

International Ocean Discovery Program
JOIDES Resolution Science Operator
FY16 Q4 Operations and Management Report

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to

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and

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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 TAMU 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.

Progress reporting

JRSO reports

JRSO FY16 Q3 Quarterly Operations and Management Report

The JRSO operations and management report for the third quarter of FY16 (April–June 2016) was submitted to NSF on 5 August (http://iodp.tamu.edu/publications/AR/FY16/FY16_Q3.pdf).

Liaison activities

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

Planning meetings

Brad Clement (JRSO Science Services Director) attended the IODP Forum meeting held 21–23 September in Buzios, Brazil.

Project portfolio management

The JRSO completed one project (Improve Web Services), initiated two new projects (Shore XRF Core Scanner Implementation and Laboratory Information Management System [LIMS] Data Display Tool—LIMSpeak II), and continued work on one existing project (Liquid Helium–Free Superconducting Rock Magnetometer Installation and Software Update) (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 <http://www.iodp.tamu.edu/scienceops/expeditions.html>.

Program website statistics

During the last quarter, the IODP TAMU website received 35,811 site visits and 343,401 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 DSDP and ODP are preserved on 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 Q4 page views*	FY16 Q4 site visits*
www-odp.tamu.edu	290,769	25,102
www.odplegacy.org	3,728	1,503
www.deepseadrilling.org	32,877	6,430
Total	327,374	33,035

*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	Port (origin)	Dates ^{1,2}	Total days (port/sea)	Days at sea (transit ³ /ops)	Co-Chief Scientists	Expedition Project Manager	
Non-IODP (31 March–4 July 2016) (96 days)						M. Malone	
Transit/Hole U1473A Remediation	362T	Cape Town, South Africa	4 July–6 August 2016	33	33 (24/9)	N/A	P. Blum
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 ⁴	366	Guam	8 December 2016–7 February 2017	61 (5/56)	56 (8/48)	P. Fryer G. Wheat	T. Williams
South China Sea Rifted Margin ⁵	367	Hong Kong	7 February–9 April 2017	61 (5/56)	56 (2/54)	Z. Sun J. Stock	A. Klaus
South China Sea Rifted Margin ⁵	368	Shanghai, China	9 April–11 June 2017	63 (5/58)	58 (4/54)	Z. Jian H.-C. Larsen	C. Alvarez Zarikian
Non-IODP (11 June–27 July 2017) (46 days)						M. Malone	
Tasman Frontier Subduction and Climate	371	Townsville, Australia	27 July–26 September 2017	61 (3/58)	58 (7/51)	R. Sutherland G. Dickens	P. Blum
Australia Cretaceous Climate and Tectonics	369	Hobart, Tasmania (Australia)	26 September–26 November 2017	61 (5/56)	56 (7/49)	R. Hobbs B. Huber	K. Bogus
Creeping Gas Hydrate Slides and Hikurangi LWD ⁶	372	Fremantle, Australia	26 November 2017–4 January 2018	39 (5/34)	34 (15/19)	I. Pecher P. Barnes	L. Levay
Ross Sea West Antarctic Ice Sheet History	374	Wellington, New Zealand	4 January–8 March 2018	63 (5/58)	58 (16/42)	R. McKay L. De Santis	D. Kulhanek
Hikurangi Subduction Margin	375	Wellington, New Zealand	8 March–5 May 2018	58 (5/53)	53 (2/51)	L. Wallace D. Saffer	K. Petronotis
Brothers Arc Flux	376	Auckland, New Zealand	5 May–5 July 2018	61 (5/56)	56 (2/54)	TBD	A. Klaus
Non-IODP (5 July–14 October 2018) (101 days)						M. Malone	
South Pacific Paleogene	378	Wellington, New Zealand	14 October–14 December 2018	61 (4/57)	57 (11/46)	TBD	C. Alvarez Zarikian
Non-IODP (14 December 2018–18 January 2019) (35 days)						M. Malone	
Amundsen Sea West Antarctic Ice Sheet History	379	Punta Arenas, Chile	18 January–20 March 2019	61 (3/58)	58 (12/46)	TBD	A. Klaus

Notes: N/A = not applicable, TBD = to be determined.

¹ Dates for expeditions may be adjusted pending non-IODP activities.

² The start date reflects the initial port call day. The vessel will sail when ready.

³ Transit total is the estimated transit to and from port call and does not include transit between sites.

⁴ Also includes Proposal 693 Ancillary Project Letter (APL), South Chamorro Seamount CORK.

⁵ Complementary Project Proposal (CPP) is contingent on substantial financial contribution outside of normal IODP funding.

⁶ Combined expedition with 841 APL and logging while drilling (LWD) from Proposal 781A (Expedition 375).

