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SPECIAL ISSUE

INITIAL SITE PROSPECTUS
INTERNATIONAL PROGRAM OF OCEAN DRILLING

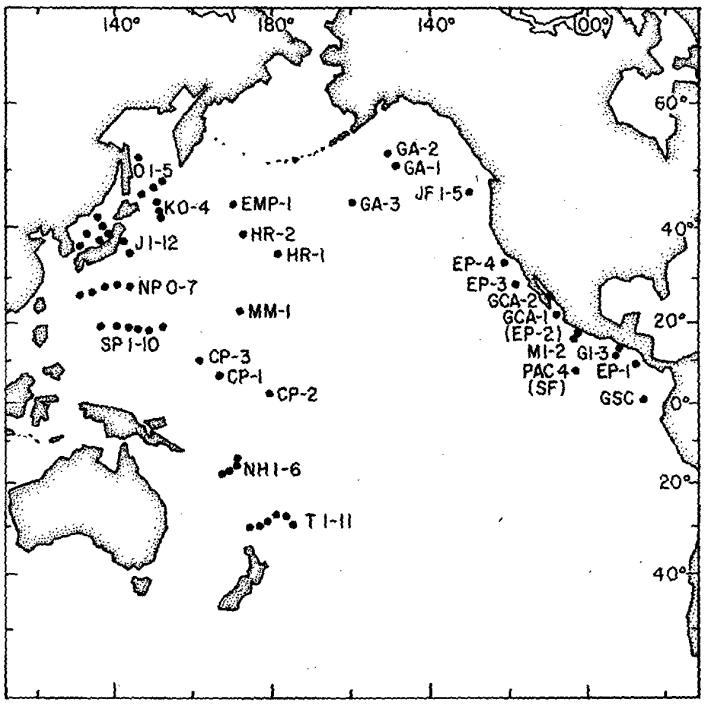

Figure 1. Pacific Ocean Drilling Sites

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PUBLICATION STATEMENT

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The purpose of JOIDES JOURNAL is to serve as a means of communication among the JOIDES Committees and Advisory Panels, the National Science Foundation, the Deep Sea Drilling Project and interested earth scientists.

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SCIENTIFIC PROSPECTUS FOR PROPOSED SITES

At the request of the JOIDES Advisory Panels and the Planning Committee, the JOIDES Office, in coordination with the advisory panels, is compiling background information and an initial site prospectus for each proposed geographic area (and sites) to be drilled during IPOD of the Deep Sea Drilling Project.

The minimum requirements for the Initial Site Prospectus to be provided by advisory panel groups are:

1. Background information including regional and local geologic setting and identification of existing geophysical/geological data base
2. Specific drilling objectives with priorities
3. Proposed site locations and possible alternatives
4. Drilling requirements for each objective (e.g., time, water depth, total drill length, re-entry, supplementary programs (logging), etc.)
5. Known data deficiencies needed for:
    a. suitable location of drill sites
    b. interpretation and extrapolation of drilling results
6. Statement of potential safety problems in implementing the proposed drilling
7. An individual assigned as proponent for each site who is responsible for providing the above information and will be contacted when there are any questions.

Following is a summary of the information pertaining to the individual sites to be drilled which was received from the assigned proponents of each site. Additional information was taken from past panel minutes and records on file in the JOIDES Office.

Because the information presented is incomplete, the JOIDES Office is requesting that the assigned proponent(s) for each site send the omitted information to the JOIDES Office so it may be forwarded and inserted into the JOURNAL. It is for this reason we have left this issue unbound. Please present and key your inputs to the minimum requirements listed above or to the site form found on the following page.

KEY TO NUMBERING SYSTEM

CP - Central Pacific Basin
EMP - Emperor Seamounts
EP - East Pacific
G - Guatemala (Mid America Trench)
M - Mexico (Mid America Trench)
GA - Gulf of Alaska
GCA - Gulf of California
GSC - Galapagos Spreading Center
J - Japan Trench
JF - Juan de Fuca
K - Kuril Arc Trench
O - Sea of Okhotsk
MM - Mid Pacific Mountains
NP - North Philippine Sea
NH - New Hebrides
PAC 4(SF) - Siqueros Fracture Zone
SP - South Philippine Sea
T - Tonga Trench
HR - Hess Rise

DSDP/IPOD SITE PROPOSAL

SITE:
POSITION:
GENERAL AREA:

GENERAL OBJECTIVE:

PANEL INTEREST:

OBJECTIVES:

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m):_____ Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

GENERAL SCIENTIFIC NARRATIVE FOR ACTIVE MARGINS (AMP minutes, August 1975)

Active margins can be considered under two main subdivisions: active margin-trench systems and back arc basins and inter-arc basins.

Active Margin-Trench Systems

In terms of plate tectonics, the convergence of two plates may result in under-thrusting (subduction) of one plate beneath the other. The process generally envisioned for seismically active island arcs and continental margins, marked by a deep-sea trench, is that the sediments of the descending sea floor are either offscraped and thrust against the adjacent margin or dragged beneath it. It is possible that blocks of oceanic crust may also be incorporated in the inner wall of the trench.

Morphologically, the trench system can be generally divided into a number of discrete elements which are, from the ocean landwards:

1. a rise seawards of the trench,
2. the trench proper,
3. a zone of imbricate under-thrusting beneath the inner wall of the trench and
4. the mid/upper slope of the inner wall of the trench landwards, containing either relatively undisturbed sediments overlying a diffracting zone, imbricate thrust zone or downfaulted basement block.

Deep drilling is needed to investigate the nature of the sediments and basement rocks comprising the slopes of active margins and thus provide clues as to the whereabouts of sediments eroded from the hinterlands and those offscraped from the ocean crust and/or carried down the subduction zone; i.e., to provide critical tests of the hypothesis of plate tectonics.

The determination of the nature and structure of the rocks in the imbricate zone (toe of the trench) and the rocks beneath the unconformity are the prime objectives in the investigation. Other significant objectives are the study of the history of sedimentation above the unconformity and the nature of the oceanic crust being subducted into the trench and its subsequent effect on the style of arc-margin volcanism.

The trenches may have evolved by (a) addition of material to the inner wall by plastering of sediments deposited initially in the trench and ocean floor and/or by incorporation of oceanic crustal blocks (accretionary margins) and (b) tectonic removal of continental or oceanic crust by the descending slab (non-accretionary or consumptive margins).

The tectonic styles of trench margin systems have been classified as follows:

1. Inner slopes underlain by thick masses of sedimentary rock (e.g., Middle America and Japan trenches)
2. Inner wall underlain by thin sediment or igneous rocks (fore-arc slopes with basic or ultrabasic rocks exposed, e.g., Peru, Chile, and northern Middle America trenches).

Back Arc Basins and Inter-arc Basins

Back-arc (or marginal sea) basins are normally associated with active island arc-trench systems and flanked by passive continental margins. The back-arc basins

vary greatly in depth to the sea floor, thickness of sedimentary fill, magnetic and gravity field strength, and heat flow. Hypotheses on the origin of back-arc basins and possible examples include:

1. entrapment of old oceanic crust by formation of the island arc (West Philippine Sea, Bering Sea, Sea of Okhotsk),
2. generation of new crust by arc migration (sea floor spreading) (Sea of Japan, Andaman Sea, East Philippine Sea),
3. subsidence or collapse of continental or quasi-continental crust with attendant or subsequent oceanization (Seas of Japan and Okhotsk, South China Sea, Sulu-Celebes Seas),
4. rejuvenation of the sea floor by intense volcanism (Philippine Sea), and
5. any combination of these mechanisms.

The genesis is believed to be directly related to the formation of the bordering island arc.

The inter-arc basins and intraoceanic marginal seas have comparatively thin sediments and sometimes show evidence of formation by extension. They are usually flanked on the landward side by essentially submerged ridges and on the oceanward side by an active island-arc trench system. The study of island arcs is regarded as an integral part of the study of active margins, the simpler ones such as the Mariana and Tonga arcs should be especially instructive.

Although evidence of an extensional origin is common, later events may have obscured simple spreading patterns. Controversy exists as to whether they result from symmetrical, asymmetrical or irregular spreading, e.g., in the Japan Basin, Shikoku Basin and the South Fiji Basin. Later modification appears to have occurred in the eastern Shikoku Basin and the South Fiji Basin and the structure of the Parece Vela Basin may differ from that of the Shikoku Basin to the north.

Two inter-arc basins are known, the Mariana Trough and the Lau Havre Trough. Both are youthful and appear to have been formed by spreading and rifting of island arcs.

GENERAL SCIENTIFIC NARRATIVE FOR OCEAN PALEOENVIRONMENT

Paleo-oceanographic History of the North Pacific and the Evolution of Plankton Communities

Overview

The North Pacific Ocean is in many respects an ideal region in which to scrutinize Cenozoic paleo-oceanographic-paleoclimatic history and associated evolutionary development of plankton communities. Significantly, the North Pacific has experienced a more stable long term configuration than either the North Atlantic or Indian Oceans, and a similar counterpart half-ocean (the South Pacific) is available for comparative studies and tests of synchroneity with southern hemisphere events. Moreover, the present-day oceanography and plankton communities of the North Pacific are relatively well known, forming dynamic models against which to view Cenozoic patterns. Indeed, laboratory-like patterns of surface circulation, upwelling, and productivity have apparently characterized the North Pacific throughout the Cenozoic, with fundamental changes of the basic circulatory scheme and plankton community structure occurring in response to (a) mid-Cenozoic closing of the Tethys seaway and initiation of the Circum-Antarctic

circulation, (b) late Cenozoic closing of the Isthmus of Panama, and (c) multiple Cenozoic glacial episodes of varying frequency and intensity. All of these paleo-oceanographic and tectonic events have repeatedly stressed existing plankton communities with evolutionary and paleoenvironmental responses documented within the evolving arrays of fossil calcareous and siliceous plankton common to North Pacific deep sea sediments. Variations in the thickness, extent, and dissolution facies of these biogenic deposits with time provide another perspective of biologic responses on a grander scale and together with plate motion have produced paleo-oceanographically meaningful plate stratigraphies.

Studies of modern plankton in the North Pacific and elsewhere have repeatedly demonstrated that distinct assemblages of foraminifera, coccolithophorids, diatoms, and radiolarians mirror major water mass boundaries as well as areas of intense vertical circulation and productivity. Subarctic, Transitional, Central Gyre, Equatorial, and Eastern Equatorial plankton communities are readily distinguished in the present-day surface waters of the North Pacific, and evidence is equally clear that fossil distributions of these same groups record past configurations and dynamics of North Pacific circulation. For example, initial studies of Neogene DSDP cores and deep marine sequences exposed along the eastern rim of the North Pacific illustrate that temperature sensitive planktonic foraminiferal biofacies have migrated north and south within the California Current province in concert with paleoclimatically induced adjustments of surface isotherms, a major oceanic front, and centers of intense upwelling. Glimpses of mid and early Cenozoic patterns are present at other DSDP sites in this region and portend equally dynamic paleo-oceanographic, paleoenvironmental, and evolutionary histories for all four major boundary currents and gyres of the North Pacific.

Proposed Cenozoic Paleoenvironmental Sites and Objectives in the North Pacific

Given the initial insights into the nature of North Pacific Cenozoic paleo-oceanographic and plankton evolution, it is clear that a systematic program of drilling within this region together with extant DSDP sequences will provide a uniquely synoptic view of both physical and biologic responses of a relatively simple half-ocean to climatic maxima and minima over the past 70 million years -, a period characterized by tectonic partitioning of the world ocean and elimination of circum-meridial circulation. The proposed program centers on the drilling of 13 plankton-rich Neogene and Paleogene sequences beneath the tracks of the major North Pacific boundary currents, Central and Subarctic Gyres, and the distal and central Equatorial Current regime. Several of these sites have multiple paleo-environmental and tectonic objectives, including sites J-2 and NP-7 (Figure 1) proposed by other IPOD panels.

The primary objectives of this program are (a) to gain a basic understanding of the Cenozoic paleo-oceanography of the North Pacific in terms of surface water mass structure and dynamics, as reflected by the distribution of fossil plankton and biogenous deep sea and marginal basin sediments and (b) to study the development of Cenozoic oceanic plankton communities within the framework of a dynamic but relatively uncomplicated ocean. It is important to note that the package of proposed and extant North Pacific sites will allow major paleoclimatic/paleo-oceanographic signals to be repeatedly traced in time and space around an entire oceanographic circuit. This in turn will allow study of time delay and phase relationships of both circulatory and plankton responses within eastern and western boundary currents, regional adjustments of surface isotherms, and the migration of oceanic fronts. Thus, proposed IPOD sites include locations beneath the Oyashio-Kuroshio convergence in the northwestern Pacific (Site J-2), beneath the mixing zone of the distal California Current (EP-3), and across the zone of migration of the

North Pacific Front (HR-1, HR-2; Figure 1). These same areas offer superb settings in which to analyze highly stressed planktonic faunal and floral biofacies through at least the late Neogene. The California Current and associated plankton probably represent one of the best known current regimes in the world, and study of DSDP site 173 together with proposed sites EP-1, EP-2, EP-3, and EP-4 (Figure 1) will allow the development of subarctic, transitional, and subtropical plankton communities within this current to be traced back through the Neogene together with a detailed paleo-oceanographic history. More specifically, proposed site EP-4 in the Patton Basin off southern California (Figure 1) should provide an expanded Plio-Pleistocene record of the California Current and upwelling due to the relatively high rates of terrigenous sedimentation within this borderland basin.

Two primary aspects of the development of oceanic plankton communities will be emphasized in this regional study: (a) the Neogene history and development of present-day North Pacific plankton communities and (b) the late Eocene-Oligocene period of great extinction and radiation of oceanic plankton. The early Jurassic-Cretaceous evolution of plankton is also of critical importance to this investigation with relevant Mesozoic IPOD sites treated in a separate Ocean Paleoenvironment Panel summary. Evolutionary studies at the proposed Cenozoic sites will address a number of important questions regarding (a) the persistence or transcience of dominant members of each plankton community, (b) evidences of synchronization of evolving changes within distinct lineages of individual communities, (c) the extent and direction of interchange between Atlantic and Pacific communities, (d) paleo-climatically induced changes in water mass structure (horizontal and vertical) and community structure, and (e) restructing of plankton communities via changes in nutrient input to the oceans as modulated by tectonic and paleo-oceanographic phenomena.

DSDP/IPOD SITE PROPOSAL

SITE: CP-1
POSITION: 7°10'N; 164°45'E
GENERAL AREA:
Central Pacific
Nauru Basin

GENERAL OBJECTIVE: Jurassic and Cretaceous history of Pacific

PANEL INTEREST: OPP, OCP, SCP

OBJECTIVES:

1. To investigate the late Jurassic history of the Pacific Ocean.
2. To test whether the fluctuations of the carbonate line in the Pacific through the Cretaceous indicate that paleo-circulation was basin/basin fractionated (as today) or whether marginal sea/deep ocean fractionation prevailed, Late Cretaceous paleo depth 4 km.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: RC 17, 21, Nov. 2, 0430 + V 32, 33 Oct. 5, 1030

Other Data:

Site Survey Data: Conducted by: D. Hussong (HIG)

Date: Spring 1977
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 4400 Sediment Thickness (m): > 300 Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): > 300

Nature of Sediments Anticipated: 200-300 m transported sed., up to 1 km indurated limestone/chert or volcanic sequence
Weather Conditions: good year round
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: 3 paleontologists

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Y. Lancelot/H. Thierstein (OPP)	OPP highest priority		

DSDP/IPOD SITE PROPOSAL

SITE: CP-1
POSITION: 7°10'N; 164°45'E
GENERAL AREA:
Central Pacific
Nauru Basin

GENERAL OBJECTIVE: Old high latitude Pacific crust

PANEL INTEREST: OCP, OPP SCP

OBJECTIVES:
The aim is a multiple re-entry hole as deep as possible into basement. The chief objective is to study very old fast spreading crust and the effects of aging on such crust as compared with young Pacific crust. At this site the paleolatitude of formation was great enough to simplify the interpretation of paleomagnetic data from drilled samples, so that a major paleomagnetic effort is planned here. If good penetration is achieved here then this will be a major site aimed at deep penetration for crustal structure studies. The age of the crust is more than 153 m.y. with a spreading rate of 4.7 cm/yr.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: D. Hussong (HIG)

Date: Spring 1977
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5000 Sediment Thickness (m): 500 Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m):

Nature of Sediments Anticipated: chalks and limestones (?)

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Roger Larson	Panel(s) Endorsement OCP, OPP	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: CP-2
POSITION: $1^{o}45'N$; $178^{o}40'E$
GENERAL AREA:
Central Pacific
East of Gilbert Islands

GENERAL OBJECTIVE: Cretaceous history of Pacific

PANEL INTEREST: SCP, OPP

OBJECTIVES:
To test fluctuation of carbonate line and Cretaceous paleo-oceanography (probability of improving sediment recovery of nearby Sites 169 and 170 considered moderate)
Preferably at nearby deeper site with >300m sediments

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: RC 13-04, V 28-11

Other Data:

Site Survey Data: Conducted by: R. Larson

Date: Spring 1977
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5000 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: clays, oozes, cherts

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Y. Lancelot/H. Thierstein	OPP second priority		

DSDP/IPOD SITE PROPOSAL

SITE: CP-2
POSITION: $1^{\circ}45'N$; $178^{\circ}40'E$
GENERAL AREA:
Central Pacific Basin

GENERAL OBJECTIVE: Old high latitude Pacific crust

PANEL INTEREST: OCP, OPP, SCP

OBJECTIVES:

Same objectives as CP-1 (ocean crustal drilling)

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: Age of crust: 121 m.y.; spreading rate: 6.4 cm/yr

Site Survey Data: Conducted by: D. Hussong

Date: Spring 1977
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5400 Sediment Thickness (m): 200-300 Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): _____

Nature of Sediments Anticipated: Radiolarian ooze

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Roger Larson	Panel(s) Endorsement OCP	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: CP-3
POSITION: 9°N; 160°E
GENERAL AREA:
Central Pacific
SE - Mariana Basin

GENERAL OBJECTIVE: Triassic (?) and Jurassic history of Pacific

PANEL INTEREST: OPP, SCP

OBJECTIVES:
We expect this to be the oldest (>160 m.y.) preserved oceanic record.
Will do current open ocean environmental and sediments prior to evolution and radiation of major plankton groups.
Late Cretaceous paleo depth ~5km

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: GC, Nov 1, 1971, 00.00-07.00, v 13-04, V38-14

Other Data:

Site Survey Data: Conducted by: Hussong/Larson (HIG)

Date: Spring 1977
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5000 Sediment Thickness (m): > 3 sec Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): _____ _____

Nature of Sediments Anticipated: 0.15 transparent sed., > 0.3 sec opaque sed.

Weather Conditions: good year round (typhons?)
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: > 3 paleontologists

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Lancelot/Thierstein	OPP highest priority		

EMPEROR SEAMOUNTS (EMP)

The Hawaiian-Emperor chain (Figure 1) is believed to be a completely volcanic island chain with some of the highest peaks in the world. It is about 6,000 km long and composed of some 107 shield volcanoes. It has formed indiscriminantly across older rocks of the Pacific plate over at least the last 70 m.y. in a generally progressive way. The geology and petrology of the southeastern end of the Hawaiian chain make it the best studied volcanic area in the world by an order of magnitude. The Hawaiian-Emperor chain is the only chain in the Pacific that has a demonstrable age progressive bend. Southeast of the bend it is composed of 67 individual shields with a volume of 745,000 km^3 deployed over a distance of 3,550 km. The Emperors are only slightly less impressive, being composed of at least 40 individual shield volcanoes with a total volume of 336,000 km^3 over a distance of 2,250 km.

Twenty-one fairly reliable ages are available from the Hawaiian portion of the chain. The ages show some scatter but are generally older toward the bend, where rocks from three seamounts have recently been dated at 40-42 m.y. B.P. Only one volcano in the Emperors has been dated with assurance - Koko Seamount, only 330 km north of the bend at 46.4 $\pm$ 1.1 m.y. B.P. Meiji Seamount, which may belong to the Emperor chain, has a minimum fossil age of about 72 $\pm$ 3 m.y. No reliable age data exist between these points.

The age and latitude of formation of these shields is of extreme interest in testing the hypotheses of fixed reference frames for global tectonics. The textures and compositions of volcanic rocks collected from islands, dredged or drilled as far as Koko Seamount have been found to be similar to Hawaiian lava types and distinct from oceanic ridge basalts with the exception that phonolites, unknown in the southeastern islands have been found at Koko. Whether these rocks presage a different fractionation system or bulk chemical composition further up the Emperors is unknown - at any rate volcanic rocks further to the north will yield information on mantle source rock homogeneity or heterogeneity with time.

It is here proposed that one re-entry hole and one single-bit hole be drilled in the Emperor Seamount chain during IPOD Phase I in summer 1977. Successful drilling of these holes will provide critical tests of the fixed hot spot hypothesis and data relevant to the following questions:

1. Does the progressive nature of Hawaiian volcanism extend into the Emperor Seamounts, and what is the volcanic propagation rate on the Emperor segment?
2. At what time and at what paleolatitude did the Emperor Seamounts form, and has the Hawaiian melting anomaly remained fixed during the last 60-70 m.y.?
3. Does the chemistry of the mantle source region beneath the Pacific plate, as evidenced by the major and minor element chemistry and the isotopic composition of shield lavas, remain constant through time, or change?
4. Are there compositional differences between large and small seamounts in this area?

We submit that drilling no other seamount chain can yield answers to these questions simply because no other linear island chain has adequate information on geochronology, paleomagnetic positions, and basic chemical composition to permit a meaningful comparison.

Proposed Drilling Sites

For the present we would suggest that two sites be drilled in the central Emperor chain, one a pilot and a re-entry hole in a large composite seamount, the other a single-bit hole in a smaller seamount. The exact positions of these sites must await site surveys, but areas of prime interest may be selected at this time.

Selected Areas and Drilling Plans

Bathymetric consideration of the central Emperor chain shows Suiko Seamount to lie about midway between Koko Seamount, whose rocks are well documented from dredge hauls and Meiji Seamount, which is believed to be the most northerly edifice of the Emperor chain. Suiko is also one of the largest edifices in the chain, with a volume of 23.9 km^3. Suiko has been dredged and dredge hauls recovered "andesite", "andesite tuff," quartzo-feldspathic sandstone, granite, argillite, and mudstone. A number of airgun profiles were run north-northwest across the seamount, but we have as yet been unable to see these records, although Dr. Kobayashi of the University of Tokyo is attempting to locate them for us. Nonetheless, it seems safe to say from the dredge haul data that debris from the Aleutian arc is at least locally distributed over the seamount, and we do not envisage a problem in spudding in. The seamount is far enough north of Kilauea (25 degrees latitude) so that paleolatitude data should be statistically sound, and geochronologic data are solely needed in this part of the chain.

We propose that a single-bit pilot hole be drilled once a site on the seamount is selected, and, if successful, a re-entry hole be spudded nearby. We would hope that the re-entry hole enables the drill to reach depths of more than 500 m. Coring and logging should be continuous. We estimate drilling and re-entry time at this site to be on the order of 30 days.

Further we propose a second single-bit site be drilled either on Tenchi Seamount, or on one of the smaller seamounts just to the south of it (the seamounts in this area range in volume from 3.2 to 10.0 km^3). Again, large-scale bathymetry and the contents of one dredge haul are now available for this area. The rocks recovered from Tenchi are tholeiitic basalt, crystal tuff, volcanic sandstone, quartz-bearing mudstone, and graywacke, again suggesting at least partial cover with Aleutian debris. No acoustic profiles are available in this area. Again the single-bit hole should be continuously cored and logged. We estimate that the drilling time at this site would be on the order of 10 days.

DSDP/IPOD SITE PROPOSAL

SITE: EMP-1
POSITION: approx. 45°N; 170°E
GENERAL AREA:
Emperor Seamount Chain

GENERAL OBJECTIVE: Testing hot spot hypothesis

PANEL INTEREST: OCP

OBJECTIVES:
Plans are for one multiple re-entry hole on Suiko Seamount in the Emperors and one single bit hole on a small, un-named seamount nearby. Objectives are (1) to find the paleolatitude of formation of one or more seamounts in the chain to test the fixed hot spot model; (2) to find the age of formation of at least two seamounts in the chain to find the rate of migration of volcanism along the chain, (3) to investigate systematic changes in petrology and chemistry along the chain, and (4) to compare the structure, age and petrology of a small seamount with a large one.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: Green et al.

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2400-3600 Sediment Thickness (m): variable Total Time on Site (days)

(Single Bit) -- (Re-entry) Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Dale Jackson	Panel(s) Endorsement OCP	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: EP-1
POSITION: 22°30'N; 109°45'W
GENERAL AREA:
Southern tip of Baja California Peninsula

GENERAL OBJECTIVE: Cenozoic paleo-oceanography of North Pacific; evolution of planktic communities

PANEL INTEREST: OPP

OBJECTIVES: The San Lucas submarine fan forms a relatively thick (800-1000m) and rapidly deposited wedge of Pleistocene and Recent terrigenous sediment at the southern tip of the Baja California peninsula. Site EP-1 is located over the thickest portion of this feature and should yield an undisturbed record of fan growth as well as an expanded if somewhat interrupted record of Quaternary siliceous and calcareous plankton in an area of dynamic interplay between the distal California Current, equatorial water, and Gulf of California water. In addition, penetration to basement at this site should allow dating of the relatively young crust on the west flank of the East Pacific Rise bearing directly on the history of rifting in the Gulf of California and provide a check on the estimated Gauss age of the magnetic anomaly beneath this site.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: S10 (Horizon) reflection profiles & refraction stations - see Line E attached
Other Data: See Normark and Curray, 1968, Geology & structure of the tip of Baja California, Mexico. GSA, v. 79. Additional & updated info available from W. Normark (USGS).
Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3100 Sediment Thickness (m): 800+ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: Interbedded fine sands, silts and clays

Weather Conditions: Frequent tropical storms August through November
Jurisdiction: Mexico
Other:

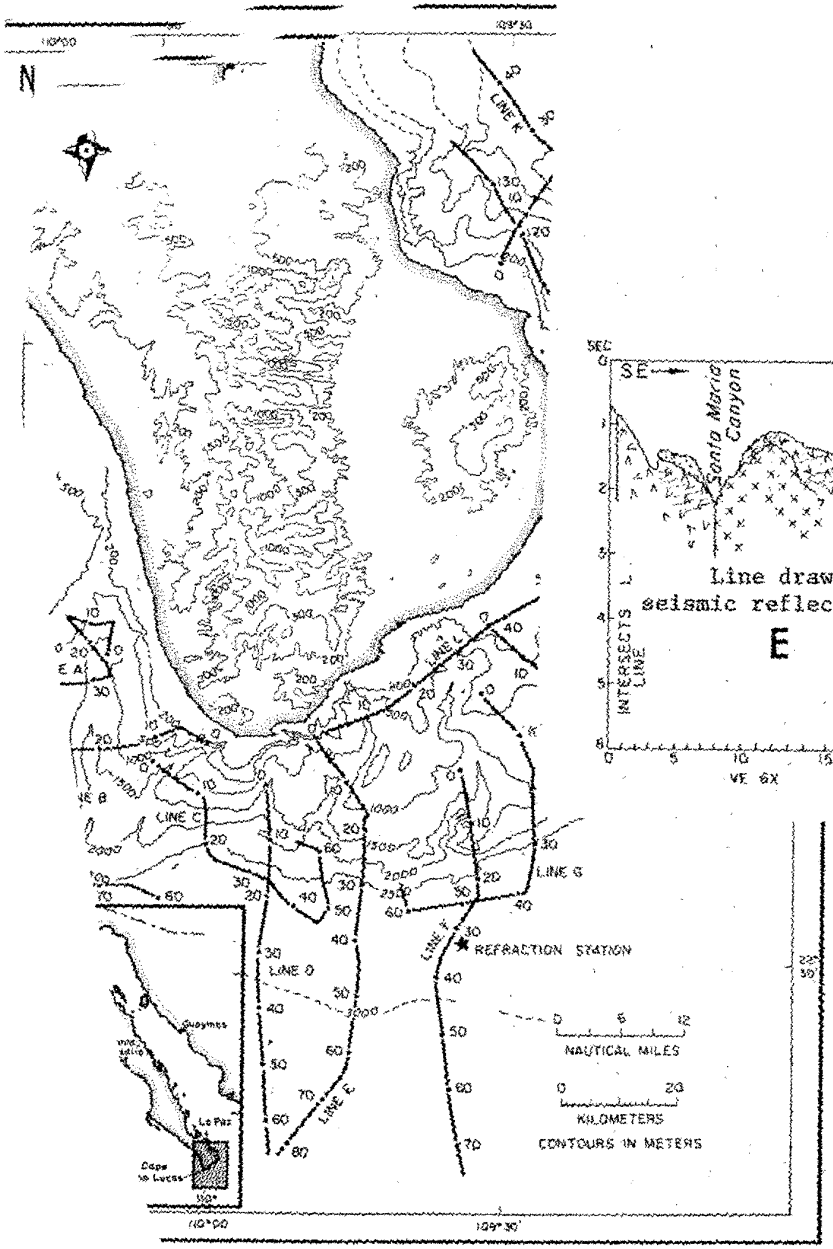
SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

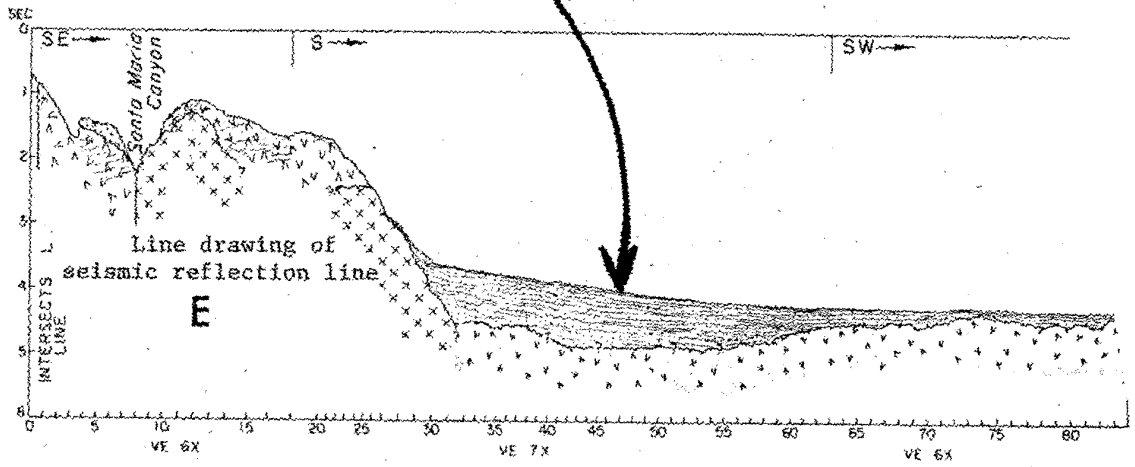
Shoreboard:

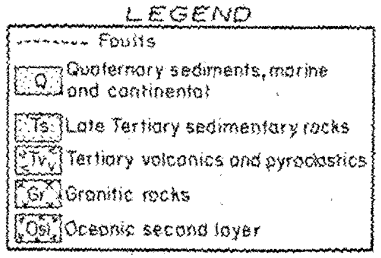
Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Ingle			



PROPOSED IPOD SITE





ck for seismic reflection profiles A through L across Cabo San Lucas continental
ve keyed with the line drawings and photographs of records (Pls. 2, and 4 to 6).

FROM: Normark, W.R. and Curray, J. R., 1968
[illegible] J.R. Baja [illegible] Geology
structure of the tip of Amer. Baja Cal[illegible] California, Mexi
Geological Soc. A[illegible]er.. [illegible], Bull., vol amer., Bull

DSDP/IPOD SITE PROPOSAL

SITE: EP-2
POSITION: 23°30'N; 112°30'W
GENERAL AREA:
SW margin of Baja California peninsula

GENERAL OBJECTIVE: Cenozoic paleo-oceanography of the North Pacific; evolution of planktic communities.

PANEL INTEREST: OPP

OBJECTIVES: Site EP-2 is located just south of the present mixing zone between the distal California Current and equatorial water. Accumulating evidence indicates this oceanic front has migrated as much as 15° from its present position. Penetration of the estimated 400+m of Miocene (?) through Recent sediment at the Site EP-2 base-of-slope location should provide an excellent siliceous planktic record of late Neogene paleooceanographic events in this important area. Magnetic anomaly patterns in the Site EP-2 area suggest a crustal age no older than anomaly 5; penetration to basement will provide a check on this interpretation as well as critical evidence bearing on cessation of Neogene subduction along this portion of the Baja California margin.

BACKGROUND INFORMATION:

Regional Data: Seismic Profiles: SIO Baja 69 expedition reflection profiles & other SIO 1967 through 1976 records.

Other Data: Good seismic, magnetic, and dredge data available from W. Normark (USGS).

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 3800 Sediment Thickness (m): 400 Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: Interbedded fine grained turbidites and hemipelagic muds

Weather Conditions: Tropical storms frequent August through November

Jurisdiction: Mexico

Other:

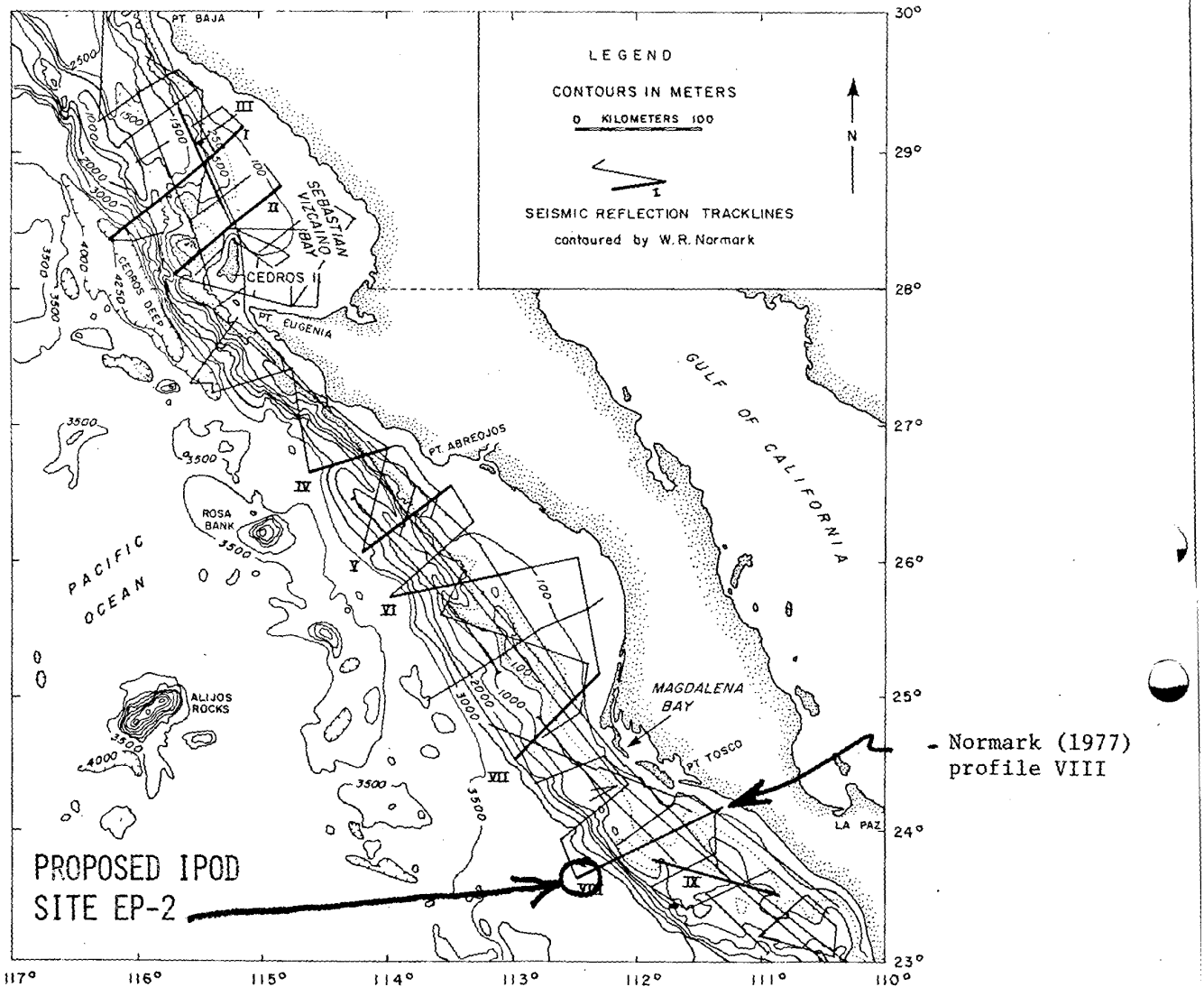
SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

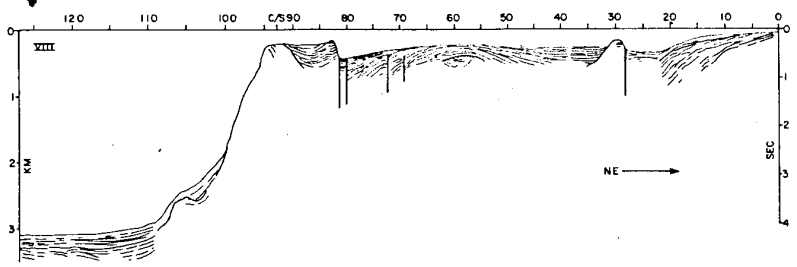
STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Ingle			



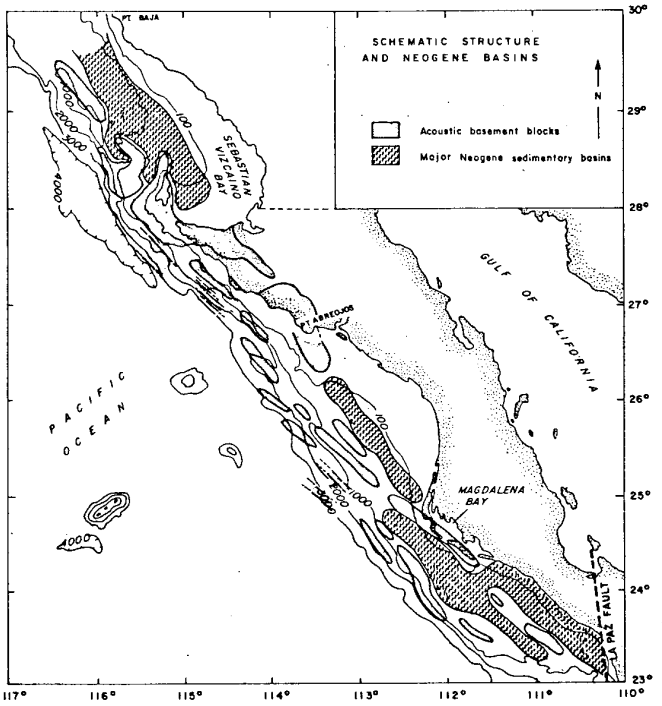
Bathymetry of Baja California continental margin with track lines for seismic reflection data; contour interval 500 m except for 100-m, 250-m (dotted), and 4,250-m contours included for defining physiographic features; map area contoured by the author using Scripps Institution of Oceanography sounding data in addition to track lines shown; profile locations for Fig. 2 - 5 shown by heavy lines.

FROM: Normark, W.R., 1977, Neogene basins and transform motion within the Pacific continental margin of Baja California. Proc. Offshore Tech. Conf., Ninth Ann., Houston, p. 93-100.

PROPOSED IPOD SITE EP-2



Line drawing of Normark (1977) reflection profile VIII across the Magdalena Borderland province. Vertical scales in seconds of round-trip travel time and kilometers of water depth; profile location on Figure 1.



Schematic representation of areas underlain by acoustic basement (solid) and major Neogene sedimentary basins (hachured); pattern of northwest-trending ridges and banks along the marin in some cases are continuous with pre-Neogene metavolcanic, metasedimentary, and intrusive rocks underlying onshore coastal uplands or islands.

DSDP/IPOD SITE PROPOSAL

SITE: EP-3
POSITION: 32°38'N; 120°30'W
GENERAL AREA:
Southern California margin

GENERAL OBJECTIVE: Cenozoic paleoceanography of North Pacific; evolution of planktic communities

PANEL INTEREST: OPP

OBJECTIVES: Site EP-3 lies in a paleo-trench (?) at the base of the Patton Escarpment immediately west of the Southern California Continental Borderland. Available seismic records indicate that this depression contains at least 600m of transparent Miocene (?) through Holocene sediment presenting an excellent opportunity to recover a late Neogene record of siliceous plankton beneath the southern portion of the California Current in an area free of potential hydrocarbon hazards. In addition, dating of this column and underlying seismic basement will provide contraints on the timing of tectonic events and evolution of the Patton Escarpment and the adjacent borderland. This is a companion or alternate site to proposed IPOD Site EP-4 in the Tanner Basin (see Ingle North Pacific

BACKGROUND INFORMATION: Proposal of 2-1-77).

Regional Data:

Seismic Profiles: One good seismic reflection line available from J. Crouch (SIO)

Other Data: None

Site Survey Data: Conducted by:

Date:

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 3700 Sediment Thickness (m): 600 Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: 600 m Miocene (?) through Recent terrigenous clay and silts

Weather Conditions:

Jurisdiction:

Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Ingle			

DSDP/IPOD SITE PROPOSAL

SITE: EP-4
POSITION: 33°45'N; 121°00'W
GENERAL AREA:
Southern California margin

GENERAL OBJECTIVE: Cenozoic paleo-oceanography of North Pacific; evolution of planktic communities.

