International Ocean Discovery Program

JOIDES Resolution Science Operator

FY19 Q1 Operations and Management Report

1 October–31 December 2018

Cooperative Agreement OCE-1326927

Submitted by the JRSO

to

The National Science Foundation

and

The JOIDES Resolution Facility Board

6 February 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
Brothers Arc Flux	376	Auckland, New Zealand	5 May– 5 July 2018	61 (5/56)	56 (2/54)	C. de Ronde S. Humphris	T. Höfig
Non-IODP (Maintenance, Subic Bay, Philippines) (5 July–15 November 2018) (133 days)							M. Malone
Return to Hole U1503A (South China Sea)	368X	Hong Kong	15 November– 8 December 2018	23 (3/20)	20 (2/18)	N/A	L. Childress
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 (504B) and Restoring Hole 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

Expedition		Port (origin)	Dates[1]	Total days (port/ sea)	Days at sea (transit[2]/ ops)	Co-Chief Scientists	Expedition Project Manager
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
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 375: Hikurangi Subduction Margin

Postexpedition activities

A joint postcruise editorial meeting for Expeditions 372 and 375 was held 5–9 November in College Station, Texas.

Expedition 376: Brothers Arc Flux

A postcruise editorial meeting for Expedition 376 was held 3–7 December in College Station, Texas.

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

Planning

Preparations for surface and air freight were completed, the shipments were dispatched, and port call planning and logistics were finalized.

Staffing

Science Party staffing was completed on 8 October. The Taiwanese observer was confirmed.

Table 2.2. Expedition 68X Science Party staffing breakdown

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

Clearance, permitting, and environmental assessment activities

The tentative Science Party and crew list was submitted on 2 October. Clearance authorizations from Taiwan and China were received 13 and 14 November, respectively.

Table 2.3. Expedition 368X coring summary

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (*N*)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1503	U1503A	18°08.6300′N	116°18.8456′E	3867.7	87	715.0	26.00	26.00
Expedition 368X totals					**87**	**715.0**	**26.00**	**26.00**

Science summary

Expedition 368X (15 November–8 December) returned to Site U1503 to complete operations initiated during Expedition 368: South China Sea Rifted Margin. A key operational objective of Site U1503 was to sample the lowermost ~300 m of sediments on top of basement to constrain the age and subsidence history of the crust at this location, the timing of normal faulting, and the environment of the early half-graben fill. The other critical goal was to sample the igneous stratigraphy to at least 100 m below the sediment/basement interface. Deep representative sampling of the basaltic material at this site will provide an important reference frame for the modeling of the South China Sea breakup.

The reentry system and 10¾ inch casing (to 995.1 m below seafloor [mbsf]) installed during Expedition 368 was used to reenter Hole U1503A. A free-fall funnel atop a 5 m extension was added to the reentry system to aid reentries during the expedition. The sediment sequence was cored with the rotary core barrel system from 995.1 to 1597.84 mbsf (602.74 m cored; 128.01 m recovered; 21% recovery) and then continuously cored 112.26 m into the underlying basalt from 1597.84 to 1710.1 mbsf (47.91 m recovered; 43% recovery). Following the final core, the bit was released on the seabed. Logging with the Vertical Seismic Imager tool was conducted within the casing only. The final depth (1710.1 mbsf) is the fifth deepest penetration depth by the *JOIDES Resolution*.

Expedition 379: Amundsen Sea West Antarctic Ice Sheet History

Planning

The Expedition 379 *Scientific Prospectus* addendum was published in November. Port call logistics and ice monitoring services were finalized. Preparations for surface and air freight were completed, and the shipments were dispatched.

Staffing

The second ice observer accepted the invitation to sail.

Clearance, permitting, and environmental assessment activities

The modified Antarctic waste management permit was approved 21 December. The environmental evaluation for Expeditions 379, 382, and 383 was completed for the sites in Antarctic waters on 21 December. The Antarctic radioisotope use request form was approved 21 December.

Expedition 382: Iceberg Alley and Subantarctic Ice and Ocean Dynamics

Planning

Alfred Wegener Institute scientists began preparing a joint press release for Amundsen Sea and the following two expeditions. The Expedition Project Manager met with some members of the Science Party at the American Geophysical Union (AGU) Fall Meeting in December.

Staffing

Ice Observer staffing is in progress. One replacement scientist from the European Consortium for Ocean Research Drilling (ECORD) Science Support and Advisory Committee (ESSAC) was invited and accepted the invitation to sail.

Clearance, permitting, and environmental assessment activities

The modified Antarctic waste management permit was approved 21 December. The environmental evaluation for Expeditions 379, 382, and 383 was completed for the sites in Antarctic waters on 21 December. The Antarctic radioisotope use request form was approved 21 December.

Expedition 383: Dynamics of Pacific Antarctic Circumpolar Current

Planning

The Expedition 383 *Scientific Prospectus* addendum was published in October. The Expedition Project Manager met with some members of the Science Party at AGU. One of the expedition Co-Chief Scientists was contacted by a film producer about the possibility of making a science documentary.

Staffing

Science Party staffing was completed in October.

