulhas Plateau	(SOP -Kennett)	10/84
115/B	Agulhas Plateau and Adjacent Basins	(Herb & Oberhansli)	4/85*
116/B	90°E & Chagos-Laccadive Ridge Drilling	(Oberhansli & Herb)	4/85*
117/B	N Red Sea	(Cochran)	10/84
118/B	Cenozoic History of E Africa	(Kennett, et al)	11/84
119/B	Early Opening of Gulf of Aden	(Stein)	12/84
120/B	Red Sea, Atlantis II Deep	(Zierenberg, et al)	12/84
121/B	Exmouth/Wallaby Plateaus & Argo Abys. Plain	(Von Rad, et al)	5/86*
134/B	Gulf of Aden	(Girdler)	4/86*
135/B	Broken Ridge: Thermo-mechanical Models	(Weissel & Karner)	3/85
137/B	Fossil Ridges in Indian Ocean	(Schlich, et al)	3/85
138/B	Rodrigues Triple Junction	(Schlich, et al)	8/85*
139/B	Agulhas Plateau, SW Indian Ocean	(Jacquart & Vincent)	8/85*
140/B	Central & N Red Sea Axial Areas	(Pautot & Guennoc)	8/85*
141/B	Indus Fan	(Jacquart, et al)	8/85*
150/B	90°E Ridge/Kerg.-Gaussb.Ridge: Hard Rock	(Frey & Sclater)	7/85

Ref. No.	Theme/Area	Author(s)	Date Rec'd.
Indian Ocean, continued			
173/B	Seychelles, Mascarene Pl., NW Indian Ocean	(Patriat, et al)	8/85
183/B	Periplatform Ooze, Maldives	(Droxler, et al)	3/87*
196/B	90°E Ridge: Impact of India on Asia	(Peirce)	12/85
197/B	Otway Basin/W Tasman Region	(Wilcox, et al)	12/85
208/B	Ancestral Triple Junction	(Natland, et al)	1/86
211/B	Deep Stratigraphic Tests	(SOHP -Arthur)	1/86
215/B	Red Sea: Sed. & Paleocean. History	(Richardson & Arthur)	2/86
219/B	Gulf of Aden Evolution	(Simpson)	3/86
223/B	Central Indian Ocean Fracture Zone	(Natland & Fisher)	4/86
226/B	Eq. Indian Ocean: Carb. System & Circ.	(Prell & Peterson)	8/86*
240/B	Argo Abyssal Plain	(Gradstein)	7/86*
246/B	Mesozoic Upwelling off S Arabian Margin	(Jansa)	7/86
251/B	Seychelles-Mascarene-Saya de Mayha Region	(Khanna)	8/86
262/B	Mid Indus Fan	(Haq)	11/86
288/B	Repositioning EP2 to EP12, Exmouth Plateau	(Mutter & Larson)	8/87
300/B	Return to Site 735B- Deep Crustal Drilling	(Dick, et al)	2/88

SOUTHERN OCEANS

54/C	Sub-Antarctic & Weddell Sea Sites	(Kennett)	3/84
71/C	Drilling on the Shaka Ridge [idea proposal]	(Sclater)	7/84
73/C	Antarctic Margin off Adelie Coast	(Wannesson, et al)	8/84
108/C	E Antarctic Cont. Margin (Prydz Bay)	(SOP)	5/87*
109/C	Kerguelen - Heard Plateau	(SOP -Kennett)	10/84
110/C	Wilkesland - Adelie Cont. Margin	(SOP -Kennett)	10/84
111/C	SE Indian Ocean Ridge Transect (Subantarc.)	(SOP -Kennett)	10/84
114/C	Crozet Plateau	(SOP -Kennett)	10/84
129/C	Bounty Trough	(Davy)	5/86*
136/C	Kerguelen - Heard Plateau	(Schlich, et al)	7/85*
169/C	S Tasman Rise	(Hinz & Dostmann)	7/85
185/C	Kerguelen Plateau: Origin, Evol. & Paleo.	(Coffin, et al)	8/85
209/C	Eltanin Fracture Zone	(Dunn)	1/86
228/C	Weddell Sea (E Antarctic Cont. Margin)	(Hinz, et al)	5/86
230/C	Wilkes Land Margin, E Antarctica	(Eittreim, et al)	5/86
244/C	W Ross Sea	(Cooper, et al)	8/86*
273/C	S Kerguelen Plateau	(Schlich, et al)	3/87
296/C	Ross Sea, Antarctica (Subs. for 244/C)	(Cooper, et al)	12/87
297/C	Pacific Margin, Antarctic Peninsula	(Barker, et al)	12/87

WESTERN PACIFIC OCEAN

25/D	New Hebrides Arc	(ORSTOM team)	1/84
26/D	Tonga-Kermadec Arc	(Pelletier & Dupont)	6/86*
27/D	Sulu Sea Marginal Basin	(Rangin)	7/85*
28/D	S China Sea	(Letouzey, et al)	1/84
29/D	Ryukyu Island & Okinawa Backarc Basin	(Letouzey)	1/84
42/D	Sunda Straits Area	(Huchon)	3/84
43/D	SW Pacific Drilling Outline	(Falvey)	3/84
46/D	S China Sea Margin History	(Hayes, et al)	11/87*

Ref. No.	Theme/Area	Author(s)	Date Rec'd.
Western Pacific Ocean, continued			
47/D	Manila Trench, S China Sea	(Lewis & Hayes)	3/84
48/D	Sulu Sea & S China Sea	(Hinz & Schlueter)	12/85*
49/D	E Banda Arc/Arafura Sea	(Schlueter & Fritsch)	3/84
50/D	Nankai Trough & Shikoku Forearc	(Kagami, et al)	8/85*
51/D	Sea of Japan	(Tamaki, et al)	3/84
52/D	Solomon Sea	(Milsom)	3/84
67/D	Tonga-Lord Howe Rise Transect	(Falvey, et al)	7/84
80/D	Sunda & Banda Arc	(Karig & G.Moore)	10/84*
82/D	Sulu Sea	(Thunell)	9/84
83/D	Izu-Ogasawara (Bonin) Arc Transect	(Okada & Takayanagi)	4/86*
126/D	Drilling in the Australasian Region	(Crook, Falvey,Packham)	1/85
127/D	E Sunda Arc & NW Australian Collision	(Reed, et al)	1/85
130/D	Evolution of SW Pacific (N of New Zealand)	(Eade)	1/85
131/D	Banda Sea Basin: Trapped Ocean Crust etc.	(Silver)	3/85
132/D	TTT-type Triple Junction off Boso, Japan	(Ogawa & Fujioka)	6/85*
144/D	Kuril Forearc off Hokkaido: Arc-arc Collis.	(Seno, et al)	6/86*
145/D	Ryukyu Arc: Left-lateral Dislocation	(Ujiie)	6/86*
146/D	Toyamu Fan, E Japan Sea	(Klein)	7/85*
147/D	S China Sea	(Wang, et al)	6/85
148/D	Near TTT-type Triple Junction off Japan	(Ogawa, et al)	6/85
149/D	Yamoto Basin, Japan Sea: Active Spreading	(Kimura, et al)	6/86*
151/D	Japan Sea: Mantle Plume Origin	(Wakita)	7/85
154/D	Banda-Celebes-Sulu Basin Entrapment	(Hilde)	7/85
156/D	Kita-Yamamoto Tr., Japan Sea: Massive Sulf.	(Urabe)	7/85
157/D	Japan Sea Paleoceanography	(Koizumi & Oba)	7/85
158/D	Japan Sea & Trench: Geochem. & Sed.	(Matsumoto & Minai)	7/85
163/D	Zenisu Ridge: Intraplate Deformation	(Lallemant, et al)	4/88*
164/D	Japan Trench & Japan-Kuril Trench Junction	(Jolivet, et al)	7/85
165/D	Shikoku Basin Ocean Crust	(Chamot-Rooke & LePichon)	7/85
166/D	Japan Sea: Evolution of Mantle Wedge	(Tatsumi, et al)	7/85
167/D	Okinawa Trough & Ryukyu Trench	(Uyeda, et al)	6/86*
168/D	Japan Sea: Siliceous Sediments	(Iijima, et al)	7/85
170/D	Valu Fa Ridge/Lau Basin: Back-arc Spreading	(Morton, et al)	7/85
171/D	Bonin Region: Intra-oceanic Arc-trench Dev.	(B.Taylor)	4/86*
172/D	Mariana Forearc, Arc & Back-arc Basin	(Fryer)	8/85
174/D	Japan Sea: Forearc Tectonics	(Otsuki)	8/85
175/D	Japan Trench: Origin of Inner Wall	(Niitsuma & Saito)	8/85
176/D	S Japan Trench: Migration of Triple Junct.	(Niitsuma)	8/85
177/D	Zenisu Ridge: Intra-ocean Plate Shortening	(Taira, et al)	9/87*
178/D	Nankai Trough Forearc	(Shiki & Miyake)	8/85
179/D	Daito Ridges Region: NW Philippines Sea	(Tokuyama, et al)	6/86*
180/D	N Philippines Sea: Kita-Amami Basin/Plateau	(Shiki)	8/85
181/D	Izu-Ogasawara-Mariana Forearc: Crust/Mantle	(Ishii)	8/85
184/D	Papua New Guinea/Bismark Sea Region	(Exon, et al)	8/85
187/D	New Hebrides Arc Region, SW Pacific	(F.Taylor & Lawver)	9/85
189/D	Tonga Ridge - Lau Ridge Region	(Stevenson, et al)	10/85
190/D	New Hebrides (Vanuatu) Arc-ridge Collision	(Fisher, et al)	10/85
191/D	Solomon Isl.: Arc-plateau Coll./Intra-arc	(Vedder & Bruns)	10/85
194/D	S China Sea	(Liu, et al)	4/88*
198/D	Ulleung Basin: Neogene Tectonics & Sed.	(Chough, et al)	12/85
206/D	GBR: Mixed Carb/Epiclastic Shelf	(Davies, et al)	12/85
216/D	S China Sea	(Rangin, et al)	2/86

