# International Ocean Discovery Program

## *JOIDES Resolution* Science Operator

## FY15 Q2 Operations and Management Report

1 January–31 March 2015

Cooperative Agreement OCE-1326927

Submitted by the JRSO

to

The National Science Foundation

and

The *JOIDES Resolution* Facility Board

5 May 2015


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# Introduction

The organization of this quarterly operations and management report reflects activities and deliverables outlined in the International Ocean Discovery Program (IODP) *JOIDES Resolution* Science Operator (JRSO) FY15 Annual Program Plan to the National Science Foundation (NSF), as implemented by Texas A&M University (TAMU), acting as manager and science operator of the research vessel *JOIDES Resolution* as a research facility for IODP. Administrative services in support of JRSO activities are provided by the Texas A&M Research Foundation (TAMRF) through the TAMU System (TAMUS) Office of Sponsored Research Services (OSRS). When appropriate, this quarterly also reports on US Implementing Organization (USIO) contract activities conducted for IODP's predecessor, the Integrated Ocean Drilling Program.

# Management and administration

Management and administration functions of the JRSO include planning, coordinating (with other IODP-related entities), overseeing, reviewing, and reporting on IODP activities.

## Subcontract activities

### Overseas Drilling Limited

The JRSO continued to interact with Overseas Drilling Limited (ODL) to ensure efficient and compliant operations of the *JOIDES Resolution*.

### Schlumberger Technology Corporation, Inc.

The JRSO continued to interact with Schlumberger Technology Corporation to ensure that wireline logging operations aboard the *JOIDES Resolution* continue in an efficient and compliant manner. The JRSO and Schlumberger have worked successfully to streamline travel and shipping activities.

### Kochi Institute for Core Sample Research

The subcontract with the Kochi Institute for Core Sample Research (KOCHI), Japan Agency for Marine-Earth Science (JAMSTEC), to provide for curatorial services for the NSF-owned core stored at the Kochi Core Center (KCC) was finalized this quarter and approved by NSF.

## Progress reporting

### JRSO reports

The JRSO operations and management report for the first quarter of FY15 (October–December 2014) was submitted to NSF on 13 February 2015 (iodp.tamu.edu/publications/AR/FY15).

### USIO reports

This quarter, the JRSO produced the last Annual Report for the legacy Program, which concluded on 30 September 2014. The IODP-USIO FY14 Annual Report was submitted to NSF on 27 January 2015 (iodp.tamu.edu/publications/AR/FY14AR.pdf).

## Liaison activities

The JRSO reports to and liaises with funding agencies and IODP-related agencies (e.g., *JOIDES Resolution* Facility Board [JRFB], JRFB advisory panels, Program Member Offices [PMOs], and other national organizations and facility boards) and participates in facility board, advisory panel, and IODP Forum meetings. Minutes from the facility board meetings are available online (iodp.org/facility-boards).

## Project portfolio management

The JRSO began work on phase III of the Laboratory Information Management System (LIMS) On-line Report Environment (LORE) project and re-opened the Stratigraphic Correlation Enhancements project to expand the scope following feedback obtained during Expedition 353. Three new projects were selected this quarter using the updated project portfolio management process: Superconducting Rock Magnetometer Installation and Software Update; Improve Web Services; and Scanning Electronic Microscope Uploader and Downloader (see "Software development" in "Development, IT, and databases).

## Web services

In addition to internal JRSO web page updates and additions, new content is regularly added to IODP expedition web pages at iodp.tamu.edu/scienceops/expeditions.html.

### Program website statistics

| JRSO website | FY15 Q1 page views* | FY15 Q1 site visits* |
|---|---|---|
| www.iodp-usio.org | 3,846 | 3,098 |
| iodp.tamu.edu | 456,835 | 36,553 |
| **Total** | **460,681** | **39,651** |

*Where possible, visits by JRSO employees and search engine spiders were filtered out.

### Legacy web services

The Ocean Drilling Program (ODP) science operator, ODP legacy, and Deep Sea Drilling Project (DSDP) publications websites are hosted at TAMU. Key data, documents, and publications produced during the DSDP and ODP are preserved in the legacy websites, which highlight the scientific and technical accomplishments of these ground-breaking precursors to the Integrated Ocean Drilling Program and IODP. The legacy websites contain downloadable documents that cover a wide spectrum of Program information, from laboratory and instrument manuals to Program scientific publications, journals, and educational materials.

*Legacy website statistics*

| Legacy website | FY15 Q1 page views* | FY15 Q1 site visits* |
|---|---|---|
| www-odp.tamu.edu | 1,067,193 | 43,677 |
| www.odplegacy.org | 5,358 | 2,245 |
| www.deepseadrilling.org | 581,422 | 17,441 |
| **Total** | **1,653,973** | **1,653,973** |

*Where possible, visits by USIO employees and search engine spiders were filtered out.

# Science operations

The JRSO is responsible for planning, managing, coordinating, and performing activities and providing services, materials, platforms, and ship- and shore-based laboratories for JRSO expeditions; long-range operational planning for out-year JRSO expeditions; and technical advice and assistance for ECORD Science Operator (ESO) and Center for Deep Earth Exploration (CDEX) expeditions.

## JRSO expedition schedule

| Expedition[1] | | Port (Origin) | Dates[2, 3] | Total Days (Port/ Sea) | Days at Sea (Transit[4]/ Ops) | Co-Chief Scientists | Expedition Project Manager |
|---|---|---|---|---|---|---|---|
| Indian Monsoon | 353 | Singapore | 29 Nov 2014–29 January 2015 | 61 (5/56) | 56 (7/49) | S. Clemens<br>W. Kuhnt | L. LeVay |
| Bengal Fan | 354 | Singapore | 29 January–31 March 2015 | 61 (5/56) | 56 (6/50) | C. France-Lanord<br>V. Speiss | A. Klaus |
| Arabian Sea Monsoon (CPP)[5] | 355 | Colombo, Sri Lanka | 31 March–31 May 2015 | 61 (5/56) | 56 (5/51) | D. Pandey<br>P. Clift | D. Kulhanek |
| Tie Up/Non-IODP [31 May–31 July 2015] | | | | | | | M. Malone |
| Indonesian Throughflow | 356 | Fremantle, Australia | 31 July–30 September 2015 | 61 (5/56) | 56 (4/52) | S. Gallagher<br>C. Fulthorpe | K. Bogus |
| Maldives Monsoon and Sea Level | 359 | Darwin, Australia | 30 September–30 November 2015 | 61 (5/56) | 56 (17/39) | C. Betzler<br>G. Eberli | C. Alvarez Zarikian |
| Southwest Indian Ridge Lower Crust and Moho | 360 | Colombo, Sri Lanka | 30 November 2015–30 January 2016 | 61 (5/56) | 56 (14/42) | H. Dick<br>C. MacLeod | P. Blum |
| South African Climates[6] | 361 | Port Louis, Mauritius | 30 January–31 March 2016 | 61 (5/56) | 56 (6/50) | I. Hall<br>S. Hemming | L. LeVay |
| Non-IODP [31 March–31 July 2016] | | | | | | | M. Malone |
| Sumatra Seismogenic Zone | 362 | Colombo, Sri Lanka | 31 July–30 September 2016 | 61 (5/56) | 56 (7/49) | L. McNeill<br>B. Dugan | K. Petronotis |
| Western Pacific Warm Pool | 363 | Singapore | 30 September–30 November 2016 | 61 (5/56) | 56 (8/48) | Y. Rosenthal<br>A. Holbourn | D. Kulhanek |

Notes: TBD = to be determined.
[1] Further expedition information can be obtained at iodp.tamu.edu/scienceops/expeditions.html.
[2] Dates for expeditions may be adjusted pending non-IODP activities.
[3] The start date reflects the initial port call day. The vessel will sail when ready.
[4] Transit total is the estimated transit to and from port call and does not include transit between sites.
[5] Complementary Project Proposal (CPP) is contingent on substantial financial contribution outside of normal IODP funding.
[6] Also includes Proposal 845-APL, Agulhas Current LGM Density.

