

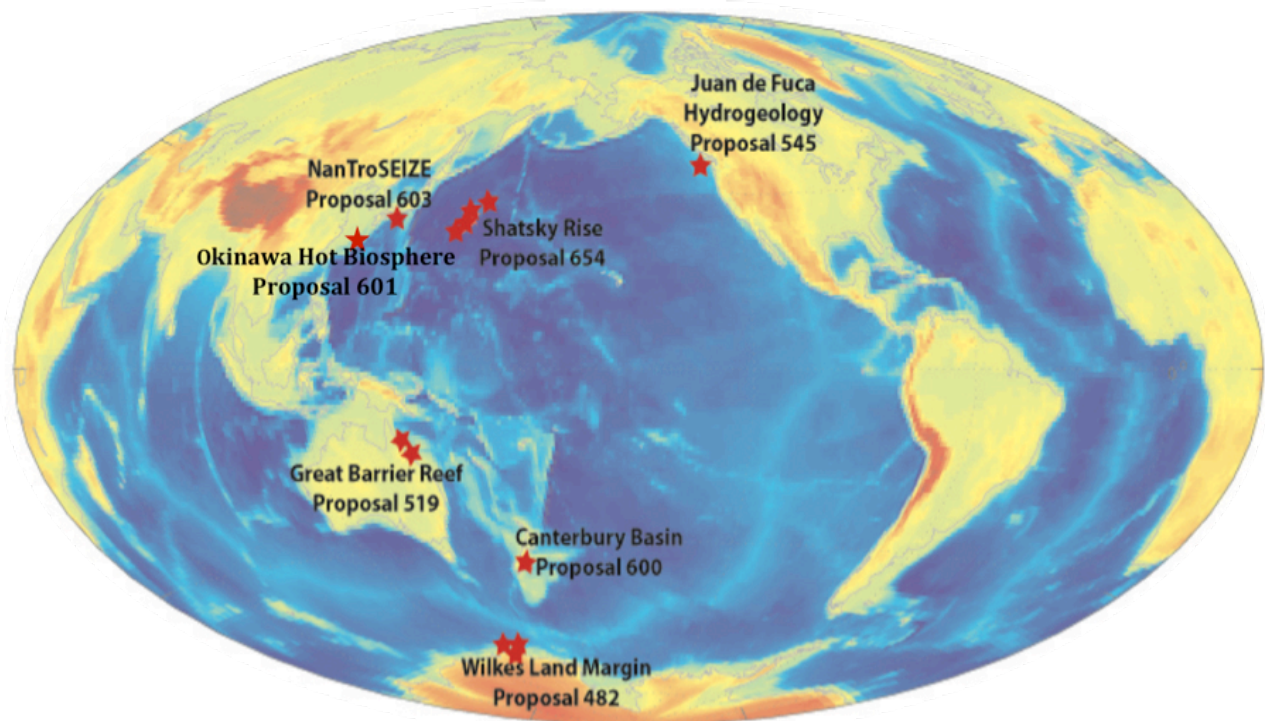
July 12, 2010

# Annual Program Plan

Integrated Ocean Drilling Program



**IODP**  
INTEGRATED OCEAN  
DRILLING PROGRAM





# Annual Program Plan FY2010

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## *Integrated Ocean Drilling Program*

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# 1 Introduction

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

IODP is sponsored by Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the U.S. National Science Foundation (NSF) as Lead Agencies; by the European Consortium for Ocean Research Drilling (ECORD); the People's Republic of China Ministry of Science and Technology (MOST); the Interim Asian Consortium; the Ministry of Earth Sciences of India (MoES), and the Australia-New Zealand IODP Consortium (ANZIC).

FY2010 is the seventh year of the 10-year program. In FY2009, the *JOIDES Resolution* (JR) returned to operation after a significant renovation for a much-enhanced capability for scientific drilling and lab/living environments. The *Chikyu* entered the Stage II of the NanTroSEIZE project and in particular, this marks the first scientific riser drilling. The liftboat *Kayd* was the Mission-Specific-Platform for operation of the New Jersey Shallow Shelf Expedition. For the first time in the history of scientific ocean drilling, three platforms have started operating in 3 different environments at the same time through a single international planning structure.

However, the required costs to operate the JR and *Chikyu* year-round and to their full capabilities are unlikely to be fully funded by the Lead Agencies. The MSP operation of one expedition per year pace may also be difficult to achieve. Each IO has been making progress towards improving the condition. Also, IODP-MI took on its own endeavor to seek industry-academia venture to fill the gap for a year round operation of JR. Year-round operation requires both IODP and non-IODP resources. It will continue to be a challenge for IODP to keep its integrity towards realizing ISP goals, when fiscal realities require the IODP platforms to service other customers.

The five major functions of IODP-MI are; (1) science support and review, (2) operation support and review, (3) engineering development, (4) data management and publications, and (5) outreach. The IODP New Ventures in Exploring Scientific Targets (INVEST) meeting which is the community wide conference for the international scientific planning of ocean drilling beyond 2013 will have taken place in September, 2009. The new science plan accompanied with a realizable implementation plan will be produced in the years to follow. The operational support will have to be adaptive to the changing surrounding conditions. After near completion of the LTBMS development, the engineering development plan includes developments for a simplified CORK system (SCIMPI) and an accurate in-situ pressure measurement system (MDHDS). Wide

distribution and easy recovery of data from the program is a key deliverable, and the SEDIS development will continue in collaboration between IODP-MI, the IOs and selected vendors to provide easy and single point data discovery.

An overall review of IODP-MI, which is the second triennial review for FY2007-2009 will take place.

## 2 Budget Summary

This Program Plan budget identifies a total program cost of \$115,117,768 for FY2010 (see **Tables APP-1** and **APP-2**) to meet the high priority needs identified by the SAS. Of this cost, 19% is Science Operation Costs (SOCs) and the remaining 81% is Platform Operation Costs (POCs). SOCs and POCs are defined in Annex I of NSF/MEXT Memorandum on the IODP, and the latest POC-SOC guidance from Lead Agencies is attached as **Appendix H**.

	IODP-MI	IODP-MI Operators & Subcontractors					Total
		USIO <sup>1</sup>	CDEX	ESO	Bremen	SIO	
<b>SOCs</b>	\$6,169,644	\$4,113,208	\$8,082,390	\$2,984,200	\$338,792	\$353,050	\$22,041,284
<b>POCs</b>	0	63,012,335	28,801,889	1,743,000	0	0	\$93,557,224
<b>Total</b>	<b>\$6,169,644</b>	<b>\$67,125,543</b>	<b>\$36,884,279</b>	<b>\$4,727,200</b>	<b>\$338,792</b>	<b>\$353,050</b>	<b>\$115,598,508</b>

**Table APP- 1: Summary IODP budget for FY2010**

<sup>1</sup> USIO POC: \$25M comes from the American Reinvestment and Recovery Act.

Description	IODP-MI	USIO	CDEX	Bremen	SIO	Total
Management and Administration	3,690,823	634,794	345,596	-	-	\$ 4,671,213
Technical, Engineering and Science Support	-	323,442	5,415,296	-	-	\$ 5,738,738
Engineering Development	1,345,332	160,356	184,974	-	-	\$ 1,690,662
Core Curation	-	432,495	1,028,912	338,792	-	\$ 1,800,199
Data Management	483,411	1,062,475	853,460	-	353,050	\$ 2,752,396
Publications	197,868	1,443,613	-	-	-	\$ 1,641,481
Outreach	452,210	56,034	254,152	-	-	\$ 762,396
<b>Total</b>	<b>\$ 6,169,644</b>	<b>\$ 4,113,208</b>	<b>\$ 8,082,390</b>	<b>\$ 338,792</b>	<b>\$ 353,050</b>	<b>\$ 19,057,084</b>

**Table APP- 2: IODP-MI Contract Budget Summary for FY2010**

<sup>1</sup> This summary does not include the operational SOC funds of USIO or **ESO SOC** funds (amount in **Table APP-1** directly funded by EMA).

<sup>2</sup> This budget includes one-time costs associated with office relocation, detailed in Appendices A and G.

<sup>3</sup> This budget includes FY09 Carry Forward tasks of \$433,112 (IODP-MI \$350,062 and SIO \$83,050).

IODP-MI's budget is \$6,122,016 (100% SOC). This includes the costs for providing necessary integration/coordination functions to IODP as the Central Management Organization. IODP-MI will consolidate and relocate its offices in FY2010. Onetime costs of office consolidation/relocation are budgeted in **Appendix A** (\$34,900) and **Appendix G** (\$266,943) for relocation (\$31,261) and contractual service (\$235,683)).

The USIO budget is \$67,125,543 (6% SOC; 94% POC). An amount of \$160,356 originally included in **Appendix A** as Engineering Development of Multi-sensor Magnetometer Module logging tool has been reprogrammed in **Appendix B** (Engineering SOC is \$160,356 and not \$0). The USIO SOC budget of \$4,113,208 includes costs for Management and Administration, Technical,



Engineering and Science Support (TESS), Engineering Development, Core Curation, Data Management, Publications, and Outreach. According to the guidance from Lead Agencies (LAs), SOC for USIO is no longer partitioned into “operational” costs (SOC Operations) and other costs (SOC Non-operations). SOC Operations costs are defined as “that which funds SODV SOC operations at sea and all costs in support of these operations such as planning, logistics, engineering science support, etc.” This amount is now included in POC and the SOC is equivalent to previous SOC Non-operations, which are to be funded through the IODP-MI contract. The details of the USIO activities are described in **Appendix B**.

The CDEX budget is \$36,884,279 (22% SOC, 78% POC). The CDEX SOC budget of \$8,082,390 includes support for the *Chikyu* operation for the Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) project and the Deep Hot Biosphere drilling in the Okinawa Trough, as well as costs for Management and Administration, Engineering Development, Core Curation, Data Management, and Outreach. The details of the CDEX activities are described in **Appendix C**.

The ESO budget is no longer funded through IODP-MI contract, but direct through EMA. The ESO budget is \$4,727,200 (63% SOC, 37% POC). The ESO SOC of \$2,984,200 includes support of the New Jersey Shallow Shelf Expedition Onshore activities and the Great Barrier Reef Environmental Changes Expedition Offshore/ Onshore activities, as well as associated costs for Management and Administration, Core Curation, Data Management, and Outreach. The details of the ESO activities are described in **Appendix D**.

The University of Bremen Core Repository budget is \$338,792 (100% SOC). These funds are primarily for personnel and operating costs (consumables, supplies, telecommunications, etc.) associated with normal IODP/ODP core sampling and core archiving operations. Funds for curatorial support for MSP operations are identified in the ESO budget. Details of the University of Bremen activities are described in **Appendix E**.

The Scripps Institution of Oceanography (SIO) budget of \$353,050 (100% SOC) is for operation of the Site Survey Data Bank (SSDB). Details of the SIO activities will be described later in **Appendix F**.

The subcontract with the Advanced Earth Science and Technology Organization (AESTO) and the *Ippan Shadan Hojin* IODP-MI (ISHI) supporting the IODP-MI Sapporo office and Tokyo Office is described in **Appendix G**.

## 3 Organizational Structure

### 3.1 Organizational Framework

IODP operations are based on three components:

*The Central Management Office (CMO):*

IODP Management International, Inc. (IODP-MI) has received a 10-year contract from the Lead Agencies to run the CMO.

### *The Implementing Organizations (IOs):*

There are three IOs:

1. The USIO is responsible for operations of the riserless vessel, the *JOIDES Resolution*.
2. Center for Deep Earth Exploration (CDEX), which is responsible for the riser-equipped ship, *Chikyu*.
3. ECORD Science Operator (ESO), which is responsible for mission-specific platforms (MSPs).

### *The Science Advisory Structure (SAS):*

The IODP Science Advisory Structure consists of scientists, engineers, and technologists designated by IODP member organizations.

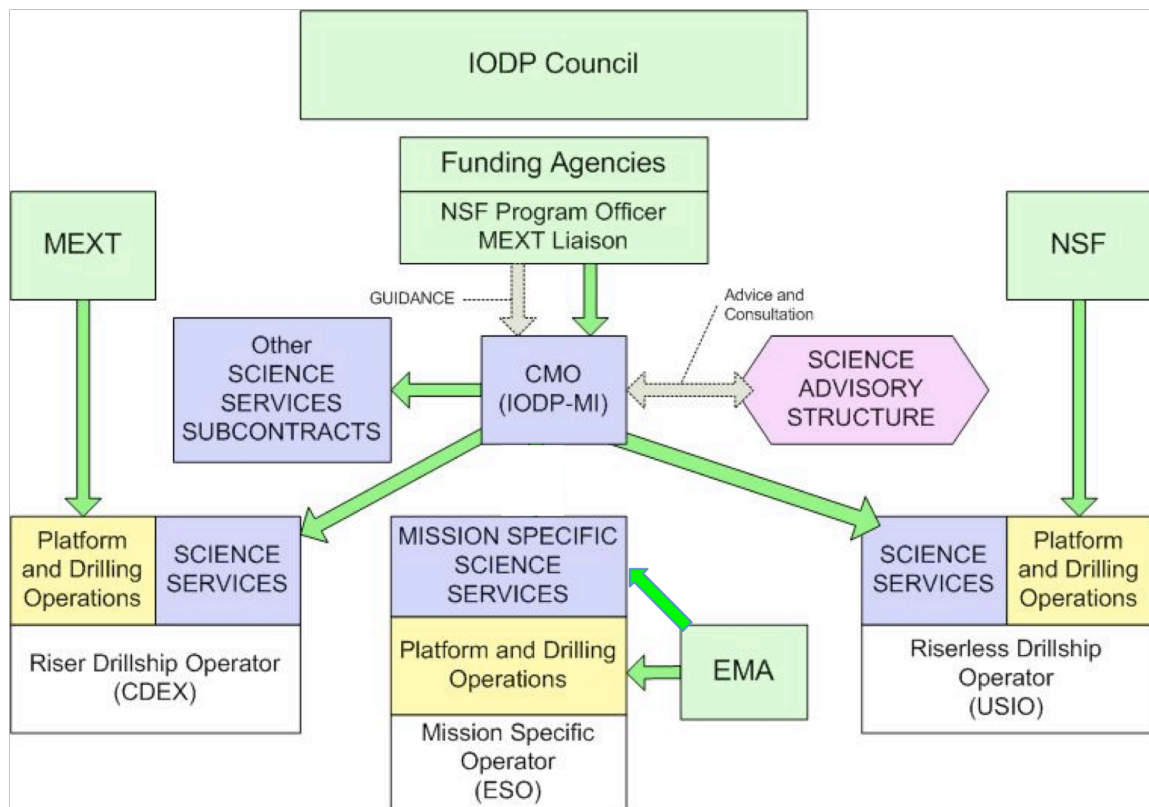
According to the principles upon which the program was founded, IODP “Science Operations Costs” (SOCs) will be, in principle, supplied to the nonprofit corporation known as IODP Management International, Inc. (IODP-MI), the IODP Central Management Organization (see **Fig. APP-1**). In turn, IODP-MI distributes SOCs to IOs (drilling operators) and to other subcontractors according to the budgets outlined in this and subsequent IODP Annual Program Plans (APPs). SOC funds are collected from IODP Members, commingled by the U.S. NSF, and provided through contract to IODP-MI (see **Fig. APP-1**). The flow of USIO SOC operations funding became an exception as described in Section 2, but the SOC operations USIO activities remain under the umbrella of IODP-MI.

Currently, IODP members are: the U.S.A. represented by the National Science Foundation (NSF); Japan, as represented by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT); the European Consortium for Ocean Drilling (ECORD) as represented by the ECORD Management Agency (EMA); the People’s Republic of China as represented by the Ministry of Science and Technology (MOST); the Interim Asian Consortium represented by the Korea Institute of Geoscience and Mineral Resources (KIGAM); India as represented by the Ministry of Earth Sciences of India (MoES); and the Australia-New Zealand IODP Consortium (ANZIC). The NSF and MEXT are designated as Lead Agencies; EMA is a Contributing Member; and MOST, KIGAM, MoES, and ANZIC are Associate Members.

