International Ocean Discovery Program
JOIDES Resolution Science Operator
FY22 Q1 Operations and Management Report

1 October–31 December 2021
Cooperative Agreement OCE-1326927

Submitted by the JRSO
to
The National Science Foundation
and
The *JOIDES Resolution* Facility Board

27 January 2022

JOIDES Resolution Science Operator

IODP INTERNATIONAL OCEAN DISCOVERY PROGRAM

NSF

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) FY22 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 this quarter);
- Clearance, permitting, and environmental assessment activities;
- Expedition operations (including a site map for each expedition under way during this quarter, a coring summary table for each expedition completed during the quarter, and preliminary science results for each expedition completed during this quarter); and
- Postexpedition activities (including postcruise editorial meetings).

Table 2.1. JRSO expedition schedule

Expedition		Port (origin)[1]	Dates[2]	Total days (port/ sea)	Days at sea (transit[3]/ ops)	Co-Chief Scientists	Expedition Project Manager/ Contact
Mid-Norwegian Continental Margin Magmatism and Paleoclimate Implications	396	Reykjavík, Iceland	6 August–6 October 2021	61 (5/56)	56 (7/49)	C. Berndt S. Planke	C. Alvarez Zarikian
Non-IODP (Transit and maintenance) (6 October–6 December 2021) (61 days)							
Walvis Ridge Hotspot	391	Cape Town, South Africa	6 December 2021–5 February 2022	61 (5/56)	56 (11/45)	W. Sager K. Hoernle	T. Hoefig
Agulhas Plateau Cretaceous Climate	392	Cape Town, South Africa	5 February–7 April 2022	61 (5/56)	56 (6/50)	G. Uenzelmann-Neben S. Bohaty	L. Childress
South Atlantic Transect 1	390	Cape Town, South Africa	7 April–7 June 2022	61 (5/56)	56 (14/42)	R. Coggon J. Sylvan	E. Estes
South Atlantic Transect 2	393	Montevideo, Uruguay	7 June–7 August 2022	61 (5/56)	56 (14/42)	D. Teagle J. Reece	T. Williams
Non-IODP (Transit and tie up) (7 August–6 October 2022) (60 days)							
Iberian Margin Paleoclimate	397	Lisbon, Portugal	6 October–6 December 2022	61 (5/56)	4/52	D. Hodell F. Abrantes	C. Alvarez Zarikian

Expedition		Port (origin)[1]	Dates[2]	Total days (port/ sea)	Days at sea (transit[3]/ ops)	Co-Chief Scientists	Expedition Project Manager/ Contact
Hellenic Arc Volcanic Field	398	Tarragona, Spain	6 December 2022–5 February 2023	61 (5/56)	5/51	T. Druitt S. Kutterolf	T. Hoefig
Non-IODP (Transit and maintenance) (5 February–7 April 2023) (61 days)							
Building Blocks of Life, Atlantis Massif	399	Ponta Delgada, Portugal	7 April– 7 June 2023	61 (5/56)	8/48	A. McCaig S. Lang	P. Blum
Reykjanes Mantle Convection and Climate	395	Ponta Delgada, Portugal	7 June– 7 August 2023	61 (TBD)	TBD	R. Parnell-Turner A. Briais	L. LeVay
NW Greenland Glaciated Margin	400	St. John's, Canada	7 August– 7 October 2023	61 (5/56)	13/43	P. Knutz A. Jennings	L. Childress

Notes: TBD = to be determined.

[1]Ports subject to change, pending issues related to the COVID-19 pandemic.

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

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

Expedition 395C: Reykjanes Mantle Convection and Climate: Crustal Objectives

Postexpedition activities

A core description party and hard rock sampling is planned for 9–27 May 2022 at the Gulf Coast Repository (GCR).

Expedition 396: Mid-Norwegian Continental Margin Magmatism and Paleoclimate Implications

Postexpedition activities

The postcruise editorial meeting is planned for 28 February–4 March in College Station, Texas. A post-cruise sampling party is planned for 21–28 April at the Bremen Core Repository in Germany. These activities could be impacted by COVID-19 travel restrictions.

Table 2.2. Expedition 396 science party staffing breakdown

Member country/consortium	Participants	Co-Chief Scientists
USA: United States Science Support Program (USSSP)	10	0
Japan: Japan Drilling Earth Science Consortium (J-DESC)	2	0
Europe and Canada: European Consortium for Ocean Research Drilling (ECORD) Science Support and Advisory Committee (ESSAC)	9	2
Republic of Korea: Korea Integrated Ocean Drilling Program (K-IODP)	0	0
People's Republic of China: IODP-China	2	0

Member country/consortium	Participants	Co-Chief Scientists
Australia and New Zealand: Australia/New Zealand IODP Consortium (ANZIC)	0	0
India: Ministry of Earth Science (MoES)	1	0

