## **IODP Scientific Technology Panel (STP)**

## 1<sup>st</sup> Meeting, 19 – 22 March 2012

## Kochi Core Center and Kochi City Culture-Plaza Kochi, Japan



The IODP Scientific Technology Panel convened first in Kochi Core Center (KCC) for a one-day investigative review. This visit was followed by a full agenda 3-day meeting held at the Kochi City Culture-Plaza, Kochi. The meeting was hosted jointly by Dr. Takehiro Hirose at Kochi Institute for Core Sample Research, JAMSTEC and CDEX/J-DESC (Hiroyuki Kikuta and Akiko Fuse). The meeting resulted in 18 Consensus Statements and 6 Action Items. 16 of the full complement of 18 members attended the meeting. Yuhji Yamamoto attended as an alternate for Saburo Sakai, Jang-Jun Bahk for Sang Min Hyun. David Boutt and Katrina Edwards were not able to attend the meeting and no alternates attended for them. The opportunity to visit the KCC and evaluate many of the new and enhanced systems was a highlight of this meeting. No Conflicts of Interest were identified by the membership at the start of the meeting.

#### STP Consensus Statement 1203-01: Review of the KCC Facility

The STP recommends that for core description the following measures be taken by the Kochi Core Center (KCC):

1. To allow for the laying out of one or several full cores at a time for description and sampling purposes.

2. To provide additional light and magnification options for use during core description.

3. To investigate the feasibility of taking a low-resolution photo/scan of each core section after sampling to allow scientists to observe the state of the remaining core material prior to submitting a sample request.

4. Curation of cores should be maintained as it is, i.e., in a 4°C-refrigerated repository.

Regarding the Routine Microbiological Sample (RMS) procedure, the STP recommends the following:

1. Maintain stratigraphic context (top/bottom) of split and residual sample material.

2. Consider renaming the RMS procedure to encourage sample requests from scientists in addition to microbiologists. RMS have considerable value in geomicrobiology. The name change would foster collaborative research between microbiologists and inorganic and organic geochemists.

3. Publish the results of the fluorescent bead contamination test in the RMS manual or literature, and consider additional contamination tests that are relevant to other disciplines (e.g., trace elements or organic geochemistry).

Regarding the track systems available at the KCC, the STP recommends that if any free time is available, that the equipment be opened up to the broader IODP community outside of Japan. If additional time is available STP recommends that it be opened up to the broader community, especially those from non-IODP countries as a form of outreach.

### Vote: 16 Yes, 0 No, 0 Abstentions, 2 Absent (Boutt, Edwards)

### **Priority: Medium**

### STP suggests this be forwarded to CDEX, KCC, and IODP-MI

**Background to STP Consensus Statement 1203-01:** The STP was overall very impressed by the curation and sample handling at KCC, as well as the use of J-CORES for core curation and storage. The curatorial staff were all professional, and the work flow ensured that each of the curation specialists were given all necessary information prior to sampling commencing. The use of bar code scanners for checking core in and out of the reefers, as well as the J-CORES system for logging samples prior to shipping, builds a system of multiple checks that ensures integrity when taking samples. This is particularly important during large sampling parties conducted over a short period of time. The organization of the core sampling soft and hard sediment. The current sampling system allows for two core sections to be laid out and sampled at one time. Although the STP recognizes that sampling is easiest on the core closest to the sampler, there are instances when being able to view an entire core (7 sections) at one time would be preferable. This is particularly important for core description; however, it is also useful when sampling a large sediment package or attempting to select one sample per core from the best lithology for the study. Although KCC can accommodate this upon request by setting aside a table, we recommend that it be a common practice rather than something to do only when requested.

The STP has two further recommendations regarding core curation and sampling. The first is for KCC to provide additional light and magnification options for use during core description. The option used by the USIO, a combination magnifier with light source used on the JOIDES Resolution (JR), would be one possible tool to achieve this. Furthermore, STP suggests that KCC investigate the feasibility of taking a low-resolution photo/scan of each core section after sampling to allow scientists to observe the state of the remaining core material prior to submitting a sample request. The J-CORES system appeared to be very stable at KCC for sampling; similar feedback from panel member Steffen Kutterolf indicates that this was also the case onboard Chikyu during expeditions. Although we did not look at the manual/documentation for J-CORES, Dr. Gupta indicated that one is available. Due to lack of time, the STP was not able to evaluate core description and data entry using J-CORES. We recommend that CDEX and KCC continue to use comments from the Operations Review Task Force (ORTF) to continue to improve J-CORES and fix known bugs.

STP also assessed the RMS onshore curation facilities and the procedures used to subsample RMS whole rounds for distribution to the scientific community. The procedure is well documented and illustrated in the RMS curation manual. The saw used to cut the whole rounds is located in a clean booth that prevents contamination. The booth is positioned near freezers to enable efficient transfer of material to/from the storage freezers. A fluorescent bead test demonstrated the cutting procedure did not contaminate the interior of the whole round with external material. Overall, the procedures are well designed and conducted in a microbiologically clean manner.

KCC contains an exceptional array of equipment for physical properties measurements (CT X-ray, XRF-TATSCAN F2, MSCL, NGR) that essentially mimics what is available on the Chikyu. This equipment is wonderfully maintained and well supported by the technical staff. These physical properties equipment and staff represent an exceptional opportunity to the IODP and broader community.

## **STP Consensus Statement 1203-02: Manual for Routine Microbiological Sample Curation**

The STP would like to thank KCC for formulating the manual for curation of frozen core material of Routine Microbiological Samples (RMS). The STP also thanks Prof. Frederick Colwell and Dr. Anna Kaksonen for their help to review the manual. The STP and two external scientists reviewed the document and recognized that the document captured the necessary detail in how to collect these samples so that any competent individual can move forward in proper manner. Also, STP recognizes that these curatorial procedures are highly useful for implementing RMS curation onboard and onshore. The STP also encourages KCC to make this document accessible on-line to let all the relevant scientists know how the samples were taken, frozen and curated.

Vote: 16 Yes, 0 No, 0 Abstentions, 2 Absent (Boutt, Edwards)

#### **Priority: High**

#### STP suggests this be forwarded to IODP-MI, KCC, and IOs

**Background to STP Consensus statement 1203-02:** This action item follows STP Recommendation 0908-09 referencing relevant recommendations generated by the 2003 IODP Microbiology Working Group Report, the IODP Deep Biosphere Workshop held in Vancouver, BC (October 2006), the manuscript resulting from that workshop (D'Hondt et al., Scientific Drilling No. 5, Sept. 2007), the Sept. 2007 report to IODP-MI from the Subsurface Life Task Force (SLTF), and past STP consensus statements including 0708-14, 0807-12, 0807-17, 0807-18, 0903-06, and 0903-07. Following the SLTF report at the Edmonton 2008 STP Meeting, STP issued a set of recommendations for RMS on IODP expeditions (including those for which microbiology is the primary scientific objective) so that samples are adequately and consistently preserved for future microbiological analysis. At the STP meeting in Auckland (2011), STP received a draft manual for RMS that includes onboard procedure, shipment, and curation in repositories from KCC for review. The STP asked Frederick Colwell (Oregon State University, USA) and Anna Kaksonen (CSIRO, Australia) to review the manual and they kindly reviewed and provided comments with editorial suggestions.

#### STP Consensus Statement 1203-03: Shipboard Paleomagnetism

STP recommends that an electronic laboratory notebook and/or "wiki" be developed to track and search corporate memory for Superconducting Rock Magnetometer (SRM) related issues. STP recommends that a taskforce be organized so that a common user interface platform can be developed to facilitate shipboard paleomagnetic studies; this project should be conducted in close collaboration with the IOs. STP does not recommend use of high alternating fields (>50 mT) for demagnetization when using the SRM. The above taskforce could look into additional shielding options that might reduce Anhysteritic Remanent Magnetism (ARM) acquisition of SRM measurements. STP recommends in view of the absence of an absolute standard, that the use of relative standards provides a realistic solution for continuity of shipboard (SRM and spinner) paleomagnetic data.

### Vote: 16 Yes, 0 No, 0 Abstentions, 2 Absent (Boutt, Edwards)

#### **Priority: High**

### STP suggests this be forwarded to IODP-MI and IOs

**Background to STP Consensus Statement 1203-03:** STP Consensus Statement 1108E-09 raised the issue in regard to corporate memory for SRM-related issues. In response to the consensus statement, the USIO is looking into electronic laboratory notebooks that would make the dissemination of such information more efficient.

It is not uncommon for scientists to bring or develop their own data processing software for the raw observations captured by the SRM or other instruments. Scientists do not always get copies of these methods, so processing can vary from expedition to expedition. STP suggests that purpose-built software be developed and that a taskforce be called to facilitate this effort.

Undesired ARMs are accidentally imparted by the inline deGausser during demagnetization using the SRM. This dates back to the initial installation of the current SRM on the JOIDES Resolution in 1996. AF-field output was checked and was found to be in compliance with expected values. The USIO has found that ARM are exacerbated by vessel heading. Depending on heading, field leakage can approach a substantial portion of the Earth's magnetic field strength, and the ARM effect is substantial. This is particularly important when AF demagnetization uses peak fields higher than 50 mT. For sediment expeditions, onboard scientists usually demagnetize half cores by 20-25 mT and the ARM effect is rarely a problem. In contrast, for hard rock expeditions, scientists sometimes want higher field demagnetization and in this case the problem arises. STP recognizes that this issue could be resolved if a magnetically shielded room were built, although lower cost options may be possible.

There has been the need to prepare standard reference materials for the SRM, but there are no commercially available standards. The USIO suggests that scientists use an impulse magnetizer onboard the JR to impart a sufficient saturation isothermal remnant magnetization (SIRM) to samples. The imparted SIRM can be used as a relative standard to compare measured magnetization between onboard and onshore. STP recognizes this as a realistic, although not optimal, solution.

## STP Consensus Statement 1203-04: Scientific Earth Data Information System (SEDIS)

The STP thanks Jamus Collier for his demonstration of SEDIS. STP recognizes that SEDIS is a well-established portal to access data from DSDP, ODP and IODP. STP recommends that SEDIS be finalized as soon as possible, with some minor changes to the system:

•Provide additional citation information for the publication results;

·Ability to sort publication results by year published;

·Use of special characters (e.g., umlaut) rather than the English transliteration; and ·Use of wildcards in searches.

Furthermore, STP strongly recommends that SEDIS be maintained by the future support office of the International Ocean Discovery Program beyond 2013.

## Vote: 16 Yes, 0 No, 0 Abstentions, 2 Absent (Boutt, Edwards)

### **Priority: High**

### STP suggests this be forwarded to IODP-MI

**Background to STP Consensus Statement 1203-04**: Jamus Collier (IODP-MI) demonstrated SEDIS, a portal designed to access data and publications from the legacy programs (DSDP and ODP), as well as the current IODP. This portal has been developed in three phases since 2006; completion of the final phase is anticipated in March 2012, with ongoing maintenance planned for the remainder of the current program. This portal is the only site that allows access to data from all of the Implementing Organizations and IODP-MI at one time.

The STP members spent some time testing the portal following the demonstration and asking questions about its functionality. As a result, STP identified a number of potential problems with the portal. Jamus Collier noted that some of the problems were known and were being addressed (e.g., dateline issue when drawing a bounding box); other issues he noted down to have checked (e.g., search for basalt vs. basalts returning very different numbers of results). STP members also made a number of suggestions to improve the portal, including providing additional citation information for publication results, the ability to sort publication results by publication year, using special characters rather than the English equivalent, and use of wildcards for searches.

## STP Consensus Statement 1203-05: Approval of the Measurement Plans for CDEX and the USIO

The STP approves the measurement plans presented by CDEX and the USIO for Expeditions 337, 342 and 343. Furthermore, the STP recommends that CDEX presents to the panel the results of the 5 microbiology experiments using Third-Party Tools to be deployed on Expedition 337. This will allow STP to assess the value of the Third-Party Tools.