JRSO expeditions

Expedition 356: Indonesian Throughflow

Postexpedition activities

The JRFB granted a temporary publication embargo on the Expedition 356 *Preliminary Report* to give authors time to submit key findings papers to major scientific publications. One paper was rejected despite positive reviews, and the other paper is pending editorial decision. Thus, the temporary publication embargo on the Expedition 356 *Preliminary Report* is still ongoing.

Expedition 361: South African Climates

Planning

Detailed planning continued this quarter for the postexpedition sampling party to be held in October. X-Ray Fluorescence (XRF) scanning was completed on archive-half cores sent to Lamont-Doherty Earth Observatory (LDEO), and the cores were returned to the Gulf Coast Repository (GCR) this quarter. Completion of XRF scanning of cores shipped to Scripps is anticipated near the end of the next quarter.

Expedition 362T: Hole U1473A Remediation

Operational summary

After arriving on site, the initial operations plan was to collect new borehole data with a temperature and natural gamma ray logging tool string. The tool string encountered a bridge at 276 mbsf and could not advance further downhole, so the hole was re-entered with a tricone bit and drilling assembly to clean out the bridge. The hole was reamed and cleaned to 465 mbsf in approximately one day and then the bit was retrieved and replaced. The hole was reamed and cleaned for another day with a new bit, which finally broke through the bridge at 487 m, after which the bottom of the hole was reached and circulated clean with mud sweeps. The hole was entered next with the reverse circulating junk basket (RCJB) to fish the retaining sleeve from the mechanical bit release that was left in the hole at the end of Expedition 360 (SW Indian Ridge Lower Crust and Moho). The RCJB was returned to the ship with an 18 cm wide, 36 cm long rock core but without the retaining sleeve. This result was interpreted to indicate the retaining sleeve had been recovered during the last fishing run during Expedition 360 but fell out of the basket while pipe was being tripped to the surface. To verify that the hole was clean, the hole was advanced by coring 19.7 m with five rotary core barrel (RCB) cores recovering 16.9 m of gabbro. The final remediation operation in the remediation was to cement as much of the identified fault zone horizons between ~580 and 160 mbsf as possible. The first zone (~574–509 mbsf) was cemented with 50 barrels, the top of which was tagged at ~500 mbsf. Three attempts to cement the second zone (484–409 m) were made using 152 barrels of cement, with the top of the cemented zone tagged at 434 mbsf. The third attempt did not add to the height of the cement plug, indicating that the borehole in the fault zone was

enlarged enough to accommodate the 55 barrels of cement slurry laterally. The last attempt consumed the cement available for the remedial effort, concluding operations.

Expedition 362: Sumatra Seismogenic Zone

Planning

The final Expedition 362 shipment was dispatched via air freight, and logistical planning for the port call was finalized.

Staffing

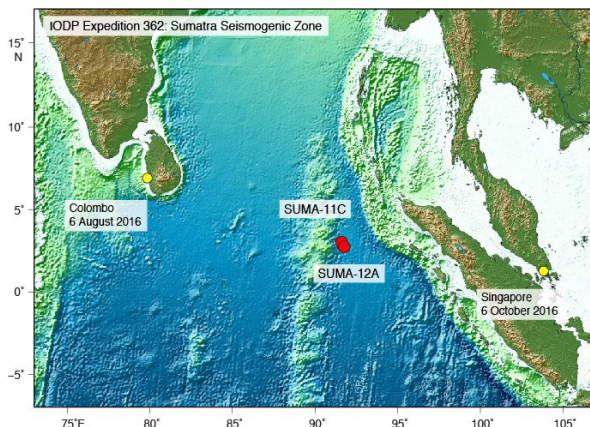
A scientist from India withdrew on 20 July and was replaced in time to sail on the expedition.

Expedition 362 Science Party staffing breakdown		
Member country/consortium	Participants	Co-Chief Scientists
USA: United States Science Support Program (USSSP)	8	1
Japan: Japan Drilling Earth Science Consortium (J-DESC)	4	
Europe and Canada: European Consortium for Ocean Research Drilling (ECORD) Science Support and Advisory Committee (ESSAC)	9	1
Republic of Korea: Korea Integrated Ocean Drilling Program (K-IODP)	1	
People's Republic of China: IODP-China	3	
Australia and New Zealand: Australia/New Zealand IODP Consortium (ANZIC)	2	
India: Ministry of Earth Science (MoES)	1	
Brazil: Coordination for Improvement of Higher Education	1	

Clearance, permitting, and environmental assessment activities

At the July meeting, the Environmental Protection and Safety Panel (EPSP) and the TAMU Safety Panel recommended approval of the two new alternate sites. The draft environmental evaluation to conduct a vertical seismic profile (VSP) was submitted to NSF on 5 July and, after revision, was approved on 4 August.