As detailed in **Figure APP-1**, Platform Operations Costs (POCs) are supplied directly from individual funding agencies of the countries or consortia operating IODP drilling assets: from NSF to the USIO (Consortium for Ocean Leadership, Inc., Texas A&M University [TAMU], Lamont-Doherty Earth Observatory [LDEO] of Columbia University) for operation of the SODV; from MEXT to CDEX for the riser-equipped ship *Chikyu*; and from ECORD to ESO for MSP operations.

The technical management relationship consists of the following components:

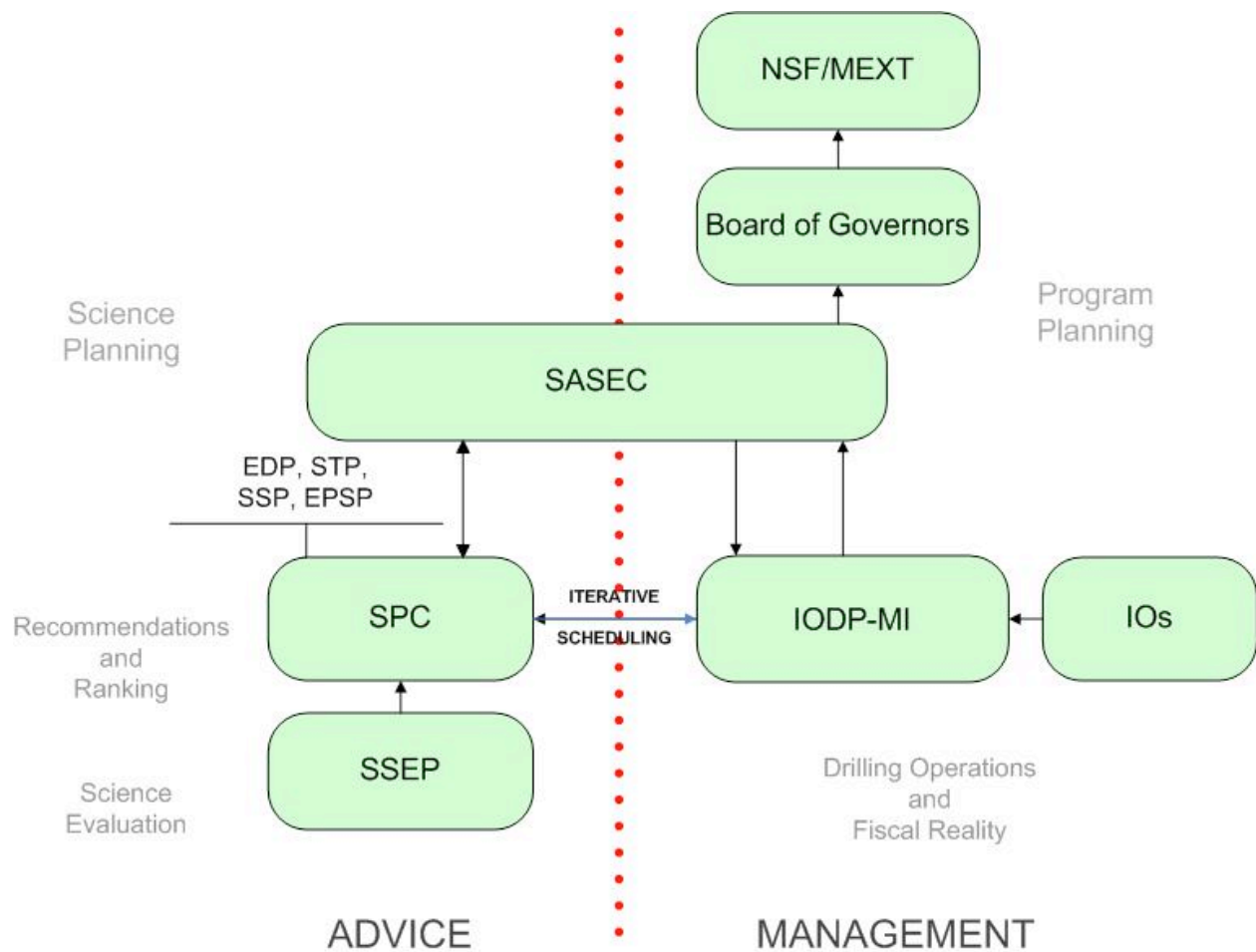
- a. Overall central management tasks and responsibilities for science operations by IODP-MI
- b. Science advice provided by the SAS, supported by a planning office at IODP-MI
- c. Multiple IOs, as listed above – USIO, ESO, and CDEX



**Figure APP- 1: IODP Program Management Structure (in principle).** SOC and POC are detailed in accompanying budgets, both in the Program Plan and in Appendices A-G. The funding agencies consist of NSF and MEXT (as Lead Agencies), EMA as a Contributing Member, MOST, the Interim Asian Consortium, MOES, and ANZIC as Associate Members. Solid arrows indicate flow of funds. Dotted arrows indicate flow of advice.

### 3.2 IODP-Management International - The Central Management Organization

A Central Management Organization (CMO) was established with the concurrence of MEXT and NSF to develop and manage IODP science operations and implementation plans. CMO functions are provided by IODP-MI through a 10-year contract with NSF (**Appendix A**). The CMO: a) receives advice and recommendations from SAS on scientific priorities and plans; b) requests plans from IOs responsive to this advice; and c) works with IOs and the SAS to produce an integrated IODP Annual Program Plan (APP) (**Fig. APP-2**).



**Figure APP- 2: The flow of scientific advice towards expedition scheduling.**

Scientific advice to the IODP management structure occurs via advisory panels and committees. Scientific planning for the IODP is provided by a Science Advisory Structure (SAS) led by the Science Planning Committee (SPC). IODP-Management International, Inc. (IODP-MI) is the Central Management Organization (CMO) that translates the scientific priorities of the ocean-drilling community into program plans to carry out scientific IODP operations. It does so based on advice from the international IODP Science Advisory Structure (SAS), and in consultation with vessel operators or IOs.

IODP-MI submits the program's Annual Program Plan to SASEC, which is the executive authority of the SAS and a committee of IODP-MI Board of Governors (BoG), for review and approval prior to consideration by the IODP-MI BoG and Lead Agencies. The NSF is responsible for contractual

approval of the Annual Program Plan (APP) in consultation with MEXT. After Lead Agencies' approval, any significant changes in the Annual Program Plan are to be considered and approved by IODP-MI and the Lead Agencies prior to implementation, in consultation with the SASEC and the IOs, as appropriate.

The Annual Program Plan is to be consistent with budget guidance provided to IODP-MI by the Lead Agencies. The Annual Program Plan includes a presentation of total program costs, which include both SOC and POC. IODP-MI will manage SOC funds provided under contract with the NSF. The NSF is expected to administer the contract with due consideration to the interests of MEXT. POCs will be provided directly to the IOs from the Lead Agencies and EMA (**Fig. APP-1**).

### 3.3 Implementing Organizations (IOs)

Riserless drilling capability is supplied by the NSF through a contract to the USIO, which consists of Ocean Leadership, Inc., the prime contractor and overall manager; Texas A&M University (TAMU), the subcontractor that operates the riserless drillship and provides associated services and functions such as expedition staffing, logistics, program-specific engineering development and operations, shipboard laboratories, curation, and distribution of core samples and data; and Lamont-Doherty Earth Observatory (LDEO) of Columbia University, responsible for geophysical and geochemical logging services aboard the riserless vessel, and involving acquisition, processing and interpretation of logging measurements. Details of the USIO and its operational plans for FY2009 are presented in **Appendix B**.

Riser-equipped drilling capability, by way of the vessel *Chikyu*, is supplied by CDEX (see **Appendix C**). CDEX is part of the Japan Agency for Marine-Earth Science and Technology (JAMSTEC). CDEX also operates the Kochi Core Center Repository (KCC).

MSP drilling, sampling, and logging capability is supplied by the ESO (see **Appendix D**), a consortium led by the British Geological Survey (BGS), which conducts MSP operations and program-specific engineering development; the European Petrophysics Consortium (EPC) which provides logging services, and the University of Bremen which provides repository services for MSP samples and cores. The ESO has a contractual arrangement with the EMA, affiliated with the Centre Nationale de la Recherche Scientifique (CNRS) based in Paris. Details of ESO and its operational plans for FY2009 are presented in Appendix D. ESO will utilize Bremen curatorial personnel and services during actual MSP operations. These ESO funds are separate from the normal IODP core archive and sampling operations proposed by Bremen in the Annual Program Plan (See **Appendix E**).

### 3.4 Science Advisory Structure (SAS)

The SAS provides long-term guidance on the scientific planning of the IODP and recommends annual science and engineering plans based on proposals from the international science community. The SAS consists of the Science Advisory Structure Executive Committee (SASEC), the Science Planning Committee (SPC), as well as several advisory panels (see **Fig. APP-3**) that contain hundreds of scientists from the international geoscience community in IODP member

countries and consortia. In January 2008, SASEC decided to name a standing budget subcommittee.

The SASEC is the Executive Authority of the SAS and is composed of representatives from scientific organizations in IODP member countries. SASEC is also a committee of IODP-MI BoG. The SASEC provides scientific oversight and long-term planning. An important responsibility of the SPC is to prioritize the recommendations for the drilling sites. It considers recommendations from the various SAS support panels and is the focus of scientific planning for IODP.

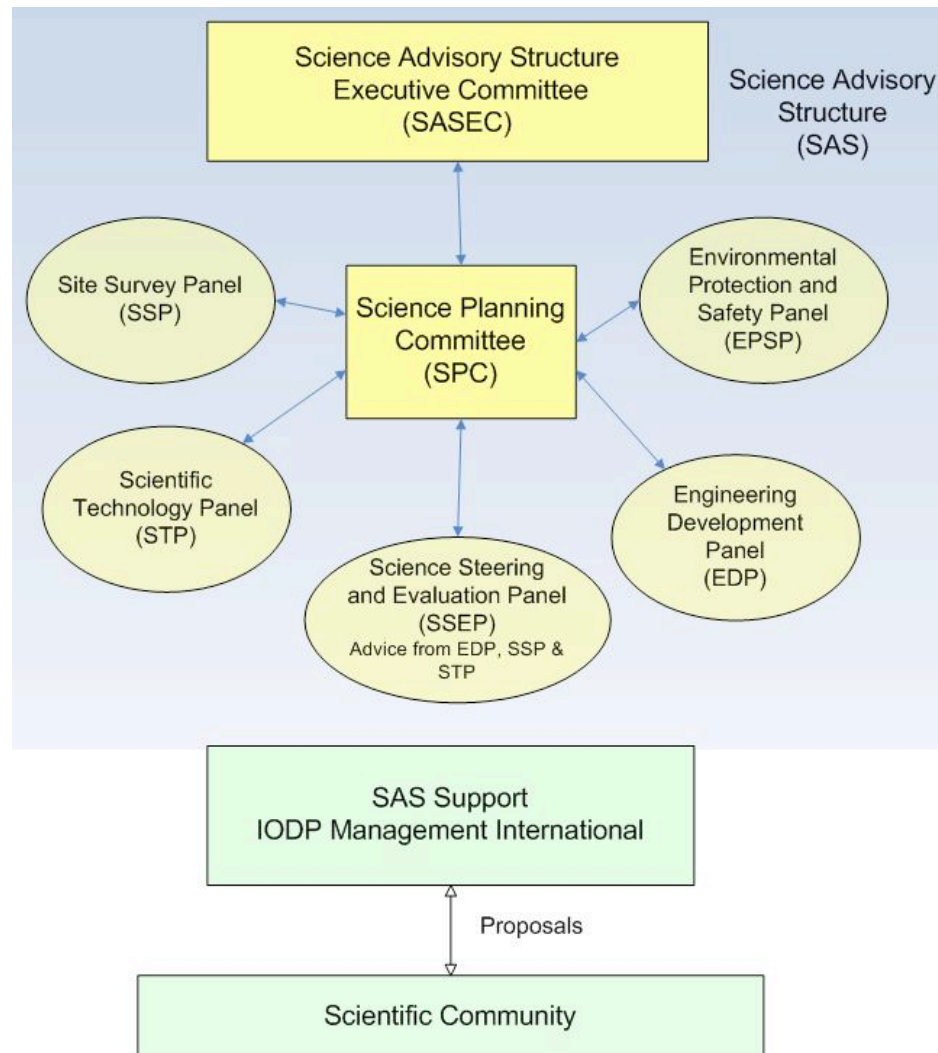


Figure APP- 3: IODP Science Advisory Structure (SAS)

## 4 FY2010 Expedition Operations

### 4.1 FY2010 Schedule

#### *USIO*

The USIO plans to conduct eight months of operations (five expeditions) in FY2010, with three expeditions residing entirely within the fiscal year, (see **Figure APP-4**). The FY2010 program will begin with the continuation of the Shatsky Rise expedition (begun in the previous fiscal year), followed in succession by Canterbury Basin and Wilkes Land. After the Wilkes Land expedition, the *JOIDES Resolution* will be tied-up for four months. Then, Juan de Fuca II Expedition will be conducted in the last two months of FY2010.

#### *CDEX*

FY2010 operations for *Chikyu* will consist of continuing efforts toward completion of the NanTroSEIZE program and a microbiology expedition in the Okinawa Trough. Specifically, the FY2010 program will finish Expedition 322- Subduction Inputs (begun in FY2009) and extend for ~10 days into FY2010 (October 2009). In mid July 2010, *Chikyu* will resume IODP operations with the top hole preparation of Stage 3 riser drilling at site C0002, where drilling will proceed intermittently over the course of several years to reach the megasplay fault, décollement, and the oceanic crust, with an expected total depth of drilling to ~7,000 m below sea floor.

#### *ESO*

The offshore phase of the Great Barrier Reef Environmental Changes Expedition was partly included in the FY2009 Annual Program Plan because of the possibility that it may have begun in September 2009 and to ensure that funds were in place ahead of time to place contracts for both a vessel and for logging services. Consequently only a proportion of offshore expedition funds will be provided from the FY2010 budget. Present plans are that mobilization may begin at the end of September, but that an October start is more likely.

Onshore Science parties for both the New Jersey Shallow Shelf and Great Barrier Reef Environmental Changes expeditions will take place in FY2010 at the Bremen Core Repository. It is anticipated that the work for each expedition will last up to 4 weeks, but the precise duration will depend on the length of the core to be processed and the speed of throughput.



