International Ocean Discovery Program

JOIDES Resolution Science Operator

FY19 Q2 Operations and Management Report

1 January–31 March 2019

Cooperative Agreement OCE-1326927

Submitted by the JRSO

to

The National Science Foundation

and

The *JOIDES Resolution* Facility Board

9 May 2019

Contents

1. Introduction

This quarterly operations and management report reflects activities and deliverables outlined in the International Ocean Discovery Program (IODP) *JOIDES Resolution* Science Operator (JRSO) FY19 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).

2. Expedition operations

This section provides information on the following aspects of JRSO expedition support:

- Planning (including logistics and engineering development);
- Staffing (including a staffing table for expeditions under way during the quarter);
- Clearance, permitting, and environmental assessment activities;
- Expedition operations (including a site map for each expedition under way during the quarter, a coring summary table for each expedition completed during the quarter, and preliminary science results for each expedition that was completed during the quarter); and
- Postexpedition activities (including postcruise editorial meetings).

Table 2.1. JRSO expedition schedule

Expedition		Port (origin)	Dates[1]	Total days (port/sea)	Days at sea (transit[2]/ ops)	Co-Chief Scientists	Expedition Project Manager
Non-IODP (8 December 2018–18 January 2019) (41 days)							M. Malone
Amundsen Sea West Antarctic Ice Sheet History	379	Punta Arenas, Chile	18 January–20 March 2019	61 (5/56)	56 (14/42)	K. Gohl J. Wellner	A. Klaus
Iceberg Alley and Subantarctic Ice and Ocean Dynamics[3]	382	Punta Arenas, Chile	20 March–20 May 2019	61 (5/56)	56 (9/47)	M. Weber M. Raymo	T. Williams
Dynamics of Pacific Antarctic Circumpolar Current	383	Punta Arenas, Chile	20 May–20 July 2019	61 (5/56)	56 (20/36)	F. Lamy G. Winckler	C. Alvarez Zarikian
Non-IODP (JR100)	379T	Punta Arenas, Chile	20 July–18 August 2019	29 (5/24)	24 (8/16)	TBD	L. Childress
Panama Basin Crustal Architecture and Deep Biosphere: Revisiting Holes 504B and 896A	385T	Antofagasta, Chile	18 August–16 September 2019	29 (1/28)	28 (18/10)	B. Orcutt M. Tominaga	P. Blum
Guaymas Basin Tectonics and Biosphere	385	San Diego, California (USA)	16 September–16 November 2019	61 (5/56)	56 (9/47)	A. Teske D. Lizarralde	T. Höfig
Non-IODP (16 November 2019–3 January 2020) (48 days)							M. Malone
South Pacific Paleogene Climate	378	Fiji[4]	3 January–4 March 2020	61 (3/58)	58 (27/31)	D. Thomas U. Röhl	L. Childress
Engineering Testing	384	Papeete, Tahiti	4 March–26 April 2020	53 (5/48)	48 (25/23)	TBD	P. Blum
Amazon Margin	387	Barbados	26 April–26 June 2020	61 (5/56)	56 (8/48)	P. Baker C. Guizan Silva	L. Childress
Equatorial Atlantic Gateway	388	Recife, Brazil	26 June–26 August 2020	61 (5/56)	56 (2/54)	G. Fauth T. Dunkley Jones	L. LeVay

Expedition		Port (origin)	Dates[1]	Total days (port/sea)	Days at sea (transit[2]/ ops)	Co-Chief Scientists	Expedition Project Manager
Non-IODP (26 August–5 October 2020) (40 days)							M. Malone
South Atlantic Transect 1	390	Rio de Janeiro, Brazil	5 October–5 December 2020	61 (5/56)	56 (14/42)	TBD	C. Alvarez Zarikian
Walvis Ridge Hotspot	391	Cape Town, South Africa	5 December 2020–4 February 2021	61 (5/56)	56 (11/45)	TBD	K. Petronotis
Agulhas Plateau Cretaceous Climate	392	Cape Town, South Africa	4 February–6 April 2021	61 (5/56)	56 (6/50)	TBD	D. Kulhanek
South Atlantic Transect 2	393	Cape Town, South Africa	6 April–6 June 2021	61 (5/56)	56 (13/43)	TBD	C. Alvarez Zarikian

Notes: TBD = to be determined.

[1] The start date reflects the initial port call day. The vessel will sail when ready.

[2] Preliminary total estimated transit (i.e., to and from operational area and between sites).

[3] Proposal 902 combined with APL 846.

[4] Port in Fiji TBD.

Expedition 368X: Return to Hole U1503A (South China Sea)

Postexpedition activities

The *Preliminary Report* was published in January. Plans were made for a postcruise core description, editorial meeting, and sampling party to be held 16–23 April in College Station, Texas.

Expedition 379: Amundsen Sea West Antarctic Ice Sheet History

Planning

IODP JRSO technical staff installed new shipboard X-ray system that will provide images of whole round and split core sections.

Table 2.2. Expedition 379 Science Party staffing breakdown

Member country/consortium	Participants	Co-Chief Scientists
USA: United States Science Support Program (USSSP)	9	1
Japan: Japan Drilling Earth Science Consortium (J-DESC)	3	
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 (CAPES)	1	

Clearance, permitting, and environmental assessment activities

The Annual Antarctica Waste Report was submitted to the NSF on 27 March 2019.

