# International Ocean Discovery Program

# *JOIDES Resolution* Science Operator

# FY24 Q2 Operations and Management Report

1 January–31 March 2024

Cooperative Agreement OCE-1326927

Submitted by the JRSO

to

The National Science Foundation

and

The *JOIDES Resolution* Facility Board

22 April 2024



# 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) FY23 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 implemented during this quarter);
- Clearance, permitting, and environmental assessment activities;
- Expedition operations, including a site map, a coring summary table, 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) | Dates[1] | Total days (port/ sea) | Days at sea (transit[2]/ ops) | Co-Chief Scientists | Expedition Project Manager/ Contact |
|---|---|---|---|---|---|---|---|
| Mediterranean-Atlantic Gateway Exchange | 401 | Amsterdam, Netherlands | 10 December 2023–<br>9 February 2024 | 61 (3/58) | 58 (10/48) | R. Flecker<br>E. Ducassou | T. Williams |
| Tyrrhenian Continent-Ocean Transition | 402 | Napoli, Italy | 9 February–<br>8 April 2024 | 59 (5/54) | 54 (2/52) | N. Zitellini<br>A. Malinverno | E. Estes |
| Transit/Tie up (maintenance) 402T (8 April–4 June 2024; Napoli, Italy, to Amsterdam, Netherlands) (57 days) | | | | | | | |
| Eastern Fram Strait Paleo-Archive | 403 | Amsterdam, Netherlands | 4 June–<br>2 August 2024 | 59 (3/56) | 56 (14/42) | R. G. Lucchi<br>K. St. John | T. Ronge |
| Tie up/Demobilization 404D (2 August–30 September 2024; Amsterdam, Netherlands) (59 days) | | | | | | | |

[1]The start date reflects the initial port call day. The vessel will sail when ready.
[2]Preliminary total estimated transit (i.e., to and from the operational area and between sites).

## Expedition 395: Reykjanes Mantle Convection and Climate

### Postexpedition activities

A postcruise sampling party was held 15–21 January at the Bremen Core Repository (BCR), in Bremen, Germany. A postcruise editorial meeting was held 26 February–1 March at the JRSO office in College Station, TX.

# Expedition 400: NW Greenland Glaciated Margin

## Postexpedition activities

A postcruise sampling party was held 18–24 March at the BCR. A postcruise editorial meeting is scheduled for 3–7 June at the JRSO office in College Station, TX.

# Expedition 401: Mediterranean-Atlantic Gateway Ocean Transition

Table 2.2. Expedition 401 science party staffing breakdown

| Member country/consortium | Participants | Co-Chief Scientists |
|---|---|---|
| USA: United States Science Support Program (USSSP) | 12 | |
| Japan: Japan Drilling Earth Science Consortium (J-DESC) | 3 | |
| Europe and Canada: European Consortium for Ocean Research Drilling (ECORD) Science Support and Advisory Committee (ESSAC) | 6 | 2 |
| People's Republic of China: IODP-China | 2 | |
| Australia and New Zealand: Australia/New Zealand IODP Consortium (ANZIC) | 1 | |
| India: Ministry of Earth Science (MoES) | 1 | |

Note: the science party also included one observer from Portugal and one observer from Morocco.

## Clearance, permitting, and environmental assessment activities

Because of a delay caused by the US Embassy not forwarding communication from the Moroccan government, we were unable to receive consent from Morocco. We worked with the Morocco Observer but were unsuccessful. This was only relevant for two alternate sites, and the expedition's scientific success was not impacted.