Ref. No.	Theme/Area	Author(s)	Date Rec'd.
Western Pacific Ocean, continued			
217/D	Lord Howe Rise	(Mauffret & Mignot)	2/86
218/D	Manila Trench & Taiwan Coll. Zone, SCS	(Lewis, et al)	2/86
220/D	Three Sites in Lau Basin	(Hawkins)	3/86
235/D	Solomon Sea: Arc-trench Devel., Backarc	(Honza, et al)	6/86
239/D	Two Sites in Lau Basin	(Cronan)	6/86
242/D	Backthrusting & Backarc Thrust., Sunda Arc	(Silver & Reed)	9/87*
243/D	Outer Tonga Trench	(Bloomer & Fisher)	6/86
260/D	Ogasawara Plateau, Near Bonin Arc	(Saito, et al)	10/86
265/D	W Woodlark Basin	(Scott, et al)	12/86
266/D	Lau Basin	(Lau Consortium)	12/86
268/D	Hydrothermal Ore Dep. Queensland Plateau	(Jansa, et al)	12/86
274/D	S China Sea	(Zaoshu & Yan)	3/87
281/D	Accr. Prisms: Kuril/Japan Trench & Nankai	(Okamura & Yamazaki)	6/87
292/D	Drilling in SE Sulu Sea	(Hinz, et al)	3/88*
293/D	Drilling in Celebes Sea	(Hinz, et al)	9/87
294/D	Ophiolithe Analog. in Aoba Basin, Vanuatu	(Shervais)	10/87
295/D	Hydrogeol. & Struct., Nankai Accr. Complex	(Gieskes, et al)	12/87
301/D	Integrated Proposal for Nankai Forearc	(Gieskes, et al)	3/88

CENTRAL & EASTERN PACIFIC OCEAN

2/E	Mid America Trench and Costa Rica Margin	(Crowe & Buffler)	12/82
3/E	Flexural Moats, Hawaiian Islands	(Watts, et al)	11/85*
4/E	Tuamoto Archipelago (French Polynesia)	(Okal, et al)	6/83
8/E	S Chile Trench	(Cande)	9/83
14/E	Zero Age Drilling: EPR 13°N	(Bougault)	1/84
34/E	Pacific-Aleutian-Bering Sea (Pac-a-bers)	(Scholl & Vallier)	2/84
37/E	Costa Rica, Test of Duplex Model	(Shipley, et al)	8/84*
75/E	Gulf of California	(Becker, et al)	8/84
76/E	EPR: Oceanic Crust at Axis	(Francheteau & Hekinian)	11/84*
84/E	Peru Margin	(Kulm & Hussong)	9/84
123/E	Studies at Site 501/504	(Mottl)	12/84
124/E	Deepening Hole 504B	(LITHP -Becker)	1/85
142/E	Ontong-Java Plateau: Eq. Pac. Depth Trans.	(Mayer & Berger)	4/85
153/E	Three Sites in SE Pacific	(Hays)	7/85
182/E	Sounder Ridge, Bering Sea: Stratigraphy	(Taira)	8/85
192/E	Baranoff Fan, SE Gulf of Alaska	(Stevenson & Scholl)	10/85
195/E	Bering Sea Paleoenviron. & -climate	(Sancetta)	12/85
199/E	N Pacific: Pelagic Sed. in Subarctic Gyre	(Janecek, et al)	12/85
202/E	N.Marshall Isl. Carbonate Banks	(Schlanger)	12/85
203/E	Guyots in Central Pacific	(Winterer, et al)	12/85
207/E	Bering Sea Basin & Aleutian Ridge Tectonics	(Rubenstone)	1/86
210/E	NE Gulf of Alaska: Yakutat Cont. Margin	(Lagoe & Armentrout)	1/86
212/E	Off N & Central California	(Greene)	1/86
213/E	Aleutian Subd.: Proc. Controlling Accret.	(McCarthy & Scholl)	1/86
214/E	Cent. Aleutian Forearc: Trench-slope Break	(Ryan & Scholl)	1/86
221/E	Eq. Pacific: Late Cenozoic Paleoenv.	(Pisias, et al)	3/86
222/E	Ontong-Java Pl.: Origin, Sed., Tectonics	(Kroenke, et al)	7/87*
224/E	Escanaba Trough (Gorda Ridge), NE Pacific	(Fisk, et al)	9/87*
225/E	Aleutian Basin, Bering Sea	(Cooper & Marlow)	4/86
227/E	Aleutian Ridge, Subsidence & Fragmentation	(Vallier & Geist)	5/86

