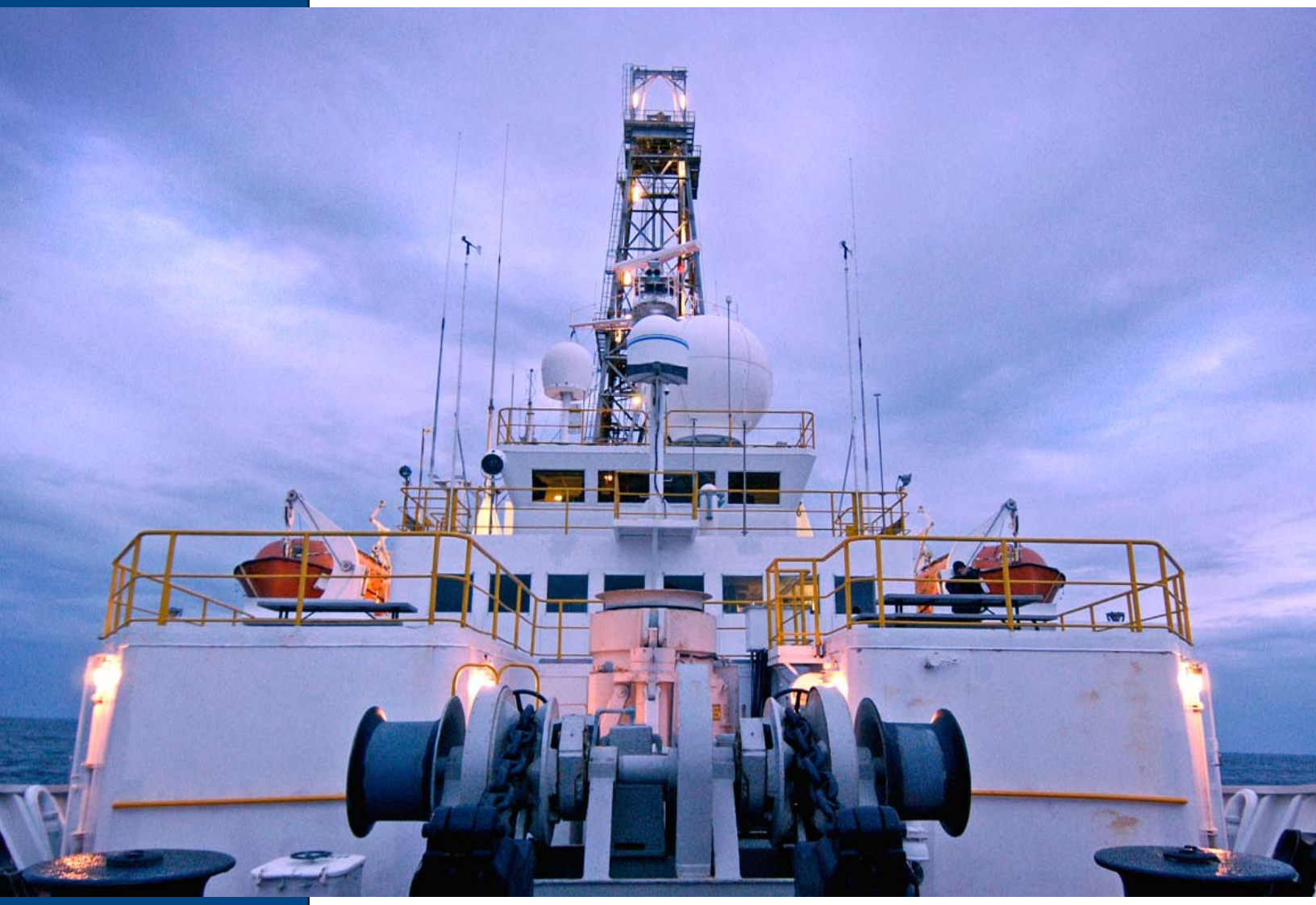
Fiscal Year 2008 Annual Report



Integrated Ocean Drilling Program
U.S. Implementing Organization

Integrated Ocean Drilling Program
United States Implementing Organization

Consortium for Ocean Leadership, Inc.
Lamont-Doherty Earth Observatory
of Columbia University
Texas A&M University

National Science Foundation
Contract OCE-0352500

1 October 2007–30 September 2008

Integrated Ocean Drilling Program (IODP) is an international marine research program that conducts seagoing expeditions to explore Earth's history and structure as recorded in seafloor sediments and rocks and to monitor subseafloor environments. IODP builds upon the earlier successes of the Deep Sea Drilling Project (DSDP) and the Ocean Drilling Program (ODP), programs that revolutionized our view of Earth's history and global processes through ocean basin exploration. IODP's principal research themes are outlined in the Initial Science Plan: "Earth, Oceans and Life: Scientific Investigations of the Earth System Using Multiple Drilling Platforms and New Technologies."

IODP greatly expands on the previous programs by simultaneously using multiple drilling platforms—a riserless drilling vessel, a riser drilling vessel, and mission-specific platforms—to achieve its scientific goals. The riserless drilling vessel allows IODP to drill more deeply than is possible with the other platforms while continuing to expand global sampling coverage and disciplinary breadth that were characteristic of DSDP and ODP. The riser drilling vessel allows IODP to drill for months to a year or more at a single location. Mission-specific platforms allow drilling in environments unsuitable for either the riserless or riser vessel, such as near the shoreline in shallow-water areas and in climatically sensitive or ice-covered regions.

Three implementing organizations (IOs) serve as science operators for the various platforms: the USIO is responsible for operating the riserless drilling vessel *JOIDES Resolution,* Japan's Center for Deep Earth Exploration (CDEX) for the riser drilling vessel *Chikyu,* and the European Consortium for Ocean Research Drilling (ECORD) Science Operator (ESO) for the mission-specific platforms. Each IO sails one Staff Scientist, who participates as a member of the expedition Science Party, providing consistency from one expedition to the next.

IODP Management International, Inc. (IODP-MI), a nonprofit U.S. corporation with an international membership of academic institutions, serves as the central management organization for IODP and is responsible for Program-wide science planning and oversight, as well as provision of continuous performance evaluation and assessment of all elements of IODP. Science planning is provided by the Science Advisory Structure (SAS), which involves many scientists and engineers on many standing committees and panels. Each of the IOs provides liaisons with appropriate expertise to interact with SAS panels and other IODP-MI working groups and task forces.

The USIO comprises the Consortium for Ocean Leadership, Inc. (Ocean Leadership) and its partners, Lamont-Doherty Earth Observatory (LDEO) of Columbia University and Texas A&M University (TAMU). Ocean Leadership is the prime contractor with National Science Foundation (NSF) with ultimate responsibility for all contractual obligations entered into by the USIO. LDEO and TAMU serve as subcontractors that contribute distinct but complementary capabilities that collectively support the full range of activities necessary for implementation of riserless drilling vessel scientific drilling programs. Administrative services in support of TAMU activities are provided by the Texas A&M Research Foundation (TAMRF). In this document, references to TAMU include TAMRF.