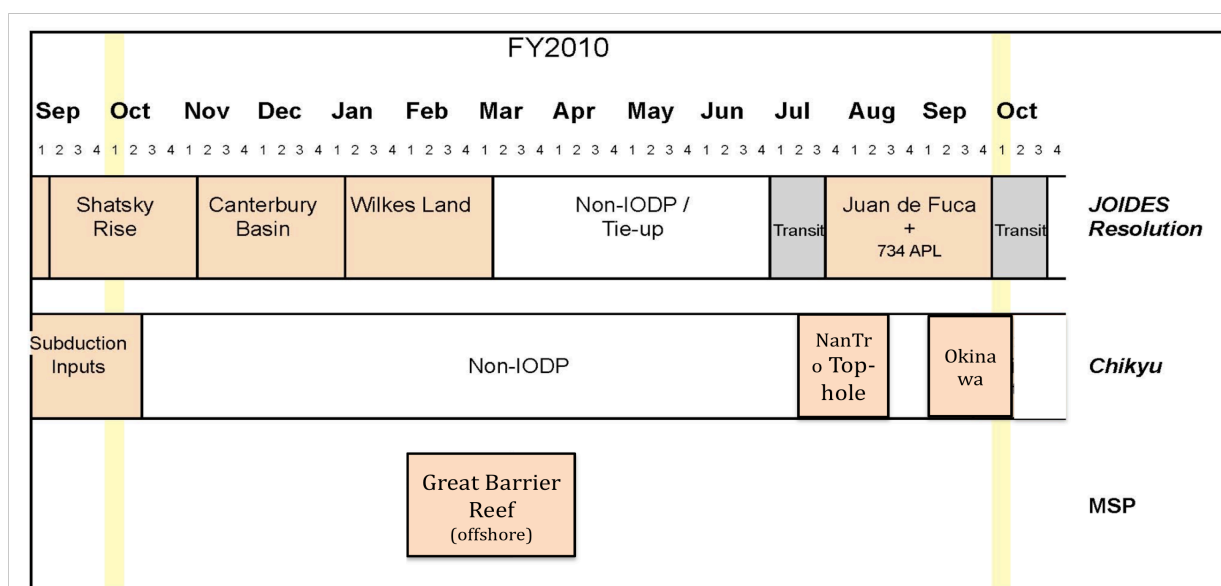


Figure APP- 4: Operations schedule for FY2010.

Note operations for Shatsky Rise (USIO), Subduction Inputs (CDEX) straddle FY2009/ FY2010. Operations for Okinawa (CDEX) straddle FY2010/11.

## 4.2 USIO Operations

### 4.2.1 Shatsky Rise Expedition

#### 4.2.1.1 Proposed Operations

The primary objective of the Shatsky Rise Expedition is to core igneous rocks from the volcanic massifs of Shatsky Rise to determine the age, sources, and evolution of this oceanic plateau and to test the hypotheses of its origin. Five primary sites will be drilled with the RCB. Four sites will be drilled 100 m into basement and one site will be drilled 300 m into basement. Each site will be logged with triple combo and FMS sonic tool strings and with the VSI for a VSP survey.

#### 4.2.1.2 Experiments

No experiments are planned for this expedition.

#### 4.2.1.3 Environment and Safety

Operations will be conducted at Shatsky Rise during the Pacific typhoon season, which could impact operations, although the historical average for this area is 0–1 storms per year during this operational window.

#### 4.2.1.4 Logistics

Operations for the Shatsky Rise expedition require an estimated 61 days (5 in port, 17 in transit, and 39 in operations). For FY10, these include 22 days of operations and 13 days in transit.



#### 4.2.1.5 Core Storage

Cores for the Shatsky Rise expedition will be stored at the Gulf Coast Repository

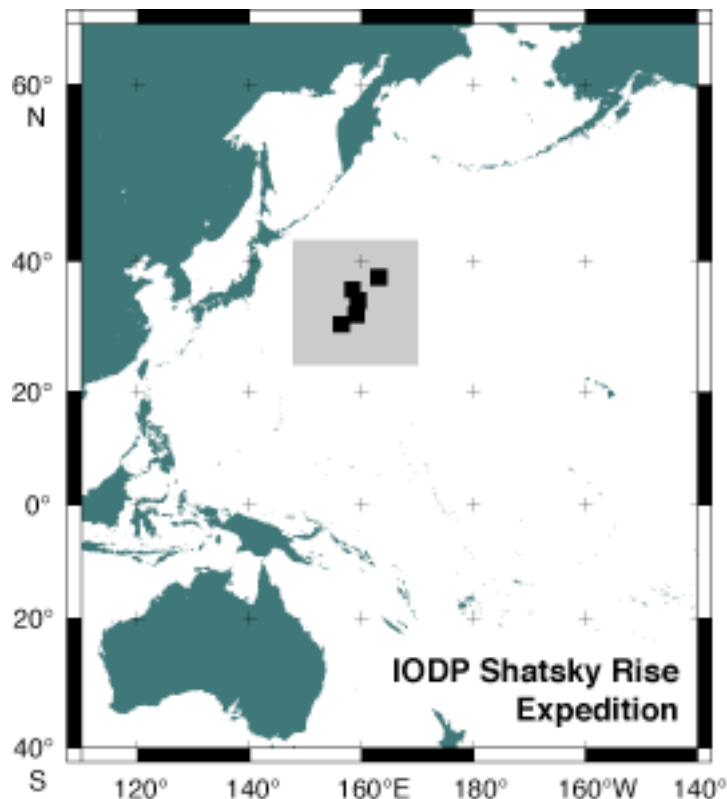


Figure APP- 5: Location of Primary sites for the Shatsky Rise Expedition

#### 4.2.2 Canterbury Basin Expedition

##### 4.2.2.1 Proposed Operations

The primary focus of the Canterbury Basin Expedition is to understand the relative importance of global sea level versus local tectonic and sedimentary processes in controlling continental-margin depositional cyclicity in the Oligocene to Holocene period. Drilling the Canterbury Basin on the eastern margin of the South Island of New Zealand takes advantage of high rates of Neogene sediment supply, which preserved a high-frequency (0.5–1 m.y. periods) record of depositional cyclicity.

Three shelf sites and one slope site will be cored with the advanced piston corer (APC)/extended core barrel (XCB)/rotary core barrel (RCB) to total depth, which ranges from 700 to 1700 meters below seafloor (mbsf). Each site will be logged with the triple combination (triple combo) and Formation MicroScanner (FMS)-sonic tool strings and with the Versatile Seismic Imager (VSI) for a vertical seismic profile (VSP) survey.

#### 4.2.2.2 *Experiments*

No experiments are planned for this expedition

#### 4.2.2.3 *Environment and Safety*

The water depths for all primary sites (85–346 m) fall under the shallow water coring guideline. Alternate deeper water sites are available if the sea state presents challenges to shallow water locations. Because the potential for shallow gas exists within the operational area, a third-party consultant was hired to conduct a detailed hazard assessment that was used by the Environmental Protection and Safety Panel (EPSP) and TAMU Safety Panel for site approval. An experienced organic geochemist will also sail during the expedition. The IODP marine mammal policy will be in effect during the check shot survey.

#### 4.2.2.4 *Logistics*

Operations for the Canterbury Basin Expedition are budgeted based on an estimated 61 days (5 in port and 56 operating).

#### 4.2.2.5 *Core Storage*

Cores for the Canterbury Basin Expedition will be stored at the Gulf Coast Repository.

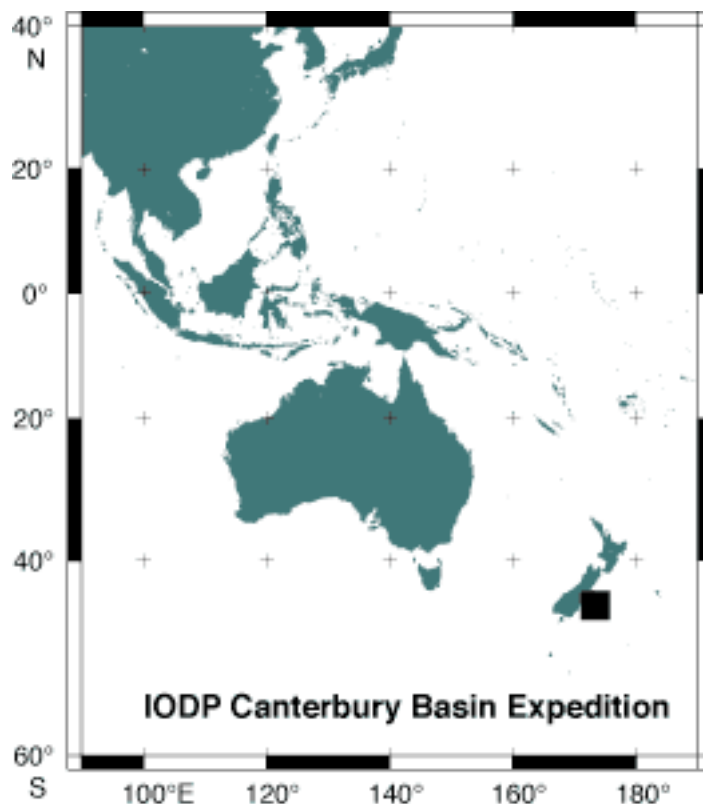


Figure APP- 6: Location of primary sites for the Canterbury Basin Expedition

### 4.2.3 Wilkes Land Expedition

#### 4.2.3.1 *Proposed Operations*

The main goal of the Wilkes Land Expedition is to understand the evolution and dynamics of the Antarctic cryosphere, from its inception during the Eocene–Oligocene transition (~33 Ma) through the significant periods of climate change during the Cenozoic. The primary operations plan is to core and log at five sites: one on the inner shelf continental deep basins (Adelie Drift), two on the continental shelf, one on the continental rise, and one on the abyssal plain. All sites will be APC cored to refusal.

Four of the five sites will be deepened using XCB/RCB coring to depths ranging from ~200 mbsf at the shelf sites to ~1000 mbsf at the rise and abyssal plain locations. Each site will be logged with the triple combination (triple combo) and Formation MicroScanner (FMS)-sonic tool strings and with the Versatile Seismic Imager (VSI) for a vertical seismic profile (VSP) survey. The Adelie Drift site will be multiple cored with the APC to ensure recovery of the complete stratigraphic sequence.

#### 4.2.3.2 *Experiments*

No experiments are planned for this expedition.

#### 4.2.3.3 *Environment and Safety*

An ice/weather observer will sail during the expedition because, although the expedition is planned in the preferred weather window, sea ice conditions may vary strongly from year to year and could affect operations or force occupation of alternate sites. The IODP marine mammal policy will be in effect during the check shot survey.

#### 4.2.3.4 *Logistics*

Operations for the Wilkes Land Expedition are budgeted based on an estimated 64 days (5 in port and 59 operating).

#### 4.2.3.5 *Core Storage*

The cores for the Wilkes Land expedition will be stored at the Gulf Coast Repository.

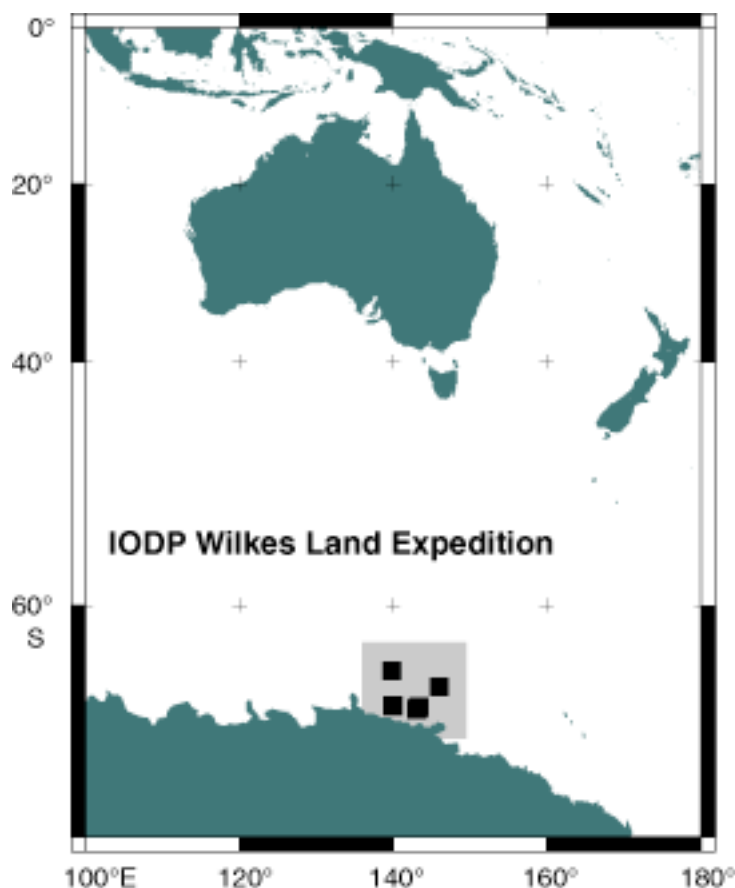


Figure APP- 7: Location of primary sites for the Wilkes Land Expedition

#### 4.2.4. Juan de Fuca Hydrogeology Expedition

##### 4.2.4.1 Proposed Operations

The Juan de Fuca Hydrogeology Expedition is designed to evaluate the formation-scale hydrogeologic properties within oceanic crust, determine how fluid pathways are distributed within an active hydrothermal system, and elucidate relations between fluid circulation, alteration, microbiology, and seismic properties.

Two new subseafloor observatories will be installed into oceanic crust at Proposed Site SR-2 for long-term monitoring (pressure, temperature, geochemistry, and microbiology), one observatory will be replaced (ODP Site 1027), and cross-hole hydrologic experiments will be conducted on four existing monitoring observatories installed during IODP Expedition 301 and ODP Leg 168. The deeper of the two new subseafloor observatory holes will be logged using the triple combo tool string.

##### 4.2.4.2 Experiments

Cross-hole hydrogeologic pump tests will be conducted.

##### 4.2.4.3 Environment and Safety

his expedition is scheduled in the summer weather window because installation of observatories requires calm seas.

#### **4.2.4.4 Logistics**

Operations for the Juan de Fuca Hydrogeology Expedition are budgeted based on an estimated 61 days (5 in port and 56 operating).

#### **4.2.4.5 Core Storage**

The cores for the Juan De Fuca expedition will be stored at the Gulf Coast Repository.

### **4.2.5. Ancillary Project Letter 734/Transit**

#### **4.2.5.1 Proposed Operations**

The transit to Tahiti for the beginning of the South Pacific Gyre Expedition will begin with the implementation of Ancillary Project Letter (APL) 734. Hole 889C was equipped with a circulation obviation retrofit kit (CORK) hydrologic observatory in 1992 during ODP Leg 146. However, because of unstable formation conditions and deteriorating weather, the sensor string was damaged during installation and a proper seal was not achieved. APL 734 proposes to install a simple ACORK with 4 pressure sensors in a new hole to revitalize pressure/strain monitoring that the original installation was designed to achieve.

#### **4.2.5.2 Experiments**

No experiments are planned for this expedition.

#### **4.2.5.3 Logistics**

Operations for Transit/APL 734 are budgeted based on an estimated 32 days (5 in port, including major resupply for the South Pacific Gyre Expedition and personnel transfers, and 27 operating), 8 of which are for the APL.

## 4.3 CDEX Operations

FY2010 operations for *Chikyu* will consist of continuing efforts toward completion of the NanTroSEIZE program and the Okinawa Hot Biosphere program. Specifically, the FY2010 program will finish Expedition 322- Subduction Inputs (begun in FY2009) and extend for ~10 days into FY2010 (October 2009). In mid July 2010, *Chikyu* will resume IODP operations with the preparation of riser drilling at site NT3-01, where drilling will proceed intermittently over the course of several years to reach the megasplay fault, décollement, and the oceanic crust, with an expected total depth of drilling to ~7,000 m below sea floor.

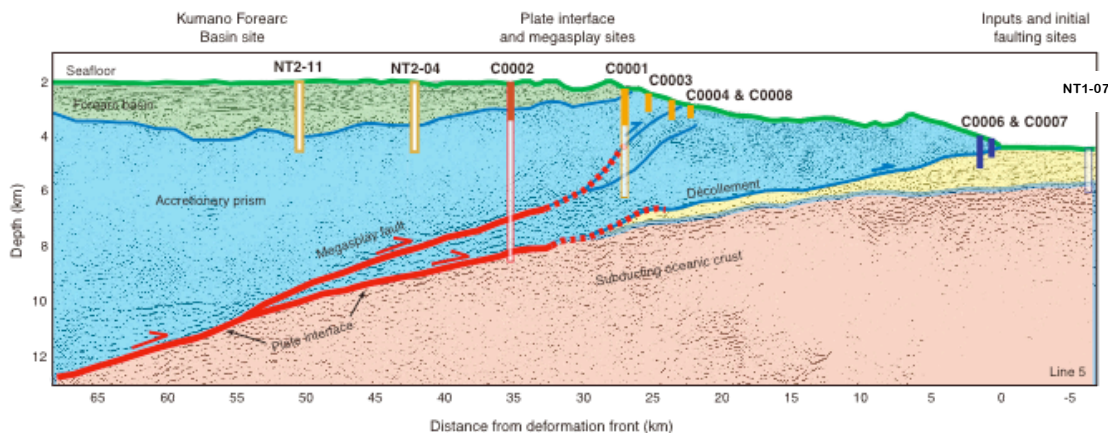


Figure APP- 8: Stylized cross-section of NanTroSEIZE area of operations. Site NT1-7 is the primary site for Expedition 322. A second FY2010 Expedition to riser Site NT3-01 (C0002 on Figure) will start in September 2010.

