

## INTERNATIONAL OCEAN DISCOVERY PROGRAM (IODP)

\$50,400,000  
+\$2,400,000 / 5.0%

### International Ocean Discovery Program Funding (Dollars in Millions)

FY 2021 Actual	FY 2022 (TBD)	FY 2023 Request	Change over	
			FY 2021 Actual Amount	Percent
\$48.00	-	\$50.40	\$2.40	5.0%

### Brief Description

The *JOIDES Resolution (JR)* drillship represents NSF's primary contribution to IODP. The *JR* is a deep-ocean drilling vessel whose scientific operations are procured for NSF by means of a long-term lease held by the *JOIDES Resolution* Science Operator (JRSO), Texas A&M University. Besides NSF, the Ministry of Education, Culture, Sport, Science and Technology (MEXT) of Japan and the European Consortium for Ocean Research Drilling (ECORD) continue to provide drilling platforms to IODP.

### Scientific Purpose

IODP began in FY 2014 as the replacement for the Integrated Ocean Drilling Program, which succeeded the Ocean Drilling Program. IODP represents an international partnership of the scientists, research institutions, and funding organizations of 22 nations collecting geologic data and samples from beneath the ocean floor. IODP explores Earth's evolution and structure recorded in the ocean basins. IODP platforms provide sediment and rock samples (cores), *in situ* monitoring, sampling,



*JOIDES Resolution* on station conducting scientific ocean drilling during IODP Expedition 352 (July-September 2014). Credit: Tom Fulton.

measurement from borehole observatories, shipboard and shore-based descriptive and analytical facilities, downhole geophysical and geochemical measurements (logging), and opportunities to conduct experiments to determine *in situ* conditions beneath the sea floor.

### Status of the Facility

The award with Texas A&M University supports facility operations during FY 2020-2024. In cooperation with the *JOIDES Resolution* Facility Board (JRFB), NSF convenes an annual external panel to examine

facility performance and community responsiveness. Due to pandemic conditions, the most recent panel review was held in February 2020. The summary of this panel review follows:

"The JRSO Site Visit Panel concludes that the facility is being managed extremely well by JRSO, with continued positive evolution of management practices, facility enhancements, and efforts related to making data and publications more widely available to the scientific community. JRSO interacts extremely well with the JRFB and related panels to implement the IODP Science Plan."

After numerous international workshops, the IODP community has released a new science plan named *2050 Science Framework for Scientific Ocean Drilling*.<sup>1</sup> This plan guides multidisciplinary sub-seafloor research into the interconnected processes that characterize the complex Earth system and shape our planet's future. The *2050 Science Framework* has a 25-year outlook, requiring state-of-the-art approaches for scientific ocean drilling to achieve its objectives into the mid-21st century. Foundational Earth science research is described in seven Strategic Objectives and five Flagship Initiatives with Enabling Elements that encourage innovation and new discoveries. The Framework is supported by Enduring Principles that discuss access to data, the proposal process, planning and safety, diversity and inclusion, and international collaboration. The new Framework is available on the IODP website.

#### Summary of COVID-19 Impacts

The COVID-19 pandemic continues to have a significant impact on IODP, particularly on operations of the *JR* facility. Science expeditions conducted with a science party resumed in August 2021, immediately after three prior FY 2021 expeditions sailing with reduced technical staff and a minimal onboard scientist presence.

#### **Meeting Intellectual Community Needs**

A comprehensive online survey of the U.S. science community was undertaken from December 2016 to May 2017 with the support of the United States Advisory Committee (USAC), the advisory committee for the United States Science Support Program that supports US. Scientist participation in IODP. The survey assessed the success of the *JR* in meeting the needs of the IODP Science Plan. A total of 876 complete responses were received. In September 2017, 81 scientists convened for the *JR* Assessment Workshop to distill and analyze these survey responses, examine the science results of FY 2014-2017 *JR* operations, and make recommendations to NSF regarding whether the *JR* was still needed to address the remaining objectives of the ten-year science plan.

The report states: "the survey results underscore the scientific community's deep satisfaction with the *JOIDES Resolution* and its ability to continue to fulfill IODP objectives. Responses were strongly positive with respect to the ship's drilling systems, analytical systems, and logging systems, with each receiving favorable ratings from over 90 percent of the respondents ... the vessel's operational time has recently increased from eight to 10 or more months per year, positioning IODP to achieve high-priority science goals at an accelerated rate."