Figure 2.1 Expedition 401 site map

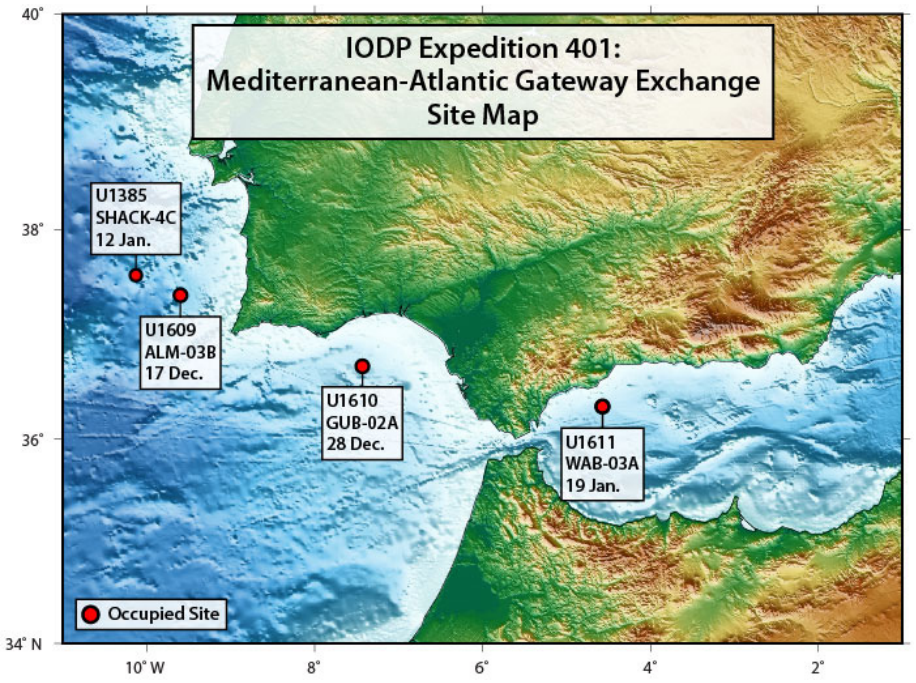

Table 2.3. Expedition 401 coring summary. Site U1385 was previously drilled on Expeditions 339 and 397.

| Site | Hole | Latitude | Longitude | Water depth (mbsl) | Cores (*N*) | Total penetration (DSF) | Interval cored (m) | Core recovered (m) | Recovery (%) |
|---|---|---|---|---|---|---|---|---|---|
| U1609 | U1609A | 37°22.6259′N | 9°35.9120′W | 1659.5 | 73 | 610.0 | 610.0 | 572.23 | 94 |
| | U1609B | 37°22.6159′N | 9°35.9119′W | 1659.5 | 60 | 508.7 | 436.1 | 410.75 | 94 |
| Site U1609 | | | | | 133 | 1118.7 | 1046.1 | 982.98 | 94 |
| U1610 | U1610A | 36°41.9812′N | 7°25.8844′W | 556.3 | 99 | 1438.7 | 933.5 | 751.20 | 80 |
| Site U1610 | | | | | 99 | 1438.7 | 933.5 | 751.20 | 80 |
| U1385 | U1385K | 37°34.0099′N | 10°7.6370′W | 2584.2 | 20 | 552.5 | 167.5 | 127.89 | 76 |
| | U1385L | 37°34.0197′N | 10°7.6367′W | 2584.2 | 7 | 443.9 | 67.9 | 58.44 | 86 |
| Site U1385 | | | | | 27 | 996.4 | 235.4 | 186.33 | 79 |
| U1611 | U1611A | 36°18.7537′N | 4°34.2717′W | 810.1 | 85 | 1281.9 | 625.6 | 431.22 | 69 |
| | U1611B | 36°19.3779′N | 4°34.7520′W | 784.0 | 64 | 1069.9 | 325.0 | 253.38 | 78 |
| Site U1611 | | | | | 149 | 2351.8 | 950.6 | 684.60 | 72 |
| **Expedition 401 totals** | | | | | **408** | **5905.6** | **3165.6** | **2605.11** | **82** |

### Science summary

Marine gateways play a critical role in the exchange of water, heat, salt, and nutrients between oceans and seas. Changes in gateway geometry can significantly alter both the pattern of global ocean circulation and climate. Today, the volume of dense water supplied by Atlantic–Mediterranean exchange through the Gibraltar Strait is among the largest in the global ocean. For the past 5 My, this overflow has generated a saline plume at intermediate depths in the Atlantic Ocean that deposits distinctive contouritic sediments and contributes to the formation of North Atlantic Deep Water. This single gateway configuration only developed in the Early Pliocene, however. During the Miocene, two narrow corridors linked the Mediterranean and Atlantic: one in northern Morocco and the other in southern Spain. Formation of these corridors followed by progressive restriction and closure resulted in extreme salinity fluctuations in the Mediterranean, leading to the precipitation of the Messinian Salinity Crisis salt giant. Expedition 401 is the offshore drilling component of a Land-2-Sea drilling proposal: Investigating Miocene Mediterranean–Atlantic Gateway Exchange (IMMAGE). Its aim was to recover a complete record of Atlantic–Mediterranean exchange from its Late Miocene inception to its current configuration by targeting Miocene offshore sediments on either side of the Gibraltar Strait. Miocene core from the two precursor connections now exposed on land will be obtained by future International Continental Scientific Drilling Program (ICDP) campaigns.

