International Ocean Discovery Program

JOIDES Resolution Science Operator

FY15 Q4 Operations and Management Report

1 July–30 September 2015

Cooperative Agreement OCE-1326927

Submitted by the JRSO

to

The National Science Foundation

and

The *JOIDES Resolution* Facility Board

3 November 2015

Table of contents

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) Sponsored Research Services (SRS).

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 JRSO continued to interact 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).

Progress reporting

JRSO reports

JRSO FY15 Q3 Quarterly Operations and Management Report

The JRSO operations and management report for the second quarter of FY15 (April–June 2015) was submitted to NSF on 6 August (iodp.tamu.edu/publications/AR/FY15).

FY16 Annual Program Plan

The JRSO Annual Program Plan for FY16 was approved by the JRSO on 13 July and submitted to NSF on 17 July.

FY15 Annual Report

Planning and preparations for the FY15 Annual Report began in August with approval of the table of contents.

Liaison activities

The JRSO reports to and liaises with funding agencies and IODP-related agencies (e.g., 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).

Planning meetings

The JRSO Director attended the US Advisory Committee (USAC) meeting held at Lamont-Doherty Earth Observatory (LDEO) on August 18 and 19.

Project portfolio management

The JRSO completed one project, initiated two new projects, and continued working on four existing projects this quarter (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

During the last quarter, the IODP TAMU website received 35,047 site visits and 488,036 page views. Where possible, visits by JRSO employees and search engine spiders were filtered out of the count.

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 Q4 page views*	FY15 Q4 site visits*
www-odp.tamu.edu	748,966	31,993
www.odplegacy.org	4,839	2,072
www.deepseadrilling.org	485,608	11,444
Total	**1,239,413**	**45,509**

*Where possible, visits by JRSO 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 European Consortium for Ocean Research Drilling (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
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 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 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 C. MacLeod	P. Blum
South African Climates[5]	361	Port Louis, Mauritius	30 January–31 March 2016	61 (5/56)	56 (6/50)	I. Hall S. Hemming	L. LeVay
Non-IODP [31 March–6 August 2016] [128 days]							M. Malone
Sumatra Seismogenic Zone	362	Colombo, Sri Lanka	6 August–6 October 2016	61 (5/56)	56 (7/49)	L. McNeill B. Dugan	K. Petronotis
Western Pacific Warm Pool	363	Singapore	6 October–8 December 2016	63 (5/58)	58 (8/50)	Y. Rosenthal A. Holbourn	D. Kulhanek
Mariana Convergent Margin[6]	366	Guam	8 December 2016–7 February 2017	61 (5/56)	56 (8/48)	P. Fryer G. Wheat	T. Williams
South China Sea Rifted Martin[7]	367	Hong Kong	7 February–9 April 2017	61 (5/56)	56 (2/54)	TBD	Adam Klaus
South China Sea Rifted Martin[7]	368	Hong Kong	9 April–9 June 2017	61 (5/56)	56 (2/54)	TBD	C. Alvarez Zarikian
Non-IODP [9 June–4 October 2017] [117 days]							M. Malone
Australia Cretaceous Climate and Tectonics	369	Fremantle, Australia	4 October–4 December 2017	61 (5/56)	TBD	TBD	K. Bogus
TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Hikurangi Subduction Margin[8]	TBD	TBDF	TBD	TBD	TBD	TBD	K. Petronotis

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] Also includes Proposal 845-APL, Agulhas Current LGM Density.

[6] Also includes Proposal 693-APL, South Chamorro Seamount CORK.

[7] Complementary Project Proposal (CPP) is contingent on substantial financial contribution outside of normal IODP funding.

[8] Will be implemented in FY18 but will not be placed in the expedition sequence until the 2016 JRFB meeting.

JRSO expeditions

Expedition 354: Bengal Fan

Postexpedition activities

The Expedition 354 postexpedition editing meeting was held 7–10 July in College Station, TX, and the sampling party was held 30 August–5 September at the KCC.

Expedition 355: Arabian Sea Monsoon CPP

Postexpedition activities

The Expedition 355 sampling party was held 24–28 August at the Gulf Coast Repository (GCR).

