

**NSF Response to the *JOIDES Resolution* Science Operator Site Visit Panel Report  
February 28 - March 2, 2018**

The National Science Foundation's Division of Ocean Sciences, Ocean Drilling Program welcomes the recommendations of the *JOIDES Resolution* Science Operator Site Visit Panel Report and will take action on all of them.

NSF was pleased to receive the Executive Summary that states: **"The *JOIDES Resolution* (JR) is a unique scientific research facility that permits Earth exploration and hypothesis-testing globally to tackle large-scale problems at the frontiers of our knowledge. No other platform offers its range of capabilities. The *JOIDES Resolution* Science Operator (JRSO) continues to perform the tasks of technical and scientific support to the world-wide research community in outstanding ways. The JR is an exceptional platform for research collaboration, with an outstanding track record of safety and operational efficiency that forges the development of international teams with diverse expertise that creates an enduring legacy. The JRSO Site Visit Panel concludes that the facility is being managed superbly well by the JRSO, with effective support from the *JOIDES Resolution* Facility Board and NSF, to meet the international scientific communities' Science Plan."**

The primary finding that the facility is being "superbly" run by the JRSO, with effective management and oversight by the *JOIDES Resolution* Facility Board (JRFB) and NSF is welcome and indicates that the holistic system for managing this facility for the benefit of the International Ocean Discovery Program (IODP) is working well. Fundamentally, the Panel determined that the JR is needed to address the IODP Science Plan, noting that the five IODP Expeditions in FY2017 addressed 12 of the 14 identified challenges in all four Science Plan themes. The Panel noted that "the operational measure of the facility (planned vs actual operations) for FY2017 operation is remarkable (95%)," while also stating that "considering the highly constrained budget environment, the financial performance of JRSO is exemplary."

The Panel was impressed with how well the JRSO incorporated recommendations of previous Panels into their operations, including enhanced use of their website and other media interfaces to provide information and guidance regarding operational capabilities and associated risks, innovative means of archiving legacy publications and documents, increased capabilities of the Gulf Coast Repository, and enhanced interaction with IODP Members in staffing. NSF is grateful to both the JRSO and to the Panel for their hard work on behalf of the ocean drilling science community.

The panel identified three areas of concern, given here verbatim:

- 1) The review panel emphasizes that the aging infrastructure of the JR increases the chances of future major failures and significant downtime. The panel

- urges NSF, the JRSO and other potential partners to begin planning for future facilities.
- 2) The review panel recognizes and acknowledges the increased complexity of drilling operations taken on by the JRSO and commends the facility for the operational successes and scientific contributions that have derived from those expeditions. However, in light of anticipated continued budget pressures, we are concerned that the JRSO can continue to pursue the same pace of more advanced operations.
  - 3) Availability of sufficient high-quality seismic data continues to impact ability to submit competitive proposals. Continuation of this trend ultimately can/will impact viability of/need for JRSO facility.

NSF acknowledges these concerns, and will work with the JRFB and JRSO in ensuring operational planning in the current IODP that reflects budget realities and manages facility risk. After a decision regarding renewal of the JR is made in FY2019, NSF will respond to science community needs through future planning in scientific ocean drilling. NSF also remains committed to supporting the seismic research needs of the U.S. ocean science community.

The Panel's ten recommendations fall into several main areas and half concern risk management of JR operations, with a focus on mining of existing data to reduce risk. Others focus on enhanced support of the shipboard science parties and enhanced support for archiving external publications related to IODP.

#### **Facility Operations Risk Management Recommendations:**

**Recommendation 1: We recommend that the JRSO continue to develop and apply risk analysis methods for proposed drilling operations and continue to communicate preliminary risk evaluations during the proposal development process (i.e. at the IODP Science Evaluation Panel, known as SEP) and to help the proposal review process at SEP identify operational approaches that might reduce risk and complexity. Moreover, we recommend that the JRSO pursue discussions with SEP and the JRFB about the likely convergence of the cost of more complex operations and a decreasing budget that could result in the reduction of annual drilling expeditions.**

**Recommendation 2: The streamlined proposal review process is effective and resulting in high-quality proposals being forwarded to the JRFB. We recommend that JRSO utilize their participation in this process to ensure that sufficient alternate sites are included for all expeditions, including sites that require differing operational approaches (different water depths, sediment thickness and/or type, etc.).**

**Recommendation 3: We recommend that the JRSO consider developing and implementing mechanisms and procedures to compile, mine, and publicize the rich and abundant information accumulated over the years in drilling operations.**