Expedition 401 conducted coring and downhole logging operations at four sites. Three of these were the primary sites that were included in the *Scientific Prospectus*. The fourth site (known as the Shackleton site) was made possible because of time saved during the expedition and was cored following the success of Expeditions 339 (Mediterranean Outflow) and 397 (Iberian Margin Paleoclimate) and in collaboration with the Expedition 397 science party. Holes U1385K and U1385L extended the existing record into the Miocene. All sites were successful in meeting their targets.

## Expedition 402: Tyrrhenian Continent–Ocean Transition

### Planning

Meetings between the EPM, Co-Chief Scientists, and technical staff were held to finalize laboratory measurements and research plans. A final discussion regarding the use of downhole tools was held. All

port call activities were finalized and completed. The science party boarded the vessel on 10 February. Multiple ship tours were held during the port call at the start of the expedition and are being planned for the April port call at the end of the expedition.

### Clearance, permitting, and environmental assessment activities

JRSO obtained authorization from Italy to conduct research on 11 January. In the authorization, Italy requested two observers. Both were invited and accepted the invitation to sail. In the weeks preceding the expedition, JRSO worked closely with the Italian Co-Chief Scientist and hydrographic agency to understand the locations of newly identified seafloor cables and eliminate a few sites with higher risk.

## Expedition 403: Eastern Fram Strait Paleo-archive

### Planning

A change was made to the starting port call to reduce operating costs. The starting and ending port call will be in Amsterdam, The Netherlands. A correlator meeting was held on 22 January, and GEODESC training was held on 13 February. A sediment workshop is planned for the week of 21 April in Trieste, Italy. The EPM, Co-Chief Scientists, and technical staff have been meeting to review laboratory measurements and research plans.

### Staffing

A scientist withdrew, and their position was refilled.

### Clearance, permitting, and environmental assessment activities

The required Environmental Evaluation (EE) was completed and was approved by NSF on 17 January. The expedition obtained authorization from Norway on 11 March to conduct research in the Svalbard Archipelago, which falls in Norway's Exclusive Economic Zone. The authorization limits vertical seismic profiles (VSPs) to June because of the increased presence of whales and their calves. The science party may change the order of drill sites to conduct more VSPs in June if ice conditions allow it.

# 3. Management and administration

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

## Progress reporting

The JRSO operations and management report for the first quarter of FY24 (October–December) was submitted to NSF on 30 January (**http://iodp.tamu.edu/publications/AR/FY24/FY24_Q1.pdf**. The IODP JRSO FY23 Annual Report was published on 20 December (**https://iodp.tamu.edu/publications/AR/FY23AR.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, Program Member Offices [PMOs], and other national organizations and facility boards) and participates in facility board, advisory panel, and IODP Forum meetings.

Minutes from the facility board meetings are available online (**http://iodp.org/boards-and-panels/facility-boards**).

## Project portfolio management

JRSO continued work on the New Rig Instrumentation System (iRIS) and the Hyperspectral Line Scan Logger projects. In addition, we reactivated the Google Migration project so we can close the scientific-ocean-drilling Google Workspace.

### 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*

All major components of the system are complete. Acceptance testing conducted during Expedition 401 revealed significant flaws in the driller and operations interfaces. Developers have worked to correct those defects but have faced significant challenges finding time to work on the system because it is necessary to code and test on the production system without disrupting critical coring operations. Testing during Expedition 402 revealed that over the course of development of iRIS a dependency was added into RigWatch on the iRIS infrastructure.

### Hyperspectral Line Scan Logger

*Scope and deliverables*

The purpose of this project is to select a suitable hyperspectral camera and integrate it into a logger system to provide noncontact, ultrahigh-resolution spectral data to replace the current Ocean Optics spectrometer and, potentially, the existing image logger. The new hyperspectral camera will provide higher quality color data by removing artifacts caused by GLAD ClingWrap and will provide higher spatial resolution color spectral data because each pixel represents the full color spectrum of the base image. The project manager is Lisa Crowder (JRSO Laboratory Officer).