## JRSO expeditions

### Expedition 352: Izu-Bonin-Mariana: Fore Arc

*Postexpedition activities*

The Expedition 352 postexpedition editing meeting was held 16–20 February 2015 in College Station, TX.

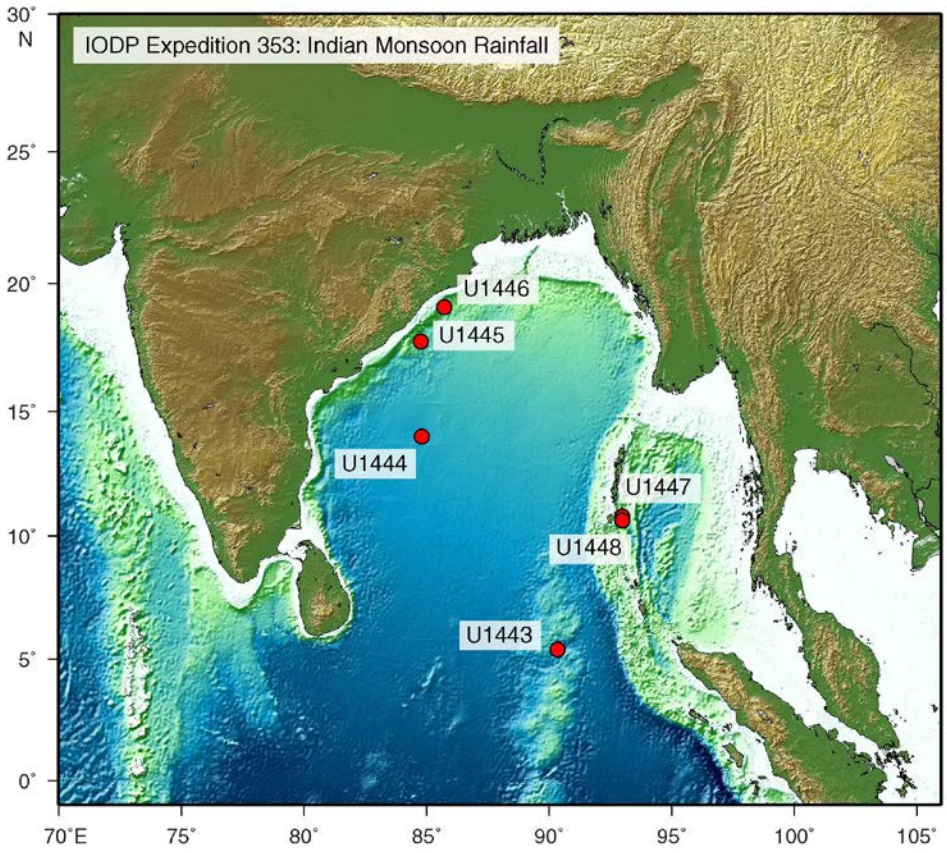
## Expedition 353: Indian Monsoon

*Staffing*

| Expedition 353 Science Party staffing breakdown | | |
|---|---|---|
| **Member country/consortium** | **Participants** | **Co-Chief Scientists** |
| USA: United States Science Support Program (USSSP) | 8 | 1 |
| Japan: Japan Drilling Earth Science Consortium (J-DESC) | 4 | |
| Europe and Canada: European Consortium for Ocean Research Drilling (ECORD) Science Support and Advisory Committee (ESSAC) | 9 | 1 |
| Republic of Korea: Korea Integrated Ocean Drilling Program (K-IODP) | 1 | |
| People's Republic of China: IODP-China | 3 | |
| Australia and New Zealand: Australia/New Zealand IODP Consortium (ANZIC) | 1 | |
| India: Ministry of Earth Science (MoES) | 3* | |
| Brazil: Coordination for Improvement of Higher Education | 0 | |

*IODP-India withdrew from participation in September 2014. Three Indian scientists boarded on 30 December as part of the clearance agreement.

*Site map*



*Coring summary*

| Site | Hole | Latitude | Longitude | Water depth (mbrf) | Cores (n) | Interval cored (m) | Core recovered (m) | Recovery (%) |
|---|---|---|---|---|---|---|---|---|
| U1443 | U1443A | 5°23.0098'N | 90°21.7100'E | 2,940.2 | 48 | 344.00 | 326.80 | 95.0 |
| | U1443B | 5°23.0190'N | 90°21.7091'E | 2,935.5 | 40 | 326.40 | 308.51 | 94.5 |
| | U1443C | 5°23.0078'N | 90°21.6984'E | 2,935.4 | 28 | 207.90 | 182.87 | 88.0 |
| | U1443D | 5°22.9991'N | 90°21.6992'E | 2,935.3 | 2 | 8.20 | 7.48 | 91.2 |
| **Site U1443 totals** | | | | | **118** | **886.50** | **825.66** | **93.1** |
| U1444 | U1444A | 14°00.0057'N | 84°49.7405'E | 3,143.4 | 37 | 330.60 | 226.05 | 68.4 |
| | U1444B | 13°59.9940'N | 84°49.7412'E | 3,142.5 | 9 | 81.10 | 74.16 | 91.4 |
| **Site U1444 totals** | | | | | **46** | **411.70** | **300.21** | **72.9** |
| U1445 | U1445A | 17°44.7217'N | 84°47.2518'E | 2,513.1 | 77 | 672.60 | 666.40 | 99.1 |
| | U1445B | 17°44.7098'N | 84°47.2498'E | 2,514.5 | 4 | 33.00 | 33.36 | 101.1 |
| | U1445C | 17°44.7095'N | 84°47.2387'E | 2,513.5 | 36 | 305.20 | 305.60 | 100.1 |
| **Site U1445 totals** | | | | | **117** | **1,010.80** | **1,005.36** | **99.5** |
| U1446 | U1446A | 19°5.0090'N | 85°44.0894'E | 1,441.2 | 21 | 180.00 | 186.63 | 103.7 |
| | U1446B | 19°5.0085'N | 85°44.0786'E | 1,440.5 | 3 | 27.10 | 27.20 | 100.4 |
| | U1446C | 19°5.0215'N | 85°44.0780'E | 1,441.1 | 23 | 182.00 | 180.55 | 99.2 |
| **Site U1446 totals** | | | | | **47** | **389.10** | **394.38** | **101.4** |
| U1447 | U1447A | 10°47.4061'N | 92°59.9999'E | 1,402.2 | 88 | 738.00 | 732.96 | 99.3 |
| | U1447B | 10°47.3945'N | 93°00.0028'E | 1,403.1 | 3 | 24.40 | 24.26 | 99.4 |
| | U1447C | 10°47.3952'N | 93°00.0114'E | 1,403.6 | 17 | 158.90 | 158.32 | 99.6 |
| **Site U1447 totals** | | | | | **108** | **921.30** | **915.54** | **99.4** |
| U1448 | U1448A | 10°38.0315'N | 93°00.0036'E | 1,109.7 | 60 | 421.00 | 434.82 | 103.3 |
| | U1448B | 10°38.0202'N | 93°00.0032'E | 1,107.9 | 57 | 357.10 | 369.38 | 103.4 |
| | U1448C | 10°38.0830'N | 93°00.0233'E | 1,108.2 | 4 | 34.30 | 34.77 | 101.4 |
| **Site U1448 totals** | | | | | **121** | **812.40** | **838.97** | **103.3** |
| **Expedition 353 totals** | | | | | **557** | **4,431.80** | **4,280.12** | **96.6** |