Expedition 356: Indonesian Throughflow

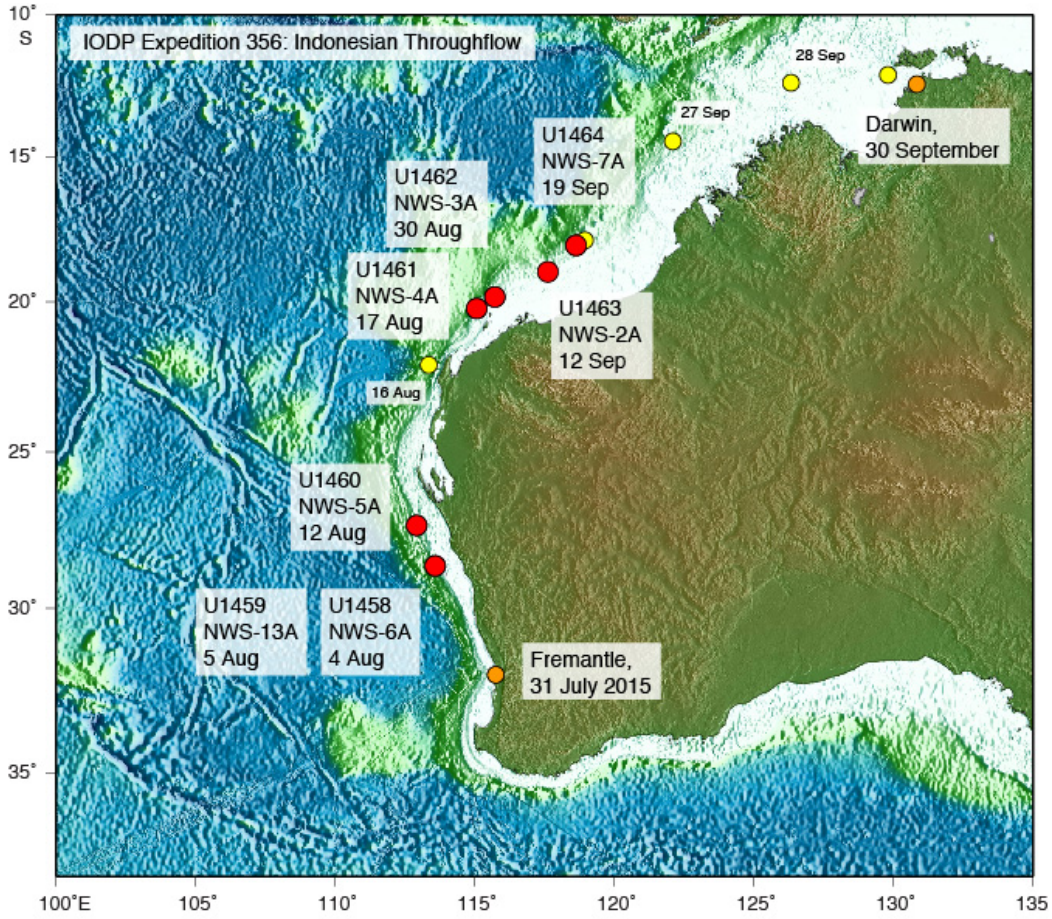
Planning

Final travel and logistical planning including Australian public relations activities were completed this quarter.

Staffing

Expedition 356 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)	10	
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)	3	1
India: Ministry of Earth Science (MoES)	0	
Brazil: Coordination for Improvement of Higher Education	1	

Site Map



Coring summary

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (n)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1458	U1458A	29°49.8576'S	113°34.6676'E	167.5	4	10.00	3.72	37.2
Site U1458 totals					**4**	**10.00**	**3.72**	**37.2**
U1459	U1459A	28°40.2606'S	113°33.5376'E	203.0	14	70.30	30.59	43.5
	U1459B	28°40.2519'S	113°33.5375'E	203.0	49	219.50	171.77	78.3
	U1459C	28°40.2398'S	113°33.5365'E	203.0	41	194.20	22.60	11.6
Site U1459 totals					**104**	**484.00**	**224.96**	**46.5**
U1460	U1460A	27°22.4948'S	112°55.4296'E	225.2	65	300.10	291.39	97.1
	U1460B	27°22.4867'S	112°55.4265'E	225.1	68	306.60	300.81	98.1
Site U1460 totals					**133**	**606.70**	**592.20**	**97.6**
U1461	U1461A	20°12.8634'S	115°3.9495'E	138.1	42	284.70	287.59	101.0
	U1461B	20°12.8522'S	115°3.9396'E	138.7	129	879.20	743.24	84.5
	U1461C	20°12.8427'S	115°3.9369'E	138.1	72	440.90	448.53	101.7
	U1461D	20°12.8325'S	115°3.9389'E	138.3	58	559.40	325.51	58.2
Site U1461 totals					**301**	**2,164.20**	**1,804.87**	**83.4**
U1462	U1462A	19°49.2857'S	115°42.5984'E	98.0	100	855.00	320.54	320.5
	U1462B	19°49.2801'S	115°42.6091'E	98.0	9	52.30	1.99	2.0
	U1462C	19°49.2764'S	115°42.6186'E	98.0	177	917.00	398.29	398.3
Site U1462 totals					**286**	**1,824.30**	**720.82**	**39.5**

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (n)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1463	U1463A	18°57.9181'S	117°37.4217'E	156.7	2	19.40	8.59	44.3
	U1463B	18°57.9190'S	117°37.4340'E	156.3	60	530.00	399.00	75.3
	U1463C	18°57.9295'S	117°37.4336'E	155.8	61	392.20	397.34	101.3
	U1463D	18°57.9285'S	117°37.4216'E	155.5	47	352.80	346.61	98.2
Site U1463 totals					**170**	**1,294.40**	**1,151.54**	**89.0**
U1464	U1464A	18°03.9125'S	118°37.8824'E	271.0	2	19.40	0.00	0.0
	U1464B	18°03.9115'S	118°37.8935'E	275.3	35	316.90	292.27	92.2
	U1464C	18°03.9244'S	118°37.8942'E	275.3	55	532.00	94.03	17.7
	U1464D	18°03.9230'S	118°37.8836'E	275.3	58	529.60	300.74	56.8
Site U1464 totals					**150**	**1,397.90**	**687.04**	**49.1**
Expedition 356 totals					**1148**	**7,781.50**	**5,185.15**	**66.6**

