International Ocean Discovery Program

JOIDES Resolution Science Operator

FY16 Q1 Operations and Management Report

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Submitted by the JRSO

to

The National Science Foundation

and

The *JOIDES Resolution* Facility Board

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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) FY16 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 (OSR).

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.

Progress reporting

JRSO reports

JRSO FY15 Q4 Quarterly Operations and Management Report

The JRSO operations and management report for the fourth quarter of FY15 (July–September 2015) was submitted to NSF on 2 November (http://iodp.tamu.edu/publications/AR/FY15/FY15_Q4.pdf).

JRSO FY15 Annual Report

The JRSO FY15 Annual Report was completed and delivered to NSF and the *JOIDES Resolution* Facility Board (JRFB) on 22 December 2015 (http://iodp.tamu.edu/publications/AR/FY15AR.pdf).

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

Senior JRSO staff attended the US Science Support Program (USSSP) leadership meeting on 15 December 2015 at the American Geophysical Union (AGU) Fall Meeting.

Project portfolio management

The JRSO completed two projects this quarter and continued work on four other projects. The JR-6A Spinner Magnetometer Uploader and 360 Deg Images to LIMS projects were completed. Ongoing projects under way this quarter include Liquid Helium–Free Superconducting Rock Magnetometer Installation and Software Update, Improve Web Services, Extending IMS to WRMSL and STMSL, and Thin Section Form Report Follow-up (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 38,304 site visits and 391,757 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	FY16 Q1 page views*	FY16 Q1 site visits*
www-odp.tamu.edu	895,592	42,733
www.odplegacy.org	4,433	1,682
www.deepseadrilling.org	606,917	13,593
Total	**1,506,942**	**58,008**

*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 the 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
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)	Z. Sun J. Stock	A. Klaus
South China Sea Rifted Martin[7]	368	Hong Kong	9 April–9 June 2017	61 (5/56)	56 (2/54)	Z. Jian K. McIntosh	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	TBD	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 355: Arabian Sea Monsoon CPP

Postexpedition activities

The Expedition 355 postexpedition editing meeting was held 16–20 November 2015 in College Station, TX.

Expedition 356: Indonesian Throughflow

Postexpedition activities

The JRFB granted a temporary publication embargo on the Expedition 356 *Preliminary Report* to give authors time to prepare three key findings papers submitted to major scientific publications—one to *Geology* and two to the family of *Nature* journals. Postexpedition planning was initiated for the Expedition 356 sampling party, which is scheduled for the next quarter at the Gulf Core Repository (GCR).

Expedition 359: Maldives Monsoon and Sea Level

Planning

Planning continued for the required anchorage stop in Malé, Maldives, to clear the vessel into Maldives waters and to arrange a visit to the ship by Maldives officials and media.