Table 2.3. Expedition 379 coring summary

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (*N*)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1532	U1532A	68°38.6833′S	107°31.5003′W	3972.5	11	100.6	103.04	102.43
	U1532B	68°36.6837′S	107°31.4696′W	3972.5	10	87.2	91.92	105.41
	U1532C	68°36.6952′S	107°31.4721′W	3972.5	32	214.0	179.60	83.95
	U1532D	68°36.6953′S	107°31.5015′W	3972.5	2	19.2	17.42	90.73
	U1532E	68°36.4292′S	107°32.4613′W	3988.4	0	0.0	0.00	0.0
	U1532F	68°36.6833′S	107°31.5303′W	3972.5	0	0.0	0.00	0.0
	U1532G	68°36.6954′S	107°31.5299′W	3972.5	45	421.7	366.41	86.89
Site U1532 totals					**100**	**842.7**	**758.39**	**90.00**
U1533	U1533A	68°44.0168′S	109°0.6014′W	4192.0	3	28.5	29.54	103.65
	U1533B	68°44.0994′S	109°3.0010′W	4201.4	42	357.1	250.78	70.23
	U1533C	68°44.0696′S	109°1.5103′W	4201.4	1	7.7	7.74	100.52
	U1533D	68°44.0727′S	109°1.4901′W	4195.2	5	40.0	40.01	100.52
Site U1533 totals					**51**	**433.3**	**328.07**	**75.71**
Expedition 379 totals					**151**	**1,276.0**	**1,086.46**	**85.15**

Science summary

Expedition 379 drilled two very successful sites on the continental rise of the Amundsen Sea. Site U1532 is located on a large sediment drift now called Resolution Drift and penetrated to 794 meters below seafloor (mbsf) with 90% recovery. We collected almost continuous cores from the Pleistocene through the Pliocene and into the late Miocene. At Site U1533, we drilled 383 mbsf (with 70% recovery) into the more condensed sequence at the lowermost flank of the same sediment drift. The cores of both sites contain unique records to study the cyclicity of ice sheet advance and retreat processes as well as ocean-bottom circulation and water mass changes. In particular, Site U1532 revealed a sequence of Pliocene lithofacies with an excellent paleomagnetic record for very high resolution, suborbital scale climate change studies of the previously sparsely sampled Pacific sector of the West Antarctic margin.

Recovery of core on the continental rise at Sites U1532 and U1533 cannot give a direct answer regarding the position of ice or retreat of the ice sheet across the shelf. However, the sediments contained in the cores offer a range of clues about past ice sheet extent and retreat. Coarse-grained sediments interpreted to be ice-rafted debris (IRD) were identified throughout all recovered time periods. A dominant feature of the cores is cyclicity, which is interpreted to represent relatively warmer periods variably characterized by higher microfossil abundance and higher counts of IRD alternating with colder periods characterized by dominantly gray laminated terrigenous muds. Initial comparison of these cycles to published records from the region suggests that the units interpreted to be recording warmer time intervals in the core tie to interglacial periods and the units interpreted to have been deposited during colder periods tie to glacial periods.

The cores from the two sites recovered sediments of terrigenous origin intercalated or mixed with pelagic or hemipelagic deposits. In particular, Site U1533, which is located in proximity to a deep-sea channel running from the lower continental shelf to the abyssal plain, contains coarse and fine fractions and clasts identified as having been transported downslope from the shelf. The channel is likely the path of such sediments transported downslope by turbidity currents or other sediment-gravity transport processes. The association of lithologic facies at both sites predominantly reflects the interplay of downslope and contouritic sediment transport with phases of relatively more pelagic sediment input. Despite the lack of cores from the shelf, our records from the continental rise reveal the timing of glacial

advances onto the shelf and thus the expansion of a continent-wide ice sheet in West Antarctica at least back to the late Miocene.

Cores from both drill sites contain abundant coarse-fraction sediments and clasts of plutonic origin transported either by downslope processes or by ice rafting. If detailed provenance studies confirm our preliminary assessment that the origin of these samples is from the plutonic bedrock of Marie Byrd Land, their thermochronological record will potentially reveal timing and rates of denudation and erosion linked to crustal uplift. The chronostratigraphy of both sites enables generation of a seismic sequence stratigraphy not only for the Amundsen Sea rise but also for the western Amundsen Sea along the Marie Byrd Land margin through a connecting network of seismic lines.

Expedition 382: Iceberg Alley and Subantarctic Ice and Ocean Dynamics

Planning

Port call logistics and ice-monitoring services were finalized. Preparations for surface and air freight were completed, and the shipments were dispatched.

Staffing

The ice observer accepted the invitation to sail. One US Science Support Program (USSSP) replacement scientist was invited and accepted the invitation to sail. Argentina selected and we invited their official observer for the expedition.

Clearance, permitting, and environmental assessment activities

Authorization from the United Kingdom to conduct research in the Falkland Island Exclusive Economic Zone (EEZ) was obtained on 16 January. Authorization from Argentina to conduct research in the Islas Malvinas EEZ was obtained on 19 March.

