IODP Scientific Technology Panel (STP)
3rd Meeting

MINUTES

Final

26–28 June 2006

Academy of Finland

Helsinki, Finland

Meeting participants:

STP

Ahagon, Naokazu	JAPAN	
Basile, Christophe	ECORD	
Castillo, Paterno	USA	
Christensen, Elizabeth	USA	
Ge, Hongkui	CHINA	
Kasahara, Junzo	JAPAN	
Korja, Annakaisa	ECORD	
Lovell, Mike (vice-chair)	ECORD	
Lyons, Tim	USA	– unable to attend
Mandernack, Kevin	USA	
Nunoura, Takuro	JAPAN	
Okada, Makoto (chair)	JAPAN	
Sakamoto, Tatsuhiko	JAPAN	
Screaton, Elizabeth	USA	– unable to attend
Suzuki, Noritoshi	JAPAN	
Villinger, Heinrich	ECORD	
Wheat, Geoff	USA	
Wilkens, Roy	USA	
Yamamoto, Masanobu	JAPAN	

Liaisons and Guests

Blum, Peter	USIO
Gaillot, Phillipe	CDEX
Higgins, Sean	USIO
House, Chris	PAC SODV
Inwood, Jenny	ESO
MacLeod, Chris	SPC
Röhl, Ursula	ESO
Schuffert, Jeff	IODP-MI
Sugihara, Takamitsu	CDEX

EXECUTIVE SUMMARY

Final

The STP forwards the following recommendations, consensus statements, and action items to the SPC or the IODP-MI as appropriate, and for distribution to the IOs as required. STP suggestions for whether items should be forwarded to SPC and/or IODP-MI are indicated, as are priorities for action items, Brief overviews/background are provided where appropriate in italics.

Recommendations

STP Recommendation 0606-01: Seismic source
The STP recommends equipping an appropriate size of a seismic source on IODP drilling platforms. Seismic source is necessary to obtain core-logging-seismic correlation through check shots, VSP, and underway seismic surveys. A tuned airgun with 300-1000 cubic inches and impulse-like source signature is more appropriate for depths of 4000 mbsf. Tuned airgun arrays offer improved resolution and should be considered where feasible. Accurate timing control, digital recording unit, and a short streamer are also necessary to enhance the depth resolution.

Vote: 15 Yes, 1 No (Wilkens), 0 Abstentions, 2 absent (Lyons, Screaton)
Priority: High
STP suggests this be forwarded to IODP-MI.
Background to STP Recommendation 0606-01: This is in response to SPC Consensus 0603-8: The SPC receives STP Recommendation 0601-4 on seismic sources for IODP platforms and forwards it to the IODP-MI for consideration. The committee suggests that the implementing organizations should approach the Scientific Technology Panel (STP) with specific questions about the recommended specifications for seismic sources.

Core-logging-seismic correlation is one of the most important tasks in IODP and underpins many scientific objectives. In order to obtain high resolution seismic data, check shot and/or walkaway VSP a seismic source is required. The characteristics of the seismic source require the impulse-like wave forms obtained by a tuned airgun array. To obtain enough depth penetration as deep as 4km, the appropriate chamber size (300-1000 cubic inches) is required. For the case of changing drilling sites, a relatively short streamer (12-24 channels) is also required.

STP Recommendation 0606-02: Downhole T&P Tools
The STP recommends that the IODP-MI encourage the IOs to combine their efforts with respect to all temperature and pressure downhole tools, including new purchases and developments, in order to facilitate cross-platform technical and scientific compatibility. This would also minimize required funds for purchase of new or upgrade of existing downhole tools and at the same time maximize chances for obtaining high-quality downhole measurements.

Vote: 16 Yes, 0 No, 0 Abstentions, 2 absent (Lyons, Screaton)
Priority: High
STP suggests this be forwarded to IODP-MI.
Background to STP Recommendation 0606-02: Availability and compatibility of tools will be important during upcoming Nankai drilling because there will be two platforms involved.

STP Recommendation 0606-03: Post-Expedition Results
The STP recommends that the IOs include post-expedition generated results (data and processed data) in the expedition database. The original data should be maintained in the database. Submissions should address methodology, QA/QC, and if necessary, include an explanation of how the added dataset differs from previous versions. The IODP-MI QA/QC taskforce should develop a policy for ensuring QA/QC of these results. The IOs would determine if data submission is voluntary or obligatory.

Vote: 15 Yes, 0 No, 1 Abstention (Villinger), 2 absent (Lyons, Screaton)
Priority: Medium
STP suggests this be forwarded to SPC and IODP-MI.
Background to STP Recommendation 0606-03: Currently, changes to age models and other data are not recorded in the database. This has led to a reduced quality of science in quite a few post-cruise investigations, particularly by those scientists who aren't part of the working groups associated with the expedition.

Modifications to data performed post-cruise aren't incorporated in current database. For example, post-cruise research discoveries from techniques such as oxygen isotopes concerning drilling and data quality are not incorporated into the database. Thus, even though the science party may be aware that there problems with the data (e.g., a re-cored interval from a slump; a significant unconformity not identified on ship; error in measurement, a revised age model based on post-expedition bio-magneto-iso-stratigraphic data), other investigators will not know except through personal communication. Even if a literature search is performed, it is rare that manuscripts highlight bad data. Furthermore, there is often a significant publishing delay (up to a few years) before it is available to the community. The practice of omitting post-cruise analyses from the database, particularly in the case of age models, has the potential to degenerate the quality of the science. So, important information concerning the data is lost to the community, particularly as time passes.

This refers to a previous STP Action Item 0606-04. The STP will explore the potential inclusion of post-cruise data by the IO to enhance the value of the database. A significant impact of database development is efficient data delivery but STP recognizes that the shipboard data are preliminary and need to be updated through shore-based studies. The data, such as refined age models, would be treated not as a replacement, but as a supplement with good metadata and quality control. The emphasis would be on voluntary acquisition of datasets rather than developing a policy that emphasizes enforcement. Leads: Christensen, Suzuki, Ahagon and Basile

STP Recommendation 0606-04: QA/QC Task Force

The STP thanks the IODP-MI for establishing a QA/QC Task Force. However, the STP believes the task force mandate should be reformulated to include the following points. 1) The STP recommends that the task force address the general policies for the QA/QC procedures, including the issues of complex documentation and data management. 2) These should be aimed at assuring quality across a range of platforms and expeditions. 3) The task force should address IODP minimum and standard measurements across the full range of disciplines (e.g., petrophysics, geochemistry and microbiology, core description). The IOs should then implement QA/QC policy and develop protocols for individual sets of measurements in conjunction with SAS input. The STP is prepared to provide liaisons as appropriate to this newly reformulated task force.

Vote: 16 Yes, 0 No, 0 Abstention, 2 absent (Lyons, Screaton)

Priority: High

STP suggests this be forwarded to SPC and IODP-MI.

Background to STP Recommendation 0606-04: STP Recommendation 0601-05: QA/QC was forwarded to IODP-MI. In it, STP recommended that IODP-MI coordinate the QA/QC efforts across all platforms in cooperation with the IOs and where necessary STP. STP requested a QA/QC plan for the IODP minimum measurements to be presented by the IOs/IODP-MI at the next STP meeting. Background to STP Recommendation 0601-05 stated that QA/QC is an important issue, especially given multiple platforms and the desire of scientists to integrate data acquired by different platforms across the IODP. This recommendation follows on from previous discussions at SciMP and STP, and provides a route towards addressing this in a timely manner for Phase 2 of IODP. STP understands that IODP-MI received STP Recommendation 0601-5 on QA/QC and proposed at SPC (March) to establish a task force to develop the framework for the IODP shipboard and shore-based QA/QC laboratory procedures.

At SPC (March) IODP-MI indicated it would discuss with STP post-SPC meeting the mandate and constitution of the task force.

Immediately prior to the STP meeting in Helsinki (0606) STP was asked through the SPC chair to provide a liaison to the IODP-MI task force. By this stage the task force mandate appeared finalized with 5 geochemistry specialists invited to participate. STP is concerned that QA/QC applies to all IODP minimum and standard measurements and that the task force membership should reflect this (if anything geochemistry QA/QC is relatively well understood and documented compared to the majority of IODP measurements). STP is also concerned that the general QA/QC policy should be defined first prior to detailed procedures, that the issues concerning documentation, data management, and enforcement should be addressed, and that the community should be represented across the full range of IODP measurements. STP is concerned that as representatives of the IODP stakeholder community for IODP scientific measurements it was not further consulted as to the proposed detailed constitution and mandate of the task force. STP is pleased with the involvement of independent specialists and specialists from the IODP scientific community but believes the task force must define the measurements it aims to consider from the outset, and that this range must address the whole range of IODP minimum and standard measurements.

Consensus Statements

STP Consensus 0606-05: STP Panel Expertise
The STP provides a spreadsheet of expertise areas and identifies the expertise of current STP members. The STP requests that, where possible, this document is used in dialogue with agencies in requesting replacement panel members to ensure adequate coverage of STP's mandate.

Priority: High
STP suggests this be forwarded to IODP-MI.
Background to STP Consensus 0606-05: STP recognises the importance of IODP-MI providing appropriate advice to program member offices in allocating panel members, and in maintaining panel expertise concordant with the mandate of STP. STP Consensus 0601-04 stated that in response to a request from IODP-MI, concurrent with a change in STP's mandate, STP is working to provide detailed information on the nature of panel expertise required to meet the terms of STP mandate. This will be set against existing panel expertise, with the aim of improving dialogue with lead agencies to ensure STP can deal with a majority of issues arising under the new mandate.

STP Consensus 0606-06: SODV review – design and analytical facilities
The STP thanks the US Implementing Organization for the opportunity to review the plans for the SODV. In response, the STP has attached the following documents in order to provide feedback on the future design and analytical facilities of the SODV for the following three major disciplines; chemistry and microbiology, petrophysics and sedimentology. Additional consensus statements concerning specific issues are attached below.

Priority: High/Medium/Low
STP suggests this be forwarded to SPC and/or IODP-MI.
Background to STP Consensus 0606-06: The STP invited the SODV Project Advisory Committee (PAC) and the USIO to present an update on the SODV development following on from previous STP input at the STP Kochi meeting in January 2006. Chris House from PAC attended the Helsinki STP meeting and gave presentations, together with additional material presented by Peter Blum for the USIO. Based on these presentations and outline plans of the rearranged decks of the SODV, STP held breakout sessions to discuss the developments under the three working groups (Petrophysics, Geochemistry and Microbiology, and Core Description).

STP Consensus 0606-07: SODV review - computers
The STP recommends that a central system for virus scanning of laptops and storage devices carried to onshore and offshore laboratories will be carried out. The working laboratories of the ships should be equipped with central computers for feeding in data. Large screens, keypads, and mice should be available for scientists working with their laptop computers while writing and reviewing data. Some back-up hard-drives (USB) may be needed during the expeditions. IOs should be prepared for scientists using laptops with different operating systems (DOS, Mac, Linux).

Priority: High
STP suggests this be forwarded to IODP-MI.
Background to STP Consensus 0606-07: The USIO asked STP to consider the issue of computing provision for scientists on the SODV. Particular attention was drawn to the questions of whether scientists will require desktop computers for general use, or provision of stations for laptops to be networked in.

STP Consensus 0606-08: Measurements at High Pressure and Temperature
The STP thanks Junzo Kasahara for his talks on the effect of pressure and temperature on physical properties. The panel reiterates his recommendation to establish a laboratory facility with IODP to measure physical properties under pressure and temperature and waits for the results of a feasibility study by CDEX.

Priority: Medium

STP suggests this be forwarded to IODP-MI.

Background to STP Consensus 0606-08: This arises from discussion at SPC (March 2006) of STP Recommendation 0601-03: Vp & Vs at elevated pressures for the Riser Vessel. SPC received the recommendation but asked whether other parameters required measurement at high T & P. (SPC Consensus 0603-7: The SPC receives STP Recommendation 0603-3 and forwards it to the IODP-MI to investigate the feasibility of establishing a high-pressure facility for measuring seismic wave velocities (Vp and Vs) in core samples acquired primarily through deep riser drilling).

STP Consensus 0606-09: SODV CORK installations
The STP recommends that adequate heave compensation (either enhanced passive or active) must be considered for CORK installations and for hydrologic testing (e.g., pump tests with packer deployments). Part of this analysis should include the costs involved in the potential loss of a CORK (drilling time and hardware). "Loss" ranges from losing a hole (Leg 205) to losing hardware (Leg 301) to possibly destroying a seal thus allowing fluid exchange at the seafloor (e.g. 1026B) to losing an opportunity (e.g., remedial cementing operations for 301). The STP appreciates that this is a complex issue but believes that additional expert comments are required to address the issue of the importance of active and/or passive heave compensation on the SODV before the PAC statement is endorsed by the STP. Several experts (Pettigrew, Fisher, Davis, and Storms) have been notified, and their consistent response indicates that the lack of a proper heave compensation unit would compromise the capabilities and needs to achieve high-priority IODP objectives.

Priority: High

STP suggests this be forwarded to SPC and/or IODP-MI and EDP.

Background to STP Consensus 0606-09: This consensus arose as part of the SODV discussions. While STP believes this to be important the panel does not have sufficient appropriate expertise to address the details. Several experts have since provided comments consistent with the need for heave compensation and the importance for heave compensation to accomplish scientific goals. STP asks for SPC's support in seeking further advice for the USIO and IODP-MI.

STP Consensus 0606-10: SODV seafloor visualization
The PAC's discussion of seafloor visualization is a good summary. The STP takes a stronger stance than the PAC. The VIT (Vibration Isolated Televiewer) system should be greatly improved with additional lighting, a good-quality digital camera, pan, tilt, gyro, etc. A fiber-optic cable (such cables do not necessarily result in a larger winch footprint) will open up opportunities in the future for greater bandwidth applications. A heave compensation unit should be considered for this system.

Priority: High

STP suggests this be forwarded to SPC and IODP-MI.

Background to STP Consensus 0606-10: This consensus arose as part of the SODV discussions ands builds on the previous STP Recommendation 0601-010: Improved seafloor visualization for SODV. The STP recommends the USIO acquire an improved seafloor

visualization system for routine deployment on the SODV. Vote: 15 Yes, 0 No, 0 Abstentions, 4 absent (Castillo, Korja, Mandernack &Yamamoto). Priority: High. STP suggested this be forwarded to IODP-MI (and be copied to PAC SODV). The b*ackground to STP Recommendation 0601-10 included: STP have considered the potential benefits of an ROV for the SODV and in discussions identified a clear need to improved seafloor visualizations for scientific observations. STP believes improved seafloor visualization (better camera system with better lights, pan and tilt, orientation) would impact many areas such as:*

- *locating all sites and geologic context (e.g., in vent/hydrate/fault area)*
- *addressing issues connected with CORKs:*
  - *are valves open or closed?*
  - *inspection during and post-installation*
  - *better fishing (dropped equipment, blocked hole, dropped drill string)*

STP Consensus 0606-11: ESO Temperature Tools
STP would like ESO to consider the draft T and P accuracy document when deciding which temperature tool to lease for drilling the NJ Transect. STP encourages ESO to explore existing downhole tools used in the program in order to improve resolution and accuracy of its previously used push-in BGS temperature tool. The panel asks ESO to report back on this issue at the next meeting as the platform for the New Jersey Margin will be determined by then

Priority: High
STP suggests this be forwarded to IODP-MI.
Background to STP Consensus 0606-11: Previous downhole temperature measurements in ODP drillholes at the New Jersey Margin showed significant in situ temperature disturbances which maybe related to climate change in the past. High-resolution temperature measurements in the planned drill holes will help to decipher this question. However the current push-in BGS temperature tool with a resolution of 0.1C and an absolute accuracy of 0.2C is not sufficient, therefore an improvement in accuracy and precision is necessary.

STP Consensus 0606-12: Uniform Depth Models Meeting Participants
The STP greets with great satisfaction the advancement of discussions amongst the IOs of common cross-platform rules for the various depth models used in ocean drilling data. The STP nominates Tatsuhiko Sakamoto as a meeting participant from the STP and Roy Wilkens as an independent user participant. It is further suggested that additional participants, if needed, be drawn from a list of recent stratigraphic correlators.

Priority: High
STP suggests this be forwarded to IODP-MI.
Background to STP Consensus 0606-12: STP has been asked to suggest potential participants to join IO representatives in College Station for a meeting on depth scales to be used during IODP.

STP Consensus 0606-13: Resolution, accuracy and calibration of temperature and pressure measurements
The STP receives the draft report on resolution, accuracy, and calibration of temperature and pressure measurements. The draft report is forwarded to IODP-MI to circulate among the IOs for input. The STP requests the IOs to provide detailed feedback prior to the next STP meeting.

Priority: High
STP suggests this be forwarded to SPC and/or IODP-MI.

Background to STP Consensus 0606-13:

STP Consensus 0606-14: SODV - Larger Drill Pipe for Enhanced Well Logging
After reviewing revised plans for a tapered drill string on the SODV, the STP reiterates its support for larger diameter pipe that will allow the use of state-of-the-art well-logging tools during IODP. The STP believes the tapered drill string will considerably enhance the potential of IODP borehole geophysical science for years to come.

Priority: High
STP suggests this be forwarded to SPC and IODP-MI.
Background to STP Consensus 0606-14: This is in response to SPC Consensus 0603-11: The SPC receives STP Consensus 0601-1 on larger diameter drillpipe for the new scientific ocean drilling vessel (SODV) and awaits an analysis of the benefits and drawbacks by the U.S. implementing organization (USIO).

Many of the well logging tools currently in use are generally 20-30 years old and no longer represents state of the art technology. These constraints are imposed by the diameter of the drill pipe currently used for deep sea drilling. Moving to a larger diameter (6 5/8 inch) pipe will allow for deployment of industry standard logging tools.

The advantages of moving to industry standard tools are several:
- *new tools will be available for measurements not currently possible*
- *downhole sampling will be possible (formation fluids, sidewall cores)*
- *existing measurements will be made at higher resolution*
- *modern logging tools are faster*
- *a logging bit can be fixed to the bottom of the logging pipe (bridge busting)*

Short of moving completely to a larger drill string, it has been proposed to deploy a tapered system consisting of up to 3,000m of larger diameter pipe above a smaller diameter coring string. Logging tools will be run through the larger pipe after coring is completed.

