

INTEGRATED OCEAN DRILLING PROGRAM MANAGEMENT INTERNATIONAL



1 October 2007 – 30 September 2008

Annual Report

Contract No. NSF OCE 0432224

Submitted by IODP Management International, Inc.

to

The National Science Foundation

February 28, 2009

Blank Page

TABLE OF CONTENTS

MANAGEMENT AND ADMINISTRATION	4
TECHNICAL, ENGINEERING AND SCIENCE SUPPORT.....	7
ENGINEERING DEVELOPMENT	17
CORE CURATION.....	21
DATA MANAGEMENT.....	24
PUBLICATIONS.....	25
LOGGING.....	26
OUTREACH.....	27
IODP-MI ANNUAL REPORT DISTRIBUTION LIST.....	29
APPENDIX 1.....	29

MANAGEMENT AND ADMINISTRATION

CONTRACTUAL ACTIVITIES

NSF-CMO Prime Contract

NSF issued seven contract modifications during FY2008. Notable modifications include:

Modification #22 provided interim approval of the FY2008 contract budget at the level of \$34,283,189 and authorized incremental funding in the amount of \$5 million.

Modification #25 shifted \$1,944,406 from the FY07 to the FY2008 Program Plan and provided an additional \$4 million in incremental funding.

Modification #27 reduced the FY2008 Program Plan contract budget from \$34,283,189 to \$24,252,878.

Modification #28 fully funded the FY2008 budget by providing \$3,308,472 in incremental funding.

MAJOR SUBCONTRACT ACTIVITIES

Advanced Earth Science & Technology Organization (AESTO)

AESTO maintains the IODP-MI office in Sapporo, Japan. All functions of this office are supervised by the IODP-MI Vice President for Science Planning (VP-SP) who is stationed at the Sapporo office. The Sapporo office continues to provide a full range of support functions to the Science Advisory Structure, including publications and data management.

During the reporting period, the parties agreed to two (2) subcontract modifications (“mod” or “mods”). Mod #7 (November 2007) authorized the FY 2008 subcontract budget at the level of \$790,000.

Mod #8 (August 2008) revised the indirect cost rate schedule of the subcontract as follows:

20.2% effective 4/1/07 through 9/30/07 – Final
17% effective 10/1/07 through 9/30/08 – Final
10% effective 10/1/08 through 9/30/09 -- Provisional

Bremen University

Subcontractor provides core repository services for IODP at the Bremen Core Repository. During the reporting period, the parties executed mod #4 (November 2007) to the subcontract which authorized its FY2008 budget at \$308,039, which included \$6,000 for the subcontractor to continue work on the DSDP and ODP core redistribution project.

British Geological Survey (BGS)

Through its subcontract with IODP-MI, BGS (acting as the coordinator responsible for overall ECORD science operations) undertakes Mission-Specific Platform (MSP) science operations on behalf of the IODP.

During the reporting period, the parties executed subcontract modifications 6 and 7. Mod 6 (December 2007) authorized the FY2008 subcontract budget at the level of \$3,169,000.

Mod 7 (June 2008) revised the FY2008 subcontract budget to the level of \$1,439,000, representing a reduction of \$1,730,000. This subcontract revision was primarily due to the deferral of most MSP costs associated with the New Jersey Shallow Shelf and Great Barrier Reef Expeditions.

Japan Agency for Marine–Earth Science and Technology (JAMSTEC)

JAMSTEC serves IODP as the Japanese Implementing Organization (IO). Riser-equipped drilling capability, by way of the vessel *Chikyu*, is supplied by CDEX, part of JAMSTEC. CDEX also provides administrative services to the Kochi University Center for Advanced Marine Core Research (CMCR) repository.

During the reporting period, the parties executed subcontract modifications 4 through 6.

Mod 4 (November 2007) approved the FY 2008 subcontract budget at the level of \$11,490,505. Mods 5 and 6 approved reprogramming requests, but did not revise the total FY 2008 subcontract budget.

Consortium for Ocean Leadership (COL)

COL serves IODP as the USIO. During the reporting period, the parties executed subcontract mods 12 through 15.

Mod 12 (October 2007) approved the interim FY2008 subcontract budget at the level of \$13,786,568 and provided incremental funding. Mod 13 (January 2008) provided incremental funding in the amount of \$1.1 million. Mod 14 provided incremental funding and reduced the FY2008 subcontract budget to the level of \$5,281,257. Mod 15 fully funded the FY2008 subcontract budget at the level of \$5,281,257.

University of California, San Diego (UCSD)

The Scripps Institution of Oceanography at UCSD is the subcontractor providing the services to receive and archive scientific ocean drilling-related electronic and digital data in support of the Site Survey Data Bank (SSDB). The IODP-MI Sapporo office oversees the technical work of the subcontractor and provides support and quality control of previously archived samples and data from the Deep Sea Drilling Project and the Ocean Drilling Program.

During the reporting period, the parties executed subcontract mod #6 (April 2008), which approved the subcontractor’s FY 2008 revised scope of work at the \$300,000 budget level authorized in the IODP Annual Program Plan.

FINANCE REPORT

The annual financial report is attached (see Appendix 1).

Total contract funds approved:	\$24,252,878	This reflects all modifications made during the fiscal year.
Funds obligated from FY07	\$5,166,507	
Total funds expended:	\$24,307,275	
Funds remaining:	\$5,112,110	

Of the remaining funds, \$3,508,229 has been obligated. The balance of \$1,603,881 is unobligated. An additional \$642,790 of unobligated funds is under consideration as a request for carry-forward.

PERSONNEL STATUS

The Executive Assistant position in Washington became vacant effective September 15, 2008 due to resignation.

The Publications Manager in Sapporo resigned in May 2008. This position remained vacant through the remainder of FY2008.

SAPPORO OFFICE

The IODP-MI Sapporo Office is headed by Vice President of Science Planning & Deliverables (VP-SP), Hans Christian Larsen, employed directly by IODP-MI and dispatched to head the Sapporo Office. Contracting of all other Sapporo Office staff, office rent and associated activities are conducted through a subcontract with AESTO under the supervision of the VP-SP.

The main tasks of the VP-SP and this IODP-MI office are to oversee and manage: (1) IODP Science planning process, site survey data and support of the Scientific Advisory Structure (SAS); (2) Scientific thematic reviews (added in FY07) (3) IODP scientific publications (including editing and production of the journal *Scientific Drilling*); (4) IODP Data Management; and (5) contribution to the IODP renewal process (science planning; added in 2008).

The VP-SP, heading the Sapporo Office, is part of the senior management of the entire IODP-MI, contributes to the development of the corporate annual program plan, and manages all subcontracts related to the Sapporo office work portfolio.

The Sapporo office is hosted by Hokkaido University under contract with AESTO. Although the current contract between AESTO and Hokkaido University for hosting the IODP-MI office will end by April 2009, the VP-SP has taken the necessary steps to extend the office location in Sapporo for an additional two years.

SUPPORT FOR SCIENCE ADVISORY STRUCTURE (SAS)

The VP-SP works with the chairs of SASEC and SPC on the broader issues of science planning and review of science achievements and approves all SAS meetings except SASEC and EDP. In FY2008 the chairs of SASEC and SPC were supported by the IODP-MI science coordinators in the following fields: meeting agendas, preparation of meeting agenda books, editing of material produced during the meetings and minutes of SPC meetings.

IODP-MI also provides coordination of all other SAS meetings including confirmation and distribution of meeting rosters and logistics, support at meetings for panel chairs and panelists and updates of the IODP web site with all SAS related information. For SPC, SSEP and SSP, IODP-MI edited panel reviews, secured external reviewers, prepared and distributed proposal and site survey data packages in advance of meetings.

The Sapporo office in FY2008 also oversaw data submission to the IODP site survey data bank, received 33 drilling proposals submitted at the October 1st and April 1st deadlines, reviewed proposals for completeness and adherence to IODP rules, corresponded with proponents, and secured and edited 25 external reviews applying to 6 proposals. The numbers of proposal packages distributed at each SAS meeting are as follows:

Meeting	Num.
#9 SSEP (Nov. 2007)	22
#9 SSP (Jan. 2008)	16
#11 SPC (March 2008)	53
#10 SSEP (May 2008)	16
#8 EPSP (June 2008)	5
#11SPC (August 2008)	52

During Q4, a new science planning task for the Sapporo office gained considerable momentum: supporting the IODP renewal process in terms of the renewal conference INVEST (IODP New Ventures in Exploring Scientific Targets) and the writing of the new science plan following the INVEST meeting. The VP-SP is leading this effort from IODP-MI with support from the science coordinators, and work closely with the two co-chairs of the INVEST Steering Committee.

