# International Ocean Discovery Program

# *JOIDES Resolution* Science Operator

# FY23 Q2 Operations and Management Report

1 January – 31 March 2023

Cooperative Agreement OCE-1326927

Submitted by the JRSO

to

The National Science Foundation

and

The *JOIDES Resolution* Facility Board

5 May 2023



# 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)[1] | Dates[2] | Total days (port/ sea) | Days at sea (transit[3]/ ops) | Co-Chief Scientists | Expedition Project Manager/ Contact |
|---|---|---|---|---|---|---|---|
| Hellenic Arc Volcanic Field | 398 | Tarragona, Spain | 11 December 2022–10 February 2023 | 61 (5/56) | 56 (6/50) | T. Druitt<br>S. Kutterolf | T. Ronge |
| Transit/tie up (maintenance) 398P (10 February–12 April 2023; Heraklion, Greece to Ponta Delgada, Portugal) (61 days) | | | | | | | |
| Building Blocks of Life, Atlantis Massif | 399 | Ponta Delgada, Portugal | 12 April–2 June 2023 | 61 (5/56) | 56 (8/48) | A. McCaig<br>S. Lang | P. Blum |
| Reykjanes Mantle Convection and Climate | 395 | Ponta Delgada, Portugal | 12 June–2 August 2023 | 61 (5/56) | 56 (9/47) | R. Parnell-Turner<br>A. Briais | L. LeVay |
| NW Greenland Glaciated Margin | 400 | Reykjavík, Iceland | 12 August–13 October 2023 | 62 (5/57) | 57 (15/42) | P. Knutz<br>A. Jennings | L. Childress |
| Transit/tie up (dry dock) 400T (13 October–10 December 2023; Reykjavík, Iceland to Amsterdam, Netherlands) (58 days) | | | | | | | |
| Mediterranean-Atlantic Gateway Exchange | 401 | Amsterdam, Netherlands | 10 December 2023–9 February 2024 | 61 (3/58) | 58 (10/48) | R. Flecker<br>E. Ducassou | T. Williams |
| Tyrrhenian Continent-Ocean Transition | 402 | Napoli, Italy | 9 February–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 Reykjavík, Iceland) (57 days) | | | | | | | |

| Expedition | | Port (origin)[1] | Dates[2] | Total days (port/ sea) | Days at sea (transit[3]/ ops) | Co-Chief Scientists | Expedition Project Manager/ Contact |
|---|---|---|---|---|---|---|---|
| Eastern Fram Strait Paleo-archive | 403 | Reykjavík, Iceland | 4 June–<br>2 August 2024 | 59 (5/54) | 54 (12/42) | R.G. Lucchi<br>K. St. John | T. Ronge |
| Tie up/Demobilization 404D (2 August–30 September 2024; Amsterdam, Netherlands) (59 days) | | | | | | | |

Notes: NA = not applicable.
[1]Ports are 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 the operational area and between sites).

## Expeditions 390 and 393: South Atlantic Transect 1 and 2

### Postexpedition activities

A postcruise sediment sampling party was held 16–21 January at the Bremen Core Repository (BCR) at the University of Bremen. Following the hard rock sampling party that took place last quarter, this completed all shore-based personal sampling.

## Expedition 397: Iberian Margin Paleoclimate

### Postexpedition activities

The postcruise editorial meeting was held 27–31 March 2023 at TAMU in College Station, Texas. The shore-based sampling party is planned for mid-June at the BCR.

## Expedition 398: Hellenic Arc Volcanic Field

### Staffing

Table 2.2. Expedition 398 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) | 7 | 2 |
| Republic of Korea: Korea Integrated Ocean Drilling Program (K-IODP) | 0 | |
| 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 | |

### Clearance, permitting, and environmental assessment activities

In the latter part of the expedition, the Co-Chief Scientists requested the addition of three new sites. The Environmental Protection and Safety Panel (EPSP) and the TAMU Safety Panel conducted an electronic review and approved two of the sites. Shortly after, the Greek Ministry of Foreign Affairs granted

permission following several communications with one of the Greek observers on board, the Manager of Science Operations, and the US Embassy in Athens. The entire process took less than 10 days.