The downsides of a tapered drill string are:
- a pipe trip will be needed between coring and logging
- industry standard tools will be limited to holes in <3,000m water depth

The time needed for a pipe trip will be somewhat mitigated by the increased speed of logging using state of the art tools. The 3,000m limitation may be overcome by the addition of another 1,000m of reserve pipe during selected expeditions. However, even without this provision, 77% of all holes proposed in 26 active proposals requesting/requiring larger diameter tools are within the 3,000m range of the tapered drill string.

STP Consensus 0606-15: LA-ICP-MS
The STP wishes to thank Takamitsu Sugihara for presenting the encouraging results of *Chikyu* sea trials to investigate the LA-ICP-MS application. The STP recognizes that LA-ICP-MS analytical capability is important for IODP science but awaits further results of the ICP-MS under varying conditions (drilling and transit). The STP requests that CDEX report further ICP-MS results at the next STP meeting.

Priority: Low
STP suggests this be noted.
Background to STP Consensus 0606-15: This is a continuing item and is in response to SPC Consensus 0603-12: The SPC receives STP Consensus 0601-2 on installing a laser-ablation inductively-coupled plasma mass spectrometer (LA-ICP-MS) on IODP platforms and awaits the results of the planned testing of such an instrument onboard the Chikyu.

STP Consensus 0606-16: CAB nominations
The STP nominates Masanobu Yamamoto and Takuro Nunoura as candidates for the Curatorial Advisory Board.

Priority: High
STP suggests this be forwarded to IODP-MI
Background to STP Consensus 0606-16: This is in response to a request from IODP-MI.

STP Consensus 0606-17: VCD/Lithology Meeting Participants
The STP nominates Pat Castillo and Clive Neal as STP liaisons and Jay Miller, Greg Hirth and Benoit Ildefonse as participants at the meeting being organized by IODP-MI to discuss VCD and lithology on 25-26 September 2006 at Texas A&M University.

Priority: High
STP suggests this be forwarded to IODP-MI
Background to STP Consensus 0606-17: This is in response to a request from IODP-MI. IODP-MI will convene a VCD/Lithology Meeting in late September 2006 at Texas A&M University. The general purpose is to develop a common solution for a VCD process and common lithologic classification. IODP-MI is inviting STP to recommend potential participants.

STP Consensus 0606-18: Digital Taxa Dictionaries Meeting Participants
The STP nominates Noritoshi Suzuki and Beth Christensen as STP liaisons at the meeting being organized by IODP-MI to discuss Digital Taxonomic Dictionaries on 29-30 September 2006 at Texas A&M University.

Priority: High
STP suggests this be forwarded to IODP-MI
Background to STP Consensus 0606-18: This is in response to a request from IODP-MI.

STP Consensus 0606-19: Chair & Vice Chair
Should Clive Neal be appointed by USAC to the STP, the STP recommends Clive as vice chair starting with the first meeting in 2007.

Priority: High
STP suggests this be forwarded to SPC
Background to STP Consensus 0606-19: Makoto Okada's term as chair ends with the STP 0606 meeting and Mike Lovell becomes chair. The panel is unanimous in recommending Neal as the next vice chair, should he be appointed to the panel. STP currently has no vice chair.

STP Consensus 0606-20: The STP wishes to thank Chris House for his presentation that centered on the SODV conversion and PAC documents related to the SODV conversion. His lively participation also helped to focus our discussion, leading to many of the consensus statements above. Also, thanks for his presentation on microbiology DNA sequencing.

Priority: N/A
STP suggests this be noted.

STP Consensus 0606-21: The STP gratefully thanks Masanobu Yamamoto for his work and dedication to the IODP over the years he has served on this panel. His presence will be missed but we anticipate that he will continue to contribute to IODP through new roles, and we wish him well.

Priority: N/A
STP suggests this be noted.

STP Consensus 0606-22: The STP thanks Roy Wilkens for sharing his great lifelong experience in the drilling program, and for sharing his unique outlook on life. The Cheney principle will live on. We also appreciate the visual stimulation provided by his excellent wardrobe. Roy, we will miss your flip-flops.

Priority: N/A
STP suggests this be noted.

STP Consensus 0606-23: The STP thanks Tim Lyons for careful note-taking and his dedication to the panel.

Priority: N/A
STP suggests this be noted.

STP Consensus 0606-24: The STP thanks Liz Screaton for her sense of humor and her attention to detail.

Priority: N/A
STP suggests this be noted.

STP Consensus 0606-25: The STP thanks Kevin Mandernack for putting up with all that damned geoscience, and, of course, the giggling. We applaud that he wakes up when the discussion turns to microbiology.

Priority: N/A
STP suggests this be noted.

STP Consensus 0606-26: The STP thanks Makoto Okada for his guidance and leadership, and his great sense of humor and love of beer. We look forward to his participation in the next year in his new role as chief minute taker.

Priority: N/A
STP suggests this be noted.

STP Consensus 0606-27: The STP wishes to thank Annakaisa Korja for hosting a wonderful meeting. The city of Helsinki is a hospitable and warm city that was enjoyed by all. We were surprised that this is the first IODP/ODP meeting in Finland and fully endorse additional meetings to be held here.

Priority: N/A
STP suggests this be noted.

Action Items

STP Action Item 0606-28: STP members are invited to discuss through electronic means the short- and long-term strategic aims of the STP as IODP enters a new phase of ocean drilling.

Priority: High
STP suggests this be noted.
Background: IODP is at an exciting stage in its development and a new era of ocean drilling beckons. As the plans for the SODV are finalized it is opportune to consider the strategic aims of STP in parallel with the detailed terms expressed in the STP mandate.

MINUTES

The third meeting of the Scientific Technology Panel (STP) of the IODP was held from 26–28 June 2006 at the Academy of Finland, Vilhonvuorenkatu 6, Helsinki, Finland, with Dr Annakaisa Korja, Institute of Seismology, University of Helsinki, as host. The meeting included a field excursion on 29 June to visit geological sites of southern Finland and an official banquet was hosted by the University of Helsinki on Monday, 26 June.

The STP meeting resulted in four recommendations, twenty three consensus statements, and one action item, all of which are forwarded to SPC and/or IODP-MI as indicated in the Executive Summary.

Appendices to these minutes are as follows:

Appendix 1: Agenda
Appendix 2. Introduction: Lovell
Appendix 3. SSEP report (Potsdam): Villinger (Appendices 3a and 3b)
Appendix 4. SPC report: MacLeod
Appendix 5. IODP-MI report: Schuffert (Appendices 5ai, 5aii, and 5b)
Appendix 6. CDEX report: Sugihara
Appendix 7. USIO report: Blum
Appendix 8. PAC SODV: House
Appendix 9. USIO SODV engineering issues: Blum
Appendix 10. USIO SODV enhanced logging: Higgins
Appendix 11. USIO Analytical: Blum
Appendix 12. ESO: Inwood
Appendix 13. STP Expertise: Lovell
Appendix 14. P&T controlled PP measurements: Kasahara
Appendix 15. Temp tool New Jersey Margin: Roehl
Appendix 16. T & P Tool status: Villinger
Appendix 17. Accuracy and precision of Temperature & Pressure tools: Kasahara
Appendix 18. Post cruise data: Christensen
Appendix 19. Laser Ablation update: Sugihara/Castillo
Appendix 20. House: Microbiology
Appendix 21: STP reports to PAC on the SODV (Appendices 21a, 21b, and 21c)

1. Welcome and logistics

Lovell opened the meeting and introduced Dr. Jan Bäckman from the Academy of Finland who welcomed the panel to Helsinki.

It was explained that a reception at the main building of the University of Helsinki would be hosted later in the day by the vice-rector Thomas Wilhelmsson responsible for the foreign affairs of the University and that an excursion at the end of the meeting would visit the Tvärminne Biological station of the University of Helsinki. The meeting refreshments were sponsored by the Academy and the Institute of Seismology.

Korja explained the housekeeping arrangements for the meeting.

2. Introductions of continuing and new members, guests, liaisons

Lovell introduced panel members and guests (see participant list). Lyons and Screaton (USA) were unable to attend and had sent their apologies.

3. Review and Approval of Agenda

Lovell asked for review of the agenda. The agenda was approved with minor changes (Appendix 1).

4. Review and Approval of Minutes from July meeting (Okada/Lovell)

A unanimous consensus approved the minutes from the previous meeting.

5. STP mandate & Millard's rules of order

The mandate and terms of reference for the STP were presented and discussed (Appendix 2).

6. Conflict of Interest Policy

The Conflict of Interest Policy was explained by Lovell (see Appendix 2) and noted that should any conflict be determined during the meeting it must be reported in the minutes. No direct conflict arose during the meeting.

7. Brief report from SSEP Meeting in Potsdam

Villinger had attended the May 2006 SSEP meeting in Potsdam (see Appendix 3). He reminded the SSEP of several points. Proposals should go to STP if (1) unclear logging or no logging, (2) CORK installation with no PI experience, (3) unproven technology, and (4) third party tools. Also all IODP holes must be logged and sediment temperature profiles must be obtained as standard policy.

Villinger presented a list of proposals that should go to STP for review but eventually only one was sent to STP for review. There appeared to be a problem of SSEPs focusing on science but missing technical issues. Villinger suggested we may need another body for advice.

It was noted that STP has previously decided to decline to send liaisons to SSEP on a regular basis.

8. Brief report from most recent SPC meeting.

Lovell reported on the events and outcomes from the March 2006 SPC meeting in St. Petersburg, Florida. STP members expressed surprise that SPC took exception to unanimous voting on recommendations. Further discussion was deferred until after Agendum Item 9.

9. Report from SPC

MacLeod discussed the SPC meeting (Appendix 4).

(i) Update of FY07-09 scheduling development. Late 07 initial *Chikyu* Sept 2007 and SODV (Nov 2007); OTF and SPC are planning further ahead.
(ii) Proposals at SPC and forwarded proposals. There are at least 5 with CORKs not including the Juan de Fuca and Cascadia. SPC schedule for 07-09: Equatorial Pacific, NanTroSEIZE, Bering Sea, Juan de Fuca, Equatorial Pacific, Canterbury Basin, Wilkes Land Margin then go into the Indian Ocean. SCIMPI go through IODP third-party tool.
(iii) Replacement of SPPOC with a smaller SASEC group of 4:4:2 (includes two from IODP-MI Board of Governors.
(iv) Brief update on mission implementation plan. Lots of small working groups making advances but now waiting for the new SASEC. Mission concepts can be put into the system by scientists (bottom up) and IODP-MI (top down).
(v) SPC responses to STP recommendations and consensus statements.
STP 0601-02 magnetometer – SPC suggests that the SODV should look into having a magnetometer for some legs
STP Recommendation 0601-03 high pressure facility – SPC received and is forwarding it the IO
STP Recommendation 0601-04 Seismic source – SPC received and moved to IO
STP Recommendation 0601-08 T and P report – SPC accepts
STP Recommendation 0601-09 Paleontology and MRC – SPC accepted and sent to IOs
STP Consensus 0601-01 pipe size – SPC receives and awaits analysis from USIO.
STP Consensus 0601-02 laser - SPC receives and awaits the results from the planned testing
STP Consensus 0601-03 VSP – SPC accepts
STP Consensus 0601-05 New Jersey transect – SPC receives and endorses making temperature measurements whenever possible.

10. MEXT/NSF (TBN)

No reports were received.

11. IODP-MI (Schuffert)

Schuffert reviewed the status of STP recommendations, consensus, and action items (Appendix 5). He indicated that in future any action item to IOs should be recommendations since they could have resource implications.

STP 0601-01 Depth scales- several meetings in September. Invite STP participation
STP 0601-04 Seismic Platforms – What are the possible gun configurations that we need? What is the scientific justification for utilizing additional seismic guns? Need input by early August 2006.
STP 0601-05 QA/QC – Task force – initial meeting Oct 2006. Task force mostly organized, but why not have input from STP. Lovell expressed concern that the task force has been primarily populated with geochemists and that it didn't seem to be addressing minimum and standard IODP measurements across the spectrum. Need to revisit later.
STP 0601-09 MRC planning meeting on Sept 29-30. Need STP to recommend potential participants (apparently not liaisons). Taxa Control List (TCL) an immediate need. Digital Taxa Dictionary (DTD) a future need.
VCD visual core description – Meeting Sept. 25-26. Need potential STP participants. Need a

hard-rock person.
Curatorial Advisory Board has become a task force. Need potential STP participants. Need someone from the Japanese community. Last meeting we suggested to put Castillo on the board but Neal has been invited to remain for an extra period.
SEDIS – timeline - creation of a task force. Anticipate an RFP soon. A little behind schedule.
Proposal Database – under development.
Received 25 proposals – 19 new proposals. One new borehole observatory proposal to go to STP.
SAS meeting schedule.
Schuffert summarized what STP needs to do before the end of the meeting; names indicate STP members leading items.

1. Participants for Depth Scale meeting –Wilkens
2. Seismic sources – Ge, Kasahara, Korja
3. QA/QC Task Force – Everyone
4. Taxon TCL - Christensen and Suzuki
5. Visual Core Description - Castillo and Christensen
6. CAB – nomination for one position – Okada

12. CDEX (Sugihara)

Sugihara presented the *Chikyu* schedule, and discussed core storage, and balances,
The drilling schedule for this summer's test shakedown cruises was presented. (see Appendix 6).

13. USIO

Blum presented the USIO operational activities including a new schedule. He explained how it was unclear how the third-party tools policy would be enforced. Once the new SASEC is formed then hopefully they will deal with third-party tools issues. (see Appendix 7).

Sean Higgins also presented an update on downhole tools including a new magnetic susceptibility tool and a new temp tool to replace the TAP tool, which would be good to 250 degrees C. A new generation of geochemical tools was expected and a new heave composition system is being tested.

14. ESO

This item was deferred until the second day to allow discussion of SODV issues while Chris House was present.

Inwood then reported that three *Nature* papers have come out of the Arctic drilling. The Expedition 310 shore-based program was already completed. (see Appendix 12).

15. SODV update & discussion

Lovell welcomed Chris House who was present as a PAC representative at the meeting. House gave an SODV update on behalf of PAC (see Appendix 8). This included information presented previously but also drew attention to where the money goes. He described some of the changes that are included in the new ship, some of the issues, and specific PAC reaction

papers.

A. Laboratory Plans - equipment priority plans?
B. Vessel Extension – What is the back-up plan if no extension? There isn't one.
C. Seafloor visualization – Need fiber optic system ($224K difference in price)
D. Core recovery – AHC use only when needed. Why?
E. Drill Pipe Diameter – 6 5/8" pipe? Would like to proceed but must consider $. Timing issue. Brief update on the cost issues of the two sizes. Restrictions to 3000m. Never a complete change for all of the pipe.

This was followed by a USIO Report of Engineering (see Appendix 9), including the laboratory layout in response to STP input, brief views of present work, the DSS-RMM project, and the mud pulse telemetry module.

APC temperature tool – 5 tools available
APC Methane Tool – to be build by TAMU
DVTP/DVTPP – need new loggers
IWS – water sampler –
PCS – buy more
SPRT
Simulated borehole test facility.

Higgins then gave a presentation on enhanced logging (see Appendix 10). In situ fluids – technology is available, just costs. Benefits of logging with a larger diameter pipe – No real changes in cost except for the new tools. Need engineering time to test new tools for science applications
Need engineers to come and talk to STP about the in situ water sampler. There was discussion of why not a wireline re-entry tool instead of the 6 and 5/8" pipe. Saves on tripping pipe (one round trip). Also don't need any large diameter pipe.

Blum presented the Analytical Services for SODV and indicated the information management will be more complex (see Appendix 11).

STP were asked to provide input on IT support, and to discuss lab design and measurement capabilities, active heave compensation, drill pipe, camera/visualisation .. borehole and seafloor, engineering issues and downhole T and P tools, LIMS, computers

STP formed breakout groups and were asked to report back the following morning.

About 60 analytical systems projects for SODV. Presentation of a variety of systems that are being developed or have been developed.

SODV Projects – first IODP minimum measurements and then Standard measurements
About 1/3 are completed, 1/3 on hold until Fall 2006, 1/3 deferred

The LIMS connection – How are bad data eliminated from the system? The system is much more flexible than JANUS. More on the data system

Underway Surveys – Bathymetry system selected – Magnetometer – Priority #2

Seismic acquisition – Priority 1 – Need input for instruments
DESCINFO – a variety of information systems for new data capture – Hopefully all the data sets will be integrated so that one can look at a variety of data. Looks like they are doing a lot of work to capture a variety of data types and sources.

Comments from last STP include: Why a freeze dryer for paleolab? Why 3 hoods? More sinks.

Need another sterile hood for microbiology in the lab (not just in the cold room)

Core logging – whole rounds
Is the resistivity sensor working? No, it is presently in a box. USIO is not working on method development, it is up to selected scientist that are interested in the measurement.

Core logging projects are still a major focus. One of the new projects is a track that is a compact system with a good camera. Lots of new sensors and systems are being developed
.
Need feedback from microbiologists. One issue is what microscopes are needed?

Chemistry – some new instruments, some possible this fall, some on hold, but at least all of the old systems will be sea.

A series of questions pertaining to the lithologic system

Three breakout groups (based on STP working groups) discussed issues related to the SODV instrumentation that is being developed and the items listed earlier (e.g., heave compensation, visualization..).

SODV design comments:

Sedimentology – fine.
Petrology – no specific comments but need additional input.
Structural geology and tectonics – concern about not being well integrated

Does size matter? Large diameter pipe issue (pros and cons). Look forward with new technology but in the meantime let's bite the bullet and get large diameter casing. A consensus statement will be made.

Chemistry and Microbiology – first cruises are sediment oriented. Purchases should be directed along initial needs. List of several items that need to be purchased.

STP report to PAC on the SODV is appended at Apednix 21.

Prior to breaking for lunch the panel reviewed the agenda for the rest of the day.

