

INTEGRATED OCEAN DRILLING PROGRAM MANAGEMENT INTERNATIONAL



1 October 2011 – 30 September 2012

Annual Report

Contract No. NSF OCE 0432224

Submitted by IODP Management International, Inc.

to

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MANAGEMENT AND ADMINISTRATION

CONTRACTUAL ACTIVITIES – OCE 0432224

NSF-CMO Prime Contract

NSF issued 5 contract modifications during FY2012:

- Modification #47 provided \$5 million incremental funding
- Modification #48 increased the FY12 budget to \$20,271,728 and provided \$3 million incremental funding
- Modification #49 changed the Contracting Officer's Technical Representative (COTR) designation; changed Key Personnel positions and responsibilities; approved the FY11 Annual Program Plan (APP) carry forward request; reduced FY07-FY11 APP budgets and shifted reduction amount to incrementally fund FY12 APP; increased the FY12 APP budget; and adjusted the total estimated contract value.
- Modification #50 fully funded the FY12 APP
- Modification #51 decreased the FY12 APP, shifted funding, approved the FY13 APP budget at \$13,978,500, added funding, added a close-out period, and reduced the total contract value

PRINCIPAL SUBCONTRACTOR ACTIVITIES

Ippan Shadan Hojin IODP-MI (ISHI)

In FY10 ISHI replaced AESTO to support the IODP-MI Tokyo office and the FY10-FY13 APPs. During the reporting period, the parties executed 6 subcontract modifications:

- Modification #7 approved the FY12 subcontract budget at \$2.437 million
- Modification #8 reduced the FY11 budget by \$420,026
- Modification #9 provided \$212,159 incremental funding
- Modification #10 provided \$1 million incremental funding
- Modification #11 fully funded the FY12 APP budget
- Modification #12 approved and incrementally funded the FY13 APP budget

Bremen University

Subcontractor provides core repository services for IODP at the Bremen Core Repository. During the reporting period, the parties executed two modifications:

- Modification #12 de-obligated the FY11 subcontract amount by \$43,258
- Modification #13 approved and funded the FY13 APP budget of \$305,147

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 6 subcontract modifications:

- Modification #16 approved the FY12 subcontract budget at \$9.347 million
- Modification #17 provided \$2 million incremental funding
- Modification #18 provided \$1 million incremental funding and increased the FY12 budget to \$9.935 million
- Modification #19 reduced the subcontractor's FY11 APP budget; reduced the FY07-FY11 APP budgets to resolve the DCAA audit findings; shifted the reduced amount to incrementally fund the FY12 APP; and described the unallowable cost refund process
- Modification #20 increased the FY12 budget to \$10.465 million
- Modification #21 reduced the subcontractor's FY12 budget by \$465,295 and fully funded the FY12 APP

Consortium for Ocean Leadership (COL)

COL serves IODP as the USIO. During the reporting period, the parties executed 4 subcontract modifications:

- Modification #38 provided \$1 million incremental funding
- Modification #39 provided \$1 million incremental funding
- Modification #40 approved COL's FY11 carry forward and provided \$500,000 incremental funding
- Modification #41 fully funded the FY12 subcontract

FINANCE REPORT

The interim annual financial report is attached (see Appendix 1). The final FY12 financial report is pending completion of the IODP-MI audited financial statements.

Total FY12 APP contract funds:	\$ 19,959,280
Funds obligated from FY11	\$ 1,431,189
Total funds expended:	\$ 19,201,335
Total funds committed:	\$ 1,004,795
Variance:	\$ 1,184,339

PERSONNEL STATUS

The following positions are filled from the Washington, DC office of IODP-MI as of September 30, 2012: President & CEO, Director of Finance and Administration, Program Liaison Assistant, and Staff Accountant. The deputy to president position resides on the UCSD campus.

The following positions are filled under subcontractor employment in the Tokyo office as of September 30, 2011: Operations Manager, Data and Publications Manager, Outreach and Communications Manager, Office Manager, Science Manager, Associate Information Technology Manager, Operations Coordinator, Contract Officer, Publications Coordinator, SAS Coordinator, temporary Program Assistant, and one part time IT support staff.

SUPPORT FOR SCIENCE PLANNING AND ADVISORY STRUCTURE

The Science Planning team works with the chairs of SICPOM and PEP on the broader issues of science planning and review of science achievements. In FY12, the IODP-MI science manager supported the SAS's smooth transit (PEP#1 in December 2011, SIPCOM#1 in January 2012) for the consistency and continuity in the proposal evaluations. She also supported the chairs of SIPCOM and PEP in the following fields: building meeting agendas, preparation of meeting agenda books (only SIPCOM), editing of material produced during the meetings, and producing meeting minutes.

IODP-MI also provided 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 PEP and SCP, IODP-MI edited proposal reviews, secured external reviewers and edited their external reviews, prepared and distributed proposal packages in advance of meetings.

IODP-MI reviewed the proposals (7 workshop proposals and 38 drilling proposals in FY12) for completeness and adherence to IODP guidelines, and corresponded with the proponents. IODP-MI also oversaw data submission to SSDB to assist the proponents in uploading site survey data, and to examine the total data volume for a SCP meeting.

The Science Planning team cooperated with the Data Management team for the establishment of the new Proposal Database in the following fields: user and admin interface design testing the system functions, writing the user manual and IODP drilling proposal guidelines for the new system

Attended SAS meetings in FY2012 are as follows:

Date	Meeting	Meeting Place	Attendees
December 2011	#1 PEP	San Francisco, CA, USA	Yamamoto, Larsen
January 2012	#1 SIPCOM	Goa, India	Yamamoto, Suyehiro, Larsen, Kawamura
March 2012	#1 STP	Kochi, Japan	Kawamura
March 2012	#1 EPSP	College Station, TX, USA	Kagaya
May 2012	#2 PEP	Edinburgh, UK	Yamamoto, Larsen, Kawamura
June 2012	#2 SIPCOM	Washington, DC, USA	Yamamoto, Suyehiro, Larsen, Kawamura
August 2012	#2 SCP	Barcelona, Spain	Yamamoto
September 2012	#2 STP	Portland, OR, USA	Kawamura

TECHNICAL, ENGINEERING AND SCIENCE SUPPORT

IODP-MI

Platform Scheduling

Throughout the first quarter, IODP-MI worked closely with the OTF, the SAS, the IOs and the PMT to adjust operational schedules to accommodate the changing readiness and availability dates for the *JOIDES Resolution*, *Chikyu* and future *MSP* expedition planning. To arrive at the final schedule, the OTF worked very effectively and efficiently through email communications; a report summarizing the discussions and decisions made is available at <http://www.iodp.org/otf/>.

One Operations Task Force was held in FY12; Edinburgh, UK May 16 – 17, 2012 before the PEP meeting. This meeting focused on confirming schedule of *Chikyu*, *JOIDES Resolution* and Mission Specific Platform for FY13 and identifying the operation/expedition options (draft science plan) for FY14.

The full meeting report showing all possible scheduling options is available online at <http://www.iodp.org/otf/>.

Project Scoping

Total two NanTroSEIZE Project Management Team meetings (PMT) and one Japan Trench Fast Drilling Project (JFAST) PMT meeting were held during FY12.

NanTroSEIZE PMT #21 Meeting was held during AGU in San Francisco, CA on December 4, 2011. The meeting focused on planning of Exp.338 in 2012, based on CDEX operation proposals including budget and time limitations, re-prioritizing scientific goals and long-term completion plan of NanTroSEIZE objectives after 2013.

NanTroSEIZE #21-A1 mini-Project Management Teams Meeting was held during Expedition 338 pre-expedition meeting in CDEX, Yokohama, Japan on February 23 - 24 2012. The meeting discussed and modified Expedition 338 operation plan due of CDEX budget and ship time situation change. PMT discussed CDEX new operation proposals and re-prioritized scientific goals of Expedition 338 and discussed effects on long-term completion plan of NanTroSEIZE objectives after 2013.

JFAST #1 Project Management Team Meeting was held October 6, 2011, Yokohama, Japan. The meeting focused on Expedition 343 operation plan includes 3rd Party observatory installation and sites selection.

Those PMT meeting reports are available at: <http://www.iodp.org/project-scoping-groups/>.

Expedition Operational Assessment

Following six IODP-MI Operations Review Task Force meetings met in FY12 to review the operational aspects of these expeditions.

- 1) Expeditions 331 DEEP HOT BIOSPHERE
November 16 - 17, 2011
JAMSTEC, Tokyo, Japan
- 2) Expeditions 327 Juan de Fuca Hydrogeology

December 12 - 13, 2011
College Station, TX, USA

- 3) Expeditions 335 Superfast Spreading Rate Crust 4
March 7 - 8, 2012
Washington, DC, USA
- 4) Expeditions 330 Louisville Seamount Trail
May 10 - 11, 2012
BGS, Edinburgh, Scotland
- 5) Expeditions 336 Mid-Atlantic Ridge Microbiology
September 12 - 13, 2012
College Station, TX, USA
- 6) Expeditions 343/343T Japan Trench Fast Drilling Project
September 25 - 26, 2012
CDEX, Yokohama, Japan

The review concentrated on “lessons learned” from the expedition with an emphasis on “what should be done differently in the future.” The committee review was based upon confidential reports submitted by the IO and by the Expedition co-chief scientists.

Each meeting began with a detailed oral presentation by the co-chief scientists. This included a summary of the scientific findings, as well as a series of positive and negative issues that arose before, during and after the two cruises. The IO staff scientists next gave oral presentations regarding the results of the expeditions from the operator perspective. These covered coring operations, achievements, planning and implementation. Following these oral presentations, the Task Force examined the issues identified in the oral reports and in written reports submitted by scientists. The Task Force then developed summaries and recommendations for action by the IO and other IODP entities. The full report of the each expedition Operations Review Task Force is available online at: <http://www.iodp.org/ortf/>.

CDEX

IODP Expeditions were very successful this year. IODP Expedition 343 & 343T were able to sample cores down through the fault zone and also emplace a sub-seafloor observatory in record-breaking water depths. IODP Expedition 337 was successfully able to drill beyond planned target depths in a biologically important zone of coal beds to recover the deepest cores in the history of scientific ocean drilling.

These expeditions relied on a great deal of preparation, especially for the ultra-deep water depths encountered in IODP Expedition 343 & 343T. Logging-while-drilling, coring, and observatory installation operations in water depth exceeding 6900 meters were all new records, and a great engineering achievement.

The scientific value of riser drilling continued to be underlined, especially with the excellent core recovery (>76%) in difficult and unconsolidated lithologies found among the IODP Expedition 337 coal beds.