Figure 2.2 Expedition 398 site map

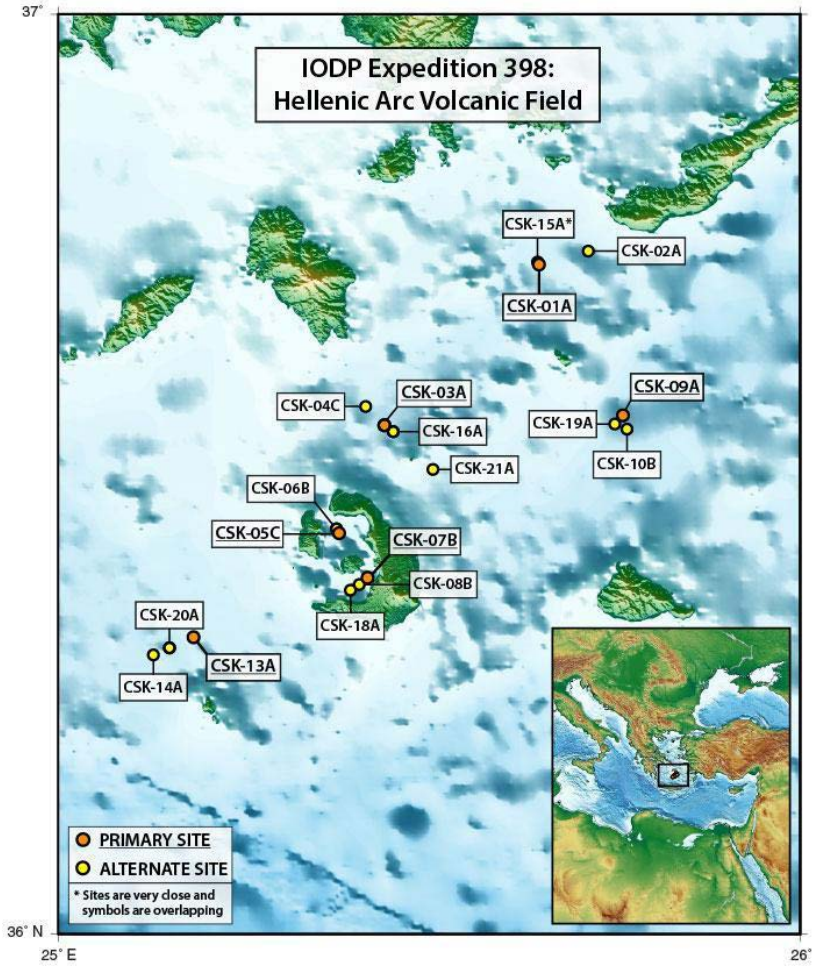


Table 2.3. Expedition 398 coring summary

| Site | Hole | Latitude | Longitude | Water depth (mbsl) | Cores (N) | Total penetration (DSF) | Interval cored (m) | Core recovered (m) | Recovery (%) |
|---|---|---|---|---|---|---|---|---|---|
| U1589 | U1589A | 36°43.7577’N | 25°38.8915’E | 484.31 | 75 | 446.7 | 446.7 | 350.55 | 74 |
| | U1589B | 36°43.7574’N | 25°38.9057’E | 482.6 | 70 | 381 | 381 | 331.46 | 87 |
| | U1589C | 36°43.7463’N | 25°38.9046’E | 482.6 | 27 | 621.9 | 261.9 | 62.08 | 62 |
| **Site U1589 totals** | | | | | **172** | **1449.6** | **1089.6** | **744.09** | **68** |
| U1590 | U1590A | 36°33.2938’N | 25°26.3888’E | 397.1 | 11 | 99.3 | 99.3 | 60.87 | 61 |
| | U1590B | 36°33.3129’N | 25°26.3644’E | 397.1 | 56 | 634.7 | 541.7 | 74.73 | 14 |
| **Site U1590 totals** | | | | | **67** | **734** | **641** | **135.6** | **21** |
| U1591 | U1591A | 36°18.7615’N | 25°9.0057’E | 514.56 | 11 | 98.8 | 98.8 | 64.76 | 66 |
| | U1591B | 36°18.7621’N | 25°9.0190’E | 513.76 | 42 | 389.2 | 364.5 | 155.08 | 43 |
| | U1591C | 36°18.7810’N | 25°8.9962’E | 513.76 | 69 | 902.9 | 668.6 | 384.47 | 58 |
| **Site U1591 totals** | | | | | **122** | **1390.9** | **1131.9** | **604.31** | **53** |

| Site | Hole | Latitude | Longitude | Water depth (mbsl) | Cores (N) | Total penetration (DSF) | Interval cored (m) | Core recovered (m) | Recovery (%) |
|---|---|---|---|---|---|---|---|---|---|
| U1592 | U1592A | 36°33.9358’N | 25°45.6784’E | 693.11 | 55 | 339.2 | 339.2 | 240.45 | 71 |
| | U1592B | 36°33.9164’N | 25°45.7027’E | 693.11 | 25 | 527.8 | 234.8 | 117.04 | 50 |
| **Site U1592 totals** | | | | | **80** | **867** | **574** | **357.49** | **62** |
| U1593 | U1593A | 36°34.5103’N | 25°24.8765’E | 397.1 | 38 | 250.6 | 250.6 | 149.55 | 60 |
| | U1593B | 36°34.4916’N | 25°24.9000’E | 397.1 | 39 | 232.8 | 232.8 | 156.78 | 67 |
| | U1593B | 36°34.5060’N | 25°24.8995’E | 397.1 | 0 | 192.6 | 0.00 | 0.00 | 0 |
| **Site U1593 totals** | | | | | **77** | **734** | **641** | **135.6** | **63** |
| U1594 | U1594A | 36°23.3368’N | 36°23.3368’N | 291 | 6 | 51.7 | 51.7 | 47.94 | 93 |
| **Site U1594 totals** | | | | | **6** | **51.7** | **51.7** | **47.94** | **93** |
| U1595 | U1595A | 36°22.8955’N | 25°24.3630’E | 291.58 | 11 | 98.6 | 98.6 | 72.3 | 73 |
| | U1595B | 36°22.8819’N | 25°24.3358’E | 291.42 | 15 | 127.1 | 127.1 | 74.02 | 58 |
| | U1595C | 36°22.8674’N | 25°24.3062’E | 291.31 | 10 | 95.3 | 46.1 | 21.37 | 46 |
| **Site U1595 totals** | | | | | **36** | **321.0** | **271.8** | **167.79** | **62** |
| U1596 | U1596A | 36°26.5378’N | 25°22.5130’E | 382.05 | 5 | 41.9 | 41.9 | 38.00 | 91 |
| | U1596B | 36°26.5568’N | 25°22.4875’E | 381.91 | 5 | 42.2 | 42.2 | 36.63 | 87 |
| **Site U1596 totals** | | | | | **10** | **84.1** | **84.1** | **74.63** | **89** |
| U1597 | U1597A | 36°26.2494’N | 25°22.7326’E | 382.35 | 5 | 43.6 | 43.6 | 40.84 | 94 |
| **Site U1597 totals** | | | | | **5** | **43.6** | **43.6** | **40.84** | **94** |
| U1598 | U1598A | 36°18.2937’N | 25°7.7155’E | 521.46 | 10 | 79.6 | 79.6 | 54.5 | 68 |
| | U1598B | 36°18.2747’N | 25°7.6929’E | 521.46 | 5 | 98.8 | 23.5 | 7.91 | 34 |
| **Site U1598 totals** | | | | | **15** | **178.4** | **103.1** | **62.41** | **61** |
| U1599 | U1599A | 36°26.9592’N | 25°46.8005’E | 591.19 | 44 | 245.4 | 245.4 | 204.57 | 83 |
| | U1599B | 36°26.9764’N | 25°46.8237’E | 592.68 | 40 | 241 | 241 | 199.13 | 83 |
| | U1599C | 36°26.9389’N | 25°46.7762’E | 592.68 | 48 | 902.9 | 668.6 | 384.47 | 50 |
| **Site U1599 totals** | | | | | **133** | **1390.9** | **1131.9** | **604.31** | **68** |
| U1600 | U1600A | 36°32.6277’N | 25°39.0553’E | 326.18 | 13 | 84.4 | 84.4 | 51.71 | 61 |
| | U1600B | 36°32.6092’N | 25°39.0311’E | 326.34 | 19 | 91.4 | 91.4 | 68.67 | 75 |
| | U1600C | 36°32.5890’N | 25°39.0066’E | 326.34 | 13 | 188.5 | 113.5 | 36.78 | 32 |
| **Site U1600 totals** | | | | | **45** | **364.3** | **289.3** | **157.16** | **54** |
| **Expedition 398 totals** | | | | | **844** | **8905.8** | **7081.8** | **4482.32** | **58** |