Expedition 383: Dynamics of Pacific Antarctic Circumpolar Current

Planning

The outreach and education plans were finalized and sent to the science party. Efforts continued with the Universidad de Magallanes and the American Corner to organize ship tours during port call. Preparations for surface freight were completed, and the shipment was dispatched.

Staffing

A special call for a stratigraphic correlator was sent out and a scientist accepted the invitation to sail. The film crew worked on securing funding for expedition participation.

Expedition 379T: JR100

Staffing

Multiple scientists withdrew from the expedition because of the schedule changes. Most positions have been re-staffed, and the Co-Chief Scientists worked to fill the remaining positions.

Clearance, permitting, and environmental assessment activities

The embassy confirmed that the diplomatic note was submitted on 28 January.

Expedition 385T: Panama Basin Crustal Architecture and Deep Biosphere: Revisiting Holes 504B and 896A

Planning

The Expedition 385T *Scientific Prospectus* was published in March. The expedition title was changed to better reflect addition of the second Ancillary Project Letter (APL). JRSO worked on addressing essential engineering issues associated with removing the wireline-deployed observatories from the two holes.

Staffing

The final science position was finalized. Three Onboard Outreach Officers were invited, and two accepted the invitation to sail.

Expedition 385: Guaymas Basin Tectonics and Biosphere

Planning

All shipboard sample/data requests and research plans were received and reviewed; thirteen will require special shipping requirements. JRSO worked on addressing questions regarding scientists' third-party tools (e.g., incubators, hybridization ovens). The postcruise editorial meeting and sample party was scheduled for 16–27 March 2020. The new electronic boards to increase the temperature range of the advanced piston corer (APC) temperature tool (APCT-3) to 100°C were received from the vendor, and plans were made for testing and calibration of the tool during the next quarter.

Staffing

An Onboard Outreach Officer was selected and accepted the invitation to sail.

Clearance, permitting, and environmental assessment activities

The marine scientific research (MSR) application was submitted to the US State Department on 19 January, and the US State Department submitted the application and diplomatic note to the Mexican government on 15 February.

Expedition 378: South Pacific Paleogene Climate

Staffing

Effort this quarter focused on replacing participants who withdrew because of the schedule change. Two scientists were invited and accepted the invitation to sail. A new USSSP Onboard Outreach Officer was invited to sail. A special call for a stratigraphic correlator was sent out.

Expedition 384: Engineering Testing

Planning

A site prospectus was provided to the bit vendors to develop specifications for operation of the bits and turbines for expected lithologies. The drilling tests will be carried out at Site U1414 with Site U1481 as a contingency based on water depth, sediment thickness, and previous basement coring.

Expedition 387: Amazon Margin

Planning

The Expedition 387 precruise meeting was held in College Station, Texas, on 28 and 29 March.

Expedition 388: Equatorial Atlantic Gateway

Planning

The Expedition 388 precruise meeting was held in College Station, Texas, on 6 and 7 February 2019.

Staffing

A call for a USSSP Onboard Outreach Officer was sent out in March.

3. Management and administration

Management and administration (M&A) activities include planning, coordinating (with other IODP-related entities), overseeing, reviewing, monitoring, assuring compliance for, and reporting on IODP activities.

Progress reporting

The JRSO operations and management report for the first quarter of FY19 (October–December) was submitted to NSF on 6 February (http://iodp.tamu.edu/publications/AR/FY19/FY19_Q1.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/boards-and-panels/facility-boards).

Planning meetings

Brad Clement met with senior management of Siem Offshore on March 27-28 to discuss moving Overseas Drilling Limited (ODL) into the Siem Offshore headquarters in Kristiansand, Norway.

JRSO site visits

JSRO hosted the Co-Chief Scientist review of FY18 operations in College Station, Texas, on 25 and 26 February. Susan Humphris (Woods Hole Oceanographic Institution, US) chaired the meeting. Attendees included Brian Huber (National Museum of Natural History, US), Richard Hobbs (University of Durham, UK), Ingo Pecher (University of Auckland, New Zealand), Philip Barnes (National Institute of Water and Atmospheric Research [NIWA], New Zealand), Laura De Santis (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale [OGS], Italy), and Demian Saffer (Pennsylvania State University, US). Robert McKay (Victoria University of Wellington, New Zealand) attended via videoconference.

Project portfolio management

GEODESC

Scope and deliverables

The purpose of this project is to replace the DESClogik core description interface, with the principal goal of increasing performance and reliability. The GEODESC project proposes to design, build, and deliver a new and improved GEODESC tool set.

Status

The GEODESC project management plan was completed on 25 March and will be reviewed by the management team in April.

Data Publishing

Scope and deliverables

The purpose of the Data Publishing project is to build a framework, tools, and processes capable of publishing expedition data sets for long-term repository storage and discovery of referenceable information. This project will also support publication of data files not currently available online. When completed, all published information will be available for science community use via the JRSO publications website, a dynamic search engine (similar to Laboratory Information Management System [LIMS] Online Report Environment [LORE]/OVERVIEW), and web-based searches.

Status

The Data Publishing project remains on track for late April completion.