PANEL INTEREST: OPP

OBJECTIVES: Site EP-4 lies on a local high at the base of the northern portion of the Patton Escarpment and is underlain by at least 800m of landward dipping Miocene (?) through Holocene sediments. Recovery of this sequence should yield a relatively expanded record of siliceous plankton beneath the southern portion of the California Current. In addition, penetration of this feature should provide definitive evidence of its depositional and/or tectonic origin as well as constraints on the origin and evolution of the Patton Escarpment and adjacent borderland. This site constitutes a companion or alternate to proposed IPOD Site EP-4 in Tanner Basin.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: One good reflection profile from the USGS RV Lee and poor records from E.B. Scripps
Other Data: magnetic records available but of poor quality

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3500 Sediment Thickness (m): 800+ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: 800+m of Miocene (?) through Holocene terrigenous clays and silts
Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Ingle			

DSDP/IPOD SITE PROPOSAL

SITE: EP-5
POSITION: 39°30'N; 127°20'W
GENERAL AREA:
Distal Delgada Fan

GENERAL OBJECTIVE: Cenozoic paleo-oceanography of North Pacific; evolution of planktic communities.

PANEL INTEREST: OPP

OBJECTIVES: Site EP-5 lies on an abyssal plain at the distal end of the Delgada Submarine Fan and immediately west of DSDP Site 34. Drilling at Site 34 yielded an incomplete record of Oligocene through Pleistocene siliceous plankton deposited at the eastern margin of the North Pacific Gyre and it is important to obtain a more complete sequence within this paleo-oceanographically important area. Seismic records and cores at Site 34 indicate a probable sediment column of 350+m of terrigenous muds and siliceous oozes at Site EP-5. It is especially important to establish the character of plankton communities in the area west of the California Current and sediments at this site should yield both a good evolutionary record as well as evidence of neogene paleo-oceanographic events west of the California Current and south of the North Pacific front.

BACKGROUND INFORMATION:
Regional Data: This is a companion site to DSDP site 173 beneath the northern California Current.
Seismic Profiles:
Challenger Site 33 and 34 seismic info attached.
Other Data:
Challenger magnetic data and drilling records at Sites 33 and 34

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4400 Sediment Thickness (m): 350 Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: 350m of terrigenous muds and siliceous oozes; possibility of cherts in lower portion of sequence.
Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Ingle			

MIDDLE AMERICA TRENCH SITES (G), (M)

Active Margin Panel Objectives

The Middle America Trench is well-developed in typical trench characteristics: active seismicity, widespread volcanism, topographic trench, etc. However, it is also particularly important since the southern part shows the characteristics of accretion of sediments and crustal material onto the continental margin, while the northern part appears to show destruction of continental margin, with very ancient rocks apparently being truncated between the Mexican shores and the adjacent trench.

Two traverses were planned to investigate these differences within a single trench system - three holes off Guatemala and two off Mexico. It would also be desirable to include a hole on the ocean crust west of the trench on the extension of each traverse, but these are not included in the following descriptions.

The drilling off Guatemala would (a) provide evidence regarding episodic subduction, (b) establish the age of sediments and volcanics, and possibly their repetition by thrusting, (c) determine times of deformation revealed by the numerous unconformities covered by little deformed sediments and (d) the structure and history of the trench slopes with the apparent geological history indicated from adjacent oceanic crust and the exposed rocks of the continent.

The transect off Mexico is designed to sample the basement rocks underlying the inner trench wall to determine their nature and age and the age of the unconformably overlying sediments. One sample of granite has been dredged from this inner wall. These sites will be tied geophysically to those off Guatemala.

Detailed geophysical data and the results of several wells from the shelf areas will be made available to further supplement the regional importance of the IPOD sites. Multifold reflection data in a few localities indicate that the proposed drilling is reasonable and possible. All of the geophysical data will be tied to the history indicated by exposed rocks on land and existing surveys in the oceanic crust to the west.

The three holes off Guatemala (G1, G2, G3) are located near the base of the inner wall, part way up the slope and at the shallowest prominent unconformity on this inner wall. Each site will test the age and nature of the rocks below this unconformity as well as of the overlying sediments. The extent of deformation and physical characteristics of the deeper rocks are also of obvious importance.

The two holes off Mexico (M1, M2) are planned to sample rocks of the acoustic basement at the base of the inner wall of the trench and at a point about midway up this slope. The objectives are to determine the age and nature of the basement underlying the veneers of little deformed sediments. Rocks exposed along the Mexican shoreline are igneous and metamorphic suites as old as Precambrian.

On Site Drilling Time for Middle America Transect Sites

Two series of holes are planned to investigate the inner wall of the Middle America Trench: three holes off Guatemala and two off Mexico. Oil company data and wells are available from much of this shelf area, which can be tied to the regional picture provided by the site surveys and the IPOD drilling. The Guatemala holes were planned for small cones and single re-entry, but it is possible that no re-entry will be required. Consequently, the non re-entry time is shown for the Guatemala holes in parentheses. The Mexican holes are planned only to sample

the sediments and one core of the underlying basement and do not involve re-entry.

Site	Location	Water Depth	Penetration	Total Stem	Days on Site
G-1a	12°50'N 91°25'W	5700m	1500m	7200m	25
G-2a	13°00'N 91°20'W	4750m	1500m	6250m	23
G-3a	13°00'N 91°99'W	2750m	1500m	4250m	18
M-1a	15°45'N 98°25'W	3500m	300m	3800m	
M-2a	16°50'N 98°22'W	5500m	300m	5800m	

DSDP/IPOD SITE PROPOSAL

SITE: G-1a
POSITION: 12°50'N; 91°25'W
GENERAL AREA:
Mid-America Trench off of Guatemala

GENERAL OBJECTIVE: Test age and nature of the rocks below prominent unconformity on this inner wall as well as the overlying sediments
PANEL INTEREST: AMP

OBJECTIVES:
1. to provide evidence regarding episodic subduction
2. establish the age of sediments and volcanics and possibly their repetition by thrusting
3. determine times of deformation revealed by the numerous unconformities covered by little deformed sediments
4. the structure and history of the trench slopes with the apparent geological history indicated from adjacent oceanic crust and the exposed rocks of the continent

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: C. Burk

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5700 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): 1500 25

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
C. Burk			

DSDP/IPOD SITE PROPOSAL

SITE: G-2a
POSITION: 13°00'N; 91°20'W
GENERAL AREA:
Mid-America Trench off of Guatemala

GENERAL OBJECTIVE: Same as G-1a

PANEL INTEREST: AMP

OBJECTIVES:

Same as G-1a

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: C. Burk

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4750 Sediment Thickness (m): _____ Total Time on Site (days) 23

Single Bit -- (Re-entry) Total Penetration (m): 1500

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent C. Burk	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: G-3a
POSITION: 13°00'N; 90°--'W
GENERAL AREA:
Mid America Trench off of Guatemala

GENERAL OBJECTIVE: Same as G-1a

PANEL INTEREST: AMP

OBJECTIVES:

Same as G-1a

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: C. Burk

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2750 Sediment Thickness (m): _____ Total Time on Site (days) 18

Single Bit -- (Re-entry) Total Penetration (m): 1500

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
C. Burk			

DSDP/IPOD SITE PROPOSAL

SITE: M-1a
POSITION: 15°45'N; 98°25'W
GENERAL AREA:
Mid America Trench off of Mexico

GENERAL OBJECTIVE: Sample basement rocks underlying the inner trench wall to determine their nature and age and the age of the unconformably overlying sediments.
PANEL INTEREST: AMP

OBJECTIVES:
M1 and M2 are planned to sample rocks of the acoustic basement at the base of the inner wall of the trench and at a point midway up this slope. The objectives are to determine the age and nature of the basement underlying the veneers of little deformed sediments.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: C. Burk

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3500 Sediment Thickness (m): _____ Total Time on Site (days) 7

(Single Bit) -- Re-entry Total Penetration (m): 300

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
C. Burk			

DSDP/IPOD SITE PROPOSAL

SITE: M-2a
POSITION: 16°50'N; 98°22'W
GENERAL AREA:
Mid America Trench off of Mexico

GENERAL OBJECTIVE: Same as M-1a

PANEL INTEREST: AMP

OBJECTIVES:
Same as M-1a

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: C. Burk

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5500 Sediment Thickness (m): _____ Total Time on Site (days) 8

(Single Bit) -- Re-entry Total Penetration (m): 300

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
C. Burk			

DSDP/IPOD SITE PROPOSAL

SITE: GA-1
POSITION: 51°N; 147°W
GENERAL AREA:
Gulf of Alaska, South of Sila FZ on anomaly 15

GENERAL OBJECTIVE: Cenozoic paleo-oceanography of the North Pacific; evolution of plankton communities

PANEL INTEREST: OPP, OCP

OBJECTIVES: The main objective at this site is to sample sediment corresponding with the Eocene-Oligocene Boundary in a ridge flank setting (in order to obtain a carbonate record as well as other microfossil groups) beneath high latitude high productivity zone. The site is located on a well defined anomaly 15 (barely older than the Eocene-Oligocene boundary) south of Sila FZ. Paleomagnetic studies of basement rocks are also considered by OCP.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: CONRAD 1010, sheet 1206

Other Data: Very good L-DGO magnetic profile, well defined high amplitude anomaly 15, See R. Larson L-DGO.

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m):_____ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated: Deep sea clay/siliceous ooze/calcareous ooze and chalk
Weather Conditions: Good from June through September
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: 3 sedimentologists, 1 nanno, 1 plankton/foram, 1 radiolarian
Shoreboard:
1 diatom
Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Y. Lancelot	OPP priority 1: 1/12/77		

DSDP/IPOD SITE PROPOSAL

SITE: GA-2
POSITION: 53°N; 149°W
GENERAL AREA:
Gulf of Alaska, North of Sila FZ on anomaly 15

GENERAL OBJECTIVE: Cenozoic paleo-oceanography of the North Pacific; evolution of plankton communities.

PANEL INTEREST: OPP, OCP

OBJECTIVES: The main objective at this site is to sample sediment corresponding with the Eocene-Oligocene boundary in a ridge flank setting (in order to obtain a carbonate record as well as other microfossil groups) beneath high latitude high productivity zone. The site is located on a well defined anomaly 15 (barely older than the Eocene-Oligocene boundary) of Sila FZ. Paleomagnetic studies of basement rocks are also considered by OCP.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: CONRAD 1109, sheets 1134-1135.

Other Data: Very good LDGO magnetic profile, well defined high amplitude anomaly 15, See R. Larson LDGO.

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m):_____ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated: Deep sea clay/siliceous ooze/calcareous ooze and chalk
Weather Conditions: Good from June through September
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: 3 sedimentologists, 1 nanno, 1 plankton/foram, 1 radiolarian
Shoreboard:
1 diatom
Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Y. Lancelot	OPP, priority 1 Dec 77		

DSDP/IPOD SITE PROPOSAL

SITE: GA-3
POSITION: 43°5'N; 157°7'W
GENERAL AREA:
Southwest Gulf of Alaska, Central Eastern Pacific-North of Surveyor FZ

GENERAL OBJECTIVE: Cenozoic paleo-oceanography of the North Pacific; evolution of plankton communities.

PANEL INTEREST: OPP

OBJECTIVES:
When backtracked, this site was located beneath the planktonic transition zone at the Tertiary Cretaceous boundary. Underlying crust is uppermost Cretaceous and the Cretaceous-Tertiary boundary could be examined in the light of the 3 major microfossil groups (ridge flank carbonate setting).

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: CONRAD 1208, sheet 1018, July 30, 1968, 18:40

Other Data: Good magnetic profile around K/T boundary

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m):_____ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated: Deep sea clay/siliceous ooze/calcareous ooze and chalk
Weather Conditions: Good from June through September
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: 3 sedimentologists, 1 nanno, 1 plankton/foram; 1 radiolarian
Shoreboard: 1 diatom
Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Y. Lancelot	OPP priority 1 Dec 77		

THE GULF OF CALIFORNIA (GCA)

Gulf of California Working Group, Passive Margin Panel Objectives

The Gulf of California is a young small ocean basin formed by oblique rifting of continental crust of the peninsula of Baja California away from the mainland of Mexico. During the Tertiary, the margin of central, southern, and Baja California was a subduction-type active margin. The triple junction between the Pacific, North America, and Farallon plates migrated southward along this plate edge, converting it into a transform margin in the northern wake of its migration. This triple junction arrived off southern Baja California in late Miocene and jumped inland into the Gulf of California region to form a complex system of short transform and spreading ridge segments opening the Gulf. Magnetic anomalies flanking the East Pacific Rise in the mouth of the Gulf and flanking the next segment of the rift show that this opening commenced about 4 m.y. ago.

It has been suggested that prior to this opening of the Gulf, a proto-Gulf of California may have existed as a narrow extensional basin. Single channel seismic reflection records show that the older sediments were bowed upward and truncated prior to and at the time of rifting. Uplift was apparently narrowly confined to the vicinity of the proto-Gulf and new rift-transform system, because few uplifted Neogene terraces or sediments are found either on Baja California or on the mainland.

The Guaymas Basin is the largest of the closed, deep basins within the Gulf of California that exhibits all the characteristics of a newly-formed spreading center except for the presence of a lineated magnetic anomaly pattern. The two rifted centers of this basin are offset by a transform fault and are the sites of large heat flow anomalies. These anomalies peak at 7 and 30 HFU across the north and south spreading center, respectively, and are less than 20 km wide. The center of the rift zones are often the location of peaks in the basement morphology that are covered by about 100 m of green, hemipelagic mud that thickens to 500-800 m over the adjacent basement. This mud is mainly diatomaceous ooze intermixed with the distal facies of turbidite deep-sea fan debris all deposited at about 2 $m/10^3$ yrs.

We propose a re-entry site on one of these rift zones which would be a true sample of "zero-age" crust. Since this site is located on a recently formed spreading center within a continent, there is the possibility of continental crustal contamination that could make this site more or less appealing, depending on the petrologists' point of view. The area is obviously the site of a very localized rift zone, so adjacent holes would be useful to study the evolution of the crust in this area. An additional re-entry hole on the flank over the proto-Gulf sedimentary section may help to interpret the history of the proto-Gulf and initiation of rifting of the younger Gulf.

The simplest passive continental margin in the Gulf lies at the tip of Baja California, where the transition from continental to oceanic crust is covered by a maximum of about 700 meters of sediment. Location of this transition can be defined rather precisely and narrowly by OBS work and magnetics. This offers an almost unique opportunity to study this transition or contact where it may be less altered or metamorphosed by deep burial and time and where it can be reached in a transect of single bit holes.

It is therefore proposed to drill a transect of 5 to 8 sites, where the ocean crust ranges in age from .5 m.y. near the East Pacific Rise axis to 3 m.y. near the tip of Baja California, and also to examine the transition to continental

crust. This transect affords the possibility of studying the aging of crust away from a spreading center, and the evolution of crust from a rifted continental margin out to the presently active spreading center in a single transect. Magnetic anomalies that are clearly recognizable from the spreading center out to the base of the Baja California continental block provide assurance that the age gradient is monotonic, and that the continental rifting process was fairly simple.

The principal objectives of the drilling plan are to investigate the transition from continental to oceanic crust, the petrology of the oceanic crust, the origin of the magnetic anomalies, and the relationship between downhole and laboratory measurements of the physical properties of the site. The latter objective would be studied with a detailed downhole seismic experiment that might include an array of hydrophones placed down the hole and tethered to a surface buoy, as well as downhole logging while on site. Sites GCA-1a at .5 m.y. and GCA-1d at 2.2 m.y. are proposed as multiple re-entry holes, and GCA-1a and GCA-1b would be symmetrically disposed on either side of the spreading center at the .5 m.y. isochrons. GCA-1c at 1-2 m.y. and GCA-1e at 3 m.y. would be single-bit holes.

An additional objective of this transect will be a study of the paleo circulation pattern of the California Current at this latitude.

This program is proposed for late in the IPOD I schedule, approximately November 1978 through February 1979. We propose initial site survey with the Research Vessel Ida Green during early summer 1977 along approximately the tracks shown in Figure 4. Later final site surveying may be proposed during early 1978 with R/V Thomas Washington. The tracks in Figure 4 for the 1977 survey will require approximately 14 days of ship time.

DSDP/IPOD SITE PROPOSAL

SITE: GCA-1 a-e
POSITION: 22°40'N; approx. 108°00'W
GENERAL AREA:
EPR near Tamayo FZ mouth of Gulf of California

GENERAL OBJECTIVE: Drill a transect in crust from .5 m.y. to 3 m.y. and also examine the transition to continental crust.

PANEL INTEREST: OPP, OCP, PMP

OBJECTIVES: 1. To investigate the transition from continental to oceanic crust. 2. The petrology of the oceanic crust, 3. The origin of the magnetic anomalies and a study of magnetic structure of the crust in a region of moderate magnetic latitude and in crust where the magnetic field history is well known, 4. Relationship between downhole and laboratory measurements of the physical properties of the site, 5. Study the paleo-circulation pattern of the California Current at this latitude. Sites GCA-1a (.5 m.y.) and GCA-1d (2.2 m.y.) are proposed as multiple re-entry; GCA-1b (.5 m.y.), GCA-1c (1-2 m.y.) and GCA-1e (3 m.y.) would be single bit holes. GCA-1a and GCA-1b would be symmetrically disposed on either side of the spreading center at the .5 m.y. isochrons.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: Spreading rate, 3 cm/yr

Site Survey Data: Conducted by: RV Ida Green during summer of 1977
RV Thomas Washington early 1978
Date:
Main Results: B. Lewis (UW) has conducted some site surveying in the area.

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3000 Sediment Thickness (m): 150 Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): _____ _____

Nature of Sediments Anticipated: Terrigenous silts (not well known)

Weather Conditions:
Jurisdiction: Mexico
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Gulf of California Working Group			

DSDP/IPOD SITE PROPOSAL

SITE: GCA-2
POSITION: 27°10'N; 111°20'W
GENERAL AREA:
Guaymas Basin, Gulf of California

GENERAL OBJECTIVE: Sample zero-age crust

PANEL INTEREST: IGP

OBJECTIVES: 1. To investigate ridge-crest processes in action on very young crust where exceptional heat flow has been measured and ridge-crest hydrothermal activity is likely to be occurring, 2. To study the geochemistry of the overlying sediments, 3. It is proposed to drill a re-entry site on one of the rift zones in the Guaymas Basin which would be of zero-age crust. The area is the site of a very localized rift zone, so adjacent holes would be useful to study the evolution of the crust in this area. An additional re-entry hole on the flank over the Proto-Gulf sedimentary section may help to interpret the history of the Proto-Gulf and initiation of rifting of the younger Gulf.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Spreading rate: 3 cm/yr

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2000 Sediment Thickness (m): 100 Total Time on Site (days)

(Single Bit) -- (Re-entry) Total Penetration (m): _____ _____

Nature of Sediments Anticipated: Green, hemipelagic mud - diatomaceous ooze mixed with distal facies of turbidite deep-sea fan debris
Weather Conditions:
Jurisdiction: Mexico
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Gulf of California Working Group - OCP: Roger Larson			

DSDP/IPOD SITE PROPOSAL

SITE: GSC
POSITION: 0°30'N; 86°N
GENERAL AREA:
Galapagos spreading center east of Galapagos Island

GENERAL OBJECTIVE: Hydrothermal processes in ocean crust

PANEL INTEREST: DMP

OBJECTIVES: This two-leg drilling operation will have a special emphasis on logging and downhole measurements. Several single bit holes are planned with some logging followed by two major multiple re-entry holes, one in a region of water inflow and one in a region of water outflow, which are to be the focus of the major logging effort. The chief objective is to look at (1) hydrothermal processes within the ocean crust, (2) hydrothermal deposits, (3) the altered rocks underlying them, and (4) the hot water flowing through the rocks. These investigations and logging will be carried out in inflow and outflow regions.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:
Spreading rate: 3 cm/yr
Age of crust: 1 m.y.
Site Survey Data: Conducted by: scientists of many institutions

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2800 Sediment Thickness (m): 30+ Total Time on Site (days)

(Single Bit) -- (Re-entry) Total Penetration (m):

Nature of Sediments Anticipated: Pelagic carbonate ooze

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Galapagos Working Group; OCP - Jim Hall			

DSDP/IPOD SITE PROPOSAL

SITE: HR-1
POSITION: 34°02'N; 178°47'E
GENERAL AREA:
Southern Hess Rise

GENERAL OBJECTIVE: Paleo-oceanography of the North Pacific; Evolution of plankton communities.

PANEL INTEREST: OPP

OBJECTIVES: The location of Site HR-1 is close to the present-day boundary between the subtropical central water mass and the transitional (temperate) water mass making this an ideal location for Neogene paleoclimatic investigation. Any shift in the boundary between these water masses is expected to be recorded in the Southern Hess Rise sections (Vincent, 1973). Paleo-oceanographic and biostratigraphic interpretations are aided by the migration of subtropical species into this region during warm intervals making this site a reference point for correlating high latitude planktic zonations with better established low latitude zonations.

BACKGROUND INFORMATION:
Regional Data: Glomar Challenger Leg 32, 2200, 24 September 1973
Seismic Profiles:

Other Data:
Site 310 located at approximately 200 miles to the NW

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2620 Sediment Thickness (m): 300 Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): 350 4-5

Nature of Sediments Anticipated: Mainly carbonates (ooze & chalk). The strong reflector at 0.11 sec (100m below surface) probably correlates with chert and porcellanite layer in this area.
Weather Conditions: good to excellent from late June to early September.
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: 3 sedimentologists, 1 nanno, 1 planktonic foram, 1 radiolarian

Shoreboard:

Shorebased:
diatoms
benthic forams

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Tj. Van Andel/Gerta Keller	OPP priority Dec 76		

DSDP/IPOD SITE PROPOSAL

SITE: HR-2
POSITION: 39°48'N; 173°49'E
GENERAL AREA:
Northern Hess Rise

GENERAL OBJECTIVE: Paleo-oceanography of the North Pacific; Evolution of planktonic communities.

PANEL INTEREST: OPP

OBJECTIVES: HR-2 lies within the south central part of the Subarctic gyre providing an excellent opportunity to study planktic communities within this high latitude water mass. In addition, its location provides the unique opportunity for biostratigraphic cross-correlation of subtropical faunal elements of Site HR-1 to subarctic faunal elements of Site HR-2. The Southern Hess Rise site together with the Northern Hess Rise site may well contribute to a more fundamental understanding of Neogene paleoceanographic history of the North Pacific as well as make a vital contribution towards establishing a high latitude planktic zonation.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Conrad 10 (955/960) 0300, 24 June 1966

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4533 Sediment Thickness (m): 360 Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): 400 4-5

Nature of Sediments Anticipated: Predominantly carbonates (ooze & chalk). Chert and porcellanite layer probably of Eocene age at 0.18 sec (depth 160m below surface assuming 1.8 km/sec penetration) Basement indistinct but probably at depth of 360 below surface.
Weather Conditions: Very good in June to August
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: 3 sedimentologists, 1 nanno, 1 planktonic foram, 1 radiolarian

Shoreboard:

Shorebased:
diatoms
benthic forams

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Tj. Van Andel/Gerta Keller	OPP priority Dec 76		

JAPAN TRENCH (J)

Active Margin Panel Objectives

The Japan Trench is a typical trench which is situated over a subduction zone between continental and oceanic crust.

The western slope of the Japan Trench can be divided morphologically into five elements, i.e., proceeding in order from the coastal area seaward: (a) continental shelf, (b) upper part of the continental slope, (c) deep sea terrace or terraces, (d) lower continental slope or the trench slope, and (e) the trench bottom.

Previous investigations in the western slope of the trench utilizing sonic surveys show a general trend of geologic structures parallel to the direction of the trench axis, or that of the northeastern Japanese arc. These studies also show thick sediment accumulations in many places under the western portion of the trench.

One of the characteristic features of the deep sea terraces is the appearance of a sedimentary basin beneath the flat top of the terrace. It is suggested that this basin acted as a pond for sediments to accumulate in. Another characteristic feature in this area is the anomalously thick sediment accumulation beneath the rather deep portion of the western trench slope. This suggests the existence of accreted sediment caused by the subduction of the oceanic plate under the continental one. Deep sea drilling in the western slope of the Japan Trench should clearly identify the stratigraphic sequences in the deep sea terrace and the accreted areas.

The stratigraphic sequences in the upper part of the continental slope will most likely be Cretaceous to Tertiary in age with Paleogene sediment present in some places. However, in the deep sea terraces in the lower half of the slope the Paleogene may be absent with Neogene sediments directly on Cretaceous deposits.

Proposed Transect

This transect commences on the inner wall of the Japan Trench, crosses the Japanese arc and takes in sites in the Sea of Japan. The tectonic features of this transect differ from those of Kurile line in that the Japanese islands have a long history extending back to the Paleozoic and include large volumes of sialic rocks, while the Kurile arc appears to have originated in the Cretaceous and is composed largely of volcanics.

The sites east of the islands on the inner trench wall are close to a SIPM multichannel line. The profile shows the margins to have the characteristics of an accretionary trench. The deeper site (J1) (Figure 2) is to penetrate the unconformity above the diffracting layer and determine the section of the rocks on the midslope of the inner trench wall. The sedimentary record at the shallow site (J2) (Figure 2) on the trench slope should provide useful data on the tectonic history of the continental margin since the Paleogene. Additional detailed site surveys including multichannel seismic reflection profiling were strongly recommended by the AMP for this region, particularly on the inner wall of the Japan Trench where safety considerations would require detailed surveys to be completed prior to drilling during IPOD-I.

The remaining sites are in the Japan Sea. Heat flow and magnetic lineations in the Japan Sea suggest that the region behind the arc may have been formed through back-arc spreading perhaps occurring in successive episodes. A second possibility is that oceanization of continental crust has occurred. Three holes are planned inline across the deeper part of the Japan Basin normal to the strike of the reported magnetic lineations. Two additional holes are also proposed to be drilled in the Yamato Basin and Hakusanse respectively, and one in the Tsushima Basin (Figure 2).

Scientific Objectives for the Japan Trench Sites (listed by drilling order)

Site	Location	Water Depth	Penetration	Objective
J12	40°37'51.68" 143°13'37.32"	1683m	1300m	Reach the Jur/Cret basement 3 weeks of drilling
J2B	39°44'52.75" 143°22'26.15"	2190m	1000m	Determine Neogene basin history
J2A	39°44'43.02" 143°39'34.63"	2611m	<1900m	Alternate to J2B
J1A	39°44'49.07" 144°05'27.75"	5712m	500m	Accretionary prism
J1B	39°44'47.28" 143°55'34.45"	4414m	800m	Accretionary prism
J1C	39°44'55.59" 144°08'21.18"	6151m	500m	Alternate to J1A, J1B
J10	39°55.0' 145°33.7'	5210m	750m	Subducting ocean plate

DSDP/IPOD SITE PROPOSAL

SITE: J-1A
POSITION: 39°44'49.07"; 144°05'27.75"
GENERAL AREA:
Japan Trench

GENERAL OBJECTIVE:
Accretionary prism

PANEL INTEREST:

OBJECTIVES:
Third priority drilling.
The accretionary prism sites are designed to establish the lithostratigraphy and biostratigraphy and also to understand structural disordering as well as physical properties, dewatering and compaction.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5712 Sediment Thickness (m): _____ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): 500 _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Nasu/Kobayashi	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: J-1C
POSITION: 39°44'55.59"N;145°08'21.18"E
GENERAL AREA:
Japan Trench

GENERAL OBJECTIVE:
Accretionary prism

PANEL INTEREST:

OBJECTIVES:
Alternate to J-1A, J-1B (Priority 4 drilling)

Same objectives.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 6151 Sediment Thickness (m): _____ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): 500 _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Kobayashi/Nasu	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: J-2A
POSITION: 39°44'43.02"N;143°39'34.63"E
GENERAL AREA:
Japan Trench

GENERAL OBJECTIVE: Determine Neogene basin history.

PANEL INTEREST:

OBJECTIVES:
Alternate site to J-2B - second priority drilling order.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2611 Sediment Thickness (m): _____ Total Time on Site (days) _____

Single Bit -- (Re-entry) Total Penetration (m): <1900

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Nasu/Kobayashi	AMP		

DSDP/IPOD SITE PROPOSAL

SITE: J-2B
POSITION: 39°44'52.75"N;143°22'26.15"E
GENERAL AREA:
Japan Trench

GENERAL OBJECTIVE: To determine Neogene basin history

PANEL INTEREST: AMP

OBJECTIVES:
Second priority drilling.
The objective is the development of the Neogene-Paleogene basin from which the tectonic history, development of sedimentary facies, and the evolutionary growth of the tectonic high can be deduced.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: Kobayashi will survey the crosslines for this basin and provide the data to the PPSP for review.

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2190 Sediment Thickness (m): _____ Total Time on Site (days) _____

Single Bit - (Re-entry) Total Penetration (m): 1000

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Nasu/Kobayashi	Panel(s) Endorsement AMP	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: J-10
POSITION: 39°55.0'N; 145°33.7'E
GENERAL AREA:
Japan Trench

GENERAL OBJECTIVE: Subducting ocean plate

PANEL INTEREST: AMP

OBJECTIVES:

Priority 5.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5210 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit - Re-entry Total Penetration (m): 750 _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Kobayashi/Nasu	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: J-12
POSITION: 40°37'51.68"N;143°13'37.32"E
GENERAL AREA:
Japan Trench

GENERAL OBJECTIVE: Reach the Jurassic/ Cretaceous basement

PANEL INTEREST: AMP

OBJECTIVES:

Top priority.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1683 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): 1300 21

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Nasu/Kobayashi			

JUAN DE FUCA (JF)

The Nature of the Margins and the Interior of the Juan de Fuca Plate

It is proposed that a number of holes be drilled in the marginal regions and the interior of the Juan de Fuca Plate. This plate is very probably the last vestige of a major plate now largely consumed beneath western North America. This plate is unusually interesting in that it has experienced and is currently experiencing considerable internal deformation, perhaps as a result of the small distance between the accretion margin, characterized by thin crust, and its collision margin with the American Plate.

The most interesting and also most time consuming hole proposed for drilling is at site JF1. Here the magnetic anomaly pattern associated with the oceanic part of the plate can be traced beneath the lower part of the continental slope. Penetration of 3000 m of sediment and perhaps 100 m of basement will, if the basal sediment is older than the underlying basement, provide important evidence in favor of the generally assumed subduction process. A hole of this depth will probably require the best part of one eight week leg. The other holes proposed will take relatively little time and might be put in the balance of the leg during which JF1 is drilled, or into part of another leg. The weather in this area is suitable for station work from May until mid-October, with July and August the best months.

The detailed site proposals for this area are as follows.

Site JF1 ($48^{o}18'N$, $126^{o}24'W$)

Reasons for drilling at this site:

1. To determine composition and age of layer 2 beneath the lower continental slope and to compare the age with that predicted by the magnetic anomaly time scale.

2. To determine the composition, origin, and age of the sedimentary section overlying layer 2, in particular, to note evidence of deformation of sediments and to determine if part of the section is older than underlying layer 2.

Water depth: 2000m; Sediment thickness: 3000m; Basement Penetration: 100m.

Information on Site: The lower part of the continental slope west of southern Vancouver Island consists of a series of ridges composed of deformed and uplifted Cascadia Basin strata. This process of tectonic accretion of the continental slope is the result of compression between Juan de Fuca and American crustal plates causing underthrusting of the continental margin by the Juan de Fuca plate. The proposed site is on the lower continental slope. Layer 2 cannot be identified on continuous seismic reflection profiles in the area. However, magnetic anomaly source depth calculations indicate that about 3 km of sediment overlie layer 2 in the region. These magnetic anomalies under the continental slope can be correlated with the anomalies produced by sea floor spreading at Juan de Fuca Ridge. This correlation indicates that the age of layer 2 below the proposed site is about 6.5 m.y. The rate of subduction combined with the large quantity of sediment in Cascadia Basin results in a rapdi rate of accretion. However, considering the uncertainty of the fate of sediment during underthrusting, the drill might pass through sediment older than the underlying layer 2. This would be definite proof of subduction.

Site JF2 (48°57'N, 130°37'W)

Reasons for drilling at this site:

1. To determine the age of Explorer Trench, and to determine if it is, or if it is likely to ever have been, part of the Explorer spreading center.

Water depth: 3200m; Sediment thickness: 200-300m; Basement penetration: 100m.

Information on site: Explorer Trench extends 85 km SSE from the southern end of Explorer Ridge, and the Brunhes magnetic anomaly associated with the latter extends into the northern part of the Trench. However, a small positive magnetic anomaly associated with the southern half of the Trench has been interpreted to be about 3 m.y. old. The transform fault zone joining Juan de Fuca and Explorer Ridges apparently intersects Explorer Trench so as to isolate most of that feature from the present Explorer Spreading Center. The proposed drill site lies in the southern part of Explorer Trench, with which the older magnetic anomaly is associated. The Trench is flat-floored, and in the vicinity of the proposed site contains 200-300 m of sediment (containing moderately strong horizontal reflectors) overlying an irregular basement (layer 2).

Site JF3 (48°16'N, 128°29'W)

Reasons for drilling at this site:

1. To determine the composition and age of basement (layer 2) on the eastern side of the crest of Juan de Fuca Ridge.

2. To determine composition, origin, and age of the overlying sedimentary section; in particular, to compare characteristics of sediments below and above the prominent unconformity in order to explain their different appearances on seismic reflection profiles, and to determine the age of that prominent unconformity.

Water depth: 2550m; Sediment thickness: 200-400m; Basement penetration: 100m.

Information on site: The site is on the western flank of the easternmost crestal valley toward the northern end of Juan de Fuca Ridge. A sedimentary section 200-400 m in thickness overlies basement (layer 2). A prominent angular unconformity separates younger sediment containing essentially horizontal reflectors from an older, more transparent sedimentary unit whose reflectors are tilted, apparently as a result of uplift and tilting of underlying layer 2. Magnetic anomalies indicate that the age of layer 2 at this site is about 1 m.y. The angular unconformity has been interpreted to indicate a period of uplift and deformation which affected the northern end of Juan de Fuca Ridge and the area to the north synchronously. Comparison of data from this drill site with that from the proposed site 3 to the north would test the validity of this interpretation.

Site JF4 (49°34'N, 128°46'W)

Reasons for drilling at site:

1. To determine composition and age of basement (layer 2).

2. To determine composition, origin and age of overlying sedimentary section; in particular, the age of the prominent angular unconformity observed

on seismic reflection profiles and the reason(s) for the change in appearance of units below and above the unconformity.

Water depth: 2350m; Sediment thickness: 400m; Basement penetration: 100m.

Information on site: The site is located in the triangular-shaped area of Juan de Fuca crustal plate north of Juan de Fuca Ridge and east of Explorer Ridge. The area has high seismicity, high heat flow and evidence of basement (layer 2) uplift . Layer 2 is overlain by a sedimentary section consisting of two distinctive turbidite units separated by an angular unconformity. These can be traced by means of seismic reflection profiles to the south over the crest of the northern end of Juan de Fuca Ridge. At the proposed site, sediment thickness is about 400 m. The upper sediment unit onlaps the lower unit, which has been tilted on the edge of a bulge in layer 2. The uplift apparently occurred after deposition of the upper unit, whose reflectors are essentially horizontal. The basal part of the lower unit generally contains only weak reflectors, but the upper part of that unit generally has strong reflectors.

Site JF5 ($50^{o}10'N$, $130^{o}00'W$)

Reasons for drilling at site:

1. To determine composition and age of basement (layer 2) and the reason for its unusually smooth appearance on seismic reflection profiles on the central "horst" of Explorer Ridge.

2. To determine age and origin of overlying sediments, and hence, the probable time of uplift of Paul Revere Ridge.

Water depth: 2250m; Sediment thickness: 150m; Basement penetration: 100m.

Information on site: The site is located on the horst between the two rifts on Explorer Ridge adjacent to Paul Revere Ridge (transform fault zone). Continuous seismic reflection profiles reveal about 150 m of sediment overlying basement (layer 2) of unusually smooth appearance. The sediment contains strong reflectors and is apparently of turbidite origin. It appears that such deposits cannot reach the horst at the present time because of Paul Revere Ridge to the east and north and the northern rift to the northwest. Uplift of Paul Revere Ridge is indicated by tilted turbidites on its eastern flank. Therefore the age of sediment on the central horst may indicate the time of uplift of the Ridge. Furthermore a negative magnetic anomaly is associated with the horst and the determination of the age of this anomaly may aid in the interpretation of the complex tectonics of the area.

DSDP/IPOD SITE PROPOSAL

SITE: JF-1
POSITION: 48°18'N; 126°24'W
GENERAL AREA:
Lower part of continental slope west of southern Vancouver Island

GENERAL OBJECTIVE: Study process of tectonic accretion of the continental slope, and proof for subduction

PANEL INTEREST: OCP

OBJECTIVES:

1. To determine the composition and age of Layer 2 beneath the lower continental slope and to compare the age with that predicted by the magnetic anomaly time scale.
2. To determine the composition, origin, and age of the sedimentary section overlying layer 2, in particular to note evidence of deformation of sediments and to determine if part of the section is older than the underlying Layer 2.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: Magnetic anomaly indicate the age of Layer 2 below proposed site is about 6.5 m.y.

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2000 Sediment Thickness (m): 3000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 100m into basement

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
B. Lewis			

DSDP/IPOD SITE PROPOSAL

SITE: JF-2
POSITION: 48°57'N; 130°37'W
GENERAL AREA:
85 km SSE of southern end of Explorer Ridge

GENERAL OBJECTIVE: Age of Explorer Trench and its association with the Explorer spreading center.

PANEL INTEREST: OCP

OBJECTIVES:
1. To determine the age of the Explorer Trench
2. To determine if the Explorer Trench was ever part of the Explorer Spreading Center

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: The Brunhes magnetic anomaly associated with the southern end of the Explorer Ridge extends into the northern part of the trench; however, a small positive magnetic anomaly associated with the southern half of the trench has been interpreted to be about 3 m.y. old.

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3200 Sediment Thickness (m): 200-300 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 100m into basement

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent B. Lewis	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: JF-3
POSITION: 48°16'N; 128°29'W
GENERAL AREA:
East side of Crest of Juan de Fuca Ridge

GENERAL OBJECTIVE:
Determine the age and composition of basement

PANEL INTEREST: OCP

OBJECTIVES:

1. To determine composition, origin and age of the basement (Layer 2) on the eastern side of the crest of the Juan de Fuca Ridge
2. To determine the composition, origin, and age of the overyling sedimentary section; compare the characteristics of sediments below and above the prominent unconformity in order to explain their different appearance on seismic reflection profiles
3. To determine the age of the prominent angular unconformity

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: Magnetic anomalies indicate the age of Layer 2 at the site is approximately 1 m.y. old.

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2550 Sediment Thickness (m): 200-400 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): 100m into basement

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
B. Lewis			

DSDP/IPOD SITE PROPOSAL

SITE: JF-4
POSITION: 49°34'N; 128°46'W
GENERAL AREA: Juan de Fuca crustal plate north of Juan de Fuca Ridge and east of Explorer Ridge

GENERAL OBJECTIVE:

PANEL INTEREST: OCP

OBJECTIVES:

1. To determine composition and age of basement (Layer 2)
2. To determine composition, origin and age of overlying sedimentary section
3. To determine the age of prominent angular unconformity
4. Explain the change in appearance of units below and above the unconformity

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles:

Other Data: High seismicity, high heat flow, evidence of basement uplift; Layer 2 is overlain by a sedimentary section consisting of 2 distinctive turbidite units separated by an angular unconformity.

Site Survey Data: Conducted by:

Date:

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 2350 Sediment Thickness (m): 400 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 100m into basement

Nature of Sediments Anticipated:

Weather Conditions:

Jurisdiction:

Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
B. Lewis			

DSDP/IPOD SITE PROPOSAL

SITE: JF-5
POSITION: 50°10'N; 130°00'W
GENERAL AREA: Horst between 2 rifts on Explorer Ridge adjacent to Paul Revere Ridge

GENERAL OBJECTIVE: Composition and age of basement

PANEL INTEREST: OCP

OBJECTIVES:

1. To determine composition and age of basement (Layer 2)
2. Attempt to explain the unusually smooth appearance on seismic reflection profiles on the central horst of Explorer Ridge
3. To determine the age and origin of overlying sediments which will probably determine the time of uplift of the Paul Revere Ridge. Tilted turbidites exist on the eastern flank of the Paul Revere Ridge.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2250 Sediment Thickness (m): 150 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 100m into basement

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent B. Lewis	Panel(s) Endorsement	PCOM Endorsement	Safety Review

OKHOTSK (O) - KURIL (K) TRANSECT

Active Margin Panel Objectives

The structures of the Sea of Okhotsk and the Kuril-Kamchatka Island arc, together with the deep oceanic Kuril-Kamchatka trench, represents the typical active oceanic margin in the Pacific area. Specific features of this zone are the deeply submerged shelf of the central part of the Sea of Okhotsk, underlain by continental but reduced crust; the deep Kuril basin with suboceanic crust; a well developed double Kuril Island arc; and an asymmetrical trench coupled with a well developed marginal oceanic swell.

The area has been studied intensively by Soviet geophysicists for the last three decades, with special emphasis occurring during the last three years, in accordance with the plans of IPOD I, Deep Sea Drilling Project.

Two traverses (Figure 2) are planned for drilling to investigate the main features of this area. The Okhotsk transect includes three sites: O-1 (the deep Kuril basin), O-2 (the Academy of Sciences Rise), and O-3 (the Derugina basin). The second, the Kuril transect includes four sites: K-1 (the oceanic slope of the Kruil trench), K-2 (the inner slope of the Kuril trench), K-3 (the outer slope of the Kuril Island arc), and K-4 (the deep Kuril basin).