### 4.3.1 Expedition 322 –NanTroSEIZE Subduction Inputs

Expedition 322 (Subduction Inputs) will begin in FY2009 and be continued into the first two weeks of FY2010

#### 4.3.1.1 Proposed Operations

The primary goal of this expedition is to characterize the input materials, architecture, and state of sediments entering into the subduction system in the Nankai accretionary prism off Kumanonada using direct sampling, in-situ measurement, and wire-line logging.

Coring and wireline logging will be performed at the input site, NT1-07. Standard core and logging data analyses will be performed aboard *Chikyu* to study the properties of the initial condition of pre-subduction material.

#### 4.3.1.2 Experiments

Downhole temperature measurements with APCT3 and DVTP are planned in addition to coring.

#### **4.3.1.3 *Environment and Safety***

No significant drilling risks are identified.

#### **4.3.1.4 *Logistics***

The Expedition will depart from the port of Shingu and return to the same port. No helicopter transfers are expected aside from emergency needs. However, if the supply boat is available, *Chikyu* will continue operations immediately after the end of the previous expedition. In this case, the science party will transit from the Minami-Ise helicopter port.

Total expedition time in FY10 is ~10 days.

#### **4.3.1.5 *Core Storage***

Cores from this expedition will be stored at the Kochi Core Center.

### **4.3.2 Expedition 326 (NanTroSEIZE Stage 3: Deep Riser Top Hole)**

#### **4.3.2.1 *Proposed Operations***

The scientific targets at Site NT3-01 (C0002) are the megasplay fault, décollement, and the oceanic crust, with an expected total depth of drilling to ~7,000 m below sea floor. Another objective at this site during this expedition is to install casing in preparation for the installation of a long-term observatory systems at a future date. This Expedition plans to case the top-hole section of Site C0002 to 800 mbsf and set a well-head. This will be a purely engineering portion, since Site C0002 was logged and cored during Stage 1; therefore, there will only be one or two science representatives onboard during this phase.

#### **4.3.2.2 *Experiments***

No experiments will be conducted.

#### **4.3.2.3 *Environment and Safety***

Standard riser hole safety monitoring will be employed.

#### **4.3.2.4 *Logistics***

1 day transit and 24 days of drilling time are planned.

#### **4.3.2.5 *Cores Storage***

No cores or cuttings will be taken.

### 4.3.3 Deep Hot Biosphere Expedition (Expedition 331)

#### 4.3.3.1 *Proposed Operations*

The scientific target is the biosphere associated with the seafloor hydrothermal activities in the Iheya North field in the Okinawa Trough. The plan is to HPCS core one shallow hole and core/case an adjacent hole using an industry system at the same site for two sites at the top and flank of hydrothermal mounds. Industrial coring and casing of another mound top is also planned. A slightly deeper hole at a flank side is also planned as a contingency. ROVs will be used for monitoring before, during and after the expedition in conjunction with the JAMSTEC research group.

#### 4.3.3.2 *Experiments*

No experiments will be conducted.

#### 4.3.3.3 *Environment and Safety*

Due to the diverse faunal communities at the mound sites, all possible care will be taken to minimize impact on the benthic environment. All onboard personnel will receive extra training in H<sub>2</sub>S hazardous environments.

#### 4.3.3.4 *Logistics*

The expedition will last about 32 days. Onboard science party will consist of 2 co- chiefs, an EPM and 27 onboard science party members. The expedition is planned to depart from and return to the port of Shingu, with two crew changes at Nago, Okinawa, during the expedition.

#### 4.3.3.5 *Cores Storage*

Cores and cuttings will be stored at Kochi Core Center.

## 4.4 ECORD Science Operator Operations

### 4.4.1 Great Barrier Reef Environmental Changes Expedition

#### 4.4.1.1 *Proposed Operations*

A prospectus has been produced and the sites at 5 transects (see location map below) approved by SSP and EPSP (with the exception of 2 new sites to be reviewed by EPSP). The sites also have the approval of the Great Barrier Reef Marine Park Authority (GBRMPA) as part of the permitting agreement. A request to carry out scientific research in Australian waters has been submitted.

A contract to provide a drilling vessel and coring services has been agreed with Bluestone Offshore Pte, a new geotechnical drilling company based in Singapore. Logging operations will be carried out by the group from the University of Montpellier, who also carried out the successful logging for the Tahiti Sea Level Expedition. The platform to be used is the Bluestone Topaz, and a variation on the piggyback drilling



concept will be employed. Drilling depths will not exceed 100 meters and water depths will range from about 30-200 meters.

#### **4.4.1.2 Experiments**

No downhole experiments are anticipated.

#### **4.4.1.3 Environment and Safety**

Environmental protection is a key issue for this expedition. It was a condition of the Marine Park research permit that an Environmental Management Plan is produced, and this document has been approved by GBRMPA.

#### **4.4.1.4 Logistics**

Mobilization is expected to take place in Singapore, after which the vessel will sail to Townsville where the science party will embark. However, if the Topaz is working in an area nearer Australia before our contract, the vessel may mobilize in Townsville.

Demobilization will be in Townsville, and it is estimated that the duration of the expedition will be about 45 days.

#### **4.4.1.5 Core Storage**

Initially the cores recovered will be stored at the Bremen Core Repository, but after the moratorium period the cores will be moved to the Kochi Core Center for long-term storage in line with IODP policy.

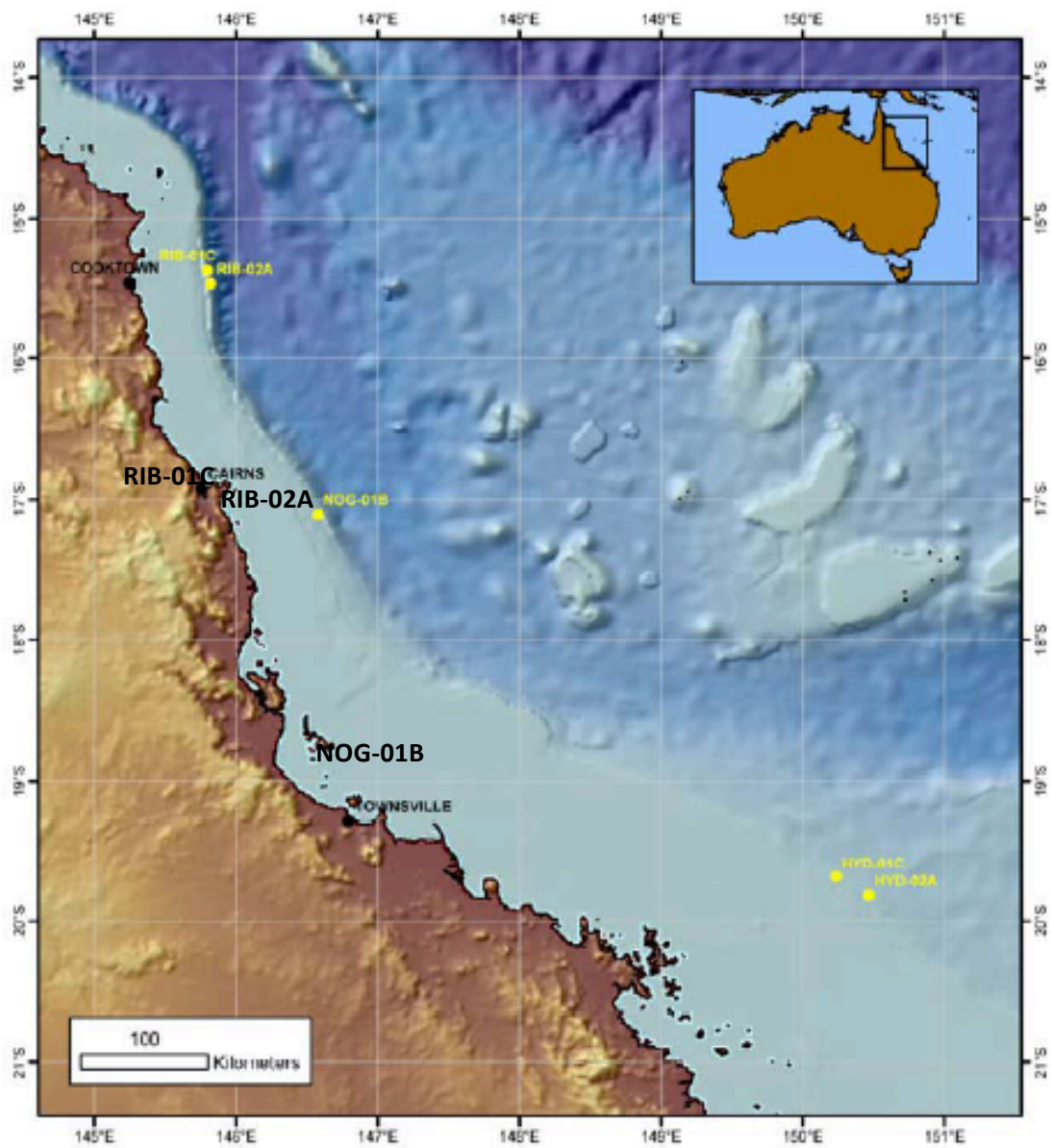


Figure APP- 9: Shaded-relief bathymetric map of the seas off Queensland showing the position of Townsville and the five chosen transects.

## 5 Management and Administration

### 5.1 Goals

The goal of Management and Administration of various IODP related entities, including IODP-MI, IOs, SAS, and Program Offices is to plan and coordinate with other IODP-related entities; oversee, review, and report on IODP activities.

### 5.2 Deliverables in FY2010

- **Annual Program Plan** – The Annual Program Plan (APP) is the central document in IODP, which describes all the planned activities and costs in Science and Platform Operations. APP is drafted by IODP-MI in close coordination with the IOs. After being approved by SASEC and the Board of Governors, the APP is finalized by approval of the Lead Agencies. Both IODP-MI and IOs are required to assure the implementation of activities written in the APP.
- **Quarterly and Annual Reports** – IODP-MI and IOs develop quarterly and annual reports, including financial reports.
- **Reporting and Liaising (Mostly for IOs)** – Report and liaise with funding agencies and with IODP-related entities (e.g., SAS meeting), Program Member Offices and other national organizations and participate in IODP-MI Task Forces, working groups, etc.
- **Coordination (for IODP-MI)** – IODP-MI “coordinates” with IOs, SAS Panels, SPC, SASEC, Board of Governors, Program Offices, funding agencies and various subcontractors. “Coordination” is the major deliverable of Management and Administration of IODP-MI, and various task forces play a key function in this coordination.
- **Contract Services** – Provide contract services for IODP-related activities.

### 5.3 Budget

Salary and Fringes	659,897	338,330	200,689	-	-	-	\$ 1,198,916
Travel	362,500	40,897	-	-	-	-	\$ 403,397
Supplies	-	5,003	10,000	-	-	-	\$ 15,003
Shipping	17,000	2,275	-	-	-	-	\$ 19,275
Communication	-	8,697	5,000	-	-	-	\$ 13,697
Contractual Services	105,600	6,000	65,200	-	-	-	\$ 176,800
Equipment	-	3,000	-	-	-	-	\$ 3,000
Other Direct Costs	2,056,418	6,949	-	-	-	-	\$ 2,063,367
<b>Total Direct Costs</b>	<b>3,201,415</b>	<b>411,151</b>	<b>280,889</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$ 3,893,455</b>
Modified Direct Costs (If applicable)	-	84,475	215,689	-	-	-	\$ 300,164
<b>Indirect Costs/Administrative Fee</b>	<b>489,408</b>	<b>223,643</b>	<b>64,707</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$ 777,758</b>
<b>Total</b>	<b>\$ 3,690,823</b>	<b>\$ 634,794</b>	<b>\$ 345,596</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 4,671,213</b>

Table APP- 3: Management and Administration Contract Budget for FY2010

## 5.4 Justification

### 5.4.1 IODP-MI

**Salaries and Fringes** – Include an anticipated cost-of-living allowance and estimated fringe benefits rate for IODP-MI direct M&A staff.

**Travel** – Includes all domestic and foreign travel for the IODP-MI M&A staff, the SPC and SASEC chairs, multiple task forces and work groups, Project Management Teams, Board of Governors and Executive Committee meetings.

**Shipping** – Includes costs for regular postage, overnight deliveries and bulk mailings.

**Contractual Services** – Include Contracts Officer position (currently a contractor).

**Other Direct Costs** –

**Association Dues and Subscriptions** \$6,000 - cover organizational membership and subscriptions.

**Meeting expenses** \$45,000 – Include the costs of meeting rooms, working lunches, audiovisual equipment, etc.

**Compensation for SPC and SASEC Chairs** \$160,000 –The SASEC Chair and SPC Chair will be located in the US in FY2010 and FY2011. IODP-MI will pay the SPC chair equivalent to five months (approx.) salary plus institutional overhead; according to the SASEC Terms of Reference (ToR). The SASEC chair is entitled to a 20% salary compensation plus institutional overhead for chairing three meetings in the year.

**Honoraria for Panel Chairpersons** \$35,000 – Panel Chairs are very important to IODP. They arrange and run meetings, take and distribute the minutes. In the United States, all scientists must account for their time away from their main (funded) duties. IODP advisory duties take the chairs away from their main duties, so they need to be compensated. Annual honoraria for SAS panel chairs are \$5,000. Co-chairs will receive \$2,500 each. Vice chairs will not receive honoraria. The three SSEP chairs will each receive \$5,000. This plan for Chairperson compensation has been approved unanimously by the IODP-MI Board of Governors.

**Specialty Coordinators** \$100,000 – Funds are allocated for approximately one month each of salary for members of the NanTroSEIZE PMT to coordinate disciplinary science for the NanTroSEIZE expeditions. Specialty Coordinators will focus on integration and coordination of scientific results between and among all of the individual expeditions. The anticipated workloads for each Specialty Coordinator will, by necessity, span the time from pre-cruise planning through post-expedition laboratory activities and synthesis.

**INVEST follow-up** \$30,000 - travel cost for a follow up steering committee meeting to write a report; printing and shipping of the report.

**Second IODP program review** \$50,000 - travel cost for review committee members

**Science Plan Writing Committee** \$108,000 – includes meeting expenses for the committee responsible for writing the new science plan and contractual services for a professional writer.

**Subcontract** – \$1,474,790 AESTO and ISHI: includes costs of Sapporo office operations and consolidation/relocation costs associated with the new Tokyo office. The move of two offices to Tokyo increases the subcontract costs in FY2010, but brings down the overall M&A cost for FY2011 and beyond. AESTO subcontract can only be renewed through March 31, 2010. IODP-MI identified ISHI (*Ippan Shadan Hojin* IODP-MI), a newly established not-for-profit Japanese corporation, to succeed the AESTO subcontractor. Essentially, the ISHI will be structured to be the Japanese arm of IODP-MI consistent with IODP-MI's 501(c)3 status. AESTO has promised to fully cooperate for this transition to take place.