Science summary

The Indonesian Throughflow (ITF) is a critical part of the global thermohaline conveyor. It plays a key role in transporting heat from the equatorial Pacific (the Indo-Pacific Warm Pool) to the Indian Ocean and exerts a major control on global climate. The complex tectonic history of the Indonesian archipelago, a result of continued northward motion and impingement of the Australasian plate into the Southeast Asian part of the Eurasian plate, makes it difficult to reconstruct long-term (i.e., million year) ITF history from sites within the archipelago. The best areas to investigate ITF history are downstream in the Indian Ocean, either in the deep ocean away from strong tectonic deformation or along proximal passive margins that are directly under the influence of the ITF. Although previous ODP and DSDP deepwater cores recovered in the Indian Ocean have been used to chart Indo-Pacific Warm Pool influence and, by proxy, ITF variability, these sections lack direct biogeographic and sedimentological evidence of the ITF. IODP Expedition 356 cored seven sites covering a latitudinal range of 29°–18°S off the northwest coast of Australia to obtain a 5 My record of ITF, Indo-Pacific Warm Pool, and climate evolution that has the potential to match orbital-scale deep-sea records in its resolution. The coring strategy was designed to reveal a detailed shallow-water history of ITF variability and its relationship to climate. This should allow us to understand the history of the Australian monsoon and its variability, a system whose genesis is thought to be related to the initiation of the East Asian monsoon and is hypothesized to have been in place since the Pliocene or earlier. It also will lead to a better understanding of the nature and timing of the development of aridity on the Australian continent.

Detailed paleobathymetric and stratigraphic data from the transect will also allow subsidence curves to be constructed to constrain the spatial and temporal patterns of vertical motions caused by the interaction between plate motion and convection within the Earth's mantle, known as dynamic topography. The northwest shelf is an ideal location to study this phenomenon because it is positioned on the fastest moving continent since the Eocene, on the edge of the degree 2 geoid anomaly. Accurate subsidence analyses over 10° of latitude can resolve whether northern Australia is moving with/over a time-transient or long-term stationary downwelling within the mantle, thereby vastly improving our understanding of deep-Earth dynamics and their impact on surficial processes.

Expedition 359: Maldives Monsoon and Sea Level

Planning

Technical, operational, and engineering requirements for Expedition 359 were finalized this quarter. The surface freight for the expedition was dispatched in July and the airfreight in late September. Planning for port call logistics and outreach activities in the Darwin port call commenced during the quarter. Planning was also initiated for the required anchorage stop in Malé, Maldives, to clear the vessel into Maldives waters, which may also include a visit to the ship by Maldives officials and media.

Clearance, permitting, and environmental assessment activities

A research permit for Expedition 359 was issued by the Maldives Ministry of Fisheries and Agriculture on 20 August. The Environmental Protection and Safety Panel (EPSP) and TAMU Safety Panel recommended approval of new alternate sites and a depth extension of a previously approved site.

Expedition 360: Southwest Indian Ridge Lower Crust and Moho

Planning

Most technical, operational, and engineering preparations were completed prior to departure of the surface freight to Colombo during the third week of September, after which efforts shifted to items that will be sent via air freight in November.

Clearance, permitting, and environmental assessment activities

The EPSP and TAMU Safety Panel reviewed the operational area (box) that was requested for approval. Final approval is contingent on submission of the Co-Chief Scientists' safety report.

Expedition 361: South African Climates

Planning

The Expedition 361 *Scientific Prospectus* was published on 1 September. Sample requests/research plans were submitted at the end of the quarter, initiating Sample Allocation Committee (SAC) review and assessment of technical and analytical support requirements.

Clearance, permitting, and environmental assessment activities

The marine scientific research application to operate in South African and Mozambique waters was submitted to the US State Department on 17 July.

Expedition 362: Sumatra Seismogenic Zone

Staffing

Scientific staffing was completed in July.

Clearance, permitting, and environmental assessment activities

Despite continued efforts, little progress was made in resolving some significant hurdles to obtaining clearance to work in Indonesian waters. The JRSO and Co-Chief Scientists will set a deadline to resolve these aforementioned issues, after which pursuing clearance will no longer be feasible and the

expedition will focus on international water sites. The EPSP and TAMU Safety Panel recommended approval of several new alternate sites at the September meeting.

Expedition 363: Western Pacific Warm Pool

Planning

The Expedition 363 pre-expedition meeting was held 3 and 4 September in College Station, TX. Two additional alternate sites were identified to provide contingency if any primary site couldn't be drilled. The initial operations plan was reviewed internally prior to providing to the Co-Chief Scientists. Long-lead hardware requirements were also reviewed.