Contents

Ocean science, leading the way.

Executive Summary

The overarching goal for the Integrated Ocean Drilling Program (IODP) U.S. Implementing Organization (USIO) in Fiscal Year 2008 was to prepare for IODP Phase 2 operations, which will commence in 2009. Efforts toward this goal were made in every area of the organization, with major achievements in the U.S. Scientific Ocean Drilling Vessel (SODV) conversion and development of technological enhancements for future expeditions. The USIO also continued its work to preserve the Program's legacy and share the knowledge and understanding that has come from decades of ocean drilling with the scientific community and the public.

The U.S. SODV Project continued refurbishment and enhancement of the research vessel *JOIDES Resolution,* the riserless drilling platform for IODP. The refitted *JOIDES Resolution* will provide all new science facilities, new and improved scientific capabilities, improved core handling capabilities, expanded information and technology network and infrastructure, enhanced logging capabilities, and larger and better organized spaces in which scientists will live and work. This vessel conversion project was the driving force behind the USIO's efforts in FY08; as planning, budgets, and schedules changed with the progress of the SODV conversion, the USIO, in consultation with the IODP central management office (IODP Management International, Inc. [IODP-MI]) and science advisory structure (SAS), made the required adjustments to the USIO Phase 2 FY08–FY09 operations schedule ensure a positive outcome.

New analytical and data systems will offer advances for all fundamental science capabilities and provide an versatile integrated database structure for all of the data gathered during an expedition. A completely new suite of core logging systems will improve sample throughput on the ship and provide dramatically improved analytical sensitivity and resolution. For example, the natural gamma radiation logger, with multiple custom sensors and both passive and active shielding, offers unprecedented capability to measure natural radioactivity in cores. New instrument systems add greater analysis throughput, flexibility, reliability, and reproducibility than previous ship analytical systems provided. A sampling of the new analytical systems was tested by a team of scientists from the scientific ocean drilling community, who concluded that the systems represent a "quantum leap in shipboard science capabilities" and offer a "truly transformative science environment." Logging capabilities will be enhanced by the improved wireline heave compensator, which will save operational time and offer more flexibility, and the option of deploying a wider array of logging tools through larger diameter drill pipe.

The Program's core legacy was secured and resources conserved by completing the DSDP/ODP Core Redistribution Project, a multiyear, integrated cooperative effort that relocated and consolidated core from four ODP repositories to three IODP core repositories according to sample origin. Scientists can now concentrate their research efforts at specific Program repositories and shore-based laboratories. ODP legacy reports were finished when the USIO completed the *ODP Final Technical Report,* the *Cumulative Index to the Proceedings of the Ocean Drilling Program,* and the *ODP Borehole Completions Manual.*

The USIO continued to broaden its efforts to educate students and teachers about scientific ocean drilling, through activities including Program presence at conferences and an ever growing selection of online educational resources. The USIO implemented a more regional educational outreach model this year, with School of Rock alumni conducting 50 outreach events across the United States. In addition, the USIO held the third session of the School of Rock, hosting 16 teachers at the Gulf Coast Repository and involving many Program scientists in the educational process.

Clearing lines for movement of the JOIDES Resolution *within the shipyard.*

This IODP-USIO Fiscal Year 2008 Annual Report covers these accomplishments and other activities undertaken in support of the National Science Foundation (NSF) Contract OCE-0352500 during the period from 1 October 2007 to 30 September 2008.

Deliverables outlined for FY08 are detailed in the FY08 IODP-USIO Annual Program Plan and its Appendix. Operational achievements in support of these deliverables are presented in the following chapters. Contractual information and financial tables describing the execution of the FY08 IODP-USIO Annual Program Plan are provided in the final chapter. Additional information on FY08 activities is available in the USIO quarterly reports.

More Online:
IODP-USIO Web page: **www.iodp-usio.org/**
FY08 Annual Program Plan: **iodp.tamu.edu/publications/PP.html**
FY08 Quarterly Reports: **iodp.tamu.edu/publications/AR.html**

On board the JOIDES Resolution.

Installing the refurbished passive heave compensator.

SODV Conversion and Capabilities

NSF invests in state-of-the-art tools for research and education to enable discovery at the frontiers of science and engineering and enhance productivity, effectiveness, and continual renewal of the science and engineering workforce. NSF supports the U.S. SODV Project, a refurbishment and enhancement of the research vessel *JOIDES Resolution,* through Major Research Equipment and Facilities Construction (MREFC) funds. Overseas Drilling Limited (ODL), as vessel owner, contracted with Jurong Shipyard PTE Ltd. for overhaul of the *JOIDES Resolution*. The resulting shipboard science facility will provide vastly improved scientific capabilities. When completed, the refurbished *JOIDES Resolution* will serve as the riserless drilling research platform for the science community and the United States' contribution to support IODP's scientific mission.

SODV Oversight and Implementation

Continued progress of the SODV Project during FY08 has required integrated efforts across organizations and involvement of the science community through oversight and implementation teams.

The SODV oversight organizational structure is composed of NSF, the USIO (Ocean Leadership, LDEO, and TAMU), and an external independent review panel, the Independent Oversight Committee (IOC), which is responsible for monitoring progress on the SODV conversion. These groups are charged with ensuring the quality of the completed vessel.

The SODV implementation organizational structure comprises five internal USIO teams and the Program Advisory Committee (PAC). The internal USIO teams include an administrative team, three implementation teams, and the Conversion Management Team (CMT). The CMT is the focal point for all strategic planning, decisions, and high-level tracking of SODV acquisition and conversion activities. The PAC, composed of members of the science and drilling communities, assesses design plans for onboard science and drilling capabilities and provides feedback to the CMT to ensure that the needs of the science community are met.

During FY08, work on the SODV Project neared completion on all the main undertakings: vessel refurbishment, new science facilities, and new and enhanced science capabilities. Improvements to shipboard communications and accommodations were also made.

20% increase in science berths

27% increase in overall square footage for science facilities

34% increase in laboratory spaces, including offices and conference rooms

Vessel Refurbishment

Shipyard work continued throughout FY08, with more than 97% of the work completed by the end of the fiscal year. Completion of vessel refurbishment is expected by December 2008 or January 2009, when the ship is to be delivered for final science equipment installation, testing, and sea trials. The newly refurbished and enhanced research facility will join the Japanese-built *Chikyu* and European-sponsored mission-specific platforms in mid-2009, when the USIO will begin conducting international operations.

