International Ocean Discovery Program
Joides Resolution Science Operator
FY21 Q4 Operations and Management Report

1 July–30 September 2021
Cooperative Agreement OCE-1326927

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

27 October 2021

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) FY21 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
Complete SAT Reentry Installations	395E	Cape Town, South Africa	6 April–6 June 2021	61 (5/56)	56 (32/24)	NA	T. Williams
Reykjanes Mantle Convection and Climate: Crustal Objectives	395C	Reykjavík, Iceland	6 June–6 August 2021	61 (5/56)	56 (3/53)	R. Parnell-Turner A. Briais	L. LeVay
Mid-Norwegian Continental Margin Magmatism	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)							K. Petronotis
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 G. Christeson	T. Williams

Expedition		Port (origin)[1]	Dates[2]	Total days (port/sea)	Days at sea (transit[3]/ ops)	Co-Chief Scientists	Expedition Project Manager/ Contact
Non-IODP (Transit and tie up) (7 August–6 October 2022) (60 days)							K. Petronotis
Iberian Margin Paleoclimate	397	Lisbon, Portugal	6 October–6 December 2022	61 (5/56)	4/52	D. Hodell F. Abrantes	C. Alvarez Zarikian
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)							K. Petronotis
Deepening Hole U1309D	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, NA = not applicable, SAT = South Atlantic Transect.

[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 395E: Complete SAT Reentry Installations

Postexpedition activities

No formal postexpedition activities are planned. Expedition 395E installed reentry systems at three South Atlantic Transect (SAT) sites, and additional operational time allowed coring at a fourth site. Core description, postcruise measurements, and personal sampling will take place in parallel with Expedition 390 and 393 activities in 2022–2023.

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

Staffing

Expedition 395C took place with limited JRSO staff and no science party. The Expedition Project Manager (EPM) sailed, and the Expedition 395 Co-Chief Scientists and science party assisted with operational and science decisions from shore. All JRSO staff made it to the ship, and COPE protocols were observed.

Postexpedition activities

Postexpedition activities were planned for 2022, including core description and XRF scanning. Additional core description, postcruise measurements, and personal sampling will take place in parallel with Expedition 395 activities in 2023–2024.

Figure 2.1 Expedition 395C site map

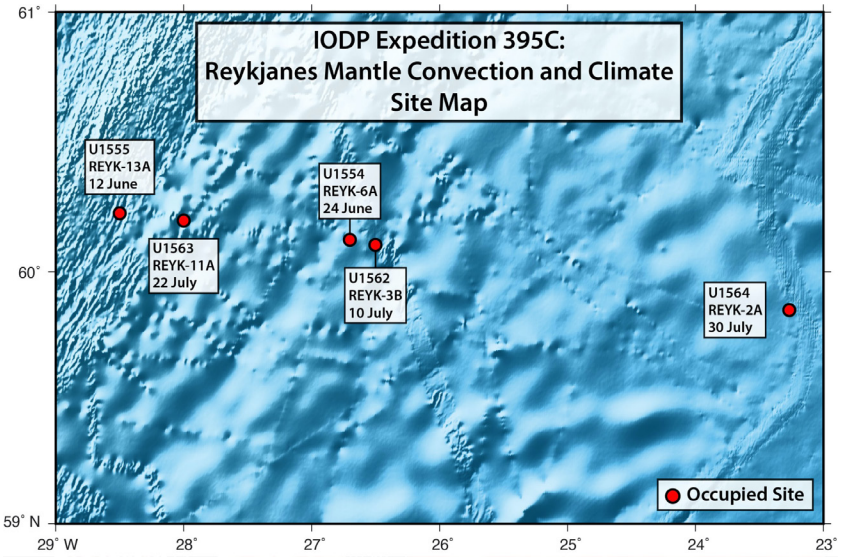


Table 2.2 Expedition 395C coring summary

Site	Hole	Latitude	Longitude	Water depth (mbsl)	Cores (*N*)	Total penetration (mbsf)	Interval cored (m)	Core recovered (m)	Recovery (%)
U1555	U1555H	60°13.6924’N	28°30.0240’W	1523.7	20	177.5	177.5	180.06	101.44
	U1555I	60°13.6897’N	28°29.9984’W	1523.6	40	376.5	217.2	104.19	47.97
Site U1555 totals					**60**	**554.0**	**394.7**	**284.3**	**72.0**
U1554	U1554E	60°7.5235’N	26°42.1324’W	1869.8	61	647.7	581.4	541.07	93.06
	U1554F	60°7.5136’N	26°42.1140’W	1869.7	30	779.9	159.9	100.15	62.63
Site U1554 totals					**91**	**1427.6**	**741.3**	**641.22**	**86.50**
U1562	U1562A	60° 6.3030’N	26°30.1245’W	2003.4	65	429.8	429.8	411.04	95.64
	U1562B	60° 6.2993’N	26°30.1026’W	2003.4	31	561.5	153.4	73.08	47.64
Site U1562 totals					**96**	**991.3**	**583.2**	**484.12**	**83.01**
U1563	U1563A	60°11.9985’N	28°00.0209’W	1417.9	49	327.6	327.6	334.98	102.25
	U1563B	60°11.9946’N	27°59.9996’W	1417.9	31	456.6	155.2	44.38	28.6
Site U1563 totals					**80**	**784.2**	**482.8**	**379.4**	**78.57**
U1564	U1564A	59°51.0377’N	23°16.0071’W	2208.1	1	9.5	9.5	9.89	104.11
	U1564B	59°51.0371’N	23°15.9868’W	2207.9	3	26.2	26.2	26.81	102.33
	U1564C	59°51.0374’N	23°16.0087’W	2208.1	75	628.9	628.9	618.71	98.38
Site U1564 totals					**79**	**664.6**	**664.6**	**655.4**	**98.62**
Expedition 395C totals					**406**	**4421.7**	**2866.6**	**2444.36**	**85.27**