The work task of Thematic Scientific Review of program progress that was added to the work portfolio of the Sapporo Office in 2007 included the start of a second thematic review in Q4.

The IODP-MI Task Force on sub-seafloor life is overseen by the Sapporo Office. In FY2008 special efforts were made to promote recommendations made by this task force to the SAS (STP and SPC) in order to facilitate a sampling policy and sample program for these kinds of samples. Communication with and within the task force was electronic.

TECHNICAL, ENGINEERING AND SCIENCE SUPPORT

IODP-MI

IODP-MI continued to work with the SAS, the IOs and the OTF in updating and restructuring the FY2009 and FY2010 operations schedules to account for: (1) the slipping *JOIDES Resolution* delivery date, (2) *Chikyu* downtime due to thruster repair work, (3) limited operation of *Chikyu* within planned NanTroSEIZE site locations due to the Kuroshio Current meander and due to seasonal fishing restrictions, and (4) postponement of the New Jersey Shallow Shelf Expedition due to challenges in mobilizing a sufficient platform.

The OTF met throughout the year via email as well as face-to-face during the March and August SPC meetings to keep up with the frequently changing unavoidable circumstances and revise the operations schedule accordingly. The reports detailing the continual transformation of the operations schedule from September 2007 through August 2008 are available at <http://www.iodp.org/otf/>.

JOIDES Resolution FY2009 and 2010 Schedule

Shortly after the multiplatform schedule for FY2009 was approved at the August SPC meeting, the community was informed by the USIO that the target date for the start of international IODP operations for the *JOIDES Resolution* had again changed. In sum, the USIO indicated that the ship would sail from Singapore by the end of January 2009. This sail-away date should have the vessel ready for international operations sometime around March 1, 2009.

The ramifications to this schedule change were large. OTF would have to evaluate the most logistically effective remaining package of options for FY2009.

The OTF first examined environmental risks. By combining data on average wave heights for each month of the year typhoons, hurricanes, currents, visibility, ice, etc further constrain the weather window with the type of proposed operations (e.g., CORK installation is much less tolerant than shallow penetration coring) a spreadsheet matrix was developed to show the preferred weather windows for each proposal. Some of the proposals are spread out over large geographic areas, so the USIO weather consultants broke down the data into separate geographic regions.

For the examination of options for FY2009, the date of March 1, 2009 was used as the start date for international IODP operations (i.e., the start of actual IODP programs...not transit, shakedown, evaluation, etc). Given this start date and the weather windows associated with the Canterbury and Wilkes Land programs, it is clear that these two operations should not be implemented in FY2009. Operational risks associated with the ice and sea-state conditions for Wilkes and sea-state conditions for a shallow water program like Canterbury in these weather windows, especially for the initial set of operations, are too high.

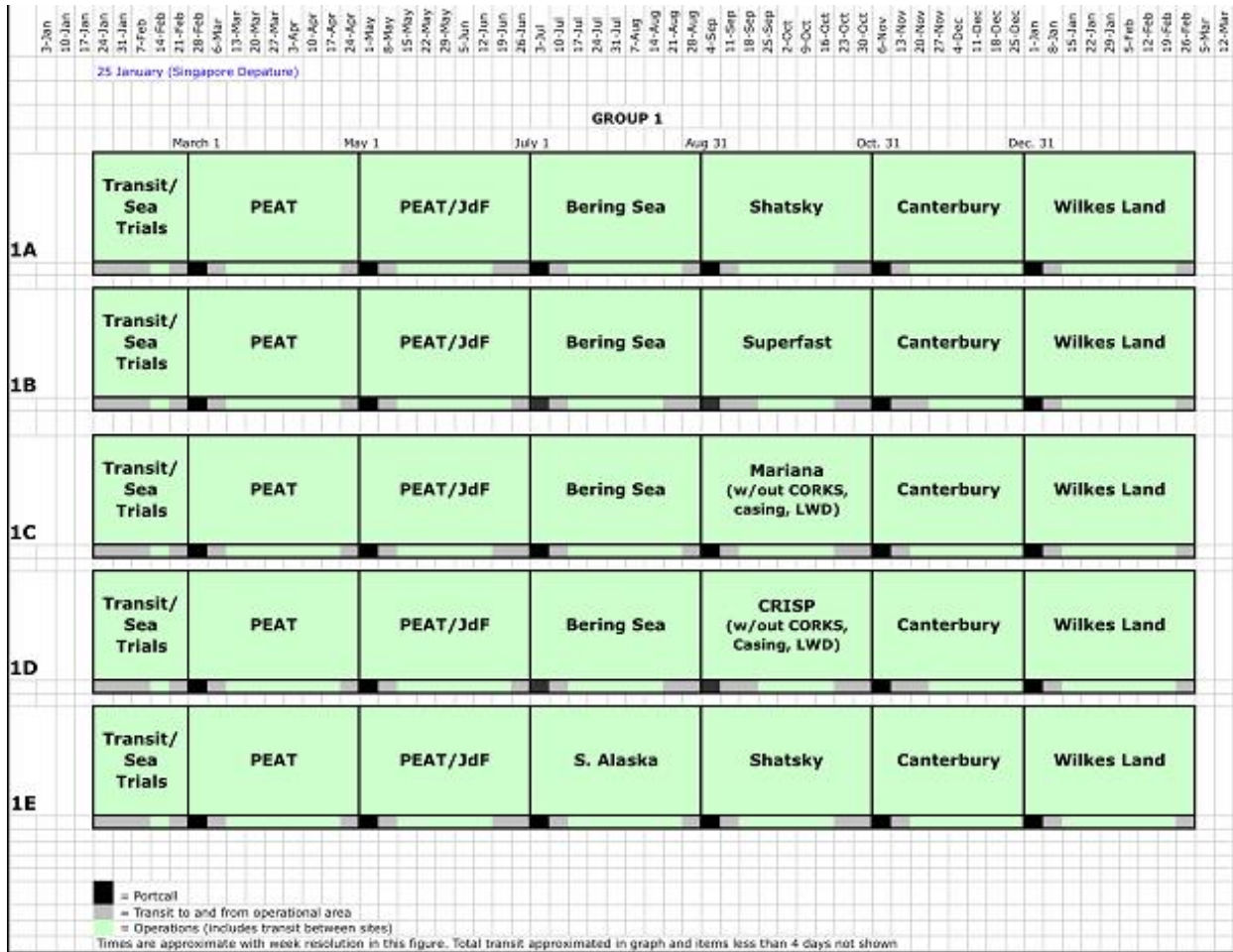
In addition to the change in start date, the USIO indicated that it would prefer, if possible, to develop a contiguous six-expedition (12 month) package spanning the FY2009/FY2010 fiscal years. This operational mode would help to maximize IODP operational time for *JR* operations immediately after coming out of the shipyard and helps to minimize transits associated with those operations. This set of operations would have the bulk of four expeditions in FY2009 and the remaining two expeditions in FY2010. Any additional operations in FY2010 would depend upon several factors not known at this time, including formal budget guidance and location/length of non-IODP operations (if any).

Thus, with the above information in hand the OTF set about developing a set of six-expedition packages for FY2009 and early FY2010. Discussions of the options for the FY2009 *JR* Schedule suggested general agreement on most main issues including:

- Commitment to Polar Programs
- Support for continuing Juan de Fuca (and thus the cementing program this year)
- Completing operations on programs we have started and/or previously scheduled but are now deferred
- Making progress on a portfolio of science that touches on each of the major ISP themes

Additionally, there did not seem to be any disagreement with the concept of inserting Canterbury and Wilkes as early FY2010 programs.

Taking these issues into account led to the general consensus (to date) that the Group 1 options, shown below, particularly Options 1A, 1B, 1D, were the preferred set of packages upon which to focus further discussion.



Discussions on the FY2009 *JOIDES Resolution* operational plan are still underway. The FY2009/10 *JOIDES Resolution* schedule will not be finalized until the first quarter of FY2009 and will be subject to changes in response to the delivery schedule.

Chikyu FY2009-2010 Schedule

The NanTroSEIZE PMT met several times throughout the year via email and in face-to-face meetings to deal with environmental and vessel infrastructure issues that arose and interfered with planned operations.