## Vote: 12 Yes, 0 No, 4 Abstentions (Morono, Hirose, Yamamoto, Saito), 2 Absent (Boutt, Edwards)

### **Priority: High**

#### STP suggests this be forwarded to the USIO, CDEX, and IODP-MI

**Background to STP Consensus Statement 1203-05:** During the 1<sup>st</sup> STP meeting in Kochi the STP reviewed 3 measurement plans presented by the IOs. The USIO presented the measurement plan for Expedition 342, which is limited to minimum and standard measurements. CDEX presented the final measurement plans for Expeditions 337 and 343. Expedition 343 will deploy two Third-Party Tools (dissolved oxygen sensor and gas chromatograph), which were used on previous expeditions and worked well. Expedition 337 will be a riser operation and ten Third-Party Tools will be deployed (Beckman flow cytometer, DiCE system, DNA genetic analysis, Quantification of Archaea, polymerase chain reaction, H<sub>2</sub> and CO,  $\delta^{13}$ C-CO<sub>2</sub> on Los Gatos  $\delta^{13}$ C-CO<sub>2</sub> analyzer, Radon in mud gas, penetrometer, microscope system for vitrinite reflectance analysis). All of the Third-Party Tools that will be deployed during Expedition 337 were presented at the Auckland STP meeting. The results of the 5 microbiology experiments should be reported back to STP after the expedition to evaluate the methods. Based on the information presented, the

STP does not see any potential issues for Expeditions 337, 342 and 343 and approves the measurement plans.

## STP Consensus Statement 1203-06: Testing of SCIMPI (Simple Cabled Instrument for Measuring Parameters In-situ)

The STP appreciates the successful bench testing of the SCIMPI and requests reporting of updates of the sea trial plan by the next STP meeting.

### Vote: 16 Yes, 0 No, 0 Abstentions, 2 Absent (Boutt, Edwards)

#### **Priority: Medium**

### STP suggests this be forwarded to IODP-MI and USIO

**Background to STP Consensus Statement 1203-06:** This consensus statement is a follow-up of STP Action Item 1107E-18. Yoshi Kawamura reported that bench tests for communication, power source switching, and deployment in December 2011 were all successful. He also reported that the sea trial of SCIMPI is planned in FY13 in Costa Rica or Cascadia margin.

### **STP Consensus Statement 1203-07: Stratigraphic Correlator/Splicer Software** The STP recommends that the USIO continue to maintain, and if funding becomes available, improve this software and its integration into the database. Chief scientists of paleoceanographic expeditions and scientists sailing as stratigraphic correlators must be made aware of the status of this software before sailing, so that optimal training before the expedition can be provided.

#### Vote: 16 Yes, 0 No, 0 Abstentions, 2 Absent (Boutt, Edwards)

### **Priority: High**

#### STP suggests this be forwarded to IODP-MI and USIO

**Background to STP Consensus Statement 1203-07:** This software is of prime importance in determining drilling stratigraphy during paleoceanographic expeditions where full recovery in overlapping holes must be established (e.g., Recommendation 323-06, ORTF 323). Non-optimal performance of this software likely results, as it was originally developed by a third party with limited support from the USIO personnel. Problems associated with documentation have largely been taken care of, although some missing functionality like downloading data vs. the splice still exists. STP recommends that the USIO fully support Correlator and its integration into the database, and provide training to technicians to ensure continuity between successive expeditions. Stratigraphic correlators must be made aware of the status of the software before sailing as long as the software has not been fully integrated, especially because paleoceanographic expeditions in general recover large numbers of cores so that little time is available for on-the-job training.

## STP Consensus Statement 1203-08: Taxonomic Name Lists (TNLs) and Paleontology Coordination Group (PCG) Activities

The STP thanks Jamus Collier for his update on the TNLs and the results of the latest PCG meeting held in October 2011. STP is pleased to learn that all commissioned TNLs have been completed and will be implemented once the database for the lists has been created. STP strongly encourages all IOs to integrate the TNLs into each IO's shipboard data-entry system once they have received the TNLs. STP recognizes the importance of the extended TNLs proposed by the PCG and recommends that IODP-MI fund this effort once funding for the new phase of the program has been secured.

## Vote: 16 Yes, 0 No, 0 Abstentions, 2 Absent (Boutt, Edwards)

### **Priority: High**

### STP suggests this be forwarded to IODP-MI, IOs and PCG

**Background to STP Consensus Statement 1203-08**: The STP received a TNL and PCG update from Jamus Collier at the 1<sup>st</sup> STP meeting. The presentation outlined the current status of the TNL project; TNLs for all commissioned fossil groups (planktonic foraminifera, calcareous nannofossils, radiolarians, diatoms and palynomorphs) have been completed. The TNLs have not yet been forwarded to the IOs, as IODP-MI is having issues with the front-end of the database for hosting the TNLs, including making it possible to search and edit the database. This work has already been funded and contracted; work is continuing to resolve it.

The PCG met in College Station in October 2011 to finalize the current TNLs and to discuss future recommendations. Top priority for the PCG is creation of extended TNLs, which would include information such as age range, biogeographic province, and water depth for benthic groups. This information would make the TNLs more useful for shipboard work, especially when less experienced paleontologists sail on an expedition. The PCG recommends using existing resources wherever possible (e.g., taxonomic catalogues), with additional information added by shipboard users. Currently there is no funding available to create these extended TNLs. A second priority for the PCG is establishment of TNLs for benthic foraminifera (top priority), ostracodes, and silicoflagellates.

Once the TNLs are distributed to the IOs to be used on the platforms, experts for each of the microfossil groups will be needed to maintain the TNLs. A small amount of money will be required to contract experts to serve in this role.

As noted in the numerous prior recommendations, consensus statements and action items (see SciMP CS 03-12-01, SciMP AI 04-06-07, SciMP Rec 04-06-05, SciMP AI 0502-02, SciMP Rec 0502-04, STP Rec 0507-08, STP CS 0612-06, STP CS 0708-21, STP CS0802-11, STP AI 0908-27, STP AI 1008-29, and STP CS 1108E-04), development of the TNLs

is a very high priority. Their integration into the shipboard data-entry systems is essential for effective data entry, management and archiving. The STP will continue to strongly support these efforts to ensure timely completion of the project.

#### STP Consensus Statement 1203-09: Improvements to DESClogik

The STP greatly appreciates the DESClogik improvements implemented by the USIO and thanks the USIO for their continued hard work to address suggestions from STP and the community. The STP particularly appreciates the changes made to the graphical user interface and the ability to download the software for use prior to an expedition. STP encourages continued improvement and development of additional features, including a form entry option, a graphical core description option, and automatic generation of graphics such as age-depth plots.

### Vote: 16 Yes, 0 No, 0 Abstentions, 2 Absent (Boutt, Edwards)

#### **Priority: High**

#### STP suggests this be forwarded to IOs and IODP-MI

**Background to STP Consensus Statement 1203-09**: At the 12<sup>th</sup> STP meeting in Auckland, New Zealand (February 2011), STP members toured the JOIDES Resolution and tested the onboard laboratory facilities, including DESClogik. At that time, the USIO gave an update on improvements recommended by members of the JOIDES Review team from June 2010, with additional input from several ORTFs and the PCG. Members of STP assessed the changes and evaluated the current state of DESClogik. In CS 1102-01 (Hands-on excursion to the JOIDES Resolution, Sunday, February 13), the panel provided the USIO with many recommendations for upgrades and improvements to DESClogik. During the 13<sup>th</sup> STP e-meeting, the USIO provided an update on the status of the improvements requested by STP and others. At that time, STP encouraged the USIO to provide more information regarding the status of pre-cruise training on DESClogik and the development of paleontological and sedimentological application tools at the next meeting (AI 1108E-24 Enhancement of DESClogik).

At this meeting, the USIO presented the many improvements to DESClogik that have been implemented since the e-meeting. This includes significant improvement to the graphical user interface for entering and retrieving data from the database. In addition, DESClogik can now be downloaded for use prior to an expedition. The USIO has plans for continued development of the program, including creation of a form entry option, which should make it easier for paleontologists to work directly in the program, rather than downloading a template into Excel, entering the data, and then uploading it into the database. There is also desire to develop a graphical data entry mode that would allow core description to occur directly on a core section photograph. Automatic generation of age-depth plots has not yet been addressed; although the panel identifies this as important and encourages the USIO to consider implementing this in the future, other improvements to DESClogik should have priority.

## STP Consensus Statement 1203-10: The Magnetic Freezing Technique CAS (Cells Alive System)

STP thanks Yuki Morono for his update on recent methodological evaluations of the CAS technique. The STP recognizes the usefulness of this novel technique designed to preserve intact microbial samples. STP acknowledges the importance of publishing the method. STP recommends sea trials of the CAS during Routine Microbiological Sampling on an IODP platform. Use of the technique for other applications should chemistry, continue to be explored (e.g., structural geology, magnetism, micropaleontology). The STP requests a full reporting of the results of any sea trial of CAS.

## Vote: 13 Yes, 0 No, 1 Abstention (Morono), 4 Absent (Boutt, Edwards, Vigier, Tominaga)

## **Priority: High**

### STP suggests this be forwarded to IODP-MI, IOs and PI

**Background to STP Consensus Statement 1203-10**: STP panel member Yuki Morono presented new method evaluations of the CAS. An alternating field facilitates homogeneous freezing of the water in sediment and rock samples without forming large ice crystals that would otherwise rupture cell walls. Relative to traditional normal storage (4 °C) and freezing methods (-20 °C through -160 °C), trial studies demonstrated that CAS fully preserves the original microbial cell concentrations. Additional tests demonstrated the CAS also preserves the magnetic properties of the sample with minimal degradation. Sample magnetic field strength was observed to decrease, but this effect occurred during all freezing methods that were tested. Future tests will be conducted to determine whether the CAS affects core microstructure and microfossil assemblages. The method will be published once tests are completed.

### STP Consensus Statement 1203-11: QA/QC Documentation

STP appreciates the efforts made by ESO to make available in its QA/QC web interface (URL: http://iodp.wdc-mare.org) all quantitative and detailed information concerning geochemical measurements of standards, reference materials and blanks during sample measurements. STP encourages other IOs to put such information online using a similar format.

### Vote: 14 Yes, 0 No, 0 Abstentions, 4 Absent (Boutt, Edwards, Vigier, Tominaga)

### **Priority: High**

### STP suggests this be forwarded to IOs and IODP-MI

**Background to STP Consensus Statement 1203-11**: Ursula Röhl gave a presentation on the status of the ESO QA/QC documentation. STP reported several cross platform QA/QC issues and consistency in methodologies (from: STP Consensus Statement 1008-02: Role of STP in the new SAS). This also relates to previous STP consensus statements: STP Consensus Statement 0802-01: Implementation of IODP-MI QA/QC TF Report STP Consensus Statement 0807-04: QA/QC Implementation and Reporting STP Consensus Statement 0908-04: Expedition QA/QC Reporting STP Consensus Statement 1003-03: Modification of QA/QC Reporting Procedures

## STP Consensus Statement 1203-12: Magnetic Susceptibility Calibration and Standardization

STP recommends the IOs utilize rare earth elements (e.g., Nd, Gd, Dy, Er) in the construction of specialized standard materials for absolute calibration and standardization of magnetic susceptibility measurements on all platforms.

## Vote: 14 Yes, 0 No, 0 Abstentions, 4 Absent (Boutt, Edwards, Vigier, Tominaga)

## **Priority: High**

## STP suggests this be forwarded to IOs and IODP-MI.

**Background to STP Consensus Statement 1203-12:** As presented by Joe Stoner, magnetic susceptibility is measured in different ways, but at present is incompletely calibrated. Requirement for standardization and calibration between equipment (discrete sample, whole round, logging tool) and platforms (Chikyu, JR, MSP) was previously raised (STP Action Item 1102-27). As a response, the USIO reported on progress made toward development of a magnetic susceptibility standard. The usefulness of rare earth oxides for absolute calibration of magnetic susceptibility has now been clearly demonstrated (Fukuma and Torii, 2011). The STP expects IOs to refer to this article when preparing standard materials for absolute calibration. STP acknowledges that the development of such a standard, even with this information, is not trivial and that trial and error will likely be needed. STP notes that such a standard is likely to be of considerable interest outside of the IODP community.

Reference: Fukuma, K. and Torii, M., Absolute calibration of low- and high-field magnetic susceptibilities using rare earth oxides, Geochem. Geophys. Geosyst., 12, Q07Z28, doi:10.1029/2011GC003694, 2011.