*Status*

A new lighting system and hyperspectral camera were purchased and tested to verify that they meet the minimum requirements of the project. Construction of the new track system is nearly complete. The application developers are writing LabVIEW code to communicate with the new camera and revising the motion control and the camera triggering algorithms to automate data acquisition from the instrument.

### Google Migration

*Scope and deliverables*

The purpose of this project is to transfer all content (Google Sites, Google Drives, Google Docs, etc.) from the scientific-ocean-drilling Workspace to the TAMU Workspace. This will transfer primary responsibility for management of these resources from IODP to the TAMU Technology Services department, thus ensuring its availability to the science community beyond the termination of the IODP program.

*Status*

Courtney Landry (IODP Configuration Manager) was selected as the new project manager. We have recruited a team of Google experts in TAMU Technology Services to assist with this migration. They assisted us in generating a comprehensive inventory of all content in the scientific-ocean-drilling Google Workspace, including users, domains, Google Sites, and MyDrives. That inventory has been distributed to the functional groups of JRSO so that they can assess and determine if any of the information can be purged and then decide how the remaining content will be extracted and archived.

## 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 biweekly to discuss operational and logistical issues.

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. The Ultrasonic Borehole Imager (UBI) tool was sent to the ship for Expedition 402, and a new APS tool will be sent to the ship for Expedition 403.

## 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); 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

Plans are in progress for a JR Academy to be held during the April Expedition 402T transit from Napoli, Italy, to Amsterdam, Netherlands. Port call tours took place at the Naples February port call at the request of IODP-Italy, and more are planned for the April port call. A three-person film crew will sail during Expedition 403. A five-part Greek documentary was released about Hellenic Arc Expedition 398.

### Other projects and activities

Planning for the demobilization of the ship is in progress.

# 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

### Hyperspectral Line Scan Logger

Work continues on the hyperspectral line scan logger (HyperScan). Full-spectrum, intensity-adjustable line lights have been installed, and applications work has begun to integrate the new logger into the IMS framework.

## 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 as needed 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.

None of the LWGs met this quarter, but they will meet next quarter as needed to discuss issues arising from recent expeditions.

# 7. TAMU Technology Services

TAMU Technology Services oversees JRSO data collection/storage, management, and archiving; maintains IT infrastructure on ship and shore; develops and maintains instrument-specific software for data acquisition; and manages the Program's extensive databases.

## Expedition data

### LIMS database

Data from Expedition 401 were added to the LIMS database on shore this quarter. Expedition 390, 393, 390C, and 395E 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 | 920 | USA | 2,151 |
| 2 | China | 373 | China | 540 |
| 3 | United Kingdom | 204 | United Kingdom | 319 |
| 4 | Australia | 197 | Germany | 219 |
| 5 | Germany | 151 | Japan | 165 |
| 6 | Brazil | 140 | France | 135 |
| 7 | Netherlands | 110 | Canada | 123 |
| 8 | Japan | 83 | Italy | 94 |
| 9 | Canada | 56 | India | 93 |
| 10 | Italy | 54 | Australia | 47 |
| 11 | Other | 248 | Other | 462 |
| | **Total** | **2,536** | **Total** | **4,348** |