*Science summary*

Expedition 353 drilled six sites in the Bay of Bengal, recovering 4,280 m of sediments during 32.9 days of on-site drilling. Recovery averaged 97%, including coring with the advanced piston corer (APC), half-length APC, and extended core barrel (XCB) systems. The primary objective of Expedition 353 was to reconstruct changes in Indian monsoon circulation since the Miocene at tectonic to centennial timescales. Postexpedition analysis of the sediment sections recovered will improve our understanding of how monsoonal climates respond to changes in forcing external to the Earth's climate system (i.e., insolation) and changes in forcing internal to the Earth's climate system, including changes in continental ice volume, greenhouse gases, sea level, and the ocean-atmosphere exchange of energy and moisture. All of these mechanisms play critical roles in current and future climate change in monsoonal regions. The primary signal targeted is the exceptionally low salinity surface waters that result, in roughly equal measure, from both direct summer monsoon precipitation to the Bay of Bengal and runoff from the numerous large river basins that drain into the Bay of Bengal.

Changes in rainfall and surface ocean salinity are captured and preserved in a number of chemical, physical, isotopic, and biological components of sediments deposited in the Bay of Bengal. Expedition 353 sites were strategically located in key regions where these signals are the strongest and best

preserved. Salinity changes at Sites U1445 and U1446 (northeast Indian margin) result from direct precipitation as well as runoff from the Ganges–Brahmaputra River complex and the many river basins of peninsular India. Salinity changes at Sites U1447 and U1448 (Andaman Sea) result from direct precipitation and runoff from the Irrawaddy and Salween River basins. IODP Site U1443 (Ninetyeast Ridge) is an open ocean site with modern surface water salinity very near the global mean but is documented to have recorded changes in monsoonal circulation over orbital to tectonic timescales. This site serves as an anchor for establishing the extent to which the north to south (19°N to 5°N) salinity gradient changes over time.

## Expedition 354: Bengal Fan

*Planning*

Critical items from the surface shipment that was delayed last quarter because of US West coast labor issue were included in the air freight at the beginning of Expedition 354. Final preparations were made for the port call, including organizing tours of the ship.

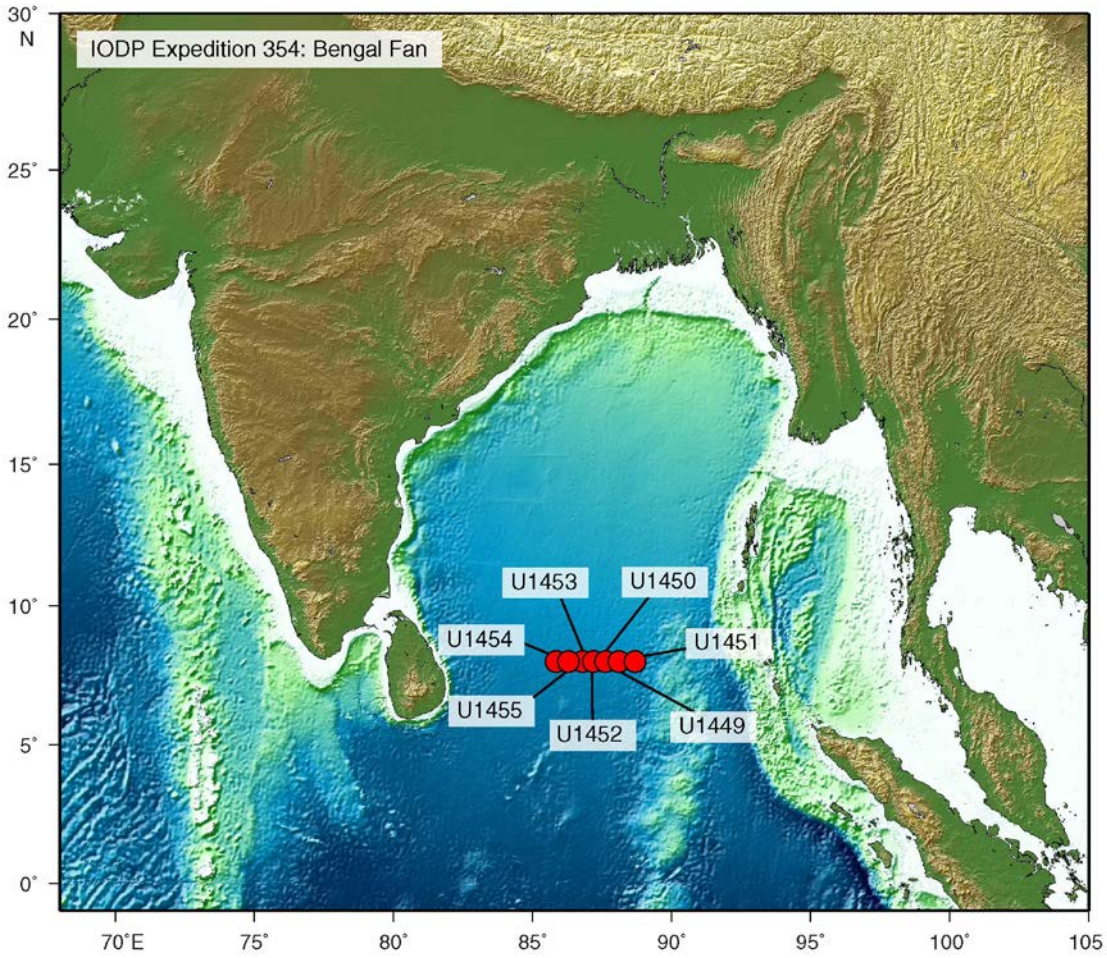
*Staffing*

| Expedition 354 Science Party staffing breakdown | | |
|---|---|---|
| **Member country/consortium** | **Participants** | **Co-Chief Scientists** |
| USA: United States Science Support Program (USSSP) | 9 | |
| Japan: Japan Drilling Earth Science Consortium (J-DESC) | 4 | |
| Europe and Canada: European Consortium for Ocean Research Drilling (ECORD) Science Support and Advisory Committee (ESSAC) | 8 | 2 |
| Republic of Korea: Korea Integrated Ocean Drilling Program (K-IODP) | 1 | |
| People's Republic of China: IODP-China | 2 | |
| Australia and New Zealand: Australia/New Zealand IODP Consortium (ANZIC) | 1 | |
| India: Ministry of Earth Science (MoES) | 2 | |
| Brazil: Coordination for Improvement of Higher Education | 2 | |

*Clearance, permitting, and environmental assessment activities*

The JRSO received approval from NSF for the use of acoustic sources to conduct zero-offset Vertical Seismic Profiles (VSPs) during Expedition 354.

