

Annual IODP Curatorial Meeting - minutes
Feb. 26 – 27, 2009
Seminar room, Kochi Core Center, Japan

Participants :

BCR

Ursula Röhl (UR)
Walter Hale (WH)
Alex Wülbers (AW)

GCR

John Firth (JF)
Phil Rumford (PR)

KCC

Lallan Gupta (LG)
Toshio Hisamitsu (TH)
Satoshi Hirano (SH)
Yohei Arakawa
Masaru Yasunaga
Shigako Nigi

CDEX

Shigemi Matsuda (SM)
Nobuhisa Eguchi (NE)
Tadashi Yoshizawa (TY)

IODP-MI

Hiroshi Kawamura (HK)
Jamus Collier (JC)

SAS

Takuro Nunoura (TN)

Observers

Wataru Azuma alias Wonn Soh
Yoshihisa Kawamura
Yuki Morono (YM)
Masao Iwai (MI)
Min-Te Chen (MC)
In Kwon Um
Jeong Hae Chang
Hiroyuki Kikuta
Takayuki Tomiyama
Noriaki Masui

Day 1 – Thursday, Feb. 26, 2009

The meeting began with brief self-introduction of participants followed by welcome remarks by *Wataru Azuma*, director, Kochi Institute of Core Sample Research, JAMSTEC. Health Safety and Environment (HSE) related information about the meeting venue and some information about local cultural events were provided by *L. Gupta*.

H. Kawamura provided an **overview of the SAS** (Science Advisory Structure) and the active proposals statistics. He reported that Dr. Kiyoshi Suyehiro would become new president of the IODP-MI in May 2009. He gave a brief account of the INVEST (IODP New Ventures in Exploring Scientific Targets) conference to be held in Bremen in September 2009, on CPP (Complimentary Project Proposal) and on forthcoming IODP-MI funded workshops. He mentioned that the IODP-MI recognizes need to promote sub-seafloor life related research. The SLTF (Subsurface Life Task Force) report and STP (Science and Technology Panel) recommendations together with ESO and USIO responses about bio-archive were also overviewed.

N. Eguchi provided **CDEX response** in terms of availability of technicians onboard, frozen sample storage facility in KCC, and operational costs. Later, a printed version of the KCC's response to the STP recommendations was also provided to the participants.

U. Röhl asked how IOs are dealing with community acceptance of samples for bio-archive (as already laid out in the USIO and ESO responses submitted to IODP-MI in the fall of 2008). *HK* suggested that a brochure might be produced to convince the community about it. *NE* commented that any conflict in sampling for bio-archive could be resolved in consultation with science party. *JF* expressed concern that many WR (whole round) samples taken during ODP times were not utilized by microbiologists, so they should show activity first to convince onboard science party for further sampling for bio-archive. *PR* informed that ODP WR were stored at -20°C (one standard at that time), but some microbiologists were interested in samples stored at -70°C only, reflecting a lack of consensus among microbiologists. During the discussions, concern was also raised whether bio-archive samples could be routinely taken at all, when the aim of an expedition was not related to the microbiology. All together, the community acceptance of buying into a routine sampling program with no scientific (microbiologist) expertise onboard is probably not going to be practical and will produce too many conflicts or just will be not followed, also taking into consideration the relatively high costs, time, and manpower involved.

STP member *T. Nunoura* reported about routine sampling procedure for **bio-archive**, costs related to shipments of such samples and accessibility of these samples. As a special rule, sample requester could be asked to cover the sample shipping cost. He was concerned that community might have not known in the past how to access to the existing ODP frozen samples. *JF* responded that a list of ODP frozen samples will be made available through the GCR website, and that should help community to utilize these samples. *WH* wondered if it was possible to get sample tube (syringe) for 15-20 cc volume commonly. *JF* asked who determined this sample volume. *TN* explained that DNA extraction required 5 to 10 g of sample, so 50 cc was a good sample volume

for bio-archive. *UR* asked about sub-sampling procedure of the frozen sample. *YM* responded that he would explain the procedure in a following presentation. He informed that the PFA containers for storing samples in Liq.N₂ were very expensive (US\$ 50 - 100 each) and his team is looking for cheaper alternatives. Moreover, he mentioned that for handling such samples microbiologically trained staff in the repositories would be required. *JF* commented that adding a new staff would constrain the SOC budget of each repository.