Agendum Item 14 was taken at this point in the proceedings.

16. <u>STP Expertise</u>

Lovell introduced this new item assessing expertise across the panel (see Appendix 13). The panel will revisit the list tomorrow to provide suggestions – expertise and names - but were asked to consider the STP mandate and whether our current expertise (including that remaining after rotations after this meeting) is sufficient to cover this.

17. Common framework for depth scales (IODP-MI)

Schuffert raised the forthcoming meeting on depth scales and asked for nominations from STP of community scientists. There was discussion of the scope of the Depth-Scale meeting and who is going to participate in the meeting? A preliminary agenda and goals were presented together with a timeline. Possible STP folks include Wilkens (who will be off the panel by the time of the meeting), Okada, Sakamoto. The issue of who pays was raised.

18. VCD procedure on IODP platforms (IODP-MI)

VCD Meeting September 2006, The agenda and goals were shown, together with provisional list of participants. A question was raised as to whether there are there any igneous petrologists? The STP panel agreed we need to have a petrologist. Lots of IO folks, but this was queried? What is the purpose? Need some end-users. Who will go? Castillo and Sakamoto (possibly Neal)? STP also nominated others? Do we need a structural geologist? Should we propose an outsider (outside of STP). Greg Hearth, Ben Ildefonse???

19. QA/QC for the IODP minimum measurements (Including possible nominations for IODP-MI task force)

Lovell gave a brief history of this issue and the proposed mandate and populating of the task force. The panel discussed how do we respond? Whereas IODP-MI had proposed a task force largely populated with geochemists, the panel considered that three different groups covering the three STP working groups would better represent the necessary expertise. It was suggested that maybe this could be a "broad thinking" group with the details worked out by stakeholders and the IOs.

20. Brief reports for current status of other Recs/Consensus from the last STP meeting (IODP-MI/IOs)

The IOs provided a brief report on the status of outstanding recommendations, consensus statements and action items from previous meetings.

21. T & P controlled PP measurements (Sakamoto/Screaton/Kasahara)

STP Action Item 0601-02 concerned the relation of Vs and Vp to high temperature and high pressure. This was a strong scientific talk (Appendix 14) that illustrated some of the importance of these measurements. Discussion of whether these measurements should be made all of the time. This should be a shore-based investigation. The discussion follows along the line of the Recommendation 0601-03 and action item. We recognize the importance of these measurements. The facility already exists in Japan but one does not exist in Kochi. JAMSTEC is supporting a new facility. STP agreed a consensus statement that reflects the desire to lean more about other measurements and the feasibility study that is being undertaken.

22. Temperature tools for the New Jersey Transect (Roehl)

Temperature tools for New Jersey transect (Appendix 15). Looking for the most appropriate tool, but can not do this yet because they do not have a platform specified. Consensus statement to ascertain what ESO's plans are for temperature.

23. Accuracy and precision of T & P tools (Kasahara/Villinger/Screaton)

Accuracy and precision of T and P tools. (Appendix 16 & 17). Update on both the shipboard and observatory needs. Requirements have now been specified. What do we do now? We will send the report to IODP-MI to forward to the IOs so that they can comment on the draft. The question was raised about observatories. At this time the IO are not responsible for these measurements.

24. Post-cruise data (Christensen/Suzuki/Ahagon)

Christensen – Item 24 Action item pertaining to age models (see Appendix 18). Presently there is no means to put in updated age models. Consider a quality control mechanism. A Recommendation will result from this action item. Discussion as to how to add data after the Expedition and to get people to use the correct up-to-date one. The discussion expanded beyond paleontology to data in general. Do we need a broader statement that encapsulates a variety of data types? This is a much bigger issue than just paleontology.

25. Tool status on platforms (Villinger/Wheat/Screaton)

STP should encourage the IOs to join forces to use the same products. Same tools on both platforms for Nankai. Recommendation forthcoming.

26. Laser ablation ICP-MS on *Chikyu* (Sugihara/Castillo)

Laser ablation ICPMS on *Chikyu* (see Appendix 19). The ship was at sea, but not drilling. A consensus statement receiving the report was proposed.

27. STP Review of SSEP proposals (Kasahara/Korja)

Review of Proposal 685-Full Ligurian Margin Borehole Observatory. Technical problems with this proposal were identified and discussed. A short document will be sent to IODP-MI for forwarding to SSEP/PIs.

28. IODP schedule: scientist participation

Wheat raised the issue of the forthcoming *Chikyu* shakedown cruises and encouraged STP members to consider participating where possible. The deadline was the next day and potential participants would need to act quickly.

29. MRCs and CHRONOS

Suzuki and Christensen spoke on this issue, considering the list of participants. Both were

keen to attend as liaisons from STP, but also nominated several scientists from the community.

30. Executive session: strategic review of STP aims, workflow, and actions

31. Review of Recommendations, Consensus Statements, and Action Items

32. Next meeting location and date

A joint meeting with EDP had been proposed in January 2007 in Monterey (with a day at MBARI), and with Geoff Wheat as host. Informal communication with EDP however had suggested that EDP and STP had insufficient overlap of issues at this time, and furthermore that EDP in particular were too busy with the Engineering Technology Roadmap at this time. An alternative strategy would be to meet in San Francisco immediately before the AGU meeting in December 2006. Wheat agreed to look into possibilities of hotels.

33. Rotation of panelists

Lovell presented an overview of the expertise represented by membership of the STP and the effect of rotations off the panel immediately following the Helsinki meeting in June 2006. The following members rotated off and were thanked appropriately through consensus statements: Lyons (USA), Screaton (USA), Mandernack (USA), Wilkens (USA) and Yamamoto (Japan). Okada (Japan) completed his term as chair of the panel, and was thanked appropriately, but will continue on the panel for two more meetings at the request of J-DESC.

34. Closure

The meeting closed at 16.00 (when the Academy closed).

Postscript:

At the end day 2 Chris House (PAC) gave a talk on microbiology (see Appendix 20) and how it is changing so fast. ODP Site 1229 was the focus. Talk of genome mapping using a different reagent for each of 4 nucleotides, but the problem was that there was not enough DNA. Chris was keen to make STP aware so that IODP thinks about the future now rather than too late. The potential is to get data back from the first hole after a few days. Instrument cost ~ $500K. We should consider this for the future not ready for the ship today. How do you know if things are dead or alive? Nothing to do yet, but sometime later. ODP has been good for microbiologists and we should endeavor to continue this through IODP.

3rd Meeting of the IODP Scientific Technology Panel (STP)

26th – 28th June 2006

Academy of Finland, Helsinki, Finland

AGENDA

1. Introductions of continuing and new members, guests, liaisons
2. Review and Approval of Agenda
3. Review and Approval of Minutes from July meeting
4. Conflict of Interest Policy & Millard's rules of order
5. STP mandate
6. Brief review of status of STP's previous recommendations and action items

Reports from the latest SAS panel meetings

7. Brief report from most recent SSEP meeting (Villinger)
8. Brief report from most recent SPC meeting (Lovell)
9. Report from SPC (MacLeod)

Reports from the lead agencies, IODP-MI and IOs

10. MEXT/NSF (TBN)
11. IODP-MI (Schuffert)
12. CDEX (Sugihara)
13. JOI Alliance (Blum)
14. ESO (Roehl)

SODV

15. SODV Update & discussion (House)

Reports on Recommendations from previous STP meetings

16. STP Expertise
17. Common framework for depth scales (IODP-MI)
18. VCD procedure on IODP platforms (IODP-MI)
19. QA/QC for the IODP minimum measurements (Nominations for IODP-MI Task Force)
20. Brief reports for current status of other Recs/Consensus from the last STP meeting (IODP-MI/IOs)

Reports on Action Items from previous STP meetings

21. T & P controlled PP measurements (Sakamoto/Screaton/Kasahara)
22. Temperature tools for the New Jersey Transect (Roehl)
23. Accuracy and precision of T & P tools (Kasahara/Villinger/Screaton)
24. Post-cruise data (Christensen/Suzuki/Ahagon)
25. Tool status on platforms (Villinger/Wheat/Screaton)
26. Laser ablation ICP-MS on Chikyu (Sugihara/Castillo)

Other Business

27. STP Review of SSEP proposals (Kasahara/Korja)

28. IODP schedule: scientist participation (Wheat)
29. MRCs and CHRONOS (Christensen/Suzuki)
30. Executive session: strategic review of STP aims, workflow, and actions
31. Review of Recommendations, Consensus Statements, and Action Items (Lovell/Okada)
32. Next meeting location and date (Okada)
33. Rotation of panelists (Okada/Lovell)
34. Closure (Lovell)

3rd Meeting of the IODP
Scientific Technology Panel
STP

Academy of Finland

26th January -28th June 2006

Helsinki, Finland

Welcome and logistics

Introductions of continuing and new members, guests, liaisons

- Approval of Agenda…

Agenda

Monday 26th June 2006 09.00

1. Welcome and logistics (Korja & Okada/Lovell)
2. Introductions (and apologies)(Okada/Lovell)
3. Review and Approval of Agenda (Okada/Lovell)
4. Review and Approval of Minutes from January (Kochi) meeting: STP 06-01(Okada/Lovell)
5. Conflict of Interest Policy & Millard's Rules of Order(Lovell/Okada)
6. STP mandate (Lovell/Okada)
7. Status of STP's previous recommendations and action items, etc. (Okada/Lovell)

8. Brief report from SSEP meeting (Villinger)
9. Brief report from SPC (Florida) meeting: 06-03 (Lovell)
10. Report from SPC (MacLeod)
11. MEXT/NSF (TBN)
12. IODP-MI (Janacek/Schuffert)
13. CDEX (Sugihara)
14. USIO (Blum)
15. ESO (Inwood)

- 11.30 Lunch

12.30

16. SODV Update & Discussions

House: Report and update from PAC

Blum: USIO update

SODV Discussions (Panel and Guests/Liaisons)

END 16.00
Monday evening: 17.00
Banquet hosted by the University of Helsinki

Tuesday 27th June, 09.00
Action Items from previous meetings

17. STP Expertise
18. Common framework for depth scales (IODP-MI)
19. VCD procedure on IODP platforms (IODP-MI)
20. QA/QC for the IODP minimum measurements - IODP-MI Task Force (Lovell)
21. Brief reports for current status of other Recs/Consensus from the last STP meeting (IODP-MI/IOs)

Reports on Action Items from previous STP meetings

21. T & P controlled PP measurements (Sakamoto/Screaton/Kasahara)
22. Temperature tools: New Jersey Transect (Roehl)
23. Accuracy and precision of T & P tools (Kasahara/Villinger/Screaton)
24. Post-cruise data (Christensen/Suzuki/Ahagon)
25. Tool status on platforms (Villinger/Wheat/Screaton)
26. Laser ablation ICP-MS : Chikyu (Sugihara/Castillo)

- Lunch

Further discussion on SODV as necessary…

Agenda

Wednesday 28th June, 09.00

Other Business

27. STP Review of SSEP proposals (Kasahara/Korja)
28. MRCs and CHRONOS (Christensen/Suzuki)
29. IODP Schedule: scientist participation (Wheat)
30. Executive session: strategic review of STP aims, workflow, and actions
31. Review of Recommendations, Consensus Statements, and Action Items (Lovell/Okada)
32. Next meeting location and date (Okada)
33. Rotation of panelists (Okada/Lovell)
34. Closure (Lovell)

- Approval of Agenda…
- Proposed & Seconded by…

- Approval of Minutes…
- Proposed & Seconded by…

COI policy

- A conflict of interest is a situation in which the interests (for example: personal, familial, professional or commercial) of an IODP SAS member or designated alternate involved in proposal nurturing, evaluation, ranking, scheduling, or assessment processes, or in IODP-related financial or commercial enterprises, have a real or perceived impact, either positive or negative, on the results of the nurturing, evaluation, ranking, scheduling or assessment processes, or related contractual work.
- Conflict of interest depends on the situation, not the character or actions of the individual.

COI policy

The COI policy is based on the following principles:

- An individual can be a member of only one SAS committee or panel.
- Any representative of IODP Management International, Inc., IODP lead funding agencies, implementing organizations (IOs), and their subcontractors cannot serve as a member on standing SAS committees and panels…
- All potential conflicts of interest will be declared at the start of every meeting, or at an otherwise appropriate time during the meeting.
- Members or other meeting attendees determined as having a conflict of interest regarding an IODP or IODP-related proposal should not be present when the relevant proposal is considered. Proponents may be present for the general discussion of proposals (e.g., how proposals address long-range objectives).
- Committee and panel members or other meeting attendees determined as having a conflict of interest regarding IODP-related financial or commercial enterprises should not be present during discussions relevant to such financial or commercial enterprises.

COI policy

- The issues of conflict of interest have three foci:
  - an understanding of who may serve on panels;
  - procedures and safeguards with regard to proposal nurturing, evaluation, ranking, scheduling, and assessment processes;
  - and procedures and safeguards with regard to IODP-related financial or commercial enterprises.

COI policy

- During panel or committee discussions that do not lead directly to a vote or that do not involve competitive ranking of proposals (e.g., discussion of long-term platform plans by the SPC or evaluation of proposals by the panels), all members may participate in general discussions in order to provide a full range of expertise to the decision-making process.

COI policy

- The goal of the COI policy is to maintain the fullest involvement possible by knowledgeable scientists from across the spectrum of IODP members in providing scientific advice to the SAS, IODP-MI, and the IOs. Managing conflict of interest effectively and efficiently within the IODP SAS will enable achievement of this goal. The SPPOC will receive a brief annual report from SAS committee and panel chairs noting how conflicts were dealt with in their respective meetings.

Roberts (Millard's) Rules of Order

(from Robert's Rules of Order, 2nd Edition, Wiley Publishing Inc., 2001)

- Some basic principles and procedures apply to all decision making processes; these principles and procedures are referred to formally as 'parliamentary procedure'. Parliamentary procedures are the rules that help us maintain order and fairness in all decision-making processes.

- The basic principles behind Robert's Rules of Order are:
  - someone has to facilitate and direct the discussion and keep order.
  - all members have the right to bring up ideas, discuss them, and come to a conclusion.
  - members should come to an agreement about what to do.
  - members should understand that the majority rules, but the rights of the minority are always protected by assuring those members the right to speak and vote.

Roberts Rules of Order

Principles and Salient Points

1) Take up business one item at a time.
   – maintains order, expedites business, and accomplishes the purpose

a. Each meeting follows an order of business - agenda.
b. Only one main motion can be pending at a time.
c. Only one member can be assigned the floor at a time.
d. Members take turns speaking.
e. No member speaks twice about a motion until all members have had the opportunity to speak.

Roberts Rules of Order

2) Promote courtesy, justice, impartiality, and equality.

- ensures that everyone is heard, that members treat each other with courtesy, that everyone has the same rights, and that no individual or group is singled out for special favors.

Roberts Rules of Order

a. Members take their seats promptly when the chair calls the meeting to order, and
   conversation stops.
b. Members raise their hands to be recognized by the chair and don't speak out of turn.
c. In debate, members do not 'cross talk', or talk directly to each other, when another member is speaking.
d. Members keep their discussion to the issues, not to personalities or other members‘ motives (unless COI).
e. Members speak clearly and loudly so all can hear.
f. Members listen when others are speaking – the majority rules, but the rights of individual, minority, and absent members are protected.

Roberts Rules of Order

This principle ensures that, even though the majority rules, the minority has a right to be heard and its ideas are taken seriously. Similarly, the minority doesn't leave the organization because it didn't win; it knows that it may win another day. Following this principle preserves the unity and harmony of the organization.

STP Mandate

1. General Purpose.

The Scientific Technology Panel (STP) reports to the Science Planning Committee and may communicate directly with IODP-MI.

The panel shall contribute information and advice with regard to handling of IODP data and information, methods and techniques of IODP measurements (including factors that impact measurements, such as sample handling, curation, etc.), laboratory design, portable laboratory needs, downhole measurements and experiments, and observatories to the SPC; through the SPC, to the Science Planning and Policy Oversight Committee (SPPOC) and IODP-MI; and, through IODP-MI, to the implementing organizations (IOs).

STP Mandate

2. Mandate.

STP recommendations shall be sent to the SPC. The STP shall provide advice on scientific measurements made onboard IODP platforms, within and around boreholes, and on samples collected by the IODP and associated programs.

The STP shall develop guidelines concerning said measurements and shall furnish advice about scientific measurements, equipment, and on certain policies and procedures in the IODP.

Specific responsibilities for the panel shall be advice on databases, sample handling, curation, computers, shipboard equipment usage and needs, as well as borehole and observatory measurements, equipment, usage, and needs.

STP Mandate

3. Decisions. Decisions shall be made either by consensus or voting, as decided on a case-by-case basis. Votes shall be decided by a majority of all members present and eligible to vote. A quorum shall consist of at least two-thirds of the voting members. Voting records shall be kept and reported in the meeting minutes.

4. Meetings. The panel shall convene biannually, generally approximately mid-way between SPC meetings, and additional electronic meetings may be held as appropriate. Robert's Rules of Order shall govern its meetings. Conflicts of interest shall be declared at each meeting, and treatment thereof shall be recorded in the meeting minutes.

TheSPC chair shall approve meeting agendas, dates, and locations, and the IODP-MI Vice-President for Science Planning and Deliverables shall authorize the meetings.

STP Mandate

5. Membership. Members shall have expertise representing the four core areas of the panel mandate covering information handling, downhole measurements, scientific measurements, and observatories.

The STP chairs shall work with IODP-MI and the national and consortia committees to maintain scientific balance and breadth of expertise in the panel's membership, and to ensure regular rotation of its membership.

With SPC approval, the panel may augment the expertise required to address its mandate by setting up ad hoc advisory committees whose lifetimes are mandated by the SPC. STP members shall normally serve for terms of three years. If a STP member misses two meetings in succession, the STP chair or vice-chair shall discuss the problem with the SPC chair or vice-chair.

STP Mandate

6. Chair and Vice-Chair.

The STP chair and vice-chair shall be nominated by the STP membership and approved by the SPC. Their terms shall be two years. The STP chair shall be responsible for providing the IODP-MI Sapporo Office with meeting minutes within one month of each meeting.