Science summary

Expedition 395C focused on drilling, coring, and downhole logging operations at sites where the primary objectives are related to mantle convection and crustal composition. At the end of the expedition, one casing and reentry system was installed at one of the sediment drift sites, which will be the focus of Expedition 395. JRSO technical staff made routine measurements on 2,444 m of core recovered from five sites. Four sites were logged. All the core and logging data were provided to the science party during and after the expedition.

Expedition 396: Mid-Norwegian Continental Margin Magmatism

Planning

The precruise shipboard laboratory measurements and sampling plan for the expedition were finalized. Preparations for surface and air freight were completed, and the shipments were dispatched. Because of staffing changes, travel reservations were rearranged and completed.

Staffing

The expedition was originally staffed with 27 scientists from five Program Member Offices (PMOs), one Onboard Outreach Officer, and one observer from Norway. However, as a result of JRSO's COVID-19 protocol, the expedition sailed with a reduced science party that included the EPM, the observer, and 18 scientists.

Expedition 391: Walvis Ridge Hotspot

Planning

Planning resumed after the expedition's 1-year postponement. The science party is working on coordinating research plans for several new scientists, and laboratory preparations are being completed. A detailed plan is being drafted for ship-to-shore collaborations during the expedition.

Staffing

The special call was successful, and two physical property specialists accepted the invitation to sail. Additionally, the previous Namibian observers had to withdraw, and two new Namibian observers were invited.

Clearance, permitting, and environmental assessment activities

Following the submission of the clearance request in May, JRSO met virtually with Namibian officials in August to explore possible additional requirements. We are in discussions with several Namibian agencies and, as requested, are developing an outreach plan with several local museums and schools.

Expedition 392: Agulhas Plateau Cretaceous Climate

Planning

The science party continued refining their research plans and worked on laboratory preparations. Virtual science party meetings occurred regularly. A meeting with third-party tool suppliers was held, and the requested materials are being ordered.

Staffing

All scientists have confirmed their participation in the rescheduled cruise.

Clearance, permitting, and environmental assessment activities

The Marine Science Research application was submitted to the US State Department on 27 July, and the US State Department submitted the application and diplomatic note to the South Africa government on 5 August.

Expeditions 390 and 393: South Atlantic Transect 1 and 2

Planning

Following the installation of several reentry systems, the coring required for those operations, and the preliminary data collected during Expeditions 390C and 395E, the four Co-Chief Scientists and two EPMs revised the operations plan for Expeditions 390 and 393.

Staffing

Following the withdrawal of several participants, three new scientists were invited in June and July, and a special call was opened in September for four empty positions.

Expedition 397: Iberian Margin Paleoclimate

Planning

Virtual precruise planning kicked off with the science presentation by the Co-Chief Scientists. Additional pre-expedition meetings were scheduled into the next quarter.

Staffing

Two Co-Chief Scientists were staffed.

Expedition 398: Hellenic Arc Volcanic Field

Planning

Virtual pre-expedition meetings were scheduled starting at the beginning of the next quarter.

Staffing

Two Co-Chief Scientists accepted the invitation to sail.

Expedition 399: Building Blocks of Life, Atlantis Massif

Staffing

Two Co-Chief Scientists accepted the invitation to sail.

Expedition 400: NW Greenland Glaciated Margin

Staffing

The first invitation was issued to a Co-Chief Scientist.

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 third quarter of FY21 (April–June) was submitted to NSF on 9 August (**http://iodp.tamu.edu/publications/AR/FY21/FY21_Q3.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://iodp.org/boards-and-panels/facility-boards**).

Planning meetings

Seven JRSO science staff attended the virtual Science Evaluation Panel (SEP) Meeting held 27–30 July. Mitch Malone (Assistant Director) and Laurel Childress (EPM) attended the remote US Advisory Committee Meeting held 9–13 August.

Project portfolio management

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

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

The Data Capture application is nearing completion, the core description functions in the Template Manager application are essentially complete, and the focus is now on the special micropaleontology functions. The first build of the Data Access application is nearly complete, and interactions between applications are being tested. The estimated project completion 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 datasets. The project manager is Margaret Hastedt (JRSO Research Specialist).

