

JOIDES Resolution Facility Board (JRFB) Meeting **8-9 May 2019 – Denver, CO USA**

Consensus Statements

Consensus 1

The JRFB is encouraged by the record number of proposals submitted to SEP on 1 April 2019 for future IODP scientific drilling. The Board sincerely appreciates the interest and collaborative efforts of the global community in raising the momentum for continued scientific drilling, and thanks the Science Support Office (SSO) for their handling of the submissions and also, in advance, members of the Science Evaluation Panel (SEP) who will evaluate the submissions over the coming months. The JRFB emphasizes the need for sustained proposal pressure in the coming years, which will provide momentum for the implementation of a new program beyond the end of the International Ocean Discovery Program.

Consensus 2

The JRFB commends the Science Support Office for its recently implemented improvements in the Site Survey Data Bank, as well as in the handling of proposals and accompanying information. These upgrades have significantly improved the ease and efficiency of working with these materials for proposal proponents, proposal reviewers, EPSP, and SEP.

Consensus 3

It is the intent of the JRFB at future meetings to consider expeditions for scheduling to the end of FY 2024, subject to the availability of the *JOIDES Resolution (JR)*. This is in response to the continued proposal pressure and the recent 5-year renewal (2019-2024) of the *JR* facility award by the National Science Board.

Consensus 4

The JRFB encourages the IODP science community to continue to generate proposal pressure along the anticipated long-term ship track for FY22—FY24. Submission of new proposals and continued development of existing proposals for drilling projects in the Indo-Pacific are particularly encouraged.

Consensus 5

The JRFB has agreed to schedule proposal 910 Continental Margin Methane Cycling for October-November, 2021. The board anticipates that many expedition options for following the ship-track in the Atlantic and Mediterranean will be available for scheduling at the 2020 JRFB meeting.

Consensus 6

The JRFB supports the efforts of the JRFSO in planning for a replacement non-riser drilling vessel for the *JOIDES Resolution* in the next era of scientific ocean drilling beyond 2023. The age of the *JR* and increasing costs of maintenance in terms of money and schedule make finding a replacement a critical near-term need for the continued success of scientific ocean drilling into the future.

Consensus 7

The JRFB is excited about the positive momentum the international Earth Science community has developed in identifying new science frontiers and platform needs for the next scientific ocean drilling program. The national/regional workshops that have been held - J-DESC (Japan), PROCEED (ECORD), Ocean Planet (ANZIC), and NEXT (USA) - have been extremely well attended with a lot of enthusiasm for developing the plan for the next era of scientific ocean drilling. We also look forward to the results from the IODP-China workshop (August 2019). The strong participation and leadership engagement by early-career scientists is a strong testament to the attraction scientific ocean drilling provides to the next generation of Earth scientists. The JRFB applauds the strong desire expressed by the workshop attendees and the IODP Forum for using a multi-platform model in writing the next science plan.

Consensus 8

The JRFB recognizes and applauds the exceptional support provided by the JRSO managing the *JOIDES Resolution*, including responsiveness to extraordinary circumstances allowing the program to continue with little interruption.

Consensus 9

The timeline for completing the new scientific ocean drilling science plan, as presented by IODP Forum Chair Dick Kroon, is ambitious. However, the JRFB strongly supports this timeline because it is necessary for advancing plans for securing a new US riserless drilling platform and for international partner renewal processes. We also greatly appreciate the open nature of the proposed process and urge that the writing team be inclusive of those responsible for coordinating the regional/national workshops, subject expertise, diversity, and early career scientists.

Consensus 10

The JRFB applauds and supports the IODP Forum Chair's plans to strengthen synergies between IODP and the International Continental scientific Drilling Program (ICDP). It is essential such synergies continue to be developed and strengthened if amphibious expeditions are to be highlighted in the new science plan.

Consensus 11

The JRFB is encouraged by the report from the Future of Marine Seismics Workshop and looks forward to the NSF response to this report in maintaining the site survey capability for US scientists. This capability is vital for submitting competitive and implementable drilling proposals.

Consensus 12

The JRFB supports the attendance of SEP member(s) for Amphibious Drilling Proposals at the ICDP SAG meetings, and that the SAG representatives be invited to the relevant SEP meetings.

Consensus 13

As noted by the 2018 JRFB Consensus 9, the JRFB in exceptional circumstances on a case-by-case basis will consider to keep unimplemented sites on the board for potential completion at a later date. As such, the JRFB has decided to keep Expedition 379 Sites ASSE-01C, 02C, 03B, and 11A at the board.

Consensus 14

The Science Support Office Annual Program Plan FY'20 is recommended for approval.

Consensus 15

Liping Zhou is sincerely thanked for his service and dedication to serving on the JOIDES Resolution Facility Board. It has been a pleasure to work with him over his term and we wish him well in his forthcoming endeavours, and hope we will see him serving again on future IODP panels.

Consensus 16

Wolfgang Bach has been a dedicated advocate of scientific ocean drilling for many years. The JRFB has greatly benefitted from his experience over the term he has served. We sincerely thank him for his service to this facility board and to scientific ocean drilling and wish him well in his life after JRFB.

Action Items

Action Item 1

Before the next JRFB meeting, NSF will provide a summation of the MoU negotiations and budget forecast for future United States participation in scientific ocean drilling.

Action Item 2

The JRFB is to provide an information document on the general capabilities of the potential new non-riser platform, including the efficiencies such a new vessel will have over the *JR*, with a percentage estimate of the higher cost to all partners.

Action Item 3

The JRFB will revise the *JR* track map and the call for proposals advertisement. This will be completed before the call for proposals is due to be published to advertise the 1 October 2019 submission deadline.

Action Item 4

The SSO is asked to investigate and summarize the reason(s) why 1 April 2019 saw a record number of proposals submitted. This could be done by asking the lead proponents of the recently submitted proposals why they were submitted in April. The results will help the JRFB and other FBs focus on what is working to generate proposal pressure, which is critical for the renewal of scientific drilling in the respective member countries. The SSO findings should be submitted to the JRFB via email as soon as they are available.

Action Item 5

The JRFB Chair will work with the SEP Co-chairs to come up with an efficient format for presentation of proposals that are forwarded to the JRFB for scheduling consideration.

Action Item 6

The JRFB will forward the final FY'20 Annual Program Plan to the JRFB for electronic approval in plenty of time to meet the 1 August 2019 deadline for the plan to be submitted to NSF.

Action Item 7

The revised policies and guidelines will be approved by electronic vote after further edits. These include the Confidentiality Policy, the Sample and Data Obligations Policy, the JRFB Advisory Panels Terms of Reference, and the Guidelines for the EPSP Safety Review Report and Presentation and Expedition Safety Package.

Action Item 8

The USSSP will initiate an advertisement for replacement of the outgoing JRFB members.

Action Item 9

For the Sample and Data Obligations policy, the JRFB Chair will work to define when the changes will take effect, including the impact on shore-based sampling parties.

JOIDES Resolution Facility Board Meeting 2019 Roster

Members

James Allan	National Science Foundation, USA
Leanne Armand	The Australian National University, Australia
Wolfgang Bach	University of Bremen, Germany
Brijesh Bansal	Ministry of Earth Science, India
Steve Bohaty	University of Southampton, UK
Priscila Lelis Cagni ¹	Coordenação de Aperfeiçoamento de Pessoal de Nivel (CAPES), Brazil
Gilbert Camoin	ECORD Management Agency, CEREGE, France
Brad Clement	JR Science Operator (JRSO), Texas A&M University, USA
Barbara John	University of Wyoming, USA
Gil Young Kim	Korea Inst. of Geoscience and Mineral Res. (KIGAM), Republic of Korea
Larry Krissek	The Ohio State University, USA
Zena Maria da Silva Martens	Coordenação de Aperfeiçoamento de Pessoal de Nivel (CAPES), Brazil
Clive Neal, Chair	University of Notre Dame, USA
Yan Sun	Ministry of Science and Technology (MOST), China
Wentao Wang ²	Ministry of Science and Technology (MOST), China
Liping Zhou	Peking University, China

Liaisons

Nobu Eguchi ³	Institute for Marine-Earth Exploration and Engineering (MarE3), JAMSTEC, Japan
Holly Given	IODP Science Support Office, Scripps Institution of Oceanography, USA
Sean Gulick	SEP Co-Chair, University of Texas at Austin, USA
Barry Katz	EPSP Chair, Chevron Corporation, Houston, TX, USA
Dick Kroon	IODP Forum Chair, University of Edinburgh, UK
Shin'ichi Kuramoto	Institute for Marine-Earth Exploration and Engineering (MarE3), JAMSTEC, Japan
Lisa McNeill	SEP Co-Chair, University of Southampton, UK
Ulla Röhl	ECORD Science Operator (ESO), University of Bremen, Germany
Yoshiyuki Tatsumi	Chikyu IODP Board Chair, University of Tokyo, Japan
Gabriele Uenzelmann-Neben	ECORD Facility Board Chair, Alfred Wegener Institute, Germany

Observers

Gary Acton	JRSO, Texas A&M University, USA
Carl Brenner	USSSP, Lamont-Doherty Earth Observatory, Columbia University, USA
Cristiano Chiessi	University of São Paulo, Brazil
Roz Coggon	PROCEED Workshop Co-Chair, University of Southampton, UK
Helen Feng	IODP Science Support Office, Scripps Institution of Oceanography, USA
Zhen Guo	IODP-China, Tongji University, China
Nadine Hallman	ECORD Management Agency, CEREGE, France
Bob Houtman	National Science Foundation, USA
Kevin Johnson	National Science Foundation, USA
Anthony Koppers	NEXT Workshop Co-Chair, Oregon State University, USA
Mitch Malone	JRSO, Texas A&M University, USA
Harue Masuda	J-DESC, Osaka City University, Japan
Ken Miller	Rutgers, The State University of New Jersey, USA
Antony Morris	ESSAC Chair, University of Plymouth, UK
Xueting Peng	Ministry of Science and Technology (MOST), China
Larry Peterson	National Science Foundation, USA
Katerina Petronotis	JRSO, Texas A&M University, USA
Angela Slagle	USSSP, Lamont-Doherty Earth Observatory, Columbia University, USA
Deborah Smith	National Science Foundation, USA
James Spencer	USSSP, Lamont-Doherty Earth Observatory, Columbia University, USA
Karen Stocks	IODP Science Support Office, Scripps Institution of Oceanography, USA
Shouting Tuo	IODP-China, Tongji University, China
John Walter	National Science Foundation, USA
Tatsuya Watanabe	Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan
James Wright	USAC Chair, Rutgers, The State University of New Jersey, USA
Michiko Yamamoto	IODP Science Support Office, Scripps Institution of Oceanography, USA

Not in Attendance

¹ Alternate for Zena Maria da Silva Martens

² Alternate for Yan Sun

³ Alternate for Shin'ichi Kuramoto

JOIDES Resolution Facility Board Meeting Notes: 8-9 May 2019 – Denver, CO USA

Wednesday

8 May 2019

09:00-17:30

1. Welcome and Introductions

JOIDES Resolution Facility Board (JRFB) Chair, Dr. Clive Neal, welcomed the group and provided an overview of the meeting structure, including:

- Reports from IODP supporting and advisory bodies
- Scheduling of the *JR* with proposals forwarded from the Science Evaluation Panel (SEP)
- Looking to the future of IODP by discussing international workshop results and developing a new Science Plan

Dr. Neal introduced the board members, moderated self-introductions for all present, and reviewed the rules of engagement, confidentiality policy, and conflict of interest (COI) management. He then went over the status of each action item and consensus statement from last year's meeting to provide a sense of continuity and context for this year's meeting.