Figure 2.1 Expedition 396 site map

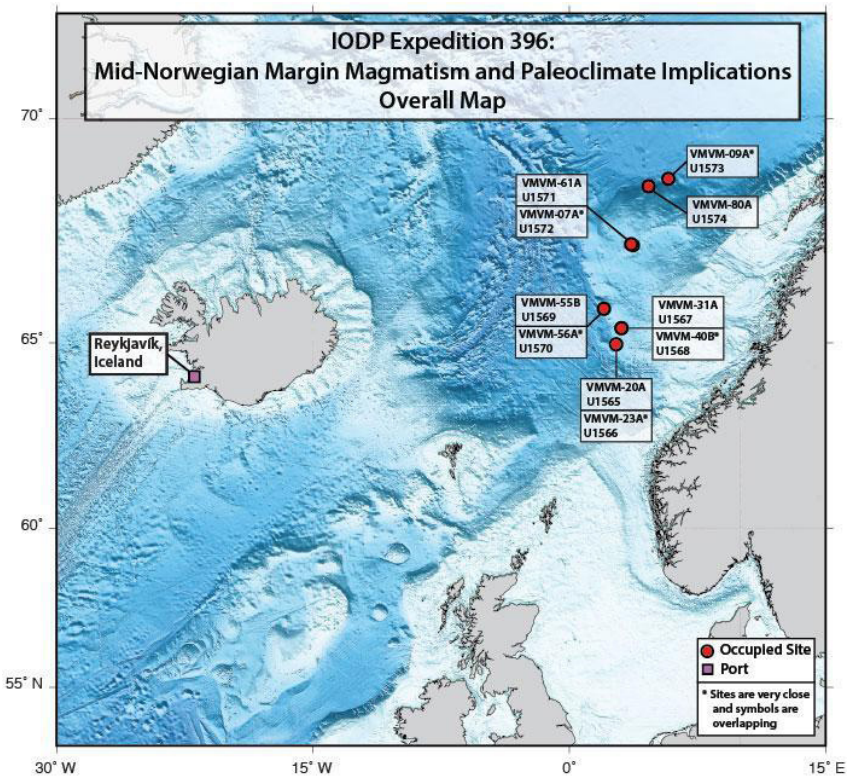


Table 2.2 Expedition 396 coring summary

Site	Hole	Latitude	Longitude	Water depth (mbsl)	Cores (*N*)	Total penetration (mbsf)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1565	U1565A	2°44.989′E	64°57.761′N	2072	4	28.0	28.0	4.21	15.04
	U1565B	2°44.845′E	64°57.804′N	2070	5	31.7	31.7	15.45	48.74
Site U1565 totals					**9**	**59.7**	**59.7**	**19.66**	**32.93**
U1566	U1566A	2°43.753′E	64°57.887′N	2099	33	181.7	181.7	100.5	55.31
Site U1566 totals					**33**	**181.7**	**181.7**	**100.5**	**55.31**
U1567	U1567A	3°3.256′E	65°21.851′N	1703	23	195.9	195.9	181.58	92.69
	U1567B	3°3.208′E	65°21.768′N	1704	10	83.0	58.0	55.29	66.61
	U1567C	3°3.219′E	65°21.785′N	1705	13	106.0	76.0	66.48	62.72
Site U1567 totals					**46**	**384.9**	**329.9**	**303.35**	**91.95**
U1568	U1568A	3°3.109′E	65°21.594′N	1704	28	200.0	200.0	156.61	78.31
	U1568B	3°3.154′E	65°21.663′N	1706	16	94.6	94.6	82.76	87.48
Site U1568 totals					**44**	**294.6**	**294.6**	**239.37**	**81.25**

Site	Hole	Latitude	Longitude	Water depth (mbsl)	Cores (*N*)	Total penetration (mbsf)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1569	U1569A	2°1.608′E	65°49.878′N	1706	44	404.0	404.6	144.91	35.82
Site U1569 totals					**44**	**404.0**	**404.6**	**144.91**	**35.82**
U1570	U1570A	1°59.623′E	65°49.890′N	2197	36	200.0	200.0	98.59	49.3
	U1570B	1°57.361′E	65°49.679′N	2270	25	163.5	163.6	71.42	43.66
	U1570C	1°58.707′E	65°49.849′N	2225	23	200.0	200.0	49.59	24.80
	U1570D	1°59.174′E	65°49.871′N	2207	28	200.0	200.0	50.49	25.25
Site U1570 totals					**112**	**763.5**	**763.6**	**270.09**	**35.37**
U1571	U1571A	3°44.250′E	67°18.402′N	1206	39	247.6	247.6	116.55	47.07
	U1571B	3°44.277′E	67°18.402′N	1205	20	143.7	143.7	112.51	78.3
Site U1571 totals					**59**	**391.3**	**391.3**	**229.06**	**58.54**
U1572	U1572A	3°37.162′E	67°19.847′N	1206	46	330.5	330.5	139.53	42.22
	U1572B	3°37.057′E	67°19.918′N	1206	33	224.3	224.3	218.35	97.35
Site U1572 totals					**79**	**554.8**	**554.8**	**357.88**	**64.51**
U1573	U1573A	5°47.688′E	68°45.624′N	3167	18	440.9	140.9	100.97	71.66
Site U1573 totals					**18**	**440.9**	**140.9**	**100.97**	**71.66**
U1574	U1574A	4°38.436′E	68°36.011′N	2825	38	260.0	260.0	88.41	34.00
	U1574B	4°38.463′E	68°36.012′N	2825	1	9.5	9.5	9.72	102.32
	U1574C	4°38.463′E	68°36.001′N	2819	20	171.5	171.5	174.97	102.02
Site U1574 totals					**59**	**441.0**	**441.0**	**273.10**	**61.93**
Expedition 396 totals					**503**	**3,947.1**	**3,562.1**	**2,038.89**	**57.24**

Science summary

The opening of the North Atlantic about 56 My ago was associated with the emplacement of the North Atlantic Igneous Province, including the deposition of voluminous extrusive basaltic successions and intrusion of magma into the surrounding sedimentary basins. The mid-Norwegian margin is a global type example of such volcanic rifted margins and is well suited for scientific drilling with its thin sediment cover and good data coverage. During Expedition 396, 20 boreholes were drilled at 10 sites in 5 different geological settings on this volcanic margin. The boreholes sampled a multitude of igneous and sedimentary settings ranging from lava flow fields to hydrothermal vent complexes, along with thick successions of upper Paleocene and lower Eocene strata. A comprehensive suite of wireline logs was collected in 8 boreholes. Among the goals of the expedition were to provide constraints for geodynamic models to test different hypotheses that can explain the rapid emplacement of large igneous provinces and the hypothesis that the associated Paleocene/Eocene Thermal Maximum was caused by hydrothermal release of carbon in response to magmatic intrusions. Successful drilling, combined with high core recovery of target intervals of all 9 primary sites and 1 additional alternate site, should allow us to achieve these goals during postcruise work.

Expedition 391: Walvis Ridge Hotspot

Planning

Port call logistics were finalized. Preparations for air freight were completed, and the shipment was dispatched.

Staffing

The original Namibian observers withdrew, and two new Namibian observers were invited and accepted the invitation to sail. Seven scientists withdrew during the month of November. One withdrew based on a medical condition unrelated to COVID, and six others withdrew due to revocation of travel approval by employing institutions or COVID-related health concerns in the wake of the new Omicron variant. These scientists are members of the science party with full access to data and samples.

Clearance, permitting, and environmental assessment activities

The Namibia Environmental Commissioner (EC) requested a scoping document of the drilling operations and the ship's environmental management plan in place of a full environmental assessment. These documents were submitted on 1 November. A diplomatic note was issued by the US embassy in Namibia on 12 November to support the clearance approval process. We received approval of the environment scoping document from the EC on 7 December. After several discussions and emails with the Namibian officials at the National Commission of Research, Science, and Technology, we obtained authorization to conduct research in the Namibian Extended Continental Shelf on 16 December. Overall, the Namibian clearance process required us to contact multiple agencies directly and to submit supplementary documentation that is not typically part of the clearance process.

Expedition pandemic issues

COVID-19 mitigation measures included following Center for Disease Control recommendations for a 7-day quarantine and testing period (assuming close contact during travel to port) prior to boarding *JOIDES Resolution*, followed by a 2-week shipboard mitigation period (e.g., masking, social distancing as much as possible, and restricted galley access schedules). Despite these efforts, an initial positive case was reported while the ship was in transit to the first site, and several more individuals became infected soon after. Upon arrival at the site, the decision was made to suspend operations and return to Cape Town, South Africa, so that the infected individuals and close contacts could quarantine on shore. All infected individuals were vaccinated and consequently had mild symptoms or were asymptomatic. After the appropriate isolation period had passed, the ship was able to depart Cape Town on December 29. The operations plan was scaled back to four sites instead of the original six primary sites.

