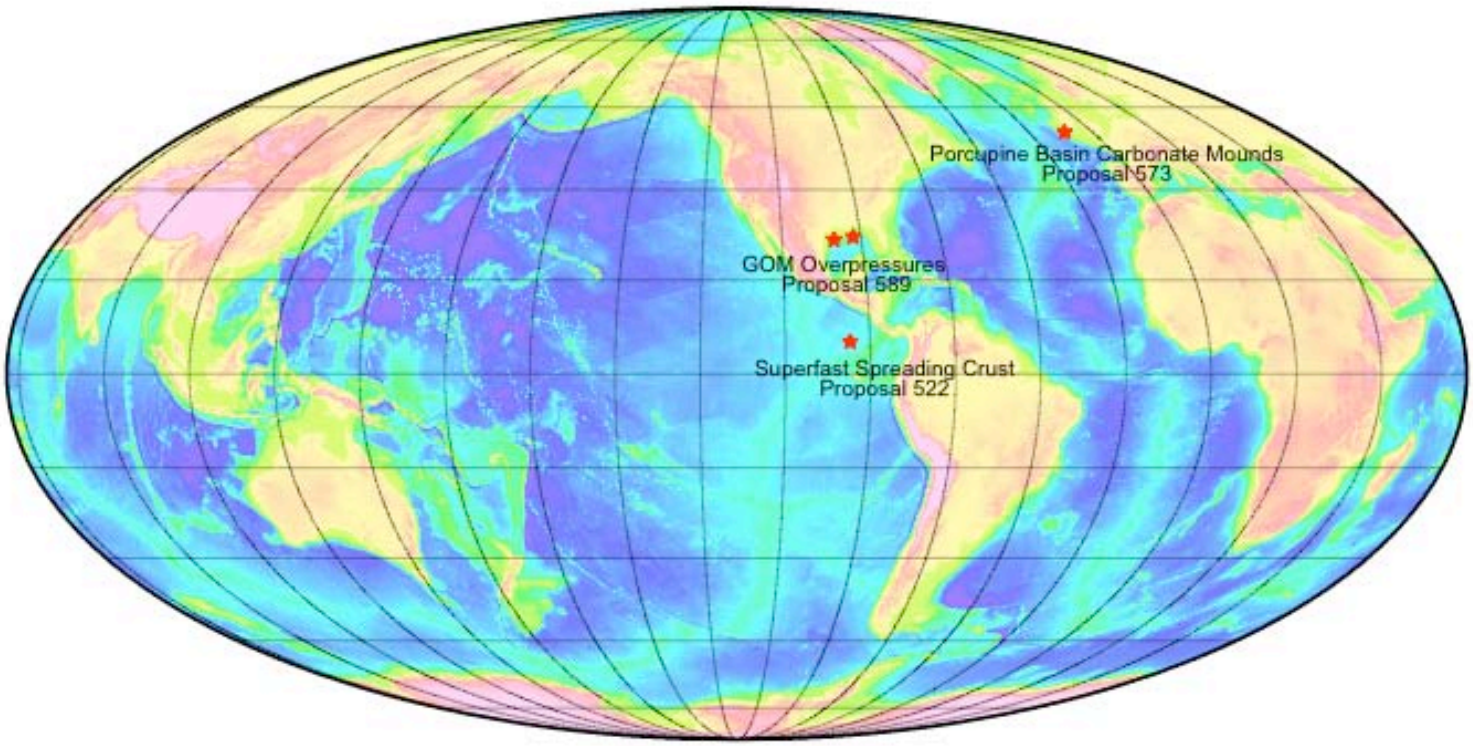
参考資料１

FY05 Program Plan Addendum for the Integrated Ocean Drilling Program (IODP)

For Time Period
1 October 2004 through 30 September 2005



A) PREFACE

This document represents an addendum to the IODP FY05 Program Plan for the second operational year of the Integrated Ocean Drilling Program (IODP). The Plan contains the scientific rationale for additional non-riser vessel (*JOIDES Resolution*) operations, spanning from May 2005 to September 2005

The science presented in this Program Plan is primarily the product of a ranking exercise of the Science Planning Committee of the IODP Science Advisory Structure that took place in June 2004. The IODP-MI Operations committee developed several operational schedules based upon this ranking and the SPC approved the schedule presented in the Program Plan addendum, which includes the Porcupine Carbonate Mounds, Gulf of Mexico Hydrogeology and Superfast Spreading.

DOCUMENT STRUCTURE

The **Executive Summary** contains three sections: the first provides a short introduction to this Program Plan Addendum. The second section provides a description of the scientific operations and associated activities for the FY05 addendum field programs. The third section provides summary budget information.

The **Program Plan** contains four major sections. the first provides a short introduction to this Program Plan Addendum.. The second section describes the planning process leading to the development of the FY05 addendum operational schedule. The third section is a description of the scientific and operational aspects of the FY05 addendum expeditions. The fourth section summarizes the specific budget for the FY05 addendum as welll as the overall budget for FY05 (detailed budgets from the JOI Alliance are presented in the appendices

Appendix A provides budget tables formatted to comply with Lead Agency Requests.

Appendix B provides detailed budgets submitted by the JOI Alliance.

B) FY05 PROGRAM PLAN ADDENDUM – EXECUTIVE SUMMARY

INTRODUCTION

This FY05 Program Plan Addendum completes the scope of work for Integrated Ocean Drilling Program (IODP) activities for the current fiscal year (FY05). This addendum, which represents an extension of USIO operations in FY05, is based on the current mission forecast from the Lead Agencies. The IODP Science Advisory Structure (SAS) has reviewed and prioritized science proposals submitted to the IODP and has recommended the operations schedule that is presented in this Program Plan Addendum, reflecting the requirements of the IODP for the near term (1–2 years).

The cost breakdown for this FY05 Program Plan Addendum is a request to IODP-MI for $3,635,662 in Science Operation Costs (SOC) expenses and a request to NSF for $16,405,930 in Platform Operations Costs (POC) expenses

FY05 ADDENDUM EXPEDITION DESCRIPTIONS

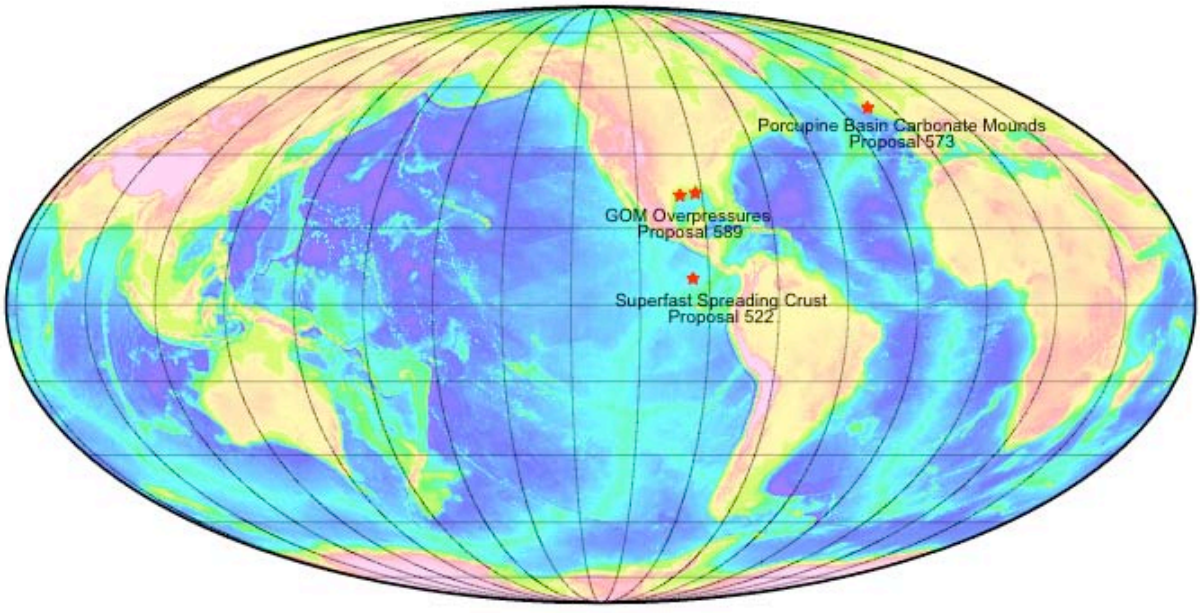


Figure PP_ADD_ES-1; *Locations of FY05 Addendum Expeditions*

Specific details concerning science operations for the FY05 addendum operations are presented in the Program Plan (pgs 8-16 of this document). The table and descriptions below provide a brief summary of these new operations.