Site map



Expedition 363: Western Pacific Warm Pool

Planning

In August, after a review of the latest security issues, Site WP-09A was removed from the Expedition 363 program because of a high risk for piracy and/or terrorism. Final planning and acquisition for supplies required during the expedition were completed, and the surface and airfreight to Singapore were dispatched.

Clearance, permitting, and environmental assessment activities

Australia agreed to use the offered observer berth for an outreach officer to be selected by the Australia/New Zealand IODP Consortium (ANZIC) office. Authorization to conduct the proposed research was issued by Papua New Guinea on 4 September, Australia on 9 September, and Federated States of Micronesia on 4 July, although the latter was not received until 13 September. The Philippines requested additional participation beyond the one observer already invited and accepted. The JRSO responded with the berth limitations that prevented additional participation and at the end of the quarter awaited the response from the Philippines.

Expedition 366: Mariana Convergent Margin

Planning

Much of the effort this quarter focused on working with the Science Party, particularly the microbiologists, on determining required supplies and reviewing third-party equipment to be utilized on the expedition. The surface shipment will depart early in the next quarter.

Staffing

Two education and outreach positions were filled, with one participant from the US and one from Germany.

Expeditions 367 and 368: South China Sea Rifted Margin

Planning

The end port for Expedition 368 was changed to Shanghai, China, and two additional days were added to the expedition to accommodate the additional transit. Two sites, one primary and one alternate, were determined to be too close to a newly laid submarine cable. An approved alternate site was elevated to primary and the Co-Chief Scientists are reviewing options for new sites. The research plans with sample and data requests were due at the end of the quarter.

Staffing

The invitation to replace one of the Co-Chief Scientists who had to withdraw from the expedition was accepted. Two scientists had to withdraw and were replaced.

Clearance, permitting, and environmental assessment activities

Proposed sites for the two expeditions were reviewed at the EPSP meeting in July. Of the 20 sites reviewed, three alternate sites were not recommended, and one was relocated. A marine scientific research application was submitted to the US State Department for Expedition 367 on 25 July and for Expedition 368 on 19 August. Follow-up queries from Taiwan and the US embassy in Beijing were also addressed during the quarter.

Expedition 371: Tasman Frontier Subduction and Climate

Planning

Planning this quarter focused on preparations for the pre-expedition meeting scheduled at the beginning of next quarter.

Clearance, permitting, and environmental assessment activities

All 12 proposed sites were reviewed and approved at the EPSP meeting in July.

Expedition 369: Australia Cretaceous Climate and Tectonics

Planning

The JRFB added Ancillary Project Letter (APL) 897 to the expedition. The Expedition 369 pre-expedition meeting was held 18 and 19 July in College Station, Texas, and the *Scientific Prospectus* was published in September.

Expedition 372: Creeping Gas Hydrate Slides and Hikurangi LWD

Planning

The Expedition 372 and 375 pre-expedition meetings were co-scheduled for 2–4 November. The Co-Chief Scientists expressed interest in using the JRSO pressure core sampler (PCS) tool, which has not been run since Expedition 311 (Cascadia Margin Gas Hydrates) and the India Gas Hydrate programs in 2005. JRSO engineering pulled the tool, began an inspection of the state of the tool, and initiated a mechanical survey to identify parts that may need to be replaced.

Staffing

Invitations were issued and accepted for the two Co-Chief Scientist positions.

Expedition 374: Ross Sea West Antarctic Ice Sheet History

Planning

The JRSO and Co-Chief Scientists began making inquiries for availability of ice breakers for the 2018 season. The pre-expedition meeting was scheduled for 15 and 16 December.

Staffing

Invitations were issued and accepted for the two Co-Chief Scientist positions.

Expedition 375: Hikurangi Subduction Margin

Planning

The Expedition 372 and 375 pre-expedition meetings were co-scheduled for 2–4 November. Proponents discussed how to use the additional time made available by transferring planned logging while drilling (LWD) to Expedition 372. A CORK design review meeting was scheduled for 10 and 11 November. JRSO engineering and operations continued work associated with planning CORKs, including finalizing manufacturing drawings, and refining the time schedule for design, fabrication, and testing. Initial orders for the longest lead items are anticipated following the November CORK meeting.

Staffing

Invitations were issued and accepted for the two Co-Chief Scientist positions.

Technical and analytical services

Analytical systems

Analytical systems acquisitions and updates

The Thermo Niton XL3t handheld energy-dispersive XRF (ED-XRF) spectrometer was replaced with an Olympus DELTA Premium unit, which will be sent on Expedition 366 to answer the Science Party's need for a rapid elemental analysis on core section halves. A user guide and protocols for data handling will be developed prior to that expedition.