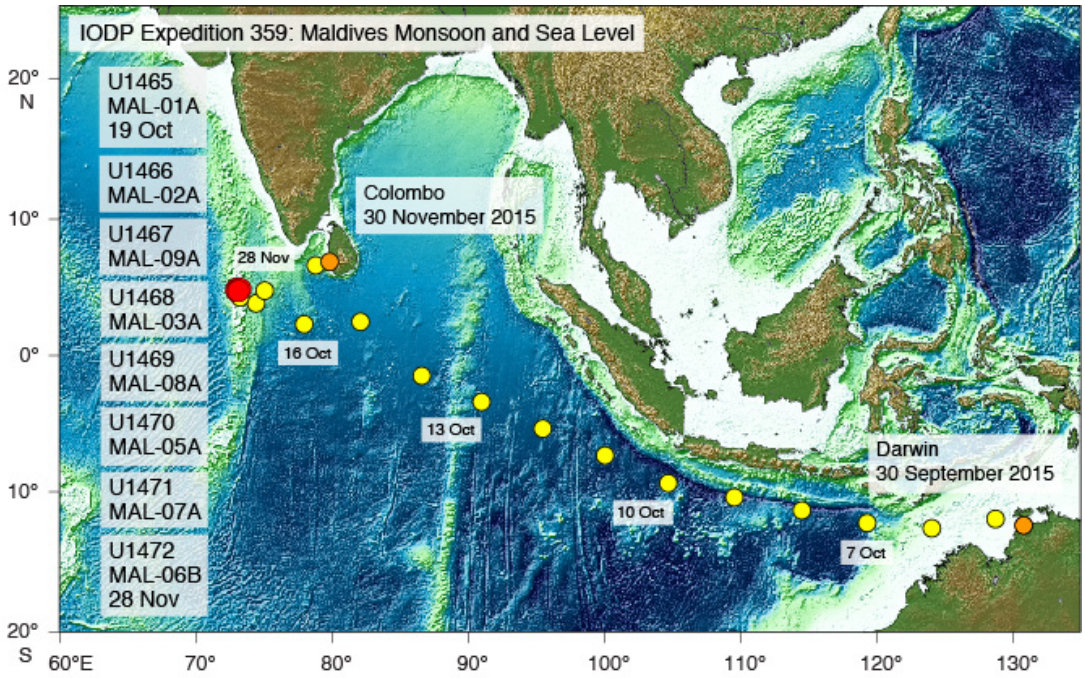
Staffing

Expedition 359 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	2	
Australia and New Zealand: Australia/New Zealand IODP Consortium (ANZIC)	1	
India: Ministry of Earth Science (MoES)	1	
Brazil: Coordination for Improvement of Higher Education	1	

Clearance, permitting, and environmental assessment activities

A special permit was required by the Maldives Ministry of Defense for the *JOIDES Resolution* to carry explosives while in Maldivian waters. The JRSO received the explosives permit on 17 October, the day before the ship arrived in the Maldives. The two observers were identified the day prior and the day of ship's arrival in the Maldives.

Site Map



Coring summary

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (n)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1465	U1465A	4°55.9873'N	73°00.6786'E	515.0	11	76.60	53.37	69.7
	U1465B	4°55.9862'N	73°00.6897'E	512.6	22	155.40	9.41	6.1
	U1465C	4°55.9865'N	73°00.7002'E	510.1	25	178.20	24.60	13.8
Site U1465 totals					**58**	**410.20**	**87.38**	**21.3**
U1466	U1466A	4°55.9888'N	73°01.6785'E	518.1	50	326.20	243.79	74.7
	U1466B	4°55.9883'N	73°01.6893'E	517.1	56	495.70	88.54	17.9
Site U1466 totals					**106**	**821.90**	**332.33**	**40.4**
U1467	U1467A	4°51.0139'N	73°17.0200'E	487.5	4	32.00	31.49	98.4
	U1467B	4°51.0255'N	73°17.0204'E	487.5	77	617.20	560.39	90.8
	U1467C	4°51.0362'N	73°17.0197'E	487.3	35	332.10	266.15	80.1
	U1467D	4°51.0475'N	73°17.0201'E	487.2	21	199.50	203.29	101.9
	U1467E	4°51.0137'N	73°17.0312'E	487.4	0	0.00	0.00	0.0
Site U1467 totals					**137**	**1,180.80**	**1,061.32**	**89.9**
U1468	U1468A	4°55.9832'N	73°04.2780'E	521.5	110	873.70	458.70	52.5
	U1468B	4°55.9832'N	73°04.2888'E	521.5	0	0.00	0.00	0.0
Site U1468 totals					**110**	**873.70**	**458.70**	**52.5**

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (n)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1469	U1469A	4°54.4143'N	72°00.4910'E	426.9	17	161.10	4.14	2.6
	U1469B	4°54.4166'N	72°00.4694'E	426.9	3	29.40	0.72	2.4
Site U1469 totals					**20**	**190.50**	**4.86**	**2.6**
U1470	U1470A	4°45.9828'N	72°59.0324'E	399.7	24	190.00	139.78	73.6
	U1470B	4°45.9818'N	72°59.0210'E	399.7	18	174.80	7.35	4.2
Site U1470 totals					**42**	**364.80**	**147.13**	**40.3**
U1471	U1471A	4°45.9825'N	73°08.1358'E	419.4	82	685.10	366.08	53.4
	U1471B	4°45.9825'N	73°08.1263'E	420.3	1	6.70	6.62	98.8
	U1471C	4°45.9831'N	73°08.1147'E	419.2	19	178.80	170.19	95.2
	U1471D	4°45.9828'N	73°08.1035'E	419.2	6	57.00	56.76	99.6
	U1471E	4°45.9829'N	73°08.0929'E	419.2	43	407.40	171.54	42.1
Site U1471 totals					**151**	**1,335.00**	**771.19**	**57.8**
U1472	U1472A	4°46.2653'N	73°04.0111'E	379.3	34	251.90	233.75	92.8
Site U1472 totals					**34**	**251.90**	**233.75**	**92.8**
Expedition 359 totals					**658**	**5,428.80**	**3,096.66**	**57.0**

Science summary

Eight sites were drilled during Expedition 359 along two transects in the Kardiva Channel in the Inner Sea of the Maldives. Drilling in the carbonate platforms and drifts in the Maldives aimed to recover the marine tropical record of the Neogene sea-level changes and the onset of the monsoon-related current system in the Indian Ocean. The recovered cores and log data elucidate both aspects with great detail. The most arresting accomplishment is the documentation of how the sea level controlled the carbonate platform system that was thriving during the Miocene Climate Optimum and abruptly transitioned into a current-dominated system in the late middle Miocene. This transition is linked to the onset of an early intensification of the Indian monsoon and the coeval demise of some of the Maldivian platforms.