Table PP_ADD_ES-1: *Current FY05 Schedule. Shaded areas highlight programs proposed in this FY05 Program Plan Addendum.*

Cruise		Port (Origin)	Dates[1,2]	Total Days (Port/Sea)	Days at Sea (Transit[3]/ Ops[4])	Co-Chief Scientists
RISERLESS-UISO Operations						
Oceanic Core Complex 1	304	Ponta Delgada	17 November '04 – 8 January '05	52 (5/47)	7/40	Donna Blackman Barbara John
Oceanic Core Complex 2	305	Ponta Delgada	8 January – 2 March	53 (5/48)	7/41	Benoit Ildefonse Yasuhiko Ohara
North Atlantic Climate 2	306	Ponta Delgada	2 March – 26 April	55 (5/50)	5/45	Toshiya Kanamatsu Rudiger Stein
Porcupine Carbonate Mounds		Dublin	26 April – 31 May[5]	35 (6/29)	19/10	TBN
Gulf of Mexico Hydrogeology		Mobile	31 May – 6 July[6]	36 (5/31)	11/20	TBN
Superfast Spreading 1		Balboa	6 July – 24 August	49 (5/44)	6/38	TBN
Superfast Spreading 2[7]		Balboa	24 August – 11 October	48 (5/43)	6/37	TBN
MSP- ESO Operations						
Tahiti Seal Level						Yasufumi Iryu Gilbert Camoin

Notes:
[1] Ship is scheduled to arrive 0600 hr on first day of port call.
[2] Initial cruise date reflects first day of port call; ship sails when ready.
[3] Transit = Estimated time to/from port to the operating area.
[4] Ops = Operations (includes both on-site and between-site time).
[5] Scientists scheduled to disembark in Ponta Delgada on xx May.
[6] Scientists scheduled to disembark in Christobal on xx July.
[7] Superfast Spreading 2 will be finalized once the FY06 program is determined.

Porcupine Carbonate Mounds

This program is a multidisciplinary research program to evaluate the role of carbonate mound genesis and its significance. The primary scientific objective is to core one of a series of giant mounds on the present seabed surface southwest of Ireland (Porcupine Basin). The mounds are 200 to 250 m high and form a cluster of over a thousand buried reefs embedded in drift deposits. The "Porcupine Drilling Project" is driven by four major research projects funded under the 5th Framework Programme of the European Union and is thus of international, multidisciplinary interest. Major objectives include

understanding (1) the role of gas seeps as a prime trigger for mound genesis, (2) the role of bacteria as main mound builders, (3) the role of reef-forming corals as a major part of the mound community and their environmental record, (4) the significance of mound "events" in the paleoenvironmental record, (5) the identification of prominent erosional surfaces as products of global oceanic turnovers, (6) the potential of mounds as a high-resolution paleoenvironmental record, (7) the value of the Porcupine-Rockall mounds as present day analogs for older reef mounds and carbonate mud mounds found in the geologic record, and (8) the potential role of fluid flow as a common source of both slope failures and mound growth.

Proposed Operations

Multiple holes will be drilled at three sites on Challenger mound in the Belgica mound province. The holes will be cored and logged to a depth of approximately 300 m below the sea floor. The emphasis of this expedition will be on sediment core recovery and analysis. Each site will be double cored with the advanced piston corer (APC) to assure recovery of the complete sediment section. Heavy use of the APC temperature (APCT) tool (also known as the Adara temperature tool), the Davis-Villinger Temperature Probe (DVTP), and the Well Seismic Tool (WST) can be expected, along with significant microbiological sampling.

Gulf of Mexico Hydrogeology

The primary objective of this expedition is to characterized overpressure and fluid-flow processes in the deepwater Gulf of Mexico. Two sites will be drilled in the normally pressured Brazos-Trinity Basin 4 in order to characterize rock and fluid properties and in situ conditions at a range of known effective stress conditions. Then two sites will be occupied in the Ursa Basin to characterize rock and fluid properties in an overpressured environment. Drilling in the Ursa Basin during this expedition will be limited to less than 300 m (i.e., about 150 m above the "Blue" horizon marking the top of the overpressured zone).

Proposed Operations

Each site will be multiple APC cored to assure recovery of the complete sediment section. Standard wireline logging will be conducted at each site. In situ measurements will include logging while drilling and piezoprobe experiments. A vertical seismic profile (VSP) is planned at each site. vii

Superfast Spreading

Expeditions ODP Leg 206 resulted, for the first time in scientific ocean drilling, in the successful construction of the borehole infrastructure required for deep drilling into the

ocean basement. The Superfast Spreading 1 and 2 Expeditions are the second part of a two-stage drilling strategy to deepen and log the full depth extent of Hole 1256B and recover a complete data section of the upper oceanic crust formed at a superfast spreading rate (>200 m/yr). The observed relationship between ocean ridge spreading rate and the depth to axial low-velocity zones, interpreted to be melt lenses, predicts that the dike–gabbro transition should be at its shallowest in crust formed at superfast spreading rates. Gabbros are predicted to occur at the depth range 900 to 1300 msbf. These expeditions will address important issues related to the structure of the oceanic crust, alteration processes, and geochemical budgets, as well as igneous and structural processes involved in the construction of the crust. In addition, the temperature logs will aid in studying the effects of temperature on the extent of microbial activity, as microbial alteration of volcanic glass decreases with basement depth at other sites. The temperature and depth limits to subbasement microbiological activity are not well defined.

Proposed Operations

From on operational standpoint, these will be routine hard rock expeditions. During ODP Leg 206, Hole 1256B was cased into basement and cored 500 m into basement. The hole was left clean and open for further deepening. The Superfast Spreading 1 and 2 Expeditions will deepen Hole 1256B by RCB coring to the maximum depth possible. The hole will be logged with standard tool strings. Significant microbiological sampling is expected as we continue to probe the depth of the deep crustal biosphere.

FY05 ADDENDUM BUDGETS

This Program Plan Addendum budget identifies additional program costs for the JOI Alliance of $20,041, 592 (see **Table PP_ADD_ES-2**), to meet the high-priority needs identified by the SAS. Of this cost, 18.1% is considered to be Science Operation Costs (SOCs) and the remaining 81.9% is Platform Operation Costs (POCs). The JOI Alliance FY05 Addendum Budget of $20,041,592 mainly includes support for four additional expeditions in FY05 including Porcupine Carbonate Mounds, Gulf of Mexico Hydrogeology and Superfast Spreading 1 and 2 .

	IODP-MI		IODP-MI Operators & Subcontracts				Totals
	Washington DC	Sapporo	JOI-Alliance	CDEX	ESO	Bremen	
SOCs	$ -	$ -	$ 3,635,662	$ -	$ -	$ -	$ 3,635,662
POCs	$ -	$ -	$ 16,405,930	$ -	$ -	$ -	$ 16,405,930
Total	$ -	$ -	$ 20,041,592	$ -	$ -	$ -	$ 20,041,592

Table PP_ADD_ES-2: *Summary Budgets for the FY05 Program Plan Addendum*

Budget Process – Science Operation Costs

Detailed budgets for Science Operation Costs were submitted to IODP-MI by the USIO (JOI Alliance) for the FY05 addendum and are presented below in (**Table PP_ADD_ES-3**).

	IODP-MI		IODP-MI Operators & Subcontracts				Total SOC
	D.C.	Sapporo	JOI-Alliance	CDEX	ESO	Bremen	Total
Management & Administration	$ -	$ -	$ 156,131	$ -	$ -	$ -	$ -
Site Survey Data Bank	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Support for Science Advisory Structure	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Engineering Development	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Technical, Engineering & Science Support	$ -	$ -	$ 1,972,949	$ -	$ -	$ -	$ -
Core Curation	$ -	$ -	$ 54,383	$ -	$ -	$ -	$ -
Data Management	$ -	$ -	$ 183,558	$ -	$ -	$ -	$ -
Publications	$ -	$ -	$ 16,788	$ -	$ -	$ -	$ -
Logging	$ -	$ -	$ 1,251,853	$ -	$ -	$ -	$ -
Education & Outreach	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	**$ -**	**$ -**	**$ 3,635,662**	**$ -**	**$ -**	**$ -**	**$ 3,635,662**

Table PP_ADD_ES-3: *IODP-MI, Operator, and subcontractor activity for FY05 Addendum (SOCs) only.*

C) FY05 PROGRAM PLAN ADDENDUM

INTRODUCTION

This FY05 Program Plan Addendum completes the scope of work for Integrated Ocean Drilling Program (IODP) activities for the current fiscal year (FY05). This addendum, which represents an extension of USIO operations in FY05, is based on the current mission forecast from the Lead Agencies. The IODP Science Advisory Structure (SAS) has reviewed and prioritized science proposals submitted to the IODP and has recommended the operations schedule that is presented in this Program Plan Addendum, reflecting the requirements of the IODP for the near term (1–2 years).