Status

JRSO decided to proceed with the Hamamatsu C123000-321 camera in lieu of the Teledyne Shad-o-Scan 3001. The loaner Hamamatsu camera was installed, and more comprehensive tests are under way. The team is finalizing the wiring harness and cRIO logic for the shutter and safety interlock subsystems and working through the image acquisition issues, such as occasional dropped grabs, oversaturation at the beginning of a scan, and image artifacts from (presumed) track stiction. Onscreen image processing is a rate-limiting step right now. The team plans on implementing heat-mitigation measures with the camera in the next quarter. The leaded-vinyl shielding is about 75% installed. The estimated project completion date was revised to 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

JRSO decided to place more emphasis on the Rig Instrumentation System project for now, so this project has seen very little progress. 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 only implemented incremental changes since the last report. The team completed some specification fine-tuning and conducted testing and recursive development-and-testing cycles in response. The estimated project completion date was revised to 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

Programming was completed for the new cRIO, which will be the backbone of the parallel data acquisition system (iRIS). The new iRIS system was installed into the enclosure, and the backup iRIS system was prepared for air freight to Reykjavik. Data send/receive was tested, and web services to insert and retrieve real-time data were completed and tested. JRSO personnel will conduct shipboard tests. The estimated project completion date of December 2021 is uncertain.

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

The team completed the integration of TAMU Single Sign On services; all staff can now log into MerlinOne using Single Sign On through iodp.merlin.net. We are looking for ways to improve accessibility for outreach interests, and we are continuing to transfer the last and largest catalog, Pubs1, which contains 407,927 records. The estimated project completion date was revised to November 2021.

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

The JRSO management team approved the project management plan in July, and project execution began soon thereafter. Work has focused on implementing the Create New Request functionality. All of the

screens for this functionality are built and are being refined to fit specifications, and testing and bug resolution continue as new features are developed. 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 charter in August and is currently reviewing the project management plan. The estimated project completion date will be set following approval of the project management plan.

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 as the pandemic progresses.

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. We also initiated discussions for the purchase of a new high-temperature cable to serve as the new backup cable.

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

No tours were conducted on *JOIDES Resolution* during the review period because of restrictions related to COVID-19. As part of the clearance requirement, Namibia is requesting more outreach activities. Activities are being set up with the National Earth Science Museum (NESM), the National Maritime Museum of Namibia (NMMN), the University of Namibia, the Geological Survey of Namibia, and several local schools via the NMMN. Activities will include a series of live ship-to-shore events, development of educational content for schools, sharing on social media, production of a video that will be displayed at the NESM, and other activities that have yet to be defined.

Other projects and activities

Several staff scientists participated as watchdogs in the July Science Evaluation Panel meeting. The Supervisor of Science Support, the Supervisor of Operations Support, and the Manager of Science

Operations assisted proponents with proposals for the October submission deadline. Staff scientists mentored several graduate and undergraduate students in the College of Geosciences. In addition, staff scientists were involved with several external grants that focus on research, data migration, and outreach.

6. Technical and analytical services

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

Analytical systems

SPECIM FX10 Hyperspectral Imaging Logger

The experiments with the FX10 were very encouraging, prompting TAS to leverage the rental fee to purchase a FX10 camera at a reduced price. TAS will be constructing its own core logger for the hyperspectral camera using materials on hand (e.g., NSK robot module, stepper motors, and controllers) and will begin experiments to further evaluate the system. This technology could be an answer to one of the recommendations of the 2016 Color Workshop report to eliminate the spectral distortion caused by the GLAD Wrap film that covers each section half.

X-ray core section imager project

The XSCAN project schedule has slipped because the selected TDI X-ray camera vendor (Hamamatsu) has provided a 6- to 8-month delivery timeframe for the camera. TAS continues to work with the “loaner” Hamamatsu camera and will retain it at least through the end of the calendar year so that experiments can continue. As noted before, the original X-ray imager remains operational on board for the interim.

Scanning electron microscope—energy dispersive spectrophotometer

The NanoImages SNE-4500M (equipped with a Brüker XFLASH 630 Mini energy dispersive spectrophotometer [EDS]) was installed, and staff is continuing the process of defining workflows to allow the upload of images and data from the device into the LIMS database. The Applications Development section began work on the data structures to hold and to report these data. This system will replace the Hitachi TM-3000 scanning electron microscope (SEM) on the ship, and the older SEM will be transferred to College Station, Texas, where it will be available for use by visiting scientists and staff. As with all onsite work, this has slowed because of limited access to workspaces.

Carbon-hydrogen-nitrogen-sulfur analyzer

JRSO held off shipping the new carbon-hydrogen-nitrogen-sulfur (CHNS) analyzer to allow troubleshooting of a leak. The service call was delayed until October because of vendor schedules, and shipment is now targeted for the Expedition 392 (Agulhas Plateau) port call in February 2022.

Handheld/portable X-ray fluorescence spectrometer

Work continues with the new Brüker AXS Tracer-5g portable X-ray fluorescence spectrometer (pXRF) to develop the workflow, data upload, and data download procedures. The vendor has made the

adjustments to their output format we requested, and TAS is now working with applications developers to modify the uploader and LORE report accordingly.