Table 7.2. Top 20 database web queries

| Rank | Janus database | | LIMS database* | |
|---|---|---|---|---|
| | Query | Views | Query | Views |
| 1 | X-ray—XRDFile | 11,128 | Images—core photo | 1,589 |
| 2 | Images—core photo | 3,114 | Samples | 1,530 |
| 3 | X-ray—XRD | 1,598 | Images—section photo | 1,247 |
| 4 | Special holes summary | 1,422 | Section summary | 1,002 |
| 5 | Site summary | 1,003 | Hole summary | 943 |
| 6 | Chemistry—carbonates | 974 | Core summary | 674 |
| 7 | Paleontology—age model | 753 | Physical properties—MS | 489 |
| 8 | Physical properties—GRA | 657 | Chemistry—carbonates | 401 |
| 9 | Sample | 573 | Physical properties—MAD | 396 |
| 10 | Physical properties—MAD | 432 | Chemistry—interstitial water | 375 |
| 11 | Chemistry—ICP | 413 | X-ray—XRF | 361 |
| 12 | Core summary | 386 | Physical properties—GRA | 328 |
| 13 | Hole summary | 345 | Chemistry-ICP-AES | 293 |
| 14 | Paleontology—age profile | 343 | X-ray—XRD | 285 |
| 15 | Physical properties—RSC | 322 | Images—thin section | 275 |
| 16 | Depth point calculator | 312 | Images—closeup | 270 |
| 17 | Physical properties—MS | 284 | Physical properties—NGR | 262 |
| 18 | Physical properties—AVS | 283 | Paleomag—SRM section | 243 |
| 19 | Paleomag—cryomag | 137 | Physical properties—RSC | 184 |
| 20 | Images—closeup | 133 | Paleomag—MSPOINT | 179 |
| | Other | 1,686 | Other | 4,201 |
| | **Total** | **26,298** | **Total** | **15,527** |

Table 7.3. Data requests to the TAMU Data Librarian

| Requests | Total | | Country | Total |
|---|---|---|---|---|
| Data | 5 | | USA | 4 |
| Images | 3 | | China | 2 |
| Forwarded | 1 | | France | 2 |
| Seismics | 1 | | New Zealand | 1 |
| Data not available | 1 | | Italy | 1 |
| | | | Egypt | 1 |
| **Total** | **11** | | **Total** | **11** |

## Network systems operation, maintenance, and security

JRSO conducted routine system maintenance in accordance with the TAMU IT security policy. We have completed the annual risk assessment and discovered 53 new findings. We have created a risk register to document these findings and track progress in remediating them. We have made significant progress to date in remediating 21 of the findings. We have established priorities and are currently working to establish schedules and completion dates for remediation of the remaining findings.

We also completed the inventory of all IT equipment on the *JOIDES Resolution* and are working with the Demob team to ensure it is either returned to shore or properly disposed of during the demobilization in August and 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 Gulf Core Repository (GCR).

## Sample and curation strategies

This quarter, JRSO planned sample and curation strategies for Expeditions 401 and 402. GCR staff also prepared sample lists and traveled to the BCR to assist with the Expedition 395 and 400 postexpedition sample parties, which were held 15–21 January and 18–24 March, respectively. Preparations began for the upcoming Expedition 399 sample party that will be held at the GCR in April.

## Sample requests and core sampling

The following table provides a summary of the 2,515 legacy (postmoratorium) 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 X-ray fluorescence (XRF) analysis. For public relations or educational visits/tours, the purpose of the visit is shown in brackets in the “Sample request number, name, country” column, and no 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 |
|---|---|---|
| 104697IODP, Li, China | 292 | 0 |
| 104702IODP, McKenzie, USA | 200 | 1 |
| 104838IODP, Shreedharan, USA | 6 | 0 |
| 104861IODP, Hoegler, USA | 146 | 0 |
| 105000IODP, Fangliang Li, China | 51 | 0 |
| 105011IODP, Wood, UK | 70 | 0 |
| 105026IODP, Luiza Fraga Ferreira, Germany | 24 | 0 |
| 105021IODP, Zhang, Switzerland | 12 | 0 |
| 105001IODP, Chen, China | 188 | 0 |
| 105034IODP, Jepsen, USA | 31 | 0 |
| 104928IODP, Piedrahita, China | 32 | 0 |
| 105048IODP, Verhaert, Australia | 9 | 0 |
| 105061IODP, Pei, USA | 53 | 0 |
| 105037IODP, Zhang Pan, Australia | 77 | 0 |
| 105082IODP, Henderiks, Sweden | 22 | 0 |
| 105035IODP, Clark, Switzerland | 28 | 0 |
| 104908IODP, Brabson, USA | 84 | 0 |
| 105097IODP, Brunet, France | 0 | 0 |
| 105103IODP, Marsaglia, USA | 253 | 3 |
| 105111IODP, Huber, USA | 8 | 0 |
| 105123IODP, Foley, USA | 49 | 0 |
| 105130IODP, Jamson, Canada | 155 | 0 |
| 105129IODP, Tatzel, Germany | 48 | 0 |
| 105068IODP, Shorrock, New Zealand | 235 | 0 |
| 105105IODP, Xu, China | 48 | 0 |
| 105171IODP, Druce, New Zealand | 107 | 0 |
| 105190IODP, Calves, France | 10 | 0 |
| 105195IODP, Weldeab, USA | 100 | 0 |
| 105226IODP, Fantle, USA | 8 | 0 |
| 105253IODP, Yasukawa, Japan | 87 | 0 |
| 105295IODP, Childress, USA | 0 | 0 |
| 105287IODP, Raffi, Italy | 66 | 0 |
| 105298IODP, Musgrave, Australia | 5 | 0 |
| 105316IODP, Lam, USA | 0 | 3 |
| 105347IODP, Stock, USA | 14 | 1 |
| Tours/demonstrations (2) | 0 | 46 |
| **Totals** | **2,515** | **54** |

