International Ocean Discovery Program

JOIDES Resolution Science Operator

FY17 Q2 Operations and Management Report

1 January–31 March 2017

Cooperative Agreement OCE-1326927

Submitted by the JRSO

to

The National Science Foundation

and

The *JOIDES Resolution* Facility Board

12 May 2017

Contents

Introduction

The organization of this quarterly operations and management report reflects activities and deliverables outlined in the International Ocean Discovery Program (IODP) *JOIDES Resolution* Science Operator (JRSO) FY16 Annual Program Plan to the National Science Foundation (NSF), as implemented by Texas A&M University (TAMU), acting as manager and science operator of the research vessel *JOIDES Resolution* as a research facility for IODP. Administrative services in support of JRSO activities are provided by the Texas A&M Research Foundation (TAMRF) through TAMU Sponsored Research Services (SRS).

Management and administration

Management and administration functions of the JRSO include planning, coordinating (with other IODP-related entities), overseeing, reviewing, monitoring, assuring compliance, and reporting on IODP activities.

Subcontract activities

Overseas Drilling Limited

The JRSO continued to interact with Overseas Drilling Limited (ODL) to ensure efficient and compliant operations of the *JOIDES Resolution*.

Schlumberger Technology Corporation Inc.

The JRSO continued to interact with Schlumberger Technology Corporation (Schlumberger) 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.

Progress reporting

JRSO FY17 Q1 Quarterly Operations and Management Report

The JRSO operations and management report for the first quarter of FY17 (October–December 2016) was submitted to NSF on 2 February 2017 (http://iodp.tamu.edu/publications/AR/FY17/FY17_Q1.pdf).

JRSO FY18 Annual Program Plan

Budget and text development for the IODP JRSO FY18 Annual Program Plan was initiated this quarter.

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).

Facility performance assessment

The JRSO hosted two meetings this quarter to assess the JRSO's performance. The first meeting, held 27 and 28 February, was a Co-Chief Scientist review chaired by Lisa McNeill (University of Southampton, United Kingdom) and attended by seven of the eight Co-Chief Scientists of FY16 expeditions. Attendees assessed the JRSO's performance in implementing FY16 Expeditions 359–362 and compiled their findings in a report that was submitted to NSF and presented at a subsequent NSF-convened panel held 1–3 March to assess the JRSO's performance as a facility in meeting the needs of IODP in fulfilling its Science Plan. The panel's primary finding was that the facility is well run with exceptional management and effective oversight, showing exemplary financial performance and reflecting the dedication, hard work, and competence of the JRSO, JRFB, Science Evaluation Panel (SEP), and Environmental Protection and Safety Panel (EPSP). NSF provided guidance to the JRSO based on the panel's recommendations, and plans were made to address several of those recommendations in the JRSO FY18 Annual Program Plan.

Project portfolio management

The JRSO approved two new projects for project management plan development (GEODESC and Coulometer), closed one project (Liquid Helium–Free Superconducting Rock Magnetometer Installation and Software Update), and continued work on three existing projects: X-Ray Fluorescence (XRF) Core Scanning Facility project, Laboratory Information Management System (LIMS) Data Display Tool—LIVE, and XRF Core Scanner Uploader and Reports (See "Software development" in "Development, IT, and databases").

Web services

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

Program website statistics

During the last quarter, the IODP TAMU website received 42,628 site visits and 453,408 page views. Where possible, visits by JRSO employees and search engine spiders were filtered out of the count.

Legacy web services

The Ocean Drilling Program (ODP) science operator, ODP legacy, and Deep Sea Drilling Project (DSDP) publications websites are hosted at TAMU. Key data, documents, and publications produced during DSDP and ODP are preserved in the legacy websites, which highlight the scientific and technical accomplishments of these ground-breaking precursors to the Integrated Ocean Drilling Program and IODP. The legacy websites contain downloadable documents that cover a wide spectrum of Program information, from laboratory and instrument manuals to Program scientific publications, journals, and educational materials.

Legacy website statistics

Legacy website	FY17 Q2 page views*	FY17 Q2 site visits*
www-odp.tamu.edu	319,790	29,631
www.odplegacy.org	4,377	1,901
www.deepseadrilling.org	40,258	8,506
Total	**364,425**	**40,038**

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

Science operations

The JRSO is responsible for planning, managing, coordinating, and performing activities and providing services, materials, platforms, and ship- and shore-based laboratories for JRSO expeditions; long-range operational planning for out-year JRSO expeditions; and technical advice and assistance for European Consortium for Ocean Research Drilling (ECORD) Science Operator (ESO) and Center for Deep Earth Exploration (CDEX) expeditions.

JRSO expedition schedule

Expedition		Port (origin)	Dates [1, 2]	Total days (port/ sea)	Days at sea (transit[3]/ ops)	Co-Chief Scientists	Expedition Project Manager
Western Pacific Warm Pool	363	Singapore	6 October– 8 December 2016	63 (5/58)	58 (8/50)	Y. Rosenthal A. Holbourn	D. Kulhanek
Mariana Convergent Margin[4]	366	Guam	8 December 2016– 7 February 2017	61 (5/56)	56 (8/48)	P. Fryer G. Wheat	T. Williams
South China Sea Rifted Margin[5]	367	Hong Kong	7 February– 9 April 2017	61 (5/56)	56 (2/54)	Z. Sun J. Stock	A. Klaus
South China Sea Rifted Margin[5]	368	Shanghai, China	9 April– 11 June 2017	63 (5/58)	58 (4/54)	Z. Jian H.-C. Larsen	C. Alvarez Zarikian
Non-IODP (11 June–27 July 2017) (46 days)							M. Malone
Tasman Frontier Subduction and Climate	371	Townsville, Australia	27 July– 26 September 2017	61 (3/58)	58 (7/51)	R. Sutherland G. Dickens	P. Blum

Expedition		Port (origin)	Dates [1, 2]	Total days (port/ sea)	Days at sea (transit[3]/ ops)	Co-Chief Scientists	Expedition Project Manager
Australia Cretaceous Climate and Tectonics	369	Hobart, Tasmania (Australia)	26 September – 26 November 2017	61 (5/56)	56 (7/49)	R. Hobbs B. Huber	K. Bogus
Creeping Gas Hydrate Slides and Hikurangi LWD[6]	372	Fremantle, Australia	26 November 2017– 4 January 2018	39 (5/34)	34 (15/19)	I. Pecher P. Barnes	L. LeVay
Ross Sea West Antarctic Ice Sheet History	374	Wellington, New Zealand	4 January– 8 March 2018	63 (5/58)	58 (16/42)	R. McKay L. De Santis	D. Kulhanek
Hikurangi Subduction Margin	375	Wellington, New Zealand	8 March– 5 May 2018	58 (5/53)	53 (2/51)	L. Wallace D. Saffer	K. Petronotis
Brothers Arc Flux	376	Auckland, New Zealand	5 May– 5 July 2018	61 (5/56)	56 (2/54)	C. de Ronde S. Humphris	T. Höfig
Non-IODP (5 July–14 October 2018) (101 days)							M. Malone
South Pacific Paleogene	378	Wellington, New Zealand	14 October– 14 December 2018	61 (4/57)	57 (11/46)	TBD	C. Alvarez Zarikian
Non-IODP (14 December 2018–18 January 2019) (35 days)							M. Malone
Amundsen Sea West Antarctic Ice Sheet History	379	Punta Arenas, Chile	18 January– 20 March 2019	61 (3/58)	58 (12/46)	TBD	A. Klaus