*Site map*


IODP Expedition 354: Bengal Fan
30° N
25°
20°
15°
10°
5°
0°
70°E
75°
80°
85°
90°
95°
100°
105
U1453
U1450
U1454
U1451
U1455
U1452
U1449

*Coring summary*

| Site | Hole | Latitude | Longitude | Water depth (mbrf) | Cores (n) | Interval cored (m) | Core recovered (m) | Recovery (%) |
|---|---|---|---|---|---|---|---|---|
| U1449 | U1449A | 8°0.4194'N | 88°6.5994'E | 3,652.7 | 37 | 212.50 | 129.38 | 60.9 |
| | U1449B | 8°0.4206'N | 88°6.6091'E | 3,651.9 | 1 | 7.90 | 7.91 | 100.1 |
| **Site U1449 totals** | | | | | **38** | **220.40** | **137.29** | **62.3** |
| U1450 | U1450A | 8°0.4201'N | 87°40.2478'E | 3,655.3 | 86 | 444.70 | 282.73 | 63.6 |
| | U1450B | 8°0.4192'N | 87°40.2586'E | 3,655.4 | 21 | 203.90 | 46.67 | 22.9 |
| **Site U1450 totals** | | | | | **107** | **648.60** | **329.40** | **50.8** |
| U1451 | U1451A | 8°0.4195'N | 88°44.5012'E | 3,607.3 | 72 | 394.90 | 337.80 | 85.5 |
| | U1451B | 8°0.4203'N | 88°44.4745'E | 3,607.2 | 70 | 627.60 | 180.86 | 28.8 |
| **Site U1451 totals** | | | | | **142** | **1,022.50** | **518.66** | **50.7** |
| U1452 | U1452A | 8°0.4196'N | 87°10.9001'E | 3,670.5 | 1 | 8.00 | 8.03 | 100.4 |
| | U1452B | 8°0.4191'N | 87°10.9128'E | 3,670.3 | 34 | 174.50 | 138.21 | 79.2 |
| | U1452C | 8°0.4088'N | 87°10.9116'E | 3,671.5 | 6 | 41.30 | 33.30 | 80.6 |
| **Site U1452 totals** | | | | | **41** | **223.80** | **179.54** | **80.2** |
| U1453 | U1453A | 8°0.4193'N | 86°47.8973'E | 3,679.5 | 37 | 186.70 | 164.78 | 88.3 |
| **Site U1453 totals** | | | | | **37** | **186.70** | **164.78** | **88.3** |
| U1454 | U1454A | 8°0.4067'N | 85°50.9882'E | 3,709.9 | 1 | 7.50 | 7.54 | 100.5 |
| | U1454B | 8°0.4083'N | 85°51.0025'E | 3,710.3 | 29 | 147.40 | 129.51 | 87.9 |
| | U1454C | 8°0.3968'N | 85°51.0033'E | 3,710.3 | 6 | 37.20 | 30.16 | 81.1 |
| | U1454D | 8°0.3975'N | 85°50.9927'E | 3,710.7 | 5 | 37.10 | 24.46 | 65.9 |
| **Site U1454 totals** | | | | | **41** | **229.20** | **191.67** | **83.6** |
| U1455 | U1455A | 8°0.4189'N | 86°16.9983'E | 3,732.5 | 1 | 0.90 | 0.90 | 100.0 |
| | U1455B | 8°0.4189'N | 86°17.0096'E | 3,733.0 | 1 | 6.90 | 6.88 | 99.7 |
| | U1455C | 8°0.4081'N | 86°17.0090'E | 3,732.5 | 54 | 350.70 | 198.00 | 56.5 |
| **Site U1452 totals** | | | | | **56** | **358.50** | **205.78** | **57.4** |
| **Expedition 353 totals** | | | | | **462** | **2,889.70** | **1,727.12** | **59.8** |

*Science summary*

Expedition 354 drilled a 320 km-long transect across the Bengal Fan, with three deep penetration sites and four shallow sites giving a spatial overview of the primarily turbiditic depositional system comprising the Bengal deep sea fan. Sediments originate from Himalayan rivers, documenting terrestrial changes of the Himalayan erosion and weathering, and are transported through a delta and shelf canyon, supplying turbidity currents loaded with a full spectrum of grain sizes. Mostly following transport channels, sediments deposit on and between levees, while depocenters are laterally shifting over hundreds of kilometers on millennial time scales. Expedition 354 documented these deposits in space and time, and the recovered sediments have Himalayan mineralogical and geochemical signatures relevant to reconstruct time series of erosion, weathering, and changes in source regions as well as impacts on the global carbon cycle. Expedition 354 tracked Miocene shifts in terrestrial vegetation, sediment budget, and style of sediment transport and extended the record of early fan deposition by 10 My into the late Oligocene.

## Expedition 355: Arabian Sea Monsoon CPP

*Planning*

Two new alternate sites for Expedition 355 were submitted based on new seismic data. Laboratory, technical, and curatorial requirements were finalized, surface and air freight shipments were dispatched, and final logistical planning was completed. Issues with visa requirements for the concluding port call as well as the 2-day berth limitation imposed by the port authority in Mumbai resulted in the decision to defer logistics and IODP and Siem crew changes until the ship transits to Colombo, Sri Lanka; however, the Science Party will still disembark in Mumbai. Planning commenced for tours organized by IODP-India in Mumbai.

*Clearance, permitting, and environmental assessment activities*

The Environmental Protection and Safety Panel (EPSP) and the TAMU Safety Panel recommended approval of one of the new sites and shifted the other proposed site to a new location. The environmental evaluation for acoustic activity during zero-offset VSPs was submitted to NSF and approved.

## Expedition 356: Indonesian Throughflow

*Planning*

It was determined this quarter that all sailing staff will be required to obtain an Australian Maritime Crew Visa. Research plans and sample requests received at the end of the quarter will assist finalization of the laboratory, technical, and curatorial support requirements and initiate research discussions and collaborations. Public relations and outreach activities were planned for the first 2 days of port call (31 July and 1 August).

*Staffing*

Scientific staffing was completed during this quarter.

*Clearance, permitting, and environmental assessment activities*

Australia submitted several clarification questions regarding the marine scientific research application. The draft environmental evaluation for acoustic activity during zero-offset VSPs was received at the end of the quarter.

## Expedition 359: Maldives Monsoon and Sea Level

*Planning*

After consultation with and direction from NSF, the decision was made not to implement Ancillary Project Letter (APL) 849 as part of Expedition 359; consequently, the proposed sites (KK-03A and KK-03B) originally planned for scientific drilling in the Kerala-Konkan Basin in the Indian Exclusive Economic Zone (EEZ) were dropped. Two new alternate sites will be proposed. Work began on a revised operations plan and addendum to the *Scientific Prospectus*.

*Staffing*

The initial rounds of invitations were issued after completion of two special calls for applications for paleomagnetics and nannofossil specialists. Despite four declines, all but one position were filled by the end of the quarter.

*Clearance, permitting, and environmental assessment activities*

The marine scientific research application was submitted to the US State Department on 27 February 2015.

## Expedition 360: Southwest Indian Ridge Lower Crust and Moho

*Planning*

The Expedition 360 *Scientific Prospectus* was published in February. All long-lead items were ordered, and archive halves from previous expeditions were identified to be available as a reference during the expedition.

*Staffing*

Staffing invitations were issued in January, and all scientific positions were filled by 23 February.

## Expedition 361: South African Climates

*Planning*

The Expedition 361 pre-expedition meeting was held 25 and 26 February in College Station, TX.

*Staffing*

Out of 22 initial invitations issued this quarter, 21 were accepted. Special calls for paleomagnetics and nannofossil specialists were issued.

## Expedition 362: Sumatra Seismogenic Zone

*Planning*

Planning for the pre-expedition meeting, scheduled for 4 and 5 May, was initiated.

*Staffing*

An early call for applications was issued on 15 February with applications due to the PMOs on 15 April, and a goal was set to complete staffing prior to submitting the marine scientific research application.

## Expedition 363: Western Pacific Warm Pool

*Planning*

Initial discussions were initiated with the Co-Chief Scientists, including a draft operations plan.

## Engineering support

### Engineering equipment acquisitions and updates

*Vibration-isolated television system*

The new replacement vibration-isolated television (VIT) cable was completed and shipped to the third-party vendor, who will spool it on the winch drum. A sample of the cable was sent to the drum vendor to modify the sleeve.