IODP Management International, Inc. [IODP-MI]), with input from IODP funding agencies (U.S. National Science Foundation [NSF], Japanese Ministry of Education, Culture, Sports, Science and Technology [MEXT], European Consortium for Ocean Drilling Research [ECORD] Management Agency [EMA], and Ministry of Science and Technology [MOST], People's Republic of China), have provided guidance and instruction to the IODP-USIO (the JOI Alliance) on the preparation of the USIO contribution to the IODP FY05 Program Plan Addendum.

The cost breakdown for this FY05 Program Plan Addendum is a request to IODP-MI for $3,635,662 in Science Operation Costs (SOC) expenses and a request to NSF for $16,405,930 in Platform Operations Costs (POC) expenses.

FY5 PROGRAM PLAN ADDENDUM OPERATIONAL DEVELOPMENT

Ranking of Proposals

At its June 2004 meeting, SPC committee reviewed nineteen drilling proposals in the order specified below, with the proposals grouped according to the three main themes of the IODP Initial Science Plan. For each proposal, the lead watchdog presented the scientific objectives, the committee discussed the objectives in detail, and the SSEPs co-chairs offered a final assessment of the scientific priority as determined by the SSEPs.

Proposal	Short title	Watchdogs	Conflicts
Deep Biosphere and Subseafloor Ocean			
547-Full4	Oceanic Subsurface Biosphere	Kato/Moore/Ito	None
553-Full2	Cascadia Margin Hydrates	Kato/Ito/Moore	None
555-Full3	Cretan Margin	MacLeod/Duncan/Ito	None
557-Full2	Storegga Slide Gas Hydrates	Miller/Tatsumi/Mori	None
573-Full2	Porcupine Basin Carbonate Mounds	Kenter/Quinn/Saito	None
584-Full2	TAG II Hydrothermal	Tatsumi/Kawahata/Brumsack	None
621-Full	Monterey Bay Observatory	Ito/Becker/Kato	None

Environmental Change, Processes, and Effects

477-Full4	Okhotsk/Bering Plio-Pleistocene	Kawahata/Brumsack/Moore	None
482-Full3	Wilkes Land Margin	Moore/Saito/Miller	None
548-Full2	Chicxulub K-T Impact Crater	Brumsack/Mori/Filippelli	None
581-Full2	Late Pleistocene Coralgal Banks	Quinn/Kenter/Kawahata	None
595-Full3	Indus Fan and Murray Ridge	Filippelli/Saito/Quinn	None
600-Full	Canterbury Basin	Filippelli/Miller/Kawahata	None

Solid Earth Cycles and Geodynamics

522-Full3	Superfast Spreading Crust	Duncan/MacLeod/Kenter	None
537-CDP4	CRISP Overview	Ildefonse/Mori/Austin	None
537A-Full3	CRISP Stage 1	Mori/MacLeod/Duncan	Suyehiro
603-CDP3	NanTroSEIZE Overview	Austin/Ildefonse/Tatsumi	Soh
603A-Full2	NanTroSEIZE Phase 1	Ildefonse/Austin/MacLeod	Soh
603B-Full2	NanTroSEIZE Phase 2	Tatsumi/Austin/Ildefonse	None

The committee agreed to rank the individual CDP components separately within the context of their associated overarching CDP proposal. The committee decided without debate to include Proposals 477-Full4, 482-Full3, 522-Full3, 547-Full4, 553-Full2, 555-Full3, 557-Full2, 584-Full2, 600-Full, 603A-Full2, and 603B-Full2 in the pool for global ranking.

The committee considered not ranking Proposal 537A-Full3 because of the critical scientific concerns raised earlier. Members worried that the project could rank high enough to go to OPCOM even though they regarded it as not ready for drilling. The committee considered limiting the scope of Proposal 573-Full2 before ranking it but decided to follow the precedent from the previous ranking exercise and rank the science of the whole proposal and then determine whether to forward only part of it to OPCOM for scheduling. The committee decided the same for Proposal 581-Full2 after initially considering to limit its scope or split it into two pieces before ranking it.

The committee believed that Proposal 548-Full2 clearly would not compete well in the ranking because it still lacked sufficient site-survey data, and members worried that another low ranking could seriously damage it. The committee suggested that the proponents needed better imaging to improve their model and recognized that if the proponents revised the proposal as intended then it had to return to the SSEPs.

SPC Consensus 0406-13: In view of recent ICDP drilling of the Chicxulub impact structure and planned geophysical work, the SPC decides to exclude Proposal 548-Full2 from the current pool of proposals for global scientific ranking. The committee suggests that the proponents organize a joint IODP/ICDP workshop to discuss major scientific questions related to the Chicxulub impact structure, once new seismic data from onshore and offshore become available. The major goal of such a workshop should be to specify the drilling targets evolving from the latest cratering models and recent ICDP drilling,

and to locate the best sites required to test the hypotheses and fulfill the scientific objectives of Proposal 548-Full2.

The SPC Chair recommended forwarding Proposal 621-Full to OPCOM without ranking it. He also suggested removing the scientific component to decrease the operational time and expense. The committee agreed, while recognizing that an engineering expedition could always have a small science party attached.

SPC Consensus 0406-14: The SPC recognizes the importance of installing borehole observatories within the Monterey Accelerated Research System (MARS) facility as described in Proposal 621-Full Monterey Bay Observatory. The strength of this proposal lies in the engineering investment for developing future borehole observatories and for integrating such observatories into cabled seafloor observatories. In that context, the committee deems it inappropriate to evaluate this proposal using the same scientific criteria as for other proposals and therefore decides not to include it in the current pool of proposals for global scientific ranking. Instead the SPC forwards Proposal 621-Full directly to OPCOM for possible scheduling of the engineering effort in FY2005 or FY2006. The committee requests that OPCOM provide a report and recommendation at the October 2004 SPC meeting. At that meeting, the SPC anticipates augmenting the June 2004 groupings of scientific proposals, without re-ranking, including consideration of Proposal 621-Full. The SPC also requests the SciMP and the TAP to work with MBARI and other proponents in developing a draft plan for managing the MARS-IODP borehole test facility. The SciMP and the TAP should submit a joint report for the October 2004 SPC meeting, and the SPC and OPCOM will submit a final report for the December 2004 SPPOC meeting.

Each SPC member assigned the numerical rankings of one to fifteen to the fifteen proposals in the pool. The results are presented below:

Rank	Proposal #	Short Title	Mean	Stdv
1	522-Full3	Superfast Spreading Crust	3.18	2.30
2	603A-Full2	NanTroSEIZE Phase 1	3.47	2.45
3	603B-Full2	NanTroSEIZE Phase 2	3.76	2.77
4	477-Full4	Okhotsk/Bering Plio-Pleistocene	5.12	3.43
5	482-Full3	Wilkes Land Margin	5.94	3.27
6	553-Full2	Cascadia Margin Hydrates	6.35	3.12
7	600-Full	Canterbury Basin	6.88	3.57
8	595Full3	Indus Fun and Murray Ridge	8.82	2.88
9	547-Full4	Oceanic Subsurface Biosphere	9.24	3.99
10	557-Full2	Storegga Slide Gas Hydrates	9.65	4.05
11	581-Full2	Late Pleistocene Coralgal Banks	10.53	2.94
12	584-Full2	TAG II Hydrothermal	10.88	2.96
13	555-Full3	Cretan Margin	11.18	2.24
14	573-Full2	Porcupine Basin Carbonate Mounds	12.06	2.95
15	537A-Full3	CRISP Stage 1	12.94	1.95

After the rankings were established the SPC committee discussed which proposals should be forwarded to OPCOM for scheduling. The following consensus resulted:

SPC Consensus 0406-15 The SPC forwards the top fourteen of fifteen ranked proposals to OPCOM in three groups as follows. The committee requests that OPCOM propose scheduling options for FY2005 and FY2006 that honor and adhere to these ranking groups as closely as possible.

Group I includes the top seven proposals. This group equates in priority to the Group I proposals previously forwarded to OPCOM and currently awaiting scheduling (519-Full2 South Pacific Sea Level, 545-Full3 Juan de Fuca Flank Hydrogeology, 564-Full New Jersey Shelf, and 589-Full3 Gulf of Mexico Overpressures). The committee recommends scheduling the Group I proposals if at all possible within operational constraints.