## 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 provided repository tours for undergraduate students that attended the A-STEP summit, held at JRSO in January. These students presented the results of research

projects initiated during educational workshops held on the *JOIDES Resolution* and University-National Oceanographic Laboratory System (UNOLS) vessels last summer. A repository tour was also given to TAMU Galveston students.

## Onshore XRF scanning

During this quarter, 1,544 core sections and discrete samples were scanned on the XRFs at the GCR. Three non-IODP metal samples were scanned for engineering testing purposes. 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 |
|---|---|---|---|---|
| Programmatic | 400, Yeon, Childress, Grant, Frank, Martens, Ives, Bryant, Cargill, Gray, Tibbet, USA | 473 | 771 | 0 |
| Personal | 181, 198, Patterson and Lam, USA | 147 | 143 | 0 |
| Personal | 371, Brunet, France | 0 | 4 | 0 |
| Personal | 167, Weldeab, USA | 0 | 3 | 0 |
| Personal | non-IODP, Bakri, USA | 1 | 0 | 0 |
| Personal | non-IODP, Chou, USA | 1 | 0 | 0 |
| Personal | non-IODP, Martin Diaz, USA | 1 | 0 | 0 |
| **Totals** | | **623** | **921** | **0** |

Notes: XRF = X-ray fluorescence, SHIL = Section Half Imaging Logger.

# 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 |
|---|---|---|
| *Scientific Prospectuses* | | |
| *Preliminary Reports* | 10.14379/iodp.pr.398.2024<br>10.14379/iodp.pr.399.2024<br>10.14379/iodp.pr.400.2024 | |

| Reports and publications | JRSO | Other |
|---|---|---|
| Expedition Reports | 10.14379/iodp.proc.390393.2024<br>10.14379/iodp.proc.390393.101.2024<br>10.14379/iodp.proc.390393.102.2024<br>10.14379/iodp.proc.390393.103.2024<br>10.14379/iodp.proc.390393.104.2024<br>10.14379/iodp.proc.390393.105.2024<br>10.14379/iodp.proc.390393.106.2024<br>10.14379/iodp.proc.390393.107.2024<br>10.14379/iodp.proc.390393.108.2024<br>10.14379/iodp.proc.390393.109.2024 | |
| Data Reports | | |

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 second quarter of FY24, the IODP TAMU website received 1,032,895 page views and 192,014 site visits, and the IODP Publications website received 465,525 page views and 62,731 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 218 countries.

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 | FY24 Q2 page views* | FY24 Q2 site visits* |
|---|---|---|
| www-odp.tamu.edu | 250,064 | 37,719 |
| www.odplegacy.org | 4,148 | 2,642 |
| www.deepseadrilling.org | 156,698 | 12,667 |
| **Total** | **410,910** | **53,028** |

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

## 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 | January 2024 | February 2024 | March 2024 | FY24 Q2 total |
|---|---|---|---|---|---|
| IODP | 10.14379 | 21,836 | 16,911 | 20,849 | **59,596** |
| Integrated Ocean Drilling Program | 10.2204 | 17,059 | 14,054 | 17,461 | **48,574** |
| ODP/DSDP | 10.2973 | 30,282 | 29,678 | 47,584 | **107,544** |