Expedition 392: Agulhas Plateau Cretaceous Climate

Planning

A virtual kick-off meeting is planned for 13 January. An additional planning meeting to discuss HF use and safety measures will be held in January. The COVID Mitigation Protocols Established for Safe JR Operations (COPE) document is being revised based on the Expedition 391 experience, with improvements focusing on increasing testing frequency on board to reduce the transmission of COVID-19 during the early days of the expedition.

Staffing

Because of the COVID-19 Omicron variant and increased travel restrictions, participants will need to reconfirm participation.

Clearance, permitting, and environmental assessment activities

Authorization from South Africa to conduct research in the South Africa Exclusive Economic Zone was obtained on 13 December.

Expeditions 390 and 393: South Atlantic Transect 1 and 2

Planning

A revised operations plan that takes into account the progress made during Expeditions 390C and 395E will be published in an addendum to the Expedition 390/393 *Scientific Prospectus*. Meetings between the Expedition Project Manager (EPM), Co-Chief Scientists, and technical staff were held to review laboratory measurements and sampling. The EPM and Co-Chief Scientists also met with the curators to discuss sample party plans. The preliminary postcruise sampling plan is to hold a hard rock sampling party in Bremen in late November–early December and a sediment sampling party at the GCR in January–February of the following year.

Staffing

The sedimentologist and microbiologist positions from the special call for Expedition 390 were filled. The physical properties specialist/stratigraphic correlator for Expedition 390 withdrew, and the expedition management team began discussing potential replacements. Expedition 393 currently has four open positions that need to be filled.

Expedition 397: Iberian Margin Paleoclimate

Planning

Because the Co-Chief Scientists could not travel, a series of virtual precruise meetings were held over a 6-week period from the end of September to the beginning of November. The *Scientific Prospectus* is in the final draft stages and is expected to be published next quarter. An informational webinar hosted by the US Science Support Program (USSSP) was held on 19 October and was attended by a record number of 94 scientists.

Staffing

The Program Member Offices (PMOs) submitted their nominations, and the first round of invitations were sent out at the end of December. Of the 15 invitations, 11 scientists have accepted the invitation to sail.

Clearance, permitting, and environmental assessment activities

The Marine Science Research application will be submitted during the next quarter.

Expedition 398: Hellenic Arc Volcanic Field

Planning

To accommodate pandemic-related travel issues, a series of virtual precruise meetings were held over the first 2 weeks of October. The *Scientific Prospectus* is in the final draft stage and is expected to be published next quarter.

Staffing

The call for applications closed at the beginning of November, and the PMOs are expected to submit their nominations early next quarter. Two Greek observers were invited and have accepted the invitation to sail.

Expedition 399: Building Blocks of Life, Atlantis Massif

Planning

A general review of fluid sampling plans was held on 22 November. Because of COVID-19, the regular precruise meeting will take place as a set of virtual meetings, which will be held over a period of 6 weeks during the next quarter to accommodate all participants.

Staffing

A call for applications is in progress, with a deadline of 1 February. A USSSP webinar is planned for 5 January.

Expedition 395: Reykjanes Mantle Convection and Climate

Planning

Because of COVID-19, a portion of Expedition 395 was postponed to 7 June–7 August 2023. The Co-Chief Scientists began working on an updated expedition plan and are interested in adding new sites. Any revised research requests that involve the use of associated Expedition 384 or 395C data and samples are due in early February. Additionally, a core description and hard rock sampling party for Expedition 395C is planned for 9–27 May at the GCR.

Staffing

All science party members will be asked to reaffirm their participation for Expedition 395 within the next quarter.

Expedition 400: NW Greenland Glaciated Margin

Planning

The Co-Chief Scientists began working on the *Scientific Prospectus* draft and text for the call-for-applications advertisement to be published in *Eos*.

Staffing

Two Co-Chief Scientists were invited and accepted the invitation to sail.

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 FY21 (July–September) was submitted to NSF on 27 October (**http://iodp.tamu.edu/publications/AR/FY21/FY21_Q4.pdf**).

The FY21 IODP JRSO Annual Report (October 2020–September 2021) was submitted to NSF on 8 December (**http://iodp.tamu.edu/publications/AR/FY21AR.pdf**).

Liaison activities

JRSO reports to and liaises with funding agencies and IODP-related agencies (e.g., *JOIDES Resolution* Facility Board [JRFB], JRFB advisory panels, 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://www.iodp.org/boards-and-panels/facility-boards**).

Planning meetings

The JRSO Director and Manager of Science Operations attended the IODP Forum meeting held 11–13 October in Rome, Italy.

Project portfolio management

JRSO completed the Digital Asset Management Migration project and continued work on the GEODESC, X-Ray Linescan Core Imager, Core Orientation, Quality Control (QC) Data Viewer, New Rig Instrumentation System, Sample and Data Request Replacement, and GCR Core Storage Expansion projects.

GEODESC

Scope and deliverables

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

Status

JRSO demonstrated GEODESC to an internal audience on 18 November, presenting three of the four main applications. JRSO also began the design and specification review for the Catalog Manager application, which is the last of the four main GEODESC applications. Catalog Manager coding will begin in January. The estimated project completion date is April 2022.

X-Ray Linescan Core Imager

Scope and deliverables

The purpose of this project is to design and fabricate a standalone X-Ray Linescan Imager (XSCAN) to replace the prototype X-Ray Imager that has been in use since Expedition 379 (Amundsen Sea West Antarctic Ice Sheet History). Like the prototype, the XSCAN will provide the fundamental 2-D X-ray images for scientists to observe structures or objects such as dropstones, lamination, shells, burrows, faults, and fractures that might aid in the interpretation of geologic processes, depositional settings, environmental conditions, alteration, and tectonics. Similarly, it will produce images that might aid in

core-splitting decisions aimed at targeting specific material for sampling or minimizing damaging or disturbing important structures or objects. Unlike the prototype, the XSCAN will be capable of producing line-scanned X-ray images of each core section that can be viewed in the LIVE application or used for stratigraphic correlation or other analyses, similar to the images produced by the Section Half Imaging Logger. Additionally, the XSCAN will be able to rotate the source and detector around the core, which will provide different angular views of structures within the sections and could also be incorporated into volume estimates to be used to improve other data sets. The project manager is Margaret Hastedt (JRSO Research Specialist).

Status

Project progress slowed considerably with the departure of the JRSO Laboratory Officer who was working on the ship during the tie-up from October to December. JRSO continued to work with the loaner Hamamatsu camera and their engineers to get external triggering to work. JRSO also received delivery of the leaded acrylic in early December and began to document the hardware wiring layout. The estimated project completion date is May 2022.

