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IODP Operations Review Task Force Meeting

Expedition 318
Wilkes Land

March 8th - 9th, 2011
LDEO, New York,
NY, USA

Expedition 318 Task Force Members

Co-Chief Scientists
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USIO/TAMU
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MEETING FORMAT

The IODP-MI Operations Review Task Force met on March 8th – 9th, 2011, at LDEO (Lamont-Doherty Earth Observatory), New York (USA) to review the operational aspects of IODP Expedition 318 (Wilkes Land). The review concentrated on lessons learnt from the expedition with an emphasis on what should be done differently in the future, while taking note of topics specific to Expedition 318 and items which had been, or were, in the process of being addressed. The Task Force review was based upon confidential reports submitted by the U.S. Implementing Organization (USIO) and the Expedition 318 Co-Chief Scientists, as well as on expedition daily and weekly reports available on-line.

The meeting began with oral presentations by the Co-Chief Scientists (Carlota Escutia and Henk Brinkhuis), the Expedition Project Manager (EPM: Adam Klaus) and the Logging Staff Scientist (Trevor Williams), who summarized the Co-Chief Scientists report and USIO reports, respectively. The Co-Chief Scientists presented their recommendations. Following these oral presentations, the Task Force identified specific topics for discussion from the pre-expedition, expedition, and post-expedition phases. On the second day of the meeting, the Task Force reviewed the recommendations and came to a consensus on each one. These recommendations are presented in this report.

EXPEDITION SUMMARY

Expedition 318: January 4th, 2010 – March 8th, 2010
Co-Chief Scientists: Carlota Escutia, Henk Brinkhuis
Expedition Project Manager: Adam Klaus
USIO Operations Superintendent: Ron Grout

Expedition 318 (Wilkes Land) was devoted to investigating the long-term record of Antarctic glaciation and its relationship with global sea level, paleoclimate and paleoceanographic changes. Precruise planning was negatively impacted by uncertainty and delays in delivery of the renovated JOIDES Resolution. Expedition 318 drilled in an area of very challenging weather and ice conditions off the Wilkes Land coast of Antarctica. They drilled 14 holes at seven sites and cored 3071 m and recovered 1972 m of core (64% recovery). Downhole logs were collected in two holes.

The Wilkes Land sites U1356, U1358, U1359, U1360 and U1361 were successful in recovering high-quality pre-glacial early-middle Eocene, Oligocene glacial sediments, albeit with several significant hiatuses and high-resolution Miocene, Pliocene and Pleistocene sections. An unconformity at Site U1356 prevented recovering a record across the E-O transition. Although the three holes at the Adelie Drift Site U1357 proved an extremely fast sedimentat accumulation rate, laminated Holocene section, weather and overall expedition priorities prevented full penetration in the third hole. In addition, severe gas expansion impacted recovery.

The overall time distribution included 5.85 days in port, 22.7 days in transit, and 35.6 days on site. The on-site time includes 4.9 days in which we had to cease operations because of

the severe Antarctic weather and ice conditions. The transit time also includes >4 days spent trying to reach some of the shelf sites only to be turned back by severe ice conditions. As expected, the shelf sites (U1358, U1360) were very difficult to initiate and to advance coring. The bottom-hole assembly broke off at Site U1358 and coring at Site U1360 had to be terminated due to approaching ice and could not be re-occupied. However, the primary scientific objectives were achieved to the level allowed by the harsh environmental conditions and challenging formations. Within the laboratories, core description (DESKlogik), the database system (LIMS), and physical properties acquisition systems were the primary concerns raised by scientific participants. Postcruise activities were dominated by two intensive core sampling parties.

See http://iodp.tamu.edu/scienceops/expeditions/wilkes_land.html for more details regarding the background and objectives, the preliminary scientific results, and conclusions of Expedition 318.

RECOMMENDATIONS OF THE EXPEDITION 318 REVIEW TASK FORCE

Overall, the Expedition 318 Operations Review Task Force found that the Wilkes Land Expedition was a major success. This success resulted from a combination of factors including the refurbishment of the *JOIDES Resolution* and its equipment, close collaboration and communication between science party and operators, and professionalism, willingness and the concerted effort shown by all parties to work through issues as they arose at sea and onshore. All parties involved in this operation are to be congratulated on a successful expedition. In particular, the ship operator successfully conducted the *JOIDES Resolution* operation with a highly experienced management team in challenging weather and ice conditions in area of the Antarctic margin.

> **Comment 318-01 Successful Expedition:** Expedition 318 was successful, both scientifically and operationally in a particularly challenging environment. This success can be attributed, to the largest part to the highly experienced management team, including a Captain and Operation Superintendent experienced in icy high latitude operations and a co-operative and committed team of scientists and support staff, including the add on of dedicated weather- and ice-experts.

The Review Task Force identified several areas for future operational improvement, particularly pre-expedition planning/preparation, expedition operations, and post-expedition reporting. Various issues discussed during this review were related to the establishment of a streamlined operation process of the *JOIDES Resolution* include staffing and technologies for special circumstances at challenging environment. Although the primary focus of this review was on USIO operations during Expedition 318, the recommendations in this report are equally valuable for IODP operators, IODP management and to the Program Member Offices. As such, some recommendations are also directed to these entities.