The JRSO took delivery of the 2G Enterprises superconducting rock magnetometer (SRM) and set it up at IODP Headquarters for testing. The SRM was inspected by Bill Goodman of Applied Physics, who pronounced it “one of the best magnetometers they've sold to date” based on quality of signal and noise level. The new SRM software was used extensively during Expedition 362 with a high degree of success, providing an enhanced experience for the paleomagnetic laboratory scientists. The SRM is being shipped to Guam for installation during the Expedition 366 port call.

The refitting of the Agilent 7890 gas chromatographs (GCs) is still in process; other duties were given higher priority.

Vinny Percuoco (JRSO Research Assistant) created a new inductively coupled plasma spectroscopy (ICP) data reduction program that incorporated changes suggested by various ICP-experienced scientists. This program will be tested in parallel to the existing data reduction software during Expedition 363 and, if successful, will replace ICP Analyzer.

The JRSO ordered an additional XRF Core Scanner to support IODP operations. The JRSO is developing guidelines for the support of postexpedition XRF scanning, and plans to fold the TAMU College of Geosciences system into JRSO management and control.

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 did not meet this quarter due to scheduling conflicts. It will meet next quarter.

Geophysics

The Geophysics LWG did not meet this quarter due to scheduling conflicts. It will meet next quarter.

Geochemistry

The Geochemistry LWG met this quarter to discuss ongoing issues and those arising from Expeditions 359, 360, and 361. External members in attendance were Becky Robinson (University of Rhode Island Graduate School of Oceanography) and Jason Sylvan (TAMU Department of Oceanography). Marguerite Godard (CNRS, Université de Montpellier, France) has joined the LWG but was unable to attend until the next meeting. The LWG discussed the following topics:

- Chieh Peng (JRSO Assistant Laboratory Officer) will step down as technical lead, and Lisa Brandt (JRSO Research Specialist) will take over that role.
- Expedition 359 scientists complained that ion chromatograph precision was disappointing; a Hamilton auto-diluter was purchased to provide more precise dilution, and the complaint has not been repeated.

- A scientist suggested decreasing the time for pH measurements to limit degassing; the JRSO will not change this because it will introduce more error, not less.
- Expedition 360 scientist Jason Sylvan gave a review of the Plexiglass enclosure used during the expedition for microbiological work and recommended its use on future microbiology-focused expeditions.
- An Expedition 361 scientist complained that they did not have guidance on whether to use the cation data from the ion chromatograph or the same data from the ICP (i.e., which data should they trust more?).
 - The LWG notes that the technicians are responsible for checking the precision and proper operation of the instruments, not to determine whether the resulting values make scientific sense. However, they can provide input in terms of what has been done on previous expeditions and/or what they have noticed is unusual. They should also recommend that scientists check previous IODP volumes and/or email the LWG.
- Expedition 361 scientists reported on the ease of introducing a mistake in the coulometer software; the JRSO is planning a revision of the software to address this and other issues.
- Expedition 361 scientists noted the disappointing quality of phosphate measurements on the Agilent CARY 100 UV-VIS spectrometer (primarily drift, the LWG believes, but the comment was unclear). An autosampler was added to the instrument, and the JRSO will run additional blanks to check for drift.
- Expedition 361 scientists noted that sulfur results on the carbon-hydrogen-nitrogen-sulfur (CHNS) analyzer are more difficult to obtain. The instrument can be reconfigured to optimize S at the cost of making the CN results worse. If CNS is desired (which is most often the case) and S levels are low, the Science Party is commonly disappointed.
 - The LWG recommends that S measurements should be seen as the exception, not the rule, and should be requested at the expedition planning stages so we can arrange to have proper combustion columns available. The trade-off between CN and S should be made clear to geochemists before the expedition.
- Vinny Percuoco introduced the Olympus DELTA Premium ED-XRF to the LWG, and the group discussed the use of the instrument on the *JOIDES Resolution* and how to handle data, radiation safety, and XRF limitations (e.g., on sediment section halves, the data are qualitative, not quantitative).
- Vinny Percuoco introduced the new ICP data reduction software, which will be used during Expedition 363 against the existing ICP Analyzer software to ensure it is properly calculating results.

- A draft chemistry/microbiology “capability” document will be created and discussed at the next LWG meeting; examples include a discussion of the CN vs. S issue in CHNS analysis, the availability of the microbiology enclosure, and other “good to know” items that the technicians could use as a reference for scientist queries.
- The LWG reviewed a few LIMS report issues, for example the difficulty of differentiating RHIZON and squeeze cake interstitial water samples; technicians will try to ensure that the samples from RHIZON and squeezers are named appropriately and consistently to make this easier.
- The LWG discussed future purchases—current plans include a -86°C freezer to replace an aging one that does not hold temperature and replacement of the aging scintillation counter in the radiation safety van.