2. Approval of Meeting Agenda

Dr. Neal requested and received consensus to approve the agenda.

3. Approval of May 2018 JRFB Meeting Minutes

Dr. Neal requested and received consensus to approve the 2018 Meeting Minutes.

4. National Science Foundation (NSF) Report

4A. National Science Board Review

NSF IODP Program Director, Dr. Jamie Allan, gave the NSF report. He explained the timeline of the *JR* facility renewal by the National Science Board (NSB), noting that the extension of the current award should happen soon. The *JR* facility award will be extended through 2024, which is a standard NSF 5-year award and provides an additional year of operations beyond the *JR* memoranda negotiations as a safety valve. The revised JOIDES Resolution Consortium draft memoranda have been returned to the *JR* consortium partners for final comments before the official NSF clearance process.

4B. NSF Budget Forecast

Dr. Allan described the "neutral" budget news this year. The President's proposed FY2020 budget for the NSF is ~\$7B. The OCE/ODP 2020 budget has not yet been determined, but a flat budget should be expected. The FY2020 fiscal guidance to the *JR* Science Operator (JRSO) remains the same as in the previous year, at \$65M, which will cover 8 months of operations. Given the current state of fiscal affairs, FY2021's budget may be lower.

Dr. Neal asked the board to bear in mind the expedition cost categories when scheduling the *JR* and to think about the science that can be achieved within the budget presented. Dr. Allan responded that there could be a cash flow issue, as the NSF budget for this year is \$48M, with an expected base contribution between \$11.7M and \$17.7M for 2020 and contributions from China for that year between \$3M and \$6M. Some savings have accrued from recent Complementary Project Proposals (CPPs), but the savings have been reduced from year to year so there is a need to be somewhat conservative in terms of scheduling the ship.

4C. 2023 Renewal

NSF was presented with the idea of a replacement drillship for the *JR*, as the aging ship, particularly the drilling equipment, is getting difficult to maintain. After a new Science Plan has been drafted (which may be as early as January 2020), NSF will consider issuing a *Dear Colleague Letter* to determine community interest in a possible post-2023 plan. Dr. Allan explained that a *Dear Colleague Letter* is one way that NSF communicates with the scientific community, by requesting responses that help NSF determine possible paths forward. NSF would like to gauge interest in the US scientific community for providing a post-2024 science platform for scientific ocean drilling, and this would be reflected in the number of responses received. The earliest award for a new drillship would be made in Summer 2023, with current *JR* partners expected to contribute a similar percentage of operational costs. Dr. Allan noted that it will be difficult to minimize a drilling hiatus, as NSF is using funds to plan for a new ship and will need financial help from *JR* partners to bridge a possible gap.

4D. JR-100 Update

Dr. Allan gave a brief overview of the *JR-100* program and its history. The US used to have a long-coring facility on the R/V *Knorr* run by the Woods Hole Oceanographic Institution and owned by the Navy. After the *Knorr* was retired, the *JR* was found to be a suitable replacement to do piston coring at <100 m penetration depth during transits. Operational funds are provided by the Integrated Programs Section (IPS) of NSF, which are separate from funds dedicated to *JR* operations. The first implementation of the program was complicated by a dry dock incident that upended the ship schedule and cost IPS much more than planned, but did not result in any loss of science. Funding is tight at NSF, so it remains to be determined whether another call can be scheduled. Dr. Allan concluded that using the *JR* for *JR-100* operations is an efficient use of ocean science resources, without impacting IODP operations, and was considered favorably by the NSB.

4E. Q&A

JRFB Member, Dr. Leanne Armand, asked Dr. Allan to explain what provisional funding may be expected of *JR* partners, as the information may be relevant for ANZIC's renewal efforts. Dr. Allan said he is unable to provide any details, although a hiatus is likely due to the nature of program transitions. Depending on the community's response, an open competition may be required, which would lengthen the process. He doesn't want a gap in the program, but it is difficult unless more funds are secured, emphasizing the importance of contributions from *JR* consortium partners.

Dr. Armand asked about contingency plans for the program, and Dr. Allan relayed the guidance that the NSB received: first reduce the complexity of operations, then restrict the amount of operations, and finally end the program as a last resort. Dr. Armand suggested another contingency option for funding consideration through the support of legacy data to achieve science objectives. Dr. Allan said the goal is to keep the ship running as long as possible, recalling the 2004 transition during which the *JR* took on intermittent work and helped preserve IODP as a program. There may be hard choices to make in 2022 or 2023. However, if funding from *JR* partners materializes (e.g., China provides \$6M, ANZIC steps up its contribution, new members join) then the program will be in good shape. Losing members would put the program in trouble. Dr. Neal emphasized that there are many unknowns, but the international partners should be aware of the flat NSF budget, possible replacement of the *JR*, and importance of international contributions in keeping the workhorse of the program going. Dr. Allan added that the options should become clearer at the next JRFB meeting and NSF should have a range of projections, as they will likely have signed memoranda in place by then.

ESSAC Chair, Dr. Tony Morris, asked what a *Dear Colleague Letter* would trigger, and Dr. Allan replied that NSF would be inviting responses from institutions in the US interested in being a platform provider. IODP Forum Chair, Dr. Dick Kroon, asked if the first indication of a new vessel would be in 2023. Dr. Allan confirmed that would be the earliest date where NSF could be in a position to make an award for a new vessel. Dr. Kroon noted that it would take 4-5 years to build a new vessel, and Dr. Allan responded saying there were different ways of dealing with a gap in the program, reiterating that additional funds would be needed to run the *JR* to avoid the gap.

NEXT Workshop Co-Chair, Dr. Anthony Koppers, being on the steering committee for post-2023 scientific ocean drilling, asked what would happen if international partner contribution signs looked poor. Dr. Allan said the first step would be getting approval in terms of signing memoranda. The NSB indicated a range of acceptable operational funds, which could be enough to run the ship at reduced operations through 2022. Guidance from NSF leadership has implied that the partners need to contribute a certain percentage for NSF to consider extending the *JR* beyond 2024.

Dr. Neal noted that the partners need to report back to their funding agencies with material to support their continued participation in the program, and Dr. Allan responded that the memoranda are on the table and state their intentions. They are non-binding and may be subject to available funds, and it is up to the partners to accept. The Director of the ECORD Management Agency, Dr. Gilbert Camoin, said ECORD is not on the same timeline as ANZIC. Their renewal is in 2023, so they will need to know in 2022 how things may shape up. Dr. Allan replied that the future of the program should be much clearer in a year from now.

Action Item 1

Before the next JRFB meeting, NSF will provide a summation of the MoU negotiations and budget forecast for future United States participation in scientific ocean drilling.

5. US Seismic Imaging and Site Surveying Options

5A. Options for the US community – near-term/far-term

Drs. Debbie Smith and Larry Peterson, NSF program officers, provided the context for discussing US seismic imaging and site survey options, explaining that they receive proposals to analyze core data and do site surveys. In April, there was a workshop at NSF examining the future of US marine seismic capabilities, which are currently provided by the R/V *Langseth*. The goal of the workshop was to identify models for providing seismic capabilities and consider how to move forward on implementing the models. The workshop report was just received and has not been discussed internally yet but is available for public access. Mr. Bob Houtman, Section Head at NSF, noted that it is posted on the University-National Oceanographic Laboratory System (UNOLS) and Marine Seismic Research Oversight Committee (MSROC) websites.

Dr. Smith went over recent site characterization awards, listing 6 site survey proposals funded by NSF between 2016 and 2019. Dr. Neal asked if there was a way forward on the relevant consensus statement from last year's JRFB meeting, as site survey data are needed to support quality drilling proposals. He also asked if NSF was open to funding time on non-US ships. Dr. Smith responded that his questions were addressed in the workshop report. She noted that there was representation from Japan at the workshop, and NSF was willing to consider funding the use of their vessels.

5B. Q&A

Dr. Kroon followed up on NSF options for supporting site surveys asking why Japan would be the only viable option for marine seismic resources, and Dr. Smith replied that was just an example.

Consensus 11

The JRFB is encouraged by the report from the Future of Marine Seismics Workshop and looks forward to the NSF response to this report in maintaining the site survey capability for US scientists. This capability is vital for submitting competitive and implementable drilling proposals.

6. Report of the JR Science Operator (JRSO)

6A. JRSO Performance in FY'18

Dr. Brad Clement, Director of the JRSO, informed the group that the annual Co-Chief review had been held, and they are waiting on the NSF panel to weigh in and provide recommendations before taking their next steps. He noted that FY2018 may have been the most ambitious year in the history of ocean drilling, with 5 expeditions undertaken involving expensive and complicated operations. Dr. Clement commended the Board for scheduling the Hikurangi observatory work several years in advance, as it greatly benefited from the JRSO having enough time to prepare for the workload. He also praised JRSO staff members Drs. Katerina Petronotis and Mitch Malone for their efforts in keeping the proponents on track and dealing with other unexpected and challenging logistical problems, respectively. Dr. Clement then presented on the events since last year's meeting.

- Expedition 376 (Brothers Arc Flux): Drill into a back-arc submarine volcano to study hydrothermal activity, mineral resources, and microbiology in an extreme

environment. The expedition was operationally challenging but successful; despite not achieving desired depths, the recovered material provided the scientists plenty to work with.