YM reported about a **pilot study** ongoing at the KCC for proper handling of frozen core samples (**bio-archive**). He elaborated about the aseptic condition of sample handling, sub-sampling, preparation of cookbook and training of staff for microbiological curation. The sub-sampling is conducted at room temperature, however, the sample is not allowed to thaw by careful handling (e.g., a deep-freezer next to the bandsaw for temporary storage of the sample). Sub-samples are being stored in various temperature conditions (4°C, -20°C, -80°C, Liq.N₂) for a long-term storage test. *PR* asked when would it be possible to see results from sample storage at different temperature conditions. *YM* responded that the pilot study was planned for 3 yrs period, so the results would be available shortly after that.

The discussions on bio-archive related issues could be summarized as follows:

Community acceptance: Some science party members may not like the idea that WR samples be permanently removed from the intact core for bio-archive, especially when there is no microbiologist onboard who will actually work on the samples, and who could also convince the party about the potential importance of these samples. If a microbiologist would be a member of the science party, who requests his/her set of samples, it may be easier to convince the science party of the need to take these samples.

Sub-seafloor microbiology research results based on ODP frozen samples are yet to be seen; a list of such samples will be made available soon, and then monitor the response of community for these samples. Severe underutilization of frozen core samples from previous ODP expeditions by the microbiology community is a cause of major concern in the process of establishing a larger bio-archive.

As to current draft plan, collecting a WR (for bio-archive) e.g., next to each IW sample will cost heavily in terms of labor, consumables, and time, especially if sub-sampling of WR using 4 syringes is enforced for the recommended frequency. It may be better to take WR not per IW sample, but definitely reduce the number (e.g., for high-recovery paleoceanographic expeditions like IODP Expeditions 320 and 321 easily around 700 microbio samples would accumulate if the current plan would be followed) as otherwise it will be impossible to ever receive community acceptance at all.

Some of the SOC funds need to be allocated for employing new staff (microbio trained curator), and that may constrain the current distribution of SOCs to all 3 IOs.

Instead of establishing bio-archives at 3 repositories, a central repository for bio-archive samples could be an option. For deciding on an appropriate temperature for

sample storage [-80°C versus -160°C (Liq.N₂)], results from tests being conducted at the KCC first need to be examined in near future.

UR presented the **ICDP report** on behalf of Ulrich Harms, who could not attend the meeting due to unavoidable circumstances. By now about 23 ICDP project sites throughout the world were drilled. Due to legal reasons, the ICDP cores are usually stored in the countries they are drilled, however, many lake core sediments are stored at LaCore repository, at the University of Minnesota, USA. ICDP would like to create a network of national core repositories, which would work for the ICDP, and also plans to more closely cooperate with the IODP. *JF* mentioned that the Lake El cores might provide a 5 Myr geological record. *HK* asked if existing New Jersey cores belonged to IODP or ICDP and where the cores from upcoming IODP Expedition 313 would be stored. *JF* responded that the New Jersey cores belonged to the IODP, because funding was provided by both NSF and the NJGS. *UR* explained that Expedition 313 cores would be stored at BCR.

UR reported about the **ESO expedition** schedule and ongoing preparations related to it. The sample requests for Expedition 313 (New Jersey Shallow Shelf) were submitted still using the MSP form. The Onshore Science Party at BCR is scheduled for November 2009. The sample requests for Expedition 325 (Great Barrier Reef Environmental Changes) will be submitted through the SMCS. The Onshore Science Party at BCR is planned for April 2010. After the moratorium year, the cores from this expedition will be relocated to the KCC.

There was no Powerpoint presentation from the USIO side, *JF* used the USIO website to explain about the **forthcoming USIO expeditions**. All the cores collected during both Expeditions 320 and 321 (PEAT I and II) will be offloaded at Vancouver portcall after completion of Expedition 321 in July 2009. The cores (about 3 – 4 km in total) collected during the Expedition 323 (Bering Sea) will be offloaded at Yokohama port soon after completion of the expedition in Sep. 2009, and be transferred to the KCC in D-tubes. Since a shrink wrapping machine is not available on the JR, the core sections need to be shrink-wrapped at KCC. A sampling party for these cores will be held at KCC sometime in Jan. 2010.

NE reported about the thruster repair work of the Chikyu, and reviewed preparations for the **Expeditions 319 and 322**. The expedition prospectuses are already available to science party, and preparation is being done to receive sample requests. During the port-call soon after repair work, more than 9000 people visited the ship in one day as a part of outreach activity in Kobe.