Clearance, permitting, and environmental assessment activities

Australian authorities clarified that Australia has seabed rights to the Indonesian Exclusive Economic Zone (EEZ) waters where one Expedition 363 site is located, confirming that a coring expedition would only require authorization from Australia and the Australian government would provide notification to Indonesia. The US State Department has concurred and the JRSO will now pursue clearance for this site from Australia.

Expedition 366: Mariana Convergent Margin

Planning

The Expedition 366 pre-expedition meeting was scheduled for October, next quarter.

Staffing

Two Co-Chief Scientists accepted invitations to sail.

Clearance, permitting, and environmental assessment activities

The EPSP and TAMU Safety Panel recommended approval for Expedition 366 sites. All sites are in US waters and will require notification to the Bureau of Ocean Energy Management (BOEM) once the *Scientific Prospectus* is published. One site has been identified that may require conflict resolution with naval operations.

Expeditions 367 and 368: South China Sea Rifted Margin

Clearance, permitting, and environmental assessment activities

The EPSP and TAMU Safety Panel reviewed sites in September. The proponents were asked to come back at next year's meeting to address concerns and issues raised by the panels, at which time the JRSO will need to be ready to discuss a hydrocarbon-monitoring plan.

Expedition 369: Australia Cretaceous Climate and Tectonics

Clearance, permitting, and environmental assessment activities

The EPSP and TAMU Safety Panel recommended approval for the Expedition 369 sites.

Expedition TBD: Hikurangi Subduction Margin

Planning

The second CORK engineering design meeting was held 17 and 18 September in College Station, TX, with six of the proponent group in attendance. The next design meeting was tentatively planned for March 2016.

Engineering support

Engineering equipment acquisitions and updates

Vibration-isolated television system

The new fiber optic umbilical was received, tested, and delivered to the *JOIDES Resolution* in July in Fremantle, Australia. The umbilical was installed during the tie-up period and was successfully tested during Expedition 356.

Technical and analytical services

Maintenance period activities

Shipboard installation and testing of the migration of control software on the Whole-Round Multisensor Logger (WRMSL) was successfully completed during the 2015 maintenance period. New drive hardware on this instrument was also installed and tested and, as planned, the system was rolled back to its previous state after testing until the Geophysics Laboratory Working Group (LWG) reviews the results and makes a recommendation to complete the migration permanently. Implementation of a scanning electron microscope (SEM) image uploader and Laboratory Information Management System (LIMS) report was also completed during the maintenance period. As is common, several systems experienced restart issues as they were reinitialized after the complete shutdown. These restart issues were a result of interrupted activity, and all were resolved by the end of the maintenance period.

Analytical systems

Analytical systems acquisitions and updates

- The new DTECH alternating field (AF) demagnetizer was installed on the ship and used during Expedition 356.
- Construction and testing of the second shipboard imaging logger for performing 360° imaging of the outside of hard rock core sections was initiated and nearly completed during the quarter. The logger will be shipped to the Expedition 360 (SW Indian Ridge Lower Crust and Moho) port call.
- Planning work continued and software development began for the new He-free superconducting rock magnetometer (SRM) from 2G Enterprises.

Laboratory working groups

The 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.

The Geology, Geochemistry, and Curation and Core Handling LWGs did not meet this quarter, as there was a maintenance period and no new expedition issues. These LWGs will meet next quarter to discuss issues from recent expeditions.

Geophysics

The Geophysics LWG met this quarter to discuss the following issues arising from Expedition 355. This was the first LWG meeting to include external participants (D. Blackman and T. Morris), who joined by videoconference.

- Paleomagnetics data processing: Scientist L. Tauxe passed on the request that our report structure not change so that various scientists' third-party software (e.g., PuffinPlot) would continue to parse data correctly. The LWG agreed that changes to the report format should be limited and that a general statement as to what software is available on the ship should be added to the pre-expedition materials sent to the participants. Tauxe also requested that third-party software be made available, but the JRSO is not in a position to support third-party software and keep such software updated.
- Whole-round magnetic susceptibility measurements: The LWG and Bartington Instruments reviewed measurement experiments done during Expedition 355 to check the correction factor for the frequency-adjusted Bartington MS2C loops and found them compelling; the loop correction factor was adjusted to match the empirically determined value.
- Poor color reflectance performance in the darker end of cores and first derivative measurements for mineral species: The LWG tasked the Analytical Systems section with testing new sensors and light sources in the coming months and reporting results back to the LWG with a proposal for a path forward to improve color measurements on the ship.
- Automated Vane Shear: There was a problem with parsing information from the barcode label incorrectly; the LWG established an action item to ensure the barcode scanner is programmed properly to enable the upload to work correctly.
- Agico JR-6A spinner magnetometer data: The LWG discussed a project to integrate Agico JR-6A spinner magnetometer data into the LIMS database. A project was approved this quarter to write an uploader that will accept the JR-6A Spinner Magnetometer files and make the data available in the LIMS database (see "Software development" in "Development, IT, and Databases").
- Problems with the old DTECH AF demagnetizer: The AF demagnetizer was replaced, but there is no report yet on the performance of the new one.