Table 9.4. Top 10 IODP DOIs resolved during FY24 Q2

| DOI (10.14379) | Resolutions | Title |
|---|---|---|
| 10.14379/IODP.PROC.359.101.2017 | 1,038 | *Proceedings* Volume 359: Expedition 359 summary |
| 10.14379/IODP.PROC.396.2023 | 652 | *Proceedings* Volume 396: Mid-Norwegian Margin Magmatism and Paleoclimate Implications |
| 10.14379/IODP.SP.400.2022 | 592 | *Scientific Prospectus*: Expedition 400 NW Greenland Glaciated Margin |
| 10.14379/IODP.PR.396.2022 | 552 | *Preliminary Report*: Expedition 396 Mid-Norwegian Margin Magmatism and Paleoclimate Implications |
| 10.14379/IODP.PROC.367368.2018 | 543 | *Proceedings* Volume 367/368: South China Sea Rifted Margin |
| 10.14379/IODP.PROC.390393.2024 | 532 | *Proceedings* Volume 390/393: South Atlantic Transect |
| 10.14379/IODP.PROC.367368.105.2018 | 485 | *Proceedings* Volume 367/368: Site U1501 |
| 10.14379/IODP.PROC.367368.103.2018 | 386 | *Proceedings* Volume 367/368: Site U1499 |
| 10.14379/IODP.PROC.385.2021 | 322 | *Proceedings* Volume 385: Guaymas Basin Tectonics and Biosphere |
| 10.14379/IODP.PROC.378.2022 | 300 | *Proceedings* Volume 378: South Pacific Paleogene Climate |

### ScienceOpen

Integrated Ocean Drilling Program and IODP expedition reports and data reports are indexed at ScienceOpen.

Table 9.5. ScienceOpen collection statistics (**https://www.scienceopen.com/collection/IODP_Publications** and **https://www.scienceopen.com/collection/8b0582f6-47bf-4988-b90a-8533135e6fcc**)

| Collection | Number of articles | Article views | Number of authors | Referenced articles |
|---|---|---|---|---|
| *Proceedings of the International Ocean Discovery Program* collection | 836 | 27,140 | 2,045 | 9,810 |
| *Scientific Ocean Drilling Expedition Research Results* collection | 10,866 | 71,063 | 22,770 | 109,5111 |

## 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.

## 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. Currently, our collection houses 2 TB of data and more than 8.5 million files. Integrated Ocean Drilling Program *Proceedings* volumes for Expeditions 301–312 were uploaded to Zenodo this quarter.

# 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 40,800 records for Program-related scientific ocean drilling publications from 1969 to the present.

Table 9.6 Scientific Ocean Drilling Bibliographic Database statistics

| Program-related publications | January 2024 | February 2024 | March 2024 | FY24 Q2 total |
|---|---|---|---|---|
| Searches | 457 | 768 | 527 | **1,752** |
| Citation views | 246 | 313 | 123 | **682** |

## 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 301–405. The IODP program publication and JRSO staff-authored publication lists are updated quarterly. Expedition-related bibliography lists are updated monthly.

## Articles authored by JRSO staff

Articles published during this quarter authored by JRSO staff include the following. Bold type indicates JRSO staff (**http://iodp.tamu.edu/staffdir/indiv.html**).

- Alonso-Garcia, M., Reolid, J., Jimenez-Espejo, F.J., Bialik, O.M., **Alvarez Zarikian, C.A.**, Laya, J.C., Carrasquiera, I., Jovane, L., Reijmer, J.J.G., Eberli, G.P., and Betzler, C., 2024. Sea-level and monsoonal control on the Maldives carbonate platform (Indian Ocean) over the last 1.3 million years. Climate of the Past, 20(3):547–571. **https://doi.org/10.5194/cp-20-547-2024**
- **Childress, L.B.**, **Acton, G.D.**, **Percuoco, V.P.**, and **Hastedt, M.**, 2024. The LILY database: linking lithology to IODP physical, chemical, and magnetic properties data. Geochemistry, Geophysics, Geosystems, 25(2):e2023GC011287. **https://doi.org/10.1029/2023GC011287**
- Druitt, T., Kutterolf, S., **Ronge, T.**A., Hübscher, C., Nomikou, P., Preine, J., Gertisser, R., Karstens, J., Keller, J., Koukousioura, O., Manga, M., Metcalfe, A., McCanta, M., McIntosh, I., Pank, K., Woodhouse, A., Beethe, S., Berthod, C., Chiyonobu, S., Chen, H., Clark, A., DeBari, S., Johnston, R., Peccia, A., Yamamoto, Y., Bernard, A., Perez, T.F., Jones, C., Joshi, K.B., Kletetschka, G., Li, X., Morris, A., Polymenakou, P., Tominaga, M., Papanikolaou, D., Wang, K.-L., and Lee, H.-Y., 2024. Giant

offshore pumice deposit records a shallow submarine explosive eruption of ancestral Santorini. Communications Earth & Environment, 5(1):24. **https://doi.org/10.1038/s43247-023-01171-z**