Curation and Core Handling

The Curation and Core Handling LWG met this quarter to discuss ongoing issues; no curatorial issues arose from recent expeditions. The LWG discussed

- Standard operating procedures (SOPs) for sampling parties in order to increase efficiency;
- Standardization of label formats (e.g., paleomagnetism cubes vs. physical properties samples);
- Lallan Gupta’s (Kochi Core Center [KCC]) request that the JRSO provide detailed guidelines for sample and data request (SaDR) role assignment;
- Ideas for displays on the east wall of the GCR’s main workspace now that it has been painted and made accessible; and
- The following issues arising from the Expedition 356 and 359 on-shore sample parties:
 - Participants reported that they received their information about the sampling party from a number of different people; the curatorial staff and EPMS need to provide this information repeatedly to ensure it is fully communicated.
 - It is difficult to determine where we missed the mark when a fair or needs improvement rating is given; therefore, the post-sampling party questionnaire will be amended to inquire “where can the JRSO improve.”
 - A complaint was received regarding the unclear chain of authority for confirmation and unclear instructions to those doing the sampling; therefore, the SOP will be amended to include how changes are handled.

- There was some confusion among the scientists about transport schedule and process, so more communication up front in regard to these issues should be implemented.

Other projects and activities

Geosciences Laboratory

The new detector for the XRF Core Scanner is three times as fast, can detect Mg (at percent-level concentration), and has higher resolution. Unfortunately, the first detector had a manufacturing defect and the collimator ring came unglued, requiring replacement. The replacement detector failed due to an internal electrical fault after a short time, so the manufacturer provided a third detector, which has been reliable so far; the scientists have been happy with the results.

Rescanning activities continued this quarter, along with new requests, and the system is booked solid through May 2017. Despite some down time for the detector issues, the instrument has been in use nearly 90% of available days.

Core curation

The JRSO provides services in support of Integrated Ocean Drilling Program and IODP core sampling and curation of the core collection archived at the GCR.

JRSO expedition core sampling

The JRSO planned sample and curation strategies this quarter for upcoming JRSO Expeditions 363 and 366. A JRSO Curatorial Specialist supervised shipboard core sampling during Expedition 362 and reviewed all shipboard and moratorium-related requests in coordination with the other members of the expedition Sample Allocation Committee (SAC).

Gulf Coast Repository activity

Sample requests

The following “Sample requests” table provides a summary of the 2,876 samples 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
40734IODP, Bryant, USA	80			
41843IODP, White, USA	10			
43487IODP, Pekar, USA	8			
42114IODP, Firth, USA	0			

Sample request number, name, country	Number of samples taken	Number of cores XRF scanned	Number of cores Imaged	Number of visitors
42874IODP, Yu, China	156			
41922IODP, Algeo, USA	63			
42272IODP, Napier, USA	2			
41191IODP, Jovane, Brazil	149			
43350IODP, Wycech, USA	17			
43301IODP, Andrews, USA	18			
42723IODP, Heaton, USA	9			
42250IODP, Pavia, USA	20			
43607IODP, Thomas, USA	29			1
43607IODP, Thomsa, USA	41			1
41989IODP, Wiederwohl, USA	8			
42201IODP, Lupi, Italy	135			
42394IODP, McCartney, Poland	19			
41981IODP, Wan, USA	3			
40546IODP, Biester, Germany	70			
41690IODP, St. John, USA	31			
44024IODP, Gill, USA	103			
43328IODP, Jovane, Brazil	149			
43866IODP, Kuppusami, India	117			
40817IODP, Georgescu, Canada	6			
41998IODP, Wiederwohl, USA	8			
40728IODP, Wiederwohl, USA	8			
44700IODP, Tzanova, USA	315			
44620IODP, Walczak, USA	26			
43967IODP, Barbarin, France	15			
44019IODP, Menicucci, USA	6			
40118IODP, Mortyn, Spain	68			
43946IODP, Deeg, USA	76			
44090IODP, Ohta, Japan	436			
45308IODP, Grant, New Zealand	1			
45128IODP, Si, USA	14			
45119IODP, Gusarevich, United Kingdom	17			
44954IODP, Katz, USA	40			
45396IODP, Manners, United Kingdom	1			
43771IODP, Fu, USA	97			1
42836IODP, Flood, Netherlands	25			
41701IODP, Jovane, Brazil	17			
45720IODP, Hastedt, USA	12			
43461IODP, Fenton, United Kingdom	418			
43650IODP, Koppers, USA	9			1
43640IODP, Michael, USA	32			1
Postcruise, De Vleechouwer		93		
Postcruise, Bogus		78		

Sample request number, name, country	Number of samples taken	Number of cores XRF scanned	Number of cores Imaged	Number of visitors
Postcruise, McHugh		336		
Postcruise, Kroon/Zarikian		660		
Postcruise, Reuning		128		
Tours/demonstrations				88
Totals	2884	1295	0	93

GCR tours/visitors

Type of tour or visitor	Number of visitors
Scientist visitors	5
Educational tours/demonstrations (5)	80
Public relations tours (3)	8
Totals	93

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. In addition, the GCR hosted the Minority-Serving Institution–Reconstructing Earth’s Climate History (MSI-REaCH) Program Faculty Development Workshop, which was held 1–5 August.