The NanTroSEIZE PMT Meeting #11 was held December 9, 2007, in San Francisco immediately preceding the AGU conference. The meeting focused on finalizing a Stage 1B plan and further developing a solid main plan and several logical contingency plans for NanTroSEIZE Stage 2.

The NanTroSEIZE PMT Meeting #12 was held February 22-23, 2008, at the CDEX offices in Yokohama, Japan. This meeting focused on adjusting the Stage 1B and Stage 2 plans

based on the newly identified operational constraints place upon *Chikyu* due to the migration of the Kuroshio Current into the NanTroSEIZE study area.

The NanTroSEIZE PMT Meeting #13 was held June 2-3, 2008, in Chicago, Illinois. The meeting was called to recommend new operational plans for *Chikyu* after CDEX informed IODP-MI of technical issues regarding *Chikyu's* azimuthal thrusters.

The PMT meetings agenda and action items are all posted at: <http://www.iodp.org/project-scoping-groups/>.

As of September 30, 2008, the *Chikyu* schedule is as follows:

Operation	Exp #	Dates of Operation
Port Call at Shingu		05 Mar 09 - 09 Mar 09
Riser/Riserless Observatory (NT2-11)	319	10 Mar 09 - 30 Jul 09
Subduction Inputs	322	31 Jul 09 - 12 Sep 09

Chikyu will be spend FY2010 doing non-IODP work.

MSP FY2009-2010 Schedule

MSP operations are fairly straightforward as ESO will run two MSP operations in FY2009 and FY2010: New Jersey Shallow Shelf starting in May of 2009 and Great Barrier Reef Environmental Changes starting in September of 2009. There will be no further operations until FY2011.

Contractual discussions regarding the drilling and platform contract for New Jersey are making progress and should be finalized in early FY2009.

CDEX

All efforts were concentrated on the support of NanTroSEIZE Stage 1 expeditions and port call at the port of Shingu in the first two quarters.

Lab KAIZEN improvements were conducted during dock work at Sasebo after the Stage 1 expeditions. The main modifications included floor repainting, installing additional power supply, interlock for XCT room, additional ceiling lights, installation of gas bottle racks and gas cradles, and rearrangement of the core lab. New equipment (e.g., NGR sensor for MSCL-S, new camera system for MSCL-I, laser ablation unit for ICP-MS, pressure P-wave analyzer, laser particle analyzer, XRF, etc.) was also set up in the onboard laboratory. During the expeditions, TAMU helped APCT3 and DVTP tools operations.

After thruster gear trouble was found in the second quarter, *Chikyu* remained in Sasebo Bay. Laboratory maintenance and improvement plans were developed and implemented. Four laboratory technicians worked onboard for maintenance and improvement of laboratory equipment. Other important activity included the first dry run of the onboard laboratory started in September to be continued to October. Nineteen MWJ technicians with two CDEX representatives aboard investigated potential problems with the core flow. The operation of each instrument was reviewed as issues were found; solutions of which will be reflected in

further laboratory action plans as well as in the Lab Measurement Manual for each measurement and for new core processing procedures.

The FY2009 expedition plan was developed after the NanTroSEIZE PMT meeting held in Chicago on June 2-3, 2008. NanTroSEIZE Stage 2 operation plans were discussed at the EPSP in Hanover on June 16-18, 2008, where CDEX presented a provisional plan. Six Co-Chief Scientists for Exp. 319 and two for Exp. 322 were invited to CDEX in the last quarter. A provisional agreement from the Co-Chiefs was obtained and discussion began on expedition plans. Planning pre-expedition meetings for both expeditions had also started and draft agendas were made. Calls for Application for Science Party for both expeditions were started on September 1, 2008.

NanTroSEIZE

The three inaugural Stage 1 expeditions concluded in February 2008, and were immediately followed by preparations for Stage 2. The three Stage 1 expedition reports have now reached their final stage of pre-production, as galley proofs for all three have been examined and approved by their respective Editorial Review Board members. The combined 2nd Post Cruise meeting is now in the planning stage. The initial three Stage 2 expeditions have been consolidated into two, and assigned IODP expedition numbers 319 and 322.

Expedition 314

New age determinations obtained by combining micropaleontology and paleomagnetic studies were critical to understanding the evolution of this part of the Nankai subduction complex and the geological history of the seismogenic zone. During coring operations, good quality borehole temperature data were obtained, which will allow evaluation of the thermal gradient in the upper layers. This, in combination with core thermal conductivity measurements will result in more accurate estimates of heat flow and better understanding of the temperatures at greater depths near the seismogenic zone.

Expedition 315

Because of the cancellation of casing operations at Site C0001, contingency Site C0002 was drilled and cored during the latter half of the expedition. However, due to a lack of time and human resources to process these cores, some cores (20 cores) remained unsplit after minimum non-destructive (whole-round) measurements. These cores were split, measured and described at Kochi Core Center with the help of some volunteers from the Science Party.

Expedition 316

A wide array of fault rocks, from fractured rocks to breccia to fault gouge, sedimentary materials ranging from fine clay and mud, to siltstone and sand, and extremely coarse-grained materials from paleo-trench-axis channels were successfully recovered. Materials sampled include recent slope apron deposits (including several mass transport complexes that may shed light on the periodicity of slope failure), ancient accretionary prism rocks, and material that has been over-ridden during thrust faulting events. Analyses of these wide-ranging data sets will shed new light on the evolution, structure, and architecture of the Nankai Accretionary Prism off the Kii Peninsula.

Expedition 319

Future Expedition 319 (NanTroSEIZE Riser and Riserless Observatory) operations were discussed among scientists and the CDEX IODP and CDEX Operation group, in Yokohama in August. General schemes and several observatory layout diagrams were presented, reaching several technical decisions and identifying future action items. Co-Chiefs have been

invited, and a call for participation as Science Party members has been sent out, and responses are being evaluated. Currently, the Scientific Prospectus is being prepared in preparation for the pre-expedition meeting in January 2009.

Expedition 322

Chikyu's riserless NantroSEIZE expedition, Subduction Input, was first approved by OTF in March, 2008. CDEX invited Michael Underwood (Univ. of Missouri) and Saneatsu Saito (IFREE, JAMSTEC) as co-chief scientists. The expedition was announced on the CDEX website with a summary of scientific targets. The pre-expedition meeting was set for May, but later postponed until further notice due to delays in the expedition schedule. The call for science party participants was publicized in September.

ESO (BGS)

Expedition 313 New Jersey Margin

Activities regarding the New Jersey Shallow Shelf Expedition have continued following the 2007 postponement. As the first step in re-tendering for a contractor, a notice was placed in the Official Journal of the European Union (OJEU). Tender responses were required by January 30, 2008, and those received were subsequently reviewed.

On February 15, 2008, a meeting was held with Fugro Seacore to discuss their tender. Following the meeting a visit was arranged to the USA for 3 ESO personnel with a Fugro Seacore representative to further investigate the proposed platform (off Louisiana), proposed drill rig (in Salt Lake City) and proposed mobilization area (in the Atlantic City area). These visits satisfied ESO as to the viability of the Fugro Seacore proposals, following which Fugro Seacore were nominated as preferred contractors and contact negotiations ensued.

At the end of March there remained unresolved contractual issues and detailed discussions were taking place. On April 11, 2008, Fugro Seacore informed ESO that they had committed all their staff to other projects and could not start until September.

There was no possibility of approaching another drilling contractor for this year due to contracting regulations. After urgent discussions, Fugro Seacore attempted to see if they could get suitable staff from elsewhere, but this proved impossible given the present high demand for drillers.

The preferred option would then have been to sign a contract for 2009, but again this was not possible due to contractual regulations and the significant change to the tender terms. Consequently, a new 'fast-tracked' OJEU notice was issued for drilling in May 2009, and 4 expressions of interest were received.

After assessment, a meeting was held with a potential contractor in Swindon on August 26, 2008. This proved a valuable meeting with good agreement on a way forward subject to some further clarifications from both sides. Since that time, discussions have continued with a view to starting the New Jersey Expedition at the beginning of May 2009.

Throughout the developments, discussions have continued regarding logging contracts for New Jersey, and the Science Party has been kept informed of developments. A replacement has been sought for Steven Hesselbo (UK) who has withdrawn from the position of New Jersey Co-chief Scientist.

Great Barrier Reef

Following the submission to the Great Barrier Reef Marine Park Authority (GBRMPA) of a drilling application to carry out the GBR Expedition in September-November 2008 (or 2009), and the provision of additional information to GBRMPA in response to some concerns, GBRMPA informed ESO on October 9, 2007 that the application is to be refused. This decision was published in the Australian Government Commonwealth Gazette on December 20, and ESO had until January 21, 2008 to request reconsideration.