Epifluorescence microscopes

The new microbiology epifluorescence microscopes were shipped to the vessel and will be installed during Expedition 396T tie up.

Agico MFK2-FA dual-frequency KappaBridge magnetic susceptibility meter

The new KappaBridge magnetic susceptibility meter was shipped to the vessel and installed in the paleomagnetism laboratory.

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 project work and planning for expanding the core refrigeration area (core reefer).

- The catwalk module of the SampleMaster replacement project was completed, and the sample table module was postponed until the SaDR system replacement is complete.
- Core storage expansion was discussed, with the expected path forward to convert the GCR warehouse and the XRF Core Scanner laboratory to reefer space. The LWG and the core storage expansion team discussed how best to reorganize existing spaces elsewhere to allow activities to continue (e.g., core wrapping and TAS department instrument development).
- The LWG discussed the need to make microbiology samples better advertised and more accessible. One suggestion was to use System for Earth Sample Registration/International Geo Sample Number identification to assist with this.
- The LWG discussed a number of recent problems with World Courier refrigerated and frozen sample shipments. JRSO is looking at potential alternative vendors.

Geochemistry and Microbiology

The Geochemistry LWG met this quarter to discuss the following issues:

- The microbiology workshop report was published as IODP Technical Note 4 (**https://iodp.tamu.edu/publications/TN/TNote 4.pdf**). The LWG discussed this and microbiology tracer effectiveness.
- After consultation with the vendor, the LWG decided that it is time to replace the aging UIC CM5015 coulometers (for inorganic carbon) with the newly released CM5017 model. Some of the components of the CM5015 units are no longer manufactured, and although UIC has parts in their supplies for some time, any given service request may or may not be granted. This was considered too risky for such a fundamental measurement.

- The possible addition of ultraviolet/visible light detectors to the existing Metrohm ion chromatograph was discussed. This would allow analysis of nitrate, nitrite, and bromide, in addition to the existing anions. Given that requests for these ions have been few and far between, the LWG decided to table this possibility for the current time.
- There have been requests to add multiple-component results to the LIVE data display tool. Ion chromatograph data, for example, is saved in the database as ({compound_name}, {value}) pairs (e.g., chloride, 562), instead of individually-defined components (e.g., for gamma ray attenuation [GRA] density, a component is pre-defined for bulk density).
    - Although LIVE has no method for displaying these complex components, the new QC Viewer tool was constructed with the ability to qualify data, and that code could potentially be leveraged to provide this capability.
    - The developer group will investigate the feasibility and workload to modify LIVE for these qualifiers, to be discussed at the next LWG meeting.
- The different file types and extensions used by the Brüker software and the Malvern-Panalytical software were discussed. The LWG recommends renaming some of the LORE report components so that it is clear which instrument ran a given data set.
    - The Malvern-Panalytical AERIS data are not currently producing a diffractogram image, and this is also to be addressed.
- Scientists need to access HighScore, the Malvern-Panalytical X-ray diffraction (XRD) data reduction software, from multiple workstations on the ship. The LWG was informed that a virtual HighScore installation is on the servers and XRD-interested scientists will be instructed on how to access it (from any workstation on the ship).
- The LWG discussed updates to hydrofluoric acid safety policies and their ease of accessibility for upcoming scientists; the safety manual is currently only available within the TAMU firewall, but it will be added to the outward facing document wiki during the next tie up.
- The LWG was updated on work to incorporate the Brüker Tracer-5g handheld XRF into the LIMS data structure. The Brüker pXRF is still on shore pending completion of this work, and the Olympus DELTA Premium pXRF is still available on board.
- The LWG discussed the possibility of converting the volume concentration (ppmv) of the headspace gases to an absolute concentration in the base material (ppm). This is possible, but would require weighing of the mini-core taken by chemistry technicians for headspace analysis. It is not practical to do this before the measurement because (1) it is necessary to rapidly seal the headspace vial to avoid loss of volatile constituents, and (2) weighing materials on the ship is a time-consuming process (several minutes' duration).
    - Vials could be pre-weighed with their caps, and then weighed after the headspace experiment to determine the net mass of the sample. This will only be done upon request by the science party.

Geology

The Geology LWG met this quarter to discuss the following issues:

- The LWG is still monitoring improvements to the Section Half Imaging Logger image quality, with modifications to the system to better control LED light temperature (and avoid the blue-shifting noted by technicians) being undertaken during Expedition 396T.
- The LWG discussed ongoing work within TAS and the development group to evaluate the new-model Zeiss microscope cameras and their software to determine if a viable workflow can be created for

microimaging. SPOT cameras could be purchased as older models age out, but the Zeiss cameras have better performance and are desirable if they can fit JRSO's needs.