- *JR* Dry Dock: 10-day tie up in Subic Bay, Philippines that caused significant damage to the vessel when the shipyard blocked for 11,000 tons instead of the 16,000 tons needed. The wooden blocks collapsed, and the vessel fell forward instead of sideways, which was fortunate and the ship is still operational. Significant damage was done to the hull and internal tanks were dented, but the shipyard covered the work at no cost to the ship owner or JRSO.
- Propeller Inspection: Cracks were found in the 40-year-old propellers (possibly related to incompetent work during the dry dock, but not the fall), so new propellers had to be manufactured and delivered, causing a 12-week delay in the ship's schedule.
- Expedition 368X (Return to Hole U1503A): Determine the nature of the basement across the continent-ocean transition in the South China Sea. Low clutch failure from Expedition 368 resulted in the abandonment of Site U1503, but the hole was left in good condition. Due to schedule changes, returning to the site allowed the target depth to be reached and key scientific objectives could be achieved.
- Expedition 379 (Amundsen Sea West Antarctic Ice Sheet History): Reconstruct the glacial history of the WAIS, compare proximal and global records, and study the relationship between incursions of warm deep water and ice sheet stability. A record number of alternate sites was proposed for a well-developed strategy against sea ice, but actual conditions extended beyond the worse-case scenarios predicted and all the shelf sites were blocked by ice. Special ice monitoring methods were developed and could be improved upon for future expeditions (e.g., the contingency time needed to lay down and bring up pipe before ice comes along). Some excellent Late Miocene to Quaternary sequences were recovered, but a shipboard accident resulted in the emergency evacuation of one crew member, who is recovering after multiple surgeries.
- Expedition 382 (Iceberg Alley and Subantarctic Ice and Ocean Dynamics): Currently ongoing, waiting on ice but optimistic with high-resolution paleoceanographic sequences obtained.

The rescheduling of Expedition 378 (South Pacific Paleogene) moved expenses out of FY2018/2019 and into FY2020, which helps with JRSO's financial situation. Dr. Clement acknowledged the ability of Drs. Allan and Koppers to react quickly and adjust the schedule, and Dr. Neal agreed that the Board was able to make the best out of a bad situation. Dr. Clement showed the revised *JR* schedule, and Dr. Neal asked if the JRSO would be able to deal with various budget uncertainties in FY2020. Dr. Clement replied that the dry dock incident allowed them to remove some current expenses and have funds to carry forward into 2020. There may also be funds coming back from the 3 expeditions out of Chile, as Chile waives some taxes for work done in the Antarctic, and the JRSO has already received credit for one expedition.

6B. Budget consideration of Category 1, 2, and 3 proposals on the schedule and at JRFB

Dr. Clement provided a high-level overview of the facility costs. The fixed costs to keep the facility available, not including IODP science operations, account for ~80% of the total budget. These include the ODL standby day-rate, payroll, and tie-up port costs. The variable costs are expedition- or schedule-dependent, and consist of operating costs, fuel, etc.

Dr. Clement explained how *JR* expeditions are assigned into 3 cost categories, with the costs referring to only additional costs on top of any nominal expedition:

- Category 1: Little to no expensive hardware (APC, XCB, RCB, some reentry/casing), \$300K - \$800K extra;
- Category 2: Significant casing and/or reentry systems, or cold-water fuel, \$800K - \$1.5M extra;
- Category 3: Complex and expensive (CORKs and/or LWD), \$1.5M - \$2.5M extra.

He noted that costs change over time, so scheduling the *JR* too far out may not be optimal. Generally, 18-24 months after the Facility Board meeting works well.

6C. Impact of future scheduling

Dr. Clement showed the list of 5 expeditions scheduled for FY2020, with 3 in Category 1 and 2 in Category 2. FY2021 is planned for all Category 1 expeditions. It may be difficult to anticipate costs beyond 2021, so Dr. Clement would prefer to consider adding only 1 more expedition to the schedule.

Dr. Sean Gulick, SEP Site Co-Chair, noted that there will be many proposals coming from SEP to be considered at the next JRFB meeting, and Dr. Malone replied that they are aware and may have more flexibility next year depending on how things go through the system. Hopefully they will be able to maximize the weather windows for the expeditions. Dr. Neal reminded the group that a long lead time may be advantageous in the implementation of complex expeditions, and that next year's JRFB meeting may need to be extended to 3 days. Dr. Allan emphasized the importance of being as honest and transparent as possible in *JR* scheduling, operations, and JRFB oversight. The next meeting may involve a lot of hard decisions.

6D. Q&A

Dr. Armand asked if the JRFB had previously sorted or ranked proposals waiting to be scheduled. Dr. Neal responded that all the proposals that have been forwarded by SEP are eligible for scheduling consideration. The main factors are the regional track and weather windows. Dr. Holly Given, Science Support Office (SSO) Executive Director, added that JRFB's intention is to schedule all the proposals they've received. Dr. Armand requested a positive message for the community in light of scheduling just one expedition, and Dr. Neal said he would work on an encouraging consensus statement. Dr. Clement noted that the map will help determine which proposals are scheduled as the ship is coming across a forking path.

JRFB science member, Dr. Steve Bohaty, asked if the JRSO was building any new line items in the budget to deal with unforeseen problems as the ship ages. Dr. Clement responded that there is contingency in the budget. While unlikely, the next dry dock may be viewed as a high-risk event.

JRFB science member, Dr. Bobbie John, asked if the next tie-up would take place in South America. Dr. Clement replied that the current expedition schedule ends with the South Atlantic Transect so it hasn't been determined yet. Options for the ship track will be discussed later at the meeting.

Consensus 8

The JRFB recognizes and applauds the exceptional support provided by the JRSO managing the *JOIDES Resolution*, including responsiveness to extraordinary circumstances allowing the program to continue with little interruption.

7. Report of the Science Support Office (SSO)

7A. SSO Performance in FY'18

Dr. Given outlined the major tasks defined for the SSO, including programmatic services (JRFB and SEP meeting support, managing proposal submissions and reviews) and IODP-specific software systems (technical developments on PDB, SSDB, iodp.org). Dr. Given stated that the office is in year 6 of the 10-year cooperative agreement, as NSF had decided to extend the existing agreement. Dr. Jeff Gee has replaced Dr. Donna Blackman as a co-PI. His expertise is in paleomagnetism, and he recently served as the Deputy Director of Research at the Scripps Institution of Oceanography.

Dr. Given then summarized the statistics of proposal and data progress since the JRFB last met. Over the past 2 SEP meetings, 34 proposals were reviewed, with more than twice the data submission volume of last year (~2,700 files). SEP deactivated 10 proposals, forwarded 2 to the JRFB, and sent 5 to external review. There are currently 104 active proposals (including those given an expedition number but not yet drilled). The April submission deadline produced the highest number of submissions ever received in the program's history, so the upcoming June SEP meeting will be very busy. With 18 new and 13 revised proposals, there is a significant SSO and panelist workload. Dr. Given presented additional histograms and pie charts delineating proposals by science plan theme, target ocean, science plan challenge, review stage, lead proponent's member affiliation, active proponent distribution, drilling platform, and proposal category. The distribution of platform use by lead PI affiliation shows that ECORD and US proponents requested use the *JR* and MSP in roughly equal proportions, whereas more Japanese lead PIs proposed to use the *Chikyu*.

In the special issue of *Oceanography* commemorating 50 years of scientific ocean drilling, Dr. Given had contributed a joint memoriam for Drs. Walter Munk and Gustaf Arrhenius, two leaders in the field of oceanography from Scripps. She noted some of their most well-known contributions: Dr. Munk's work on Project MoHole to drill into the mantle and Dr. Arrhenius' extensive publications on marine sediments.

Expedition 385 will be the first *JR* port call in the US since 2002, and there are plans for a science symposium to take place at the Seaside Forum at Scripps in San Diego. Dr.

Given reminded the group that the first drilling leg of Deep Sea Drilling Project (DSDP) in Guaymas Basin had been led by Scripps scientists, and they are working with JRSO and regional institutions to set up outreach and shipboard activities.

7B. Impacts of the current Confidentiality policy on the SSDB

Dr. Karen Stocks, SSO Information Services Director, provided background information on how data are handled in the Site Survey Data Bank (SSDB) with respect to confidentiality considerations. Currently, proponents use the system to upload data and indicate whether the data are released, held, or restricted. Released data can be downloaded by any registered user, and are essentially public. Held data are made accessible for the review process and any scheduled operations. Restricted data require signing a non-disclosure agreement (NDA) to obtain access.

For files submitted to the SSDB in the past 6 years, more than half were placed on hold. There have been discussions on how to encourage more open data access, with one possible solution requiring text justification for held files. Dr. Stocks reminded the JRFB that the SSO is not responsible for gatekeeping or judging whether files may be placed on hold. Dr. Neal added that data must be accessible after an expedition has been scheduled for scientific and safety reasons, and changes in the confidentiality policy will reflect this position. The JRFB and SEP should work together to support these changes. Dr. Stocks noted that text in the current policy states that data will be made available for operations, but it is unclear what that means. Dr. Barry Katz, Environmental Protection and Safety Panel (EPSP) Chair, added that restricted data have the same issues, as EPSP may find itself making difficult decisions without full access to the survey data, which could end an expedition already underway prematurely.

7C. Software updates and ongoing development

Dr. Stocks described operations, maintenance, and development updates for the software systems rolled out over the past year: the concept of a master site table and related proposal lineage, an EPSP report tool, and many improvements to the SSDB. In the coming year, there will be additional support for SEP reviewers added to the Proposal Database (PDB) as well as new seismic data upload tools and map-based search capability for the SSDB.

7D. Q&A

Dr. Kroon noted the importance of the statistics charts and graphs in highlighting the international nature of IODP and asked if there was any explanation for the spike in submissions for the most recent deadline. Dr. Given did not have any speculation on this, and Dr. Gulick suggested that the large number of workshops over the last 2 years could have prompted many of the new proposal submissions. Dr. Rosalind Coggon, Co-Chair of the PROCEED Workshop, brought up the impending end of operations as a potential motivator for people to get their proposals submitted into the system. Dr. Neal emphasized the importance of having proposal pressure to support the program's renewal, with the aim to schedule provisionally into 2024 and show funding agencies that it is a vibrant program.

Consensus 2

The JRFB commends the Science Support Office for its recently implemented improvements in the Site Survey Data Bank, as well as in the handling of proposals and

accompanying information. These upgrades have significantly improved the ease and efficiency of working with these materials for proposal proponents, proposal reviewers, EPSP, and SEP.

Action Item 4

The SSO is asked to investigate and summarize the reason(s) why 1 April 2019 saw a record number of proposals submitted. This could be done by asking the lead proponents of the recently submitted proposals why they were submitted in April. The results will help the JRFB and other FBs focus on what is working to generate proposal pressure, which is critical for the renewal of scientific drilling in the respective member countries. The SSO findings should be submitted to the JRFB via email as soon as they are available.

