

NSF Response to the JOIDES Resolution Science Operator (JRSO) Mid-Award Site Visit Panel  
Report  
July 19 - 21, 2022

The NSF Panel site visit and mid-award review of JRSO Award OCE-1326927 occurred July 19-21, 2022, at the JRSO facility in College Station Texas. This Panel replaced two previous panels that were scheduled to review FY 2020 and 2021 operations (February 2021 and February 2022). These two panels were deferred due to pandemic conditions. The review period of JRSO operations thus covered October 1, 2019 to July 1, 2022. The Panel found continued excellent JRSO performance in all aspects of science operations and was impressed with how effectively the JRSO confronted the challenges of maintaining effective operations while under severe pandemic protocols. The Panel emphasized the importance of keeping NSF-owned DSDP, ODP, and IODP cores in instrumented repositories, with continued support of these cores, data legacy migration, and publication activities during a proposed five-year IODP program closeout by the JRSO after JR operations cease.

The Panel Executive Summary states:

*The JRSO facility, led by the US, is vital to the marine geoscience community for continued global leadership in addressing critical issues of climate change, Earth hazards, and habitability. This facility also presents an excellent continuing opportunity for US technology, innovation, partnerships, and workforce development. The JOIDES Resolution is in remarkable condition for its age, as described in a report stemming from a June 2022 ship visit by JMS Naval Architects and in co-chief and science party reviews. The physical facility (ship and instruments) and human resources currently provided through the JRSO and its contractors are remarkably strong and are not readily reproducible. Current science and technical staffing have enabled the achievement of major scientific goals. In support of the physical facility, the JRSO is spearheading the implementation of innovative measurements, curation (cores and data), computing, publications, and training the next generation of scientists and technical innovators. The program, including the interaction of the JRSO, JOIDES Resolution Facility Board (JRFB), and supporting panels, is working remarkably well and is addressing the current science plan as well as key elements of the 2050 Scientific Framework. We fully endorse the efforts of the JRSO, the JRFB, and attendant structure to complete operations for IODP in 2024. We strongly recommend using all means possible to extend the use of these finely-honed tools as a US program through the planned life of the vessel in 2028, paving the way for a next-generation scientific ocean drilling vessel.*

The Panel made eight recommendations to NSF, which NSF receives or accepts. These recommendations along with their responses are given below, grouped where appropriate.

**Recommendation 1:**

**The JRSO facility should be continued and supported not only through 2024 to implement scheduled scientific drilling, but also beyond 2024 as a critical bridge to developing/obtaining the next generation platform.**

**Recommendation 2:**

**We strongly encourage continued use of the JOIDES Resolution after IODP ends in 2024 to foster US leadership in ocean sciences and provide a bridge to implementation of the 2050 Science Framework.**

The Panel recognized the importance of the JR in making transformative discovery, noting that it is both unique and likely capable of operating until 2028. NSF receives these recommendations and responds that a confidential internal process within NSF is underway to determine whether the JRSO Cooperative Agreement for science operation of the JR should be renewed. This process follows NSF internal guidance on determining whether to renew, compete, or dispose of a major facility.

**Recommendation 3:**

**Every effort should be made to retain talented JRSO staff to ensure safe and effective operations and continue the science achievements of the program.**

The Panel was concerned about retention of key JRSO staff, especially if the JRSO Award was not renewed. The Panel noted how creative and adept JRSO staff have been in mitigating the effects of the COVID-19 pandemic, especially when the JR has sailed with reduced or absent science parties, thus increasing JRSO staff expedition workload. NSF accepts this recommendation and forwards it to the JRSO; it is up to JRSO to implement it within the allowable limits of NSF award and Texas A&M University personnel policies.

**Recommendation 4:**

**Expand virtual training platforms (e.g., videos featuring instrument operations protocols and how to resolve commonly occurring issues) that scientists can reference in addition to the existing online manuals and other text-based resources.**

This recommendation is oriented towards providing more effective training for scientists unfamiliar with the JR shipboard science equipment, especially for those in their early career. Creation of these training aids may help to alleviate shipboard resource limitations, especially in having technical assistance on all lab shifts. NSF accepts this recommendation and forwards it to the JRSO for implementation as resources allow, noting that staff shortages may interfere with implementation.