SampleMaster Replacement

Scope and deliverables

The purpose of the SampleMaster Replacement project is to replace the SampleMaster application with a modular program. SampleMaster is an application that provides for all initial IODP data entry into the LIMS database. This interface is used across the organization by a wide range of people who fall into groups of users, and those users perform specific tasks.

Status

The Sample Planning Tool (SPLAT) was completed and deployed in March. The project manager intends to submit the SampleMaster Catwalk Module Charter in April for management team review. The entire project, comprising multiple modules, remains on track for completion in February 2021.

4. Subcontract activities

The JRSO continued to interact with ODL to ensure efficient and compliant operations of the *JOIDES Resolution*. The JRSO is working with ODL to produce a restatement of the TAMRF/ODL contract, which is intended to simplify the document by removing irrelevant material and condensing amendments into simplified text.

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 worked successfully to streamline travel and shipping activities.

The JRSO started the process of recompeting the wireline logging subcontract by issuing a call for proposals.

5. Science operations

The Science Operations (SciOps) department provides scientific, operational, engineering, and logistical planning and implementation for *JOIDES Resolution* drilling expeditions in response to the IODP science planning structure. The JRSO is responsible for scoping, planning, managing, and implementing science expeditions (see Section 2); conducting long-range operational planning for out-year JRSO expeditions; providing services and materials for the platform, oversight to drilling and logging contractors, and utilizing IODP resources to oversee engineering development projects.

Expedition outreach support

JRSO staff assisted with planning for Expedition 383 and 385 port call public relations and outreach activities and participated with Onboard Outreach Officer training for Expeditions 382, 383, and 385.

6. Technical and analytical services

The Technical and Analytical Services (TAS) department develops, maintains, and operates a diverse array of scientific equipment for analyzing cores and core samples; staffs the shipboard laboratories with skilled technicians; provides support for shipboard scientists; assists with downhole tools and measurements; and facilitates shipboard core curation, handling, and shipping.

Analytical systems

Activities, acquisitions, and repairs during this quarter include the following:

- During the Expedition 379 port call, the new X-Ray Imager was installed on the Whole-Round Multi-Sensor Logger (WRMSL) in the core track area. The system uses a continuous source (120 kV, 1 mA max power) and a high-resolution digital detector to provide the science party with X-ray images of whole- or half-round core sections. During the expedition, the X-ray system was used to image every whole-round section and many section halves. JRSO-developed software runs the instrument and reduces the raw image data to adjust brightness and contrast and to compensate for the geometric distortion of analyzing round samples.
- A digital computer numeric control (CNC) mill was purchased in order to facilitate machining of replacement parts and/or modification of parts to improve services aboard the *JOIDES Resolution*. The CNC mill will be installed on an upcoming cruise.
- A vacuum impregnation system was purchased in order to better impregnate thin section billets and produce better quality thin sections on difficult samples.

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 any concerns raised by the IODP Issues Management Team to provide advice on corrective actions and potential developments for laboratories.

Curation and Core Handling

The Curation and Core Handling LWG met this quarter to discuss the following issues:

- Upcoming work on the second part of the replacement for the Sample Master curatorial software, which will be the "catwalk module," used for entry of core sections and catwalk samples taken from the whole-round sections. The first part of the curatorial software replacement created the sample planning software (primarily used for sampling parties).
- The need for a standard operating procedure for shipping samples, especially core sections, to and from other institutions.
- The shortage of space in the Gulf Coast Repository (GCR) core refrigerators in general.
- Space in the core refrigerators to handle postcruise, programmatic XRF Core Scanner measurements. It may be necessary to rent a refrigerated container to keep some of these cores, as the LWG did not want to create a situation where programmatic measurements run out of time because of space concerns. Their recommendation also included providing a 2-month grace period (4 months total) in case of emergency/rescheduling.
- The Sample and Data Request (SaDR) software and comments received by science users as well as the developers. The recommendation was to propose a project to begin replacing this system.

Geochemistry and Microbiology

The Geochemistry and Microbiology LWG did not meet this quarter.

Geology

The Geology LWG met this quarter to discuss the following ongoing issues. There were no reported issues arising from Expedition 368X.

- Stratigraphic correlation—Correlator Version 3 was released with improvements to the user experience. To ensure that technical staff will be able to provide shipboard support in Correlator basics, it was decided that the Assistant Laboratory Officers (ALOs) will be trained in the basic stratigraphic correlation workflow.
- The LWG discussed the hydrofluoric acid (HF) use guidelines document and its implications for expeditions wishing to use it.
- A suggestion was made to replace the color digital linescan cameras on the Section Half Imaging Logger (SHIL) with a more modern camera. The technical staff will consider this suggestion for a later decision.
- The LWG discussed the GEODESC project proposal to replace DESClogik, the core description software, especially in terms of ensuring that paleontological data entry is better supported than in DESClogik.

Geophysics

The Geophysics LWG only had an email notification from the science lead this quarter because only one comment was received from Expedition 368X (that we provide a new Agico KappaBridge with furnace

and cryogenic capability). The TAS department will consider this, as well as the option for dual-frequency magnetic susceptibility measurements.