7. Liaison.

The STP chair shall be liaison to the SPC, with the vice-chair as alternate. The STP shall have liaison(s) from the SPC. Liaisons to SAS panels and working groups may be requested by the SPC. A science coordinator from the IODP-MI Sapporo Office shall attend each STP meeting. Representatives from the IOs shall also be invited to attend the meetings.

Scientific Technology Panel – Kochi Meeting

Status review of recommendations etc…

STP Recommendation 0601-02: SODV Magnetometer

The STP recommends that the USIO not include an underway magnetometer in the SODV suite of instrumentation

SPC Consensus 0603-6: The SPC **receives** STP Recommendation 0603-2 and recommends that the U.S. implementing organization (USIO) investigate the possibility of providing underway magnetometer capability, when circumstances warrant its use, on the new scientific ocean drilling vessel (SODV).

The SPC decided that it could not accept this recommendation to exclude a magnetometer in isolation from other budgetary considerations. Several SPC members stated they had found magnetometer data useful.

STP Recommendation 0601-03: Vp & Vs at elevated pressures for the Riser Vessel

The STP recommends that an elevated pressure velocity measurement system be established for the riser drilling ship program.

SPC Consensus 0603-7: The SPC receives STP Recommendation 0603-3 and forwards it to the IODP-MI to investigate the feasibility of establishing a high-pressure facility for measuring seismic wave velocities (Vp and Vs) in core samples acquired primarily through deep riser drilling.

SPC decided to forward this to IODP-MI for consideration. There was general agreement that if this is necessary for some samples obtained by the CHIKYU it would be equally important for some samples from other platforms.

STP Recommendation 0601-04: Seismic sources for IODP Platforms
The STP recommends that seismic sources acquired for IODP platforms be of sufficient power to reach an appropriate total depth (not hole depth) at all operational water depths and that operators be appropriately trained in their operation.

SPC Consensus 0603-8: The SPC **receives** STP Recommendation 0601-4 on seismic sources for IODP platforms and forwards it to the IODP-MI for consideration. The committee suggests that the implementing organizations should approach the Scientific Technology Panel (STP) with specific questions about the recommended specifications for seismic sources.
SPC stated that STP should be advising on specifics in addition to the general statement. This will require consideration at (and prior to) our next meeting.

STP Recommendation 0601-08:Temperature and Pressure Tools report
The STP recommends to SPC acceptance of the Temperature and Pressure Tools report and the report be forwarded to IODP-MI for implementation.

SPC Consensus 0601-9: The SPC **accepts** STP Recommendation 0601-8 and forwards the downhole temperature and pressure tools report to the IODP-MI for implementation.
This was accepted in full.

STP Recommendation 0601-09: Digital taxonomic dictionaries
The STP recommends that IODP-MI coordinate the development of a paleontologic taxonomic/stratigraphic reference standard, with MRC involvement, to ensure continued effective use of DSDP-ODP legacy sites, as well as to improve IODP's own paleo data resolution and reproducibility.
These dictionaries are required across all platforms and should be developed with appropriate funds provided by IODP-MI to the MRCs. The MRCs, while outside the IODP structure, can provide significant input to this process, including digital taxonomic dictionaries (DTDs) for microfossil taxa, linking DSDP-ODP and current taxonomic concepts. This is an important part of the QA/QC process and the STP is seriously concerned that further delay will adversely impact IODP science.
SPC Consensus 0603-10: The SPC **accepts** STP Recommendation 0601-9 on developing digital taxonomic dictionaries for use on all IODP platforms and forwards it to the IODP-MI for implementation.
This was accepted at long last and passed to IODP-MI.

STP Consensus 0601-01: Larger Drill Pipe Diameter
Consensus Statement: STP strongly supports larger drillpipe diameter on the SODV to allow new downhole logging tools.

SPC Consensus 0601-11: The SPC **receives** STP Consensus 0601-1 on larger diameter drillpipe for the new scientific ocean drilling vessel (SODV) and awaits an analysis of the benefits and drawbacks by the U.S. implementing organization (USIO).
While our concensus was welcomed SPC was not convinced that sufficient details were available about potential drawbacks and effectively passed this to the USIO. The main problem is that given the timing we probably won't have any further opportunity to influence the immediate design for the SODV.

STP Consensus 0601-02: LA-ICP-MS
The STP wishes to thank Clive Neal and Taka Sugihara for their presentations on the prospect of LA-ICP-MS usage in the SODV and the current status of a similar instrument on the Chikyu, respectively. STP recognizes that LA-ICP-MS analytical capability is important for IODP science, but most especially in providing critical (real time) analyses needed to direct drilling operations.
SPC Consensus 0603-12: The SPC receives STP Consensus 0601-2 on installing a laser-ablation inductively coupled plasma mass spectrometer (LA-ICP-MS) on IODP platforms and awaits the results of the planned testing of such an instrument onboard the Chikyu.
SPC Consensus 0603-12: The SPC **receives** STP Consensus 0601-2 on installing a laser-ablation inductively coupled plasma mass spectrometer (LA-ICP-MS) on IODP platforms and awaits the results of the planned testing of such an instrument onboard the *Chikyu*.
This awaits the results from the CHIKYU..

STP Consensus 0601-03: Open hole VSP – request for EDP advice
STP recognizes that improvements in open hole VSP operations need to be made in IODP. Specifically, advancements in either receiver technology and/or implementation of downhole sources should be investigated. STP requests advice from EDP in exploring the state of the art in these areas and their applicability to IODP requirements. STP nominates Kasahara-san as a liaison to EDP for this issue.
SPC Consensus 0603-13: The SPC **accepts** STP Consensus 0601-3 to seek advice from the Engineering Development Panel (EDP) concerning the current technology and applicability of open-hole, vertical seismic profile (VSP) experiments.
STP will need to liaise with EDP on this over the coming months.

STP Consensus 0601-05: New Jersey Transect Measurements Plan
STP received and reviewed the initial measurements plan for the New Jersey Transect. STP thanks the ESO for a thorough plan. Temperature measurements were not included in the initial plan, but need to be considered as it is an IODP minimum measurement (note action item and recommendation above). STP accepts the measurement plan subject to IODP minimum measurements being met.
SPC Consensus 0603-14: The SPC **receives** STP Consensus 0601-5 on the initial measurements plan for Expedition 313 New Jersey Shallow Shelf and reaffirms SPC Consensus 0410-20 on measuring sedimentary temperature profiles wherever feasible on IODP expeditions.
SPC reaffirmed the previous consensus that temperature profiles should be measured wherever feasible.

14.1. Third-party tools policy

SPC Consensus 0601-26: The SPC accepts STP Consensus 0601-8 and forwards the revised draft third-party tools policy to the Science Planning and Policy Oversight Committee (SPPOC) for approval.
SPC accepted the revised version of this policy submitted after the Kochi meeting.

1. Overall:

SPC expressed surprise that all our recommendations and consensus statements were unanimous.

Overall 2. QA/QC
STP Recommendation 0601-05: QA/QC
The STP recommends that IODP-MI coordinate the QA/QC efforts across all platforms in cooperation with the IOs and where necessary STP. STP requests a QA/QC plan for the IODP minimum measurements to be presented by the IOs/IODP-MI at the next STP meeting.

Here we recommended IODP-MI take on this task without a Task Force. Independently of STP, however, IODP-MI proposed a Task Force be established and will be coming back to STP for help in identifying individuals to advise on specific areas of measurements.

STP issues raised at the IODP Science Planning Committee 7th Meeting, 6-9 March 2006 Hilton St.Petersburg BayFront, St. Petersburg, Florida, U.S.A.

Based on annotated extracts from SPC draft executive summary (v.1.0)

Heiner Villinger
STP Liason
University of Bremen

STP Recommendation
0601-08:Temperature and Pressure Tools report
The STP recommends to SPC acceptance of the Temperature and Pressure Tools report and the report be forwarded to IODP-MI for implementation.
Report is on:
- T & P tool status
- QA/QC issues (calibration, training, protocols)
- recommendations for future use

SPC Consensus
0601-9 The SPC **accepts** STP Recommendation 0601-8 and forwards the downhole temperature and pressure tools report to the IODP-MI for implementation.

STP Recommendation
0601-09: Digital taxonomic dictionaries
The STP recommends that:

- IODP-MI coordinate the development of a paleontologic taxonomic/stratigraphic reference standard with MRC involvement
- these dictionaries should be developed with appropriate funds provided by IODP-MI to the MRCs.

This is an important part of the QA/QC process and the STP is seriously concerned that further delay will adversely impact IODP science.

SPC Consensus
0603-10: The SPC **accepts** STP Recommendation 0601-9 on developing digital taxonomic dictionaries for use on all IODP platforms and forwards it to the IODP-MI for implementation.

STP Recommendation
0601-05: New Jersey Transect Measurements Plan
STP received and reviewed the initial measurements plan for the New Jersey Transect. Temperature measurements were not included in the initial plan, but need to be considered as it is an IODP minimum measurement. STP accepts the measurement plan subject to IODP minimum measurements being met.

SPC Consensus
The SPC **receives** STP Consensus 0601-5 on the initial measurements plan for Expedition 313 New Jersey Shallow Shelf and reaffirms SPC Consensus 0410-20 on measuring sedimentary temperature profiles wherever feasible on IODP expeditions.

STP Recommendation
0601-26: Third Party Tool Policy
The SPC accepts STP Consensus 0601-8 and forwards the revised draft third-party tools policy to the Science Planning and Policy Oversight Committee (SPPOC) for approval.

Third Party Tool Policy is on:
• development of tools for (1) downhole (transient borehole measurements), (2) observatory (left behind in the hole after hole is completed), and (3) laboratory (shipboard or IODP core repository).
• implementation of development plan, testing and certification of tools
• responsibilities and reporting.

SPC Consensus
SPC accepted the revised version of this policy submitted after the Kochi meeting.

STP Recommondation
0601-05: QA/QC
The STP recommends that IODP-MI coordinate the QA/QC efforts across all platforms in cooperation with the IOs and where necessary STP. STP requests a QA/QC plan for the IODP minimum measurements to be presented by the IOs/IODP-MI at the next STP meeting.

Here STP recommended IODP-MI take on this task without a Task Force. Independently of STP, however, IODP-MI proposed a Task Force be established and will be coming back to STP for help in identifying individuals to advise on specific areas of measurements.

Proposals should go to STP and/or EDP, if

- **unclear logging plans or no logging at all**
- **CORK installation is planned and no experienced CORK scientist is co-PI**
- **if use of unproven technology is crucial for success of leg**
- **Third Party Tool Issues**

Logging

SPC Meeting Corvallis, October 2004

SPC Consensus 0410-12:
The SPC receives SciMP recommendation 04-06-1 and accepts the principle that **all IODP sites should be logged**. The committee recommends that the **absence of planned logging** at any IODP proposed sites **must be explained and justified** in the related proposal or expedition prospectus.

Recommendation 04-06-01: SciMP recommends that all IODP sites should be logged. The absence of planned logging of IODP sites in a proposal has to be explained and justified explicitly in the proposal.

Downhole temperature measurements

SPC Meeting Corvallis, October 2004

SPC Consensus 0410-20: The SPC receives SciMP Recommendation 04-06-9 and recommends **wherever feasible measuring the temperature** profile at each sedimentary IODP site.

Recommendation 04-06-09: SciMP recommends that APC temperature measurements be taken at least at one hole per site at a frequency of 1 measurement per approximately 30 m, with a suggested minimum of 3 measurements per site.

H. Villinger STP Liason

SSEP Meeting Potsdam May 2006

Recommondation for SSEP

- All the proposals marked in yellow should go to STP and/or EDP as they contain significant technological or 3rd party tool issues which should be looked at by the other panel(s). At which point in the proposal submission process this should happen is up to the panel but I suggest as early as possible. Especially proposals asking for CORKed holes need to have at least one or better two CORK-experts among the proponents.
- The proposals marked in blue lack the required temperature measurements; I didn't find arguments in those proposals not mentioning the temperature measurements that they are not feasible. These proposals do not have to be sent to STP but SSEP should remind the proponents of the SPC approved policy regarding temperature measurements.

H. Villinger, 24.5.06

Proposal	Logging Plan	T &/ or P	CORKs	Remarks
522 Superfast Spreading	yes	n/a	no	
574 Rainbow	yes	yes	yes	Lots of high-T issues
612 Paloeamag; Pacific	yes	no	no	make sure that APC & DVTP temperature measurements are done
633 Mud volcano; CR	yes	no	yes	make sure that APC & DVTP temperature measurements are done
656 Belize margin	yes	no	no	make sure that APC & DVTP temperature measurements are done
661 Newfoundland	yes	no	no	make sure that APC & DVTP temperature measurements are done
669 Walvis Ridge	yes	no	no	make sure that APC & DVTP temperature measurements are done
685 Ligurian Sea Observatory	yes	yes	yes	lots of technical and 3rd party tool issue
689 Deep biosphere, mud volcanoe	?	no	yes	logging plan not specified; technical issues re CORK installation; make sure that APC & DVTP temperature measurements are done
690 SeisCORK	no	no	yes	lots of technical and 3rd party tool issue
691	no	no	no	Form seems to be messed up

Weddell Sea				
692 Newfoundland breakup	-	-	-	not sure how they filled out the form
693 CORK Modernization	n/a	yes	yes	Technical issues
694 IBM	n/a	n/a	n/a	No site summaries available
695 IBM	yes	yes	no	
696 IBM	yes	yes	no	
697 IBM	yes	yes	no	
698 IBM	yes	yes	no	
699 Messinian Salinity Crisis	yes	yes	no	
700 Maud Rise	yes	no	no	make sure that APC & DVTP temperature measurements are done
701 Great Australian Bight	yes	yes	no	
702 Agulhas Current	yes	no	no	make sure that APC & DVTP temperature measurements are done
703 SeisCORK	yes	no	yes	Technological and 3rd party tool issues; make sure that APC & DVTP temperature measurements are done
704 Sumatra	yes	no	no	make sure that APC & DVTP temperature measurements are done
705 Santa Barbara Basin	yes	no	no	make sure that APC & DVTP temperature measurements are done
706 Kerguelen	yes	no	no	make sure that APC & DVTP temperature measurements are done
707 Tokyo Bay Area	yes	no	yes	Technological and 3rd party tool issues; make sure that APC & DVTP temperature measurements are done

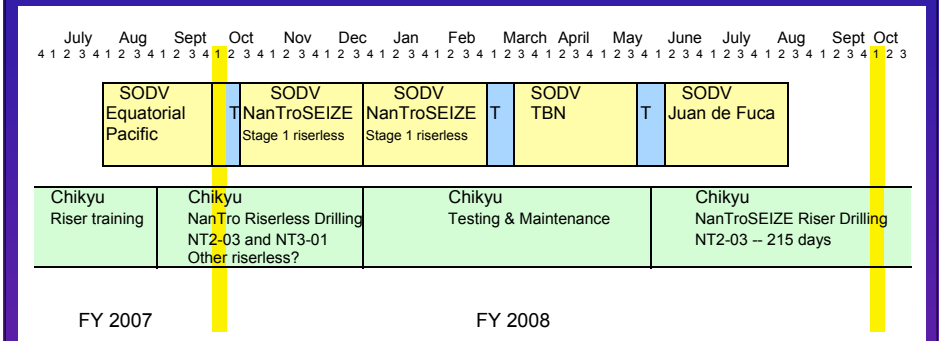
SPC Report to STP
Helsinki, June 2006

1. Update on FY07-09 schedule development
2. March 2006 SPC Rankings for FY09/10
3. Change of SPPOC to SAS Executive Committee (SASEC)
4. Brief update on planning for mission implementation - more on May 31
5. March SPC response to STP recs

Development of FY07/08 Science Plan

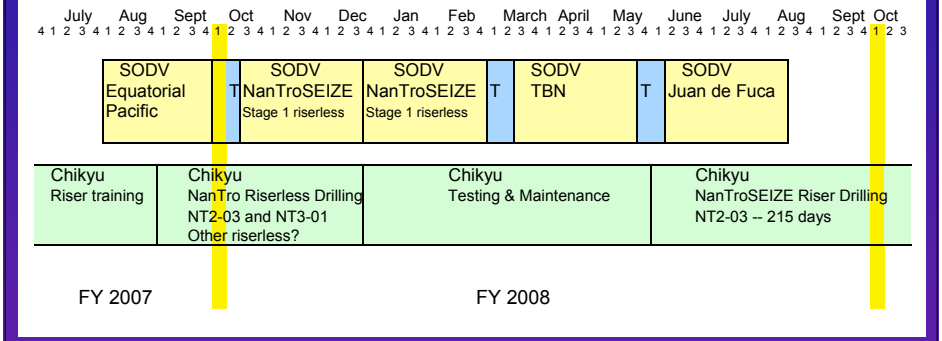
- Late FY07 will mark initiation of Chikyu and Phase II SODV operations - but with only modest actual time in FY07
- OTF and SPC took this as an opportunity to advance the scheduling lead time beyond the timeline required by Lead Agencies for FY07 APP
- SPC made firm recommendations well into FY08 and projected SODV operations into FY09
- SPPOC formally approved this approach in January, and SPC/OTF will follow this path in future years

Summary FY07/08 Schedule Recommendation as of Oct 2005 SPC



- MSP: New Jersey Sea Level now in FY07
- FY08/09 program TBN after March 2006 SPC
- Choice about “TBN” SODV slot at March 2006 SPC
- SODV FY09: Canterbury Basin and Wilkes Land

Summary FY07/08 Schedule Recommendation as of Oct 2005 SPC



Some modifications are ongoing as a result of (a) rankings at March 2006 SPC and (b) June OTF. Review the SPC rankings first...