Core Orientation

Scope and deliverables

The purpose of this project is to (1) develop a new nonmagnetic orientation tool that will be directly attached to the core barrel and (2) improve methods used to align the core liner within the core barrel. Specifically, a new gyroscopic orientation tool (GOT) will be developed in house that will be attached directly to the core barrel, avoiding possible problems with misalignment between the sinker bars and core barrel. Because the GOT does not use the magnetic field for orientation, the large magnetic fields associated with the drill string are irrelevant. To improve the alignment of the core liner, JRSO will investigate whether it is possible to modify the advanced piston corer core barrels to allow the core liner to be aligned and attached at both ends. Currently, the top of the liner is oriented and attached to the core barrel with a screw but the bottom of the liner is free to twist, which it might do as sediment enters the liner. The project manager is Bill Rhinehart (JRSO Operations Engineer).

Status

This project remains on hold pending completion of the Rig Instrumentation System project. This is a very complex project with many unknowns. The project completion date remains open ended.

QC Data Viewer

Scope and deliverables

The purpose of this project is to design and implement a QC viewer program to visualize QC data acquired during IODP expeditions. The project manager is David Houpt (JRSO Supervisor of Analytical Systems).

Status

JRSO is testing the QC Data Viewer during Expedition 391. The estimated project completion date is January 2022.

New Rig Instrumentation System

Scope and deliverables

This project will provide a drilling/coring driller's display system (DDS) that will replace the existing RigWatch/Tru-VU with a modular DDS that meets the performance and end user experience–related requirements as determined during the design and review phases of the project lifecycle. As much as possible, the system will use the sensor, cabling, computing, and data display infrastructure currently installed on the *JOIDES Resolution* rig instrumentation system. The project manager is John Van Hyfte (JRSO Supervisor of Engineering and Logistics Support).

Status

Most critical coding is complete, and JRSO is testing the new Rig Instrumentation System during Expedition 391. The completion date has been delayed to allow full testing during operations.

Digital Asset Management Migration

Scope and deliverables

The scope of this project is to migrate the current Cumulus taxonomy and assets to MerlinOne. The scope involves developing system and taxonomy migration plans and allocating the resources to migrate them. Additionally, the project will find alternative solutions for shipboard Cumulus activities so that Cumulus may be removed from the ship. The scope includes taxonomy development, metadata, database, and asset migration. The project manager is Michael Berardi (JRSO Configuration Manager).

Status

JRSO completed the Digital Asset Management Migration project on 29 October.

Sample and Data Request Replacement

Scope and deliverables

The scope of this project is to design and implement a replacement program for the current IODP sample and data request replacement (SaDR) application. This project will be used for pre-expedition research planning, along with all postexpedition sample requests, including X-ray fluorescence (XRF) scanning and education and outreach requests. All existing SaDR functions will be carried over to the replacement program. Some additional functions will be added to overcome shortcomings of SaDR. Work on this project will be conducted in four main phases: creating new requests, administrative functions, integration with the Sample Planning Tool (SPLAT), and data migration from SaDR to the replacement.

Status

JRSO implemented all major functions for Creating New Requests. The project team drafted formal test plans for Login and is also resolving known bugs, refining processes and code to better fit TAMU IT security requirements, and conducting informal testing. The estimated project completion date is March 2022.

GCR Core Storage Expansion

Scope and deliverables

The scope of this project is to plan expansion of the core storage facilities within the Gulf Coast Repository (GCR). This planning will consider how to provide the best long-term storage and preservation of core material while maximizing available space within the GCR at a reasonable budget.

Status

The JRSO management team approved the project management plan in September. So far, the project team has defined requirements for new reefers, new XRF laboratory/rock cutting, new shrink-wrap area/Technical and Analytical Services (TAS) development, and old reefer remediation. The estimated project completion date is September 2022.

4. Subcontract activities

JRSO continued to interact with ODL AS to ensure efficient and compliant operations of *JOIDES Resolution*. JRSO management meets with ODL AS weekly to discuss evolving travel/shipping restrictions and other logistical issues arising as the pandemic continues.

JRSO continued to interact with Schlumberger to ensure that wireline logging operations aboard *JOIDES Resolution* continue in an efficient and compliant manner. JRSO and Schlumberger worked successfully to streamline travel, shipping, and maintenance activities. Maintenance was conducted in November at the tie up in Cape Town, South Africa, and a new high-temperature cable was ordered.

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. JRSO is responsible for scoping, planning, managing, and implementing science expeditions (see Expedition operations); conducting long-range operational planning for out-year JRSO expeditions; providing services and materials for the platform and oversight to drilling and logging contractors; and utilizing IODP resources to oversee engineering development projects.

Expedition outreach support

An Onboard Outreach Officer is sailing during Expedition 391, and support is being provided for social media postings, videoconferences, and other activities. The Onboard Outreach Officer also provided essential precruise support during the Namibia clearance approval period by organizing events with Namibian museums and educational institutions.

Other projects and activities

Two EPMs taught the TAMU Introduction to Environmental Geosciences class this quarter. EPMs also participated in the College of Geosciences “Undergraduate Research Mixer” in November and conducted research with several undergraduate and graduate students. In December, the Clearance and Permitting Specialist presented a talk on Geology and IODP to elementary school students at St. Francis Xavier in Willard, Ohio, and six JRSO staff worked at the IODP/USSSP booth at the American Geophysical Union (AGU) Fall Meeting. One EPM continued to support the Pop-Up/Drill-Down Exhibit as a Co-Principal

Investigator on an NSF grant and coordinated the shipment of the MICRO-JR inflatable to New Orleans, Louisiana, for the AGU Fall Meeting. Another EPM is working on an NSF EarthCube grant to integrate IODP data with the paleobiology database (eIODP) and supervised one student worker for this work. Finally, one EPM is a member of the College of Geosciences Diversity and Climate Committee, and several EPMs are members of the JRSO Diversity, Equity, and Inclusion Working Group, which aims to improve respect, inclusion, and diversity at TAMU and on *JOIDES Resolution*.

6. Technical and analytical services

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

Analytical systems

Coulometers

IODP has two coulometers (UIC Model 5015) used for the determination of the concentration of carbon dioxide (CO_2) in powdered samples. In a recent technical support call with UIC, Inc., JRSO learned that the Model CM5015 will not be supported in the near future because several of the parts used in this model are no longer being manufactured. To avoid support issues, JRSO purchased two replacement coulometers (UIC Model CM5017), which are being tested on shore before being sent to the ship.

SPECIM FX10 hyperspectral imaging logger

TAS began experiments with the FX10 camera, including installing it on a track system and acquiring images of core sections and color standards. Work began on properly calibrating the system, automating the acquisition workflow, and developing the data flow from acquisition to color products, in addition to storing the hyperspectral "data block" itself. New lighting systems are being acquired and will be tested with the goal of increasing the spectral power in the 400–500 nm wavelength band.