Ship Infrastructure

Hull refurbishment and all dry dock activities were accomplished during the fiscal year: steel was replaced where necessary, the hull was painted above and below the waterline, all thrusters were refurbished, shafting and propellers were inspected and reconditioned, shaft bearings were replaced, and the propeller shaft was aligned. Except for the basic ship's hull, the existing structure forward of the drill rig was demolished. New steel decks, bulkheads, and a deckhouse were constructed on shore, lifted on board, and fitted to the vessel. This new larger

The JOIDES Resolution *docked in Singapore.*

structure provides increased space for laboratories, offices, accommodations, and recreational spaces.

Refined and Expanded Accommodations

Outfitting of the new accommodations neared completion, providing additional berths designated for USIO staff and the Science Party; there are now 60 science berths. New double-occupancy staterooms include shared toilets and showers, and improved noise reduction was incorporated throughout the accommodations. By the end of FY08, finishing touches began on the new galley and mess room facility and outfitting began on the new air-conditioned gym, movie facilities, and lounge.

Drilling Service Life Extension

Drilling equipment and infrastructure, including the derrick, were removed from the ship and refurbished; reinstallation was nearly completed by the end of the

fiscal year. The passive heave compensator was refurbished and modified, pipe rackers were refurbished and modified to carry $6\frac{5}{8}$ inch pipe, and service life extension of other ship equipment and systems was also nearly completed.

Information Technology Network and Infrastructure
A new information technology (IT) system was procured, tested, and prepared for installation. System components provide expanded data servers and storage systems with enhanced large file management, wireless network access throughout laboratories and living areas, a digital media management system, workstations, videoconference capability, and a video distribution system. The system was shipped to Singapore, where it awaits installation.

Communications
Installation of components for the dual very small aperture terminal (VSAT) units began. These units will provide enhanced ship-to-shore communications for phone and e-mail service, video streaming, data file transfer, and shipboard system management from shore.

Left: Welding construction on the catwalk.

Right: Assembling the microbiology bench.

Ship Systems Testing
Dockside testing of vessel equipment and systems began, including operation of the ship's generators; auxiliary equipment such as pumps and compressors; and heating, ventilation, and air conditioning (HVAC) air-handling units. All ship systems will undergo at-sea testing prior to leaving the shipyard.

New Science Facilities

The new layout of laboratory and other science spaces provides better core handling and workflow. Improvements include increased bench space and chemical hoods; refrigerated storage for more than 8000 meters of core; and an enclosed, sound-controlled core splitting and sampling room. The design also includes safe, direct access to the Microbiology Isotope Laboratory container and a science conference facility capable of seating the entire science party.

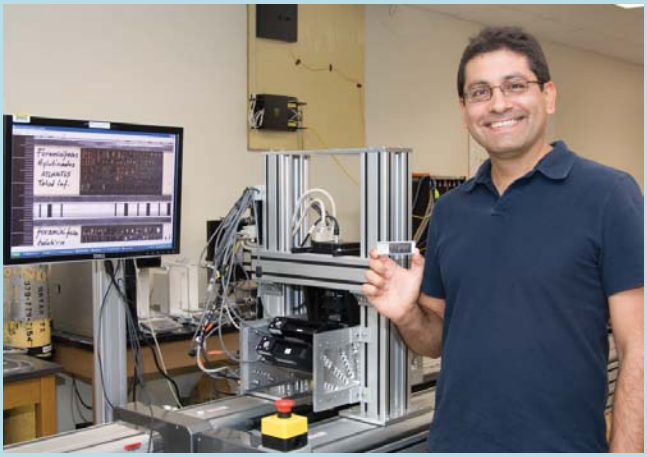
As the shipyard neared completion of the science space outfitting, the USIO began installing furnishings, including laboratory benches and hoods, in the major laboratories and other science spaces; approximately 95% was completed by the end of the year.

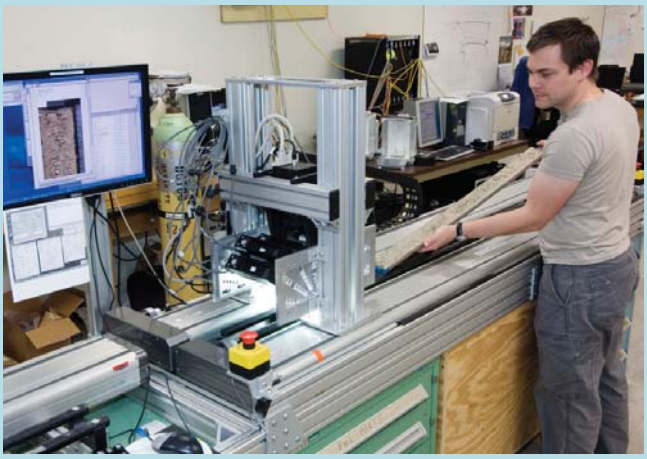
New and Enhanced Science System Capabilities

While vessel refurbishment efforts were ongoing in Singapore, the USIO worked stateside to finalize shipboard analytical systems, IT network and infrastructure, and logging capability systems. All equipment and systems underwent extensive testing on shore prior to being shipped to Singapore and stored in warehouse facilities. Installation and onboard testing will commence as the shipyard completes outfitting of each laboratory.

Shipboard Analytical Systems

As part of the SODV Project, nearly all pre-existing shipboard analytical systems were replaced with new or enhanced systems and new capabilities were added as funds permitted. All shipboard analytical systems work packages were completed in FY08. Instruments and applications not yet shipped to Singapore were assessed by a team of 14 community scientists in June 2008.





Left: Testing image resolution on the new section imaging logger.

Right: Imaging split core on new section half imaging logger.

Laboratory Information Management System: New data management capabilities were built around an information management system that uses the LabWare Laboratory Information Management System (LIMS), an Oracle database system, and a digital asset management system. Web services are used to obtain data for reports and visualization.

Sampling Support: A new sampling application (SampleMaster) facilitates the different roles in the workflow of recording sample information (e.g., crew members recording holes drilled and cores retrieved, technicians processing cores, and scientists collecting samples for shipboard or postexpedition analysis).

Chemistry Systems: Shipboard analytical chemistry will benefit from the upgrade of most instruments with state-of-the-art systems. These instruments include a new inductively coupled plasma–atomic emission spectrometer (ICP-AES) for major and trace element analyses, an ion chromatograph for anion and cation analyses, a discrete analyzer for colorimetry, a source rock analyzer for the analysis of organic matter and kerogen maturity, a new CHNS elemental analyzer, and a high-performance X-ray diffractometer for clay mineral analyses. Chemistry data upload into the LIMS is more efficient, with customized uploaders for each instrument system.

Physical Properties Systems: A new set of core loggers was built for rapid and nondestructive acquisition of images and other physical property data from whole-round and split drill cores. New and innovative designs allow line-scan imaging and natural gamma ray loggers to capture data at unprecedented quality. New instrumentation was also developed for moisture and density analysis, including a new dual-balance system and computer-controlled gas pycnometers. A new thermal conductivity instrument was acquired, and a new core orientation tool system will allow orientation of advanced piston corer (APC) cores.