March 2006 Proposals - for FY08/09 (I)

- Still at SPC from prior rankings: [not actually ranked]
  - 552-Full3 Bengal Fan
  - 547-Full4 Oceanic Subsurface Biosphere
  - [548-Full2 Chixculub K-T Impact Crater (MSP, to be revised)]
  - 584-Full2 TAG II Hydrothermal
  - 505-Full5 Mariana Convergent Margin
  - [581-Full2 Late Pleistocene Coralgal Banks (MSP, to be revised)]
  - 555-Full3 Cretan Margin
  - [557-Full2 Storegga Slide Gas Hydrates (to be revised)]
  - 666-APL2 SCIMPI Tool Development (w. Monterey Bay)
- Forwarded to SPC at May 2005 SSEP:
  - 618-Full3 East Asian Margin (riser and MSP-riser?)
  - 659-Full Newfoundland Rifted Margin (SODV)

March 2006 Proposals - for FY08/09 (II)

- Forwarded to SPC at Nov 2005 SSEP
  - 535-Full5 735B/SW Indian Ridge
  - 537-CDP6 + 537-Full4 CRISP Phase A (non-riser)
  - 537-CDP6 + 537-Full3 CRISP Phase B (riser)
  - 549-Full6 N Arabian Sea Monsoon
  - 603D-Full2 NanTroSEIZE Ref Site Observatories (non-riser)
  - 605-Full2 Asian Monsoon
  - 637-Full2 New England Shelf Hydrogeology (MSP)
  - 638-APL2 Adelie Drift (w. Wilkes Land)
  - 654-Full2 Shatsky Rise Origin
  - 667-Full NW Australian Shelf Eustasy (100-300 m depth)
  - 677-Full Mid-Atlantic Ridge Microbiology

Results of March 2006 Rankings

	Proposal #	Short Title	Mean	Stdv
1	677-Full	Mid-Atlantic Ridge Microbiology	2.4	2.06
2	603D-Full2	NanTroSEIZE Observatories	2.9	1.85
3	637-Full2	New England Shelf Hydrogeology	3.9	3.57
4	605-Full2	Asian Monsoon	5.9	3.57
5	549-Full6	Northern Arabian Sea Monsoon	6.0	3.22
6	537A-Full5	Costa Rica Seismogenesis Project Phase A	6.6	3.50
7	537B-Full4	Costa Rica Seismogenesis Project Phase B	8.6	3.37
8	552-Full3	Bengal Fan	9.7	3.89
9	505-Full5	Mariana Convergent Margin	10.5	3.61
10	659-Full	Newfoundland Rifted Margin	10.6	3.08
11	654-Full2	Shatsky Rise Origin	11.1	3.40
12	555-Full3	Cretan Margin	11.5	4.69
13	667-Full	NW Australian Shelf Eustasy	11.8	3.99
14	535-Full5	Atlantis Bank Deep	12.2	3.54
15	584-Full2	TAG II Hydrothermal	12.5	4.24
16	618-Full3	East Asia Margin	13.0	3.39
17	547-Full4	Oceanic Subsurface Biosphere (OSB)	13.8	2.91

Red = identified for forwarding to OTF for FY08/09/10 schedule development
Green shading = site survey issues to be resolved before forwarding

Forwarded to OTF for FY08/09/10

		Proposal #	Short Title	Mean	Stdv
Group 1	1	677-Full	Mid-Atlantic Ridge Microbiology	2.4	2.06
	2	603D-Full2	NanTroSEIZE Observatories	2.9	1.85
	3	637-Full2	New England Shelf Hydrogeology	3.9	3.57
	4	605-Full2	Asian Monsoon	5.9	3.57
	5	549-Full6	Northern Arabian Sea Monsoon	6.0	3.22
	6	537A-Full5	Costa Rica Seismogenesis Project Phase A	6.6	3.50
Group 2	7	537B-Full4	Costa Rica Seismogenesis Project Phase B	8.6	3.37
	8	552-Full3	Bengal Fan	9.7	3.89
	9	505-Full5	Mariana Convergent Margin	10.5	3.61
	10	659-Full	Newfoundland Rifted Margin	10.6	3.08
	11	654-Full2	Shatsky Rise Origin	11.1	3.40
	12	555-Full3	Cretan Margin	11.5	4.69
	13	667-Full	NW Australian Shelf Eustasy	11.8	3.99
	14	535-Full5	Atlantis Bank Deep	12.2	3.54
	15	584-Full2	TAG II Hydrothermal	12.5	4.24
	16	618-Full3	East Asia Margin	13.0	3.39
	17	547-Full4	Oceanic Subsurface Biosphere (OSB)	13.8	2.91

Group 1 proposals remain at OTF until scheduled.
Group 2 proposals re-ranked at March 2007 SPC if not scheduled.
Green-shaded proposals await resolution of site survey issues.

Mods to FY07/08/09 SODV Schedule - March SPC

SPC Consensus 0603-29: The SPC approves the revised FY2007-09 operations schedule of the U.S. scientific ocean drilling vessel (SODV) as proposed in Model 1B of the Operations Task Force (OTF). The recommended expeditions would begin in August 2007 and proceed through March 2009 as follows:

- Equatorial Pacific Paleogene Transect I (Proposal 626-Full2)
- Costa Rica Seismogenesis Project Stage 1 (Proposal 537A-Full5)
- NanTroSEIZE Stage 1 (Proposals 603A-Full2, 603B-Full2, 603C-Full)
- NanTroSEIZE Stage 1 continued (Proposals 603A-Full2, 603B-Full2, 603C-Full)
- Bering Sea Paleoceanography (Proposal 477-Full5)
- Juan de Fuca Flank Hydrogeology III (Proposal 545-Full3)
- Equatorial Pacific Paleogene Transect II (mini expedition, Proposal 626-Full2)
- Canterbury Basin (Proposal 600-Full)
- Wilkes Land Margin (Proposals 482-Full3, 638-APL2)

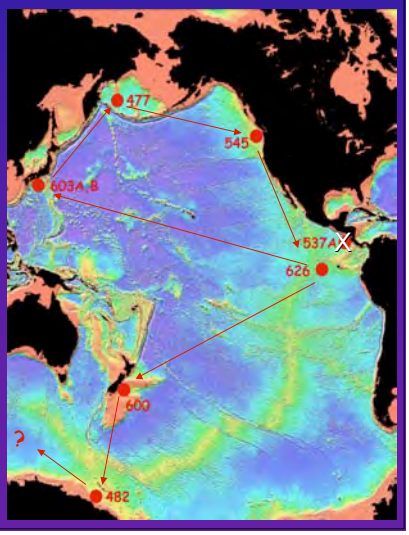
The SPC recognizes this scenario as a preferred model subject to significant change, especially pending further knowledge about the actual SODV drydock location and starting date for IODP operations. The committee thus encourages the OTF to explore further possibilities of revising the FY2007-09 operations schedule before the August 2006 SPC meeting.

Mods to SODV Schedule - since March SPC

CRISP Stage 1 deferred because of lead-times and costs.
At June OTF meeting, USIO indicated that SODV would be ready Nov 1 2007, not August 2007.

The current working model,
to be approved at August SPC:

- Equatorial Pacific Paleogene Transect I (626-Full2)
- NanTroSEIZE Stage 1 (603A, B, C)
- NanTroSEIZE Stage 1 cont'd (603A, B, C)
- Bering Sea Paleoceanography (477-Full5)
- Juan de Fuca Flank Hydrogeology III (545-Full3)
- Equatorial Pacific Paleogene Transect II (626-Full2)
- Canterbury Basin (Proposal 600-Full)
- Wilkes Land Margin (Proposals 482-Full3, 638-APL2)



Other Schedule Considerations - March SPC

SPC Consensus 0603-19: The SPC recognizes the value of Hole 1256D as a potential site for drilling through the ocean crust. The committee requests that the USIO identify the operational requirements (i.e., casing plan) for further drilling in Hole 1256D and make that information available before the Mission Moho workshop planned for September 2006. The proponents of Proposal 522-Full3 Superfast Spreading Crust should present their plans for deepening Hole 1256D at the workshop and then submit an addendum if they believe that their original objectives remain unachieved; otherwise, they should submit a new proposal.

SPC Consensus 0603-23: The SPC forwards Proposal 638-APL2 Adelie Drift to the Operations Task Force (OTF) for potential scheduling.

SPC Consensus 0603-22: The SPC advises the proponents of Proposal 666-APL2 SCIMPI Tool Development to follow the IODP third-party tools policy and explore alternative locations for conducting the proposed deployment of the device.

Replacement of SPPOC by SASEC

- SPPOC was chartered both as SAS Executive Authority and as a committee of the IODP-MI Board of Governors (BoG)
- At its April 1 meeting, the IODP-MI BoG approved a motion to replace SPPOC with a smaller SAS Executive Committee (SASEC)
- SPPOC was then formally disbanded
- SASEC membership nominations solicited for May 15, aiming for initial meeting July 11-12 (when SPPOC had been scheduled)
- SASEC mandate is very similar to that of SPPOC, except that BoG proposed a voting membership of 8, those being 2 from IODP-MI BoG (1US, 1Japan), then 2 each from US, Japan, and ECORD
- Lead Agencies requested 4:4:2 ratio for member appointees, keeping membership of SAS Executive Committee proportional as intended in Memoranda for all SAS committees and panels

Brief Update on Mission Implementation Plan

- Small Group incorporated the very useful feedback from Nov SSEP in its report submitted to January SPPOC meeting.
- SPPOC thought Mission implementation plan in Small Group report was too complicated, and formed its own ad hoc working group (S. Humphris, chair) to develop a simpler implementation plan for approval by March SPC and April 1 IODP-MI BoG.
- After presentation at SPC, that working group report and plan were modified considerably, then approved by SPC and SPPOC in late March, then IODP-MI BoG on April 1.
- That plan included formation of a third small ad hoc group to develop a method to integrate Mission planning into the "normal" proposal process, with one member each from SPPOC, SPC, SSEP, and IODP-MI. Final plan to be ready for approval at August SPC.
- But, BoG then dissolved SPPOC - so process is awaiting formation of SASEC and nomination of one its members to third WG...

SPC Responses to STP Recs (1)

STP Recommendation 0601-2: The STP recommends that the USIO not include an underway magnetometer in the SODV suite of instrumentation.

SPC Consensus 0603-6: The SPC *receives* STP Recommendation 0601-2 and recommends that the U.S. implementing organization (USIO) investigate the possibility of providing underway magnetometer capability, when circumstances warrant its use, on the new scientific ocean drilling vessel (SODV).

SPC Responses to STP Recs (2)

STP Recommendation 0601-3: The STP recommends that an elevated pressure velocity measurement system be established for the riser drilling ship program.

SPC Consensus 0603-7: The SPC *receives* STP Recommendation 0601-3 and forwards it to the IODP-MI to investigate the feasibility of establishing a high-pressure facility for measuring seismic wave velocities (Vp and Vs) in core samples acquired primarily through deep riser drilling.

SPC Responses to STP Recs (3)

STP Recommendation 0601-4: The STP recommends that seismic sources acquired for IODP platforms be of sufficient power to reach an appropriate total depth (not hole depth) at all operational water depths and that operators be appropriately trained in their operation.

SPC Consensus 0603-8: The SPC *receives* STP Recommendation 0601-4 on seismic sources for IODP platforms and forwards it to the IODP-MI for consideration. The committee suggests that the implementing organizations should approach the Scientific Technology Panel (STP) with specific questions about the recommended specifications for seismic sources.

SPC Responses to STP Recs (4)

STP Recommendation 0601-8: The STP recommends to SPC acceptance of the Temperature and Pressure Tools report and the report be forwarded to IODP-MI for implementation.

SPC Consensus 0603-9: The SPC *accepts* STP Recommendation 0601-8 and forwards the downhole temperature and pressure tools report to the IODP-MI for implementation.

SPC Responses to STP Recs (5)

STP Recommendation 0601-9: The STP recommends that IODP-MI coordinate the development of a paleontologic taxonomic/stratigraphic reference standard, with MRC involvement, to ensure continued effective use of DSDP-ODP legacy sites, as well as to improve IODP's own paleo data resolution and reproducibility.

These dictionaries are required across all platforms and should be developed with appropriate funds provided by IODP-MI to the MRCs. The MRCs, while outside the IODP structure, can provide significant input to this process, including digital taxonomic dictionaries (DTDs) for microfossil taxa, linking DSDP-ODP and current taxonomic concepts. This is an important part of the QA/QC process and the STP is seriously concerned that further delay will adversely impact IODP science.

SPC Consensus 0603-10: The SPC *accepts* STP Recommendation 0601-9 on developing digital taxonomic dictionaries for use on all IODP platforms and forwards it to the IODP-MI for implementation.

SPC Responses to STP Recs (6)

STP Consensus 0601-1: The STP strongly supports larger drillpipe diameter on the SODV to allow new downhole logging tools.

SPC Consensus 0603-11: The SPC *receives* STP Consensus 0601-1 on larger diameter drillpipe for the new scientific ocean drilling vessel (SODV) and awaits an analysis of the benefits and drawbacks by the U.S. implementing organization (USIO).

SPC Responses to STP Recs (7)

STP Consensus 0601-2: The STP wishes to thank Clive Neal and Taka Sugihara for their presentations on the prospect of LA-ICP-MS usage in the SODV and the current status of a similar instrument on the Chikyu, respectively. STP recognizes that LA-ICP-MS analytical capability is important for IODP science, but most especially in providing critical (real time) analyses needed to direct drilling operations.

SPC Consensus 0603-12: The SPC *receives* STP Consensus 0601-2 on installing a laser-ablation inductively coupled plasma mass spectrometer (LA-ICP-MS) on IODP platforms and awaits the results of the planned testing of such an instrument onboard the Chikyu.

SPC Responses to STP Recs (8)

STP Consensus 0601-3: The STP recognizes that improvements in open hole VSP operations need to be made in IODP. Specifically, advancements in either receiver technology and/or implementation of downhole sources should be investigated. STP requests advice from EDP in exploring the state of the art in these areas and their applicability to IODP requirements. STP nominates Kasahara as a liaison to EDP for this issue.

SPC Consensus 0603-13: The SPC *accepts* STP Consensus 0601-3 to seek advice from the Engineering Development Panel (EDP) concerning the current technology and applicability of open-hole, vertical seismic profile (VSP) experiments.

SPC Responses to STP Recs (9)

STP Consensus 0601-5: The STP received and reviewed the initial measurements plan for the New Jersey Transect. STP thanks the ESO for a thorough plan. Temperature measurements were not included in the initial plan, but need to be considered as it is an IODP minimum measurement (note action item and recommendation above). STP accepts the measurement plan subject to IODP minimum measurements being met.

SPC Consensus 0603-14: The SPC *receives* STP Consensus 0601-5 on the initial measurements plan for Expedition 313 New Jersey Shallow Shelf and reaffirms SPC Consensus 0410-20 on measuring sedimentary temperature profiles wherever feasible on IODP expeditions.

IODP-MI report to STP, June 2006

Status of Recommendations from January 2006 STP meeting

STP Recommendation 0601-1: Common framework for depth scales
IODP-MI is currently organizing a meeting to discuss the issue of developing a common framework for depth scales. This two-day meeting is tentatively scheduled for late September at TAMU and will include mainly internal IODP specialists and a few external experts. The IOs have been informed of the possible meeting and have been requested to provide their position and suggest possible participants. The outcome of the meeting will produce: (a) a draft technical note that will include standard requirements and describe the IODP solution based on results of the meeting and (b) a plan with timeline for the implementation of all the decisions and agreements. The results of the meeting will be presented to STP. We are currently working on a preliminary agenda, and we ask the STP to nominate at least one of its members to serve as a liaison to the task force. We also invite the STP to nominate a few other potential external participants, particular with expertise in physical properties and magnetics.

STP Recommendation 0601-2: SODV magnetometer
Currently being evaluated and prioritized as part of the SODV project.

STP Recommendation 0601-3 Vp & Vs at elevated pressures
IODP-MI forwarded this to CDEX for study.

STP Recommendation 0601-4: Seismic sources for IODP platforms
IODP requests additional information from STP concerning seismic source guns. What are the possible gun configurations that we need? What is the scientific justification for utilizing additional guns? The deadline for STP input is early August 2006 so that the USIO can include this in the Environmental Impact Statement. Please refer to: (a) letter from Neil Banerjee and (b) Core-Log-Seismic Integration workshop report.

STP Recommendation 0601-5: QA/QC
IODP-MI is currently populating the taskforce with an anticipated inaugural meeting before October 2006. For information, we provide the STP with the terms of reference for the task force, and we invite the STP to nominate a few potential participants from the community. This could include current STP members.

STP Recommendation 0601-6: IODP Measurements
IODP-MI requested the IOs to provide information about units, format, etc. for each measurement type in the IODP Measurements document. No response from the IOs so far. This will be used for metadata development for SEDIS and for QA/QC implementation.

STP Recommendation 0601-7: Temperature Measurements for ESO Operations
IODP-MI forwarded this to ESO for comments and IODP-MI will ask EDP to consider downhole temperature tools in their technology roadmap development.

STP Recommendation 0601-8: Temperature and Pressure Tools report
IODP-MI has reviewed the document and it will be forwarded to the QA/QC taskforce and to each of the IOs to incorporate into their Phase 2 operations.

STP Recommendation 0601-9: Digital taxonomic dictionaries
IODP-MI requested to the MRCs to participate at their next meeting, but they do not plan to meet for a while and have not met for several years. For IODP we need to have a common IODP taxonomy control list; this is not a dictionary but just a control list that contains all the names and references to publications. This list will be used by all IOs to ensure that all future data entered are consistent and there are no spelling mistakes. We are also interested in a

future global taxonomic dictionary. There are already other community efforts working on similar dictionaries and we need to find out what currently exists and how we can use these initiatives.

IODP-MI is planning a small working group meeting first to resolve our IODP taxonomy control list and make sure all IOs use a unique list. The one-day meeting will possibly follow the depth-scale and VCD meetings at TAMU in late September. We will need a group of experts (internal or external) to help us maintain the taxonomy control list. At this meeting we are willing to invite external people from CHRONOS, PaleoDB, and the MRCs to start the discussion about global taxonomic dictionaries. We consider that IODP should be involved in helping steer the development of a global taxonomic dictionary as a potential user, but IODP should not plan to develop one on its own.

STP Recommendation 0601-10: Improved seafloor visualization for SODV
Currently being evaluated and prioritized as part of the SODV project.

STP Consensus 0601-1: Larger drill pipe diameter
Currently being evaluated and prioritized as part of the SODV project.