ESO requested reconsideration on January 21, 2008, and on February 29, 2008, a permit was granted. ESO wish to acknowledge the assistance of Dr. David Falvey and Dr. Jody Webster as well as other Australian scientists for their support.

Subsequently, Jody Webster (Australia) and Yusuke Yokoyama (Japan) were appointed as Co-chiefs for the expedition, and a call for applications for the GBR Science Party issued. Also, EPSP and SSP approval for the sites has been granted, although following a September GBRMPA meeting, two additional sites are desired, which will require acceptance from both SSP and EPSP.

Work has begun in cooperation with GBRMPA to produce an Environmental Management Plan, a condition of the permit. Also required as a permitting condition is the completion of a Deed of Agreement that places significant liabilities upon NERC, as the permittee. This document was assessed by NERC and signed by the NERC Chief Executive.

There remained some issues regarding the permit, such as the number of sites permitted and an end date that is too early (November 1). In order to resolve these issues and establish a better relationship with GBRMPA and discuss other matters, in particular outreach, meetings between ESO and GBRMPA were arranged with the GBRMPA on September 19 and 20, 2008, also attended by co-chief scientist Jody Webster. The meetings were very productive and it was agreed that ESO would submit a new permit requesting additional holes and an extension to December 30, 2010. GBRMPA anticipated that these new terms would be acceptable.

Following the OJEU procedure, tenders were issued for the drilling contract for the Great Barrier Reef Expedition for return no later than August 8, 2008. After their assessment, a preferred contractor was identified and contractual discussions have continued; to date, these discussions have been very positive.

Other Expeditions

The 2nd post-expedition meeting of Expedition 310 Tahiti Sea Level was held in Papeete, Tahiti from November 12-16, 2007. Thirty-four Expedition Scientists and collaborators met to present and discuss their post-cruise research. Additionally, 2 field trips were held, one to see the volcanic lithologies of the island, and the other was to the modern coral reefs.

Further informal discussions took place with the proponents of the Chicxulub Impact Crater proposal which was resubmitted to SPC for consideration in March 2008.

USIO

The USIO made great progress in preparing for Phase 2 during challenging circumstances in FY2008. Despite shipyard delays and funding issues that required careful prioritizing throughout the year, the USIO achieved many significant goals in the areas of operational

planning, engineering and tool development and support, data management, and redistribution of DSDP and ODP legacy core collections.

USIO operational planning during FY2008 included planning and staffing for IODP Phase 2 expeditions, acquiring clearances needed for those expeditions, and finalizing the IODP-USIO Programmatic Environmental Impact Statement (PEIS).

Throughout the year, the USIO accommodated a changing schedule based on SODV progress. With a delivery date of March 2009 for the return to international operations immediately following SODV transit and sea trials, the USIO worked with the OTF to develop a revised FY2009 expedition schedule, which was published in October 2008.

Science staffing was continually reevaluated along with the changing expedition schedule. By the end of the year, science staffing was completed for all expeditions approved in the 27 May 2008 schedule. Scientists from Australia and New Zealand were included based on lead agency and IODP-MI guidance that the Australian Research Council (ARC), Australian/New Zealand Consortium would be joining IODP.

Territorial clearance was obtained to operate in Canadian and New Zealand waters for the Juan de Fuca cementing operations and the Canterbury Basin Expedition, respectively, and New Zealand observers were identified. Because of potential shallow gas hazards associated with Canterbury Basin drilling, the USIO sought and completed negotiations for a hydrocarbon gas specialist to sail on the expedition. To meet requirements for operating in Antarctica, the USIO retained Metcalf and Eddy to prepare a combined environmental assessment/initial environmental evaluation that would identify and evaluate the potential environmental impacts associated with operating the *JOIDES Resolution* in the area off the Wilkes Land. In addition, options were investigated for weather forecasting services and for a weather/ice observer to sail on the Wilkes Land Expedition.

The IODP-USIO PEIS was finalized with publishing of the Record of Decision on June 30, 2008 and submission of the document to the Environmental Protection Agency. The PEIS will be effective with IODP Phase 2 expeditions of the *JOIDES Resolution*.

Engineering Support

The USIO completed several engineering projects in FY2008 and continued others, making significant progress with technology enhancements and providing tool support for others.

The USIO completed a number of technology enhancements in FY2008 that will enable onshore tool calibration and improve shipboard data acquisition. Key accomplishments for the fiscal year are highlighted below. Several other major projects were suspended during FY2008 because of staffing and funding issues (see details in the quarterly reports).

Metrology Laboratory. The Metrology Laboratory (Calibration Laboratory), located at TAMU, was completed and in service throughout the year for calibration of temperature tools deployed during Expeditions 315 and 316 and tools to be deployed during the first expeditions of the renovated *JOIDES Resolution*. A successful acceptance test with external participation was conducted in August 2008, resulting in acceptance of the facility with suggestions for future calibration data storage.

Common Downhole Data Acquisition System. Development of the new Common Downhole Data Acquisition (CDAQ) system was completed, and a successful acceptance test with

external participation from the science community was conducted in July 2008. The CDAQ is designed to work with most IODP and relevant third-party downhole tools, including temperature and pressure tool and pressure core or fluid samplers. However, the firmware needs to be configured for each tool and currently it is only available for the new Sediment Temperature (SET) tool. The CDAQ acceptance team concluded that this system will have broad impact and has the potential to serve as the foundation for a range of downhole tools in the future.

Sediment Temperature Tool. The SET is a reincarnation of the Davis-Villinger Temperature Probe (DVTP) equipped with the new CDAQ electronics; as a result, it is significantly shorter and easier to maintain and operate. The SET was deployed successfully on three occasions during Expedition 316 on the *Chikyu* in 4000 m of water. A total of five SET tools are now available to provide services on the *JOIDES Resolution* and the *Chikyu*.

Logging-while-Coring Project. The *Logging-while-Coring Project Final Report* was submitted to IODP-MI on 30 October 2007. Logging while Coring (LWC) is a method to acquire data on formations during the coring process. The purpose of this project was to build core tubes and ancillary hardware for use with LWC equipment that was previously deployed as a “proof of concept” during ODP Legs 204 and 209. Tests using a new polycrystalline diamond compact (PDC) bit commissioned from Varel showed that the system worked well and recovered clean-cut core, although the core catchers need further evaluation for different formation types.

Schlumberger Telemetry Project. The USIO worked with Schlumberger to develop an integrated downhole telemetry system, a software-based project that will standardize telemetry protocols for use across different platforms. Preliminary bench testing and subsequent open-hole testing were successful using the Modular Temperature Tool (MTT) and Magnetic Susceptibility Sonde (MSS), both USIO-developed logging tools, in combination with Schlumberger logging strings. Data from the MSS and MTT were acquired, stored, and plotted using the Schlumberger surface acquisition system. The ability for the Schlumberger system to acquire data from any properly configured third-party tool offers greater flexibility and added reliability for future third-party tool deployments.

Multi-Functional Telemetry Module Project. The Multi-Functional Telemetry Module (MFTM) is under development to replace the Universal Downhole Telemetry Module (UDTM), used to transmit data over a 25,000 foot 8 conductor logging cable. The USIO initiated hardware and design requirement specifications to prepare for development of the initial hardware design package.

Lockable Flapper Valve Project. The Lockable Flapper Valve (LFV) prevents fluids from backflowing up through the drill pipe during logging operations. The goal of the LFV project is to modify the valve design to minimize the risk of the LFV prematurely closing and snagging the logging cable and tool as they are being retrieved. After preliminary tests were conducted, the planned redesign of the LFV was abandoned in favor of using a simple sleeve system to maintain the open position of the valve during logging operations.

Measurement-while-Coring Project. The Downhole Sensor Sub (DSS) and Remote Memory Module (RMM) were acquired to measure weight on bit, torque on bit, and pressure near the bit during drilling operations. The objective of this project is to analyze those parameters along with rig instrumentation data and to improve drilling parameters based on the analysis, thereby improving the chance to recover more material and less

disturbed core. The DSS and RMM were completed, bench tested, and rig tested this year. Deployment of this equipment was postponed pending potential further use and testing.