8. Report of the ECORD Facility Board

8A. Report on the March 2019 EFB meeting

Dr. Gabriele Uenzelmann-Neuben, Chair of the ECORD Facility Board (EFB), reported on the March meeting in Bremen. She went over membership updates, showed a map of Mission Specific Platform (MSP) expeditions completed in 2017-2018, and provided brief overviews of the proposals at EFB.

- Expedition 389 (Hawaiian Drowned Reefs) postponed for 2022. The preferred bidder for the platform withdrew unexpectedly, and the second group couldn't provide a test drill. The ECORD Science Operator (ESO) and Japanese colleagues have been collaborating on its implementation.
- Expedition 377 (Arctic Ocean Paleoceanography) has a tight budget for implementation in 2021, as costs for the expedition are rising tremendously.
- Expedition 373 (Antarctic Cenozoic Paleoclimate) has had difficulty securing a suitable vessel, but there has been discussion with Australian colleagues.
- Preparations for Expedition 386 (Japan Trench Paleoseismology) have been going well. ESO has been working with Japan as well.
- Proposal 637 (New England Shelf Hydrogeology) has had proactive proponents working on the onshore components of the project, and they are in communication with the International Continental Scientific Drilling Program (ICDP).
- Proposal 730 (Sabine Bank Sea Level) has many shallow shelf and deep guyot sites, which makes it difficult from an operational perspective. It may need to be split into 2 parts, with the MSP covering shallow sites and the *JR* covering deep sites. This has been suggested as an option to the proponents, and a response is expected soon.

8B. Update on scheduled MSP expeditions

The operational plan for 2019-2023 has been updated, with Expedition 389 moved to 2022. No expeditions are planned for this year. Dr. Uenzelmann-Neben noted the

concerning lack of incoming MSP proposals. Discussions on improving the flow of MSP proposals speculated that undrilled proposals provided a poor signal to proponents and discourages people from writing MSP proposals. There may be a lack of information that MSPs are very different than *JR* expeditions, which should be communicated to the community more clearly. Clustering MSPs by region may be one way to make them more attractive to bidders, as expenses at high latitudes can be very high depending on in-kind contributions. Proponents may need to be engaged in the process of implementing MSPs. Despite many challenges, MSPs have their advantages, including not having to follow a set ship track. There may be a push to strengthen the link with ICDP via amphibious proposals, to help MSPs find a niche in the new program.

8C. Q&A

Dr. Gulick asked if the CPP Gulf of Mexico Gas Hydrates was not going to be implemented, and if it was out of the program. Dr. Uenzelmann-Neben said it was a Council decision, and Dr. Neal confirmed that it was out of the program.

Dr. Lisa McNeill, SEP Science Co-Chair, asked how many MSP proposals were submitted each round through time. Dr. Given responded that she could look into providing the statistics.

Dr. Neal noted that MSPs don't have a singular platform, so the idea of having cluster MSPs may be helpful in securing regularity. This could be announced to the community if everyone agreed to commit to the idea. Dr. Uenzelmann-Neben confirmed that EFB had discussed the option. Dr. Kroon emphasized the importance of having more ideas for strengthening the program, such as having more amphibious proposals to tie into ICDP proposals. Dr. Camoin added that 2 more workshops are on the calendar, and more amphibious proposals are expected (at least 1 MSP and 1 *JR*).

9. Report of the *Chikyu* IODP Board

Chikyu IODP Board (CIB) Chair, Dr. Yoshiyuki Tatsumi, told the JRFB that this year's CIB meeting will be held in June due to Expedition 358 operations extending through the normal March meeting time. The agenda is in progress. They plan to review the addendum for riser proposals and then discuss *Chikyu* operations.

9A. Expedition 358 Report

Dr. Nobu Eguchi, Director of Operations at the Institute for Marine-Earth Exploration and Engineering (MarE3), presented Expedition 358 outcomes. The goal of the expedition was to reach the seismogenic plate boundary where earthquakes are generated, as the final project under NanTroSEIZE expeditions. However, from October 2018 through March 2019, they had 6 months of extremely challenging operations. Due to the length of the expedition, several Co-Chiefs (known as Science Leaders) were involved. Repeated attempts were made to deepen the hole with several branches, but they eventually decided not to proceed and changed to a riserless operation. Dr. Malone asked about one section where they got stuck, and Dr. Eguchi explained that some material was left from the expandable casing and some parts got caught so they were unable to go deeper.

A Technical Advisory Team (TAT) will meet in June to review operations, and they are considering hiring a third-party company as well. During the expedition, a Real-Time Geomechanics (RTG) team was watching the borehole and logging while drilling (LWD) live from Houston to make recommendations about the mud weight. Despite all the preparations, the expedition didn't go well and will have to be reviewed to find out what can be learned from such a disaster.

Dr. Clement asked about the implications of the pipe angle and vertical bedding. Dr. Eguchi responded that because the bedding plan was almost vertical, once it started collapsing there was no way to stop it. Dr. Clement asked if they were fracking along the bedding plane, and Dr. Eguchi replied that mud additive was expensive and should cover microcracks, but they were unable to test it within the drilling intervals to confirm its utility.

9B. Future Chikyu operations through 2023

Dr. Eguchi briefly presented the IODP proposals currently with the CIB: Proposal 537 (Costa Rica Seismogenesis Project Phase B), Proposal 698 (Izu-Bonin-Mariana Arc Middle Crust), Proposal 781B (Hikurangi: Riser), Proposal 835 (Japan Trench Tsunamigenesis), and Proposal 871 (Lord Howe Rise Continental Ribbon). He noted that Proposal 871 is a CPP.

Dr. Eguchi then reported on organizational restructuring that went into effect with the conclusion of Expedition 358. The Center for Deep Earth Exploration (CDEX) has been dissolved, and instead the *Chikyu* will be overseen by the Institute for Marine-Earth Exploration and Engineering (MarE3), which will also run JAMSTEC's fleet of other research vessels. The engineering, operations, maintenance, fisheries, etc. groups will all be under MarE3. Dr. Eguchi showed the new institute's organizational chart and provided personnel updates.

9C. Q&A

Dr. John asked about the current status of the *Chikyu*, and Dr. Eguchi said that the vessel is tied up in Shimizu. There are no plans for operations yet, and this will be discussed at the CIB meeting.

Dr. Clement asked if online references to CDEX should be updated to MarE3, which Dr. Eguchi confirmed. Historical references can remain unchanged.

Dr. Neal commended MarE3's approach to reviewing the challenging drilling environment of Expedition 358. Even though the objective was not achieved, there can still be a lot learned for the future.

10. USAC Report

Dr. Jim Wright, Chair of the US Advisory Committee (USAC) to IODP, presented the USAC report. USAC has 10 members (expanding to 12 members for increased proposal reviews) and meets twice a year. Their role includes:

- Reviewing proposals
- Making staffing recommendations to all the operators

- Advising on education and outreach efforts
- Recommending panel members (USSSP, SEP, JRFB)
- Overseeing the Schlanger fellowships
- Sponsoring a distinguished lecture series

Dr. Wright described different workshops supported by USAC (diatom stratigraphy, early career, Antarctic school) and other funding efforts for US PIs (international workshops and training courses). New initiatives have included developing the steering committee for the future of scientific ocean drilling (NEXT Workshop), early career mentoring (assigning USAC members to Schlanger fellows and inviting them to lunch at AGU), and diversity discussions (to be reviewed and addressed; gender imbalance was not as concerning as the lack of racial diversity in the earth science community). Dr. Neal said that USAC's work was relevant to the JRFB's international partners and good for awareness. Increased coordination would improve future planning and allow for better use of limited funds to have a bigger impact.

JRFB science member Dr. Larry Krissek asked about the proportion of graduate students invited to expedition science parties. Carl Brenner, Director of the US Science Support Program (USSSP), responded that under USAC guidance, the goal of having 30-40% early career scientists in the science party has been met.

11. EPSP Preview of Proposals at JRFB

Dr. Katz provided a summary of the February 2019 EPSP meeting to review Proposals 859 (Amazon Margin Drilling, Baker) and 910 (Continental Margin Methane Cycling: Rio Grande, Malinverno). This was Dr. Katz's 23rd meeting as EPSP Chair. He noted difficulties in dealing with the 2 south Atlantic proposals reviewed due to various reasons, including relatively deep hydrocarbon provinces, and wanted to ensure there would be a sufficient number of sites for the scheduled expeditions. Dr. Katz presented the key requests and outcomes for each proposal, noting site modifications and approvals that would provide a viable drilling plan. The next EPSP meeting will be a 2-day meeting in September.

12. SEP Overview of Proposals for FY'21-22 Expedition Scheduling

Dr. McNeill outlined the SEP report to the board, noting SEP operations (5 watchdogs reviewing each proposal to determine a rating), terms of reference, and outlook on proposals that may be forwarded for the next JRFB meeting. Reminders were given for COIs to leave the room, as well as adherence to the proposal confidentiality policy. Drs. McNeill and Gulick then reviewed SEP summaries for each of the proposals to be considered by the JRFB for scheduling.

Dr. Neal reminded the group of the few expeditions that were partially drilled but did not complete their objectives due to exceptional circumstances. These expeditions remain at the JRFB and will be considered on the second day of the meeting.

Consensus 1

The JRFB is encouraged by the record number of proposals submitted to SEP on 1 April 2019 for future IODP scientific drilling. The Board sincerely appreciates the interest

and collaborative efforts of the global community in raising the momentum for continued scientific drilling, and thanks the Science Support Office (SSO) for their handling of the submissions and also, in advance, members of the Science Evaluation Panel (SEP) who will evaluate the submissions over the coming months. The JRFB emphasizes the need for sustained proposal pressure in the coming years, which will provide momentum for the implementation of a new program beyond the end of the International Ocean Discovery Program.

Consensus 13

As noted by the 2018 JRFB Consensus 9, the JRFB in exceptional circumstances on a case-by-case basis will consider to keep unimplemented sites on the board for potential completion at a later date. As such, the JRFB has decided to keep Expedition 379 Sites ASSE-01C, 02C, 03B, and 11A on the board.

Action Item 5

The JRFB Chair will work with the SEP Co-chairs to come up with an efficient format for presentation of proposals that are forwarded to the JRFB for scheduling consideration.