Other GCR activities

The GCR staff did extensive preparation for the Expedition 361 Sample Party, including development of a set of criteria for a standard operating procedure for GCR-hosted sample parties.

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

Data from JRSO Expedition 362T were added to the LIMS database on shore this quarter. These data are currently under moratorium and available only to the scientists who sailed on this expedition. Data for JRSO Expeditions 353, 354, and 355 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				
Rank	Janus database		LIMS database	
	Country	Visitor sessions	Country	Visitor sessions
1	USA	1,200	USA	622
2	United Kingdom	531	Japan	180
3	Germany	244	Germany	148
4	China	117	United Kingdom	112
5	Japan	93	China	92
6	Australia	68	Unknown	80
7	Canada	68	India	46
8	France	59	Australia	39
9	Netherlands	51	Netherlands	36
10	Spain	39	Canada	35
	Others	217	Others	108
	Total	2,687	Total	1,498

Top 20 database web queries				
Rank	Janus database		LIMS database	
	Query	Downloads	Query	Downloads
1	Imaging—core photos	1,961	Samples	864
2	Core summaries	1,652	Section summaries	682
3	Site summaries	1,115	Images—LSIMG	573
4	Chemistry—gas	570	Hole summaries	295
5	Hole summaries	518	Core summaries	230
6	Samples	467	Images—core photos	219
7	Special holes	438	DESC report	196
8	Physical properties—MSL	230	Physical properties—GRA	156
9	Hole trivia	228	Physical properties—MAD	143
10	Physical properties—GRA	212	Gas	134
11	Chemistry—carbonates	164	SRM Section	115
12	Paleontology—age models	160	Physical properties—MS	108
13	Physical properties—RSC	126	Chemistry—carbonates	97
14	Chemistry—IW	122	Chemistry—IW	85
15	Images—prime data	120	MSPOINT	85
16	Physical properties—MAD	118	Physical properties—NGR	79
17	Images—closeups	107	PWC	75
18	Physical properties—PWL	103	Chemistry—ICP-AES	73
19	Chemistry—PMAG	95	Splice detail	71
20	Physical properties—NGR	90	Hole summaries list	70
	Others	1,326	Others	1,121
	Total	9,922	Total	5,471

Data requests submitted to the TAMU Data Librarian		Countries submitting data requests to the TAMU Data Librarian	
Requests	Total	Country	Total
Core photos	8	USA	12
How to access or find data	6	Germany	4
RGB	2	Japan	3
Carbonates	1	Australia	2
Chemistry	1	United Kingdom	2
Drilling data	1	China	1
Geod	1	Denmark	1
MAD	1	New Zealand	1
MS	1	Switzerland	1
Paleontology	1	Unknown	1
Paleomagnetism	1		
RockEval	1		
Samples	1		
Seismics	1		
XRD	1		
Total	28	Total	28

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. JRSO set up the new SRM on shore and continued developing and testing the updated software package. Applied Physics Systems conducted system checks and provided training to technical staff during a visit to the JRSO on 19 September.

Improve Web Services

Project scope and deliverables

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

Project status

The JRSO successfully completed this project on 30 September.

LIMS Data Display Tool—LIMSpeak II

Project scope and deliverables

The goal of this project is to replace the current LIMSpeak application with a set of applications that will replicate the majority of its features while (1) improving the user interface and experience and (2) adopting some user-requested improvements.

Project status

The JRSO completed the project management plan and solicited software development vendor proposals, which are due the first week of October.

Shore XRF Core Scanner Implementation

Project scope and deliverables

The JRSO will purchase a second Avaatech XRF core scanner to be used on shore along with an existing Avaatech scanner to facilitate postexpedition XRF scanning. Goals include (1) developing data structure, uploader, and reports for XRF Core Scanner data; (2) developing quality assurance guidelines and quality control data tracking; (3) taking delivery of a second XRF Core Scanner; and (4) training JRSO staff in the use, care, and maintenance of both scanners.

Project status

JRSO initiated this project on 15 September.

Other projects and activities

Tieup activities

JRSO IT staff continued work on several activities during tieup, including CommVault backup program bug fixes, Zenworks implementation, Sassafra K2 asset inventory compliance application installation, and Microsoft Exchange testing.