Clearance, permitting, and environmental assessment activities

The marine scientific research (MSR) application was submitted to the US State Department on 10 October. The US State Department submitted the diplomatic note to Chile on 28 November. The modified Antarctic waste management permit was approved on 21 December. The environmental evaluation for Expeditions 379, 382, and 383 was submitted for the sites in Antarctic waters on 21 December. The Antarctic radioisotope use request form was approved 21 December.

Expedition 379T: JR100

Staffing

Three JR100 participants have indicated they cannot sail on the new dates. The Chief Scientist reported that the intention is to replace.

Clearance, permitting, and environmental assessment activities

An addendum with changes in dates, ports, and site status was submitted to the US State Department on 12 October. The embassy reported that a new clearance application would be required, and a revised clearance application was submitted to the US State Department on 30 November. The Washington, DC, clearance office is currently following up with the embassy to confirm that the diplomatic note with the application has been submitted.

Expedition 385T: Panama Basin Crustal Architecture (504B) and Restoring Hole 896A

Planning

Communications began with the Science Party on laboratory methods and operations.

Staffing

Two Co-Chief Scientists accepted the invitation to sail. Invitations to sail were extended and five scientists have accepted.

Expedition 385: Guaymas Basin Tectonics and Biosphere

Planning

The Expedition 385 *Scientific Prospectus* was published in November. Communications with the Science Party on laboratory methods and operations began.

Staffing

Scientific Party staffing was completed in October. A special call for a diatom and nannofossil micropaleontologist was sent out, and two scientists accepted the invitation to sail. Applications were received for Onboard Education Officers and interviews were tentatively scheduled for mid-January.

Clearance, permitting, and environmental assessment activities

JRSO representatives met with US State Department contacts and discussed the upcoming steps regarding necessary forms and documentation. The MSR application for Mexico was completed for submission early in the next quarter.

Expedition 378: South Pacific Paleogene Climate

Staffing

The Science Party was requested to reconfirm participation during the new expedition dates by 15 January. Some scientists will be changing institutions, which may change their status. This needs to be resolved before final staffing can proceed.

Clearance, permitting, and environmental assessment activities

A report of the Iwi notification and response and an initial environmental assessment form were submitted to the New Zealand Environmental Protection Authority on 11 October. New Zealand required a new MSR application, which was submitted on 25 October.

Expedition 384: Engineering Testing

Planning

Site specifics will be provided to the bit vendors in early January to develop the operating specifications and protocols for the bits to be tested.

Expedition 387: Amazon Margin

Staffing

Two Co-Chief Scientists accepted the invitation to sail and received an overview of the staffing procedures, which will begin in the third quarter.

Expedition 388: Equatorial Atlantic Gateway

Planning

An Expedition 388 pre-expedition meeting was scheduled for 4–8 February in College Station, Texas.

Staffing

Two Co-Chief Scientists accepted the invitation to sail and received an overview of the staffing procedures, which will begin in the third quarter.

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 fourth quarter of FY18 (July–September) was submitted to NSF on 13 November (http://iodp.tamu.edu/publications/AR/FY18/FY18_Q4.pdf), and the FY18 IODP JRSO Annual Report was submitted to NSF on 21 December (http://iodp.tamu.edu/publications/AR/FY18AR.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).

Brad Clement (JRSO Director), Mitch Malone (JRSO Assistant Director and Manager of Science Operations), Adam Klaus (retiring JRSO Supervisor of Science Support), and Katerina Petronotis (new JRSO Supervisor of Science Support) attended a meeting of the US scientific ocean drilling leadership held in Washington, DC, on 12 December.

Project portfolio management

The JRSO continued work on the SampleMaster Replacement, Data Publishing, and GEODESC projects.

GEODESC

Scope and deliverables

The purpose of this project is to replace DESClogik, 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 remains on track for submitting a revised project management plan in February 2019.

Data Publishing

Scope and deliverables

The purpose of the Data Publishing project is to build a framework, tools, and processes capable of publishing expedition information 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

Changes to the data publishing workflow caused a software rewrite and retesting, pushing the project's target completion date to April.

SampleMaster Replacement

Scope and deliverables

The purpose of the SampleMaster Replacement project is to replace SampleMaster 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 (formerly known as the Sample Party Module) completion date was extended to 31 January 2019 and is in final testing. The entire project, comprising multiple modules, remains on track for completion in February 2021.

4. Subcontract activities

The JRSO continued to interact with Overseas Drilling Limited (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.

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 technical advice and assistance for ECORD Science Operator (ESO) and Center for Deep Earth Exploration (CDEX) expeditions; and utilizing IODP resources to oversee engineering development projects.

Engineering support

The vibration isolated television winch system was fully tested during the transit from Subic Bay, Philippines, to Hong Kong, running the camera to near the seafloor in ~3,900 m of water. The system worked well with some fine tuning to optimize its speed.

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.

Maintenance period activities

During the end of the Subic Bay tie-up, the transit to Hong Kong, and the Hong Kong dry dock, the following projects were completed:

- Removed old deck crane from the fantail;
- Painted most of the laboratory floors, the gym floor, and the pallet stores floor;
- Installed built-in bookshelves in the Science Lounge; and
- Replaced older laboratory chairs that were deemed nonergonomic with new chairs.