Descriptive Data Capture and Management: A new and innovative framework and application were developed for capturing descriptive and interpretive information (DESCINFO) from geological subdomains such as sedimentology, petrology, paleontology, structural geology, and stratigraphy. The DESCINFO system includes a database integrated into the LIMS, controlled vocabularies and taxa name lists with version control, and an application (DESClogik) with a highly configurable spreadsheet environment for data capture and visualization of context data collected with the shipboard core loggers and other instruments.

Flexible and Configurable Data Reporting and Visualization: A combination of commercial and USIO-developed user applications were implemented for workflow-specific data extractions, generic and customized data reporting, and data visualization within the versatile shipboard working environment. The Web Tabular Report provides basic access to any existing information in the LIMS. The Web Graphics Report offers quick data plots through a Web page. The LIMS2Excel application allows users to specify any subset of information in the LIMS and export it in an Excel workbook properly formatted for plotting in the commercial Strater application. Another LIMS export function downloads data ready for use by the new stratigraphic correlation application (Correlator).

SODV Science Systems Test Drive: A preliminary review of the analytical and data management systems developed for the SODV was conducted 18–20 June 2008 in College Station, Texas, during the interim between completion of the analytical work packages and the equipment shipping dates. An external assessment team of 14 scientists from across the United States, representing 10 years of collective experience aboard scientific drilling vessels, enthusiastically accepted all of the systems as "ready for operations." The team hailed the new shipboard science facilities and improved science system capabilities as a truly transformative science environment.

"We found the capabilities presented in the science system computing infrastructure and the specific analytical systems we were able to review truly exciting. The systems we tested represent advances in fundamental components of the shipboard science capabilities, including petrophysics track systems, core description capabilities, uploading of chemistry data, and an integrated database structure unifying the shipboard science environment. …The science system and physical improvements result in a quantum leap in shipboard science capabilities, resulting in a truly transformative science environment."

SODV Science Systems Test-Drive Committee

Logging Capability
Logging capabilities were improved with new systems, and the logging office, telemetry laboratory, and downhole measurement laboratory were integrated into the forward deck house with the other laboratories to improve communication and facilitate greater scientific integration/exchange. Installation of the wireline logging data acquisition instrumentation units awaits the shipyard's completion of these spaces and final inspection.

Wireline Heave Compensator: The wireline heave compensator (WHC) underwent shore-based testing using input signals simulating different heave conditions prior to shipment to Singapore; at-sea testing will take place during the transit from Singapore. The WHC was installed near the rig floor to allow permanent wireline rig-up, thus reducing operational time and adding flexibility. Onboard installation included a new motion reference unit (MRU) for acquiring acceleration data that will control the movement of the WHC.

Logging IT System: The logging IT system has been integrated into the overall IT environment on board the *JOIDES Resolution*. The system consists of common workstation platforms that allow data storage on a redundant array of independent disks (RAID) system to minimize the chance of data loss from single-disk failure and stocking one set of spare parts to minimize system maintenance workload.

Logging Office and Laboratories: The logging office and the telemetry, downhole measurements, and underway laboratories were outfitted, including installation of electrical systems. Furniture was installed in the logging office and telemetry laboratory, the data acquisition rack for the telemetry laboratory was secured, and cabinets were installed in the downhole measurements laboratory. The data acquisition rack for the telemetry laboratory was secured, and a 16-conductor control cable was routed from the telemetry laboratory to the underway laboratory for providing inputs for vertical seismic profile (VSP) experiments.

When the *JOIDES Resolution* sails in 2009, it will bring with it unrivaled shipboard science capabilities. With transformed living and working spaces, expanded IT capabilities and communications, and new and enhanced analytical systems and logging capabilities, the ship is virtually new from bow to rig—a floating laboratory equipped for the 21st Century.

More Online:
SODV Web site: **www.oceanleadership.org/sodv/**
A message from JOIDES Resolution *systems "Test-Drive" committee:* **www.oceanleadership.org/sodv/test-drive/**
SODV brochure: **www.oceanleadership.org/files/JR_Brochure_Web.pdf**
SODV progress videos: **www.youtube.com/user/OceanLeadership**

Rig floor.

Racking the last legacy core section to be stored at the Kochi Core Center and celebrating the completion of the DSDP/ODP Core Redistribution Project.

Preparing for IODP Phase 2

The USIO made great progress in preparing for Phase 2 during challenging circumstances in FY08. Despite shipyard delays and funding issues that required careful prioritizing throughout the year, the USIO achieved many significant goals in the areas of operational planning, engineering and tool development and support, data management, and redistribution of DSDP and ODP legacy core collections.

Operational Planning

USIO operational planning during FY08 included planning and staffing for IODP Phase 2 expeditions, acquiring clearances needed for those expeditions, and finalizing the IODP-USIO Programmatic Environmental Impact Statement (PEIS).

Expedition Planning and Staffing

Throughout the year, the USIO accommodated a changing schedule based on SODV progress. With a delivery date of March 2009 for the return to international operations immediately following SODV transit and sea trials, the USIO worked with the OTF to develop a revised FY09 expedition schedule, which was published in October 2008.

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

Clearances

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

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

Engineering and Tool Development and Support

The USIO completed several engineering projects in FY08 and continued others, making significant progress with technology enhancements and providing tool support for others.

Technology Enhancements
The USIO completed a number of technology enhancements in FY08 that will enable onshore tool calibration and improve shipboard data acquisition. Key accomplishments for the fiscal year are highlighted below. Several other major projects were suspended during FY08 because of staffing and funding issues (see details in the quarterly reports).

Simulated Borehole Test Facility.

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

Common Downhole Data Acquisition System: Development of the new Common Downhole Data Acquisition (CDAQ) system was completed, and a successful acceptance test with external participation from the science community was conducted in July 2008. The CDAQ is designed to work with most IODP and relevant third-party downhole tools, including temperature and pressure tool and pressure core or fluid samplers. However, the firmware needs to be configured for each tool and currently it is only available for the new Sediment

Temperature (SET) tool. The CDAQ acceptance team concluded that this system will have broad impact and has the potential to serve as the foundation for a range of downhole tools in the future.

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

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

Left: DSS-RMM pressure test.

Right: Metrology Laboratory.

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

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

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

Measurement-while-Coring Project: The Downhole Sensor Sub (DSS) and Remote Memory Module (RMM) were acquired to measure weight on bit, torque on bit, and pressure near the bit during drilling operations. The objective

Left: Core logger development.

Right: Moisture and density interface.

of this project is to analyze those parameters along with rig instrumentation data and to improve drilling parameters based on the analysis, thereby improving the chance to recover more material and less disturbed core. The DSS and RMM were completed, bench tested, and rig tested this year. Deployment of this equipment was postponed pending potential further use and testing.