- The GEODESC project manager presented an update of where the project stands and its estimated timeline for completion. It is about to enter a phase for external testers.
- The LWG was updated on current upgrades planned for Correlator and informed that the newest version is available for testing.
- Scientists have complained about the temperatures in the core laboratory. The Laboratory Officer will log temperatures during the maintenance period to map out actual temperatures and present this information to Siem to see if anything can be done to mitigate extremes.
- The LWG discussed microbiology destructive testing and the need to curate/photograph pieces before they are broken down for microbiology sampling.
- There is a need to adopt less-reflective monitors for the description area's core logging systems because bright sunlight can cause a number of issues if it falls directly on a monitor (including making touch-sensitive monitors temporarily unresponsive). IT will investigate.

Geophysics

The Geophysics LWG met this quarter to discuss the following issues:

- The LWG was informed that a project was approved to upgrade (and simplify to the user's perspective) the Natural Gamma Radiation Logger active shielding electronics. A purchase order will be issued for this work. This project will simplify operation and troubleshooting; it will have no effect on the system's data quality or detection limits.
- The LWG was informed of various superconducting rock magnetometer software upgrades (e.g., the inclusion of the "U-turn" functionality to properly reverse data on a section placed upside down on the core boat).
- The LWG discussed the conductivity/temperature/depth system and the possibility of adding water column sampling capability to the setup. JRSO will look into commercially available water sampling systems that could be added to the vibration-isolated television (VIT) frame without overloading it. A suggestion to simply strap a KUSTER tool onto the VIT frame was also discussed.
- The Winfrog navigational software will no longer be supported by the vendor, so Winfrog will be replaced with Navipac software during the Expedition 396 transit.
- The SyQuest Bathy 2010 bathymetric system will be replaced with a new Knudsen Chirp 3260 system during the Expedition 396 transit. This should resolve intermittent issues with the 3.5 kHz Precision Depth Recorder experienced over the past several expeditions.
- The LWG was informed of planned Schlumberger logging upgrades next fiscal year (e.g., high-temperature cable replacements and active heave compensator replacements).
- The LWG was updated on the XSCAN project (see above).
- The LWG science lead presented work done on the Magnetic Susceptibility Sonde to properly identify data channels, reduce the data taking temperature into account, and repair the unit sent to 1000 Discovery Drive.
- The LWG discussed continuing issues with the core orientation tools (Minex FlexIT and Icefield MI-5 tools). Two of the three MI-5 tools have been sent back to the vendor because of failures in the magnetic sensors. TAS is closely monitoring their performance.

- A marine technician gave a presentation on improvements to the Vertical Seismic Imager data that might be attained if the caliber arm was extended.
- The LWG discussed the hyperspectral camera experimentation being done by TAS (see above).
- Engineering staff gave a presentation on development of a different advanced piston corer temperature tool cutting shoe with differently placed thermistors and a modular construction that will allow bent cutting edges to be replaced without having to machine an entire new tool. This is in the drawing stage, and prototypes will be built in the next fiscal year.

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 395C were added to the LIMS database on shore this quarter. These data are currently under moratorium and available only to the Expedition 395C scientists. Data from Expeditions 383 and 385 were released from moratorium during this quarter.

Expedition data requests

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

Table 7.1. Top 10 countries accessing JRSO web databases

	Janus database		LIMS database	
Rank	**Country**	**Visitor sessions**	**Country**	**Visitor sessions**
1	USA	426	USA	572
2	China	245	China	489
3	United Kingdom	127	Japan	252
4	Japan	95	Germany	107
5	Germany	86	New Zealand	102
6	Australia	63	United Kingdom	89
7	France	44	Sweden	75
8	Netherlands	37	Canada	73
9	Canada	28	France	66
10	New Zealand	23	Italy	49
	Other	348	Other	475
	Total	**1,522**	**Total**	**2,349**

Table 7.2. Top 20 database web queries

Rank	Janus database		LIMS database*	
	Query	Views	Query	Views
1	Imaging—core photo	1,573	Sample report	1,305
2	Site/hole summary	1,177	Section summary	835
3	Chemistry—carbonates	1,044	Hole summary	725
4	Sample report	890	Images—section line scans	492
5	Chemistry—rock eval	627	Core summary	434
6	Chemistry—gas	622	Images—core composites	407
7	Core summary	612	Physical properties—GRA	246
8	Chemistry—interstitial water	582	Physical properties—MAD	211
9	Hole summary	501	Physical properties—MS	192
10	Imaging—prime data images	496	XRF summary	190
11	Imaging—closeups	476	Chemistry—carbonates	187
12	Paleontology—age model	392	Chemistry—interstitial water	184
13	Hole details	304	Magnetism—SRM	167
14	Paleontology—range table	303	Physical properties—color reflectance	164
15	Paleontology—paleo investigation	274	X-ray diffraction	153
16	Physical properties—smear slide	252	Magnetism—MSPOINT	153
17	Magnetism—cryomag	232	Physical properties—NGR	146
18	Special holes report	213	Images—closeups	141
19	Physical properties—MAD	205	Images—photomicrographs	133
20	X-ray diffraction	195	Chemistry—ICP	131
	Other	1,693	Other	2,352
	Total	**12,663**	**Total**	**8,948**

Table 7.3. Data requests to the TAMU Data Librarian

Requests	Total
How to	7
Photo	4
Unavailable data	2
Ages	1
Seismics	1
Total	**15**

Country	Total
USA	8
United Kingdom	4
Australia	2
Germany	1
Total	**15**

Network systems operation, maintenance, and security

JRSO completed its required annual TAMU IT risk assessment in July, conducted routine system maintenance in accordance with TAMU IT security policy, and completed its annual disaster recovery exercise in September.