Expedition 343: JFAST: Japan Trench Fast Drilling Project

The main science goal of JFAST is to investigate and elucidate the physical mechanisms and dynamics of large slip earthquakes, a fundamental issue but, which is currently poorly understood. Specifically, the level of frictional stress during the earthquake rupture and the physical characteristics of the fault zone are being investigated. The objectives of JFAST include locating the fault that ruptured during the Tohoku event by logging while drilling, characterizing the composition, architecture, and fundamental mechanisms of dynamic frictional slip and healing processes along the fault by taking core samples, and estimating the frictional heat and stress within and around the fault zone by placing a temperature measurement observatory across the fault.

Not all of the objectives of the expedition were initially achieved because of delays associated with severe weather, challenges of operating in such great water depths, and ultimately from failure of equipment necessary for completion of the operations. In particular, failure of the electrical and fiber-optic cable that supports and operates the underwater television system prevented timely installation of the temperature measurement observatory. A follow-up technical extension (IODP Exp 343T) will fulfill the observatory installation target. However, the other objectives were largely achieved. An LWD-MWD hole was drilled to a depth of 850.5 mbsf (total depth 7740 mbsl) and logging data were recovered. A coring hole was drilled to a depth of 844.5 mbsf (7734 mbsl) and a total of 21 cores were recovered, and the cored intervals span the two main fault targets.

The fault zone at ~720 mbsf and the plate boundary décollement at ~822 mbsf were selected as the two primary targets for coring and for the temperature measurement observatory. Several lines of evidence suggest that within the local region around the drill site, fault slip during the Tohoku earthquake, and slip at other times in the geologic past, likely occurred on the plate boundary décollement.

Success in logging and core recovery, especially from the high-shear strain zone and neighboring sediments from the plate-boundary décollement provides much material for mechanical and physical properties testing, as well as for geochemical, mineralogical, and microstructural analyses. The primary constituents of the mudstones that make up the prism are terrigenous silt and clay, vitric ash, and biogenic silica. The pelagic sediments of the footwall are similar to those described at a reference drill site on the Pacific Plate east of the Japan Trench (DSDP Leg 56, Site 436; Scientific Party, 1980). The fault, interpreted as the plate boundary décollement, consists of a sub horizontal zone (<5 m thick) of highly sheared clay that displays penetrative scaly fabric and localized slip surfaces.

Expedition 343T: JFAST: Japan Trench Fast Drilling Project II

Expedition 343T operations began at sea on 5 July 2012. This expedition was a continuation of JFAST (IODP Expedition 343), and the goal was to deploy the MTL observatory, which was cancelled due to equipment failure during Expedition 343. The MTL Observatory is a simple, autonomous sensor system, comprising an array of individual MTL and RBR temperature and pressure sensors hung from a length of vectran rope. The sensors are arranged to cover the assumed fault zone, where it is hoped the residual heat signal from the Tohoku quake can be captured.

The entire assembly hangs freely inside the observatory tubing. The sensor string will be recovered by ROV at the beginning of next fiscal year at the earliest. The observatory was successfully lowered into place onto the seafloor wellhead at ~1730 h on 16 July. *D/V Chikyu* began transit to Hachinohe Port at 1245 h on 17 July, reaching the standby anchoring point

at 0900 h on 18 July. The scientists disembarked via harbor boat, ending Expedition 343T at midnight on 19 July.

Expedition 337: Deep Coalbed Biosphere off Shimokita

Expedition 337 started when *D/V Chikyu* left Hachinohe Port on 26 July 2012. Hole C9001D, which had been drilled to 647 mbsf and cased to 511 mbsf during the *D/V Chikyu* shakedown cruise in 2006, was going to be deepened to 2200 mbsf to target deep sub-seafloor biosphere in and around coal beds. This is the second scientific riser drilling campaign by *D/V Chikyu* and IODP, following IODP Expedition 319 in 2009. The drilling and coring operation at the hole, renamed Hole C0020A, turned out to be a great success, with average core recovery >76%. Several coal layers and organic-rich sediments were in the recovered core providing sufficient material for microbial research in these intervals. Riser drilling proved its ability to recover quality core from difficult formations consisting of various lithologies, from unconsolidated loose sand and fragile coal to hard shale.

The hole was deepened further beyond the original planned depth of 2,200 mbsf, and reached the terminal depth of 2,466 mbsf. This established the deepest hole in the history of scientific ocean drilling, exceeding the previous record of 2,111 mbsf in hole 504B at Costa Rica Rift. The samples from the deepest hole will provide a new insight into the limit of subseafloor life. In addition to drilling to the deep hydrocarbon target with riser drilling, the expedition was full of new technical challenges. Formation fluid sampling, using Schlumberger's Quicksilver tool, was attempted and provided pristine fluid samples from six horizons. The newly developed mud gas monitoring system was adopted during the riser operation. An extensive set of microbiological analyses was carried out in the onboard laboratory, including automated cell counting, DNA analysis, and radioisotope tracer experiments.

ESO

Expedition 325: Great Barrier Reef Environmental Changes (post-Exp)

The Expedition 325 Scientists are continuing to conduct their post-Expedition research, with two or three peer-reviewed papers expected soon. The Expedition 325 2nd Post-expedition Meeting took place on July 3 – 7, 2012, at Heron Island, Queensland, Australia. L. Anderson and S. Morgan presented on-going research on the 325 downhole and core logging data, including core-log integration, characterization/identification of significant boundaries using downhole data and various uses of gamma. Iterative non-hierarchical cluster analysis (INCA) where relevant and possible was also conducted and presented. Discussions with the science party at the 2nd post-cruise meeting helped identify how the downhole and core logging data might fit into the community papers. Focus for EPC research will be on M0058A (fore-reef) and M0054B (LGM). A special session was co-organised with scientists associated with Expedition 310 (Tahiti) for the 12th International Coral Reef Symposium (9 – 13 July, Cairns, Australia).

Expedition 313: New Jersey Shallow Shelf (post-Exp)

The Expedition 313 Scientists are continuing to conduct their post-Expedition research, with a series of collaborative peer-reviewed papers expected to be published before August 2012.. S. Morgan completed XRF core scanning on M0027A Unit II cores at the BCR – 4-6 Oct. A. McGrath completed the crushing, preparation and analysis of fusion beads and pellets for

discrete XRF analysis at University of Leicester. This consisted of 36 MAD residue samples through M0027A Unit II cores, covering the same interval investigated by the core scanner at the BCR. Results were received on the 6 Oct. J. Inwood continued working on a publication draft analyzing logging data for Expedition 313.

The Science Party has received approval by Geosphere to proceed with submitting Expedition 313-related papers for a special electronic publication under the theme "Results of IODP Expedition 313: The history and impact of sea-level change offshore New Jersey". Sally Morgan spent one week (20-24 Feb) at MARUM collecting XRF core scanning data on Unit 2 cores from Hole M0028A. J. Inwood spent 20-21 February in Bremen Core Repository to work with S. Morgan. J. Inwood completed the final draft of 313 paper 'Statistical classification of log response as an indicator of facies variation during changes in sea level: IODP Expedition 313'. The draft version is out for comment with the co-authors, including the 313 Co-chiefs.

J. Inwood travelled to Montpellier (28th-31st May) to work with J Lofi on Expedition 313 research and produce first draft of the Lofi et. al. paper to be submitted to Geosphere. J. Inwood submitted an Expedition 313 paper to G-Cubed (June 6th). Masters student H. Foster completed her project on Expedition 313 petrophysics and geochemistry (supervised by S. Davies, J. Inwood, S. Morgan and A. McGrath) and graduated with a first-class degree.

A. McGrath visited Bremen Core Repository for three days in July 2012 to take 73 discrete samples from Unit II of Hole M0027A (Expedition 313, New Jersey) from a new sample request (MSP0161A). The samples were taken at targeted intervals between 198.83mbsf and 210.32mbsf (cores 313/27A/67-X-2 to 71-H-1 inclusive). Sixty selected MAD samples were also taken from Unit II of Hole M0029A, from an existing sample request (MSP0160B) in February 2012. The data from the new samples will extend and build upon a pilot project began in July 2011.

Expedition 347: Baltic Sea Basin Paleoenvironment (scoping)

The European Science Operator (ESO) continued to scope potential drilling methodologies, contamination tests, analytical equipment and procedures for this expedition. The closing date for expressions of interest in providing the IODP Expedition 347 coring services and platform was on 11 April. Six companies had responded with expressions of interest and were invited to submit full tenders. Three full tender responses were received by the closing date on 5 July. At the time of writing, the ESO is assessing the tender responses with a view to choosing a preferred contractor by the end of July.

The ESO continued to work with proponents T. Andr n and B. Baker J rgensen to accommodate the requirements of the proposed science program. The final science plan will be documented in the Scientific Prospectus later this year. The Call for Scientists closed on 30 April, with the ESO receiving the last nominations from the PMOs on 4 July. The following numbers of nominations were received from each IODP member: ECORD (75), USA (19), Japan (5), China (2), India (1), ANZIC (1), Korea (0). The ESO partners will work with the Co-chief Scientists and the PMOs to produce a Science Party for Expedition 347 that is balanced in terms of both expertise and nationality.

By the closing date on 5 July, three full tender responses were received from companies interested in providing the IODP Expedition 347 coring services and platform. At the time of writing, the ESO-BGS was in contract negotiations with the preferred contractor. S. Davies and S. Morgan continued negotiations with companies regarding the logging contract for the

expedition. S. Morgan has worked with Geotek to develop a fast-track MSCL system for use offshore. S. Morgan has been in discussion with Geotek regarding modifications to the existing MSCL-XYZ to reduce the time involved with logging cores prior to the Baltic Onshore Science Party. Three new ESO containers (Science, Data Management, ESO office) have been ordered, with a delivery date of February 2013.

The ESO-Bremen has been working intensely on fine-tuning the scientific program (Scientific Prospectus, Sample and Measurement Plan, Core Flow) and assessing contamination tests, as well as planning for the microbiology and geochemistry requirements and program for IODP Exp. 347 (Baltic Sea) including:

- Planning and preparation for required lab space, temperature-controlled storage and shipping of recovered materials (especially for microbiological purposes).
- Maintenance of reefer containers.
- Feasibility study and conception of new containerized microbiological laboratory.
- Containers upgrade (Curation + Lab Container).
- Installation and tests of renewed Curation Container facilities.
- Quotation processes of required specified equipment for this expedition incl. specific analytical equipment (spectrophotometer for sulphide, GC-analytical lines, double-digit refractometer, ultra-pure water device and HPLC pumps and accessories for PFT tracer injection, tracer handling).
- Planning and quotation process for the HPLC pump equipment (to deliver the PFC Tracer to the mud stream during Exp. 347) has started.

The Expedition 347 Scientific Prospectus was published by the USIO Publications Services on 10th October. The prospectus contains the scientific background to the expedition, with the operational details, Science Party and Measurements Plan to be published on the expedition web page at a later date. At the Exp. 347 Co-chiefs Meeting, the Science Party was chosen and approval sought from the PMOs shortly thereafter. Note: e-mail invitations were sent to scientists on 10th October. Scientists will confirm their place on the Science Party when they sign the expedition's Conditions of Membership. S. Morgan presented a poster at the 11th BSMG Colloquium in Helsinki Finland. "Downhole Logging and Core Petrophysics: IODP Expedition 347, Baltic Sea Paleoenvironment".