WH reported about the **BCR status**. He mentioned that ideal condition for storage of evaporite cores is dry and warm. He brought up the issue of organic geochemistry WR, which were frozen for many years at GCR, later warmed up there, and are currently stored in reefer at 4°C, but there has been no sample request for these till date at all. So, there are considerations if they should be split now, and be made available for discrete sampling. Their usefulness still for organic geochemistry studies is questionable and leaving them as whole rounds would require special (non-standard) storage racks. Or, alternatively, they might present an opportunity to conduct some geriatric study to identify changes in core material with time. In order to distinguish 'archive' halves from 'working' halves, red labels were pasted on

'archive' half end caps of the DSDP cores. This project is now completed. The curated length (CL) and liner length (LL) record of DSDP cores is being updated in Janus by examining photographs of cores in a cooperative project with the database staff at the GCR. This project may be completed in about 6 months, depending on the portion of the work that will have to be done by the BCR, and the level of BCR sample requests in the near future.

JF reported about the **GCR status** without a Powerpoint presentation, which he prepared for this topic but did not open due to technical problem. He mentioned that racking of many cores was yet to be done, shrink-wrapping was not complete for all cores yet. Some sample residues and thin sections together with about a pallet of cores from GCR will be sent to the KCC by using the JR, and these will be offloaded from the JR together with Bering Sea cores during port-call at Yokohama in Sep. 2009. Some sample residues and thin sections together with organic geochemistry WR samples, which used to be frozen at -20°C but are no longer frozen now, will be sent to the BCR in near future.

LG reported about the **KCC status**. A timeline of KCC establishment and Legacy core reception was provided. After completion of the redistribution, it has been estimated that of all Legacy core, which was supposed to be received by the KCC, only about 97.5% has been actually received. Some of the missing 2.5 % core may be accounted for reasons like 'All to Paleo', 'Void core', 'Missing', 'Display core', etc. *JF* will extract data from Janus and provide information about these 2.5% cores to the KCC.

SH reported about a few **QA/QC related issues for sampling** and sample handling. Sampling of dried up cores by U-channel is nearly impossible, and requesters need to be advised for discrete sampling by PMAG cubes. About the sample volume and intervals, some degree of flexibility in these is expected from the sample requester, so they need not be exact all the time. Packing of physical property WR samples in aluminum bags was appreciated and this packing may be considered for packing WR on JR, too.

KCC repository and lab tour was held towards end of the day 1 to familiarize the participants with current status of the KCC. The participants saw experimental preservation of cores in -20°C freezer room, and Legacy core storage in reefers at 4°C. They showed interest in newly designed core cases, which obviate the use of cardboard boxes for transferring cores from ship to shore. In the **Bio-archive facility**, samples frozen in Liq.N₂ tanks, and equipment and technique used in sub-sampling of frozen samples were demonstrated. In the backyard of the KCC, participants inspected some of the reefer containers ready to be sent to the Chikyu, storage of salt cores and sample residues in air-conditioned containers.

Day 2 – Friday, Mar. 27, 2009

LG explained what Community whole round (**COM-WR**) **samples** are and how the sample requests for these samples may be evaluated in post-moratorium period. There were 2 options: treat them as permanent archive (5-yr moratorium) or as special archive (no moratorium), both with evaluation from CAB. [It was agreed that treating](#)

them as special archive would be the only feasible option, especially in respect of the potential interest from the scientific community. *HK* asked if it was acceptable to increase the number of CAB members. *JF* responded that membership of CAB may be increased to 7 (include one microbiologist) but probably not more, because it would become a time-taking process to reach a conclusion when too many members will be involved in decision-making. CAB can always get opinion of additional experts / specialty co-ordinators if needed. *UR* agreed with this comment. *WH* asked if and at which point such WR would be considered to be split. *JF* responded that CAB might decide about this matter.

LG provided a brief account of how the **cuttings** will be curated onboard Chikyu during the Expedition 319 and at the KCC. About the issue of defining some volume of the cuttings archive as permanent archive, *JF* suggested that first sample demand should be monitored, and if required a third of initial volume might be kept for a long-term storage in repository. Later, STP may decide about 'permanent archive' of the cuttings.