Notes: TBD = to be determined.
[1] Dates for expeditions may be adjusted pending non-IODP activities.
[2] The start date reflects the initial port call day. The vessel will sail when ready.
[3] Transit total is the estimated transit to and from port call and does not include transit between sites.
[4] Also includes Proposal 693 Ancillary Project Letter (APL), South Chamorro Seamount CORK.
[5] Complementary Project Proposal (CPP) is contingent on substantial financial contribution outside of normal IODP funding.
[6] Combined expedition with 841 APL and logging while drilling (LWD) from Proposal 781A (Expedition 375).

JRSO expeditions

Expedition 362: Sumatra Seismogenic Zone

Postexpedition activities

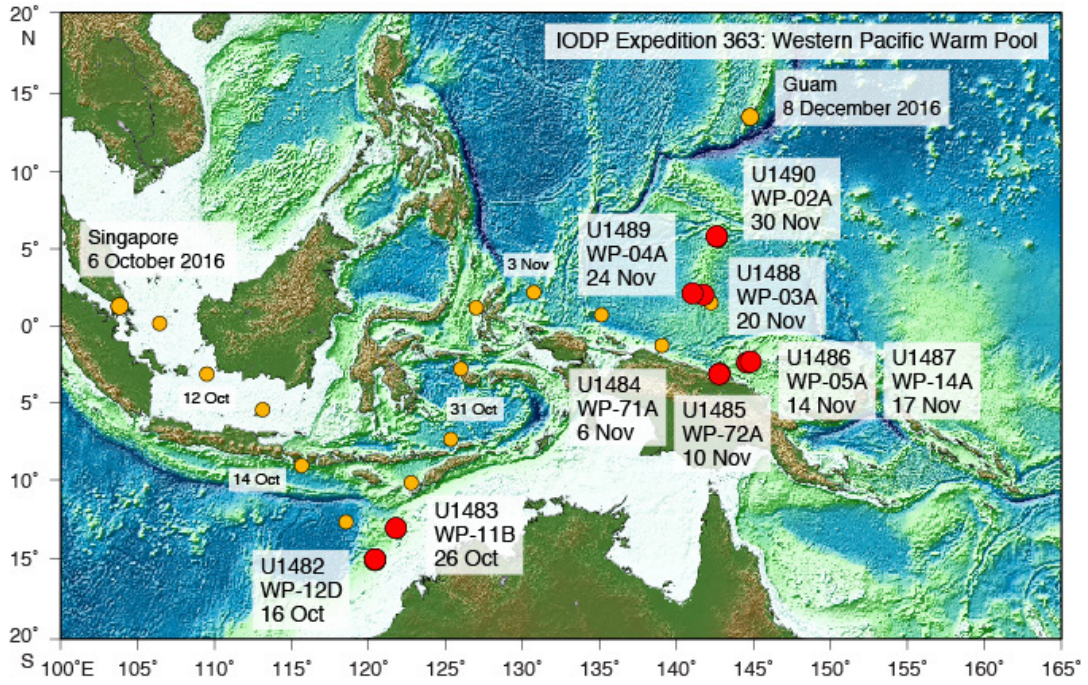
The Expedition 362 postexpedition editorial meeting was held 21–24 February in College Station, Texas.

Expedition 363: Western Pacific Warm Pool

Staffing

Expedition 363 Science Party staffing breakdown		
Member country/consortium	Participants	Co-Chief Scientists
USA: United States Science Support Program (USSSP)	10	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)	8	1
Republic of Korea: Korea Integrated Ocean Drilling Program (K-IODP)	1	
People's Republic of China: IODP-China	3	
Australia and New Zealand: Australia/New Zealand IODP Consortium (ANZIC)	2	
India: Ministry of Earth Science (MoES)	0	
Brazil: Coordination for Improvement of Higher Education	1	

Site map



Coring summary

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (*N*)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1482	U1482A	15°3.3227′S	120°26.1049′E	1467.7	58	490.00	505.88	103.2
	U1482B	15°3.3142′S	120°26.0988′E	1464.5	40	349.10	365.82	104.8
	U1482C	15°3.3298′S	120°26.1135′E	1465.2	56	517.10	535.86	103.6
	U1482D	15°3.3305′S	120°26.0920′E	1466.1	9	80.40	82.77	102.9
Site U1482 totals					**163**	**1436.60**	**1490.33**	**103.7**
U1483	U1480A	13°05.2382′S	121°48.2424′E	1732.9	31	293.30	308.58	105.2
	U1480B	13°05.2371′S	121°48.2538′E	1734.0	31	287.00	301.62	105.1
	U1480C	13°05.2479′S	121°48.2537′E	1731.2	30	281.80	292.42	103.8
Site U1483 totals					**92**	**862.10**	**902.62**	**104.7**
U1484	U1484A	03°07.9228′S	142°46.9699′E	1030.9	27	223.20	220.60	98.8
	U1484B	03°07.9223′S	142°46.9809′E	1030.5	30	220.90	220.51	99.8
	U1484C	03°07.9335′S	142°46.9822′E	1030.8	31	219.40	225.46	102.8
Site U1484 totals					**88**	**663.50**	**666.57**	**100.5**
U1485	U1485A	03°06.1585′S	142°47.5750′E	1144.8	44	300.80	312.36	103.8
	U1485B	03°06.1584′S	142°47.5854′E	1145.3	46	295.70	291.18	98.5
	U1485C	03°06.1574′S	142°47.5991′E	1145.8	3	27.50	29.35	106.7
	U1485D	03°06.1574′S	142°47.5867′E	1144.4	7	62.90	68.22	108.5
Site U1485 totals					**100**	**686.90**	**701.11**	**102.1**
U1486	U1486A	02°22.3375′S	144°36.0796′E	1330.3	1	9.50	9.95	104.7
	U1486B	02°22.3368′S	144°36.0794′E	1333.8	23	211.20	215.49	102.0