Scoping of potential future Expeditions

The following table presents the *MSP* schedule for FY12 to FY14, and operation options for FY15 and beyond. Operations for FY12 to FY14 have been approved by SIPCOM (Jan 2012). Operations for FY15 and beyond are tentative and subject to approval by the ECORD Facility Board (to be established by ECORD Council). New *MSP* proposals forwarded by the PEP will be considered for FY15 and beyond.

ESO Proposed Expedition Schedule

FY13, next MSP			
672	Baltic Sea Basin Paleoenvironment	OTF	Forwarded March 2011, SPC ranked #2 Spring/Summer 2013
548	Chicxulub K-T Impact Crater (hazard survey)	OTF	Forwarded March 2010, SPC ranked #4 April-July 2013.
FY14 / FY15 options			
548	Chicxulub K-T Impact Crater (drilling)	OTF	Forwarded March 2010, SPC ranked #4 First MSP of the new program, 2014?
758	Atlantis Massif Seafloor Processes	OTF	Forwarded March 2011, SPC ranked #1 2014-2015? Depends on seabed drill readiness
FY16 and beyond			
716	Hawaiian Drowned Reefs	OTF	Forwarded March 2009, SPC ranked #6
581	Late Pleistocene Coralgall Banks (full expedition)	OTF	Forwarded March 2010, SPC ranked #10
637	New England Shelf Hydrogeology	OTF	Forwarded March 2009, SPC ranked #4 In holding bin with technology and cost issues
Plus new MSP proposals, possibly in the Arctic			

The ESO is continuing to scope the remaining, highly-ranked *MSP* proposals which will provide excellent options for *MSP* expeditions in the first years of the International Ocean Discovery Program.

Proposal 581: Late Pleistocene Coralgall Banks

The ESO received an offer from Fugro of 24 hours of geotechnical ship time for \$75k to conduct a coring test on the coralgall mounds of Southern and Baker Banks in the Gulf of Mexico. The objective was to use Fugro's geotechnical vessel R/V Seaprobe 1 to deploy a single coring tool, the QDTEch Alien Corebarrel (developed by Marshall Pardey and used during Expedition 313) to test its suitability for coring uncemented coralgall reef material. The opportunity window was offered as mid-March to May 2012. After e-mail exchanges and conference calls with Fugro representatives, the ESO delivered the signed contract to Fugro to allow preparations to begin. Despite frequent communication attempts by NERC contracts staff since March, Fugro have ceased responding with regard to this opportunity. It is assumed that the ship is no longer available for this drilling test.

Proposal 548: Chicxulub Impact Crater

The ESO aim to commission the hazard site survey for 2013, providing funding is forthcoming for an *MSP* program in the new IODP. The ESO aim to implement the drilling operation in 2014. ESO is continuing to solicit potential contractors for the hazard site survey and drilling work, and will start the tendering and permitting processes once confirmation of funds is given by ECORD. The ESO will seek approval from ECORD Council at their June meeting to proceed with tendering for the Chicxulub hazard survey.

The ESO is preparing to issue a Notice of Interest in the Official Journal of the European Union (OJEU) for the Chicxulub hazard survey in mid-July. The ESO is currently running a tendering exercise to source a survey company to conduct a hazard survey in preparation for implementing the Chicxulub Impact Crater Expedition. Following receipt of 11 notes of interest, 7 companies were invited to tender. The ESO aim to contract the survey between

April and June 2013. Providing funding is forthcoming for an *MSP* program in the new IODP, the ESO aim to implement the drilling operation in 2014.

Proposal 758: Atlantis Massif Seafloor Processes

A full and up-to-date copy of the site survey database associated with this proposal has been assembled on the servers at the BGS. BGS Marine Operations staffs are continuing to evaluate all available seabed drill options, including the evolving BGS and MeBo (MARUM) seabed drills for this proposal.

BGS Marine Operations staffs continued to evaluate all available seabed drill options, including the evolving BGS and MeBo (MARUM) seabed drills for this proposal. On 9th February, BGS operations staff met with Tim Freudenthal (MARUM) to discuss the development of the MeBo and the BGS rockdrill, and how both groups might develop new downhole sampling tools that can be used in both rigs. On 18th April, the discussion continued with MARUM and Gretchen Früh-Green, the lead Atlantis Massif proponent. The discussion centered on what new sampling tools need to be developed to meet the requirements of Proposal 758.

A 2nd PMT meeting was held for this proposal at MARUM, University of Bremen on 18 April, attended by the ESO staff, Gretchen Früh-Green (ETH Zurich), Tim Freudenthal and Markus Bergenthal (MARUM/University of Bremen).

Proposal 716: Hawaii Drowned Reefs

BGS Marine Operations staffs are continuing to evaluate all available seabed drill options, including the evolving BGS and MeBo (MARUM) seabed drills for this proposal.

Arctic Expedition scoping

D. Smith and D. McInroy met with representatives of Stena, operators of icebreaking drillship Stena DrillMAX ICE, on 10th January 2012 in Stockholm, Sweden. D. Smith attended the Arctic workshop “Co-ordinated Scientific Drilling in the Beaufort Sea”, 13-15 February, Kananaskis, Canada.

Other

The ESO is continuing to implement QA/QC within *MSP* operations as asked by IODP-MI. Various work packages related to this topic which encompass overall policies and procedures for QA/QC are either in progress or already completed.

For *MSP* proposals, the ESO is currently investigating the implementation of QA/QC procedures, including documenting QA/QC procedures in offshore lab work routines. The ESO is also scoping analytical equipment and instrumentation and their associated QA/QC procedures.

USIO

The U.S. Implementing Organization (USIO) successfully completed five cutting-edge expeditions this year that will advance global understanding of Earth systems. Over the course of these expeditions, the USIO installed new subseafloor observatories in the Mid-Atlantic Ridge; collected the first sediment samples ever recovered from the deep subseafloor in the Gulf of Cádiz, documenting a 1.5 million year record of climate change; studied geophysical properties of gabbroic rock in situ for the first time in scientific ocean drilling; and conducted third-party tool sea trials that collected the *JOIDES Resolution* during

the Expedition 342 port call first in situ pressure measurement ever made on the Atlantic margin.

Expedition 336: Mid-Atlantic Ridge Microbiology

Expedition 336 (16 September–16 November 2011) successfully initiated subseafloor observatory science at a young mid-ocean-ridge flank setting. The four sites drilled during this expedition are located in the North Pond region of the Atlantic Ocean. This area is known from previous ocean drilling and site survey investigations as a site of particularly vigorous circulation of seawater in permeable 8 Ma basaltic basement underlying a <300 m thick sedimentary pile. Understanding how this seawater circulation affects microbial and geochemical processes in the uppermost basement was the primary science objective of Expedition 336 in service of a fundamental objective of the IODP Initial Science Plan (ISP)—study of the subseafloor biosphere.

Major strides in ridge-flank studies have been made with subseafloor borehole observatories (CORKs) because they facilitate combined hydrological, geochemical, and microbiological studies along with controlled experimentation in the subseafloor. During Expedition 336, two fully functional observatories were installed in two newly drilled holes (U1382A and U1383C) and an instrument and sampling string were placed in an existing hole (395A). The CORK observatory in Hole U1382A has a packer seal in the bottom of the casing and monitors/samples a single zone in uppermost oceanic crust extending from 90 to 210 meters below seafloor (mbsf). Hole U1383C was equipped with a three-level CORK observatory that spans a zone of thin basalt flows with intercalated limestone (~70–146 mbsf), a zone of glassy, thin basaltic flows and hyaloclastites (146–200 mbsf), and a lowermost zone (~200–331.5 mbsf) of more massive pillow flows with occasional hyaloclastites in the upper part.

Expedition 336 aimed to address two major scientific questions: (1) Where do deep-seated microbial communities come from? (2) What is the nature of the microbial communities harbored in young ridge flanks, and what is their role in the ocean crust weathering? North Pond is the ideal location to test opposing hypotheses concerning the first question, which have important mechanistic implications concerning dispersal mechanisms in the deep biosphere and evolutionary consequences for microbial life on Earth. With the samples recovered, scientists will analyze the microbial communities in both deep sediments (obtained from cores taken during the expedition) and basement crustal fluids (obtained with the CORKs postexpedition). The low heat flow ridge flank at North Pond represents an ideal model system for studying biologically mediated oxidative basement alteration in an attempt to answer the second question. The work completed during Expedition 336 will also provide an excellent point of comparison for the studies taking place at the Juan de Fuca Ridge.

Expedition 339: Mediterranean Outflow

During Expedition 339, five sites were drilled in the Gulf of Cádiz and two sites were drilled off the West Iberian margin from November 2011 to January 2012. The Gulf of Cádiz was targeted for drilling as a key location for the investigation of MOW flow through the Strait of Gibraltar gateway and its influence on global circulation and climate. The gulf is also a prime area for understanding the effects of tectonic activity on the evolution of the Strait of Gibraltar gateway and margin sedimentation.

Drilling in the Gulf of Cádiz and off the West Iberian margin offers a unique opportunity to tackle key scientific goals enumerated in the IODP ISP related to (1) oceanic gateways and their global influence, (2) paleocirculation and climate, (3) rapid climate change, (4) sea level

and related controls on sediment architecture, and (5) neotectonic activity and controls on continental margin sedimentation.

The Gulf of Cádiz is the world's premier contourite laboratory and thus presents an ideal testing ground for the contourite paradigm. Existing models for contourite deposition were found to be sound following recovery of >4.5 km of contourite cores that include the first sediment samples ever recovered from the deep seafloor in this region. These cores provide extensive marine sediment resulting from a deep, powerful Mediterranean Outflow through the Gibraltar gateway that began more than 4.5 million years ago. Further study of these models will undoubtedly allow us to resolve outstanding issues of depositional processes, drift budgets, and recognition of fossil contourites in the ancient record onshore.

Expedition 339 scientists found evidence for a "tectonic pulse" at the junction between the African and European tectonic plates. This pulse caused repeated rising and falling of structures in and around the Strait of Gibraltar, a gateway that affects the circulation of major ocean currents, and led to strong earthquakes and tsunamis that dumped large flows of debris and sand into the deep sea. The expedition also verified the presence of a larger than expected quantity and extensive distribution of clean and well-sorted contourite sands. These sands represent a completely new and important exploration target for potential oil and gas reservoirs. Preliminary work has shown a remarkable record of orbital-scale variation in bulk sediment properties of contourites at several of the drift sites and good correlation between all sites. Climate control on contourite sedimentation is clearly significant at this scale; further work will determine the nature of controls at the millennial scale.