M. Chen reported about a 3-year plan to build **new core repository with lab facility in southern Taiwan and a new ship** for research purpose. Usually, cores from seas around Taiwan are planned to be collected. In 1998, Taiwan received long piston cores collected under the IMAGES program, and necessity of large repository has arisen since then. Architectural plan of the new building and construction of database using PANGEA were elaborated. Current activities include making manual for sample handling and experimental methodology, providing e-news through internet, and holding open school (2/year). As for the sample request, a remarkable increase is expected in these three years. *PR* asked if Taiwan had any plan to participate in IODP. *MC* responded that because of high membership fee of IODP, it was difficult. Moreover, the community in Taiwan is also small. However, they want to participate in IODP by all means, if fund is available.

M. Iwai reported about a planned Micropaleontology Reference Center (MRC) in joint collaboration with Kochi University and KCC. SciMP recommends that MRC be continued with the IODP. The idea of new MRC in Kochi was introduced at the MRC curator meeting in Berlin in 2007. Plan is to start with diatom collection as a **satellite MRC**. The Kochi University president's fund will be requested to support the MRC. In future, close cooperation between Bremen University, Kochi University and TAMU may help in promoting research and education through MRCs. *JF* supported the idea of establishing a satellite MRC at Kochi University/KCC, and suggested that smear slides from retiring researchers may be obtained as a collection for the MRC. *MI* asked if any material for MRC was available from IODP expeditions. *JF* responded that he would be reluctant to allow more sampling, because during ODP, 4000 – 5000 samples were taken for MRC, but most of them were not used. Although each repository has slide collection, very few people used them till date. It may be better to organize slide collection at each MRC and then add necessary ones. *LG* commented that new techniques were available to make new reference material and for that new sample requests might be invited for making new slides at MRCs. *JF* responded that yes, new requests might be submitted, but they might be rejected.

J. Collier reported progress of **SEDIS**. SEDIS III is going to offer information about analytical tool and data through the Google Map. He raised the issue of amending the

IODP Sample, Data and Obligation policy to give credit to requesters who failed to publish the data they produced. Also a mechanism has to be setup to send an alert email to a sample requester and curator 6 month after deadline of publishing, if the data were not published. There is a need to evaluate publications in relation to sample requests submitted by authors of publications. *JF* proposed that additional staff at each repository was required to evaluate publications in order to judge if obligations were fulfilled or not. *UR* said that young staff (especially with M.Sc. degree only) would not be able to do the evaluation. It required expertise to evaluate what was proposed to do through a sample request, and what was actually published. Instead, requesters should be obliged to explain what they published in order to clarify their obligation fulfillment. *LG* commented that appointing extra staff would affect SOC budget of each repository. *JF* suggested that oil companies were required to send the data, which they could not publish, to curator so that it could be published on SEDIS public domain for their obligation fulfillment. *JC* also raised the issue of reference material to be used by each IO. *JF* commented that procuring physical samples might not be practical, so why not use digital images, which could be shared by IOs. *HK* inquired if the reference collection of Jay Miller was available to anyone. *JF* responded that it was available through the Janus and could be used by anyone. However, access through internet is difficult when onboard ship, so the USIO curator will compile websites and digital resources for it, and prepare a DVD for JPIO and ESO. Staff scientist onboard should explain to science party members about these resources.

WH reported about **BCR curatorial database**. Current JAVA sample program of Janus does not work in the BCR, although it apparently functions in the GCR. Old JRS works but only on Windows NT platform. He asked how long the Janus would be available for recording sample data. *JF* responded that LIMS might replace Janus for sample data in six months from now. There are about 2 million sample data in Janus, and it will be available in read-only mode after LIMS takes over. About the Central Inventory of sample data, there is no schedule to develop it as of now, but a schedule may be made after field testing of JR. BCR presently uses DIS database sampling program only for MSP Expedition sampling, but the DIS system is capable and will be used for sampling all of the BCR collection after Janus goes into read-only mode.

There was no Powerpoint presentation about the databases use at the GCR.

S. Matsuda reported about **up-gradation of J-CORES** and demonstrated how fast and convenient the J-CORES would become from Expedition 319 onwards. It will also be possible to record Legacy core sample data from the KCC rather efficiently.