Other projects and activities

JRSO migrated all shore Microsoft Exchange email and calendar services to Microsoft 365 in September.

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 Expedition 395C and Expedition 396.

Sample requests and core sampling

The following table provides a summary of the 5,105 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
088532IODP, Li, China	1,131	0
061392IODP, Lee, South Korea	1,142	0
089261IODP, Brzelinski, Germany	197	0
089443IODP, Matsumoto, Japan	88	0
089550IODP, Plank, USA	0	3
089578IODP, Zhong, China	455	0
089583IODP, Zhong, China	395	0
089591IODP, Zhang, Switzerland	34	0
089663IODP, Tikoo-Schantz, USA	3	0
089637IODP, Hess, USA	30	0
089784IODP, Jovane, Brazil	75	0
089483IODP, Lacerra, USA	36	0
089823IODP, Plank, USA	70	0
089829IODP, Nirenberg, USA	261	0
090058IODP, Tamayo, Colombia	303	0
089910IODP, Them, USA	8	0
089918IODP, Rafter, USA	65	0
090016IODP, Kars, Japan	110	1
090070IODP, Algeo, USA	237	0
090086IODP, Lamyman, United Kingdom	4	0
090175IODP, Yao, China	21	0
090286IODP, Woodhouse, USA	220	0
090302IODP, Holo, USA	25	0
090378IODP, Hastie, United Kingdom	4	0
090415IODP, Varma, Netherlands	11	0
090436IODP, Almeida, Switzerland	26	0
090499IODP, Rigalleau, Germany	62	0

Sample request number, name, country	Number of samples taken	Number of visitors
090535IODP, Kulhanek, USA	2	1
090555IODP, Lear, United Kingdom	34	0
090584IODP, Bhattacharya, USA	47	0
090667IODP, Penman, USA	5	0
090898IODP, Kasbohm, USA	4	0
Tours/demonstrations (4)	0	22
Totals	**5,105**	**27**

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, the GCR hosted four live tours for 20 middle school students from the Summer Science Safari camp and two visiting scientists from Houston, Texas (USA). Two virtual tours of the GCR were also given to 151 TAMU freshmen as part of the College of Geosciences GeoX event and to more than 50 scientists participating in the Coastal Ocean Environment Summer School in Ghana.

Onshore XRF scanning

During this quarter, 790 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 8.3. Core sections scanned

Request type	Expedition, name, country	XRF 1	XRF 2	SHIL	WRMSL*
Personal	170, Plank, USA		79	79	
Programmatic	379, Kulhanek, USA	29			
Programmatic	385, Hoefig, USA	405	89		
Programmatic	390C, Estes/Williams, USA		188		
Totals		**434**	**356**	**79**	

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, 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	ESO
Scientific Prospectus		10.14379/iodp.sp.377.2021
Expedition Reports	10.14379/iodp.proc.383.101.2021 10.14379/iodp.proc.383.102.2021 10.14379/iodp.proc.383.103.2021 10.14379/iodp.proc.383.104.2021 10.14379/iodp.proc.383.105.2021 10.14379/iodp.proc.383.106.2021 10.14379/iodp.proc.383.107.2021 10.14379/iodp.proc.383.108.2021 10.14379/iodp.proc.385.101.2021 10.14379/iodp.proc.385.102.2021 10.14379/iodp.proc.385.103.2021 10.14379/iodp.proc.385.104.2021 10.14379/iodp.proc.385.105.2021 10.14379/iodp.proc.385.106.2021 10.14379/iodp.proc.385.107.2021 10.14379/iodp.proc.385.108.2021 10.14379/iodp.proc.385.109.2021	
Data Reports	10.14379/iodp.proc.369.205.2021 10.14379/iodp.proc.372A.201.2021 10.2204/iodp.proc.346.207.2021	

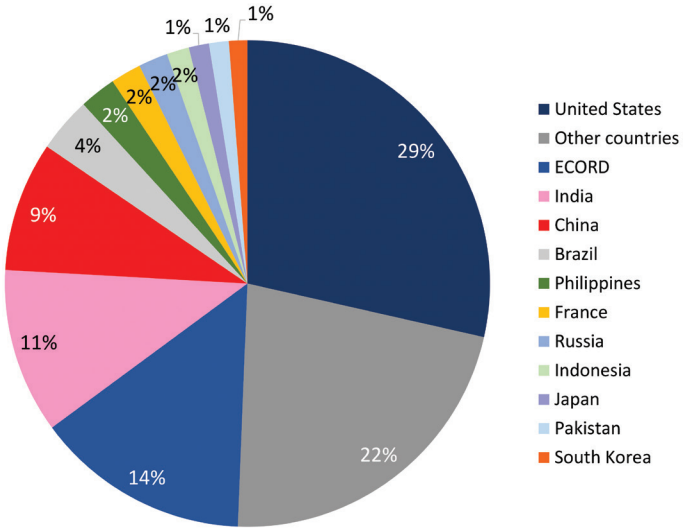
Note: There were no MarE3 publications published during the quarter.