Experienced staff

Recommendation 318-01: ORTF 318 highlights the role of experienced staff in expedition success, and recommends continued communication between the IO and ship operator to ensure appropriate expertise especially weather and ice specialists for operation in challenging areas such as the Antarctic.

ORTF 318 also acknowledges the importance of retaining a highly experienced and well-trained team despite non-operational times.

Routing: USIO, other IOs
Background: USIO deployed highly experienced captain, crews and expertise include Ice Observer and a Weatherman to conduct successful operation in an area of very challenging weather and icy conditions at Expedition 318. Without those expertise, they would not have been able to reach the sites and to stay on site as much as they did during Expedition.318.

Prospectus

Recommendation 318-02: ORTF 318 recommends the development of the prospectus at the pre-cruise meeting that includes the production and scheduling of APLs to engender realistic expectations amongst all parties and optimize science during operations. With this in mind, ORTF 318 would request SPC schedule APLs as early as possible.

Routing: USIO, OTF, SPC, IODP-MI
Background: APL (638-APL2 Adelie Drift) was added to cruise after science party and IO had the pre-cruise meeting in 2007. They had to re-discuss the expedition science plan and operation scenario includes contingency planning which was already discussed and planned.

Staffing

Recommendation 318-03: ORTF recommends that all PMOs provide a sufficiently large choice of qualified applicants to provide IOs with flexibility for scientific staffing, recognizing the complexity of balancing the national representation, expertise, and an appropriate range of experience within the scientific party.

Routing: PMOs
Background: Overall staffing on Expedition 318 went well, the PMOs provided 118 nominations for shipboard participation. However, Co-Chiefs Scientists and the USIO had narrow flexibility with specialty and national balance on selecting scientist because not all PMOs provided more than the minimum to fill their allotted number of slots.

Contingency Planning

Recommendation 318-04: ORTF notes the success of Expedition 318's contingency planning and recommends that all future expeditions in such challenging environments plan likewise.

Routing: USIO, other IOs

Background: Prior and during the pre-cruise planning phase, much thought was devoted to contingency planning by proponents and USIO because of the extreme remoteness, severe and unpredictable regional weather, extensive ice coverage, and potentially difficult downhole conditions. These efforts on contingency planning were extremely useful at the cruise.

Staffing and technologies for special circumstances

Recommendation 318-05: ORTF 318 notes the benefits of staffing with experts for weather forecasting and ice observations in challenging environments, and recommends investigation by the USIO of technologies, such as TeraScan that provide staff with cost-effective tools to optimize operations.

Routing: USIO

Background: USIO was provided satellite analysis of ice in the drilling area by the National Ice Center (NIC). The NIC data were very helpful in providing annotated medium density imagery of ice coverage used to prioritize site selection. However, the data they received lacked the needed resolution to make informed decisions regarding of the actual ice coverage where sites were located. Fortunately USIO was able to receive some TeraScan satellite images from the French research vessel when this vessel was in proximity to cruise area.

Recommendation 318-06: ORTF 318 recommends that in high latitudes where different microfossil groups are important, in addition to calcareous microfossils, the microscopes should be set up accordingly and in consultation with the shipboard micropaleontologists.

Routing: USIO

Background: Micropaleontologists on the cruise found that some of on-board microscope's setup was not optimized for high latitudes microfossil group observation.

Organic Geochemistry and Paleontology

Recommendation 318-07: ORTF understands that the support for organic geochemistry (e.g., biomarkers) and organic microfossils could be enhanced and recommends that STP and the IOs develop a plan of action to address this issue.

Routing: STP, IOs

Background: USIO could receive small number of candidates on organic geochemist and paleontologist from PMO for the cruise.

Laboratory Systems

Recommendation 318-08: ORTF 318 notes the apparent problems with laboratory systems on Expedition 318, including LIMS, DescLogik, and physical property tools, as well as ongoing efforts by the USIO to make improvements. ORTF 318 recommends timely testing and external review of progress on laboratory systems, including documentation and training plans. For example, ORTF 318 recommends such action as soon as possible during an upcoming non-operational period.

Routing: USIO, STP

Background: A wide range of issues on laboratory systems were identified by the scientists in this specialty at the cruise, some of it has been completed and others are on work by USIO. ORTF reviewers appreciated the efforts made by USIO for improving those systems on cruise by cruise. However they also agreed that USIO need to devote additional effort to provide pre-cruise training of the shipboard systems to the shipboard scientists so they are able to familiarize themselves before the cruise start.

Education and Outreach

Recommendation 318-09: ORTF notes the benefit of strong education and outreach activities, particularly the professional quality videography and other educational efforts of Expedition 318.

ORTF 318 recommends consistently supporting similar high standards throughout the program. With this in mind, ORTF recommends the appropriate pre-cruise training of a shipboard education officer.

Routing: USIO, IODP-MI

Background: Expedition 318 shipboard outreach and education efforts were focused on the use of video and should be a one of reference expedition of how to move forward in making IODP science available to the public. This was possible by professional videographer who was part of ship crew. This professional videographer produced high-quality weekly video updates that were distributed to wider public through joidesresolution.org and the Consortium for Ocean Leadership's YouTube channel and etc. Some of video updates and documentary were downloaded 20,900 times and hundreds of DVDs have been given to educators and students worldwide.