# STP Consensus Statement 1203-13: QA/QC Reports from Expeditions 327, 330 and 334

STP appreciates the detailed review by the USIO of QA/QC reports made by the scientific parties of IODP expeditions, ORTF reports, and laboratory updates. For geochemical analysis and microbial analyses, STP notes the following:

1. STP requests an update on the progress of attaining standard reference materials for the handheld XRF that match the matrix of sample materials.

- 2. STP requests an update on the progress of analytical solutions proposed by Dionex and exchange of information about analytical parameters with CDEX.
- 3. The new Chloride Autotitrator was a success and STP endorses its use.
- 4. STP acknowledges that the USIO is developing an in-house manual for the OI TOC analyzer.
- 5. STP encourages continued communication between the USIO and scientific party before each cruise to optimize the supply of consumable materials needed for CHNS elemental analysis.
- 6. STP acknowledges the successful deployment of the Agilent Cary 100 Spectrophotometer and requests an update on the use of the spectrophotometer and pre-existing OI Analytical Discrete Analyzer.

STP requests that these be provided at the next meeting.

### Vote: 14 Yes, 0 No, 0 Abstentions, 4 Absent (Boutt, Edwards, Vigier, Tominaga)

## **Priority: High**

### STP suggests this be forwarded to IODP-MI and IOs

**Background to STP Consensus Statement 1203-13**: STP Consensus Statement 1108E-09 recommended further clarification and information regarding issues from the QA/QC reports from Expeditions 327, 330 and 334. The issues are the following:

1. Handheld XRF spectrophotometer during Exp. 330. The XRF provided unreliable results. The USIO has continued to work on the handheld XRF issues, but is waiting for feedback from the vendor. The USIO is currently exploring options for standard reference materials within the proper matrix and surface characteristics.

2. Ion Chromatography during Exp. 334. Pore water sulfate precision was unacceptable (12%). Baseline variability is large relative to the amplitude of the sulfate peak in diluted seawater samples. The USIO is in discussion with Dionex about the problem. The Chikyu uses a different ion chromatograph made by Agilent. The USIO and CDEX will compare methodologies and explore alternate solutions.

3. Chloride autotitrator during Exp. 339. The new autotitrator was successfully deployed and produced excellent results (<<1% RSD) on IAPSO seawater standard.

4. OI TOC Analyzer during Exp. 339. The USIO is developing an in-house manual.

5. CHNS elemental analysis during Exp. 317. The stocked supplies were not sufficient for the number of organic samples analyzed during the expedition. The Technical Support group is now communicating closely with oncoming science parties to meet the needs of the scientific analyses.

6. Agilent Cary 100 Spetrophotometer during Exp. 339. The new instrument was used successfully. The USIO will evaluate whether the spectrophotometer can replace the OI Analytical Discrete Analyzer.

## STP Consensus Statement 1203-14: Survey of the Scientific Community with Regards to IODP Publications

The STP recommends that the USIO conduct a survey of the broader scientific community to define how IODP publications are used and what the minimum publication requirements should be for the next phase of scientific ocean drilling. The STP also recommends preserving the uniformity of publication products across platforms. STP requests an update on this issue at the next meeting.

## Vote: 14 Yes, 0 No, 0 Abstentions, 4 Absent (Boutt, Edwards, Vigier, Tominaga)

## **Priority: High**

## STP suggests this be forwarded to IODP-MI and IOs

**Background to STP Consensus Statement 1203-14:** This consensus statement is a follow up to STP Consensus Statement 1108-10 (New Publication Format). During this 1<sup>st</sup> STP meeting, Angie Miller from the USIO Publications Services presented the developments and current status of publication issues regarding IODP scientific publications, publication archive, data presentation, etc. The STP appreciates that the USIO Publication Services has made the following progress on issues related to IODP publications:

1) ISO disc images of Expedition Report DVDs are now available online.

2) Cited-by linking queries between IODP and non-IODP publications are being developed.

3) Permanent archive needs of IODP, ODP and DSDP publications have been assessed and continue to be explored.

**STP Consensus Statement 1203-15: Revision of Scientific Technology Roadmap** STP asks the IOs to review the current version of the scientific technology roadmap and provide the most recent status of the technologies described in the roadmap for the next meeting.

### Vote: 14 Yes, 0 No, 0 Abstentions, 4 Absent (Boutt, Edwards, Vigier, Tominaga)

### **Priority: High**

### STP suggests this be forwarded to IODP-MI and IOs

**Background to STP Consensus Statement 1203-15:** The scientific technology roadmap was updated during the 1<sup>st</sup> STP meeting. Since more than four years have passed since

the STP developed the roadmap, major revision is required to incorporate recent status of technology completed or planned by the IOs as well as current technologies in industry.

STP Roadmap Action Items:

The Core Description group would like to request information specifically on:

- Status of the various tools currently available for automated sediment grain size and shape analysis (A1-9);
- An update on the tool developed and used on the JR to provide a whole round surface photograph, specifically addressing if shipboard scientists are happy with the results from this tool (A1-17);
- A report from CDEX on the implementation of the Standard Procedure of Handling Cuttings from Riser Drilling during upcoming Exp. 337. In addition, STP would like to know if there is any evidence of hole stability problems, resulting in significant downhole caving, which could jeopardize the value of scientific results from cuttings. If there is evidence that this is a serious issue, the mud system used onboard the Chikyu should be examined.

The STP also requests CDEX to report the result on the use of large diameter coring, pressure coring, in situ fluid sampling, and cuttings analysis to identify feasibility, technical and operational concerns.

### STP Consensus Statement 1203-16: KCC Visit

The STP thanks Kochi Core Center (KCC) for their hospitality and for organizing the efficient visit of STP members to KCC. This visit provided a good opportunity to evaluate the routine operation of KCC and interact with KCC staff members. All the STP members enjoyed their stay, in particular the BBQ party in the evening.

# Vote: 13 Yes, 0 No, 1 Abstention (Morono), 4 Absent (Boutt, Edwards, Vigier, Tominaga)

**Priority: High** 

STP suggests this be forwarded to KCC

STP Consensus Statement 1203-17: Appreciation of the Efforts of our Local Host, Dr. Takehiro Hirose, Logistics Organizers Hiroyuki Kikuta and Akiko Fuse and CDEX/J-DESC

The STP greatly appreciates the hard work of Dr. Hirose, Mr. Kikuta and Ms. Fuse before and during the IODP 1<sup>st</sup> STP Meeting in Kochi, Japan. The organization and support for travel was superb as was the care taken to ensure that the meeting ran without any logistical problems whatsoever. The STP particularly enjoyed the educational

opportunity to learn a new game (or sport?) on our Tuesday evening banquet and we expect that such educational opportunities may become a part of future STP meetings! Furthermore, Takehiro's ability to shepherd us out of the restaurant at the end of such a recreation without problems was of particular note. The generous hosting of our Tuesday reception by J-DESC, too, was highly appreciated.

Doumo arigatou gozaimashita!

# Vote: 13 Yes, 0 No, 1 Abstention (Hirose), 4 Absent (Boutt, Edwards, Vigier, Tominaga)

## **Priority: High**



### STP Consensus Statement 1202-18: Yuki Morono

The STP wishes to thank Yuki Morono for the last three years of selfless service to this panel and to the Integrated Ocean Drilling Program. His departure from the panel is a tragic loss and he will be difficult to replace. His shipboard experience and vast knowledge of IODP and microbiology are unsurpassed and invaluable for STP deliberations. His continued efforts have almost eliminated contamination issues from routine microbiological sampling during *Chikyu* riser drilling. He has also delighted us by showing us the latest microbiological technology including the fascinating Cells Alive System (CAS) that uses magnetic fields to reduce cell damage during freezing. We will never forget his passion for all things IODP. We wish you the best of luck for your post-STP future and would welcome you back at any time.

Vote: 13 Yes, 0 No, 1 Abstention (Morono), 4 Absent (Boutt, Edwards, Vigier, Tominaga)

## **Priority:** High





In New Zealand (2011)

In Jeju (2009)

# STP Action Item 1203-01: Review of *Chikyu* Lab Instrumentation for Future Operations

The STP will review possible upgrades of lab instrumentation onboard *Chikyu* for future operations. STP asks CDEX to provide its list of instruments being considered. STP will review and rank this list and make recommendations at the next meeting.

#### **Priority: High**

Leads: CDEX, STP Members

#### **Deadline: Next STP meeting**

**Background to STP** Action Item 1203-01: The CDEX will consider building new lab capability as well as improving current lab settings of Chikyu to accommodate drilling expeditions in both sedimentary and hard rock environments. To maximize scientific contribution from Chikyu to a broader community, CDEX and STP will work together to establish a list of recommended instruments by the next STP meeting.

# STP Action Item 1203-02: Proposed Testing of the MDHDS (Motion Decoupled Hydraulic Delivery System)

Yoshi Kawamura from IODP-MI presented the results of a field test of the MDHDS. IODP-MI reported 4 failures and one issue. The MDHDS has been redesigned and modified, and a second field test will be conducted in April 2012. STP will review (electronically) the results of the second field test before the next meeting in order to approve a potential sea trial.

## **Priority: High**

## Leads: IODP-MI, STP members

## **Deadline: Before Exp. 342**

**Background to STP** Action Item 1203-02: This action item is a follow-up of STP Consensus Statements 1102-03, 1102-04 and STP Action Item 1107E-18. Yoshi Kawamura (IODP-MI) reported that a field test was conducted at the Schlumberger facility in Sugarland, TX. During the test there were four failures and one issue. The failures were, ERS could not re-latch onto MDHDS, hydraulic mechanical release of MDHDS did not function, MDHDS tether system was destroyed by differential pressure in inner barrel and the ERS couldn't reach MDHDS inner barrel fishing neck (mismatched dimensions). Moreover, it was noted that there was no availability of an emergency retrieval/fishing mechanism. The test was carried out on a platform but did not recreate ship conditions. Actions are on to modify ERS (set mechanical stopper, extend sinker bar), adjust hydraulic-mechanism release, modify MDHDS inner barrel for pressure difference and introduce 4" GS fishing system. Full test at SLB Sugarland will be carried out by 4-5 April. Results to be reviewed electronically by STP before Exp. 342 (2 June-1 August 2012).

**STP Action Item 1203-03: Evaluation of Smear Slide Reference Material Package** STP will evaluate the digital and physical reference material of a smear slides catalogue for sedimentological analyses that is currently being developed by Kathy Marsaglia and Kitty Milliken.

### **Priority:** *Medium*

### Leads: John and Kutterolf

# Deadline: Depending on completion of first set of slides and manual; review period between April to August 2012.

**Background to STP** Action Item 1203-03: This is an action item following up issues on cross platform consistency and goes back to a topic brought up by STP regarding the development of digital as well as physical reference material for smear slide analysis for sedimentology. This is financially supported by IODP-MI. The purpose is to develop a digital and physical reference material catalogue for sedimentological analyses to be used as a guide by untrained participants and early career sedimentologists and also to

establish a comparable descriptive basis for all platforms during expedition sedimentological work. The first draft is available and the package is designated to be finished in July 2012. The size should be around 20 pages for a digital version accompanied by a deliverable consisting of about 100 smear slides. Complete packages (6) will be given to the three IOs for distribution to the platforms and the repositories. Additionally, a digital catalogue of smear slide images will also be provided by July, 2012.

### Recommendation by STP:

- Someone should be responsible for curating these physical materials on the ships and at the repositories.
- High resolution digital images of the smear slides should be made as soon as they are ready to serve as backup material.

Additional sample materials should be provided to the IOs so that the smear slides can be easily replicated. For the future, if enough material is provided, this can also be used as the basis for a set of international standard reference smear slide materials that can be provided by IODP upon request. These would provide for outreach opportunities for IODP.

## STP Action Item 1203-04: Third-party Tool Documentation

STP asks IODP-MI to revise the IODP Third-Party Tool and Laboratory Instrumentation Development, Procurement and Deployment Guidelines version 4.0, including assignment flow path of third-party laboratory measurement tools. STP will continue to discuss the observatory sampling and data policy issues.

### **Priority: Medium**

### Leads: IODP-MI and STP

### **Deadline:** Next meeting

**Background to STP** Action Item 1203-04: This action item is a follow-up of STP Action Item 1108E-20 (Third-party tool documentation and sample/data from observatories). IODP-MI pointed out suggested revision of the flow path of third-party laboratory measurement equipment. STP recognizes that no protocol or policy exist on post-cruise samples from legacy boreholes using third-party sampling tools or with regards to data acquired from borehole observatories. These issues will be discussed at the next STP meeting.