Instrumented Water Sampler. The Instrumented Water Sampler (IWS) is a formation fluid sampling tool designed to recover in situ interstitial water in soft to firm sediments while recording downhole temperature and pressure. The overall design and most of the motor control design and drawing package for the IWS were completed by summer 2008. Procurement of parts and assembly of the first tool were postponed, and all drawings and documentation for this suspended project were archived for future use.

Simulated Borehole Test Facility. The Simulated Borehole Test Facility (SBTF) was designed and built to test and analyze the performance of downhole tools that sample fluids and measure pressure, temperature, and other parameters in formations at the bottom of the hole. The SBTF was completed in summer 2008. The testing and acceptance process was initiated, but SBTF use was postponed and the equipment is being stored for future use.

Technical Documentation and Development. The USIO created a new system for producing and managing user guides and other technical documentation for engineering tools, laboratory analytical systems, and soft ware applications. This system facilitates creation of a complete set of documents with the broad participation of technical, editorial, and management staff; provides easy access to the documents; and supports rapid and incremental revisions as users provide feedback. The USIO used this technical documentation system to produce IODP Phase 2 laboratory analytical user guides and technical systems documents for maintenance and repair.

Program Integration and Support for Others. During FY2008, the USIO continued efforts to collaborate with and support CDEX, ESO, and others; activities included implementing the new Advanced Piston Corer Temperature Model 3 (APCT3) tools with CDEX and providing downhole tool support for CDEX, ESO, and a third party.

USIO/CDEX Joint APCT3 Implementation: The USIO and CDEX continued their collaborative effort to implement the new APCT3 tools. In FY2008, the USIO tested and calibrated the CDEX-owned loggers, purchased in FY07, in the Metrology Laboratory and shipped three units to CDEX for deployment during Expeditions 315 and 316.

Formation Temperature Measurement Services for CDEX. The USIO provided formation temperature measurement services aboard the *Chikyu* during Expeditions 315 and 316, including deployment of a tool technician on the first expedition and an engineer on the second. During Expedition 316, the engineer provided coring tool operations services that were requested on short notice.

Three APCT3 tools, two DVTPs, and a SET tool provided critical and high-quality formation temperature data to the NanTroSEIZE Science Party. The newly implemented APCT3 and SET tools were accepted as operational tools based on these deployments. The USIO also loaned two DVTPs, three APCT3 heat flow shoes, two heat flow catcher subs, one colleted delivery system, and one laptop computer to CDEX for use during Expeditions 315 and 316.

Third-Party Support. The USIO provided design support and loaned equipment to the University of Miami's Rosenstiel School of Marine and Atmospheric Science for the removal of instrument strings from circulation obviation retrofit kit (CORK) observatories installed during Expedition 301 (Holes 1026B and 1301A). The USIO modified the design of an Otis

running tool for operation by a submersible vehicle, allowing for retrieval of the original instrument strings and installation of new top plugs and short prototype microbiology strings for a one year deployment in the holes.

ENGINEERING DEVELOPMENT

In close conjunction with the SAS, IODP-MI has continued and improved upon its role in facilitating, encouraging, and implementing engineering development projects to advance and expand science capabilities, while enhancing operations and technology success rates. Highlights of these activities during FY2008 include:

Engineering Development Proposals — The engineering development proposal process went through mild iteration during the first quarter of FY2008 incorporating valuable lessons learned from the inaugural 2007 submission season, resulting in the document available at www.iodp.org/eng-dev.

The second Engineering Development Proposal submission season ended April 15, 2008. Three proposals were received, shown below. The proposals were first reviewed by IODP-MI and then by the Engineering Task Force (ETF), which met April 23-24, 2008. For the three proposals thought to meet IODP's present and future technological needs, a response letter was sent explaining the strengths and weaknesses of each proposal and providing a timeline of events to occur before the proposal could be selected and incorporated into the FY2010 Annual Program Plan. Each proponent was given an opportunity to address the IODP-MI / ETF review comments prior to the July EDP meeting, where members evaluated each of the proposals at a more detailed level and provided IODP-MI with advice.

Engineering Development Proposals					
Proposal submitted in 2008 by April 15th					
Proposal ID	Title	Lead Proponent(s)	ETF Review	EDP Review	Status
EDP-2010-01-B	Deep Rock Stress Tester (DRST)	Takatoshi Ito	yes	yes	Proponent responded to reviews in full. Revised proposal is scheduled to be re-reviewed by EDP at the January meeting.
EDP-2009-02-B	Anti-Contamination Coring System	Kazuyasu Wada	yes	yes	Proposal resides with proponent following the July 2008 EDP review.
EDP-2009-03-B	Multi-sensor Magnetometer Module (MMM)	Helen Evans	yes	yes	Tentatively scheduled to receive funds for development in FY2011.

FY2009 Engineering Development Plan

IODP-MI coordinated potential design efforts with the proponents of the SCIMPI and S-CORK proposals. This effort revealed the need to build one common deployment system that can be used by both the SCIMPI and the S-CORK observatories. Proponents submitted revised proposals with modified project phasing to IODP-MI in January 2008. In preparation

for FY2009 work, the design of a common deployment system to be used by both simple observatory systems commenced with Stress Engineering.

FY2010 Engineering Development Plan

Based on proposal ranking and discussion from the July 2008 EDP meeting, IODP-MI developed the FY2010 engineering development plan. This plan includes continuation of the Long Term Borehole Monitoring System development, continuation of the simple observatory initiative, a second year of development for the Motion Decoupled Hydraulic Delivery System, and development of the Multi-sensor Magnetometer Module – a wireline magnetometer. SPC endorsed this pathway forward at its August 2008 meeting.

Engineering Task Force – The Engineering Task Force (ETF) met remotely on December 10, 2007 using web-conferencing and tele-conferencing tools to review the FY2007 engineering development deliverables, to review and comment on the status of FY2008 projects and to advise IODP-MI on the proposed FY2009 Engineering Development plan.

The 4th Engineering Task Force (ETF) meeting was held at the IODP-MI Washington, DC office, April 23-24, 2008. The main purpose of the task force was to review the three engineering development proposals competing for FY2010 funds. A summary of meeting activities can be found at: <http://www.iodp.org/engineering-task-force/2/>.

Core Quality and Quantity Assessment

IODP-MI initiated an effort to understand the relationship between surface motion, downhole bit motion, core quality and core quantity. During FY2008, work commenced. Background research was conducted during the first quarter and coring experts were contacted to help develop the project scope and identify problem areas. During the second quarter, coring and logging data was examined for all IODP expeditions in an effort to describe past results in terms of quality and quantity and to identify some of the more challenging coring environments which should be focused on in the future.

Adhering to EDP Consensus 0801-10:

Comment on Core Quality Study: The EDP recommends that the core quality and quantity study be separated into two components. The first component, which should be completed most promptly, should provide an assessment of sample quantity based on prior drilling leg experience. The second component, assessment of sample quality, is equally important but requires more extensive research, is less likely to benefit from legacy leg experience, and may require collection of new data.

IODP-MI took a slightly different approach and focused much of its efforts to simply quantify past coring results to get an overall broad idea of recovery successes and failures over the course of the program as a whole. This entailed a very large data gathering and sorting effort and resulted in general statistics on core recovery from all IODP and ODP expeditions.

This task was completed most promptly and reported back to the EDP during the July meeting Salt Lake City. Additional work was then done to look at core quality and determine how to universally describe quality and to develop specific case studies to focus efforts in FY2009. Outside consultancy services were then secured for completion of the case studies in the upcoming year.

Offshore Technology Conference

Through personal interface, booth visuals, brochures, and other handouts, the IODP Engineering Development initiative was successfully promoted at the Offshore Technology Conference (OTC) held in Houston, Texas, May 5 -8, 2008.

Engineering Development Web Page —IODP-MI continually updates the web page, www.iopd.org/eng, as necessary with key dates, technology highlights, the most recent engineering development documentation, and current developments within the program.

Industry Collaboration/Partnership

IODP-MI joined the DeepStar and RPSEA consortiums during the second quarter of FY2007. DeepStar is a joint-industry collaboration to produce oil in ultra-deepwater led by Chevron, BP, Petrobras, Total, Kerr-McGee, Anadarko, Marathon, Statoil, and ENI. RPSEA, Research Partnership to Secure Energy for America, is a U.S. Department of Energy initiative. DeepStar/RPSEA actively seeks opportunities to commit resources for engineering development, and IODP-MI responded to their request for proposals with great success.