13. Options for FY'21-22 Expedition Scheduling

13A. Category of Proposals available (1, 2, 3)

Dr. Malone presented the JRFB with options from JRFSO for the discussion of expedition scheduling. He reminded the group that last year's meeting scheduled 2 years of operations, having set the schedule into the austral winter and spring with 4 months of tie-up for the *JR*. The planned tie-up period could be used to transit north, which would be a more efficient use of the vessel and will be up for discussion.

Dr. Malone showed a map of the JRFB proposals in the Atlantic and brought up notable considerations for each:

- Proposal 732 (Antarctic Peninsula Sediment Drifts): Must be scheduled in Antarctic weather window, Category 2 expedition due to fuel costs
- Proposal 910 (Continental Margin Methane Cycling: Rio Grande): Pressure coring and environmental gas hazard concerns, should build in contingency to be successful, October to April weather window, Category 1 expedition if using IODP pressure coring system as proposed
- Proposal 771 (Iberian Margin Paleoclimate): Preferable to be scheduled in November weather window, cable placement issues, Category 1 expedition
- Proposal 874 (Neogene Newfoundland Sediment Drifts): Narrow weather window from early to mid-summer, EPSP would like more alternate sites, Category 1 expedition
- Proposal 892 (Reykjanes Mantle Convection): Very narrow weather window, 2 casing strings needed, high end of Category 1 expedition

Dr. Malone explained that the Board may find it more reasonable to wait until next May to add onto the ship's schedule, as there are many proposals at SEP likely to be forwarded to the JRFB next year. The schedule has already been set 2 years out, so nothing is pressing from a planning perspective. The *JR* will have a 4-month tie-up ending in October, so scheduling for that timeframe provides 2 possible expeditions: Rio Grande Cone or Iberian Margin.

Dr. Allan noted that going back to Expedition 360, SW Indian Ridge Lower Crust/Moho, as an option would add huge transit times. Dr. Malone brought up recommendations from the deep crustal drilling workshop on how to approach deep crustal holes by bringing tools on the expedition for riserless drilling, describing the issues they had encountered. Expedition 360 participant and ESSAC Chair Dr. Antony Morris added that one of the main objectives of the expedition was to reach the lower crust. Shipboard magnetics indicated that they were close to the boundary (within a few hundred meters), but then the medical emergency occurred and the hole had to be abandoned. JRFB science member Dr. Wolfgang Bach asked if deepening the existing hole would be a one-leg expedition whereas starting a new hole would be a two-leg expedition, which Dr. Malone confirmed. Dr. Clement said that new drilling bits might be able to penetrate faster, but they are untested. Dr. Morris noted that drilling was ideal once the fault zone had been crossed, and faults would probably be encountered at any other location chosen.

14. Development of a FY'21-22 *JR* Schedule

Dr. Neal told the board to think about the scheduling options overnight. He would like constructive feedback on how to proceed forward, and did not want to set a precedent for making scheduling decisions that would need to be adjusted in the future.

15. Long-Term Cruise Track of the *JOIDES Resolution*

Dr. Neal projected an annotated map of the *JR* track and explained that there were 3 viable options between scheduling either 0, or 1 of 2, expeditions. Dr. Malone noted that all the proposals at the JRFB are Category 1, except for one that is Category 2 (in the Antarctic). There may be more proposals incoming from SEP in June. It is likely that the ship track will go through the Panama Canal and into the Pacific at some point before the end of the program. The JRFB will determine the path based on proposal pressure. Dr. Bohaty noted that there are potentially enough proposals coming through that the *JR* could spend all of 2023 in the North Atlantic, and Dr. Neal approved of the healthy proposal pressure.

Dr. Given asked for guidance from the JRFB, as she will arrange the next call for proposals in the September issue of *EOS*. There was discussion on how to clarify and update the ship track map, which Dr. Neal agreed to do. A 2024 arrow would indicate to the community where they should focus their proposals.

Dr. Katz asked if the ship needed to be at a specific location at the end of the program. Dr. Allan said there may be the possibility of another award at the end of the current program. Dr. Clement explained that the contract with the ship owner states that a mutually agreed upon place will be needed to demobilize the ship.

Consensus 3

It is the intent of the JRFB at future meetings to consider expeditions for scheduling to the end of FY 2024, subject to the availability of the *JOIDES Resolution (JR)*. This is in response to the continued proposal pressure and the recent 5-year renewal (2019-2024) of the *JR* facility award by the National Science Board.

Consensus 4

The JRFB encourages the IODP science community to continue to generate proposal pressure along the anticipated long-term ship track for FY22—FY24. Submission of new proposals and continued development of existing proposals for drilling projects in the Indo-Pacific are particularly encouraged.

Action Item 3

The JRFB will revise the *JR* track map and the call for proposals advertisement. This will be completed before the call for proposals is due to be published to advertise the 1 October 2019 submission deadline.

16. Replacement of the *JR* post-2023

Dr. Neal gave an overview of the *JR*'s history with scientific ocean drilling, accomplishments, and importance as an international platform to set the scene for Dr. Clement's presentation on looking into replacement options for the aging vessel.

Dr. Clement presented the opportunity to obtain a new drill ship and have a new platform without having to find the costs to build it. The current ship owner is willing to pay for a new ship up front, provided that there is a 10-year contract to operate the ship. This would allow the new program to start in 2024 with a new vessel to operate for a full 10 years and into the future. There may be challenges with NSF, but there should be a way to move forward with the new science plan. As the current facility awardee, JRSO could be tasked with overseeing the completion of designing the vessel. Operations for the new vessel would have to be competed. This would allow NSF to go to the NSB with a new science plan and capable platform to do the work.

Reasons for replacing the *JR* mainly revolve around its age. There are occasional issues that arise with aging vessels, and the drilling equipment was built with 1970s technology and tools. It is difficult to repair parts that are no longer manufactured or supported, and there are no commercially available spares. The ship crew has found creative ways to keep the ship running, but maintenance costs have been increasing, and the *JR* will become more expensive to operate post-2024, which will be discussed on the second day of the meeting.

Labs and the drilling system used to acquire cores are vital to the vessel's productivity. With a more efficient vessel, more core per dollar could be achieved. Considerations for the new ship include similar sizing as the *JR*, as 120 people must be housed for 60+ days at sea in a global ranging vessel, and the ability to core. There should also be space beneath the rig floor to assemble Circulation Obviation Retrofit Kits (CORKs) and observatories. A much more detailed list of requirements will be produced to meet Scientific Ocean Drilling Vessel (SODV) requirements from the last decade.

Dr. Clement showed a video animation of a vessel that had been designed with the program's needs in mind, pointing out efficiencies in projections for fuel usage, drilling capability, and maintenance. Siem Offshore (the parent company of ship owner ODL) has offered to cover the capital expense of building a new vessel, and they plan to make their money back by increasing the day rate. This is estimated to be a 12% increase in the total JRSO budget and would depend on a 10-year commitment. The cost would be significantly higher for a 5-year commitment. Overall, there would be much greater efficiencies for a small increase in the cost of the facility, although NSF's budget may not cover the cost.

17. Implications of a new US Drilling Vessel – Discussion

The real value in having a new vessel would be the improvement in science achieved, by having more lab space and operating more days every year. Comparing fuel consumption to the *JR*'s over the last 6 years, the new vessel would be able to save 79 days of transit. More fuel would be burned at higher speeds, but more science could be fit into the time spent transiting.

The timeline for a new vessel would be around 30 months from contract signing to commissioning. Dr. Shouting Tuo of the IODP-China Office asked how much the budget would be for building the ship. Dr. Clement responded that it would likely be upwards of \$280M, and Dr. Neal noted that the cost was only half of one of NASA's missions. Dr. Clement agreed that the program had overcapitalized on the current platforms, as none of them can operate as fully intended due to financial concerns throughout the international community. Going for a major facility upgrade would require a new influx of money, or the international model for priorities should be reconsidered.

Dr. Armand asked how labs would be equipped on the new vessel, and Dr. Clement responded that the plan would be to transfer existing lab equipment over without incurring a major expense.

Dr. Coggon raised the issue of longer contract lengths being cheaper and asked if it would be possible to write a 15-year science plan for NSF. Dr. Clement said that would be unlikely due to the difficulty of NSF making a commitment beyond 5 years. A 10-year contract may be considered but 15 years would be too long, as costs cannot be predicted within 2-3 years. Mr. Houtman clarified that the community could create a science plan for any number of years as NSF would not control the science plan. Dr. Armand added that other programs would be using the science plan as well, as different program members renew on different timelines. There was further discussion on the length of the science plan, with emphasis on determining the science plan first and having the infrastructure to achieve the science plan to follow. Dr. Neal suggested the science plan include regular reviews that would allow the international community to change the direction or emphasis of the science plan. There could be an evolving science plan instead of a new one brought in every 10 years. Every Program Member Office (PMO) could consider the option to discuss at the Forum meeting.

Dr. Allan acknowledged the difficult issues to consider, but highlighted the importance of the ship facility having such a healthy relationship with the ship owner and community,

providing options for future development, which reflects extremely well on the program. Dr. Neal asked the Board how they could show international support for the platform. Dr. John asked if private donations could supplement funding from NSF and the program partners. Dr. Clement replied that the annual operating expenses are much higher than the capital costs of a new vessel, and ongoing recurring costs would be hard to cover.

Dr. Armand said that ANZIC is going through their renewal process, requesting a one-page letter from Dr. Clement detailing the costs and capabilities of the new vessel in theory, which would help to obtain more funding. International partners from Brazil and China agreed that such a letter would be useful in obtaining positive responses to the Memoranda of Understanding (MoU) that have gone out. Dr. Camoin noted that ECORD is committed through 2023, so they will not request any updates for their memoranda with NSF before 2022.

Consensus 6

The JRFB supports the efforts of the JRSO in planning for a replacement non-riser drilling vessel for the *JOIDES Resolution* in the next era of scientific ocean drilling beyond 2023. The age of the *JR* and increasing costs of maintenance in terms of money and schedule make finding a replacement a critical near-term need for the continued success of scientific ocean drilling into the future.

Action Item 2

The JRSO is to provide an information document on the general capabilities of the potential new non-riser platform, including the efficiencies such a new vessel will have over the *JR*, with a percentage estimate of the higher cost to all partners.

Thursday	9 May 2019	9:00 – 17:30
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18. Report of the IODP Forum

Dr. Kroon presented an overview of the IODP Forum, noting its role in developing a way forward for the program, what was achieved at the 2018 meeting in Goa, and how to prepare for the upcoming 2019 meeting in Osaka with regards to a new science plan.