# STP Action Item 1203-05: Review of Formation Factor Measurements and Interpretation

Members of STP will provide an updated review of the techniques for the measurement of the formation factor during expeditions. This information is requested by the microbiological community to assist in their estimation of nutrient supply to microbes.

### **Priority: High**

#### Leads: Schmitt

### **Deadline:** Next meeting

**Background to STP** Action Item 1203-05: The formation factor is essentially a measurement of the relationship between the bulk electrical conductivity of a sample relative to the conductivity of the suturing fluid. This measure provides indirectly information on the porosity, permeability, and tortuosity of the pore space in the rock. The microbiological community employs the formation factor in assessing the ability of the pore space to provide nutrients to microorganisms and would like to see its measurement become standard during expeditions. Such measurements can be difficult to carry out repeatedly and as such there is a concern as to how this can be carried out consistently across platforms. Both the USIO and CDEX have spent time attempting to determine how to best carry out these measurements but despite this careful work some concerns were still raised as to how these methods should be carried out.

Further, there is also some concern as to the interpretation of the results as they can be highly influenced by the existence of clays or other conductive materials within the samples. STP will re-examine this issue with regards to how such measurements are carried out in practice by industry and what types of corrections may be necessary to fully understand the measurement with a view to making routine measurements and on conducting subsequent QA/QC reporting.

This issue has been discussed a number of times at STP meetings (Recommendation 0807-10 Formation Factor Determination; Consensus Statement 1003-10 Determination of Formation Factor; Action Item 1003-28 Cross-Platform Consistency of Formation Factor Issues and Action Item 1008-39 Evaluation of Infrastructure and Development of Standards for Formation Factor Determination).

# STP Action Item 1203-06: Advice Regarding Measurement of Thermal Conductivity on Lithified Materials

The USIO provided a detailed QA/QC update on a number of technical issues related to recent expeditions. STP thanks David Houpt for his presentation. As part of this, the USIO has asked for advice on alternative techniques for the measurement of thermal conductivity on hard rock.

### **Priority:** *High*

#### Leads: Schmitt and Tominaga

#### **Deadline:** Next Meeting

**Background to STP** Action Item 1203-06: The USIO provided a detailed QA/QC update on a number of technical issues that arose on a recent expedition as already discussed above in Consensus Statement 1203-13. STP thanks the USIO for such a comprehensive presentation and appreciates the level of technical discussion with regards to the problems encountered and how these were rectified. The complete listing of these may be found in the STP meeting minutes. However, the USIO requests additional advice with regards to thermal conductivity measurements. The USIO noted from Expedition 327 that the TeKa Berlin thermal conductivity half-space needle probes had failure problems that were primarily due to corrosion of the needle from leakage of the sea water. TeKa have modified their design and one needle appears to be working. The Expedition 327 science party also recommended finding a different supplier and the USIO has requested assistance in finding different methods. **STP Consensus Statement 1205E-01: Endorsement of MDHDS sea trial on** *JR* The STP thanks Dr. Peter Flemings for his report on the results of the second field test of the MDHDS, titled 'System Integration Test of T2P/MDHDS/ERS/MFTM'. The STP is impressed by the excellence of this report addressing most of the issues raised from the first field test. The STP fully endorses and supports the MDHDS sea trial on the *JOIDES Resolution* during Expedition 342. The STP looks forward to reviewing the results of the sea trial. The STP also recommends that in the interim period the ERS be modified and re-tested, and these new tests be presented to the panel.

Vote: 15 Yes, 0 No, 0 Abstentions, 3 Absent (Hirose, Schmitt, Stoner)

## **Priority: High**

## STP suggests this be forwarded to IODP-MI, OTF, IOs, and PI

Background to STP Consensus Statement 1205E-01: This consensus statement follows STP Action Item 1203-02. At the 1<sup>st</sup> STP meeting Yoshi Kawamura, Operations Manager at IODP-MI, reported four failures and one issue that arose during the first field test of the MDHDS. He also reported that the MDHDS has since been redesigned and modified. The second field test was conducted on 3-5 April 2012 at the Genesis Rig, Schlumberger, Suger Land, TX (USA). Upon request from Kawamura the STP electronically reviewed the MDHDS second field test report, submitted by Dr. Peter Flemings. The report states that 1) deployment and recovery of the penetrometer system (T2P and SET-P) using wireline (MFTM + ERS + MDHDS) and 2) real-time communication through wireline + MFTF + ERS + MDHDS + T2P during the entire deployment operation had been successfully tested. They identified three areas for improvement and concluded that the system was capable of working properly in a downhole environment and that future deployment on the JR was the logical next step. The only issue that might have impacted sea trials was an ERS latching issue; however, the field test report noted that this issue can be avoided in the short term by taking care not to run the ERS motors too far forward. This can be done by estimating the time to necessary to close the latch on the deck prior to deployment. In the long term this issue will be fixed by modifying the ERS design. During discussion, Kawamura noted that only one ERS unit had this latching issue and that unit would not be used during the planned JR sea trial.

*Note:* T2P = Temperature Two Pressure Penetrometer, MDHDS =Motion Decoupled Hydraulic Delivery System, ERS = Electronic Recovery System, MFTM = Multi-Function Telemetry Module.

## STP Consensus Statement 1205E-02: Review of a proposal for examination of biological processes during standard IODP storage

The STP reviewed a proposal entitled 'Examination of Biological Processes Altering Core Material during Standard IODP Storage', submitted by Dr. Heath Mills and others. The STP recognizes the overall significance of their proposed project and potential implications for core storage in the future; however, the STP cannot assess the appropriateness of this request because the proposal does not explain clearly why 1.5-m-long whole-round sections are required and how the requested cores will be analyzed. The STP strongly recommends that the proponents address these questions and strengthen the sampling/scientific plan before formal submission of their sample request to the sample allocation committees of any given future expeditions, or for an APL proposal. The STP would be happy to review the revised version of this proposal.

### Vote: 15 Yes, 0 No, 0 Abstentions, 3 Absent (Hirose, Schmitt, Stoner)

## **Priority: High**

### STP suggests this be forwarded to IODP-MI, IOs, IODP Curators, and PI

**Background to STP Consensus Statement 1205E-02:** Dr. Heath Mills submitted a proposal requesting special sampling to conduct examination of biological processes altering core material during standard IODP storage for STP review in late March 2012. They are planning to request a series of 1.5-m-long whole-round sections from cores to be recovered during Expeditions 342 and 344 to conduct their project. The STP electronically reviewed this proposal in May 2012. The STP recognizes the importance of the proposed study of the alteration that may occur during storage; however, STP identified a number of issues that need to be addressed by the PI as follows:

1) The reason for requesting full sections of whole-round core is unclear. The proponents need to indicate a required sample volume for each analysis and the minimum length of time required to conduct their long-term study. The latter will depend on estimated rates of oxygen penetration through different lithologies. As noted by USIO, the requested length of 1.5 m is longer than the coolers used for refrigerated samples. The sample length therefore poses an issue with storage and transport which should be addressed in the proposal.

2) The analytical methods and long-term monitoring plan are not clearly detailed and explained. The proponents need to specify which chemical and solid phase mineralogical/geochemical measurements among the many ephemeral properties they propose to track.

3) The amount of shipboard work required of the science party and/or technicians to fulfill the sample request is unclear. The proponents need to indicate this explicitly and discriminate between analyses to be carried out onboard by members of the science party and those that will be completed as shore-based work by the PIs following the

expeditions. A further issue is that sample selection onboard will require a trained specialist to assess whether the core quality is sufficient to achieve the proponent's research goals. This would ideally be done by one of the proponents.

4) All core sections are stored as working and archive halves in the IODP Core Repositories. The surface area exposed for gas exchange is much smaller in a wholeround core section than that in a split core section; therefore, using results from the proposed study utilizing whole-round sections to evaluate standard IODP storage would be questionable.

1 Ittellace 5		1 meeting	
Family	First Name	Institute	Country
Bahk	Jang-Jun	KIGAM (Alternate for Hyun)	Korea
Boutt	David	Univ. of Massachusetts Amherst (Not attending)	USA
Dharmaraj	Sathia	National Institute of Ocean Technology	India
Edwards	Katrina	Univ. of Southern California (Not attending)	USA
Gilhooly	William	Indiana University-Purdue University Indianapolis	USA
Hirose	Takehiro	Kochi, JAMSTEC	Japan
John	Cedric	Imperial College London	UK
Kulhanek	Denise	GNS Science	New Zealand
Kutterolf	Steffen	GEOMAR	Germany
Morono	Yuki	Kochi, JAMSTEC	Japan
Saito	Saneatsu	IFREE, JAMSTEC	Japan
Schmitt	Douglas	University of Alberta	Canada
Stoner	Joseph	Oregon State University	USA
Sun	Weidong	Guangzhou Institute of Geochemistry	China
Tominaga	Masako	Woods Hole Oceanographic Institution	USA
Vigier	Nathalie	CRPG-CNRS	France
Yamamoto	Yuhji	Kochi University (Alternate for Sakai)	Japan
Yamanaka	Toshiro	Okayama University	Japan
Ahagon	Naokazu	Kochi, JAMSTEC	Japan
Anderson	Louise	ESO, University of Leicester	UK
Collier	Jamus	IODP-MI	Japan
Evans	Helen	USIO, LDEO	USA
Fuse	Akiko	CDEX/J-DESC	Japan
Gupta	Lallan	КСС	Japan
Houpt	David	USIO, TAMU	USA
Igarashi	Chiaki	CDEX, JAMSTEC	Japan
Kawamura	Yoshihisa	IODP-MI	Japan
Kikuta	Hiroyuki	CDEX/J-DESC	Japan
Miller	Angie	USIO TAMU	USA
Miller	Jay	USIO, TAMU (Not Attending)	USA
Muraki	Hiroaki	MWJ	Japan
Murayama	Masafumi	PEP, Kochi University	Japan
Myers	Greg	Consortium for Ocean Leadership	USA
Röhl	Ursula	ESO, MARUM, University of Bremen	Germany
Sanada	Yoshinori	CDEX, JAMSTEC	Japan

Attendee's list of 1<sup>st</sup> STP Meeting

## Agenda for the 1<sup>st</sup> IODP STP Meeting

Day 1: On-site assessment of facilities at KCC

- 1. Welcome, logistics, safety, introduction
- 2. Tour through all the laboratories and repository
- 3. Hands-on assessment
- 4. Discussion

#### Day 2: 0900-1700

- 1. Welcome, meeting logistics, safety, introduction, Robert's Rules, COI
- 2. Approval of meeting agenda
- 3. Approve Minutes from #13 STP Meeting
- 4. Preliminary discussion of next meeting locations and dates; panel rotations (Saito)
- 5. Review status of previous meeting action items and consensus statements (Saito)
- 6. IODP program updates (Saito)
- 7. SAS Reports and role of STP
  - a) SAS updates and role of STP (Saito)
  - b) PEP report (Murayama)
- 8. IO reports
  - a) ESO Report (Roehl/Anderson)
  - b) USIO Report (Myers/Evans)
  - c) CDEX Report (Igarashi/Sanada/Gupta)
- 9. Report from recent ORTF meetings and identify new issues (Kawamura)
- 10. Review of expedition QA/QC reports for Expeditions 335, 336, 339, and 340T (IOs, ALL)
- 11.Summary of KCC visit (ALL)
- 12.SEDIS demonstration and evaluation (Collier, ALL)

#### **Day 3:** Regular meeting (0900-1700)

- 1. SEDIS demonstration and evaluation (cont.) (Collier, ALL)
- 2. Approval of Measurement Plans for the upcoming expeditions: Exps. 337, 338, 342, and 343 (IOs, ALL)
- 3. Finalize action items and consensus statements from previous meetings (ALL)
  - a) Drill head failure during Expedition 335 (IODP-MI, USIO)
  - b) Proposed testing of the MDHDS and SCIMPI (IODP-MI)
  - c) Stratigraphic correlator/splicer software (USIO)
  - d) Enhancement of DESClogik (USIO)
  - e) Use of Cells Alive System (Morono)
- 4. Issues on cross platform consistency
  - a) Depth scale implementation (IOs)
  - b) Review and modification of Third Party Tool Policy (IODP-MI, Saito)
  - c) Magnetic Susceptibility Calibration and Standardization (Stoner)
  - d) Formation Factor Issues (Schmitt)
  - e) Taxonomic Name Lists for micropaleontology coordination group (Collier)
  - f) Update on smear slide reference material (Collier)
  - g) New Publication Format (Miller)
- 5. Technological feasibility of drilling proposals selected by PEP (Saito, Schmitt)

#### **Day 4:** Regular meeting (0900-1700)

- 1. Select Meeting Location
- 2. STP Roadmap update, link to NSP, implementation, and advertisement (ALL)
- 3. Finalize Recommendations/Consensus Statements and Action items

#### DAY 1: KCC VISIT (0900-1700)

Professor Iwao Watanabe (Center for Advanced Marine Core Research, Kochi University) welcomed the Scientific Technology Panel (STP) participants to Kochi Core Center (KCC). He noted that KCC has a proposal for STP consideration to open up the center for international researchers and collaboration.