**Recommendation 5:**

**Learning from the experience of COVID-19, and the recently expanded bandwidth on the JOIDES Resolution, we encourage greater leveraging of shore-based investigators (core-log-seismic integrations, data analysis, etc.).**

The Panel was impressed with the resilience of science parties to cope with reduced staffing during expeditions because of last-minute science party member withdrawal and limitations in

berthing due to pandemic restrictions. Recent improvements in JR communications bandwidth allowed for much greater involvement in IODP expedition science discovery from shore-based scientists, thereby allowing for greater total shipboard science party expertise in making science decisions at sea. The Panel thus encourages a greater integration of shore-based scientists with the ship-board science party. This recommendation has implications regarding scientific staffing, data security, and maintaining the data Moratorium integrity, and needs broad-based discussion before being acted upon. Therefore, NSF receives the recommendation and forwards it to the JRSO, JRFB, USSSP, and the IODP Forum for further discussion.

**Recommendation 6:**

**We suggest that the JRFB chair debrief the Science Evaluation Panel (SEP) and Environmental Protection and Safety Panel (EPSP) panel chairs twice a year to discuss issues. We also encourage the JRSO to ask co-chiefs to comment on how the expedition addressed the 2050 Science Framework, perhaps in the Preliminary Report.**

The Panel was impressed with how the peer-review process is occurring in the JRFB panels, noting the value of the “Small Group Meeting” held after SEP meetings under the auspices of the Scripps IODP Science Support Office to examine issues regarding proposal review. The Panel felt that the JRFB Chair should convene meetings twice a year with the JRFB Panel Chairs to brief them on items of importance and to discuss strategy. The Panel further wished for the JRSO to ask Co-Chiefs to address expedition results within the context of the 2050 Science Framework. NSF receives these recommendations and forwards the suggestion and encouragement to the JRFB Chair and JRSO.

**Recommendation 7:**

**We encourage continued development of a strong early-career workforce utilizing the JRSO facility. We suggest sailing as many early career US-based participants on the JOIDES Resolution as possible.**

The Panel recognized that the JRSO has done an exemplary job in staffing JR scientific parties, and further noted that the JRSO and USSSP have worked effectively together in ensuring opportunities for U.S. scientists, especially those early in their career. The Panel recognizes that there are limited expeditions left in the IODP for staffing, and notes that not all available berths have been filled during IODP expeditions. The Panel recommends sailing as many U.S. early career scientists as possible in the remaining IODP expeditions while honoring the rights of NSF IODP Memorandum partners.

NSF accepts this recommendation and directs the USSSP and JRSO to work together in maximizing the numbers of U.S. early career scientists to be staffed as shipboard science party members in the remaining IODP expeditions.

**Recommendation 8:**

**We strongly endorse that during demobilization of the JOIDES Resolution that critical instrumentation be moved to US-based locations and that the JRSO continue to provide services for continued scientific study of cores.**

The Panel endorsed a presented five-year legacy plan to wind down JRSO IODP support activities in a new award if the JRSO award for operations of the JR is not renewed. This plan is paced by publications activity and includes support for migration of JANUS and LIMS data to archival storage within the Zenodo database at CERN and support for an instrumented core repository at Texas A&M University. The Panel urges that when the JR is demobilized after the cessation of operations, that the science equipment on board be moved wherever possible to the Gulf Coast Repository at Texas A&M University and other core repositories rather than disposed elsewhere.

NSF receives this recommendation, and forwards it to JRSO for consideration, noting that the equipment onboard the JR is fully owned by Texas A&M University. Thus, JRSO is responsible for JR science equipment disposition. Support for demobilized JR equipment in an instrumented Gulf Coast core repository will be considered through peer-review of a JRSO-submitted five-year legacy plan.