STP Consensus 0601-2: LA-ICP-MS
IODP-MI is currently awaiting the results of *Chikyu* sea trials to evaluate ICP-MS-LA applications across IODP platforms.

STP Consensus 0601-3: Open hole VSP – request for EDP advice
IODP-MI will ask EDP to consider this topic in their technology roadmap.

STP Consensus 0601-4: STP expertise
The STP vice chair expects to provide a draft list of desired expertise before the June 2006 STP meeting and issue a final recommendation at that meeting.

STP Consensus 0601-5: New Jersey Transect measurements plan
IODP-MI forwarded to ESO for consideration

STP Action Item 0601-1: Temperature tools for MSP operations
IODP-MI forwarded to ESO for consideration

STP Action Item 0601-3: Third-party tools policy
SPC received the third-party tools policy (SPC Consensus 0601-26), and it is being forwarded to SASEC for approval at their July 2006 meeting.

STP Action Item 0601-6: Tool status developments
LIMS to be utilized on SODV and potentially other platforms. IODP-MI and the IOs will monitor how this improves input/output, QA/QC, reports, etc., and may recommend IODP-wide implementation after evaluating the results. EDP has asked the IOs for an update on all coring tools on each platform. Based on this input, EDP will recommend appropriate new tool developments for each platform.

Other topics of interest

VCD and Lithology
IODP-MI is currently organizing a meeting to discuss VCD and lithology at TAMU in late September, in conjunction with the depth-scale meeting noted above. This two-day meeting will come to a common solution for a VCD process and common lithologic classification. The IOs have been informed about this meeting and are expected to be ready to discuss and solve the issues. The outcome of the meeting will include: (a) a document describing one common lithologic classification (or a set of classifications) that define the terms and values for basic elements to be used by all IOs in future expeditions, including the graphical representations

for software and publications, and (b) a document describing the IODP VCD process, listing and defining all of the basic elements that need to be collected and stored in all IO databases to provide consistent search capability to the geoscience community. The results of the meeting will be presented to STP. We are currently working on a preliminary agenda, and we invite the STP to nominate a few potential participants from the community. This could include current STP members.

SEDIS RFP

The SEDIS RFP is currently under final public review, and based on the comments received, the IODP-MI expects to issue the final RFP soon.

Curatorial Advisory Board (CAB)

By request of IODP-MI President Manik Talwani, the IODP curatorial advisory board has become an IODP-MI task force, co-chaired by the two IODP-MI vice presidents. The previous CAB membership of Clive Neal, Heiner Villinger, and Kenji Nanba has been retained, but the latter will soon rotate off. We ask the STP to nominate two or three potential replacements for that opening, preferably but not necessarily from the Japanese community. This could include current STP members.

Scientific Technology Panel

3rd Meeting, 26-28 June 2006
Helsinki, Finland

IODP-MI Report

Jeff Schuffert
Senior Science Coordinator

INTEGRATED OCEAN DRILLING PROGRAM
MANAGEMENT INTERNATIONAL

Outline

- Status of STP Recommendations
- Data Management
- Proposals
- SAS Meeting Schedule
- Planning Workshops

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Status of STP Recommendations

0601-01	Common framework for depth scales	IODP-MI
0601-02	SODV magnetometer	USIO
0601-03	Vp & Vs at elevated pressures	CDEX
0601-04	Seismic sources for IODP platforms	IODP-MI
0601-05	QA/QC	IODP-MI
0601-06	IODP measurements	IODP-MI
0601-07	Temperature measurements for ESO operations	ESO
0601-08	Temperature and Pressure Tools report	IOs
0601-09	Digital taxonomic dictionaries	IODP-MI
0601-10	Improved seafloor visualization for SODV	USIO

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Status of STP Consensus Statements

0601-01	Larger-diameter drill pipe	USIO
0601-02	LA-ICP-MS	CDEX
0601-03	Open hole VSP – request for EDP advice	EDP
0601-04	STP expertise	STP
0601-05	New Jersey Transect measurements plan	ESO

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Status of STP Action Items

0601-01	Temperature tools for MSP operations	ESO
0601-02	Physical properties measurements (T&P)	STP
0601-03	Third-party tools policy	SASEC
0601-04	Post-cruise data	STP
0601-05	Temperature & pressure measurements	STP
0601-06	Tool status developments	STP/EDP
0601-07	LA-ICP-MS	STP

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STP Recommendation 0601-1
Common framework for depth scales

IODP-MI will convene a Depth Scale Meeting on 27-28 September 2006 at Texas A&M University.

General purpose is to develop a common framework for depth scales.

Expected outcome of meeting:

a) draft technical note that will include standard requirements and describe the IODP solution based on results of the meeting

b) a plan with timeline for implementating all decisions and agreements.

We invite STP to recommend potential participants.

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Depth Scale Meeting
Potential Participants

IODP-MI (2)	Bernard Miville, Manu Soeding
CDEX (4)	Philippe Gaillot, Shinichi Kuramoto, Shigemi Matsuda, Kyoma Takahashi
ESO (2)	Colin Graham, Jenny Inwood
USIO (3)	Peter Blum, Paul Foster, Mitch Malone
Independents (1)	Tatsuhiko Sakamoto

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STP Recommendation 0601-04
Seismic sources for IODP platforms

IODP requests additional information from STP concerning seismic source guns.

What are the possible gun configurations that we need?

What is the scientific justification for utilizing additional guns?

Deadline for STP input is early August 2006 so that the USIO can include this in its Environmental Impact Statement.

For reference see: (a) letter from IODP-TAMU and (b) Core-Log-Seismic Integration workshop report.

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STP Recommendation 0601-05
Quality Assurance and Quality Control

IODP-MI is currently populating a QAQC Task Force with an anticipated inaugural meeting before October 2006.

For information, see the terms of reference for the task force.

We invite the STP to nominate a few potential participants from the community and assign at least one STP liaison.

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QA/QC Task Force Terms of Reference (1 of 4)

1. General Purpose. The Quality Assurance Quality Control (QAQC) Task Force reports to IODP-MI. The task force shall establish the framework for the IODP shipboard and shore-based QAQC laboratory procedures and also monitor the success of the implemented QAQC process for a short period after Phase II scientific operations commence. The QAQC Task Force will be dissolved once its mandate has been achieved.

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QA/QC Task Force Terms of Reference (2 of 4)

2. Mandate. The QAQC Task Force is charged with defining a suite of laboratory guidelines to be followed by the IOs for IODP shipboard and shore-based minimum and standard measurements including, but not limited to:

a) ensuring that all data generated by IODP platforms are reproducible
b) defining the accuracy and precision thresholds for the data
c) establishing the calibration protocols for IODP laboratory instrumentation
d) identifying appropriate Standard Reference Materials (SRMs) to use program-wide

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QA/QC Task Force Terms of Reference (3 of 4)

3. Recommendations. Recommendations of the QAQC Task Force shall generally be made by consensus. If there is dissent amongst the task force members, it will be recorded in the meeting minutes.

4. Meetings. The framework of the QAQC protocols must be established prior to IODP Phase II operations in August 2007. The QAQC Task Force shall convene as often as necessary and feasible to accomplish its mandate. Additional electronic meetings may be held as appropriate. The inaugural meeting of the task force shall take place prior to the end of FY2006.

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QA/QC Task Force Terms of Reference (4 of 4)

5. Membership. Membership of the QAQC Task Force will be composed of representatives from IODP-MI, the IOs, the scientific community stakeholders, independent QAQC experts, and a liaison from the IODP Science Advisory Structure (SAS).

6. Chair and Vice-Chair. The QAQC Task Force chair shall be determined by IODP-MI. The vice chair shall be the IODP-MI representative to the task force.

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QA/QC Task Force Members

Kelly Kryc	IODP-MI	low-temperature geochemistry
David Houpt	USIO	analytical chemistry, lab management
Philippe Gaillot	CDEX	physical properties, paleomag, logging
Ursula Röhl	ESO	geochemistry, lab management
Tim Brewer	ESO	analytical chemistry, logging
Katie Kelley	U Rhode Island	high-temperature geochemistry
Phil Meyers	U Michigan	organic chemistry
Dave Murray	Brown U	analytical chemistry, lab management
Julian Pearce	Cardiff U	high-temperature geochemistry
To Be Named:		
Two scientists	Japan	physical properties, magnetics
Two experts	external	QA/QC
Liaison(s)	STP	?

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STP Recommendation 0601-09
Digital Taxonomic Dictionaries

IODP-MI will convene a Paleontology Planning Meeting on 29-30 September 2006 at Texas A&M University.

General purpose of meeting is to explore possibilities of collaborating in developing a taxa control list (TCL) and a digital taxa dictionary (DTD).

We invite STP to recommend potential participants.

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Paleontology Planning Meeting Goals (1 of 2)

Phase I: Taxa Control List (TCL) - an immediate need

Determine how to collaborate, compile, store, disseminate, verify, and maintain TCL.

Devise trategies to promote acceptance of TCL by scientific community.

Identify other projects that might have a need for a TCL.

Decide on easily exchangeable data format, e.g., Excel, XML, etc.

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Paleontology Planning Meeting Goals (2 of 2)

Phase II: Digital Taxa Dictionary (DTD) - a future need

What already exists in terms of format, developer, maintenance, and distribution?

Who else needs a DTD? Who should try to develop one? What can IODP contribute?

What technical infrastructure would be needed? How can these data be exported into other project databases?

How can we start such a development or collaboration process? IODP seeks broadest possible consent with various funded paleontology projects.

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Paleontology Planning Meeting Potential Participants

IODP-MI (2)	Bernard Miville, Manu Soeding
IODP curators (3)	John Firth, CDEX?, ESO?
IODP data (3)	Ronald Conze, David McInroy, Peter Blum, Carlos Zarikian, Shigemi Matsuda, Kyoma Takahashi
MRCs (2)	David Lazarus, Yoshiaki Aita
Chronos (1)	Pat Diver, Brian Huber, Mark Leckie
PaleoDB (1)	Suzanne Feist-Burkhardt, Charles Marshall, John Alroy
Independents (3)	Mike Kaminski, Masao Iwai, Woody Wise

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Visual Core Description (VCD) and Lithologic Classification Scheme

IODP-MI will convene a VCD/Lithology Meeting on 25-26 September 2006 at Texas A&M University.

General purpose is to develop a common solution for a VCD process and common lithologic classification.

We invite STP to recommend potential participants.

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Visual Core Description (VCD) and Lithologic Classification Scheme

Expected outcome of VCD/Lithology meeting:

a) document describing one common lithologic classification (or set of classifications) that defines terms and values for basic elements to be used by all IOs in future expeditions, including graphical representations for software and publications

b) document describing IODP VCD process, listing and defining all basic elements that need to be collected and stored in all IO databases to provide consistent search capability to geoscience community.

INTEGRATED OCEAN DRILLING PROGRAM
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VCD/Lithology Meeting Potential Participants

IODP-MI (2)	Bernard Miville, Manu Soeding
CDEX (4)	Kan Aoike, Shinichi Kuramoto, Shigemi Matsuda, Kyoma Takahashi
ESO (2)	Colin Graham, David McInroy
USIO (2)	Peter Blum, Paul Foster
POSC (1)	Paul Maton
IASU-Chronos (1)	Arun Rao
UIC-Corewall(1)	Josh Reed
Independents (1)	Tatsuhiko Sakamoto

INTEGRATED OCEAN DRILLING PROGRAM
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Curatorial Advisory Board

IODP Curatorial Advisory Board (CAB) has become an IODP-MI task force, co-chaired by two IODP-MI vice presidents.

Previous CAB membership of Clive Neal, Heiner Villinger, and Kenji Nanba has been retained, but the latter will soon rotate off.

We ask the STP to nominate two or three potential candidates to fill the vacancy, preferably but not necessarily from the Japanese community. This could include current STP members.

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SEDIS

Scientific Earth Drilling Information Service

- Web portal: http://sedis.iodp.org
- **Phase I**: Metadata catalog providing a searchable inventory of all data collected for each drilling hole in IODP and of legacy data.
- **Phase II**: Addition of scientific publications (and their data?) to the metadata catalog. Provides tools to efficiently search publications from distributed databases including content based searches.
- **Phase III**: Advanced search and extraction of data from distributed databases. Provides advanced mapping and data visualization tools.

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SEDIS: Timeline

- March 2006: Creation of Task Force
- Review of RFP specifications
- April 2006: Issue RFP SEDIS Phase I
- Summer 2006: Development start
- End 2006: Requirements and RFP Phase II
- Spring 2007: SEDIS Phase I online
- Summer 2007: Requirements and RFP Phase III
- 2007/2008: SEDIS Phase II online
- End 2008: SEDIS Phase III online

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Proposal Database

- Under development by kk+w digital cartography
- Upload proposals, online entry of site summary forms
- Download proposals for SAS, external reviewers
- Compatible with SSDB
- Full beta version ready for testing early July 2006
- Final version ready for use by September 2006?

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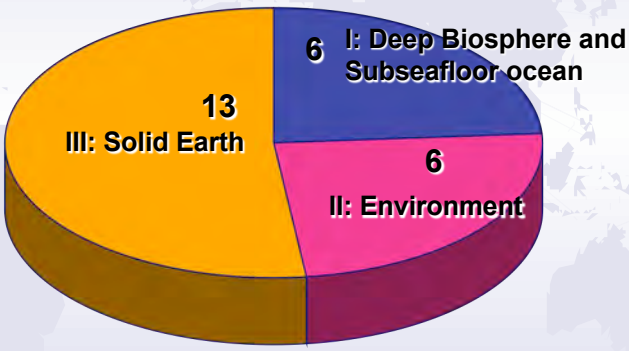
Submissions for 1 April 2006 deadline: 25

By ISP Themes



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STP Proposal Review

- SSEP forwarded one proposal to STP, May 2006
  685-Full Ligurian Margin Borehole Observatory
  SSEP recommends that the SAS (e.g., STP) should establish protocols for community access to the test bed and for acquiring, transmitting, sharing, and publishing the resulting data.
- Preserve confidentiality
- Declare and record conflicts of interest
- Produce written evaluation

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STP Proposal Review

SPC chair and vice-chair suggested in July 2005:
STP review should be directed at assessing whether the proposed measurement program (or the routine shipboard program, if no specific program is described in proposal) would be sufficient to meet proposed objectives and is technically feasible. If not, what other measurements would be required to meet the objectives? What added measurements and/or laboratory development projects might significantly enhance the scientific program? If added developments would enhance the program, how long is required for these developments?

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SAS Meeting Schedule

STP	26-28 Jun 2006	Helsinki, Finland
EDP	27-29 Jun 2006	Windischeschenbach, Germany
IIS PPG	07-08 Jul 2006	The Hague, Netherlands
SASEC	11-12 Jul 2006	Washington, D.C., USA
SSP	24-26 Jul 2006	Sapporo, Japan
SPC	28-31 Aug 2006	Bergen, Norway
SSEP	*13-16 Nov 2006*	*Sapporo, Japan*
EPSP	*09-10 Jan 2007*	*Yokohama, Japan*

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Planning Workshops

Fault-zone Drilling	23-26 May 2006 Miyazaki, Japan
Mission Moho	6-9 Sep 2006 Portland, Ore., U.S.A.
Continental Break-up	15-18 Sep 2006 Pontresina, Switzerland
Subseafloor Life	3-5 Oct 2006 Vancouver, Canada

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IODP Program Journal

Scientific Drilling

Reports on Deep Earth Sampling and Monitoring

- IODP program journal
- co-published with ICDP
- 2 issues / year, ~50-60 pages / issue
- 3rd issue in September 2006
- Target audience is the broader Earth science community
- Content:
  - program and expedition reports
  - technical developments
  - project progress reports
  - workshop reports & news items
- 3 IODP editors, 1 ICDP editor
- DOI referenced; internally reviewed
- Distributed free of charge

INTEGRATED OCEAN DRILLING PROGRAM
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New IODP member

South Korea has joined IODP

First member of Interim Asian Consortium

Korean Institute of Geoscience and Mineral Resources (KIGAM) is first affiliated institution

INTEGRATED OCEAN DRILLING PROGRAM
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Quality Assurance Quality Control (QAQC) Taskforce

1. General Purpose. The Quality Assurance Quality Control (QAQC) Taskforce reports to IODP-MI. The taskforce shall establish the framework for the IODP shipboard and shorebased QAQC laboratory procedures and also monitor the success of the implemented QAQC process for a short period after Phase II scientific operations commence. The QAQC taskforce will be dissolved once its mandate has been achieved.

2. Mandate. The QAQC taskforce is charged with defining a suite of laboratory guidelines to be followed by the IOs for IODP shipboard and shorebased minimum and standard measurements including, but not limited to:

a. Ensuring that all data generated by IODP platforms are reproducible,
b. Defining the accuracy and precision thresholds for the data,
c. Establishing the calibration protocols for IODP laboratory instrumentation,
d. Identifying appropriate Standard Reference Materials (SRMs) to use program-wide,

3. Recommendations. Recommendations of the QAQC taskforce shall generally be made by consensus. If there is dissent amongst the taskforce members, it will be recorded in the meeting minutes.

4. Meetings. The framework of the QAQC protocols must be established prior to IODP Phase II operations in August 2007. The QAQC taskforce shall convene as often as necessary and feasible to accomplish its mandate. Additional electronic meetings may be held as appropriate. The inaugural meeting of the taskforce shall take place prior to the end of FY2006.

5. Membership. Membership of the QAQC taskforce will be composed of representatives from IODP-MI, the IOs, the scientific community stakeholders, independent QAQC experts, and a liaison from the IODP Science Advisory Structure (SAS).

6. Chair and Vice-Chair. The QAQC taskforce Chair shall be determined by IODP-MI. The Vice-Chair shall be the IODP-MI representative to the taskforce.