X-ray core section imager

The XSCAN project continues to be delayed by supply-chain issues. Primarily, the delivery of the TDI X-ray camera (Hamamatsu) has been delayed for many months and is not expected for several more. TAS will continue to use a "loaner" Hamamatsu camera at least through the end of January. The current shipboard X-ray Imager remains operational on board for the interim.

Scanning electron microscope–energy dispersive spectrophotometer

The scanning electron microscope–energy dispersive spectrophotometer (SEM-EDS) project has stalled because of a hardware failure with the Brüker XFLASH 630 Mini EDS, which has been sent back to the factory for repair. This system will eventually replace the Hitachi TM-3000 SEM on the ship, and the older SEM will be transferred to College Station, Texas, where it will be available for use by staff and visiting scientists.

Carbon-hydrogen-nitrogen-sulfur analyzer

A service call was made in December to fix a leak in the new carbon-hydrogen-nitrogen-sulfur analyzer. The service call revealed that the pressure sensor had been miscalibrated by the vendor, and there was

no leak. The new instrument will be sent to the ship to replace the older FLASH EA1112 system, which will be installed at the GCR for use by staff and visiting scientists. The fact that only one furnace is functioning is not an issue on shore, where the instrument could be repaired.

Handheld/portable X-ray fluorescence spectrometer

Work continues with the new Brüker AXS Tracer-5g handheld/portable X-ray fluorescence spectrometer to develop the workflow, data upload, and data download procedures. The vendor made our requested adjustments to their output format, and TAS is now working with developers to modify the uploader and Laboratory Information Management System (LIMS) Online Report Environment accordingly. In addition, Brüker AXS now has an air-atmosphere calibration for their general geology mode, and the instrument has been sent back to the manufacturer to add this capability.

Epifluorescence microscopes

The new microbiology epifluorescence microscopes were shipped to the vessel and installed prior to Expedition 391. They will need different nose pieces so that they can be centered properly for nannofossil use. JRSO will acquire these and send them to the vessel.

Icefield MI-5 core orientation tools

Two of the three Icefield MI-5 tools developed faults and were returned to the manufacturer for repair. One of these had a failing, older model analog magnetometer, which was replaced with a more sturdy digital magnetometer. The third MI-5 tool and both of the older FlexIT orientation tools remain on board for use.

Laboratory working groups

The laboratory working groups (LWGs) provide oversight, research direction, and quality assurance for the methods, procedures, and analytical systems both on *JOIDES Resolution* and on shore. The groups meet regularly to review cruise evaluations, expedition technical reports, and any concerns raised by the IODP Issues Management Team to provide advice on corrective actions and potential developments for laboratories.

Curation and Core Handling

The Curation LWG met this quarter to discuss ongoing issues.

- The LWG discussed the ongoing SampleMaster replacement project. Curation informed the LWG that work on the next module (to replace the Sample Table portion of SampleMaster) has been postponed until a new system is created to replace the current IODP SaDR system.
- The LWG was given an update on the SaDR replacement. Initial efforts to use TAMU resources (LaserFische) will not be possible because they require a TAMU ID for use. Instead, the program will be rewritten with the intention of integrating it with publications tracking and the sample list generator program in the LIMS database.
- The LWG was informed of upcoming meetings to plan the new reefer space for the GCR.
- The LWG discussed methods to make the microbiological sample collection more accessible and possibly register individual samples with SESAR (**http://www.geosamples.org**) to improve tracking them once they leave the repository.

- The LWG also discussed recent issues with World Courier shipments (e.g., samples arriving unfrozen) and were informed that the JRSO Logistics group is looking at other vendors.

Geochemistry and Microbiology

The Geochemistry and Microbiology LWG met this quarter to discuss ongoing issues and recent cruise evaluations.

- The LWG had originally decided to put off purchasing new Coulometers, but that decision was reexamined because the CM5015 model was going out of service, as mentioned above.
- The LWG discussed updates to the hydrofluoric acid (HF) safety documentation—namely, to make that documentation available on the public-facing wiki site for manuals, user guides, and resources. This has been completed in the shipboard wiki and will be promulgated to the shore version of the wiki at the end of Expedition 391.
- Before leaving port, the Expedition 396 scientists did a full test run of the HF process with play core material to identify hazardous situations that might occur. The LWG recommends that this be done on future expeditions, and this recommendation is included in the updated HF information on the wiki.

Geology

The Geology LWG met this quarter to discuss ongoing issues and recent cruise evaluations.

- The LWG discussed older complaints from scientists about the temperature in the microscope and core laboratories. Experiments were conducted during Expedition 396T with temperature recorders, which indicated the temperature in the laboratories is consistent with the temperature set on the thermostat.
- The LWG discussed the need to photograph hard rock samples for documentation before they undergo destructive testing procedures and will form a working group to explore the best approach for this. The need to photograph these samples must be weighed against the possibility of contamination if the microbiological procedures are delayed.
- The LWG was given a brief update on improvements to the Section Half Imaging Logger lighting and calibration to remove artifacts; those mentioned during Expedition 378 were partially due to reflections that were addressed shortly after that cruise.
- The LWG discussed the possibility of saving an additional unaltered set of JPG (i.e., raw JPG) core images to preserve the raw red/green/blue (RGB) values. Currently, the JPG images are adjusted so that the image looks good on screen or on paper, but this alters the RGB values. Raw TIFF images are already preserved, but are currently only accessible by requests to the Data Librarian. A goal is to make these accessible in the open Zenodo database, which would alleviate the need to save another JPG version of images. The LWG appointed a task group to discuss this further.
- Expedition 396 issues
    - The workload to image all of the hard rock sections both dry and wet was high, but the science party believed (incorrectly) that this was required. This same type of misunderstanding has occurred in the past regarding scraping or not scraping sediment section surfaces for imaging. The imaging laboratory standard operating procedures will be updated to make it clear that the science party decides whether wet/dry or scraped/unscraped imaging is better suited for their cores.

- Some comments noted that DESClogik needed improvements or enhancements. Because this will be largely handled by the GEODESC project, the discussion was tabled for now.
- A request that we train staff to make thick section slides was deemed to be for personal and not expedition purposes. Scientists can request samples for making thick sections as part of their postcruise research. Shipboard preparation of thick sections will not be considered unless a situation arises where such samples are necessary.
- A comment regarding the need for JRSO to provide interpreted X-ray diffraction mineralogical information was briefly discussed. JRSO does not provide interpretation. This is (and should be) in the realm of the science party.
- Several comments requested improvements to the LIVE data visualization tool. These were collected for a possible "LIVE Version 2.0" project in the future, potentially leveraging techniques created for the QC Viewer tool.

Geophysics

The Geophysics LWG met this quarter to discuss several issues.