After this introduction, Sanny Saito (STP chair) asked all attendees to introduce themselves.

Professor Masafumi Murayama (Kochi University) then gave STP an overview of KCC. An opening ceremony for the center (called the Center for Advanced Marine Core Research [CMCR]) was held in May 2003. Since 2005 it has been managed by two institutions: Kochi University and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC). Kochi Core Center is actually a nickname, adopted in 2006, and most educational and research activities are promoted using this name. In 2007, KCC became a full-scale core curation facility for the Integrated Ocean Drilling Program (IODP); it houses cores from the western Pacific and Indian Oceans. KCC began routine microbiological sample (RMS) curation in 2009, with deep freezers for storage. There are currently 174 RMS stored at KCC, with the first sample request received in March 2011.

The CMCR is available for use by not only students and faculty at Kochi University (~80-100 people/year), but also nationwide (~80 people/year). The CMCR also provides significant outreach to high school students. The Global Environmental Change by Earth Drilling Science (GEEDS) project is a major research initiative at the CMCR. In addition, the Japan Drilling Earth Science Consortium (J-DESC) promotes KCC outreach, including a core school and post-cruise work. There are three primary functions of the KCC, each operated from a different source of funding. Kochi University funds education and research at the university. JAMSTEC funds JAMSTEC research done at KCC. Finally, the IODP core sample curation is funded from the IODP science operating costs (SoC) or platform operating costs (PoC). KCC is currently investigating opening the facility for international usage, particularly for measurements done on continuous core sections as opposed to discrete samples (e.g., using the multisensor core logger [MSCL] or X-ray fluorescence [XRF]). Once available, an application system will be posted on the KCC website.

Dr. Lallan Gupta (KCC curator) gave an overview of IODP core curation at KCC. The staff includes a curator, superintendent, bio-curator, as well as four staff for shipboard work from Marine Works Japan (MWJ), and two part-time employees. KCC houses 164,811 core sections (~93 km) from 784 holes drilled during 61 different legs/expeditions. The cores are stored in 6000 m<sup>2</sup> of refrigerated core storage (4 reefers). Reefer 1 houses non-IODP cores, reefers 2 and 3 house legacy cores, and reefer 4 houses

IODP cores. The first three reefers are full and the fourth is 87% full. Thus, there is a need to expand the core storage capabilities for the new program. KCC submitted a proposal to add 2000  $m^2$  of refrigerated storage; however, the first proposal was not accepted so they are revising it for resubmission.

Since 2007, a total of 887 sample requests for both IODP and legacy cores have been received at KCC, with approximately 126,000 samples taken. These sample requests come from 24 different countries. A total of 90,540 samples have been shipped off from KCC (including 61,318 in 2010 when the Exp. 323 Bering Sea Paleoceanography sampling party was held at the facility). The KCC also welcomes visitors from both Japan and abroad. In general there has been an increase in the number of visitors to the facility since 2007. KCC also conducts outeach, including sending posters to many institutions and presenting posters and videos at meetings. More information about KCC can be found on their website (www.kochi-core.jp/en). Also available online is the Virtual Core Library, which houses 3D images of cores collected by the *Chikyu*. These files are very large, so KCC is collaborating with Kochi and Tsukuba Universities and JAMSTEC to develop software to create smaller files to view.

KCC has curated RMS since 2009; currently the facility holds 174 RMS in very low temperatures (-80°C and -160°C). So far, three sample requests for RMS have been received at KCC. To help encourage use of these samples, there is currently discussion about changing the name to something that does not contain the word routine. A draft of the RMS procedure was sent to STP, who contacted the Subseafloor Life Task Force to review this document (see minutes from Day 3 for more information). KCC and JAMSTEC also conducted an experiment on a non-IODP cruise using fluorescent beads to check for contamination of the core by drilling fluids. This study found that the beads did not penetrate to the center of the core; however, this procedure is not routinely done. There was some discussion amongst STP about the need for routine testing for contamination; however, geochemists generally do not want the beads added as it can cause contamination for their measurements, so it really depends on the primary goals of the expedition.

KCC is conducting a core quality experiment to examine the effect of storage temperature on core quality. Using non-IODP cores, one half is being stored in the KCC reefer at 4°C (80% humidity), whereas the other half is being stored at room temperature (humidity 80%). Routine measurements are taken every 2-4 months and the cores will be monitored for three years (the experiment began in 2011). The experiment is to determine if older cores could be stored at room temperature (20°C) to reduce costs.

Currently the facilities at KCC are available to researchers nationwide and to international collaborators. KCC is investigating opening up the analytical facilities (to scan split or whole cores) to international users without Japanese collaborators. The equipment that would be made available includes the MSCL, X-ray computed tomography (XCT) and XRF. Applications to use the equipment would need to be lodged at least three months in advance and some charges for consumables may apply.

In addition to the proposed facility expansion and development of software for 3D XCT images discussed above, the KCC has a number of activities currently underway or planned for the future. These include additional advertisement for both RMS and cores

stored at KCC. Development of a central inventory for samples taken at KCC (in collaboration with the Integrated Ocean Drilling Program, Management International [IODP-MI]). Finally, KCC is providing advice to or collaborating with other countries planning core repositories, including China, Korea and Taiwan.

#### **Onsite Assessment of Kochi Core Center Facilities**

On the first day of the 1<sup>st</sup> Scientific Technology Panel (STP) meeting in Kochi, Japan, STP members visited the Kochi Core Center (KCC) to assess the facility and services provided. The day began with an introduction to the facility, followed by a tour. In the afternoon, STP members split into three groups to assess the measurement hardware, software and data handling, and lab environment for three different areas at KCC: curation and J-CORES, physical properties measurements, and microbiology.

The first group evaluated core curation and J-CORES, which is the system used to log samples and core data in the database. The group was very impressed with the professionalism of the staff, as well as the process through which information about current sampling is distributed to the staff for each sample request. The KCC staff is kept aware of each sampling plan through a series of briefings and a white board where all relevant information is maintained. The multiple checks within the J-CORES system to ensure sampling integrity were particularly impressive. The group had two primary suggestions for the core repository: (1) the ability to lay out more than two cores together for sampling and description, and (2) additional light, possibly with a magnification loop, such as those used on the *JOIDES Resolution*, for use when describing core. Lallan Gupta (IODP curator at KCC) noted that it was possible to lay out an entire core on one table by putting together four of the section holders. The group only had time to evaluate J-CORES for sampling; it was found to be a very good system for curation purposes, although shortcomings are known for core description using the system.

The second group evaluated the physical properties capabilities of KCC. This group was very impressed with the exceptional array of equipment available at KCC, and the knowledge of the support staff operating the equipment. The main suggestion from this group was to open up the facility to researchers from outside Japan, particularly those from developing countries that do not have access to the types of equipment found at KCC. Lallan Gupta noted that the facility is already available to international collaborators, but they are in the process of making the facility available to others in the future, although currently much of the equipment is already fully booked.

The third group evaluated the routine microbiological sample (RMS) procedure in place at KCC. This group noted that a manual for RMS exists and is currently under review by STP. They were impressed by the thoroughness in the methods for doing RMS; in particular, the time spent cleaning the equipment between samples was commendable. They primarily recommended encouraging use of these samples by disciplines other than microbiology (e.g., geochemistry), and particularly to develop more interdisciplinary research between the groups. A final recommendation was to maintain stratigraphic context of the sample (top/bottom) when splitting an RMS whole round for a subsample.

Overall STP was very impressed with the KCC facility; each group noted many positive observations, with only a few suggestions. One issue that has come up in the past

is the pressure for KCC to reduce its running costs, possibly by storing older cores at room temperature rather than in a refrigerated environment. The STP has issued a clear statement recommending that storage continue as it is currently done (i.e., at 4°C). The results of the visit were again summarized during Day 2 of the meeting, with a consensus statement drafted covering the results from all three groups. At the end of the first day, we all enjoyed further hospitality at KCC, as they hosted a BBQ for the STP members!

#### DAY 2: REGULAR MEETING (0900-1700)

On the second day of the meeting, Sanny Saito officially opened the meeting by welcoming everyone and introducing the new members, as well as alternates for those who could not attend. He then introduced Robert's Rules of Order and established that there were no conflicts of interest (COIs) amongst the panel members. The panel then approved the 1<sup>st</sup> STP meeting agenda and the minutes for the 13<sup>th</sup> STP e-meeting with no changes. Saito then reviewed 11 consensus statements and 8 action items from the previous meeting, as well as two consensus statements approved via email after the last meeting, and five items deferred from the 12<sup>th</sup> STP meeting in Auckland. He also stated that e-meetings would not be conducted in the future as the experience for STP was not positive (13<sup>th</sup> STP e-meeting took over one month to complete).

Sanny Saito presented IODP program updates provided by Jamie Allan (US National Science Foundation [NSF]) and Shingo Shibata (Japan Ministry of Education, Culture, Sports, Science and Technology [MEXT])

#### New IODP Program Beyond 2013

The new structure for the IODP program proposed by lead agencies is the following:

- An Executive committee on top
- The Science Advisory Structure (SAS) panels (Proposal Evaluation Panel [PEP], Environmental Protection and Safety Panel [EPSP], Site Characterization Panel [SCP], and STP)
- A small support office (=IODP-MI, but smaller than current)
- Three Platform Providers (NSF, European Consortium for Ocean Research Drilling [ECORD], MEXT) operate independently in terms of funding and ship scheduling

Each platform provider will essentially make their own scheduling decision, but a mechanism is in place to flag proposals as "complex proposals" that require multiple platforms, and the Implementing Organizations (IOs) will need to exchange information for it to happen. How this exchange of information will occur is unknown at this point. There is also hope that shipboard scientists will be able to exchange berths to participate on different platforms, although the details for this are also not yet known. For curation, the preferred model is to keep the current system based on geographic distribution (i.e., Gulf Coast Repository [GCR] keeps the East Pacific, Southern Ocean and Caribbean cores, KCC the West Pacific cores, and the Bremen Core Repository [BCR] the Atlantic and Arctic cores), rather than each operator keeping cores collected by the IO's platform. Yoshi Kawamura noted that this preferred model has budget implications for the IOs.

The new SAS structure is in place, with the first meetings of the new panels beginning in late 2011. Currently, the Science Implementation and Policy Committee (SIPCom) is the executive committee; the Operations Task Force (OTF) meets concomitantly to produce drilling schedules. PEP meetings are held in May and November of each year, approximately 6 weeks after each proposal submission deadline, whereas SCP meets twice a year in February and August, and EPSP once a year in March. STP meetings are held twice a year a couple of months before each PEP meeting (usually in March and September). The general purpose of STP is to advise PEP, the IOs and IODP-MI in matters involving data, publications and policy. A new role for STP is to advise PEP on

the technical feasibility of drilling proposals identified by PEP to forward to STP. STP will identify watchdogs to review these proposals. IODP-MI has also implemented a new proposal submission system, Proposal Database System version 2.0 (PDB 2.0) for the 1 April 2012 proposal submission deadline.

Masafumi Murayama (PEP member, Kochi University) reported on the first PEP meeting, held in San Francisco in early December 2011. The new proposal evaluation system allows for only one revision at each stage (i.e., pre, full, externally reviewed). At the first meeting, PEP reviewed 48 proposals; 2 of the reviewed proposals were forwarded to SIPCom/OTF, 2 sent for external review, and 11 deactivated. Nine pre-proposals were invited to submit full proposals, and the remaining proposals were sent back to proponents for revision. PEP identified one proposal for STP to review: 782-Pre Kanto Asperity Project (discussed further on Day 3).