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (*N*)	Interval cored (m)	Core recovered (m)	Recovery (%)
	U1486C	02°22.3478′S	144°36.0798′E	1334.5	21	197.30	172.70	87.5
	U1486D	02°22.3484′S	144°36.0690′E	1334.1	18	162.70	166.53	102.4
Site U1486 totals					**63**	**580.70**	**564.67**	**97.2**
U1487	U1487A	02°19.9979′S	144°49.1627′E	873.9	16	144.20	146.43	101.5
	U1487B	02°19.9975′S	144°49.1746′E	873.6	18	144.30	148.73	103.1
Site U1487 totals					**34**	**288.50**	**295.16**	**102.3**
U1488	U1488A	02°02.5891′N	141°45.2864′E	2603.4	35	314.50	327.20	104.0
	U1488B	02°02.5901′N	141°45.2966′E	2604.4	33	304.90	315.77	103.6
	U1488C	02°02.5793′N	141°45.2974′E	2604.0	17	159.30	153.60	96.4
Site U1488 totals					**85**	**778.70**	**796.57**	**102.3**
U1489	U1489A	02°07.1976′N	141°01.6654′E	3419.8	1	9.50	9.53	100.3
	U1489B	02°07.1984′N	141°01.6757′E	3419.5	14	129.20	120.66	93.4
	U1489C	02°07.1772′N	141°01.6746′E	3423.7	42	385.60	376.35	97.6
	U1489D	02°07.1761′N	141°01.6651′E	3421.6	26	238.80	229.24	96.0
Site U1489 totals					**83**	**763.10**	**735.78**	**96.4**
U1490	U1490A	05°48.9492′N	142°39.2599′E	2341.0	44	382.80	367.35	96.0
	U1490B	05°48.9507′N	142°39.2698′E	2339.7	31	258.90	267.60	103.4
	U1490C	05°48.9385′N	142°39.2690′E	2341.3	18	164.00	168.24	102.6
Site U1490 totals					**93**	**805.70**	**803.19**	**99.7**
Expedition 363 totals					**801**	**865.80**	**6,956.00**	**101.3**

Science summary

Expedition 363 sought to document the regional expression and driving mechanisms of climate variability (e.g., temperature, precipitation, and productivity) in the Western Pacific Warm Pool (WPWP) as it relates to the evolution of Neogene climate on millennial, orbital, and geological timescales. To achieve our objectives, we selected sites with wide geographic distribution and variable oceanographic and depositional settings. Nine sites were cored during Expedition 363, recovering a total of 6,956 m of sediment in 875–3,421 m water depth with an average recovery of 101.3% during 39.6 days of on-site operations. Two sites are located off northwestern Australia at the southern extent of the WPWP and span the late Miocene to present. Seven sites are situated at the heart of the WPWP, including two sites on the northern margin of Papua New Guinea (PNG) with very high sedimentation rates spanning the past ~450 ky, two sites in the Manus Basin north of PNG with moderate sedimentation rates recovering upper Pliocene to present sequences, and three low sedimentation rate sites on the southern and northern parts of the Eauripik Rise spanning the early Miocene to present. The wide spatial distribution of the cores, variable accumulation rates, exceptional biostratigraphic and paleomagnetic age constraints, and mostly excellent foraminifer preservation will allow us to trace the evolution of the WPWP through the Neogene at different temporal resolutions, meeting the primary objectives of Expedition 363. Specifically, the high sedimentation rate cores off PNG will allow us to better constrain mechanisms influencing millennial-scale variability in the WPWP, their links to high-

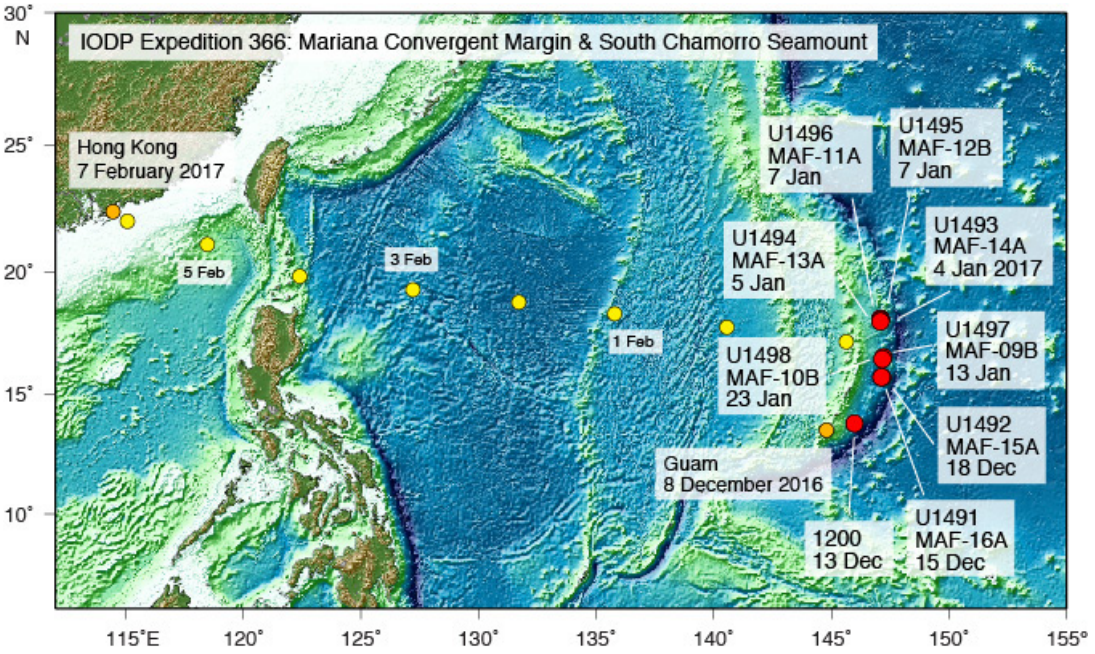
latitude climate variability, and implications for temperature and precipitation variations in this region under variable climate conditions. Furthermore, these high accumulation rates offer the opportunity to study climate variability during previous warm periods at a resolution similar to existing studies of the Holocene. With excellent recovery, Expedition 363 sites are suitable for detailed paleoceanographic reconstructions at orbital and suborbital resolution from the middle Miocene to Pleistocene and thus will be used to refine the astronomical tuning, magnetostratigraphy, isotope, and biostratigraphy of hitherto poorly constrained intervals within the Neogene timescale (e.g., the late Miocene) and to reconstruct the history of the East Asian and Australian monsoon and the Indonesian Throughflow on orbital and tectonic timescales. Results from high-resolution interstitial water sampling at selected sites will be used to reconstruct density profiles of the western equatorial Pacific deep water during the Last Glacial Maximum. Additional geochemical analyses of interstitial water samples in this tectonically active region will be used to investigate volcanogenic mineral and carbonate weathering and their possible implications for the evolution of Neogene climate.