- The LWG was updated on a project to upgrade the Natural Gamma Radiation Logger electronics to simplify the logic module operation.
- The LWG discussed features added to the superconducting rock magnetometer software.
- The LWG received an update on the Magnetic Susceptibility Sonde (MSS). Data from expeditions beginning with Expedition 360 have been corrected for misidentification of data (the susceptibility and resistivity channels were flipped). The MSS tools have been reconfigured to produce data in the proper channels, and this will be tested during an upcoming expedition.
- The LWG was updated on the technical issues with the Icefield MI-5 tools and on the progress with the gyroscope orientation sub.
- The LWG discussed the Conductivity-Temperature-Depth (CTD) system and the possibility of adding a water sampler to it.
  - A Niskin bottle was purchased that will be attached to the vibration isolated television frame similar to the CTD system and will be tested during Expedition 391 if time allows.
- The LWG was updated on the 3.5 kHz precision depth recorder echo sounder problems (since repaired) and the installation of new NaviPac positioning and navigation software to replace the obsolete WinFrog. TAS also purchased a Knudsen Chirp 3260 dual channel echo sounder to replace the SyQuest Bathy 2010 system. Additionally, a new 500 m magnetometer cable was purchased after the previous cable was found to be twisted inside the sheath.
- The LWG discussed contracting with Schlumberger to extend the Versatile Seismic Imager (VSI) caliper arm to make the VSI more effective. The decision was made not to proceed with this project because a longer caliper arm might add more risk of the tool getting stuck.
- The LWG was presented with improvements to the design of the advanced piston corer temperature tool to make it more resilient and easier to maintain in the future.

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 JRSO network and server resources to ensure safe, reliable operations and security for IODP

data and information technology (IT) resources. Additional activities include managing expedition and postexpedition data, providing long-term archival access to data, and supporting JRSO IT services.

Expedition data

LIMS database

Data from Expedition 396 were added to the LIMS database on shore this quarter. These data are currently under moratorium and available only to the Expedition 396 scientists. 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

Rank	Janus database		LIMS database	
	Country	Visitor sessions	Country	Visitor sessions
1	USA	700	China	904
2	China	383	USA	517
3	United Kingdom	217	Japan	273
4	Germany	175	Germany	222
5	Netherlands	122	United Kingdom	165
6	France	81	Brazil	104
7	Italy	79	Canada	66
8	Canada	61	Qatar	65
9	Sweden	60	France	56
10	Japan	53	Republic of Korea	53
	Other	385	Other	358
	Total	**2,316**	**Total**	**2,783**

Table 7.2. Top 20 database web queries

Rank	Janus database		LIMS database*	
	Query	Views	Query	Views
1	Imaging—core photo	2,121	Imaging—section line scans	1,304
2	Site summary	1,785	Sample report	1,297
3	Imaging—prime data images	1,510	Hole summary	739
4	Core summary	905	Section summary	522
5	Sample	896	Imaging—core composites	491
6	Chemistry—interstitial water	723	Physical properties—color reflectance	481
7	Hole summary	562	Core summary	449
8	Physical properties—MAD	524	Chemistry—interstitial water	344
9	Depth point calculator	466	Personal samples	318
10	Special holes	423	Shipboard samples	303
11	Physical properties—MS	420	Physical properties—MAD	302
12	Imaging—closeup	309	Mixed samples	297

Rank	Janus database		LIMS database*	
	Query	Views	Query	Views
13	Physical properties—color reflectance	287	Core type drilling summary	288
14	Chemistry—carbonates	234	Physical properties—MS	275
15	Physical properties—GRA	234	Physical properties—NGR	210
16	Physical properties—AVS	214	Physical properties—GRA	199
17	Paleontology—age model	197	Imaging—thin sections	182
18	Paleontology—paleo investigation	196	Imaging—section line scans extended	174
19	Hole details	193	Chemistry—carbonates	161
20	Physical properties—NGR	187	Magnetism—SRM	158
	Other	2,163	Other	3,038
	Total	**14,549**	**Total**	**11,532**

Table 7.3. Data requests to the TAMU Data Librarian

Requests	Total
How to	6
Forwarded to JAMSTEC/MARUM	2
Photo	1
Data corrections	1
Other	1
Total	**11**

Country	Total
USA	7
China	2
United Kingdom	1
Australia	1
Total	**11**

Network systems operation, maintenance, and security

JRSO conducted routine system maintenance in accordance with the TAMU IT security policy and responded to two emergent TAMU campus-wide system security vulnerability remediation requests.

8. Core curation

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

Sample and curation strategies

This quarter, JRSO planned sample and curation strategies for Expeditions 396 and 391.

Sample requests and core sampling

The following table provides a summary of the 3,783 samples taken at the GCR during this quarter. Sample requests that show zero samples taken may represent cores that were viewed by visitors during this quarter, used for educational purposes, or requested for 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 number 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
075127IODP, Liu, China	560	0
090115IODP, Zhu, China	80	0
090383IODP, Strachan, New Zealand	40	0
090566IODP, Bell, USA	30	0
090620IODP, Groenveld, Germany	260	0
090647IODP, Wu Sifan, China	150	0
090825IODP, Passchier, USA	42	0
090882IODP, Jones, Germany	787	0
090317IODP, Brunet, France	0	0
090938IODP, Sweere, Switzerland	36	0
090980IODP, Standring, USA	0	1
090990IODP, Archontikis, United Kingdom	566	0
090964IODP, Strachan, New Zealand	40	0
091039IODP, Siebert, USA	146	0
091018IODP, Rattanasriampaipon, USA	48	1
090365IODP, Yu, China	115	0
091150IODP, Fitzgerald, USA	26	0
091157IODP, Farley, USA	63	0
091137IODP, Dengfeng Li, China	7	0
091332IODP, Brabson, USA	4	0
091397IODP, Bablon, France	57	0
091404IODP, Liao, China	73	0
091514IODP, Nana Yobo, USA	87	1
091415IODP, Saenger, USA	4	0
091555IODP, Biester, Germany	116	0
091567IODP, McCall, USA	5	0
091428IODP, Chen, USA	95	0
091659IODP, Liao, USA	14	0
091752IODP, Kashbohm, USA	147	0
091906IODP, Woodhouse, USA	0	1
091778IODP, Deasy, USA	9	0
091940IODP, Smart, United Kingdom	52	0
091959IODP, Yao, China	62	0
091995IODP, Varma, Netherlands	15	0
092164IODP, Carey, Australia	0	0
092155IODP, Carey, Australia	0	0
092173IODP, Carey, Australia	0	0
092296IODP, Matsumoto, Japan	1	0
092647IODP, Lacerra, USA	46	0
Tours/demonstrations (7)	0	61
Totals	**3,783**	**65**

Use of core collection and education and outreach support

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, tours were given to 50 TAMU undergraduate students as part of a laboratory exercise for their sedimentology class. Additionally, VIP tours were given to leaders from Los Alamos National Laboratory. The GCR also oversaw the transfer of the Amoco micropaleontology collection to other institutions and museums. Palynology slides were transferred to the Center for Excellence in Palynology (CENEX) at Louisiana State University, fusulinid slides to the University of Kansas Natural History Museum, and all slides from Alaskan wells to the Alaska Geologic Materials Center.