One of the sites drilled during the expedition on the west Portuguese margin unearthed a record of climate change over the past 1.5 million years, covering at least four major ice ages and providing a new marine archive to compare against ice core records from Greenland and Antarctic ice sheets, and with numerous land-based records. Shipboard analyses have already revealed the first evidence of climate cycles. Yet, it will take many months and even years of postexpedition research in shore-based laboratories to properly decode the signals of climate change in the past, to document periods of very rapid change comparable to rapid global warming today, and hence help understand what we might expect in Earth's future.

Expedition 340T: Atlantis Massif Oceanic

Core Complex During Expedition 340T (15 February–2 March 2012), borehole logging was completed in IODP Hole U1309D on the domal core of Atlantis Massif just west of the spreading axis of the Mid-Atlantic Ridge. This expedition aimed to test the hypothesis that highly altered intervals and/or fluid-bearing fault zones at depth might be responsible for density/seismic contrasts sufficient to reflect seismic energy. Such contrasts were found in the dominantly gabbroic section cored during IODP Expedition 304/305. If this hypothesis proves true, it will allow interpretation of the reflectivity patterns in terms of hydration pathways within young ocean crust. Atlantis Massif provided a good location for this study because it includes rock types that are typically only found much deeper in ocean crust. Geophysical properties of these gabbroic rocks were studied in situ for the first time during Expedition 340T, providing measurements that will allow scientists to infer how gabbroic rocks will appear on future seismic surveys, making it easier to map seafloor geophysical structures.

Prior seismic imaging showed considerable reflectivity within the footwall of this oceanic core complex, and new results document the geologic explanation for at least some of the impedance contrast. Data from Expedition 340T confirm that borehole velocity of altered

olivine-rich troctolite intervals at Site U1309 is sufficiently distinct from surrounding rock to produce a multichannel seismic reflection. Small dips in temperature found in borehole fluid adjacent to known faults suggest that percolation of seawater along the fault zone is still active, not a past process that produced the alteration documented in Expedition 305 cores. Expedition 340T obtained the first seismic coverage of the 800–1400 mbsf portion of Hole U1309D. Vertical seismic profile station coverage at zero offset now extends the full length of the hole, including the uppermost 150 mbsf, where detachment processes are expected to have left their strongest imprint. Opportunistic sampling of a seafloor feature, now designated IODP Site U1392 and located a few meters from Hole U1309D, recovered fragments of possible cap rock that may provide information on processes within the exposed detachment.

Two observations made during Expedition 340T inform young ocean lithosphere studies in general. Each required minimum possible disturbance approaching and reentering the hole. Visual observation of whether the well was “producing” (flow out of the hole) addresses fluid flow within the crust and chemical exchange with seawater in maturing lithosphere. Measurement of borehole fluid temperature assesses conditions that may be encountered by future ultradeep drilling/logging of an intrusive oceanic section and tests for possible fluid flow (temperature deviations) within fault zones of Atlantis Massif’s footwall.

Expedition 340: Lesser Antilles Volcanism and Landslides

The primary aim of Expedition 340 (2 March–17 April 2012) was to further understanding of the constructive and destructive processes related to island arc volcanism. Processes occurring along these arcs are among the most fundamental on Earth. Styles of magmatism and eruptive activity are diverse in this geological setting not only between different arcs, but also between the different islands that make up an arc. Because of the association of volcanic activity in island arcs with potentially large geohazards (explosive eruptions and tsunamis), it is imperative to further investigate and thus better understand the evolution of these volcanoes and the histories of their related landslides.

Knowledge of island arc volcanism is largely limited to the subaerial geological record. Combining this record with information from related submarine deposits will provide a more complete picture of volcanic activity in this geological setting. The Lesser Antilles arc is well suited to achieving this combined record, offering a diverse range of magmatic and eruptive styles across a relatively small geographic area. In addition, the frequency of flank collapse events that result in the deposition of debris avalanches is high, with the style of flank collapse varying along the arc. The scientific objectives for Expedition 340 were (1) to understand the timing and emplacement processes of potentially tsunamigenic large debris avalanche emplacements, (2) to document the long-term eruptive history of the arc to assess volcano evolution (cycles of construction and destruction) and major volcanic hazards, (3) to characterize the magmatic cycles and long-term magmatic evolution of the arc, (4) to document dispersal of sediment into the deep ocean, and (5) determine the processes and element fluxes associated with submarine alteration of volcanic material. These objectives are related to the overarching ISP objective of “Recycling of Oceanic Lithosphere into the Deeper Mantle and Formation of Continental Crust.”

Data acquired during this expedition will be utilized to further investigate magmatic evolution and eruptive activity along the Lesser Antilles arc. In addition, a better understanding of the mechanisms involved in both the transport and deposition of volcanic debris avalanche deposits may be reached, and the potential for volcanic hazards associated with these avalanches may be assessed.

Expedition 342: Paleogene Newfoundland Sediment Drifts

Expedition 342 (1 June–30 July 2012) was designed to recover Paleogene sedimentary sequences with unusually high deposition rates across a wide range of water depths to answer a series of pressing questions about the rate and magnitude of past ecosystem changes. The drilling area was positioned to capture sedimentary records of ocean chemistry and circulation changes beneath the Deep Western Boundary Current in the northwest Atlantic Ocean to further our understanding of climate change, ocean currents, and glaciations. The major objectives of Expedition 342 addressed the extreme climates and transient climate ISP objectives. In addition, two operational days were dedicated to a sea trial of the MDHDS developmental tool (see “Third-party tool support” in “Operational and Technical Support”).

The expedition was primarily targeted at reconstructing the Paleogene CCD in the North Atlantic for reference to recently obtained high-fidelity records of the CCD in the equatorial Pacific. The combination of sites yields a record of the history of CCD change over a 2 km depth range from the ocean abyss to middle range water depths. Notable findings include the discovery of intermittent calcareous sediments in the Cretaceous, Paleocene, and early to middle Eocene at 4.5 km paleodepth, suggesting a deep Atlantic CCD during these times. A second major objective of Expedition 342 was to recover clay-rich sequences with well-preserved microfossils and high rates of accumulation in comparison to the modest rates of accumulation typically encountered at pelagic sites. As anticipated, Expedition 342 recovered sequences with sedimentation rates high enough to enable studies of the dynamics of past abrupt climate change, including transitions into both “greenhouse” and “icehouse” climate states, the full magnitudes of hyperthermal events, and rates of change in the CCD. An unexpected finding was the recovery of a number of Cretaceous “critical boundaries,” including the Cretaceous/Paleogene (K/Pg) boundary, the Campanian–Coniacian interval, the Cenomanian/Turonian boundary and oceanic anoxic Event (OAE) 2, and the Albian/Cenomanian boundary OAE 1d. These intervals were drilled opportunistically when they were encountered near or above the target depth for a given site.

Expedition planning

Pre-expedition planning meetings were held in College Station, Texas, for FY13 Expeditions 344 (Costa Rica Seismogenesis Project [CRISP] 2), 345 (Hess Deep Plutonic Crust), and 346 (Asian Monsoon). Corrosion issues in the sea chest of the *JOIDES Resolution* required a brief dry dock for repairs, which shifted the expedition schedule and delayed Expedition 340T (Atlantis Massif Oceanic Core Complex) 4 weeks. No operational days were lost.

The USIO coordinated science staffing to fulfill specialized needs and made shipboard berths available to accommodate education and outreach efforts (see “Education” in “Broader Impacts”). Science staffing was completed this year for FY12 Expeditions 339 (Mediterranean Outflow), 340T, 340 (Lesser Antilles Volcanism and Landslides), and 342 (Newfoundland Sediment Drifts), including MDHDS participant staffing, and FY13 Expeditions 344, 345, and 341 (Southern Alaska Margin Tectonics, Climate, and Sedimentation). Staffing of FY13 expeditions was re-opened during the last quarter to allow participation of scientists from the newest IODP member country, Brazil.

Clearance applications were submitted to the U.S. State Department for operations in the Exclusive Economic Zone (EEZ) waters of Spain and Portugal during Expedition 339; the Montserrat, Guadeloupe, Dominica, and Martinique EEZs during Expedition 340; and the Costa Rica EEZ during Expedition 344; and to include new locations for Expedition 340 sites

that were shifted because of proximity to submarine cables. Requests were submitted to the Environmental Protection and Safety Panel (EPSP) and Texas A&M University (TAMU) Safety Panel to extend the drilling depth of Expedition 339 proposed Site GC-09A to 870 mbsf, and the Bureau of Ocean Energy Management was notified of the dates and objectives of Expedition 341 and the MDHDS test during Expedition 342, both of which would take place in U.S. waters. Environmental evaluations for vertical seismic profile (VSP) work during Expeditions 340T, 340, and 344 and the use of acoustic sources as part of the Expedition 344 check shot surveys were submitted to NSF, and development of the environmental evaluation report for Expedition 341 was initiated. Seismic data collected during FY11 Expedition 334 (CRISP 1) also resulted in the development of a request to the EPSP for one new primary site and several additional alternate sites for Expedition 344.

Substantial overlap/collaboration with the Expedition 334 Science Party was observed during evaluation of Expedition 344 sample requests, as expected, and some Expedition 334 cores were identified for shipment to the port call along with all of the Expedition 334 data. Operational and laboratory supplies, including third-party analytical equipment, were acquired and shipped to the re-supply port call in St. Johns, Newfoundland (Canada), for Expedition 344. Design modifications were completed this year for hammer-drill-type funnels and free-fall funnels to increase the options for establishing reentry capabilities for Expedition 345, and planning began for core description support for select Ocean Drilling Program (ODP) Leg 147 cores and thin sections that will be on board during the expedition. Finally, the decision to use Valdez, Alaska, as the end port for Expedition 341 and beginning port for Expedition 346 resulted in reduced overall transit time, potentially adding 3 days of operations to Expedition 341 and ~4 days of operations to Expedition 346.

ENGINEERING DEVELOPMENT

Offshore Technology Conference

Through personal interface, booth visuals, brochures, and other handouts, the IODP Engineering Development initiative was promoted at the Offshore Technology Conference (OTC) held in Houston, Texas, April 30 - May 3, 2012.

IODP-MI Managed Projects (Third-Party)

Motion Decoupled Hydraulic Delivery System (MDHDS): The MDHDS team performed systems integration test and sea-trial in FY12.

The MDHDS team performed a systems integration test of the MDHDS include ERS, MFTM, T2P, and SET-P on April 3 - 5, 2012 at the Genesis Rig in Schlumberger, Sugar Land, TX. The purpose of the test was to check that all of these systems are interacted correctly in the field. The test had two key components: 1) Deploy, and recover the penetrometer system using the wireline; 2) Maintain real-time communication with the tool during the entire deployment via the wireline. Five set-up/cases were tested. From the test results, three areas needed to be modified: 1) MDHDS latch spring strength; 2) T2P pressure sensor robustness; 3) ERS latch positioning.

The MDHDS sea-trial was performed by *JOIDES Resolution* on June 2012 before the Expedition 342 Newfoundland Sediment Drifts. They tested the MDHDS at ODP Site 1073 (Leg 174A, 639 m water depth), offshore New Jersey, by deploying with MFTM, ERS, T2P, and SET-P into borehole. Two tests were run and each of those tests had several failures.