## Science summary

The objectives of Expedition 398, Hellenic Arc Volcanic Field (11 December 2022–10 February 2023), were to study the volcanic record of the central Hellenic Island arc; document the links and feedbacks between volcanism/magmatism, crustal tectonics, and sea level; investigate the processes and products of shallow submarine eruptions of silicic magma; and groundtruth the seismic stratigraphy of Santorini caldera. Additional objectives were to reconstruct the subsidence history of the southern Aegean Sea and search for deep life inside and outside of Santorini caldera

The expedition drilled ten of the originally proposed primary and alternate sites and both of the new sites that were approved during the expedition. Outside of Santorini caldera, drilling penetrated the thick basin fills of the crustal rift system hosting the Christiana-Santorini-Kolumbo volcanic field, identifying numerous pumice and ash layers and pushing back the onset of volcanism in the area into the Early Pleistocene or even Pliocene. Significant events of mass wasting into the basins accompanied by

very high sedimentation rates were also documented. These basin sites will groundtruth the seismic stratigraphy of the basins and open the way to unraveling relationships between volcanic activity and crustal rift pulses. Two sites of condensed sequences on the basin margins sampled many volcanic layers with age-depth constraints provided mainly by biostratigraphy. Drilling penetrated basement at three basin sites northeast of Santorini, whereas in the Christiana Basin to the southwest it penetrated a thick sequence of Messinian evaporites. Drilling inside Santorini caldera penetrated to ~120 meters below seafloor (mbsf), which was less than planned due to hole instability issues but deep enough to groundtruth the seismic stratigraphy and to sample the different layers. One intracaldera hole yielded a detailed tephra record of the history of the Kameni Islands, as well as possible evidence for deep bacterial colonies within the caldera. Despite variable recovery in the unstable pumice and ash deposits, the expedition was a significant success and will make it possible to address almost all of the science objectives.

## Expedition 399: Building Blocks of Life, Atlantis Massif

### Planning

Meetings between the Expedition Project Manager (EPM), science party, and technical staff were held to review laboratory measurements, engineering plans, and research sampling plans. Engineering activities included the design and manufacturing of crossover parts for the Elevated Temperature Borehole Sensor (ETBS) downhole temperature tool. Research plans and laboratory preparations are ongoing. All Tarragona, Spain, surface and air freight shipments, medical exams, and precruise safety training were completed. All third-party laboratory shipments from scientists were received in Tarragona. The final shipment (Schlumberger flasking equipment) will arrive in Ponta Delgada, Portugal, during the port call.

## Expedition 395: Reykjanes Mantle Convection and Climate

### Planning

An addendum to the *Scientific Prospectus* is in progress. Research plans and laboratory preparations are ongoing. The end port was changed to Reykjavik, Iceland, because of the problematic multi-month process required to obtain Canadian visas for some crew members and staff. This resulted in a gain in operational time.

### Staffing

Following the withdrawal of two scientists, a Special Call was issued and three US scientists were invited and accepted the invitation to sail.

### Clearance, permitting, and environmental assessment activities

We obtained authorization from Iceland and Denmark (Greenland) to conduct research in the Iceland Extended Continental Shelf and the Greenland Exclusive Economic Zone (EEZ) on 1 February and 21 March, respectively.

## Expedition 400: NW Greenland Glaciated Margin

### Planning

The start and end ports were changed to Reykjavik, Iceland. The expedition was extended by 1 day to mitigate the loss of operational time. Research plans and laboratory preparations are ongoing. Starlink

was installed on the vessel to improve satellite communications in the Baffin Bay operational area. We are in the process of finalizing the two ice observers.

### Clearance, permitting, and environmental assessment activities

We are waiting on Denmark (Greenland) to grant the clearance permit. An environmental assessment needed for vertical seismic profile (VSP) operations is in progress.

## Expedition 401: Mediterranean-Atlantic Gateway Ocean Transition

### Planning

The precruise meeting took place 3–4 January in College Station, Texas. The *Scientific Prospectus* will be published in the next quarter. The science party prepared a new safety package for EPSP review (see below). Co-Chief Scientist R. Flecker will host a precruise workshop at Bristol University in July attended by both expedition scientists and IMMAGE (Land-2-Sea project) investigators.

### Staffing

Staffing is in progress with the first-round invitations sent out. Outreach Officer interviews took place late in the quarter. The science party may include as many as three observers from Portugal, Spain, and Morocco due to the proximity of sites to the Spanish/Moroccan marine border and to support the Land-2-Sea aspects of this project.

### Clearance, permitting, and environmental assessment activities

The science party submitted several requests to EPSP to deepen some sites, drill down at some sites, and add new sites. EPSP and the TAMU Safety Panel conducted an electronic review at the very end of the quarter and approved most of these requests. This expedition will take place within the Portuguese and Spanish EEZ; the clearance application with the revised sites will be submitted in the next quarter to Portugal, Spain, and Morocco at the advice of the US State Department. An environmental assessment for VSP operations will also be completed.

## Expedition 402: Tyrrhenian Continent–Ocean Transition

### Planning

The *Scientific Prospectus* was published this quarter.