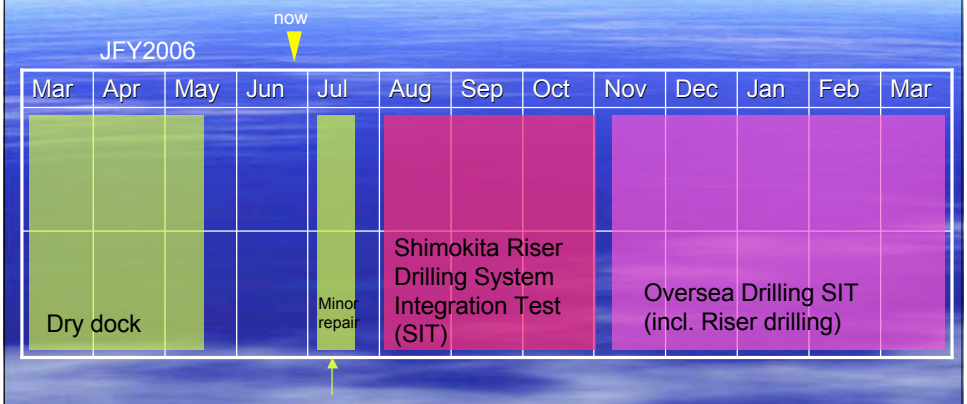
CDEX status report

Takamitsu SUGIHARA
CDEX/JAMSTEC

Contents

- Chikyu update
- Plan for SHIMOKITA Riser Drilling SIT in this summer
- Future schedule

Schedule of CHIKYU



CDEX will carry out Riser drilling System Integration Test (SIT) by CHIKYU from August. We are preparing for the Riser operation SIT.

CHIKYU update: Recently installed equipments

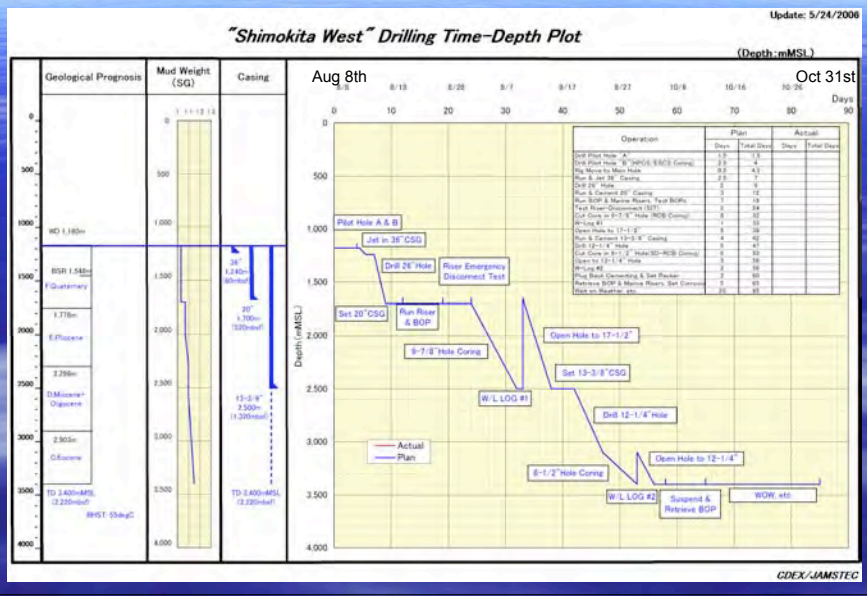
- Refrigerated container
- Electric balance and Micro electric balance

Refrigerated container for core storage (Prototype)

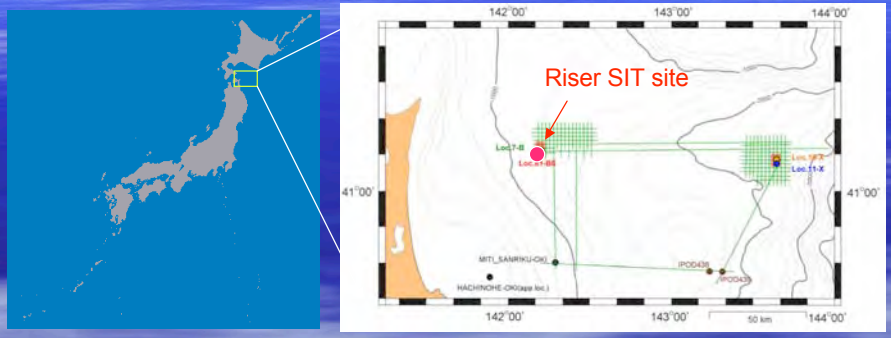
We plan that the processed core sections are stored in the refrigerated container. Its prototype was made last JFY. Our container has movable core racks inside.

Electric balance (>0.1g) and Micro balance (1g to 1mg)

Riser drilling SIT off Shimokita peninsula (SHIMOKITA Riser SIT)



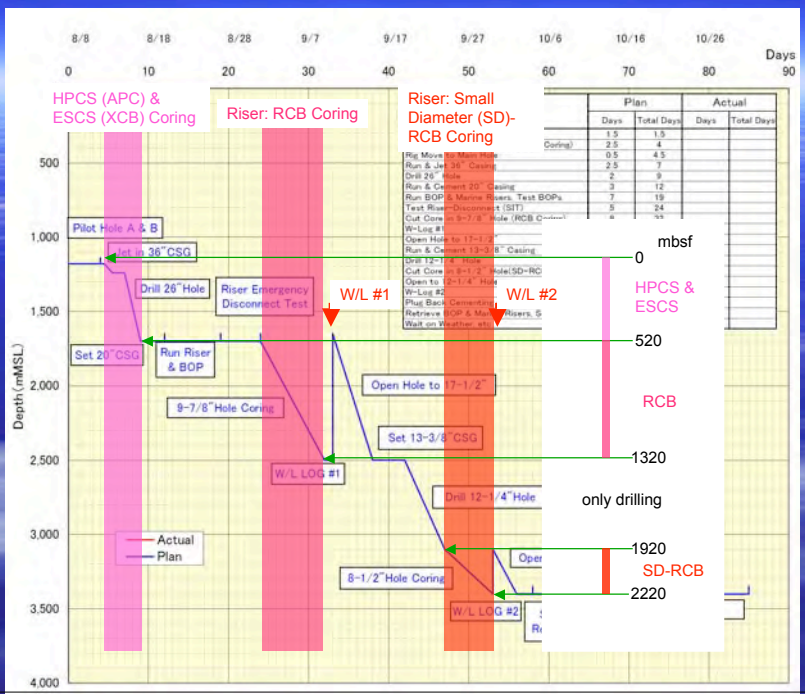
Riser drilling System Integration Test off Shimokita peninsula (SHIMOKITA Riser SIT)



The Riser drilling SIT is carried out at the same site as the non-riser coring SIT last year, because safety issue regarding the riser operation is already confirmed in the last coring SIT.

SHIMOKITA Riser SIT

- Riser SIT Objectives
- Training of drilling operators and the related marine crews.
- Evaluation of operation procedures of the drilling equipments and the related system.
- Evaluation of the ship operation procedure during the drilling.
- Test of the laboratory operation and training of laboratory staffs in accordance with the actual core flow.



Laboratory Operation Plan

- Objective:
- To evaluate all lab. functions of the laboratory area on CHIKYU
- To train lab. staffs for the international operation.

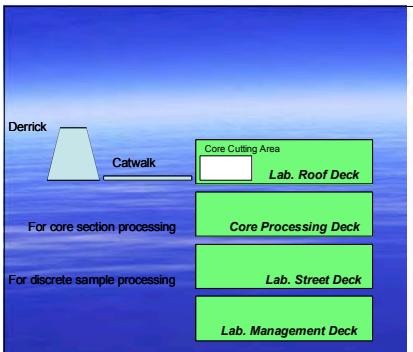
Laboratory Operation Plan

- Most of minimum and standard measurements discussed in STP will be covered.
- Biostratigraphy and paleomagnetic age determination will be conducted.
- Geochemical analyses (IW chemistry, and organic and Inorganic bulk chemistry) will be added to non-destructive measurement core flow in the last coring operation.
- Mud logging will also be carried out.
- W/L logging: HRLA-DSI-Gr-EMS, VSI

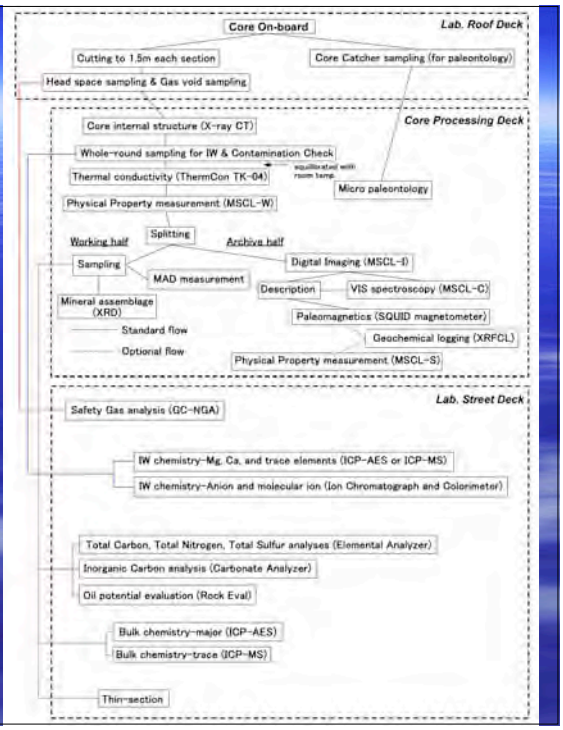
Measurement Plan

- Safety monitoring (Head space and gas-void samplings and natural gas analyses by GC-NGA)
- Non-destructive observation of core internal structure (X-ray CT)
- Thermal conductivity (Thermal conductivity meter: TK-04)
- Physical property core logging for whole-round core (GEOTEK system MSCL-W with gamma-ray attenuation density, non-contact resistibility, P-wave velocity, Magnetic susceptibility, and Natural gamma-ray)
- Biostratigraphy
- Contamination monitoring especially for the riser mud (GC-ECD for PFC detection, under development)
- Split core scanning digital imaging (GEOTEK system MSCL-I)
- Visible light spectroscopy (GEOTEK system MSCL-C)
- Moisture & density measurement (Pentapycnometer and Shipboard balance system)
- Visual core description
- Natural remnant magnetism with step-wise demagnetization (2G-SQUID magnetometer system)
- Geochemical core logging (XRFCL)
- Physical property core logging for split core (GEOTEK system MSCL-S with gamma-ray attenuation density, non-contact resistibility, P-wave velocity, Magnetic susceptibility)
- X-ray diffraction (XRD)
- Thin-section
- Bulk CNS analyses (Elemental analyzer)
- Carbonate analyses (Carbonate analyzer with coulometer)
- Pore water chemistry (ICP-AES, ICP-MS, Ion chromatogram, UV-VIS spectrophotometer, and Titration)
- Bulk solid material chemistry (ICP-AES, ICP-MS)
- Mud logging (natural gas analyses, paleontology, XRD analyses, CHN analyses)

Red color indicates the additional measurements to those of the last year



Structure of the Lab. area on CHIKYU



Core flow for SHIMOKITA Riser SIT

Trial of Database system (J-CORES) during the Riser SIT

- Digital input of VCD information into the J-CORES using tablet-PC
- Improvement of browsing speed of Composite Log Viewer
- Test of newly developed functions in the J-CORES

Conclusion: Future schedule

- Aug-Nov 2006: Riser Drilling SIT
- Nov 2006-Aug 2007: Oversea Drilling SIT
- Sep-Oct 2007: NanTro SEIZE exp.1
- Nov 2007: NanTro SEIZE exp.2
- Nov-Dec 2007: NanTro SEIZE exp.3
- Jan-Feb 2008: NanTro SEIZE exp.4 (1st Riser expedition)
- Mar-May 2008: 1st Inspection in Shipyard

USIO

USIO Report Part 1 of 4

Program Update

STP Meeting, Helsinki

June 26, 2006

USIO

Outline

- USIO operational updates activities
- SODV summary update
- Riserless vessel schedule
- Other updates

USIO Operational Activities

USIO

- Submitted initial FY07 Program Plan. Will submit revised version to accommodate changes in schedule
- Completed demobilization activities in Galveston and released vessel for independent commercial enterprise
- Provided input into the Guidelines for the EPSP Safety Review Report and Presentation, and Expedition Safety Package
- Developed an operational schedule for FY08
  - Staffing to commence 1 August 2006
- Core repository redistribution planning continues
- Personnel changes
  - Mitch Malone replaced Tom Davies as Manager of Science Operations
  - Greg Myers departed LDEO for IODP-MI, replacement TBN

SODV Highlights

USIO

- Completed negotiations for SODV and logging subcontracts
- Engineering design continues
  - Integration of mechanical elements into design
  - Final design package planned for August 06
  - Preliminary stability analysis completed
  - Initial dialogue established with shipyards
  - Selection anticipated in fall 06
- Issues still under consideration
  - Acquisition of larger diameter pipe for logging
  - Visualization
  - Core recovery/quality & heave compensation
- Continued development of EIS
  - Exhaust emissions, acoustic measurements, seafloor cuttings

SODV Highlights

USIO

- Science Instrumentation
  - Work packages were prioritized based on IODP minimum, standard, and supplemental measurement capabilities and other criteria
  - Authorizations for initial group of work packages were issued in May
  - Remaining packages will be considered and partly re-prioritized once shipyard prices are known
- Established initial project baseline
  - Reexamine baseline once shipyard costs are finalized
- NSF management review completed
  - Program status, requirements, WBS, budget, schedule & shipyard selection
  - Next review targeted for Autumn 2006

SODV Highlights

USIO

- SODV Conversion schedule
  - Engineering Design Phase Feb 06 - Sept 06
  - Shipyard Solicitation Apr 06 - May 06
  - Review Shipyard Proposals June 06 - Aug 06
  - Ship Arrives, Tanks Cleaned Nov 06 - Nov 06
  - Ship in shipyard Nov 06 - Sept 07
  - Dock Trials, Inclining, Completion Oct 07 - Oct 07

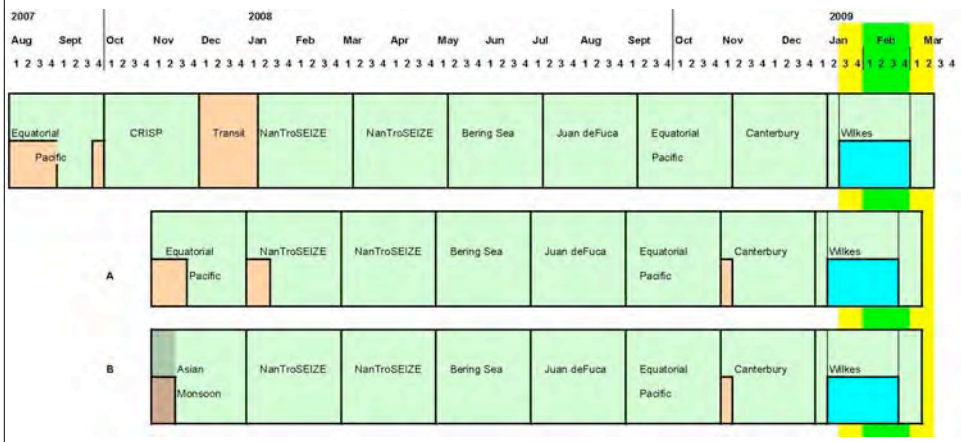
Riserless Vessel Schedule

USIO

- Schedule Adjustment: Expedition will commence from shipyard port
  - Previous plan called for a transit
  - For planning purposes we have assumed a Western Pacific shipyard
- Vessel availability target: 1 November 2007
  - Will be adjusted when shipyard is finalized (~Sept.)
  - Will be tuned about 5-6 months prior to completion (Spring 07)
  - Proposed schedule can accommodate 2-3 week adjustment

Riserless Vessel Schedule

USIO



DRAFT USIO RISERLESS VESSEL PLANNING SCHEDULE[1]

Cruise		Port (Origin)	Dates	Total Days (Port/Sea)	Days at Sea (Transit/Ops)	Co-Chief Scientists	Alliance Contact(s)
Equatorial Pacific	TBN	Singapore	1 November 07 – 6 December	61 (6/55)	34/21	TBN	TBN
NanTroSEIZE	TBN	Honolulu	1 January 08 – 2 March	61 (6/55)	16/39	TBN	TBN
NanTroSEIZE	TBN	Yokohama	2 March – 2 May	61 (5/56)	4/52	TBN	TBN
Bering Sea	TBN	Hokkaido?	2 May – 2 July	61 (5/56)	15/41	TBN	TBN
Juan de Fuca	TBN	Victoria	2 July – 1 September	61 (5/56)	5/51	TBN	TBN
Equatorial Pacific	TBN	San Diego	1 September – 1 November	61 (5/56)	16/40	TBN	TBN
Canterbury Basin[3]	TBN	Tahiti	TBD	TBD	TBD	TBN	TBN
Wilkes Land[3]	TBN	Wellington	TBD[5]	TBD	TBD	TBN	TBN

[1] **This operational schedule is ONLY a draft issued for planning purposes.**
[2] Dates for each expedition **WILL CHANGE**. Specific dates will be adjusted in Sept/Oct 2006 once the shipyard is finalized, and in Spring 2007 midway between the shipyard project.
[3] At present the schedule needs to be extended about 2-3 weeks to provide the best environmental window for Wilkes Land. This will take place Fall 2006.
[4] Adjustments to the total days assigned to each cruise **WILL CHANGE**. For example, Equatorial Pacific will commence from the shipyard which remains to be determined, a hazard assessment is pending for Canterbury Basins and Adelie is being considered for integration into Wilkes Land.
[5] The ending date will be determined after Adelie is incorporated into the schedule and port call is determined.