# Technical and analytical services

## Analytical systems

### Analytical systems acquisitions and updates

The Agico KLY-4 KappaBridge and the UIC Model 5015 coulometer were returned to the vessel during the Expedition 355 port call and are back in place.

A variable integration time method was developed for the Ocean Optics color reflectance measurements done on the Section Half Multisensor Logger (SHMSL). This method allows the instrument to measure light saturation on the detector and to lengthen the integration time when needed to improve performance on low-reflectance targets. A significant reduction in noise on low-reflectance core section samples was successfully demonstrated during Expedition 354 and the technique is available for use on future expeditions. Future work will be done to evaluate newer detector systems with better signal-to-noise ratios in order to further improve the quality of the color measurements.

The Expedition 355 microbiologist agreed to try perfluromethyldecalin (PFMD, $C_{11}F_{20}$) as an alternative perfluorocarbon tracer (PFT) to perfluoromethylcyclohexane (PFMCH, $C_7F_{14}$). The expedition will pump PFMD from shipboard stock (approximately 2 liters) until it is consumed, then resume PFT pumping with PFMCH. It is hoped that the PFMD's significantly lower vapor pressure (0.29 kPa compared to 14 kPa) will prevent the environmental contamination seen in previous expeditions.

### Laboratory working groups

The laboratory working groups (LWGs) provide oversight, research direction, and quality assurance for the methods, procedures, and analytical systems both on the *JOIDES Resolution* and on shore. The groups meet regularly to review cruise evaluations, expedition technical reports, and issues management communications to provide advice on corrective actions and potential developments for laboratories. LWG meetings held this quarter covered issues arising from the Expedition 353 cruise evaluations.

*Geology*

The Geology LWG did not meet this quarter, but the LWG lead presented the ongoing issues, recommendations, and action items (e.g., stratigraphic correlation support) to the Issues Management Team.

*Geophysics*

The recent discovery of erroneous CIELAB L* values in edge cases was discussed and the LWG recommended that all of the math/equations used in the core loggers be extracted from code and made available for review. Additionally, whenever new equations or formulas are introduced, the LWG would like to review them, especially if they have been used during an expedition.

The correction factor provided by Bartington for the frequency-adjusted MS2C 90 mm loops appears to be overcorrecting results, so the loop performance will be evaluated against a range of results in order to empirically determine the appropriate factor. The Whole-Round Multisensor Logger (WRMSL) and Special Task Multisensor Logger (STMSL) configuration files allow the use of any correction factor, and care must be taken that this is set correctly. By practice, the normal-frequency loops are always used on the WRMSL and the adjusted loops are always used on the STMSL, in order to decrease the likelihood of an error.

Color reflectance issues, including the aforementioned variable integration time method, were evaluated. LWG members are examining older expedition data to determine what corrections, if any, need to be applied to CIELAB L*, a*, and b* values in the LIMS database.

The SHMSL point magnetic susceptibility (MS) measurements showed an end-of-section bias for core with low MS values. The root cause for this behavior is being sought.

The Sediment Temperature Tool 2 (SET2) has been modified to use the same Antares data logger used in the APC temperature tool (APCT-3) and a new version of the TP-FIT software is being written to accommodate the change.

Finally, a number of changes made to various core loggers to improve performance (e.g., utilizing a polling technique for MS measurements on the whole-round loggers increases the speed of MS acquisition by about 30%) were discussed in detail. The performance of the affected loggers will be carefully monitored during Expedition 355.

*Geochemistry*

One of the comments from the Expedition 353 cruise evaluations was that the CARY 100 spectrophotometer needs to have an autosampler. Thermo Scientific has a device similar to the Discrete Analyzer (the Gallery), but the consensus was that it was highly complex. The CARY 100 had an XY autosampler option when it was owned by Varian; Agilent will be queried to see if they still provide that option for possible future purchase.

Cold room temperature fluctuations during Expedition 353 were a result of ship's chiller system problems that have since been resolved.

Problems with the new natural gas analyzer gas chromatograph (GC) injections were discussed and a solution is still being sought. The second GC was shipped to shore for a more thorough investigation of the issue.

Problems with coulometer data were solved by the use of an ultra-high purity (UHP) $N_2$ tank; the nitrogen generator–supplied nitrogen was insufficiently pure because of the high demand in the microbiology laboratory.

A request for an additional Cahn microbalance to be set up to improve coulometer/carbon-hydrogen-nitrogen-sulfur analyzer (CHNS) throughput was considered and rejected, as the provision of an additional balance would not speed up the process.

Finally, a request for a dedicated GC with a flame ionization detector (GC-FID) for "quick" biomarker analysis was considered; the consensus is that biomarker work is best done postexpedition, as the *JOIDES Resolution* does not have all of the infrastructure needed for onboard biomarker work and biomarkers are non-ephemeral if properly preserved.

#### *Curation and Core Handling*

No curation-related comments were made in the Expedition 353 cruise evaluations. The Curation and Core Handling LWG discussed various ongoing curatorial issues this quarter, including a redesign of the nannofossil label to make it legible and updates on upcoming sampling party activities for Expeditions 353, 354, 355, and 356. Finally, the LWG discussed the impending Gulf Core Repository (GCR) renovation and its impact on GCR operations; steps are being taken to keep the GCR at least partially in service.

### Other projects and activities

#### *Geosciences Laboratory*

The TAMU Geoscience XRF Core Scanner facility hosted four groups of scientists during this period for X-ray fluorescence (XRF) scanning projects. Dr. Brendan Roark had his GEOS 405 class run core on the XRF Core Scanner for hands-on experience with instrumental scanning techniques. Total utilization of the facility was approximately 60% of available days.

## Core curation

The JRSO provides services in support of Integrated Ocean Drilling Program and IODP core sampling and curation of the core collection archived at the GCR. The JRSO also maintains a subcontract with KOCHI for curation of JRSO cores at the KCC in Japan.

### JRSO expedition core sampling

The JRSO planned sample and curation strategies this quarter for upcoming JRSO Expeditions 355 and 356. A JRSO Curatorial Specialist supervised shipboard core sampling during Expeditions 353 and 354 and reviewed all shipboard and moratorium-related requests in coordination with the other members of the expedition Sample Allocation Committee (SAC).

### Gulf Coast Repository activity

#### *Sample requests*

The following "Sample requests" table provides a summary of the 2,446 samples that were taken at the GCR during the quarter. Sample requests that show zero samples taken may represent cores that were viewed by visitors during the quarter, used for educational purposes, or requested for XRF analysis.

Public relations tours and educational visits to the repository are shown in the “GCR tours/visitors” table.