Other projects and activities

Geosciences Laboratory

The TAMU Geosciences X-ray fluorescence (XRF) Core Scanner facility hosted six groups of scientists for XRF scanning projects during this period, using the facility approximately 70% of the available days. It is becoming more common for IODP expedition scientists to desire XRF scanning to enhance the shipboard

splice; the Expedition 355 and Expedition 356 Science Parties plan to do extensive scanning while the cores are in College Station.

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.

JRSO expedition core sampling

The JRSO planned sample and curation strategies this quarter for upcoming JRSO Expeditions 359, 360, and 361. A JRSO Curatorial Specialist supervised shipboard core sampling during Expedition 356 and reviewed all shipboard and moratorium-related requests in coordination with the other members of the expedition SAC.

Gulf Coast Repository activity

Sample requests

The following table provides a summary of the 2,523 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.

Sample request number, name, country	Number of samples taken	Number of cores XRF scanned	Number of cores Imaged	Number of visitors
36504, Rolewicz, USA	11			1
36106, Hartman, Netherlands	44			
34405, Gill, USA	251			
34635, Frings, Sweden	18			
35937, Harper, USA	10			
35634, Weimin, USA	18			
33955, Bijl, Netherlands	69			
34232, Gill, USA	51			
33895, Zellers, USA	11			
34220, Sweet, USA	18			1
33923, Weimin, USA	17			
33985, Hammes, USA	23			1
33907, Patterson, USA	269			
34279, St. John, USA	1			
26770, Diz, Spain	73			
32903, Ohneiser, New Zealand	29			
30736, Pekar, USA	255			
32774, Kordesch, United Kingdom	141			
33887, Ramos, USA	19			
32854, Setoyama, USA	12			
33812, Gombosi, USA	28			1
33620, Ford, USA	29			
33556, McKinley, USA	8			1

Sample request number, name, country	Number of samples taken	Number of cores XRF scanned	Number of cores Imaged	Number of visitors
32903, Taylor, United Kingdom	30			
31714, Woodard, USA	173			
31713, Gombosi, USA	52			1
31151, Diester-Haas, Germany	163			
31806, Westerhold, Germany	97			
31755, Norris, USA	136			
28102, Guyard, France	44			
30316, Huang, Australia	58			
30894, Okawara, Japan	19			
29914, Brens, Australia	5			
29403, Bendle, United Kingdom	12			
30916, Python, Japan	55			
30529, Loyd, USA	180			
31246, Paytan, USA	149			
Expedition 355 Sample Party				21
Tours/demonstrations	4			35
Totals	**2,523**	**0**	**0**	**62**

GCR tours/visitors

Type of tour or visitor	Number of Visitors
Scientist visitors	28
Educational tours/demonstrations (4)	35
Totals	**62**

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 classroom exercises.

Other GCR activities

Expedition 355 sampling party

The Expedition 355 sampling party was held 24–28 August at the GCR, with 21 scientists from Expedition 355 in attendance. More than 17,000 samples were taken over the 5-day period.

GCR renovation

The GCR refurbishment project began on September 15 with the demolition and removal of the existing furniture and cabinetry. Sampling activities are being conducted in a temporary space in the chemistry laboratory until anticipated project completion in December 2015.

Curating the legacy and IODP core collection at the KCC

Under a long-term contract with the TAMRF, the KCC curates the Legacy (DSDP and ODP) cores and the IODP cores collected by the *JOIDES Resolution*. Sample requests related to these cores are received from

the researchers all over the world, and the KCC provides services in support of core sampling, analysis, and education.

Sample requests

The following table provides a summary of the 602 samples that were taken at the KCC 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. The KCC conducted digital imaging of working half sections that were pulled for sampling during the quarter; however, the imager broke down and efforts were initiated to repair it as soon as possible.

KCC Sample request number, name, country	Number of samples taken	Number of visitors to KCC
18419IODP, Bahk, South Korea	0	2
25278IODP, Chen, China	30	
27134IODP, Sun, China	28	
27875IODP, Herbert, USA	80	
30894IODP, Okawara, Japan	62	
31168IODP, Dunbar, New Zealand	127	
31206IODP, Bernabeu, Spain	102	
31696IODP, Lear, United Kingdom	15	
32702IODP, Firth, USA	0	
32718IODP, Boyko, Israel	3	
32725IODP, Quintana, USA	0	
33375IODP, Moss, Australia	61	
33789IODP, Arculus, Australia	85	
34126IODP, Scott, New Zealand	3	
34147IODP, Andrews, USA	6	
Totals	**602**	**2**

KCC tours/visitors

Type of tour or visitor	Number of Visitors to KCC
Teacher and students from Osaka Toyonaka High School	8
Staff and students from National Taiwan University (NTU)	5
PTA members from high school in Hiroshima	30
Ministry of Education, Culture, Sports, Science and Technology (MEXT) staff	1
Students from various Chinese universities	20
Mass communication staff (Kochi Shimbun)	2
Totals	**66**

Use of core collection

The KCC promotes outreach use of the core collection by conducting tours to the repository (see "KCC tours/visitors" table above) and providing materials for display at meetings and museums. Media

representatives from Kochi Shimbun (local newspaper) also visited the KCC this quarter to collect information to write an article on IODP cores.