---

<sup>1</sup> [www.iodp.org/2050-science-framework](http://www.iodp.org/2050-science-framework)

## Governance Structure and Partnerships

### NSF Governance Structure

The *JOIDES Resolution* facility provided by NSF to IODP is managed at NSF by an Integrated Project Team consisting of the NSF/OCE/ODP Program director, the GEO Senior Advisor for Facilities, and staff from BFA's Large Facility Office, the Cooperative Services Branch in the Division of Acquisition and Contract Support, and others in BFA.

GEO's Division of Ocean Sciences manages IODP operations of the *JR* and the IODP Support Office under the NSF Ocean Drilling Program. NSF's Ocean Drilling Program is located within the Integrative Programs Section, with one Program Officer dedicated to oversight. This Program Officer has responsibility for the awards supporting *JR* operations, the IODP Support Office, and the U.S. Science Support Program that funds U.S. scientist participation in IODP.

### External Governance Structure

NSF provides the *JR* as the light IODP drillship through an award with Texas A&M University as the JRSO. MEXT provides the *Chikyu* as the heavy IODP drillship through the Japan Agency for Marine-Earth Science and Technology, while the British Geological Survey manages ECORD drilling contributions through single-use mission-specific platforms. Each entity providing an IODP drilling platform is responsible for sample and data storage, publications, and other science costs associated with the respective platform operations.

The JRFB, one of three IODP governing bodies, is chaired by a U.S. scientist, with participation by NSF, other contributing international funding agencies, community scientists, and the facility operator. Scientific community members are selected from among nominations submitted through a process managed by the U.S. IODP Science Support Office, housed at Scripps Institution of Oceanography; representatives from the funding agencies, NSF and the facility operator are chosen by those organizations. The JRFB provides operational and management oversight of (1) the *JR* (via the operator—Texas A&M University), (2) the Science Support Office, and (3) the *JR* Facility Advisory Panels. The JRFB approves annual program plans and decides on ship tracks on behalf of IODP; NSF decides whether to accept these plans in executing its fiduciary and legal authority for the *JR*.

### Partnerships and Other Funding Sources

IODP participants include the United States, Japan, ECORD (Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom), the People's Republic of China, Korea, India, Australia, and New Zealand, with all participants except Japan providing financial contributions to the *JR* operations. Japan provides program support through substantial investment in the heavy drill ship *Chikyu* operations, with U.S. and Japanese scientists enjoying reciprocal rights on each drilling vessel.

**Funding**

**Total Obligations for IODP**

(Dollars in Millions)

	FY 2021	FY 2022	FY 2023	ESTIMATES <sup>1</sup>				
	Actual	(TBD)	Request	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Operations & Maintenance	\$48.00	-	\$50.40	\$50.40	\$50.40	\$50.40	\$50.40	\$50.40

<sup>1</sup> Outyear estimates are for planning purposes only. The current cooperative agreement ends September 2024.

The FY 2023 Request includes \$50.40 million for IODP. The increase above FY 2021 is primarily associated with inflationary increases in drilling equipment, supplies, and other operational costs.

**Reviews**

Review of FY 2020 *JR* operations and awardee performance by an NSF panel would normally have occurred in February 2021. This review was postponed due to pandemic travel restrictions and the associated reduction in FY 2020 *JR* science operations. The next NSF Panel is scheduled to meet in summer 2022 to review both FY 2020 and FY 2021 *JR* operations and awardee performance.

**Renewal/Recompetition/Termination**

After NSB authorization and the NSF Director’s approval, the current award was renewed for an additional five years of operation from FY 2020 through FY 2024.

The IODP Science Support Office award at the University of California, San Diego, was extended in 2018 for another five years after excellent performance and panel proposal review.

NSF does not plan to operate *JR* beyond 2028, which would slightly exceed the planned service life of the drillship. In response to a Dear Colleague Letter, NSF received Expressions of Interest in acquiring and operating a new, globally-ranging scientific drilling vessel to meet challenges posed by the *2050 Science Framework for Scientific Ocean Drilling*. Planning for a replacement drill ship to meet the needs of a new, U.S.-led program has begun. Currently, U.S. science community efforts are under way to define Science Mission Requirements for this new vessel.