During the second quarter of FY2008, DeepStar awarded IODP-MI a contract to conduct a feasibility study for using the *JOIDES Resolution* as the vessel of opportunity to deepen the current threshold of operation for a dual-gradient seafloor mud pump designed by AGR drilling services, called Riserless Mud Recovery (RMR™) technology. The use of the RMR™ system aboard the *JOIDES Resolution* would significantly increase the depths to which the *JOIDES Resolution* can drill by providing borehole stability normally only obtained with the use of a marine drilling riser. Currently, RMR™ technology has been proven in water depths of about 5,000 feet. This feasibility study looks to extend its capabilities to 6,000, 9,000, and 12,000 feet below sea level.

IODP-MI will work closely with the United States Implementing Organization and with AGR Drilling Services in the first quarter of FY2009 to conduct the feasibility study which has 3 main components: (1) determining the feasibility of using the RMR™ system aboard the *JOIDES Resolution*, (2) determining the feasibility of deepening the current depth limitations of AGR's RMR™ technology to operate in water depths of 6,000, 9,000 and 12,000 feet below sea level and (3), preparing field trial planning documents that may be used in the future. The final report will be presented to DeepStar in December of 2008 and final documentation submitted by February of 2009.

CDEX

Long-Term Borehole Monitoring System (LTBMS)

FY2008 Deliverables. The following documents were submitted to IODP-MI on 30 September 2008 as USFY2008 deliverables: a) detailed system design document, b) EXP manufacturing plans and the system integrated mock-up for environmental life tests, c) environmental life tests plan, d) system control software specifications, e) operation procedure draft for the EXP deployment, f) field test requirements, and g) revised project plan.

Design Work. High-level design documents have been internally prepared and reviewed. Key comments for system design are mainly related to reliability, synchronization and testability. Fault tolerant design specifications were drafted and reviewed internally. Fabrication was started on a design evaluation mockup for the open fault detection circuit and the current closed circuit.

Telemetry System. LTBMS power system specifications were prepared for detailed design discussions. Major conclusions include: Power transition should be performed by voltage comparison. Development and evaluation for the power-up Zener diode is key for the design of the power system.

The main changes in the LTBMS Subsea specifications include the introduction of an internal clock (Sea scan product) for 5-year operation. A detailed block diagram of the power system and electronics of the subsea module was prepared and the power system and storage media (2 TByte) was researched. Circuit diagrams and PCB designs of the subsea module controller were completed and production started. Detailed design work on the solid state drive (SSD) board and the SSD file system test has also begun.

The Downhole Module schematic diagram was drafted and PCB routing and fabrication completed. One assembled set of Downhole main board and Slow ADC board was debugged before the system test. Some design modifications for the downhole power supply system became necessary based on the recent requirement changes identified by the JAMSTEC LTBMS Project Team (PT).

Mechanical Design. The current PCB size, as determined by telemetry circuit detail design, can be installed into the existing Schlumberger Subsea Monitoring and Control module (SMC), and is currently under revision. First, the maximum size of the pressure tight housing was considered, based on the full specifications of PCB size. Modal analysis was also conducted for chassis design.

Reliable wet-mate connectors installed onto the Subsea module housing were examined, and the housing design drawings are under revision. The chassis design for the main PCB and the data storage section is almost complete. LTBMS specifications were solidified, with the internal battery and all sensor I/Fs removed from the Subsea module.

One of the key parts of the downhole module design is the head section and the bulkhead. These were newly designed, and welding tests on these parts were planned for the end of September using the test piece manufactured in the U.S. However, the tests were postponed until October due to a massive hurricane hitting the Texas coast. The detailed chassis section design has not been completed since it requires the use of a flexible board design. Additionally, one fast sampling ADC channel was changed to a 9,600 bps serial channel.

Risk Assessment. Preliminary risk assessments were conducted with related project members (SKK, Schlumberger K. K.; Vetco gray; and JDC, Japan Drilling Company) to identify risk items, prevention methods, and mitigation methods. The results were submitted to IODP-MI on 31 March for ETF (Engineering Task Force) review.

EXP parts procurement. A cable spooler, sheave and 1,500 m long PDC (Permanent Downhole Cable) were purchased and scheduled for delivery in March 2008. Based on experimental results comparing mono-conductor cables and twisted pair-conductor cables, we concluded that mono-conductor cable met our telemetry cable requirements (attenuation, noise, etc.).

Related Activities. The LTBMS Project Team had been discussing the LTBMS Xmas tree with Vecto gray. CDEX and TAMU have made an agreement on riserless observatory incorporated in the present MOU for future operations.

CORE CURATION

IODP-MI

DSDP/ODP Core Redistribution Project

IODP-MI personnel worked with curators from the USIO, Bremen, and CDEX to refine timelines and track progress for the DSDP/ODP Core Redistribution Project. These timelines were posted on the IODP website with regular core movement updates, provided by the curators. Now that the project is complete, a table and map illustrating the resulting core distribution can be found at: <http://www.iodp.org/repositories/2/>

Bremen Core Repository

Bremen Core Repository (BCR) experienced another busy year, with the major activities including regular sampling for scientist's requests, and sending and receiving core material under the Core Redistribution Project. A total of 27,760 samples were taken at the BCR for 200 requests during this fiscal year. BCR again observed a substantial increase in the number of sample requests for DSDP and older ODP cores; although the total number of samples taken is lower than in some past years due to the absence of new high-recovery paleoceanography expeditions within the reporting term.

The DSDP/ODP Core Redistribution project was begun in August 2006. During FY06 BCR received three containers of core and one of residues from the ECR. In FY07, 17 containers of core were received from the ECR and four containers of core were sent to the GCR. By comparison, during FY 2008 BCR received 16 additional containers of DSDP and ODP core material from the ECR and GCR, and sent one shipment of cores to the KCC. The cores received have all been racked.

A summary of the sampling activity for this report period is given in table form. The table below provides an overview of all sampling operations, showing the numbers of requests, samples taken, and scientific visitors broken down by quarter and type of activity. As the table illustrates, BCR was able to carry out extensive sampling activities with very good results, although no large sample/science party was scheduled.

Summary of sampling activity:

Quarter:	Operation Type:	#Requests	# Samples	# Sci. visitors
Oct-Dec '07	Normal Opps.	43	6,301	18
Jan-Mar '08	Normal Opps.	48	4,725	12
Apr-Jun '08	Normal Opps.	60	8,555	22
Jul-Sept '08	Normal Opps.	49	8,179	22
TOTALS:		200	27,760	74

During this fiscal year, no new IODP expeditions were drilled in the Atlantic, so no new core was received at the BCR (except redistribution cores from the ECR).

DSDP/ODP Core Redistribution Project

According to the core redistribution scheme, the BCR will retain and receive cores from the Atlantic and Arctic Oceans and the Mediterranean Sea, the GCR will store cores from the Caribbean Sea and Gulf of Mexico, eastern and central Pacific, and Southern Oceans, and the KCC will be the repository for western Pacific and Indian Ocean cores. The largest volume of transfer of existing core involved mostly Atlantic cores from the ECR to BCR, Pacific cores from the WCR to GCR and KCR, and western Pacific and Indian Ocean cores from the GCR to KCR.

Preparations for the move began at all repositories during FY 2006. During this fiscal year (2008) BCR received 15 containers from the ECR with working halves of cores from DSDP Leg 94, Site 610 through Leg 150, Site 906, and archive cores from DSDP Leg 93, Site 603 through Leg 150, Site 906. The cores all arrived in good condition and were well-organized so that placing them into the racks in the correct order was carried out with relative ease. In addition to the Atlantic Ocean cores received from the ECR, BCR also received one container from the GCR with over 1,000 whole-round (not split into work and archive halves) sections from a large variety of DSDP legs. These are sections that were originally taken more-or-less routinely for the purpose of organic geochemistry analysis.

They were stored frozen at the GCR for a long period of time and then at some point, probably due to a lack of interest in sampling by the geoscience community, they were allowed to thaw but were still maintained as whole rounds. These will now have to be curated; either stored in custom racks that will have to be designed and constructed because our standard racks are for split cores, or they will have to be split into work and archive halves. This will result in a continuation of work directly related to the core redistribution project. In addition, because the DSDP archive halves received were not provided with red endcaps, BCR has begun a project to print red section labels for all the DSDP cores and relabel the archive halves with these labels to protect against mistaken sampling of the archive halves. This project was approximately half finished during FY2008, and will also be continued as part of the redistribution project in FY2009. The overall amount of sampling activity for the DSDP material has steadily increased with the size of the collection.