Other KCC activities

Expedition 354 sampling party

The Expedition 354 sampling party was held 31 August–5 September at the KCC, with 7,736 samples taken by the 21 researchers and students in attendance. A dark room was set up during the sampling party to facilitate splitting and sampling of approximately 60 core sections in red-light condition so the researchers could analyze samples for light-sensitive parameters. One researcher also utilized KCC's XRF and X-ray computed tomography (XCT) analytical facility.

Expedition 353 sampling party

The Expedition 353 core sampling party was scheduled for 13–23 October at the KCC. Integrated sample lists for each site and hole were created and a video conference with the JRSO staff was organized to initiate preparations for the sampling party.

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

No new data were added to the LIMS database on shore this quarter. Data for Expeditions 351 and 352 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	880	USA	504
2	United Kingdom	268	United Kingdom	239
3	Germany	200	Japan	199
4	Russia	99	Germany	180
5	China	97	China	111
6	Australia	77	Unknown	94
7	Brazil	77	Netherlands	50
8	Japan	68	France	32
9	France	59	New Zealand	29
10	New Zealand	51	India	26
	Others	279	Others	108
	Total	**2,155**	**Total**	**1,572**

Top 20 database web queries				
Rank	Janus database		LIMS database	
	Query	Downloads	Query	Downloads
1	Core summaries	2,175	Samples	1,347
2	Site summaries	959	Images—LSMIG (section scans)	893
3	Images—photos	852	Section summaries	765
4	XRD files	543	Images—core photos (scan composites)	707
5	Point calculation	465	Physical properties—RGB	317
6	Sample	422	DESC report (descriptive data)	279
7	Special holes	333	Core summaries	270
8	Paleontology—age model	286	Hole summaries	221
8	Paleontology—age model	286	Hole summaries	221
9	Chemistry—rock eval	277	Physical properties—RSC	196
10	Hole trivia	197	Physical properties—GRA	188
11	Hole summaries	178	Chemistry—IW	155
12	Physical properties—MAD	172	Chemistry—carbonates	152
13	Images—TSMicro	157	Physical properties—MS	139
14	Physical properties—MSL	146	Physical properties—PWL	91
15	Physical properties—GRA	144	X-ray–XRD	89
16	Leg summaries	116	Composite depths	88
17	Paleontology—Paleo investigation	112	Physical properties—MAD	87
18	Images—prime images	111	Hole summary list	86
19	Images—close-ups	109	Splice detail	82
20	Chemistry—IW	107	Splice	81
	Others	1,714	Others	893
	Total	**9,575**	**Total**	**7,126**

Data requests submitted to the TAMU Data Librarian	
Requests	**Total**
How to access data	6
Samples	4
Color	1
Depths	1
Drilling data	1
Overview	1
Paleomagnetism	1
Photos	1
Porosity	1
Splice	1
Total	**18**

Countries submitting data requests to the TAMU Data Librarian	
Country	**Total**
USA	11
United Kingdom	3
Australia	1
Brazil	1
Germany	1
Spain	1
Total	**18**

Network systems operation, maintenance, and security

Tie-up Activities

During the tie-up period (31 May–31 July), the JRSO

- Installed and configured a new storage array (HP 3PAR SAN);
- Updated Windows and Macintosh workstations;
- Upgraded McAfee antivirus, NetSight, and NAC software;
- Migrated email services to Groupwise 2014;
- Configured Novell OES services; and
- Upgraded network firmware.

Software development

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

Work continued on this project, which is on track to complete all deliverables by the end of the 2016 tie-up period.

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

Work continued on this project, which is on track to complete all deliverables by July 2016.

Scanning Electron Microscope Uploader and Downloader

Project scope and deliverables

When completed, this project will provide online access to all images taken with the 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, and sample type and ID).

Project status

The JRSO successfully completed this project in July.

Extending IMS to WRMSL and STMSL

Project scope and deliverables

This project replaces the current applications used on the WRMSL and STMSL with the current version of Integrated Measurement System (IMS) framework application.

From the user's perspective, this application will have the look and feel of the other IMS-supported logging systems. From the developer's perspective, a large percentage of the code will be reused from the other IMS-supported logger libraries and new code will be developed in the IMS framework.

Project status

All work on this project was completed this quarter; however, the management team has approved the Expedition Project Manager's request to delay deployment from the Expedition 359 sail date to Expedition 361, which ends on 31 March 2016.

360 Deg Images to LIMS

Project scope and deliverables

This project improves support for capture, retrieval, and management of Whole-Round Line Scan (WRLS) images and their composites. Successful integration entails revisions to data storage definitions, LIMS Reports, the data upload facility, and the Section Half Image Logger (SHIL).

Project status

Work continued on this project, which is on track to complete all deliverables by December 2015.