Expedition 366: Mariana Convergent Margin

Staffing

Expedition 366 Science Party staffing breakdown		
Member country/consortium	**Participants**	**Co-Chief Scientists**
USA: United States Science Support Program (USSSP)	9	2
Japan: Japan Drilling Earth Science Consortium (J-DESC)	4	
Europe and Canada: European Consortium for Ocean Research Drilling (ECORD) Science Support and Advisory Committee (ESSAC)	9	
Republic of Korea: Korea Integrated Ocean Drilling Program (K-IODP)	1	
People's Republic of China: IODP-China	3	
Australia and New Zealand: Australia/New Zealand IODP Consortium (ANZIC)	1	
India: Ministry of Earth Science (MoES)	0	
Brazil: Coordination for Improvement of Higher Education	1	

Site map



Coring summary

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (*N*)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1491	U1491A	15°47.1175′N	147°08.4909′E	4493.7	1	1.30	1.32	101.5
	U1491B	15°47.1176′N	147°08.4908′E	4492.5	5	19.40	18.98	97.8
	U1491C	15°47.1940′N	147°08.4119′E	4518.9	9	34.20	23.08	67.5
Site U1491 totals					**15**	**54.90**	**43.38**	**79.0**
U1492	U1492A	15°42.6775′N	147°10.6003′E	3656.6	9	38.30	38.49	100.5
	U1492B	15°42.6216′N	147°10.6011′E	3669.1	13	51.40	52.03	101.2
	U1492C	15°42.5590′N	147°10.6001′E	3666.5	30	139.10	71.35	51.3
	U1492D	15°42.5694′N	147°10.5991′E	3666.4	0	0.00	0.00	0.0
Site U1492 totals					**52**	**228.80**	**161.87**	**70.7**
U1493	U1493A	17°59.1668′N	147°06.0057′E	3358.9	1	0.10	0.09	90.0
	U1493B	17°59.1665′N	147°06.0060′E	3358.9	9	32.60	19.03	58.4
Site U1493 totals					**10**	**32.70**	**19.12**	**58.5**
U1494	U1494A	18°3.0896′N	147°6.0003′E	2199.8	10	39.00	27.99	71.8
Site U1494 totals					**10**	**39.00**	**27.99**	**71.8**
U1495	U1495A	18°05.6693′N	147°06.0004′E	1405.8	3	10.70	4.84	45.2
	U1495B	18°05.6788′N	147°05.9901′E	1401.9	4	10.80	10.18	94.3
Site U1495 totals					**7**	**21.50**	**15.02**	**69.9**
U1496	U1496A	18°6.5936′N	147°6.0999′E	1243.4	10	42.80	38.36	89.6
	U1496B	18°6.6205′N	147°6.0998′E	1240.2	9	30.00	22.08	73.6
	U1496C	18°06.6068′N	147°06.1001′E	1243.2	11	105.00	8.52	8.1
Site U1496 totals					**30**	**177.80**	**68.96**	**38.8**

Site	Hole	Latitude	Longitude	Water depth (mbrf)	Cores (*N*)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1497	U1497A	16°32.2536′N	147°13.2642′E	2019.2	9	34.20	22.47	65.7
	U1497B	16°32.2528′N	147°13.2606′E	2018.2	6	23.80	19.91	83.7
	U1497C	16°32.2504′N	147°13.2500′E	2018.3	0	0.00	0.00	0.0
	U1497D	16°32.2548′N	147°13.2621′E	2018.8	0	0.00	0.00	0.0
Site U1497 totals					**15**	**58.00**	**42.38**	**73.1**
U1498	U1498A	16°27.0898′N	147°09.8502′E	3496.2	19	181.60	20.59	11.3
	U1498B	16°27.3716′N	147°10.1166′E	3284.7	27	260.00	82.82	31.9
Site U1498 totals					**46**	**441.60**	**103.41**	**23.4**
Expedition 366 totals					**185**	**1,054.30**	**482.13**	**45.7**

Science summary

Geologic processes at convergent plate margins control geochemical cycling, seismicity, and deep biosphere activity in subduction zones and the suprasubduction zone lithosphere. Expedition 366 was designed to address the nature of these processes in the shallow to intermediate depth of the Mariana subduction channel. Although there is no technology available to permit direct sampling of the subduction channel of an intraoceanic convergent margin at depths of up to 18 km, the Mariana forearc region (between the trench and the active volcanic arc) provides a means to access this zone.

Active conduits resulting from fractures in the forearc are prompted by along- and across-strike extension that allows slab-derived fluids and materials to ascend to the seafloor along associated faults, resulting in the formation of serpentinite mud volcanoes. Serpentinite mud volcanoes of the Mariana forearc are the largest mud volcanoes on Earth. Their positions adjacent to or atop fault scarps on the forearc are likely related to the regional extension and vertical tectonic deformation in the forearc. Serpentinite mudflows at these volcanoes include serpentinized forearc mantle clasts, crustal and subducted Pacific plate materials, a matrix of serpentinite muds, and a deep-sourced formation fluid. The mud volcanism on the Mariana forearc occurs within 100 km of the trench, representing a range of depths and temperatures to the downgoing plate and the subduction channel. These processes have likely been active for tens of millions of years at this site and for billions of years on Earth.

At least ten active serpentinite mud volcanoes have been located in the Mariana forearc. Two of these mud volcanoes are Conical and South Chamorro Seamounts, which are the farthest from the Mariana Trench at 86 and 78 km, respectively. These seamounts were cored during ODP Legs 125 and 195, respectively. Data from these two seamounts represent deeper, warmer examples of the continuum of slab-derived materials as the Pacific plate subducts, providing a snapshot of how slab subduction affects fluid release, the composition of ascending fluids, mantle hydration, and the metamorphic paragenesis of subducted oceanic lithosphere. Data from the study of these two mud volcanoes constrain the pressure, temperature, and composition of fluids and materials within the subduction channel at depths

of about 18 to 19 km. Understanding such processes is necessary for elucidating factors that control seismicity in convergent margins, tectonic and magma genesis processes in the forearc and volcanic arc, fluid and material fluxes, and the nature and variability of environmental conditions that impact subseafloor microbial communities.