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- Kodama, S.T., Cox, S.E., Thomson, S.N., Hemming, S.R., **Williams, T.**, Licht, K.J., Formica, A., and Reiners, P.W., 2024. Multimethod dating of ice-rafted dropstones reveals hidden localized glacial erosion in Wilkes Subglacial Basin, Antarctica. Geosphere, 20(2):367–388. **https://doi.org/10.1130/GES02701.1**
- Lamy, F., Winckler, G., Arz, H.W., Farmer, J.R., Gottschalk, J., Lembke-Jene, L., Middleton, J.L., van der Does, M., Tiedemann, R., **Alvarez Zarikian, C.**, Basak, C., Brombacher, A., Dumm, L., Esper, O.M., Herbert, L.C., Iwasaki, S., Kreps, G., Lawson, V.J., Lo, L., Malinverno, E., Martinez-Garcia, A., Michel, E., Moretti, S., Moy, C.M., Ravelo, A.C., Riesselman, C.R., Saavedra-Pellitero, M., Sadatzki, H., Seo, I., Singh, R.K., Smith, R.A., Souza, A.L., Stoner, J.S., Toyos, M., de Oliveira, I.M.V.P., Wan, S., Wu, S., and Zhao, X., 2024. Five million years of Antarctic Circumpolar Current strength variability. Nature, 627(8005):789–796. **https://doi.org/10.1038/s41586-024-07143-3**
- Li, H., Zhang, H., Li, H., Duan, L., Zhang, X., Gao, Y., Hall, I.R., Hemming, S.R., and **LeVay, L.J.**, 2024. Sedimentary DNA reveals the link between microbial community dynamics and climate during the late last glaciation in the offshore region of the Zambezi River, Southwest Indian Ocean. Science of The Total Environment, 906:167787. **https://doi.org/10.1016/j.scitotenv.2023.167787**
- Preine, J., Karstens, J., Hübscher, C., Druitt, T., Kutterolf, S., Nomikou, P., Manga, M., Gertisser, R., Pank, K., Beethe, S., Berthod, C., Crutchley, G., McIntosh, I., **Ronge, T.**, Tominaga, M., Clark, A., DeBari, S., Johnston, R., **Mateo, Z.**, Peccia, A., Jones, C., Kletetschka, G., Metcalfe, A., Bernard, A., Chen, H., Chiyonobu, S., Fernandez-Perez, T., Joshi, K.B., Koukousioura, O., McCanta, M., Morris, A., Polymenakou, P., Woodhouse, A., Yamamoto, Y., Wang, K.-L., Lee, H.-Y., Li, X., and Papanikolaou, D., 2024. Hazardous explosive eruptions of a recharging multi-cyclic island arc caldera. Nature Geoscience. **https://doi.org/10.1038/s41561-024-01392-7**
- Vickers, M.L., Jones, M.T., Longman, J., Evans, D., Ullmann, C.V., Wulfsberg Stokke, E., Vickers, M., Frieling, J., Harper, D.T., Clementi, V.J., and IODP Expedition 396 Scientists (including **C.A. Alvarez Zarikian**), 2024. Paleocene–Eocene age glendonites from the Mid-Norwegian Margin – indicators of cold snaps in the hothouse? Climate of the Past, 20(1):1–23. **https://doi.org/10.5194/cp-20-1-2024**
- Wang, C.-C., Hemming, S., O'Connell, S., Carter, E., Rasbury, T., **Williams, T.**, Reilly, B.T., Brachfeld, S., and Li, S., 2024. Sedimentary stratigraphy and provenance off Dronning Maud Land (East Antarctica) during the mid-Pleistocene transition: Implications for paleoclimate and ice dynamics. Quaternary Science Reviews, 325:108483. **https://doi.org/10.1016/j.quascirev.2023.108483**

# Appendix: JRSO quarterly report distribution

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