Ref. No.	Theme/Area	Author(s)	Date Rec'd.
Central & Eastern Pacific Ocean, continued			
229/E	Bering Sea, Beringian Cont. Slope & Rise	(Cooper, et al)	5/86
231/E	N Pacific Magnetic Quiet Zone	(Mammerickx, et al)	5/86
232/E	N Juan de Fuca R.: Hi Temp./Zero Age Crust	(Davis, et al)	5/86
233/E	Oregon Accr. Complex: Fluid Proc. & Struct.	(Kulm, et al)	5/86
234/E	Aleutian Trench: Kinematics of Plate Conv.	(von Huene, et al)	6/86
236/E	N Gulf of Alaska	(Bruns, et al)	6/86
237/E	Active Margin off Vancouver Island	(Brandon & Yorath)	6/86
241/E	Gulf of Alaska (Yakutat Block) & Zodiak Fan	(Heller)	6/86
245/E	Transform Margin of California	(Howell, et al)	7/86
247/E	NE Pacific: Ocean., Climatic & Volc. Evol.	(Bornholm, et al)	1/88*
248/E	Ontong-Java Plateau	(Ben-Avraham & Nur)	8/86
249/E	Sedimentation in Aleutian Trench	(Underwood)	8/86
250/E	Navy fan, California Borderland	(Underwood)	8/86
252/E	Loihi Seamount, Hawaii	(Staudigel, et al)	10/86*
253/E	Shatsky Rise: Black Shales in Ancestr. Pac.	(Schlanger & Sliter)	8/86
256/E	Queen Charlotte Transform Fault	(Hyndman, et al)	9/86
257/E	Farallon Basin, Gulf of California	(Lawver, et al)	9/86
258/E	Stockwork Zone on Galapagos Ridge	(Embley, et al)	10/86
259/E	Meiji Sediment Drift, NE Pacific	(Keigwin)	10/86
261/E	History of Mesozoic Pacific Ocean	(Larson & Lancelot)	10/86
263/E	S Explorer Ridge, NE Pacific	(Chase, et al)	11/86
269/E	Aleutian Pyroclastic Flows in Marine Env.	(Stix)	12/86
271/E	Paleocean. Trans. of California Current	(Barron, et al)	2/87
275/E	Gulf of California (Composite Proposal)	(Simoneit & Dauphin,eds)	3/87
277/E	Aseismic Slip in Cascadia Margin	(Brandon)	4/87
278/E	Blanco Trans. Fault: Alter., Layer Three	(Hart, et al)	5/87
279/E	Seamount 6 Near EPR	(Batiza)	5/87
280/E	Cret. Seamounts & Guyots, W Pacific	(Vogt, et al)	6/87
282/E	Tracing Hawaiian Hotspot	(Niitsuma & Okada)	6/87
283/E	Kuroshio Current & Plate Motion History	(Jacobi, et al)	6/87
284/E	Escanaba Trough, S Gorda Ridge Hydrotherm.	(Zierenberg, et al)	7/87
285/E	Jurassic Quiet Zone, W Pacific	(Handschumacher, et al)	7/87
286/E	Return to 504B, Layer2/3 Trans.	(Becker)	7/87
287/E	M-Series Drilling, W Pacific	(Handschumacher & Vogt)	8/87
289/E	Japan Arc Mass Budget - ^{10}Be Geochem. Ref.	(Sacks, et al)	9/87
290/E	Axial Seamount, Juan de Fuca Ridge	(Johnson, et al)	9/87
291/E	Marquesas Volcanic Moat, Apron	(Natland & McNutt)	9/87
303/E	Fracturing/Volcanism on Hawaiian Swell	(Keating)	4/88

GENERAL & INSTRUMENTAL / DOWNHOLE EXPERIMENTS

13/F	Water Column Research Lab	(Wiebe)	1/84
53/F	Vertical Seismic Profiling	(Phillips & Stoffa)	3/84
66/F	Laboratory Rock Studies to Reveal Stress	(Whitmarsh)	9/87*
69/F	Rock Stress Measurements, Norwegian Sea	(Stephansson)	7/84
70/F	Borehole Seismic Exp., Sites 417 & 603	(Stephen, et al)	7/84
128/F	Phys. Props. in Accretionary Prisms	(Karig)	1/85
133/F	In-situ Pre Fluid Sampling	(McDuff & Barnes)	3/85
143/F	In-situ Magnetic Susc. Measurements	(Krammer & Pohl)	12/85*
152/F	Borehole Seismic Exp., Tyrrhenian Sea	(Avendik & Dietrich)	7/85
155/F	Downhole Meas., Japan Sea	(Suyehiro, et al)	9/87*

Ref. No.	Theme/Area	Author(s)	Date Rec'd.
General & Instrumental/Downhole Experiments, continued			
159/F	Phys. Cond. Across Trench: Izu-Mariana-	(Kinoshita, et al)	7/85
160/F	Lith. Plate Geophys. Cond., Weddell Sea	(Kinoshita, et al)	7/85
161/F	Magnetic Field & Water Flow Meas.	(Kinoshita, et al)	7/85
162/F	Offset VSP. SW Ind. Ocean Fract. Zones	(Stephen)	7/85
186/F	SW Ind. Ocean Fract. Zones: Hydrology etc.	(von Herzen)	8/85
188/F	395A Boreh. Geophys./418A Drill. & Geophys.	(DMP -Salisbury)	9/85
193/F	Upper Ocean Part. Fluxes, Weddell Sea	(Biggs)	11/85
200/F	Boreh. Magnetic Logging, Leg 109 (MARK)	(Bosum)	12/85
201/F	High-precision Borehole Temp. Meas.	(Kopietz)	12/85
238/F	Pore Pressure in Makran Subd. Zone	(Wang & von Huene)	6/86
267/F	Conv. Margin Old Crust, Argo & W Pacific	(Langmuir & Natland)	12/86
270/F	Tomographic Imaging of Hydrotherm. Circ.	(Nobes)	1/87
272/F	Long-term Downh. Meas. Around Japan	(Kinoshita)	2/87
298/F	Acquiring VSP, Nankai Trough ODP Sites	(G.Moore)	1/88
299/F	Def. of Seds., self-bore P-meter	(Brandon & Moran)	2/88
302/F	Elect. Conductivity Structure, Japan Sea	(Hamano, et al)	3/88

* indicates date of most recent revision

CALL FOR ODP DRILLING PROPOSALS

Although the planning structure of JOIDES is undergoing changes, ODP remains a proposal-driven program. Through proposals, individual scientists and groups have the opportunity to respond to the major thematic drilling priorities for ODP and contribute their expertise. These priorities are being developed by the JOIDES thematic panels and are published in the JOIDES Journal. The COSOD II report is another major input for defining the direction of ODP science.

The listing of proposals received by the JOIDES Office has traditionally been organized by oceans. Aside from its non-thematic filing system, the JOIDES Office does forward new drilling proposals to the appropriate thematic panels (and to service panels when necessary) for full consideration of their relevance to ODP drilling objectives. Proponents are asked to supply as complete a data base as possible and note upcoming surveys.

The guidelines for submission also require that proponents forward six copies of a proposal to the JOIDES Office. [Note: Keep fold-outs to a minimum as they slow down copying and mailing of proposals.] For further information on requirements for submission of proposals to ODP, contact the JOIDES Office.

JOIDES/ODP BULLETIN BOARD

JOIDES MEETING SCHEDULE

Date	Place	Committee/Panel
9-10 June	College Station, TX	DMP
28-29 June	Corvallis, OR	PPSP
18-19 July	Corvallis, OR	CEPAC
25-26 July	Corvallis, OR	SOHP
28-29 July*	Austin, TX	TECP
23-25 August	Oxford, UK	PCOM
13-15 September	Edinburgh, UK	EXCOM
12-17 September*	Cornerbrook, Canada	LITHP
27-29 September*	Swansea, UK	SSP
3-7 October*	Hannover, FRG	TECP
4-6 October*	Milan, Italy	SOHP
17-19 October*	Ann Arbor, MI	CEPAC
27-29 October*	tba	WPAC
28 Nov - 2 Dec	Miami, FL	PCOM/Panel Chairmen (Annual Meeting)

* Tentative meeting (not yet requested or approved) (5/25/88)

PCOM/PANEL LIAISONS

Atlantic Regional Panel - CADET
Central & Eastern Pacific Regional Panel - COULBOURN & LEINEN
Downhole Measurements Panel - COWAN & LANGSETH
Indian Ocean Regional Panel - VON RAD
Information Handling Panel - CADET & GARTNER
Lithospheric Panel - KASTNER & MALPAS
Pollution Prevention & Safety Panel - PISIAS
Sediments & Ocean History Panel - BRASS & VON RAD
Site Survey Panel - FRANCIS & LANGSETH
Southern Oceans Regional Panel - PISIAS
Technology & Engineering Development Committee - FRANCIS
Tectonics Panel - ELDHOLM & SHIPLEY
Western Pacific Regional Panel - PISIAS & TAIRA

ODP PUBLICATIONS UPDATES

TITLE CHANGES OF ODP PROCEEDINGS

As a result of recommendations from several groups in the JOIDES community, a decision was made to change the designations for both parts of the Proceedings of the Ocean Drilling Program. For the first series of the Proceedings, the term Initial Reports will be retained; the second series will now be called Scientific Results instead of Final Reports to emphasize the scientific integrity of the peer-reviewed papers contained therein. All reference to Part A and Part B will be dropped, not only for current and future volumes but for past volumes as well.