Expedition 366 focused on data from cores collected along the pressure-temperature subduction-channel continuum defined by three Mariana serpentinite mud volcanoes closer to the trench. Sites were chosen 55 to 72 km from the Mariana Trench. Cores were recovered from active sites of eruption on their summit regions and on flanks where ancient flows are overlain by more recent ones. Recovered materials show the effects of dynamic processes that are active at these sites, bringing a range of materials to the seafloor, including materials from the lithosphere of the Pacific plate and materials (including coral) from subducted seamounts. Most of the recovered material consists of serpentinite mud containing lithic clasts, which were derived from the underlying forearc crust and mantle and the subducting Pacific plate. It is now proven that the cores from each of the three seamounts drilled during Expedition 366, as well as those from ODP Legs 125 and 195, all include material from the underlying Pacific plate. A thin cover of pelagic sediment was recovered at many of the Expedition 366 sites; Site U1498 cored through serpentinite flows to the underlying pelagic sediment and volcanic ash deposits. Recovered serpentinites are largely uniform in major element composition, with serpentinized ultramafic rocks and serpentinite muds spanning a limited range in SiO_2, MgO, and Fe_2O_3 compositions. However, variation in trace element composition reflects the pore fluid composition, which differs as a function of the temperature and pressure of the underlying subduction channel. Dissolved gases H_2, CH_4, and C_2H_6 are highest at the site furthest from the trench, which also has the most active fluid discharge of the Expedition 366 serpentinite mud volcanoes. These dissolved gases and their active discharge from depth likely support active microbial communities and will be the focus of in-depth subsampling and preservation for shore-based analytical and culturing procedures. The effects of fluid discharge are also registered in the porosity and gamma ray attenuation (GRA) density data, indicated by higher than expected values at some of the summit sites. These high values are consistent with overpressured fluids that minimize compaction of serpentinite mud deposits. In contrast, flank sites have significantly greater decreases in porosity with depth, suggesting that processes in addition to compaction are required to achieve the observed data. Heat transported by fluid discharge is evident in thermal measurements at the summit of Yinazao; elsewhere, thermal data reveal higher heat flow values on the flanks (~31 mW/m^2) than on the summit (~17 mW/m^2) of the seamounts. The new 2G Enterprises superconducting rock magnetometer (SRM; liquid helium free) was installed, revealing relatively high values of both magnetization and bulk magnetic susceptibility of discrete samples related to ultramafic rocks, particularly in dunite. Magnetite, a product of serpentinization, and authigenic carbonates were observed in the mudflow matrix materials.

In addition to coring operations, Expedition 366 focused on the deployment and remediation of borehole casings for future observatories and thus set the framework for in situ experimentation. Borehole work commenced at South Chamorro Seamount, where the original-style CORK was partially removed. Work then continued at each of the three summit sites following coring operations. Cased boreholes with at least three joints of screened casing were deployed, and a plug of cement was placed at the bottom of each hole. Water samples were collected from two of the three boreholes, revealing significant inputs of formation fluids. These fluids suggest that each of the boreholes tapped a hydrologic zone, making these boreholes suitable for experimentation with the future deployment of a CORK-lite.

Expedition 367 and 368: South China Sea Rifted Margin

Planning

Final preparations for Expedition 367 port call logistics were completed. Final supplies were acquired and shipments were readied for Expedition 368.

Staffing

An observer from Taiwan for Expeditions 367 and 368 accepted the invitation to sail. The JRSO received a request from IODP-China for an observer from the Ministry of Science and Technology (MOST); the last berth on Expedition 368 was allocated to the MOST observer.

Clearance, permitting, and environmental assessment activities

Taiwan authorized both expeditions on 16 January, completing clearance requirements. The EPSP and TAMU Safety Panel received and reviewed a request from the Expedition 367 Science Party to deepen the drill down without coring and to extend the total depth based on the revised velocity model from initial coring results at SCSII-8B. The depth extension was granted and the drill-down request was approved with an interval of spot coring.

Expedition 371: Tasman Frontier Subduction

Planning

Feedback from the New Zealand Department of Conservation was received to clarify status of acoustic guidelines relative to the acoustic source planned that would likely be in force during Expedition 371. The deadline for sample, data, and research plans is the end of the quarter.

Staffing

Science staffing was completed in January. The initial invitation for an Education and Outreach (E&O) officer (videographer) was declined.

Clearance, permitting, and environmental assessment activities

The purchase order (PO) was issued in February to generate the environmental evaluation of the planned check shot surveys. A clarification query on the clearance application was received from Australia. Sites that have the same approval and target depth will be the subject of depth extension requests at the next EPSP meeting.

Expedition 369: Australia Cretaceous Climate and Tectonics

Planning

Communication with the Science Party was initiated, and research plan instructions were sent out on 3 March, with responses due on 31 May.

Staffing

Science staffing was completed during the quarter. A US E&O officer applicant declined the invitation to sail.

Clearance, permitting, and environmental assessment activities

The clearance application was submitted on 23 February. A referral form was also submitted to the Australian Department of Environment and Energy to meet specific requirements for the Expedition 369 operational area. The referral public comment period was initiated and concludes at the beginning of the next quarter. The environmental evaluation for the planned check shot surveys was completed and approved by NSF earlier than usual so that it could be included as part of the referral package.

Expedition 372: Creeping Gas Hydrate Slides and Hikurangi LWD

Planning

As key members of the Science Party were filled, a review and discussion of the preferred logging-while-drilling (LWD) tools occurred and an updated LWD quote was obtained. A list of parts for the pressure core system was identified and a request for quotes was issued. At the end of Expedition 367, the temperature dual-pressure tool (T2P) will be returned to the third-party owner for checking and calibration. An initial pressure core sampler (PCS) degassing conference call was held with shipboard scientists and key JRSO staff. The *Scientific Prospectus* was published in February.

Staffing

The second round of staffing was issued with 12 of 13 accepting. The last position will be filled early next quarter. The US E&O position was also filled this quarter.

Clearance, permitting, and environmental assessment activities

The clearance application process was initiated and will be submitted at the beginning of next quarter.

Expedition 374: Ross Sea West Antarctic Ice Sheet History

Planning

The Co-Chief Scientists worked on completing the final compilation of the *Scientific Prospectus* components during the quarter. Conversations with the *Nathaniel B. Palmer* (NBP) schedulers continued. In February, a general NBP schedule was presented that would escort the *JOIDES Resolution* into the Ross Sea and be in the area for emergency support during the expedition. Their schedule could require us to depart from Ross Sea a few days earlier than planned if ice conditions require an escort.

Staffing

A third round of invitations was issued at the end of the quarter to fill the last science berths. E&O officer interviews were planned for April.

Expedition 375: Hikurangi Subduction Margin

Planning

The *Scientific Prospectus* was completed and published in January. A CORK design update conference call was held 2 March. Designs were finalized and POs issued for long-lead hardware and components including reentry hardware, ACORK and CORK-II bodies, umbilicals, packers, casing screens, and various seats and valves. Plans were made to send a joint initial welcome communication after completion of Expedition 372 staffing.

Staffing

Science Party staffing was completed. Application call for the US E&O officer was initiated. A second outreach berth will be staffed from New Zealand to focus on local media efforts.

Expedition 376: Brothers Arc Flux

Planning

Preparations continued for the pre-expedition meeting next quarter. The Co-Chief Scientists, Expedition Project Manager (EPM), and Operations Superintendent held a videoconference on 30 January to discuss operations and challenges with Expedition 376. Operations and engineering began a review of the status of the motor-driven core barrel (MDCB), which hasn't been used since ODP Leg 198. Engineering continued to review options for determination of borehole temperature prior to logging runs, including the Ultra-High Temperature Multi-Sensor Memory Tool (provided by Keir Becker [University of Miami]), which was last used during ODP Leg 193 (Manus Basin).