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 334,216 page views and 36,374 site visits and the IODP Publications website received 316,053 page views and 23,700 site visits. Where possible, visits by JRSO employees and search engine spiders were filtered out of the counts. Visitors to the IODP TAMU website came from more than 220 countries.

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



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	FY21 Q4 page views*	FY21 Q4 site visits*
www-odp.tamu.edu	285,401	37,809
www.odplegacy.org	2,912	1,598
www.deepseadrilling.org	46,115	4,864
Total	**334,428**	**44,271**

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

Publications coordination

Data reports related to Expeditions 334, 363, 372B/375, and 374 were received, sent to peer review, accepted, and/or published this quarter.

Discovery and accessibility

Digital object identifiers

IODP is a member of CrossRef, the official digital object identifier (DOI) registration agency for scholarly and professional publications. All IODP scientific reports and publications are registered with CrossRef and assigned a unique DOI that facilitates online access. 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	July 2021	August 2021	September 2021	FY21 Q4 total
IODP	10.14379	7,125	8,404	9,248	**24,777**
Integrated Ocean Drilling Program	10.2204	6,343	6,052	6,907	**19,302**
ODP/DSDP	10.2973	24,717	21,383	30,589	**76,689**

Table 9.4. Top 10 IODP DOIs resolved during FY21 Q4

DOI (10.14379)	Resolutions	Title
10.14379/IODP.PROC.383.2021	771	Volume 383: Dynamics of the Pacific Antarctic Circumpolar Current
10.14379/IODP.SP.396.2021	672	Expedition 396 Scientific Prospectus: Mid-Norwegian Continental Margin Magmatism
10.14379/IODP.PROC.382.2021	447	Volume 382: Iceberg Alley and Subantarctic Ice and Ocean Dynamics
10.14379/IODP.PR.385.2020	395	Expedition 385 Preliminary Report: Guaymas Basin Tectonics and Biosphere
10.14379/IODP.PR.390C.2021	338	Expedition 390C Preliminary Report: South Atlantic Transect Reentry Systems
10.14379/IODP.PROC.379.2021	245	Volume 379: Amundsen Sea West Antarctic Ice Sheet History
10.14379/IODP.PROC.363.2018	237	Volume 363: Western Pacific Warm Pool
10.14379/IODP.PROC.367368.2018	189	Volume 367/368: South China Sea Rifted Margin
10.14379/IODP.PR.371.2018	123	Expedition 371 Preliminary Report: Tasman Frontier Subduction Initiation and Paleogene Climate
10.14379/IODP.PROC.369.2019	117	Volume 369: Australia Cretaceous Climate and Tectonics

Table 9.5. Top 10 Program DOIs resolved during FY21 Q4

DOI (10.14379, 10.2204, 10.2973)	Resolutions	Title
10.14379/IODP.PROC.383.2021	771	Volume 383: Dynamics of the Pacific Antarctic Circumpolar Current
10.14379/IODP.SP.396.2021	672	Expedition 396 Scientific Prospectus: Mid-Norwegian Continental Margin Magmatism
10.14379/IODP.PROC.382.2021	447	Volume 382: Iceberg Alley and Subantarctic Ice and Ocean Dynamics
10.14379/IODP.PR.385.2020	395	Expedition 385 Preliminary Report: Guaymas Basin Tectonics and Biosphere
10.14379/IODP.PR.390C.2021	338	Expedition 390C Preliminary Report: South Atlantic Transect Reentry Systems
10.14379/IODP.PROC.379.2021	245	Volume 379: Amundsen Sea West Antarctic Ice Sheet History
10.14379/IODP.PROC.363.2018	237	Volume 363: Western Pacific Warm Pool
10.2973/ODP.PROC.IR.110.102.1988	208	Volume 110 Initial Report, Introduction and Explanatory Notes
10.14379/IODP.PROC.367368.2018	189	Volume 367/368: South China Sea Rifted Margin
10.2204/IODP.SP.346.2013	177	Expedition 346 Scientific Prospectus: Asian Monsoon

ScienceOpen

Integrated Ocean Drilling Program and IODP expedition reports and data reports are indexed at ScienceOpen. JRSO deposited data reports from Volumes 338, 362, 363, and 372/375 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–FY20	747	10,921	238	1,827	8,776
FY21 Q1	9	616	261	1,848	2
FY21 Q2	2	214	275	1,853	0
FY21 Q3	0	8,713	291	1,853	0
FY21 Q4	0	3,881	295	1,851	15
Total to date	**758**	**16,761**	—	—	**8,888**

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–FY20	4,732	18,801	40,733	11,895	47,235
FY21 Q1	107	1,603	42,374	12,070	1,294
FY21 Q2	140	1,189	46,053	12,426	2,625
FY21 Q3	4,030	10,539	63,881	18,155	33,202
FY21 Q4	26	3,269	65,302	19,710	2,851
Total to date	**9,035**	**35,401**	—	—	**87,207**

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 data reports for Expeditions 338, 363, 362, 369, and 372B/375.

