Closeout of *JOIDES Resolution* IODP Expedition Obligations and Operation of an Instrumented Gulf Coast Repository

FY25 Q2 Operations and Management Report

1 January–31 March 2025

Cooperative Agreement OCE-2412279

Submitted by TAMU Scientific Ocean Drilling

to

The National Science Foundation

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Contents

1. Introduction

This quarterly operations and management report reflects activities and deliverables outlined in the Proposed Work section of the proposal Closeout of International Ocean Discovery Program (IODP) Expedition Obligations and Operation of an Instrumented Gulf Coast Repository submitted to the National Science Foundation (NSF), as implemented by Texas A&M University (TAMU). Administrative services in support of these activities are provided by the Texas A&M Research Foundation (TAMRF) through TAMU Sponsored Research Services (SRS).

2. Gulf Coast Repository

On behalf of NSF, the Gulf Coast Repository (GCR) at Texas A&M University stores and curates 151 kilometers of Deep Sea Drilling Project (DSDP), Ocean Drilling Program (ODP), Integrated Ocean Drilling Program, and IODP cores from the Pacific Ocean, the Caribbean Sea and Gulf of Mexico, and the Southern Ocean.

Laboratories

The GCR infrastructure includes 9,000 square feet of newly renovated instrumented laboratories and 15,000 square feet of refrigerated space. The laboratories contain most of the instruments that were demobilized from the *JOIDES Resolution*.

During this quarter, hiring continued to fill new positions in the GCR from the JRSO staff. Hiring will continue into the next quarter. The GCR hosted initial users of its service center and developed procedures for invoicing service-center users. Three posters on the GCR's analytical capabilities were presented at the Texas A&M Core Facility showcase.

At the end of FY25 Q2, the status of instrumentation removed from the ship and/or under development in the new laboratories is described below.

Instruments installed and operational

- X-ray Linescan Imager (XSCAN)
- Section Half Multisensor Logger (SHMSL)
- Section Half Image Logger (SHIL)
- Whole-round Multisensor Logger (WRMSL)
- AGICO JR-6A Spinner Magnetometers
- AGICO Kappabridge MFK2-FA Magnetic Susceptibility Meter
- ASC Scientific D-2000 AF Demagnetizer
- ASC Scientific Thermal Demagnetizer
- ASC Scientific Impulse Magnetizers
- Malvern Panalytical AERIS X-Ray Diffractometer (XRD)
- Hitachi Scanning Electron Microscope (SEM)
- SEC SNE-4500M Plus scanning electron microscope with Bruker Quantax EDS (SEM and EDS)
- Rock powdering preparation equipment (X-Press, Shatter Box, Mixer Mills)
- Labconco Freeze Dryer

- Natural Gamma Radiation Logger (NGR) Instrument
- Superconducting Rock Magnetometer (SRM)
- Transmitted light and stereo microscopes
- Barnstead Water Purification System
- Coulometrics CM5011 Coulometer
- Agilent Cary 100 UV-Visible Spectrophotometer

Instruments uncrated; not yet operational

- Hyperspectral Line Scan Logger (HYPERSCAN)
- Moisture and Density Station (MAD)
- Metrohm Ion Chromatograph (IC)
- Metrohm Titrino Autotitrators (Alkalinity/PH/Chloride)
- Agilent 5110 ICP-OES
- Thermo Electron Flash EA 1112 Elemental Analyzer (CHNS)
- Agilent 7890 Gas Chromatographs (GCs)
- Weatherford Instruments Source Rock Analyzer (SRA)
- Tormach CNC Mill
- Core Splitter

Instruments pending uncrating and installation

- Thermal Conductivity

Use of laboratory facilities

X-ray fluorescence core scanning

During this quarter, 1,150 core sections were scanned on the X-ray fluorescence (XRF) scanners as part of eight projects. Following the completion of Expedition 403 programmatic scanning last quarter, there will be no more programmatic XRF scanning.