The information obtained from drilling along these transects in the IPOD I phase (i.e., sites O-1, O-2, K-1, K-2, and K-3) would establish and provide insight into the following.

1. The age of sediments, basement and features penetrated.
2. The history of the deeply submerged shelf in the central part of the Sea of Okhotsk (O-2).
3. The sedimentologic and biostratigraphic history of sediments filling the Kuril Basin.
4. A study of the basement and the processes which created it (e.g., O-1).
5. Deciphering the structure and history of the inner trench slope and its relationship to the island arc, and subduction processes (K-3, K-2).
6. The structure and geologic history of the outer trench slope with features, and
7. A petrologic and geophysical comparison of the basement of the marginal swell with the basement of the inner slope.

Rocks, exposed along these transects, some of which have been sampled by dredge hauls, are early Cretaceous in age (70-90 m.y.) and have compositions characteristic of continental and island arc assemblages. Sediments located in the central part of the Sea of Okhotsk contain evidences of being locally derived from the Cretaceous bedrock which exists in the area. Sequences of the rocks dredged on the outer slope of the Kuril arc lead to the supposition of the existence of two parallel geosynclines or two slabs beneath this slope. Only basalt was dredged from the oceanic slope of the Kuril trench. The ocean crust at Site K-1 has a very thin second layer with characteristic high gravity anomalies. Very high seismic velocities are present at the Mohorovicic discontinuity. K-1 is located on magnetic anomaly M-0(?).

Proposed Transect

The program in this region comprises drilling on transects across the arc-trench system of the Japan and Kuril-Kamchatka trenches and in the marginal seas (Seas of Japan and Okhotsk). A substantial part of the drilling will be carried out in Phase II of the Project.

A sequence of sites was proposed in the Sea of Okhotsk, designed to provide insight into formation of back-arc and marginal basins as well as the associated active arc, capped by the Kuril chain of islands with water depth largely between 1000 and 1500 m. It has been suggested that the Kuril Basin and an extensive part of the Okhotsk Sea may be underlain by oceanized continental crust. It was considered equally probable that this region may have also formed by either entrapment of oceanic crust or back-arc spreading.

The Kuril Island arc is probably no older than upper Cretaceous and it presents the opportunity for investigating some of the more important processes controlling arc formation, including the history of and possibly even the rates of deformation.

Two drilling transects have been proposed in the region. The first transect in the Sea of Okhotsk includes three sites: the first (O-1) at the northern end of the Kuril Basin near the base of the Academy of Sciences Rise (Phase 1); the second, on the upper flank of the same rise (Phase 1), and the third in Derugina Basin (Phase II).

The second transect crosses the southern Kuril trench-arc and includes the Kuril Basin. The Kuril trench, like the Middle America trench, is an accretionary type but in an island arc situation in contrast to a continental margin. The first site (K1) is on an identifiable magnetic lineation. The second (K2) and third (K3) are located on the inner trench wall of the Kuril outer arc: one on the toe of the inner wall requires Phase II capability. The fourth site (K4) would be a deep hole in the central part of the Western Kuril Basin which would definitely require Phase II capabilities.

In order to provide additional control on the drilling of the Kuril Trench, Soviet scientists proposed to extend the South Kuril transect further to the southeast on the Pacific Plate. One single bit hole was proposed to be drilled in the deeper part of the ocean basin in waters 6000 m deep southeast of the outer swell of the Kuril trench. Ten days would be required to drill 300 m of sediment and 500 m of layer 2 for a total penetration of 800 meters. The Panel considered that such a site on the Pacific plate to the southeast (K-0) of the control site (K1) would have substantial value and accordingly recommended that the OCP consider this additional site in its future planning. (This additional hole and K1 may be merged into one hole on M1 as mentioned above.)

The Panel recommended that, in addition to detailed site surveys for the above transects, two long multichannel seismic reflection survey lines be positioned to tie the sites together along the two transects. Furthermore, the Panel urged that detailed refraction surveys be conducted to provide the three dimensional crustal structure in the Kuril and Derugina Basin to more precisely define potential ocean-continent boundaries.

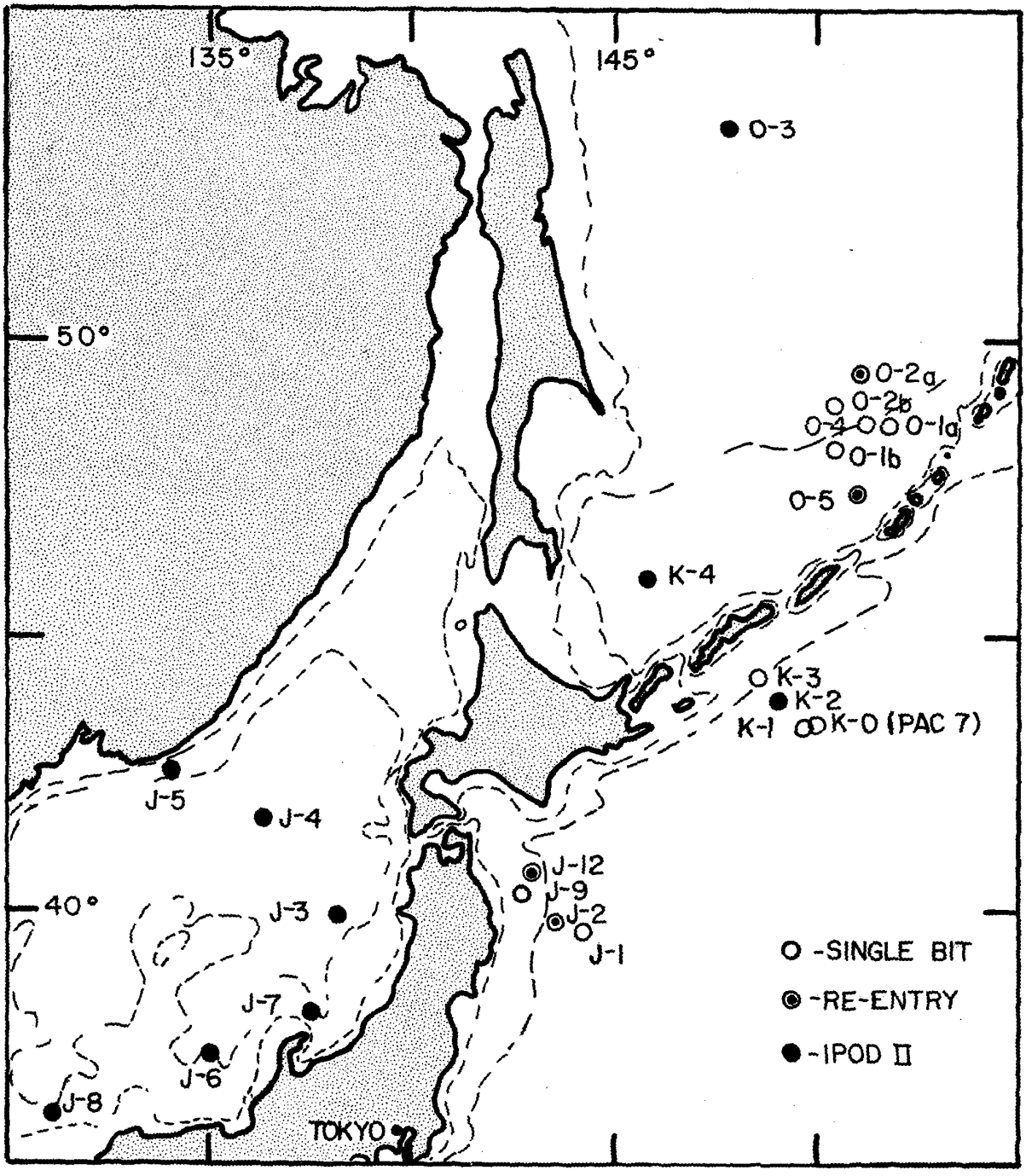


Figure 2. Drill sites for Kuril Arc, Sea of Okhotsk, Japan Trench.

DSDP/IPOD SITE PROPOSAL

SITE: K-0
POSITION: 42°45'N; 150°20'E
GENERAL AREA:
Ocean Crust outside Kuril Arc

GENERAL OBJECTIVE:
Old end of Pacific transect

PANEL INTEREST: OCP, AMP

OBJECTIVES:
This site is to be a single bit site unless multiple re-entry is not possible at EMP-1a, in which case this will be a multiple re-entry site. The objective here is to examine the effects of age on Pacific crust and the variations in mantle processes with time. The site will also provide information on the material being subducted in the Kuril Trench at present.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: Spreading rate, 4 cm/y; Age of crust, 108 m.y.

Site Survey Data: Conducted by: Soviet ships

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5000 Sediment Thickness (m): 500 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: Diatomaceous ooze overlying pelagic clays with perhaps some chert.
Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Dale Jackson Roger Larson	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: K-3A
POSITION: 44°15.8'N; 149°01.1'E
GENERAL AREA:
Upper slope of Kuril Trench

GENERAL OBJECTIVE:

PANEL INTEREST:

OBJECTIVES:
5th drilling priority.
Sedimentary history of upper slope of Kuril Trench

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4430 Sediment Thickness (m): _____ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): 1500 _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Ludwig Kosminskaya	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: K-2c
POSITION:
GENERAL AREA:
Inner slope of Kuril Trench

GENERAL OBJECTIVE: Sedimentary basement of Jurassic/Cretaceous Age

PANEL INTEREST: AMP

OBJECTIVES:
4th drilling priority.
Site K-2C is to be a re-entry site of which the major objective is to reach the strong reflector thought to be either the subsided Mesozoic sedimentary basement or accretionary prism.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5250 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): 1100 _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Ludwig Kosminskaya	AMP		

DSDP/IPOD SITE PROPOSAL

SITE: 0-1b
POSITION: 48°17.5'N; 150°26.1'E
GENERAL AREA: Kuril Basin

GENERAL OBJECTIVE: Kuril Basin crust and sedimentation history

PANEL INTEREST: AMP

OBJECTIVES:

3rd priority drilling order.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: Shot point 275 PR17

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3100 Sediment Thickness (m): _____ Total Time on Site (days) _____

Single Bit -- (Re-entry) Total Penetration (m): 1300

Nature of Sediments Anticipated: ?

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Ludwig Kosminskaya	AMP		

DSDP/IPOD SITE PROPOSAL

SITE: 0-2b
POSITION: 48°59.2'N; 150°25.2'E
GENERAL AREA:
Academy of Sciences Rise

GENERAL OBJECTIVE: Back-arc shelf basement and sediments

PANEL INTEREST: AMP

OBJECTIVES:
2nd priority drilling.
Nature and age of back-arc shelf basement and sedimentary sequence near the basin-shelf boundary

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1450 Sediment Thickness (m): _____ Total Time on Site (days) _____

Single Bit -- Re-entry Total Penetration (m): 1000

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Ludwig Kosminskaya	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: O-3A
POSITION:
GENERAL AREA:

GENERAL OBJECTIVE: Back-arc shelf sedimentary basement and younger cover

PANEL INTEREST: AMP

OBJECTIVES:

1st drilling priority

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: Shot point 130 PR24

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1275 Sediment Thickness (m): _____ Total Time on Site (days) _____

(Single Bit) -- Re-entry Total Penetration (m): 400

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Ludwig Kosminskaya			

DSDP/IPOD SITE PROPOSAL

SITE: MM-1
POSITION: 21°24'N; 174°18'E
GENERAL AREA:
Western part of northern Mid-Pacific Mountains

GENERAL OBJECTIVE: North Pacific Evolution of Plankton Communities

PANEL INTEREST: OPP

OBJECTIVES: The age of basement of the northwestern Mid-Pacific Mountains is Upper Jurassic. The primary objective of Site MM-1 is to obtain lower Tertiary and Mesozoic sections. The lower Tertiary and Mesozoic planktic record in the North Pacific is scanty, thus good sections are desparately needed for both biostratigraphic and paleoceanographic interpretations. Study of Mesozoic and lower Tertiary sediments from this locale should provide fundamental insights into the character of planktic communities, circulation, and productivity during a period of major biologic crises associated with the Mesozoic-Cenozoic boundary when global circulation patterns were fundamentally different from the post-Tethyan period.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Mahi 7004, 0430, 9 December 1970

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2700 Sediment Thickness (m): 630 Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): 650 5-6

Nature of Sediments Anticipated: Mainly carbonates (ooze & Chalk). Estimated sediment thickness 0.7 sec, but basement may be as low as 0.9 sec. Strong reflector at 0.38 sec (340m below surface) probably represents chert.
Weather Conditions: good all year around.
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: 3 sedimentologists, 1 foram., 1 nanno., 1 rad.
Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
T. van Andel/Gerta Keller	OPP priority December 1976		

NORTH PHILIPPINE SEA (NP) SITES

Active Margin Panel Objectives

The North Philippine Sea transect of IPOD may be divided into three subgroups: Shikoku Basin sites (NP-2, NP-3), Daito Basin and Ridge sites (NP-4, NP-5, NP-7) and Bonin-Okinawa Arc-Trough sites (NP-1, NP-6) (Figure 3).

The Shikoku Basin is certainly one of the most typical inter-arc basins. It is bordered on the west from the Daito and West Philippine basins by the Kyushu-Palau Ridge. On the east its frontal barrier is the Shichito-Iwojima Ridge which is comprised at least partly of active or recent volcanoes. The Shikoku Basin appears to continue to the Parece Vela Basin in the South. However, the Shikoku Basin has distinct linear magnetic anomalies identified to have been formed by crustal extension during Oligocene to Miocene. Recent detailed surveys by the Japanese ships Hakuho-maru and Bosei-maru have further revealed a clear NNW-SSE trending lineation in the basin with bathymetry as well as magnetic anomalies. In contrast, magnetic lineations have not been detected in the Parece Vela Basin. It is important to test whether the spreading of the basin is symmetric or one-limbed by drilling two appropriate holes in the Shikoku Basin; one at the axial zone and the other in its east, at both of which magnetic anomalies are well identified.

DSDP hole 297 located in the northwestern corner of the basin ($30^{o}52.36'$N; $134^{o}09.89'$E) revealed the estimate of the minimum basement age and sedimentary history of the area, although information regarding the age and nature of the basement from this hole was quite insufficient because of failure in penetration to the basaltic basement. Recently accumulated seismic data enable us to select better sites to recover more uniform sedimentary cover and basement rocks.

Variable angle reflection and refraction studies using sonobuoys and two-ship shooting revealed the crustal structure beneath these two sites. Site NP-3 is situated at the possible crest of a remnant ridge and seems to have an anomalous crust in which layer 2 is thinner (approximately 1.3 km in total) and has lower P-wave velocities (2.8, 4.0 and 4.7 km/sec from the top) than the usual oceanic basement. Site NP-2 on its flank has a normal layer 2. Re-entry is proposed at NP-3 to establish petrological and magnetic structure of the upper crust at the remnant center of spreading. Shallower penetration to the basaltic basement may hopefully be achieved at NP-2 even by a single entry of drill, as the sediment cover is thinner than 500 m there. It would be of great interest to compare petrological, geochemical and magnetic features of the basement rocks in the Shikoku Basin with those cored in the Parece Vela Basin and other inter-arc basins.

The difference in magnetic anomalies between the Shikoku and Parece Vela Basins is to be studied by detailed paleomagnetic measurement of recovered cores. The paleomagnetic and/or petrological nature of the basement rocks are to be correlated to the origin of smaller amplitudes of magnetic anomalies in the marginal basins compared with Atlantic anomalies having the same trend and formed at the same latitude.

Continuous coring of sediments at these two sites may provide crucial information on the volcanic and tectonic history of the Shikoku Basin and the surrounding arcs. These sites hold an advantage that the sedimentary strata are free from turbidites transported from Shikoku Island. In the northern

portion of the basin turbidites prevail in the pre-Pliocene sediments and may overwhelm evidence of other tectonic events occurring around the basin.

The Daito-Amami Triangle situated in the northwestern corner of the Philippine Sea is an enigmatic area. It is composed of oceanic basins bordered by the Oki-Daito Ridge on the south, by the Kyushu-Palau Ridge on the east, and by the northern extension of the Ryukyu Trench on the west. The Daito Ridge, trending parallel to the Oki-Daito Ridge, divides the basin into two. The Amami Plateau is situated in the northwestern corner of the north basin.

Seismic refraction studies have shown that the crust beneath the Oki-Daito Ridge has a thick (5 km) layer 2 with P-wave velocity of 6.0 km/sec, similar to the crustal structure beneath the Kyushu-Palau Ridge. The crust beneath the deep basins within the triangle is similar to that of normal ocean and back-arc basins, although free-air gravity anomalies are slightly negative (-20 to -60 mgal in the southern basin) to almost zero, in contrast to small positive anomalies (10 to 20 mgal) common in back-arc basins.

Many dredge hauls performed by Japanese ships (GDP-8, GDP-11 and GDP-15 cruises of Bosei-maru; KH72-2 of Hakuho-maru and GH74-7 of Hakurei-maru) have provided us samples of rocks and megafossils from the crestal region of the ridges. Noteworthy is Nummulites collected at several localities on either of these three topographic highs at the present depths of 1,100-2,300 m. The species is quite similar to Nummulities boninensis previously found in the Eocene formations exposed at Hahajima, in the Bonin Islands. Occurrence of such a shallow water fossil indicates that the crests of these topographic highs were near to the sea level in early to middle Eocene and have subsided later.

Several andesitic rocks, as well as hornblende schist and serpentinite, collected from this area suggest that the ridges were island arcs before their subsidence. The K-Ar ages of some samples (85 m.y., 82 m.y. and 75 m.y.) provide a constraint to the age of the arc formation.

Three hypotheses have been postulated to explain the origin of this triangular area including ridges and basins. One explanation is that these topographic highs were fragments of the Kyushu-Palau Ridge and that they were torn away when the West Philippine Basin rotated counterclockwisely. An alternative hypothesis is to assume existence of a paleo-trench south of the Oki-Daito Ridge. The ridges and basins were presumably the past island arcs and back-arc basins formed by the migration of continental crust and volcanic activity caused under the influence of the northward subduction of the Philippine Sea plate.

The third possible explanation may be that the ridges and basins in the triangle were drifted from the south when the West Philippine Basin spread from the present Central Basin Fault trending NWW--SEE. Drilling of three holes in this area has been proposed to provide critical tests of these hypotheses. Sites NP-4 and NP-5 are located in the basins to find the age of rifting and to examine the later geological history including vertical movement of the basin floor. Site NP-7 is planned to sample basement rocks of the Daito Ridge and to substantiate stratigraphic sequences and lithofacies of overlying sediment with an aim of clarifying the history of this triangle. Multichannel profiling records along these sites enable us to select the most appropriate locations for drilling.

The Okinawa Trough is proposed to be an active back-arc spreading basin. Drilling at NP-6 site could test this hypothesis and hopefully sample metamorphic rocks because heat flow is very high and furthermore, the temperature gradient is extremely high under the sediment cover in the trough.

NP-1 drilling is aiming to clarify the tectonic complexities of the Bonin arc-trough system. Apparently it is an active island arc-back arc basin behind the Bonin Trench. However, sediment cover in the Bonin Trough is too thin and uniform to be actively spreading. The age of rocks on the Bonin Islands is rather old (40-26 m.y. B.P. from K-Ar dating). Drilling at an appropriate margin of the arc-trough system would establish the structural framework of the evolution of this corner in the northern Philippine Sea district.

DSDP/IPOD SITE PROPOSAL

SITE: NP-1a
POSITION: 29°N; 140°E (?)
GENERAL AREA:
Bonin-Okinawa arc-trough

GENERAL OBJECTIVE: Basement and sedimentation history of Bonin Ridge

PANEL INTEREST:

OBJECTIVES:

Lowest priority because of very thick sediments.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3000 Sediment Thickness (m): _____ Total Time on Site (days) 7

(Single Bit) -- Re-entry Total Penetration (m): 800

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Kobayashi			

DSDP/IPOD SITE PROPOSAL

SITE: NP-2b
POSITION: 29°21.7'N;137°21.5'E
GENERAL AREA:
Shikoku Basin

GENERAL OBJECTIVE: Basement age, spreading Neogene pattern

PANEL INTEREST:

OBJECTIVES:

Same objective as NP-3b
NP-2b becomes re-entry if NP-3b is unsuitable.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4685 Sediment Thickness (m): 500 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 500 ? 7

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Kobayashi	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: NP-3b
POSITION: 28°59.4'N;136°03'E (?)
GENERAL AREA:
Shikoku Basin

GENERAL OBJECTIVE: To determine the age and nature of the 4.7 km/sec basement

PANEL INTEREST: AMP, OCP

OBJECTIVES:
1. To investigate the magnetic properties of the Shikoku Basin and compare it with the magnetically smooth Parece Vela Basin.
2. The OCP would be interested in this hole particularly in the crustal structure of the marginal basin and the petrological nature of the crust. This might be considered a fossil ridge crest (aborted).
3. Test for a fossil ridge and find the spreading center.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: The AMP recommends drilling a pilot hole to investigate drilling at NP-3b to see if the basaltic layer is drillable. If not, this will be a single bit hole and NP-2b becomes the re-entry site.
Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4770 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): 1000 15

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Kobayashi			

DSDP/IPOD SITE PROPOSAL

SITE: NP-4
POSITION: 26°40'N;134°E
GENERAL AREA:
Daito Basin and Ridge

GENERAL OBJECTIVE: Basement nature and age.

PANEL INTEREST:

OBJECTIVES:
Basement nature and age; sedimentation history of North Daito Basin; relationship to events on surrounding ridges.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5200 Sediment Thickness (m): _____ Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): 800 7

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Kobayashi	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: NP-5b
POSITION: 24°42'27"N;132°45'50"E
GENERAL AREA:
Daito Basin and Ridge

GENERAL OBJECTIVE: Same as NP-4.

PANEL INTEREST:

OBJECTIVES:
To determine the sedimentary history of the basin and penetrate the acoustic basement. It should also be used to determine the age of extinction and rate of subsidence of the island arc because such a basin within the ridge must have formed after the ridge began to subside.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results: Site located on line 3 at SP6000

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4934 Sediment Thickness (m): 580 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Kobayashi			

DSDP/IPOD SITE PROPOSAL

SITE: NP-6
POSITION: 26°N, 126°30'E
GENERAL AREA:
Bonin-Okinawa Arc-trough

GENERAL OBJECTIVE: Nature of basement

PANEL INTEREST:

OBJECTIVES:
Possible embryonic marginal sea.
The objectives are to determine the nature of the basement and the history of rifting and sedimentation.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2000 Sediment Thickness (m): _____ Total Time on Site (days) 7

Single Bit -- Re-entry Total Penetration (m): 1000

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent Kobayashi	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: NP-7b
POSITION: 25°32'04"N;133°14'12"E
GENERAL AREA:
Daito Basin and Ridge

GENERAL OBJECTIVE: Subsidence history of the Daito Ridge

PANEL INTEREST:

OBJECTIVES:

The sedimentary cover on the Daito Ridge appears to be very different in seismic character from the sediments in the basin adjacent to the Ridge. These ridge covering sediments, which from dredging are known to include Eocene limestones, may be older than the sediments filling the adjacent basins.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: Further surveying will be done in May 1977 using sonobuoy and OBS with airgun.
Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3385 Sediment Thickness (m): 600 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): 700

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Kobayashi	AMP		

NEW HEBRIDES SITES (NH)

The two main subdivisions (active margin-trench system and back-arc basins) have been observed in the New Hebrides arc which is an example of young non-accretionary margin. Because of its youthfulness, these objectives can be studied on a short transect.

Six New Hebrides drilling sites are proposed (Figure 1) located on the multichannel seismic profile AUS 113.

The nature of the descending sea floor (North Loyalty Plateau) may be determined on the rise seawards of the trench (NH 1) and compared with the basement beneath the inner wall.

Two slopes define two steps in the imbricate zone underthrust beneath the inner wall of the trench (toe of the trench). The objective is to investigate the nature and origin of rocks offscraped from the oceanic crust or eroded from the hinterlands and incorporated in the toe, and to reach the basement underlain by this prism, (NH 2). The upper slope discontinuity or the inner wall bounds the imbricate zone and can provide information on the nature of this accumulation of thick deformed sediment (NH 3).

The frontal arc has a basement which is covered by volcanic tuffs. The nature and age of this basement is of fundamental interest (NH 4).

At the rear of the arc, the nature of trough or back arc basin would be investigated and the problem of intrusion or sea floor spreading would be studied (NH 5).

Not far from this trough, the nature of the basement of Fiji Plateau would provide a good comparison between these rocks and that of the trough. Rock age determinations will help in the comprehension of this plate creation (NH 6). As the North Fiji Plateau has an oceanic crust it is interesting to know if it is a part of an insular arc or a particular convergence of a new oceanic crust against an older one (North Loyalty Plateau). The entire proposed drilling would permit us to understand the mechanisms of an arc creation.

The first and last drillings also interest the OCP. Multichannel seismic reflection records (8200 k) and 6500 km of single channel seismic reflection through the New Hebrides Arc will allow us to define the structural features typical of an intra oceanic margin with associated island arc and predominantly thrust faulting.

Scientific Objectives for the New Hebrides Transect

Site	Location	Water Depth	Penetration	Total Stem	Days at Sea	Objective
NH-1	18°20.3'S 167°25.5'E	5650m	600m	6250m	9	Oceanic crust and sediment of the rise seaward of the trench
NH-2	18°17.93'S 167°29.6'E	6600m	800m	7400m	11	In the trench lower part of the toe and descending crust
NH-3	18°15.83'S 167°46.88'E	3000m	800m	3800m	7	Sediment and crustal rocks in imbricate zone of the inner wall
NH-4	17°57'S	1000m	1600m	2600m	14	History of arc volcanism and age; nature of arc basement
NH-5	17°50.66'S 169°17.72'E	2400m	500m	2900m	6	Basalt basement or deep intrusion in the back arc basin or trough
NH-6	17°43.04'S 169°40.36'E	2200m	800m	3000m	6,5	Basement of the oceanic crust behind the arc system

DSDP/IPOD SITE PROPOSAL

SITE: PAC-4 SF
POSITION: 9°10'N; 105°10'W
GENERAL AREA:
East Pacific Rise near Siqueros Fracture Zone

GENERAL OBJECTIVE: Fast spreading young crust.

PANEL INTEREST: OCP

OBJECTIVES:
This is to be a multiple re-entry site preceded by two pilot holes.
1. To compare the structure and composition of young, fast spreading, non-rifted crust to the slower spreading, rifted crust already drilled in the Atlantic.
2. Principal means of making the comparison will be through structural studies on the core, petrology and geochemistry of basalts, paleomagnetism and alteration petrology.
3. To compare the drilled lithologies and physical properties with the results of geophysical surveys concentrating on seismic properties.
4. The results can be used to study the aging of the Pacific coast and the variation with time of mantle processes.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data: spreading rate, 5.5 cm/yr; age of crust about 2 m.y.

Site Survey Data: Conducted by: Rosendahl, Dorman et al.

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3100 Sediment Thickness (m): 75 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: Pelagic carbonate ooze

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

SOUTH PHILIPPINE SEA TRANSECT: EASTERN SEQUENCE (SP1-4)

Active Margin Panel Objectives

The ridges and basins of the eastern Philippine Sea appear to form the most straightforward sequence of back-arc basins and remnant arcs known. Existing geological and geophysical data suggest the Parece Vela Basin is a back arc basin formed by crustal generation in Oligocene to Miocene time and the Mariana Trough is an active back-arc basin formed by crustal generation since the Late Pliocene. Calcareous rocks dredged from the West Mariana Ridge, a remnant arc, are Late Miocene to Early Pliocene in age. The West Philippine Basin just west of the Palau-Kyushu Ridge (at DSDP Site 290) is Middle Eocene in age but does not seem to have formed by the same mechanism as the back arc basins further east. The Mariana frontal arc is exposed in places as the islands of Guam, Saipan, Taiwan and others. These islands are composed of volcanic and calcareous rocks at least as old as Eocene. The striking age progression of features between the Palau-Kyushu Ridge and the Mariana frontal arc suggest episodic arc migration and back-arc basin crustal generation.

Proposed Transect

SP-1 is a joint site with the Ocean Crust Panel. The primary AMP objective of SP-1 (Figure 3) is to sample oceanic crust prior to subduction in order to establish a basis for comparison with sites drilled into other portions of the active margin. Other objectives include: 1) dating basement in order to fix the age of newly discovered, and as yet unidentified, magnetic anomalies on the ocean floor previously thought to be in the Jurassic quiet zone; 2) describe depositional history of the Mariana Basin; and 3) to determine nature and geochemistry of the upper crustal rocks.

The original site, SP-1a, was located at 18^{o}N, 150^{o}E, which is just west of a very large guyot in the Magellan Seamounts. There are small volcanic features near the site and sediment thickness appears to be about 100 m. It would seem likely that drilling at this location would encounter alkalic, seamount-related volcanism which occurred sometime after crustal generation. SP-1b is proposed at location $17^{o}45'$N, $148^{o}35'$E (Figure 3). Observable sediment thickness at the site is about 250 m.

The objective of SP-2 is to determine the nature and structure of the rocks in the imbricate zone of the lower trench slope. The original site at 18^{o}N, 148^{o}E was found to be on the rear flank of a small seamount just entering the trench axis. The reconnaissance survey results showed the lower trench slope to have few regions of observable sediment for spudding into. These sediments are ponded behind low ridges on the generally featureless lower slope. Site SP-2b is located at $17^{o}45'$N, $147^{o}40'$E in a re-entrant in the slope at a depth of about 7000 meters. Sediment thickness is probably less than 100 meters.

The primary objective of site SP-3 is to detail the formation and development of the Mariana arc. The record of arc volcanic activity and structural deformation should document the history of related subduction and/or back arc crustal formation. Thus, it is a key site for testing the arc migration hypothesis as well as for determining general island arc structure.

The original location, SP-3a, was in the mid-slope region at 18^{o}N, 147^{o}E. The reconnaissance survey results indicate that this location is on the flank of a ridge of acoustically chaotic material. There is no observable sediment cover on

the ridge. The ridge material appears to form the acoustic basement on the single-channel, reconnaissance reflection data in the mid-slope region.

The most valuable contribution of SP-3 to the study of back arc basin and island arc development would be realized by locating the site on the frontal arc approximately 20 to 30 miles east of the volcanic arc. The optimum location for studying subduction processes and trench slope structure would be just west of the trench slope break, in the general vicinity of the original site. For this reason, it is proposed that SP-3 be assigned two sites. The site on the frontal arc (SP-3b) would be postponed until IPOD II because of potential hydrocarbon hazard and possibly having to penetrate 2.5 to 3 km into the bottom to attain the objective. The site on mid-slope (SP-3c) is proposed for IPOD I with the objective of determining the lithology and structure of mid-slope rocks.

The mid-slope site SP-3c is proposed at $17^{o}40'N$, $147^{o}15'E$ in a faulted sediment basin with greatest thickness about 600 m surrounded by basement highs, some of which outcrop as ridges. A basement outcrop just west of the proposed site was dredged during the reconnaissance survey and indurated samples of homogeneous, clayey to sandy silt were recovered.

The frontal arc site SP-3b is tentatively proposed at $17^{o}48'N$, $146^{o}08'E$ near the eastern edge of the frontal arc. Penetration on the reconnaissance single channel reflection data is limited in this region. Preliminary refraction results indicate low velocity material to a subbottom depth of about 2.5 km. It may be necessary to move the proposed site to the syncline further west ($145^{o}58'E$). Multichannel reflection data will be needed to locate this site properly.

Site SP-4 will sample the crust of the Mariana Trough. The objectives of this reentry site are: 1) the petrological and geochemical sampling of active inter-arc basin crust; 2) testing the arc migration hypothesis by determining the age and lithology of the crustal rocks to see if older rocks are buried by recent volcanism; and 3) determining whether inter-arc basin crustal formation is similar to that at mid-ocean spreading centers.

Chemical and petrologic similarity is reported between basalts dredged from the Lau basin and basalt from mid-ocean ridges (MORB). Pillow basalts dredged from an active spreading center in the North Fiji plateau are comparable in chemistry to both MORB and the basalt from the Lau basin. However, Mariana trough basalts, while similar to MORB in some aspects, differ from them in having higher concentrations of K, Sr, Rb, Ba, as well as higher overall concentrations of rare earths. These rocks are also relatively undepleted in light rare earth elements and exhibit a lower Ni abundance. In most of these respects, the Mariana basalts obviously differ from both Lau and North Fiji plateau basalts. In addition, $^{87}Sr/^{86}Sr$ values of Mariana trough basalts are much lower than those of Lau basin.

These differences among basalts from the three basins may reflect: 1) differences in the mechanism of crustal generation; 2) crustal contamination of the basalt; or 3) differences in source or depth of source region.

Originally, two alternate sites were proposed: Sp-4a ($18^{o}N$, $145^{o}E$) on the eastern side of the Mariana trough, and SP-4b ($18^{o}N$, $144^{o}E$) on the western side of the trough. Results of reconnaissance survey (Hawaii Institute of Geophysics) indicate sparse sediment cover on the eastern side of the Mariana trough except for the part covered by the volcani clastic apron. The western part of the trough in the vicinity of SP-4b is deeper and contains a more general sediment cover with

several local ponds containing up to about 200 meters of sediment. The Panel decided that a site in the western part of the trough would be less likely to be contaminated by arc volcanism. Therefore, SP-4c is positioned in the most favorable pond at 17°45'N, 144°E. The 200 meters of sediment in this pond will provide the necessary support for the re-entry assembly.

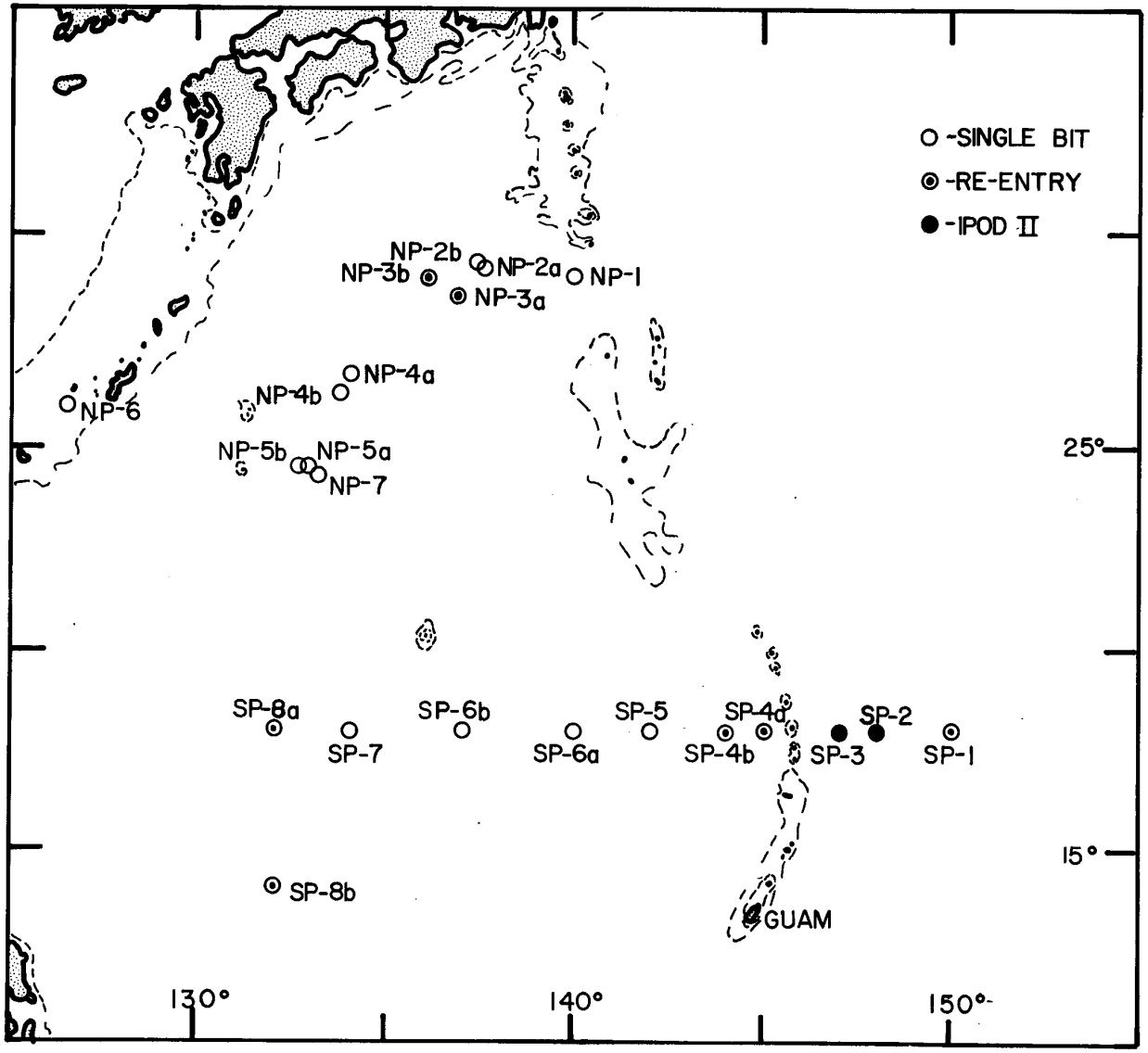


Figure 3. Drill sites for Philippine Sea, Northern and Southern Transects.

DSDP/IPOD SITE PROPOSAL

SITE: SP 1
POSITION: 18°N; 151°E
GENERAL AREA:
South Philippine Transect
East of Mariana Tr.

GENERAL OBJECTIVE: Jurassic history of Pacific

PANEL INTEREST: OPP, AMP, SCP

OBJECTIVES:
To investigate the Jurassic history of the Pacific Ocean (magnetic anomalies might be of early Jurassic age?)
To test whether Cretaceous paleocirculation was basin-basin fractionated (as today) or whether marginal sea-deep oceans fractionation prevailed, late Cretaceous paleo depth 6 km.
Should be moved to location with locally thickest sediment cover.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: HIG - multichannel survey by D. Hussong

Other Data: RC 11, record 964-966, v. 24, 980-985; Silas Bent (NAVOCEANU), Dec. 3-7, 1968.

Site Survey Data: Conducted by: D. Hussong (HIG)

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 6500 Sediment Thickness (m): 200 Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m): 250 5

Nature of Sediments Anticipated: Deep-sea clay overlying thin carbonate sequence

Weather Conditions: good year round (typhoons?)
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: 1 Paleontologist (nanno)

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Y. Lancelot/H. Thierstein	OPP 2nd priority		

DSDP/IPOD SITE PROPOSAL

SITE: SP-1a
POSITION: 18°N; 150°E
GENERAL AREA: Just west of large guyot in the Magellan Seamounts

GENERAL OBJECTIVE: Sample ocean crust prior to subduction

PANEL INTEREST: OPP, AMP

OBJECTIVES:

1. dating basement in order to fix the age of newly discovered and as yet unidentified magnetic anomalies on the ocean floor previously thought to be in the Jurassic quiet zone
2. describe the depositional history of the Mariana Basin
3. determine the nature of geochemistry of the upper crustal rocks

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by: Ludwig SP-1-4 - Vema 24 channel seismic record along the SP5 traverse; Bibee records from the Mariana Trough region
Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5700 Sediment Thickness (m): 100 Total Time on Site (days)
Single Bit - (Re-entry) Total Penetration (m): 800 15

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent L. Kroenke	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SP-1b
POSITION: 17°45'N, 148°35'E
GENERAL AREA:
See SP-1a

GENERAL OBJECTIVE: See SP-1a.

PANEL INTEREST:

OBJECTIVES:

Same as SP-1a.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m): 250 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent L. Kroenke	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SP-2b
POSITION: $17^{o}45'N;147^{o}40'E$
GENERAL AREA:
Mariana Trench

GENERAL OBJECTIVE: Nature and structure of rocks in imbricate zone of lower trench slope

PANEL INTEREST:

OBJECTIVES:
Accretionary processes in Mariana Trench site as deep as possible on inner wall.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 7000 Sediment Thickness (m): <100 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 600 8(?)

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent L. Kroenke	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SP-3c
POSITION: 17°40'N;147°15'E
GENERAL AREA:
Midslope site in faulted sediment basin

GENERAL OBJECTIVE: Lithology and structure of midslope rocks

PANEL INTEREST:

OBJECTIVES:
1. Study back arc basin and island arc development
2. Study subduction processes and the trench slope structure

Note: SP-3b is planned for IPOD II

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m): 600 Total Time on Site (days)

(Single Bit) -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated: Homogenous, clayey to sandy silt

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent L. Kroenke	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SP-4c
POSITION: 17°45'N;144°E
GENERAL AREA:
Western part of Mariana Trough

GENERAL OBJECTIVE: Petrological sampling of inter-arc basin crust

PANEL INTEREST: AMP

OBJECTIVES:

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3600 Sediment Thickness (m): 200 Total Time on Site (days) 15

Single Bit - (Re-entry) Total Penetration (m): 800

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent L. Kroenke	Panel(s) Endorsement	PCOM Endorsement	Safety Review

PHILIPPINE SEA SOUTHERN TRANSECT: SITES SP5-10

Active Margin Panel Objectives

Back-arc (or marginal sea) basins are normally associated with active island arc-trench systems and flanked by passive continental margins. The back-arc basins vary greatly in depth to the sea floor, thickness of sedimentary fill, magnetic and gravity field strength, and heat flow. Hypotheses on the origin of back-arc basins include entrapment of old oceanic crust by formation of the island arc, generation of new crust by arc migration (sea floor spreading), subsidence or collapse of continental or quasi-continental crust with attendant or subsequent oceanization, rejuvenation by intense volcanism, and any combination of these mechanisms. The genesis is believed to be directly related to the formation of the bordering island arc and continental margin. We believe that deep drilling combined with surveys designed to provide geological and geophysical data for the selection of the best possible sites may help to discriminate between these hypotheses.