### Staffing

Staffing is in progress. However, because we received a large number of candidates for some laboratories but few or no applicants in other laboratories, we had to issue special invitations and will defer staffing until those applications are received. Outreach Officer interviews took place late in the quarter.

### Clearance, permitting, and environmental assessment activities

This expedition will take place within the Italian EEZ; the clearance application will be submitted in the next quarter following the identification of a potential observer from the applicant pool.

## Expedition 403: Eastern Fram Strait Paleo-archive

### Planning

The precruise meeting took place 13–14 March in College Station, Texas. The end port was changed in mid-March to Amsterdam, The Netherlands, following NSF's decision to demobilize the ship in FY24, and the Co-Chief Scientists were informed during the meeting. The operations plan was adjusted accordingly and the *Scientific Prospectus* is in progress. The added Starlink service will also improve communications for Expedition 403 operations.

### Staffing

A United States Science Support Program (USSSP) informational webinar took place in mid-February. The call for applications closed on March 1 and the applications should be received from the Program Member Offices (PMOs) on 1 May. Invitations will be sent out in the third and fourth quarters. A film crew is expected to sail and cover some outreach activities.

### Clearance, permitting, and environmental assessment activities

The Co-Chief Scientists plan to add one or more alternate sites and are preparing a package for EPSP and TAMU Safety Panel review. This expedition will take place within the Norwegian EEZ; the clearance application will be submitted in early FY24. An environmental assessment will be produced for VSP operations. Shipboard personnel will include two ice observers in addition to a potential observer from Norway.

## Expedition 404: Arctic-Atlantic Gateway Paleoclimate

### Planning

As a result of NSF's decision to end JR operations at the end of IODP and demobilize the vessel in FY24, Expedition 404 was removed from the schedule as recommended by the JRFB in this eventuality and the Co-Chief Scientists were informed. *JOIDES Resolution* will most likely be demobilized in Amsterdam, The Netherlands.

# 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 FY23 (October–December) was submitted to NSF on 27 January (**http://iodp.tamu.edu/publications/AR/FY23/FY23_Q1.pdf**).

## Liaison activities

JRSO reports to and liaises with funding agencies and IODP-related agencies (e.g., 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**).

## Project portfolio management

JRSO continued work on the GEODESC, X-Ray Linescan Core Imager, New Rig Instrumentation System, and Sample and Data Request Replacement projects. The Google Migration project remains on hold, the Gulf Core Repository (GCR) Core Storage Expansion will be replaced by a new project to accommodate demobilized instrumentation from the ship, and the Core Orientation project was discontinued.

### 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 core description tool set. The project manager is Peter Blum (JRSO EPM).

*Status*

JRSO deployed the GEODESC application on *JOIDES Resolution* on 11 October for operational testing and use during Expedition 397 (Iberian Margin Paleoclimate) in place of DESClogik. The Expedition 397 and 398 scientists' evaluations were quite favorable, and their input throughout the expedition guided developers in fixing bugs and improving the software in real time. JRSO will continue working on key components, including the Catalog Manager, which is needed to complete the functionality of GEODESC. The estimated project completion date was changed to 30 June 2023.

### 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 linescanned 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 (SHIL). 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*

The XSCAN project made rapid progress this quarter. Construction was completed and a software package was written for operating the instrument. Additional radiation tests confirmed that the fully assembled XSCAN was safe to operate. XSCAN was then rigorously tested by multiple users scanning a large number of cores from the GCR. The system was deemed plug-and-play ready and was shipped out in February, arriving at the ship on 29 March for installation on the Core Deck. Initial tests on the ship indicate the system is fully functional. The project was estimated to be completed in March. Although the

instrument is now fully functional, the project will not be considered closed until it is used successfully during Expedition 399.

## 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*

The existing magnetic orientation tools were tested extensively during Expedition 384 to quantify how well they work. One of the three primary tools was found to be severely misaligned and was repaired, and adjustments were made to the standard operating procedures, which reduce the potential for obtaining erroneous orientations. With those changes, the magnetic orientation tools were shown to give accurate results, which alleviated much of the need for developing a GOT. This project has been discontinued as it is unlikely that a functioning device could be developed before June 2024, when the last expedition is scheduled to start.

## 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*

JRSO continued to fine-tune the New Rig Instrumentation System (iRIS), monitor its use on *JOIDES Resolution*, collect data, and gather feedback. JRSO is developing a reporting module following a meeting with stakeholders and continues work on user and developer documentation. The project manager requested an extension due to a resource deficit and to ensure the requirement to fully operate the iRIS system over the course of two fully staffed expeditions. Full acceptance testing is expected to be completed by the end of Expedition 399. The estimated project completion date was extended to 31 August 2023.

## 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 (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 pro- gram. Some additional functions will be added to overcome the shortcomings of SaDR. Work on this project will be conducted in four main phases: creating new requests, administrative functions, integration with the Sample Planning Tool (SPLAT), and data migration from SaDR to the replacement.

*Status*

JRSO development work on major components is almost complete, except for a few known bugs and minor issues with data migration from the old database schema to the new database schema. Rigorous testing resumed in December, and developers began migrating data from the old program to the new program. Final acceptance testing is scheduled to begin in February in preparation for an operational release in May. The project team developed a comprehensive deployment plan that scheduled work to avoid disruption of upcoming sample parties. The estimated project completion date was changed to May 2023.

## GCR Core Storage Expansion

*Scope and deliverables*

The scope of this project is to plan expansion of the core storage facilities within the 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*

This project was placed on hold pending TAMU action. Given the recent NSF decision to discontinue *JOIDES Resolution* operations past FY24, this project will be closed and replaced by one to make modifications to the GCR support areas to be able to accommodate demobilized instruments and equipment from the ship.

## Google Migration

*Scope and deliverables*

The scope of this project is to migrate all Google applications including Drive, Sites, Calendar files, and objects from the Google scientific-ocean-drilling.org domain to the Google TAMU.edu domain. Included in this migration is the transfer of responsibility for Google audit and compliance to TAMU's Division of IT.