Group II includes the next three proposals (#8-10). The committee recommends considering these proposals as alternatives only if the Group I proposals cannot fill the schedule.

Group III includes the lower four proposals (#11-14). The committee recommends considering these proposals as alternatives only if those in Groups I and II cannot fill the schedule. Although scheduling should and will be guided primarily by the results of the global scientific ranking, the SPC recommends limiting the drilling options of Proposal 581-Full2 Late Pleistocene Coralgal Banks to several sites around one of the drowned reefs at Southern Bank, while nonetheless addressing as many of the proposed scientific objectives as possible. Likewise, the committee recommends limiting the drilling options of Proposal 573-Full2 Porcupine Basin Carbonate Mounds to several sites around one mound.

SPC Consensus 0406-18: The SPC recommends that OPCOM explore possible scheduling options for FY2005 and FY2006 that would enable coring the two Irminger Basin (IRM) sites of Proposal 572-Full3 North Atlantic Late Neogene-Quaternary Climate without requiring a support vessel. Such possibilities might include rescheduling the second North Atlantic Paleoclimate expedition into the optimal weather window or incorporating the IRM sites into another expedition. If the IRM sites get scheduled, alternate sites should not be drilled on the North Atlantic Paleoclimate expeditions.

Scheduling Proposals by OPCOM and SPC approval.

OPCOM met twice (Sept 30-Oct 1 and Oct 25 to discuss and develop several scheduling option for SPC to consider. The OPCOM scheduling strategy involved the following:

- Examine Proposed Science Plans for each Proposal
- Determine Operational and Environmental Constraints
- Develop matrix that combines science plan with operational and environmental constraints and risk, operational days at sea, and transits
- Add fiscal reality to determine viable options to forward to SPC.

OPCOM was given the following guidance by the lead agencies;

> The Lead Agencies have determined, based upon estimated FY05 IODP Program Plan costs and available funds, that $10M in POC and $2M in SOC will be available for an additional 4 months of JOIDES Resolution
>
> In addition to $10M in POC funds, NSF and the JOI Alliance allocated $4.5M of FY05 demobilization funds to the available POC funds.

OPCOM generated three models that it felt would be feasible given the budgetary and operational constraints:

- Model 1: Porcupine Carbonate Mounds, Gulf of Mexico and Superfast Spreading.
- Model 2: Bering Sea and Monterey
- Model 3: Bering Sea (two expeditions)

Model 1 (**Figure PP_ADD_1**) was developed as a option that minimized transits and maximized the total amount of science (see Expedition Descriptions for more details on the operations proposed for these expeditions). Model 2 presented SPC with an option for highly ranked science (Bering Sea) and the option to establish an engineering test site. Model 3 was presented as the lowest cost option as the Bering Sea operations do not require significant hardware or supplies.

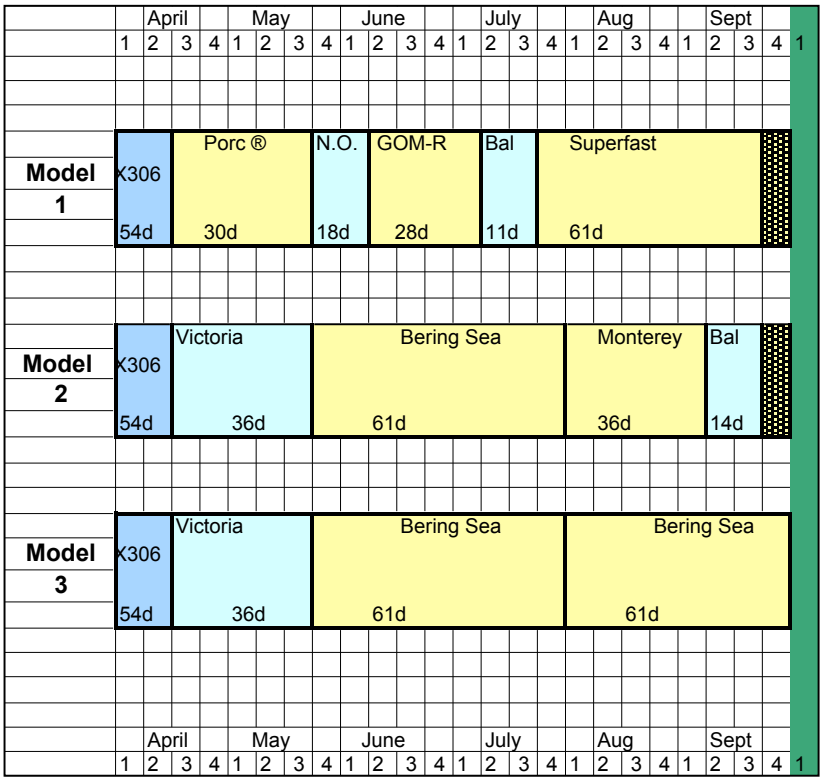


Figure PP_ADD_1: *Scheduling Options prepared by OPCOM*

Each of the Models left SPC with numerous FY06 options (e.g., to go north or south in the Pacific Ocean, depending on the mission forecast and budget projections)

SPC discussed the above options and came to the following consensus:

SPC Motion 0410-33: After considering the scientific priorities previously determined by the SPC and the potential drilling schedules for FY2005 as presented by OPCOM, the SPC recommends Model 1 (Proposal 573-Full2 Porcupine Basin Carbonate Mounds, as modified in 573-PRL5; Proposal 589-Full3 Gulf of Mexico Overpressures as modified in 589-Add; and Proposal 522-Full3 Superfast Spreading Crust) as the preferred option and Model 3 (Proposal 477-Full4 Okhotsk and Bering Seas Paleoceanography, Parts 1 and 2) as a
backup plan.

FINAL FY05 OPERATIONAL SCHEDULE

The revised FY05 operational schedule developed by OPCOM and SPC, which incorporates the changes described above, is provided in **Table P_ADD_1** below :

Table PP_ADD_1: *Current FY05 Schedule. Shaded areas highlight programs proposed in this FY05 Program Plan Addendum.*

Cruise		Port (Origin)	Dates[1,2]	Total Days (Port/Sea)	Days at Sea (Transit[3]/ Ops[4])	Co-Chief Scientists
RISERLESS-UISO Operations						
Oceanic Core Complex 1	304	Ponta Delgada	17 November '04 – 8 January '05	52 (5/47)	7/40	Donna Blackman Barbara John
Oceanic Core Complex 2	305	Ponta Delgada	8 January – 2 March	53 (5/48)	7/41	Benoit Ildefonse Yasuhiko Ohara
North Atlantic Climate 2	306	Ponta Delgada	2 March – 26 April	55 (5/50)	5/45	Toshiya Kanamatsu Rudiger Stein
Porcupine Carbonate Mounds		Dublin	26 April – 31 May[5]	35 (6/29)	19/10	TBN
Gulf of Mexico Hydrogeology		Mobile	31 May – 6 July[6]	36 (5/31)	11/20	TBN
Superfast Spreading 1		Balboa	6 July – 24 August	49 (5/44)	6/38	TBN
Superfast Spreading 2[7]		Balboa	24 August – 11 October	48 (5/43)	6/37	TBN
MSP- ESO Operatoions						
Tahiti Seal Level						Yasufumi Iryu Gilbert Camoin

Notes:
[1] Ship is scheduled to arrive 0600 hr on first day of port call.
[2] Initial cruise date reflects first day of port call; ship sails when ready.
[3] Transit = Estimated time to/from port to the operating area.
[4] Ops = Operations (includes both on-site and between-site time).
[5] Scientists scheduled to disembark in Ponta Delgada on xx May.
[6] Scientists scheduled to disembark in Christobal on xx July.
[7] Superfast Spreading 2 will be finalized once the FY06 program is determined.