18A. Report on the Goa meeting

Dr. Kroon first highlighted 3 consensus statements from the Goa meeting:

- The Forum received positive updates on the midterm IODP renewal and long-term planning from all member countries and consortia. The midterm renewal is well-advanced; IODP is healthy for the next 5 years. Dr. Kroon praised the renewal efforts of the UK in particular.
- The Forum noted that the IODP platforms are doing well, as is the program overall. It is not necessary to change the program structure in the future. Modifications or clarifications may be considered, but the program works well as a collaboration.

- Five international workshops were planned to stimulate the community and produce the framework for a new science plan. These have been important in seeking input from the broader community.

18B. Plans for Osaka

Discussion of the Osaka meeting can be found in the following section.

18C. Plan to develop the Science Plan

Dr. Kroon noted that the program should continue to broaden partnerships with IODP partners and other scientific programs, and a link to ICDP should be sorted out before having a new science plan. Dr. Kroon described proposed scenarios regarding ICDP:

- Scenario 0: Maintain the current structure (2 different science plans with links through amphibious drilling proposals). Post-2023, both science plans will expire.
- Scenario 1: Assume 4 platforms for a new marine drilling program and a new science plan. IODP would be partially unified with ICDP by having a few common chapters in their respective science plans.
- Scenario 2: Put the 2 programs under one umbrella. They would share the same science plan, although the evaluation panels (SEP and SAG) would be separate.
- Scenario 3: Totally combine the 2 programs. SEP and SAG would be combined into one evaluation panel.

Dr. Kroon gave his opinions on each scenario, believing that the programs would not be ready for Scenarios 2 and 3 at this stage. While a combined science plan could be written, the 2 programs have entirely different organizational structures (core curation, operations, etc.). A new science plan needs to be written to support a new drilling vessel. He believed that Scenario 1 was optimal, in order to provide unique platforms without changing funding and programmatic structures, and would like the Board's input.

Dr. Kroon presented a way forward to creating a new science plan, emphasizing the need to integrate the international workshop results together while the momentum was there. Details can be found under Agenda Item 25.

18D. Q&A

Dr. Krissek was supportive of a science plan lasting longer than 10 years. A 15-year period may allow enough time for a new platform to ramp up, as well as provide the structure to be able to take advantage of longer contracts. Dr. Kroon noted that avoiding a gap in the program could be achieved by working quickly and creating a new science plan within half a year. The community is expecting results from the workshops, and Dr. Kroon emphasized the importance of building on the momentum. Dr. John added a 15-year science plan makes sense, but needs to be held accountable for achieving its objectives. Dr. Kroon asked if the achievements of the last decade should be included in the new science plan, and Dr. John replied that only the new science that will be accomplishable should be included.

Dr. Coggon voiced support for Scenario 1, creating a new science plan quickly, and having it span 15 years. Some projects take longer than 10 years, even with developing technology. She asked if the PROCEED Workshop results should identify goals on differing timescales of 5, 10, and possibly 25 years. The science plan could request progress reported back every 5 years. Discussion of Scenario 1 resulted in favor of Dr. Kroon inviting ICDP to collaborate on a few chapters of a new science plan. Dr. Armand noted that ANZIC is not in ICDP, so it would be a hard sell to get them to join. Keeping the programs separate may be better, although there would be scientifically compelling reasons for links. Dr. Bach also was in favor of Scenario 1, considering the benefits of merging funds from the 2 drilling programs, as was recent SEP Member Dr. Cristiano Chiessi.

Dr. Clement asked how much collaboration there would be between IODP and ICDP, such as in producing publications. There may be some resistance due to cultural differences, but they may find ways to share efficiencies. NSF program officer Dr. Kevin Johnson suggested one way to implement Scenario 1 quickly would be to have evaluation panel representatives from SEP and SAG at each program's meetings for amphibious drilling proposal reviews. This would benefit both programs without any restructuring and provide clearer feedback for the proponents. Dr. Gulick noted that the Chair of SAG works in Edinburgh, which works out well with the upcoming SEP meeting to be held in June.

Dr. Katz suggested that a long-term science plan may provide a good basis, but may need to include periodic refreshing every 3 years or so, in order to take into account new knowledge, tools, and technology that may be available. Setting a review into the plan would strengthen the program by allowing it to adapt and grow. Dr. Neal added that NSAS does 10-year surveys with a midterm review. For a 15-year plan, a 5-year review and course correction may be appropriate.

Consensus 10

The JRFB applauds and supports the IODP Forum Chair's plans to strengthen synergies between IODP and the International Continental scientific Drilling Program (ICDP). It is essential that such synergies continue to be developed and strengthened if amphibious expeditions are to be highlighted in the new science plan.

Consensus 12

The JRFB supports the attendance of SEP member(s) for Amphibious Drilling Proposals at the ICDP SAG meetings, and that the SAG representatives be invited to the relevant SEP meetings.

19. Report from the NEXT Workshop

Dr. Koppers reported results from the NEXT Workshop, which was held on May 6-7, 2019 in Denver, CO, with the mission to determine the next generation riserless drilling platform and science plan.

The US had 4 important concerns:

- Staying leaders in the program

- Growing international participation beyond the 23 countries currently involved
- Securing a global ranging riserless vessel to support scientific drilling for the next 20+ years (and the next generation of scientists)
- Not having a gap between the current and next program

At the NEXT Workshop, results from the *JOIDES Resolution* Assessment Workshop (JRAW) were discussed, and each participant was asked to consider modifications to the current science plan, new science plan challenges, and necessary components for a new drilling vessel.

The workshop was a success due to the participants' preparation beforehand. Four overarching science structures came out of the breakout sessions, with overlapping content in structure and intent. The emphasis was more on connections rather than science themes. 139 science questions were distilled into 8 strategic objectives to match the science structure.

Dr. Bohaty asked Dr. Koppers if the strategic objectives are foreseen to function in the same way as the science challenges in the current science plan regarding how proposals are written and as a measurement of achievements. Dr. Koppers replied that the objectives are more inclusive, allowing more or new questions to be considered. Dr. Neal added that it was important to get new unknown science into the program and encourage new science that might not have been considered to come in and be evaluated. Course corrections can be made in the new science plan to be more inclusive.

Dr. Morris thought the outcomes reflected well on the meeting and applauded its major contributions to moving the program forward. Dr. Given asked where mantle drilling might fit in under the new objectives, and Dr. Koppers responded that some omissions may be discussed at the Forum meeting due to the fast pace of creating a new science plan. Dr. Bach also congratulated Dr. Koppers on the successful workshop and asked if the new science plan would be applicable to the new *JR* or entire program. Dr. Koppers said the new science plan would be international. Each workshop was planned from a national perspective, but they were all very much in favor of a single international science plan.

20. Report from the PROCEED Workshop

Dr. Camoin presented major outcomes from the PROCEED Workshop, which was held on April 6-7, 2019 in Vienna, Austria, with the mission of expanding frontiers of scientific ocean drilling. The organizing committee consisted of ECORD members, and the science committee consisted of researchers nominated by ESSAC. Discussions focused on the science plan and facilities, new challenges, the role of MSPs, new drilling infrastructure, and what worked and what didn't work during the current phase of the program.

Regarding the current science plan, 94% of the people polled believed the contents are still appropriate to guide scientific ocean drilling beyond 2023. This could indicate that a science plan lasting longer than 10 years would be appropriate. The program could facilitate better use of existing data, as well allow for more interdisciplinary science to be

achieved by creating more connections between current themes and challenges. The importance of land-to-sea transects and amphibious drilling proposals was addressed, highlighting the link to ICDP and other entities as possible programmatic partners. It was also determined that ECORD must continue its role as an MSP provider and IODP partner. More awareness could help increase the effectiveness of MSPs, and more funding should be obtained to meet the challenges of the new program.

Overall, the ECORD science community is very healthy and proponents have shown remarkable activity, participating in all aspects of IODP globally and supporting the use of all facilities available. In terms of facilities, the *JR* was viewed as the most critical for ECORD (more so than MSPs). There was strong interest in using the *Chikyu*, but it was not viewed as critical.

Going forward, the PROCEED Workshop report will be made available Summer 2019. In 2021, ECORD has plans for a new White Paper to obtain money from funding agencies. ECORD MoUs and partner MoUs are expected to be signed for ~15 members in 2022 and 2023.

Dr. Coggon agreed with Dr. Camoin's summary, adding that the workshop comments emphasized identifying links between science challenges in order to make the public aware of the societal relevance of the program, as climate change is not just a process but a planetary hazard.

Dr. Given liked the workshop's idea to widen the Forum to include ICDP. The Forum Terms of Reference could be modified to include the mandate of writing a new science plan and collaborating with ICDP SAG members at SEP meetings.

Dr. Koppers brought up the need to consider how the science plan may affect the next generation of scientists who haven't begun thinking about scientific ocean drilling. Dr. Camoin suggested 2 versions of a science plan: long and short. The next science plan could have another version tailored for funding agencies or a public audience. Dr. Coggon suggested a graphic poster representation of the science plan for the public. Dr. Koppers reiterated the need to write a new science plan quickly. Dr. Neal noted how encouraging it was to see the compelling overlaps and synergies between the regional workshops.

21. Report from the ANZIC Workshop

Dr. Armand gave an overview of ANZIC's Ocean Planet Workshop, which was held on April 14-16, 2019 in Canberra, Australia. The workshop focused on themes and priorities for the program. Five themes were investigated, which were supported by broad universal underpinnings: biosphere frontiers, earth dynamics, global climate, natural hazards, and ocean health through time. The new concept of ocean health through time was conceived by the younger generation of scientists who are concerned about the future and interested in the ocean surface interface, as the Anthropocene hasn't been defined in the oceans.

ANZIC has an evolving timeline for its decadal plan contributions. The new science plan roadmap will be discussed at the Forum meeting, with a final draft in 2020, which works

from ANZIC's perspective. Early and mid-career researchers will be key in implementing the new science plan. The new themes and challenges should be inclusive and spotlight issues rather than prioritize them. People are excited for a new scientific platform for technology and engineering in the program.

Regarding the future of ANZIC, participation might end with Expedition 386 (Japan Trench Paleoseismology), as funding will end in 2020. With the rescheduling of Expedition 389 (Hawaiian Drowned Reefs) to 2022, it is unclear if funding can be secured by then.

ANZIC's renewal strategy should be ready for implementation at the end of June. ANZIC will likely sign on a new member, the University of South Australia. Dr. Armand had created an ANZIC IODP Participation Report to show each member how much impact their funds had, which really helped underline the importance of their contribution. The renewal strategy started with a roadmap in 2016, then developed into an infrastructure plan and AAS Geosciences decadal plan in 2018. The National Research Infrastructure for Australia (NCRIS) will make a funding decision, which might be influenced by the upcoming Australian election results.