Postexpedition activities

The JRFB granted a temporary publication embargo on the Expedition 359 *Preliminary Report* to give authors time to prepare and submit a key findings paper to *Science*.

Expedition 360: Southwest Indian Ridge Lower Crust and Moho

Planning

Efforts to finalize port call preparations continued this quarter, and efforts to finalize laboratory and supply requirements continued until the airfreight deadline on 17 November 2015.

Clearance, permitting, and environmental assessment activities

After receipt of the Co-Chief Scientists' safety report and clarification of the coordinates of the box around the operational area, the Environmental Protection and Safety Panel (EPSP) recommended approval for operations within the coordinate box.

Expedition 361: South African Climates

Planning

Review of sampling and research requests was initiated this quarter, including technical review for special requirements in the laboratories. Final purchasing and packing was completed for the surface shipment deadline in the first week of December.

Staffing

The Ancillary Project Letter (APL) proponent withdrew from participation in late October. After a special call, an applicant accepted the invitation to fill the position and oversee APL-related issues.

Clearance, permitting, and environmental assessment activities

In late December, the JRSO received notification that South Africa will be issuing the research permit and responded to related queries relayed from the US embassy. The environmental evaluation for vertical seismic profile (VSP) activities was received, reviewed, and forwarded to NSF for approval in late December.

Expedition 362: Sumatra Seismogenic Zone

Planning

The draft *Scientific Prospectus* was revised to reflect the decision to operate in international waters and incorporate the additional sites reviewed by the EPSP at the end of the last quarter. A meeting with the Expedition 362 scientists in attendance at the AGU Fall Meeting was held to discuss expedition planning and the change in the operational plan.

Clearance, permitting, and environmental assessment activities

After no progress over 6 months of efforts to resolve issues related to clearance, the decision was made to focus only on international water sites and forego pursuing clearance for sites in the Indonesia Exclusive Economic Zone (EEZ). The JRSO also decided to offer Indonesia two guest scientific berths.

Expedition 363: Western Pacific Warm Pool

Planning

The Co-Chief Scientists and proponents continued to work to finalize documentation of two new alternate sites to submit for review. Work also continued on finalization of the draft *Scientific Prospectus,* which was made available to invited scientists.

Staffing

The first two rounds of invitations were issued this quarter.

Expedition 366: Mariana Convergent Margin

Planning

The Expedition 366 pre-expedition meeting was held 19 and 20 October 2015 in College Station. Work on finalizing the *Scientific Prospectus* for publication continued through the quarter. A manufacturer was found to make and install screens on 10¾ inch casing for the sites that will be outfitted with CORK-lites postexpedition.

Staffing

Nominations were received in mid-November, and the Co-Chief Scientists and Expedition Project Manager (EPM) began work on evaluating applicants and preparing an initial invitation list.

Clearance, permitting, and environmental assessment activities

The decision was made to extend the depth of some sites, which will require review by the EPSP and the TAMU Safety Panel. An initial query was sent to the Navy (COMSUBPAC) concerning de-conflicting operations at Site 1200. A follow-up will be sent when the *Scientific Prospectus* is published.

Expedition 367 and 368: South China Sea Rifted Margin

Planning

A combined pre-expedition meeting was scheduled for 29 February–1 March 2016.

Staffing

Four Co-Chief Scientists were staffed during the quarter. A call for scientists to sail was issued with an application deadline to the PMOs of 15 January 2016.

Expedition TBD: Hikurangi Subduction Margin

Planning

The JRSO and proponents continued to work on various aspects of the CORK designs. A meeting was held to review status and discuss issues on 13 December 2015 during the AGU Fall Meeting, and a CORK design meeting was scheduled for 7 and 8 March 2016 in College Station where convergence on a final design is anticipated.

Technical and analytical services

Analytical systems

Analytical systems acquisitions and updates

A second imaging logger was built and placed aboard the ship to facilitate 360-degree imaging of the outside of rock sections. After comparing images from the original shipboard imaging logger to images from the new one, the Science Party elected to use the original system to image both the outside of the core sections and the cut faces. The second imaging logger will be returned to shore, where it will become a test bed for program improvements and upgrades.

New color reflectance spectrophotometers were purchased from Ocean Optics. These QEPro detectors are Peltier-cooled and have exceptionally low dark current noise as well as enhanced sensitivity and dynamic range. Testing is planned to determine if the color issues we have been facing (largely the high level of noise on the blue end of the spectrum) can be overcome with these new detectors. Testing of the QEPro on hematite and goethite pigments also demonstrates that these detectors provide equivalent or better performance for the use of the first derivative of percent reflectance as a function of wavelength ($d\%R/d\lambda$), which provides a proxy for the presence and rough concentration of hematite and goethite in marine sediment.