FY05 ADDENDUM EXPEDITION DESCRIPTIONS

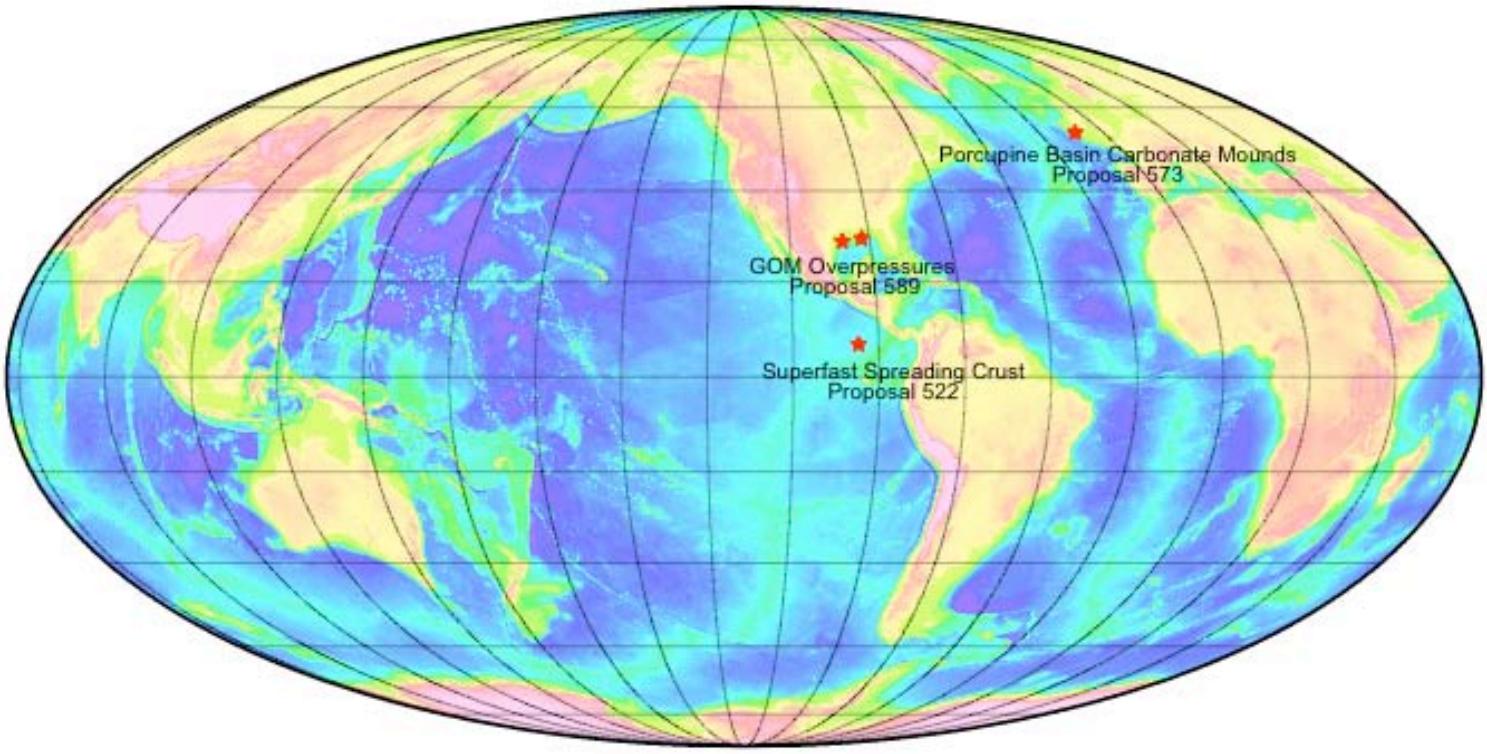


Figure PP_ADD_2; ***Locations of FY05 Addendum Expeditions*:**

Porcupine Carbonate Mounds Expeditions

Expedition	**Porcupine Carbonate Mounds**
Proposal	**573-Full2**
Title	**Modern Carbonate Mounds: Porcupine Drilling**
Proponents	**J.-P. Henriet, B. De Mol, W.-C. Dullo, A. Freiwald, B.B. Joergensen, J. Parkes, J.W. Patching**

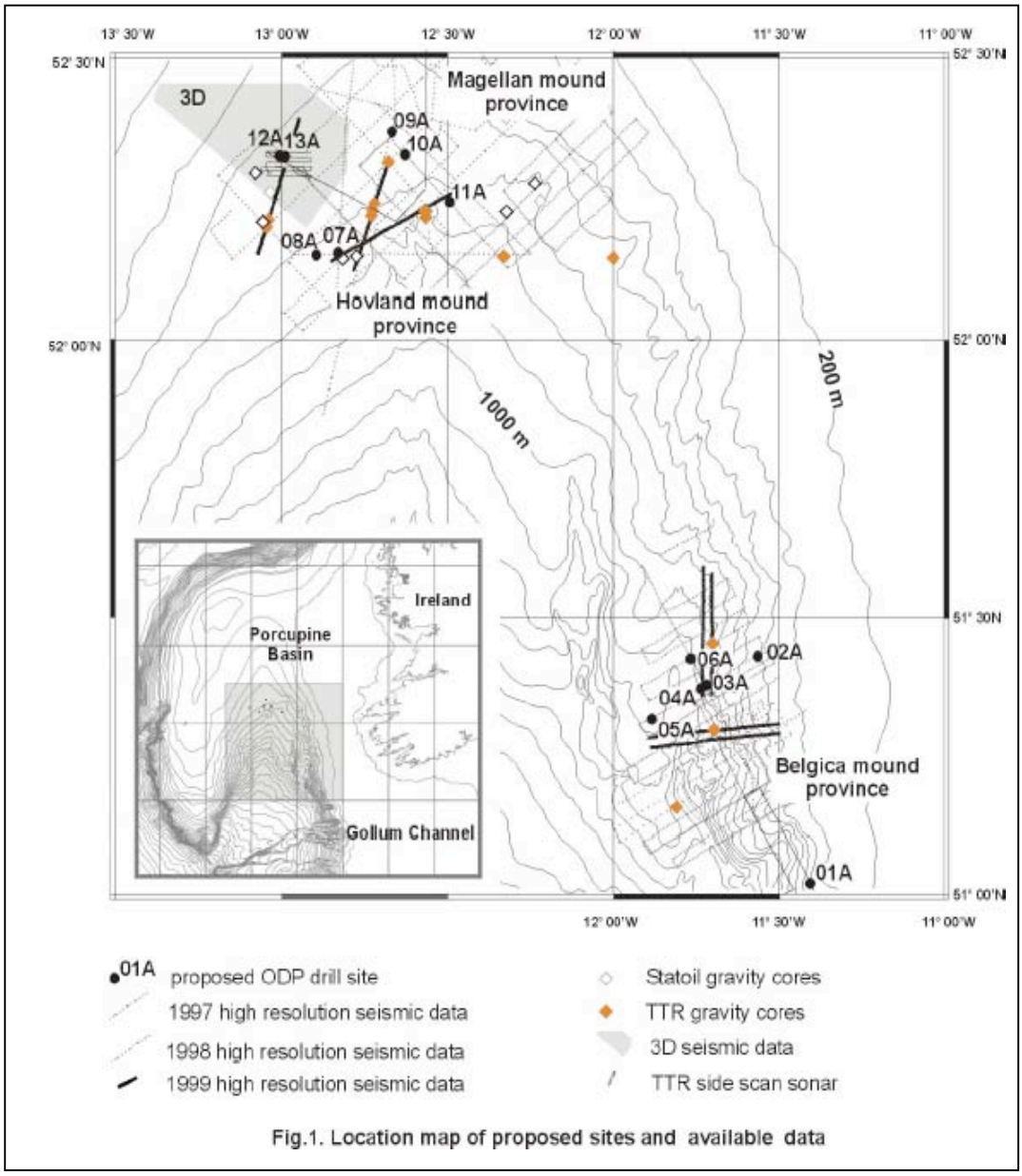


Figure PP_ADD_3: *Location map showing Porcupine Carbonate Mounds Sites*

Science Plan

This program is a multidisciplinary research program to evaluate the role of carbonate mound genesis and its significance. The primary scientific objective is to core one of a series of giant mounds on the present seabed surface southwest of Ireland (Porcupine Basin). The mounds are 200 to 250 m high and form a cluster of over a thousand buried reefs embedded in drift deposits. The "Porcupine Drilling Project" is driven by four major research projects funded under the 5th Framework Programme of the European Union and is thus of international, multidisciplinary interest. Major objectives include understanding (1) the role of gas seeps as a prime trigger for mound genesis, (2) the role

of bacteria as main mound builders, (3) the role of reef-forming corals as a major part of the mound community and their environmental record, (4) the significance of mound "events" in the paleoenvironmental record, (5) the identification of prominent erosional surfaces as products of global oceanic turnovers, (6) the potential of mounds as a high-resolution paleoenvironmental record, (7) the value of the Porcupine-Rockall mounds as present day analogs for older reef mounds and carbonate mud mounds found in the geologic record, and (8) the potential role of fluid flow as a common source of both slope failures and mound growth.