7. Development, IT, and databases

The Development, IT, and databases (DITD) department manages data supporting IODP activities, operates and maintains shipboard and shore-based computer and network systems, and monitors and protects the JRSO network and server resources to ensure safe, reliable operations and security for IODP data and IT resources. Additional activities include managing expedition and postexpedition data, providing long-term archival access to data, and supporting JRSO Information Technology (IT) services.

Expedition data

LIMS database

Data from Expedition 379 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 the expedition. Data from Expedition 371 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.

Table 7.1. Top 10 countries accessing JRSO web databases

	Janus database		LIMS database	
Rank	Country	Visitor sessions	Country	Visitor sessions
1	USA	1,094	USA	1,453
2	China	365	UK	286
3	UK	266	China	277
4	Australia	111	Germany	115
5	Germany	108	Russia	76
6	Norway	98	France	74
7	Unknown	97	Unknown	74
8	France	84	Japan	63
9	Switzerland	81	Europe	58
10	Italy	68	Brazil	50
	Others	422	Others	306
	Total	**2,794**	**Total**	**2,832**

Table 7.2. Top 20 database web queries

	Janus database		LIMS database	
Rank	Query	Views	Query	Views
1	Imaging—TSmicro	3,666	Imaging—core composites	14,982
2	Imaging—core photo	2,889	Samples	1,206
3	Site summary trivia	982	Imaging—section scans	1,090
4	Site summary	867	Section summaries	664
5	Samples	773	Physical properties—MS	612
6	Imaging—core close-up photos	771	Hole summaries	594
7	Leg summaries	696	Physical properties—GRA	588
8	Paleo—age profile	694	Core summaries	428

Rank	Janus database		LIMS database	
	Query	Views	Query	Views
9	Core summaries	693	Chemistry—carbonate	384
10	Point calculations	691	Physical properties—RSC	354
11	Chemistry—carbonates	672	Physical properties—MAD	340
12	Paleontology—paleo dictionary	596	Physical properties—NGR	340
13	Hole trivia	581	Physical properties—MSPOINT	268
14	Physical properties—GRA	567	Imaging—core close-up photos	250
15	Paleo—range tables	549	SRM sections	238
16	Special holes	423	Chemistry—IW	230
17	Hole summaries	406	XRD	214
18	Prime data images	394	Physical properties—PWL	194
19	Paleontology—age models	347	Physical properties—TCON	172
20	Chemistry—IW	288	Imaging—microimages	166
	Others	3,331	Others	2,912
	Total	**20,876**	**Total**	**26,270**

Table 7.3. Data requests to the TAMU Data Librarian

Requests	Total
Photos	6
How to	3
Samples	3
Affline	2
Depth	2
Ages	1
Carbonates	1
MAD	1
RGB	1
VCD	1
XRF	1
Total	**22**

Country	Total
USA	13
Germany	3
China	1
Japan	1
European Union	1
France	1
Ireland	1
Japan	1
UK	1
Total	**22**

Network systems operation, maintenance, and security

JRSO initiated a project to rebid the very small aperture terminal (VSAT) services for the *JOIDES Resolution*. The scope of this work will include upgrades to shipboard satellite service equipment with the potential for a future increase in bandwidth. A request for proposal (RFP) was disseminated to 35 vendors in March. JRSO will review proposals and select a vendor by June. Equipment upgrades were scheduled for the November 2019 port call in San Diego, California (USA).

In response to a Texas A&M University System mandate to consolidate all "significant IT equipment" to an approved member or commercial data center by 1 September 2019, JRSO initiated a project to migrate nearly all of its IT equipment to the TAMU West Campus Data Center (WCDA). Project completion is currently scheduled for late June.

Temporary satellite service charge

At ODL's request, JRSO will reduce channel space on the *JOIDES Resolution*'s satellite connection on 20 May and allocate 384 kbps of bandwidth for the exclusive use of the Siem Offshore crew in support of Expedition 383. ODL will reimburse the JRSO for the use of this bandwidth, which will be reallocated for JRSO use in July 2019.

8. 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.

Sample and curation strategies

The JRSO planned sample and curation strategies this quarter for upcoming JRSO Expeditions 379, 382, and 383.

Sample requests and core sampling

The following table provides a summary of the 2,615 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 X-ray fluorescence (XRF) analysis. For public relations or educational visits/tours, the purpose of the visit is shown in brackets in the "Sample request number, name, country" column and "No samples" is recorded in the "Number of samples taken" column if no new samples were taken.

Table 8.1. GCR sample requests

Sample request number, name, country	Number of samples taken	Number of visitors
67395IODP, Strojie, USA	52	1
67520IODP, Shankle, USA	98	
67907IODP, O'Connell, USA	137	4
67347IODP, Bouquet, Netherlands	52	
67537IODP, Ting, China	55	
66676IODP, Mignard, France	91	1
68793IODP, Kim, USA	91	2
68690IODP, Bralower, USA	7	
66111IODP, Inglis, UK	12	
67829IODP, Inglis, UK	4	
69179IODP, Bralower, USA	1	
66530IODP, Fontorbe, China	14	
68622IODP, Elmore, USA	38	
67321IODP, Wagner, UK	114	
67417IODP, Alexander, UK	23	
66923IODP, Woodhouse, UK	10	
67639IODP, Carme, Germany	106	
67304IODP, Osselin, France	2	
68096IODP, Chalk, UK	40	
68932IODP, Ford, USA	31	
69075IODP, Seki, Japan	22	
67146IODP, Zeng, China	42	
69206IODP, Rattanasriampaipong, USA	69	1
69654IODP, Kim, USA	12	
67219IODP, Mottoni, France	9	
68006IODP, Si, USA	101	
69215IODP, Kuppusamy, India	757	
69280IODP, McCartney, Poland	107	
69373IODP, Di Capua, Italy	86	
69549IODP, Auderset, Germany	116	