Table 2.1. Core sections XRF scanned

Request type	Expedition	Name, country	XRF 1	XRF 2
Research	198, 206, 324	Nelson, USA	0	80
Research	383	Arz, Plewe, Ruggieri, Germany	86	85
Education	178	Christensen, Drury, Auer, Childress, USA, UK, Austria	19	20
Research	32, 198	Villa, Germany	65	189
Research	178	Williams, Mossell, USA	0	93
Research	145	Nirenburg, USA	55	0
Research	318	Wang, USA	46	0
Research	401	Feakins, USA	216	196
Totals			**487**	**663**

Non-destructive core logger measurements

During this quarter, multiple projects utilized non-destructive core loggers that are part of the GCR service center facility.

Table 2.2. Core sections scanned on non-destructive core loggers

Request type	Expedition	Name, country	SHIL	SRM	SHMSL	XSCAN	NGRL	WRMSL	HyperScan
Research	145	Straub, USA	105	0	0	0	0	0	0
Education	178	Christensen, Drury, Auer, Childress, USA, UK, Austria	39	39	39	39	39	39	0
Totals			**144**	**39**	**39**	**39**	**39**	**39**	**0**

Curatorial services

The GCR provides services in support of core sampling and curation of the IODP and predecessor programs Integrated Ocean Drilling Program, ODP, and DSDP core collection archived at the GCR.

Sample requests

The following table provides a summary of the 3,070 legacy (postmoratorium) samples taken at the GCR during this quarter. Sample requests that show zero samples taken may represent cores requested for XRF analysis. For public relations or educational visits/tours, the purpose of the visit is shown in brackets in the "Sample request number, name, country" column, and no number is recorded in the "Number of samples taken" column if no new samples were taken.

Table 2.3. GCR sample requests

Sample request number, name, country	Number of samples taken	Request type (R/E/ND)	Number of visitors
106299IODP, Zhang, China	359	R	0
106203IODP, Nirenberg, USA	0	ND	1
106426IODP, Zhang, China	57	R	0
106422IODP, Neydon, USA	648	R	2
106431IODP, Xu, China	261	R	0
106439IODP, Wickenaeuser, USA	6	R	0
106269IODP, Feakins, USA	0	ND	2
106398IODP, Nelson, USA	39	R	0
106453IODP, Kimble, USA	2	R	0
105897IODP, Seki, Japan	833	R	0
106461IODP, Rodriguez, USA	51	R	0
106496IODP, Percival, Netherlands	50	R	0
106500IODP, Nana Yobo, USA	98	R	1
106503IODP, Connor, USA	12	R	0
106524IODP, Arz, Germany	0	ND	2
106522IODP, Chaudhari, India	236	R	0
106533IODP, Saad, USA	25	R	0

Sample request number, name, country	Number of samples taken	Request type (R/E/ND)	Number of visitors
106552IODP, Liao, China	47	R	0
106521IODP, Su, Ireland	17	R	0
106528IODP, Marschalek, UK	10	R	0
106581IODP, Micallef, USA	18	R	0
106560IODP, Yasuhara, China	220	R	0
106609IODP, Lee, USA	5	R	1
106489IODP, Wickenhaeuser, USA	3	R	0
106637IODP, Fernandez, Spain	25	R	0
106654IODP, Childress, USA	35	E	22
106718IODP, Wang, USA	0	ND	1
106720IODP, Wan, USA	13	R	0
Tours/demonstrations (10)			60
Totals	**3,070**		**90**

R = research, E = education, ND = nondestructive analysis.

Use of core collection

The GCR 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, repository tours were given to TAMU Oceanography faculty candidates, participants of the US GEOTRACES workshop, interested TAMU students and staff as part of the Core Facility Showcase and a TAMU Galveston campus Marine Geology class.

Expedition and legacy project curation and sample strategies

Sampling strategies were conducted, including Sample Allocation Committee review/approval for the Expedition 403 postexpedition sample party. The Expedition 403 sample party was held 20–29 January at the Bremen Core Repository (BCR). This was the final *JOIDES Resolution* postexpedition sample party.