Proposed Operations

Multiple holes will be drilled at three sites on Challenger mound in the Belgica mound province. The holes will be cored and logged to a depth of approximately 300 m below the sea floor. The emphasis of this expedition will be on sediment core recovery and analysis. Each site will be double cored with the advanced piston corer (APC) to assure recovery of the complete sediment section. Heavy use of the APC temperature (APCT) tool (also known as the Adara temperature tool), the Davis-Villinger Temperature Probe (DVTP), and the Well Seismic Tool (WST) can be expected, along with significant microbiological sampling.

Environment and Safety

The expedition falls in the optimum weather window for this region, so operations should not be hampered by bad weather. Since the mounds are believed to be fed by gas seeps from below, gassy cores can be expected.

Logging Operations

Log data will provide in situ physical properties and depth calibration of drift sediments. The triplecombination (triple combo) tool will be used to correlate core depth with hole depth and to gain information about physical properties. Formation MicroScanner (FMS)-sonic and Ultrasonic Borehole Imager (UBI) data will be used to image brecciated facies. From the "velocity pull-up" of the seismic section, some cementation is expected in the mounds. This cementation should be picked up by the triple combo and the FMS-sonic tool strings. In addition, log data will be valuable resources for correlation with high-resolution seismic data. The standard suite of logging tools and the UBI and Well Seismic Tool (WST) are planned for each site.

- The triple combo tool string consists of several probes used to determine contents of K, U, and Th, obtain formation density, and measure photoelectric effect, electrical resistivity, neutron porosity, and temperature.
- The FMS will provide high-resolution borehole electrical images of stratigraphic sequences and boundaries. FMS images can be visually compared with core to ascertain the orientations of bedding and fracture patterns. The FMS should also be able to image the presence of corals within the mounds quite well. The Dipole Sonic Imager (DSI) will produce a full set of waveforms (*P*-, *S*-, Stoneley waves).
- The UBI provides the amplitude and transit time images with 100% borehole wall coverage, which allows detection of small-scale fractures, the shape of the borehole, and

the roughness of the borehole wall. Fractures, breakouts, and lithologic variations can easily be recognized in the UBI amplitude image.
• The WST records acoustic waves generated by an air gun located near the sea surface. The tool provides a complete check shot survey, a depth-traveltime plot, and synthetic seismograms that will be essential for determining in situ velocity profiles and correlating seismic data.

Logistics

The Porcupine Carbonate Mounds Expedition will require an estimated 35 days (6 days in port, 19 days in transit, and 10 on site).

Gulf of Mexico Hydrogeology Expedition

Expedition	**Gulf of Mexico Hydrogeology**
Proposal	**598-Full3**
Title	**Overpressure and Fluid Flow Processes in the Deepwater Gulf of Mexico**
Proponents	**Peter B. Flemings, Alan Huffman, James A. Thomson, Michael O. Maler, Richard E. Swarbrick, Andrew Whittle, Charles Winker**

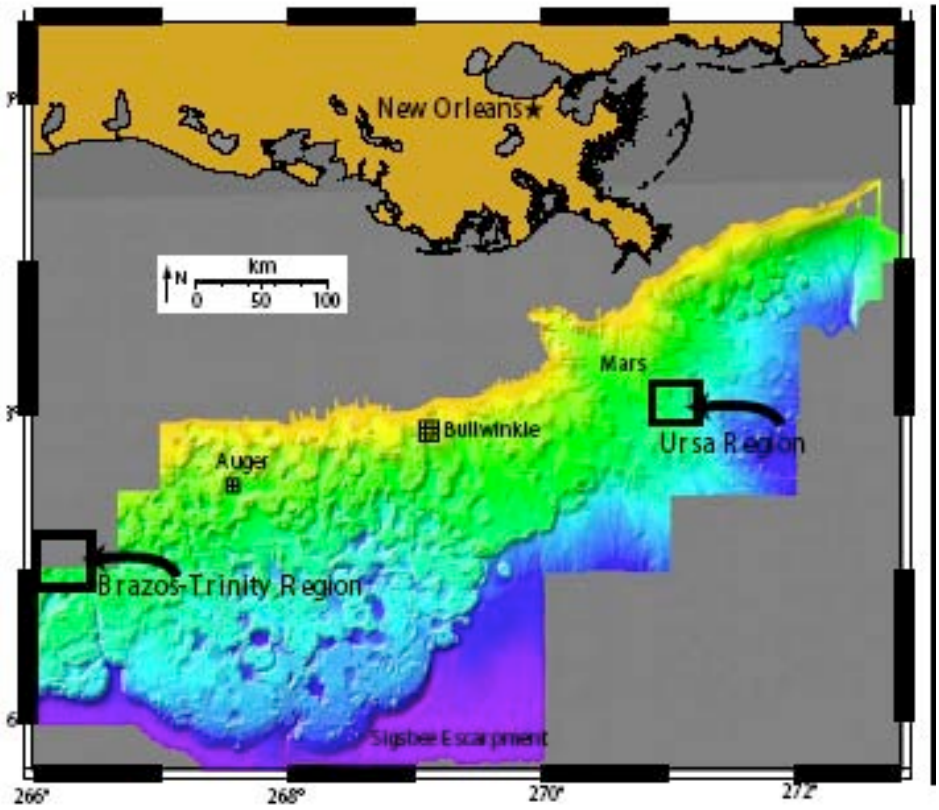


Figure PP_ADD_4: *Location map of Brazos Trinity and Ursa Region Sites For Gulf of Mexico Expedition*

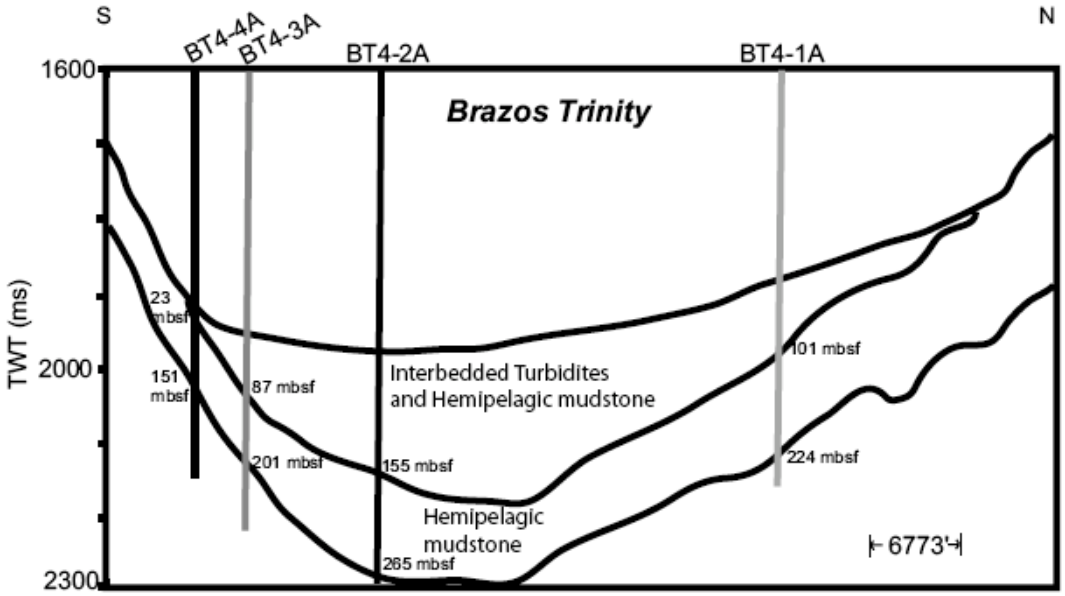


Figure PP_ADD_5: Cross section showing location of primary Brazos Trinity Sites BT4-2A and BT4-4A.