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

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

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

Left: Preparing the DVTP tool for deployment on the Chikyu.

Right: Calibrating electronics for downhole instruments.

Program Integration and Support for Others
During FY08, the USIO continued efforts to collaborate with and support CDEX, ESO, and others; activities included implementing the new Advanced Piston Corer Temperature Model 3 (APCT3) tools with CDEX and providing downhole tool support for CDEX, ESO, and a third party.

USIO/CDEX Joint APCT3 Implementation: The USIO and CDEX continued their collaborative effort to implement the new APCT3 tools. In FY08, the USIO tested and calibrated the CDEX-owned loggers, purchased in FY07, in the Metrology Laboratory and shipped three units to CDEX for deployment during Expeditions 315 and 316.

Formation Temperature Measurement Services for CDEX: The USIO provided formation temperature measurement services aboard the *Chikyu* during Expeditions 315 and 316, including deployment of a tool technician on the first

expedition and an engineer on the second. During Expedition 316, the engineer provided coring tool operations services that were requested on short notice.

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

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

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

Left: Phase 2 whole-round multi-sensor core logger.

Right: New Dionex ICS3000 Ion Chromatograph.

(Holes 1026B and 1301A). The USIO modified the design of an Otis running tool for operation by a submersible vehicle, allowing for retrieval of the original instrument strings and installation of new top plugs and short prototype microbiology strings for a one year deployment in the holes.

Data Management

The main data management projects for the USIO in FY08 were continuing the phased release of the Inventory Asset Management System (AMS), producing Janus metadata for the IODP Scientific Earth Drilling Information Service (SEDIS), archiving and distributing information found in the Janus database, testing the LIMS system from a data management perspective, and integrating ESO data into the log database.

Inventory Asset Management System
The phased production release of the AMS began during FY08 as Order, Inventory, Warehouse, and Shipment archives and functions were migrated to the new system. Work continued on the AMS Property module through the last quarter.

Janus Database
Hole core summary metadata extensible markup language (XML) files for ODP Legs 101–210 were prepared, successfully harvested, and sent to IODP-MI for use in the IODP SEDIS portal.

Close-up photos from DSDP Legs 46–96 were scanned, added to the Janus database, and sent to the National Geophysical Data Center (NGDC) along with scanned images from ODP Legs 101–210.

Log Database
ESO and USIO personnel worked together to prepare Expedition 310 log data, associated metadata, and processing notes for inclusion in the new USIO log database. In addition, a similar process began for Expedition 302 data. Unique names were created for all log data files, and data were harvested and made available within the meta-database.

Left: New Humble Instruments Source Rock (SR) Analyzer.

Right: New OI Analytical DA 3500 Discrete Analyzer.

DSDP/ODP Core Redistribution Project
The USIO has been working since early 2005 to redistribute DSDP and ODP legacy cores according to the geographic distribution model for the IODP core collection, which assigns cores to one of three IODP core repositories according to the sample's origin, regardless of which platform acquired the sample. The DSDP/ODP Core Redistribution Project was completed at the end of FY08.

109.64 km core at the Gulf Core Repository

144.90 km core at the Bremen Core Repository

85.10 km core at the Kochi Core Center

285 visitors to the USIO core repositories

30,348 samples processed by USIO core repositories

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

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

FY08 accomplishments have prepared the USIO to move into IODP Phase 2 ready to support IODP expedition operations with an expanded array of tools and testing capabilities, dramatically improved data accessibility, and repositories prepared to archive all future IODP recovered core.

More Online:

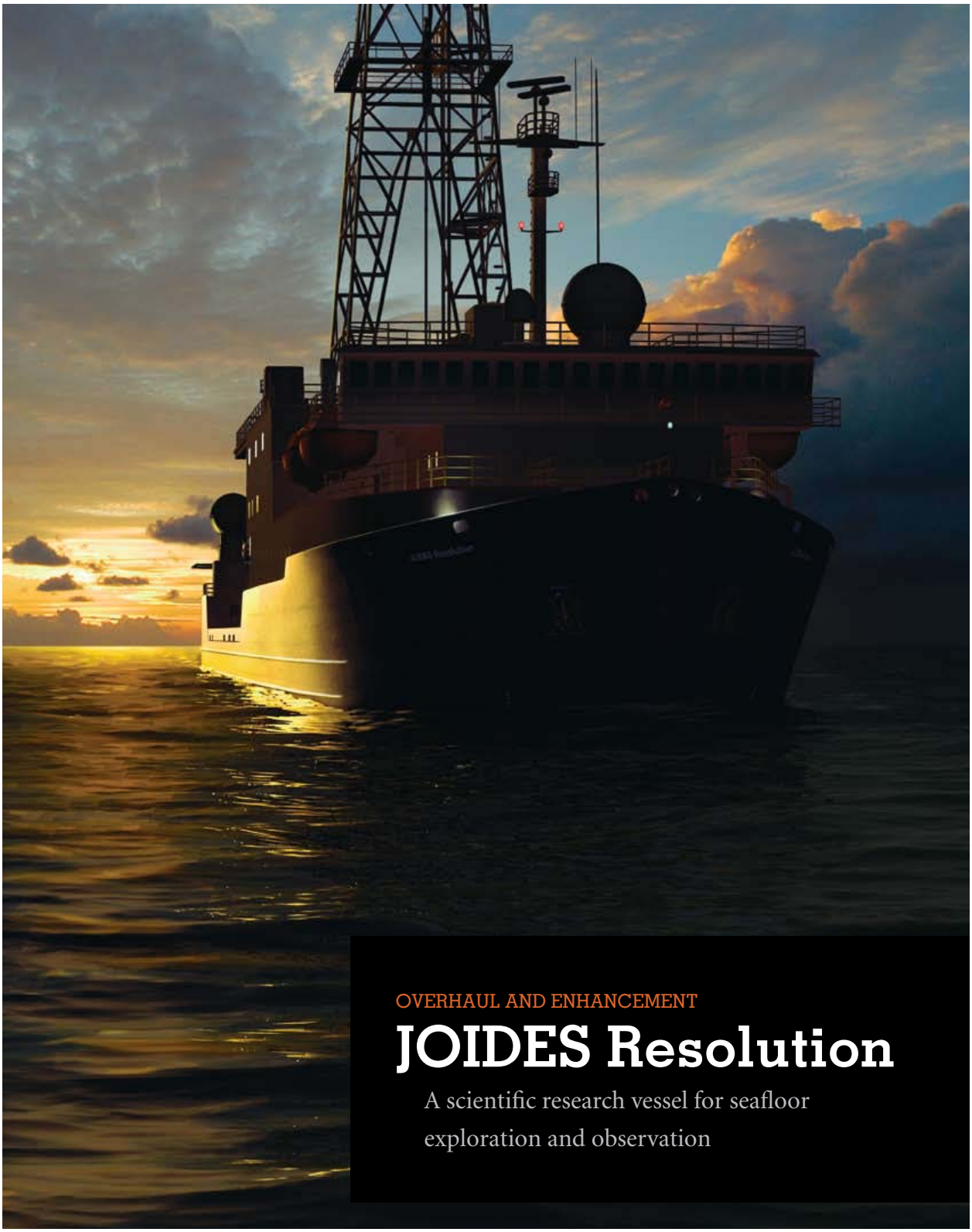
USIO Reports
FY08 Quarterly Reports: **iodp.tamu.edu/publications/AR.html**