Engineering support

Engineering equipment acquisitions and updates

Most of the engineering activity this quarter was focused on expedition-specific projects described above. The order for the replacement of the hydraulic power unit for the vibration-isolated television (VIT) winch was issued. Effort at the end of the quarter was focused on specifying piping and related supplies and working with ODL and Siem Offshore staff on planning for installations during the upcoming tie up period and transit.

Technical and analytical services

Analytical systems

Analytical systems acquisitions and updates

The 2G Enterprises helium-free SRM has been used on the *JOIDES Resolution* since Expedition 366. Plans were made for a representative of Applied Physics to travel to Hong Kong to inspect the SRM system in its final installed form and to advise the JRSO with regard to minimizing noise and optimizing measurements.

The Ocean Optics QE Pro spectrometers were installed on the Section Half Multisensor Logger (SHMSL) to improve color reflectance measurements. The QE Pro data is a significant improvement in data quality over the previous USB 4000 units.

Development work continued on implementation of a new *P*-wave logger (PWL) system on the Special Task Multisensor Logger (STMSL). The system had to be modified slightly upon installation, and the development work will continue during Expedition 368. As noted last quarter, the new system will use the same transducers and electronics as the old system; the change is simply to resolve mechanical issues in the opening and closing mechanism of the system.

The Brüker AXS D4 ENDEAVOR X-Ray diffractometer (XRD) power supply failed during Expedition 366, and a service call was made during the Expedition 367 port call in Hong Kong to restore it to functionality and to perform preventive maintenance.

One of the detectors for the natural gamma radiation (NGR) logger failed during Expedition 367, and the Science Party was forced to measure each core section with a 20 cm gap in the measurements. Plans were made to replace the detector and send the faulty unit back to the US for failure analysis and repair.

The JRSO ordered an additional XRF Core Scanner to support IODP operations in a smaller size factor to facilitate possible future operations on the *JOIDES Resolution*. The JRSO continues to develop guidelines for the support of postexpedition XRF scanning, and the first expedition to utilize the XRF facility

(Expedition 363) began work this quarter. Plans to fold the College of Geosciences XRF Core Scanner into JRSO management and control continued.

Laboratory working groups

The laboratory working groups (LWGs) provide oversight, research direction, and quality assurance for the methods, procedures, and analytical systems both on the *JOIDES Resolution* and on shore. The groups meet regularly to review cruise evaluations, expedition technical reports, and issues management communications to provide advice on corrective actions and potential developments for laboratories.

Curation and Core Handling

The Curation and Core Handling LWG met this quarter to discuss

- Issues related to scheduling the upcoming sample party;
- Database and report implementation of the CSF-B depth scale and instructions to the development group to correct the reporting tools to fully honor the scale;
- The return of core pallets to the Gulf Core Repository (GCR) from the Kochi Core Center (KCC) and other logistics issues;
- The KCC inquiry about the practicality of storing J-CORES sample information in the JRSO science database; and
- The handling of ghost cores and their positioning within the hole.

On the latter issue, the LWG was responding to an expedition positioning the ghost core for an overdrilled interval in an unusual way (to avoid overlapping data); the LWG concluded that this should not be allowed in the future because such an action is interpretive.

Geochemistry

The Geochemistry LWG did not meet this quarter but will meet next quarter to discuss ongoing matters as well as any issues arising from Expeditions 363, 366, and 367.

Geology

The Geology LWG did not meet this quarter but will meet next quarter to discuss ongoing matters as well as any issues arising from Expeditions 363, 366, and 367.

Geophysics

The Geophysics LWG met this quarter to discuss issues arising from Expeditions 363 and 366 as well as ongoing issues.

Expedition 363 issues:

- The Wayne-Kerr component analyzer, used for the measurement of sediment resistivity, is quite old and in poor repair, so the decision was made to retire the instrument. As science parties typically bring their own resistivity meter when these measurements are desired, the JRSO will not replace the system at this time.
- Metal tools to extract moisture and density (MAD) samples from harder sediments were obtained to address comments about plastic ones being too weak for some materials.
- Complaints about the availability of a MATLAB- and Adobe Creative Suite–equipped workstation in the physical properties/stratigraphic correlation area were addressed by requesting the Development, IT, and Databases department to configure either a laptop or a virtual PC instance that can be issued to/used by a scientist on an as-needed basis.

Expedition 366 issues:

- A status report was presented on the ongoing development of an alternate PWL system on the STMSL; it was noted that some parts had to be modified and development would continue during Expedition 368.
- Comments from the physical properties scientists regarding the ability to handle missing core intervals on the whole-round tracks led to a recommendation to implement “ignored interval” behavior on those systems such that measurements would be skipped; this was partially implemented (allowing the tracks to ignore an interval from the bottom of the section) during Expedition 366, but requires further discussion.

Ongoing issues:

- An analysis of the TeKa-calculated and best-fit/intercept approach was presented. Although there is a noticeable trend in many cases, the scatter off of a linear pattern is quite high. The possibility that this is a consequence of partially-rejected values being averaged into the mean of multiple measurements will be investigated for the next LWG meeting.
- The JRSO continues to investigate an issue with declination measurements by the Icefield MI-5 and Minex FlexIT orientation tools; a solid brass “snubber shock” component was constructed for

deployment on the next available APC-plus-orientation expedition in order to isolate the brass/rubber snubber shock as a potential source of this problem.

- The LWG discussed the planned Applied Physics service call to evaluate the SRM electronics and to help the JRSO optimize the new system.

Other projects and activities

Geosciences Laboratory

The XRF Core Scanner continues to be 100% booked through August 2017, and the facility eagerly awaits the installation of the second instrument to open up the calendar. The JRSO hired a full-time technician to manage the facility and made plans for management of the facility to be transferred from Analytical Systems to Curation in the near future. The twin projects for consolidation of expedition-related moratorium measurements into the LIMS database and for management and oversight of the XRF Core Scanner Facility continued their efforts during the quarter.

Core curation

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

JRSO expedition core sampling

The JRSO planned sample and curation strategies this quarter for upcoming JRSO Expeditions 367, 368, and 371.

GCR activity

In the “Sample requests” table, visitors to the repository are shown in the “Visitors” column in the same row as the sample with which the visit is associated. 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” column if no new samples were taken.

The following table provides a summary of the 7,318 samples that were taken at the GCR during the quarter. Sample requests that show zero samples taken may represent cores that were viewed by visitors during the quarter, used for educational purposes, or requested for XRF analysis.