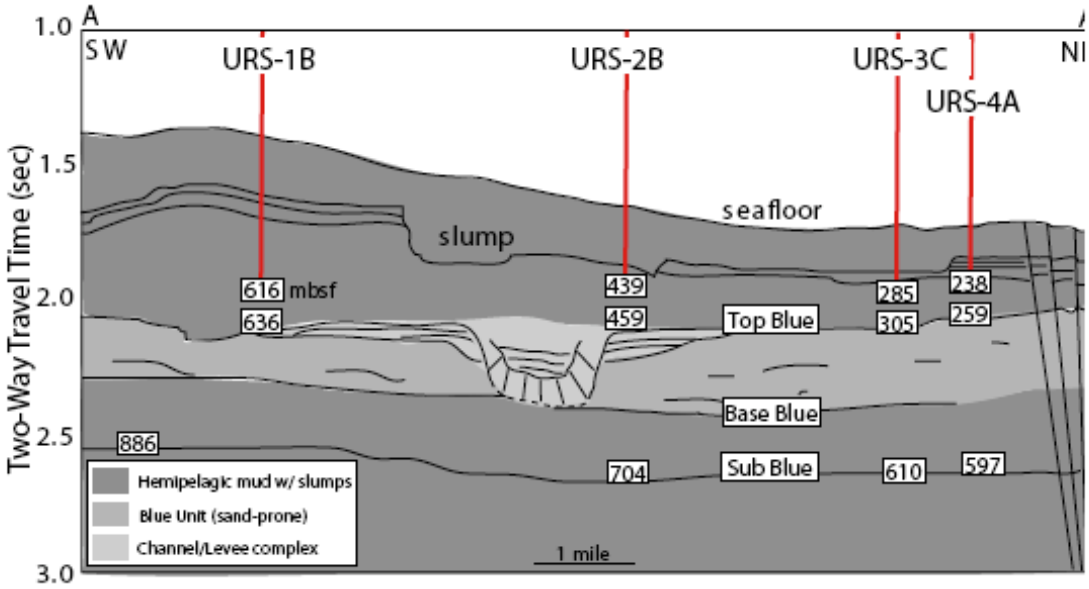


Figure PP_ADD_6: *Cross section showing location of primary Ursa region sites URS-1B and URS-3C*

Science Plan

The primary objective of this expedition is to characterized overpressure and fluid-flow

processes in the deepwater Gulf of Mexico. Two sites will be drilled in the normally pressured Brazos-Trinity Basin 4 in order to characterize rock and fluid properties and in situ conditions at a range of known effective stress conditions. Then two sites will be occupied in the Ursa Basin to characterize rock and fluid properties in an overpressured environment. Drilling in the Ursa Basin during this expedition will be limited to less than 300 m (i.e., about 150 m above the "Blue" horizon marking the top of the overpressured zone).

Proposed Operations

Each site will be multiple APC cored to assure recovery of the complete sediment section. Standard wireline logging will be conducted at each site. In situ measurements will include logging while drilling and piezoprobe experiments. A vertical seismic profile (VSP) is planned at each site. vii

Environment and Safety

Potential problems include hole instability and gas or fluid flows. To mitigate these, a careful independent analysis of the existing seismic data will be conducted to ensure sites are located in areas of minimal risk, and a supply of heavy mud will be available to kill any flows encountered. Clays can be expected to cause holes to swell closed, making standard logging difficult and increasing the risk of stuck pipe. The sites planned for the Gulf of Mexico Hydrogeology Expedition are close to existing oilfield installations and pipelines, requiring a careful survey of the seafloor at each site before drilling commences. The VSP work will require operating under existing IODP guidelines to mitigate potential impacts on marine mammals.

Logging Operations

Successfully meeting science objectives in the targeted Gulf of Mexico rocks requires the use of both wireline and logging while drilling (LWD) logging tools. Anticipated hole stability problems will require the drilling of dedicated LWD holes at the four sites, (BT4-1A, BT4-2A, URS-1B, URS-2B) which will be accomplished during a 10 day miniexpedition. Standard measurements consisting of gamma, sonic, density, porosity, and resistivity imaging with both wireline and LWD tools will be acquired to identify lithologic contacts and, most importantly, to recover a continuous profile of density and porosity from the seafloor to total depth to accurately compute in situ overburden pressure. A wireline check shot utilizing the single axis in-line tool or a stand-alone vertical seismic profiling tool will to be used to provide critical information for well-to-seismic ties and define the seismic velocity gradient of the sequences drilled at each site. During the wireline logging with the standard tool strings, multiple passes will be made to acquire azimuthal data, potentially critical for ties to seismic lines, identifying the presence of gas hydrates, and for understanding rock properties. It is anticipated that the FMS tool will help characterizing fracture anisotropy and turbiditic sequences in the area.

Logistics

Operations will require an estimated 36 days (5 days in port, 11 days in transit, and 20 on site).

Superfast Spreading 1 and 2

Expedition	**Superfast Spreading 1 and 2**
Proposal	**522-Full3:**
Title	**A Complete in-situ Section of Upper Oceanic Curst formed at a Superfast Spreading Rate – Part II: Testing Fundamental Paradigms for Formation of the Oceanic Lithosphere**
Proponents	**Jeffrey C. Alt, Damon A.H. Teagle, Douglas S. Wilson, Robert S. Detrick, Susumo Umino, Kari M. Cooper, Neil R. Banerjee**

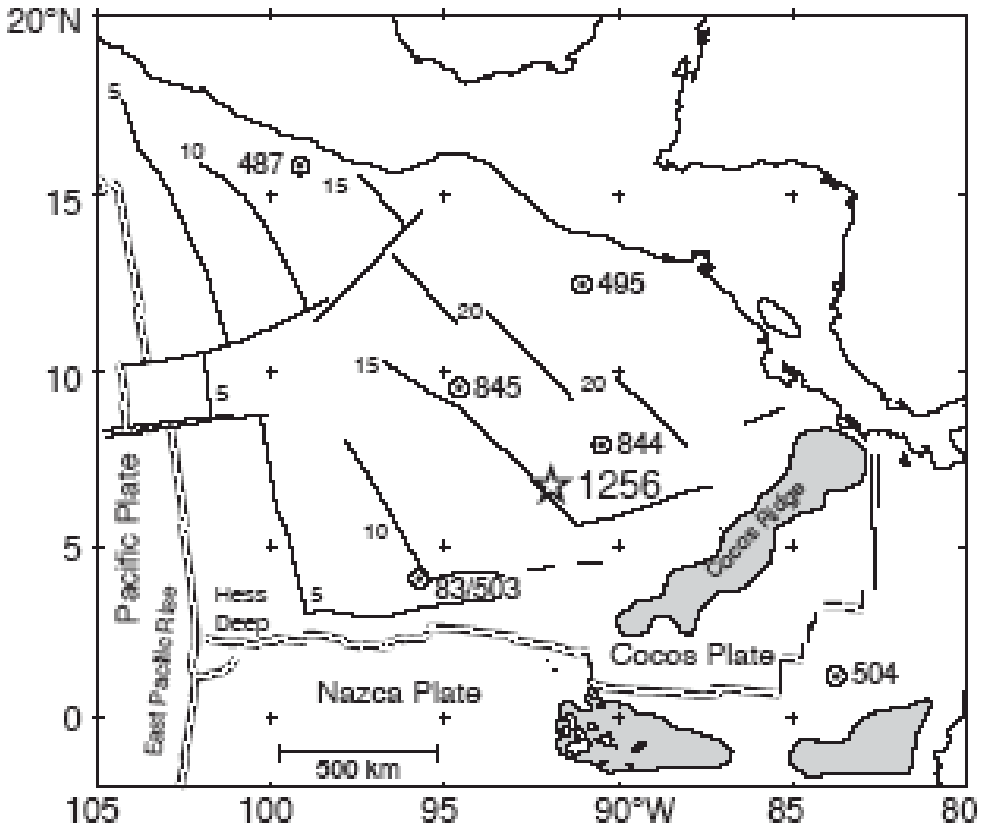


Figure PP_ADD_7: *Location Map of Superfast spreading site.*

Science Plan

Expeditions ODP Leg 206 resulted, for the first time in scientific ocean drilling, in the successful construction of the borehole infrastructure required for deep drilling into the ocean basement. The Superfast Spreading 1 and 2 Expeditions are the second part of a two-stage drilling strategy to deepen and log the full depth extent of Hole 1256B and recover a complete data section of the upper oceanic crust formed at a superfast spreading rate (>200 m/yr). The observed relationship between ocean ridge spreading rate and the depth to axial low-velocity zones, interpreted to be melt lenses, predicts that the dike–gabbro transition should be at its shallowest in crust formed at superfast spreading rates. Gabbros are predicted to occur at the depth range 900 to 1300 msbf. These expeditions will address important issues related to the structure of the oceanic crust, alteration processes, and geochemical budgets, as well as igneous and structural processes involved in the construction of the crust. In addition, the temperature logs will aid in studying the effects of temperature on the extent of microbial activity, as microbial alteration of volcanic glass decreases with basement depth at other sites. The temperature and depth limits to subbasement microbiological activity are not well defined.

Proposed Operations

From on operational standpoint, these will be routine hard rock expeditions. During ODP Leg 206, Hole 1256B was cased into basement and cored 500 m into basement. The hole was left clean and open for further deepening. The Superfast Spreading 1 and 2 Expeditions will deepen Hole 1256B by RCB coring to the maximum depth possible. The hole will be logged with standard tool strings. Significant microbiological sampling is expected as we continue to probe the depth of the deep crustal biosphere.