Thin Section Form Report Follow-up

Project scope and deliverables

This project improves the appearance of reports generated by the Report Writer application, particularly relating to pagination, in response to repeated user requests and improves user friendliness of the Report Builder, which should improve task efficiency and report quality for personnel defining reports and shorten the learning curve for new personnel assigned to that role.

Project status

The JRSO initiated this project in August with a planned completion date of 1 November.

JR-6A Spinner Magnetometer Uploader

Project scope and deliverables

The goal of this project is to write an uploader that will accept the JR-6A Spinner Magnetometer files and make the data available in the LIMS database. The JR-6A Spinner Magnetometer is the primary instrument used in the paleomagnetism laboratory to measure discrete samples. A large amount of data is collected with this instrument, but the data are not uploaded to LIMS. The Geophysics LWG has received requests from scientists to make these data available in LIMS.

Project status

The JRSO approved this project for initiation in September with a planned start date of 1 December and estimated completion date of 15 February 2016.

Publication services

IODP Publication Services provides publication support services for Integrated Ocean Drilling Program and IODP riserless and riser drilling expeditions; editing, production, and graphics services for 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 distribution of Integrated Ocean Drilling Program, ODP, and DSDP publications.

Scientific publications

JRSO publications

Preliminary Reports

http://dx.doi.org/10.14379/iodp.pr.355.2015

Proceedings

http://dx.doi.org/10.14379/iodp.proc.351.2015

Expedition reports

http://dx.doi.org/10.14379/iodp.proc.351.101.2015

http://dx.doi.org/10.14379/iodp.proc.351.102.2015

http://dx.doi.org/10.14379/iodp.proc.351.103.2015

USIO publications

Data reports

http://dx.doi.org/10.2204/iodp.proc.317.209.2015

http://dx.doi.org/10.2204/iodp.proc.334.203.2015

http://dx.doi.org/10.2204/iodp.proc.336.203.2015

CDEX publications

Data reports

http://dx.doi.org/10.2204/iodp.proc.314315316.222.2015

http://dx.doi.org/10.2204/iodp.proc.338.202.2015

Citation management

Scientific publication digital object identifiers

Reports and publications	Digital object identifier (DOI) prefix	Number of online DOI resolutions			
		July 2015	August 2015	September 2015	FY15 Q4 total
IODP	10.14379	337	493	549	**1,379**
Integrated Ocean Drilling Program	10.2204	4,542	5,920	4,906	**15,368**
ODP/DSDP	10.2973	21,048	20,971	7,945	**49,964**

Ocean Drilling Citation Report

IODP Publication Services produces an annual Ocean Drilling Citation Report to provide information on how Program-related research is disseminated into the scientific community through publications. To illustrate the impact of Program science, the report includes figures that show the top peer-reviewed serials publishing Program-related research and the number of published theses based on Program science. The report also highlights the number of citations related to research undertaken in support of science themes from the 2003–2013 Integrated Ocean Drilling Program Initial Science Plan.

This year's study was conducted on citations published through December 2014 that were contained in the Ocean Drilling Citation Database, a subset of the American Geosciences Institute (AGI) GeoRef database, as of June 2015. The study was completed this quarter and is available online at http://iodp.tamu.edu/publications/AGI_studies/AGI_study_2015.pdf.

Publications management

Integrated Ocean Drilling Program closeout activities

Publications closeout

Integrated Ocean Drilling Program publications closeout activities continued during the reporting period. 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." In addition, publication obligation papers and data reports related to Expeditions 307, 312, 314/315/316, 318–320/321, 329, 331, and 334–344 were submitted to English language peer-reviewed journals or the Program.

Closing of Publication Services distribution center

TAMU warehouse space used as the Publication Services distribution center was vacated and made available to the College of Geosciences in early July. Three archive sets of the *Initial Reports of the Deep Sea Drilling Project*, the *Proceedings of the Ocean Drilling Program,* and the *Proceedings of the Integrated Ocean Drilling Program* were moved from the distribution center to the JRSO offices during FY15 Q1; before the distribution center was closed, the scientific ocean drilling community was offered the remaining inventory at no cost other than shipping. Scientific publications from the previous drilling programs are available at no charge online.

Publications website

The IODP Publications website is hosted at TAMU. During the last quarter, the IODP Publications website received 17,228 site visits and 313,308 page views.

JRSO expedition science outreach support

JRSO staff provided support to the Education Officers during Expedition 356 and assisted with planning for 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.

Asia Oceania Geosciences Society 12th Annual Meeting

- Li, C.-F., Lin, J., and **Kulhanek, D.,** 2015. Scientific drilling in the South China Sea to unravel continental breakup and seafloor spreading processes [Asia Oceania Geosciences Society (AOGS) 12th Annual Meeting, Singapore, 2–7 August 2015].
- Pandey, D.K., Clift, P., and **Kulhanek, D.,** 2015. Scientific drilling in the Arabian Sea (IODP Expedition 355): climate-tectonic interactions in the Western Himalaya [Asia Oceania Geosciences Society (AOGS) 12th Annual Meeting, Singapore, 2–7 August 2015].