In addition to the normal core redistribution shipping activity, BCR also sent a 20-foot container of archive core halves to the KCC, containing sections from ODP Legs 116 and 184, which were here at the BCR for XRF scanning under the Clift request number 21161A. These are cores that were part of the redistribution plan but because of the XRF scanning request, they made a detour through the BCR on their way to Kochi.

CDEX

Curatorial activities on board *Chikyu* were conducted from the pre-expedition of NanTroSEIZE Expeditions, including providing advice, database support, consumables, containers, etc.

Discrete samples collected during Expedition 316, frozen samples collected during expeditions 315 and 316, as well as offloading of all core sections (total core length ca. 2.1 km) were delivered to the Kochi Core Center (KCC). As a part of NanTroSEIZE Stage 1 Expedition 315 ship-board work, 174 core sections were split at KCC, and visual core description (VCD) and non-destructive analyses (MSCL-I, MSCL-C) were performed.

Samples were taken for moisture and density (MAD) and paleomagnetic measurements with the Science Party, CDEX and Marine Works Japan (MWJ).

There have been 64 new sample requests during FY2008, with a total of 55 (mix of old and new requests) having been completed. For one sample request, 171 Archive half sections (including 15 core catcher) from Leg 184 Site 1143 were shipped to the Tongji University, Shanghai, China for non-destructive XRF scanning. The cores were returned to KCC in October 2008.

The number of sample/data requests for the NanTroSEIZE expeditions submitted via SMCS reached 174, including some requests submitted after the conclusion of Expedition 316. Discrete samples collected by the Expedition 315 Science Party members were shipped from *Chikyu* in January 2008. NanTroSEIZE core sampling was conducted at KCC for new sample requests submitted during the Stage 1 expeditions' Moratorium period.

IODP sample, data and obligations policy was explained to the Science Party of NanTroSEIZE Stage 1 expeditions as well as to prospective Science Party members of future IODP expeditions.

KCC was visited by a number of researchers, technicians and administrative staff from Japan as well as foreign countries like China, India, New Zealand, South Korea and USA. A number of reports were published and/or broadcast by local and national media, for example, NHK, CBC, RKC, SunSun, KUTV, Yomiuri Shinbun, Kochi Shinbun, Mainichi Shinbun, Asahi Shinbun, and Nikkei Shinbun.

DSDP/ODP Core Redistribution Project

More than forty shipments of Legacy cores were delivered to KCC from BCR, ECR, GCR and WCR in FY 08. The redistribution of Legacy cores will be soon completed, the last cores are scheduled to be received and stored in October 2008. A significant amount of curatorial sampling tools were also received from GCR.

USIO

DSDP/ODP Core Redistribution Project

The USIO has been working since early 2005 to redistribute DSDP and ODP legacy cores according to the geographic distribution model for the IODP core collection, which assigns cores to one of three IODP core repositories according to the sample's origin, regardless of which platform acquired the sample. The DSDP/ODP Core Redistribution Project was completed at the end of FY2008.

The Bremen Core Repository (BCR) at University of Bremen, Germany, now houses core collected in the Atlantic and Arctic Oceans north of the Bering Strait; the Kochi Core Center (KCC) at Kochi University, Japan, houses core collected from the Pacific Ocean (west of the western boundary of the Pacific plate), the Indian Ocean (north of 60°S), and all of the Kerguelan Plateau; and the Gulf Coast Repository (GCR) at Texas A&M University houses core collected from the Pacific Ocean (Pacific plate east of western boundary), the Caribbean Sea and Gulf of Mexico, and the Southern Oceans (south of 60°S, except the Kerguelan Plateau).

The East Coast Repository (ECR) and West Coast Repository (WCR) stopped receiving sample requests on June 15, 2008 and were officially closed on September 30, 2008.

DATA MANAGEMENT

IODP-MI data management services in FY2008 included a number of important activities to increase the dissemination and integration of IODP and legacy program data and information resources. The first phase of development of the Scientific Earth Drilling Information Service (SEDIS) was completed in FY2008. SEDIS phase II was awarded in FY2008 and development initiated on the SEDIS II deliverables. SSDB operations continued in FY2008 with the development work substantially completed and a transition of the contract towards maintenance and operations for FY2009 and beyond. Other data management projects completed in FY2008 include post-cruise data capture, updating and maintenance of the IODP Google Earth database, Proposal Database, IODP Central Registry LDAP system, and internal office IT resource operations and maintenance.

IODP-MI worked closely with the Implementation Organizations (IOs) to increase understanding of and develop methods for providing consistent and compliant metadata for the SEDIS I data catalogue. By May 2008, all IOs had successfully achieved automated generation and harvesting of the SEDIS metadata. SEDIS II focuses on publications related to IODP—by linking publications and data, creating a full-text publications search functionality in SEDIS, providing a map-based graphical search interface, and providing a Publication Obligation Tracking System (POTS). The SEDIS II publications metadata is harvested from an American Geological Institute (AGI) GeoRef database. SEDIS II publication search interfaces and links to data sets were largely completed in FY2008 with public launch in the first quarter of FY2009.

In FY2008, IODP-MI initiated a requirements gathering, design and planning effort in advance of undertaking the SEDIS III subcontract(s) and development. The requirements gathering and planning effort included a meeting in July attended by representatives from all of the IOs as well as members of the geosciences application development community. The meeting was an important step in delineating a common set of goals and a strategy for providing increased access to IODP data in ways that make that access most efficient and forward-looking for the end users of IODP data. The foundation of the SEDIS III strategy will be services oriented architectures (SOA), e.g., data delivery via web services with open discovery functionality along with pre-arranged integration with analytical applications currently in use within the IODP community. An RFP for SEDIS Phase III is planned for publication in FY2009 shortly after final APP09 approval.

The data management activities planned for the FY2008 APP were delayed due to a number of factors: (1) review of all, and in some areas, restructuring of SEDIS plans by the newly appointed IODP-MI Data Manager (following a 2.5 month vacancy of the position); and (2) personnel shortages at IODP-MI sub-contractors, including key staff turnover at MARUM. Another factor in the delays was that SEDIS I was not completed until May 2008 due to lack of IO compliance in delivering input data, setting back the development of SEDIS II and planning for SEDIS III.

SEDIS II is on schedule for completion by April 2009. Given the delays in FY2009 APP approval, a realistic goal is to complete all data management projects initiated in FY2009 by December 2009, with the exception of the full SEDIS III project, which will be targeted for completion by May 2010.

In summary, IODP-MI has been involved in following projects /activities during FY2008:

- IODP-MI chaired Data Management Coordination Group meeting (Sapporo, February 2008)
<http://www.iodp.org/data-management-coordination-group/>
- SEDIS III strategy planning work group (Washington, D.C., July 2008)
- Creation of the Sample Materials Curation System (SMCS) v. 2 requirements with all the IOs. The USIO is currently developing the system
http://millstone.iodp.tamu.edu/wiki/index.php/SMCS_project
- Scientific Earth Drilling Information Service (SEDIS) Phase requirements, presentation at 2008 European Geophysical Union conference, contracts, preparation of request for proposals, proposals review and contract award
<http://sedis.iodp.org>
- Deployment of the IODP user registry LDAP system
- Updating and maintenance of a database of all DSDP, ODP, IODP drilled holes location and IODP proposed drilled sites and link to their respective data and publications. Display results using Google Earth
<http://campanian.iodp-mi-sapporo.org/google/iodp.kml>
- Completion of development of Site Survey Database (SSDB) and transition toward routine operation and maintenance
<http://ssdb.iodp.org>
- Geoinformatics 2008 Conference (May 2008)
<http://www.geosociety.org/meetings/08geoinfo/>

Activities planned and managed by IODP-MI for FY2009

- SEDIS operation & maintenance, completion of phase II, start of phase III
- SEDIS Service Oriented Architecture Framework development
- Logging Data web services development
- Core-photo and image metadata embedding tool development
- SSDB operations and maintenance
- Completion of MATRIX
- IODP Google Earth database operations and maintenance
- SMCS, Sample Material Request System and Central Inventory developed by USIO

PUBLICATIONS

FY2008 activities included: 1) publication of the program journal *Scientific Drilling*, 2) oversight and coordination of program reports and proceedings, 3) implementation of publication policies and procedures, and 4) planning and preparation for further integration of publications and data management through SEDIS II.

The bi-annual journal *Scientific Drilling* that was launched jointly with the International Continental Scientific Drilling Program (ICDP) in September 2005 features articles about ongoing and finished drilling projects, as well as reports on technical developments and program outlook.