The Thermo Niton XLT3 handheld X-Ray Fluorescence (XRF) spectrometer suffered a complete failure of its onboard processor and was sent to shore for repair. The JRSO is evaluating options for repair or replacement of the instrument to continue to provide this capability (or an equivalent).

2G Enterprises informed the JRSO that delivery of the new liquid helium-free superconducting rock magnetometer (SRM) would be delayed until approximately late February 2016. This will shorten time to test the new system and the software being developed by JRSO staff but should not affect the new system's availability for Expedition 362 unless the schedule slips further.

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.

Geology

The Geology LWG met this quarter to discuss current action items as well as issues arising from Expedition 356. This was the first meeting to include external participants (Steffen Kutterolf [GEOMAR Helmholtz Centre for Ocean Research, Kiel], Benoit Ildefonse [French National Centre for Scientific Research], and Christopher Charles [Scripps Institution of Oceanography]), all of whom participated by phone/video.

Action items:

- DESClogik upgrade: Requirements are being organized and prioritized for a potential change to DESClogik's data structure with an eye toward significant improvements to performance. LWG members are also writing a comprehensive user guide document, from concept to procedures. Work has been done to simplify a number of the predefined value lists (e.g., the definitions list for microfossil abundance and preservations have been moved to a legacy page and will not be handled within DESClogik any longer).
- Structure orientation computations: DESClogik users have requested the ability to do structural computations within the product. This has proved infeasible (DESClogik is not MS Excel, though it has a similar look and feel), so B. Ildefonse and others on Expedition 360 will ensure that procedures, a computational Excel worksheet, data management, and documentation are all compatible and available.
- DESCINFO Value List Manager: This program is currently run through Google Docs, but accessibility and usability from the ship is very poor. Specifications have begun to change this workflow to be local to the ship and synced to shore at specific intervals (e.g., end of expedition).
- Microscope issues: Users have complained of the flashing from the close-up station at the aft end, so a screen was obtained to block this light. Additionally, the micrograph scale bar computation will be adjusted to be correct regardless of objective and field of view; user error was too easy to make if the process was not well understood.
- BugWin trial: Technicians are creating a guide to introduce scientists to the tool in a better way so that we can get the feedback needed to decide upon future use.
- Automated SHIL image cropping: Automated cropping of the sides of images from the section half imaging logger (SHIL) did not work as intended; further research is needed to determine a good method to accomplish automated cropping to reduce the possibility of user-created error in the cropped images.

- Onboard digital library: Work continued on researching licensing of an onboard digital library of scientific publications, as downloading them over the satellite is a slow and painful process. A few publishers have given their okay to having a local copy available on the *JOIDES Resolution,* and C. Charles will talk to Wiley in his capacity as Editor of *Paleoceanography* and report back.
- Stratigraphic correlation process: IODP technicians have been trained in the correlation workflow and have a basic introduction to the Correlator program to help orient new scientists in the process of stratigraphic correlation. Their responsibility is to do this orientation, not to work on the actual correlation process.
- Digital hand lens: Dinolite USB handheld microscopes are available on board for use as a digital hand lens. These tools are capable of capturing images, but it was decided that the JRSO will not manage such images. (Tools do exist to upload such an image into the core description software as a digital asset, if an image is of particular importance.)

Expedition 356 cruise-related Issues:

- One scientist complained about the complexity of the new Scanning Electron Microscope (SEM) image capture program, saying it was too laborious. Further feedback is needed, since more than 800 images were successfully uploaded to the database using the tool.
- Scientists complained about being required to use Adobe Illustrator and that its learning curve was too sharp. We do not require the scientists to use Illustrator, only that they save files in a format that can be opened in Illustrator for later Publication Services work. To ensure clear communication of this, an MS PowerPoint tutorial will be created and given during the cruise orientation period when our expectations and requirements are explained.

Geophysics

The Geophysics LWG met this quarter to discuss current action items as well as issues arising from Expedition 356. External participants were Donna Blackman (Scripps Institution of Oceanography) and Tony Morris (School of Earth, Ocean, and Environmental Sciences; University of Plymouth).