## IO Reports

Ursula Röhl provided the ECORD Science Operator (ESO) report, with an update on planned Mission Specific Platform (MSP) expeditions through the remainder of the current program. During Fiscal Year (FY) 2012, a drilling trial will be performed for proposal 581-Full2 Late Pleistocene Coralgal Banks. There will be one more MSP prior to the end of the program, which will be 672-Full3 Baltic Sea Basin Paleoenvironment. This expedition will be implemented in 2013; a call for scientific participants has just been released. In addition, planning is continuing for 548-Full3 Chixculub K-T Impact Crater. The process of obtaining permits is currently underway, with the next step being a hazard survey, possibly in FY13, if drilling is affordable for FY14. The next ECORD summer school will be on submarine landslides, earthquakes and tsunamis; the application deadline is mid-May.

Greg Myers gave a quick review of past US Implementing Organization (USIO) expeditions, including any Quality Assurance/Quality Control (QA/QC) issues that occurred, and he also presented measurement plans for upcoming expeditions (details given below). The *JOIDES Resolution* (*JR*) is currently on Exp. 340 Lesser Antilles Volcanism and Landslides, with five additional expeditions planned before the end of the current program: Exp. 342 Paleogene Newfoundland Sediment Drifts; Exp. 344 Costa Rica Seismogenesis Project 2 (CRISP2); Exp. 345 Hess Deep Plutonic Crust; Exp. 341 Southern Alaska Margin Tectonics, Climate & Sedimentation; and Exp. 346 Asian Monsoon. In addition, there is potential for a non-IODP commercial venture for the *JR* in north Atlantic during one of the tie-up periods in 2012. More information will be available at a later date should this go ahead.

Chiaki Igarashi reviewed the upcoming expeditions for the *Chikyu*, which will be the first IODP work completed since the earthquake and tsunami in March 2011 that resulted in one of the thrusters being badly damaged. Yoshinori Sanada also reported on the logging plans for these expeditions. The first is Exp. 343 Japan Trench Fast Drilling Project (J-FAST), which is a rapid response drilling project in response to the earthquake. The next is Exp. 337 Deep Coalbed Biosphere off Shimokita (postponed from last year); this will be the first expedition to collect cuttings following the newly approved Standard Procedure of Handling Cuttings Samples onboard *Chikyu*. The last is Exp. 338 Nankai Trough Seimogenic Zone Experiment (NanTroSEIZE) Plate Boundary Deep Riser 2, which will last a total of 146 days, with two full science parties switching out

approximately halfway through. Prior to the end of the current program there will be an additional NanTroSEIZE expedition. Also during this year, the azimuth thruster repair work will occur, followed by a sea trial before riser operations on Exp. 337. Additionally, a new SQUID system will be installed on the *Chikyu*, a 760 4k SRM helium-free operation. The Center for Deep Earth Exploration (CDEX) also indicated that they are planning to upgrade instruments and improve lab systems on the *Chikyu* following the end of the current program. They request that STP provide suggestions for ways to improve the *Chikyu*.

#### **Report from Recent ORTF Meetings**

Yoshi Kawamura reviewed reports from five recent Operations Review Task Force (ORTF) meetings, highlighting recommendations of interest to STP. Two items from Exp. 325 Great Barrier Reef Environmental Changes were noted. Recommendation 325-05 relates to the definition of shipboard measurements, and suggests that IODP-MI consider not publishing non-standard measurement data in Preliminary and Expedition reports to maintain science party rights. This recommendation is primarily relevant to MSP expeditions, where some work is often completed on the cores prior to the onshore science party (OSP) held in Bremen. In this instance, geochemical dating was completed prior to the OSP to assist with targeted sampling; ordinarily these types of measurements would be part of the post-expedition work. These data were published in the expedition reports, but in the future the ORTF recommends that these types of data be excluded. The second recommendation (325-03) relates to contingency planning so that better decisions can be made during the expedition when difficult scenarios are encountered.

A number of lab measurement issues were encountered during IODP Exp. 327 Juan de Fuca Hydrogeology; most of these have since been resolved by the USIO. Those of interest to STP include 327-09 (hard rock core description in DESClogik), 327-10 (P-wave measurement issues), 327-11 (thermal conductivity issues), 327-13 (recording and storing all seafloor operations videos), 327-15 (lab space on the JR), and 327-16 (rig instrumentation system (RIS)).

There were several issues of importance to STP from Exp. 329 South Pacific Gyre Subseafloor Life. Recommendation 329-04 suggests that a limit be set on purchasing supplies for Third-Party Tools used on expeditions to provide clear and consistent guidelines for future expeditions. This was discussed further during the Third-Party Tool discussion on Day 3. Other recommendations related to lab measurements on the JR, including 329-05 (flexibility of lab space on JR), 329-06 (testing a new analytical method prior to the start of an expedition, with a backup method secured), 329-08 (routine resistivity measurements, including Formation Factor), 329-09 (spectral gamma ray as a routine measurement; already done on JR, but not on *Chikyu* or MSP expeditions), and 329-11 (Laboratory Information Management System [LIMS] database improvements).

Two *Chikyu* expedition ORTFs were also reviewed. Several recommendations from Exp. 331 Deep Hot Biosphere were noted for STP: 331-03 (additional -80°C freezer), 331-11 (sampling of ephemeral properties be allowed to be undertaken by scientists, although this is a matter of safety training), 331-12 (use of aluminum, fiberglass or steel liners for high temperature coring operations), and 331-13 (ability to measure downhole temperatures above 100°C). STP also considered a single recommendation from Exps. 332/333 NanTroSEIZE: 332/333-03 (CDEX consider

alternate methods for obtaining specific scientific expertise). This has already been addressed; CDEX asked the STP chair for help to find paleontologists suitable for Exp. 337. The STP chair passed the request on to the Paleontology Coordination Group (PCG), who put out a call, resulting in the position being filled.

## Review of Expedition QA/QC Reports for Exps. 335, 336, 339 and 340T

David Houpt provided updates on priority QA/QC issues from previous USIO expeditions. The USIO has been in contact with the US Geological Survey (USGS) to obtain powder standards for the handheld XRF; however, the results have not been satisfactory and the USIO will continue to report to STP on the progress. For the Superconducting Rock Magnetometer (SRM), technical notes are retained from cruise to cruise and made available to scientists; however, many scientists bring their own software tools and the USIO does not always get a copy. The USIO hopes to rework the software for the SRM, but currently does not have the time or resources to do this. TeKa has finally recognized that their re-designed half-space needles for the TeKa04 are faulty; the re-engineered needle has not yet failed on the JR. The Exp. 327 Juan de Fuca Hydrogeology science party recommended an alternate system to measure thermal conductivity; however, the system only works on soft sediments, so the USIO is asking advice from STP on alternatives to the TeKa system. The P-wave velocity issue has been fixed, as the software has been revised to allow the user to make a manual pick for the first arrival; both the computer-enerated and manual pick are saved in the database. During Exp. 336 Mid-Atlantic Ridge Microbiology, ion chromatography sulfate precision was around 12%; the USIO is working with the manufacturer to try to rectify this problem. The Chikyu uses a different ion chromatograph, and the USIO would like to know what the precision is for that system. The USIO has also implemented over 50 feature improvements to the DESClogik software (discussed further later in the meeting), as well as giving scientists the ability to edit data and re-upload the corrections into the database (although the original values are also retained). The USIO has created and is now testing a synthetic Uranium standard for use on the JR. A chloride autotitrator was installed and used during Exp. 339 Mediterranean Outflow, resulting in <<1% standard deviation. Finally, there are vendor manuals available for the Total Organic Carbon (TOC) Analyzer, but not an in-house method, which is on the list of things to do.

David Houpt also responded to some of the ORTF comments directed to the USIO from previous expeditions. During Exp. 317 Canterbury Basin Sea Level there were not enough reaction columns onboard for CHNS (carbon, hydrogen, nitrogen, sulfur) analysis; the USIO has increased the stock level and the technical support staff is also communicating more effectively with the scientists prior to cruises. The Gas Chromatography – Mass Selective Detector (GC-MSD) has been removed from the JR, as it is a very old instrument; however, it is still in College Station if needed for a specific expedition. Additionally, the USIO is investigating non-SPOT cameras, as the software currently in use on the JR is too slow.

David Houpt noted several new QA/QC issues from recent expeditions. During Exp. 336 Mid-Atlantic Ridge Microbiology, the buffer overflowed on the Spinner Magnetometer; this has since been resolved after speaking with the manufacturer. Another issue encountered during the expedition was a cryomag anhysteretic remanent magnetization (ARM) issue – at higher than 50 mT, ARM gets imparted onto the rock sample; this is a common problem with the system that is exacerbated by being on a ship at low latitudes,

as the heading makes a big difference (best when facing east/west). The USIO may recommend that these measurements only be taken when the ship is facing east/west, and that if it is a problem, keep the setting below 50 mT. During Exp. 339 Mediterranean Outflow, one of the two new stereomicroscopes installed on the *JR* had to have a phototube returned, as it had oil in it. This problem has been resolved. There were also continued issues with the Bartington MS2C loops, as jams were often occurring with the 80 mm loops. The USIO has decided to buy 90 mm loops instead; this will reduce the signal and the 80 mm loops will be retained if needed. Joe Stoner noted that when collecting data at 5 cm, the effect would be barely noticeable. There was an issue with the discrete analyzer, as it was not user friendly and had additional issues. The USIO has bought an Agilent Cary 100 Spectrophotometer, which is an easier machine to work with. Finally there was a problem with the C/N ratios obtained during Exp. 339 Mediterranean Outflow – some of the measurements were impossible as a result of very low N<sub>2</sub>. In the future, the USIO will try to ensure they have a selection of standards with different concentration levels so that a more appropriate standard can be selected.

Ursula Röhl presented the ESO QA/QC method documentation, which is available on the web.

#### Routine Microbiological Sample (RMS) Manual

Yuki Morono gave a brief introduction to RMS (STP Recommendation 0908-09 Recommendation for RMS on IODP expeditions). As a result, an RMS manual was developed; during the Auckland meeting (Feb. 2011), the STP recommended that the Subseafloor Life Task Force review the manual; however, they have never responded to Morono's requests. He has since asked individual scientists for external reviews, with two responses prior to the current meeting. Professor Rick Colwell (Oregon State University, USA) and Dr. Anna Kaksonen (CSIRO, Australia) have both reviewed the manual and been overall very impressed with only a few minor editorial suggestions. One additional scientist is also reviewing the document.

#### SEDISD demonstration and Evaluation

Jamus Collier presented the latest evolution of the Scientific Earth Data Information System (SEDIS), a search engine capable of searching for Deep Sea Drilling Project (DSDP), Ocean Drilling Program (ODP) and IODP publication and data across all platforms and from different databases. The STP had a chance to evaluate SEDIS and make specific recommendations for improvements, but the system is operational and can provide a useful searching capability for IODP as a "one stop shop" for all data and publications related to the program.

#### DAY 3 REGULAR MEETING (0900-1700)

Sanny Saito opened the meeting at 9:02 am and presented the meeting agenda for the day.

#### SEDIS Demonstration and Evaluation (cont.)

Discussion surrounding SEDIS continued at the beginning of Day 3, with STP members continuing to make suggestions for improvement (see Consensus Statement 1203-04).