Analytical systems

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

- Onshore development and testing of the manual X-ray system for imaging core sections was completed. The system was shipped to the Expedition 379 port call, where it will be installed, further tested, and used during Expedition 379 and beyond.
- Manuals and user guides were converted to Confluence web documents as part of an effort to create a Wiki for all laboratory manuals, guides, and resources. The Wiki will allow the manuals to be updated more easily and make the updates immediately available to the users. The Confluence software tracks all changes made, records the histories of all documents, and notifies the interested parties when changes are made. The primary Wiki will reside on the ship and a copy will be accessible to the public from shore at https://wiki.iodp.tamu.edu.
- The software and hardware for the track of the Natural Gamma Radiation (NGR) system were upgraded to make the automated track compatible with all other shipboard track systems. In addition, changes were made in the software to improve the calibration process and enhance quality control by adding utilities for monitoring the status of the instrument during background, calibration, and sample measurements.
- The compressor on the superconducting rock magnetometer (SRM) was replaced.
- A faulty power supply on the X-ray diffractometer (XRD) was replaced.
- New high pressure, stainless steel air lines for seismic G-Guns, which are used for vertical seismic profiling studies, were installed and tested.

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. The LWGs did not meet this quarter because the ship was in dry dock or tie-up status for much of this and the previous quarter and there were no pending expedition issues.

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 368X 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 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.

Table 7.1. Top 10 countries accessing JRSO web databases

	Janus database		LIMS database	
Rank	Country	Visitor sessions	Country	Visitor sessions
1	USA	1,084	USA	1,128
2	China	321	China	708
3	Germany	236	United Kingdom	320
4	United Kingdom	214	Japan	309
5	Japan	136	Germany	182
6	Switzerland	82	Unknown	133
7	France	80	New Zealand	115
8	Unknown	78	South Korea	99
9	Canada	70	Brazil	86
10	Norway and Sweden	46	Russia	86
	Others	353	Others	376
	Total	**2,746**	**Total**	**3,242**

Table 7.2. Top 20 database web queries

	Janus database		LIMS database	
Rank	Query	Views	Query	Views
1	Imaging—core photos	1,758	Imaging—core photos	1,746
2	Core summaries	1,148	Samples	1,632
3	Site summaries	890	Section summaries	562
4	Samples	764	Imaging—LS section images	509
5	Physical properties—GRA	464	Physical properties—MS	437
6	Special holes	433	Core summaries	397
7	Paleontology—age models	339	Hole summaries	378
8	Chemistry—carbonates	279	Physical properties—GRA	344
9	Paleomag—cryomag	279	Chemistry—IW	249
10	Chemistry—IW	258	Physical properties—MAD	242
11	Leg summaries	238	Physical properties—NGR	226
12	Hole summaries	225	Chemistry—carbonates	196
13	Physical properties—MSL	192	Physical properties—RSC	192
14	Physical properties—MAD	187	XRD	166
15	Hole trivia	187	XRFSUM	125
16	Imaging—prime data images	169	Imaging—TS images	125
17	Imaging—core close-up photos	163	Physical properties—expanded NGR	117
18	Paleontology—range tables	135	Imaging—core close-up photos	111
19	Site summaries trivia	113	Chemistry—ICP-AES	103
20	Paleontology—age profiles	105	Paleomag—SRM discrete	90
	Others	1,593	Others	2212
	Total	**9,919**	**Total**	**10,159**

Table 7.3. Data requests to the TAMU Data Librarian

Requests	Total
How to	7
Photographs	7
Hole locations	3
Physical properties—GRA	1
Chemistry—IW	1
Seismics	1
Other	1
Total	**21**

Country	Total
USA	13
Kazakhstan	2
United Kingdom	2
Australia	1
Canada	1
Norway	1
Spain	1
Total	**21**

Temporary satellite service charge

At ODL's request, the JRSO reduced channel space on the *JOIDES Resolution*'s satellite connection on 31 December and allocated 384 kbps of bandwidth for the exclusive use of the Siem Offshore crew in support of Expedition 379. ODL will reimburse the JRSO for the use of this bandwidth, which will be reallocated for JRSO use in March 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 Gulf Coast Repository (GCR).

Sample and curation strategies

The JRSO planned sample and curation strategies this quarter for upcoming JRSO Expeditions 368X and 371.

Sample requests and core sampling

The following table provides a summary of the 2,014 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
64378IODP, Jaeger, USA	10	
64258IODP, Kahanamoku, USA	42	
63599IODP, McIntyre, United Kingdom	47	
65211IODP, Kulhanek, USA	0	1
64986IODP, Zhang, USA	71	1
63964IODP, Lyons, USA	3	
65778IODP, Kaskes, Belgium	103	1
65923IODP, Kaskes, Belgium	83	
65983IODP, Passchier, USA	144	