| GCR sample request number, name, country | Number of samples taken | Number of cores XRF scanned | Number of cores Imaged | Number of visitors to GCR |
|---|---|---|---|---|
| 25339, Wyech, USA | 66 | | | |
| 25738, Norris, USA | 40 | | | |
| 25535, Zellers, USA | 7 | | | |
| 25454, Jones, USA | 0 | 76 | | |
| 25376, Roark, USA | 0 | 24 | | |
| 25034, Furguson, USA | 77 | | | |
| 25071, Elder, USA | 114 | | | |
| 25015, Ford, USA | 8 | | | |
| 24656, Valentina, Colombia | 11 | | | |
| 25194, John, United Kingdom | 0 | | | 61 |
| 24974, Dove, USA | 8 | | | |
| 24594, Yao, Canada | 26 | | | |
| 24545, Rafter, USA | 155 | | | |
| 24536, Ramos, USA | 19 | | | |
| 24356, Dupont, Germany | 40 | | | |
| 24377, Benowitz, USA | 80 | | | 2 |
| 24341, Bertram, United Kingdom | 155 | | | |
| 24327, Henderiks, Sweden | 10 | | | |
| 23927, KcKinley, USA | 29 | | | |
| 19456, Sauvage, USA | 24 | | | |
| 23803, Alvarez, USA | 12 | | | 1 |
| 22517, Ravula, USA | 0 | 3 | | |
| 23654, Kulhanek, USA | 0 | | | 7 |
| 23621, Seitz, USA | 2 | | | |
| 23318, Elder, USA | 37 | | | |
| 23197, Shimizu, Japan | 16 | | | |
| 22655, Tauxe, USA | 138 | | | |
| 22974, Harper, USA | 60 | | | |
| 22577, Carter, United Kingdom | 13 | | | |
| 21669, Aljahdali, USA | 231 | | | |
| 22217, Ford, USA | 43 | | | |
| 22381, Tait, USA | 9 | | | |
| 22534, Kordesch, USA | 168 | | 3 | |
| 22214, O'Dea, USA | 758 | | | |
| 22261, Berenguer, France | 2 | | | |
| 22114, Fantle, USA | 19 | | | |
| 21702, Jean, Germany | 3 | | | |
| 21714, Jardine, United Kingdom | 19 | | | |
| 21661, Erhardt, United Kingdom | 12 | | | |
| 21356, Jakob, Germany | 140 | | | |
| 19324IODP, Huck, USA | 0 | 181 | 181 | 1 |
| 18235, Collins, USA | 1 | | | |
| Tours/demonstrations | | | | 122 |
| **Totals** | **2,446** | **284** | **184** | **196** |

*GCR tours/visitors*

| Type of tour or visitor | Number of visitors to GCR |
|---|---|
| Scientist visitors | 74 |
| Educational tours/demonstrations (5) | 97 |
| Public relations tours (1) | 25 |
| **Totals** | **196** |

*Use of core collection*

The JRSO promotes outreach use of the GCR core collection by conducting tours of the repository (see "GCR tours/visitors" table above) and providing materials for display at meetings and museums. The repository and core collection are also used for TAMU classroom exercises. This quarter, the GCR hosted a tour and core activity program for high school students attending the TAMU College Assistance Migrant Program (CAMP) and held tours and classes for 4 TAMU Geology and Oceanography classes. In addition, the GCR hosted a carbonate workshop for 60 graduate students from Imperial College, London, and gave a repository tour to the Batholith Workshop hosted by the College of Geosciences Dean, Dr. Kate Miller.

## Kochi Core Center activity

*Sample requests*

The following "Sample requests" table provides a summary of the 7,933 samples that were taken at the GCR during the quarter. Sample requests that show zero samples taken may represent cores that were viewed by visitors during the quarter or used for educational purposes. Public relations tours and educational visits to the repository are shown in the "KCC tours/visitors" table.

| KCC Sample request number, name, country | Number of samples taken | Number of visitors to KCC |
|---|---|---|
| 23079A, Dubicka, Poland | 161 | |
| 23144A, Kuppusamy, India | 60 | |
| 23172A, Hyun, South Korea | 119 | 2 |
| 23182A, Super, USA | 70 | |
| 23189A, Robinson, United Kingdom | 195 | |
| 22879B, Okazaki, Japan | 414 | 2 |
| 17818IODP, Fisher, United Kingdom | 162 | |
| 18712IODP, Chang, Australia | 1091 | 2 |
| 18115IODP, House, USA | 53 | |
| 7424IODP, Zhong, China | 449 | 2 |
| 19435IODP, Thompson, USA | 107 | |
| 19782IODP, Laurent, France | 49 | |
| 19893IODP, Bijl, Netherlands | 64 | |
| 19958IODP, Banerjee, India | 484 | |
| 20583IODP, Fluegeman, USA | 66 | |
| 20215IODP, Clift, USA | 31 | |
| 13846IODP, Shervais, USA | 12 | |
| 21277IODP, Li, China | 2 | |
| 21285IODP, Jonas, Germany | 60 | |

| KCC Sample request number, name, country | Number of samples taken | Number of visitors to KCC |
|---|---|---|
| 14621IODP, Bogus, USA | 78 | |
| 21732IODP, Phillips, USA | 6 | |
| 20924IODP, Sibert, USA | 156 | |
| 21017IODP, Lu, China | 377 | 1 |
| 21470IODP, Okawara, Japan | 18 | |
| 21669IODP, Aljahdali, USA | 193 | |
| 21740IODP, Chin, USA | 4 | |
| 21752IODP, Kender, United Kingdom | 7 | |
| 21769IODP, Chavrit, France | 25 | |
| 21795IODP, Liddy, USA | 10 | |
| 22038IODP, Villa, Italy | 136 | |
| 22268IODP, Setoyama, USA | 30 | |
| 15184IODP, Son, Vietnam | 70 | |
| 4684IODP, Lee, South Korea | 1,825 | 3 |
| 22275A, Singh, India | 270 | |
| 5503IODP & 6403IODP, Blanc, Spain | 14 | |
| 23175IODP, Sugisaki, Japan | 659 | 1 |
| 23916IODP, Nishimoto, Japan | 0 | |
| 24693IODP, Ahagon, Japan | 0 | |
| 24034IODP, Miller, USA | 163 | |
| 22894IODP, Shimizu, Japan | 10 | 3 |
| 23197IODP, Shimizu, Japan | 12 | 1 |
| 24761IODP, Muroto Geopark, Japan | 0 | |
| 25071IODP, Elder, USA | 31 | |
| 25281IODP, Suzuki, Japan | 33 | 3 |
| 24514IODP, Henderson, United Kingdom | 40 | |
| 25511IODP, Luebke, Germany | 43 | |
| 26460IODP, Prakasam, India | 74 | |
| 20215IODP, Clift, USA | 31 | |
| Tours/demonstrations | 0 | |
| **Total** | **7,933** | **20** |

*KCC tours/visitors*

| Type of tour or visitor | Number of Visitors to KCC |
|---|---|
| Vice Minister of the Ministry of Education, Culture, Sports, Science, and Technology (MEXT)of Japan | 2 |
| Staff from Vietnam government and academia | 10 |
| Staff from KIGAM, South Korea | 2 |
| Faculty member from Australian National University (ANU) | 1 |
| Members of Kochiken Engineers Corporation, Japan | 26 |
| Staff from Japan Aerospace Exploration Agency (JAXA) | 4 |
| Delegation from India | 5 |
| Students and staff from Shimane University, Japan | 7 |
| Members of Shikoku Paper Pulp Association, Japan | 34 |
| **Totals** | **91** |

# Development, IT, and databases

The JRSO manages data supporting IODP activities, including expedition and postexpedition data, provides long-term archival access to data, and supports JRSO Information Technology (IT) services. Daily activities include operating and maintaining shipboard and shore-based computer and network systems and monitoring and protecting JRSO network and server resources to ensure safe, reliable operations and security for IODP data and IT resources.

## Expedition data

### LIMS database

Expedition 353 data were added to the LIMS database on shore this quarter. These data are currently under moratorium and available only to the scientists who sailed on this expedition. Data for Expeditions 346 and 349 were released from moratorium during this quarter.