The initial recommendation for the changes came from the JOI Performance Evaluation Committee and last year's co-chief scientists, who were meeting in College Station at the same time in March. We informed the JOIDES Information Handling Panel of these developments, with our endorsement, and they supported the concept. The JOIDES Planning Committee, which met in April, gave us their approval to proceed.

These title changes have already gone into effect and will be reflected beginning with Initial Reports (IR) Vol. 112 and Scientific Results (SR) Vol. 101. The exact form of reference citations to these volumes should follow these examples:

Suess, E., von Huene, R., et al., 1988. Proc. ODP, Init. Repts., 112: College Station, TX (Ocean Drilling Program).

Austin, J. A., Jr., Schlager, W., et al., 1988. Proc. ODP, Sci. Results, 101: College Station, TX (Ocean Drilling Program).

NEW EDITION OF "INSTRUCTIONS FOR CONTRIBUTORS"

We have updated the booklet with the lavender cover entitled "Instructions for Contributors to the Proceedings of the Ocean Drilling Program" and have been distributing the new edition to shipboard and shore-based scientists from recent legs who are preparing contributions to the Proceedings.

Anyone who has not received a copy and would like one should contact Fabiola Byrne at ODP headquarters.

RE-COVERING OF IR VOLUMES 101/102, 103 AND 105

We are sure that every recipient of these books has noticed by now that the covers have faded to a grayish-green tint, either in part or in whole. We have worked out an agreement with our printer to recall these books and to bind them with new covers printed with colorfast inks.

Anyone may return any or all of these tomes to ODP headquarters, using our old mailing boxes if you like. We will then mail a replacement book or books back to you free of charge. In order to concentrate the recall process within a manageable time frame, we need to receive your IR 101/102 and/or 103 volumes no later than 31 August of this year. Please send your books to: Ocean Drilling Program, Attn: Fabiola Byrne, 1000 Discovery Drive, College Station, TX 77840

NEW CANADIAN ODP SECRETARIAT ANNOUNCED

Effective April 1, 1988, the Secretariat for the Ocean Drilling Program in Canada is located at the Centre for Earth Resources Research at Memorial University. John Malpas is the new Director and Bill Collins is the new Coordinator. The new address for the Secretariat is as follows:

Canadian ODP Secretariat
Centre for Earth Resources Research
Memorial University
St. John's, Newfoundland A1B 3X5
Canada
Tel: (709) 737-4708

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JOIDES OFFICE ROTATION

As of October 1, 1988 the JOIDES Office will rotate from Oregon State University to the University of Hawaii Institute of Geophysics. As of October 1, 1988 all correspondence to the JOIDES Office should be addressed to Dr. Ralph Moberly, Hawaii Institute of Geophysics, 2525 Correa Road, Honolulu, HI 96822. Please note that **correspondence should be addressed to Oregon State University through September 30, 1988.**

NEW PANEL CHAIRMAN

- Technology & Engineering Development Committee -

Mr. Charles Sparks
Institut Francais du Petrole
BP 311, 92506 Rueil Malmaison
France

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CHANGE IN JOIDES TRAVEL POLICY

Please note that a change in personnel has taken place at JOI, Inc. which will affect all JOIDES panel-related travel. In the future, all business pertaining to JOIDES panel-related travel or meeting arrangements should be addressed to Allison Burns. Patricia Henry, who previously handled travel arrangements at JOI, Inc., has left to pursue her nursing career. Doris Rucker will continue to handle all travel matters pertaining to PCOM and EXCOM business.

LEG 120 PORT CALL ATTRACTS AUSTRALIAN INTEREST

Public relations activities for the Fremantle port call were successful and did much to spread the word about ODP in Australia.

Approximately 50 people attended a press conference which was covered by approximately 15 reporters from local and regional newspapers, and the national newspaper, The Australian, as well as a reporter and camera crew from the local television station. Visitors attending the press conference included geologists from the local survey, Bureau of Mineral Resources representatives and geologists from petroleum and mining companies including Marathon Oil, Western Mining, and Woodside Exploration. Also attending were members from the U.S. consulate in Perth: Consul General William Itah, and Public Affairs Chief Jack Curran.

Several newspaper articles were generated from the press conference, and Dr. Woody Wise, Leg 120 Co-chief, was featured on a radio talk show.

During the port call, approximately 35 geology students from the University of Western Australia toured the ship with three of their professors. Some 25 juniors and seniors in science classes from Guildford Hall also toured the ship, as did staff members from a regional geological agency (CSIRO).

ODP ON-BOARD COMPUTER SERVICES REVAMPED

During the Leg 121 port call in Fremantle, Australia, ODP personnel replaced nineteen shipboard DEC PRO350 microcomputers with IBM PC/AT clones, providing IBM-compatible word processors that are more widely used in the scientific community than the system used on the PRO350s.

WordPerfect is the word-processing system selected for the IBM PC-compatible units; it is one of the most popular word-processing systems currently on the market. The installation of the IBM-compatible units, as well as the WordPerfect software, will provide scientists with a better word-processing system and more convenient mechanism for taking their manuscripts home with them after a leg.

Software has also been provided so that conversions can be made between several word processors. For instance, if a scientist uses PC-Write on shore, a conversion can be made from the WordPerfect format used on the ship to the PC-Write format to take home with the scientist. Conversions between several of the well-known word processors are available.

An additional capability provided is the ability to read and write Macintosh-format diskettes on the IBM PC located in the shipboard system manager's office. This means that information can be taken to and from the ship on Macintosh-format diskettes.

The IBM-compatible units are equipped with a hard disk and two diskette drives. One diskette drive is a 5 1/4 inch, 360 K, DS/DD drive, and the other is a 5 1/4 inch, 1.2 megabyte, high-capacity drive. Although neither system has a 3 1/2 inch, 720KB diske tte drive, there is provision to convert a 3 1/2 inch, 720KB diskette to a 5 1/4 inch diskette, and back to the 3 1/2 inch diskette.

WORKSHOPS SCHEDULED

SCIENTIFIC DRILLING INITIATIVES IN THE MEDITERRANEAN SEA

During the next CIESM Meeting in Athens (October, 1988), an Ocean Drilling Program Workshop on Scientific Drilling Initiatives in the Mediterranean Sea is scheduled. The workshop will be organized in general plenary sessions and in subgroup sessions on specific topics. Written participation (probably in the form of extended abstracts or drilling proposals) will be published within the CIESM Report. For further information on the workshop, please contact:

Dr. Jean Mascle, Laboratoire de Geodynamique Sous-Marine, B.P. 48, 06230, Villefranche-sur-Mer, France. Tel: (33) 93-01-75-80.

Dr. James Austin, Jr., Institute for Geophysics, University of Texas at Austin, 8701 Mopac Boulevard, Austin, Texas 78759-8345 U.S.A. Tel: (512) 471-0450

ROLE OF ODP DRILLING IN INVESTIGATION OF GLOBAL SEA LEVEL CHANGES

A JOI/USSAC workshop on sealevel and global change will be held 24-26 October 1988 in El Paso, Texas. Joel Watkins (Texas A&M University) and Greg Mountain (LDGO) are workshop co-conveners.

The workshop will include a wide variety of investigators who can contribute to the preparation of a document which will (1) review current knowledge of the history of global sealevel change; (2) specify the optimum site characteristics, site selection procedures, and drilling methodology required to advance the knowledge of sealevel change; and (3) recommend a prioritized list of regions where future drilling should be conducted to meet these needs. Limited travel funds are available to U.S. participants through JOI/USSAC.

A two-day field trip to the Permian Guadalupe Mountains will precede the workshop; exposures showing relative changes in sea level in this classic region will provide a stimulating backdrop to workshop discussions. Travel and accommodations for this excursion will be available to workshop participants, but costs must be borne by the individuals. Send vita and statement of interest in the workshop and/or field trip to: Joel Watkins, Dept. of Oceanography, Texas A&M University, College Station, TX 77843.

GEOLOGIC HISTORY OF THE POLAR OCEANS: ARCTIC VERSUS ANTARCTIC

The main objective of this workshop will be to bring together international geoscientists from different research fields who are actively involved in the study of the polar oceans.