The team found major issues relating to real time tool communications and MDHDS latching mechanism controlled by hydrostatic pressure. Five areas needed to be improved for future operation; 1) Readjust MDHDS latch spring force; 2) Eliminate the real time communication tether meanwhile; 3) Change the inner barrel subassembly to solid rods; 4) Introduce ERS latch positioning mechanism; 5) Readjust MDHDS latch dog.

The MDHDS was not tested extensively at this sea-trial. But many lessons were learned regarding the idiosyncrasy of the tools when deployed from the *JOIDES Resolution*. This newly gained knowledge will be reflected in the updates to technical manuals and tools modification. Discussing with USIO, after those modifications, MDHDS has been IODP certified tool/equipment.

Detail of the MDHDS systems integration test and sea-trial reports is available online at: <http://www.iodp.org/mdhds>.

Simple Cabled Instruments for Measuring Properties InSitu (SCIMPI): The team assembled entire SCIMPI array plus spares and conducted combination test on late November at Lamont Doherty Earth Observatory (LDEO). This test was performed with ERS, MFTM, and a 20,000-foot Schlumberger logging cable. The test finished with overall success. The team submitted final SCIMPI development report/ documents to IODP-MI on December 2011.

Final sea-trial plan was discussed at Operations Task Force meeting in May 2012 and was scheduled before the Expedition 341 Southern Alaska Margin Tectonics Climate & Sedimentation by *JOIDES Resolution* in FY13. USIO reported that Neptune program committed to support post-installation operation of the SCIMPI include maintenance. The SCIMPI team and USIO will have a pre-cruise meeting on October 29, 2012.

The SCIMPI team submitted 3D CAD model data of each SCIMPI components to IODP-MI. FY12 engineering development SCIMPI contract had completed, the property will be transferred to TAMU legally in Q1 of FY13.

Wireline Hydraulic Testing and Borehole Imaging Tool for Stress Measurements (DRST): DRST phase 1 report and phase 2 proposal for high-level design, fabrication and test were submitted to IODP-MI by DRST team on Sep 12 for evaluation, and was forwarded to EDP for e-review. The EDP review result were mostly fine/fair, especially technical point of view, but IODP-MI found that there is considerable issues on the project cost estimation and project management.

After internal evaluation, IODP-MI decided not to support DRST project phase 2 because of the current IODP funding situation, shorten total budget in FY12 and uncertainty in FY13. All submitted projects documents by the phase 1 project were posted to IODP Web site for IODP achievement.

CDEX

There are no Engineering Development deliverables scheduled for FY12

ESO

There are no Engineering Development deliverables scheduled for FY12.

USIO

Vibration-isolated television

Vendors were selected and purchase orders issued for components of a new vibration-isolated television (VIT) camera system to replace the almost 30-year-old existing VIT system. Installation of the new VIT system is scheduled for the Victoria, British Columbia (Canada), tie-up period in FY13. A project was also initiated to convert VIT camera system surveys and reentries to a common format and archive them digitally and to convert older VHS tapes to digital format on a time available basis.

Large-diameter pipe handling infrastructure

Work progressed during FY12 on the design and fabrication of infrastructure for safely and efficiently handling large-diameter (6-5/8 inch) pipe on board the *JOIDES Resolution*. Representatives from the USIO and subcontractors met on board the *JOIDES Resolution* during the Curaçao maintenance period in early May and reviewed detailed engineering drawings of an insert version of the 350- and 500-ton elevators, including new weight and size specifications to account for the center of gravity and provide the ability to swing and latch. Based on this review, a new handler will be designed to remediate excessive wear that occurs on the elevator bearings-guide rollers when using the existing 430-ton IODP elevator. The final design phase began of the elevators for 5, 5-1/2, and 6-5/8 inch drill pipe that will accommodate USIO recommended tool joint lengths, thus allowing additional recuts that could potentially extend the drill pipe's length of service. As this project neared completion, the USIO began exploring potential targets for at-sea testing of the new equipment.

Magnetic susceptibility sonde rebuild

The USIO completed construction of two new magnetic susceptibility sonde (MSS)-B tools this year. The MSS deep-reading sensor was successfully deployed during Expeditions 340T and 340, and the entire MSS tool suite was pressure tested, bench tested, calibrated, and shipped to the *JOIDES Resolution* for deployment in future IODP expeditions.

Multifunctional Telemetry Module

The USIO's Multifunction Telemetry Module (MFTM), which transmits third-party tool downhole data back to the surface in real time, was successfully deployed this year during Expedition 342 as part of the MDHDS initiative (see "Third-party tool support"), allowing real-time monitoring of formation temperatures and pressures while the MDHDS penetrometer was decoupled from the motion of the drill string. The MFTM is also scheduled for use in May 2013 during Expedition 341S as part of the Simple Cabled Instrument for Measuring In Situ Parameters (SCIMPI) deployment.

Multisensor magnetometer module

The USIO continued development of the multisensory magnetometer module (MMM), a third-party borehole magnetometer tool that will provide borehole and tool orientation data, continuous downhole records of formation magnetization surrounding the borehole, and measurements of the borehole field on three axes, allowing calculation of the full formation magnetization vector: inclination, declination, and total field intensity. The MMM will be capable of working in both strongly magnetized hard rock formations and in sediments with weaker magnetizations, providing downhole magnetic information that will complement core sample magnetic measurements and significantly enhance IODP's ability to magnetostratigraphically date sediment sequences. During FY12, a new pressure housing design resolved problems encountered during pressure testing with seals between the composite material and nonmagnetic field joints. All nonmagnetic housings were successfully

pressure tested to 10,000 psi, the MMM was assembled, and all sensors are operational. Complete systems integration testing is anticipated in late 2013.

Third-party tool support

A sea trial of the MDHDS with the T2P was conducted at Site U1402 on the New Jersey margin before the main leg of Expedition 342. This deployment was the culmination of the testing and development phase of a delivery system designed to remotely deploy and recover penetrometers. The benefit of this system over its predecessor is the complete decoupling of the penetrometer from the drill string, negating the effect of ship heave on the quality of data. The second of two deployments of this system fulfilled the mission goals by successfully acquiring in situ data with complete decoupling from the ship. This is the first in situ pressure measurement made on the Atlantic margin in scientific ocean drilling and confirms previous indirect pressure estimates. The USIO now has a dependable method to deploy pore pressure penetrometers successfully, which will allow the rapid measurement of in situ pressure in sediment. This new capability opens an exciting range of future science for the drilling program.

CORE CURATION

Bremen Core Repository

Bremen Core Repository (BCR) experienced another very busy year, with the major activities including regular sampling for scientists' requests and hosting a sampling party for a high-recovery expedition (Exp 339, 5.5 km of core). BCR has also continued to import data from legacy cores, samples and sample requests into the DIS database system, as well as data from new expeditions in the Atlantic. The period was also again characterized by abundant outreach activities and a number of prominent visitors. A total of 82,724 samples were taken at the BCR for 226 requests during this fiscal year. BCR has processed a substantial number of sample requests for DSDP and older ODP cores (redistribution cores), and the total number of samples taken from these remains significant compared to the average over past years.

The new MARUM II building, which contains a 440 m² core reefer, opened in the spring of 2011. After all of the non-IODP cores (University of Bremen Geosciences Department (GeoB) piston and gravity cores) were moved out of the existing BCR reefer in the MARUM building to the new reefer, it was necessary to remove the GeoB-format core racks and build new DSDP/ODP/IODP format racks, thus increasing our capacity for IODP cores (providing about 40 km of additional capacity). The new rack construction was completed in August 2012. Additional tasks this year have included providing cores for numerous educational requests involving the loan of core material, primarily for exercises in graduate-level courses in marine geosciences. Through these efforts, numerous young emerging scientists have been exposed to and inspired by materials from IODP. More details are found in the Education and Outreach section.

BCR has continued our efforts this year to improve the DIS database and are employing it to record all the samples taken from DSDP/ODP/IODP cores stored at BCR (both *MSP* and non-*MSP* cores). Easy public access is available on our data-query web site to sample, corelog, and depth data for all materials stored at the BCR, as well as core photos from the *MSP* Expeditions. Database activities have also included our testing and input for development of the SDRM v2 system for sample request management.

Ongoing activities further encompass the use of CoreWall to enhance and automate the task of core description. CoreWall-Corelyzer has been continuously undergoing improvements. The CoreWall hardware is permanently installed in the BCR lab and we are continuing to explore new ways to integrate Corelyzer into our daily normal operations, including education and outreach. Visitors are always amazed by the sharp, high-resolution pictures of cores and the ability to view the sediments from a complete hole from top to bottom, and to zoom in for extreme close-ups. This hardware setup also provides a practical work station for visitors to use the "CoreRef" web site to view IODP and ODP core photos with measurement data.

Sampling summary at BCR:

A summary of the sampling activity for this report period is given in table form. Table 1 provides an overview of all sampling operations, showing the numbers of requests, samples taken, and scientific visitors broken down by quarter.

Table 1: Summary of sampling activity

Quarter:	Oper. Type:	#Reques ts	# Samples	# Sci. visitors
1 Oct-Dec '11	normal op's.	39	6,066	15
2 Jan-Mar '12	normal op's.	41	7,250	19
3 Apr-Jun '12	normal op's.	38	2,756	11
	339 sampling	45	54,395	38
4 Jul-Sept '12	normal op's.	54	6,560	17
	339 sampling	9	5,697	6
TOTALS:		226	82,724	106

Arrival of new IODP cores

A cumulative length of about 11 km of new cores from 2 expeditions (Exp 339 "Mediterranean Outflow", February 2012, and Exp 342 "Paleogene Newfoundland Sediment Drifts", August 2012) arrived at the BCR during this fiscal year: on February 6, 2012 USIO received three 40-foot containers with the Exp 339 cores (top picture). The 816 boxes were brought into the reefer on pallets the same day, and the thousands of core sections were transferred into the racks within a month after their arrival. 503 boxes of the Exp. 342 cores were received on August 17, 2012 (bottom picture) (309 boxes with archive halves were sent to other institutes for XRF scanning prior to being forwarded to the BCR later).

Increasing the core reefer capacity

In the spring of 2011 the new MARUM II building opened, adding a second core reefer with an area of 440 m². All of the non-IODP cores (University of Bremen Geosciences Department (GeoB) piston and gravity cores) were moved out of the existing BCR reefer in

the MARUM building to the new reefer. Because the GeoB cores have a much larger diameter (ca. 12 cm) than the IODP standard, it was necessary to remove the GeoB-format core racks and install new DSDP/ODP/IODP-format racks, thus increasing our capacity for IODP cores (providing about 40 km of additional capacity). The new rack construction was completed in August 2012.