*Status*

During meetings with TAMU IT engineering in February, it was disclosed that neither Google nor TAMU IT have automated tools to migrate Google Sites. IODP technical staff are currently assessing the volume of content to be migrated and developing alternate plans to migrate content from scientific-ocean-drilling to the TAMU domain.

# 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 new high-temperature cable was installed as the primary wireline in Tarragona in preparation for Expedition 399. Expedition 399 will deploy flasked triple combo tools and sail with an additional logging engineer. JRSO is continuing to work with Schlumberger to work through the challenges of shipping replacement severing charges used during Expedition 398.

# 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

Expedition 398 had an extensive outreach program that included (1) a pre-expedition "In Search of Earth's Secrets" exhibit in Santorini, (2) shipboard outreach during the expedition with 59 live ship-to-shore tours reaching 2.5 million (6,400 not including China) people in seven countries including many school children, (3) nine news stories about the expedition, and (4) several interviews with Greek news media. In addition, in a 2 day window while in the Santorini caldera, the ship hosted several film crews and journalists, two prominent Geology professors from Greece and the United Kingdom, the Mayor and Deputy Mayor of Santorini, and the Santorini Coast Guard Commander. At least two documentaries are expected to be produced by Greek and German film crews.

Expedition 398P hosted two USSSP-funded outreach activities during the transit and tie up. The JR Academy group joined the ship for the transit between Heraklion, Greece, and Tarragona, Spain (12–22 February), and the School of Rock group joined the ship at the Tarragona tie-up (24 February–2 March).

## Other projects and activities

One staff scientist participated in the JRFB working group on Virtual Expeditions.

# 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

Development of this logger was on hold for this quarter.

## X-ray Core Section Imager

XSCAN has been installed on *JOIDES Resolution* and will be ready for use during Expedition 399 (Building Blocks of Life/Atlantis Massif).

## Scanning Electron Microscope—Energy Dispersive Spectrophotometer

The NanoImages scanning electron microscope–energy dispersive spectrophotometer (SEM-EDS) continues to have vibration issues, resulting in distortion to images being taken at higher than very low magnification (>2000x). Vibration isolation measures have been only partially effective, and the system continues to be more sensitive to the ship's motion and vibration than the older SEM. JRSO will continue to seek ways to further reduce vibrations and resolve this issue. The EDS component works well at reasonable magnification. The Hitachi TM-3000 instrument has been set up in another laboratory to provide higher magnification images when needed and will remain on board until the NanoImages problem is resolved.

# 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 and Core Handling LWG met this quarter to discuss ongoing issues.

- The LWG was updated on the SaDR replacement project; testing is nearly completed and deployment will be in early May.
- The LWG discussed curation and database entry of samples collected from the water column and not from within the borehole (e.g., Niskin bottles mounted on the vibration isolated television [VIT] frame). One issue is that the LIMS database uses the top of the hole as a reference and negative numbers would cause program crashes and other problems.
    - The proposed curatorial method is to log these samples against the mudline (depth = 0 m), to assign them a different sample type (e.g., LIQWC instead of LIQ), and to annotate in a new field the water depth from which they were taken.
- Subsamples will be created using the same chemistry laboratory methods that subsample interstitial water (IW) samples.
    - A new database field will be created for entry in the Catwalk Module that shows the water column depth of the sample; this field will be displayed in appropriate LORE reports. The new field is tentatively named x_wc_depth and will be reported in meters below rig floor (DRF).

- The LWG discussed the proper recording of drilled intervals, wash (W) cores, and ghost (G) cores in the database. W and G core handling will not be changed, but the practice of numbering drilled intervals will be updated. Currently, different Operations Superintendents enter the drilled intervals differently.
    - Some use core type "1" (numeric one) and increment the core number along with the normal cores taken in a hole (e.g., 1H, 2H, 31, 41, 51, 6R).
    - Some use core type 1–9 and increment the core type while keeping the core number the same (e.g., 1H, 2H, 31, 32, 33, 4R).
    - The LWG decision was to increment the core number and keep core type = "1" fixed.
    - Previous expeditions' data will not be changed to match the new convention; this will only be used for future drilled intervals.
- The LWG discussed storage and curation of shipboard pore water samples. A concern was raised by a member of the science community that samples from previous expeditions were not preserved properly for $\delta^{18}O$ analysis. These were tests run >5 years postexpedition.
    - The LWG noted that it is not possible to preserve pore water samples properly for all potential analyses a future scientist may want to perform.
    - The technical group always minimizes the headspace by using the smallest vials possible, and if the shipboard scientists request sealed ampoules, the technicians use those.

## Geochemistry and Microbiology

The Geochemistry LWG met this quarter to discuss ongoing issues as well as those arising from Expeditions 397 and 398.

Expedition 397

- No issues were reported by the science party for this expedition.

Expedition 398

- One scientist requested additional IW water squeezing stations be installed, which is not practical for space and workflow reasons.
- Scientists had issues using the coulometer and balance software; this was traced to a permissions issue for their account.
    - In the future, all science party members will be granted privileges for all standard scientist roles to avoid one scientist account missing a needed privilege.
- One scientist requested higher resolution hard rock analytical tools (e.g., electron microprobe).
    - LWG noted that both a handheld ED-XRF and an SEM with EDS are on board for analysis and that a microprobe would not be considered.

Other issues

- The LWG discussed the long-term pore water storage issue brought up during the Curation and Core Handling LWG meeting; the Geochemistry and Microbiology LWG endorsed the Curation and Core Handling LWG decisions.
- Discussions of destructive microbiological sampling were revisited from an earlier meeting.
    - A press inside a glove box is possible but has its issues.
    - A Dremel tool with a special blade was purchased to help; a training guide and safety measures are being developed.

- The Foldio imaging system needs documentation on the user guide wiki. This was assigned to a chemistry technician to update during their next expedition.

## Geology

The Geology LWG met this quarter to discuss ongoing issues as well as those arising from Expeditions 397 and 398.