Sample request number, name, country	Number of samples taken	Number of visitors
69051IODP, Braaten, Norway	23	
53615IODP, Kurnosov, Russia	281	2
70327IODP, Jaeger, USA	12	1
Tours/demonstrations (4)		46
Totals	**2,615**	**58**

Use of core collection and education and outreach support

The JRSO promotes outreach use of the GCR core collection by conducting tours of the repository and providing materials for display at meetings and museums. The repository and core collection are also used for classroom exercises.

Table 8.2. GCR tours/visitors

Type of tour or visitor	Number of visitors
Scientist visitors	12
Educational tours/demonstrations (4)	46
Public relations tours (0)	0
Totals	**58**

Onshore XRF scanning

During this quarter, 281 core sections were XRF scanned at the GCR. Documentation relating to the operation, advanced configurations, maintenance, and troubleshooting of the XRF can be found at https://sites.google.com/scientific-ocean-drilling.org/xrf-iodp/home.

Table 8.3. Core sections scanned

Request type	Expedition, name, country	XRF 1	XRF 2	SHIL	WRMSL*
Program	368X, Science Party, Multiple	47	0	47	0
Program	375, Science Party, Multiple	0	10	0	0
Personal	10, 77, 165, Lowery, USA	0	46	46	0
Personal	113, O'Connell, USA	0	45	37	0
Personal	356, Christensen, USA	120	0	0	0
Personal	363, Kulhanek, USA	13	0	0	0
Totals		**180**	**101**	**130**	**0**

Notes: SHIL = Section Half Imaging Logger, WRMSL = Whole-Round Multisensor Logger. *The WRMSL is currently unavailable because it is serving as the development track for a new X-ray system.

9. Publication services

The Publication Services (Pubs) department provides publication support services for IODP riserless and riser drilling expeditions (see Section 2) and editing, production, and graphics services for required Program reports (see Section 3), technical documentation (see Section 6), and scientific publications as defined in the JRSO cooperative agreement with NSF. The Pubs department also maintains legacy access and archiving of Integrated Ocean Drilling Program, Ocean Drilling Program (ODP), and Deep Sea Drilling Project (DSDP) publications.

Scientific publications

Table 9.1. Newly published content on the IODP Publications website

Reports and publications	JRSO	USIO	CDEX	ESO*
Scientific Prospectus	10.14379/iodp.sp.385T.2019			
Expedition Reports	10.14379/iodp.proc.371.2019 10.14379/iodp.proc.371.101.2019 10.14379/iodp.proc.371.102.2019 10.14379/iodp.proc.371.103.2019 10.14379/iodp.proc.371.104.2019 10.14379/iodp.proc.371.105.2019 10.14379/iodp.proc.371.106.2019 10.14379/iodp.proc.371.107.2019 10.14379/iodp.proc.371.108.2019 10.14379/iodp.proc.371.supp.2019			10.14379/iodp.proc.381.2019 10.14379/iodp.proc.381.101.2019 10.14379/iodp.proc.381.102.2019 10.14379/iodp.proc.381.103.2019 10.14379/iodp.proc.381.104.2019 10.14379/iodp.proc.381.105.2019 10.14379/iodp.proc.381.106.2019 10.14379/iodp.proc.381.107.2019 10.14379/iodp.proc.381.supp.2019
Data Report	10.14379/iodp.proc.355.202.2019 10.14379/iodp.proc.362.201.2019	10.2204/iodp.proc.344.208.2019		10.2204/iodp.proc.313.203.2019

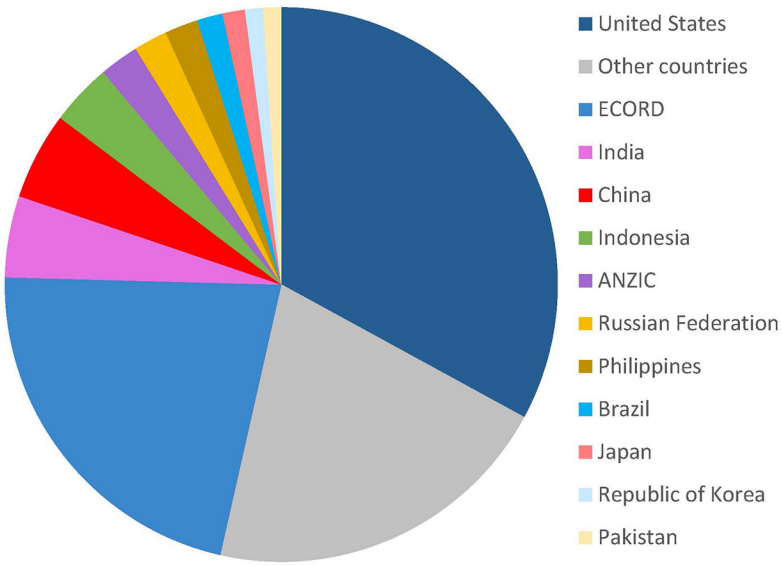
Note: *ESO publications are produced under contract with the British Geological Survey.