CDEX

In FY12, KCC continued to welcome an increased number of sample requesters, from 9 countries, who visited KCC to inspect cores and/or take core samples for their research. About 1400 core sections recovered during Expeditions 325 and 343 were stored in KCC, and the number of RMS (Routine Microbiological Samples) increased to 175.

Sample Requests

Sample requests for IODP Legacy cores (n=75) were received and processed. In total, 78 requests were completed, including 3 requests received in previous fiscal year. IODP core requests totaled 32: 28 of these were completed, while 4 are in various stages of processing. Two sample requests for RMS were also received. Three core sections from Expedition 331 were sent to the Nagoya City Science Museum, and 2 core sections from Expeditions 131 and 190 were sent to the Muroto Geopark for special exhibition. Sample requests are being regularly received from researchers all over the world. The curation service was given an award by the President of JAMSTEC for its efficiency and international recognition.

Table 2: Sample requests processed by KCC

US FY	Requests received	Cores		Samples shipped
		Legacy	IODP	
2007	3	3	0	0
2008	218	65	0	9,317
2009	169	79	9	5,358
2010	168	83	4	61,318 *
2011	201	66	27	9,017
2012	214	75	24	12,421
2013	111	18	8	657

* this number is high because of Bering Sea core sampling party, which took ca. 54000 samples

"Requests Received" includes Expedition related sample requests; "Samples Shipped" does not include samples shipped from Chikyu.

Chikyu onboard curation

Curation service was provided onboard *D/V Chikyu* during Expeditions 343 and 337. Sixty nine sample and data requests for the former and 75 requests for the latter were received and summarized into Pre-Cruise Sampling Plans (PCSP). Sixty-seven core sections and 1 RMS from Expedition 343 were received and stored in KCC. This brought the number of RMS being curated at KCC to 175. Approximately 1330 core sections taken during

Expedition 325 were transferred from the Bremen Core Repository, Germany to KCC following the geographic distribution of cores among the 3 IODP core repositories.

Miscellaneous

STP members and liaisons from IOs visited KCC facility. These visitors evaluated core curation and equipment, and provided many suggestions for improving the facility. KCC began providing access to logging equipment for all IODP researchers. The new version of the sample request database (SDRM ver. 2) was reviewed online and comments for improvement were sent to USIO staff. A new bio-curator (Ms. Nan Xiao, Ph.D.) was appointed in April 2012 supervise frozen core samples. A core splitting machine was offloaded from *D/V Chikyu*, and set up in KCC.

USIO

The USIO provides services in support of IODP core sampling and curation of the core collection archived at the Gulf Coast Repository (GCR). During FY12, the new Sample/Data Request System was tested in the Regional Test and Integration Facility environment and slated for deployment on the production server in early October 2012. The GCR hosted the Expedition 340 sampling party, and USIO personnel traveled to the Bremen Core Repository to assist with the Expedition 339 sampling party. In addition, the GCR core collection was used for Program outreach through tours of the repository, materials provided for display at meetings and museums, and classrooms and educational programs hosted at the GCR. Several core legacy documentation projects continued throughout the year, including scanning of DSDP and ODP paper sample request files and thin section archive samples for accessibility via the database. The USIO also conducted digital imaging of all working half sections that were pulled for sampling during the year, posting high-resolution images on the web to show the extent of working half sampling to date.

More from the numbers		
Repository and sample statistics		
	Visitors hosted	Samples taken
<i>Gulf Coast Repository</i>	726	27,394
JOIDES Resolution	0	26,441
Database statistics		
	Visitor sessions	Query hits
<i>LIMS database</i>	3,543	22,158
<i>Janus web database</i>	13,523	69,113
<i>Log web database</i>	5,243	34,098

DATA MANAGEMENT

IODP-MI data management services in FY12 included activities to provide access to IODP data, to launch an improved drilling proposal submission interfaces and database, to launch a re-designed IODP.org website, and to prepare and plan for the transition to post-2013 IODP. IODP-MI manages the program-wide data systems, including the Proposal Database (PDB), the Site Survey Database (SSDB), the Scientific Earth Drilling Information Service (SEDIS), the Sample Materials Curation System (SMCS), the Central Registry LDAP, the drilled sites database and map resources, and other systems. In FY12, IODP-began implementation of a permanent archive of IODP data resources. IODP-MI will continue permanent archive deployment in FY13.

The Proposal Database (PDB) is one of the core Program-wide data systems and it supports submission and review of drilling proposals. The original version was developed in 2002 as a basic file upload application. In FY12, IODP-MI successfully deployed a new PDBv .2 that utilizes World Wide Web Consortium (W3C) standard X-Forms to provide a web-based interface for completing drilling proposal forms. The PDBv.2 stores key drilling proposal information (e.g., country of proponents, proposed vessel type, proposed drill site locations, etc.) into a database where it can be exported to standardized report formats that are needed for LAs, IOs, and SAS.

The PDBv.2 was utilized for the April and October 2012 proposal submission deadlines. The old PDB was phased out by encouraging proponents to submit new proposals using the new system, while both old and new systems were accessible for re-submission of updated proposals. Based on user feedback from the April 2012 drilling proposal submission period, the PDBv.2 was modified to accept direct upload of pre-formatted main text and figures while maintaining the capture of key drilling proposal information in the backend database.

The IODP.org website is the central gateway to IODP.org activities and online resources. In FY12, the IODP-MI Data Management team lead a project the revitalize the IODP.org website. The IODP.org Content Management System (CMS) that underlies the website was migrated to a new open-source CMS, the website was re-designed, existing content was updated, and new content was developed. Additionally, new functionality was developed for the website, including a mutli-media library and a geospatial Expedition Explorer mapping interface that utilizes Google Earth/Maps and the IODP.org drilled holes database to allow users to map IODP holes and link directly to Expedition data and publications.

IODP-MI Data Management and Outreach personnel collaborated closely to engage an advisory committee consisting of a representative from each of the IOs, many PMOs, SAS, and the general community to advice on design decisions and to provide feedback on information architecture of the new site. The re-launched IODP.org website has met with a favorable reception by SAS panels and the IODP community. Since re-launch of the IODP.org site, traffic to the IODP.org website has increased consistently.

The Site Survey Data Bank (SSDB) is a Program-wide system for submission and review of drill site characterization data. IODP-MI manages the SSDB hosting, operation and maintenance contract with Scripps Institute of Oceanography (SIO). The current contract covers the period of FY11-13.

In FY12, IODP-MI continued management of operation and maintenance of the SSDB. Major activities included user support for proponents and SAS panels, operation and maintenance of the portable SSDB-in-a-box for meeting support, and coordination of Site Safety Data Packages. The SSDB-in-a-box is maintained by IODP-MI and is synced to the production SSDB before each SCP meeting in order to provide a more efficient local copy of the SSDB data under review by the panel. The Site Survey Data Packages are derived from SSDB data and are provided to IOs and EPSP.

The Scientific Earth Drilling Information System (SEDIS) is the Program-wide data and publications portal. In FY12, IODP-MI managed hosting, operation, and maintenance of SEDIS, including harvesting of core measurement, downhole logging, and publications data and metadata from data providers. SEDIS provides directly downloadable data and metadata from all IOs, including post-moratorium JANUS, J-CORES, DIS. SEDIS also harvests metadata for all SSDB data. Internal thesauruses allow integrated searching of data based on measured parameters rather than limiting searches to specific parameter names. These thesauruses also drive functionality implemented in FY12 that allows query and aggregation of data from multiple data sets.

SEDIS is a registered as a component in the Global Earth Observation System of Systems (GEOSS), an international inter-disciplinary data system. Due to the post-FY13 IODP transition plans, SEDIS may be phased out as a Program-wide data portal after FY13, and therefore IODP-MI has made plans to export SEDIS data and metadata to a permanent archive for long-term storage and access.

The SMCS system continues to be hosted by IODP-TAMU, with major re-engineering of the system continuing in FY12. The new Sample Data Request Management system (SDRM) was thoroughly tested during FY12 and was reviewed by SAS. The new SDRM provides increased functionality for IOs, core repositories and sample allocation committees. The re-engineered SDRM accommodates spreadsheet import and export for ease of desktop data entry and sample request review processes.

The Taxonomic Names Lists (TNLs) project is an effort to standardize the vocabulary used in micropaleontological analysis and identification of IODP sample materials. This effort was proposed by the Paleontology Coordination Group and utilized JANUS micropaleontology data as the starting point for names lists for each standardized taxa. The effort included performing quality control and standardization of the existing data, incorporation of new species from micropaleontology references, assignment of a cited publication to each standardized name, assignment of synonyms, and other work to create a reference list for standard identification of microfossils. The five taxa that were worked on under this effort are nannofossils, diatoms, radiolarians, foraminifera, and dinoflagellates.

In FY12, the completed TNLs were provided to all IOs for incorporation into core description data entry systems. This will ensure that all IOs utilize standard vocabulary as a basis for identification of microfossils in shipboard data systems. The TNLs were also incorporated into the SEDIS thesauruses to improve search and query results. Furthermore the TNLs were provided to developers of community microfossil catalogs such as NannoTax, CHRONOS, and Neptune to allow the standardized lists to be incorporated into those microfossil reference catalogs.

The Physical and Digital Reference for Sediment Analysis project was proposed by SAS at multiple meetings and IODP-MI contracted experts for implementation of the project. The

physical reference materials include sets of 100 smear slides of volcanoclastic and siliciclastic sediments, and sets of material for re-creation of the smear slides as needed. The digital reference includes a guide to making smear slides for use by scientist assigned to sedimentology labs aboard IODP platforms, and a digital atlas of the volcanoclastic and siliciclastic sediments that allows users to rotate and view the smear slides from a number of angles. The digital reference is fully searchable to allow users to quickly locate the sediment types they wish to compare or analyze.

During FY12, a draft version of the Physical and Digital Reference for Sediment Analysis was reviewed by the STP and IOs. The project received very favorable assessment from SAS and other reviewers. Feedback from STP and other reviewers were being incorporated into the drafts before launch in early 2013. Discussions are underway with the PIs on formal publication of the digital references for use as an educational text, as supported by STP. The project is being considered for continuation by COL with a second phase to possibly focus on carbonate and other sediments.

IODP-MI coordinated a meeting of the IODP Data Management Coordination group in FY12. This group includes technical representatives from all IOs and applications developers from the IODP scientific community (e.g., GeoMapApp, DBSeaBed, etc.). The meeting was used to coordinate plans and actions for SEDIS, SMCS and other Program-wide data systems. The meeting also served as a forum for discussion of long-term archiving of IODP data, publication and program documents, and for discussion of post-FY13 transition coordination.

Other data management activities conducted during FY12 included regular updating of the IODP Google Earth database, hosting and maintenance of the IODP Central Registry LDAP system, and internal office IT resource operations and maintenance. An IODP document repository system was launched to serve as the archive for IODP program documents (e.g., APPs, Annual Reports, SAS meeting summaries, etc.). The IODP document repository will be federated with the ODP document repository hosted by COL so that the IODP and ODP documents repositories are cross- searchable.