Sample request number, name, country	Number of samples taken	Number of visitors
60046IODP, Kuroyanagi, Japan	72	
65889IODP, Herbert, USA	295	
65993IODP, Woodhouse, United Kingdom	60	
66098IODP, Joerg, Germany	86	
66466IODP, Randle, USA	59	1
66655IODP, Smith, USA	13	
66207IODP, Bhattacharya, USA	2	
66237IODP, McCartney, USA	18	
66892IODP, Bralower, USA	38	
65745IODP, Chen, China	0	
66314IODP, Mejia, Switzerland	8	
66530IODP, Fontorbe, China	19	1
66559IODP, Auderset, Germany	120	
66992IODP, Bablon, France	5	
66135IODP, Suzuki, Japan	133	
66685IODP, Dai, China	68	
66942IODP, John, United Kingdom	55	
67135IODP, Bhattacharya, USA	10	
67102IODP, Prescott, United Kingdom	0	
66603IODP, Poirier, USA	58	
67017IODP, Bhattacharya, USA	46	1
67074IODP, Herbert, USA	115	
66790IODP, Almeida, Switzerland	8	
67131IODP, Luciani, Italy	189	
67236IODP, Kahanamoku, USA	34	
Tours/demonstrations (2)		66
Totals	**2,014**	**72**

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. This quarter, the GCR hosted a workshop for 46 students from Austin Community College.

Table 8.2. GCR tours/visitors

Type of tour or visitor	Number of visitors
Scientist visitors	6
Educational tours/demonstrations (2)	66
Public relations tours (0)	0
Totals	**72**

Onshore XRF scanning

During this quarter, 314 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	376, Höfig, USA	0	6	6	0
Personal	363, Kulhanek, USA	282	0	0	0
Personal	198, Taylor, USA	0	4	0	0
Personal	Xiao, USA	0	18	0	0
Program	375, Petronotis, USA	0	4	0	0
Totals		**282**	**32**	**6**	**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.

Postcruise editorial meetings

Postcruise editorial meetings were held in College Station, Texas, for JRSO Expeditions 372/375 (5–9 November) and 376 (3–7 December).

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.383add.2018 10.14379/iodp.sp.379add.2018 10.14379/iodp.sp.385.2018			
Expedition Report			10.14379/iodp.proc.380.2018 10.14379/iodp.proc.380supp.2018 10.14379/iodp.proc.380.101.2018 10.14379/iodp.proc.380.102.2018 10.14379/iodp.proc.380.103.2018	
Data Report	10.14379/iodp.proc.354.202.2018 10.14379/iodp.proc.353.201.2018 10.14379/iodp.proc.355.203.2018	10.2204/iodp.proc.339.204.2018 10.2204/iodp.proc.344.209.2018		

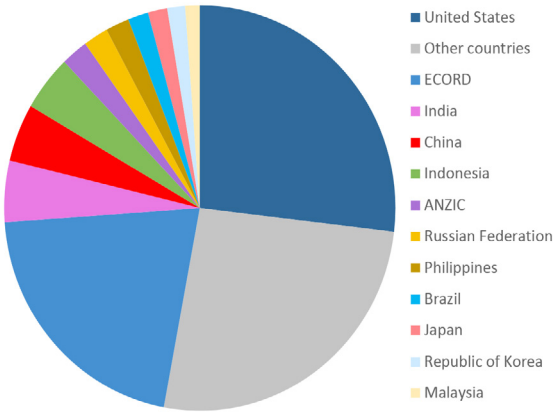
*ESO publications are produced under contract with the British Geological Survey.

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 318,802 page views and 42,189 site visits and the IODP Publications website received 241,504 page views and 21,966 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 Q1 page views*	FY19 Q1 site visits*
www-odp.tamu.edu	212,185	24,515
www.odplegacy.org	4,486	1,720
www.deepseadrilling.org	22,567	7,236
Total	**239,238**	**33,471**

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

Publications coordination

Data reports related to Expeditions 353, 354, 355, 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	October 2018	November 2018	December 2018	FY19 Q1 total
IODP	10.14379	2,914	2,973	3,473	**9,360**
Integrated Ocean Drilling Program	10.2204	4,741	3,546	6,541	**14,828**
ODP/DSDP	10.2973	17,832	5,783	27,237	**50,852**

Science Open

Integrated Ocean Drilling Program and IODP expedition reports and data reports are indexed at ScienceOpen. IODP deposited data reports from Volumes 302, 342, 346, 352, 355, and 370 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
Total to date	**668**	**5,828**	—	—	**374**	**248**

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
Total to date	**2,775**	**7,693**	—	—	**42**	**8,938**

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. In December, the JRSO used the new UI to upload DOIs of IODP *Proceedings* volumes and data reports for Expeditions 349–357, 359–366, and 370. 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 313, 314/315/316, 318, 320/321, 325, 329, 331–336, 339–344, 346, and 347 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, for this quarter included 36,656 new documents (8.7 GB). In addition, the archive houses legacy publications sites for DSDP and ODP, for a grand total of 1.2 TB of data and almost 6 million 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 9.7. Scientific Ocean Drilling Bibliographic Database statistics

Program-related publications	October 2018	November 2018	December 2018	FY19 Q1 total
Searches	857	533	527	**1,917**
Citation views	859	1,039	805	**2,703**

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).