Operational Planning
IODP Expedition Schedule: **www.iodp.org/expeditions/**
IODP Scientific Publications: **www.iodp.org/scientific-publications/**
IODP Programmatic Environmental Impact Statement: **www.oceanleadership.org/Downloads/Final_IODP-USIO_PEIS/IODP_USIO_Final_PEIS_All.pdf**
IODP PEIS Record of Decision: **www.nsf.gov/geo/oce/envcomp/IODP_USIO_PEIS_RODv3.pdf**

Data Management
Core Database: **iodp.tamu.edu/database/**
Log Database: **iodp.ldeo.columbia.edu/DATA/index.html**

DSDP/ODP Core Redistribution Project
IODP Core Repositories: **www.iodp.org/repositories/3/**

Removing ship propellers in dry dock.



USIO SODV brochure.

Communicating IODP Science

As IODP expands the legacy of discovery and innovation that began with DSDP and continued with ODP, a primary goal of the USIO is to share the Program's contributions to the global understanding of Earth's ocean basins. Communication efforts are shared between the USIO and Ocean Leadership's Deep Earth Academy, of which the USIO is a partner. Both organizations prepared for IODP Phase 2 activities by updating their products. The USIO created a new logo, featured on items that will be sold on board the *JOIDES Resolution,* and Deep Earth Academy, previously the *JOI Learning* program, created a completely new visual identity.

The USIO and Deep Earth Academy accomplished major achievements toward communicating IODP science during FY08. The USIO produces all USIO reports and all IODP expedition-related publications that are aimed at the scientific community. Deep Earth Academy oversees activities, events, and materials aimed at educating teachers and their students about IODP discoveries. In addition, the USIO raises the Program's visibility in the political and public sectors with various outreach initiatives.

Publications

Major publications efforts for FY08 included providing pre- through postexpedition publications support for NanTroSEIZE Stage 1 expeditions and producing scientific and technical documents for the Program throughout the year, including expedition volumes and reports for CDEX, ESO, and the USIO. Finally, during FY08, all remaining ODP legacy documentation projects were completed, ensuring that information from ODP is readily available for future use.

NanTroSEIZE Stage 1 Publications Support

The USIO provided shipboard and shore-based publications support for CDEX NanTroSEIZE Stage 1 expeditions. In preparation for these three expeditions, USIO personnel assisted with research and development for the use of new software for visual core description presentation and provided CDEX with a standard operating procedures manual for use by publications personnel on board the *Chikyu.* Publications Assistants from the USIO participated in all three NanTroSEIZE Stage 1 expeditions. The USIO published each expedition's *Scientific Prospectus* and *Preliminary Report,* provided postexpedition meeting support after each expedition, and began work on the NanTroSEIZE Stage 1 *Proceedings of the Integrated Ocean Drilling Program* volume, which incorporates expedition reports from Expeditions 314, 315, and 316.

Society for Technical Communication Awards

Informational Materials:
IODP Proceedings Volume 307 site chapter

Annual Report Design:
IODP-USIO FY06 Annual Report

Art Packaging Design:
Expedition 310 DVD

Online Communication:
IODP-USIO SODV Web site

Association of Education Publishers Award

Teaching Resources:
Sea90E Poster

133 data reports and expedition-related journal publications submitted in FY08

82 data reports and expedition-related journal publications accepted in FY08

~250,000 ODP Cumulative Index entries

23,814 2008 Ocean Drilling Citation Database entries

1,383 Ocean Drilling Citation Database entries added in previous year

Expedition Publications and Reports
In addition to NanTroSEIZE Stage 1 publications, the USIO produced and updated Phase 2 *Scientific Prospectuses* for the USIO, coordinated postexpedition research publications, and published data reports for all USIO and ESO Phase 1 expeditions. The USIO also completed the annual Ocean Drilling Citation Database study and other standard report deliverables, including multiple iterations of the Annual Program Plans.

Legacy Projects
The USIO completed the three remaining ODP legacy projects. The *ODP Final Technical Report,* submitted to NSF on 30 November 2007, provided an overview of the management and organization of ODP and highlighted 20 years of technical and scientific accomplishments. The *Cumulative Index to the Proceedings of the Ocean Drilling Program,* published on 30 September 2008, brought together more than 22 years of scientific material, consolidating entries from all published ODP *Proceedings* indexes into four separate indexes: subject, taxonomic, geographic/site, and author. The *ODP Borehole Completions Manual,* completed on 30 September 2008, documents every seafloor installation placed during DSDP and ODP.

School of Rock core sample review.

Education

Deep Earth Academy staff continued to create and refine methods for educating others about Earth's structure and history, as understood through ocean basin exploration. Deep Earth Academy representatives conducted teacher workshops; attended conferences around the United States; developed new educational materials; and distributed thousands of posters, DVDs, and bookmarks. Another School of Rock workshop was sponsored at the IODP Gulf Coast Repository, the booth at the 2008 National Science Teachers Association National Conference was well received, and the Deep Earth Academy Web site became more interactive with the addition of several new features.

250,828 USIO Web site visits

69,977 IODP Publications Web site visits

967,360 ODP/DSDP legacy Web site visits

30,359 posters distributed

2,397 educational DVDs distributed

30,000 bookmarks distributed

School of Rock 2008: Using Ocean Cores to Explore Past Climate Change
The 2008 School of Rock workshop was held 6–14 July 2008 at the IODP Gulf Coast Repository at TAMU. Coming from as far away as Alaska and Maine, 16 teachers spent eight days learning how cores of rock and sediments from the world's ocean floors can teach their students about climate change cycles of the past.

The teachers conducted hands-on laboratory activities and analyses of sediment and hard rock cores and created classroom activities based on the scientific discoveries they explored during the workshop. Workshop participants were mentored and taught by scientists actively engaged in IODP research, and alumni from School of Rock 2005 and 2007 returned to help lead the workshop with USIO staff.

National Science Teachers Association National Conference
At the 2008 NSTA National Conference held 27–30 March 2008 in Boston, Massachusetts, Deep Earth Academy tested a regional model for providing outreach while maintaining the mix of scientists, technicians, and teachers

Left: School of Rock class of 2008.