Sample request number, name, country	Number of samples taken	Number of cores XRF scanned	Number of cores imaged	Number of visitors
47995IODP, Park, South Korea	8			
48588IODP, Jeremiah, United Kingdom	3			
47530IODP, McCartney, USA	83			
46380IODP, Li, USA	95			
47350IODP, Marret-Davies, United Kingdom	39			
47131IODP, Underwood, USA	61			
47164IODP, Mitchison, Wales	119			
47430IODP, Valet, France	1,729			2
47219IODP, Hasagawa, Japan	69			
48679IODP, Gose, Germany	6			
48761IODP, Penman, USA	302			1
48624IODP, Penman, USA	303			
43432IODP, Kelly, USA	8			
48833IODP, Bray, USA	0			
46117IODP, Galazzo, United Kingdom	80			
48707IODP, Herda, Austria	13			
48952IODP, Bridgestock, United Kingdom	27			
49239IODP, Kelly, USA	14			
48432IODP, Keating, USA	10			
46797IODP, O Patterson, USA	432			
48338IODP, Chalk, United Kingdom	103			
48733IODP, Carter, USA	46			
48310IODP, Riesselman, New Zealand	248			
47999IODP, Abell, USA	104			
48018IODP, Si, USA	102			
47234IODP, Chase, Australia	234			
47113IODP, McCarron, United Kingdom	2			
47525IODP, Micallef, Malta	85			
49475IODP, Huck, United Kingdom	189			
49740IODP, Torres, USA	12			
47337IODP, Balestra, USA	8			
49432IODP, McKinley, USA	18			1
49338IODP, Herbert, USA	392			
49312IODP, Randle, USA	93			1
48935IODP, Sze Ling, Norway	370			
49758IODP, White, USA	10			
48348IIODP, Woodhouse, United Kingdom	132			
48827IODP, Zhang, China	117			
48848IODP, Gargano, USA	6			
49857IODP, Khim, Korea	6			
48714IODP, Katchinoff, United Kingdom	48			

Sample request number, name, country	Number of samples taken	Number of cores XRF scanned	Number of cores imaged	Number of visitors
50023IODP, Koppers, USA	12			
49850IODP, Vesselin, Japan	9			
49598IODP, Dong, China	5			
49079IODP, Valletta, USA	0			
49790IODP, Hessler, USA	52			1
50112IODP, Taylor, United Kingdom		8		2
49501IODP, Villemant, France	161			
50255IODP, Bhattacharya, USA	37			
50001IODP, Yao, Canada	24			
49747IODP, Reece, USA	44			2
50133IODP, McCartney, Poland	60			
50386IODP, Evans, USA	5			
49920IODP, Wiederwohl, USA	7			
50728IODP, King, United Kingdom	51			
50481IODP, Mejia, Switzerland	5			
50351IODP, Scher, USA	34			
49780IODP, Grimmer, Germany	89			
48249IODP, Lewis, USA	29			1
47942IODP, Portnyagin, Germany	84			
47183IODP, Diz, Spain	820			
45620IODP, LeVay, USA		16		
49982IODP, Lu, USA	64			
44687IODP, Westerhold, Germany		230		1
Tours/Demonstrations (9)				176
Totals	**7,318**	**254**	**0**	**188**

GCR tours/visitors

Type of tour or visitor	Number of visitors
Scientist visitors	12
Educational tours/demonstrations (8)	158
Public relations tours (1)	6
Totals	**176**

Use of core collection

The JRSO promotes outreach use of the GCR core collection by conducting tours of the repository (see "GCR tours/visitors" table, above) and providing materials for display at meetings and museums. The repository and core collection are also used for classroom exercises. This quarter, Dr. Debbie Thomas (Interim Dean, TAMU College of Geosciences) held two Oceanography classes for more than 100 students at the GCR.

Other GCR activities

The repository began preparations for the Expedition 363 sample party to be held in June.

Development, IT, and databases

The JRSO manages data supporting IODP activities, including expedition and postexpedition data, provides long-term archival access to data, and supports JRSO Information Technology (IT) services. Daily activities include operating and maintaining shipboard and shore-based computer and network systems and monitoring and protecting JRSO network and server resources to ensure safe, reliable operations and security for IODP data and IT resources.

Expedition data

LIMS database

Data from Expedition 366 were added to the LIMS database on shore this quarter. These data are currently under moratorium and available only to the scientists who sailed on this expedition. Data from Expeditions 356 (Indonesian Throughflow) and Expedition 360 (SW Indian Ridge Lower Crust and Moho) were released from moratorium during this quarter.

Expedition data requests

The following tables provide information on JRSO web data requests from the scientific community. Where possible, visits by JRSO employees were filtered out.

Top 10 countries accessing JRSO web databases

	Janus database		LIMS database	
Rank	Country	Visitor sessions	Country	Visitor sessions
1	USA	969	USA	821
2	United Kingdom	612	Germany	236
3	Germany	194	Japan	216
4	Australia	142	United Kingdom	124
5	France	110	Unknown	91
6	Canada	81	China	71
7	China	75	France	54
8	Norway	50	Canada	33
9	Unknown	42	Netherlands	27
10	Italy	39	Australia	25
	Others	280	Others	178
	Total	**2,594**	**Total**	**1,876**

Top 20 database web queries				
	Janus database		LIMS database	
Rank	Query	Views	Query	Views
1	Imaging—core photos	1,942	Physical properties—GRA	941
2	Site summaries	888	Samples	919
3	Samples	655	Core photos	719
4	Special holes	609	Section summaries	369
5	Core summaries	423	Hole summaries	361
6	Paleontology—age profile	367	Images–LSIMG	340
7	Physical properties—GRA	291	Core summaries	281
8	Hole summaries	213	Physical properties—extended NGR	277
9	Paleontology—age models	210	Chemistry—IW	214
10	Physical properties—MSL	210	Physical properties—MAD	203
11	Chemistry—IW	187	Chemistry—carbonates	173
12	Images—prime data	170	Physical properties—MS	107
13	Hole trivia	161	Physical properties—extended AVS	101
14	X-ray—XRD	156	Physical properties—MSPoint	66
15	Physical properties—RSC	123	Physical properties—PWL	66
16	PMAG—cryomag	119	TS images	63
17	Leg summaries	114	Physical properties—NGR	62
18	Chemistry—carbonates	114	Images—closeups	58
19	Chemistry–rock eval	114	Physical properties—RGB	55
20	Images—closeups	107	Physical properties—RSC	54
	Others	1,614	Others	1392
	Total	**8,787**	**Total**	**6,821**

Data requests submitted to the TAMU Data Librarian			Countries submitting data requests to the TAMU Data Librarian	
Requests	Total		Country	Total
How to	6		USA	9
Photographs	4		Germany	4
Paleo data	2		United Kingdom	3
Samples	2		Unknown	3
Usage and citation	2		Canada	2
Age Model	1		Greece	1
Depths	1		Hong Kong	1
NGR	1		Sweden	1
RSC	1			
Seismic surveys	1			
Special holes	1			
XRD	1			
XRF	1			
Total	**24**		**Total**	**24**

Network systems operation, maintenance, and security

The JRSO kicked off its annual security assessment in accordance with TAMU policy and will be using the State of Texas–approved web application SPECTRIM (Archer GRC) to record and assess all information technology resources by 28 April 2017.