Web services

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

During the last quarter, the IODP TAMU website received 434,443 page views and 52,963 site visits and the IODP Publications website received 407,216 page views and 22,661 site visits. Where possible, visits by JRSO employees and search engine spiders were filtered out of the counts. Visitors to the IODP TAMU website came from more than 220 countries.

Figure 9.1. Top 12 countries/consortia of visitors to the IODP TAMU website



The ODP science operator, ODP legacy, and DSDP publications websites are hosted at TAMU. Key data, documents, and publications produced during 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.

Table 9.2. Legacy website statistics

Legacy website	FY19 Q2 page views*	FY19 Q2 site visits*
www-odp.tamu.edu	278,298	25,593
www.odplegacy.org	3,912	1,704
www.deepseadrilling.org	29,036	8,626
Total	**311,246**	**35,923**

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

Publications coordination

Data reports related to Expeditions 313, 314/315/316, 341, 344, 346, 355, 362, and 366 were received, sent to peer review, accepted, and/or published this quarter.

Discovery and accessibility

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, as are the 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.

Table 9.3. Number of online DOI resolutions

Reports and publications	DOI prefix	January 2019	February 2019	March 2019	FY19 Q2 total
IODP	10.14379	3,609	5,550	7,227	**16,386**
Integrated Ocean Drilling Program	10.2204	6,183	7,645	11,509	**25,337**
ODP/DSDP	10.2973	12,081	14,392	44,483	**70,956**

Science Open

Integrated Ocean Drilling Program and IODP expedition reports and data reports are indexed at ScienceOpen. IODP deposited data reports from Volumes 339, 344, 353–355, and 380 into ScienceOpen this quarter.

Table 9.4. ScienceOpen *Proceedings of the International Ocean Discovery Program* collection statistics (https://www.scienceopen.com/collection/IODP_Publications)

Period	Articles added	Article views	Altmetric score (collection)	Number of authors	Share count	Cited by articles
FY19 Q1	55	238	135	1,592	255	14
FY19 Q2	8	822	136	1,605	225	17
Total to date	**676**	**6,650**	—	—	**599**	**265**

Table 9.5. ScienceOpen Scientific Ocean Drilling Expedition Research Results collection statistics (https://www.scienceopen.com/collection/8b0582f6-47bf-4988-b90a-8533135e6fcc)

Period	Articles added	Article views	Altmetric score (collection)	Number of authors	Share count	Cited by articles
FY19 Q1	74	2,103	16,234	8,563	24	350
FY19 Q2	196	1,247	18,860	8,961	136	428
Total to date	**2,971**	**8,940**	—	—	**178**	**9,366**

Altmetric.com

The JRSO worked with the TAMU Office of Scholarly Communication this quarter to develop and test a user interface (UI) query through which data from IODP scientific publications can be automatically mined from CrossRef into TAMU's Symplectic Elements database via DOI. The Elements database feeds data to http://altmetric.com, a platform that enables monitoring of the online activity surrounding academic research. This quarter the JRSO used the UI query to upload DOIs of Integrated Ocean Drilling Program and IODP *Proceedings* volumes and data reports for Expeditions 301–348, 367-368, and 380. There are now 685 program publication records being tracked in Altmetric.com. Additional DOIs will be uploaded quarterly as new volumes and data reports are published.

Legacy activities

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 303/306, 304/305, 310, 313–320/321, 323–325, 333, 338–346, 348, and 349 were submitted to English language peer-reviewed journals or the Program.

Publications archiving

The main IODP publications website (http://publications.iodp.org/index.html), which includes full content from all Integrated Ocean Drilling Program and IODP volumes, and other publications pages (http://iodp.tamu.edu/publications) are archived at Archive-it, a long-term archive specializing in full website backups. Quarterly crawls incrementally update the archive with new files, which included 11,130 new documents (6.9 GB) for this quarter. In addition, the archive houses legacy publications sites for DSDP and ODP, for a grand total of 1.2 TB of data and 6,366,823 documents. The archive can be viewed at https://archive-it.org/collections/9148.

Citation management

IODP Pubs contracts with the American Geosciences Institute to maintain the Scientific Ocean Drilling Citation Database, a subset of the GeoRef database that contains more than 35,000 records for Program-related scientific ocean drilling publications from 1969 to the present. This quarter, IODP Pubs sent 160 expedition-related publication citations for consideration for inclusion in the database.

Table 9.6. Scientific Ocean Drilling Bibliographic Database statistics

Program-related publications	January 2019	February 2019	March 2019	FY19 Q2 total
Searches	556	522	645	**1,723**
Citation views	359	464	354	**1,177**

IODP Pubs also maintains a current PDF list of publications and conference presentations/abstracts authored by JRSO staff and Research Information Systems (RIS)-format citation data lists for IODP program publications and staff-authored journal articles (http://iodp.tamu.edu/staffdir/indiv.html). RIS is a standardized tag format that enables citation programs to exchange data. Users can copy the content of the RIS files and import it into most bibliographic software. The IODP program publication and JRSO staff-authored lists are updated quarterly.