AGU Fall Meeting 2018

- **Acton, G.D.**, and Gordon, R.G., 2018. Late Cretaceous apparent polar wander of North America from the paleomagnetism of the Fort Hays limestone. (Abstract GP31A-0706)
- Alegret, L., Sutherland, R., Dickens, G.R., and **Blum, P.**, 2018. Chasing carbon cycle perturbations across the Paleogene and their effects on deep-sea biota: preliminary results from IODP Expedition 371, Tasman Sea. (Abstract PP21D-1437)
- Alonso-García, M., Rodrigues, T., Padilha, M., **Alvarez Zarikian, C.A.**, Kroon, D., Kunkelová, T., Betzler, C., Inoue, M., Kawahata, H., and Abrantes, F.F.G., 2018. Sea surface temperature and productivity in the Northern Indian Ocean (Maldives Sea) during the last ~550 ka (MIS 13 to present). (Abstract PP23C-04)
- **Alvarez Zarikian, C.A.,** Nadiri, C., Alonso-García, M., Hernandez, P., Marcantonio, F., Kroon, D., Kunkelová, T., Betzler, C., Rodrigues, T., and Lindhorst, S., 2018. Ostracod response to late Pleistocene oceanographic changes in the tropical Indian Ocean. (Abstract PP33E-1780)

- Barnes, P., Saffer, D.M., Wallace, L.M., Pecher, I.A., **Petronotis, K.E.**, and **LeVay, L.**, 2018. Drilling and coring the northern Hikurangi subduction margin to unlock the secrets of slow slip: International Ocean Discovery Program Expeditions 372 and 375. (Abstract T54C-03)
- Bell, R.E., Gray, M., Morgan, J.V., Henrys, S.A., Barker, D.H.N., Bangs, N.L., Barnes, P., Wallace, L.M., Saffer, D.M., and **Petronotis, K.E.**, 2018. Validating a full-waveform inversion velocity model at the north Hikurangi subduction margin using IODP drilling data. (Abstract T51I-0297)
- Berke, M.A., Taylor, A.K., Castañeda, I.S., Hall, I.R., Hemming, S.R., and **LeVay, L.**, 2018. Biomarker records of late Pliocene aridity from southeastern Africa. (Abstract PP11C-1260)
- Bhattacharya, J., Dickens, G.R., Sutherland, R., and the IODP Expedition 371 Scientists (including **P. Blum**), 2018. Record of Eocene carbon cycling in sediments from northern Zealandia. (Abstract PP21D-1442)
- Browne, I.M., Shevenell, A., Mckay, R.M., De Santis, L., **Kulhanek, D.K.**, and Expedition 374 Scientists, 2018. Antarctic Ice Sheet growth during the Miocene Climatic Optimum: paleotemperature insights from IODP Site U1521 on the Ross Sea shelf. (Abstract PP23E-1538)
- De Santis, L., Mckay, R.M., **Kulhanek, D.K.**, and IODP Expedition 374 Scientific Party, 2018. Initial seismic stratigraphic results from IODP Exp. 374 in the Ross Sea. (Abstract PP22A-03)
- Dugan, B., Pecher, I.A., Nole, M., Mountjoy, J.J., Barnes, P.M., **LeVay, L.**, IODP Expedition 372 Scientists, and IODP Expedition 375 Scientists (including **K.E. Petronotis**), 2018. Formation pore pressure through the Tuaheni landslide complex and the gas hydrate stability zone at IODP Expedition 372 Site U1517, Hikurangi Margin, New Zealand. (Abstract T51I-0313)
- Edgar, K.M., Hanson, E.M., MacLeod, K.G., Batenburg, S.J., **Bogus, K.**, **LeVay, L.**, De Vleeschouwer, D., et al., 2018. The impact of Tasman Gateway opening on early Paleogene climate and oceans: new results from IODP Expedition 369, Site U1514. (Abstract PP11D-1275)
- Fagereng, A., Savage, H.M., Morgan, J., Wang, M., Meneghini, F., Barnes, P., Bell, R.E., et al. (including **K.E. Petronotis** and **L. LeVay**), 2018. Brittle-ductile deformation and fault slip behavior of a shallow subduction thrust, Hikurangi margin, New Zealand. (Abstract T54C-06)
- Galy, V., Hemingway, J., Grant, K.E., **Childress, L.B.**, Hage, S., Rosengard, S., and Eglinton, T.I., 2018. Revisiting the reactivity of terrestrial organic matter along the land-sea continuum. (Abstract B41D-06)
- Gamboa, D., Barnes, P., Bell, R.E., Moore, G.F., Mountjoy, J.J., Paganoni, M., Clennell, M.B., et al. (including **L. LeVay** and **K.E. Petronotis**), 2018. Revisiting the giant Ruatoria debris flow on the Hikurangi margin, New Zealand: results from IODP Expeditions 372 and 375, Site U1520. (Abstract T51I-0310)
- Greve, A., Kanamatsu, T., Fagereng, A., Morgan, J., Wang, M., Savage, H.M., Kars, M.A.C., et al. (including **K.E. Petronotis**), 2018. Magnetic fabrics of deformed soft sediments at the deformation front of the Hikurangi subduction margin. (Abstract T51I-0305)
- Gruetzner, J., Uenzelmann-Neben, G., Jiménez-Espejo, F.J.J., Hall, I.R., **LeVay, L.**, and Lathika, N., 2018. High-resolution records of major element ratios for the Plio-/Pleistocene at the Agulhas Plateau: implications for orbital variations in sediment provenance, the formation of seismic reflectors and deep water flow changes. (Abstract PP11C-1264)
- Hall, I.R., Starr, A., Barker, S., Hemming, S.R., **LeVay, L.**, Jimenez, F.J., Gruetzner, J., Lathika, N., and Expedition 361 Scientists, 2018. Deep water variability on the Southern Agulhas Plateau over the past 1.5 Ma. (Abstract PP11C-1262)