JF provided an update **about SMCS** use for handling the sample requests for the forthcoming USIO expeditions. Spreadsheets were created by using sample request information on the SMCS for sample request evaluation. No onboard version of the SMCS is available, so for adding comments or modifying a request by curator onboard, access to the SMCS database onshore is necessary. This method will be followed for next 2 USIO expeditions, however, from 3rd expedition onward some improvement may occur. Implementing the LIMS is high priority at the USIO and not the improvement of current version of the SMCS. *JF* showed the new SAFOD sample request and sample database, which he thought had features that were better than the current SMCS database. He also thought that the speed with which the SAFOD

database was created, compared to the SMCS database, as well as compared to the slow speed at which any future SMCS improvements may be made (SMCS V.2), led him to ask all the IODP curatorial staff to evaluate the SAFOD product to see if it could serve as a better template for a future IODP sample request database, rather than waiting for SMCS V.2. He pointed out that the SAFOD database already provided the opportunity for scientists to see core photos, see previous samples taken, and mark new requested samples on core photos, which was one of the original ideas for an IODP-wide sample request database. He said that low resolution scanning of working half cores could allow IODP scientists to also see previously sampled core in the same manner as the SAFOD database shows them. BCR and KCC staff expressed concern about dealing with this new software in a limited period of time, and wondered about the labor and time constraints when image-scanning the cores for sample status record even at low resolution.

T. Yoshizawa reported about the ‘**Sand for Students**’ E&O program of the CDEX. The program is aimed at educating middle to high school students about the connection between neighborhood sand and ocean floor sediment. Field work is held 2 – 3 times a year. Especially in Japan, such field study is non-existent for students. The program seeks cooperation from the IODP fellows, need to collect sand from local rivers, make a database of it, and obtain some cuttings samples from the IODP expedition. *AW* asked if some experts were invited in this program. *TY* responded that some experts were made available by the PMO and universities to teach/explain to students. *JF* suggested that volcanoclastic material from Bonin-izu peninsula area might be comparable with the cores from nearby ODP sites, and that would be good material for the program. *WH* enquired how to contact schools. *TY* replied that it was through personal communications and PR activities.

WH reported about **display of cores in museum** and change in their texture and color under different storage conditions. Core kept in N₂ atmosphere with wet sponges showed no change in sample condition with time, but lack of insulation around the storage case in one instance may have resulted in development or widening of cracks in core due to water loss and shrinkage. *PR* remarked that temperature and light condition also affected the core during a display.

JF raised the issue of keeping/displaying **duplicate cores**, which were obtained from multiple holes. After making a list of duplicate cores for display purpose, proceed with discussion about reshuffling them among the three repositories. *UR* questioned that a display core might be requested for XRF scanning or sampling. *JF* responded that the cores could be scanned locally, at the ‘display’ repository, and sampling of such cores could be done at the ‘display’ repository in conference with the ‘home’ repository, although approval of requests asking samples from such cores was a remote possibility.

T. Hisamitsu reported about a company, which could make high quality **replica of cores**. However, the high cost of making the replica was a concern. It was learned during the discussions that a former GCR staff (Paula Weiss) might make good replica at much lower cost. *UR* mentioned that 5 such replicas were already being displayed at ECORD. *LG* wondered if there was any change in color/texture of replica with time. *PR* responded that clay based replica cracked, but these days they were resin based and that kept replica unchanged for long time.

General discussion about **promotion of core-based activity/science** was held. *LG* proposed about pro-active advertisement of cores through talks at academic meetings. *JF* told that TAMU had some interaction with local science community in the campus that led to formulation of lab lessons while actually utilizing cores. For various research themes, researchers may be hired to promote IODP core sample based research. Talks may be given at universities on geology and oceanography related topics. One-to-one talk with professors may bring graduate students to work on cores. Repeated attendance at meetings by setting up repository booth is also effective. He provided pdf file related to this matter for BCR and KCC. *PR* suggested that displaying posters and cores at big meeting like AGU could attract undergraduates and graduates to repository and core-based science. *UR* added that BCR's new location (in the MARUM building on the campus of the University of Bremen) generally attracts more scientists and visitors. ECORD summer school is held there to train young researchers. Also working on IODP samples is one of the initial exposures of young researchers to the program. Talks are usually given at various German universities to promote IODP. *AW* commented that reports by local newspapers and holding open school also helped publicizing activity of the BCR.