Repository projects

Projects were conducted this quarter related to enhancement of the repository curatorial facility and the collections. Work began on building new rock saw stands, and construction will continue into the next quarter. Work continues related to increasing the organization of the residue and returned sample collection. A TAMU student minoring in Museum Studies began an internship with the GCR this quarter focusing on better cataloging and organizing the GCR's thin section inventory.

Broader impacts

21st Century Drilling Workshop

GCR staff assisted with planning and implementing the 21st Century Drilling Workshop, which took place 24–28 February. This was a US Science Support Program (USSSP)–funded workshop that aimed to broaden participation and knowledge of the early and mid-career scientific ocean drilling community, teach fundamentals of working with legacy core materials, and prepare participants to develop legacy proposals. Technicians and curation staff cleaned laboratories and prepared instruments and workspaces prior to the workshop. During the workshop, technicians and curation staff assisted participants with

core, core handling, and instrument use. During the workshop, instructors and participants made use of XRF, XSCAN, SHIL, WRMSL, SHMSL, SRM, and GEODESC.

CORE School

Planning for the COres for Research and Education (CORE) School continued. Activities included meetings with the assessment team based at Washington State University, determination of external instructors for the workshop, planning meetings among internal and external instructors, and preparing the application form, which opened to applicants on 31 March.

3. Closeout

Closeout activities include completing the publications cycle for the last IODP expeditions, along with archiving publications and other digital materials, postexpedition science coordination, property disposition, legacy documentation, data access and migration, and financial closeout.

Management and administration

Management and administration (M&A) activities include planning, coordinating, overseeing, reviewing, monitoring, assuring compliance for, and reporting on IODP closeout and GCR activities.

Advice and guidance related to closeout activities are provided by the program officer and the *JOIDES Resolution* Advisory Board (JRAB), which is a continuation of the JR Facility Board that oversaw the *JOIDES Resolution* Science Operator (JRSO) activities, but in an advisory capacity. Advice and guidance associated with the instrumented repository will be provided by a GCR Advisory Board, which will be formed when instruments have been set up and made operational.

Publications

The Publications department is responsible for producing IODP scientific publications, including Expedition Reports and Data Reports contained in the volumes of the *Proceedings of the International Ocean Discovery Program*, technical documentation (*IODP Technical Notes*), and program reporting. Additionally, Publications archives legacy publications and digital assets and maintains current and legacy websites.

Expedition Reports volumes were published for The European Consortium for Ocean Research Drilling (ECORD) Science Operator (ESO) Expedition 389 and JRSO Expedition 395 (which includes data collected during Expeditions 395C and 384) and JRSO Expedition 400. Production activities continued on volumes for Expeditions 399, 401, and 402 (JRSO), which are scheduled to publish in the next quarter, and Expeditions 403 (JRSO) and 405 (The Institute for Marine-Earth Exploration [MarE3, Japan]).

Program publications

The Publications department worked on preparing Expedition Reports volumes for expeditions under moratorium and Expedition Research Results (data reports) for expeditions that are post-moratorium for JRSO, MarE3, and ESO. Digital Object Identifiers (DOIs) were deposited for the following program publications during the quarter.