Fifty to sixty participants, primarily invited experts with about 20% additional applications accepted, will attend. Partial financial support for participation may be offered. The workshop will be held from 10-14 October, 1988 in Bremen, Federal Republic of Germany and will be co-sponsored by the NATO Scientific Affairs Division, Alfred Wegener Stiftung, SCOR WG 82 (Polar Deep-Sea Paleoenvironment and ILP WG 5).

For further information contact Dr. Jorn Thiede, GEOMAR, Research Center for Marine Geosciences, Wischhofstrasse 1-3, Bldg. 4, D-2300 Kiel 13, FRG.

WORKSHOP REPORTS AVAILABLE

The following reports are now available. For copies please write to: JOI/USSAC Workshop Report, 1755 Massachusetts Ave. NW, Suite 800, Washington, DC 20036.

Measurements of Physical Properties and Mechanical State in the Ocean Drilling Project, Drs. Daniel Karig and Matthew Salisbury, conveners

Science Opportunities Created by Wireline Re-entry, Drs. Marcus Langseth and Fred Speiss, conveners

Scientific Initiatives in the South Atlantic and Adjacent Southern Oceans, Dr. James Austin, convener

Scientific Seamount Drilling, Drs. Tony Watts and Rodey Batiza, conveners

Vertical Seismic Profiling (VSP) and the Ocean Drilling Program (ODP), Drs. John Mutter and Al Balch, conveners

Wellbore Sampling, Mr. Barry Harding and Dr. Richard Traeger, conveners

ODP PHOTOGRAPHIC COLLECTION AVAILABLE

ODP announces the availability of the entire color photographic collection of core beginning with DSDP Leg 1, Core 1 through ODP Leg 120. The collection consists of over 25,000 photographs and will be available 35mm slide or 8 in video disc viewing formats. Delivery of orders will begin in June 1988.

Cost is dependent upon the format. The 35 mm slides will cost approximately $4,500 plus postage. Slides will be boxed, consecutively numbered, and include an index. The video disc will cost approximately $12.75 plus postage and will be packaged with an index. A video disc player with random access capabilities and a video monitor are required to use the video disc.

If you are interested and/or have questions, please contact John Beck at Ocean Drilling Program, 1000 Discovery Drive, College Station, TX. 77840, (409) 845-1183.

JOI/USSAC FELLOWSHIP

JOI, Inc., in cooperation with USSAC, is continuing to support its new Ocean Drilling Graduate Fellowship Program. The fellowship will provide an opportunity for scientists of unusual promise and ability in residence at a U.S. institution to conduct research compatible with that of the ODP. Award for doctoral candidates is $18,000, to be used for stipend, tuition, benefits, research costs and incidental travel. Applications are reviewed three times per year in January, May and September. Applications for upcoming legs should be submitted to JOI, Inc. according to the following schedule:

Leg	Application Deadline
128 (Japan Sea II)	1 September 1988
129 (Nankai Trough)	1 September 1988
Shorebased work	1 January 1989

An application packet, with instructions and information on upcoming cruises is available from: JOI/USSAC ODP Fellowship, 1755 Massachusetts Ave., NW, Suite 800, Washington, DC 20036.

ODP SAMPLE DISTRIBUTION

The materials from ODP Legs 112 through 115 are now available for sampling by the scientific community. The twelve-month moratorium on cruise-related sample distribution is complete for Ocean Drilling Program Legs 101-115. Scientists who request samples from these cruises (after June 1988) are no longer required to contribute to the ODP Proceedings.

Preliminary sample record inventories for ODP Legs 101-120 are now in searchable database structures. The Sample Investigations database contains records of all sample requests, the purpose for which the samples were used and the institute where the samples were sent. At present, the most efficient way to access this database is to request a search by contacting the Assistant Curator at ODP.

Request processing (number of weeks to receive samples) during the period January - May 1988:

Repository	Avg. No. Wks. for Processing	Total No. Samples
ECR	15	9839
GCR	5	2356
WCR	8	858

Investigators requiring information about the distribution of samples and/or desiring samples, or who want information about the sample investigation or sample records database, should address their requests to: The Curator, Ocean Drilling Program, 1000 Discovery Drive, College Station, TX 77840, Tel: (409) 845-4819

ODP PROMOTIONAL MATERIALS

A new portable ODP display is available for use at meetings and conventions. The display folds into two compact cylinders and may be put on board a plane as luggage or shipped. For more information and scheduling, contact Robin Smith, JOI, Inc., 1755 Massachusetts Ave., NW, Washington, DC 20036, Telephone: (202) 232-3900.

A new 24 page, 8 1/2" x 11" full-color booklet on the Ocean Drilling Program is now available from Joint Oceanographic Institutions. Write to ODP Booklet, JOI, Inc., 1755 Massachusetts Ave. NW, Suite 800, Washington, DC 20036.

The Science Operator brochure for the Ocean Drilling Program has been updated. This edition features a color photo of the JOIDES RESOLUTION when she was in the Panama Canal. The section on research has been updated and includes a summary of cruises in the South Atlantic. Copies may be ordered from Karen Riedel, Ocean Drilling Program, 1000 Discovery Drive, College Station, TX 77840 USA.

JOI, Inc. has a pamphlet available entitled "Impact of Ocean Drilling on the Earth Sciences" written by William Hay. The pamphlet is an informative overview of Ocean Drilling and could be quite useful for public relations, education, or just as an information piece for your marine science program. If you are interested, please contact Robin Smith at the JOI Office.

DSDP AND ODP DATA AVAILABLE

ODP Data Available

ODP databases currently available include all DSDP computerized data files (Legs 1-96), geological and geophysical data collected from ODP Legs 101-114, and all core photos taken by DSDP and ODP (Legs 1-114). The table below lists the data available.

Most data are available as paper and microfilm copies of original data collected aboard JOIDES Resolution. Underway geophysical data are on 35 mm continuous roll microfilm; all other data are on 16 mm microfilm.

All DSDP data and most ODP data are contained in a computerized database (some ODP data are available electronically). These data can be searched on almost any specified criteria related to the database. All files can be cross-referenced so that a data request can include information from multiple files.

Computerized data are currently available on hard-copy printouts, magnetic tape, or through BITNET.

Photos of ODP/DSDP collected cores and seismic lines are also available. Seismic lines, whole core and closeup core photos are available in black and white 8x10 prints. Whole core color 35 mm slides are also available.

The following are also available: (1) ODP Data Announcements containing information on the database; (2) Data File Documents containing information on specific ODP data files; (3) ODP Technical Note #9, "Deep Sea Drilling Project Data File Documents", which includes all DSDP data file documents. To obtain data or information contact:

Kathe Lighty, Data Librarian, Ocean Drilling Program, 1000 Discovery Dr., College Station, TX 77840, Tel: (409) 845-8495, Tx: 792779/ODP TAMU, BITNET: %DATABASE@TAMODP, Omnet: Ocean.Drilling. TAMU

Small requests can be answered quickly and free of charge. If a charge is made to recover expenses, an invoice will be sent and must be paid before the request is processed.

Data Available from National Geophysical Data Center (NGDC)

DSDP data files can be provided in its entirety on magnetic tape according to user specifications (see table below). NGDC can also provide a full range of correlative marine geological and geophysical data from other sources. NGDC will provide a complimentary inventory of all data available on request. Inventory searches are tailored to each user's needs.

Information from DSDP Site Summary files is fully searchable and distributable in PC-compatible form on floppy diskette, as computer listings and graphics, and magnetic tape. NGDC is working to make all DSDP data files fully searchable and available in PC-compatible form. Digital DSDP geophysical data are fully searchable and available on magnetic tape.

In addition, NGDC can provide analog geological and geophysical information from DSDP on microfilm. Two summary publications are available: (1) "Sedimentology, Physical Properties, and Geochemistry in the Initial Reports of Deep Sea Drilling Project Vols. 1-44: An Overview", Report MGG-1; (2) "Lithologic Data from Pacific Ocean Deep Sea Drilling Project Cores", Report MGG-4.