- Hemming, S.R., Hall, I.R., Just, J., Rasbury, T., Kubota, K., Simon, M., Barker, S., et al. (including **L. LeVay**), 2018. Timescale of paleoceanographic history at IODP Site U1474, Natal Valley, southwestern Indian Ocean. (Abstract PP11C-1269)
- Heeschen, K.U., Torres, M.E., Pecher, I.A., Schlomer, S., Owari, S., Rose, P.S., Karina, M., et al. (including **L. LeVay** and **K.E. Petronotis**), 2018. Occurrence and fractionation of light hydrocarbons in the gas-hydrate bearing sediments of IODP Site U1517, Hikurangi margin, New Zealand. (Abstract OS13A-06)
- Hoernle, K., **Höfig, T.W.**, Bezard, R., Portnyagin, M., Hauff, F., Wartho, J.A., Pfänder, J., et al., 2018. New insights into the formation and evolution of the Aleutian Arc. (Abstract T13C-04)
- Jeppson, T., Kitajima, H., Ikari, M., Lee, H., Ito, Y., Harris, R.N., Shreedharan, S., et al. (including **K.E. Petronotis** and **L. LeVay**), 2018. Lithology and cement controls on the evolution of compressional wave velocity and porosity in input materials at northern Hikurangi and other subduction zones. (Abstract T51I-0309)
- Jiang, F., Zhu, X., and IODP Expedition 351 Scientists (including **K. Bogus**), 2018. Paleoclimate evolution of the East Asian continent since Miocene inferred from Aeolian quartz in the northwestern Pacific. (Abstract PP11D-1281)
- Koge, H., McNamara, D.D., Gamboa, D., Wu, H.-Y., Kim, G.Y., Cardona, S., Shanker, U., et al. (including **L.J. LeVay** and **K.E. Petronotis**), 2018. Constraining the deformation history of the frontal wedge of Hikurangi subduction margin with analog modeling and bedding trends from borehole logging of IODP Expedition 372. (Abstract T51I-0302)
- Kurtz, K., Cooper, S.K., Bishop, T., Thomson, K., and Uncovering Earth's Secrets Outreach Team: Adamo, L.N., Casey, D., **Childress, L.**, Ferraro, C., and Walters, H., 2018. Bringing Earth and Ocean Science to Underserved Audiences: an overview of NSF-funded traveling pop-up exhibit. (Abstract ED53B-03)
- Larsen, H.C., Mohn, G., Nirrengarten, M., Sun, Z., Stock, J.M., Jian, Z., **Klaus, A.,** and **Alvarez Zarikian, C.A.**, 2018. Rapid transition from continental breakup to igneous oceanic crust in the South China Sea. (Abstract T13F-0289)
- Leah, H.R., Fagereng, A., Meneghini, F., Morgan, J., Savage, H.M., Wang, M., Saffer, D.M., Wallace, L.M., and **Petronotis, K.E.,** 2018. Subduction-related strain in a calcareous-pelagic shear zone: insights on deformation at the Hikurangi margin plate interface from the input sequence at Site U1520 and the Llanddwyn Island shear zone, Anglesey, U.K. (Abstract T51I-0304)
- **LeVay, L.,** Edgar, K.M., Hanson, E.M., **Bogus, K.,** and Huber, B.T., 2018. Calcareous nannofossils from a new high-latitude PETM section: IODP Site U1514, Mentelle Basin, Southeast Indian Ocean. (Abstract PP21G-1495)
- Lopes, A., Alonso-García, M., Salgueiro, E., Rodriguez-Diaz, C.N., Rodrigues, T., Voelker, A.H.L., Kuhnert, H., et al. (including **C.A. Alvarez Zarikian**), 2018. Benthic foraminifers response to Mediterranean Outflow Water changes during the late Pliocene-early Pleistocene transition. (Abstract PP13F-1375)
- Meneghini, F., Boschi, C., Fagereng, A., Morgan, J., Underwood, M., Hashimoto, Y., Engelmann de Oliveira, C., et al. (including **K.E. Petronotis** and **L. LeVay**), 2018. Lithification of volcaniclastic deposits in the Hikurangi subduction zone: preliminary characterization of fluid circulation in the incoming plate, and volatiles entering the trench. (Abstract T51I-0308)