**Indirect Costs** - Finance, administration, IT and legal expenditure are consolidated into an indirect cost pool.

#### 5.4.2 USIO

**Salaries and Fringes** – Salaries, fringes, and sea pay, including an anticipated cost-of-living allowance and estimated fringe benefits rate.

**Travel** – Transportation, per diem, lodging, and other associated costs. USIO travel to SAS panel meetings, task force meetings, IO meetings, USIO meetings, workshops, and national and international meetings; Ocean Leadership and TAMU travel to port calls; LDEO travel to subcontractor site visits and professional training courses and meetings; and TAMU travel to insurance meetings.

**Supplies** – General office supplies and expendables and operational supplies.

**Shipping** – Postage, express mail, courier services, and freight.

**Communication** – Telephone and fax charges.

**Contractual Services** – Consultant and contract services. Printing and copying of materials. Consultant services in support of network and video conferencing equipment (Ocean Leadership).

**Equipment** – Procurement, upgrading, or fabrication of equipment with an acquisition cost of more than \$5,000, plus those items as defined by Ocean Leadership, Columbia University, or TAMRF policy. Computers, monitors, and printers for new staff and replacement of equipment (Ocean Leadership).

**Other Direct Costs** – Costs not covered in other categories:

**Relocation** \$175 - Relocation cost for new employees (TAMU)

**Training** \$2,280 – Registration, transportation, per diem, and lodging expenses related to professional training. Registration and travel costs for professional training courses and meetings (TAMU).

**Business Conferences** \$176 – Expenses associated with meetings hosted by the USIO. Expense of program-wide conferences and meetings.

**Insurance** \$412 – Annual insurance premium.

**Services** \$2,010 – Expert assistance. Lease on off-premises records storage facility, partial cost of other support services, visitor parking permits, printing services, TAMU Physical Plant services, and temporary labor.

**TAMU Computing Services** \$1,030 – Use of TAMU’s financial and management information System (FAMIS).

**Equipment Rental** \$51– Rental of equipment for conferences.

**Furniture** \$26 – Office furniture. Office furniture and storage cabinets for use in office and at external storage facilities.

**Recruiting** \$250 – Cost of advertisements of vacant positions.

**Maintenance and Repair** \$488 – Equipment service agreements on copiers; replacement parts and service for fax machines, shredders, and so on.

**Library** \$51 – Books, journals, resources, and subscriptions to professional materials.

**Indirect Costs**—Administrative and financial costs associated with operating the Program for Ocean leadership, TAMU and LDEO. The specific equations used to calculate these costs vary by institution (For details, see **5.3 of Appendix B**).

### 5.4.3 CDEX

**Salaries and Fringes** – Salaries for managers and staff.

**Supplies** – Office supplies.

**Communication** – Telephone.

**Contractual Services** – Accounting Assistant (\$11,500), Graphic Editor (\$38,700), and Computer rental (\$15,000).

**Indirect Cost** - 30% of total direct costs except contractual services items. (Same in all WBEs)

### 5.4.4 ESO (\$732,100 directly funded through EMA; see Appendix D)

**Salaries and fringes** – Salaries, etc.

**Travel** – Transportation, per diem and accommodation for all tasks, including ESO internal meetings, IO meetings, ECORD Council meetings, ESSAC meetings, meetings of other IODP bodies including panels and committees, IODP-MI task forces, operational reviews and a range of appropriate scientific conferences (including conference fees) and workshops.

***Supplies*** – General office supplies.

***Equipment*** – Miscellaneous items, upgrades, etc.

***Other Direct Costs*** – Training for all partners.

## 6 Technical, Engineering and Science Support (TESS)

### 6.1 Goals

Goals for this Work Breakdown Element (WBE) primarily relate to the Implementing Organizations and include managing, coordinating, and performing the activities and providing the services, materials, platforms, and ship- and shore-based laboratories necessary to support IODP expeditions.

### 6.2 Deliverables for FY2010

Generic deliverables for this Work Breakdown Element are presented below. These deliverables are applicable to the specific IO expedition operations described in **Section 4** of the main text of this report, as well as in **Appendices B** (USIO), **C** (CDEX), and **D** (ESO).

- Expedition Planning and Implementation: Provide scientific and operational planning and execution for each scheduled expedition, including provision of a drilling platform. Conduct long-range operational planning for out-year expeditions.
- Reporting: Provide expedition-related reports and content for expedition publications (e.g., *Scientific Prospectus*, *Preliminary Report*, etc.). Act as a liaison to Science Advisory Structure (SAS) and other panels and task forces as appropriate.
- Expedition Staffing: Provide selection and support for scientific staffing and Co-Chief Scientist selection for each scheduled expedition. Provide support for shipboard and shorebased technical personnel and activities.
- Logistical Support: Provide for expedition and shore-based activities including procurement, shipping, and inventory of equipment and supplies.
- Analytical Systems: Provide and maintain shipboard and shore-based analytical facilities and associated quality control/quality assurance protocols. Ensure effective capture and transfer of expedition data to database systems.
- Logging: Provide for the delivery of logging services including back-off/severing services where needed.
- Engineering Support: Provide engineering support for maintaining and developing shipboard and shore-based drilling, coring, logging, and downhole systems including third-party developments.
- Applications Development: Provide maintenance and support for custom software
- Applications for the capture and shipboard management of operational, sampling, and analytical information.
- Legacy Documentation.



## 6.3 Budget

Expense Category	IODP-MI	USIO	CDEX	ESO	Bremen	SIO	Total
Salary and Fringes	-	204,001	1,219,921	-	-	-	\$ 1,423,922
Travel	-	13,629	-	-	-	-	\$ 13,629
Supplies	-	5,000	70,000	-	-	-	\$ 75,000
Shipping	-	750	20,000	-	-	-	\$ 20,750
Communication	-	3,608	-	-	-	-	\$ 3,608
Contractual Services	-	-	3,712,399	-	-	-	\$ 3,712,399
Equipment	-	-	-	-	-	-	\$ -
Other Direct Costs	-	-	-	-	-	-	\$ -
<b>Total Direct Costs</b>	-	226,988	5,022,320	-	-	-	\$ 5,249,308
Modified Direct Costs (If applicable)	-	181,988	1,309,921	-	-	-	\$ 1,491,909
<b>Indirect Costs/Administrative Fee</b>	-	96,454	392,976	-	-	-	\$ 489,430
<b>Total</b>	\$ -	\$ 323,442	\$ 5,415,296	\$ -	\$ -	\$ -	\$ 5,738,738

Table APP- 4: Technical, Engineering and Science Support Contract Budget for FY2010

## 6.4 Justification

### 6.4.1 IODP-MI

None

### 6.4.2 USIO

**Salaries and Fringes**—Salaries, fringes, and sea pay, including an anticipated cost-of living allowance and estimated fringe benefits rate.

SOC/POC—Salaries and fringes for staff supporting the USIO (see Section 3.2. USIO FTE Allocation Tables).

**Travel**—Transportation, per diem, lodging, and other associated costs.

SOC/POC—Travel to IODP meetings and workshops, pre-expedition and post expedition meetings, and FY11 planning meetings; meetings with drilling equipment supply vendors; subcontract site visits; and travel costs for USIO staff who will work at port calls, sail on FY10 expeditions and transit, and/or serve as custodians for the tie-up period. Also includes LDEO travel to professional training courses and meetings.

**Supplies**—Office and operational supplies.

SOC—General office supplies; electronic media and other computer supplies with an acquisition cost of less than \$1,000 (for TAMU); printer and copier supplies; laboratory, logistic, and shipping supplies for FY10 expeditions and shipboard and shore-based analytical and engineering laboratory and test facilities. Other drilling or science supplies may be purchased in support of USIO deliverables using cost avoidances gained during the fiscal year.

**Shipping**—Postage, express mail, and freight.

SOC/POC—Postage for regular correspondence and small packages and shipping to and from FY2010 expeditions.

**Communication**—Satellite, telephone, and fax charges.

SOC—Standard telephone line, long distance, and fax charges.

**Contractual Services**—Consultant and contract services.

SOC—Subcontract to members of the Logging Consortium (University of Montpellier, France; University of Leicester, United Kingdom; University of Aachen, Germany) to provide shipboard participation of Logging Staff Scientists, liaisons to selected panels as needed, and scientific support for Program planning and logging-related projects. Subcontract to Schlumberger for provision of a standard suite of tools, engineer services, software support, and mobilization services; specialty tools for use on individual cruises as needed; a dedicated engineer on the ship for each cruise and support from the base of operations; the services of a district engineer, staff engineer, electronics technician, and special services engineer on an as-needed basis (part-time to nearly full-time support); and the day rate for tool insurance for the deployment of downhole logging tools. Other contracts provide laboratory analytical instrument consultant service. In addition, costs are budgeted for contractual services associated with environmental assessment for marine mammal permitting associated with seismic operations.

**Equipment**—Procurement, upgrading, or fabrication of equipment with an acquisition cost of more than \$5,000, plus those items as defined by Ocean Leadership, Columbia University, or TAMRF policy.

SOC—Logging operations and laboratory equipment. Tools and equipment in support of logging operations and downhole measurement tool testing at the LDEO Environmental Stress Screening Facility and other facilities. Additional electronics for the superconducting rock magnetometer, and replacement of aging or irreparable analytical equipment, such as Cahn electrobalances, Schonstedt thermal demagnetizer, DTech magnetizer, Impulse demagnetizer, and noncontact resistivity meter.

**Other Direct Costs**—Costs not covered in other categories.

**Relocation**—Relocation costs for new employees.

SOC/POC—Relocation costs for new employees (TAMU).

**Training**—Registration, transportation, per diem, and lodging expenses related to professional training and attendance at professional meetings.

SOC/POC—Registration and travel costs for professional and safety training courses and meetings (TAMU).

**Business Conferences**—Incidental expenses associated with meetings hosted by the USIO.

SOC/POC—Expenses for pre-expedition, postexpedition, and planning meetings; refreshments provided for various business meetings; and catering services occasionally required for on-site training and professional consultant services.

**Insurance**—Annual insurance premiums.

SOC/POC—Annual insurance premiums for USIO vehicles.

**Services**—Expert assistance.

SOC—Annual physical examinations for seagoing personnel, copier services, external copying and printing services, vehicle and warehouse equipment repair, testing and calibration of laboratory instruments, and machine shop services.

***Other Expenses—***

***Furniture***—Office furniture.

SOC/POC—Replacing broken or aging office furniture and storage cabinets for use in office and at external storage facilities.

***Recruiting***—Employee recruitment.

SOC/POC—Local advertisements, advertisements in science and trade journals, and other costs related to filling/replacing positions and recruiting professional staff.

***Maintenance and Repair***—Maintenance agreements and equipment repairs.

SOC/POC—Maintenance and repair of office equipment, postage meter, vehicle fleet, equipment in warehouse, overhead cranes, other loading dock equipment, and laboratory and safety equipment.

***Library***—Books, journals, and other resources.

SOC/POC—Technical books, journals, resources, and subscriptions to professional materials.

***Indirect Costs***—Administrative and financial costs associated with operating the Program.

SOC/POC—For LDEO, indirect costs at 53% are assessed on all charges except permanent equipment. In addition, subcontracts are charged indirect costs on the first \$25,000 of each contract. The indirect costs for subcontracts established prior to FY2010 have already been paid, so these subcontracts are not subject to indirect cost during FY2010. MTDCs are the total direct costs minus these exceptions.

### **6.4.3 CDEX**

***Salary and Fringe*** – Salaries for managers, staff, and part-time workers

***Supplies*** – *Chikyu* lab supplies

***Shipping*** – Transportation costs for Cores and supplies from *Chikyu* to core laboratories

***Contractual Services*** – Funds for LWD/wireline operations (\$80,000),

Laboratory Technical Services (Marine Technical staff) (\$2,983,333); Logistics

Support (\$20,000), VSAT (\$4,060) and Equipment Maintenance (\$70,000). SQUID upgrade (\$525,000) from the broken one to a Non-Liquid-Helium type.

### **6.4.4 ESO (\$1,601,700 directly funded through EMA; see Appendix D)**

***Salaries and fringes*** - Portions of salaries at standard institution rates, including overheads for implementation of the Onshore Science party for the New Jersey Shallow Shelf Expedition, and both offshore and onshore components of the Great Barrier Reef Environmental Changes

Expedition.

POC – Most BGS costs are split 50/50 between POCs and SOC, except for non-scientific work, which is fully allocated to POCs.

SOC – All Bremen and EPC costs.

**Travel** -Scoping, planning and preparation will require a variety of meetings among ESO staff, with co-chiefs and scientists, scoping groups, discussion with actual or potential contractors, for contractual issues and staff exchanges. Also travel associated with 2 Onshore Science Parties, and supplements to the GBR travel budget presented for FY2009.

POC – All BGS planning travel, 50% of BGS offshore operations.

BGS 2 Japan/USA/Australia planning meetings @\$3,500.

4 European/other planning meetings @\$2,000.

6 journeys and accommodation for 35 nights at 2 OSPs.

3 journeys for offshore mobilization GBR @\$6,000.

SOC - All Bremen and EPC travel, 50% of BGS offshore operations.

BGS 2 Japan/USA/Australia planning meetings @\$3,500.

4 European/other planning meetings @\$2,000.

4 journeys and accommodation for 35 nights at 2 OSPs.

2 journeys for offshore operations GBR @\$5,000.

Bremen 2 Japan/USA planning meetings @\$3,500.

6 European/other planning meetings @\$2,000.

4 journeys for offshore operations GBR @\$6,000.

EPC 2 Japan/USA planning meetings @\$3,500.

3 European/other planning meetings @\$2,000.

4 journeys and accommodation for 35 nights at 2 OSPs.

2 journeys for offshore operations GBR @\$6,000.

### **Supplies**

POC – None budgeted.

SOC – Analytical and sampling consumables and D-tubes. Note that for New Jersey this is not the total cost of this item as some costs were claimed in FY2009.

### **Shipping**

POC – Shipping of operational containers for offshore operation in GBR. Note that although these items were included in the FY2009 APP, they will not be invoiced in FY2009 as the offshore operation will now take place in FY2010.

SOC – Shipping of MSP expedition samples to scientists.

### **Communication**

POC – INMARSAT licence, couriers.

SOC – Couriers, including specialised microbiology samples courier.

### ***Contractual services***

POC – None budgeted

SOC – The logging contract for Great Barrier Reef Environmental Changes expedition is included in the FY2009 APP, but only a small proportion (c \$100,000) will be required in FY2009, therefore the bulk of the cost is transferred to FY2010. An MSCL has now been purchased with funds from FY2008 and FY2009, however servicing and maintenance of both the logging equipment and the MSCL are now needed. There is also a need to hire a Natural Gamma Ray system for the New Jersey Onshore Science Party as well as a thermal conductivity system.

### ***Equipment***

POC - None budgeted.

SOC – Logging-related computer hardware is required, and in order to ensure measurement compatibility, a Hamilton Frame of their manufacture is to be purchased from TAMU.

### ***Other Direct Costs***

POC – Platform costs and other related costs (contingency, port expenses, agency fees, insurance and loss, refurbishment, medicals and medical reviews, environmental impact statement, crainage, and hire of drilling consultant) were included in the FY2009 budget but not used. A contingency cost for platform hire is included to ensure sufficient operational time to achieve the scientific objectives of the expedition.

Accommodation and victualling costs for 2 Onshore Science Parties.

SOC – Bremen University laboratory upkeep and certification. This includes regular checks, certification, and if needed, spare parts for all exhaust air from labs and especially lab hoods, gas line pipes, electric lines, water pipes, cleaning and performance checks of sediment traps in lab sinks, waste water tests for unauthorized chemicals, lack of oxygen monitoring in labs, checks for X-ray equipment (XRF, XRD labs), overall laboratory equipment performance tests and certificates (e.g. chemical lab), balances calibration service, certified element standards, certified sediment standards, software updates, licence fees, etc., for IODP labs, proportionate for labs at Bremen University (e.g. used for Onshore Science Parties) and mobile lab containers sent to MSP expeditions.