Right: HBCU fellow.

that was successful in 2007. The model reduces travel expenses, fosters longer term relationships between scientists and educators, and decreases the carbon footprint associated with conference outreach efforts. Use of the model is possible because School of Rock graduates and volunteer scientists and technicians include representatives from nearly every part of the United States. The regional model was successful; this year's booth was staffed mainly by scientists and School of Rock alumni from the New England region.

Deep Earth Academy representatives shared materials at workshops and share-a-thons, and at least 600 contacts were made at the hands-on, museum-style booth where several new products were debuted.

Expanded Deep Earth Academy Web Site Interactivity
Deep Earth Academy continued to add new materials for teachers, students, and scientists to its Web site. The new "Ask a Scientist" page encourages student

interaction with scientists, starting with those on board the *Chikyu* during IODP Expedition 316. Bubba's Tour gives an overview of scientific ocean drilling and engages children with questions and answers, providing a certificate of completion after they have solved a puzzle. In addition, School of Rock 2007 participants created data-rich, inquiry-based classroom activities that were posted on the "Activity of the Month" page.

Diversity Support
The USIO continued to support minority outreach by funding two Historically Black Colleges and Universities (HBCU) Fellows and releasing the HBCU Fellowship application for FY09. The USIO also supported participation of four students and one program representative at IODP's Science Steering and Evaluation Panel (SSEP) meeting held 20–22 May 2008 in Busan, South Korea, as part of the the Minorities Striving and Pursuing Higher Degrees of Success (MS PHD'S) program.

Outreach

USIO outreach activities publicize both our specific achievements and scientific ocean drilling in general. The USIO continued to develop partnerships with several museums and participated in professional meetings throughout the year. Key outreach activities in FY08 included publicizing the progress of the SODV conversion, participating in the first annual Geosciences Congressional Visits Day, and hosting a booth at the Coalition for National Science Funding Exhibition.

Left: Deep Earth Academy education booth and USIO staff.

Right: NSF Director Arden L. Bement, Jr., discussing the upcoming Canterbury expedition with Co-Chief Scientist Dr. Craig Fulthorpe at the Coalition for National Science Funding Exhibition.

SODV Outreach
The USIO produced a brochure that presents information about the importance and relevance of scientific ocean drilling and explains the magnitude of the *JOIDES Resolution* conversion. This brochure was distributed at major outreach opportunities throughout the year, including American Geophysical Union (AGU), Geological Society of America (GSA), and Oceans 2008 science conferences.

The USIO outreach team also produced a slideshow of the progress of conversion work in the shipyard and documented substantive progress on the SODV Project in a photo chronology of initial demolition and ongoing renovation work.

Geoscientists Visit Capitol Hill
The USIO participated in the first annual Geosciences Congressional Visits Day in September 2008 by bringing four U.S. scientists to meet with their congressional delegations to convey the importance of geoscience research to America's competitiveness in the global marketplace given the tremendous challenges arising from a rapidly changing climate. As scientists actively involved in IODP, they were able to deliver those messages through stories about individual accomplishments within scientific ocean drilling.

Coalition for National Science Funding Exhibition
The USIO exhibited at the 14th Annual Coalition for National Science Funding (CNSF) Capitol Hill Reception and Exhibition. The NSF directorate and several Members of Congress and staffers attended the reception and interacted with scientists staffing the USIO exhibit.

Publications, Education, and Outreach activities reach a global audience that includes people from all walks of life. From coloring pages used by grade school students to press releases covered in major media outlets, each year the USIO finds new and improved ways to communicate the science, technology, and understanding of ocean drilling to the world.

More Online:

USIO Reports:
FY08 Quarterly Reports: **iodp.tamu.edu/publications/AR.html**

Publications:
IODP Scientific Publications: **www.iodp.org/scientific-publications/**
FY08 Annual Program Plan: **iodp.tamu.edu/publications/PP.html**
2008 Ocean Drilling Citation Report: **iodp.tamu.edu/publications/citations/AGI_study.pdf**
ODP Final Technical Report: **www-odp.tamu.edu/publications/ODP_Final_Technical_Report.pdf**
Cumulative Index to the Proceedings of the Ocean Drilling Program:
www-odp.tamu.edu/publications/ (click on Cumulative Index)

Education:
Deep Earth Academy: **www.oceanleadership.org/learning**
School of Rock 2008 Web site: **www.oceanleadership.org/schoolofrock2008/**
Ask a Scientist: **www.oceanleadership.org/learning/askascientist**
Bubba's Tour: **www.deepearthacademy.org/Bubba/**
Activity of the Month: **www.oceanleadership.org/learning/activityofthemonth/home/**
HBCU Fellows: **www.oceanleadership.org/diversity/fellows/current_past/**
MS PHD'S: **www.oceanleadership.org/diversity/professionals**

Outreach:
USIO Newsroom Web site: **www.iodp-usio.org/Newsroom/default.html**
SODV brochure: **www.oceanleadership.org/files/JR_Brochure_Web.pdf**
USIO videos: **www.youtube.com/user/OceanLeadership**

Testing lifeboat davits aboard the JOIDES Resolution.

Contractual and Financial Overview

IODP is funded by several entities acting as international partners. NSF and Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) are lead agencies, and ECORD is a contributing member. Associate members include the People's Republic of China Ministry of Science and Technology (MOST); the Interim Asian Consortium, represented by the Korea Institute of Geoscience and Mineral Resources (KIGAM); and the ARC, Australian/New Zealand Consortium.

The USIO provides all deliverables through contracts with IODP-MI for science operating costs (SOC) and with NSF for platform operating costs (POC). The commingled funds that make up the SOC budget come from the international partners as part of their membership fees that are used to fund IODP science. POC funds for each implementing organization are the responsibility of the implementing organization supplying the platform capability.

USIO Contractual Relationships

The USIO was formally established in 2003 when Ocean Leadership, then known as Joint Oceanographic Institutions, established subcontracts with LDEO of Columbia University and the College of Geosciences at TAMU through TAMRF. Each of the three USIO institutions (Ocean Leadership, LDEO, and TAMU) provides fiscal and contractual administration, and the organizational structure employed by the USIO is designed to mirror the work breakdown element accounting structure used by IODP. This structure also aligns the organization to efficiently and economically provide the full array of USIO deliverables.

USIO Prime Contractor

As the U.S. Systems Integration Contractor, Ocean Leadership is ultimately responsible to NSF and IODP-MI for overall program leadership; technical, operational, and financial management; and delivery of services for the *JOIDES Resolution* and related activities. Ocean Leadership leads long-term planning development for the USIO and represents the USIO and the Program as a whole, when appropriate.

USIO Subcontractors

LDEO and TAMU contribute distinct but complementary capabilities that directly support the full range of scientific and technical activities necessary for implementation of a riserless scientific drilling program. LDEO is responsible for logging-related shipboard and shore-based science services and technological

support and for leading an international logging consortium to participate in scientific ocean drilling operations. LDEO contracted with Schlumberger to provide downhole logging equipment and engineering support.