PUBLICATIONS

IODP-MI has overall responsibility for publishing of IODP Scientific Prospectuses, Preliminary Reports, Proceedings Volumes and Technical Reports, and is responsible for production of the journal *Scientific Drilling* published in cooperation with ICDP. IODP-MI works closely with the USIO-TAMU Publications Services Group, the IOs, and the co-Chief Scientists to produce program publications in a timely and professional manner. IODP-MI handles matters of publications policies in coordination with IOs and IODP Curators.

Publications activities in FY12 included:

- 1) Oversight and coordination of program reports and proceedings,
- 2) Publication of the program journal *Scientific Drilling*,
- 3) Review and updating of publication policies and procedures,
- 4) Management of publication services and applications, and
- 5) Planning and preparation an accessible archive of IODP Publications

Program publications published during FY12 include the following:

IODP Program Publications and Reports

IODP Proceedings Volumes

- Volume 336 of the Proceedings of the Integrated Ocean Drilling Program, Expedition 336, Mid-Atlantic Ridge Microbiology
- Volume 335 of the Proceedings of the Integrated Ocean Drilling Program, Expedition 335, Superfast Spreading Rate Crust 4
- Volume 334 of the Proceedings of the Integrated Ocean Drilling Program, Expedition 334, Costa Rica Seismogenesis Project (CRISP)
- Volume 319 of the Proceedings of the Integrated Ocean Drilling Program, Expedition 333, NanTroSEIZE Stage 2: Subduction Inputs 2 and Heat Flow
- Volume 332 of the Proceedings of the Integrated Ocean Drilling Program, Expedition 332, NanTroSEIZE Stage 2: Riserless Observatory
- Volume 331 of the Proceedings of the Integrated Ocean Drilling Program, Expedition 331, DEEP HOT BIOSPHERE
- Volume 330 of the Proceedings of the Integrated Ocean Drilling Program, Expedition 330, Louisville Seamount Trail
- Volume 329 of the Proceedings of the Integrated Ocean Drilling Program, Expedition 329, South Pacific Gyre Seafloor Life

Expedition Preliminary Reports

- Expedition 337 Preliminary Report, Deep Coalbed Biosphere off Shimokita
- Expedition 336 Preliminary Report, Mid-Atlantic Ridge Microbiology
- Expedition 339 Preliminary Report, Mediterranean Outflow
- Expedition 340 Preliminary Report, Lesser Antilles Volcanism and Landslides
- Expedition 340T Preliminary Report, Atlantis Massif Oceanic Core Complex
- Expedition 342 Preliminary Report, Paleogene Newfoundland Sediment Drifts
- Expedition 343 Preliminary Report, Japan Trench Fast Earthquake Drilling Project (JFAST)

Scientific Prospectuses

- Expedition 342 Scientific Prospectus, Paleogene Newfoundland Sediment Drifts
- Expedition 344 Scientific Prospectus, Costa Rica Seismogenesis Project Program A Stage 2 (CRISP-A2)
- Expedition 347 Scientific Prospectus, Baltic Sea Basin Paleoenvironment
- Expedition 341 Scientific Prospectus Addendum, Southern Alaska Margin
- Expedition 338 Scientific Prospectus, NanTroSEIZE Stage 3: Plate Boundary Deep Riser 2
- Expedition 343 Scientific Prospectus, Japan Trench Fast Earthquake Drilling Project (JFAST)
- Expedition 345 Scientific Prospectus, Hess Plutonic Deep Crust
- Expedition 337 Scientific Prospectus, Deep Coalbed Biosphere off Shimokita

Up-to-date publications information, including links to all FY12 IODP publications can be found at the IODP.org website (<http://www.iodp.org/scientific-publications/>).

In FY12, IODP-MI published two volumes of the journal *Scientific Drilling*, Volumes 13 and 14, in April and September, respectively. Highlights of *Scientific Drilling* in FY12 include

Science Reports from the Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE), the Juan de Fuca Ridge, the Cascadia Subduction Zone, the Okinawa Trough, the PALEOVAN project, and the Superfast Spreading Rate Crust off Costa Rica. In FY12, *Scientific Drilling* also contained reports on drilling or proposed drilling related to the East African Rift Lakes, the South China Sea, the Indian Ocean, Lake Towuti in Indonesia, the Gulf of Mexico, the Umbria-Marche Basin in Italy, Lake Junin in Peru, Lake Issyk Kul in Kyrgyzstan, and New Zealand slow slip earthquakes.

The bi-annual journal *Scientific Drilling* published jointly with the International Continental Scientific Drilling Program (ICDP) had print runs of approximately 4700 copies per volume. It was distributed to subscribers and at international scientific conferences such as AGU, EGU JpGU, AOGS, Goldschmidt, OTC, IGC and other scientific conferences. An electronic version of each issue of the journal and individual articles is available for download from the website of both IODP and ICDP. 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 more cost effective distribution to the IODP community and new readers.

CrossRef Digital Object Identifiers (DOIs) are assigned to all IODP Proceedings and Reports and to all *Scientific Drilling* journals and articles. The database and application used to register DOIs with CrossRef is operated and maintained by IODP-MI. During FY12, the DOI registration application was updated to comply with changes to the CrossRef DOI metadata requirements.

IODP-MI developed CrossRef Cited-by-linking services for IODP published reports and Proceedings in FY11. During FY12, IODP-MI coordinated with USIO-TAMU on submission of the backlog of IODP publications to the Cited-by-linking service. During FY12, IODP-TAMU began an effort to develop capabilities to utilize Cited-by-linking data for annual reporting on utilization of IODP publications.

The Ocean Drilling Citations Database is hosted and maintained by the American Geological Institute (AGI) under contract to IODP-MI. The Ocean Drilling Citation Database is a subservice of the AGI GeoRef catalog. IODP-MI and IODP-TAMU collaborate to ensure that the Ocean Drilling Citation database is updated on a quarterly basis to include all IODP-related publications. The Ocean Drilling Citation Database is the primary source of SEDIS publications metadata, with SEDIS transforming the provided metadata into International Standards Organization (ISO) metadata format.

IODP-MI coordinated meetings with IODP-TAMU Publications Services Group during FY12. The close communication and coordination with IODP-TAMU Publications group has been helpful in dealing with a number of publication extension requests, in responding to delays in some Scientific Prospectuses and Preliminary Reports, in planning for Cited-by-linking implementation and in planning for post-FY13 IODP transition activities.

OUTREACH

IODP-MI Outreach and Communications activities in FY12 included 1) media relations, 2) new IODP website launching, 3) participation at International conferences 4) community coordination, and 5) graphic and publication development with reaching the target audiences;

the science community, Lead Agencies, IOs and PMOs, educators and students, the general public and very importantly, the media.

1) Media Relations

IODP-MI outreach handled media inquiries and coordinated interviews by major international media such as CNN, Reuters, Discovery Channel, *Eos* and national and on line media. Many of them were published and “The \$1 billion mission to reach the Earth’s mantle (CNN)” was one of highlighted outcomes.

IODP-MI outreach issued several press releases and tracked the success of IODP news coverage. The news stories were placed in notable media, both on printed and online outlets such as BBC, Nature, Science magazine, *Eos* and TV and radio broadcasting such as BBC radio with covering each expedition. Significant scientific findings of the program and highlights of FY12 were also released. Issued press releases by IODP-MI outreach in FY12 were as follows:

- Additional information on *Chikyu's* New World Drilling-Depth Record of Scientific Ocean Drilling (September 10, 2012)
- *Chikyu* Sets a New World Drilling-Depth Record of Scientific Ocean Drilling (September 6, 2012)
- New Nature Study Illuminates 55 Million Years of the Carbon Cycle and Climate History (August 30, 2012)
- Return to the Japan Trench: New Subseafloor Observatory Begins Measurement of Frictional Heating by the 2011 Tohoku, Japan Earthquake (July 23, 2012)
- Expedition to Undersea Mountain Yields New Information About Sub-Seafloor Structure (March 21, 2012)
- Japan Trench Fast Drilling Project - Understanding the Devastating Tsunami 2011 (March 29, 2012)
- Scientists Look to Microbes to Help Unlock Earth’s Deep Secrets (January 9, 2012)
- In an Underwater River of Sand and Mud off the Iberian Coast, Six Million Years of Earth History (January 18, 2012)

The IODP-MI outreach sought the opportunities of holding the media conferences working closely with Co-Chief Scientists, EPMs and outreach specialists. The IODP-MI outreach planned, coordinated and implemented a joint press conference with MARUM about Tohoku-Oki Earthquake “Uncovering the traces of the treat Tohoku Earthquake” during EGU that resulted in major international and national media coverage such as Nature, BBC, Bloomberg and German public broadcasting.

2) New Website Launching

The new IODP.org website with some new featured functions, multimedia gallery and expedition explorer, was launched in the middle of June. The goal of this project was IODP.org website to be applied as website for the 2013 Program. The project was about new content management system (CMS) to update the backend of the IODP.org website and enable to reduce administrative cost, increase efficiency of daily updating and creating much more user friendly website. In order to achieve these objectives, the IODP-MI outreach organized and an external committee to gather over 80 entirities’ comments from different

professions from and outside the community to reflect them to the new website before the launch.

The average of the total numbers of visits in a month is 8,000 since the launch. IODP-MI outreach continued updating and maintaining of the iodp website and the contents were enriched with videos, news coverage, expedition information and calendar listings. Many inquiries were handled via website from scientists, educators, students, the industries, the general public and the media to assist in increasing their understanding about the program wide.

3) Exhibitions and Town Hall Meetings

IODP-MI outreach planned, coordinated and implemented exhibition participation at international scientific and technology conferences, and Town Hall Meetings. IODP-MI outreach planned, coordinated with IOs for implementing 4 IODP booths and 1 Town Hall Meeting (AGU, OTC, JPGU, Goldschmidt) as well as 2 joint booths and 1 joint Town Hall Meeting with ICDP at EGU and IGC. The larger numbers of participants were welcomed at AGU Town Hall Meeting (over 350 participants, 35% + than FY11) and 225 entities participated at the IODP-ICDP Town Hall Meeting during EGU.

4) Community Coordination

IODP-MI outreach produced and submitted advertisements to *Eos* for publication on Call for Proposals, Call for Applications, Call for Workshops and IODP Town Hall Meeting at AGU Fall Meeting.

IODP-MI outreach supported IOs and PMOs on media inquiries, image requests, expedition-related activities, educational and training programs for teachers and young scientists, and general public activities including a skype lecture between JR on shore during Exp.345 and Japanese high school.

IODP-MI outreach supported some of the program partners activities, IODP workshops, scientific sessions and symposiums including ICAMG of IODP session, SouthWest Pacific Ocean IODP WS and KCC's participation on RMS by providing informational materials including posters, NSP and incentive goods.