*Expeditions 397 and 398*

- The Expedition 397 and 398 science parties submitted comments regarding several GEODESC bugs and suggested improvements. Most of the bugs have been fixed already.
    - Despite numerous comments on GEODESC, the response from the scientists was very positive, especially among those who had used DESClogik in the past. The consensus was that it was much easier to work with and responds much faster than the older software.
    - Both science parties were appreciative of the integration of GEODESC and the LIVE data display tool, which made quality assurance much easier to perform.

*Expedition 397*

- A scientist complained that the SPOT camera on the smear slide upright microscope produced fuzzy images and poor color reproduction; this will be investigated during Expedition 399 and corrected, if possible. A replacement camera will also be purchased.
- A scientist complained that Correlator would still sometimes crash with large data sets. A new Mac with much greater processing capability was installed before Expedition 399; hopefully, this will prove more stable than using the Windows version of Correlator.

*Ongoing Issues*

- Prior action items for better documentation for destructive hard rock sampling and section half preparation for the imaging logger (SHIL). These are still on target to be completed sometime this spring.
- A need for a more general microscope camera workflow to replace the aging Image Capture software was identified. A technician was assigned to gather preliminary information and produce a proposal for TAS management.

## Geophysics

The Geophysics LWG did not meet this quarter but will convene in April.

# 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 398 were added to the LIMS database on shore this quarter. These data are currently under moratorium and available only to the Expedition 398 scientists. No 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 | United States | 1,143 | United States | 2,900 |
| 2 | China | 413 | China | 772 |
| 3 | United Kingdom | 253 | United Kingdom | 393 |
| 4 | Germany | 195 | Germany | 272 |
| 5 | Netherlands | 76 | France | 137 |
| 6 | Australia | 73 | Canada | 112 |
| 7 | Italy | 71 | Japan | 105 |
| 8 | France | 64 | Italy | 94 |
| 9 | Canada | 53 | Sweden | 84 |
| 10 | Hong Kong | 35 | New Zealand | 77 |
| 11 | Other | 313 | Other | 398 |
| | **Total** | **2,689** | **Total** | **5,344** |

Table 7.2. Top 20 database web queries

| Rank | Janus database | | LIMS database* | |
|---|---|---|---|---|
| | Query | Views | Query | Views |
| 1 | Images—core photo | 2,157 | Samples | 1,553 |
| 2 | Site summary | 1,689 | Chemistry—carbonates | 1,436 |
| 3 | Chemistry—carbonates | 1,442 | Images—core photo | 1,304 |
| 4 | Physical properties—AVS | 1,411 | Images—section photo | 1,135 |
| 5 | Depth point calculator | 1,206 | Hole summary | 996 |
| 6 | Physical properties—MS | 1,082 | Section summary | 870 |
| 7 | Paleontology—age model | 1,033 | Chemistry—interstitial water | 724 |
| 8 | Physical properties—MAD | 969 | Core summary | 628 |

| Rank | Janus database | | LIMS database* | |
|---|---|---|---|---|
| | Query | Views | Query | Views |
| 9 | Sample | 842 | Physical properties—GRA | 591 |
| 10 | Chemistry—interstitial water | 719 | Physical properties—MAD | 504 |
| 11 | Physical properties—GRA | 682 | Physical properties—MS | 493 |
| 12 | Sediments—smear slides | 662 | Physical properties—NGR | 464 |
| 13 | Core summary | 660 | Paleomag—MSPOINT | 427 |
| 14 | Physical properties—NGR | 558 | Paleomag—SRM section | 366 |
| 15 | Physical properties—RSC | 556 | X-ray—XRD | 355 |
| 16 | Chemistry–rockeval | 533 | Physical properties—RSC | 352 |
| 17 | Hole summary | 497 | Images—thin section | 339 |
| 18 | Site details | 481 | Images—closeups | 330 |
| 19 | Paleontology—age profile | 347 | X-ray—XRF | 301 |
| 20 | Special holes summary | 320 | Chemistry—gas safety | 301 |
| | Other | 2,447 | Other | 4,483 |
| | **Total** | **20,293** | **Total** | **17,952** |

Table 7.3. Data requests to the TAMU Data Librarian

| Requests | Total |
|---|---|
| Data | 5 |
| Data not available | 2 |
| How to | 2 |
| Forwarded | 1 |
| **Total** | **10** |

| Country | Total |
|---|---|
| USA | 5 |
| United Kingdom | 3 |
| India | 1 |
| New Zealand | 1 |
| **Total** | **10** |

## Network systems operation, maintenance, and security

JRSO conducted routine system maintenance in accordance with the TAMU IT security policy.

# 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 398 and began planning for Expedition 399. The GCR also completed planning for the postexpedition sediment sample party for Expeditions 390 and 393, which was held 16–22 January at the BCR. GCR staff traveled to the BCR to assist with this sample party. This quarter, planning began for the upcoming postexpedition sample party for Expedition 397 to be held 5–19 June at the BCR.

## Sample requests and core sampling

Expedition 395C (Reykjanes Mantle Convection and Climate: Crustal Objectives) postexpedition sediment sampling continued this quarter, during which two groups of expedition scientists visited to assist with the collection of 3,026 samples.

The following table provides a summary of the 6,137 legacy (postmortatorium) 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.

In addition to the IODP samples collected at the GCR this quarter, samples were also collected for two requests for San Andreas Fault Observatory at Depth (SAFOD) cores. Three visitors traveled to the GCR to assist with the collection of 39 SAFOD samples.