## Approval of Measurement Plans for Upcoming Expeditions: Exps. 337, 338, 342, and 343

The measurement plans for upcoming expeditions were presented to the STP for approval. Greg Myers presented the USIO plans, whereas Chiaki Igarashi presented the plans for CDEX. Exp. 342 Paleogene Newfoundland Sediment Drifts (USIO) has a minimum and standard measurement plan, which was approved by STP. Exp. 343 Japan Trench Fast Drilling Project (CDEX) will deploy two Third-Party Tools (TPT), one to measure dissolved oxygen content in pore water and the second a gas chromatographer. Cryogenic magnetometer measurements will be done post cruise on discreet samples. Exp. 337 Deep Coalbed Biosphere off Shimokita (CDEX) is a riser expedition which means cuttings samples will be taken, additionally 10 TPT will be deployed (Beckman flow cytometer, DiCE system, AB13130x capillary sequencer, StepOnePlus, Experion Electrophoresis System, GC-RGD, Los Gatos  $\delta^{13}$ C-CO<sub>2</sub> analyzer, Alpha GUARD PQ2000 pro, penetrometer, and a microscope system for vitrinite reflectance analysis). Yuki Morono noted that STP should review the results of the microbiology experiments to evaluate the methods. There is room on *Chikyu* for all ten TPT and based on the information given, STP does not see any potential issues. Expedition 338 NanTroSEIZE Plate Boundary Deep Riser 2 will conduct all minimum and standard measurements; however, planning for the expedition is still underway, so CDEX will provide an update with any changes at the next meeting. STP approved both CDEX measurement plans, and requested CDEX update the panel on the value of the TPT microbiology equipment at the next STP meeting.

#### *FinalizeAaction Items and Consensus Statements from Previous Meetings* a) Drill Head Failure during Expedition 335

Yoshi Kawamura presented the ORTF report for Exp. 335 Superfast Spreading Rate Crust 4 (Hole 1256D). Greg Myers elaborated, noting that there were problems with the C9 drill bit, which was destroyed within 24 hours of being deployed, instead of lasting  $\sim$  60 hours. The lithology penetrated was extremely hard (fine-grained basaltic dikes), dramatically reducing penetration rate; however, the main issue seemed to be hole stability, resulting in cobble-size pieces falling into the hole, which impacted on the functionality of the 4 roller cones at the side of the drill bits. There are some options for overcoming this problem with the drill bit, including modifying the side of the bit. Hardness can only be improved by switching to diamond bits, which are expensive and also more brittle and could be broken through ship motion. This problem is relevant for the upcoming Exp. 345 Hess Deep Plutonic Crust, as well as a potential Mohole project because drilling conditions could be similar to those encountered during Exp. 335.

There was some discussion about hole stability, particularly when entering a previously drilled hole. This was part of the problem, although the lithologies of the boulders that caused the main issue were coming from near the bottom of the hole. Hole management is an issue that needs to be improved in the future. Greg Myers noted that one option would be to drill a new hole; however, as Cedric John pointed out, drilling is not much faster than coring in hard rocks and is therefore not a viable option in this environment.

Ultimately, the main recommendation is to stabilize the bit, and keep the hole clean by circulating mud to remove the bit pieces and caved rocks. Cementing the unstable portion of the hole during Exp. 335 seemed to have resolved the problems with the drill bits. Lithologic conditions encountered during Exp. 312 and 335 were unexpected, but should henceforth be planned for.

#### b) Proposed Testing of the MDHDS and SCIMPI

Yoshi Kawamura updated the panel on the field tests of the Motion Decoupled Hydraulic Delivery System (MDHDS) and the Simple Cabled Instrument for Measuring Parameters In-situ (SCIMPI). The MDHDS is a system replacing the old Colleted Delivery System (CDS) and designed for downhole tool deployments such as the DVTP-P or T2P. Four failures occurred during a shore-based trial in Sugarland, TX. First, the electric releasing mechanism (ERS) could not re-latch to the MDHDS inner barrel fishing net due to overretracting of the catcher. The second problem was that the hydraulic release mechanism did not operate as expected under the applied pressure. Third, the MDHDS tether system was destroyed by the differential pressure in the MDHDS inner barrel. The last problem was that the ERS could not reach the MDHDS inner barrel fishing neck while the tool was fully extended due to mismatched dimensions of the tools. Several technical steps were taken to remediate these problems, and a full field test is planned at the Schlumberger Facility in Sugarland on 4-5 April, with a JR sea trial on 4-8 June 2012 (Exp. 342 Paleogene Newfoundland Sediment Drifts). SCIMPI is completely built, and a field test was done at Lamont Doherty Earth Observatory (LDEO) in December 2011. All tests, which included communication, observing power source switching and deployment in vertical positions, were successful. The SCIMPI will be shipped to TAMU for sea trial in FY13, possibly during Exp. 344 CRISP2 or at Cascadia during transit. The STP was happy to receive updates on these two instruments, and will need to approve a sea trial for the MDHDS electronically should the April field test be successful.

#### c) Stratigraphic Correlator/Splicer Software

STP previously urged IODP-MI and the USIO to address the issues of using Correlator on the JR, in part because the stratigraphic correlators need to be trained on the use of this software, preferably prior to the start of an expedition. David Houpt indicated that prior to Exp. 339 Mediterranean Outflow, the USIO contacted the stratigraphic correlators to train them ahead of time, and that this approach worked. During the expedition, Gary Acton utilized Correlator, whereas Lucas Lourens used a third party software. One current issue is that no one has been identified within the USIO to support this software package. This is an issue as Correlator is a critical piece of software on paleoceanographic expeditions. When coring, gaps (of approximately 50 cm) occur between cores. In order to obtain a complete sectin, multiple holes are drilled and then spliced together. Correlator virtually shifts the depths of the cores based on features in physical properties measurements to create a complete composite section. Currently, Correlator can produce a splice but data cannot be retrieved from the database following the splice.

Jamus Collier spoke with NSF representatives about putting funding in IODP-MI data management to support Correlator, but there is currently no support at NSF for the USIO or IODP-MI to do this. In order for the USIO to maintain the software (for instance, making sure it is still compatible when there are upgrades to Windows), manpower is required. Software maintenance is usually 10-20% of the cost of creating the software. STP discussed a number of possibilities for maintaining the software, such as partnering with a programming department or possibly giving scientists (such as post docs) the opportunity to write scripts and add functionality. Joe Stoner noted that support for maintaining the software is functional, although it does require significant training to use. Documentation and training materials are also available and in good shape. STP continues to recommend that Correlator be maintained as IODP software.

#### d) Enhancement of DESClogik

STP requested that the USIO provide updates on enhancements made to DESClogik since the last meeting. David Houpt gave an update and demonstrated the latest version of the software, stating that DESClogik is a software package written in-house to allow for the description of geological material. DESCINFO is the concept behind DESClogik and information about it can be found at www.descinfo.org. Value lists for DESClogik are now Google docs and available for download and maintenance by the community.

DESClogik is composed of three applications, the graphical data capture, the tabular format, and the form data entry (still to be developed). Templates are now built by IODP staff, which ensures consistency and avoids problems. Many previously identified issues have been fixed, such as the ability to make changes and re-upload these changes to the database. Furthermore, based on a previous STP recommendation, DESClogik can now be downloaded for training purposes prior to an expedition. Although not all issues that have plagued paleontologists have been fixed, the program is working much better now. Some opt to work directly in DESKlogik (preferred); however, others still opt to download a template and work in Excel, uploading the data after it has been captured. This feature is working much more smoothly now. The USIO hopes that the development of a form entry method will work much better for paleontologists, allowing most to work directly in the program. Other future developments include a feature that allows for cross parameter searches, as well as the addition of a graphical entry tool that will allow core description to occur directly on a core photograph. STP commended the USIO for all of the improvements made over the last year, particularly the ability to download the software for use prior to an expedition, and also recommended that further improvements be made, including those already identified by the USIO, but also the potential for automatically generating charts such as an age-depth plot.

#### e) Use of Cells Alive System

Yuki Morono gave an update on freezing core material using the Cells Alive System

(CAS), which applies a magnetic field prior to freezing. The major advantage of this system is that it forms homogenous, small ice crystals, which means that original features (such as organic tissues) are preserved. CAS has become widely used in the food industry. Trial studies were done using CAS on non-IODP core material at KCC. Yuji Yamamoto further described the paleomagnetics experiment, indicating that 1 cm<sup>3</sup> of carbonate and 1 cm<sup>3</sup> of deep-sea sediment were demagnetized by ARM at KCC. The ARM was then reapplied and the samples frozen using CAS. The results of the different experiments indicate that this system preserved the microbiologic content of the cores much better than other methods, as well as most magnetic properties of sediments (although the intensity of the magnetic field did decrease). The CAS system also helped with difficult to cut samples that are easily broken (combining CAS method for microbiology and other applications, and recommends sea trials of the system.

#### **Issues on Cross Platform Consistency**

#### a) Taxonomic Name Lists for Micropaleontology Coordination Group

Previous STP consensus statements (1108E-04 and 1108E-08) encouraged IODP-MI and the IOs to continue developing the Taxonomic Name Lists (TNL), as well as the CHRONOS database. The TNLs are important because in the past, paleontologists have not used names or spellings for species consistently, which clutters the database. The establishment of TNLs will resolve this issue. Jamus Collier reported that the TNLs for all microfossil groups originally contracted are finished, but that technical issues have delayed the launch of the database. The Paleontology Coordination Group (PCG) met in October 2011 to finalise the TNLs. At this meeting, they developed a wish list for the future, with the highest priority item the development of extended TNLs, which would include age information, biogeography and paleo depth for benthic groups. Secondarily, they would like to see TNLs developed for benthic foraminifera, ostracodes and silicoflagellates. An additional topic of discussion was the maintenance of the TNLs, which will require experts to check possible additions or changes to the lists. These experts would need to be paid a nominal fee to justify their involvement. The second issue is the stability of the CHRONOS database, which is a problem for the planktonic foraminifer community. Ocean Leadership is currently the host of CHRONOS and has plans to stabilize it. Once that has occurred it will need to be resynced with Neptune (which has continued to be maintained). IODP-MI has some funds available to assist with this once Ocean Leadership has resolved the stability issues. The STP recommended that the extended TNLs are important and should be developed should the new program go forward. STP would also like to hear an update on the CHRONOS database at the next meeting.

#### b) Update on Smear Slide Reference Material

STP previously recommended the development of smear slide reference materials to be housed in the core repositories and on the platforms. Kathy Marsaglia and Kitty Milliken were contracted to develop these materials and the project is set to be completed in July 2012. The current deliverables consist of a 20-page document with images for early career scientists to explain how, when and why to create smear slides, a digital catalogue of smear slides, and six sets of 100 physical smear slides of different lithologies. Each IO will get two sets, one for the repository and one for the platform. Since there is some

concern that smear slides will disappear over time, David Houpt suggested that both sets may be kept on the *JR*. In addition, a small amount of material for each slide could also be included so that new slides can be made as necessary. As IODP-MI has had trouble finding suitable people to review the deliverables for this project, they have asked STP for assistance. As a result, the smear slide catalogue will be reviewed by Steffen Kutterolf and Cedric John and by any other interested scientists before acceptance of the deliverables by IODP-MI.

#### c) Depth Scale Implementation

STP requested that the IOs report on the implementation of the latest depth scale document and training of personnel in appropriate depth scale use prior to expeditions to ensure that the depth scales are used properly and consistently. During the Auckland STP meeting (Feb. 2011), STP requested four updates to the depth scale document: (1) add the document on usage of the depth scale to the depth scale description document; (2) add figures to illustrate usage of the depth scale; (3) spell out the name of depth scales before using the acronyms; and (4) link the depth scale acronyms in the table to descriptions of the depth scales. David Houpt indicated that the new document provides a much better orientation for scientists and that the implementation has been very successful. The CSF-A scale is now the basic scales used for expedition reports and the CSF-B scale can be generated automatically from the database. Both CDEX and ESO have not had any expeditions since the new document was released, so they will provide further updates in the future.

#### d) Review and Modification of Third Party Tool Policy

Yoshi Kawamura presented the Third-Party Tool (TPT) policy, which allows scientists to bring additional equipment onto an IODP platform during an expedition. TPTs can be downhole, observatory or laboratory instruments. The status of the tools can be in development, certified, off-the-shelf (i.e., commercial) or laboratory measurement (which are generally off-the-shelf tools). The TPT policy addresses how to introduce this equipment onto one of the platforms for an expedition. These tools are not supported financially by the program; however, data collected using these TPTs is considered the property of IODP and becomes part of the expedition reports, available online and accessible to anyone following the moratorium period. Currently this policy does not include observatory data, which is becoming more of an issue as the program is often retrieving or replacing observatories during expeditions. Another issue is when observatories are connected to a network of cables and is available live. These issues need to be discussed and a policy developed.