The transect of core holes across the Philippine Sea at 18^{o}N and into the South China Sea (Figure 3) are planned to investigate the origin, development, and interrelation of several "geophysically diverse" back-arc basins. The IPOD site survey and drilling program is closely allied with the Philippine Sea Transect Zone study of the IDOE/SEATAR project, with IDOE/IPOD/ONR crustal studies in the Philippine Sea and South China Sea, and with land based metallogenesis studies on Luzon.

The Mariana trough is proposed to be an active inter-arc basin formed by crustal extension. Drilling at site SP-5 through the volcaniclastic apron on the rear flank of the West Mariana ridge would establish the nature and age of the sediments and basement rock there. Comparison of the drilling results with those of SP-3 (Mariana frontal arc) and SP-4 (Mariana inter-arc trough) might establish if the West Mariana ridge is a rifted remnant of the frontal arc that was left behind by formation of the inter-arc basin.

The results of magnetic measurements and JOIDES drilling suggest that the West Philippine basin formed during the Eocene by sea floor spreading from the Central Basin fault. Core hole data suggest that the Parece Vela basin also formed by crustal extension, but during Oligocene-Miocene time. However, the depth to "basement" in the West Philippine Basin is much deeper than accreted sea floor of similar age in the main ocean basin, suggesting that the magnetic data might better be interpreted in terms of the Mesozoic geomagnetic time-scale.

Generally, positive gravity anomalies occur over back-arc basins believed to have been formed by crustal extension; trapped crust seems to be indicated by negative or near zero anomalies. The Parece Vela has positive gravity anomalies of 15-20 mgal, whereas the West Philippine basin is characterized by near zero anomalies. Furthermore, reconnaissance seismic refraction studies in the Philippine Sea have indicated that the sea floor topography of the basins is controlled by a layer of velocity 3.5 km/sec that may not represent true basement, but instead may be (Early Tertiary) volcanics capping a much older oceanic crust.

Drilling in the Parece Vela basin (Site SP-6) and West Philippine basin (Site SP-8) will provide critical tests of the alternate hypotheses of formation of these basins. Site SP-8 is to be located where the 3.5 km/sec layer 2A is either thin or absent, thus enabling deep penetration of the oceanic basement (possibly to layer 3). Site SP-7 is planned to sample rocks of the Palau-Kyushu ridge. The objectives are to study the chemical and structural composition of a remnant arc

and determine the relationship of the ridge to the Parece Vela basin and Mariana ridge.

The east-west trending magnetic lineations in the east-central portion of the South China Sea basin have tentatively been identified as Late Jurassic-Early Cretaceous in age, suggesting that the basin was formerly part of the main Pacific basin. The global age vs. basement depth curve of Sclater and others, however indicates an Early Tertiary age for the basin. Compared to the Philippine Sea basins, the South China Sea basin is shallower by about 1500m and heat flow is high. The northern margin of the basin is a zone of tension (graben and horst structures), the southern margin is a zone of compression (fold structures), the western margin is a zone of shear, and the eastern margin is a subduction zone (Palawan trough and Manila trench). Two drill sites (SP-9 and SP-10) are planned in the South China Sea basin, to be drilled during IPOD II after extensive surveying designed to establish the structural framework of the basin and bordering margins.

Scientific Objectives for the South Philippine Sea Transect

Site	Location	Water Depth	Penetration	Days at Sea	Objective
SP-1	18°N, 150°E	5700m	800m	15	Pacific plate in Jurassic quiet zone or older; oldest ocean crust with a good chance of sampling; higher priority than Nauru Basin
SP-2	18°N, 148°E	8000m	300m	8	Accretionary processes in Mariana Trench site as deep as possible on inner wall
SP-3	18°N, 147°E	3500m	900m	17	Mariana arc formation history; in arc-trench gap
SP-4a	18°N, 145°E	3600m	800m	15	Alternative sites on E and W of Mariana Trough; petrological samples of inter-arc basin crust
SP-4b	18°N, 144°E	3600m	800m	15	
SP-4c	17°N, 144°E	3600m	800m	15	
SP-5	18°N, 142°E	3600m	800m	7	Western flank of remnant arc, basement and sedimentation history
SP-6a	18°N, 140°E	4300m	400m	7	Alternative sites to sample crust of East or West Parece Vela Basin; inactive marginal sea
SP-6b	18°N, 137°E	4700m	300m	7	
SP-7	18°N, 134°E	3500m	300m	7	Sample of Palau-Kyushu Ridge for comparison with SP-5 and Mariana Arc
SP-8a	18°-20°N, 132°E	5700m	800m	22	Layer 2A is thin or absent, drilling to layer 3; possible evidence of age of West Philippine Sea
SP-8b	14°N	5400m	800m	22	
SP-9	19°N	3000m	?	?	Age and shallow petrology
SP-10	14°N, 116°E	3500m	?	?	Age and shallow petrology

DSDP/IPOD SITE PROPOSAL

SITE: SP-6a
POSITION: 18°N; 140°E
GENERAL AREA:
Parece Vela Basin

GENERAL OBJECTIVE: Sample crust of Parece Vela Basin

PANEL INTEREST:

OBJECTIVES:

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4300 Sediment Thickness (m): _____ Total Time on Site (days) 7

(Single Bit) -- Re-entry Total Penetration (m): 400

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent W. Ludwig	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SP-6b
POSITION: 18°N; 137°E
GENERAL AREA:

GENERAL OBJECTIVE:
Inactive Marginal Sea

PANEL INTEREST: AMP

OBJECTIVES:

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4700 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 300 7

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent W. Ludwig	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SP-7
POSITION: 18°N; 134°E
GENERAL AREA:
Palau-Kyushu Ridge

GENERAL OBJECTIVE:

PANEL INTEREST: AMP

OBJECTIVES:

Sample the Palau-Kyushu Ridge for comparison to SP-5 and Mariana Arc.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3500 Sediment Thickness (m): _____ Total Time on Site (days) 7

Single Bit -- Re-entry Total Penetration (m): 300

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
W. Ludwig			

DSDP/IPOD SITE PROPOSAL

SITE: SP-8a
POSITION: 18-20°N;132°E
GENERAL AREA:
West Philippine Basin

GENERAL OBJECTIVE:

PANEL INTEREST:

OBJECTIVES:
1. Layer 2A is thin or absent; the possibility of reaching Layer 3 exists.
2. Determine the age of the West Philippine Sea

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5700 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit -- (Re-entry) Total Penetration (m): 800 22

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent W. Ludwig	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SP-8b
POSITION: 14°N;132°E
GENERAL AREA:
West Philippine Basin

GENERAL OBJECTIVE:

PANEL INTEREST: AMP

OBJECTIVES:

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5400 Sediment Thickness (m): Total Time on Site (days)

Single Bit - (Re-entry) Total Penetration (m): 800 22

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
W. Ludwig			

THE TONGA TRENCH SITES (T)

The Tonga Arc is a relatively young but well developed island arc trench system. Toward the rear of the back arc region are found the tectonic units generally associated with the standard or classical island arc model: an active marginal basin (Lau Basin) and an inactive marginal basin (South Fiji Basin). The Tonga arc trench system may deviate, however, from the standard or classical island arc model in that the lower slope accretionary prism appears undeveloped or, at most, poorly developed. There are also suggestions that formation of the Lau Basin may be related to the divergence on the Fiji Plateau as a consequence of convergence of the Austral-Indian and Pacific plates as opposed to simple arc migration. Furthermore there is evidence to suggest that the inactive South Fiji basin was formed by entrapment in contrast to formation by old arc migration and back-arc spreading.

Structurally, as revealed by multichannel data, the arc may be the least complicated, in comparison with others currently being considered for drilling. Deformation in the arc appears to have migrated westward toward the back-arc region progressively with time, along with formation of a well developed secondary volcanic arc downdip from the original volcanic arc. The potassium content of andesite in the Tonga island arc, although low, increases with depth to the Benioff zone as seen in other circum Pacific island arcs.

In short, cessation of ocean-island type volcanism (perhaps associated with active transform faulting) which formed the island of 'Eua (now in the frontal part of the arc) appears to have occurred in late Eocene time. Carbonate sedimentation offshore from 'Eau during the Eocene has been postulated to continue into the Oligocene. Initial uplift and erosion of the Tonga frontal arc including 'Eau during initiation of subduction in middle to late Oligocene time is believed to have resulted in the formation of a middle to upper Oligocene clastic wedge in the vicinity of 'Eua. Upper Oligocene-lower Miocene carbonates admixed with volcaniclastics, deposited during nascent Tongan island-arc volcanism, appear to onlap the Oligocene clastic wedge near 'Eua. Volcanism in the proximity of Tongatapu appears to have shifted or migrated westward approximately 50 km in late Miocene/Pliocene time to its present position approximately 200 km west of the axis of the Tonga trench. Thus the older Miocene/Pliocene volcanic centers appear to have formed along a line extending north-northeast from Tongatapu to Nomuka and Vava'u islands. The young Pliocene/Oligocene centers, about 70 km apart, occur along a line extending from Tofua to Late and Fonualei Islands. The postulated location of the older belt of island arc volcanism approximately 150 km west of the present trench axis, and its subsequent shift or migration to a position approximately 200 km west of the trench axis, suggest that very little accretion to the lower trench slope could have occurred since formation of the arc. In support of this conclusion, dredging on the lower slopes of the inner wall indicates that mafic and ultramafic rocks are exposed.

Since initiation of island arc volcanism in late Oligocene to early Miocene time, part of the Tonga ridge appears to have been subjected to repeated cycles of subsidence and submergence followed by successive cycles of uplift and emergence. Block faulting and extensional tectonics in the frontal part of the arc are considered responsible for much of the post Miocene subsidence. Subsidence and submergence of exposed portions of the frontal arc enabled construction of reef platforms and terraces similar to those observed to outcrop on 'Eua Island. Doming during magma intrusion and formation of volcanic ridges in the back-arc region, coupled with minor amounts of imbricate

underthrusting and undercutting of the inner trench wall, is believed to best explain the repeated intervals of post Miocene uplift and emergence.

Back arc spreading in the Lau basin is characterized by petrologic affinity to mid ocean ridges. A chemical and petrologic similarity has been reported between basalts dredged from the Lau Basin and the North Fiji Plateau and basalt from mid-ocean ridges (MORB). Basalts from these basins are different from samples dredged from another active marginal basin (the Mariana trough) in concentrations of K_2O and some trace elements. In addition Sr isotope ratios of Lau Basin basalts (those from the North Fiji Plateau samples have not been reported) are higher than either MORB or Mariana trough basalts.

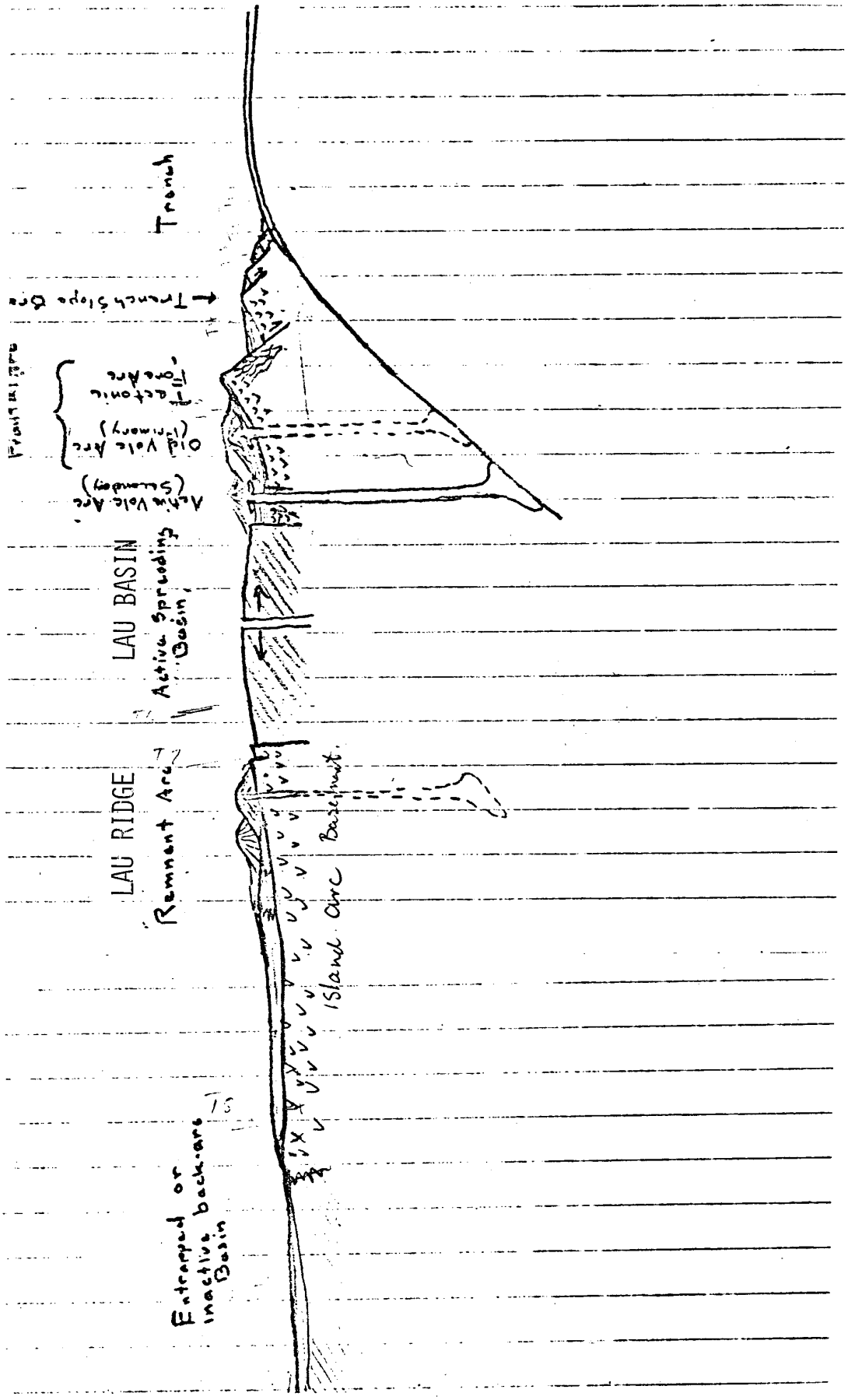
The differences in chemistry suggest that: 1) marginal basins may not all form by the same mechanism; 2) the source of material forming the basin may differ in chemistry or may be at different depth; and 3) some form of contamination of the crustal material may be taking place.

The primary AMP objective of Site T1 is to characterize petrologically and geochemically the oceanic crust (including the sediment overburden) seaward of the trench and prior to subduction to: 1) reveal whether or not oceanic crust and sediments are being incorporated into the inner wall of the trench; 2) identify any petrologic control exerted on andesitic island arc volcanism by the oceanic crustal component being subducted, and 3) determine, perhaps, whether or not oceanic crust seaward of the trench and within the back arc basin have any reasonable afinities, i.e., magma production controlled by similar sources or source depths in the upper mantle.

Because of the length of drill stem required, Site T2 is planned for IPOD II. The site, however, is designed to penetrate the toe of the lower trench slope on the inner trench wall to determine if: 1) the toe represents original sea floor material, uplifted when the arc was formed and later downfaulted, perhaps as a result of minor undercutting of the lower trench slope; 2) thin slabs of oceanic topographic irregularities entered the trench and accreted to the lower slope; or 3) andesitic island arc crustal material is being consumed in the trench by erosion of the base of the frontal arc (upper plate subduction).

Site T3, in a sediment pocket on the lower slope of the inner trench wall, is planned to be drilled in order to compare and contrast with results with site T2 (planned for IPOD II). The objective is to sample the middle region of the lower slope (below the trench slope break) to determine if the basement is indeed composed of ultramafic oceanic crustal rocks. The anticipated sequence includes volcanic silts and siltstones, perhaps admixed with derived carbonate sediments from the upper slopes, overlying altered basalts and serpentinized gabbros. If the material were to represent repeated inthrust slices of oceanic crust associated with autochthonous veneers of pelagic sediments, an increase in age should be detected. Comparison with Site T2, should reveal an age progression from younger material downslope at T2 through older material at T3.

Site T4 was chosen to sample the sediment and the underlying crustal rocks on the 4000 m shelf (on the inner trench wall). This site is designed in part to elucidate the early history of trench formation, particularly in relation to identification of basement together with the record of uplift or subsidence. It is also planned, in part, to compare with Site T5 planned for IPOD II and expected to contain a more complete record of arc deformation and volcanism. Approximately 100 m of silt underlain by approximately 300 m of


Trench
Trench slope Dep
Frontal Arc
Old Vole Arc (Primary)
Active Vole Arc (Secondary)
LAU BASIN
Active Spreading Basin
LAU RIDGE
Remnant Arc
Island Arc Basement
Entrapped or inactive back-arc Basin

volcanic silts and siltstones, admixed with a derived carbonate component, should be encountered prior to drilling into basaltic basement above the trench slope break. The basement at this site is expected to be composed of original sea floor, initially uplifted during arc formation and later downfaulted during subsequent arc deformation.

Site T5 has as its objective definition of the history of arc deformation and volcanism. The site is planned as a re-entry site in phase II of IPOD. A sedimentary basement section should be encountered containing the most complete history of deformation and volcanic activity of the Tonga arc. A sequence of rock types indicating pre-island arc, mid ocean volcanism and pelagic ocean floor sediment accumulation should be encountered under a blanket of detrital sediments deposited during uplift of the frontal arc. These should be covered by volcaniclastics derived from the early stages of the Tonga arc, and should be, in turn, buried by recent volcanic sediments produced during volcanism on the Tofua ridge.

Lau-South Fiji Basin Sites (T6-11)

The geology of the Lau Ridge can be traced back only to the late Miocene by study of island outcrops. The Tonga and Lau Ridges were both part of a single arc prior to the formation of the Lau Basin. Bathymetry and existing seismic records suggest that the volcanic activity was centered on the eastern side of the ridge. The crust on which the arc is built can be studied on the western flank and the deposits on the flank should give a much more complete and longer history of the ridge than is available from the study of the islands.

Discrimination between the various models that have been suggested for the South Fiji basin is necessary to understand the genesis of the arc, e.g., whether the trench was initiated by back-arc spreading or whether the arc originated on existing oceanic crust in an intra-oceanic location. Determination of the nature of the Three King Rise is also essential as a test of the models as explained in the discussion of the objectives of Site T-11.

Site T6 is located in the Lau Basin, a young active inter-arc basin (latest Miocene onwards). The principal objective of this site is to sample the crust in the basin, to compare and control the petrology and geochemical properties with ocean crust drilled seaward of the trench.

Located on the eastern flank of the Lau Ridge is Site T7. The expected stratigraphic succession from the top downward should be: 1) oozes and ashes from the volcanoes on the west flank of the Tonga Ridge, 2) shallow water deposits laid down after rift formation of the Lau Basin (late Miocene), 3) an erosional break corresponding to uplift associated with the final stage of the Lau Basin, 4) a volcanic sequence, either sedimentary or igneous, deposited on the arc crust prior to rifting. This last segment should correlate with that drilled at Site T4 but more igneous rocks should be present.

Site T8 is located on the western side of the South Fiji Basin on the rear flank of the arc. The sedimentary column at this site will complement that of the eastern fore-arc basin and like it may have a more complete stratigraphy than the ridge crest. The basement under the basin is possibly the basement on which the island arc has been built and should be compared with that beneath the fore arc basin (T3 and T4).

The objective of Site T9 is to determine the history of formation of the basin floor. This site is located on a linear anomaly identified as anomaly 8. In combination with this site is the sea floor age of 30 m.y. at Site 205, determined from drilling and located on an anomaly identified as anomaly 12. The convergence of the mapped anomalies and their shapes could be interpreted as a sequence symmetrical about the basin axis, with neither of them a westward younging succession.

Site $T10_b$ is located northwest of a supposed old spreading ridge or a magnetic anomaly like that at Site $T9_b$ identified as anomaly 8. The objective at this site is to test the basement age and determine the validity of the anomaly identification. This site is in a region where prominent east-west ridges draped with sediment are submerged beneath the sediment derived from the Lau Ridge in the mid to late Miocene. Tracing of this province from the north would suggest that it is significantly older than suggested by the anomaly identification and that the supposed old spreading ridge is the junction between older crust (to the northwest) and younger crust (to the east).

Site T11 is located on the northern end of the Three Kings Rise. If the south Fiji Basin has been formed by extension this should be a remnant arc older than the basin. Alternatively, if the interpreted pattern of magnetic anomalies is correct, a substantial amount of ocean crust has been lost. In this case it may have been either subducted under the ridge or obducted onto it. Drilling a hole on the ridge should resolve its nature and age.

Scientific Objectives for the Tonga Trench Transect

Site	Location	Water Depth	Penetration	Total Stem	Days at Sea	Lithology
T1	20°20'S,172°20'W	5000m	500m	5500m	7	Clay (200m), cherty clay-stone (200m), basalt (100m)
T2	20°40'S,173°30'W	9000m	500m	9500m	8	
T3	20°50'S	6500m	300m	6800m	7	Silt (100m), serpentinized gabbro (200m)
T4	21°00'S,174°20'W	4000m	400m	4400m	7	Silt (100m), siltstone (300m)
T5	21°30'S,175°30'W	1000m	1800m	2800m	20	
T6	22°20'S,177°00'W	1700m	500m	2220m	11	Calcareous silt (ash)(200m) basalt (300m)
T7	23°10'S,178°30'W	1700m	400m	2100	3	Calcareous clay + silt (300m), andesite (100m)
T8	26°15'S,179°30'E	2250m	700m	3250m	8	Calcareous volcani-clastics (600m), basalt (100m)
$T9_b$	26°00'S,175°55'E	4600m	600m	5200m	6	Calcareous ooze clay (50m), clay-siltstone (450m), basalt (100m)
$T10_b$	25°40'S,174°30'E	4600m	600m	5200m	6-8	Calcareous ooze-clay (50m), clay silt (450m), basalt (100m)
T11	28°30'S,173°00'E	2000m	400m	2400m	3-8	Calcareous ooze (200m), clay stone (100m), basalt (?) (100m)

Enclosed is a supplement to the JOIDES Journal, Special Issue, Vol. III, No. 3, "Initial Site Prospectus International Program of Ocean Drilling". The supplement focuses on the current Atlantic Program. With the exception of the two Caribbean sites, all of the proposed areas are new. The Caribbean sites should be added to the end of the previous Caribbean Section. The numbering in the new sections continues in sequence.

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DSDP/IPOD SITE PROPOSAL

SITE: CAR-8
POSITION:
GENERAL AREA: North Panama Rise

GENERAL OBJECTIVE: Neogene carbonate sequence to study closing of middle America seaway

PANEL INTEREST: OPP/PMP

OBJECTIVES: Located on the North Panama rise, not far from the previous Site 154, the Site would allow the recovery of a complete Neogene carbonate sequence to determine the effects on biogeography paleooceanography and biostratigraphy of the closing of the Middle America Seaway in the late Neogene. This represents a first order paleooceanographic event that appears to have hard major repercussions on global climates and oceanic circulation.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Several MCS Lines IFP-CEPM lines 109 and 112, UTMSI line CTT-12 cross the area. Some more regional
Other Data: lines would be useful.

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3000 Sediment Thickness (m): Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 1000 14

Nature of Sediments Anticipated: Neogene carbonates

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
J. P. Kennett	OPP, PMP		

DSDP/IPOD SITE PROPOSAL

SITE: CAR-1P
POSITION: 15°01.02'N, 73°24.58'W
GENERAL AREA: Southern Beata Ridge

GENERAL OBJECTIVE: Recover complete Tertiary sequence to study closing of Isthmus of Panama

PANEL INTEREST: OPP

OBJECTIVES: Located on the Beata ridge at the previous Site 151, drilling the site would allow recovery of a complete Tertiary sequence in the Caribbean deposited above the CCD. The location would be the best to recover:

a) a complete sequence,
b) a well preserved open marine Miocene-Pliocene boundary (water depth at the site is 2000 m), and
c) to study the paleoceanographic effects of the closing of the Panama Isthmus.

BACKGROUND INFORMATION: previous Site 151, no further preparation needed
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: **Conducted by:**

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ **Sediment Thickness (m):**_____ **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** 400 7

Nature of Sediments Anticipated: Calcareous oozes, chalk, marl and carbonate

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: **Staffing** **Special Analyses**

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
I. Premoli Silva	OPP		

IPOD DRILLING ON THE CONTINENTAL MARGIN OF EASTERN NORTH AMERICA

The continental margin of eastern North America is the passive margin with the oldest geological history available in the modern oceans. Rifting and sea-floor spreading between the North America and African continents began in early Jurassic-late Triassic, with possible ridge-jumps and reorganizations which left some of the oldest ocean crust on the western margin of the North Atlantic. As a result of this old age, extremely thick sediment accumulations have developed on the continental slope and rise north of Cape Hatteras, and existing drill string limits of the GLOMAR CHALLENGER have not permitted penetration of the older sediments except at sites more than 500 km seaward of the present continental shelf edge. However, even with the present drill string limit (6800 m), there are many excellent targets for drilling identified recently on more than 15,000 km of new multi-channel seismic reflection profiles collected in the last 3 years by various institutions.

New knowledge on the pre-Beta seismic stratigraphy has led to the mapping of three major horizons over a wide area. The seismic data reveal that these horizons might be "nicked" on their easternmost extent, especially in the Blake-Bahama Basin which has been sediment starved and eroded by strong submarine currents. Previous DSDP drilling in the basin failed to reach these deepest seismic horizons formed of the oldest sediments in the Atlantic Ocean basin (Site 391). A new effort near this site is essential, now even more so, in light of the new widespread documentation of the pre-Beta seismic stratigraphy.

The new seismic data reveal that the pre-Beta layers also occur in basement ponds under the Delaware lower continental rise near DSDP Sites 105 and 388. Apparently the sedimentary section is better developed a small distance away from 105, which was drilled on a basement high and which might not have penetrated the complete pre-Beta sequence. Targets are identified on the lower rise (within the drill string limit) which will extend the stratigraphy beyond that sampled in Site 105.

The post-Beta seismic stratigraphy is well developed on the lower continental rise off Delaware and New Jersey. Proposed IPOD sites with 1000 to 1500 m of penetration could penetrate the seismic Horizons A^*, A^c, and A^T where they are well separated and where they have not been sampled before. These reflectors are thought to be a chalk layer near the boundary between the Middle Cretaceous black shales and the Late Cretaceous vari-colored shales (A^*), the Eocene chert layer (A^c) and turbidite layers above the chert (A^T), as they are where drilled on the Bermuda Rise.

With the availability of DSDP and IPOD drill sites on the Delaware-New Jersey lower continental rise, and the recently available B2 and B3 COST wells on the New Jersey shelf, an IPOD site on the upper continental rise with penetration of 500 m into the Cretaceous sediments will be invaluable as documentation of the slope facies transitions. Seismic reflection profiles across the New Jersey-Delaware slope and rise can be interpreted to show facies transitions from a reefal-carbonate bank margin to an off-bank slope facies for the Cretaceous, and erosional slope migrations through the Tertiary. These important paleoenvironmental changes must be documented. Such a hole will also provide vital physical properties information in an area where future drilling to deeper depths is proposed.

In the Blake Outer Ridge area of the continental rise several significant geological features are identifiable on the new seismic data. Drastic erosional "scalloping" on the upper rise once cut canyons with up to one km of relief, which are now buried by 1000 to 2000 m of sediments. The age and nature of the erosional event is unknown but could be determined with proposed IPOD drilling. Under the Blake Outer Ridge a large volume of sediment exists below Reflector X forming the core of the ridge. The age and character of this sediment is unknown and could be determined by drilling. On the crest of the ridge a bottom simulating reflector is interpreted to be a clathrate inversion boundary based on acoustic character and geochemical theory. But the clathrate has never been drilled with the proper testing equipment to prove this theory, and this remains an outstanding goal to be completed by proposed IPOD drilling.

The sites proposed for IPOD drilling in 1981 will address the above mentioned problems, and they also will complement future Ocean Margin Drilling (OMD) which will penetrate much deeper. According to the FUSOD (Future of Scientific Ocean Drilling) document, high priority will be given to drilling on the Gulf of Mexico and United States Atlantic continental margins. OMD sites are proposed for transects on the Blake Plateau and the New Jersey-Delaware continental margins to supplement data from existing DSDP-IPOD sites and recently released COST wells. The proposed sites discussed here fill in these proposed transects by sampling the shallower geology at critical points along the profile, and by providing evidence from the shallower geology on what is to be expected in the deeper probes.

Pre-drift reconstructions of the North Atlantic define the southwestern edge of the Grand Banks as a previous transform margin with the African Plate. The Newfoundland Ridge has been interpreted as a fracture zone in oceanic crust tracing the seaward continuation of this transform margin. Multichannel reflection seismic data, however, indicate that acoustic basement underlying the Newfoundland Ridge is composed of sedimentary strata, possibly continental in origin, which may be a foundered element of the Grand Banks structural block. The indicated thick section of sedimentary strata suggests that this feature is the remnant of a foundered sedimentary basin, possibly a fragment of additional, subsided continental crust adjacent to the Newfoundland Ridge. Knowledge of the age and depositional environment of these sediments would illuminate the nature of the early seaway between North America and Iberia.

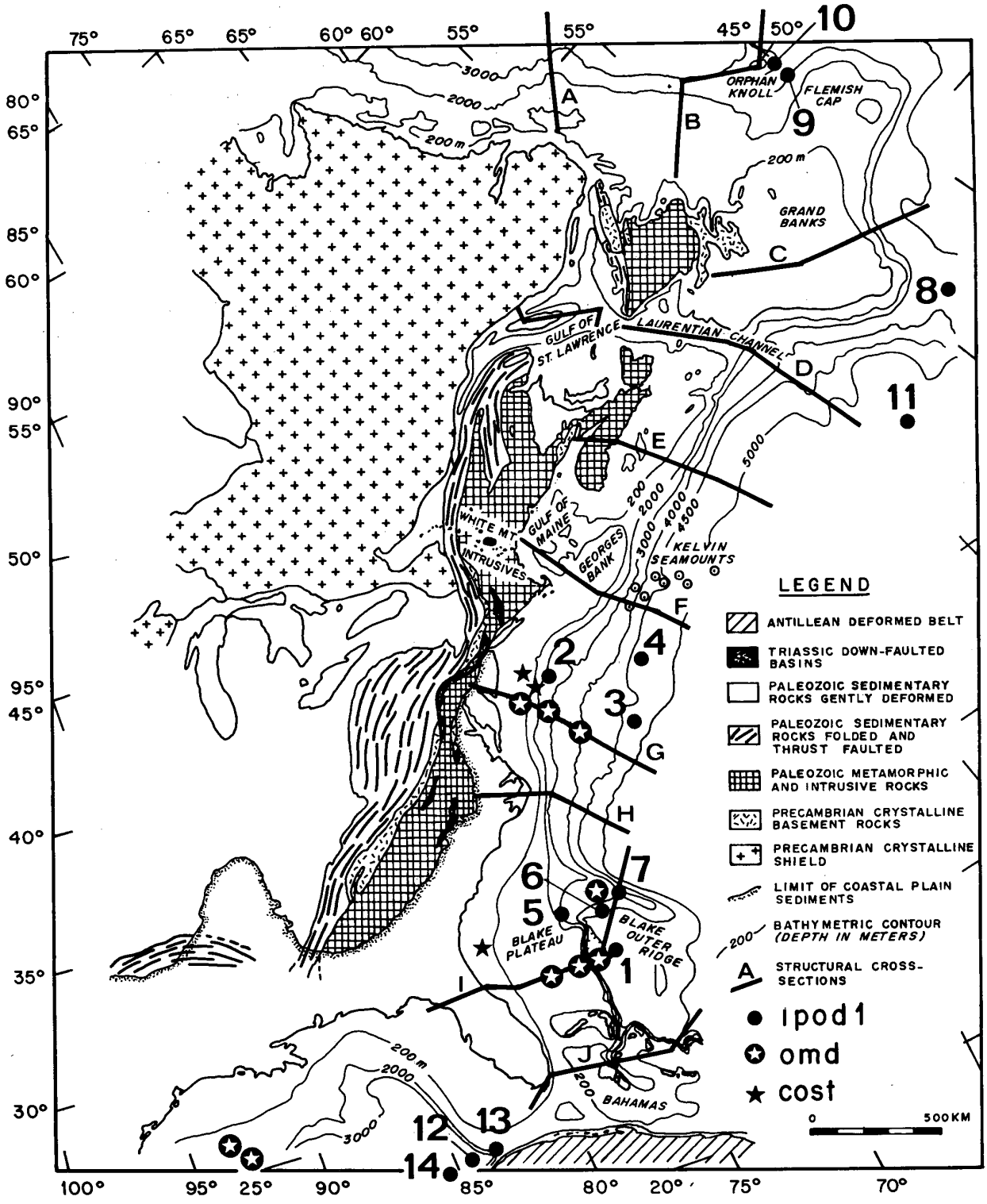
The subsidence history of the Orphan Subbasin as inferred from DSDP Hole 111 on Orphan Knoll and the basin margin wells to the west, is anomalous in terms of recognized passive margin models. According to the published models, rapid subsidence should take place immediately after seafloor spreading begins; at Hole 111 it apparently took place in the Paleocene, some 25 million years after initial spreading. If subsidence is a direct result of the crustal thinning which is documented geophysically in Orphan Subbasin, accurate subsidence history curves for various parts of the basin could throw some light on the means by which the crust has been thinned.

Abundant new drilling and seismic data on the Nova Scotian shelf provides fundamental data on this passive margin. However, offshore no drilling exists to document the stratigraphy of the basin under the continental rise. Now seismic data indicates reflectors A and Beta

might be reached here. Are these the same as A and Beta to the South?

Recent geophysical studies of the Gulf of Mexico part of the eastern North American margin indicate that sediments of possible Jurassic age are in reach of the CHALLENGER drill string in the western Florida straits. These Jurassic beds are continuous over a wide area of the Gulf and probably are continuous with the Jurassic under Florida and into the western North Atlantic; these were probably accumulated in what was a continuous Tethyan seaway. Sampling this Jurassic will provide significant data on Tethyan reconstructions vital to the geologists studying the Gulf of Mexico, eastern North American, and European geology.

Moreover, the shallow sediments in the western Florida straits show indications of current erosion, which dates and gives evidence on the origin of the Florida Current and Gulf Stream circulation. Drilling here will document these Tertiary paleoenvironment changes at this important gateway to the Atlantic.



PROPOSED EASTERN NORTH AMERICA CHALLENGER DRILL SITES

DSDP/IPOD SITE PROPOSAL

SITE: ENA-1
POSITION: 28°20'N 75°22'W
GENERAL AREA: Blake-Bahama Basin

GENERAL OBJECTIVE: Oldest sediments

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Recover oldest ocean sediments and date oceanic basement in the magnetic quiet zone in the vicinity of the Blake Spur anomaly; calculate Middle Jurassic spreading rates for western North Atlantic quiet zone; penetrate completely the Jurassic sediments beneath Horizon C, thought to be equivalent to Horizon J_1, and possibly penetrate J_2.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: R/V CONRAD MC 89 0415Z 21 Oct 77 (NE to SW)
R/V CONRAD MC 89 1715Z 21 Oct 77 (N to S)
Other Data: R/V CONRAD MC 89 0445Z 22 Oct 77 (E to W)

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4900 Sediment Thickness (m): 1800 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): 1800 28

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-2
POSITION: 39°05'N 72°05'W
GENERAL AREA: Continental slope off New Jersey

GENERAL OBJECTIVE: Cretaceous/Tertiary Sediments

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Continuous coring of Late Cretaceous slope sediments where most of the Tertiary section is eroded away; determination of facies changes in Cretaceous units between COST B2 well and continental slope; determination of ages of Tertiary erosional hiatuses on the slope for possible correlation with Tertiary sea level changes. Collection of undisturbed HPC samples for good physical properties.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: U.S.G.S. Line 2 SP 1900 (W to SE)
U.S.G.S. Line 35 (NE to SW)
Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2070 Sediment Thickness (m): > 9000 Total Time on Site (days) 10

Single Bit -- Re-entry Total Penetration (m): 500

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-3
POSITION: 35°08'N 69°10'W
GENERAL AREA: Continental Rise off Delaware

GENERAL OBJECTIVE: Reflector J

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Continuous coring of pre-Beta stratigraphy to basement; sampling of reflector below Beta possibly equivalent to Horizon C or J_1; dating basement of magnetic anomaly M26; determine Jurassic paleoenvironment of Callovian-Oxfordian.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: R/V FAY-LEG 20 Line 6-20002, 27 July 76 (NE to SW)

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4870 Sediment Thickness (m): 1800 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 1800 28

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-4
POSITION: 37°32'N 67°42'W
GENERAL AREA: Continental Rise off Delaware

GENERAL OBJECTIVE:

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Continuous coring of the post-Beta stratigraphy to sample seismic Horizons A*, A^C, A^T; source-bed analysis on Cretaceous black shales at a new locality closer to continental shelf; determination of erosional hiatuses and possible correlations with sea level changes and paleo-oceanography.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: R/V FAY LEG 21-Line 2 2000Z 30 Aug 76 (NW to SE)
R/V FAY LEG 20-Line 4 1400Z 17 Aug 76 (NE to SW)
Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5000 Sediment Thickness (m): 2400 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 1800 ~ 28

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-5
POSITION: 30°54.0'N 76°52'm
GENERAL AREA: Continental Rise of Blake Outer Ridge

GENERAL OBJECTIVE: Erosional unconformity

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Determine the age and nature of the extensive erosional sculpturing on the upper Blake Outer Ridge, which appears to cut Cretaceous sediments and to be buried by Tertiary sediments, correlate erosion with sea-level changes and paleo-oceanography.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: R/V GILLIS 7903.5 Line 16

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2200 Sediment Thickness (m): > 8000 Total Time on Site (days) 10

Single Bit -- Re-entry Total Penetration (m): 500

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-6
POSITION: 30°20'N 75°20'W
GENERAL AREA: Blake Outer Ridge

GENERAL OBJECTIVE: Reflector X

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Sample Reflector X and the as yet unsampled sediments below this horizon; interpret early origins of the Blake Outer Ridge.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: R/V CONRAD MC 83 intersecting CONRAD MC2.

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4463 Sediment Thickness (m): ~ 3500 Total Time on Site (days) 28

Single Bit -- Re-entry Total Penetration (m): 1500

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-7
POSITION: 31°18'N 74°53'W
GENERAL AREA: Crest of Blake Outer Ridge

GENERAL OBJECTIVE: Pressure Core Barrel - Gas Hydrates

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Sample clathrate with pressure core barrel; conduct pressure and geochemical tests on sample; identify diagenetic products associated with clathrate.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: R/V CONRAD MC 87 2215Z 18 Oct 77

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3150 Sediment Thickness (m): ~ 5000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 400 4

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-8
POSITION: 41°03'N 48°48'W
GENERAL AREA: Newfoundland Ridge

GENERAL OBJECTIVE: Origin of Newfoundland Ridge

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Sample sediments down to and especially below Mid-Cretaceous unconformity (at approximately 500m) to determine geologic origin of the Newfoundland Ridge and provide data on the nature of the Early Mesozoic seaway between North America and Europe.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SEISCAN DELTA Line 117 (1972)

Other Data:

Site Survey Data: **Conducted by:**

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3225 **Sediment Thickness (m):** > 7000 **Total Time on Site (days)** 12

Single Bit -- Re-entry **Total Penetration (m):** 1000

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-9
POSITION: 49°52'N 45°47'W
GENERAL AREA: East Newfoundland Basin

GENERAL OBJECTIVE: History of Orphan Basin

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Continuous coring of Mesozoic and Cenozoic sediments on the southwest flank of Orphan Knoll to provide data on the Cretaceous and Tertiary subsidence history of the Orphan Basin and its relationship to Orphan Knoll. To establish facies and ages of regional seismic horizons and determine the magnitude of hiatuses within the section. To provide data on paleocirculation, climate and depositional environments relevant to the separation of this area from the continental shelf west of Ireland.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Imperial Oil 73-I13-70207 (1)

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3400 Sediment Thickness (m): 1800 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-10
POSITION: 49°59'N 45°52'30"W
GENERAL AREA: East Newfoundland Basin

GENERAL OBJECTIVE: History of Orphan Basin

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Continuous coring of Cenozoic, Mesozoic sediments and pre-Mesozoic basement (to a depth of 100 m) to provide data on the pre-Cretaceous subsidence history of the Orphan Basin and its relationship to Orphan Knoll. To determine age and facies of oldest sedimentary sequences mapped to provide data on initial foundering of Orphan Basin. To determine if Jurassic facies have affinities with western Europe or the southern Grand Banks and thereby establish paleogeographic relationships in pre-spreading times. To determine the nature of the pre-Mesozoic Basement and its relationship to the Hercynian front.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Imperial Oil 74-I13-70209 (1)

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2900 Sediment Thickness (m): 1400 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 1400

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-11
POSITION: 39°15'N 54°13'W
GENERAL AREA: Lower Scotian Continental Rise

GENERAL OBJECTIVE: Reflectors North of Kelvin Seamounts

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Continuous coring of sediment above basement. Identification of seismic Horizons A and Beta in the Scotian basin north of Kelvin seamounts. Penetration of basaltic basement just northwest of J-Anomaly ridge.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: R/V CONRAD MC 149 2030 8 July 78 (NE-SW)

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5200 Sediment Thickness (m): 1500 Total Time on Site (days) 28

Single Bit -- Re-entry Total Penetration (m): 1500

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-12
POSITION: 23°47'N 84°27'W
GENERAL AREA: Western Florida Straits

GENERAL OBJECTIVE: Oldest Gulf Sediments

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: To penetrate Lower Cretaceous and Upper Jurassic sediments which are traceable over entire Gulf of Mexico. Study of Tethyan continuations and paleogeography related to western Atlantic rifting.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: UTMSI lines GT3-69 and GT2-10

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3050 Sediment Thickness (m): 3000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 1500 28

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-13
POSITION: 23°51'N 84°07'W
GENERAL AREA: Western Florida Straits

GENERAL OBJECTIVE: Hiatuses

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Continuous coring of Tertiary and Cretaceous sediments. Study of age and cause of hiatuses related to the origins of the Florida Current and exchange of water from Gulf of Mexico to Atlantic.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: UTMSI line GT3-69

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2475 Sediment Thickness (m): 3500 Total Time on Site (days) 14

Single Bit -- Re-entry Total Penetration (m): 1000

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: ENA-14
POSITION: 23°55'N 85°10'W
GENERAL AREA: Catoche Knoll

GENERAL OBJECTIVE: Composition of Catoche Knoll

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Penetration of thin cover of sediment to recover basement of a debatable nature. Is this area underlain by rifted continental crust with basement as old as Paleozoic? Or is this area underlain by volcaniclastic rocks formed in oceanic rifting as young as Late Jurassic?