Abstracts authored by JRSO staff

Abstracts of conference presentations during this quarter authored by JRSO staff include the following. Bold type indicates JRSO staff (http://iodp.tamu.edu/staffdir/indiv.html).

IODP/ICDP Kolloquium 2019

- Eijsink, A.M., Ikari, M.J., Wallace, L.M., Saffer, D.M., Barnes, P.M., Pecher, I.A., **Petronotis, K., LeVay, L.J.**, and the IODP Expedition 375 and 372 Scientists, 2019. Plate-rate frictional behavior of sediment inputs to the Hikurangi subduction margin: which lithologies cause slow slip events? [presented at the IODP/ ICDP Kolloquium, 18–20 March 2019, Köln, Germany].
- Heeschen, K., Pecher, I., Schlömer, S., Torres, M., Screaton, E., Georgiopoulou, A., Mountjoy, J., et al. (including **L. LeVay** and **K. Petronotis**), 2019. IODP Site U1517: Insights from hydrocarbon measurements into the gas-hydrate bearing slope sediments at the Toaheni Landslide Complex (TLC) offshore New Zealand [presented at the IODP/ ICDP Kolloquium, 18–20 March 2019, Köln, Germany].
- Kutterolf, S., Ikari, M.J., Huepers, A., and Expedition 372 and 375 Scientists (including **L. LeVay** and **K. Petronotis**), 2019. Unlocking the secrets of slow slip by integrating core data, seismic and mechanical experiments, as well as borehole observatories at the offshore Hikurangi subduction zone, IODP Expeditions 372 & 375 [presented at the IODP/ ICDP Kolloquium, 18–20 March 2019, Köln, Germany].

Irish Geological Research Meeting 2019

- Behboudi, E., McNamara, D.D., Murray, J., Wallace, L., Saffer, D., Barnes, P., Pecher, I., et al. (including **K. Petronotis** and **L. LeVay**), 2019. The link between stress, pore pressure, and subduction dynamics: implications for offshore geohazards and resource development [presented at the Irish Geological Research Meeting, 1–3 March 2019, Dublin, Ireland].
- Couvin, B., Georgiopoulou, A., Mountjoy, J., Crutchley, G., and IODP Expeditions 372 and 375 Participants (including **L. LeVay** and **K. Petronotis**), 2019. Exploring the characteristics of the Tuaheni Landslide Complex, Hikurangi Margin, offshore New Zealand [presented at the Irish Geological Research Meeting, 1–3 March 2019, Dublin, Ireland].

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 Scientific Ocean Drilling Bibliographic Database (http://iodp.tamu.edu/publications/

bibliographic_information/database.html) and the IODP expedition-related bibliographies (http://iodp.tamu.edu/publications/citations.html).

- Auer, G., De Vleeschouwer, D., Smith, R.A., **Bogus, K.**, Groneveld, J., Grunert, P., Castañeda, I.S., et al., 2019. Timing and pacing of Indonesian Throughflow restriction and its connection to Late Pliocene climate shifts. *Paleoceanography and Paleoclimatology*. https://doi.org/10.1029/2018PA003512
- Jovane, L., Florindo, F., **Acton, G.**, Ohneiser, C., Sagnotti, L., Strada, E., Verosub, K.L., et al., 2019. Miocene glacial dynamics recorded by variations in magnetic properties in the ANDRILL-2A drill core. *Journal of Geophysical Research: Solid Earth*, 124(3):2297–2312, https://doi.org/10.1029/2018JB016865
- Gruetzner, J., Jiménez Espejo, F.J., Lathika, N., Uenzelmann-Neben, G., Hall, I.R., Hemming, S.R., **LeVay, L.J.**, and the Expedition 361 Scientists, 2019. A new seismic stratigraphy in the Indian-Atlantic Ocean Gateway resembles major paleo-oceanographic changes of the last 7 Ma. *Geochemistry, Geophysics, Geosystems,* 20(1):339–358. https://doi.org/10.1029/2018GC007668
- Khim, B.-K., Lee, J., Ha, S., Park, J., Pandey, D.K., Clift, P.D., **Kulhanek, D.K.,** et al., 2019. Variations in δ13C values of sedimentary organic matter since late Miocene time in the Indus Fan (IODP Site 1457) of the eastern Arabian Sea. *Geological Magazine*, 7 January 2019. https://doi.org/10.1017/S0016756818000870
- Yu, Z., Colin, C., Wan, S., Saraswat, R., Song, L., Xu, Z., Clift, P, et al. (including **D. Kulhanek**), 2019. Sea level–controlled sediment transport to the eastern Arabian Sea over the past 600 kyr: clay minerals and Sr–Nd isotopic evidence from IODP Site U1457. *Quaternary Science Reviews*, 205:22–34. https://doi.org/10.1016/j.quascirev.2018.12.006

Appendix: JRSO quarterly report distribution

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