Expedition 356 cruise-related issues:

- Standard logging data: Shear wave data were not acquired by the Schlumberger engineer because the Science Party did not think they would be useful. The data are useful for legacy purposes and the acquisition does not adversely affect the expedition (no added time or operational constraints; the shear wave data are acquired by a tool on the triple combination [triple combo] and Formation MicroScanner [FMS] tool strings). The LWG formally requested that all standard logging data always be acquired and saved.
- Data parsing issues: The new Icefield core orientation tools had problems with data parsing because of the inclusion of commas in the comments string; this will be investigated and corrected, either by programmatically removing commas or by training users not to use them.
- Surfar software issue: One scientist wanted to use the DOS-based Surfar software for the KLY-4 KappaBridge instead of Gee's LabVIEW program and the staff had difficulty getting it to work on modern PCs. The LWG recommended that the Surfar software not be used.

- Giesa Automated Vane Shear software issue: The software appears to be incompatible with the latest Windows or Microsoft Office updates and was not available. Inquiries to the vendor for updates or the command codes for their controller (for a JRSO-written control program) have not been fruitful, and no other vendor has been found that provides a similar product. JRSO information technology (IT) staff will try to work around the problem.
- Axis assignment: Some *P*-wave caliper data on discrete samples were acquired without having an axis assigned and these data did not show up on the report; the report has been adjusted to report "unknown" axis results, though the LWG recommends an axis always be assigned if possible.
- Sensor drift: Complaints about the drift of the Bartington MS2K sensors were the result of exceptionally weakly magnetic cores. The drift problem is below the stated precision of the Bartington instrument (±10 instrument units); the JRSO has no solution in this sort of case.
- GLAD Wrap use: During the expedition, it was discovered that one shift was using GLAD Wrap on core sections, while the other was not (the sections being dry enough to allow this). The difference was discovered because of a high variance of CIELab a* and b* shift-to-shift, and shifts were urged to always use the GLAD Wrap regardless of the wet/dryness of the core sections. The section-half multisensor logger (SHMSL) user guide will be amended with an explanation of this issue, and the IODP marine technicians will include this in their training and orientation to ensure that these factors are understood by the Science Party.
- SRM software: Scientists continue to complain about the SRM software; the JRSO is developing new (more user-friendly) software along with the installation of the new He-free system.

Geochemistry

The Geochemistry LWG did not meet this quarter and will discuss issues from Expedition 356 as well as subsequent expeditions next quarter.

Curation and Core Handling

The Curation and Core Handling LWG met this quarter. This was the first meeting with external participation, though only Jason Sylvan was able to make the meeting. Issues discussed include the following:

- GCR renovations: The LWG was updated on the GCR renovations and its impact on GCR operations and the upcoming scheduled sampling parties (Expeditions 356 and 359).
- Alternative plastics: The cost of plastic is rising: current tubes and scoops for sampling are priced at $0.25 apiece. The LWG endorsed the exploration of alternative plastics, provided they have sufficient hardness and resilience.
- Sample locating: Samples are often assigned a "test list," which is a list of routing instructions (e.g., MAD, CARB) used by the technicians to ensure samples end up in the proper place. The LWG discussed various possible means to expand this concept to make it easier to find samples (e.g., for the alkalinity autotitrator software to find the specific alkalinity split). This will require further investigation.

- SampleMaster program: The LWG discussed how to begin replacing the aging SampleMaster program with a new program(s). It was decided that modules (e.g., “driller/core tech,” “catwalk samples,” etc.) would be proposed for development, rather than a single large replacement project.

Other projects and activities

Geosciences Laboratory

The TAMU Geoscience XRF Core Scanner facility hosted eight groups of scientists during this period for XRF scanning projects. Total utilization of the facility was approximately 80% of available days. IODP expedition science parties continue to request postexpedition XRF time. Expedition 355 researchers did a significant amount of work in the third quarter of FY15, and science parties from Expeditions 356 and 359 have both made large requests. Unfortunately, the X-ray source on the XRF Core Scanner failed in early January 2016, and a replacement will not be available until late March at the earliest. This will impose logistical challenges for the Expedition 356 and 359 scientists.

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 Expedition 361. A JRSO Curatorial Specialist supervised shipboard core sampling during Expeditions 359 and 360 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 4,601 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
25589IODP, Firth, USA		10	10	1
25642IODP, Firth, USA		14	14	1