Table 8.1. GCR sample requests

| Sample request number, name, country | Number of samples taken | Number of visitors |
|---|---|---|
| 098437IODP, Galazzo, Germany | 233 | 0 |
| 099933IODP, Xiaoli, China | 258 | 0 |
| 100180IODP, Liu, China | 77 | 0 |
| 100233IODP, Kong, USA | 181 | 0 |
| 100348IODP, Zhong, China | 301 | 0 |
| 100379IODP, Gonzalez-Lancha, United Kingdom | 69 | 0 |
| 100415IODP, Nirenberg, USA | 86 | 0 |
| 100445IODP, Saenger, USA | 30 | 0 |
| 100567IODP, Halpin, Australia | 34 | 0 |
| 100557IODP, Marschalek, United Kingdom | 15 | 0 |
| 100360IODP, Kender, United Kingdom | 2 | 0 |
| 100705IODP, Tang, China | 145 | 0 |
| 100720IODP, Wu, China | 47 | 0 |
| 100731IODP, Ferreira, Germany | 63 | 0 |
| 100767IODP, Bao, China | 175 | 0 |
| 100826IODP, Graham, United Kingdom | 46 | 0 |
| 100820IODP, Barrett, United Kingdom | 54 | 0 |
| 100923IODP, Zheng, China | 67 | 0 |
| 100935IODP, Gai, China | 269 | 0 |
| 100981IODP, Wang, USA | 33 | 3 |
| 100992IODP, Raffi, Italy | 47 | 0 |
| 101045IODP, Zhong, China | 318 | 0 |
| 100804IODP, Tashjian, USA | 31 | 0 |
| 101083IODP, Feakins, USA | 111 | 0 |
| 101117IODP, Zhong, China | 130 | 0 |
| 101251IODP, Williams, USA | 0 | 2 |
| 101134IODP, Kimble, USA | 347 | 0 |
| 101167IODP, Mershon, USA | 13 | 0 |
| 101261IODP, Ravelo, USA | 762 | 0 |
| 101269IODP, Perez, Spain | 198 | 0 |
| 101345IODP, van Peer, United Kingdom | 2 | 0 |
| 101338IODP, Cheviet, France | 47 | 0 |
| 101430IODP, Nirenberg, USA | 30 | 0 |

| Sample request number, name, country | Number of samples taken | Number of visitors |
|---|---|---|
| 102078IODP, Hingley, United Kingdom | 5 | 0 |
| 102098IODP, Liu, China | 48 | 0 |
| 101609IODP, Rauzi, New Zealand | 148 | 0 |
| 102277IODP, Mershon, USA | 13 | 0 |
| 102398IODP, Zhang, China | 3 | 0 |
| 102450IODP, Shorrock, New Zealand | 172 | 0 |
| 102475IODP, Tian, United Kingdom | 30 | 0 |
| 102504IODP, Hoogakker, United Kingdom | 49 | 0 |
| 102556IODP, Matsuzaki, Japan | 126 | 0 |
| 102636IODP, Hoogakker, United Kingdom | 10 | 0 |
| 102647IODP, Ngadi, New Zealand | 188 | 0 |
| 101671IODP, Guo, USA | 10 | 0 |
| 102619IODP, Cheng, USA | 42 | 0 |
| 102728IODP, Shakun, USA | 252 | 0 |
| 102736IODP, Clark, USA | 26 | 0 |
| 102749IODP, Dai, Australia | 38 | 0 |
| 102812IODP, Mershon, USA | 15 | 0 |
| 102447IODP, Tawil-Morshink, Canada | 36 | 0 |
| 102910IODP, Mershon, USA | 4 | 0 |
| 102962IODP, Mershon, USA | 12 | 0 |
| 102995IODP, Wan, China | 378 | 0 |
| 102468IODP, Haoyufei, China | 141 | 0 |
| 102979IODP, Duke, New Zealand | 93 | 0 |
| 103156IODP, Schaefer, Germany | 5 | 0 |
| 103185IODP, Liu, USA | 31 | 0 |
| 103104IODP, McDonald, New Zealand | 29 | 0 |
| 103251IODP, Gonzalez-Lancha, United Kingdom | 12 | 0 |
| Tours/demonstrations (1) | 2 | 20 |
| **Totals** | **6,137** | **25** |

## Use of core collection and education and outreach support

JRSO promotes outreach use of the GCR core collection by conducting tours of the repository and providing materials for display at meetings and museums. The repository and core collection are also used for classroom exercises. This quarter, tours were given for Dr. Tim Dellapenna's marine geology class from TAMU's Galveston campus.

## Onshore XRF scanning

During this quarter, 757 core sections and discrete samples were scanned on the XRFs at the GCR. Documentation relating to the operation, advanced configurations, maintenance, and troubleshooting of the XRF is available at **https://sites.google.com/scientific-ocean-drilling.org/xrf-iodp/home**.

Table 8.2. Core sections scanned

| Request type | Expedition, name, country | XRF 1 | XRF 2 | SHIL | WRMSL* |
|---|---|---|---|---|---|
| Personal | 113, O'Connell, Lehman, Wang, USA | 25 | 0 | 0 | 0 |
| Programmatic | 391, Shervais, Dalla Valle, White, USA/Italy | 68 | 103 | 0 | 0 |
| Programmatic | 395C, O'Connell, Lehman, Fu, Zhao, Coombs, Friedman, USA | 0 | 104 | 0 | 0 |
| Programmatic | 397, Alvarez, Kars, Yeon, Shook, Haygood, Sadiq, Olvera, Svoboda, Dos Santos Rocha, USA | 232 | 225 | | |
| **Totals** | | **325** | **432** | **0** | **0** |

Notes: XRF = X-ray fluorescence, SHIL = Section Half Imaging Logger, WRMSL = Whole-Round Multisensor Logger. *The WRMSL is currently unavailable because it is serving as the development track for a new X-ray system.

# 9. Publication services

The Publication Services (Pubs) department provides publication support services for IODP riserless and riser drilling expeditions (see Expedition operations) and editing, production, and graphics services for required Program reports (see Management and administration), technical documentation (see Technical and analytical services), and scientific publications as defined in the JRSO cooperative agreement with NSF. The Pubs department also maintains legacy access and archiving of Integrated Ocean Drilling Program, Ocean Drilling Program (ODP), and Deep Sea Drilling Project (DSDP) publications.