TAMU is responsible for providing services directly related to the scientific and engineering activities necessary to support science cruises (vessel and drilling operations, ship- and shore-based science laboratories), as well as managing expedition-related, shore-based functions (data management, core curation, and publications). TAMRF manages administrative services in support of TAMU activities. On behalf of the USIO, TAMRF contracted with ODL for the services of the *JOIDES Resolution*, which is being converted for use as the riserless drilling vessel for USIO operations in FY09 and beyond.

USIO FY08 Annual Program Plan and Appendix

FY08 USIO contractual requirements for SOC and POC funds are outlined in the IODP-USIO FY08 Annual Program Plan; U.S. Systems Integration Contract costs (SIC), including activities related to the mobilization of the *JOIDES Resolution* for IODP Phase 2 as well as other required tasks, are outlined in the Appendix to the FY08 Annual Program Plan.

Repainting the JOIDES Resolution *hull in dry dock.*

The Annual Program Plan and Appendix set forth the goals of the USIO, the scope of USIO work for IODP deliverables, definitions of projects, and details of required budgets that incorporate funding allocations from NSF or IODP-MI for science operations and from NSF for platform operations and U.S.-sponsored tasks (educational outreach projects, minority outreach projects, initiation of mobilization activities, completion of reports and legacy documentation, and planning for maintenance of future U.S. scientific ocean drilling capability for IODP).

The complex nature of IODP operations requires Annual Program Plans spanning operational years to establish priorities and allow procurement of long–

lead time equipment and services. The FY08 Annual Program Plan was based on (1) the current mission forecast provided for the USIO by NSF and IODP-MI, and (2) the draft USIO operations schedule awaiting final approval by the OTF and the Science Planning Committee (SPC). In addition, the final FY08 Annual Program Plan was tied to the schedule for completion of the SODV conversion project, which was still subject to change over the coming months.

The USIO FY08 Annual Program Plan was based on a preliminary operational schedule defined by the SPC for U.S. riserless drilling vessel operations during FY08 and beyond, which included costs associated with the necessary planning and purchase of long–lead time items and additional items to support expeditions scheduled for FY09. Project delays in the Singapore shipyard where SODV conversion was taking place resulted in multiple revisions to the FY09 operations schedule and, consequently, multiple iterations of the FY08 Annual Program Plan. The final version was accepted in May 2008, eight months into the fiscal year. The timing of final acceptance of the Annual Program Plan resulted in a budget that included cost obligations associated with preparation for expeditions that were on the operations schedule at the time the initial FY08 Annual Program Plan was approved.

Left: Installing dynamic positioning thruster.

Right: JOIDES Resolution *in dry dock.*

USIO FY08 Budget

The USIO used a 21 December 2004 directive and subsequent advice from the lead agencies and IODP-MI to guide the FY08 budget development process. Definitions of SOC and POC were contained in Annex 1 of the bilateral cooperative agreement between MEXT and NSF concerning cooperation on the Integrated Ocean Drilling Program; POC were interpreted to include costs associated with safely making and completing a hole, along with installation of subseafloor hardware as necessary, as well as management and oversight of POC items. When developmental tools and drilling equipment become operational, funding for these items, in principle, converts from SOC to POC.

Specific items identified as POC included

- Costs of the drilling crew and ship's crew; catering services;
- Fuel, vessel supplies, and other related consumables;
- Berthage and port call costs;
- Waste disposal;
- Crew travel;
- Inspections and insurance;
- Drilling equipment, supplies, and related consumables;
- Backoff/severing services;
- Engineering or geophysical surveys and data acquisition and laboratory analyses required for the safety of platform and drilling operations; and
- Administration and management costs of the platform operators.

Specific items identified as SOC included

- Technical services;
- Computer capability;

Left: Laboratory space construction.

Right: Two-man living quarters.

- Storage and distribution of data;
- Description, archiving, and distribution of data and samples;
- Deployment of a standard suite of logging tools;
- Development of new drilling tools and techniques required by IODP research;
- Production of program publications;
- Costs of consumables (exclusive of those identified under platform operations costs);
- Costs required for administration and management, including the central management office; and
- Education and outreach.

In October 2007, the USIO SOC budget was partitioned into two cost categories: operational costs and other costs. Operational costs (SOC Operations), funded by NSF, included "that which funds SODV SOC operations at sea and all costs in support of these operations such as planning, logistics, engineering science support, etc." All other SOC costs were defined as SOC Nonoperations, funded through the IODP-MI contract. Based on additional NSF guidance received on 25 February 2008, all SOC Operations costs were incorporated into the SIC budget submitted to NSF in the Appendix to the FY08 Annual Program Plan.

Most of the FY08 analytical development projects were executed as part of the U.S. SODV MREFC Project. Labor costs were primarily funded by the SODV Project through June 2008, but costs were increasingly shifted to operational accounts beginning in the third quarter of FY08 as SODV projects were closed out.

The lead agencies also encouraged scientific participants to contribute additional funds to IODP activities through links and funding obtained from other

Left: Ship workers.

Right: Ship workers boarding JOIDES Resolution.

scientific programs and initiatives, including national IODP programs. Third-party tool development represents an outstanding example of such additional contributions. Several NSF-funded USIO education and diversity-enhancing activities that promote activities within the United States were developed in conjunction with U.S. Science Support Program education activities (both programs are coordinated by Ocean Leadership).

USIO FY08 Financial Tables

The following financial tables provide a detailed overview of the FY08 IODP-USIO Annual Program Plan budget, FY07 carryforward of obligated and unobligated funds, budget modifications that took place throughout the fiscal year, expenditures that were made to execute the Annual Program Plan, and end-

of-year totals of obligated and unobligated funds pending approval for transfer to FY09.

These tables individually represent

- USIO FY08 end-of-year financial summary, which encompasses SOC, POC, and SIC budgets for the USIO with detail provided for each USIO institution (Ocean Leadership, LDEO, and TAMU);
- USIO FY08 end-of-year summary for the POC budget;
- USIO FY08 end-of-year summary for the SIC demobilization budget (for additional U.S.-sponsored activities funded by NSF);
- USIO FY08 end-of-year summary for the SIC nondemobilization budget (for additional U.S.-sponsored activities funded by NSF);
- USIO FY08 end-of-year summary for the SOC (NSF and IODP-MI) budget; and
- USIO FY08 end-of-year summary for the SOC Nonoperations (IODP-MI only) budget.

More Online:
FY08 Annual Program Plan: **iodp.tamu.edu/publications/PP.html**
FY08 Quarterly Reports: **iodp.tamu.edu/publications/AR.html**

Please contact **info@oceanleadership.org** for hard copies of the financial pages (pages 35–60).

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United States Implementing Organization
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