Sample request number, name, country	Number of samples taken	Number of cores XRF scanned	Number of cores Imaged	Number of visitors
33515IODP, Roark, USA		216		1
32556IODP, Varkuohi, United Kingdom	27			1
31013IODP, Huck, United Kingdom		273		1
32893IODP, Tripati, United Kingdom	500			
30829IODP, Liu, China	685			
35165IODP, Suh, USA	34			
36256IODP, Yao, Canada	43			
36442IODP, Si, USA	6			
35236IODP, van der Ploeg, Netherlands	46			
37157IODP, Herrle, Germany	945			1
35694IODP, Jiang, China	278			
34121IODP, Harper, USA	141			
35255IODP, Hoogakker, United Kingdom	66			
36312IODP, O'Brien, USA	43			
37447IODP, Si, USA	2			
19870IODP, Tiwari, India	497			
33779IODP, Peterson, USA	372			
37760IODP, Beltran, New Zealand	15			
37446, Algeo, USA	100			
33314IODP, Sexton, United Kingdom	50			
37387IODP, Drury, Germany	340			1
37832IODP, Algeo, USA	64			
37916IODP, Ohta, Japan	46			
37791IODP, Fontorbe, Sweden	64			
37955IODP, Hofmann, Germany	34			
37747, Lopes, Brasil	39			
37570IODP, Mills, USA	51			1
36448IODP, Hammes	0	154		
37305IODP, Morey	0			
37262IODP, vander Weijst	20			
36724IODP, Bhattacharya, USA	93			1
32133IODP, Mote, USA	0			
Totals	**4,601**	**667**	**24**	**9**

GCR tours/visitors

Type of tour or visitor	Number of Visitors
Scientist visitors	9
Educational tours/demonstrations (1)	25
Public relations tours (2)	18
Totals	**52**

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. The Environmental Geosciences and Environmental Studies review team visited the GCR in October, and US Representative John Culberson (7th District of Texas) and his staff toured the facility on 13 November 2015.

Other GCR activities

GCR renovation

Refurbishment of the GCR continued this quarter. New floors, benches, and cabinets were installed. By the end of December 2015, the only work left to perform was to hook up the utility connections. This work was scheduled for completion the first week of January 2016.

Expedition 353 sampling party

The Expedition 353 postexpedition sampling party was held 13–23 October 2015 at the Kochi Core Center (KCC). JRSO staff worked with the KCC Curator to create integrated sample lists before the party and resolved further sampling issues during the party. A record number of more than 40,000 samples were taken during 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 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

Data from Expeditions 356 and 359 were added to the Laboratory Information Management System (LIMS) database on shore this quarter. These data are currently under moratorium and available only to the scientists who sailed on these expeditions. No new data 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	878	USA	539
2	United Kingdom	611	Japan	364
3	Russia	212	Germany	248
4	Germany	155	United Kingdom	131
5	China	131	Unknown	73
6	Japan	125	Australia	40
7	France	99	China	40
8	Taiwan	46	India	39
9	Sweden	39	France	36
10	Australia	35	Netherlands	34
	Others	315		193
	Total	**2,646**	**Total**	**1,737**

Top 20 database web queries				
Rank	Janus database		LIMS database	
	Query	Downloads	Query	Downloads
1	Images—photo	1,369	Samples	1,201
2	Site summaries	1,313	Images—photos	878
3	Core summaries	1,279	Core photos (composite)	716
4	Samples	619	Section summaries	544
5	Special holes	378	Core summaries	307
6	Chemistry—IW	232	Physical properties—MS	295
7	Chemistry—carbonates	214	Physical properties—GRA	241
8	Hole summaries	182	Physical properties—RGB	211
9	Paleontology—age models	151	Hole summaries	179
10	Hole trivia	145	Physical properties—RSC	171
11	Images—prime data images	122	Physical properties—NGR	167
12	Chemistry—rock eval	112	DESC reports	146
13	Images—close-ups	110	Affine detail	134
14	Physical properties—MSL	105	Splice detail	134
15	Physical properties—GRA	105	Images—close-ups	127
16	Images—TS micrographs	87	Hole summaries list	124
17	Leg summaries	83	Physical properties—MAD	117
18	Physical properties—color	82	SRM sections	100
19	Physical properties—MAD	81	Chemistry—carbonates	82
20	Paleontology—age profiles	76	Images—microphotographs	72
	Others	1,128	Others	863
	Total	**7,973**	**Total**	**6,809**

Data requests submitted to the TAMU Data Librarian	
Requests	**Total**
How to access data	8
Paleomagnetism	3
Photos	3
DESC	2
Isotopes	2
Magnetic susceptibility	2
Natural gamma radiation	2
Splice	2
DHT	1
Interstitial water	1
Moisture and density	1
P-wave logger	1
Solids	1
Visual core description	1
Total	**30**

Countries submitting data requests to the TAMU Data Librarian	
Country	**Total**
USA	16
Germany	3
United Kingdom	2
Austria	1
Brazil	1
Hong Kong	1
Japan	1
New Zealand	1
Norway	1
Portugal	1
Sweden	1
Unknown	1
Total	30

Network systems operation, maintenance, and security

Apple computer file storage access

The JRSO encountered an intermittent file server issue on the *JOIDES Resolution*, which impacted a few Apple computer users across three expeditions. The JRSO corrected the issue by installing new file servers with more stable Apple File Protocol service during the tie-up period in summer 2015.