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

Reports and publications	JRSO	USIO	CDEX	ESO*
Scientific Prospectus	10.14379/iodp.sp.362add.2016 10.14379/iodp.sp.369.2016			
Preliminary Report				
Data Report	10.14379/iodp.proc.350.201.2016 10.14379/iodp.proc.349.201.2016	10.2204/iodp.proc.335.204.2016	10.2204/iodp.proc.338.206.2016	
Expedition Report	10.14379/iodp.proc.354.2016 10.14379/iodp.proc.353.2016 10.14379/iodp.proc.355.2016			

*ESO publications are produced under contract with the British Geological Survey.

Citation management

Scientific publication digital object identifiers

IODP is a member of CrossRef, the official digital object identifier (DOI) registration agency for scholarly and professional publications. All IODP scientific reports and publications are registered with CrossRef and assigned a unique DOI that facilitates online access. DOIs have also been assigned to Integrated Ocean Drilling Program, ODP, and DSDP scientific reports and publications. CrossRef tracks the number of times a publication is accessed, or resolved, through the CrossRef DOI resolver tool. Program statistics for the reporting quarter are shown in the table below.

Reports and publications		Number of online DOI resolutions			
		July 2016	August 2016	September 2016	FY16 Q4 total
IODP	10.14379	708	976	1,074	2,758
Integrated Ocean Drilling Program	10.2204	4,637	2,136	3,036	9,809
ODP/DSDP	10.2973	9,555	12,048	8,243	29,846

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 320/321, 322, 329, 331, 335, 338–342, 344, 345, 347–352, 355, and 359 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 17,290 site visits and 143,700 page views. Where possible, visits by JRSO employees and search engine spiders were filtered out of the count.

Other projects and activities

Scientific Ocean Drilling Bibliographic Database interface

The American Geosciences Institute (AGI) launched the new Scientific Ocean Drilling Bibliographic Database on 30 September. This redesigned web interface utilizes VuFind software and replaces the Inmagic interface AGI developed 15 years ago for the Ocean Drilling Program. The database is a subset of AGI’s GeoRef database and includes more than 32,000 entries related to IODP and the preceding scientific ocean drilling programs, representing nearly a half century of scientific ocean drilling research.

With the new interface, users may set up accounts to customize their experience by making publication lists, adding notes to records, and saving favorite searches. Interface search and support is offered in multiple languages, and users will find expanded search fields; suggested keywords and categories based on search; and options for filtering results, browsing, conducting geographic searches, and exporting bibliographic records in multiple formats.

FY16 Scientific Ocean Drilling Bibliographic Database Report

Each year, IODP Publication Services produces an annual report that provides information on how Program-related research is disseminated into the scientific community through publications. The 2016 Scientific Ocean Drilling Bibliographic Database Report looks at publications from highly ranking peer-reviewed journals, publications by authors from current IODP member countries, and publications by IODP expedition and Science Plan theme. In addition, the report also illustrates through “cited-by” data from Google Scholar how often scientific drilling program publications are cited in other research articles. The study was published 30 September and is available online at http://iodp.tamu.edu/publications/AGI_studies/AGI_study_2016.pdf.

JRSO expedition science outreach support

JRSO staff assisted with planning for Expedition 363 port call public relations and outreach activities.

Abstracts authored by JRSO staff

- Bassetti, M.A., **Alvarez-Zarikian, C.**, Angue Minto’o, A.M., Courtillart, M., Hull, K., Holbourn A., Kumar Singh, R., Wan, S., Zhao, D., and Expedition 346 Scientists, 2016. Sediment input and bottom water trophic level in the East China Sea, in response to glacial/interglacial sea level change and monsoon rainfall intensity. Insights from benthic microcrustaceans (ostracods) and foraminifera at Site U1429 (IODP Expedition 346) [presented at the 35th International Geological Congress, Cape Town, South Africa, 27 August–4 September].
- **Bogus, K.**, 2016. Palynomorph geochemistry as a kerogen proxy: preliminary work using organic-walled dinoflagellate cysts [presented at the 2016 Joint Meeting of the TSOP, AASP, ICCP, Houston, TX, 18–23 September, Houston, Texas].
- **Bogus, K.A.**, Fox, L.R., Kender, S., Leng, M.J., and the Exp. 354 Science Party, 2016. Stable isotopes from Miocene to Pliocene planktonic and benthic foraminifera: preliminary results from IODP Expedition 354 (Bengal Fan) [presented at the 35th International Geological Congress, Cape Town, South Africa, 27 August–4 September].
- Inoue, M., Dwi Pratiwi, S., Nakakuni, M., Niino, K., Betzler, C., Eberli, G.P., **Alvarez-Zarikian, C.A.**, and IODP Expedition 359 Scientists. Reports of IODP Exp. 359: sea level, currents, and monsoon evolution in the Indian Ocean [presented at the Japan Geoscience Union Meeting 2016, Chiba-city, Japan, 22–26 May 2016].
- Ishizuka, O., Tani, K., Harigane, Y., Ohara, Y., Taylor, R.N., Kusano, K., Hickey-Vargas, R., Yogodzinski, G.M., Sudo, M., Mccarthy, A., Savov, I.P., Arculus, R.J., and **Bogus, K.**, 2016. Geochemical and