In early FY2008 a Special Issue including extended abstracts and the report from the IODP/ICDP Fault Zone Workshop held in Miyazaki, Japan in May 2006 was printed in 700 copies. However, the extended drilling hiatus 2006-2008, and the associated lack in

expedition reports vastly reduced IODP generated contributions to the journal *Scientific Drilling* in FY2008. Hence, issue No. 6 of *Scientific Drilling* was published in July 2008 instead of as planned in March 2008. A similar nine-months interval is expected between issue No. 6 and 7 (planned for March 2009) in order to accommodate for the drilling hiatus. Issue No. 8 is planned for September 2009 provided drilling is resumed in 2009.

In order to improve the overall quality and recognition of *Scientific Drilling*, an Editorial Review Board was successfully established during FY2008. SD6 was the first issue, which had the main articles – expedition reports and major workshop reports (i.e., topical white papers) peer reviewed. Editors for the board were invited through the IODP and ICDP communities, covering a wide spectrum of science and technology. The experience so far has been very positive, resulting in improved review of manuscripts, and, at least technically, a peer-review status of the main articles published by the journal.

The print run of *Scientific Drilling* No. 6 was 5,500 copies. Most of these have been distributed to subscribers and at conferences like AGU and EGU. An electronic version of the journal is available for download from the IODP website. The *Scientific Drilling* subscriber database had been based on an old community database maintained by JOI during ODP times. However, The Sapporo office has requested subscribers since issue No. 3, to verify and update their addresses at least once every three years. Before printing issue No. 6, the subscriber database had been completely updated. In addition to unique, single subscribers, a large number of printed copies are sent as bulk subscriptions to IODP related institutions (e.g., Program Member Offices) for a most cost effective distribution.

In FY2008 IODP also published four Scientific Prospectuses for Expeditions, originally scheduled for FY2008/FY2009. These were Expedition 317: Canterbury Basin, Expedition 318: Wilkes Land, Expedition 320: Pacific Equatorial Age Transect, and Expedition 321: Pacific Equatorial Age Transect/Juan de Fuca.

In addition three Preliminary Reports have been published on the Expeditions 314-316, NantroseIZE Project Stage 1. These were the first Preliminary Reports prepared by the Japanese Implementing Organization (CDEX) and forwarded to the Publication group at IODP-TAMU, and useful experiences gained for future activities. As a result, CDEX is making some changes to the J-CORES system in order to provide more smooth delivery of VCD graphics.

Electronic versions of all expedition reports are available for download in PDF from the general IODP publication website at <http://publications.iodp.org/>.

To improve visibility and further integrate IODP publications with the data the development of SEDIS II was begun. The contract was awarded to MARUM at the University Bremen, Germany. Details on the progress of SEDIS II can be found under data management.

LOGGING

ESO (BGS)

Planning for the New Jersey Shallow Shelf Expedition in May was undertaken during the first half of the year, including discussion of tool requirements and timetabling with a number of potential logging service contractors. The Co-chief Scientist visited Leicester to discuss the

logging options for the New Jersey Sea Level Expedition. LWD was planned for one hole (through discussions with LDEO) and wireline logging in 3 holes to be undertaken by EPC through Montpellier who would also run the VSP experiments. A 2 km winch was purchased for EPC to undertake the logging in 750 m holes, preparation of logging tools was completed, and the petrophysics container checked.

Following postponement of the New Jersey Expedition, EPC undertook logging program planning for both the New Jersey Shallow Shelf and Great Barrier Reef in 2009. Much discussion regarding New Jersey has centred around the feasibility of LWD, while plans are in hand to prepare for the wireline logging. Wireline logging comparable to that used for the Tahiti Sea Level Expedition will be put in place for the Great Barrier Reef Environmental Changes expedition.

USIO

USIO personnel developed plans for logging-while-drilling (LWD) operations and staffing for Expedition 313 with ESO representatives.

OUTREACH

Web-related

Grew Web traffic to *iodp.org*:

- From an average of 208,447 hits on the home page (first quarter) to an average of 434,293 hits in the fourth quarter.
- Developed a core group of *iodp.org* users—an average of 6,109 frequent users—who visit more than once per month. This figure remained constant throughout the fiscal year.

Continuously updated *iodp.org* with value-added content such as PowerPoint presentations for download contributed by co-chief scientists, access to weekly news clippings, video productions derivative of expeditions and lectures, links to current news related to IODP science.

Continuously promoted visitation to *iodp.org* at science conferences: presenting the home page live in the IODP exhibit booth; distributing tip sheet of “IODP Top 10 Destinations” featuring the site’s high-power search engine and other unique features, and including links to legacy data, the *Chikyu* “finder,” the *JR* drilling “toolbox” and more dynamic content on the site.

Events

Created and implemented the inaugural DRILLS Lecture Series: a program that presented three IODP lecturers to a total of 35 audiences at academic institutions in the United States, Europe, Japan, Australia, Brazil, New Zealand and Korea. The well-attended lectures attracted hundreds of scientists on academic campuses, resulted in videotaped lectures streamed online (www.iodp.org/drills/2/) and feedback from universities and lecturers that praised the DRILLS program, primarily for exposing new and young scientists to IODP.

Produced eight IODP exhibition booths at academic and industry expositions:

1. In coordination with USIO at Geological Society of America, Oct. 28-31, 2007, Denver.
2. At AGU, Dec. 10-14, 2007, San Francisco
3. In coordination with USIO Education at AAAS, Feb. 14-18, 2008, Boston.
4. At American Association of Petroleum Geologists, with support from USIO, April 20-34, 2008, San Antonio.
5. In coordination with ECORD at European Geophysical Union, April 13-18, Vienna, Austria.
6. At Offshore Technology Conference, May 5-8, 2008, Houston.
7. In coordination with CDEX/JAMSTEC at Japan Geoscience Union, May 25-30, 2008, Chiba, Japan.
8. In coordination with ECORD, USIO, and CDEX/JAMSTEC at International Geosciences Congress, Aug. 6-14, 2008, Oslo.

Hosted a Town Hall Meeting and reception at AGU Fall Meeting, San Francisco, attended by 350+ scientists and guests. Coordinated panel of speakers and PowerPoint presentations later streamed on the IODP web site. (www.iodp.org/education/2/#4)

Video Production

Produced IODP video presentations:

- NanTroSEIZE video (7 minutes long) featuring Harold Tobin giving overview of the complex drilling project. (streamed online).
- Streamed three (rough) DRILLS lectures online.
- Delivered six video shorts (two minutes each) to Smithsonian National Museum of Natural History for installation in Ocean Hall, a new permanent exhibition hall that opened Sept. 27, 2008. (Videos include: IODP overview, ACEX scientific findings, black shales and extreme climate change, LIPs, *Chikyu* labs, *Chikyu* riser technology)

Media Relations

- Held news conference on NanTroSEIZE achievements at AGU Fall Meeting, attended by several dozen reporters, and which generated positive news coverage of IODP on television, in print and online.
- Coordinated NanTroSEIZE outreach community to collaborate on media outreach. Efforts resulted in numerous local and regional stories, as well as cable TV productions: (syndicated article by Associated Press, also published in the International Herald Tribune; coverage in *Nature*; story placements on ScienceCentric, Stern Magazine (Germany), El Pais.com (Spain), Penn State Live (web site).
- *Nature* (journal) identified *Chikyu's* first expedition into the Nankai Trough as a top story of 2007 in its last published issue of the year.
- Conducted fruitful media outreach efforts with elite media to produce news coverage by: the Discovery Channel, *Popular Science*, BBC 2, ZDV TV (Germany), PBS-WGBH NOVA TV), A & E Television Networks, the History Channel, *Wired* Magazine, *TIME* Magazine.
- Produced five news releases; tracked and counted 108 news stories that specifically mentioned IODP (during a year of no expeditions).

Publication

- Produced six issues of *IODP E-News*. Metrics show a steady core readership (audience) of about 500 individuals.
- Produced six issues of *The Pipeline* to strengthen intra-program communications among Outreach specialists and their managers.
- Produced full-color, 16-page comprehensive brochure about IODP, distributed to all IODP partners, streamed online, and dispensed at science conferences, and through other program venues.

IODP-MI ANNUAL REPORT DISTRIBUTION LIST

J. Morris, NSF
J. Allan, NSF
M. Rouse, NSF

R. Batiza, NSF
J. Walter, NSF

Appendix 1

Financial report