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profile F-168 ALIMINOS TA&M, UTMSI multichannel profile

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2820 Sediment Thickness (m): 100 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 100

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DRILLING OFF THE EUROPEAN MARGIN

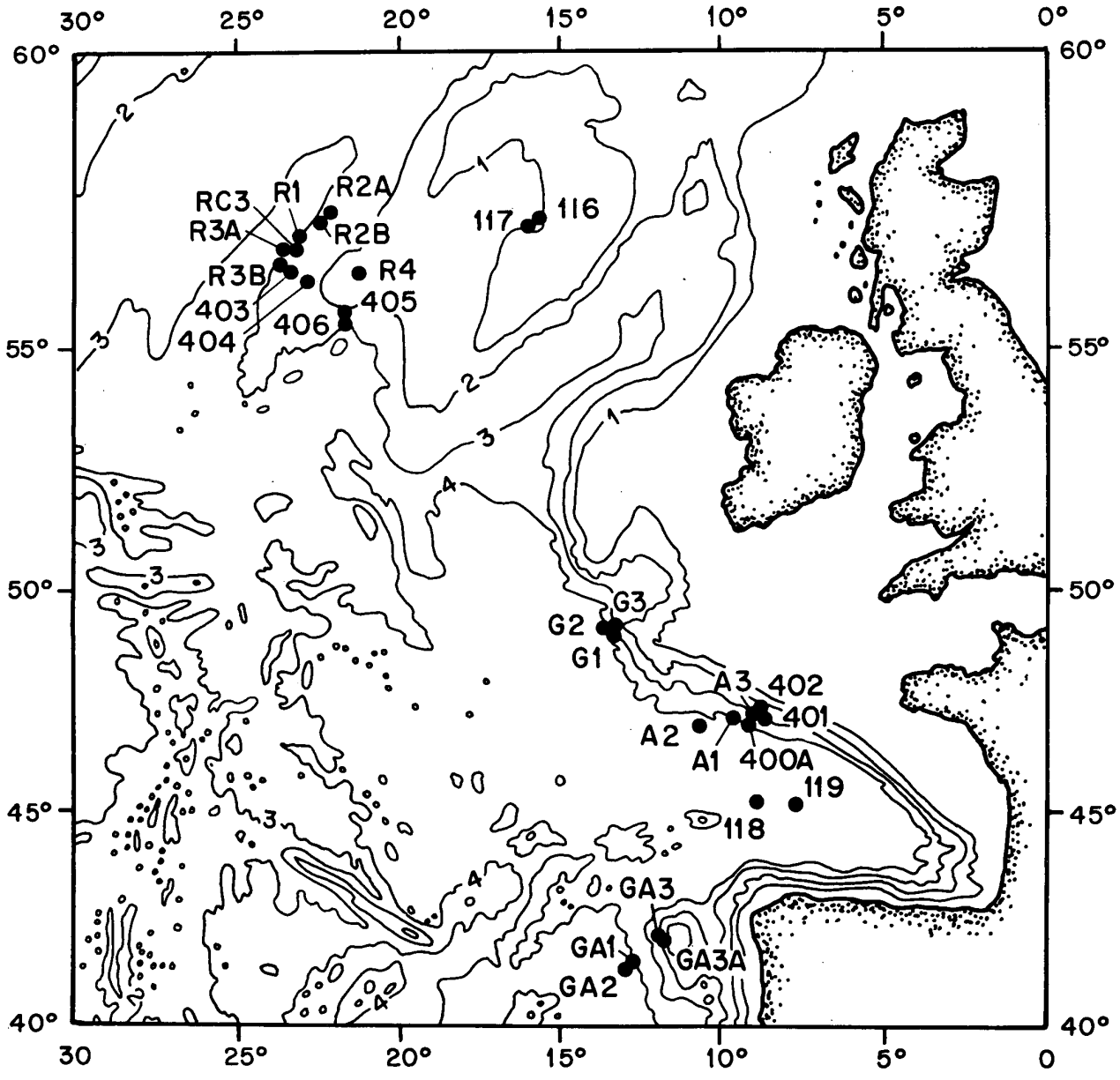
During 1976, one and a half legs of the IPOD phase of the Deep Sea Drilling Project were dedicated to drilling on the passive margins of the North East Atlantic. The drilling programme was designed to test hypotheses of passive margin evolution formulated by the Passive Margin Panel and to examine the structural and stratigraphic evolution of contrasting margin types. The results have been new and exciting, resolving some problems yet raising others. Testing, by drilling, the new model of passive margin evolution developed from these results offers an exciting and fundamental challenge.

On the basis of the drilling results and seismic data, starved margins can tentatively be classified into two types. One type is characterised by a series of tilted and rotated fault blocks whose polarity is consistently down towards the axis of the rift trough now marked by the continent-ocean boundary. Pre-rift sediments contained within the fault blocks are overlain by a thin cover of syn and post-rift sediments. Well documented examples include the Armorican margin of Biscay and the west margin of Iberia. The second type is not characterised by such features. Tilted and rotated fault blocks are apparently absent and the structure of the outer part of the margin consists of a broad high or horst locally overlain by a thick sequence of strong reflectors that appear to pass laterally into an oceanic crust clearly identified and characterised by oceanic magnetic anomalies. The west margin of Rockall Plateau and its conjugate off South East Greenland, Lofoten Basin and Outer Voring Plateau are good examples of this type which may also be present at other localities on passive margins.

The first type was possibly formed by rifting, without major volcanism, that led to the creation of a substantial submarine relief while the second was associated with volcanism and a large sub-aerial relief. Problems of fundamental importance in both cases include the duration and rate of subsidence during rifting for these bear on mechanisms of rifting and the further constraints provided by the nature of the basement and the crustal structure revealed by multichannel seismic data. The nature of the first oceanic crust and the continent-ocean boundary formed in both cases is not understood. Problems of the subsequent history of these margins that are of wider relevance to sedimentary basin development include the spatial variability of post-rift subsidence in relation to crustal attenuation, decoupling across the continent-ocean boundary and the validity of the age versus depth curves in describing the subsidence of the newly formed oceanic crust.

These problems which are outstanding and fundamental to earth science can be best approached with a reasonable chance of success by concentrating the drilling programme on the well documented transects off North West Europe. The 'end-member types' are well known in Biscay, Rockall Plateau, Galicia and an 'intermediate type'may be present on Goban Spur. The absence of a thick sediment cover in all these areas offers an ideal opportunity to address and test various aspects of the model thus deepening our understanding of passive margin structural development. We also wish to emphasise the importance of passive margin, and not least North East Atlantic margin, paleoenvironments as monitors of changes in the ocean paleoenvironment. Finally, the previous drilling has amply demonstrated that all sites proposed herein can be drilled with safety.

This proposal is therefore concerned with a drilling program that logically exploits the results of Legs 47B and 48 and associated geophysical studies and is likely to provide answers without recourse to deepholes requiring re-entry as of necessity.



R = ROCK; G = GOS; A = ARM; GA = GAL

THE ARMORICAN MARGIN OF THE BAY OF BISCAY

A. Outline Geology and Tectonic History

The northern of Armorican margin of the Bay of Biscay is characterised by a series of tilted and rotated fault blocks bounded by listric faults whose polarity is consistently down toward the ocean. The tilted and rotated blocks can be followed out to the continent-ocean boundary in water depths exceeding 4500m. Within these tilted blocks, dipping reflectors of variable acoustic aspect that locally rest on basement are present. The blocks are overlain by a thin sequence of Cretaceous and Tertiary sediments. Because of the absence of a thick sediment cover, syn and pre-rift sediments can be easily penetrated by drilling to relatively shallow depths.

During Leg 48, three holes (400A-402) were drilled in the Armorican margin of Biscay. The drilling was restricted in its scope because of the near total loss of the drill string at site 400A. Nonetheless, the results carry important implications for the evolution of passive margins. Results and conclusions of general interest are:

1. By the end of rifting and at the onset of spreading in Aptian time, a submarine relief of c. 2000m. had been created.

2. Completion of the transition from rifting to spreading is probably recorded by the rapid subsidence beginning in late Aptian time. Subsidence was probably initiated by cooling associated with the change in thermal regime and/or changes in crusted density and thickness consequent in the transition from rifting to spreading.

3. Palaeodepth data show that the accretion of first ocean crust probably took place in 2000 m. water depths. Present depth of the ocean crust adjacent to the margin is in agreement, with the depth of c. 5500m predicted from the age versus depth curve.

4. The greatest post-rift subsidence is observed on thinned crust situated adjacent to the continent-ocean boundary and the least at sites situated on thicker crust. Subsidence curves hint that the subsidence ended earlier at sites most distant from the continent-ocean boundary and on the thickest crust.

5. Subsidence took place by regional warping and tilting rather than renewed faulting.

6. The post Eocene stratigraphy has been largely shaped by changes in circulation and water chemistry revealed by prominent hiatuses, palaeotemperatures and changes in the deposition of biogenic silica and carbonate. These changes appear to have been rapid and are plausibly related to global oceanographic events.

7. 'Black shales' of Albian-Aptian age were laid down by turbidity currents in an open freely circulating basin. The organic carbon is oxidized and is of terrestrial origin.

B. Proposed Drilling Programme

The Armorican margin of the Bay of Biscay - the transition from rifting to spreading and a test of subsidence models of passive margin evolution.

The major problems of passive margin evolution that can be resolved by further drilling are listed below.

1. Nature of the environment of deposition of pre-rift and syn-rift sediments

The problem here is not simply to establish whether the basin was deep or shallow in the pre-rift period, though this is clearly important. We wish to establish the onset and rate of subsidence during rifting so that one can assess the roles of brittle fracture and ductile flow in crustal extension and attenuation during and before the rifting process. Sites to achieve this will be required in half-grabens exhibiting contemporaneous deposition.

2. Comparative subsidence histories

The results suggest that subsidence history of the continental crust may be a function of crustal thickness and distance from the continent-ocean boundary. Sites close to the continent-ocean boundary are considered to subside with the same constant as the ocean crust. We wish to compare the subsidence histories of the continent and ocean crusts on either side of the continent-ocean boundary. A site to achieve this would be seated on the oceanic crust adjacent to the continent. The site will also allow comparison of the subsidence history of this early oceanic crust with the age versus depth curves of the oceanic crust.

3. Margin palaeoenvironments

The results of the drilling show that the stratigraphic record of passive margins is an accurate record of vertical and horizontal changes in ocean circulation. Margins such as the Bay of Biscay offer an ideal opportunity to examine Tertiary changes in circulation and subsidence initiated in the Late Cretaceous. A hole in midwater depths not subject to solution is required to examine variations in SiO_2 production, the CCD and water temperatures during the Cenozoic. The sites may also contribute to Late Cretaceous oceanography although the site situated on the Aptian oceanic crust is expected to be more useful.

4. Nature of the pre-rift sediment

Sampling of the pre-rift sequence is not a prerequisite for the proposed drilling programme. However, a series of sites are proposed to sample, should time permit, the pre-rift sediments exposed on the sea bed or in thinly covered fault blocks. The results would contribute to our general understanding of the margin in a regional sense.

C. Site Survey Proposal

During July, 1979, a detailed study of the continent-ocean boundary will be made using seismic refraction (PUBS/OBS) and two ship multichannel seismic reflection techniques. The purpose of the programme is to document the variations in deep crustal structure associated with the transition from continent to ocean and to pinpoint the boundary or transition. The existing multichannel seismic coverage is already excellent but additional multichannel seismic lines will be occupied to document continent-ocean boundary sites in more detail.

DSDP/IPOD SITE PROPOSAL

SITE: ARM-1
POSITION: 47°22.90'N-9°11.90'W
GENERAL AREA: North Biscay margin

GENERAL OBJECTIVE: Rifting and subsidence of passive continental margins

PANEL INTEREST: Passive margin panel

OBJECTIVES: ARM-1 was drilled during leg 48 (site 400A) but abandoned prematurely at 773.5 m following loss of the drill string after penetrating deep water Aptian black shales (immature terrestrial organic matter). The objective of the hole is to penetrate syn-rift (Lower Cretaceous) and pre-rift sediments (Jurassic) and test models of attenuation and extension during rifting and geothermal models.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: 04 412 SP300 and tielines

Other Data: MCS, Magnetics, Gravity, Refraction

Site Survey Data: **Conducted by:** IFP-CNEXO-CEDM-IOS for leg 48 in 1975 and 76

Date: Summer 1979-MCS Survey by IFP: Refraction by
Main Results: IFP-IOS-CNEXO

See Initial Report Leg 48

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4399 **Sediment Thickness (m):** 1200 **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** 1200

Nature of Sediments Anticipated:

Weather Conditions: Summer, good
Jurisdiction: France
Other:

SCIENTIFIC REQUIREMENTS: **Staffing** **Special Analyses**

Shipboard: Palaeontology (Planktonic and Benthic forams, (nano)
Palaeomagnetism
Organic geochemistry

Shoreboard: Sedimentology
Organic geochemistry

Shorebased: Mineralogy
Geochemistry
Logging

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Montadert - Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: ARM-2
POSITION: 47°05'N 10°35'W
GENERAL AREA: North Biscay Margin

GENERAL OBJECTIVE: Rifting and subsidence of continental margins

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: To establish the subsidence history of the oceanic crust by comparison with that of the adjacent continent and the age versus depth curves inferred for the oceanic crust and the nature and environment of accretion of the first oceanic crust.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: OC 308 SP 2000 - 2270

Other Data: MCS, magnetics, gravity, refraction

Site Survey Data: Conducted by: IFP-CNEXO-CEPM-IOS-for leg 48

Date: Summer 1979. Complementary survey necessary MCS-refraction by IFP-IOS-CNEXO
Main Results:

See Initial Reports Leg 48

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4650 Sediment Thickness (m): 1500 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 4500 + basement

Nature of Sediments Anticipated:

Weather Conditions: Summer good
Jurisdiction: France
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Palaeontology (Planktonic and benthic forams and nannos) Sedimentology	Palaeomagnetism Organic geochemistry Logging
Shoreboard:	Organic geochemistry	
Shorebased:	Palaeontology-Palaeomagnetism Mineralogy - Geochemistry	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Montadert - Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: ARM-3
POSITION: 47°45'N 9°09'W
GENERAL AREA: North Biscay Margin

GENERAL OBJECTIVE: Rifting and subsidence of passive continental margins.

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Sample on the midslope a complete Tertiary and Late Cretaceous section to be compared with deep water section and to establish nature of fluctuations in SiO_2 production, CCD, water masses.

Establish subsidence curve in an area where continental crust has intermediate thickness.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: OC301 SP910

Other Data: MCS, magnetics, gravity, refraction

Site Survey Data: **Conducted by:** IFP-CNEXO-CEPM-IOS for leg 48

Date: Summer 1979 Complementary survey. MCS-refraction by IFP-IOS-CNEXO
Main Results:
See Initial Reports Leg 48

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3225 **Sediment Thickness (m):** 1000 **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** 1000

Nature of Sediments Anticipated: Upper Cretaceous to recent pelagic sediments

Weather Conditions: Summer good
Jurisdiction: France
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Palaeontology (Planktonic & benthic forams & nannos) Sedimentology	Palaeomagnetism Organic geochemistry Logging
Shoreboard:	Organic Geochemistry	
Shorebased:	Palaeontology - Palaeomagnetism Mineralogy - Geochemistry	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Montadert - Roberts			

THE MARGIN OFF GALICIA

A. Outline Geology and Tectonic History

During Leg 47B, site 398 situated to the south of Vigo Seamount, demonstrated that the rifting between Iberia and Galicia Bank occurred in a pre-existing marine basin and that syn-rift deposition occurred in a deep water marine environment. In this area, however, rifting was not followed by spreading. Indeed, the true margin of the continent is situated beneath the rise to the west of Galicia Bank. In this area, over a short distance between the elevated Galicia Bank and the adjoining abyssal plain, tilted blocks bounded by listric faults can be followed to their boundary with the highs of the oceanic crust. A deep seismic reflector observed beneath the tilted blocks is interpreted as the boundary between the ductile lower, and brittle upper parts of the continental crust.

To the east beneath the shallow banks, truncation of the tilted blocks is observed and has been interpreted as a syn-rift subaerial erosion surface of lower Cretaceous age. Towards the oceanic crust however, this erosion surface is no longer observed and implies that tilting of the blocks during rifting there occurred in deeper water. In this area, the margin has been extremely starved so that the blocks were not thickly covered by post-rift sediments, and thus lie just beneath or outcrop on the sea floor. The oceanic crust is also thinly sedimented and outcrops locally.

B. Proposed Drilling Programme

Galicia Bank-the continent-ocean boundary and the change in altitude before, during and after rifting.

The objective of the drilling programme is to document the continent-ocean boundary developed in a rifted epicontinental basin. This target may lie beyond the reach of the drill in Biscay. A series of holes on exposed or breached blocks in the west of Galicia are proposed to easily and safely sample syn-and pre-rift sediments, continental and oceanic basement at different palaeodepths both on and immediately adjacent to the oceanic crust.

C. Site Survey Proposal

Previous multichannel surveys by IFP-CNEXO and University of Paris VI show that basement structures are continuous and oriented North-South. Proposed site locations are based on multichannel seismic profiles GP11 and GP12. Complementary site surveys will be made by IFP-CEPM during Summer 1979, to document proposed sites in more detail.

DSDP/IPOD SITE PROPOSAL

SITE: GAL 1
POSITION: 42°05'N - 12°51'W
GENERAL AREA: Galicia Bank

GENERAL OBJECTIVE: Rifting and subsidence passive continental margins oceanic-continental crust transition

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: The objective is to establish the environment of accretion and the nature and age of first oceanic crust adjacent to the continent ocean boundary as well as the subsidence history.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: GP 12 MCS SP 1075

Other Data: MCS + magnetics (IFP-CEPM-CNEXO - University of PARIS VI)

Site Survey Data: Conducted by: IFP - (France): Already surveyed in 1975 before Leg 47 B

Date: Summer 1979: Complementary survey
Main Results: See Initial Reports of Leg 47B

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5244 Sediment Thickness (m): 300m Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 600m

Nature of Sediments Anticipated:

Weather Conditions: Summer - good
Jurisdiction: SPAIN
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Paleontology (Plank.Benth.Foram) Sedimentology Nanno	Paleomag. Org. Geochemistry Logging
Shoreboard:	Org. Geochemistry	
Shorebased:	Paleontology - Paleomag. Mineralogy - Geochemistry	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
L. Montadert			

DSDP/IPOD SITE PROPOSAL

SITE: GAL 1 A
POSITION: 42°05'N-13°07'W
GENERAL AREA: Galicia Bank

GENERAL OBJECTIVE: Rifting and subsidence of passive continental margins oceanic-continental crust transition

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: This site is on the oceanic crust adjacent to the continental crust. It is located about 17 km West of GAL 1 and could be drilled if results on GAL 1 still indicate existence of thin continental crust.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: GP 12 M C S SP 1475

Other Data: MCS + magnetics (IFP-CEPM-CNEXO - University of Paris VI)

Site Survey Data: Conducted by: IFP (France). Already surveyed in 1975 before Leg 47B
Date: Summer 1979 Complementary survey
Main Results: See Initial Reports of Leg 47 B.

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5265 Sediment Thickness (m): 600 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 600 m + basement

Nature of Sediments Anticipated: Pelagic cores - turbidites (?)

Weather Conditions: Summer-good
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Paleontology (Plank. Benth. Foram. Nanno) Sedimentology Organic Geochemistry	Paleomag. Org. Geochemistry Logging
Shoreboard:		
Shorebased:	Paleontology - Paleomag. Mineralogy - Geochemistry	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
L. Montadert			

DSDP/IPOD SITE PROPOSAL

SITE: GAL 2
POSITION: 42°19'N - 12°03'W
GENERAL AREA: Galicia Bank

GENERAL OBJECTIVE: Rifting and subsidence of Passive Continental margins
Oceanic-continental crust transition

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Nature, age, paleobathymetry of syn-rift and pre-rift sediments on a deeply subsided tilted block (almost the whole sequence is outcropping on the sea floor). Associated with GAL 2A.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: GP 11 MCS SP 1050

Other Data: MCS + magnetics (IFP-CEPM-CNEXO - University of PARIS VI)

Site Survey Data: Conducted by: IFP (France): already surveyed in 1975 before Leg 47 B
Date: Summer 1979: Complementary Survey
Main Results: See Initial Reports of Leg 47 B

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3670 Sediment Thickness (m): 1000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 1000

Nature of Sediments Anticipated:

Weather Conditions: Summer - good
Jurisdiction: SPAIN
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Paleontology (Plankt. and benth. Sedimentology Foram. Nanno) Org. Geochemistry	Paleomagn. Org. Geochemistry Logging
Shoreboard:		
Shorebased:	Paleotology - Paleomag. Mineralogy - Geochemistry	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
L. Montadert			

DSDP/IPOD SITE PROPOSAL

SITE: GAL 2 A
POSITION: 42°19'N - 12°01'W
GENERAL AREA: Galicia Bank

GENERAL OBJECTIVE: Rifting and subsidence of Passive continental margins
Oceanic-continental crust transition

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Nature, age, paleobathymetry of synrift and pre-rift sediments. Located on the same block tilted than GAL 2, but downward; this hole would allow to penetrate deeper sequences than GAL 2.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: MCS GP 11 SP 1000

Other Data: MCS - magnetics (IFP-CEPM-CNEXO- University of PARIS VI)

Site Survey Data: Conducted by: IFP (France). Already surveyed in 1975, before Leg 47 B
Date: Summer 1979; complementary MCS Survey
Main Results: See Initial Reports of Leg 47 B

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3000 Sediment Thickness (m): 1000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 1000

Nature of Sediments Anticipated:

Weather Conditions: Summer - good
Jurisdiction: SPAIN
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Paleontology (Plank. Benth. Foram. Nanno) Sedimentology Org. Geochemistry	Paleomag. Org. Geochemistry Logging
Shoreboard:		
Shorebased:	Paleontology - Paleomag. Mineralogy - Geochemistry	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
L. Montadert			

DSDP/IPOD SITE PROPOSAL

SITE: GAL 3
POSITION: 42°09'N - 11°46'W
GENERAL AREA: Galicia Bank

GENERAL OBJECTIVE: Rifting and subsidence of Passive continental margins
Oceanic-continental crust transition

PANEL INTEREST: Passive Margin Panel

OBJECTIVES:
Complement hole GAL 2 to establish age, nature, paleobathymetry of post-rifting sediments.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: MCS GP 11 SP 630

Other Data: MCS + magnetics (IFP-CEPM-CNEXO - University of PARIS VI)

Site Survey Data: Conducted by: IFP (France). Already surveyed in 1975 before Leg 47 B
Date: Summer 1979: complementary Survey
Main Results: See Initial Reports of Leg 47 B

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5200 Sediment Thickness (m): 300 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): 500

Nature of Sediments Anticipated:

Weather Conditions: Summer good
Jurisdiction: SPAIN
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Paleontology (Plankt. and benthic Sedimentology Foram. Nanno) Org. Geochemistry	Paleomagn. Org. Geochemistry Logging
Shoreboard:		
Shorebased:	Paleontology - Paleomagn. Mineralogy - Geochemistry	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
L. Montadert			

THE GOBAN SPUR

A. Outline Geology and Tectonic History

The Goban Spur comprises part of the margin of NW Europe between 50°N and 48°30'N. It lies north of and is contiguous with the northern or Armorican Margin of Biscay from which it exhibits significant topographic and geological differences.

The topography of the Goban Spur consists of a broad and smooth slope that dips gently westward to depths of 1500m where it abruptly steepens falling to depths of 4000 to 4500m. In contrast, the Armorican margin is characterised by a steeper slope cut by numerous canyons. The differences in morphology can be attributed to the different structure and structural history of the two regions.

Beneath a thin cover of Late Mesozoic and Tertiary pelagic sediments the main structure consists of a series of tilted and rotated fault blocks that trend NW-SE parallel to the steep slope and whose polarity is consistently down toward the ocean. Within the fault blocks. well developed dipping reflectors indicate a pre-rift sedimentary sequence underlain by locally outcropping basement that consists of granites of Late Hercynian aspect. In a regional sense, the Goban Spur lies on the prolongation of the Cornubian platform underlain by Late Hercynian granites. The platform is flanked to the north by the Celtic Sea Basin and to the south by the South-western Approaches Basin.

The continent-ocean boundary adjacent to the Goban Spur is clearly shwon by a sharp change in seismic character from the strongly diffracting oceanic basement to the sub-horizontal surface of a tilted fault block containing reflectors. The change in seismic character is often associated with a large fault as well as a prominent magnetic anomaly.

The crests of the fault blocks are typically horizontal indicating a well developed erosion surface. The surface is not confined to the upper slope but can be followed downslope to the continent-ocean boundary in marked contrast to the Armorican margin.

Analysis of the seismic stratigraphy of the Goban Spur suggests that the transition from rifting to spreading took place west of Goban Spur in Late Cretaceous time (cf. Aptian Bay of Biscay).

The margin west of the Goban Spur has a number of anomalous features.

1. The oceanic crust adjacent to the continent-ocean boundary lies between 4300 and 4500 m (after isostatic correction) and is thus anomalously shallow.

2. The erosion surface can be followed close to the continent-ocean boundary.

3. The continent-ocean boundary is clearly shown by a prominent normal fault and can be defined on seismic character to within 5 km.

B. Proposed Drilling Programme

The Goban Spur - an 'intermediate' type of passive margin - the transition between continental and oceanic crust.

The proposed drilling programme is a transect designed to sample the continent-ocean boundary of a margin that may be intermediate in type between the Bay of Biscay and Rockall Plateau. The oceanic crust adjacent to the continent-ocean boundary is shallow and there is evidence that fault blocks near the continent-ocean boundary have been subjected to subaerial erosion. The objectives of the transect are:

1. establish the environment of accretion, nature and age of the first oceanic crust as well as its subsidence history.

2. to penetrate pre-rift sediments and basement adjacent to the continent-ocean boundary to establish the environment of deposition. The site would also penetrate syn-rift sediments to determine the duration of rifting and the transition from rifting to spreading. The hole would also examine the role of uplift and the nature of the prominent erosion surface.

3. to penetrate syn- and post rift sediments in a midslope environment to establish the history of post-rift subsidence and with the rest of the transect, the change in subsidence history as a function of distance from the continent-ocean boundary.

C. Site Survey Proposal

A number of multichannel seismic traverses of the Goban Spur have been made by IOS and IFP-CEPM. Single channel seismic reflection profiles have been occupied by IOS and have also prepared structure maps of a number of key horizons. Additional crosslines acquired using multichannel seismic techniques will be occupied by IFP-CEPM during Summer 1979.

DSDP/IPOD SITE PROPOSAL

SITE: GOS-I
POSITION: 48°32'N 13°24'W
GENERAL AREA: Goban Spur, South Western

GENERAL OBJECTIVE: Oldest ocean crust adjacent to the continent-ocean boundary

PANEL INTEREST: PMP, OCP, OPP

OBJECTIVES: The objective is to establish the environment of accretion and the nature and age of first oceanic crust adjacent to the continent-ocean boundary as well as the subsidence history. The site would aim to sample as complete a Tertiary and Late Cretaceous section as possible.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SP 1350 IOS CM-11

Other Data: RRS DISCOVERY, CR 74 RRS SHACKLETON 3/76: Magnetics

Site Survey Data: Conducted by: IOS D.G. Roberts/L. Montadert
Complementary site survey by IFP planned for summer 1979
Date: 1977
Main Results: Summarised in Initial Report for Leg 48

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 37001 Sediment Thickness (m): c.800 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): c.800

Nature of Sediments Anticipated: Pelagic Cretaceous and Tertiary sediments

Weather Conditions: Good in June, July and August
Jurisdiction: Irish (?)
Other:

SCIENTIFIC REQUIREMENTS: Staffing

Shipboard: Igneous petrologist
Sedimentology
Palaeontology
Shoreboard:

Shorebased: Igneous geochemistry
Palynology

Special Analyses
Logging
Palaeomagnetic

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D.G. Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: GOS-II
POSITION: 48°55'N 13°28'W
GENERAL AREA: Goban Spur, South Western Approaches

GENERAL OBJECTIVE: Subsidence history-nat[illegible] of syn and post rift sediments, basement

PANEL INTEREST: PMP OPP

OBJECTIVES: The objective of this mid-slope hole is to sample a completed but breached section of and post rift sediments resting on an erosion surface. The purpose is to establish the subsidence history of the mid-slope and the significance of the erosion surface that can be followed close to the continent-ocean boundary.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SP 1510 IOS CM-10

Other Data: RRS DISCOVERY CRUISE 74, RRS SHACKLETON 3/76: Magnetics

Site Survey Data: Conducted by: IOS

Date: 1977

Main Results: Complementary survey by IFP, scheduled for summer 1979

Summarised in Initial Report for Leg 48

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m): c. 600 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): c. 600 _____

Nature of Sediments Anticipated: Pelagic Mesozoic Cretaceous and Tertiary on basement

Weather Conditions: Good in June, July, and August
Jurisdiction: Irish (?)
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Igneous Petrologist Sedimentology Palaeontology	Logging Palaeomagnetic
Shoreboard:		
Shorebased:	Igneous Geochemistry Palynology	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D. G. Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: GOS-III
POSITION: 49°05'N 13°03'W
GENERAL AREA: Goban Spur, South Western Approaches

GENERAL OBJECTIVE: Continent-ocean boundary subsidence history

PANEL INTEREST: PMP OPP

OBJECTIVES: The site is located on an eroded fault block adjacent to the continent-ocean boundary. The purpose of the site is to establish the nature of the erosion surface and the subsidence history of the site adjacent to the continental-ocean boundary for comparison with sites situated on oceanic crust and in the mid-slope. It is also intended to establish the nature of the underlying basement.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SP 2230 IOS CM-10

Other Data: RRS DISCOVERY CR.74, RRS SHACKLETON 3/76: Magnetics

Site Survey Data: Conducted by: IOS
Complementary site survey scheduled for summer 1979 by IFP
Date: 1977
Main Results: Summarised in Initial Report for Leg 48

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m): c.1000 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): c.1000 _____

Nature of Sediments Anticipated: Pelagic Mesozoic and Tertiary on basement

Weather Conditions: Good in June, July and August
Jurisdiction: Irish (?)
Other:

SCIENTIFIC REQUIREMENTS:	Staffing	Special Analyses
Shipboard:	Igneous petrologist Sedimentology Palaeontology	Logging Palaeomagnetic
Shoreboard:		
Shorebased:	Igneous geochemistry (?) Palynology	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D. G. Roberts			

THE SOUTH WESTERN ROCKALL PLATEAU

A. Outline Geology and Tectonic History

The Rockall Plateau is an extensive shallow topographically isolated area west of the British Isles that is the only major microcontinent known in the North Atlantic. Its margins were formed as a result of the successive rifting and spreading phases that opened the North Atlantic of which the earliest shaped the Rockall Trough by rifting and spreading in Early to Late Cretaceous time. The western margins of Rockall Plateau, subject of this proposal and of the Leg 48 drilling, were shaped during the later episodes outlined below.

In brief, the west margin of the Rockall Plateau consists of a series of poorly defined shelf-like features and a continental slope that extends over a depth range of 1000-3000m. Major changes in the trend and morphology of the margin at 55°30'N are a consequence of the different rifting/spreading episodes. North of this latitude, the NW-SE margin closely parallels the oldest, 52my, anomaly recorded in the adjacent ocean crust to the south, the margin is rectilinear in plan. The oceanic magnetic anomalies are truncated against the east-west slope and young westward. The truncated anomalies suggest the east-west may have been a fracture zone active between 76 and 52my, in contrast to the adjacent rifted margin.

The west margin was formed by two phases of rifting and spreading. The first phase structured the rectilinear by rifting followed by spreading and transform faulting between 76 and 52my. The second phase structured the NW-SE margin by rifting which was at least partly contemporaneous with the spreading to the south and was followed by spreading between Greenland and Rockall that began at about 52my.

Seismic profiles across the rifted and transform margins show radical differences in structure and style. On the NW-SE margin, a thick sequence of strong reflectors prograde oceanward. One reflector within this sequence can be followed onto the ocean crust where it is underlain by a discontinuous suite of reflectors. No clear continent-ocean boundary can be seen although a basement ridge, locally flat-topped but often of subdued relief may be present. In contrast, seismic profiles across the transform fault scarp show a large change in basement depth of c. 6 km along the continent-ocean boundary. Sites proposed for Leg 48 were situated on the rifted and transform margins.

During Leg 48 four holes (403-406) were drilled on the west margin of the Rockall Plateau. Two holes (116 and 117) had been previously drilled during Leg XII. The drilling was of limited success since key reflectors could not be reached at two sites due to mechanical problems and poor weather (403/404). Nonetheless, the results met many key objectives and carry important implications. These results have been fully documented and their implications explored in the Initial Report for Leg 48.

Results and conclusions of general interest are:-

1. That the principal relief along continental margins transform offsets was probably created during the transition from rifting to spreading, and possibly also during the phase of active transcurrent motion along the transform. Vertical decoupling

did not take place after separation of the offset trailing edges of the continent.

2. Rifting between Greenland and Rockall created a substantial sub-aerial relief of c.1400m and syn-rift beds were deposited in depths of 0-600m. The prominent flat-topped shoal or high along the continent-ocean boundary was probably sub-aerial.

3. The reflector merging with the oceanic basement reflection arises from an Early Eocene tuff which was deposited towards the end of the reversed polarity interval preceding anomaly - 24 and contemporaneous with accretion of first ocean crust.

4. Transition from rifting to spreading may have taken between 2 and 3.2my and resulted in the formation of a sinuous split possibly associated with local migration of the spreading axis. The first accretion of ocean crust may be recorded by the eruptive phase in NP10 time that is of regional importance in view of its occurrence in the North Sea.

5. Completion of the transition from rifting to spreading is probably recorded by the rapid subsidence beginning in anomaly 24 time. Absence of an appreciable change in sedimentation rate suggests that the subsidence was initiated by cooling associated with the change in thermal regime and or changes in crustal thickness and density consequent on the transition from rifting to spreading.

6. Paleodepth data from paleontological and seismic studies indicates accretion of first ocean crust in depths of 850 metres or less. The basement high at the continent-ocean boundary may have been in shallow depths or even locally subaerial. Contemporaneous sedimentation rates were high and at least 71m/my.

7. 'Layered structure' of the oceanic basement is most easily attributed to inter bedding of lava flows and sediments.

8. Present depth of the oceanic crust adjacent to the margin is c.3200m and is thus substantially shallower than the depth of 5500m predicted from the age versus depth relationship for ocean basins.

9. The greatest post-rift subsidence is observed at sites 403/404 adjacent to the continent-ocean boundary and situated on substantially thinned crust and the least at site 117 on the thickest crust of Rockall Bank and furthest from the youngest continent-ocean boundary. Subsidence curves suggest that the subsidence ended earlier at sites situated most distant from the continent-ocean boundary and on the thickest crust.

10. Subsidence took place by regional warping and tilting rather than by renewed faulting.

11. The post-Eocene stratigraphy has been largely shaped by changes in circulation and waterchemistry revealed both by prominent hiatuses and radical increases in deposition of biogenic silica.

B. Proposed Drilling Programs

The western '52my' margin of Rockall Plateau - a type example of a shallow rifted basin margin.

The proposed drilling programme is a transect designed to sample and calibrate the transition from oceanic to continental crust across a margin formed initially by rifting in a subaerial/shallow water marine environment. The main thrust of the programme is to compare the subsidence history of the oceanic and continental parts of the margin in relation to rifting and spreading. Sites have been chosen to provide maximum information on the nature of the first oceanic crust and the changing Tertiary palaeoenvironment of the North Atlantic. Results from the proposed holes when added to previous geophysical surveys will improve our understanding of the evolution of this type of margin. A particular advantage is that only limited penetration is required at all sites.

C. Site Survey Proposal

Extensive and detailed surveys of the south west Rockall Plateau using multichannel seismic techniques have been made by IOS and IFP-CEPM. Additional single channel seismic surveys previously made by NAVOCEANO, LDGO and IOS give a fairly comprehensive seismic coverage of the south west margin. Detailed shipborne magnetic surveys are available from NAVOCEANO.

Additional multichannel seismic profiles are planned for August 1979 to further document the proposed sites.

DSDP/IPOD SITE PROPOSAL

SITE: ROCK-1
POSITION: 56°57'N 22°50'W
GENERAL AREA: SW Rockall Plateau

GENERAL OBJECTIVE: Continent-ocean boundar nature of oldest oceanic crust

PANEL INTEREST: Passive Margin Panel
Ocean Crust Panel

OBJECTIVES: To establish the environment of accretion of first oceanic crust of anomaly-24 age by penetrating through basement into the underlying sequence of discontinuous reflectors below. Site will aim to establish subsidence history of the oldest ocean crust adjacent to the continent and nature of deep reflectors in oceanic basement. Comparison will provide a quantitative assessment of the value of age versus depth curves for new oceanic crust. The site is likely to yield a more complete Eocene to Early Miocene section and is comparable to sites in the Lofoten Basin.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SP2250 on CEPM line RH116

Other Data: Multichannel seismic IFP-CEPM Rockall-Hatton; IOS/IPOD
Single channel seismic: IOS, LGO, Navoceano: Magnetics

Site Survey Data: Conducted by: IFP/IOS - contact D. G. Roberts/L. Montadert

Date: 1975-76
Main Results: Summarised in Initial Report for Leg 48

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3000 **Sediment Thickness (m):** 600 **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** 500-600

Nature of Sediments Anticipated: Pelagic oozes and volcanoclastics

Weather Conditions: Good in June, July
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Igneous petrologist Sedimentology	Palaeomagnetic Logging
Shoreboard:	Palaeontology (benthic foram nanno)	
Shorebased:	Igneous geochemistry Palynology Silicoflagellates	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D. G. Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: ROCK-IIA
POSITION: 57°39'N 21°51'W
GENERAL AREA: West Rockall Plateau

GENERAL OBJECTIVE: Outer high/continent-ocean boundary

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Site Rock IIA is situated on the prominent basement ridge that lies adjacent to the oldest oceanic crust. Site objective to establish the altitude of the high both during rifting and following the transition from rifting to spreading. It is also intended to penetrate and establish the nature of the underlying basement. Knowledge of the nature and role of this feature may be directly relevant to understanding similar highs observed along other continent-ocean boundaries.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SO 2340 on GSl Linel (single channel)
Other Data: RRS DISCOVERY CRUISE 29, Vema Cruise 30, IFP-CEPM. Rockall-Hatton (Multichannel) Magnetics; Single channel seismic lines by IOS, LGO, Navoceano
Site Survey Data: **Conducted by:** IFP/IOS
Date: 1969-1976. Various see above. Complementary survey tentatively scheduled for summer 1979.
Main Results: Summarised in Leg 48 Initial Report

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2600 **Sediment Thickness (m):** 2-300 **Total Time on Site (days)**
Single Bit -- Re-entry **Total Penetration (m):** 2-300

Nature of Sediments Anticipated: Pelagic Neogene sediments on volcanoclastic Palaeogene
Weather Conditions: Metamorphic basement?
Jurisdiction: Good in June, July
Other: International

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Igneous petrologist Palaeontology (benthic foram)_ (Nanno)	Palaeomagnetic Logging
Shoreboard:	Igneous geochemistry	
Shorebased:	Palynology Silicoflagellates	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D. G. Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: ROCK-IIB
POSITION: 56°53'N 22°30'W
GENERAL AREA: West Rockall Plateau

GENERAL OBJECTIVE: Outer High-Continent-Ocean Boundary

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: Site Rock IIB is situated on the prominent basement ridge that lies adjacent to the oldest oceanic crust. Site objective is to establish the altitude of the high during rifting and following the transition from rifting to spreading. It is also intended to penetrate and establish the nature of the underlying basement. Knowledge of the role and nature of this feature may be directly relevant to understanding similar highs observed along other continent-ocean boundaries.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SP 2700 on CEPM RH 116 (Multichannel)

Other Data: IPOD 76-7; GSI 1, 3; (Multichannel and single channel), Magnetics, Single channel seismic lines by IOS, LGO, Navoceano

Site Survey Data: **Conducted by:** IFP 110S

Date: 1969-1976 Complementary survey starting summer 1979
Main Results:
Summarised in Leg 48 Initial Report

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2600 **Sediment Thickness (m):** 300 **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** 300

Nature of Sediments Anticipated: Neogene pelagic sediments on volcanoclastic Palaeogene

Weather Conditions: Metamorphic Basement?
Jurisdiction: Good in June, July
Other: International

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Igneous petrologist Palaeontology (Benthic foram) (Nanno)	Palaeomagnetic Logging
Shoreboard:	Sedimentology	
Shorebased:	Igneous geochemistry? Palynology, Silicoflagellates	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D. G. Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: ROCK-IIIA
POSITION: 56°03'N 23°14'W
GENERAL AREA: S.W. Rockall Plateau

GENERAL OBJECTIVE: Pre-rift and syn-rift sediments. Subsidence of passive margins.