### Expedition data requests

The following tables provide information on JRSO web data requests from the scientific community. Where possible, visits by JRSO employees were filtered out.

| Top 10 countries accessing JRSO web databases | | | | |
|---|---|---|---|---|
| | Janus database | | LIMS database | |
| Rank | Country | Visitor sessions | Country | Visitor sessions |
| 1 | USA | 666 | USA | 681 |
| 2 | United Kingdom | 348 | Germany | 199 |
| 3 | Germany | 273 | Japan | 196 |
| 4 | France | 195 | United Kingdom | 153 |
| 5 | China | 122 | Unknown | 88 |
| 6 | Norway | 86 | Canada | 50 |
| 7 | Australia | 65 | France | 50 |
| 8 | Canada | 56 | China | 41 |
| 9 | Spain | 47 | Portugal | 21 |
| 10 | Japan | 43 | Netherlands | 19 |
| | Others | 241 | | 88 |
| | **Total** | **2,142** | **Total** | **1,586** |

| Top 20 database web queries | | | | |
|---|---|---|---|---|
| Rank | Janus database | | LIMS database | |
| | Query | Downloads | Query | Downloads |
| 1 | X-ray diffraction | 7,017 | LORE—LSIMG | 1,548 |
| 2 | Phys props—GRA | 4,338 | LIMS REPORTS—section summaries | 1,018 |
| 3 | Paleomag—cryomag | 3,582 | LIMS REPORTS—sample report | 915 |
| 4 | Images—core photos | 3,554 | LIMS REPORTS—LSIMG | 851 |
| 5 | Phys props—smear slide data | 3,279 | LIMS REPORTS—core photo | 706 |
| 6 | Chemistry—Rock Eval | 2,498 | LIMS REPORTS—core summaries | 271 |
| 7 | Images—Tsmicrographs | 2,422 | LIMS REPORTS—desc report | 244 |
| 8 | Chemistry—carbonates | 2,401 | LORE—srmsection | 243 |
| 9 | Chemistry—gas | 2,372 | WTR—science data | 226 |
| 10 | Paleontology—investigations | 2,362 | LIMS REPORTS—carbonates | 219 |
| 11 | Phys props—MAD | 2,347 | WTR—samples | 189 |
| 12 | X-ray fluorescence | 2,339 | LIMS REPORTS—GRA | 173 |
| 13 | Site summary | 1,195 | LIMS REPORTS—hole summaries | 158 |
| 14 | Hole summary | 615 | LIMS REPORTS—splice intervals | 158 |
| 15 | Core summary | 515 | LIMS REPORTS—RSC | 138 |
| 16 | Special holes | 426 | LIMS REPORTS—composite depths | 137 |
| 17 | Samples | 411 | LIMS REPORTS—TSimage | 11 |
| 18 | Point calculations | 363 | LIMS REPORTS—MS | 104 |
| 19 | Hole trivia | 278 | LIMS REPORTS—microimg | 94 |
| 20 | Chemistry—IW | 168 | LIMS REPORTS—IW report | 92 |
| | Others | 1,966 | Others | 1,090 |
| | **Total** | **44,448** | **Total** | **8,585** |

| Data requests submitted to the TAMU Data Librarian | |
|---|---|
| Requests | Total |
| Photographs | 8 |
| How to access | 5 |
| Depth calculations | 4 |
| Samples | 3 |
| Phys props—MAD | 2 |
| Chemistry—IW | 1 |
| Paleontology | 1 |
| Paleomag | 1 |
| Seismics | 1 |
| Splice | 1 |
| Summaries | 1 |
| | |
| **Total** | **28** |

| Countries submitting data requests to the TAMU Data Librarian | |
|---|---|
| Country | Total |
| USA | 11 |
| United Kingdom | 3 |
| Australia | 2 |
| Germany | 2 |
| Italy | 2 |
| Spain | 2 |
| Canada | 1 |
| India | 1 |
| Japan | 1 |
| Norway | 1 |
| Portugal | 1 |
| Unknown | 1 |
| **Total** | **28** |

# Software development

## LIMS On-line Report Environment

*Project scope and deliverables*

The goal of the LIMS LORE project is to implement a reporting framework that can incrementally handle very large data sets. The implementation will accommodate smooth transition from legacy systems to the new model. The implementation will ease the discovery and sharing of IODP content.

This effort focuses on the immediate need to be able to retrieve very large data sets (such as red-green-blue color space [RGB]) from current online systems without crashing end-users' browsers or intermediate systems participating in the transfer process. This effort does not address the needs and requirement for data publishing, which will be managed in a separate effort. Not only will this project solve the big data problems represented by RGB and other reports, but it will create a framework for the distribution of all kinds of data reports going forward. It is viewed as the replacement for both Web Tabular Reports and the current LIMS Reports.

*Project status*

The JRSO began work on phase III of this project in November 2014 as defined in the project management plan. During this quarter all chemistry reports were at various stages of testing, with two completed; 87% of physical properties reports were ready; and 60% of image reports were ready. Remaining deliverables are scheduled for completion by June 2015.

## Stratigraphic Correlation Enhancements

*Project scope and deliverables*

This project delivers an updated set of programs to provide spliced data sets assembled using the affine table and splice interval table provided by the shipboard stratigraphic correlation specialist. The deliverables will ensure accurate data, reliable process, and user-friendly interfaces and minimize the risk of spliced data sets that do not meet user intent and expectations. The scope includes the following components:

1. Correlation table files. Content and format of user-generated files for affine table, splice interval table (SIT), and splice tie points table (STPT; if still needed) are defined in detail as part of this project. The SIT represents the correlation specialist's splice definition more explicitly and completely than the STPT used to do and will therefore be used as the key table in the correlation workflow. This change in workflow should eliminate confusion among correlation specialists, support personnel, and computer programs.
2. Uploader for correlation files. The uploader program will be updated to comply with the newly defined correlation files' content and format in 1. This will also include the creation of new LIMS database tables for the correlation information.
3. Spliced data reports. The ultimate goal is to provide spliced data sets based on the affine table and SIT and the LIMS-internal program to assemble the spliced data sets. The existing program needs to be replaced to comply with 1 and 2.
4. Correlation files. The correlation files defined in 1 and loaded in 2 will be reported similarly to the way they are currently reported, but using all the new definitions and database tables.
5. Correlation data. LIMS2Correlator (the program used to extract correlation data from the LIMS database for use in the Correlator application) will be updated (or replaced). The main requirement is to include export of RGB data files.
6. Naming convention. A naming convention for alternate depth scales and splices will be implemented to facilitate user's selection of items from the choice lists on the LIMS Reports/LORE interface.

7. Legacy data conversion. Legacy data conversion will be included in this project if external users and expedition project representatives deem it worthwhile by assisting in the process.
8. Documentation. Processes and tools will be documented.

*Project status*

The JRSO re-opened this project to expand the scope following feedback obtained during Expedition 353. Specifically, the Stratigraphic Correlation Enhancements application is being modified to overcome a bug discovered in the Correlator application.

## Superconducting Rock Magnetometer Installation and Software Upgrade

*Project scope and deliverables*

In FY14, the JRFB and NSF approved replacement of the current shipboard liquid helium cryogenic magnetometer with a new liquid helium–free magnetometer. The magnetometer currently in use on board the *JOIDES Resolution* is almost 20 years old. Although it is still functioning well, the age of the system, the increasing costs of obtaining liquid helium, and the importance of magnetic measurements to IODP science were key factors in the decision to replace the current system. During this project, the JRSO will install the new helium-free magnetometer aboard the *JOIDES Resolution,* complete testing of the new system prior to Expedition 362, send the old liquid helium magnetometer to shore, and replace the software running the system.

*Project status*

The JRSO purchased the new cryogenic magnetometer from 2G-Enterprises in late 2014 and anticipates delivery in December of 2015. Software development will begin in April 2015.

## Improve Web Services

*Project scope and deliverables*

The goal of this project is to improve functionality and maintainability of web services for data input and output to LIMS by fixing and replacing existing web services with newer versions while implementing secure authentication for all services that use accounts and passwords (part of meeting a TAMU security requirement).

*Project status*

The JRSO will begin software development in April 2015.