- Morgan, J., Fagereng, A., Savage, H.M., Want, M., Meneghini, F., Barnes, P., Bell, R.E., et al. (including **K.E. Petronotis** and **L. LeVay**), 2018. Seafloor overthrusting creates ductilely deformed fault rocks in marine sediments at the Hikurangi margin: implications for fault zone evolution and mechanics at IODP Site U1518. (Abstract T51I-0301)
- Nole, M., Daigle, H., Dugan, B., Clennell, M.B., Paganoni, M., Barnes, P., Pecher, I.A., **LeVay, L.**, IODP Expedition 372 Scientists, and IODP Expedition 375 Scientists (including **K.E. Petronotis**), 2018. Pore morphology, permeability, and constraints on gas hydrate accumulation in sediments from the Tuaheni Landslide Complex, NZ. (Abstract OS51F-1331)
- Pecher, I.A., Oluwunmi, P., Djeffal, A., Bangs, N.L., Crutchley, G.J., Mountjoy, J.J., Villinger, H.W., et al. (including **L. LeVay** and **K.E. Petronotis**), 2018. Response of gas hydrate systems to subduction-zone processes on the northern Hikurangi margin, New Zealand. (Abstract T54C-08)
- Penkrot, M.L., Jaeger, J.M., Cowan, E.A., Walczak, M.H., Mix, A.C., and **LeVay, L.**, 2018. Tectonic and climate influences on spatial and temporal variations of subglacial erosion; Bering Glacier, Alaska. (Abstract C51E-1119)
- Prunella, C., Shevenell, A., Mckay, R.M., De Santis, L., **Kulhanek, D.K.**, and Expedition 374 Scientists, 2018. Plio-Pleistocene ocean temperatures at the Ross Sea shelf break: foraminifer-based paleotemperature records from IODP Site U1523. (Abstract PP23E-1537)
- Rabinowitz, H.S., Savage H.M., Shreedharan, S., Ikari, M., Meneghini, F., Ito, Y., Kitajima, H., Wallace, L.M., Saffer, D.M., and **Petronotis, K.E.**, 2018. Frictional behavior of incoming sediment in the Hikurangi subduction zone at in-situ PT conditions. (Abstract T51I-0300)
- Saffer, D.M., Bell, R.E., Barnes, P., Wallace, L.M., Kitajima, H., Moore, G.F., Han, S., Pecher, I.A., **Petronotis, K.E.**, and **LeVay, L.**, 2018. Elastic moduli and physical properties of fault rock and protolith associated with SSEs at the northern Hikurangi margin, NZ. (Abstract T54C-04)
- Savage, H.M., Coffey, G.L., Shreedharan, S., Polissar, P.J., Fagereng, A., Meneghini, F., Morgan, J., et al. (including **K.E. Petronotis** and **L. LeVay**), 2018. Signatures of brittle deformation in a shallow fault in the Hikurangi subduction margin. (Abstract T51I-0303)
- Screaton, E., Torres, M.E., Dugan, B., Heeschen, K.U., Mountjoy, J.J., Oware, S., Rose, P.S., et al. (including **L. LeVay** and **K.E. Petronotis**). Impact of sea-level and bottom water temperature change on methane-hydrate stability: IODP Site U1517, Hikurangi margin. (Abstract T51I-0312)
- Shevenell, A., Browne, I.M., Dodd, J.P., Mckay, R.M., De Santis, L., **Kulhanek, D.K.**, and IODP Expedition 374 Science Party, 2018. Early to middle Miocene oceanographic conditions in the Ross Sea, Antarctica: initial XRF results from IODP Site U1521. (Abstract PP23E-1539)
- Solomon, E.A., Huepers, A., Luo, M., Malie, P.R., Saffer, D.M., Torres, M.E., Wallace, L.M., et al. (including **K.E. Petronotis** and **L. LeVay**), 2018. Geochemical constraints on fluid-rock reactions, fluid sources, and flow pathways along the IODP Expedition 375 transect; northern Hikurangi margin. (Abstract T54C-07)
- Sutherland, R., Dickens, G.R., and **Blum, P.**, 2018. Drilling reveals continental-scale impacts of Eocene Tonga-Kermadec subduction initiation. (Abstract T44A-06)
- Underwood, M., Rabinowitz, H.S., Noda, A., Meneghini, F., Kutterolf, S., Hashimoto, Y., Engelmann de Oliveira, C., et al. (including **K.E. Petronotis** and **L. LeVay**), 2018. Lithostratigraphy of the Hikurangi subduction inputs: results of coring during IODP Expedition 375. (Abstract T51I-0307)

- van der Lubbe, J., Hall, I.R., Baars, T.F., Barker, S.R., **LeVay, L.**, and Expedition 361 Scientists, 2018. A five-million-year long eolian dust record from the Mozambique Channel - IODP Site U1476. (Abstract PP11C-1265)
- Wallace, L.M., Barnes, P., Saffer, D.M., Henrys, S.A., Barker, D.H.N., Bassett, D., Tontini, F.C., et al. (including **K.E. Petronotis** and **L. LeVay**), 2018. The dynamics of shallow plate interface slip at the offshore Hikurangi subduction margin, New Zealand. (Abstract T52C-03)
- Wallace, L.M., Solomon, E.A., Fulton, P.M., Saffer, D.M., **Petronotis, K.E.**, Jannasch, H.W., Davis, E.E., et al. (including **B. Rhinehart**, **J. Van Hyfte**, **K. Grigar**, and **L. LeVay**), 2018. IODP borehole observatories to monitor slow slip at the offshore Hikurangi subduction zone. (Abstract T51I-0293)
- Wang, M., Barnes, P., Morgan, J., Bell, R.E., Fagereng, A., Savage, H.M., Saffer, D.M., Wallace, L.M., and **Petronotis, K.E.**, 2018. Compactive deformation in the incoming sedimentary section of the Hikurangi subduction margin, New Zealand: constraints from seismic reflection data and IODP cores. (Abstract T51I-0306)
- Wei, L., Cook, A., Nole, M., Malinverno, A., Daigle, H., Georgiopoulou, A., Barnes, P., et al. (including **L. LeVay** and **K.E. Petronotis**), 2018. Gas hydrate accumulations in thin sands. (Abstract OS31F-1853)