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: The proposed site is intended to penetrate the relatively condensed sequence of syn-rift sediments along the inner edge of the basin adjacent to the continent-ocean boundary. Specific objectives include an assessment of changes in basin depth and geometry during rifting with especial reference to the problem of sub aerial uplift of the basin margins. A more complete Eocene to Early Miocene section would precisely establish the form of the subsidence curve and enable a comparison of the subsidence history of sites situated on continental and oceanic crust.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: SP 15450 IOS/IPOD 76.3 76.4

Other Data: Multichannel seismic surveys (IFP-CEPM Rockall-Hatton, IOS/IPOD, Magnetics. Single channel seismic lines by IOS, Naveceano, LGO

Site Survey Data: **Conducted by:** IOS/IFP D. G. Roberts/L. Montadert

Date: 1976

Main Results: Summarised in Initial Report for Leg 48
Complementary survey tentatively scheduled for summer 1979

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 3000 **Sediment Thickness (m):** 300 (min) **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** min 300

Nature of Sediments Anticipated: Neogene pelagic sediments: Palaeogene volcanoclastics

Weather Conditions: Good in June, July
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Igneous petrologist Palaeontology (Benthic foram, nanno)	Palaeomagnetic Logging
Shoreboard:		
Shorebased:	Igneous geochemistry Palynology Silicoflagellates	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D. G. Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: ROCK-IIIB
POSITION: 56°10'N 23°28'W
GENERAL AREA: S.W. Rockall Plateau

GENERAL OBJECTIVE: Pre-rift and syn-rift sediments. Subsidence of passive margins

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: The proposed site is intended to penetrate the relatively condensed sequence of syn-rift sediments along the inner edge of the basin adjacent to the continent-ocean boundary. Specific objectives include an assessment of changes in basin depth and geometry during rifting with especial reference to the problem of sub aerial uplift of the basin margins. A more complete Eocene to Early Miocene section would precisely establish the form of the subsidence curve and enable a comparison of the subsidence history of sites situated on continental and oceanic crust.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SP 15800 Line IPOD 76-8

Other Data: Multichannel seismic surveys: IFP-CEPM Rockall-Hatton IOS/IPOD 7
Single channel lines: Kane 10, Vema 27, 30, Conrad 9.

Site Survey Data: **Conducted by:** IOS D. G. Roberts

Date: 1976
Main Results: Summarised in Initial Report for Leg 48. Complementary site survey tentatively scheduled for summer 1979.

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2300 **Sediment Thickness (m):** 800 **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** 800

Nature of Sediments Anticipated: Neogene pelagic sediments

Weather Conditions: Good in June, July
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Igneous petrologist Palaeontology (Benthic foram) (Nanno)	Logging Palaeomagnetics
Shoreboard:	Igneous geochemistry	
Shorebased:	Palynology Silicoflagellates	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D. G. Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: ROCK-IIIC
POSITION: 56°51'N 22°29'W
GENERAL AREA: SW Rockall Plateau

GENERAL OBJECTIVE: Pre-rift and syn-rift sediments. Subsidence of passive margins.

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: The proposed site is intended to penetrate the relatively condensed sequence of syn-rift sediments along the inner edge of the basin adjacent to the continent-ocean boundary. Specific objectives include an assessment of changes in basin depth and geometry during rifting with especial reference to the problem of sub aerial uplift of the basin margins. A more complete Eocene to Early Miocene section would precisely establish the form of the subsidence curve and enable a comparison of the subsidence history of sites situated on continental and oceanic crust.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SP 2850 CEPM RH 116

Other Data: Multichannel seismic: IFP-CEPM Rockall-Hatton IOS/IPOD 76
Single Channel seismic: IOS, LGO, Navoceano; Magnetics
Site Survey Data: Conducted by: IOS-IFP, D. G. Roberts/L. Montadert

Date: 1976
Main Results: Summarised in Initial Report Leg 48
Complementary survey tentatively scheduled for summer 1979

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2400 **Sediment Thickness (m):** 500 **Total Time on Site (days)**
Single Bit -- Re-entry **Total Penetration (m):** approx 500

Nature of Sediments Anticipated: Neogene

Weather Conditions: Good in June July
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS:

	Staffing	Special Analyses
Shipboard:	Igneous petrologist Palaeontology (Benthic foram) (Nanno)	Logging Palaeomagnetics
Shoreboard:		
Shorebased:	Igneous geochemistry Palynology Silicoflagellates	

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D.G. Roberts			

DSDP/IPOD SITE PROPOSAL

SITE: ROCK-IV
POSITION: 56°31'N 20°49'W
GENERAL AREA: Western & Hatton-Rockall Basin/Hatton Bank

GENERAL OBJECTIVE: Subsidence history of thicker rifted continental crust

PANEL INTEREST: Passive Margin Panel OPP

OBJECTIVES: The objective of the site is to test the hypothesis that subsidence of passive margins decreases with increasing distance from the continent-ocean boundary as the crust thickens. The site is therefore, positioned in shallow water on the col between Hatton Bank and Edcras Bank where a complete sedimentary section is present. This elevated site is expected to be valuable for palaeoenvironmental studies of the Neogene and the changing palaeoenvironments that ensue from the subsidence.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: SP 11800 IOS/IPOD 76-9C tielines Vema 29 and Vema 30

Other Data: Magnetics

Site Survey Data: Conducted by: IOS

Date: 1976
Main Results: Summarised in Roberts (1975) and Initial Report Leg 48

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1350 Sediment Thickness (m): c.800 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): c.800

Nature of Sediments Anticipated: Pelagic Neogene Palaeogene clastic in lower part, possible igneous basement or volcanoclastics

Weather Conditions: Good in June, July
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing

Shipboard: Igneous petrologist, Sedimentology

Shoreboard: Palaeontologist (Benthic foram Nanno)

Shorebased: Igneous geochemistry, Palynology, Silicoflagellates

Special Analyses: Logging, Palaemagnetism

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
D. G. Roberts			

SUBSIDENCE HISTORY, SHAPING, AND SEDIMENTARY PROCESSES AT THE NW AFRICAN PASSIVE CONTINENTAL MARGIN

BACKGROUND

The Northwest African margin can serve as an excellent model for a mature, passive continental margin which is as varied, but generally less buried, as its symmetrical counterpart off NE America. Geophysically and geologically, this is one of the best studied passive margins of the world. It includes evaporitic rift basins, thick Mesozoic-Cenozoic progradational wedges including major hiatuses (off Mauretania and Southern Morocco), carbonate buildups followed by starved sedimentation (e.g. Mazagan Plateau), and - near the Azores-Gibraltar Fracture Zone - even a convergent setting which is influenced by the Eurasian-African plate boundary.

The results of 12 years of Deep-Sea Drilling (Legs 2, 3, 14, 41, 47A, 50) show that the Northwest African margin provides an excellent model to test and document various models of fundamental passive margin problems by drilling. Unfortunately, most of the existing 17 DSDP holes off NW Africa experienced only spot coring, particularly in the Cenozoic sections. Thus the addition and redrilling of only a few supplementary, continuously cored multipurpose sites which have been carefully selected in this proposal, offer the unique opportunity to provide answers for many important open questions concerning structural, sedimentary and paleoenvironmental passive margin objectives. We propose to attack these problems by concentrating on transects with a few new or redrilled holes between the Azores-Gibraltar Fracture Zone (135 R off SW Portugal) and Cape Verde (MAU 1/4). Redrilling some earlier sites which have essentially remained uncored (135 R, MAU 5/140) or drilling in the close vicinity of such sites, provides a number of advantages:

(1) optimum predictability of stratigraphy and required station time;

(2) maximum gain of information per ship time;

(3) lack of safety risk (mid-Cretaceous black shales already penetrated before).

All the proposed sites are shallow to intermediate (200-1200 m) non-reentry sites. Recent multichannel seismic pre-site surveys by the BGR have also helped to propose a few very deep reentry sites (especially MOR-4 off central Morocco), which are not included in this proposal, since they have to await GLOMAR EXPLORER-type drilling.

OBJECTIVES

By drilling the proposed sites off Northwest Africa the following structural and margin paleoenvironment problems should be addressed which include some fundamental objectives, as formulated by the JOIDES Passive Margin Panel:

1. Formation of a continent-ocean boundary

150-160 m.y. old oceanic crust near the ocean-continent boundary can be reached in Site 135 R in a passive margin setting near a convergent/transform plate boundary. Cambrian granitic basement underlies the Mazagan Plateau (MAZ 1/2); it is possibly overlain by younger Paleozoic sediments and/or crystalline rocks; true oceanic basement is present only 40 km seaward of Site MAZ-1. The mutual coupling of oceanic and continental crust can be studied at these sites.

2. Paleobathymetry and subsidence of the continental margin, especially during the early stages of rifting and drifting

The time and space relationship and the driving forces of subsidence during the rifting and early drifting stages can be studied in the proposed Sites 135 R (on oceanic crust) and MAZ 1 and 2 (continental crust, probably overlain by Paleozoic to early Mesozoic pre-drift sediments). The Mazagan sites should also allow the quantitative deduction of the subsidence history, since well datable Jurassic (? perireefal) carbonates were deposited at high sedimentation rates close to sea level, before they subsided. In fact, the Mazagan Escarpment is one of the very few places in the Atlantic Ocean, where the Jurassic paleoenvironment of rifting and the early subsidence history of the proto-Atlantic Ocean can be easily studied by Glomar Challenger-type drilling. Possibly, the granitic basement is overlain by late Paleozoic to Triassic "syn-rift" to early post-rift clastic and restricted (evaporitic or carbonaceous) sediments. Following an early to middle Jurassic transgression the carbonate-buildup commenced. The formation of the early Jurassic (?) evaporites in the proto-Atlantic is an important unsolved problem, and clues, whether they formed according to a shallow- or deep-basin model, are badly needed. It is an unique opportunity that such a sequence, which has never before been drilled, is here in easy reach of the bit of the "Glomar Challenger".

3. Stratigraphy and depositional development of carbonate buildups

The Mazagan sites allow the study of the stratigraphy, depositional environment, evolution, and diagenetic history of the thick perireefal carbonate platforms so typical of the tropical to subtropical belts of the Mesozoic Atlantic Ocean. The results should also yield important comparisons with the evolution of Blake Plateau at the conjugate NE American margin.

4. Shaping of the steep Mazagan Escarpment

The Mazagan sites could also explain the origin of the spectacular, 3 km high Mazagan Escarpment which can serve as a

model for similar features around the present North Atlantic. The experiment of the proposed Sites MAZ 1 and 2 should help to prove, whether vertical tectonics, rotational slumping along listric faults, erosional processes, or non-deposition after carbonate buildup have been responsible for the shaping of such escarpments.

5. Cretaceous history of oceanic gradients between surface, intermediate, and bottom-water masses (e.g. black shale event)

The detailed history of the development of these water masses which impinge on the Northwest African continental margin can be derived from their geochemical, sedimentological, and paleontological effects on the margin sediments. The Neocomian paleoenvironment (Wealden-type delta, etc.) and the mid-Cretaceous black shale events, can be identified in a continent-near facies in candidate sites 135-R and MAU-1. Both sites form an ideal N-S transect together with the existing Sites 369, 397 and 367. Site MAU-1 is also expected to lie above the CCD for a large part of the time under discussion, possibly also at the Cretaceous-Tertiary boundary.

6. Cenozoic history of paleoclimate, circulation and sedimentation, characteristic of an eastern subtropical continental margin

Together with the existing Sites 368, 369, and 397, Sites MAU-1, 4, and 5, as well as Site 135 R can help to limit the regional and stratigraphic extent of continental upwelling and to reveal N-S gradients and the history of Tethyan - Atlantic seaways in low latitudes (especially 135-R). Further important objectives are to delineate and synthesize the dimension and cause of the conspicuous Oligocene contour current event (influence of AABW?) and to quantify its large-scale erosion and related mass wasting which have led to a spectacular oversteepening and backcutting of the Northwest African continental margin. Also the impact of the late Miocene Messinian event on the Atlantic sediments should be well documented in Site 135-R (detailed history of CCD fluctuations, development of eastern boundary current, upwelling, fertility, etc.).

7. Correlation of seismic stratigraphy with hiatuses and gravity-driven overthrusts

The strongly needed correlation of oceanic seismic reflectors with the temporal and spatial distribution of hiatuses and the complex transgression-regression history of the continental slope, shelf, and adjacent coastal basins can be best established at the proposed Site MAU-1. This site lies in a proximal position to the continent and is expected to contain rather undisturbed, datable carbonate-rich sediments, especially in the latest Cretaceous-Paleogene section. This site would ideally bridge the gap between the well-known oceanic and continental stratigraphic record.

Parts of the Northwest African continental margin were deformed during alpine orogenesis (e.g. Sites MOR 1-3 off central Morocco).

The adjacent coastal basins are filled by transgressive and regressive sequences because of the response between plate movements, vertical tectonics and global sea level changes.

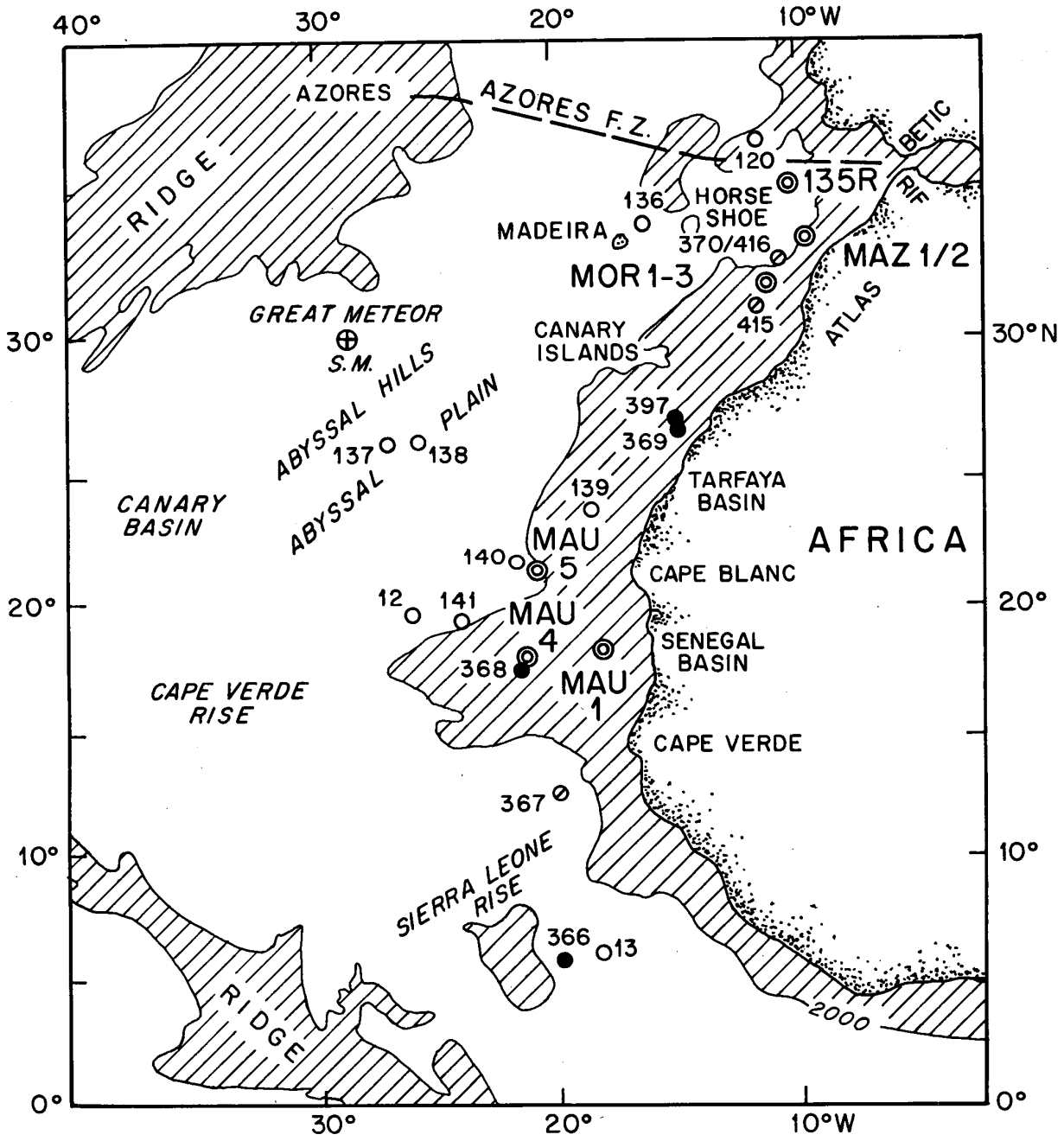
The continental margin off central Morocco is well known because of its dramatic, seismically detected downslope mass movements whose nature and age can only be resolved by further drilling (MOR 1-3). The complex seismic structures off central Morocco might be due to gravity sliding (overthrusts) and/or salt tectonics.

8. Origin and climatic-oceanographic significance of giant Neogene sand bodies or lenses along the continental rise (history of the Saharan desert)

The formation, diagenetic history, and physical properties of Neogene mega-sand bodies at the upper continental rise off West Africa can be studied by the proposed Sites MAU-4 and 5. These sites also serve as an important experiment for the model of eolian-sand turbidites expected from the Saharan desert during climatic phases of extreme continental aridity, offland paleowinds, and lowered sea level. Together with the record from eolomarine dust deposits, we expect from the sand lenses a detailed story of the cyclic climatic history and the lateral gradients of continental climate as well as of the position of the paleowind systems (history of desertification of NW Africa, etc.)

9. Diagenesis of continental margin sediments

The diagenetic evolution of clayey, siliceous, and carbonate sediments, as influenced by time, temperature, burial depth (high sedimentation rates, upwelling, fertility, etc.) and the chemical environment, can be studied in all proposed sites. An important objective for the evaluation of the hydrocarbon potential of outer passive margins in general is the provenance, dispersal, stability, and maturation of organic matter and the formation of clathrates (135-R, MAU-1, MAU-4, MAU-5; especially HPC data). The results from these sites can be compared with those from black shales in the Angola Basin and Walvis Ridge at the SW African margin and with deep-sea occurrences.



LOCATION OF ALL EXISTING DSDP/IPOD SITES AND PROPOSED DRILLING SITES (LEG 79)

- O ESSENTIALLY UNCORED OLDER DSDP SITES
- ⊘ DSDP/IPOD SITES WITH SPOT-CORED AND ± CONTINUOUSLY CORED
- ● MESOZOIC ± CONTINUOUSLY CORED DSDP/IPOD SITES
- ◎ CANDIDATE SITES OF THIS PROPOSAL

DSDP/IPOD SITE PROPOSAL

SITE: MAU-1
POSITION: 17°55.0'W, 18°13.8'N
GENERAL AREA: Lower continental slope off Senegal

GENERAL OBJECTIVE: Rise-slope transect (wit 368); dating of seismic stratigraphy; mid-Cretaceous events, Paleogene/Cretaceous paleoenvironment.
PANEL INTEREST: PMP, OPP, OGP, Prior.1 of Mesoz WG(SCP)

OBJECTIVES: (1) Sample lower slope equivalents of organic-rich black shales which further north are eroded or buried too deeply (here uplifted 2600 m in Paleogene). Comparison with deep-sea and coastal basin black shales: seismic profiles indicate facies change from basinal shales (367, 368) to more sandy carbonaceous sediments under the slopes.
(2) Geostrophic paleocirculation during mid-Tertiary uplift.
(3) Neogene paleoenvironment and climatic history of Saharan desert as represented by eolian dust supply and eolomarine turbidites. Distal facies of deep-sea super fan off Tioulit-Canyon.

BACKGROUND INFORMATION: Reports of BGR deep-water study group on NW African Margin

Regional Data:
Seismic Profiles: (BGR 1975 (VALDIVIA 10-84, single-trace)
(BGR 1978 (EXPLORA 048 , 48-channel)
(BGR 1979 (VALDIVIA-79 , 24-channel)
Other Data: (WHOI 1973 (ATLANTIS II-109, single-trace)
(IFP-CEPM 1978 (OA-209 , 48-channel)

Site MAU-1 on intersection of 3 multichannel lines:
VA 79/31 (SP 980)
VA 79/33 (SP 920)
EXPLORA 78/48 (SP 7560)

Site Survey Data: Conducted by: Bundesanstalt für Geowissenschaften u. Rohstoffe (BGR), Hannover
Date:
Main Results: Basement intrusion uplifts Jurassic to Neogene sediments. Mesozoic sediments and modified oceanic crust are here 2-4 km shallower than usual.

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2680 HPC Sediment Thickness (m): 2700 - 3000 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): to Cenom. 800m 6-8d (incl. HPC)

Nature of Sediments Anticipated: Neogene oozes and marls, Paleogene turbidites mid to late Cretaceous black shales (marls) and calcareous oozes (marls)
Weather Conditions: Fair throughout year
Jurisdiction: International (site is 103 n.miles = 191 km off coastline of Mauretania)
Other:

SCIENTIFIC REQUIREMENTS:

Staffing	Special Analyses
Shipboard: Paleontologists, Sedimentologists	Interstitial water chemistry
Shoreboard: Organic Geochemist	HPC in upper 200 m
Shorebased:	Logging, Gas-chromatography etc.

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
G. Wissman, K. Hinz, M. Sarnthein			

DSDP/IPOD SITE PROPOSAL

SITE: MAU-4
POSITION: 18°4.5'N 21°1.5'W
GENERAL AREA: Cape Verde Rise

GENERAL OBJECTIVE: Cenozoic paleoceanography
Sahara paleoclimate

PANEL INTEREST: OPP, PMP

OBJECTIVES: MAU-4 would obtain a complete Cenozoic section complementary to the closely neighbored Site 368, at which the Neogene essentially was not cored. Unlike 368, carbonate sedimentation is expected to reach also in the Paleogene at MAU-4, because of an unlayered transparent reflection type at this position below the Oligocene silty clay unit. MAU-4 might provide information on a)the history of bottom and surface water stratification in response to the gradual closure of the Tethyan gataways, b) the climatic history of NW-Africa, from the Saharan dust supply, c) the nature, origin and diagenesis of large sand lenses expected from the seismograph, which possibly are eolian-sand turbidites.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Meteor-25 line (single channel), OR 114 multichannel 48 traces,
Other Data: Valdivia 10-II (single trace), Glomar Challenger XXXXI

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3050 Sediment Thickness (m): 2000 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): 600 4-5 days

Nature of Sediments Anticipated: 265 m Nanno ooze and marl, 340 m of calcareous silty clay

Weather Conditions: Good
Jurisdiction: 130 sm off Cape Verde Isles (Guinea-Bissau)
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: Paleontologists, sedimentologists

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
M. Sarnthein K. Hinz, G. Wissmann			

DSDP/IPOD SITE PROPOSAL

SITE: MAU-5
POSITION: 21°20'N 20°45'W
GENERAL AREA: Outer Rise W of Cape Blanc

GENERAL OBJECTIVE: Neogene mega sand lenses and upwelling history

PANEL INTEREST: PMP, OPP, SPP

OBJECTIVES: MAU-5 is located right off the center of the Sahara desert. The shallow sand lenses provide in this hole an excellent opportunity to study the development of potential hydrocarbon reservoir rocks at the continental rise. The sequence of sand lenses also serves as an experiment to prove the mode of eolian sand turbidites off NW-Africa indicating strong continental aridity and offland winds coupled with low sea lev l. Eolo-marine dust and biogenic opal deposits can help to establish the history of dust-carrying wind system and upwelling at a crucial position. MAU-5 almost redrills Site 140 which essentially was not cored during Leg 14 drilling.

BACKGROUND INFORMATION:
Regional Data: See Initial Reports DSDP, Vol. 14 (1972)
Seismic Profiles: VEMA-32-05 (Feb. 7, 1975, 22:50) - Alternative positions: VA-79-28 (24-channel), SP 1420 (20°4'N, 18°53'W)
Other Data: VEMA-23 Lines, GLOMAR CHALLENGER (Site 140, Leg 14)

Site Survey Data: Conducted by: L-DGO, BGR

Date: 2/1975, 10/1979
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3960 HPC Sediment Thickness (m): 1500 - 2000 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): 200 2-3 (only HPC)

Nature of Sediments Anticipated: Neogene ± Siliceous calcareous oozes with interbedded (?eolomarine) turbidites
Weather Conditions: Fair through out year
Jurisdiction: International (400 km off Cape Blanc/South Morocco)
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: Sedimentologists, Paleontologists
Shoreboard:
Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
M. Sarnthein, G. Wissmann E. Seibold			

DSDP/IPOD SITE PROPOSAL

SITE: MOR-1
POSITION: 31°56.66'N/10°48.25'W
GENERAL AREA: Continental margin off Morocco

GENERAL OBJECTIVE: Evolution of the continental margin off Morocco

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: 1. To investigate the nature of widespread complex seismic structures off Morocco which before drilling Site 415 have been interpreted as salt domes. New multichannel seismic reflection data indicate that the majority of the complex seismic structures may represent gravity-driven overthrusts.

2. To investigate the time of deformation.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: M 46-09/05/06/11/14

Other Data: Gravity, Magnetics
DSDP site 415, 416

Site Survey Data: Conducted by: METEOR-cruise No. 46, chief scientist: Dr. K. Hinz, BGR, Hannover

Date: October/November 1977
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2950 Sediment Thickness (m): > 3000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): max. 600

Nature of Sediments Anticipated: 300 m of middle/upper Miocene to Quaternary sediments, below reflector RED Cretaceous shales and deltaic sandstones and/or evaporites

Weather Conditions: March-November, Good
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: MOR-2
POSITION: 32°02.26'N/10°41.37'W
GENERAL AREA: Continental margin off Morocco

GENERAL OBJECTIVE: Evolution of the continental margin off Morocco

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: 1. To investigate the nature of widespread complex seismic structures off Morocco which before drilling Site 415 have been interpreted as salt structures. New multichannel seismic reflection data indicate that the majority of the complex seismic structures may represent gravity-driven overthrusts.

2. To investigate the time of deformation.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: M-46-04/90/11/14

Other Data: Gravity, Magnetics
DSDP-site 415 + 416

Site Survey Data: **Conducted by:** METEOR-cruise No. 46, chief scientist: Dr. K. Hinz, BGR, Hannover

Date: October/November 1977
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2750 **Sediment Thickness (m):** >3000 **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** Max. 800

Nature of Sediments Anticipated: 500 m of Cenozoic sediment, below reflector RED (base Tertiary) Cretaceous shales, deltaic sandstones and/or evaporites

Weather Conditions: March to November, good
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: MOR-3
POSITION: 32°00.5'N/10°08.64'W
GENERAL AREA: Continental margin off Morocco

GENERAL OBJECTIVE: Evolution of the continental margin off Morocco

PANEL INTEREST: Passive Margin Panel

OBJECTIVES:

To investigate the nature of widespread complex seismic structures off Morocco.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: M 46-18, M 46-03/04/17/19/14

Other Data: Magnetics, Gravity

Site Survey Data: Conducted by: METEOR-cruise No. 46, chief scientist: Dr. K. Hinz, BGR, Hannover

Date: October/November 1977
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1200 Sediment Thickness (m): 2000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): max. 800

Nature of Sediments Anticipated: 400 m Cenozoic-Cretaceous sediments, below reflector BLUE evaporites and/or allochthonous Cretaceous shales, deltaic sandstones
Weather Conditions: March to November, good
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

MAZAGAN PLATEAU AND ESCARPMENT

Mazagan Plateau

Mazagan Plateau is the submerged part of a continuous Jurassic to Early Cretaceous carbonate front which can be identified on offshore seismic records between 33°N and Cape Juby near 28°N.

The Mazagan Escarpment is one of the few places in the North Atlantic, where the pre-Cretaceous history and paleoenvironment of the Atlantic Ocean and the development of its eastern passive margin can be directly sampled. Important reflectors crop out at the extremely steep, approximately 3 km high escarpment which has been sampled by Lamont-Doherty Geological Observatory during "Vema" cruise 30 in 1973. The most important result of this survey was the discovery of shallow-water algal limestones with a rich middle Oxfordian ammonite fauna in dredge V30-RD 38 at a water depth of 3300-3150 m (RENZ et al. 1975). During the V-30 (1973) and Valdivia-79 (1979) cruises granite fragments were recovered from a small hill at the base of the escarpment.

In the search for further clues about the evolution of the Mazagan Plateau, R.V. "Meteor" visited the area in 1977 and R. V. "Valdivia" in 1979, in order to take additional dredges and collect new seismic data.

A review of all published information and the new Meteor 46 and Valdivia 79 data allow the following tentative outline of the structure and stratigraphy of the Mazagan Plateau (see WISSMANN & von RAD, 1979):

Basement

In the Doukkala Basin southeast of the Mazagan Plateau Paleozoic sediments which were slightly folded during the Hercynian orogenesis are 2-3 km below sea level and truncated by an early Permian "rift-onset unconformity". About 50 km west of the foot of Mazagan Escarpment, oceanic crust lies at a depth of 8-9 km below sea level. Granite (K/Ar age: 520 m.y.) was cored and dredged at the foot of the escarpment. Therefore, we infer that under the outer Mazagan Plateau continental basement subsided by flexuring and down-faulting to at least 4 km below sea level. Hence the Mazagan Plateau is part of the stable Moroccan Meseta and the place of initial separation of the rifted North American and African continents was west of the present escarpment.

Early-rift sediments

About 700 m of early-rift sediments overly oceanic crust seaward of the Mazagan Plateau. These sediments were mobilized into complex seismic structures and salt diapirs near the foot of the escarpment. In the Doukkala Basin up to 3 km of terrestrial and evaporite sediments fill out Hercynian synclinal structures and Triassic fault troughs. Updoming of pre-middle Cretaceous sediments might indicate the presence of evaporites also under the plateau.

Jurassic Early Cretaceous carbonate buildup

Under the Doukkala Basin, a mid-Jurassic "breakup unconformity" can be observed which is covered by Oxfordian to Neocomian transgressive sediments. At that time algal "reefs" flourished at a coastline which was near the present Mazagan Escarpment. A shallow high-energy carbonate shelf was covered by a calcareous sand, rich in reworked detritus of algal material, benthonic foraminifers and mollusks (M 46 and V 30 dredges). These 2-3 km thick sediments suggest a subtidal perireefal environment, a water depth of a few tens of meters, and temperate, normally saline water conditions. During Jurassic times, the subsidence rates of the basement, amounted to about 60-80 m/m.y.; they decreased considerably during the Early Cretaceous. In general, seismic evidence suggests that carbonate buildup on Mazagan Plateau persisted until Cenomanian times; new bioherms continued to grow until Senonian times further shoreward (Fig. 1) above a marked Cenomanian unconformity. However, seaward of these bioherms - i.e., along the present Mazagan Escarpment - hemipelagic quartzose radiolarian nanno marls were deposited at middle Aptian to lower Albian times. They reflect an outer sublittoral to upper bathyal environment (?outer shelf).

Late Cretaceous-Tertiary pelagic sedimentation

Due to global transgressions and reduced sedimentation rates during Cenomanian to Turonian times, the Mazagan Plateau - except for the mentioned lower Late Cretaceous bioherms - gradually subsided to greater water depths. The shelf edge shifted about 60 km landward during the past 100 m.y. Only a few hundred meters of latest Cretaceous to Eocene hemipelagic outer shelf to upper slope sediments cover the carbonate platform at the rim of the Mazagan Plateau which has yielded early to middle Eocene glauconitic marls and clastics (Figs. 4 A). For the first time a Paleogene unconformity (coinciding with a global regression?) was seismically detected and dated by correlation of the land geology, with shelf outcrops, and the Eocene V30 core. Following the Eocene transgression, phosphorite-rich sediments were deposited in the Doukkala Basin. Similar glauconitic and phosphoritic rocks crop out on the Central Moroccan shelf. An accentuated sea level fall during the Oligocene resulted in a renewed truncation of the Moroccan shelf and Mazagan Plateau. Only up to 300 m of hemipelagic slope sediments of Miocene to Quaternary age, encompassing also a Quarternary unconformity, overly the Oligocene unconformity under the Mazagan Plateau, whereas Paleogene to Mesozoic rocks are exposed on large parts of the adjacent shelf. Thus non-deposition and erosion prevailed on the shelf and backcutting and slumping along the continental slope during Cenozoic times, whereas the depocenter shifted to the continental rise.

The proposed drilling sites MAZ-1 and 2 form a transect with MAZ-1 emphasizing the Jurassic carbonate buildup and the underlying basement, and MAZ-2 stressing the plate Paleozoic to early Mesozoic pre-drift to early-drift environment and tectonics. Both sites have mostly sediments in a non-terrigenous (starved) setting well above the CCD and will help to solve a number of very important passive margin objectives, which can only be drilled by "Glomar Challenger" in this area (see also Site Proposal Sheets).

DSDP/IPOD SITE PROPOSAL

SITE: MAZ-1
POSITION: 33°35.5'N 9°25.5'W
GENERAL AREA: Mazagan Escarpment (lower part)

GENERAL OBJECTIVE: Jurassic carbonate buildup, Paleoenvir. and subsidence history during early drift, continental crust

PANEL INTEREST: PMP, OPP, SCP (Mesozoic WG)

OBJECTIVES: Non-terrigenous (starved) setting (total section above CCD)
1) Stratigraphy and depositional development of Jurassic perireefal carbonate buildup; 2) Shaping of steep escarpment of a carbonate bank;
3) Quantitative paleobathymetry, subsidence history, and paleoenvironment of the low-latitudinal continental margin during the stage of early drifting.
4) Paleolatitudinal reports of BGR offshore deep-water study group on the NW African margin location with Tethyan faunas for eco. & envir. studies.
5) Transect for changes of horiz. & vert. oceanogr. gradients in time.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Meteor 46-31

Other Data: VA 79-02 (SP 1720, w.d. 2625) and bathymetric, multichannel + high resolution seismic profiles of Meteor 53 (II/1980), esp. for spud-in position.
Site Survey Data: **Conducted by:** BGR & L-DGO (+ insight into commercial profiles from SHELL and GSI)
Date: M8/1967, V30/1973, M46/1977, Valdivia 1979.
Main Results: See HINZ, 1979 (unpublished cruise report VA 79 and Wissmann & von RAD, 1979 (Meteor Forsch. Erg., C31:1-20).

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3375 **Sediment Thickness (m):** 950 **Total Time on Site (days)**
Single Bit -- Re-entry **Total Penetration (m):** 960 10

Nature of Sediments Anticipated: 200m Quat. + slumped CK.-Tert. 750m middle-late Jur. shallow-water carbonates + possibly Tri. (& older) pre-drift sed's.
Weather Conditions:
Jurisdiction: 10m E. Paleozoic granite permission or an invitation from the Kingdom of Morocco necessary, since MAZ 1 is in their claimed economic zone.
Other:

SCIENTIFIC REQUIREMENTS: **Staffing** **Special Analyses**

Shipboard: Sedimentologists (carbonate and clastics) No HPC!
Paleontologists (Mesozoic, ? Paleozoic)
Shoreboard: Hard-rock petrologist

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
Hinz, v. Rad, Wissmann			

DSDP/IPOD SITE PROPOSAL

SITE: MAZ-2
POSITION: 33°44.4'N 9°24.5'W
GENERAL AREA: near foot of Mazagan Escarpment

GENERAL OBJECTIVE: (1) Pre-rift, rift, early drift paleoenvironment (late Paleozoic-mid Jurassic). - (2) Shaping of carbonate bank escarpments. (3) Coupling of cont. and oceanic crust.
PANEL INTEREST: PMP (OPP, SCP, OCP)

OBJECTIVES:

(1) Shaping of steep escarpments of carbonate banks (tectonics, rotational slumping, or erosion/non-deposition).

(2) Quantitative paleobathymetry, subsidence history, and paleoenvironment of the cont. margin during the stages of rifting and early drifting (? late Paleozoic-Triassic-Jurassic): ?Evaporites, ?pre-drift terrigenous sediments, mid-Jurassic global transgression and initiation of carbonate buildup.

(3) Age, composition and formation of continental crust near continent-ocean boundary (coupling of oceanic-cont. crust)

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: See MAZ-1 VALDIVIA 79/02 (24-channel), SP 1650

Other Data: See MAZ-1

Site Survey Data: Conducted by: See MAZ-1

Date:

Main Results: See MAZ-1

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 3525 Sediment Thickness (m): 800 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 810 8 (no HPC!)

Nature of Sediments Anticipated: ? 300 m late Jurassic-Tertiary sediments 500 m ? Paleozoic - mid-Jurassic early-rift sed (? slumped) 10 m continental basement (?granite)

Weather Conditions:

Jurisdiction: see MAZ-1

Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard: See MAZ -1

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. Hinz, U. v. Rad, G. Wissmann			

NORWEGIAN SEA

DRILLING IN THE NORWEGIAN SEA - A SUMMARY

A sequence of strong seaward dipping reflectors exists on the western part of the Voring Plateau which is characterized by NE-trending magnetic anomalies interpreted as anomalies 23-24. This stratified sequence underlies basalt, 49-53 Mya old (Initial Reports of the Deep Sea Drilling Project, XXXVIII, 1976) and overlies a "real" basement of unknown nature and age. A similar sequence of strong seaward dipping reflectors has been observed in the deep Lofoten Basin and, via new BGR multi-channel seismic lines (obtained in 1979), also seaward of the Faeroe-Shetland escarpment beneath a shallow strong acoustic reflector originally interpreted as the top of oceanic layer 2.

The nature and age of this widespread layered sequence and the "real" basement is unknown. The layered sequence locally appears to either pass into oceanic crust or terminate against basement highs that downlap on a smooth basement.

Some investigators believe that this widely spread sequence of strong seaward dipping reflectors represents pre- and syn-rift sediments deposited in pre- and syn-rift grabens whereas others think that pyroclastic material intermingled with terrigeneous sediments and lava flows, contemporaneous with the initiation of sea floor spreading cause this stratified seismic pattern.

In 1976 a program was proposed to drill the Norwegian continental margin (enclosed proposals NOR-3 - NOR-5) during Leg 49 with the following objectives:

- to determine origin, nature and age of the widely spread layered sequence and of the underlying basement which possibly was created at the time of the initiation of spreading;
- to determine the origin of the magnetic anomalies interpreted as anomalies 23-24;
- to study the mechanisms and environment at the initiation of spreading.

After safety review in March, 1976 (NOR-3 and NOR-5 were accepted with a few modifications) the whole Leg 49 had to be cancelled due to the following message received from the Norwegian Petroleum Directorate:

> "It is the decision of the Norwegian Petroleum Directorate that, providing satisfactory information and assurance as to the question of responsibility in the event of an accident resulting from drilling operations, are received, permission to drill the following of the proposed holes will be given:

Site 49-1 now NOR-3 - Voring

Site 49-3 now NOR-5 - Lofoten Basin

Site 49-4 now NOR-6 - Jan Mayen Ridge."

DSDP could not take responsibility for an accident, so the holes were not drilled.

Since the above mentioned scientific fundamental problems are not solved we recommend Sites NOR-1 and NOR-2 as alternative sites and additional drilling on the Jan Mayen Ridge, Site NOR-6. A new site proposal for the Voring Plateau which considers the new geophysical data of R/V CONRAD is in preparation.

DSDP/IPOD SITE PROPOSAL

SITE: NOR-1
POSITION: 63°36'N/01°33.8'W
GENERAL AREA: Norwegian Sea

GENERAL OBJECTIVE: Processes and environment at the initiation of spreading, continent-ocean boundary.

PANEL INTEREST: PMP, OCP

OBJECTIVES: Origin, nature, and age of the layered sequence (sub-basement reflectors): mechanisms and environment at the initiation of spreading

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: BGR-79-01 SP 4050

Other Data: Lamont Doherty Geological Observatory, IFP-CEPM

Site Survey Data: Conducted by: BGR

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2577 Sediment Thickness (m): 670 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 980

Nature of Sediments Anticipated: Terrigeneous sediments, pelagic oozes, flood basalts, pyroclastic sediments
Weather Conditions: Good in June-September
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing / Special Analyses

Shipboard: Igneous petrology, Sedimentology
Shoreboard: Paleontology, Organic Geochemistry
Shorebased:

Special Analyses: Logging, Paleomagnetics

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. Hinz			

DSDP/IPOD SITE PROPOSAL

SITE: NOR-2
POSITION: 63°24'N/00°56.5'W
GENERAL AREA: Norwegian Sea

GENERAL OBJECTIVE: Continent-ocean boundary, outer high

PANEL INTEREST: Passive Margin Panel

OBJECTIVES: NOR-2 is located on a prominent basement high which lies adjacent to a zone of "sub-basement reflectors".