Costs for services are (shipping and handling is included): $90/ magnetic tape, $30/ floppy diskette, $20/ microfilm reel, $12.80/ copy of Report MGG-1, $10/ copy of report MGG-4. Costs for computer listings and custom graphics vary. Prepayment is required by check or money order (drawn on a U.S. bank), or by charge to VISA, Mastercard or American Express. A $10 surcharge is added to all shipments ($20 for foreign shipments), and a $15 fee is added to all rush orders.

Data Announcements describing each DSDP data set are available at no charge. For technical details, call (303) 497-6339 or write to the address below. For additional information contact:

Marine Geology & Geophysics Division, Natl. Geophysical Data Center, NOAA E/GC3 Dept 334, 325 Broadway, Boulder, CO 80303, Tel: (303) 497-6338

AVAILABLE DATA

Data Available	Data Source	Description	Comments
1. LITHOLOGIC and STRATIGRAPHIC DATA			
Visual Core Descriptions –Sediment/sedimentary rock	Shipboard data	Information about core color, sedimentary structures, disturbance, large minerals and fossils, etc.	
–Igneous/metamorphic rock	Shipboard data	Information about lithology, texture, structure, mineralogy, alteration, etc.	
Smear slide descriptions	Shipboard data	Nature and abundance of sedimentary components.	
Thin section descriptions	Shipboard data	Petrographic descriptions of igneous and metamorphic rock. Includes information on mineralogy, texture, alteration, vesicles, etc.	
Paleontology	*Initial Reports, Proceedings*	Abundance, preservation and location for 26 fossil groups. The "dictionary" consists of more than 12,000 fossil names.	
Screen	Processed data	Computer-generated lithologic classifications. Basic composition data, average density, and age of layer.	
2. PHYSICAL PROPERTIES			
G.R.A.P.E. (gamma ray attenuation porosity evaluator)	Shipboard data	Continuous whole-core density measurements.	
Grain size	Shore laboratory	Sand-silt-clay content of a sample.	Legs 1–79 only
Index properties: bulk and grain density, water content, and porosity	Shipboard data	Gravimetric and volumetric measurements from a known volume of sediment.	
Liquid and plastic limits	Shipboard data	Atterberg limits of sediment samples.	
Shear-strength measurements	Shipboard data	Sediment shear-strength measurements using motorized and Torvane instruments.	
Thermal conductivity	Shipboard data	Thermal conductivity measurements of sediments using a thermal probe.	
Velocity measurements	Shipboard data	Compressional and shear-wave velocity measurements.	
Downhole measurements –Heatflow	Shipboard data	*In-situ* formation temperature measurements.	
–Pressure	Shipboard data	*In-situ* formation and hydrostatic pressure.	
3. SEDIMENT CHEMICAL ANALYSES			
Carbon-carbonate	Shipboard data, shore laboratory	Percent by weight of the total carbon, organic carbon, and carbonate content of a sample.	Hydrogen percents for Legs 101, 103, 104, 106–108; nitrogen percents for Legs 101, 103, 104, 107, 108.
Interstitial water chemistry	Shipboard data, shore laboratory	Quantitative ion, pH, salinity, and alkalinity analyses of interstitial water.	
Gas chromatography	Shipboard data	Hydrocarbon levels in core gases.	
Rock evaluation	Shipboard data	Hydrocarbon content of a sample.	
4. IGNEOUS/METAMORPHIC CHEMICAL ANALYSES			
Major element analyses	Shipboard data, shore laboratory	Major element chemical analyses of igneous, metamorphic, and some sedimentary rocks composed of volcanic material.	
Minor element analyses	Shipboard data, shore laboratory	Minor element chemical analyses of igneous, metamorphic, and some sedimentary rocks composed of volcanic material.	

AVAILABLE DATA (Continued)

Data Available	Data Source	Description	Comments
5. X-RAY MINERALOGY			
X-ray mineralogy	Shore laboratory	X-ray diffraction.	*Legs* 1–37 only
6. PALEOMAGNETICS			
Paleomagnetics	Shipboard data, *shore laboratory*	Declination, inclination, and intensity of *magnetization* for discrete samples and continuous whole core. Includes NRM *and alternating* field demagnetization.	
Susceptibility	Shipboard data	Discrete sample and continuous whole-core measurements.	
7. UNDERWAY GEOPHYSICS			
Bathymetry	Shipboard data	Analog records of water-depth profile.	*Available on* 35 mm continuous microfilm
Magnetics	Shipboard data	*Analog* records and digital data.	Available on 35 mm continuous microfilm
Navigation	Shipboard data	Satellite fixes and course and speed changes that have been run through a navigation smoothing program, edited on the basis of reasonable *ship and drift velocities*, and later merged with the depth and magnetic data.	Available *in MGD77* exchange format.
Seismics	*Shipboard data*	Analog records of sub-bottom profiles and unprocessed signal on magnetic tape.	Available on 35 mm continuous microfilm
8. SPECIAL REFERENCE FILES			
Leg, site, hole summaries	Shipboard data, initial core descriptions	Information on general leg, site, and hole characteristics (i.e. *cruise objectives*, location, water depth, sediment nature, drilling statistics).	
DSDP Guide to Core Material	*Initial Reports*, prime data files	Summary data for each core: depth of core, general *paleontology*, sediment type and structures, carbonate, grain size, x-ray, etc.	Legs 1–85 only
AGEPROFILE	*Initial Reports*, hole summaries	Definition of age layers downhole.	
COREDEPTH	Shipboard summaries	Depth of each core. Allows *determination of precise* depth (in m) of a particular sample.	
9. AIDS TO RESEARCH			
ODASI		A file of ODP-affiliated scientists and institutions. Can be *cross-referenced* and is searchable.	
Keyword Index		A computer-searchable bibliography of DSDP- and ODP-related *papers and studies in progress*.	
Sample Records		Inventory of all shipboard samples taken.	
Site Location Map		DSDP and ODP site positions on a world map of ocean topography.	
Thin Section Inventory		*Inventory of* all shipboard thin sections taken.	

BIBLIOGRAPHY OF THE OCEAN DRILLING PROGRAM

The following publications are available from the ODP Subcontractors. Information from Texas A&M University is available from ODP, 1000 Discovery Drive, College Station, TX 77840. Information from the Lamont-Doherty Geological Observatory can be obtained from R.Anderson or R.Jarrard at the Borehole Research Group, LDGO, Palisades, NY 10964.

TEXAS A&M UNIVERSITY

1. Proceedings of the Ocean Drilling Program, Part A (Initial Reports)

   Volumes 101/102 (combined) Dec 86
   Volume 103 published Apr 87
   Volume 104 published July 87
   Volume 105 published Aug 87
   Voume 107 published Oct 87
   Volume 108 published Jan 88
   Volumes 106/109/111 (combined) Feb 88
   Volume 110 published Apr 88

2. Technical Notes

   #1 Preliminary time estimates for coring operations (Rev. Edition Dec 86)
   #2 Operational and laboratory capabilities of JOIDES RESOLUTION (June 85)
   #3 Shipboard scientist's handbook (rev. July 87)
   #4 Five papers on the Ocean Drilling Program from "OCEANS '85" (May 86)
   #5 Water Chemistry Procedures aboard JOIDES RESOLUTION (Sep 86)
   #6 Organic Geochemistry aboard JOIDES RESOLUTION - An Assay (Sep 86)
   #7 Shipboard Organic Geochemistry on JOIDES RESOLUTION (Sep 86)
   #8 Shipboard sedimentologists' handbook (Feb 88)
   #9 Deep Sea Drilling Project data file documents (Jan 88)
   #10 A Guide to ODP Tools for Downhole Measurement (June 88)

3. Scientific Prospectuses

   #0 (Mar 86) Leg 100
   #12 (Aug 86) Leg 112
   #13 (Oct 86) Leg 113
   #14 (Feb 87) Leg 114
   #15 (May 87) Leg 115
   #16 (May 87) Leg 116
   #17 (June 87) Leg 117
   #18 (June 87) Leg 118
   #19 (Sep 87) Leg 119
   #20 (Oct 87) Leg 120
   #21 (Mar 88) Leg 121
   #22/23 (June 88) Legs 122 & 123