geochronological constraints on the subduction initiation of the Izu-Bonin arc. *V.M. Goldschmidt Conference Program and Abstracts*, 26:1282. (Abstract) <http://goldschmidt.info/2016/uploads/abstracts/finalPDFs/1282.pdf>

- O'Brien, E., **Bogus, K.**, and the Exp. 356 Science Party, 2016. Elemental abundances and paleoclimate implications: preliminary results from XRF core scanning of IODP Expedition 356 Site U1463, [presented at the 35th International Geological Congress, Cape Town, South Africa, 27 August–4 September].

The following abstract from FY16 Q3 was missing from the third quarterly report:

- Betzler, C., Eberli, G.P., **Zarikian, C.**, and the IODP Expedition 359 Scientists Team, 2016. IODP Expedition 359: Maldives Monsoon and Sea Level. *Geophysical Research Abstracts*, 18:EGU2016-5572. <http://meetingorganizer.copernicus.org/EGU2016/EGU2016-5572.pdf>

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).

- Betzler, C., Eberli, G.P., Kroon, D., Wright, J.D., Swart, P.K., Nath, B.N., **Alvarez-Zarikian, C.A.**, Alonso-García, M., Bialik, O.M., Blättler, C.L., Guo, J.A., Haffen, S., Horozal, S., Inoue, M., Jovane, L., Lanci, L., Laya, J.C., Mee, A.L.H., Lüdmann, T., Nakakuni, M., Niino, K., Petruny, L.M., Pratiwi, S.D., Reijmer, J.J.G., Reolid, J., Slagle, A.L., Sloss, C.R., Su, X., Yao, Z., and Young, J.R., 2016. The abrupt onset of the modern South Asian Monsoon winds. *Scientific Reports*, 07/2016:6. <http://dx.doi.org/10.1038/srep29838>
- Hernández-Molina, F.J., Hodell, D.A., Stow, D.A.V., and **Alvarez-Zarikian, C.**, 2016. Virtual special issue on IODP Expedition 339: the Mediterranean outflow. *Marine Geology*, 377:1–6. <http://dx.doi.org/10.1016/j.margeo.2016.05.009>
- Hernández-Molina, F.J., Sierro, F.J., Llave, E., Roque, C., Stow, D.A.V., **Williams, T.**, Lofi, J., Van der Schee, M., Arnáiz, A., Ledesma, S., Rosales, C., Rodríguez-Tovar, F.J., Pardo-Igúzquiza, E., and Brackenridge, R.E., 2016. Evolution of the gulf of Cadiz margin and southwest Portugal contourite depositional system: tectonic, sedimentary and paleoceanographic implications from IODP expedition 339. *Marine Geology*, 377:7–39. <http://dx.doi.org/10.1016/j.margeo.2015.09.013>

- Hodell, D.A., Hernández-Molina, F.J., Stow, D.A.V., and **Alvarez-Zarikian, C.**, 2016. Virtual special issue on IODP Expedition 339: the Mediterranean outflow. *Global and Planetary Change*, 144:263–269. <http://dx.doi.org/10.1016/j.gloplacha.2016.06.016>
- Takashimizu, Y., Kawamura, R., Rodríguez-Tovar, F.J., Dorador, J., Ducassou, E., Hernández-Molina, F.J., Stow, D.A.V., and **Alvarez-Zarikian, C.A.**, 2016. Reworked tsunami deposits by bottom currents: circumstantial evidences from Late Pleistocene to Early Holocene in the Gulf of Cádiz. *Marine Geology*, 377:95–109. <http://dx.doi.org/10.1016/j.margeo.2015.09.009>

The following article from FY16 Q3 was missing from the third quarterly report:

- Mertens, K.N., Gu, H., Takano, Y., Price, A.M., Pospelova, V., **Bogus, K.**, Versteegh, G.J.M., Marret, F., Turner, R.E., Rabalais, N.N., and Matsuoka, K., 2016. The cyst-theca relationship of the dinoflagellate cyst *Trinovantedinium pallidifulum*, with erection of *Protoperidinium lousianensis* sp. nov. and their phylogenetic position within the *Conica* group. *Palynology*, 40:1–20.

Appendix: JRSO quarterly report distribution

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