Table 3.1. New content published on the IODP Publications website

Publications	DOI	Science operator
Preliminary Reports	10.14379/iodp.pr.402.2025	JRSO
IODP *Proceedings*	10.14379/iodp.proc.395.2025	JRSO
	10.14379/iodp.proc.395.101.2025	
	10.14379/iodp.proc.395.102.2025	
	10.14379/iodp.proc.395.103.2025	
	10.14379/iodp.proc.395.104.2025	
	10.14379/iodp.proc.395.105.2025	
	10.14379/iodp.proc.395.106.2025	
	10.14379/iodp.proc.395.107.2025	
	10.14379/iodp.proc.395.108.2025	
	10.14379/iodp.proc.389.2025	ESO
	10.14379/iodp.proc.389.101.2025	
	10.14379/iodp.proc.389.102.2025	
	10.14379/iodp.proc.389.103.2025	
	10.14379/iodp.proc.389.104.2025	
	10.14379/iodp.proc.389.105.2025	
	10.14379/iodp.proc.389.106.2025	
	10.14379/iodp.proc.389.107.2025	
	10.14379/iodp.proc.389.108.2025	
	10.14379/iodp.proc.389.109.2025	
	10.14379/iodp.proc.389.110.2025	
	10.14379/iodp.proc.389.111.2025	
	10.14379/iodp.proc.389.112.2025	
	10.14379/iodp.proc.389.113.2025	
	10.14379/iodp.proc.389.114.2025	
	10.14379/iodp.proc.389.115.2025	
	10.14379/iodp.proc.389.116.2025	
	10.14379/iodp.proc.389.117.2025	
	10.14379/iodp.proc.400.2025	JRSO
	10.14379/iodp.proc.400.101.2025	
	10.14379/iodp.proc.400.102.2025	
	10.14379/iodp.proc.400.103.2025	
	10.14379/iodp.proc.400.104.2025	
	10.14379/iodp.proc.400.105.2025	
	10.14379/iodp.proc.400.106.2025	
	10.14379/iodp.proc.400.107.2025	
	10.14379/iodp.proc.400.108.2025	
Data reports	10.14379/iodp.proc.385.206.2025	JRSO
	10.14379/iodp.proc.385.207.2025	JRSO
	10.2204/iodp.proc.338.209.2025	MarE3

Publications legacy and archiving

Digital object identifiers

Indexing, archiving, and tracking use of IODP, ODP, and DSDP legacy publications are enabled through registration of a CrossRef DOI for each leg/expedition chapter and volume. CrossRef tracks the number of times a publication is accessed online through the CrossRef DOI resolver tool. Program statistics for this quarter are shown in the table below.

Table 3.2. Number of online DOI resolutions

Scientific drilling program	DOI prefix	Jan 2025	Feb 2025	Mar 2025	FY25 Q2 totals
International Ocean Discovery Program	10.14379	17,369	15,045	13,969	**46,383**
Integrated Ocean Drilling Program	10.2204	8,041	6,393	5,690	**20,124**
ODP and DSDP	10.2973	34,560	34,259	43,190	**112,009**

NSF Public Access Repository

Metadata for IODP volumes and data reports are deposited to the NSF Public Access Repository (PAR) upon publication.

ScienceOpen

IODP expedition reports and data reports are indexed at ScienceOpen in the IODP *Proceedings* collection at **https://www.scienceopen.com/collection/IODP_Publications**. Expedition-related publications are indexed at ScienceOpen in the Scientific Ocean Drilling Expedition Research Results collection at **https://www.scienceopen.com/collection/8b0582f6-47bf-4988-b90a-8533135e6fcc**. Collection statistics are shown in the table below.

Table 3.3. ScienceOpen collection statistics

Collection	Articles (#)	Article views (#)	Authors (#)	Referenced articles (#)
Proceedings of the International Ocean Discovery Program collection	847	35,340	2,128	10,154
Scientific Ocean Drilling Expedition Research Results collection	11,348	127,332	23,762	117,697

Zenodo

Complete volumes from the Integrated Ocean Drilling Program (Expeditions 301–348) are archived in the IODP Community at Zenodo (**https://zenodo.org/communities/iodp**; Resource type: Publication).

Internet Archive and Bibliographic Database

Digital archives of full volumes from DSDP, ODP, and both IODP programs are available as an Internet Archive collection at **https://archive-it.org/collections/9148**.

Metadata records for program publications and other leg/expedition-related publications can be found in the AGI Scientific Ocean Drilling Citation Database, a subset of the AGI GeoRef database, at **http://iodp.americangeosciences.org/**.

IODP volume publications from Expeditions 301–current are listed along with current citation counts in a Google Scholar profile at **https://scholar.google.com/citations?hl=en&user=lqVDYooAAAAJ&view_op=list_works&sortby=pubdate**.