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).

- Arculus, R.J., Ishizuka, O., **Bogus, K.A.**, Gurnis, M., Hickey-Vargas, R., Aljahdali, M.H., Bandini-Maeder, A.N., Barth, A.P., Brandl, P.A., Drab, L., do Monte Guerra, R., Hamada, M., Jiang, F., Kanayama, K., Kender, S., Kusano, Y., Li, H., Loudin, L.C., Maffione, M., Marsaglia, K.M., McCarthy, A., Meffre, S., Morris, A., Neuhaus, M., Savov, I.P., Sena, C., Tepley, F.J., III, van der Land, C., Yogodzinski, G.M., and Zhang, Z., 2015. A record of spontaneous subduction initiation in the Izu-Bonin-Mariana arc. *Nature Geoscience,* 8:728–733. http://dx.doi.org/10.1038/ngeo2515
- Hollis, C.J., Hines, B.R., Littler, K., Villasante-Marcos, V., **Kulhanek, D.K.,** Strong, C.P., Zachos, J.C., Eggins, S.M., Northcote, L., and Philips, A., 2015. The Paleocene–Eocene Thermal Maximum at DSDP Site 277, Campbell Plateau, southern Pacific Ocean. *Climates of the Past,* 11:1009–1025. http://dx.doi.org/10.5194/cp-11-1009-2015
- Li, C.-F., Li, J., Ding, W., Franke, D., Yao, Y., Shi, H., Pang, X., Cao Y., Lin, J., **Kulhanek, D.K., Williams, T.,** Bao, R., Briais, A., Brown, E.A., Chen, Y., Clift, P.D. Colwell, F.S., Dadd, K.A., Hernandez-Almeida, I., Huang, X.-L., Hyun, S., Jiang, T., Koppers, A.A.P., Li, Q., Liu, C., Liu, Q., Liu, Z., Nagai, R.H., Peleo-Alampay, A., Su, X., Sun, Z., Tejada, M.L.G., Trinh, H.S., Yeh, Y.-C., Zhang, C., Zhang, F., Zhang, G.-L., and Zhao, X., 2015. Seismic stratigraphy of the central South China Sea basin and implications for neotectonics. *Journal of Geophysical Research: Solid Earth,* 120(3):1377–1399. http:/dx.doi.org/10.1002/2014JB011686
- Mertens, K.N., Takano, Y., Yamaguchi, A., Gu H., **Bogus, K.,** Kremp, A., Bagheri, S., Matishov, G., and Matsuoka, K., 2015. The molecular characterization of the enigmatic dinoflagellate *Kolkwitziella acuta* reveals an affinity to the *Excentrica* section of the genus *Protoperidinium. Systematics and Biodiversity*. http://dx.doi.org/10.1080/14772000.2015.1078855

Appendix: JRSO quarterly report distribution

J. Allan, NSF, USA, jallan@nsf.gov
T. Janacek, NSF, USA, tjanacek@nsf.gov
T. Kashmer, NSF, USA, tkashmer@nsf.gov
K. Miller, TAMU, USA, kcmiller@tamu.edu
G. Camoin, European Management Agency, CEREGE, France, camoin@cerege.fr
M. de Castro Silva Filho, CAPES, Brazil, marcio.filho@capes.gov.br
B.K. Bansal, MoES, India, bansalbk@nic.in
Q. Sun, MOST, China, sunqing@acca21.org.cn
M. Coffin, ANZIC, University of Tasmania, Mike.Coffin@utas.edu.au
G.Y. Kim, KIGAM, Korea, gykim@kigam.re.kr
R. Anma, University of Tsukuba, Japan, ranma@sakura.cc.tsukuba.ac.jp
A. Koppers, Oregon State University, USA, akoppers@coas.oregonstate.edu
C. Neal, University of Notre Dame, USA, neal.1@nd.edu
C. Ravelo, University of California Santa Cruz, USA, acr@ucsc.edu
A. Roberts, Australian National University, andrew.roberts@anu.edu.au
P. Wilson, University of Southampton, United Kingdom, paul.wilson@noc.soton.ac.uk
J. Austin, IODP Forum, University of Texas at Austin, USA, jamie@utig.ig.utexas.edu
R. Gatliff, ESO, British Geological Survey, United Kingdom, rwga@bgs.ac.uk
H. Given, Scripps Institution of Oceanography, USA, hgiven@ucsd.edu
K. Gohl, ECORD, Alfred Wegener Institute, Germany, karsten.gohl@awi.de
B. Katz, EPSP, Chevron Corporation, USA, BarryKatz@chevron.com
S. Kuramoto, CDEX, JAMSTEC, Japan, s.kuramoto@jamstec.go.jp
D. Mallinson, SEP, East Carolina University, USA, MALLINSOND@ecu.edu
K. Miller, SEP, Rutgers University, USA, kgm@rci.rutgers.edu
Y. Tatsumi, CIB, Kobe University, Japan, tatsumi@diamond.kobe-u.ac.jp