Objective of the site is to establish the nature and age of the "real" basement and of the series of basement highs observed along the Norwegian continental margin.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: BGR-79-01 SP 3350

Other Data: LDGO, IFP-CEPM

Site Survey Data: Conducted by: BGR

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2038 Sediment Thickness (m): 570 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 780

Nature of Sediments Anticipated: Terrigeneous sediments, pelagic oozes, basalts, metamorphic basement?
Weather Conditions: Good June-September
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing

Shipboard: Igneous petrology
Sedimentology
Shoreboard: Paleontology
Organic Geochemistry
Shorebased:

Special Analyses

Paleomagnetics
Logging

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. Hinz			

DSDP/IPOD SITE PROPOSAL

SITE: NOR-3 (previously 49-1)
POSITION: 67°11'N/02°59'E
GENERAL AREA: Outer Voring Plateau offshore the cost of Norway of the Voring Plateau Escarpment

GENERAL OBJECTIVE: Nature and early rifting history of Voring Plateau

PANEL INTEREST: PMP

OBJECTIVES: The Voring Plateau is divided by the Voring Plateau Escarpment in an outer and an inner part. The Outer Voring Plateau is characterized by NE-SW striking magnetic anomalies and by a flat lying acoustic reflector which is interpreted as the top of igneous oceanic crust created at the initial stage of rifting.

New multichannel reflection seismic records show below the shallow acoustic reflector, originally interpreted as basement and from which DSDP holes (338, 342) drilled basalt, stratified layering. It is desired to determine the nature and age of these layers and underlying

BACKGROUND INFORMATION: (see next page

Regional Data:

Seismic Profiles:

Other Data:

Site Survey Data: **Conducted by:**

Date:

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 1275 **Sediment Thickness (m):** ca.800-1000 **Total Time on Site (days)**

Single Bit -- Re-entry **Total Penetration (m):** ∿ 850-1050 14

Nature of Sediments Anticipated: 400 m - 500 m are terrigeneous sediments, calcareous oozes, clays, muds, 50-100 m flood basalts and pyroclastic sediments? Sediments of unknown nature and age, real basement.

Weather Conditions:

Jurisdiction:

Other:

SCIENTIFIC REQUIREMENTS: **Staffing** **Special Analyses**

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. Hinz, L. Montadert			

NOR-3 OBJECTIVES (Continued):

acoustic basement. Major objectives are:

(1) history of a rifted passive margin
(2) origin and nature of basement probably created at the time of initiation of spreading
(3) determination in what ways these basalts differ from basalts created under steady state spreading conditions at the present mid-ocean ridge crest
(4) recovery of oldest sediments
(5) vertical tectonics
(6) glacial history
(7) Neogene-paleoenvironment section

DSDP/IPOD SITE PROPOSAL

SITE: NOR-5 (previously 49-3)
POSITION: 68°53'N-08°56'E
GENERAL AREA: Seaward of the Lofoten Islands beyond the base of the continental slope

GENERAL OBJECTIVE: Continent-Ocean transition

PANEL INTEREST: PMP

OBJECTIVES: The top of probably continental crust can be followed by reflection seismic from the shelf over the relatively steep slope to the deep sea where it suddenly disappears near an escarpment which probably is a continuation of the Voring Plateau Escarpment. Seaward of the escarpment there is a zone with a strong reflection horizon interpreted as top of basalt and seaward dipping acoustic reflectors below. The magnetic anomalies within this zone are related to seafloor spreading. It is desired to determine the nature and age of these layers.

(continued next page)

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: PR-4, SP 3400

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3060 Sediment Thickness (m): 1080 Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m): 1280 14

Nature of Sediments Anticipated: 1100 m are probably terrigenous sediments, calcareous oozes, clays, muds, 200 m are probably semiconsolidated/consolidated sediments, pyroclastic sediments, basalts

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. Hinz, L. Montadert			

NOR-5 OBJECTIVES (Continued):

Major objectives are:

(1) Transition from continental to oceanic crust at a narrow rifted passive margin

(2) Nature and origin of crust created at the time of initiation of spreading

(3) Nature and age of the deep seaward dipping reflectors

(4) Complete record of glacial and interglacial events

(5) High latitude Cenozoic paleoenvironment section

DSDP/IPOD SITE PROPOSAL

SITE: NOR-6 (previously 4904)
POSITION: 69°08'N - 08°05'W
GENERAL AREA: Jan Mayen ridge (northern part)

GENERAL OBJECTIVE: Pre-drift sediments

PANEL INTEREST: PMP

OBJECTIVES: To locate pre-drift sedimentary evidence. Several studies have suggested Jan Mayen Ridge is a continental fragment, however continental nature can only be conclusively proved by drilling into continental basement or finding of pre-drift sedimentary sequences similar to those on East Greenland. None of the seismic data have demonstrated an acoustic basement within reach of drilling. However, drilling on Leg 38 was able to penetrate to Eocene sediments. On the basis of new multichannel data a hole in a slightly different location can be drilled to reach deeper horizons at shallow depths. The Jan Mayen Ridge is best example of the hypothesis (continued next page)

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Multichannel seismics by IFP - CEPM - CNEXO (France)

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 900 Sediment Thickness (m): 1000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 1020

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

NOR-6 OBJECTIVES (Continued):

that isolated continental fragments can be split off by a shifting of the ridge axis. Two multichannel surveys will be utilized to pin-point optimum position.

Major objectives are:

(1) Recovery of pre-drift sediments

(2) Data can be used for subsidence histories in conjunction with existing JOIDES holes

(3) Vertical tectonics and rifting of continental margins.

A thick sequence of sediments above an acoustic basement is truncated by an horizontal erosion surface, and covered by about 80-100 m of pelagic mud. Offset holes could give a complete section of the sedimentary column.

SOUTH ATLANTIC PROGRAM

At the time of this supplemental JOIDES Journal preparation the "South Atlantic" sites had already been grouped into Legs 73-75. The sites to be drilled on these Legs and their objectives are outlined in the following section.

LEG 73

MID-ATLANTIC RIDGE TRAVERSE

SITE SA-IV, 1 thru 3

Objectives

These sites constitute a cluster of sites designed to solve the mystery of Mid-Tertiary CCD crisis, which was noted during early phases of Atlantic and Indian Oceans drilling. Since the M. Miocene stratigraphy records from the Atlantic are very incomplete because of the dramatic elevation (some 2000m) of CC during this critical epoch, the sites occupying crustal positions at times of anomaly 5 (SA IV-1, 10 m.y.); anomaly 5a (SA IV-2, 14 m.y.); and anomaly 5c (SA IV-3, 17m.y.) -- should yield calcareous sequences of basal Tortonian, Serravallian, and Langhian (and possibly uppermost Burdigalian) ages. Drill data should also solve the controversy if there had been a slowdown or brief interruption of spreading in the Atlantic and Indian Oceans.

SITE SA-IV, 4 thru 7

Objectives

These sites constitute a cluster designed to understand a major paleo-oceanographic revolution which took place probably in Oligocene. It has been suggested that the change occurred as a consequence of the start of Antarctic glaciation and that a thermal stress replaced halogenic stress as the major driving force of oceanic circulation (e.g. Berger). The sites are positioned over anomalies 13+ (Site IV-4, 36m.y.); 18 (Site IV-5, 42m.y.); 20 (Site IV-6, 46m.y.); 21 (Site IV-7, 50m.y.). This cluster is the link between anomaly 5 holes and Angola Basin holes. It is indispensable for the completion of the traverse of South Atlantic at about 30°S.

SITE SA-III-2

Objectives

This is a companion site to SA-I-2 and is positioned on a Maastrichtian (or latest Campanian) isochron (near anomaly 32). Drilling here is expected to penetrate latest Cretaceous and early Paleogene biogenic sediments which are rarely preserved in other parts of Atlantic because of raised CCD during those times. Samples might yield critical information on environmental changes at the end of Mesozoic. Furthermore, cores obtained here complemented by those at other SA-I and SA-II sites, should give indispensable information on the lateral and vertical gradients of paleo-oceanographic circulations.

LEG 74

WALVIS RIDGE TRANSECT

SITES SA-II 1 thru 7

Objectives

These sites constitute a profile of drill sites selected in order to generate a spectrum of paleo-depths in the Cenozoic for analysis of changes in carbonate dissolution levels and in oceanic circulations. The Eocene surface is unbroken in this part of the Walvis Ridge, thereby allowing one to estimate the paleo-depth difference (Δh) between drill sites and to determine precisely changes of CCD. The information should also permit a reconstruction of the subsidence history of this aseismic ridge. It is worthwhile to drill into the basement here to ascertain the origin of the aseismic ridge and to provide data to determine Mesozoic paleo-oceanographic gradients.

LEG 75

ANGOLA BASIN - WALVIS RIDGE

SITE SA I-1

Objectives

This drill site lies in the Angola Basin immediately north of the Walvis Ridge on a late Cenomanian crust. It should provide maximum information on the distribution of the Mid-Cretaceous black shales. It is a good companion site in a basinal setting for Site 363 on the crest of the Walvis Ridge and Site 364 on the Angola Salt Plateau. A comparison of the sequences here would provide vital information on paleo-oceanographic gradients.

SITE SA-I-2

Objectives

This drill site lies in the Angola Basin immediately north of the Walvis Ridge on a Maastrichtian isochron (anomaly 31, 68m.y.). This site is designed to obtain late Cretaceous sediments and early Tertiary sediments, which are not likely to be preserved at Site SA-I because of the very high CCD in the Atlantic during these times. Samples might yield critical information on environmental changes accompanying Cretaceous-Tertiary boundary and to check an hypothesis (by Shackleton) of significant (up to 5°C) warming of ocean-bottom during the crisis. It may also be one of the few places to obtain both calcareous and siliceous faunas for Late Cretaceous and Early Tertiary. The site should further yield information on the role of Walvis Ridge to circulation (since the Maastrichtian) and on paleo-oceanographic gradients, and can be considered the northern end of the traverse across the Walvis Ridge (SA-II sites).

LEG 75

SITE SA I-5

Objective

To evaluate the Cretaceous anoxic history for the formation of the black shales. The Site is located between DSDP Site 363 and the basin. Crust is of Albian age.

DSDP/IPOD SITE PROPOSAL

SITE: SA I-1
POSITION: 19°25'S 08°05'E
GENERAL AREA: Southern Angola Basin

GENERAL OBJECTIVE: Mid-Cretaceous Event
Late Mesozoic Paleoenvironment
Organic Geochemistry

PANEL INTEREST: OPP, PMP, OGP SCP, SP4

OBJECTIVES: This drill site lies in the Angola Basin immediately north of the Walvis Ridge on a late Cenomanian isochron (in magnetic quiet zone). This site should provide maximum information on the distribution of the Mid-Cretaceous black shales. It is a good companian site in a basinal setting for Site 363 on the crest of the Walvis Ridge and Site 364 on the Angola Salt Plateau. A comparison of the sequences here would provide vital information on paleooceanographical gradients. This site is also designed as a pair to the Northern Cape basin site SA III-1 to assess the role of Walvis Ridge to paleooceanographic circulations.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: C 1313, (18.30h, Oct. 6), V1912, V2906, A676.

Other Data: (magnetics, dredging, piston core, etc. ...):
C-1313, V 1912, V 2906, A 676

Site Survey Data: Conducted by: (to be) IPOD, Site-Surveying Management

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4900 Sediment Thickness (m): 1200 Total Time on Site (days) 13-15

Single Bit or Re-entry Total Penetration (m): 900 - 1200

Nature of Sediments Anticipated: Oozes, hemipelagic sediments, black shales with limestones near base.

Weather Conditions: Good
Jurisdiction: International
Other: The site could be shifted to the east, if as OGP wishes, a site on a 110 m.y. (Aptian) isochron in a basinal setting can be found.

SCIENTIFIC REQUIREMENTS: Staffing / Special Analyses

Shipboard: Paleontologists, sedimentologists, Organic Geochemist — Organic Geochemistry
Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. J. Hsü, W.B.F. Ryan (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA I-2
POSITION: 17°45'S 2°40'E
GENERAL AREA: Angola Basin, SE Atlantic

GENERAL OBJECTIVE: Cretaceous-Paleogene Paleoenvironment, End of Mesozoic Crisis

PANEL INTEREST: OPP, PMP SCP, SP4

OBJECTIVES: This drill site lies in the Angola Basin immediately north of the Walvis Ridge on a Maastrichtian isochron (Anomaly 32, 68 my). This site is designed to obtain late Cretaceous sediments and early-Tertiary sediments, which are not likely to be preserved at Site SA I-1 because of the very high CCD in the Atlantic during these times. Samples might yield critical information on environmental changes accompanying Cretaceous-Tertiary boundary and to check a hypothesis (by Shackleton) of significant (up to 5°C) warming of ocean-bottom during the crisis. It may also be one of the few places to obtain both calcareous and siliceous faunas for Late Cretaceous and Early Tertiary. (con't. next page)

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: V2712 (21.45, Feb. 26), A 600 Atlantis II

Other Data: V2712, A605, Atlantis II

Site Survey Data: Conducted by: JOIDES Site Surveying Management

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5300 Sediment Thickness (m): ~ 500 Total Time on Site (days) 6-7

Single Bit -- Re-entry Total Penetration (m): ~ 500

Nature of Sediments Anticipated: Oozes, hemipelagic marls

Weather Conditions: "Good"
Jurisdiction: International
Other: Survey needed to find a relatively complete stratigraphic section

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: Paleontologists, sedimentologists

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. J. Hsü, (SE Atlantic W.G.)			

SA I-2 - OBJECTIVES (Continued):

The site should further yield information on the role of Walvis Ridge to circulation (since the Maastrichtian) and on paleooceanographic gradients, and can be considered the northern end of the traverse across the Walvis Ridge (SA II Site).

DSDP/IPOD SITE PROPOSAL

SITE: SA II-1
POSITION: 29°04.'S 2°58'E
GENERAL AREA: Walvis Ridge, SE Atlantic

GENERAL OBJECTIVE: Tertiary Paleooceanographic subsidence history of aseismic ridges

PANEL INTEREST: OPP, OCP, PMP, SCP, SP4

OBJECTIVES: SA 2-1 to SA 2-6 constitute a profile of drill sites that has been selected in order to generate a spectrum of paleo-depths in the Cenozoic for analysis of changes in carbonate dissolution levels and in oceanic circulations. The Eocene surface is unbroken in this part of the Walvis Ridge, thereby allowing one to estimate the paleo-depth difference (Δh) between drill sites and to determine precisely changes of CCD. The information should also permit a reconstruction of the subsidence history of this aseismic ridge. We intend to drill into the basement to ascertain the origin of the aseismic ridge, and to provide data to determine Mesozoic paleooceanographic gradients, especially at times of black shale formation.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: V2712(08.00h, Feb. 20), V2206, V2906

Other Data: (magnetics, dredging, piston core, etc.): V 2712, V 2206, V 2906.

Site Survey Data: Conducted by:

Date:

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 2500 Sediment Thickness (m): 600 Total Time on Site (days) 6-7

Single Bit -- Re-entry Total Penetration (m): 650

Nature of Sediments Anticipated: mainly pelagic oozes

Weather Conditions: Fair-Good
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: Paleontologists, sedimentologists

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. J. Hsü and W.B.F. Ryan (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA II-2
POSITION: 28°54'S 2°54'E
GENERAL AREA: Walvis Ridge, SE Atlantic

GENERAL OBJECTIVE: Tertiary Paleooceanographic Subsidence history of aseismic ridges

PANEL INTEREST: OPP, OCP, PMP, SCP, SP4

OBJECTIVES: SA 2-1 to SA 2-6 constitute a profile of drill sites that has been selected in order to generate a spectrum of paleo-depths in the Cenozoic for analysis of changes in carbonate dissolution levels and in oceanic circulations. The Eocene surface is unbroken in this part of the Walvis Ridge (Δh) between drill sites and to determine precisely changes of CCD. The information should also permit a reconstruction of the subsidence history of this aseismic ridge. We intend to drill into the basement to ascertain the origin of the aseismic ridge, and to provide data to determine Mesozoic paleooceanographical gradients, especially at times of black shale formation

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: V 2712 (11.50h, Feb. 20) V 2206, V 2906

Other Data: (magnetics, dredging, piston core, etc.):
V 2712, V 2206, V 2906

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3000 Sediment Thickness (m): 450 Total Time on Site (days) 5-6

Single Bit -- Re-entry Total Penetration (m): 500

Nature of Sediments Anticipated: Mainly pelagic oozes

Weather Conditions: Fair-Good
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: Paleontologists, sedimentologists

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J. Hsü + W.B.F. Ryan (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA II-3
POSITION: 28°32'S 2°20'E
GENERAL AREA: Walvis Ridge, SE Atlantic

GENERAL OBJECTIVE: Tertiary and Mesozoic Paleooceanography, Origin and subsidence history of aseismic ridges

PANEL INTEREST: OPP, OCP, PMP, SCP, SP4

OBJECTIVES: SA 2-1 to SA 2-6 constitute a profile of drill sites that has been selected in order to generate a spectrum of paleo-depths in the Cenozoic for analysis of changes in carbonate dissolution levels and in oceanic circulations. The Eocene surface is unbroken in this part of the Walvis Ridge, thereby allowing one to estimate the paleo-depth difference (Δh) between drill sites and to determine precisely changes of CCD. The information should also permit a reconstruction of the subsidence history of this aseismic ridge. We intend to drill into the basement to ascertain the origin of the aseismic ridge, and to provide data to determine Mesozoic paleooceanographical gradients especially at times of black shale formation.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: V 2712 (15.15h Feb. 20), V 2206, V 2906

Other Data: (magnetics, dredging, piston core, etc.): V 2712, V 2206, V 2906

Site Survey Data: Conducted by:

Date:

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 3700 Sediment Thickness (m): 500 Total Time on Site (days) 6-7

Single Bit -- Re-entry Total Penetration (m): 550

Nature of Sediments Anticipated: Mainly pelagic oozes

Weather Conditions: Fair to Good
Jurisdiction: International
Other: Should receive OCP support

SCIENTIFIC REQUIREMENTS: Staffing / Special Analyses

Shipboard: Paleo, sed., petrologists
sed.
Shoreboard: petrology — shorebased: petrology

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.S. Hsü, W.B.F. Ryan (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA II-4
POSITION: 27°21'S 2°06'E
GENERAL AREA: Walvis Ridge, SE Atlantic

GENERAL OBJECTIVE: Tertiary Paleooceanography, Subsidence history of aseismic ridge

PANEL INTEREST: OPP, OCP, PMP, SP4, SPC

OBJECTIVES: SA 2-1 to SA 2-6 constitute a profile of drill sites that has been selected in order to generate a spectrum of paleo-depths in the Cenozoic for analysis of changes in carbonate dissolution levels and in oceanic circulations. The Eocene surface is unbroken in this part of the Walvis Ridge thereby allowing one to estimate the paleo-depth difference (Δh) between drill sites and to determine precisely changes of CCD. The information should also permit a reconstruction of the subsidence history of this aseismic ridge. We intend to drill into the basement to ascertain the origin of the aseismic ridge, and to provide data to determine Mesozoic paleooceanographical gradients, especially at times of black shale formation.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: V 2712 (17.05h, Feb. 20), V 2206, V 2906

Other Data: (magnetics, dredging, piston core, etc.): V 2712, V 2206, V 2906

Site Survey Data: Conducted by:

Date:

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 4000 Sediment Thickness (m): 450 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 500 5-7

Nature of Sediments Anticipated: Mainly pelagic oozes

Weather Conditions: Fair to Good

Jurisdiction: International

Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: sed., paleo.

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J. Hsü, W.B.F. Ryan (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA II-5
POSITION: 27°55'S 1°36'E
GENERAL AREA: Walvis Ridge, SE Atlantic

GENERAL OBJECTIVE: Tertiary Paleooceanography. subsidence history of aseismic ridge

PANEL INTEREST: OPP, OCP, PMP, SP4, SCP

OBJECTIVES: SA 2-1 to SA 2-6 constitute a profile of drill sites that has been selected in order to generate a spectrum of paleo-depths in the Cenozoic for analysis of changes in carbonate dissolution levels and in oceanic circulations. The Eocene surface is unbroken in this part of the Walvis Ridge thereby allowing one to estimate the paleo-depth difference (Δh) between drill sites and to determine precisely changes of CCD. The information should also permit a reconstruction of the subsidence history of this aseismic ridge. We intend to drill into the basement to ascertain the origin of the aseismic ridge, and to provide data to determine Mesozoic paleooceanographic gradients especially at times of black shale formation.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: V 2712 (20.40h, Feb. 20), V 2206 V 2906

Other Data: (magnetics, dredging, piston core, etc.): V 2712, V 2206, V 2906

Site Survey Data: Conducted by:

Date:

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 4500 Sediment Thickness (m): 300 Total Time on Site (days) 5-6

Single Bit -- Re-entry Total Penetration (m): 350

Nature of Sediments Anticipated: Mainly pelagic oozes

Weather Conditions: Fair to Good
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: sed., paleo.

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J. Hsü, W.B.F. Ryan (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA II-6
POSITION: 29°30'S 3°29'E
GENERAL AREA: Base of Walvis Ridge, (Cape Basin), SE Atlantic

GENERAL OBJECTIVE: Cenozoic Paleooceanograp

PANEL INTEREST: OPP, OCP, PMP, SP4, SCP

OBJECTIVES: SA 2-1 to SA 2-6 constitute a profile of drill sites that has been selected in order to generate a spectrum of paleo-depths in the Cenozoic for analysis of changes in carbonate dissolution levels and in oceanic circulations. The Eocene surface is unbroken in this part of the Walvis Ridge, thereby allowing one to estimate the paleo-depth difference (Δh) between drill sites and to determine precisely changes of CCD. The information should also permit a reconstruction of the subsidence history of this aseismic ridge. Site 2-6 is designed to provide information for a comparison of oceanographic conditions in this semi-isolated region. It has a depth similar to Site 2-5.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: V 2712 (04.00h, Feb. 20), V 2206, V 2906

Other Data: (magnetics: V 2712, V 2206, V 2906

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4700 Sediment Thickness (m): > 600 Total Time on Site (days) 6-7

Single Bit -- Re-entry Total Penetration (m): > 500

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other: PMP may consider extend the hole to basement to date the western edge of "abyssal quiet zone" and to interpret the spreading history of the Cape Basin.

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: paleo, sedim.

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. J. Hsü, W.B.F. Ryan (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA II-7
POSITION: 30°12'S, 02°48'E
GENERAL AREA: Walvis Ridge

GENERAL OBJECTIVE: Subsidence history and Composition of an Aseismic Ridge

PANEL INTEREST: OPP, OCP, PMP, SP4, SCP

OBJECTIVES:

Same as other SA II sites

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Thomas B. Davie Cruise 38

Other Data: Leg 40 (Holes 362 and 363)

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1000 Sediment Thickness (m): ∿ 200 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): ∿ 250

Nature of Sediments Anticipated: Basement age ∿ 80 Ma

Weather Conditions:
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SA III-1
POSITION: 27°15'S 10°45'E
GENERAL AREA: Northern Cape Basin, SE Atlantic

GENERAL OBJECTIVE: Mid-Cretaceous Event, late Mesozoic Paleoenvironment, organic geochemistry

PANEL INTEREST: OPP, PMP, OGP, SP4, SCP

OBJECTIVES: The major part of the proposed section will be of Cretaceous age as the site is positioned over an Aptian isochron (near MO). This site should provide information on the Mesozoic history of the South Atlantic and is targeted to provide what would have been a basin axis setting (i.e., deepest part of the depocenter) in Aptian and Albian times. The resulting facies from this setting is considered by many as critical to the evaluation of the "oxygen-minimum" hypothesis for the formation of the so-called "black shales".

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: C-1703 (21.45h, Dec. 14), Atlantis II-30

Other Data: magnetics, C 1703, Atlantis II-30

Site Survey Data: Conducted by: (to be) IPOD Site Surveying Management

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4700 Sediment Thickness (m): 1500 Total Time on Site (days)
Single Bit or Re-entry Total Penetration (m): 1000 plus 13-15

Nature of Sediments Anticipated: Oozes, hemipelagic sediments, black shales, limestones near the gase.
Weather Conditions: "Good"
Jurisdiction: International
Other: Site could be shifted westward to reach basement at about 1'' plus if desired by PMP

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: paleontologists, sedimentologists, organic geochemists
Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.H. Hsü, W.B.F. Ryan (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA III-2
POSITION: 36°55'S 0°30'E
GENERAL AREA: NW Cape Basin, SE Atlantic

GENERAL OBJECTIVE: Cretaceous-Paleogene Paleoenvironments
End of Mesozoic crisis

PANEL INTEREST: OPP, OCP, SCP, SP4

OBJECTIVES: This is a companion site to SA 1-2 and is positioned on a Maastrichtian (or latest Campanian) isochron (near anomaly 32). Drilling here is expected to penetrate latest Cretaceous and early Paleogene biogenic sediments which are rarely preserved in other parts of Atlantic because of raised CCD during those times. Samples might yield critical information on environmental changes at the end of Mesozoic. Furthermore, cores obtained here complemented by those at other SA-1, and SA-2 sites, should give indispensable information on the lateral and vertical gradients of paleooceanographic circulations.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: C 1313 (15.30h, 28 Oct.), A 675, C 1214

Other Data: (magnetics, dredging, piston core, etc.):
C 1313, A 675, C 1214

Site Survey Data: Conducted by: Site Survey Panel

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5000 Sediment Thickness (m): ∿ 500 Total Time on Site (days) 6-7

Single Bit -- Re-entry Total Penetration (m): ∿ 500

Nature of Sediments Anticipated: Oozes, hemipelagic marls

Weather Conditions: in southern Summer only (can be difficult)
Jurisdiction: International
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: sedimentologists
paleontologists
Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J. Hsü, Dave Needham (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA IV-1
POSITION: 26°00'S 11°25'W
GENERAL AREA: E. flank MAR, S. Atlantic

GENERAL OBJECTIVE: Late Tertiary Paleoceanography, CCD crisis, M. Miocene spreading history

PANEL INTEREST: OPP, OCP, SCP, SP4

OBJECTIVES: Sites SA 4-1 to SA 4-3 constitute a cluster of sites designed to solve the mystery of a Mid-Tertiary CCD crisis, which was noted during early phases of Atlantic and Indian Ocean drilling. Since the M.Miocene stratigr. records from the Atlantic is very incomplete because of the dramatic elevation (of some 2000 m) of CC during this critical epoch, the sites occupying crustal positions at times of anomaly 5 (SA 4-1, 9my), 5a (SA 4-2, 12my), and 5b (SA 403, 16 my), should yield calcareous sequences of basal Tortonian, Serravallian, and Langhian (and possibly uppermost Burdigalian) ages. Drill data should also solve the controversy if there had been a slow down or brief interrupt of spreading in the Atlantic and Indian Oceans.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: C 801 (13.00h, Dec. 20), V 2011

Other Data: (magnetics, dredging, piston core, etc.)
C 801, V 2011

Site Survey Data: Conducted by: Site Survey Management

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 4250 Sediment Thickness (m): 300 Total Time on Site (days) 4-5

Single Bit -- Re-entry Total Penetration (m): 350

Nature of Sediments Anticipated: pelagic oozes

Weather Conditions: Good
Jurisdiction: International
Other: OCP may be interested in obtaining crustal materials from the SA 4 holes

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: paleo, sed., petrologist

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J. Hsü (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA IV-2
POSITION: 26°10'S 11°00'N
GENERAL AREA: E. flank MAR, S. Atlantic

GENERAL OBJECTIVE: Late Tertiary Paleo-oceanography, CCD crisis, M. Miocene spreading history

PANEL INTEREST: OPP, OCP, SP4, SCP

OBJECTIVES: Sites SA 4-1 to SA 4-3 constitute a cluster of sites designed to solve the mystery of a Mid-Tertiary CCD crisis, which was noted during early phases of Atlantic and Indian Ocean drilling. Since the M.Miocene stratigr. records from the Atlantic is very incomplete because of the dramatic elevation (of some 2000 m) of CC during this critical epoch, the sites occupying crustal positions at times of anomaly 5 (SA 401, 9my), 5a (AA 402, 12 my), and 5b (SA 4-3, 16 my), should yield calcareous sequences of basal Tortonian Serravallian, and Langhian (and possible uppermost Burdigalian) ages. Drill data should also solve the controversy if there had been a slow down or brief interrupt of spreading in the Atlantic and Indian Oceans.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: C 801 (18.00h, Dec. 20) V 2011

Other Data: (magnetics, dredging, piston core, etc.)
C 801, V 2011

Site Survey Data: Conducted by: Site Survey Management

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) ~4250 Sediment Thickness (m): 150 ? Total Time on Site (days) 3-4

Single Bit -- Re-entry Total Penetration (m): 200

Nature of Sediments Anticipated: Pelagic oozes

Weather Conditions: Good
Jurisdiction: International
Other: OCP may be interested in obtaining crustal materials from SA 4 holes

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: paleo, sed., petrologist

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J.Hsü (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA IV-3
POSITION: 26°15'S 10°25'W
GENERAL AREA: E. flank MAR, S. Atlantic

GENERAL OBJECTIVE: Late Tertiary Paleo-oceanography, CCD crisis, M. Miocene history

PANEL INTEREST: OPP, OCP, SCP, SP4

OBJECTIVES: Sites SA 4-1 to SA 4-3 constitute a cluster of sites designed to solve the mystery of a Mid-Tertiary CCD crisis, which was noted during early phases of Atlantic and Indian Ocean drilling. Since the M.Miocene stratigr. record from the Atlantic is very incomplete because of the dramatic elevation (of some 2000 m) of CC during this critical epoch, the sites occupying crustal positions at times of anomaly 5 (SA 4-1, 9 my), 5a (SA 4-2, 12 my), and 5b (SA 4-3, 1y my), should yield calcareous sequences of basal Tortonian, Serravallian, and Langhian (and possibly uppermost Burdigalian) ages. Drill data should also solve the controversy if there had been a slow down or brief interrupt of spreading in the Atlantic and Indian Oceans.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: C 801 (23.30h, Dec. 20), V 2011

Other Data: (magnetics, dredging, piston core, etc.):
C 801, V 2011

Site Survey Data: Conducted by: Site Surveying Management

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 3600 Sediment Thickness (m): 200 ? Total Time on Site (days) 4-5

Single Bit -- Re-entry Total Penetration (m): 250

Nature of Sediments Anticipated: pelagic oozes

Weather Conditions: Good
Jurisdiction: International
Other: OCP may be interested in obtaining crustal materials from SA 4 holes

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: sed., paleo., petrologist

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J. Hsu (Se Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA IV-4
POSITION: 26°25'S 5°42'W
GENERAL AREA: East flank MAR
S. Atlantic

GENERAL OBJECTIVE: Paleogene Paleooceanography
Oligocene crisis

PANEL INTEREST: OPP, OCP, SP4, SCP

OBJECTIVES: The sites SA 4-4 to SA 4-7 constitute a cluster of sites designed to understand a major paleooceanographic revolution which took place probably in Oligocene. It has been suggested that the change occurred as a consequence of the start of Antarctic glaciation and that a thermal stress replaced halogenic stress as the major driving force of oceanic circulation (e.g. Berger). The sites are positioned over anomalies 13 (Site 4-4, 38my), 18 (Site 4-5, 46 my), 20 (Site 4-6 49 my), 21 (Site 4-7, 53my). This cluster is the link between anomaly 5 holes + Angola Basin holes. Is indispensable for the completion of the traverse of S. Atlantic at about 30°S.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: V 2011 (22.15h, Oct. 22), C 801 (0845 h, Dec. 22)

Other Data: (magnetics, dredging, piston core, etc.):
V 2011, C 801

Site Survey Data: **Conducted by:** Site Survey Panel

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 4450 **Sediment Thickness (m):** 100 + **Total Time on Site (days)** 2-3

Single Bit -- Re-entry **Total Penetration (m):** 150

Nature of Sediments Anticipated: pelagic oozes

Weather Conditions: Good
Jurisdiction: International
Other: OCP may be interested in obtaining crustal materials from SA 4-4 to SA 4-7 holes

SCIENTIFIC REQUIREMENTS: **Staffing** **Special Analyses**

Shipboard: paleo, sed., petrologist

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J. Hsü (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA IV-5
POSITION: 26°02'S 4°12'W
GENERAL AREA: East flank MAR
S. Atlantic

GENERAL OBJECTIVE: Paleogene Paleooceanography
Oligocene crisis

PANEL INTEREST: OPP, OCP, SP4, SCP

OBJECTIVES: The sites SA 4-4 to SA 4-7 constitute a cluster of sites designed to understand a major paleooceanographic revolution which took place probably in Oligocene. It has been suggested that the change occurred as a consequence of the start of Antarctic glaciation and that a thermal stress replaced halogenic stress as the major driving force of oceanic circulation (e.g. Berger). The sites are positioned over anomalies 13 (Site 4-4, 38my), 18 (Site 4-5, 46 my), 20 (Site 406, 49my), 21 (Site 4-7, 53 my). This cluster is the link between anomaly 5 holes + Angola Basin holes. Is indispensable for the completion of the traverse of S. Atlantic at about 30°S.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: V 2011 (12.00 h, Oct. 22), C 801 (23.30h, Dec. 22)

Other Data: (magnetics, dredging, piston core, etc.):
V 2011

Site Survey Data: Conducted by: Site Survey Panel

Date: 1979
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 4500 Sediment Thickness (m): 150 Total Time on Site (days) 2-3

Single Bit -- Re-entry Total Penetration (m): 200

Nature of Sediments Anticipated: pelagic oozes

Weather Conditions: Good
Jurisdiction: International
Other: OCP may be interested in obtaining crustal materials from SA 4-4 to4-7 holes

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: paleo, sed., petrologist

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
" K.J.Hsu (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA IV-6
POSITION: 25°10'S 3°15'W
GENERAL AREA: East flank MAR
S. Atlantic

GENERAL OBJECTIVE: Paleogene Paleooceanography
Oligocene crisis

PANEL INTEREST: OPP, OCP, SP4, SCP

OBJECTIVES: The sites SA 4-4 to SA 4-7 constitute a cluster of sites designed to understand a major paleooceanographic revolution which took place probably in Oligocene. It has been suggested that the change occurred as a consequence of the start of Antarctic glaciation and that a thermal stress replaced halogenic stress as the major driving force of oceanic circulation (e.g. Berger). The sites are positioned over anomalies 13 (Site 4-4, 38my), 18 (Site 4-5, 46 my), 20 (Site 4-6, 49 my), 21 (Site 4-7, 53 my). This cluster is the link between anomaly 5 holes and Angola Basin holes. Is indispensable for the completion of the traverse of S. Atlantic at about 30°S.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: V)2011 (02.10h, Oct. 22), C 801 (05.00h, Dec. 23)

Other Data: (magnetics, dredging, piston core, etc.):
V 2011, C 801

Site Survey Data: Conducted by: Site Surveying Management

Date: 1979
Main Results: (need to search for sediment-ponds to avoid fracture zone)

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 5200 Sediment Thickness (m): 150 ? Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 200 ? 2-3

Nature of Sediments Anticipated: pelagic oozes

Weather Conditions: Good
Jurisdiction: International
Other: May have to be shifted slightly in position to avoid fracture zone and to find good sediment sequences

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: paleo, sed., petrologist

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K.J. Hsü (SE Atlantic W.G.)			

DSDP/IPOD SITE PROPOSAL

SITE: SA IV-7
POSITION: 24°18'S 2°30'W
GENERAL AREA: East flank MAR
S. Atlantic

GENERAL OBJECTIVE: Paleogene Paleooceanography
Oligocene crisis

PANEL INTEREST: OPP, OCP, SP4, SCP

OBJECTIVES: The sites SA 4-4 to SA 4-7 constitute a cluster of sites designed to understand a major paleooceanographic revolution which took place probably in Oligocene. It has been suggested that the change occurred as a consequence of the start of Antarctic glaciation and that a thermal stress replaced halogenic stress as the major driving force of oceanic circulation (e.g. Berger). The sites are positioned over anomalies 13 (Site 404, 38my), 18 (Site 4-5, 46 my), 20 (Site 406, 49 my), 21 (Site 4-7, 53 my). This cluster is the link between anomaly 5 holes + Angola Basin holes. Is indispensable for the completion of the traverse of S. Atlantic at about 30°S.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: V 2011 (21.00h, Oct. 21), C 801 (15.00h, Dec. 23)

Other Data: (magnetics, dredging, piston core, etc.):
V-2011, C 801

Site Survey Data: Conducted by: Site Surveying Management

Date: 1979

Main Results: (Need to search for sediment-ponding and avoid fracture zone)

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 4700 Sediment Thickness (m): 100 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): 150 2-3

Nature of Sediments Anticipated: pelagic oozes

Weather Conditions: Good

Jurisdiction: International

Other: May have to be shifted slightly in position to avoid fracture zone and to find good sediment sequences

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard: paleo, sed., petrologist

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review
K. J. Hsü (SE Atlantic W.G.)			

DRILLING IN THE WESTERN SOUTH ATLANTIC AND ANTARCTIC OCEANS, AN OVERVIEW

An understanding of the oceanographic changes which have occurred in the high latitude South Atlantic and Antarctic Oceans is critical to a global history of climatic and oceanographic change. This region has undergone pronounced geographic alterations through the Mesozoic and Cenozoic which have apparently led to a metamorphosis from a temperate marine climate to the frigid ocean of ice it is today. Thus, this region, more than any other, represents the great magnitude of climatic change that has taken place since middle Mesozoic times. It is sensitive to climatic change, and has probably figured importantly in the history of deep and surface circulation. Exactly how did these oceanographic changes occur?

All sites proposed in this study have been selected primarily on their value in reconstructing a history of oceanographic change in this very important region of the world ocean. Some sites, however, have added importance because of their usefulness in biostratigraphic studies and as checks on the geophysical reconstructions of the basins. The accurate reconstruction of the ocean boundaries in this region is itself an important aspect of the proposed paleoenvironmental studies and figures prominently in all of the major problems which this study addresses.

The material collected at each proposed site will contribute to a better understanding of one or more of the following specific questions in oceanographic history.

(1) The history of bottom water flow in the Southern Ocean. How is it related to changes in geographic barriers to flow and to changes in the climate. What have been the changes in the intensity of bottom water flow? What have been the sources of bottom water through time?

(2) The history of surface water flow, what has been the pattern of surface water flow in this region. How has it changed with the opening of the South Atlantic Ocean, the Indian Ocean and the Drake Passage? When did the Circumpolar Current come into existence and how is its development related to climatic change, the creation of steep zonal gradients, and the creation of the Polar Front.

(3) The history of changes in the vertical structure of the oceans. How have the lysocline, the CCD, and the vertical distribution of oxygen isotopes (in benthic foraminifera) varied with time? How have these variations been related to changes in bottom flow patterns, surface circulation, and the associated changes in climate? How does the history of the water structure in the various basins under study compare, and can these histories give us a clue to the existence and timing of inter-basinal connections?

(4) The history of biogeography. How have the marked changes in inter-ocean connections during the Mesozoic and Cenozoic affected

biogeographic distributions? How can changes in these distributions be related to changes in climate, changes in the distribution of surface water masses, and the development of new types of surface water masses.

(5) Glacial and climatic change: What are the temporal relationships between the changes in ocean circulation surrounding the Antarctic continent and the development of glaciation on and close to the continent? Certain sites have been selected to derive information about glacial history of the continent and related sedimentary history particularly with regard to sources and transportational modes of terrigenous sediments and of the development of biogenic sedimentary patterns in adjacent oceans.

SOUTHWEST ATLANTIC OBJECTIVES

The Southwest Atlantic region has, during the Cenozoic, represented an important conduit for northward bottom-water from sources to the South in the Weddell Sea andother Antarctic regions. The Vema and Hunter Channels presently dissect the east-west trending Rio Grande Rise in the southwest Atlantic and thus allow the movement of bottom waters northwards and southwards in abyssal basins of the central and North Atlantic. The Vema Channel represents the only area of potential northward flow because the Walvis Ridge, in similar position in the southeast Atlantic, lacks deep dissections. An understanding of bottom water flow throughout the oceans represents an important element of global paleooceanography. Sites are required to be drilled in the Southwest Atlantic for several purposes:

1. To examine the history of bottom water flow through the region during the Cenozoic based on its erosional, transportational and depositional consequences; on calcium carbonate dissolution and on the oxygen isotopic record.

2. To provide sequences older than the Cenozoic to assist in the definition of the paleoceanographic conditions related to the early opening and development phases of the Atlantic of the same ages in the southeastern sector.

3. To provide required Cenozoic biostratigraphic sequences in southern Atlantic temperate and warm subtropical areas.

4. To provide sites on the northern part of the Falkland Plateau for examination of the biostratigraphic, biogeographic and sedimentological history related to major changes in circulation patterns through the Mesozoic and Cenozoic. The paleoceanographic alterations occurred in response to initial opening and enlargement of the South Atlantic, the development of bottom water passageways through ridges and fracture zones in the vicinity of the Falkland Plateau, the opening of the Drake Passage and climatic evolution of Antarctica and the Southern Ocean.

NORTHERN FALKLAND PLATEAU

In order to understand bottom water history in a region it is necessary that a group of complementary sites be obtained with the same and different structural units. Interpretations based on the drilling of single sequences are often equivocal because the effects of local erosion cannot be clearly differentiated from broader-scale regional effects. We thus propose a group of sequences be obtained from the southwest Atlantic region to supplement the single useful site already available (Site 358) from the northeastern Argentine Basin. The proposed sections start with the sites AB1, AB2 and AB2A which bracket the northward flow of deep water around the eastern end of the Falkland Plateau. These sites can be compared with those to the north, around the Rio Grande Rise, and with proposed sites in the Weddell Sea to give a detailed history of climatic change and associated erosional and depositional episodes.