4. Preliminary Reports

   #0 (May 86) Leg 100
   #12 (Feb 87) Leg 112
   #13 (May 87) Leg 113
   #14 (June 87) Leg 114
   #15 (Sep 87) Leg 115
   #16 (Sep 87) Leg 116
   #17 (Nov 87) Leg 117
   #18 (Feb 88) Leg 118
   #19 (Mar 88) Leg 119
   #20 (June 88) Leg 120

5. Other Items Available

   - Ocean Drilling Program (in English, French, Spanish or German)
   - Onboard JOIDES RESOLUTION
   - ODP Sample Distribution Policy
   - Instructions for Contributors to Proceedings of the Ocean Drilling Program (new edition available Feb 88)
   - ODP Engineering and Drilling Operations
   - Multilingual brochure with a synopsis of ODP in English, German, French, Japanese and Spanish (publication date late June)

LAMONT-DOHERTY GEOLOGICAL OBSERVATORY

Wireline Logging Manual (2nd Edition, Dec 86)

DIRECTORY OF JOIDES COMMITTEES, PANELS AND WORKING GROUPS

As reported in the last issue, the entire directory will now be published once annually. Beginning with this issue, new panel/committee members and address changes will be listed as below. Please refer to the complete Directory in the la issue of the JOIDES Journal when making these corrections. As always, the JOIDES Journal staff appreciates your help in keeping Directory listings up to date.

EXCUTIVE COMMITTEE (EXCOM)

New Address:

Stel, Dr. Jan
Netherlands Marine Research Foundation (SOZ), Koning in Sophiestraat 124, 2595 TM The Hague, The Netherlands, Tel: (31) 70-82-42-31, Tx: 20000/MEMO NL

PLANNING COMMITTEE (PCOM)

New member:

Leinen, Dr. Margaret
Replacing Dr. Roger L. Larson
(Liaison to CEPAC)
Graduate School of Oceanography, Univ. of Rhode Island, Narragansett, RI 02882-1197, Tel: (401) 792-6268, Tx: 257580/KNAU UR, Tmail: M.Leinen
[Alt: Dr. Roger Larson, Tel: (401) 792-6165, Tx: 7400188/LARS UR]

Other changes:

Brass, Dr. Garry
Change Telemail address to: GWBrass

Coulbourn, Dr. William T.
Change Telephone to: (808) 948-8489

Eldholm, Dr. Olav
Change Telephone to: (47) 2-456676

Shipley, Dr. Thomas H.
Change Telephone to: (512) 471-6156

ATLANTIC REGIONAL PANEL (ARP)

New Alternate:

Hemleben, Dr. Christoph
[Alt: Dr. Michael Sarnthein, Geologisch-Palaeontologisches Institut, Universitaet Kiel, Olshausenstr. 40, 2300 Kiel-1, Federal Republic of Germany, Tel: (49) 431-880-2851

CENTRAL & EASTERN PACIFIC REGIONAL PANEL (CEPAC)

New members:

Beiersdorf, Dr. Helmut
Replacing Dr. Ulrich Von Stackelberg
Bundesanstalt fur Geowissenschaften und Rohstoffe, Stilleweg 2, D-3000 Hannover 51, Postfach 510153, Federa Republic of Germany, Tel: (49) 511-643-2412, Tx: 923730/BGR HA D
[Alt: Dr. H-J. Brumsack, Geochemisches Inst. der Univ. Goettingen, Goldschmidtstr.1, 3400 Goettingen, Federal Republic of Germany]

Floyd, Dr. P.A.
Replacing Dr. Hugh C. Jenkyns
Department of Geology, University o Keele, Keele, Staffordshire ST5 5BG U.K., Tel: (44) 782-62-1111, Tx: 36113/UNKLIBG

New address:

Okada, Dr. Hakuyu
Dept. of Geology, Faculty of Scienc Kyushu Univ. 33, Hakozaki, Fukuoka-shi 812, Japan, Tel: (81) 092-641-1101 x4301, Tx: 25607/ORIUT J, Tmai ORI.Tokyo

New liaisons:

PCOM Liaisons: Coulbourn & Leinen
SOHP Liaison: Droxler

DOWNHOLE MEASUREMENTS PANEL (DMP)

New Liaisons:

PCOM Liaisons: Cowan & Langseth

INDIAN OCEAN REGIONAL PANEL (IOP)
No Changes

INFORMATION HANDLING PANEL (IHP)
No Changes

LITHOSPHERIC PANEL (LITHP)

New alternate:

Erzinger, Dr. Joerg
[Alt: Dr. H.Puchelt, Institut fur Petrographie und Geochemie, Univ., Karlsruhe, Kaiserstr. 12, 7500 Karlsruhe, Federal Republic of Germany]

POLLUTION PREVENTION & SAFETY PANEL (PPSP)

New members:

Aoki, Dr. Yutaka
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TECHNOLOGY & ENGINEERING DEVELOPMENT COMMITTEE (TEDCOM)

New Chairman:

Sparks, Dr. Charles, **Chairman**

New members:

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Forster, C.	EPR-WG	(801)750-1247	3789426/UTAHSTATEU LOGAN
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Garrison, R.	SOHP	(408)429-2114	9105984408/UC SC LIB SACZ
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Gill, J.	WPAC	(408)429-2425	9105984408/UC SC LIB SACZ
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Hemleben, C.	ARP	(49)7071-292-496	7262867/UTZV D
Herb, R.	SOP	(41)31-65-87-63	33228/UNI BE CH
Hertogen, J.	IHP	(32)16-20-10-15	23674/KULEUV B