Environment and Safety

Hole stability and slow rates of penetration may limit the achievable depth of the hole, although since Hole 1256B is cased into basement instability in the sedimentary part of the section has been minimized and during ODP Leg 206 the basement drilled cleanly and relatively rapidly.

Logging Operations

These logging plans build upon the results of ODP Leg 206, in which a full sequence of highresolution downhole logs recorded a significant amount of variation in physical properties within the massive units, lava flows, pillow lavas, and hyaloclastites recovered from Hole 1256C and 1256D. The combined measurements of FMS, UBI and other downhole logs allowed characterization of the lithostratigraphic sequence, flow thickness, and structural features such as fractures. For example, discrimination of magnetic subunits from the log-based stratigraphy correlated well with shipboard paleomagnetic data.

Preliminary logging operations with the triple combo tool string are proposed prior to the deepening of the hole so that (1) equilibrium temperatures and borehole geometry information can be acquired before drilling operations perturb the thermal structure of the

crust and (2) initial casing operations can be determined. Fluid sampling should also be considered as an important aspect of the initial downhole operations as the results will pertain to the microbiological and geochemistry objectives of the expedition. A full suite of wireline logging tools, similar to those used during Leg 206, will be deployed after the completion of drilling operations. These tool strings should include the following:

• Triple combo tool string: The tool string will measure standard geophysical parameters including gamma ray, porosity, density, and electrical resistivity for full lithological characterizations of the drilled sequences. A temperature probe should be included in the suite of measurements to assess borehole temperature conditions and potentially determine the presence of fluid flow zones.
• FMS-sonic tool string: Compressional, shear, and Stoneley wave data will provide information about the seismic structure of the upper oceanic crust. The FMS tool obtains high-resolution microresistivity images of the borehole wall, which are useful for identification of lithologic units and tectonic features (e.g., the presence of fractures and/or faults and their orientations).
• UBI: Ultrasonic borehole images with 100% borehole wall coverage, which will allow detection and orientation of small-scale fractures that can provide information about the local stress field and borehole geometry.
• Three-component magnetometer: Data from the magnetometer will be used to monitor changes in the magnetic properties of the upper oceanic crust as well as changes in paleomagnetic direction that can aid in determination of the magnetic polarity. (Note: this would need to be a third-party deployment).
• Three-component WST: The WST-3 records acoustic waves that will provide a seismic velocity gradient and a depth traveltime information for determining in situ velocity profiles.

Logistics

Operations for the Superfast Spreading 1 Expedition require an estimated 49 days (5 in port, 6 in transit, and 38 on site). For the Superfast Spreading 2 Expedition, operations require an estimated 48 days (5 in port, 6 in transit, and 37 on site).

FY05 BUDGET OVERVIEW

This Program Plan Addendum budget identifies additional program costs for the JOI Alliance of $20,041, 592 (see **Table PP_ADD_2a**), to meet the high-priority needs identified by the SAS. Of this cost, 18.1% is considered to be Science Operation Costs (SOCs) and the remaining 81.9% is Platform Operation Costs (POCs). The JOI Alliance FY05 Addendum Budget of $20,041,592 mainly includes support for four additional expeditions in FY05 including Porcupine Carbonate Mounds, Gulf of Mexico Hydrogeology and Superfast Spreading 1 and 2 . The total IODP FY05 program costs are identified in **Table_PP_ADD_2b**.

Table PP_ADD_2a: *Summary Budgets for the FY05 Program Plan Addendum*

	IODP-MI		IODP-MI Operators & Subcontracts				Totals
	Washington DC	Sapporo	JOI-Alliance	CDEX	ESO	Bremen	
SOCs	$ -	$ -	$ 3,635,662	$ -	$ -	$ -	$ 3,635,662
POCs	$ -	$ -	$ 16,405,930	$ -	$ -	$ -	$ 16,405,930
Total	$ -	$ -	$ 20,041,592	$ -	$ -	$ -	$ 20,041,592

Table PP_ADD_2b: *Summary Budgets for the total FY05 Program Plan*

	IODP-MI		IODP-MI Operators & Subcontracts				Totals
	Washington DC	Sapporo	JOI-Alliance	CDEX	ESO	Bremen	
SOCs	$ 3,509,000	$ 1,594,123	$ 16,467,400	$ 644,143	$ 1,758,000	$ 240,736	$ 24,213,402
POCs			$ 38,318,085	$ 8,656,293	$ 4,996,000		$ 51,970,378
Total	$ 3,509,000	$ 1,594,123	$ 54,785,485	$ 9,300,436	$ 6,754,000	$ 240,736	$ 76,183,780

Budget Process – Science Operation Costs

Detailed budgets for Science Operation Costs were submitted to IODP-MI by the JOI Alliance for the FY05 addendum and are presented below in (**Table PP_add-3a**). Total SOC budgets are for FY05 are presented in **Table PP_add-3b**)

Table PP_ADD_3a: *IODP-MI, Operator, and subcontractor activity for FY05 Addendum (SOCs only).*

	IODP-MI		IODP-MI Operators & Subcontracts				Total SOC
	D.C.	Sapporo	JOI-Alliance	CDEX	ESO	Bremen	Total
Management & Administration	$ -	$ -	$ 156,131	$ -	$ -	$ -	$ -
Site Survey Data Bank	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Support for Science Advisory Structure	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Engineering Development	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Technical, Engineering & Science Support	$ -	$ -	$ 1,972,949	$ -	$ -	$ -	$ -
Core Curation	$ -	$ -	$ 54,383	$ -	$ -	$ -	$ -
Data Management	$ -	$ -	$ 183,558	$ -	$ -	$ -	$ -
Publications	$ -	$ -	$ 16,788	$ -	$ -	$ -	$ -
Logging	$ -	$ -	$ 1,251,853	$ -	$ -	$ -	$ -
Education & Outreach	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total	**$ -**	**$ -**	**$ 3,635,662**	**$ -**	**$ -**	**$ -**	**$ 3,635,662**

Table PP_ADD_3b: IODP-MI, Operator, and subcontractor activity for Total FY05 Addendum (SOCs) only.

	IODP-MI		IODP-MI Operators & Subcontracts				Total SOC ***
	D.C.	Sapporo****	JOI-Alliance	CDEX*	ESO**	Bremen	Total
Management & Administration	$ 2,659,000	$ 663,123	$ 2,126,941	$ -	$ -	$ -	**$ 5,449,064**
Site Survey Data Bank	$ 420,000	$ -	$ -	$ -	$ -	$ -	**$ 420,000**
Support for Science Advisory Structure	$ -	$ 901,000	$ -	$ -	$ -	$ -	**$ 901,000**
Engineering Development	$ 90,000	$ -	$ -	$ -	$ -	$ -	**$ 90,000**
Technical, Engineering & Science Support	$ -	$ -	$ 7,255,494	$ 303,402	$ 1,064,000	$ -	**$ 8,622,896**
Core Curation	$ -	$ -	$ 889,975	$ -	$ 13,000	$ 240,736	**$ 1,143,711**
Data Management	$ -	$ -	$ 2,544,202	$ 153,012	$ 165,000	$ -	**$ 2,862,214**
Publications	$ -	$ 30,000	$ 970,309	$ -	$ 10,000	$ -	**$ 1,010,309**
Logging	$ -	$ -	$ 2,580,479	$ -	$ 450,000	$ -	**$ 3,030,479**
Education & Outreach	$ 340,000	$ -	$ 100,000	$ 187,729	$ 56,000	$ -	**$ 683,729**
Total	**$ 3,509,000**	**$ 1,594,123**	**$ 16,467,400**	**$ 644,143**	**$ 1,758,000**	**$ 240,736**	**$ 24,213,402**

ADDITIONAL FOOTNOTES ON NEXT PAGE

* CDEX SOC budget funded directly by MEXT in FY05
** Actual subcontract to British Geological Survey
*** The actual amount of the SOC contract with NSF is $23,569K ($24,213K - $644K)
**** AESTO budget split between M&A costs for data specialist, publications manager and Program Associate ($287K) and Support for Science Advisory Structure ($901K)

The summary budget table PP_add-2 (a and b) is given in a format we believe relates most clearly to the Program Plan. This table is related to tables add_APP_A1 and add_APP_A2 found in Appendix A, which are given in slightly different formats. Table add_APP_A1 is in a format required by NSF for contractual reporting and Table add_APP-_A2 is in a format required by MEXT. The main difference between the formats is that some of the tasks are combined in different ways. In addition, NSF required that the Management and Administration costs in the JOI Alliance budget appear in a separate line whereas MEXT required it to be part of one or more tasks. We emphasize that the three tables contain identical figures; they are merely formatted differently.