## Scientific publications

Table 9.1. Newly published content on the IODP Publications website

| Reports and publications | JRSO | Other |
|---|---|---|
| *Scientific Prospectuses* | 10.14379/iodp.sp.402.2023 | |
| *Preliminary Reports* | 10.14379/iodp.pr.393.2023<br>10.14379/iodp.pr.397.2023 | |
| Expedition Reports | | |
| Data Reports | 10.14379/iodp.proc.361.203.2023<br>10.14379/iodp.proc.354.204.2023 | |

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 FY23, the IODP TAMU website received 506,921 page views and 39,340 site visits, and the IODP Publications website received 523,566 page views and 76,554 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 130 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 | FY23 Q2 page views* | FY23 Q2 site visits* |
|---|---|---|
| www-odp.tamu.edu | 198,582 | 37,506 |
| www.odplegacy.org | 4,745 | 3,418 |
| www.deepseadrilling.org | 106,290 | 14,307 |
| **Total** | **309,617** | **55,231** |

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 2023 | February 2023 | March 2023 | FY23 Q2 total |
|---|---|---|---|---|---|
| IODP | 10.14379 | 14,844 | 12,304 | 11,807 | **38,955** |
| Integrated Ocean Drilling Program | 10.2204 | 16,593 | 13,038 | 9,985 | **39,616** |
| ODP/DSDP | 10.2973 | 48,247 | 21,382 | 27,113 | **96,742** |

Table 9.4. Top 10 IODP DOIs resolved during FY23 Q2

| DOI (10.14379) | Resolutions | Title |
|---|---|---|
| 10.14379/IODP.PROC.385.2021 | 513 | *Proceedings* Volume 385: Guaymas Basin Tectonics and Biosphere |
| 10.14379/IODP.PR.396.2022 | 511 | *Preliminary Report*: Expedition 396 Mid-Norwegian Margin Magmatism and Paleoclimate Implications |
| 10.14379/IODP.PROC.378.2022 | 449 | *Proceedings* Volume 378: South Pacific Paleogene Climate |
| 10.14379/IODP.PROC.367368.2018 | 434 | *Proceedings* Volume 367/368: South China Sea Rifted Margin |
| 10.14379/IODP.PROC.363.2018 | 430 | *Proceedings* Volume 363: Western Pacific Warm Pool |
| 10.14379/IODP.PR.397.2023 | 369 | *Preliminary Report*: Expedition 397 Iberian Margin Paleoclimate |
| 10.14379/IODP.PROC.354.2016 | 348 | *Proceedings* Volume 354: Bengal Fan |
| 10.14379/IODP.SP.398.2022 | 317 | *Scientific Prospectus*: Expedition 398 Hellenic Arc Volcanic Field |
| 10.14379/OMANDP.PROC.2020 | 272 | Oman Drilling Project volume |
| 10.14379/IODP.SP.395.2020 | 255 | *Scientific Prospectus*: Expedition 395 Reykjanes Mantle Convection and 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 | 816 | 22,676 | 2,001 | 9,541 |
| *Scientific Ocean Drilling Expedition Research Results* collection | 9,662 | 55,799 | 20,978 | 99,737 |

## 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. Scheduled crawls incrementally update the archive with new files. Currently, our collection houses 2 TB of data and more than 8.5 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 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 2023 | February 2023 | March 2023 | FY23 Q2 total |
|---|---|---|---|---|
| Searches | 344 | 354 | 411 | 1,109 |
| Citation views | 243 | 218 | 183 | 644 |

### 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 301–399. 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**).

*EGU General Assembly*

- Doiron, K., Brassell, S., Bijl, P., Wager, T., Herrle, J., Uenzelmann-Neben, G., Bohaty, S., **Childress, L.**, and the Expedition 392 Science Party, 2023. Alkenones confirmed in sediments from high southern latitudes during the Cretaceous and Paleocene: results from the Transkei Basin (IODP Site U1581). Presented at the EGU General Assembly 2023, Vienna, Austria, 24–28 April 2023. https://doi.org/10.5194/egusphere-egu23-10010
- Hodell, D., Abrantes, F., **Zarikian, C.**, and the IODP Expedition 397 Scientists [including **Carlos Alvarez Zarikian**], 2023. Benchmark sedimentary records recovered from the Iberian margin during IODP Expedition 397. Presented at the EGU General Assembly 2023, Vienna, Austria, 24–28 April 2023. https://doi.org/10.5194/egusphere-egu23-16019
- Planke, S., Berndt, C., **Alvarez Zarikian, C.A.**, Huismans, R.S., Bünz, S., Faleide, J.I., Lebedeva-Ivanova, N., Zastrozhnov, D., and Expedition Scientists [including **Carlos Alvarez Zarikian**], 2023. Breakup magmatism and Paleogene paleoenvironment: initial results from IODP Expedition 396 on the Mid-Norwegian Continental Margin. Presented at the EGU General Assembly 2023, Vienna, Austria, 24–28 April 2023. https://doi.org/10.5194/egusphere-egu23-13260
- Tangunan, D., Hall, I., Beaufort, L., Berke, M., **LeVay, L.**, Mejia, L.M., Palike, H., Starr, A., and Flores, J.A., 2023. The early to mid-Pliocene latitudinal migration of the Southern Ocean subtropical front (IODP Site U1475, Agulhas Plateau). Presented at the EGU General Assembly 2023, Vienna, Austria, 24–28 April 2023. https://doi.org/10.5194/egusphere-egu23-17081
- Velázquez-Aguilar, M., Pérez-Cruz, L., Urrutia-Fucugauchi, J., Aldama-Cervantes, A., Venegas-Ferrer, R., Aiello, I., Jiang, S., Ran, L., Sarao, J., Martínez, P., Váldez-Hernández, M., and the International Ocean Discovery Program Expedition 385 Scientists [including **T.W. Höfig**], 2023. Radiolarians and silicoflagellates as clues of the paleoceanographic history of Guaymas Basin in the Gulf of California during the past 31,000 yr. Presented at the EGU General Assembly 2023, Vienna, Austria, 24–28 April 2023. https://doi.org/10.5194/egusphere-egu23-10718

## Articles authored by JRSO staff

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