5) Design and Publications

IODP-MI outreach coordinated and produced informational materials for the science community, the media and the public with communications and outreach specialists at IOs and PMOs.

IODP-16 page brochures and the drill site map were updated and printed a few times in FY12. The timing of updates and distribution to the science community, Lead Agencies, IOs, PMOs, media and the public was sought such as at the international conferences. Large numbers of copies such as 600 copies of the brochures were distributed at AGU to provide program updates and increase program awareness. Other major information materials, including the 3 vessels poster, were displayed at AGU, EGU and IGC. They were also displayed at national interactive Science Museum, Questacon, Australia in coordination with ANZIC and ECORD.

IODP-MI ANNUAL REPORT DISTRIBUTION LIST

D. Conover, NSF
J. Allan, NSF
T. Janecek, NSF

J. Beard, NSF
M. Rouse, NSF
R. Batiza, NSF

Appendix 1

Financial report

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INTEGRATED OCEAN DRILLING PROGRAM MANAGEMENT INTERNATIONAL



Appendix 1

1 October 2011 – 30 September 2012

Annual Report

Contract No. NSF OCE 0432224

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IODP-MI Statement for the Quarter Ended September 30, 2012

NSF CONTRACT SUMMARY

Major Cost Category	Operating Budget FY 2012	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ 5,448,940.00	\$ 1,283,229.00	\$ 4,577,799.00	\$ 220,756.00	\$ -	\$ 650,385.00
Technical, Engineering & Science Support	\$ 8,494,478.00	\$ 4,979,425.00	\$ 8,496,888.00	\$ (45.00)	\$ -	\$ (2,365.00)
Engineering Development	\$ 478,703.00	\$ 79,769.00	\$ 371,001.00	\$ 142,246.00	\$ -	\$ (34,544.00)
Core Curation	\$ 1,360,343.00	\$ 313,643.00	\$ 1,090,670.00	\$ 244,168.00	\$ -	\$ 25,505.00
Data Management	\$ 2,687,435.00	\$ 790,650.68	\$ 2,512,014.68	\$ 252,607.00	\$ -	\$ (77,186.68)
Publications	\$ 1,684,496.00	\$ 349,578.00	\$ 1,403,451.00	\$ 20,830.00	\$ -	\$ 260,215.00
Logging	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Outreach	\$ 1,236,076.00	\$ 180,546.00	\$ 749,511.00	\$ 124,233.00	\$ -	\$ 362,332.00
NSF Contract Total	\$ 21,390,471.00	\$ 7,976,840.68	\$ 19,201,334.68	\$ 1,004,795.00	\$ -	\$ 1,184,341.32

Note: The FY12 NSF Contract Operating Budget includes FY12 APP (\$19,959,280) plus FY11 obligated carryforward (\$1,431,189).

IODP-MI Statement for the Quarter Ended September 30, 2012

IODP-MI DC	Operating Budget FY 2012	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ 2,177,480	\$ 486,164	\$ 1,728,737	\$ 177,290	\$ -	\$ 271,453
Technical, Engineering & Science Support	\$ -			\$ -	\$ -	\$ -
Engineering Development	\$ 343,049	\$ 74,570	\$ 300,512	\$ 77,081	\$ -	\$ (34,544)
Core Curation	\$ -			\$ -	\$ -	\$ -
Data Management	\$ 266,841	\$ 87,666	\$ 264,348	\$ 100,172	\$ -	\$ (97,679)
Publications	\$ 105,500	\$ 597	\$ 4,476	\$ -	\$ -	\$ 101,024
Logging	\$ -			\$ -	\$ -	\$ -
Outreach	\$ 187,029	\$ 57,265	\$ 157,219	\$ 61,447	\$ -	\$ (31,637)
Total	\$ 3,079,899	\$ 706,262	\$ 2,455,292	\$ 415,990	\$ -	\$ 208,617

IODP-MI Statement for the Quarter Ended September 30, 2012

IODP-MI Japan	Operating Budget FY 2012	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ 1,482,385.00	\$ 327,753.00	\$ 1,153,597.00	\$ -	\$ -	\$ 328,788.00
Technical, Engineering & Science Support	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Engineering Development	\$ -	\$ -	\$ -		\$ -	\$ -
Core Curation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Data Management	\$ 213,422.00	\$ 63,441.00	\$ 221,722.00	\$ -	\$ -	\$ (8,300.00)
Publications	\$ 142,916.00	\$ 60,853.00	\$ 180,879.00	\$ -	\$ -	\$ (37,963.00)
Logging	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Outreach	\$ 598,287.00	\$ 58,942.00	\$ 293,823.00	\$ -	\$ -	\$ 304,464.00
Total	\$ 2,437,010.00	\$ 510,989.00	\$ 1,850,021.00	\$ -	\$ -	\$ 586,989.00

COL	Operating Budget FY 2012	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ 1,123,745.00	\$ 299,154.00	\$ 1,042,023.00	\$ 33,954.00	\$ -	\$ 47,768.00
Technical, Engineering & Science Support	\$ 285,576.00	\$ 87,484.00	\$ 275,201.00	\$ (684.00)	\$ -	\$ 11,059.00
Engineering Development	\$ 135,654.00	\$ 5,199.00	\$ 70,489.00	\$ 65,165.00	\$ -	\$ -
Core Curation	\$ 413,894.00	\$ 97,695.00	\$ 357,567.00	\$ 36,937.00	\$ -	\$ 19,390.00
Data Management	\$ 1,144,039.00	\$ 357,999.00	\$ 980,183.00	\$ 119,328.00	\$ -	\$ 44,528.00
Publications	\$ 1,436,080.00	\$ 288,128.00	\$ 1,218,096.00	\$ 20,830.00	\$ -	\$ 197,154.00
Logging	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Outreach	\$ 74,032.00	\$ 19,342.00	\$ 46,400.00	\$ -	\$ -	\$ 27,632.00
Total	\$ 4,613,020.00	\$ 1,155,001.00	\$ 3,989,959.00	\$ 275,530.00	\$ -	\$ 347,531.00

IODP-MI Statement for the Quarter Ended September 30, 2012

CDEX	Operating Budget FY 2012	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ 665,330.00	\$ 170,158.00	\$ 653,442.00	\$ 9,512.00	\$ -	\$ 2,376.00
Technical, Engineering & Science Support	\$ 8,208,902.00	\$ 4,891,941.00	\$ 8,221,687.00	\$ 639.00	\$ -	\$ (13,424.00)
Engineering Development	\$ -	\$ -	\$ -			
Core Curation	\$ 598,190.00	\$ 118,440.00	\$ 425,996.00	\$ 207,231.00	\$ -	\$ (35,037.00)
Data Management	\$ 770,088.00	\$ 223,404.00	\$ 752,769.00	\$ 33,107.00	\$ -	\$ (15,788.00)
Publications	\$ -	\$ -	\$ -			\$ -
Logging	\$ -	\$ -	\$ -			\$ -
Outreach	\$ 376,728.00	\$ 44,997.00	\$ 252,069.00	\$ 62,786.00	\$ -	\$ 61,873.00
Total	\$ 10,619,238.00	\$ 5,448,940.00	\$ 10,305,963.00	\$ 313,275.00	\$ -	\$ -

IODP-MI Statement for the Quarter Ended September 30, 2012

Bremen	Operating Budget FY 2012	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Technical, Engineering & Science Support	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Engineering Development						
Core Curation	\$ 348,259.00	\$ 97,508.00	\$ 307,107.00	\$ -	\$ -	\$ 41,152.00
Data Management				\$ -	\$ -	\$ -
Publications	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Logging	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Outreach	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 348,259.00	\$ 97,508.00	\$ 307,107.00	\$ -	\$ -	\$ 41,152.00

IODP-MI Statement for the Quarter Ended September 30, 2012

UCSD/Scripps	Operating Budget FY 2012	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Technical, Engineering & Science Support	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Engineering Development						
Core Curation	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Data Management	\$ 293,045.00	\$ 58,140.68	\$ 292,992.68		\$ -	\$ 52.32
Publications	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Logging	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Outreach	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total	\$ 293,045.00	\$ 58,140.68	\$ 292,992.68	\$ -	\$ -	\$ 52.32

IODP SOC Activity for the Quarter Ended September 30, 2012

IODP SOC SUMMARY

Major Cost Category	Operating Budget FY 2011	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ 6,288,010.00	\$ 1,393,984.00	\$ 5,033,203.00	\$ 501,356.00	\$ -	\$ 753,451.00
Technical, Engineering & Science Support	\$ 10,057,034.00	\$ 5,073,381.00	\$ 8,959,473.00	\$ 643,505.00	\$ -	\$ 454,056.00
Engineering Development	\$ 478,703.00	\$ 79,769.00	\$ 371,001.00	\$ 142,246.00	\$ -	\$ (34,544.00)
Core Curation	\$ 1,443,772.00	\$ 355,343.00	\$ 1,132,370.00	\$ 285,897.00	\$ -	\$ 25,505.00
Data Management	\$ 3,024,319.00	\$ 827,724.68	\$ 2,638,794.68	\$ 422,957.00	\$ -	\$ (37,432.68)
Publications	\$ 1,684,496.00	\$ 349,578.00	\$ 1,403,451.00	\$ 20,830.00	\$ -	\$ 260,215.00
Logging	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Outreach	\$ 1,376,776.00	\$ 198,210.00	\$ 825,518.00	\$ 149,083.00	\$ -	\$ 402,175.00
IODP SOC Total	\$ 24,353,110.00	\$ 8,277,989.68	\$ 20,363,810.68	\$ 2,165,874.00	\$ -	\$ 1,823,425.32

Note: The IODP SOC Summary includes IODP-MI's NSF Contract plus the ESO SOC activity. ESO's SOC activity is reported for information purposes only.

IODP SOC Activity for the Quarter Ended September 30, 2012

ESO	Operating Budget FY 2012	Expenditure		Committed	Projected	Variance
		QTD	YTD			
Management & Administration	\$ 839,070	\$ 110,755	\$ 455,404	\$ 280,600	\$ -	\$ 103,066
Technical, Engineering & Science Support	\$ 1,562,556	\$ 93,956	\$ 462,585	\$ 643,550	\$ -	\$ 456,421
Engineering Development	\$ -	\$ -	\$ -		\$ -	
Core Curation	\$ 83,429	\$ 41,700	\$ 41,700	\$ 41,729	\$ -	\$ -
Data Management	\$ 336,884	\$ 37,074	\$ 126,780	\$ 170,350	\$ -	\$ 39,754
Publications	\$ -	\$ -	\$ -		\$ -	\$ -
Logging	\$ -	\$ -	\$ -		\$ -	\$ -
Outreach	\$ 140,700	\$ 17,664	\$ 76,007	\$ 24,850	\$ -	\$ 39,843
Total	\$ 2,962,639	\$ 301,149	\$ 1,162,476	\$ 1,161,079	\$ -	\$ 639,084

Note: ESO's SOC activity is reported for information purposes only. ESO's APP Budget is funded directly through EMA.