## Scanning Electron Microscope Uploader

*Project scope and deliverables*

When completed, this project will provide online access to all images taken with the Scanning Electron Microscope (SEM), including metadata that were collected aboard the *JOIDES Resolution*. Data access will be established within the LIMS Reports interface, which already provides access to numerous reports of instrumental data. This tool will enable shipboard scientists and support staff to upload files, including pictures of thin sections, rock pieces, fossils, and so on. The metadata associated with the images will include equipment configuration (e.g., magnification, methods of sample preparation, sample type and ID).

*Project status*

The JRSO will begin software development in April 2015.

# Publication services

IODP Publication Services provides publication support services for IODP and Integrated Ocean Drilling Program riserless, riser, and mission-specific drilling expeditions; editing, production, and graphics services for all required Program reports (see "Progress reporting" in "Management and administration"), technical documentation, and scientific publications as defined in the JRSO cooperative agreement with NSF; and warehousing and distribution of Integrated Ocean Drilling Program, ODP, and DSDP publications.

## Scientific publications

### JRSO publications

*Scientific Prospectus*

10.14379/iodp.sp.360.2015

*Preliminary Report*

10.14379/iodp.pr.352.2015

*Proceedings*

10.14379/iodp.proc.349.2015

### USIO publications

*Proceedings*

10.2204/iodp.proc.346.2015

*Data report*

10.2204/iodp.proc.335.201.2015

### CDEX publications

*Proceedings*

10.2204/iodp.proc.348.2015

*Data report*

10.2204/iodp.proc.343343T.201.2015

### ESO publications

*Proceedings*

10.2204/iodp.proc.347.2015

# Citation management

## Scientific publication digital object identifiers

| Reports and publications | Digital object identifier (DOI) prefix | Number of online DOI resolutions | | | |
|---|---|---|---|---|---|
| | | January 2015 | February 2015 | March 2015 | FY15 Q2 total |
| IODP | 10.14379 | 107 | 111 | 143 | **361** |
| Integrated Ocean Drilling Program | 10.2204 | 2,234 | 2,603 | 2,921 | **7,758** |
| ODP/DSDP | 10.2973 | 7,692 | 13,933 | 5,567 | **27,192** |

## Special citation report requests

IODP Publication Services provided Australia- and New Zealand–specific citation statistics to the Australia-New Zealand IODP Consortium (ANZIC) this quarter for use in their annual report and request to the Australian Research Council (ARC) for future IODP funding.

# Publications management

## Integrated Ocean Drilling Program closeout activities

### *Publications closeout*

Integrated Ocean Drilling Program publications closeout activities continued during the reporting period. Information about the IODP-USIO FY14 Annual Report is provided in "Progress reports" in the "Management and administration" section of this report. Expedition reports and postexpedition research publications published during the quarter in the *Proceedings of the Integrated Ocean Drilling Program* are listed above in "Scientific publications." Publication Services digitally archived all Integrated Ocean Drilling Program expedition reports volumes, data reports, syntheses, and Preliminary Report and Scientific Prospectus series this quarter. In addition, publication obligation papers and data reports related to Expeditions 310, 311, 317, 318, 319, 320/321, 322, 323, 327, 329, 330, 331, 334, 336, 337, 338, 340, 343, and 344 were submitted to English language peer-reviewed journals or the Program.

## IODP publications redesign

A multiyear effort to design and contemporize the *Proceedings of the International Ocean Discovery Program* culminated 30 March 2015 with publication of the shipboard reports from Expedition 349: South China Sea Tectonics. The redesigned PDF version of the *Proceedings* returns to a two-column layout, with figures laid out in-line in journal fashion. Data tables in the site chapters are provided as .csv files that can be downloaded on demand. Responsive web design enables the HTML product to function well on a wide range of electronic devices—from handheld to desktop. There are now multiple ways to access figures in the HTML version, including from thumbnails in text. The IODP Publication Services staff led and implemented the publication redesign. More than 300 members of the international scientific community helped guide efforts by providing important feedback about desired publication features and functionality.

# Publications website

The IODP Publications website (publications.iodp.org) is hosted at TAMU. During the last quarter, the IODP Publications website received 18,753 site visits and 388,076 page views.

## JRSO expedition science outreach support

JRSO staff provided support to the Education Officers during Expeditions 353 and 354 and also assisted with planning for Expedition 355 Education Officer activities and support and Expedition 356 port call public relations and outreach activities.

## Abstracts authored by JRSO staff

Ocean drilling science abstracts presented by JRSO staff at professional conferences during this quarter include the following. Bold type indicates JRSO staff.

### International Nannoplankton Association Meeting, 15th

- **Kulhanek, D.K.,** Hollis, C.J., Hines, B.R., Littler, K., Strong, C.P., Zachos, J.C., and Villasante-Marcos, V., 2015. A new Paleocene-Eocene thermal maximum record from Deep Sea Drilling Project Site 277 (Campbell Plateau): a window into calcareous nannofossil response in the high southern latitudes. *Journal of Nannoplankton Research,* 35:52.
- **Kulhanek, D.K.,** 2015. Micropaleontology and the International Ocean Discovery Program: a primer. *Journal of Nannoplankton Research,* 35:51.
- Shepherd, C.L., **Kulhanek, D.K.,** and Hollis, C.J., 2015. Early Eocene nannofossil responses to climate change, Canterbury Basin, New Zealand. *Journal of Nannoplankton Research,* 35:76.

## Articles authored by JRSO staff

Program-related science and other articles authored by JRSO staff published during this quarter include the following. Bold type indicates JRSO staff. Other Program-related science articles are available online through the ocean drilling citation database (iodp.tamu.edu/publications/citations/database.html) and the IODP Expedition-related bibliography (iodp.tamu.edu/publications/citations.html).

- D'Hondt, S., Inagaki, F., **Alvarez Zarikian, C.,** Abrams., L.J., Dubois, N., Engelhardt, T., **Evans, H.,** Ferdelman, T., Gribsholt, B., Harris, R.N., Hoppie, B.W., Hyun, J.-H., Kallmeyer, J., Kim, J., Lynch, J.E., McKinley, C.C., Mitsunobu, S., Morono, Y., Murray, R.W., Pockalny, R., Sauvage, J., Shimono, T., Shiraishi, F., Smith, D.C., Smith-Duque, C.E., Spivack, A.J., Steinsbu, B.O., Suzuki, Y., Szpak, M., Toffin, L., Uramoto, G., Yamaguchi, Y.T., Zhang, G., Zhang, X.-H., and Ziebis, W., 2015. Presence of oxygen and aerobic communities from sea floor to basement in deep-sea sediments. *Nature Geoscience,* 8:299–304. http://dx.doi.org/10.1038/ngeo2387
- Mertens, K.N., Wolny, J., Carbonell-Moore, C., **Bogus, K.**, Ellegaard, M., Limoges, A., de Vernal, A., Gurdebeke, P., Omura, T., Al-Muftah, A., and Matsuoka, K., 2015. Taxonomic re-examination of the toxic armored dinoflagellate *Pyrodinium bahamense* Plate 1906: Can morphology or LSU sequencing separate *P. bahamense* var. *compressum* from var. *bahamense*? *Harmful Algae,* 41:1–24. http://dx.doi.org/10.1016/j.hal.2014.09.010
- Hagino, K., Young, J.R., Bown, P.R., Godrijan, J., **Kulhanek, D.K.,** Kogame, K., and Horiguchi, T., 2015. Re-discovery of a "living fossil" coccolithophore from the coastal waters of Japan and Croatia. *Marine Micropaleontology,* 115:28–37. http://dx.doi.org/10.1016/j.marmicro.2015.01.002

# Appendix: JRSO quarterly report distribution

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