HathiTrust

Archived DSDP and ODP hard-copy volumes are available in digital format at HathiTrust, an open-access, trusted digital library/repository as follows:

ODP archive: **https://babel.hathitrust.org/cgi/mb?a=listis;c=1868324439**;
DSDP archive: **https://babel.hathitrust.org/cgi/mb?a=listis&c=1930557976**.

Expedition-related publications

Legacy expedition-related publications published in peer-reviewed literature, along with current citation counts, are listed in the following Google Scholar profiles:

International Ocean Discovery Program (Expeditions 349–405): **https://scholar.google.com/citations?user=i9nuMIgAAAAJ&hl=en**

Integrated Ocean Drilling Program (Expeditions 301–348): **https://scholar.google.com/citations?user=RUruDbgAAAAJ&hl=en**

Ocean Drilling Program (Legs 101–210 published since 2000): **https://scholar.google.com/citations?user=dRcpdRoAAAAJ&hl=en**

Website management

The Publications department maintains the GCR website and provides access to previous scientific drilling program information including the IODP/JRSO and IODP Publications websites, as well as the ODP, DSDP, and ODP Legacy websites.

Table 3.4. Current and legacy website statistics

URL	Website	FY25 Q2 page views	FY25 Q2 site visits
https://gcr.tamu.edu/	Gulf Coast Repository	2,103	915
https://iodp.tamu.edu/	IODP/JRSO Home	283,310	60,153
http://publications.iodp.org/	IODP Publications	327,114	71,352
https://www-odp.tamu.edu/	ODP Home	154,952	51,236
http://www.odplegacy.org/	ODP Legacy	18,247	10,116
http://www.deepseadrilling.org/	DSDP Publications	76,775	17,885
Totals		**862,501**	**211,657**

Digital asset management

JRSO maintains an archive of all IODP digital assets, including expedition photos, videos, maps, logos, technical and operational reports, publications, and various other multimedia and documents, in a digital asset management system called MerlinOne (**https://iodp.merlinone.net/MX/Profiles/en/landing/**). During this quarter, 880 assets were uploaded, all of which were files related to archiving *JOIDES Resolution* manuals. Over the same period, 433 assets were downloaded between JRSO staff and guest users, which were a mix of Friends and Family photos and technical documents.

Publications authored by staff

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**).

- Sanfilippo, A., Pandey, A., Akizawa, N., Poulaki, E., Cunningham, E., Bickert, M., Lei, C., Vannucchi, P., **Estes, E.R.**, Malinverno, A., Abe, N., Di Stefano, A., Filina, I.Y., Fu, Q., Gontharet, S.B.L., Kearns, L.E., Koorapati, R.K., Loreto, M.F., Magri, L., Menapace, W., Pavlovics, V.L., Pezard, P.A., Rodriguez-

Pilco, M.A., Shuck, B.D., Zhao, X., Garrido, C., Brunelli, D., Morishita, T., and Zitellini, N., 2025. Heterogeneous Earth's mantle drilled at an embryonic ocean. Nature Communications, 16(1):2016. https://doi.org/10.1038/s41467-025-57121-0

Postexpedition science coordination

Moratorium activities

Early postexpedition activities include coordinating review and publication of the *Preliminary Report*, sample parties, and postexpedition editorial meetings for five JRSO expeditions that were under moratorium in the first quarter.

Postmoratorium activities

Activities include Sample Allocation Committee (SAC) activity, science party communications, review coordination of the galley proofs of the *Proceedings* volume, and Editorial Review Board (ERB) tasks.

Property disposition

Shore-based

Staff from several departments assisted in unpacking and organizing the instruments, computers and monitors, and furniture that were demobilized from the *JOIDES Resolution*. Supplies and operational equipment related to the *JOIDES Resolution* stored at the JRSO RELLIS campus warehouse were either returned to the building or marked for disposal. Final items will be removed from the RELLIS warehouse next quarter. Items no longer needed were scrapped or sent to TAMU's surplus center and removed from the property database.

Legacy documentation

Operational, coring tool, and CORK drawings

Operations and Engineering staff in the Science Operations Department archived drawings of the majority of tools used in coring, drilling, and downhole measurement operations. The documentation for all standard coring systems was organized and archived.