## 7 Engineering Development

### 7.1 Goals

IODP-MI will utilize the SAS-derived IODP Technology Roadmap as the primary guide for the acquisition of existing or latent technology required for IODP to meet the science objectives described in the Initial Science Plan.

IODP-MI Engineering project oversight will extend to Platform Operating Costs (POC) projects in FY2010 as a service to the funding agencies (when requested). The goal of this additional service is to provide uniform review and oversight to all areas of engineering within the Integrated Ocean Drilling Program. IODP-MI will not have any fiscal authority over POC-funded engineering projects, but will only offer advice to funding agencies for their use in prioritizing and monitoring POC-funded projects.

### 7.2 Deliverables in FY2010

The FY2010 engineering plan builds on the successful implementation of the FY2009 engineering plan, which marked the beginning of centrally coordinated detailed engineering effort within the IODP structure. Four projects will continue and one new project will commence in FY2010.

- A. Long Term Borehole Monitoring System (LTBMS)
  - Completion of the long term environmental life test
  - Project documentation and conclusion
- B. Motion Decoupled Hydraulic Delivery System (MDHDS)
  - Finalize design and fabricate all electronic and mechanical systems
- C. Simple Cabled Instrument for Measuring Parameters In-situ (SCIMPI)
  - Complete detailed design and fabricate electronics and mechanical systems
- D. Core Quality and Quantity Study
  - Conclude coring study
- E. Multi-sensor Magnetometer Module logging tool (MMM)
  - Complete detailed design and begin fabrication of all systems

Both SPC and EDP approved the FY2010 IODP-MI engineering development plan (Specific consensus items shown below).

**EDP Consensus 0901-09:** The EDP re-affirms its endorsement of the existing IODP-MI FY10 Engineering Development Plan.

**SPC Consensus 0808-23:** The SPC recognizes the progress that has been made with the Simple Observatory design, and endorses its continuation as well as the second year development of the Motion Decoupled Hydraulic Delivery System outlined in the draft FY2010 engineering plan presented by IODP-MI. In addition, the SPC recognizes the high scientific value of providing a

wireline magnetometer to all IODP platforms and looks forward to the start of this development in FY2010.

### 7.2.1 Long Term Borehole Monitoring System (LTBMS)

The LTBMS project will extend into FY2010 to conclude the long-term environmental testing of the telemetry system. Funding for personnel will be required. The Environmental System Evaluation Test Report will be completed to describe the plan and final testing results of the destructive test i.e., shock test and high temperature life test.

Task	FY2009						FY2010						FY2011					
	O	D	F	A	J	A	O	D	F	A	J	A	O	D	F	A	J	A
Long Term Borehole Monitoring System																		
Build experimental prototype																		
Complete 13 month sytem life test																		
Systems Integration Test (SIT) with experimental prototype																		
Begin system test report																		
Complete final system life test report																		
Integrate and assemble uphole and downhole components																		
Prepare for deployment																		
Deployment																		

Figure APP- 10: The LBTMS development plan for FY2010. The area highlighted in red represents the tasks to be funded by the FY2010 APP.

### 7.2.2 Motion Decoupled Hydraulic Delivery System (MDHDS)

The University of Texas will complete the second year of the MDHDS project, which will facilitate the acquisition of accurate in-situ temperature and pressure measurements by decoupling the heave induced motion of the bottom hole assembly from the logging cable deployed measurement device. The system will be deployable from any platform utilizing IODP drillpipe and bottom hole assembly components. The USIO and Stress Engineering will be providing the design and fabrication services for the system as assisting with the testing and deployment.

Funding for this project in FY2010 will come from both IODP and the University of Texas. The total cost to IODP for year two is \$164,876. The University of Texas is providing a cost share in the amount of \$66,741.

Task	FY2009						FY2010						FY2011					
	O	D	F	A	J	A	O	D	F	A	J	A	O	D	F	A	J	A
Motion Decoupled Hydraulic Deployment System																		
Detailed design																		
Task 1) lower latch mechanism subassembly																		
Task 2) upper latch mechanism subassembly																		
Task 3) T2P Piston Rod subassembly																		
Task 4) Design the hot line connect																		
Task 5) Integrate Deployment Tool assembly																		
Fabrication																		
Task 6) Fabrication Drawings Package																		
Task 7) Technical Manual for Deployment																		
Task 8) Fabrication of prototype tool																		
Task 9) Inspection, Assembly, Bench Test																		
Field Trials and Data Evaluation																		
Task 10) Field Testing																		
Task 11) Space-out design																		
Task 12) Analysis of Field Data																		
Reports and Deliverables																		
Task 13) Drafting																		
Task 14) Performance Analysis																		
Task 15) Operations manuals																		

Figure APP- 11: The multiple year Motion Decoupled Hydraulic Delivery System development plan. The area highlighted in red represents the tasks to be funded by the FY2010 APP.

### 7.2.3 Simple Cabled Instrument for Measuring Parameters In-situ (SCIMPI)

The detailed design of the SCIMPI tool will be completed in FY2010. The design will build upon the high level design effort conducted in FY2009. Following the completion of the design work, a working prototype of the SCIMPI will be constructed in FY2010 and prepared for testing in FY2011.

Task		FY2009						FY2010						FY2011						FY2012					
		O	D	F	A	J	A	O	D	F	A	J	A	O	D	F	A	J	A	O	D	F	A	J	A
SCIMPI																									
	High Level Design																								
	Detailed design																								
	Prototyping																								
	Fabrication																								
	Testing																								
Common Deployment System																									
	Begin design																								
	Finalize design																								
	Fabrication																								

Figure APP- 12: The multiple year SCIMPI development plan. The area highlighted in red represents the tasks to be funded by the FY2010 APP.

### 7.2.4 Core Quality and Quantity Study

IODP-MI personnel initiated the first phase of a study in FY2008 to quantitatively evaluate coring results in an effort to identify, and ultimately remediate, factors that affect the quantity and quality of recovered core. In FY2009, IODP-MI personnel coordinated case studies to help identify factors controlling the quantity and quality of core collected by IODP. IODP-MI will conclude the study in FY2010 and generate the final report.

Task		FY2010					
		O	D	F	A	J	A
Core Quality and Quantity Analysis							
	Review deliverables from FY2009 contractors						
	Issue contract for remaining scoping studies						
	Complete final analyses						
	Generate final project report						

Figure APP- 13: The final year of the core quality and quantity analysis project. The area highlighted in red represents the tasks to be funded by the FY2010 APP.

### 7.2.5 Multi-sensor Magnetometer Module logging tool (MMM)

The MMM is a new project for FY2010 that was first proposed one year ago and subsequently vetted through SAS and IODP-MI engineering management. The Lamont-Doherty Earth Observatory has proposed to develop a logging tool that replaces no-longer-available commercial logging equipment used to measure total magnetic field in-situ. The development will occur over a three-year period at a total cost of \$305,212. Year one costs will be \$160,356. The development will result in a downhole tool that provides continuous records of the magnetic field in the borehole, from which magnetization and polarity of the rocks surrounding



the borehole can be calculated. This new tool will have the capability to measure a wide range of rock types, from highly magnetic basalts to more weakly magnetized unlithified sediments. The magnetization of the igneous ocean crust – a fundamental subject in marine geophysics – can be examined with the new tool. The tool will also be able to provide a magnetostratigraphy from IODP holes whose cores have been magnetically overprinted, as demonstrated at ODP Site 1084 with the previous generation of downhole magnetometer (Schlumberger’s GHMT, no longer available to IODP). The MMM will provide valuable new downhole magnetic information to complement the magnetic measurements on core samples, and significantly enhance IODP’s ability to magnetostratigraphically date sediment sequences.

Task	FY2010						FY2011						FY2012					
	O	D	F	A	J	A	O	D	F	A	J	A	O	D	F	A	J	A
Multi-Sensor Magnetometer Module																		
Design																		
Sensor acquisition																		
Electronics and software creation																		
Tool calibration																		
Testing																		
Deployment																		

Figure APP- 14: The multiple year Multi-sensor magnetometer module development plan. The area highlighted in red represents the tasks to be funded by the FY2010 APP.

## 7.3 Budget

Expense Category	IODP-MI	USIO	CDEX	ESO	Bremen	SIO	Total
Salary and Fringes	214,351	69,195	142,288	-	-	-	\$ 425,834
Travel	46,600	6,000	-	-	-	-	\$ 52,600
Supplies	-	-	-	-	-	-	\$ -
Shipping	-	-	-	-	-	-	\$ -
Communication	-	-	-	-	-	-	\$ -
Contractual Services	925,416	-	-	-	-	-	\$ 925,416
Equipment	-	25,000	-	-	-	-	\$ 25,000
Other Direct Costs	-	13,273	-	-	-	-	\$ 13,273
<b>Total Direct Costs</b>	<b>1,186,367</b>	<b>113,468</b>	<b>142,288</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$ 1,442,123</b>
Modified Direct Costs (if applicable)	-	88,468	142,288	-	-	-	\$ 230,756
<b>Indirect Costs/Administrative Fee</b>	<b>158,965</b>	<b>46,888</b>	<b>42,686</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$ 248,539</b>
<b>Total</b>	<b>\$ 1,345,332</b>	<b>\$ 160,356</b>	<b>\$ 184,974</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 1,690,662</b>

Table APP- 5: Engineering Development Contract Budget for FY2010

## 7.4 Justification

### 7.4.1 IODP-MI

**Salary and Fringes** – Salaries for IODP-MI personnel leading IODP engineering development for SOC funded projects as well as provide oversight and management to the funding agencies for POC engineering projects.

**Travel** – Travel costs for engineering development personnel required to attend science advisory structure panel meetings, contractor oversight and workshops as needed.

**Contractual Services** – IODP-MI is requesting \$780,854 to complete projects “B” through “D” above. The second year of the MDHDS project will be subcontracted to the University of Texas in the amount of \$164,876. These costs are based on the existing two year contract with IODP-MI.

The second year of the contractual award to the University of Rhode Island will be subcontracted to conduct the detailed design and the fabrication of the SCIMPI device. The award to URI will be in amount of \$587,978 and is based on the existing three year contract with IODP-MI. Lastly, \$28,000 is requested to retain an engineering/drilling consultant to conclude the Core Quality and Quantity Study.

#### 7.4.2 USIO

USIO with the Lamont-Doherty Earth Observatory will work on the design and fabrication of the Multi-sensor Magnetometer Module for \$160,356.

#### 7.4.3 CDEX

**Salary and Fringes** – Salary and fringe for Managers and staff associated with the wrap up of the LTBMS project will be \$142,288.

#### 7.4.4 ESO

No budget at ESO.

## 8 Core Curation

### 8.1 Goals

The major goal associated with this Work Breakdown Element is to provide services in support of IODP core sampling and curation of the core collection archive. IODP supports operations at three core repositories: the Gulf Coast Repository (GCR) operated by the USIO, the Kochi Core Center Repository (KCC) operated by CDEX, and the Bremen Core Repository operated by Bremen University (**Table APP-8**).

Repository	Institution	Geographic Location
GCR	Texas A&M University	Pacific Ocean (east of western trench boundaries); Caribbean Sea and Gulf of Mexico; Southern Ocean (>60°S, except Kerguelan Plateau)
BCR	University of Bremen	Atlantic Ocean, Mediterranean Sea, Arctic Ocean (north of Bering Strait)
KCC	Kochi University	Western Pacific Ocean (west of trench boundaries); Indian Ocean, Kerguelan Plateau; Bering Sea

Table APP- 6: Core Distribution Scheme for IODP

### 8.2 Deliverables in FY2010

The primary deliverables for the repositories during FY2010 are listed below.

- Policy and Procedures: Work with other IOs, the Science Advisory Committee (SAS), and the IODP central management office (IODP-MI) to implement a policy for IODP core curation. Work closely with staff to coordinate, standardize, and document curatorial procedures for IODP cores and samples.
- Sample and Curation Strategies: Plan sample and curation strategies for specific expeditions identified in Section 4 of this Annual Program Plan and review all shipboard and moratorium-related requests in coordination with the other members of the Sample Allocation Committee (SAC) for each expedition.
- Sample Requests: Respond to post-moratorium sample requests from the scientific community.
- Core Curation: Conduct all responsibilities associated with curation of core collections.
- Use of Core Collection: Promote the outreach use of the core collection in collaboration with Implementing Organization (IO) and IODP-MI education/outreach personnel by providing materials for display at meetings or museums, as well as conducting tours and supporting other program outreach activities.

- Meetings: Host and/or participate an annual IODP curatorial staff meeting. Act as IO liaison for meetings with the other IOs, IODP-MI, and the SAS, as appropriate.
- Prepare legacy documentation on sampling activities

### 8.3 Budget

Expense Category	IODP-MI	USIO	CDEX	ESO	Bremen	SIO	Total
Salary and Fringes	-	286,500	323,992	-	188,179	-	\$ 798,671
Travel	-	34,950	-	-	5,050	-	\$ 40,000
Supplies	-	15,000	100,000	-	8,765	-	\$ 123,765
Shipping	-	18,750	40,000	-	40,000	-	\$ 98,750
Communication	-	2,561	5,000	-	-	-	\$ 7,561
Contractual Services	-	-	419,222	-	-	-	\$ 419,222
Equipment	-	70,000	-	-	-	-	\$ 70,000
Other Direct Costs	-	4,734	-	-	-	-	\$ 4,734
<b>Total Direct Costs</b>	-	432,495	888,214	-	241,994	-	\$ 1,562,703
Modified Direct Costs (If applicable)	-	-	468,992	-	-	-	\$ 468,992
Indirect Costs/Administrative Fee	-	-	140,698	-	96,798	-	\$ 237,496
<b>Total</b>	\$ -	\$ 432,495	\$ 1,028,912	\$ -	\$ 338,792	\$ -	\$ 1,800,199

Table APP- 7: Core Curation Budget for FY2010

### 8.4 Justification

#### 8.4.1 IODP-MI

None budgeted.

#### 8.4.2 USIO

**Salaries and Fringes**—Salaries, fringes, and sea pay, including an anticipated cost-of-living allowance and estimated fringe benefits rate. Salaries, fringes, and sea pay for staff supporting the USIO (see Section 3.2. USIO FTE Allocation Tables).

**Travel**—Transportation, per diem, lodging, and other associated costs. Travel to IODP meetings and workshops, IO meetings, and USIO meetings, including an annual IODP Curators meeting; an AGU meeting; and travel costs for TAMU staff who will sail on FY10 expeditions.

**Supplies**—Office and operational supplies. General office supplies, printer supplies, general laboratory supplies, specialized supplies for sampling and curatorial tasks, and supplies for packing extra-large shipments, packing deep frozen microbiological shipments, and hosting sampling parties.

**Shipping**—Postage, express mail, and freight. Postage for regular correspondence, regular-sized sample shipments to scientists, shipping for the Expeditions 320 and 321 sampling party, and as many as ten special sample shipments for FY10 (for deep-frozen microbiological samples, Uchannels, or whole core sections for XRF scanning) at an average cost of \$1,000 each.

**Communication**—Telephone and fax charges. Standard telephone line, long distance, and fax charges.

**Contractual Services**—None budgeted.

**Equipment**—Procurement, upgrading, or fabrication of equipment with an acquisition cost of more than \$5,000, plus those items as defined by Ocean Leadership, Columbia University, or

TAMRF policy. Two new –86°C freezers to hold microbiological archive samples and one new emergency diesel generator to provide backup power supply to all microbiological deep freezers.

**Other Direct Costs**—Costs not covered in other categories.

**Training**—Registration, transportation, per diem, and lodging expenses related to professional training. Registration and travel costs for professional training courses and meetings (TAMU).