Onshore XRF scanning

During this quarter, 425 core sections and discrete samples were scanned on the XRFs at the GCR. Documentation relating to the operation, advanced configurations, maintenance, and troubleshooting of the XRF is available at **https://sites.google.com/scientific-ocean-drilling.org/xrf-iodp/home**.

Table 8.2. Core sections scanned

Request type	Expedition, name, country	XRF 1	XRF 2	SHIL	WRMSL*
Personal	77, Standring, USA	23			
Personal	10, Standring, USA	43			
Personal	165, Standring, USA			21	
Personal	371, Blum, USA		65		
Personal	385, Hoefig, Yeon, Wood, USA		59	56	
Personal	375, Woodhouse, USA		71		
Program	390C, Sylvan, Williams, Lowery, Estes, Christenson, USA		134		
Program	396, Alvarez Zarikian, USA	30			
Totals		**96**	**329**	**77**	**0**

Notes: XRF = X-ray fluorescence, 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 Expedition operations) and editing, production, and graphics services for required Program reports (see Management and administration), technical documentation (see Technical and analytical services), and scientific publications as defined in the JRSO cooperative agreement with NSF. The Pubs department also maintains legacy access and archiving of Integrated Ocean Drilling Program, Ocean Drilling Program (ODP), and Deep Sea Drilling Project (DSDP) publications.

Scientific publications

Table 9.1. Newly published content on the IODP Publications website

Reports and publications	JRSO	Other
Preliminary Reports	10.14379/iodp.pr.395E.2021	
Data Reports	10.14379/iodp. proc.372B375.207.2021 10.14379/iodp. proc.372B375.208.2021 10.14379/iodp.proc.363.205.2021 10.2204/iodp.proc.334.204.2021	

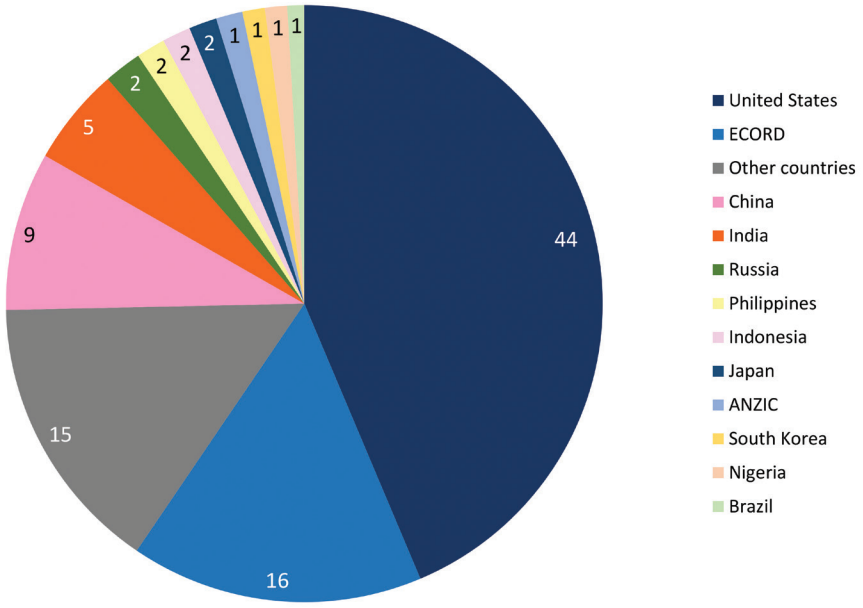
Notes: Other = European Consortium for Ocean Research Drilling Science Operator (ESO), The Institute for Marine-Earth Exploration and Engineering (MarE3), Integrated Ocean Drilling Program US Implementing Organization (USIO), and Oman expedition publications.

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 398,928 page views and 40,510 site visits and the IODP Publications website received 399,365 page views and 26,336 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 214 countries.

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



Notes: ECORD = European Consortium for Ocean Research Drilling, ANZIC = Australia/New Zealand IODP Consortium. ECORD countries include Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

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 these legacy websites that highlight the scientific and technical accomplishments of these ground-breaking precursors to the Integrated Ocean Drilling Program and IODP. These 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	FY22 Q1 page views*	FY22 Q1 site visits*
www-odp.tamu.edu	200,134	36,238
www.odplegacy.org	3,419	2,045
www.deepseadrilling.org	52,044	8,166
Total	**255,597**	**46,449**

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

Publications coordination

Data reports related to Expeditions 367/368 and 372B/375 were received, sent to peer review, accepted, and/or published this quarter. In addition, peer-reviewed postcruise research result publications related to Expeditions 349, 351–353, 355–357, 360–361, 363–364, 366, 367/368–370, 372B/375, 374, and 376 were added to the publications database.

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. CrossRef tracks the number of times a publication is accessed, or resolved, through the CrossRef DOI resolver tool. Program statistics for this quarter are shown in the tables below.

Table 9.3. Number of online DOI resolutions

Reports and publications	DOI prefix	October 2021	November 2021	December 2021	FY22 Q1 total
IODP	10.14379	9,714	9,178	9,865	**28,757**
Integrated Ocean Drilling Program	10.2204	8,011	9,472	11,695	**29,178**
ODP/DSDP	10.2973	128,259	91,468	41,487	**261,214**

Table 9.4. Top 10 IODP DOIs resolved during FY22 Q1

DOI (10.14379)	Resolutions	Title
10.14379/IODP.SP.396.2021	721	Expedition 396 Scientific Prospectus: Mid-Norwegian Continental Margin Magmatism
10.14379/IODP.PROC.385.2021	566	Volume 385: Guaymas Basin Tectonics and Biosphere
10.14379/IODP.PR.390C.2021	548	Expedition 390C Preliminary Report: South Atlantic Transect Reentry Systems

DOI (10.14379)	Resolutions	Title
10.14379/IODP.PR.385.2020	438	Expedition 385 Preliminary Report: Guaymas Basin Tectonics and Biosphere
10.14379/IODP.PROC.382.2021	344	Volume 382: Iceberg Alley and Subantarctic Ice and Ocean Dynamics
10.14379/IODP.PROC.383.2021	310	Volume 383: Dynamics of the Pacific Antarctic Circumpolar Current
10.14379/IODP.PROC.367368.2018	284	Volume 367/368: South China Sea Rifted Margin
10.14379/IODP.SP.391.2020	206	Expedition 391 Scientific Prospectus: Walvis Ridge Hotspot
10.14379/IODP.SP.395.2020	187	Expedition 395 Scientific Prospectus: Reykjanes Mantle Convection and Climate
10.14379/IODP.PR.395E.2021	119	Expedition 395E Preliminary Report: Complete South Atlantic Transect Reentry Systems