ANZIC's renewal proposition is aiming for a 10-year funding period with interim reporting and flexibility for membership. The next phase would likely commence mid-2021 due to funding cycles. Full *JR* membership would be sought, along with membership increases with ECORD's platform and the *Chikyu*. They would also like to participate in China's platform provided it operates as a fully IODP-compliant platform. Greater workshop participation and more staff would also be planned.

Issues that need to be addressed include ANZIC's inclusion in the new IODP science plan, the *JR* replacement, a possible *JR* hiatus, future MoU changes, and participation vs. membership costs. Funding at current levels (\$2M/year) would be risky due to the likelihood of members pulling out. The focus may change to legacy material (existing samples and data) depending on funding timelines.

Dr. Armand presented an alternative option for IODP in the event that the *JR* will not have a replacement post-2023/2024. The "fourth platform – the ship that doesn't sink" could be funded to provide data nodes as a contingency plan. This could be an opportunity for a fourth platform to keep the program running productively.

Dr. Koppers asked if the ocean health theme will be written into ANZIC's renewal efforts. Dr. Armand responded that it will not necessarily be mentioned, just the workshop highlights, as funding agencies won't worry about the structure as much as the questions being asked.

Dr. Clement noted the high cost of using drilling platforms to acquire other types of data that could be acquired on cheaper vessels. Dr. Koppers replied that equipment could be brought onboard as a partnership, not as a facility, and Dr. Armand said that the ship may be in remote areas that are difficult to reach so proposals may take advantage of that aspect. Integrating big data and making products out of data may help keep member partners involved in the program. Dr. McNeill liked the suggestion of

emphasizing legacy data in the new science plan and providing better use of the material in databases with great potential.

22. Report from the J-DESC Workshop

Dr. Harue Masuda, from the Japanese Drilling Earth Science Consortium (J-DESC), presented results from the J-DESC Workshop: Scientific Ocean Drilling Beyond 2023, which was held on April 2-3, 2019 in Yokohama, Japan. She provided an overview of the steering committee and approximately 150 participants, of which a quarter were graduate students, and noted the commitment to diversity of gender and age for workshop participants.

Key discussion questions involved the framework of IODP beyond 2023, achievements and challenges of the international science plan, and resources needed to achieve science goals by IODP beyond 2023. Dr. Masuda presented summaries from each breakout session held in ocean and climate, biosphere frontiers, earth in motion, and earth connections. Discussions across disciplines were fused to link the fields and find relationships between them.

Young scientists from outside of IODP fields were invited to the workshop to introduce new collaboration opportunities and technologies. These plenary sessions included Mars sample return, geo-neutrino measurement, identification and separation of microfossil tests by artificial intelligence, data-driven (“big data”) geosciences, and synchrotron (STXM)-based geomicrobiology and chemistry. Out-of-the-box thinking may provide ways to improve on IODP science.

Dr. Masuda summarized future plans, emphasizing that the new international science plan should be driven by what the scientific community wants to achieve in the next program. Suggestions were made to repackage the theme chapters, highlight mantle drilling, think about new challenges, and develop new analytical methods, proxies, and technology. The workshop report will be presented at the JpGU2019 meeting in May, with the writing of a new science plan to begin in June. Results will be presented at the Osaka Forum meeting in September.

Dr. Kroon asked how repackaging the science themes would map with Dr. Koppers’ plans, and Dr. Masuda replied that duplicate fields could be mapped and there would be more focus on linking the themes. Drs. Kroon and Neal also voiced their support for highlighting the importance of mantle drilling. Dr. Koppers noted that the overlap from the workshops could be fit into strategic objectives with some rephrasing. Dr. McNeill supported the out-of-the-box thinking to incorporate new ideas into the science plan.

23. Report from China regarding IODP Renewal

Dr. Tuo reported on IODP-China’s plans for the next phase of the program. He first provided an overview of China’s involvement with scientific ocean drilling, joining the Ocean Drilling Program (ODP) in 1998. They have since increased their contribution to \$3M/year, along with funding several CPP expeditions, and are looking to the future. Last year, China celebrated 50 years of international scientific ocean drilling, along with 20 years of Chinese involvement. There was discussion regarding the progress of the

past 20 years and future plans. Chinese scientists have been increasingly participating in the program and support the future of IODP.

China would like to become an IODP platform provider and play a more important role in the science plan beyond 2023. They have plans to increase Chinese membership as a *JR* partner by contributing \$6M (up from \$3M), which will need approval from the Ministry of Science and Technology (MOST). A fourth core repository may also be built, with plans for one in Shanghai. They have worked with the Guangzhou Marine Geological Survey and Qingdao Marine Science and Technology Lab to consider options for a drilling platform.

China plans to take on a more active role in the program beyond 2023. They will hold a series of small international workshops in June, then organize a national meeting to discuss the Chinese science plan beyond 2023. Approximately 150 participants are expected. In 2020, China would be willing to host an international workshop to discuss the new science plan if needed.

Dr. Armand asked how IODP-China will build their roadmap for the new science plan since their meeting will take place after the other members have created one. Dr. Tuo responded that the results of the PROCEED, NEXT, ANZIC, and J-DESC Workshops will all be helpful to build off of, with additions of Chinese priorities. Dr. Kroon said the plan was excellent, and it would be great to move forward with some kind of consensus. There may be new ideas from Chinese colleagues.

Dr. Eguchi asked if the pre-Forum meeting in July could be shifted later, as China's meeting will take place in August. Dr. Kroon responded that the timing would be too close to the September meeting in Osaka. Dr. Koppers said that the roadmap would be a version of the future science plan, so there shouldn't be any issues adding China's outcomes. Dr. Armand added that the different workshops benefited from cross-participation, and a flexible roadmap should be produced to allow for the inclusion of China's workshop outcomes. Dr. Neal noted that they could ask China to discuss the roadmap produced out of the July meeting and provide comments to incorporate any possible changes or additions.

Consensus 7

The JRFB is excited about the positive momentum the international Earth Science community has developed in identifying new science frontiers and platform needs for the next scientific ocean drilling program. The national/regional workshops that have been held - J-DESC (Japan), PROCEED (ECORD), Ocean Planet (ANZIC), and NEXT (USA) - have been extremely well attended with a lot of enthusiasm for developing the plan for the next era of scientific ocean drilling. We also look forward to the results from the IODP-China workshop (August 2019). The strong participation and leadership engagement by early-career scientists is a strong testament to the attraction scientific ocean drilling provides to the next generation of Earth scientists. The JRFB applauds the strong desire expressed by the workshop attendees and the IODP Forum for using a multi-platform model in writing the next science plan.

24. Input from other *JR* Partners (India, Korea, Brazil)

Dr. Neal noted the absence of Dr. Brijesh Bansal, JRFB Member from IODP-India, and said that Dr. Bansal passed along continued strong support for the program from India.

Dr. Priscila Lelis Cagni, standing in for Dr. Zena Maria da Silva Martins of the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), discussed Brazil's intended participation and concerns for the program through 2023. The current political situation has affected all agency-funded programs, although their contribution will continue at \$1M/year. Brazil has major concerns regarding the new MoUs due to relatively low use of facilities by the Brazilian scientific community. The young program is still improving its capabilities. Budget cuts occurred across all federal agencies, so they are looking into other funding possibilities. Dr. Cagni also presented statistics of Brazilian involvement in expeditions and proposals.

Dr. Kroon asked if more berths would be available when the *JR* reached Brazilian waters. Dr. Cagni replied that they are talking about the situation with NSF. CAPES is trying to increase the number of Brazilian states involved in the program. Results of an internal program evaluation will be presented at the Forum meeting. Dr. Neal asked how the JRFB could help Brazil. Dr. Cagni said that CAPES is working on various strategies and considering looking to the Brazilian marines for political support, along with private donors or national petroleum agencies. Dr. Koppers noted that as the *JR* will likely be in Brazilian ports in the near future, the JRFB could meet with private donors or ministers to provide extra support and exposure for the benefit of the program.

Dr. Gil Young Kim, JRFB Member from K-IODP, gave an update on Korea's plans for the program. Korea is preparing for the next phase of the program. This needs to be done in two steps, from the Ministry of Oceans and Fisheries to the Ministry of Science and Technology. They are waiting on the second evaluation results and are optimistic. Dr. Kim noted that letters from each PMO would be helpful for obtaining funding in Korea.

25. Discussion of Enhancements to Science Plan post-2023 – Input to the IODP Forum

Dr. Kroon proposed a potential way forward incorporating the results of the regional workshops, and Dr. Neal asked the JRFB for input regarding the following:

1. Post workshop results on the IODP website, and invite community comments.
2. Integrate workshop results and produce a 2- to 3-page roadmap document for a new science plan (posted on the IODP website for comments) at a meeting at the Lamont-Doherty Earth Observatory by mid-July. The core working group will consist of 3 delegates from each of the regional workshops, and 1 each from Brazil, Korea, and India.
3. Present the roadmap and form a writing group for the new science plan at the Forum meeting in Osaka in September. The writing group will be formed by adding 10-15 people to the 18-person working group.

4. Produce the first draft of new science plan (to be posted on the IODP website for comments) by mid- to late-January 2020. The American Geophysical Meeting (AGU) Fall Meeting may be a convenient time to meet up and write.
5. Review the first draft and integrate community comments for a second iteration of the new science plan by mid 2020. An additional review group of 10-15 scientists should be formed for this task.

Dr. Camoin asked how the writing group would be formed, with the core working group (3 delegates from each regional workshop and 1 delegate from additional countries) and a selection of 10-15 scientists. Dr. Kroon said that after the core group has been determined by their respective PMOs, an informed decision can be made on selecting the additional scientists needed. The Forum would oversee this process. Dr. Morris approved of the approach, and said that the writing group should have broad representation covering different fields of expertise. Dr. Allan thought the core group should consist of the people who ran the workshops in order to preserve the interests associated with each workshop. Dr. McNeill was concerned that such a large group of people, potentially over 30 with the core group and additional writers, could hinder the efficiency or effectiveness of creating a new science plan on a short timescale. Dr. Kroon said it was important to have so many participants if the core group lacked expertise in some areas.

It was agreed that Dr. Kroon should send out an invitation to the PMOs and find out availabilities for the meeting, including organizers from China's not-yet-held workshop. Dr. Eguchi requested that the list of participants be determined early enough to factor into the logistics for the Forum meeting in Osaka.