**Business Conferences**—Incidental expenses associated with meetings hosted by the USIO. Expenses for sampling parties at the GCR.

**Services**—Expert assistance.

Annual physical examinations for seagoing personnel and wiring for new emergency diesel generator supplying backup power to deep freezers.

**Maintenance and Repair**—Maintenance agreements and equipment repairs. Repairs and maintenance for storage buildings; refrigeration units; deep freezers; laboratory, repository, and office equipment; forklift; and shrink-wrap machine.

### 8.4.3 CDEX

**Salary and Fringes** – Salaries for Managers, staff and part-time workers

**Supplies** – Laboratory Curation and office supplies

**Shipping** – Sample shipping (DHL, FedEx, UPS, etc)

**Communication** - Telephone, etc.

**Contractual Services** – Curatorial Technical Services (\$372,222) for onboard laboratory technical services including one technician and one administrative assistant; Waste treatment (\$10,000); Core management system maintenance (\$15,000); Forklift rental (\$10,000); Brochures, novelties (\$5,000); Computer rental for curators (\$7,000).

### 8.4.4 ESO (\$60,900 directly funded through EMA; see Appendix D)

**Salaries and fringes**

SOC - Portions of salaries at standard institution rates, including overheads. (See organizational chart and position and percent effort table in the “Introduction” section). The services provided by the University of Bremen are in general not limited to the individuals listed in the Table “FTE Allocation for all WBEs”, but may be covered in part by support scientists, technicians and students, so that the percentages shown for specified individuals are in some case higher than anticipated.

POC—None budgeted.

**Travel**

SOC - This category is an estimated projection for travel to meetings related to IODP curatorial topics. It may include visits to the Gulf Coast and Kochi Repositories for technical and training exchange, as well as cooperative work. Bremen 2 Japan/USA meetings @ \$3,500

POC—None budgeted.

### ***Supplies***

SOC - The bulk of this category is for materials related to sampling needs. This includes plastic scoops and tubes, u-channels, Pmag cubes, Styrofoam plugs, sample bags, shipping boxes, labels and ink bands for the printers; tape for the d-tubes and for packing, etc. The amount is loosely based on past needs for MSP core sampling, but future sampling activity levels are difficult to assess.

We can only assume that sampling levels will increase as the size of our collection increases.

POC—None budgeted.

### ***Shipping***

SOC - These costs are primarily for courier shipping of samples (incl. u-channels, and archive core halves for non-destructive measurements requests) worldwide to the requesting investigators. As with the Supplies category, the amount depends on the amount of sampling activity, which certainly will continue to increase with the size of our collection.

POC—None budgeted.

## **8.4.5 Bremen**

### ***Salary and Fringes***

SOC- This category is the equivalent of 1.6 FTE positions, and is used to cover 80% of the salaries of W. Hale and A. Wülbers.

POC—None budgeted.

### ***Travel***

This category is an estimated projection for travel to meetings related to IODP curatorial topics. It may include visits to the Gulf Coast and Kochi Repositories for technical and training exchange, as well as cooperative work.

POC—None budgeted.

### ***Supplies***

The bulk of this category is for materials related to sampling needs. This includes plastic scoops and tubes, u-channels, Pmag cubes, Styrofoam plugs, sample bags, shipping boxes, labels and ink bands for the printers; tape for the d-tubes and for packing, etc. The amount is loosely based on past needs, but future

sampling activity levels are difficult to assess. We can only assume that sampling levels will increase as the size of our collection increases.

POC—None budgeted.

### ***Shipping***

These costs are primarily for courier shipping of samples worldwide to the requesting investigators. As with the Supplies category, the amount depends on the amount of sampling activity, which certainly will continue to increase with the size of our collection.

POC—None budgeted.

### ***Indirect Costs***

University and institute administrative costs.

## 9 Data Management

### 9.1 Goals

The goals of data management include: management of data supporting IODP activities, management of expedition and post-expedition data, ensuring long-term archiving, increasing access to data, IT support services, and the IODP Site Survey Data Bank.

### 9.2 Deliverables in FY2010

The IOs are responsible for capturing and storing all drilling-related data generated during shipboard operations. They use their own specific protocols and databases for this. The system used by the USIO is a customized LIMS (Laboratory Information Management System) data system put into production in FY2009. USIO will manage all new data, whether it is generated from new drilling activities or from new analysis of sample materials collection prior to FY2009. The JANUS system is being transitioned to an archival system. Updates to JANUS will hereafter be limited to corrections of inaccurate data. The system to be used by CDEX is the J-CORES system and is currently being modified to improve data access and visual core description (VCD) generation. For expedition use (shipboard and shore-based core description), ESO is using a modified version of the DIS developed for the International Continental Drilling Program (ICDP). ESO-generated expedition data are subsequently legacy-stored in the World Data Center (WDC) PANGAEA system. In FY2010, each IO is responsible for providing access to metadata describing data stored in their respective databases as well as access to data resources (core measurements data, borehole logging data and core photographs and digital images). The Scientific Drilling Information Service (SEDIS) will provide central access to the distributed IO databases (see **Figure APP-15**) by harvesting metadata from each IO and by integrating the distributed data systems using a web services approach. SEDIS will also serve as the “one-stop” access point for accessing IOs data, supporting service-oriented software applications access and SEDIS parameterized query access to the source data systems. Sample requests and related core repository data will be handled by the Sample Materials Curation Management System (SMCS). A re-engineering and enhancements to SMCS will continue in FY2010, in order to improve the usability of the Sample Data and Materials Request (SDRM) web interface.

SEDIS will continue to be a strong focus of data management development in FY2010. The SEDIS Phase I portal is currently online and serves as a central data discovery for the scientific community. SEDIS II will be completed in FY2009 and will serve as the IODP publications catalogue, as well as supporting publication obligation tracking for IODP sample requests. SEDIS III development will begin in FY2010 and will focus on providing web services access to IOs data systems. By developing an integrated access point for IODP web services data with documented schemas, vocabularies and namespaces, software application developers will be able to build automated access to IODP data into analytical tools used by the IODP scientific community and geoscience educators.



Phase III of SEDIS will extend the existing access to IO's data sets to enable users to dynamically compile data from the distributed IOs data systems. The main features will be parameterized query functionality, data transformation services, and web services capable of serving data to service-enabled software tools (e.g., GeoMapApp, CoreWall) and SEDIS III applications.

The SMCS Sample Materials Request Systems (SRMS) will be re-engineered in FY2010 to overcome major user interface and performance issues that have limited its utilization by shipboard and post-expedition requestors. The Sample Data and Request Management system version 2 will be completed in FY2010. The completed SMCS will improve management and coordination of sample requests.

The IODP Proposal Database maintenance and upgrades will be performed in FY2010. The maintenance and upgrades will focus on improving the administrative interface for reviewing and managing the IODP proposal process, including versioning and revisions of proposals, and increasing the integration of proposals coversheet information with the SEDIS data inventory. IODP proposal coversheets will be searchable via keywords, controlled vocabularies and geospatial search interfaces in SEDIS.

The IODP Central Registry LDAP (Lightweight Directory Access Protocol) system is currently operational. Maintenance of the Central Registry, including integration with other IODP systems, is expected during FY2010.

Further details of IO data management activities are included in **Appendices B to D**.

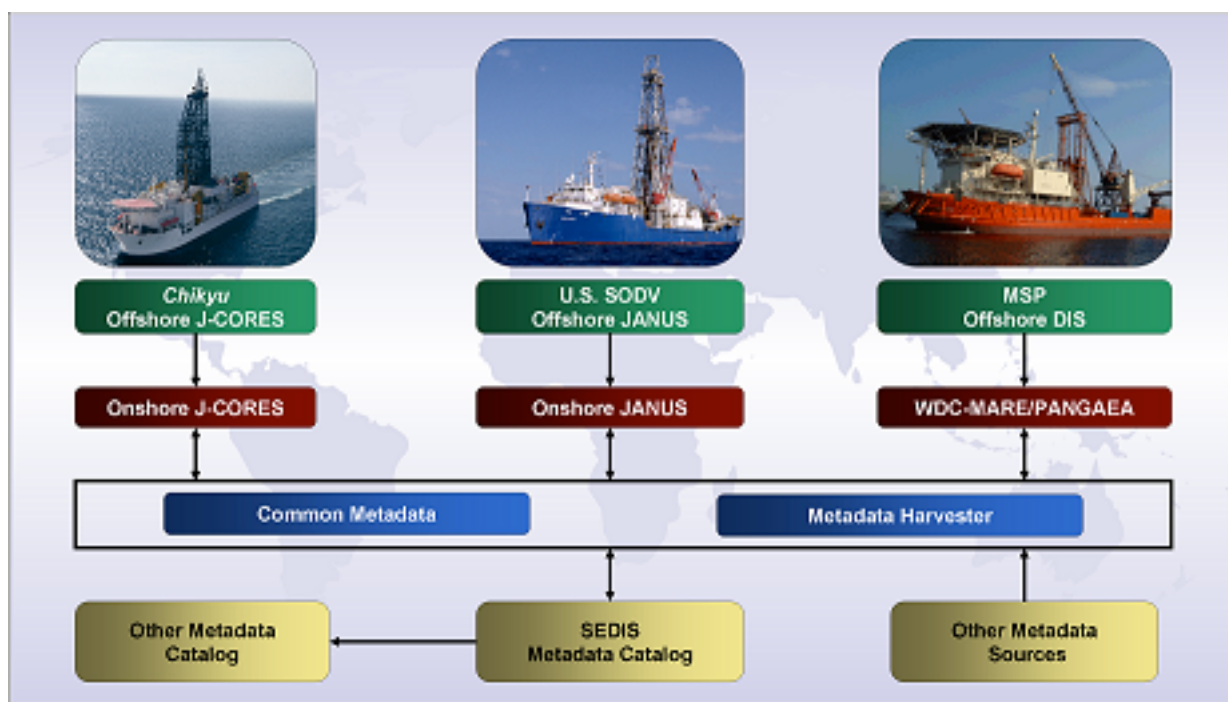


Figure APP- 15: Major Aspects of IODP Data Management

### 9.2.1 Expedition Data

Maintain and manage databases supporting expedition-planning data. Operate and maintain data management and harvesting systems (including QA/QC) for storage and archiving of expedition and post-expedition data, including core and sample tracking.

- a. **Completion of data access services:** CDEX is currently modifying J-CORES database to accommodate data access at a more granular level and for the creation and harvesting of related metadata for SEDIS. SEDIS Phase III will make J-CORES data via SEDIS as a web services during FY2010. This effort will build upon FY2009 work to create a framework and reference implementation for J-CORES to expose data via web services. USIO has completed initial shipboard and shore-based rollout of LIMS. SEDIS Phase III will make archived data sets available via web services data from JANUS and LIMS available via SEDIS during FY2010. This effort will build upon FY2009 work to create a framework and reference implementation for JANUS to expose data via web services by expanding the JANUSAMP integration with SEDIS to include other types of core measurements data and digital images. ESO will continue to use the DIS system for collection of data and the WDC-PANGAEA for access to data sets and web services via SEDIS.
- b. **Acquisition of core and logging data:** Each IO is responsible for capturing the scientific data that will be collected during the scheduled expeditions for FY2010 and arranging for storage of the data in a database so it is accessible to the expedition participants and to the scientific communities via SEDIS. FY2009 work to develop OGC standards-compliant web services for borehole logging data will be continued in FY2010 and will provide web services access to borehole logging data from all IOs via SEDIS web services.

### 9.2.2 Program-wide access portal

Provide program-wide access portal including supporting metadata.

- a. Metadata access from each IO: Each IO is responsible for providing metadata describing the datasets they have in their own databases. This metadata will continue to be regularly harvested by SEDIS to provide central access to the program data by the scientific community.
- b. SEDIS Phase II: Publication search engine linked to data discovery: SEDIS Phase II development will be completed by in FY2009. Publications metadata will continue to be regularly harvested by SEDIS via access to AGI-GeoRef Ocean Drilling Citations Database metadata.
- c. SEDIS Phase III strategies: Parameterized Querying, Data Delivery and Data Services: SEDIS Phase III will commence in FY2010. SEDIS Phase III development is expected to be completed during FY2011.
- d. SEDIS III and SEDIS system maintenance: SEDIS will be extended with web services access to IO's data to enable users to dynamically compile data from the distributed IOs data systems. The main deliverables of SEDIS III development will be web services

capable of serving JANUS, J-CORES, WDC-MARE/PANGAEA and LIMS data to service-enabled software tools (e.g., GeoMapApp, CoreWall) and SEDIS III applications, parameterized query functionality, data transformation services. IODP-MI will pursue a four-year agreement for SEDIS maintenance and hosting contracts to ensure SEDIS system availability through 2013. Plans for a permanent IODP data archive will be developed in 2010.

- e. SMCS enhancements: An upgraded version (v.2) of SMCS Sample Materials Request Systems (SRMS) will be completed in FY2010 to overcome user interface and performance issues.

### **9.2.3 Operation and maintenance**

Provide operation and maintenance of computer and network systems.

- a. Evaluation, maintenance, and possible enhancements: The systems developed in FY2009 will need to be closely monitored and maintained in FY2010. This could require some minor adjustments and enhancements.
- b. Continuing operation of the SSDB: No development is expected in FY2010. The SSDB is now mature and should only require normal operation and maintenance tasks from Scripps Institute of Oceanography.

### **9.2.4 Common vocabularies and terminology within IODP**

This is an important aspect of data management within IODP. The process will continue during FY2010 with development of consistent and common vocabularies and terminologies for specific disciplines to be coordinated by IODP-MI. FY2009 work included development of the first versions of Simple Knowledge Organization System (SKOS) Resource Description Framework (RDF) documents to describe IODP data. The IODP SKOS vocabularies provide interoperability of the IODP data systems within the SEDIS integration framework. Updates, maintenance and expansion of the IODP SKOS vocabularies and the IODP namespaces will be continued in FY2010.

Standardization of vocabularies for lithology and paleontaxonomic data will be continued in FY2010. The CHRONOS system has been selected as the “master” Taxonomic Names List server from which all IOs will derive paleontaxonomic terms, synonyms, relationships, etc. A similar system of standardization of lithology terms across IOs will be developed in FY2010.

## 9.3 Budget

Expense Category	IODP-MI	USIO	CDEX	ESO	Bremen	SIO	Total
Salary and Fringes	-	600,429	486,969	-	-	204,994	\$ 1,292,392
Travel	18,500	44,023	-	-	-	-	\$ 62,523
Supplies	-	20,865	8,000	-	-	4,800	\$ 33,665
Shipping	-	925	-	-	-	-	\$ 925
Communication	-	8,142	-	-	-	3,990	\$ 12,132
Contractual Services	351,900	-	210,000	-	-	-	\$ 561,900
Equipment	-	48,171	-	-	-	-	\$ 48,171
Other Direct Costs	113,011	243,263	-	-	-	14,727	\$ 371,001
<b>Total Direct Costs</b>	<b>483,411</b>	<b>965,818</b>	<b>704,969</b>	<b>-</b>	<b>-</b>	<b>228,511</b>	<b>\$ 2,382,709</b>
Modified Direct Costs (If applicable)	-	182,371	494,969	-	-	-	\$ 677,340
<b>Indirect Costs/Administrative Fee</b>	<b>-</b>	<b>96,657</b>	<b>148,491</b>	<b>-</b>	<b>-</b>	<b>124,539</b>	<b>\$ 369,687</b>
<b>Total</b>	<b>\$ 483,411</b>	<b>\$ 1,062,475</b>	<b>\$ 853,460</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 353,050</b>	<b>\$ 2,752,396</b>

Table APP- 8: Data Management Contract Budget for FY2010

## 9.4 Justification

### 9.4.1 IODP-MI

**Travel** – Travel cost for staff attending data management coordination and task force meetings, visits to vendors and professional meetings

**Contractual Services** – The Data Management budget for FY2010 will be mainly used for the SEDIS III development to make IODP data easily available to analytical tool users in the geosciences community. The SEDIS system will be maintained and hosted. The SMCS Sample Data and Request Management system will be upgrade and contracts established for hosting and maintenance of the SMCS system. The proposal database, user registry, and other IODP-MI applications (e.g., Google Earth data layers) will also need to be maintained and hosted in FY2010. As part of SEDIS publications index and search system, an annual fee for digital object identifier (DOI) and access to the American Geological Institute (AGI) citation database are required.