Discussion was held on onshore measurements of cores by using **XRF core loggers**. XRF scanning at BCR was done in ODP times while the shipping costs were covered by the requester. Since IODP times the shipping cost has been paid by GCR and BCR budgets (according to a general decision by IODP-MI that there would be no cost limit on a individual request). *LG* raised the issues of operating costs and shipping costs (in case cores were sent to other organizations for scanning). *UR* clarified that the scanners are not IODP property, but belong to cooperating institution. So, repositories/IODP cannot dictate the use of these labs for IODP. *JF* mentioned that GCR would provide scanning service at a charge to be paid by the requester, as the scanner belongs to a TAMU lab. *UR* told that scanner should be operated by the requesters, as it is an essential part of the data acquisition to get to know the cores and especially learn about the quality of the core surfaces in detail, and, so to speak it would be a training for the requester and a key in order to properly interpret the elemental intensities retrieved from the scanner. All agreed that shipping costs from the repositories' budgets definitely could not be used to cover consumable/operating costs for the scanners. These have to be covered by the requester (if for individual research project). *TH* raised question about how to handle multi-repository requests for scanning. It was discussed that one option could be that the requester should visit all concerned repositories and do the scanning by himself/herself. Questions were raised about comparability (QA/QC) of XRF scanner measurements, which are semi-quantitative only, among the different systems at the repositories, and it was initially discussed that using international standard samples for calibrating the different instruments would be the right way to approach this.

TH reported data from **temperature monitoring of various sample packages** and proposed an inter-repository network to distribute cool and frozen samples to requesters around the world. The network could substantially reduce the shipping costs to be paid by repositories. *JF* suggested that overall sample size could be reduced to bring down the shipping costs. It was also proposed that requesters might be asked to pay, when high cost specialized carriers are used to ship frozen samples. Another suggestion was to include extraordinary shipping costs in the program

(expedition) costs. In order to test the inter-repository network, it was agreed that we cooperate on a smaller scale first and check if it works in the expected way.

TH reported about the newly designed **core case and core racks being used at KCC**, and asked how the cores be transferred from the Chikyu or KCC to the BCR and GCR, if such requirement occurred in future. The core cases are relatively cheap and obviate the use of cardboard boxes for transferring cores among ship and repositories. *JF* appreciated the idea of core cases, and said that GCR could receive the cores in core cases. *WH* also appreciated this and would consider about this issue for the BCR.

Discussion was held about **storage temperature (4°C) for cores**. Dried up cores (e.g. DSDP) and indurated and hard-rock cores may be considered for shifting them to air-conditioned (AC) space. However, at present there is no crisis of storage space, so this is not an urgent issue. Moreover, taking relatively small numbers of hard-rock cores out of the racks would leave small gaps that could probably not be used for other purposes anyway. *JF* told that by using some test cores, experiments might be planned to examine the effect of storage condition on the cores in the meantime. *UR* added that ICDP cores were stored in AC condition, and some rock cores were kept in the environment without AC.

Discussion about **fungal growth and secondary crystal growth** on some cores led to suggestions that not much could be done about the secondary crystal growth, however, cores with fungal growth needed to be cleaned in fume hood with proper PPE put on. It is enough to shave off the fungi-infected surface at the time of sampling. A study may be conducted to find out what kind of fungi grow on the cores.

LG raised a few issues related to the **IODP Sample, Data, and Obligations Policy**. In case decision of SAC is not acceptable to a requester, can he/she appeal to CAB without first contacting the IODP curator? Technically, yes, especially on the occasions when the IODP curator is member of the respective SAC. The role of speciality coordinators do not appear in the policy as pointed out by *JF*. Therefore, they have no authority to make decisions, but could provide valuable advice to SAC. About the issue of first author versus primary requester while tracking obligation fulfillment, it was agreed that as long as the data were published it does not matter whether the primary requester is a first author or a co-author. At this stage the 3 repositories evaluate requests independently, however, the results of obligation tracking are not shared. It may be tedious/irritating for a sample requester to clarify his/her obligation fulfillments to each repository, every time he/she submits a new sample request. A common database/mechanism would be helpful to share such information among the repositories. About unused samples and the obligation of the requester to return them to the repository, an option could be that the requester shared those samples to third party. The current policy does not restrict such activity. If the requester has fulfilled his/her obligations, it is not an issue if a third person uses the sample residues effectively and publishes the results by acknowledging IODP. However, such sharing of sub-samples to 3rd party should not occur within the moratorium period, as conflicts of interest with members of the science party are relatively likely.