Software development

Liquid Helium–Free Superconducting Rock Magnetometer Installation and Software Upgrade

Project scope and deliverables

In FY14, the JRFB and NSF approved replacement of the current shipboard liquid helium cryogenic magnetometer with a new liquid helium–free magnetometer. The magnetometer currently in use aboard the *JOIDES Resolution* is almost 20 years old. Although it is still functioning well, the age of the system, the increasing costs of obtaining liquid helium, and the importance of magnetic measurements to IODP science were key factors in the decision to replace the current system. During this project, the JRSO will install the new helium-free magnetometer aboard the *JOIDES Resolution,* complete testing of the new system prior to Expedition 362, send the old liquid helium magnetometer to shore, and replace the software running the system.

Project status

The JRSO completed this project on 28 February 2017.

LIMS Data Display Tool—LIVE

Project scope and deliverables

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

Project status

Work continued on this project, which is on track for completion by June 2017.

XRF Core Scanner Uploader and Reports

Project scope and deliverables

This project was formerly referred to as the Shore XRF Core Scanner Implementation project. The JRSO will purchase a second Avaatech XRF core scanner to be used on shore along with an existing Avaatech scanner to facilitate postexpedition XRF scanning. Goals include (1) developing data structure, uploader,

and reports for XRF Core Scanner data; (2) developing quality assurance guidelines and quality control data tracking; (3) taking delivery of a second XRF Core Scanner; and (4) training JRSO staff in the use, care, and maintenance of both scanners.

Project status

The JRSO management team approved the project management plan for use in project execution on 5 January. This project is on track for completion by August 2017.

XRF Core Scanner Laboratory

Project scope and deliverables

The purpose of this project is to review and revise current XRF operations and devise new procedures for the JRSO shore-based XRF laboratory. The implementation of these changes, both before and during installation of the new machine, should streamline the XRF core scanning process and provide a solid foundation for the new XRF laboratory. This project is closely related to the XRF Core Scanner Uploader and Reports project.

Project status

This project is on track for completion by July 2017.

GEODESC

Project scope and deliverables

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

Project status

The JRSO management team approved this project for project management plan development on 5 January.

Coulometer

Project scope and deliverables

The purpose of this project is to design, build, and deliver an application with a simple, intuitive user interface that will make it easier for technicians and scientists to operate the Coulometer and correctly record the results of measurements. The new application will guide the user through a series of steps that make it simple and intuitive to operate the instrument and to save or discard results. The

Coulometer application will be used as a pilot project for the development of a new and improved instrument control framework.

Project status

The JRSO management team approved this project for project management plan development on 22 March.

Publication services

IODP Publication Services provides publication support services for Integrated Ocean Drilling Program and IODP riserless and riser drilling expeditions; editing, production, and graphics services for required Program reports (see "Progress reporting" in "Management and administration"), technical documentation, and scientific publications as defined in the JRSO cooperative agreement with NSF; and distribution of Integrated Ocean Drilling Program, ODP, and DSDP publications.

Scientific publications

Reports and publications	JRSO	USIO	CDEX	ESO*
Scientific Prospectus	10.14379/iodp.sp.375.2017 10.14379/iodp.sp.372.2017			
Preliminary Report	10.14379/iodp.pr.356.2017 10.14379/iodp.pr.363.2017		10.14379/iodp.pr.370.2017	10.14379/iodp.pr.364.2017
Data Report	10.14379/iodp. proc.352.201.2017	10.2204/iodp. proc.342.203.2017 10.2204/iodp. proc.339.203.2017 10.2204/iodp. proc.339.202.2017 10.2204/iodp. proc.329.204.2017	10.2204/iodp. proc.338.207.2017 10.2204/iodp. proc.348.203.2017 10.2204/iodp. proc.348.204.2017	
Expedition Report	10.14379/iodp.proc.360.2017 10.14379/iodp.proc.356.2017			10.14379/iodp.proc.357.2017

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

Citation management

Scientific publication digital object identifiers

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

Reports and publications	DOI prefix	Number of online DOI resolutions			
		January 2017	February 2017	March 2017	FY17 Q2 total
IODP	10.14379	1,386	1,484	1,329	**4,199**
Integrated Ocean Drilling Program	10.2204	4,900	1,619	3,928	**10,447**
ODP/DSDP	10.2973	17,219	3,825	29,875	**50,919**

Publications management

Integrated Ocean Drilling Program closeout activities

Publications closeout

Integrated Ocean Drilling Program publications closeout activities continued during the reporting period. Expedition reports and postexpedition research publications published during the quarter in the Proceedings of the Integrated Ocean Drilling Program are listed above in "Scientific publications." In addition, publication obligation papers and data reports related to Expeditions 329, 333, 337–342, 344, 346–352, and 355 were submitted to English language peer-reviewed journals or the Program.

Publications website

The IODP Publications website is hosted at TAMU. During the last quarter, it received 23,238 site visits and 199,683 page views. Where possible, visits by JRSO employees and search engine spiders were filtered out of the count.

Other projects and activities

Program publications on HathiTrust

IODP Publication Services worked with HathiTrust to provide a long-term digital archive of DSDP and ODP print volumes. HathiTrust's archive already contained almost all of the volumes, made ready through an agreement with Google Scholar, and the ODP volumes were already publically available. IODP Publication Services provided the necessary permissions to make DSDP volumes available as well and created a collection for each Program—a HathiTrust feature that provides specific items on a single webpage—by including links to the best scan of each volume. The DSDP collection is at https://babel.hathitrust.org/cgi/mb?a=listis&c=1930557976, and the ODP collection is at https://babel.hathitrust.org/cgi/mb?a=listis&c=1868324439.

Expedition 364 postexpedition editorial meeting

The JRSO hosted the postexpedition editorial meeting for ESO Expedition 364: Chicxulub K-T Impact Crater in College Station, Texas, from 27 through 31 March.

JRSO expedition science outreach support

JRSO staff assisted with planning for Expedition 368 port call public relations and outreach activities.

Articles authored by JRSO staff

Program-related science and other articles authored by JRSO staff published during this quarter include the following. Bold type indicates JRSO staff. Other Program-related science articles are available online through the ocean drilling citation database (http://iodp.tamu.edu/publications/bibliographic_information/database.html) and the IODP Expedition-related bibliography (http://iodp.tamu.edu/publications/citations.html).

- Balestra, B., Grunert, P., Ausin, B., Hodell, D., Flores, J.-A., **Alvarez-Zarikian, C.A.,** Hernandez-Molina, F.J., Stow, D., Piller, W.E., and Paytan, A., 2017. Coccolithophore and benthic foraminifera distribution patterns in the Gulf of Cadiz and Western Iberian margin during Integrated Ocean Drilling Program (IODP) Expedition 339. *Journal of Marine Systems,* 170:50-67. https://doi.org/10.1016/j.jmarsys.2017.01.005

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