Expedition 362 Science Meeting

- **Petronotis, K.E., Acton, G.D.**, Zhao, X., Yang, T., and Chemale, F., 2018. Paleomagnetic evidence from IODP Site U1480 of relatively recent sediment alteration linked to the generation of large Sumatra earthquakes [presented at the Expedition 362 Science Meeting, Matsue, Japan, 27–29 August 2018].

Geological Society of America Fall Meeting 2018

- Woodhouse, A.D., Malie, P., Crundwell, M.P., Shepherd, C.L., Rabinowitz, H.S., Hollis, C., Aze, T.L., et al. (including **K. Petronotis** and **L.J. LeVay**, 2018. High southern latitude record of Cretaceous Ocean Anoxic Event (OAE) in the Hikurangi Plateau (Southwest Pacific). *Geological Society of America Abstracts with Programs*, 50(6):212-8. https://doi.org/10.1130/abs/2018AM-320606
- Berke, M.A., Cartagena-Sierra, A., Castaneda, I.S., Van Der Meer, M.T.J., Hall, I.R., Hemming, S.R., and **LeVay, L.J.**, 2018. Plio-Pleistocene biomarker reconstructions at the Agulhas Plateau and implications for terrestrial African Climate. *Geological Society of America Abstracts with Programs,* 50(6):184-23. https://doi.org/10.1130/abs/2018AM-323259
- Taylor, A.K., Berke, M.A., Castaneda, I.S., Hall, I.R., Hemming, S.R., and **LeVay, L.J.**, 2018. Biomarker records of Plio-Pleistocene paleoclimate from the southeast African margin. *Geological Society of America Abstracts with Programs*, 50(6):184-16. https://doi.org/10.1130/abs/2018AM-321613
- **Acton, G.D.**, and Gordon, R.G., 2018. Implications for geomagnetic field variability during the Cretaceous Normal Superchron from the paleomagnetism of the Late Cretaceous Fort Hays limestone. *Geological Society of America Abstracts with Programs*, 50(6):20-11. https://doi.org/10.1130/abs/2018AM-319968

Geosciences 2018—The Geoscience Society of New Zealand Annual Conference

- Massiot, C., Kissling, W., Nicol, A., McNamara, D., and IODP Expedition 376 Scientists (including **Höfig, T.W.**), 2018. Structure and fluid flow in andesitic systems of the Taupō Volcanic Zone: a framework to unravel sub-seafloor hydrothermal flows at Brothers volcano, Kermadec Arc? *In* Sagar, M., Prebble, J. (Eds.), *Abstract Volume: Geosciences 2018.* Geoscience Society of New Zealand Miscellaneous Publication 151A:181. https://db.gsnz.org.nz/assets/Uploads/MP151A-181126-Geosciences-2018-Abstract-Volume3.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 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).

- Huang, H.M., Yasuhara, M., Iwatani, H., **Alvarez Zarikian, C.A.**, Bassetti, M., and Sagawa, T., 2018. Benthic biotic response to climate changes over the last 700,000 years in a deep marginal sea: impacts of deoxygenation and the Mid-Brunhes Event. *Paleoceanography and Paleoclimatology*, 33:766–777. https://doi.org/10.1029/2018PA003343
- Kunkelová, T., Jung, S.J.A., de Leau, E.S., Odling, N., Thomas, A.L., Betzler, C., Eberli, G.P., et al. (including **C.A. Alvarez-Zarikian**), 2018. A two million year record of low-latitude aridity linked to continental weathering from the Maldives. *Progress in Earth and Planetary Science*, 5:86. https://doi.org/10.1186/s40645-018-0238-x
- Lüdmann, T., Betzler, C., Eberli, G.P., Reolid, J., Reijmer, J.J.G., Sloss, C.R., Bialik, O.M., et al. (including **C.A. Alvarez-Zarikian**), 2018. Corrigendum to "Carbonate delta drift: a new sediment drift type" [*Mar. Geol.* 401 (2018) 98–111]. *Marine Geology*,406:214-215. https://doi.org/10.1016/j.margeo.2018.10.005
- Pandey, D.K., Pandey, A., Clift, P.D., Nair, N., Ramesh, P., **Kulhanek, D.K.**, and Yadav, R., 2018. Flexural subsidence analysis of the Laxmi Basin, Arabian Sea and its tectonic implications. *Geological Magazine*, 18 December 2018. https://doi.org/10.1017/S0016756818000833

Appendix: JRSO quarterly report distribution

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