**Other Direct Costs** – Salaries and fringes of staff supporting data management (including AESTO subcontract; see Appendix G).

### 9.4.2 USIO

**Salaries and Fringes** – Salaries, etc.

**Travel**— IODP meetings and workshops, other IO and USIO meetings and travel costs for staff that will support port call and sailing on the first transit, and/or sailing on FY2008 expeditions. Also includes USIO-LDEO travel to professional training courses and meetings.

**Supplies** – Office and operational supplies.

**Shipping** – Postage for regular correspondence and small packages, data and photo requests, and other shipping needs.

**Communication** – Telephone and fax charges.

**Equipment** — Procurement, upgrading or fabrication of equipment with an acquisition cost of more than \$5,000.

**Other Direct Costs** — Costs not covered in the other categories:

**Training** – Registration, transportation, per diem, and lodging expenses related to professional training.

**Business Conferences** – Incidental expenses associated with meetings hosted by USIO.

**Software** – Software subscriptions, volume licensing agreements, and concurrent usage software agreements used in support of continuing activities and systems maintenance for the entire enterprise (TAMU).

**Services** – Expert assistance.

**Maintenance and Repair** – Maintenance agreements and equipment repair.

**Library** – Books, journals, and other resources.

**Indirect Costs** – Administrative and financial costs associated with operating the Program

#### 9.4.3 CDEX

**Salary and Fringes** – Salaries, etc.

**Supplies** – Computer consumables

**Contractual Services** – J-CORES Maintenance/On-board maintenance

**Indirect Costs** – Administrative fee associated with operating the Program

#### 9.4.4 ESO (\$442,900 directly funded through EMA; see Appendix D)

**Salaries and Fringes** – Portion of salaries including overheads.

**Travel** – ESO database group meetings, Data Management Coordination Group meetings and data management liaison.

**Supplies** – Computer consumables.

**Contractual Services** – Offshore DIS support and developments; continuous upgrading is planned in line with IODP-MI requirements, including VCD development.

**Equipment** – ESO computer infrastructure upgrade and maintenance, and Bremen computer infrastructure upgrade and maintenance. BSCW license for communication and data transfer.

#### 9.4.5 Scripps Institution of Oceanography

**Salary and Fringes** – Salaries, etc. for SOC.

**Supplies** – Materials and supplies.

**Communication** – Communications, network charges, mailing, faxing, copying and phones.

**Other Direct Costs** – INT Viewer Seismic Viewer software; Computer services at SDSC.

## 10 Publication

### 10.1 Goals

The goals of IODP Publications are editing, production, and distribution of IODP scientific drilling expedition results and program activities

IODP Publications fall into four categories: Reports, IODP *Proceedings*, publications in open literature, and the *Scientific Drilling* journal published jointly with ICDP (**Figure APP-16**):

- Documentation of IO specific technology and data (Technical Notes);
- Proper scientific documentation of all drilling expeditions (Scientific Prospectus);
- Rapid documentation and publications of major findings (Preliminary Reports);
- Wide community distribution of IODP science achievements and program activities (*Scientific Drilling*) in a journal type fashion;
- Extensive legacy documentation of all expedition results (Expedition Reports of the *Proceedings*); and
- Peer-reviewed publication of post-expedition research results (open literature and data reports in *Proceedings*).

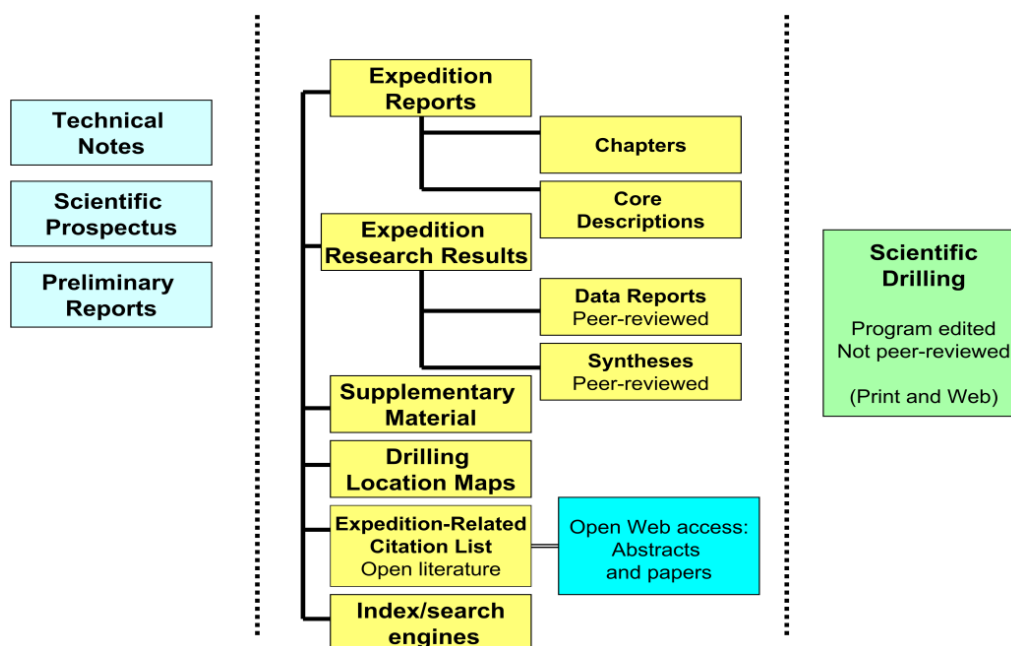


Figure APP- 16: IODP Main Publications

## 10.2 Deliverables in FY2010

The following major deliverables are covered by the FY2010 APP:

- Approximately 11 Scientific Prospectuses for FY 2010/2011 expeditions;
- Approximately ten Preliminary Reports;
- Nine Proceedings of the IODP volumes covering expedition reports;
- Ten Proceedings volumes covering expeditions research content;
- Two issues of the journal Scientific Drilling;
- Publications specialist support for ten expeditions (8 USIO, 1 CDEX, 1 ESO);
- Recording publication citations and post-expedition research submissions

IODP-MI oversees all publication activities and is the program publisher. However, except for *Scientific Drilling*, actual editing, production and distribution is outsourced to the IOs. *Scientific Drilling* is produced and published by IODP-MI in cooperation with ICDP. Each IO is contractually responsible for the production of the Technical Notes. Scientific Prospectus, Preliminary Reports and the *Proceedings* on each respective expedition; thematically related expeditions conducted within a short period of time may be considered one single project for which an integrated set of *Proceedings* is produced. Scientific Prospectus is due six months pre-expedition. Preliminary Reports are due two months post-expedition and *Proceedings* 12 months post-expedition. As in FY2009, in FY2010 the final editing and production of all IODP Reports and *Proceedings* is provided by the USIO in order to secure cross-program consistency in appearance. CDEX and ESO will deliver the edited draft material, including all necessary content and scientific editing. Tracking of IODP scientific publications in the open literature for inclusion in the *Proceedings* volume in FY2010 is provided by the USIO, based on an IODP-MI contract for generating the necessary data. *Scientific Drilling* is delivered in both print and electronic format on the Web. Printed copies (c. 5,500) are distributed by IODP-MI to funding agencies, member institutions, libraries, the PMOs, the IODP scientific community, and to ICDP (for further distribution).

Technical Notes, Scientific Prospectus, Preliminary Reports and *Proceedings* are all published electronically on the Web in html and PDF formats. Volumes of electronic *Proceedings* are also available on DVD in PDF format. The latter is supplied to funding agencies, libraries, expedition members, and also used for scientific outreach.

## 10.3 Budget

Expense Category	IODP-MI	USIO	CDEX	ESO	Bremen	SIO	Total
Salary and Fringes	-	1,285,500	-	-	-	-	\$ 1,285,500
Travel	6,000	48,500	-	-	-	-	\$ 54,500
Supplies	-	31,745	-	-	-	-	\$ 31,745
Shipping	13,000	7,093	-	-	-	-	\$ 20,093
Communication	-	8,240	-	-	-	-	\$ 8,240
Contractual Services	47,000	-	-	-	-	-	\$ 47,000
Equipment	-	-	-	-	-	-	\$ -
Other Direct Costs	131,868	62,535	-	-	-	-	\$ 194,403
<b>Total Direct Costs</b>	197,868	1,443,613	-	-	-	-	\$ 1,641,480
Modified Direct Costs (If applicable)	-	-	-	-	-	-	\$ -
<b>Indirect Costs/Administrative Fee</b>	-	-	-	-	-	-	\$ -
<b>Total</b>	\$ 197,868	\$ 1,443,613	\$ -	\$ -	\$ -	\$ -	\$ 1,641,480

Table APP- 9: Publications Contract Budget for FY2010

## 10.4 Justification

### 10.4.1 IODP-MI

**Travel** – Travel costs for staff providing publications support.

**Shipping** – Shipping cost for *Scientific Drilling*.

**Contractual Services** – Services for publishing *Scientific Drilling* (IODP contribution - excluding ICDP support).

**Other Direct Costs** – Salaries and fringes of AESTO subcontractor staff providing publication support (see Appendix G).

### 10.4.2 USIO

**Salaries and Fringes** – USIO staff providing support for IODP publications

**Travel** – IODP meetings and workshops, IO and USIO meetings, travel costs to bring off-site USIO staff to participate in onsite meetings, post-expedition meetings, and travel expenses for staff who will support port call activities and/or sail on FY2009 expeditions.

**Supplies** – General office supplies.

**Shipping** – Postage and shipping for regular correspondence and IODP scientific reports, and freight charges for bulk shipments from publication warehouse.

**Communication** – Telephone and fax charges.

**Other Direct Costs** – Costs not covered in the other categories:

**Training** – Registration, transportation, per diem, lodging expenses, and membership dues related to professional training.

**Business Conferences** – Expenses associated with meetings hosted by USIO-TAMU.

**Services** – Fees for Ocean Drilling Citation Database, new citations and production of the annual database update on CD-ROM prepared by the American Geological Institute (AGI); payments to IODP Editorial Review Board members; printing costs of FY2009 USIO Annual Program Plan; safety deposit box rental; and annual physical examinations for seagoing personnel.

**Equipment Rental** – Water cooler.

**Maintenance and Repair** – Copier, typewriter, and forklift maintenance agreements and annual maintenance of the Ocean Drilling Citation Database (prepared by AGI).

**Library** – Reference books and subscriptions.

### 10.4.3 CDEX

None budgeted under this WBE. Initial preparation of publication documents under TESS



#### 10.4.4 ESO

None budgeted under this WBE. Initial preparation of publication documents under TESS.

## 11 Outreach

### 11.1 Goals

- Work collaboratively to heighten visibility of IODP expeditions and build awareness of scientific ocean drilling, particularly its value to the public and society-at-large.
- Strengthen support among current stakeholders, and attract new support externally.

### 11.2 Deliverables in FY2010

#### 11.2.1 Outreach material

Includes print collateral (expedition news releases, brochures, newsletters), online content (images, editorial), and raw and edited video footage. Also includes communications plans.

#### 11.2.2 Exhibit booths

High-profile exhibits at internationally important scientific conferences, including AGU, EGU, and JPGU.

#### 11.2.3 Town Hall Meetings

To be held at major science conferences, including AGU, EGU, and JPGU, to facilitate direct outreach to stakeholders in the IODP community.

#### 11.2.4 Heightened public and media awareness

To be achieved through rigorous promotion of IODP, highlighting: 1) scientific objectives; 2) IODP's value as a global leader in the collection of Earth systems data; 3) IODP's international cooperation, in terms of human resources, budgetary resources, shared technologies, and core archives; 4) individual scientists participating in IODP research activities; 5) how IODP contributes to solutions for challenges the world faces today.

### 11.3 Budget

Salary and Fringes	33,206	29,774	122,809	-	-	-	\$ 185,789
Travel	27,500	8,000	-	-	-	-	\$ 35,500
Supplies	-	-	5,000	-	-	-	\$ 5,000
Shipping	-	-	10,000	-	-	-	\$ 10,000
Communication	-	-	-	-	-	-	\$ -
Contractual Services	246,150	5,000	75,000	-	-	-	\$ 326,150
Equipment	-	-	-	-	-	-	\$ -
Other Direct Costs	127,440	-	-	-	-	-	\$ 127,440
<b>Total Direct Costs</b>	<b>434,296</b>	<b>42,774</b>	<b>212,809</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$ 689,879</b>
Modified Direct Costs (If applicable)	-	-	137,809	-	-	-	\$ 137,809
<b>Indirect Costs/Administrative Fee</b>	<b>17,914</b>	<b>13,260</b>	<b>41,343</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$ 72,517</b>
<b>Total</b>	<b>\$ 452,210</b>	<b>\$ 56,034</b>	<b>\$ 254,152</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 762,396</b>

Table APP- 10: Outreach Contract Budget for FY2010

## 11.4 Justification

The total Outreach budget reflects the resources of the three IOs and IODP-MI in producing effective outreach to the scientific community (academic, government), the active/participant IODP community (stakeholders), emerging generations of researchers, related professional audiences (commercial/ industry engineers, petrologists, geophysicists), and the media (general and special interest/science) Deliverables are tied to reaching these target audiences and to the shared goals of expanding awareness about the value of scientific ocean drilling and generating public interest in IODP's activities.

### 11.4.1 IODP-MI

**Salary and Fringes** – Salaries for IODP-MI Outreach personnel prior to the transition to a consolidated office in Tokyo. Salaries and Fringes after the transition are included as Other Direct Costs, represented by AESTO subcontract; see Appendix G.

**Travel** – Travel costs for staff to one Task Force meeting per year and to conferences where booths must be staffed.

**Contractual Services** – Website hosting, maintenance and content management system migration; Video production and library maintenance; Exhibition Booths at national and international conferences; Town Hall Meeting; News monitoring, distribution and informational resources; Printing and Graphic Design.

**Other Direct Costs** – Salaries and Fringes of AESTO Subcontractor Outreach personnel (see Appendix G).

### 11.4.2 USIO

**Salary and Fringes** – Salary and fringes, including an anticipated cost-of-living allowance and estimated fringe benefits rate, for staff supporting Outreach.

**Travel** – A portion of the cost of participating in outreach to stakeholders, press events, media training, and staffing of booths at national and international meetings.

**Contractual Services** – Platform enrichment activities, including preparation of public relations materials, posters and videos; media awareness training; and booth rentals and associated costs at national meetings.

**Indirect Costs** – Administrative and financial costs associated with operating the Program.

### 11.4.3 CDEX

**Salary and Fringes** – Personnel costs of staff supporting Outreach.

**Supplies** – Office and field work supplies.

**Shipping** – Costs associated with transporting booth and related materials to national and international meetings.

**Contractual Services** – Exhibition booth design and translator services; Web maintenance; “Sand for Students” transportation support; Expedition filming/editing; Newsletter publication.  
**Indirect Costs** – Management and financial costs associated with operating the Program.

#### **11.4.4 ESO (\$146,600 directly funded through EMA; see Appendix D)**

**Salary and Fringes** – Personnel costs of staff supporting Outreach.

**Travel** – Costs to attend outreach meetings, conferences and other related activities.

**Supplies** – Printing of brochures for expeditions; booth materials and supplies.