Satellite services

The JRSO encountered an internet service degradation, which caused intermittent outages and poor performance for approximately 5 months on the *JOIDES Resolution*. The JRSO worked closely with its Very Small Aperture Terminal (VSAT) vendor, RigNET, over several months to troubleshoot and resolve the problem, which was determined be a faulty fiber modem in the Fuchsstadt, Germany, land earth station and interference by a strong carrier near the *JOIDES Resolution's* satellite operating frequency.

Software development

Liquid Helium–Free 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 aboard 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 remains 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 remains on track to complete all deliverables by July 2016.

Extending IMS to WRMSL and STMSL

Project scope and deliverables

This project replaces the current applications used on the Whole-Round Multisensor Logger (WRMSL) and Special Task Multisensor Logger (STMSL) with the current version of 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 during FY15 Q4; however, the management team has approved the EPM's request to delay operational testing until Expedition 361, which ends on 31 March 2016.

360 Degree 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

The JRSO successfully completed this project in December 2015, as scheduled.

Thin Section Form Report Follow-up

Project scope and deliverables

The goal of this project is to improve 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 2015 and is on track to complete all deliverables by 31 January 2016.

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 successfully completed this project in December 2015, as scheduled.

Other projects and activities

CoreWall Correlator

The JRSO established a contract with the University of Minnesota (UM) for Stratigraphic Correlation Tool ("Correlator") Services in August 2015 to correct Correlator's generation of splice intervals and provide application maintenance support in the out years. The JRSO worked closely with UM to pinpoint issues

this quarter and anticipates the Correlator developer will release a fully functioning version of Correlator in time for use on Expedition 361.

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

USIO publications

Data reports

10.2204/iodp.proc.318.203.2015

10.2204/iodp.proc.329.203.2015

10.2204/iodp.proc.335.202.2015

10.2204/iodp.proc.340.202.2015

10.2204/iodp.proc.340.203.2015

10.2204/iodp.proc.344.202.2015

10.2204/iodp.proc.344.206.2015

CDEX publications

Scientific Prospectus

10.14379/iodp.sp.365.2015

Data reports

10.2204/iodp.proc.331.202.2015

10.2204/iodp.proc.337.201.2015

10.2204/iodp.proc.338.203.2015

Citation management

Scientific publication digital object identifiers

Reports and publications	Digital object identifier (DOI) prefix	Number of online DOI resolutions			
		October 2015	November 2015	December 2015	FY16 Q1 total
IODP	10.14379	538	504	406	**1,448**
Integrated Ocean Drilling Program	10.2204	3,523	2,769	1,990	**8,282**
ODP/DSDP	10.2973	18,728	22,516	6,495	**47,739**

Ocean Drilling Citation Report

IODP Publication Services reviewed a streamlined process for the annual Ocean Drilling Citation Report that will reduce production time and began researching additional methods of documenting the Program's impact through scientific publications.

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 312, 318, 320/321, 330, 331, 335, 336, 338, 340–342, 344, 345, and 350 were submitted to English language peer-reviewed journals or the Program.

Publications website

The IODP Publications website is hosted at TAMU. During the last quarter, the IODP Publications website received 20,922 site visits and 367,050 page views.

JRSO expedition science outreach support

JRSO staff provided support to the Education Officers during Expedition 359 and 360 and also assisted with planning for Expeditions 359, 360, and 361 port call public relations and outreach activities.