Table 9.5. Top 10 Program DOIs resolved during FY22 Q1

DOI (10.14379, 10.2204, 10.2973)	Resolutions	Title
10.14379/IODP.SP.396.2021	721	Expedition 396 Scientific Prospectus: Mid-Norwegian Continental Margin Magmatism
10.2973/ODP.PROC.IR.110.102.1988	587	Volume 110 Initial Reports: Introduction and Explanatory Notes
10.14379/IODP.PROC.385.2021	566	Volume 385: Guaymas Basin Tectonics and Biosphere
10.14379/IODP.PR.390C.2021	548	Expedition 390C Preliminary Report: South Atlantic Transect Reentry Systems
10.14379/IODP.PR.385.2020	438	Expedition 385 Preliminary Report: Guaymas Basin Tectonics and Biosphere
10.14379/IODP.PROC.382.2021	344	Volume 382: Iceberg Alley and Subantarctic Ice and Ocean Dynamics
10.2973/ODP.PROC.SR.113.200.1990	338	Oligocene to Middle Miocene Radiolarian Stratigraphy of Southern High Latitudes From Leg 113, Sites 689 and 690, Maud Rise
10.14379/IODP.PROC.383.2021	310	Volume 383: Dynamics of the Pacific Antarctic Circumpolar Current
10.14379/IODP.PROC.367368.2018	284	Volume 367/368: South China Sea Rifted Margin
10.2973/DSDP.PROC.38394041S.119.1978	283	Diatom and Radiolarian Cenozoic Stratigraphy, Norwegian Basin; DSDP Leg 38

ScienceOpen

Integrated Ocean Drilling Program and IODP expedition reports and data reports are indexed at ScienceOpen. JRSO deposited expedition reports from Volumes 383 and 385 and data reports from Volumes 346, 369, and 372A into ScienceOpen this quarter.

Table 9.6. 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	Referenced articles
FY19–FY21	758	16,761	295	1,851	8,888
FY22 Q1	38	835	306	1,951	607
Total to date	796	17,596	—	—	9,495

Table 9.7. 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	Referenced articles
FY19–FY21	9,035	35,401	65,302	19,710	87,207
FY22 Q1	3	1,152	70,044	20,082	3,731
Total to date	9,038	36,553	—	—	90,938

Altmetric.com

JRSO contributes publications metadata to TAMU's Symplectic Elements database, which feeds data to **http://altmetric.com**, a platform that enables monitoring of the online activity surrounding academic research. This quarter, JRSO uploaded DOIs of Integrated Ocean Drilling Program expedition reports for Volumes 383 and 385 and data reports for Volumes 346, 369, and 372A.

Legacy activities

Closeout

Integrated Ocean Drilling Program publications closeout activities continued during the reporting period. Data reports published during this quarter in the *Proceedings of the Integrated Ocean Drilling Program* are listed above in Scientific publications. In addition, peer-reviewed postcruise research result publications related to Expeditions 301–303/306, 308–309/312, 311, 314/315/316, 318, 320/321, 323–324, 334–336, 338–342, and 344–347 were added to the publications database.

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 are archived at the Internet Archive, a long-term archive specializing in full website backups. Scheduled crawls incrementally update the archive with new files. Currently, our collection houses 1.5 TB of data and more than 7.6 million files.

Citation management

IODP Pubs contracts with the American Geosciences Institute (AGI) to maintain the Scientific Ocean Drilling Citation Database, a subset of the GeoRef database that contains more than 38,800 records for Program-related scientific ocean drilling publications from 1969 to the present. This quarter, IODP Pubs sent 52 expedition-related publication citations for consideration for inclusion in the database.

Table 9.8. Scientific Ocean Drilling Bibliographic Database statistics

Program-related publications	October 2021	November 2021	December 2021	FY22 Q1 total
Searches	242	246	647	1,135
Citation views	226	155	199	580

Downloadable IODP bibliographies

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 import the content of the RIS files into most bibliographic software. RIS-format citation data lists are also available for expedition-related bibliographies for Expeditions 301–396. The IODP program publication and JRSO staff-authored publication lists are updated quarterly. Expedition-related bibliography lists are updated monthly.

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**).

American Geophysical Union Fall Meeting

- Alejos, A., Winckler, G., Abell, J., Middleton, J.L., Ravelo, A.C., Santos, B., DeLong, K.A., Riesselman, C.R., Malinverno, E., Saavedra, M., and the IODP Expedition 383 Scientists (including **C.A. Alvarez Zarikian**), 2021. High-resolution records of dust and productivity from the Pacific sector of the Southern Ocean across Termination III. Presented at the AGU Fall Meeting 2021, New Orleans, LA, 13–17 December 2021.
- **Alvarez Zarikian, C.A.**, Nadiri, C., Alonso-Garcia, M., Rodrigues, T., Huang, H.-H.M., Lindhorst, S., Kunkelova, T., Kroon, D., Betzler, C., and Yasuhara, M., 2021. Ostracod response to Pleistocene monsoon intensification and oxygen minimum zone expansion in the equatorial Indian Ocean, IODP Site U1467. Presented at the AGU Fall Meeting 2021, New Orleans, LA, 13–17 December 2021.
- Chicoye, M., Hendy, I.L., Dunlea, A.G., and IODP Expedition 378 Scientists (including **L.B. Childress**), 2021. Quantifying XRF core scanning counts within different sediment matrices: transitioning from a nearshore to farshore environment at IODP Site U1553. Presented at the AGU Fall Meeting 2021, New Orleans, LA, 13–17 December 2021.
- Clementi, V., Rosenthal, Y., Bova, S.C., Wright, J., Thomas, E.K., Mortlock, R.A., Godfrey, L., Cowling, O., and **Childress, L.B.**, 2021. Geochemical fingerprinting of interstitial waters reveals the potential infiltration of geothermal fluids to the Chilean margin. Presented at the AGU Fall Meeting 2021, New Orleans, LA, 13–17 December 2021.
- Cuevas, J.M., Johnson-Groh, M., **Kachovich, S.**, and **LeVay, L.**, 2021. Adapting shipboard scientific outreach programs for shore-based participants. Presented at the AGU Fall Meeting 2021, New Orleans, LA, 13–17 December 2021.
- Daniels, M.D., Kirkpatrick, C., McHenry, K., Zanzerkia, E.E., Clyne, J., **LeVay, L.**, Wallace, K.L., and Briner, JK.P., 2021. EarthCube: a community-driven cyberinfrastructure for the geosciences – a look ahead. Presented at the AGU Fall Meeting 2021, New Orleans, LA, 13–17 December 2021.
- **Estes, E.R.**, 2021. Microscale observations of old, stable organic carbon in pelagic sediment. Presented at the AGU Fall Meeting 2021, New Orleans, LA, 13–17 December 2021.
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Articles authored by JRSO staff

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Appendix: JRSO quarterly report distribution

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