Hey, R.	SSP	(808)948-8711	723825/HIGCM HR
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Howell, E.	DMP	(214)422-6857	794784/ARCO PLNO
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Kastner, M.*	PCOM	(619)534-2065	9103371271/UCWWD SIO SDG
Keen, C.*	ARP	(902)426-3413	01931552/BIO DRT
Keen, M.*	EXCOM	(902)426-2367	01931552/BIO DRT
Kennett, J.	SOP	(805)961-3764	not available
Kent, D.*	SOHP	(914)359-2900x544	7105762653/LAMONTGEO
Kidd, R.	SSP	(44)792-295-149	48358/UCSWAN G
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Kobayashi, K.*	EXCOM,PCOM	(81)3-376-1251	25607/ORIUT J
Kristensen, A.	DMP	(47)7-96-70-11	55278/STATD N
Kristjansson, L.	ODPC	(354)1-213-40	2307/ISINFO IS
Kristoffersen, Y.	SOP	(47)5-21-30-50	42877/UBBRB N
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Langseth, M.*	PCOM	(914)359-2900x518	7105762653/LAMONTGEO
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Last, A.	PPSP	(44)1-588-8000	884614/TRIOIL G
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Orcutt, J.*	LITHP	(619)534-2887	9103371271/UCWWD SIO SDG
Ottosson, M-O.	EXCOM,ODPC	(46)8-15-15-80	13599/RESCOUN S
Pascal, G.	DMP	(33)98-46-25-21	940627/OCEAN F
Paxton, A.	TEDCOM	(44)224-574555	739721/BRTOIL G
Pearce, J.	LITHP	(44)632-328511	53654/UNINEW G
Pereira, C.	SOP	(709)737-4382	0164101/MEMORIAL SNF
Perfit, M.	LITHP,EPR-WG	(904)392-2128	not available
Peirce, J.*	SSP	(403)296-5809	03821524/PETROCANRS CGY
Peveraro, R.	DMP	(44)41-226-5555	777633/BRTOIL G
Piccardo, G.	LITHP	(39)10-51-81-84	
Pisias, N.*	PCOM	(503)754-2600	258707/JOID UR
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Porter, R.	DMP	(206)543-6515	9104740096/UW UI
Pozzi, J-P.	DMP	(33)43-29-12-25	202601/NORMSUP F
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Riddihough, R.	TECP	(613)995-4482	not available
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Roure, F.	TECP	(33)47-52-68-13	203050/IFP A F
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Sartori, R.	SSP	(39)51-22-54-44	511350/I
Saunders, J.	IHP	(41)61-25-82-82	not available
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Schaaf, A.	SOHP	(33)98-03-16-94x328	941439/SEGALEN F
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Schlich, R.	IOP	(33)88-41-63-65	890518/IPGS F
Schrader, H.	CEPAC	(47)5-21-35-00	42877/UBBRB N
Schuh, F.	TEDCOM	(214)380-0203	794784/ARCO PLNO
Scott, S.	WPAC	(416)978-5424	0623887/GEOLOGY TOR
Scrutton, R.	IOP	(44)31-667-1081	727442/UNIVED G
Segawa, J.	IOP	(81)3-376-1251x259	25607/ORIUT J
Sengor, A.	CEPAC,ODPC	(90)1-433-100	23706/ITU TR
Serocki, S.*	ODP/TAMU	(409)845-2099	792779/ODP TAMU
Shackleton, N.*	SOHP	(44)223-334871	81240/CAMSPL G
Shipley, T.*	PCOM	(512)471-6156	9108741380/UTIG AUS
Sibuet, J-C.	ARP	(33)98-22-42-33	940627/OCEAN F
Sliter, W.	CEPAC	(415)853-8300	171449/PCS USGS MNPK
Small, L.	EXCOM	(503)754-4763	5105960682/OSU COVS
Smith, R.*	JOI	(202)232-3900	257828/BAKE UR
Smythe, D.	ARP	(44)31-667-1000	727343/SEISED G
Sondergeld, C.	DMP	(918)660-3917	200654/AMOCO UR
Sparks, C.	TEDCOM	(33)47-52-63-95	203050/IFP A F
Speed, R.	ARP	(312)492-3238	not available
Srivastava, S.*	TECP	(902)426-3148	01931552/BIO DRT
Stambaugh, S.*	JOIDES	(503)754-2600	258707/JOID UR
Stanton, P.	TEDCOM	(713)940-3793	9108815579/USEPRTX HOU
Steele, J.*	EXCOM	(617)548-1400x2500	951679/OCEANIST WOOH
Stein, R.	SOHP	(49)641-702-8365	482956/GRIWOTY UNIGI D
Steingrimsson, B.	DMP		
Stel, J.	EXCOM,ODPC	(31)70-82-42-31	20000/MEMO NL
Stephen, R.*	DMP,EPR-WG	(617)548-1400x2583	951679/OCEANIST WOOH
Storms, M.*	ODP/TAMU	(409)845-2101	792779/ODP TAMU
Summerhayes, C.	SOHP	(44)9327-762672	296041/BPSUNA G
Sutherland, A.*	NSF	(202)357-9849	257653/NSFO UR
Suyehiro, K.*	SSP	(81)472-51-1111	25607/ORIUT J
Svendsen, W.	TEDCOM	(612)331-1331	210685/LYHQ UR
Taira, A.*	PCOM	(81)3-376-1251x256	25607/ORIUT J
Tamaki, K.*	SSP	(81)3-376-1251	25607/ORIUT J
Taylor, B.*	WPAC	(33)43-36-25-25x5257	200145/UPMC SIX F
Thierstein, H.	PCOM	(41)1-256-3666	53178/ETHBI CH
Thunnell, R.	WPAC	(803)777-7593	not available
Traeger, R.	DMP	(505)844-2155	9109891600/SANDIA LABS
Tucholke, B.*	PCOM	(617)548-1400x2494	951679/OCEANIST WOOH

Vil			
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Von Lieshout, R.	ODPC	(31)2159-457-39	890440/ESF F
Vris, G.	ODPC	(30)1-777-36-13	215032/SATGEO GR
llinger, H.*	DMP	(49)471-483-1215	238695/POLAR D
Vincent, E.	IOP	(33)43-36-25-25x5162	200145/UPMC SIX F
Vogt, P.	TECP	(202)767-2024	897437/NRL LIMA WSH
von Rad, U.	PCOM	(49)511-643-2785	923730/BGR HA D
Vorren, T.	SOHP	(47)83-70011	64251/UBIBG N
Vrellis, G.	TEDCOM	(30)1-80-69-314	219415/DEP GR
Watts, T.*	TECP	(914)359-2900x533	7105762653/LAMONTGEO
Wefer, G.	SOHP	(49)421-218-3389	245811/UNI D
Weigel, W.	SSP	(49)40-4123-2981	214732/UNI HH D
Westbrook, G.	TECP	(44)21-472-1301	338938/SPAPHY G
Westgaard, L.	ODPC	(47)2-15-70-12	not available
White, R.	IOP	(44)223-333-400	817297/ASTRON G
Whitmarsh, R.*	ARP	(44)42879-4141	858833/OCEANS G
Wiedicke, M.*	JOIDES	(503)754-2600	258707/JOID UR
Wilkins, R.*	DMP	(808)948-6513	7238285/HIGCM HR
Winterer, E.*	PCOM	(619)534-2360	9103371271/UCWWD SIO SDG
Wise, S.	SOP	(904)644-5860	5106000494/FSU OCEAN
Wortel, R.	TECP	(31)30-53-50-74	40704/VMLRU NL
Worthington, P.	DMP	(44)9327-63263	296041/BPSUNA G
Zeigler, P.	PPSP	(31)70-773-203	36000/NL
Zierenberg, R.	EPR-WG	(415)329-5437	171449/PCS USGS MNPK

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Special Issue No. 3: Initial Site Prospectus, Supplement Two, June 1980 (Vol. VI)

Special Issue No. 4: Guide to the Ocean Drilling Program, September 1985, (Vol. XI)

Special Issue No. 4: Guide to the Ocean Drilling Program, Supplement One, June 1986 (Vol. XI)

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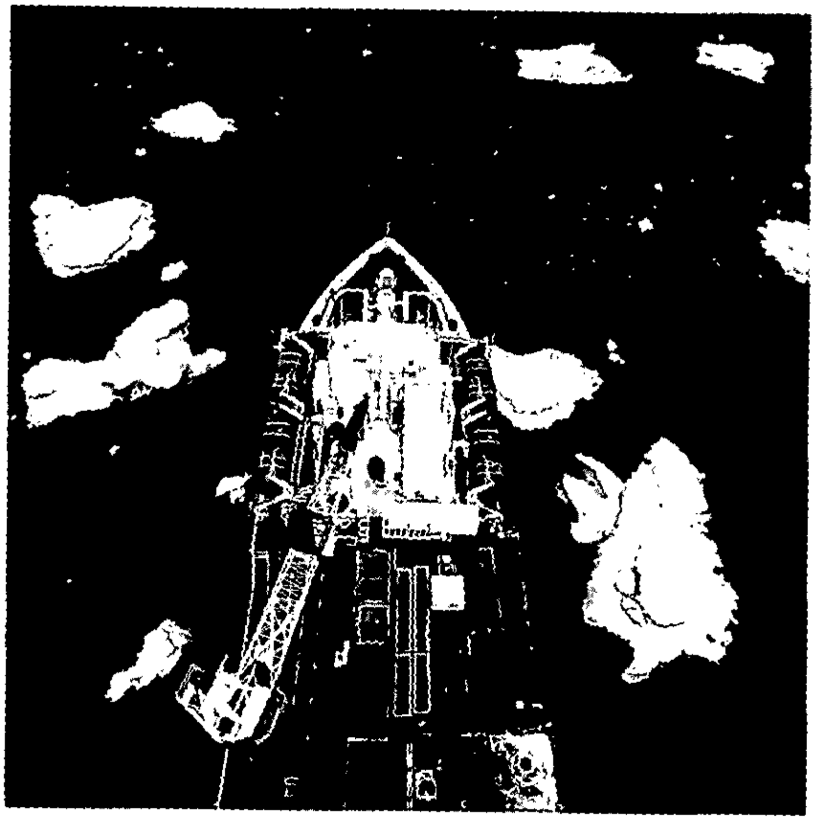

JOIDES Resolution entering the ice field in Prydz Bay during Leg 119. A chart on the ship's bridge defined these pieces of ice as "growlers" (the size of a baby grand piano) and "bergy bits" (the size of a modest house). Photo from the top of the derrick by Roy Davis, ODP/TAMU.