Shipboard laboratory documentation

The *JOIDES Resolution* legacy laboratory manuals were archived in the IODP Community at Zenodo (**https://zenodo.org/communities/iodp**).

Clearance and permitting

The final clearance and permitting reports for Expeditions 395 and 400 were submitted to the US Department of State and to agencies in Denmark and Greenland.

Scientific staffing

An SOP was finalized that documents the tasks involved with issuing calls for applications for IODP expeditions; inviting Co-Chief Scientists, scientific participants, outreach officers, and observers; vetting participants to satisfy export control regulations; and entering participant information in our in-house Crew & Cruise database.

Technology services

Data access and migration

TAMU Technology Services oversees scientific ocean drilling data storage, management, and archiving; maintains information technology (IT) infrastructure on shore for the GCR and closeout activities; develops and maintains instrument-specific software for data acquisition in the GCR; and manages the Program's extensive databases.

Expedition data requests

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

Table 5.1. Top 10 countries accessing web database

Rank	Janus database		LIMS database	
	Country	Visitor sessions	Country	Visitor sessions
1	United States	1,075	United States	3,427
2	China	247	Poland	374
3	United Kingdom	223	China	352
4	Germany	191	United Kingdom	340
5	Canada	139	Germany	198
6	Australia	96	France	119
7	Switzerland	91	Italy	102
8	France	88	India	95
9	Sweden	86	Canada	93
10	Japan	84	Spain	67
11	Other	545	Other	477
	Total	**2,865**	**Total**	**5,644**

Table 5.2. Top 20 database web queries

Rank	Janus database		LIMS database	
	Query	Views	Query	Views
1	Images—core photo	1,628	X-ray—PXRF	1,347
2	Chemistry—interstitial water	1,313	Chemistry—carbonates	1,155
3	Sample	1,055	Chemistry—interstitial water	1,088
4	Depth point calculator	1,029	Samples	1,082
5	Site summary	768	Chemistry-gas safety	985
6	Physical properties—GRA	699	Chemistry-ICP-AES	969
7	Core summary	574	Images—section photo	890
8	Physical properties—MS	559	Images—core photo	817
9	Site details	431	Section summary	747
10	Chemistry—carbonates	428	Hole summary	731
11	Images—prime data	415	Physical properties—MAD	494
12	Special holes summary	408	Core summary	481
13	Hole Summary	387	Physical properties—MS	441
14	Paleontology—range charts	360	Physical properties—NGR	403

Rank	Janus database		LIMS database	
	Query	Views	Query	Views
15	Physical properties—MAD	340	Physical properties—GRA	392
16	Physical properties—RSC	300	Paleomag—SRM section	392
17	Hole trivia	266	Physical properties—RSC	382
18	Images—closeup	181	Images—microimg	352
19	Paleontology—age model	178	X-ray—XRD	349
20	Physical properties—AVS	177	X-ray—XRF	298
	Other	2,022	Other	3,605
	Total	**13,518**	**Total**	**17,400**

Other projects and activities

JRSO conducted routine system maintenance in accordance with the TAMU IT security policy. The IT staff completed the work to enable centralized management policies that distribute security updates to all workstations. Phase 2 of the annual Risk Assessment was completed.

The login mechanism to the asset management database was re-engineered for more granular control over authentication security. The hyperscan software development phase was completed and is now in testing and quality assurance. Work is ongoing to integrate the ship's instruments and hosts into the shore computing environment. A project began to migrate legacy expedition data from physical backup media to long-term online storage.

Expeditions 395 and 400 data were released from moratorium during this quarter.

Data migration to (1) NCEI and (2) Zenodo

Data migration efforts to Zenodo continued with 251 datasets created for IODP expeditions 341, 349, 368, 372B/375, and 395. A full list of expeditions for which data has been migrated to Zenodo is available at **http://iodp.tamu.edu/database/zenodo.html**.

4. Financial closeout

Financial JRSO closeout tasks continued but will be reported in the JRSO award quarterly reports.