**We also recommend that JRSO analyze those data in an appropriate manner to help record and document the insight and experience that resides with the current staff.**

**Recommendation 4: Site survey data are critical for correctly positioning drill sites and interpreting results. We recommend that the JRSO work with JRFB and the Science Support Office to ensure that appropriate site survey data are available on the JR for each expedition.**

**Recommendation 5: The Panel recognizes the exemplary safety record of the JRSO. We recommend that a review of the safety record becomes part of the annual NSF facility review. In particular, this panel would like to see information about non-reportable recorded incidents as this record is often considered a leading indicator of potentially more serious incidents. We would also like to learn of any new safety initiatives undertaken over the course of the previous year.**

These Panel recommendations provide suggestions for mining under-utilized data and knowledge that could be used to mitigate operational risk in an aging facility where maintenance costs and breakdowns are likely to increase in the future. NSF agrees with the thrust of these recommendations and suggests that the JRSO examine ways to more effectively draw upon operational experience in planning complex operations, and convey this information to IODP proposal authors, the Science Evaluation Panel, and Expedition Co-Chiefs during the proposal evaluation and expedition planning processes. NSF understands that limitations in JRSO funding and staffing provide obstacles to this effort; initial efforts by the JRSO to classify proposed expeditions in terms of cost and complexity during the review process (as types 1, 2, or 3) is a promising start.

Recommendation 2 highlights the need for increasing the number of alternate sites in expedition planning for complex or difficult operations. NSF has confidence that the JRSO, as part of the SEP proposal review watchdog process, will implement this recommendation.

NSF supports efforts by the JRSO to work with the JRFB and IODP Science Support Office to modify Site Survey policies to ensure that critical site survey data are available onboard every JR expedition for both safety and science support. In addition, NSF tasks the JRSO with including an annual summary of the safety information provided in JR Daily Reports as part of the facility Annual Report to NSF and the JRFB, and make this information easily accessible to the Panel in future reviews.

#### **Enhancement of Science Party Support Recommendations:**

**Recommendation 6: The Panel recommends that, in addition to laboratory manuals, an annotated power point and/or video guide to labs and equipment should be available to reinforce the information provided during the introductory**

**presentations, when there is an overload of information provided and/or lack of information-retention because of culture/language issues.**

**Recommendation 10: The Panel recommends that the JRSO develop clear strategy and guidelines for co-chief scientists and EPMs to inform the science party in advance of the expedition about the measurements to be conducted onboard and at the GCR, and the logistical arrangements needed to obtain the required measurements.**

These recommendations recognize that the JRSO can enhance science planning for JR operations through better communication of what is possible and what can be realistically done aboard the JR during operations. Improvement of laboratory manuals and other visual guides to the onboard laboratories and equipment should help science parties prepare for efficient work aboard the JR, as well as devise more effective shipboard and shore-based sampling and data acquisition strategies. This information may improve the effectiveness of scientific staffing of expeditions as well. NSF requests that the JRSO examine these recommendations carefully and suggests moving forward in implementing improvements using the task management processes that have been used effectively to improve the shipboard computing environment.

**Recommendation 7: The Panel recommends that the JRSO continue to explore ways to install a whole-core XRF core scanner onboard the JR.**

NSF understands that significant laboratory spatial and financial obstacles exist that must be solved before this recommendation can be implemented and requests that the JRSO report to the JRFB the trade-offs and financial requirements needed to implement this recommendation.

**Recommendation 9: The Panel recognizes the successes of Outreach activities aboard the JR during FY17. The Panel recommends that the appropriate body continues efforts to improve the structure that allows the JRSO to effectively facilitate an Outreach program.**

Implementation of outreach activities aboard the JR in concert with IODP expedition science goals improved substantially in FY2017, with notable successes. In addition, IODP Program Members have, through the IODP Forum, converged on prioritization of outreach activities aboard IODP expeditions as opposed to educational activities. Recognizing that no funding for direct support of outreach activities is included in the JRSO Cooperative Agreement, NSF encourages the JRSO to continue working with the United States Science Support Program and the IODP Program Member Offices to ensure close collaboration between nominated outreach officers and expedition leadership prior to and during Expeditions.

**Archival Publication Recommendation:**

**Recommendation 8: The Panel recommends that JRSO review, update, and**

**simplify their interfaces for scientists to submit and report publications.**

NSF requests that the JRSO update and simplify the online form for reporting expedition-related publications by expedition science party members so as to help ensure IODP Publication Policy compliance reporting.