Abstracts authored by JRSO staff

American Geophysical Union Fall Meeting 2015

- Clift, P., Pandey, D., **Kulhanek, D.,** Ando, S., and the Expedition 355 Science Party, 2015. Cenozoic climate-tectonic interactions in the western Himalaya recorded in the Indus Submarine Fan from IODP Expedition 355. (Invited Abstract T32E-02)
- Dekins, P., Weber, M., Lantzsch, H., Das, S., **Williams, T.,** Adhikari, R., Jia, G., Fox, L., Ge, J., Manoj, M.C., Savian, J., Reilly, B., Selkin, P., Meynadier, L., Spiess, V., France-Lanord, C., and Sharma, B., 2015. Paleoceanographic history of the lower Bengal Fan during the last glacial cycle—IODP Expedition 354. (Abstract PP31A-2214).
- France-Lanord, C., Spiess, V., **Klaus, A.,** Galy, A., and Galy, V., 2015. IODP Expedition 354: a Bengal Fan record of Himalayan erosion, weathering and organic carbon burial during the Neogene. (Invited Abstract EP21E-05)
- Hernández Molina, F.J., Sierro, F., Llave, E., Roque, C., Stow, D., **Williams, T.,** Lofi, J., Van der Schee, M., Arnaíz, A., Ledesma, S., Rosales, C., Rodriguez-Tovar, F., Parto-Igúzquiza, E., and Brackenridge, R., 2015. Evolution of the Gulf of Cadiz and west Portugal contourite depositional system: tectonic, sedimentary and paleoceanographic implications from IODP Expedition 339 (Invited Abstract EP11A-07)
- Hickey-Vargas, R., Ishizuka, O., Yogodzinski, G., Bizimis, M., Savov, I., McCarthy, A., Arculus, R., and **Bogus, K.,** 2015. Geochemistry of volcanic rocks from International Ocean Discovery Program (IODP) Site 1438, Amami Sankaku Basin: implications for Izu-Bonin-Mariana (IBM) Arc initiation. (Abstract DI13A-2625)
- Kraus, C., McKay, R., Naish, T., Levy, R., and **Kulhanek, D.,** 2015. Late Oligocene glacimarine sedimentation of the central Ross Sea and implications for the evolution of the West Antarctic Ice Sheet. (Abstract PP43C-2290)
- Power, M., Avery, A., and the IODP Expedition 352 Scientists, 2015. Pleistocene to Miocene calcareous nannofossil biostratigraphy from IODP Expedition 334 Hole U1381A and Expedition 352 Hole U1439A. (Abstract PP21B-2227) [Note: Expedition 352 Scientists includes **Petronotis, K.**]
- Pu, J., Koffman, B., Recasens, C., Hemming, S., Kaplan, M., Gombiner, J., Boswell, S., and **Williams, T.,** 2015. K/Ar geochronology as a tool for tracing dust provenance in the Southern Hemisphere. (Abstract A23C-0309)
- Reilly, B., Selkin, P., Meynadier, L., Savian, J., Weber, M., Schwenk, T., Spiess, V., Stoner, J., France-Lanord, C., and **Klaus, A.,** 2015. Paleomagnetic and environmental magnetic insights into the middle to Late Pleistocene stratigraphy of the 8° North Bengal Fan transect, IODP Expedition 354. (Abstract T33D-2964)
- Spiess, V., France-Lanord, C., Schwenk, T., and **Klaus, A.,** 2015. Pleistocene through Oligocene record of Himalayan orogeny and climate: the IODP Expedition 354 drilling transect across the middle Bengal Fan at 8°N. (Invited Abstract T23E-03)

- **Williams, T.,** Pierce, E., van de Flierdt, T., Hemming, S., Cook, C., Passchier, S., Sangiorgi, F., and Bijl, P., 2015. Evidence from ice-rafted debris and sediment provenance for a dynamic East Antarctic Ice Sheet during the mid-Miocene Climate Transition. (Abstract PP24A-07)

Geological Society of America Annual Meeting 2015

- Power, M.M., and the IODP Expedition 352 Scientists, 2015. Pleistocene to Miocene calcareous nannofossil biostratigraphy from IODP Expedition 334 Hole U1381A and Expedition 352 Hole 1439A. (Paper 126-5) [Note: Expedition 352 Scientists includes **Petronotis, K.**]
- Routledge, C.M., **Kulhanek, D.K.,** Tauxe, L., Scardia, G., Singh, A.D., Steinke, S., Wise, S.W., and IODP Expedition 355 Scientists, 2015. Miocene-Pliocene calcareous nannofossil biostratigraphy of IODP Site U1457, Arabian Sea. (Paper 126-6)

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).

- Hansen, M.A., Passchier, S., Khim, B.-K., Song, B., and **Williams, T.,** 2015. Threshold behavior of a marine-based sector of the East Antarctic Ice Sheet in response to early Pliocene ocean warming. *Paleoceanography,* 30(6):789–801. http://dx.doi.org/10.1002/2014PA002704
- Hodell, D., Lourens, L., Crowhurst, S., Konijnendijk, T., Tjallingii, R., Jiménez-Espejo, F., Skinner, L., Tzedakis, P.C., and Shackleton Site Project Members, 2015. A reference time scale for Site U1385 (Shackleton Site) on the SW Iberian Margin. *Global and Planetary Change,* 133:49–64. http://dx.doi.org/10.1016/j.gloplacha.2015.07.002 [Note: Shackleton Site Project Members include **Alvarez Zarikian, C.A.,** and **Williams, T.**]
- Li, Y.-X., Zhao, X., Jovane, L., **Petronotis, K.E.,** Gong, Z., and Xie, S., 2015. Paleomagnetic constraints on the tectonic evolution of the Costa Rican subduction zone: new results from sedimentary successions of IODP drill sites from the Cocos Ridge. *Geochemistry, Geophysics, Geosystems,* 16(12):4479–4493. http://dx.doi.org/10.1002/2015GC006058

Appendix: JRSO quarterly report distribution

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