A second issue is the steps each TPT has to go through to be approved for use on the ship. Yoshi Kawamura explained the current procedure, but indicated that perhaps it should be modified, especially to clarify who needs to be notified for evaluation and recommendation prior to an expedition and who reviews the results following use of a new tool. David Houpt suggested that only TPTs that will have an effect on ship time be considered by STP. CDEX noted that they use an online form for scientists to request use of a TPT on an expedition. This form is sent to CDEX and IODP-MI. As a result of the discussion, STP will ask IODP-MI to clean up the TPT guidelines before the next meeting.

#### e) Magnetic Susceptibility Calibration and Standardization

Joe Stoner gave an update on STP Action Item 1102-27 that encouraged calibration/standardization between instruments at the different IOs for magnetic susceptibility. For this, Rare Earth Element oxides are the element of choice as they are stable, reliable and have a reasonable cost associated with them. The USIO is currently working on this issue and has looked at additional options such as sulfate salt. Once they have trialed the standards and get good results, they will be able to provide them to the other IOs.

#### **f)** Formation Factor Issues

Doug Schmitt explained what the formation factor is (an empirical parameter that provides information about the porosity of a rock) and how it is measured, but indicated that this is not an easy measurement to make. Another issue is that if clays are present they can affect the measurement of the formation factor as clays can be conductive due to their surface charge. Furthermore, the amount of dissolved gas in the fluid impacts th formation factor; since the fluid is not measured in-situ, the amount of dissolved gas may not be representative. The microbiology community would like to measure the formation factor of the rocks in order to understand the ability of nutrients to move within a pore network. The measurement of formation factor is critical for upcoming microbiological cruises, so this is still an important issue. As a starting point Doug Schmitt will investigate how this measurement is done in industry. As he has not had time to follow up on the previous action item (1102-26), STP agreed on a new deadline for the next meeting.

#### g) New Publication Format

Angie Miller presented updates from the Publications group, beginning with the results of a survey given to STP members and others following the Feb. 2011 STP meeting. Both STP and Publications agree that there is no reason to retain the DVD format going forward in the new program, although it will be continued for the remainder of the current program. Instead, Publications has recently released ISO disc images online (available as of 9 March 2012). These allow download of an entire expedition DVD with all links working properly, which the user can then burn to a DVD for personal use. The annual cost savings to the program would be approximately US\$25k-\$50k. In addition, PDF is the desire primary publication format for most products. STP needs to continue to examine several issues, including whether all data stored in the database should be replicated in the expedition Proceedings volume, if there should be minimum publication requirements, and the best way to track the impact of the program (such as through outside publications).

Other updates from Publications Services includes 36 LIMS report queries are now

available from the USIO webpage. The USIO and IODP-MI are planning to implement CrossRef's cited-by linking, which allows publishers to discover how their publications are being cited based upon reciprocal participation by publishers. This service covers monographs and journal publications. The USIO has also begun looking into a permanent archive for DSDP/ODP/IODP publications and contracted Laurie Taylor to do a needs assessment for setting up a digital archive, with the conclusion being that not all systems are capable of dealing with the complexities of the program's publications.

Publications Services has started to look at what the future of the publication model will be in the new program. Having a single publisher across IOs would be good for consistency, but in the new model, each IO is responsible for its own publication. The USIO is providing ESO and CDEX with cost estimates for publications services; however, no decisions have been made yet. Publications would also like to see STP provide a clearer definition for what should be published in the new program. Publications have held a brainstorming session to make suggestions for future publications. If there is funding available, they would like to:

- Improve navigation, use breadcrumbs
- Make the page layout more contemporary
- Offer direct links to data queries
- Offer more file formats
- Address how people with disabilities can access the data
- Utilize responsive web design techniques to create a single website that displays well on all browsers
- Develop and incorporate user testing into design of final product
- Publish scientific prospectus and preliminary report series in PDF only

In addition, they would like to do a broader community survey, which STP endorses.

### Technological Feasibility of Drilling Proposals Selected by PEP

The only proposal forwarded to STP by PEP for a technological feasibility assessment was 782-Pre Kanto Asperity Project (KAP) A. The goal is to look at the technological feasibility of measuring pore pressure downhole. PEP thought that the science was positive, and encouraged a full proposal be submitted, but asked for an assessment of the *Wireline hydraulic testing and borehole imaging tool* for stress measurements. Currently there is no information about the formation that will be penetrated, and so it is difficult to know what tools could be used. The issue is that the *Wireline hydraulic testing and borehole imaging tool* stress of lack of budget. Doug Schmitt is assigned as watchdog for this proposal and he will contact the proponent to obtain more information.

### DAY 4: REGULAR MEETING (0900-1700)

Sanny Saito opened the final day of the meeting at 9:00 am.

#### STP Roadmap update, link to NSP, implementation, and advertisement

Sanny Saito gave the panel some background information on the development of the STP Roadmap. The STP Roadmap has been developed over the last 4.5 years to improve the science that can be conducted using IODP cores and boreholes. The roadmap has been coordinate with the Engineering Development Panel (EDP), which has since been disbanded. The top ten initiatives from Version 1.0 were released on the IODP website. The roadmap, which is an Excel spreadsheet, includes shipboard lab measurements, software, drilling technology, coring technology, downhole logging, in-situ measurements, long-term downhole sensors and underway geophysics.

The STP broke into three groups (core description, petrophysics, and chemistry and microbiology) to evaluate the current STP Roadmap ver. 1.0 and update the spreadsheet with new items, updated status and priority, and nominations for the Top 10. Groups had approximately two hours to review the Roadmap and then group leaders presented results to the entire group.

#### **Petrophysics (leader: Joe Stoner)**

Joe Stoner noted that the PP group updated comments and talked in general about how to proceed with the roadmap. He indicated that STP needs to get the IOs to update the status of progress and offer a timeline that shows relative states of completeness. Then STP will be able to better refine the roadmap. He then presented each item that the group thought needed to be updated on the roadmap.

- 1. Formation Factor. Educate the users and advisors closely work with users because of the difficulty in obtaining the measurement. The results need to be vetted before applied to specific studies.
- 2. Elastic Strain Recovery comments updated.
- 3. TC meter
- 4. Small bore magnetometer this is not a survey instrument
- 5. Thermal demagnetizer is now on the JR and so this item is completed
- 6. Volume Imaging; Cedric John noted that the technology exists but there is a question of sample size (core vs. cube container), so STP needs to change the availability of the method on the spreadsheet
- 7. Core logger organic and geochemical core scanner (dream machine)
- 8. Shipboard science on pressure cores; the PP group did not know if measurements are done inside of the pressure cores. David Houpt noted that the pressure corer is pierced during the measurement and depressurized.
- 9. SQUID Magnetometer on *Chikyu* will be installed in June
- 10. Single-Pass Demagnetization the group is not sure this will work
- 11. Deep hole penetration technology, a surface blowout preventer (BOP) could provide options.
- 12. Non-magnetic core barrel, also need to develop a strong non-magnetic core barrel for advanced piston coring (APC).
- 13. Sidewall coring will be done on Exp. 337.
- 14. Logging while coring CDEX is developing this for resistivity and gamma, but sonic would be fantastic.

15. Advance downhole imaging - this has been done successfully and there are other ultrasonic tools and other TPTs available.

#### **Core Description (leader: Cedric John)**

Cedric John noted that all members of the CD group are new, resulting in a few changes to the roadmap.

- 1. Demoted A1-8 ranking to 3 because problems exist
- 2. The CD group would like to produce an action item to IOs to look into the systems described in A1-9., David Houpt noted that there are several types of particle size analyzers if sample is properly prepared;however, sample preparation can be very difficult for clay. In addition to the particle size analyzer, there are various imaging tools (software ImageJ) that can be used to determine particle size distribution on any image.
- 3. Volume imaging A1-15, change availability from M to E/M.
- 4. Whole-round A1-17, the group would like to request an update on the technique used onboard the JR.
- 5. Automatic Core Depth Integrator for age model A2-2, changed ranking from 1 or 2, not as critical as many other systems.
- 6. Visual core description A2-3, changed text to put emphasis on Graphical User Interface for DESClogik and also for creating flexibility within J-CORES.
- 7. A2-5 a database to search across IOs change availability from I to E/M as the capability exists in SEDIS.
- 8. Large diameter pipe B1-2, change priority from 3 to 2.
- 9. Tensor Tool B2-3, ask the panel about cost estimate for tool, as the cost listed in spreadsheet seems cheap for a good return, but is it realistic? David Houpt indicated that he did not know where that price came from.
- 10. Non-magnetic Core Barrel B2-4, not relevant to Core Description.
- 11. Cuttings B2-8, the CD group would like to ask CDEX to give an update on the next meeting as to how the cuttings sampling procedure worked on *Chikyu*. If the procedure works and is in place, then this item needs to be removed from the roadmap. Denise Kulhanek also asked for an report on potential caving issues when using cuttings following Exp. 337. If hole stability is a problem, resulting in significant caving, then any science completed on the cuttings samples that are taken will be compromised. The paleontologists will be able to recognize if caving is a significant problem. If it is, then methods to improve hole stability need to be considered, such as investigating the use of different drilling fluids when cuttings will be collected.
- 12. Logging while coring C1-1, the CD group would like to ask USIO/CDEX about tests and status of tests. Sanny Saito noted that the tool exists and has been tested by the USIO. CDEX notes that the tool is under development by them.
- 13. Vector magnetometer C1-4, this exists and seems to work, so it should be removed from the roadmap.

Items for the Top Ten list:

- Category A1-9: grain size critical for siliciclastic systems
- A2 (software/databases) most critical category for CD, although A2-2 is not recognized as critical

- B1-1
- B2-1 and B2-2
- Remove A1-8 (automatic system for sample preparation)

### Chemistry and Microbiology (leader: Yuki Morono)

The CMB group agrees that STP needs updates from the IOs about the current status of various items.

- 1. A1-7, contamination tracer for both microbiology and geochemistry. David Houpt noted that two years ago it was mentioned that PFT could be replace by PFcyclohexane, but the USIO is awaiting guidance from the science community. The USIO would prefer some external evaluation to test this method instead of using valuable cruise time. They would like to see how well the method works before deploying.
- 2. A1-9
- 3. A1-18, added CMB
- 4. A1-19, recommend the IOs apply the technology
- 5. A1-20, recommend STP remove this item from the roadmap. Vacuum freezing is almost identical to points listed on the CAS procedure, A1-19.
- 6. Large diameter pipe, B1-2, action item to request report from CDEX after Exp. 337. Larger diameter cores were taken during Exp. 331, but Exp. 337 will be the first full demonstration of this technique.
- 7. B1-4, real-time mud gas monitoring, specific to *Chikyu*. This is already installed and operational; once STP receives a report that it is working then it can be removed from the roadmap.
- 8. B2-6, pressurized coring with temperature control; the *Chikyu* will have an expedition that uses this technique and can report back to STP.
- 9. B2-7, sidewall coring; the CMB group would like to know if the samples are contaminated when taken and request a report from CDEX.
- 10. C2-4, collection of formation fluids at in-situ pressure and temperature. Currently scientists are concerned about contamination. CDEX notes that Schlumberger does not want anyone to touch the tool because it could be a problem of responsibility if tool stops working. Yuki Morono notes that the concern is contamination from borehole. This will be implemented during Exp. 337 and CDEX can provide a report.

Items for the Top Ten list:

- Contamination issue (A1-6, A1-7)
- Large Diameter core pipe (B1-1, B1-2)
- In-situ conditions and preservation of samples (B2-6, C2-4, A1-19)
- Enhanced core recovery and quality (B2-1, B2-2 and B2-3)
- Remove automated sample prep and analysis. .

Following the presentations Sanny Saito indicated that he and Doug Schmitt would collect the changes and create version 1.1. Since the roadmap is now nearly five years old it is time for a major revision. Thus, STP will ask the IOs to review all items on the roadmap and provide an update on the status for all technologies at the next meeting.

#### Select Next Meeting Location

Joe Stoner volunteered to host the next STP meeting in either Corvallis or Portland, Oregon (USA), likely to be held in late August or early September 2012. In addition, Weidong Sun (China) has volunteered to host a meeting, so China may be the location for the following meeting in early 2013.

#### Finalize Recommendations/Consensus Statements and Action items

The remainder of the meeting was spent reviewing and voting on the 18 recommendations/consensus statements and 6 action items that resulted from the current meeting. These statements and action items are listend in the Executive Summary at the beginning of the minutes.

At the conclusion of the meeting, Sanny Saito thanked everyone for their participation and dedication.