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 302, 303/306, 307, 308, 311, 313, 320/321, 322, 324, 325, 327–331, 333, 334, 336–340, 342, and 344–349 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 7.4 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 162 expedition-related publication citations for consideration for inclusion in the database.

Table 9.8. Scientific Ocean Drilling Bibliographic Database statistics

Program-related publications	July 2021	August 2021	September 2021	FY21 Q4 total
Searches	285	711	515	**1,511**
Citation views	174	1,171	320	**1,449**

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 301–395. 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**).

Goldschmidt Conference

- **Höfig, T.W.**, Mott, A.V., Miller, B.V., Horkley, L.K.S., Zhang, C., and Peate, D.W., 2021. Tracking the evolution of a submarine arc-hosted hydrothermal system through the deportment of phosphorous and rare-earth elements. Presented at the virtual 2021 Goldschmidt Conference, 4–9 July.

Italian Geological Society Conference

- Raffi, I., Persico, D., Villa, G., and the IODP Expedition 378 Science Party (including **L.B. Childress**), 2021. Calcareous nannofossils at IODP Site U1553, a reference paleoceanographic record for the Paleogene. Presented at the virtual Italian Geological Society Meeting, 14–16 September 2021.

Palaeontological Association Meeting

- Sheward, R.M., Herrle, J.O., and the IODP Expedition 378 Scientists (including **L.B. Childress**), 2021. The size trait toolbox: new perspectives on community structure response to climate change in calcifying marine phytoplankton. Presented at the virtual Palaeontological Association Meeting: Crossing the Palaeontological–Ecological Gap, 5–9 September 2021.

Articles authored by JRSO staff

- Savage, H.M., Shreedharan, S., Fagereng, Å., Morgan, J.K., Meneghini, F., Wang, M., et al. (including **K. Petronotis** and **L. LeVay**), 2021. Asymmetric brittle deformation at the Pāpaku fault, Hikurangi subduction margin, NZ, IODP Expedition 375. Geochemistry, Geophysics, Geosystems, 22:e2021GC009662. **https://doi.org/10.1029/2021GC009662**

Appendix: JRSO quarterly report distribution

J. Allan, NSF, USA, jallan@nsf.gov

T. Kashmer, NSF, USA, tkashmer@nsf.gov

D. Thomas, Texas A&M University, USA, dthomas@ocean.tamu.edu

G. Camoin, JRFB Member, European Management Agency, CEREGE, France, camoin@cerege.fr

M. Coffin, JRFB Member, University of Tasmania, Australia, Mike.Coffin@utas.edu.au

M. Godard, JRFB Member, University of Montpellier, France, Marguerite.Godard@umontpellier.fr

G.Y. Kim, JRFB Member, KIGAM, Korea, gykim@kigam.re.kr

L. Krissek, JRFB Member, Ohio State University, USA, krissek.1@osu.edu

S. Kutterolf, JRFB Member, GEOMAR, Germany, skutterolf@geomar.de

K. Miller, JRFB Member, Rutgers University, USA, kgm@eps.rutgers.edu

D.K. Pandey, JRFB Member, NCPOR Goa, India, pandey@ncpor.res.in

A. Shevenell, JRGB Member, University of South Florida, USA, ashevenell@usf.edu

Y. Sun, JRFB Member, MOST, China, suny@most.cn

R. Tada, JRFB Member, Chiba Institute of Technology, Japan, ryuji.tada@p.chibakoudai.jp

D. Kroon, JRFB Liaison, IODP Forum Chair, University of Edinburgh, dick.kroon@ed.ac.uk

G. Christeson, JRFB Liaison, University of Texas Austin, gail@ig.utexas.edu

S. Davies, JRFB Liaison, University of Leicester, United Kingdom, sjd27@leicester.ac.uk

B. Katz, JRFB Liaison, EPSP Chair, Chevron Corporation, USA, BarryKatz@chevron.com

S. Kuramoto, JRFB Liaison, MarE3/JAMSTEC, Japan, s.kuramoto@jamstec.go.jp

L. McNeill, JRFB Liaison, SEP Co-Chair, University of Southampton, UK, lcmn@noc.soton.ac.uk

C. Meth, JRFB Liaison, IODP Support Office, Scripps Institution of Oceanography, USA, cmeth@ucsd.edu

N. Seama, JRFB Liaison, *Chikyu* IODP Board Chair, Kobe University, Japan, seama@kobe-u.ac.jp

G. Uenzelmann-Neben, JRFB Liaison, ECORD Facility Board Chair, Alfred Wegener Institute, Germany, Gabriele.Uenzelmann-Neben@awi.de