Dr. Koppers asked about the Forum agenda. Dr. Kroon replied that future science plan discussions will occur on the first day. Each workshop group will be asked to present their results, then the core working group will present the roadmap document. Comments will be added from the China workshop, and then it will be decided if the roadmap needs modification. The program structure will be a separate agenda item at the Forum meeting. The PMO meeting will be held on the 4th day of the Forum meeting. ICDP will be invited, as well as other related communities. Dr. Eguchi will work with Dr. Kroon to accommodate the meeting attendees.

Dr. Neal noted that the Forum meeting would be the appropriate place to discuss the name of the next program, as NSF would like a new name to represent a clear future with new science objectives. Mr. Houtman added that the new science plan would drive the new and exciting future of science to be achieved, showing the NSB that the new program would be different from the program in existence. The new program would carry forward and build on the foundation of work that has been done. Dr. Allan suggested keeping keywords such as international and drilling to help tie together the 3 current, somewhat-independent platforms that are run very differently. Dr. Neal said that people should be aware that a name change will be discussed at the Forum meeting.

Dr. Given asked for guidance on posting progress of the new science plan on the IODP website, in terms of how the JRFB wanted the documents to be made available for community comments. Dr. Kroon said the process should be transparent for the

scientific community at every step, although there should be some administrative control over hostile or uneducated comments. Dr. Stocks said that various tools for collecting community responses online could be presented for Dr. Kroon and the core working group to assess. Access to the documents could be announced through moderated mailing lists, such as those regularly sent out by ESSAC, USA, or J-DESC. Dr. Morris suggested implementing a password-protected site with login credentials distributed through mailing lists.

Dr. Kroon agreed to construct the Forum agenda and send it around for comments, and there was a clear consensus on how to proceed forward with integrating the workshop and results and creating a new science plan based on Dr. Kroon's presentation.

Consensus 9

The timeline for completing the new scientific ocean drilling science plan, as presented by IODP Forum Chair Dick Kroon, is ambitious. However, the JRFB strongly supports this timeline because it is necessary for advancing plans for securing a new US riserless drilling platform and for international partner renewal processes. We also greatly appreciate the open nature of the proposed process and urge that the writing team be inclusive of those responsible for coordinating the regional/national workshops, subject expertise, diversity, and early career scientists.

26. Finalizing the FY'21-22 JR Schedule

Dr. Neal recapped the possible FY'21-22 schedules provided by Dr. Malone: no new expeditions, 1 expedition in the South Atlantic, or 1 expedition going to the Iberian Margin. Various pros and cons between each option were discussed, with the group agreeing that scheduling no expeditions would send the community a poor signal.

Dr. John asked if completing Proposal 800 was an option, and Dr. Neal explained that one proponent had sent a letter on behalf of the proponent team without the entire team's agreement. It would be better to have the proponents of the proposal all on the same page before determining how to move forward, which may require additional time and evaluation before the JRFB can consider scheduling an expedition to go back.

Scheduling the Rio Grande Cone proposal (910) received the strongest consensus due to the logistics of minimizing transit time to maximize the science that may be achieved. By following a northern transit after the expedition, potential future expeditions would have more opportunities to be scheduled.

Consensus 5

The JRFB has agreed to schedule proposal 910 Continental Margin Methane Cycling for October-November, 2021. The board anticipates that many expedition options for following the ship-track in the Atlantic and Mediterranean will be available for scheduling at the 2020 JRFB meeting.

27. Policies and Guidelines Updates

No discussion due to the lack of time. The policies will be discussed via email.

27A. Sample, Data, and Obligations Policy

27B. Confidentiality Policy

27C. EPSP Guidelines

Action Item 7

The revised policies and guidelines will be approved by electronic vote after further edits. These include the Confidentiality Policy, the Sample and Data Obligations Policy, the JRFB Advisory Panels Terms of Reference, and the Guidelines for the EPSP Safety Review Report and Presentation and Expedition Safety Package.

Action Item 9

For the Sample and Data Obligations policy, the JRFB Chair will work to define when the changes will take effect, including the impact on shore-based sampling parties.

28. Potential new members of IODP

No discussion.

29. The JRSO Draft FY'20 Annual Program Plan

Dr. Clement then presented the JRSO tasks and implementing plan for their draft FY'20 Annual Program Plan (APP). Due to the *JR*'s propellers failing inspection, several schedule changes were made, moving Expedition 378 from FY'19 into FY'20. The updated FY'20 expeditions are:

- Expedition 385: Guaymas Basin Tectonics and Biosphere (Category 1)
- Expedition 378: South Pacific Paleogene Transect (Category 1)
- Expedition 384: Engineering Testing (Category 2)
- Expedition 387: Amazon Margin (Category 2)
- Expedition 388: Equatorial Atlantic Gateway (Category 1)

The FY'20 APP budget is at \$66.9M, of which 57% is the ODL subcontract. Due to the propeller issue, some FY'18 and FY'19 funds were saved and can be moved into FY'20. Fuel costs are down this year, but the enormous transit across the Pacific will account for more out of the budget.

JRSO is in the process of re-competing the wireline logging subcontract. One or more response has been received, and Dr. Clement was confident that a new wireline logging contract will be in place soon.

Another significant change with the JRSO's subcontracts is that Siem Offshore has moved the ODL office from the Netherlands to their headquarters in Norway, legally transferring the contract with the same conditions in place. JRSO is waiting for NSF approval. There will be a new vessel manager, likely a positive development, streamlining operations. The current ODL contract began in 2004, set for 10 years with continued 1-year extensions through 2023. There are no contractual obligations beyond then. An issue has come up regarding the *JR*'s 45-year dry dock: between October

2023 and February 2024, a \$7M investment may need to be made, with only a few months of contracted work remaining. Options would be to end the contract, or split the cost and spread it out over a 5-year contract. JRSO is willing to go for the second option but wants to negotiate clauses for the extension. NSF has approved this, and JRSO would like something in place before July 1. There is some concern regarding extended access to the *JR*, although ODL is committed to extending the *JR* as long as possible.

Dr. Neal asked if the second option with the ODL subcontract (splitting the dry dock cost over a 5-year contract with a 2.6% increase in the day rate) meant that the *JR* could be used at the beginning of the new program. Dr. Clement responded that JRSO would like to keep as many options open as possible, but they don't know if ODL will agree.

Dr. Allan asked if the increase in day rate is not approved, would there be no more access to the *JR* after October 1, 2023? Dr. Clement confirmed that demobilization would have to occur before that date, so it's possible that only 5 or so *JR* expeditions could be added to the schedule. There will be difficult decisions to make down the road, but they may find future efficiencies or technological improvements to help with costs.

Dr. Tuo asked how long the *JR* could continue to be used after the dry dock. Dr. Clement responded that there would be a dry dock every 5 years, but after 2024 ODL probably won't want a locked-in day rate. The ship's environmental impact statement runs out in 2028 and cannot be renewed. Dr. Koppers asked about the risk of ship parts breaking down between 2024 and 2028. Dr. Clement replied that the drilling equipment is all from the 1970s, so there are no spares. ODL has a prescriptive maintenance plan but unanticipated breakdowns would be problematic. 2028 would be the drop-dead date for the *JR*, but demobilization would occur several months prior to 2028.

Dr. Neal said that after JRSO has finalized the program plan, the board will approve it via email.

Action Item 6

The JRSO will forward the final FY'20 Annual Program Plan to the JRFB for electronic approval in plenty of time to meet the 1 August 2019 deadline for the plan to be submitted to NSF.

30. The SSO Draft FY'20 Annual Program Plan

Dr. Given presented the SSO APP to the JRFB for approval. She reviewed the planned budget and reminded everyone of the SSO's role in facilitating the proposal review process for the benefit of both proponents and reviewers. FY'20 is year 7 of the 10-year cooperative agreement, and a few small refinements have been made to the estimates in the renewal proposal from 2017. The proposed budget of \$1.35M covers staffing for 6 FTEs, which are 86% of the direct costs. Increases in direct costs come from meetings hosted by the SSO, as the JRFB meeting can no longer be held in the NSF building due to security policies.

Dr. Given then reviewed the primary task work of the SSO:

- Task 1: Logistical and programmatic support for advisory panel meetings.

- Task 2: Proposal and data management for 2 submission deadlines every year, including the normal workflow of evaluating proposals and maintaining an archive of all documents and data. Proposal and data management was challenging due to the huge volume of submissions this deadline. Several proposals went to external review as well, with one being fast-tracked.
- Task 3: Websites for IODP, to facilitate science planning for people in IODP and provide links to all entities. While news and videos are featured, the website is not intended as an outreach website.
- Task 4: Integrated IT platform for PDB and SSDB, which entails hardware and software maintenance and new developments proposed every year.

The list of deliverables for FY'20 includes a reviewer support tool, allowing SEP members to work directly with the PDB system and alleviating the administrative role of the proposal manager. Plans for the Site Survey Data Bank include a new seismic data upload tool and an expanded geospatial search tool. Other website tasks will include post-2023 science planning documents as discussed at this meeting.

Dr. Neal received unanimous approval for the SSO's FY'20 APP.

Consensus 14

The Science Support Office Annual Program Plan FY'20 is recommended for approval.

31. Review of Consensus Statements and Action Items

Dr. Neal led the review of consensus statements and accepted appropriate changes and additions. The final statements are compiled at the front of this document.

32. Membership of JRFB

Dr. Neal noted that two JRFB members are rotating off, thanking Drs. Bach and Liping Zhou for their service. He will initiate the ads seeking nominations for the replacement of two non-US scientists on the board.

Consensus 15

Liping Zhou is sincerely thanked for his service and dedication to serving on the JOIDES Resolution Facility Board. It has been a pleasure to work with him over his term and we wish him well in his forthcoming endeavours, and hope we will see him serving again on future IODP panels.

Consensus 16

Wolfgang Bach has been a dedicated advocate of scientific ocean drilling for many years. The JRFB has greatly benefitted from his experience over the term he has served. We sincerely thank him for his service to this facility board and to scientific ocean drilling and wish him well in his life after JRFB.

Action Item 8

The USSSP will initiate an advertisement for replacement of the outgoing JRFB members.

33. Any Other Business and Next JRFB Meeting

The JRFB discussed options for scheduling the next meeting. Dr. Allan suggested the meeting be held at the Scripps Institution of Oceanography in La Jolla, CA, which Dr. Neal seconded. Dr. Given will check the venue availability for the JRFB meeting to be held on May 12-14, 2020. College Station, TX, would be fitting as an alternative or 2021 meeting location.

Dr. Neal, on behalf of the JRFB, thanked all participants for their active participation.

Meeting adjourned at 4:30 pm.