EAST FLANK OF VEMA CHANNEL

The extensive seismic profiles of LDGO, illustrated by LePichon et al., (1971, Phys. + Chem of Earth, vol. 8, chap. 2), reveal that the broad plateau on the east flank of the channel at a depth of 4200m is underlain by 1.0 - 1.5 seconds of sediment which is relatively transparent. Because of the irregular basement relief it's difficult to extrapolate other DSDP results to this region. However, the bulk of the material underlying the plateau is probably Mesozoic pelagic carbonates, perhaps similar to the sequence which was partially drilled at Site 357 to the east. The major objectives of drilling a suite of sites on the flanks of the Vema Channel would be:

1. to recover this thick sequence of presumably Mesozoic material for interpretation of depositional environments and deep circulation conditions in the SW Atlantic during the early stages of its opening;

2. to evaluate possible effects of bottom water at shallower depths through the channel and recent changes in carbonate dissolution and theposition of the CCD. These sites are well suited for these purposes, inasmuch as they are sufficiently deep to clearly represent ocean basin depositional processes versus those of the continental margin. Terrigenous dilution should be minimal.

SOUTHWEST BRAZIL BASIN

A site in the southwest part of the Brazil Basin would be located so as to obtain the erosional products of the AABW through the Vema Channel. Such a site would allow the history of AABW through the Vema Channel to be established and compared with the Hunter Channel as the principal conduits for AABW flow. A lobe of sediments exists north of the Vema Channel which McCoy and Zimmermann suggest represent northerly dispersal of sediments through this Channel during the late Pliocene and Quaternary. The dating of these sediments should provide information on the inception and variations in intensity of northward bottom water flow during the Cenozoic.

SOUTH OF HUNTER CHANNEL

A site located to the south of this channel will allow similar studies of the history of North Atlantic Bottom Water (NABW) flowing southwards through the region.

MERIDIONAL TRANSECT

Proposed sites AB3 and AB4 span the Polar Front in its most northern position and are located on a meridional section of the Mid-Atlantic Ridge. Thus, they are well situated to record the development of this front and its variation in location through time. Although the reasons for drilling these two sites stand on their own, they also form the northern end of a longer meridional transect of sites which are proposed for future high-latitude drilling. This total transect will allow a more detailed reconstruction of changes in the oceanographic gradients in high southern latitudes.

DSDP/IPOD SITE PROPOSAL

SITE: AB-1
POSITION: 49°58' 42°10'W
GENERAL AREA: Northern Falkland Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To define major Tertiary and Mesozoic erosional events and fluctuations of the CCD at a high latitude South Atlantic site; to establish biostratigraphy of high latitude calcareous microfossils and their correlation with oxygen isotope and paleomagnetic records. This site lies well above the present day CCD; it will allow comparison of data with that from DSDP Hole 327A drilled in deeper water near the present day CCD. Gaps in the section at Hole 327A (which was spot cored) can be filled by continuously coring the proposed site. Important intervals to be examined are:

(continued next page)

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: ARA ISLAS ORCADAS 1176, Nov. 4, 1976, 1300 hours, Glomar Challenger
Other Data:

Site Survey Data: Conducted by:

Date: 3 May, 1974
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1715 Sediment Thickness (m): 500 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

Site AB-1 (Continued)

1. Lower Miocene; Miocene-Oligocene boundary: to determine if erosional effects exist at the time of proposed opening of the Drake Passage and the establishment of circum-Antarctic current.

2. Eocene: to establish a biostratigraphic record; to observe fluctuations of CCD (the Eocene is very poorly represented in Antarctic sites).

3. Paleocene: to establish calcareous microfossil stratigraphy.

4. Cretaceous-Tertiary boundary; to better define major erosional event associated with this boundary and to establish the history of CCD fluctuations.

5. Campanian-Maestrichtian: to obtain continuous section to allow establishment of a calcareous microfossil zonation.

6. Santonian; Santonian-Campanian: to define major erosional (?) event and/or major CCD fluctuation.

7. Cenomanian-Santonian: to better define the Mid Cretaceous deep sea erosional event.

8. Late Albian-Cenomanian: to further observe subsidence history of the Falkland Plateau.

DSDP/IPOD SITE PROPOSAL

SITE: AB-2
POSITION: 35°S 47°W
GENERAL AREA: Northern Falkland Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Site AB2 in association with AB2A, W10, S19, S110, S111 are proposed to study the difference in paleoenvironments between the South Atlantic and Atlantic-Indian Basins. Geophysical data indicates that prior to Middle Eocene time the Falkland/Agulhas Fracture Zone system formed a continuous ridge from the Falkland Plateau to the Cape Basin. The Falkland/Agulhas Fz has a topographic relief of 2 km thereby providing a significant barrier to bottom water circulation between the two Basins from the Middle Cretaceous to the Middle Eocene.

The sites AB2-A and S1-10 will investigate the change in sedimentation

BACKGROUND INFORMATION: (continued next page)

Regional Data:

Seismic Profiles: ARA Islas Orcadas 7-75

Other Data:

Site Survey Data: Conducted by:

Date: November 8, 1975

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 5500 Sediment Thickness (m): 700 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:

Jurisdiction:

Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

SITE AB-2 (Continued)

prior to and after the break in the Falkland/Agulhas system. Each of these holes is located above a smooth acoustic basement which may be correlated to that at Site 328 (Leg 36). Drilling at Site 328 was terminated prior to reaching this reflector. By extrapolation the acoustic basement was dated as probably Aptian age. The reflector most likely manifests a drastic change in sedimentary environment within the Weddell-Indian Basin at the time of early separation of South America-Africa.

Sites W10 and S19 are located in sediment ponds on the Islas Orcadas and Randy Rises. These two ridges were formed by the spreading center jump which reduced the offset across the Falkland/Agulhas Fz. At the time of their formation, they were approximately at sea level and have subsequently subsided following the Sclater et al. cooling curves. For a good deal of their history they remained above the CCD. Sediment recovered from these ponds should therefore reveal much concerning faunal assemblages and environments during post-Eocene time.

Sites AB-2 and SI-1 are located on crust of approximately Campanian Age and this should provide an opportunity to observe the change in water circulation following the breach in the Falkland/Agulhas Fz described above.

DSDP/IPOD SITE PROPOSAL

SITE: AB-2A
POSITION: 49.5°S 35°W
GENERAL AREA: Northern Falkland Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To determine the sequence of paleoceanographic events and sedimentary changes prior to and after the break in the Falkland/Agulhas Fracture Zone system. For further background see notes on AB-2.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: ARA Islas Orcadas 7-75

Other Data:

Site Survey Data: Conducted by:

Date: November 16, 1975
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5000 Sediment Thickness (m): 300 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: AB-3
POSITION: ~40°S 21°W
GENERAL AREA: S. E. Argentine Basin

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: This site lies close to the present position of the Antarctic Convergence (Polar Front) and on anomaly 13. The primary objective is to test for Cenozoic latitudinal movement and development of the Polar Front in an area away from zonal topography. This region can be compared with the history of the Polar Front and siliceous biogenic sedimentary evolution now established off East Antarctica. A further objective is to provide a northward continuation of a transect of sites extending through the northern Weddell Sea region for biogeographic and possible bottom-water erosional histories. See also notes for AB-4.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: To be provided (Lamont-Doherty) Vema 22-04

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) ~4500 Sediment Thickness (m): ~ 0.3 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: AB-4
POSITION: ~45°S 25°W
GENERAL AREA: S.E. Argentine Basin

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: This site lies directly north of the present position of the Antarctic Convergence (Polar Front) and on Anomaly 13. Together with site AB-3 this site will provide a transect of the Polar Front at its most northerly position and a northward continuation of a longitudinal transect of sites extending through the northern Weddell Sea region. (See notes for AB-3).

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: To be provided (Lamont-Doherty) R.C. 1214

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) ~4500 Sediment Thickness (m): ~0.3 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: AB-5
POSITION: 37°10'S 31°17'W
GENERAL AREA: Southern Hunter Channel
Northeastern Argentine Basin

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To determine the Cenozoic history of NADW flow within the South Atlantic. McCoy and Zimmerman (1977) show that the Hunter Channel may be a critical passage for NADW flow. The proposed site is sufficiently far south to be away from the erosional regime in the narrowest part of the Hunter Channel, yet is north of the cyclonic gyre of AABW within the Argentine Basin. The site is sufficiently shallow such that a significant calcareous component should be present. Site is on western flank of channel axis, in a region of relatively transparent sediment.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profile #1826, Conrad 12-Leg 13, 0500 hours

Other Data:

Site Survey Data: Conducted by:

Date: 17 January 1969
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) ~ 2225 Sediment Thickness (m): ~ 1.0 second Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: AB-6
POSITION: 30°25'S 35°15'W
GENERAL AREA: Rio Grande Rise

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Continuously core the Cenozoic pelagic sequence of the SW Atlantic for biostratigraphy and paleobiogeography. Initial work has shown that this region is critically located for correlation between temporate and warm subtropical biogeographic zonations. Site is located ∿25 miles south and upslope from Site 357. By moving upslope, we may be able to avoid the Cenozoic unconformities which occur at Site 357. Taken with AB5, 7, 8, and 9, this site will provide a depth transect of the western Atlantic to compare with the CCD history developed for the eastern Atlantic Basins.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Vema 26, Record no. 820, 1830 hrs. Profile AA',
Other Data: p. 961 of Leg 39 report.

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) ∿1200 Sediment Thickness (m): ∿ 0.7 second Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: AB-7
POSITION: 30°45'S 38°10'W
GENERAL AREA: Rio Grande Rise

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To provide a carbonate biogenic site intermediate in depth between Site 327 (2100m) and AB6 on the Rio Grande Rise and the proposed site at 4400m in the Vema Channel. This site in association with the others will provide a sequence of vertical profiles from 1200m to 4400m to establish oxygen isotopic gradients and lysocline fluctuations in the western South Atlantic. Such a profile will compliment that planned for the Walvis Ridge in the Angola Basin region.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profile Vema 22 (see E'-F' on Figures 1 and 3 of LePichon et al., 1977).
Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3000 Sediment Thickness (m): 0.7 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: AB-8
POSITION: 28°45'S 38°10'W
GENERAL AREA: Vema Channel Axis

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Determine the Neogene history of AABW flow within the Vema Channel, as refelcted in sediments from near the upper limits of AABW. Piston coring on the east flank of the channel shows a continuous Pleistocene record down to 4000m, with sharp lithologic gradients at the AABW/NADW transition zone. These same lithologic parameters should serve as diagnostic indices of the vertical migrations of the AABW/NADW transition zone during the Neogene. Recover the relatively transparent Mesozoic (?) sediment sequence for paleobiogeographic studies. Previous drilling (site 357) failed to reach acoustic basement, thus the Meosozoic of the SW Atlantic remains largely unsampled.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profile #190, Conrad 11, Leg 2, 0300 hrs.

Other Data:

Site Survey Data: Conducted by:

Date: 11 Jan. 1967
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4400 Sediment Thickness (m): 1.2 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: AB-9
POSITION: 26°13'S 36°35'W
GENERAL AREA: Vema Channel Exit, Southwestern Brazil Basin

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To determine the history of AABW flow through the Vema Channel during the Cenozoic. The site selected is sufficiently downstream from the Vema Channel to represent a clearly depositional environment, probably consisting largely of erosional products advected northward in the AABW flow. Other seismic profiles farther south (e.g. RC16-10, Profile 1541, Latitude 28°S) show an erosional environment; consequently a site further downstream (i.e. to the north) is essential. The recommended site shows a thick sequence of transparent sediment, with differential accumulation in upper section (post-Horizon A?) indicative of bottom current effects.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profile #601, Vema 31, Leg 4, 0815 hrs.

Other Data:

Site Survey Data: Conducted by:

Date: 26 April 1974.
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4200 Sediment Thickness (m): 1.5 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

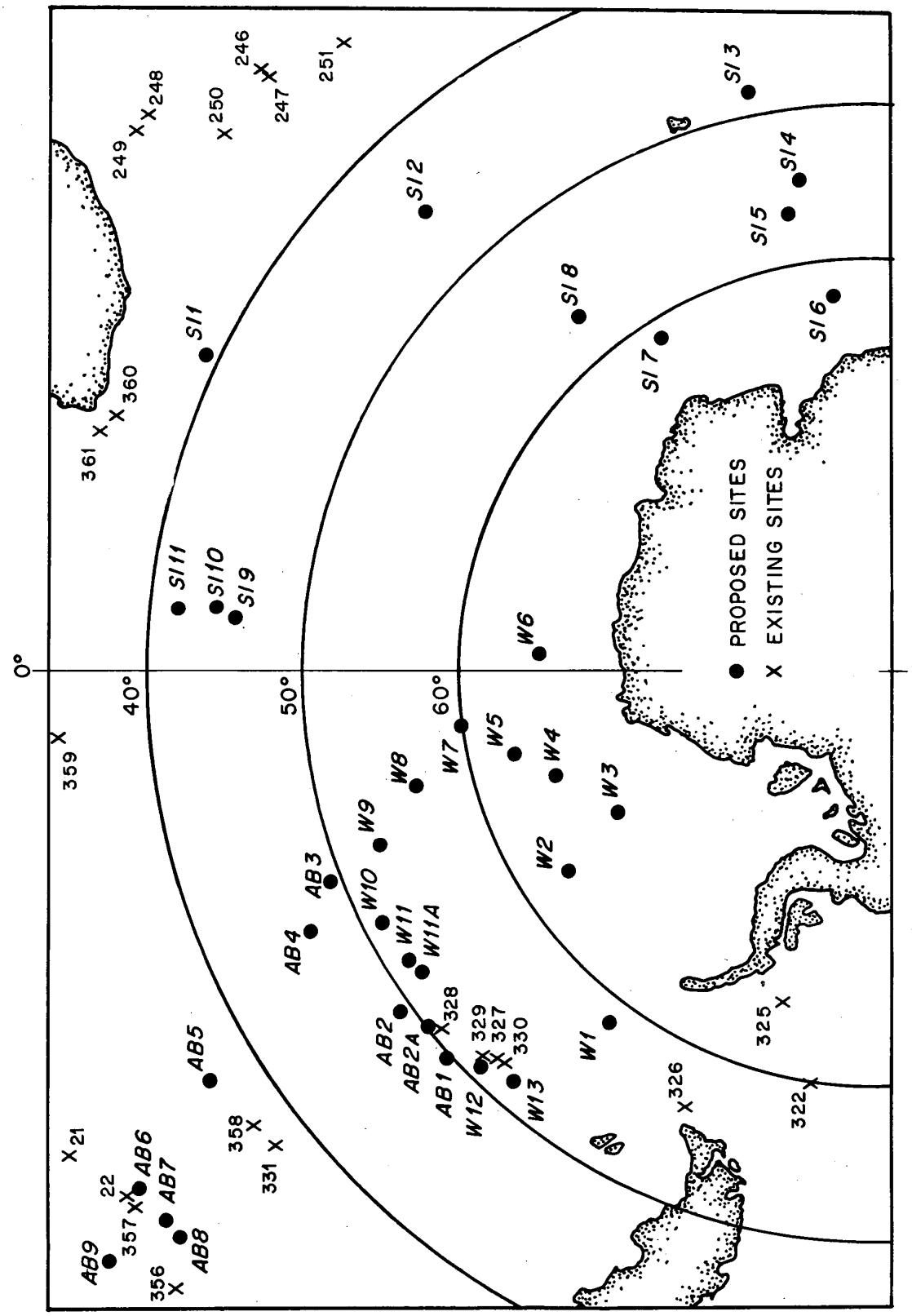
SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review



SOUTHERN INDIAN OCEAN SITES

DSDP/IPOD SITE PROPOSAL

SITE: SI-1A
POSITION: 39°10'S 25°06'E
GENERAL AREA: Agulhas Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: The primary paleoenvironmental purposes of this site are (a) to obtain a relatively shallow water carbonate sequence in the present-day southern temperate water mass for biostratigraphic, paleocirculation, and paleoclimatic purposes, (b) to obtain a Cenozoic sequence for comparison with the Falkland Plateau region; and (c) to study the history of bottom-water action over the plateau.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: 1200-1500 hours, 7 January 1974 C17-04

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2800-3300 Sediment Thickness (m): 0.5 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-1B
POSITION: 29°20'S 24°E
GENERAL AREA: Agulhas Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: The primary paleoenvironmental purposes of this site are (a) to obtain a relatively shallow water carbonate sequence in the present-day southern temperate water mass for biostratigraphic, paleocirculation, and paleoclimatic purposes, (b) to obtain a Cenozoic sequence for comparison with the Falkland Plateau region; and (c) to study the history of bottom-water action over the plateau.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: 2100-2130 hours, 15 February 1974 C17-04

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2900-3300 Sediment Thickness (m): 1.0 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-2
POSITION: 45°S 45°E
GENERAL AREA: Crozet Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Cenozoic subantarctic biostratigraphic and oxygen isotopic record in the Southern Indian Ocean sector of the Southern Ocean.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: An exact site position to be provided by Roland Schlich

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1500 Sediment Thickness (m): unknown Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-3
POSITION: 47°58.8'S 77°22.3'E
GENERAL AREA: Northern Kerguelen Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Continuous Late Cenozoic siliceous and partially calcareous biostratigraphic sequence close to Antarctic Convergence in area of high sedimentation rates. High resolution studies of fluctuations in Antarctic Convergence, glacial history and productivity, and high resolution biostratigraphy. Volcanic record of Kerguelen Island based on volcanic ash.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profiler No. 243, ELTANIN 47, 29 March 1971 0130 hours

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1430 Sediment Thickness (m): 2-4 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-4
POSITION: 57°04.9'S 77°48.2'E
GENERAL AREA: Central Kerguelen Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:
Primary objective to obtain Paleogene and Cretaceous calcareous biostratigraphy and oxygen isotopic sequence and to determine nature and age of basement. This sequence will permit the examination of Paleogene to Cretaceous antarctic glacial history, and early Cenozoic Antarctic paleoclimates in the Antarctic water mass. (Piston cores, ELTANIN 54-3 and 54-4 taken nearby and are late Eocene and Middle Eocene in age respectively).

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profiler #94 ELTANIN 47 (0415 Range, 0200 Range) 0130 hours, 22 February 1971
Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1800 Sediment Thickness (m):_____ Total Time on Site (days)
Single Bit -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-4a
POSITION: 55°50.1'S 80°591.E
GENERAL AREA: Central Kerguelen Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Primary objective to obtain Paleogene and Cretaceous calcareous biostratigraphy and oxygen isotopic sequence and to determine nature and age of basement. This sequence will permit the examination of Paleogene to Cretaceous Antarctic glacial history, and early Cenozoic Antarctic paleoclimates in the Antarctic water mass. (Piston cores, ELTANIN 54-3 and 54-4 taken nearby are are late Eocene and Middle Eocene in age respectively).

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profiler #127 ELTANIN 54 1946 hours 12 July 1972
Nearby Sonobuoy No. 5, ELTANIN 54
Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4.2 sec Sediment Thickness (m): 0.25 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-5
POSITION: 57°15.2'S 77°59.3'E
GENERAL AREA: Central Kerguelen Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To obtain continuous late Cenozoic to Eocene calcareous biostratigraphic Antarctic and oxygen isotopic sequence with overlap with the upper part of Site 3. This site will provide sequences for the study of late to middle Cenozoic paleooceanography, Antarctic glacial history and biogeography. Investigation of chertification within geologically young (Pliocene) siliceous ooze is also possible. (Piston core apparently in same stratigraphic position on profile 94, ELTANIN, is Pliocene in age).

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profiler #95 ELTANIN 47 0315 hours 22 February 1971

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 1537 Sediment Thickness (m): 0.8 sec. Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-6
POSITION: 63°50.7'S 81°19.1'E
GENERAL AREA: South Kerguelen Plateau/Gap

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To determine history of sedimentation particularly as relating to bottom water history and Antarctic glacial history in location closely adjacent to Antarctica in this section.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Profiler #149 ELTANIN 47 1030 hours 5 March 1971

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3750 Sediment Thickness (m): _____ Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-7
POSITION: 61°54'S 56°50'E
GENERAL AREA: East Enderby Basin-Continental Margin Hole

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: There are various objectives at this site: (1) To examine the erosional history of the Antarctic continent. (2) To complement the successful Sites 268 and 274 in providing information on (a) climatic history of Antarctica, from the amount of ice-rafted sediment, micro-fauna and flora, and perhaps presence of pollen in the older part of the sequence; (b) erosional history of Antarctica, and the change in drainage areas with time, from the petrology of terrigenous sediment; (3) history of bottom water movement, from the sedimentology of the sediments. This complements data to be obtained in other

(continued next page)

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: CONRAD 17-04 0140 hours 31 January 1974 (Records 606,607)
Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4800 Sediment Thickness (m): 0.8 sec. Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

SI-7 - OBJECTIVES (Continued):

proposed sites on this leg. The value of a continental rise hole in determining the Neogene and perhaps older history of Antarctica has been demonstrated on Leg 28. This site provides data from another sector of Antarctica, which paleomagnetic data suggest may have been very close to the South Pole in the Oliogene.

(3) To determine the age of the basement. There are two conflicting theories concerning the origin of the oceanic crust in the triangle between Kerguelen and Antarctica. The first has the crust very old (100-120 m.y.b.p.) with magnetic lineations trending northeast-southwest and the crust being formed as India swept away in a northwesterly direction from Antarctica (Sclater and Fisher, 1974). The second has the crust much younger (55-45 m.y.b.p.) and being created by Kerguelen moving away from Antarctica in a northerly direction at the same time as Australia commences to separate from Antarctica. A good basement date should easily resolve this conflict in ideas.

In the alternate sites, the lowest unit is very thin, and great care should be taken to sample it fully. If recovery is good, the upper part of the sequence at least should be continuously cored, so that paleomagnetic interpretation is possible. Leg 28 found it very difficult to get consistent Plio-Pleistocene dates by biostratigraphy. A minimum requirement for interpreting the sedimentary sequence is 50% coring, with good coverage at the boundaries of seismic units.

DSDP/IPOD SITE PROPOSAL

SITE: SI-7A
POSITION:
GENERAL AREA: East Enderby Basin-
Continental Margin Hole

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:
See Site SI-7

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: CONRAD 17-04 0140 hours 31 January 1974 (Records 606,607)

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m):_____ Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated: Anywhere from 000 to 0300 on below record. Basement depth up to 1 sec.

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-7B
POSITION: 61°48'S 56°36'E
GENERAL AREA: East Enderby Basin - Continental Margin Hole

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:

See Site SI-7

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: CONRAD 17-04 0140 hours 31 January 1974 (Records 606,607)

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2625 Sediment Thickness (m): 0.6 sec. Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated: For shallower basement, thinner lower sediment section. 1100 hours on below record.

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-7C
POSITION:
GENERAL AREA: East Enderby Basin - Continental Margin Hole

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:

See Site SI-7

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: CONRAD 17-04 0140 hours 31 January 1974 (Records 606,607)

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2660 Sediment Thickness (m): 0.45-0.50 sec. Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-7D
POSITION: ~64°53'S 37°40'E
GENERAL AREA: East Enderby Basin - Continental Margin Hole

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: As for proposed Site 7, but without the basement objective. Since this alternative site is farther west, it provides more information on the history of Weddell Sea glaciation than does the primary site.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: RC 17-05, Record 796 10 March 1974 2130 hours

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) > 4854 Sediment Thickness (m): 1 sec Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-8
POSITION: 57°51'S 48°42'E
GENERAL AREA: North Enderby Basin

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: The hole may yield significant information concerning the history of the deep water currents in the southern Indian Ocean. This site should also allow us to date the Enderby Basin and to understand its relations with the South Crozet Basin. The 4500m deep South Crozet Basin can be limited to the north by a line which runs through Crozet and Kerguelen Islands, to the south by a succession of topographic highs which are perhaps a structural continuation of Ob and Lena seamounts. South of this line is the 5500m deep Enderby Basin. The South Crozet Basin has been dated by well identified magnetic anomalies, 27 through 33 (Schlich, 1974); the age of the Enderby Basin is unknown. The sharp change in depth may correspond to a hiatus in age.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: Profile M01-17, shot 500 (Flexotir) 30 June 1973 1030 hours

Other Data:

Site Survey Data: Conducted by:

Date:

Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 5350 Sediment Thickness (m): 1000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:

Jurisdiction:

Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-8A
POSITION: 56°15'S 52°E
GENERAL AREA: North Enderby Basin (Alternate to B1)

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Same as SI-8. Basement age here may be just older than anomaly #33. Site is located over crust containing apparently reversed polarity magnetization. Site is also located just south of the marked topographic step (running west-northwest - east-southeast) which passed through anomaly #33 and defines the boundary between the South Crozet Basin and the North Enderby Basin. It is important to ascertain whether this topographic step represents a spreading hiatus or whether a continuous age gradient occurs across it.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: RC 17-05 (Sheet #892) 26 March 1974 1130 hours

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 5350 Sediment Thickness (m): 0.4 sec. Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-9
POSITION: 46°37.3'S 7°32.8'E
GENERAL AREA: Randy Rise

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Site SI-9 in association with AB2, AB2A, W10, SI1 and SI11 are proposed to study the difference in paleoenvironments between the South Atlantic and Atlantic-Indian Basins. Geophysical data indicates that prior to Middle Eocene time, the Falkland/Agulhas Fracture Zone system formed a continuous ridge from the Falkland/Plateau to the Cape Basin. The Falkland/Agulhas Fracture Zone has a topographic relief of 2 km thereby providing a significant barrier to bottom water circulation between the two basins from the Middle Cretaceous to the Middle Eocene. Site SI-9 is located to study the paleooceanographic effects on changes in water depth of the Randy Rise, particularly those connected with bottom water changes in the early Cenozoic. For further information, see AB2.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2480 Sediment Thickness (m): .5 sec. Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-10
POSITION: 45°36.1'S 8°41'E
GENERAL AREA: Randy Rise

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:

To investigate the changes in sedimentation prior to and after the break in the Falkland/Agulhas system. See notes on AB2 and SI-9.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4386 Sediment Thickness (m): 2 sec/ Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: SI-11
POSITION: 42°S 9°E
GENERAL AREA: Randy Rise

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:

Determine Atlantic Basin paleoenvironmental history for comparison to present. See also notes for SI-9, and SI-10.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles:

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 500 Sediment Thickness (m): 700 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

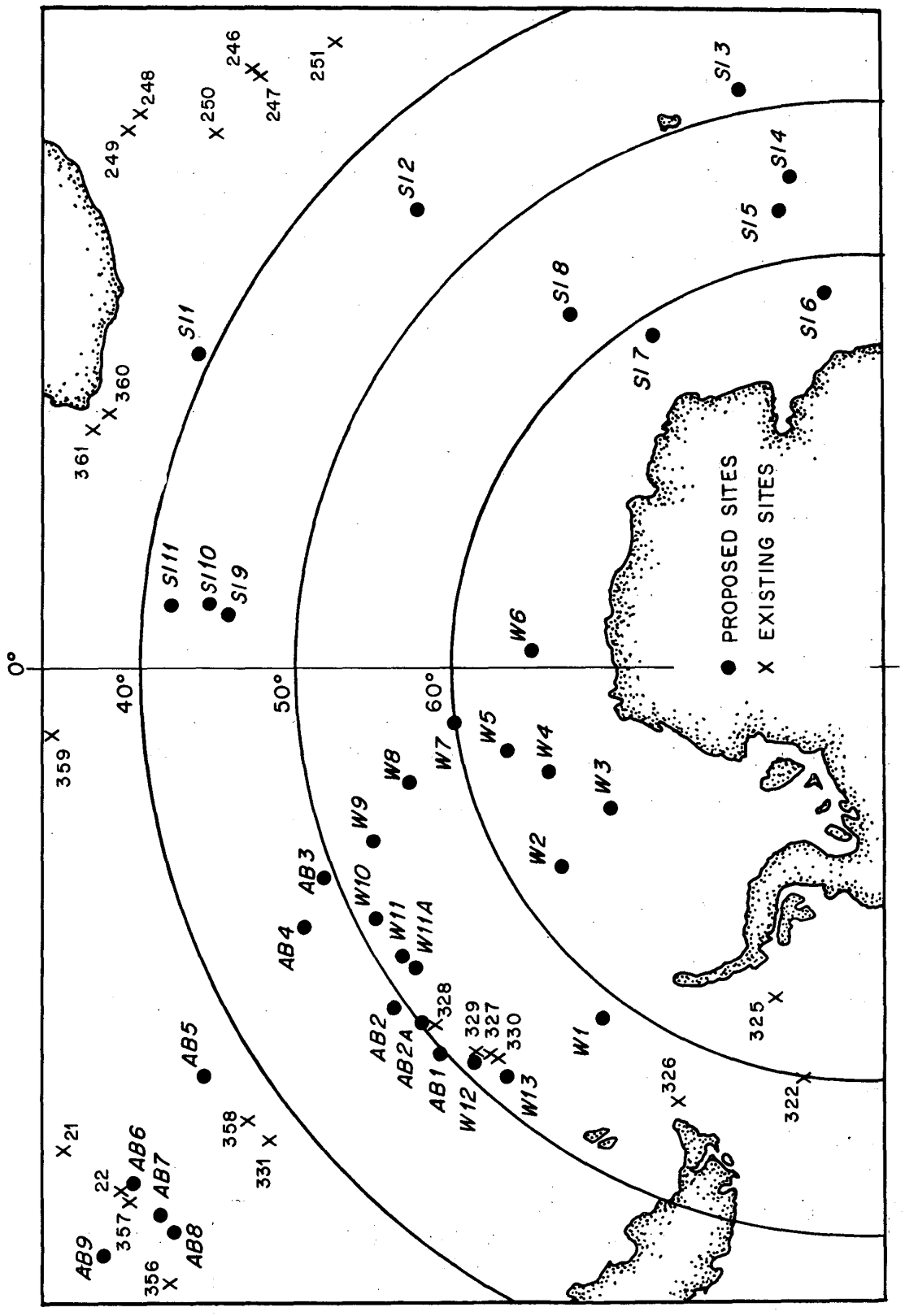
SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review



WEDDELL SEA SITES

DSDP/IPOD SITE PROPOSAL

SITE: W-1
POSITION: 59°40'S 54°00'W
GENERAL AREA: Southeast Drake Passage

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To examine a well-bedded (?biosiliceous) section in the lee of the southern ridge of the Shackleton Fracture Zone. This section spans the estimated time of opening of a deep water gap (circum-polar current) in the Drake Passage. The likely basement age is 29Ma; the age of the development of the deep gap is considered to be 23.5 ± 2.5Ma. The sequence will provide a paleooceanographic history for the Neogene through this gateway and a siliceous biostratigraphic sequence close to West Antarctica.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Birmingham - Shackelton 756 Day 017

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3600 Sediment Thickness (m): 0.9 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-2
POSITION: 64°32'S 31°W
GENERAL AREA: NW Weddell Sea

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: This site is located in the NW Weddell Sea in an optimal position to study the history of bottom water transporting to the north out of the Weddell Sea, a critical area of bottom-water formation. The site will provide information on glacial and climatic history and biogeographic development within the Weddell Sea.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Islas Orcadas, 277, 18 February 1977.

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2800 Sediment Thickness (m): 1300 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-3
POSITION: 68°30'S 25° W
GENERAL AREA: Central Weddell Sea

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: This is the southern site on a north-south traverse through the central Weddell Sea which is located to evaluate ice-rafting history in relation to the clockwise gyre of the Weddell Sea; explosive volcanic history of the South Sandwich Islands; bottom-water flow northwards out of the Weddell Sea; and benthonic and planktonic biogeographic changes associated with the northward decreasing geographic isolation of the basin. This history of sedimentation through the Late Mesozoic and Cenozoic can be directly associated with Antarctic climatic change.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Islas Orcadas #195; 10 February 1977

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2600 Sediment Thickness (m): 1000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-4
POSITION: 65°S 20°W
GENERAL AREA: Central Weddell Sea

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:
See notes on W-3.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Islas Orcadas 200, 10 February 1977

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2600 Sediment Thickness (m): 1000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-5
POSITION: 63°S 10°40'W
GENERAL AREA: Central Weddell Sea

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: See notes on W-3.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Islas Orcadas 215, 12 February 1977

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2600 Sediment Thickness (m): 1000 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-6
POSITION: 64°46'S 1°22'E
GENERAL AREA: Maud Rise

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To obtain a late Cenozoic relatively shallow water, calcaceous sequence in present day Antarctic waters which has been deposited adjacent to the Antarctic continent. The sequence will provide information on the oxygen isotopic, climatic, glacial biogenic sedimentological, and biogeographic history of Antarctic waters. Such information from the South Atlantic sector can be compared with that obtained from the Indian Ocean section on the Southern Kerguelen Plateau.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: 2000 on 2 February 1977, Islas Orcadas 1277

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 3000 Sediment Thickness (m): 0.5 sec. Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-7
POSITION: 60°S 8°W
GENERAL AREA: North Central Weddell Sea

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:

See notes on W-3.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: To be obtained in early 1978 from Islas Orcadas.

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m)_____ Sediment Thickness (m):_____ Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):_____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-8
POSITION: 57°S 15°W
GENERAL AREA: West Side, Southern Mid-Atlantic Ridge

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: This site together with W9, AB3 and AB4 is located in a north-south transect in an area in the South Atlantic away from zonal ridge crest topography. To establish a history of long term development and latitudinal migration of the polar front. The site is also located such as to be of value in studying bottom-water history north from the Weddell Sea and for examining explosive volcanic history of the Scotia Ridge.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: To be provided Lamont-Doherty Islas Orcadas 11.76.

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4500 Sediment Thickness (m): 0.3 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-9
POSITION: 53°S 19°W
GENERAL AREA: West Side-Southern Mid Atlantic Ridge

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES:

See notes on Site W-8.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: To be provided Lamont-Doherty RC 11.03.

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 4500 Sediment Thickness (m): 0.3 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-10
POSITION: 51.5°S 26°W
GENERAL AREA: Islas Orcadas Rise

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: This site is located in a sediment pond on the Islas Orcadas Rise. At the time of formation this rise was approximately at sea level and has subsequently subsided. For a good deal of the time during its history, this rise has remained above the CCD. The purpose of this site is, in addition to several others proposed for this region, to compare and contrast the paleoenvironmental history between the South Atlantic and Atlantic-Indian basins, which were separated prior to the Middle Eocene by the Falkland/Agulhas Fracture Zone. The objective of this site is to provide paleoenvironmental history in relatively shallow water during Cenozoic in the South Atlantic basin north of the fracture zone.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: Islas Orcadas, 21 November 1975, 0500-0600.

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 3000 Sediment Thickness (m): 500 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-11
POSITION: 51°51'S 33°50'W
GENERAL AREA: Northeast Georgia Rise

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: Sites W11A and W11 are being proposed to determine the evolutionary history of the Northeast Georgia Rise. Briefly the N.E. Georgia Rise lies upon the same isochron as the Agulhas Plateau. In reconstructions of S.A. Africa the N.E. Georgia Rise and the Agulhas Plateau share a common position at Aptian time and therefore probably share a common origin. During the late Tertiary S. Georgia moved eastward with respect to the S. American Plate. The northeast Georgia Rise was probably further deformed at this time. Therefore a drilling program at the northeast Georgia Rise would define the eastward motion of South Georgia and perhaps lead to a further understanding of the Agulhas Plateau.

BACKGROUND INFORMATION:

Regional Data:

Seismic Profiles: Islas Orcadas 07-75, 25 November, 2345 hours.

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:

Water Depth (m) 1350 Sediment Thickness (m): 500 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-12
POSITION: 50°33'S 47°18'W
GENERAL AREA: Maurice Ewing Bank of Falkland Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: The objectives of this site are the same as for ABl... This site is an alternate to ABl, but is located slightly south of 50°S. It would be preferred because of the availability of more precise seismic records, piston and drill core data. Furthermore, the site is better located than ABl to fulfill the various objectives as it is more centrally located in the sedimentary sequences of interest.

BACKGROUND INFORMATION:
Regional Data:
Seismic Profiles: Robert Conrad 16-06, 3 February, 0440 hours.

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) ~2000 Sediment Thickness (m): ~650 Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m): _____ _____

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review

DSDP/IPOD SITE PROPOSAL

SITE: W-13
POSITION: 52°S 47°W
GENERAL AREA: Southern Margin of the Eastern Falkland Plateau

GENERAL OBJECTIVE:

PANEL INTEREST: OPP

OBJECTIVES: To delineate and define the Mesozoic tectonic provinces of the Falkland Plateau (example, basinal vs. shelf) in order to allow accurate reconstruction of pre-drift Gondwanaland as well as an understanding of the subsequent stages of the breakup history and subsidence history of the Falkland Plateau. This site is within the "Basin Province" of the Falkland Plateau. The basement here was already 2km below sea level at the time of the Oxfordian-M. Jurassic marine transgression at Site 330. This was probably the northern boundary of the Weddell Sea before the Scotia Sea formed during the Cenozoic. We expect a basal early-middle Jurassic shallow section, perhaps volcanogenic sediments if the Weddell

BACKGROUND INFORMATION:
(continued next page)

Regional Data:
Seismic Profiles: ROBERT CONRAD 16-06, 3 February 0440 hours

Other Data:

Site Survey Data: Conducted by:

Date:
Main Results:

OPERATIONAL CONSIDERATIONS:
Water Depth (m) 2600 Sediment Thickness (m): 1.8 seconds Total Time on Site (days)

Single Bit -- Re-entry Total Penetration (m):

Nature of Sediments Anticipated:

Weather Conditions:
Jurisdiction:
Other:

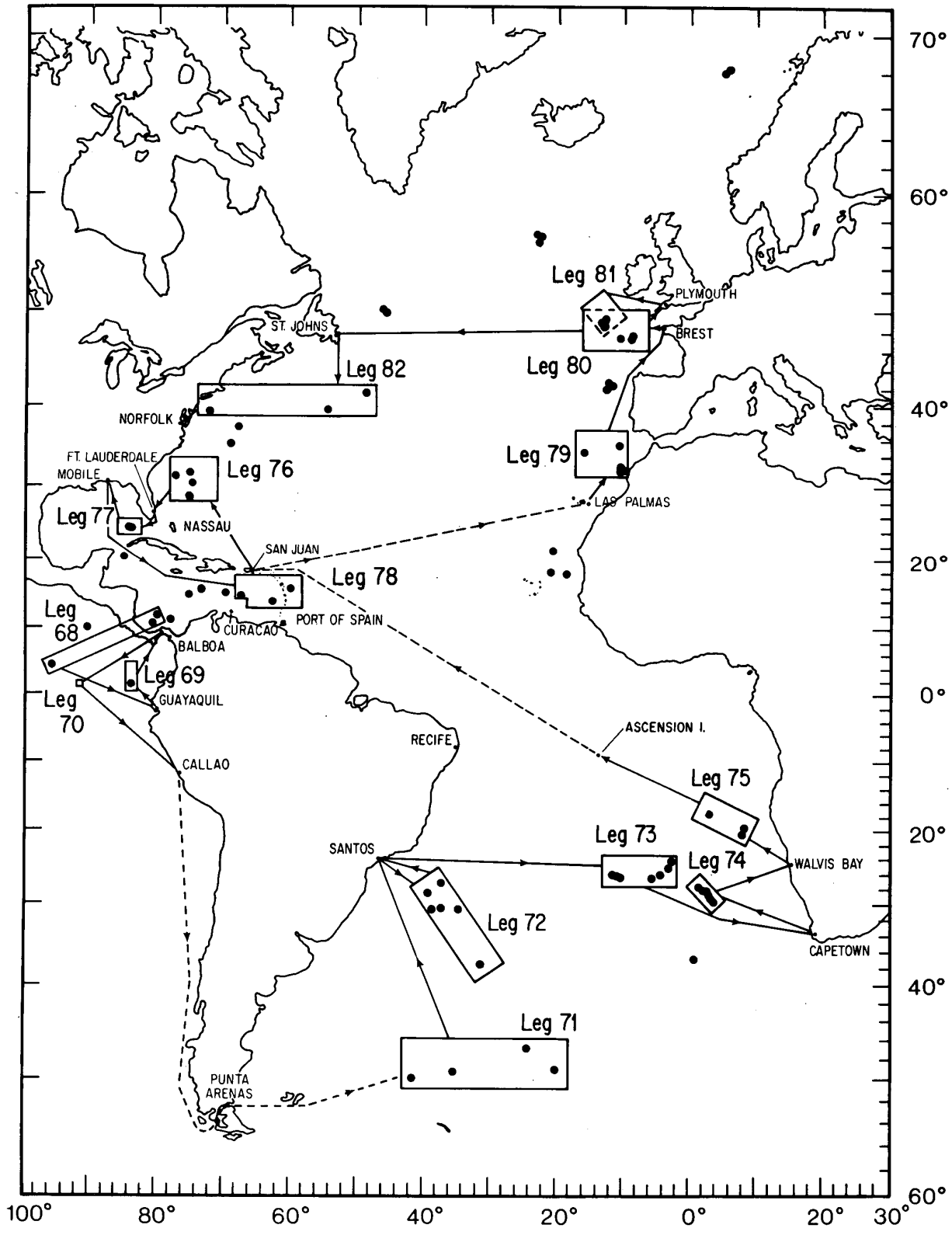
SCIENTIFIC REQUIREMENTS: Staffing Special Analyses

Shipboard:

Shoreboard:

Shorebased:

STATUS OF PROPOSAL Liaison Officer or Proponent	Panel(s) Endorsement	PCOM Endorsement	Safety Review



PROPOSED ATLANTIC SCHEDULE

SITE W-13 - OBJECTIVES (Continued):

Sea is back-arc, then sediments indicating a restricted basin to Aptian times and then an expanded Late Cretaceous section (cf. 327, 330). Sediments are probably about Eocene in age at surface, because of non-deposition following Drake Passage opening. Thus, this site may provide a good high latitude Mesozoic section for biogeographic comparisons with other basins.