14 June 2006

Riserless Vessel Schedule

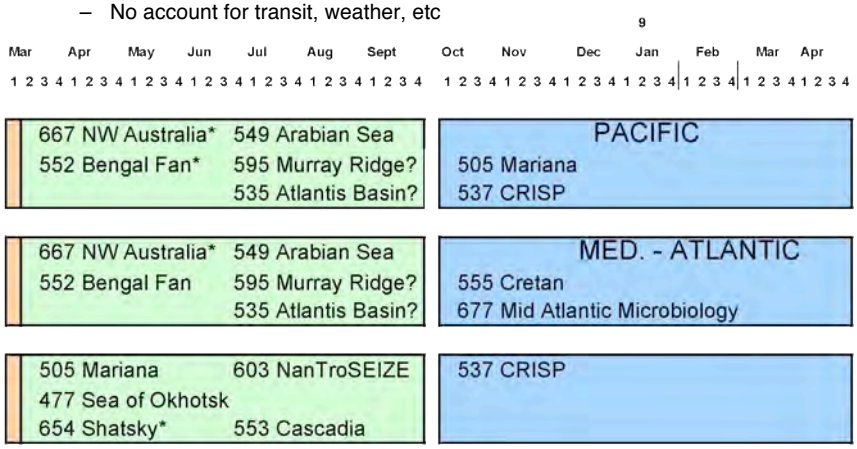
USIO

- Schedule issues
  - Shipyard decision is needed before schedule can be further tuned (due in fall 2006)
    - Determines start port for initial expedition
    - Allows adjustments for Wilkes “best fit”
    - Pre-operations evaluation requirement can be determined
  - FY08 Budget Targets have not been provided
    - Budget constraints may require certain adjustments
  - Expedition operational plans are not finalized
    - NanTroSEIZE alternate sites
    - Adelie integration with Wilkes
    - Canterbury Basin hazard assessment

Riserless Vessel Schedule

USIO

- Potential FY08/FY10 riserless ship track
  - Just potential order
  - No account for transit, weather, etc



Third Party Tools Policy

USIO

- USIO has not reviewed the latest draft in a concerted manner
- USIO views the latest draft as a working model, to be revisited over the next year as real challenges are being addressed
  - Construction of new generation downhole T (and P) tools based on third-party prototypes
  - Third-party CORK instrumentation
  - Data from third-party instruments
  - Etc.
- Policy ultimately needs to be specific rather than generic
  - Needs “teeth” for implementation
- The final policy must be formally endorsed by all IODP entities, particularly all IOs and IODP-MI
- An IODP mechanism for changing IODP policies should be established

SODV Update for STP

Chris House

Penn State University

Member of the **Program Advisory Committee**

Envisioning 2007 and Beyond

From *here*…

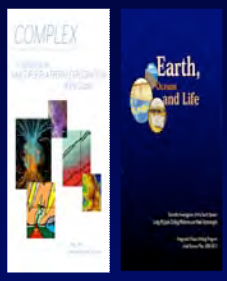
to *there*…

Scientific
Ocean
Drilling
Vessel

JOI Joint Oceanographic Institutions
SCIENTIFIC OCEAN DRILLING VESSEL

History Recap

- Planning need for riserless drilling in IODP



- Conceptual Design Committee
  - Conceptual capabilities
  - No specific vessel
  - No financial constraints
  - Planning template


The Non-Riser Drilling Vessel
for the *Integrated Ocean Drilling Program*:
A Report from the
Conceptual Design Committee"

Performance Specifications,
On Board Scientific Measurement Capabilities,
and Survey of Drilling Vessels

March 2000

History Recap *continued*

- NSF Funding 2005-2007
  - Drill ship conversion

National Science Foundation

- SODV Project
  - "Briefing Book" and comments
  - Selection of vessel
    - Finished in December 2005
    - "Extreme makeover" for JOIDES Resolution

Overarching SODV Priorities

- Provide reliable riserless drilling vessel
- Provide modern health and safety
- Meet modern environmental practices
- Provide science, sampling, and logging capabilities
- Enable operational efficiency
- Provide for efficient drilling operations
- Provide infrastructure for future growth, flexibility, and capability upgrades

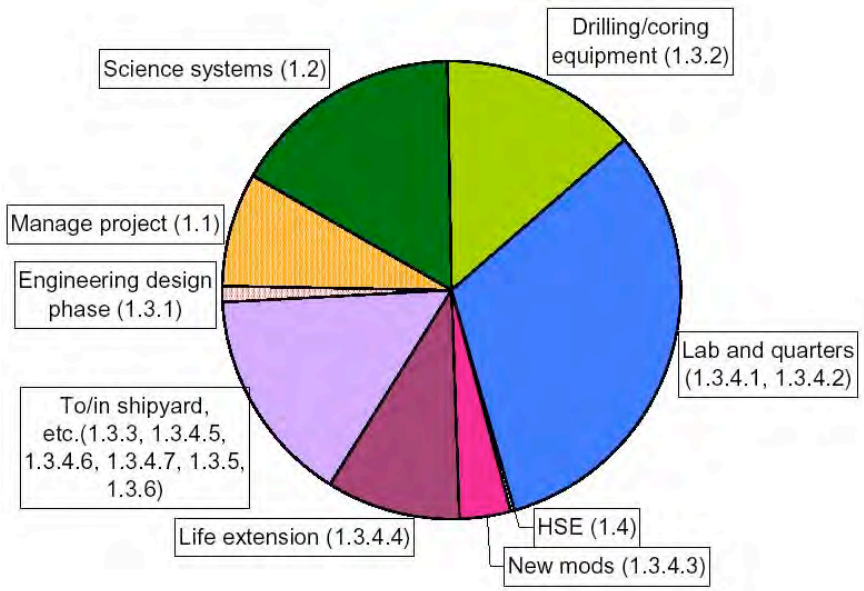
SODV Scientific Participation *Three* Levels

- Oversight
  - Independent Oversight Committee
- Implementation
  - Project Advisory Committee
- Science end user
  - Conversion Design Teams

Oversight and Implementation Committees

PAC	IOC
Peggy Delaney	Rannie Boyd
Page Chamberlain	Susan Humphris
Dave Christie	Ken Miller
Juan Garcia	Harold Tobin
Chris House	Stan Christman
Tom Janecek (non-voting)	

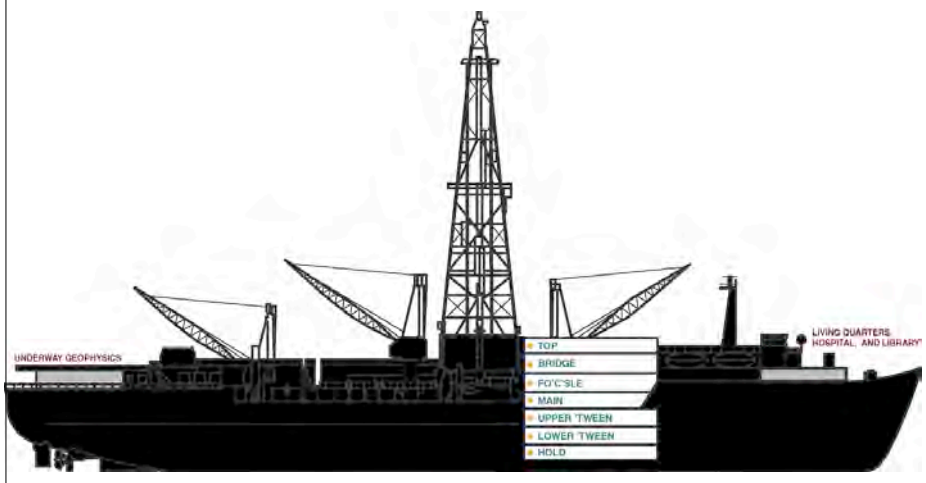
Where Is the Money Going?

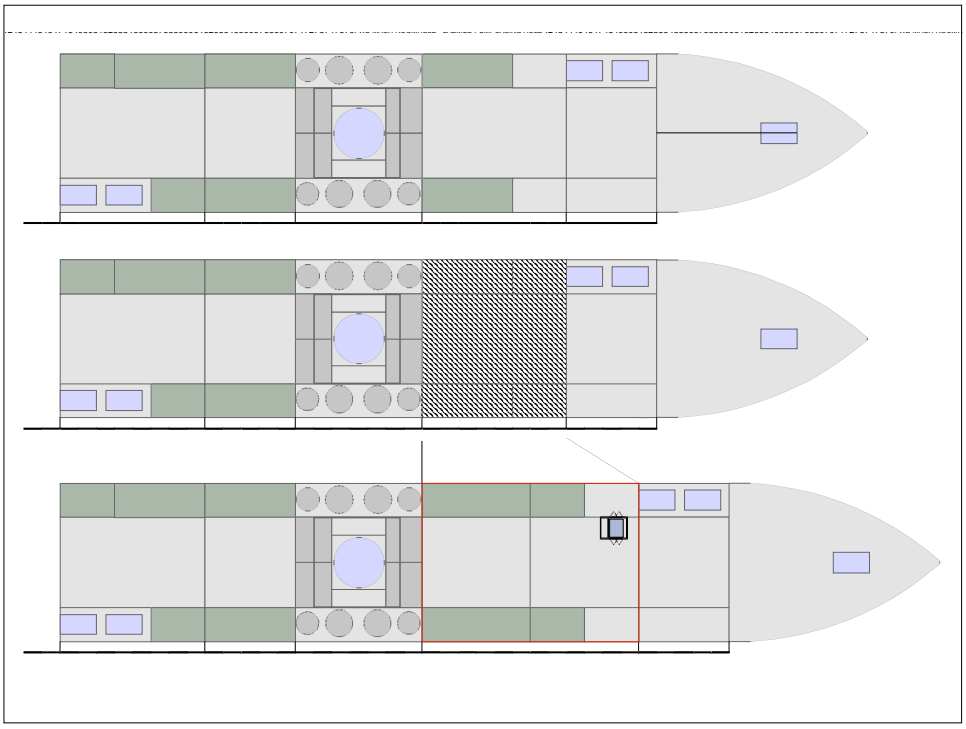


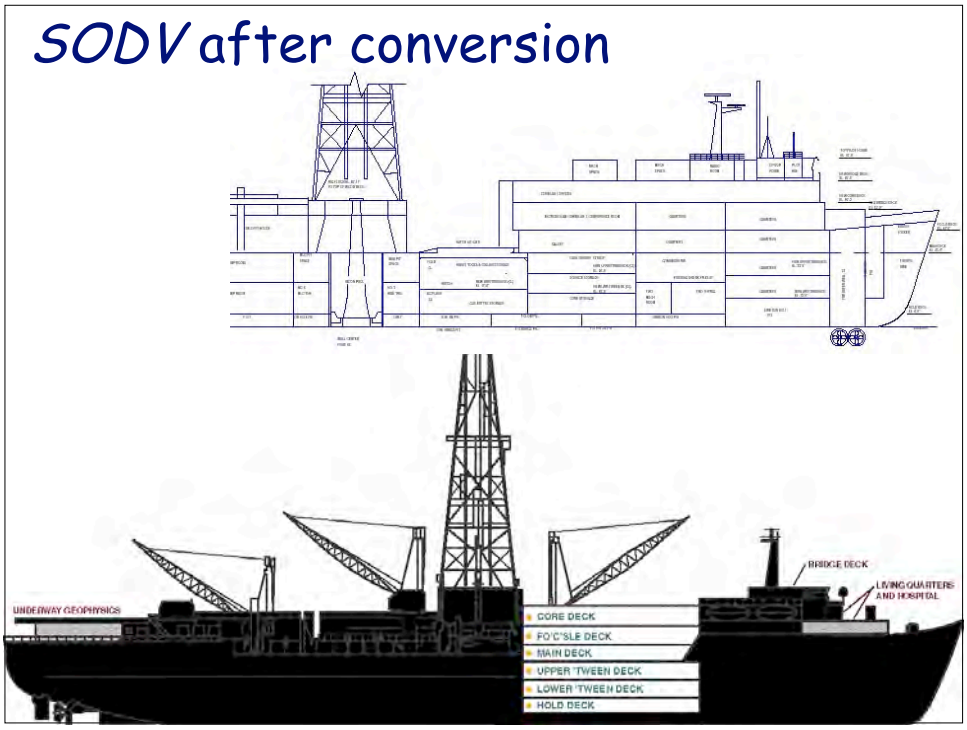
What To Expect

- Ship stretch
- Vessel characteristics
- In the scientific laboratories
- Drilling, coring, logging
- Getting work done
- Living and communicating

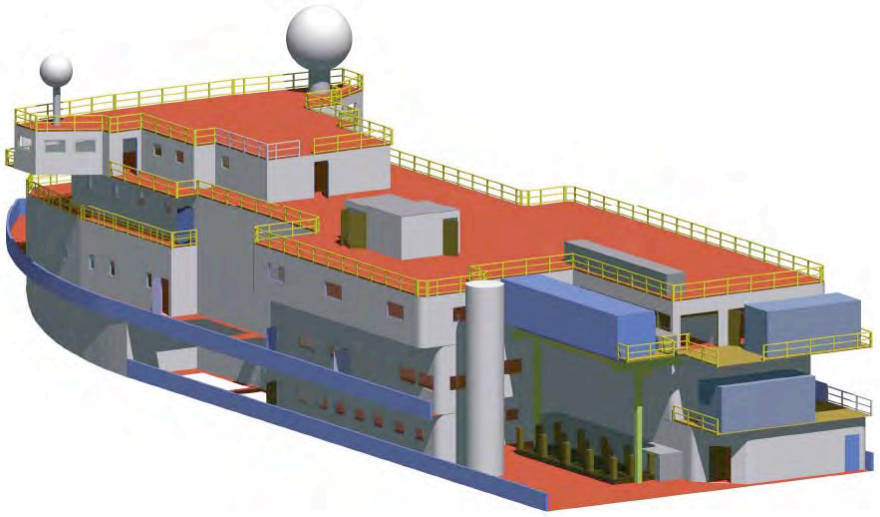
JOIDES Resolution Now






SODV after conversion
UNDERWAY GEOPHYSICS
BRIDGE DECK
LIVING QUARTERS AND HOSPITAL
CORE DECK
FO'C'SLE DECK
MAIN DECK
UPPER 'TWEEN DECK
LOWER 'TWEEN DECK
HOLD DECK

SODV after conversion



Scientific Laboratories

- Increase in lab space (~50%)
- Reconfigured lab spaces
  - Core flow, bottlenecks
  - Flexible space
- New, upgraded, modified scientific equipment
- Evolution with time

Drilling, Coring, Logging

- Reliable and efficient operations
- Rig instrumentation system
- Heave compensation
  - Under discussion
- Logging and downhole tools
  - Capability of handling larger diameter pipe for *logging conveyance*
  - Water depth limitations

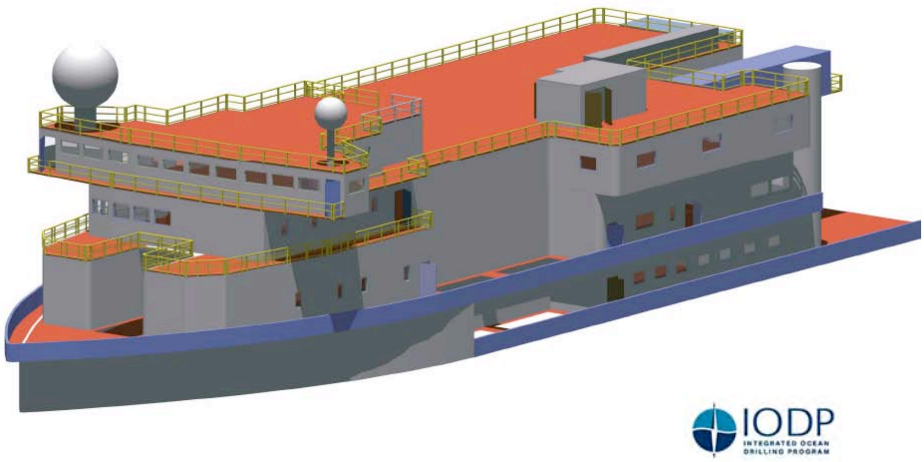
Getting Work Done

- Information technology systems
- Electronic resources
- Print resources in distributed pods
- Work space, interaction space
- Increased shipboard party size

Living and Communicating

- Habitability issues
  - Two person cabins
  - Climate control, noise control
  - Recreation space
- Ship to shore communications

SODV…to have a new name



Specific PAC reaction papers

Laboratory Plans

Vessel extension

Seafloor visualization

Coring recovery & quality/Infrastructure improvement (Drill string stabilization)

Drill pipe diameter

Laboratory Plans

✓ Ample community input (working groups, etc)

✓ Vessel Extension (~50% increase in lab space)

✓ Core handling (main deck, reduce bottle necks)

Equipment priority lists

Priority lists (based on STP) are good (1A, 1B, and 2)

But PAC is concerned about a lack of information on costs for "1A group". Can they all be done? What happens if not?

Vessel Extension

- ✓ ~50% increase in lab space is great
- ✓ Significant improvement in habitability and room for expanded science party
- ✓ Basically, necessary for ship stability

Limited back-up plan

A PAC concern is that we have little in the way of a back up plan if ship extension becomes difficult for some reason.

Seafloor Visualization

- ✓ System needs replacement to ensure program lifetime
- ✓ New system will have improved abilities (pan, tilt, and zoom for example)

Fiber optic cable or not?

Design teams recommend upgrading to fiber optic cable. PAC had been concerned about the $224K cost differential.

Coring Improvement

- ✓ Passive heave compensation to be refurbished
- ✓ Pressure-balanced bumper subs to be considered
- ✓ Monitoring of mechanical specific energy (MSE) to be implemented

Active heave compensation (AHC)?

PAC recommended removing AHC. The drilling design team has recommend keeping it, on an expedition-specific basis.

Drill Pipe Diameter

- ✓ A full string of large diameter pipe has been rejected
- ✓ A tapered string that allows logging with large tools to a depths of ~3000m is still an option
- ✓ Second pipe racker has been converted to handle large diameter pipe
- ✓ Minimum drill string needed for operations has been ordered

3000 meters of 6 5/8" pipe?

PAC would like to see this option if funding is available (later). PAC has also recommended that JOI Alliance consider other means of deployment of these larger tools.

Key Events and Projected Timeline

- What's happened?
  - 12/2005 Drilling contract
  - 1/2006-now Engineering Design Phase
  - Beginning now Shipyard Selection
- What's next?
  - Shipyard contract award
  - Conversion in shipyard
  - Testing and acceptance

To IODP in second half of 2007

USIO

USIO Report Part 2 of 4

Engineering

STP Meeting, Helsinki

June 26, 2006

USIO

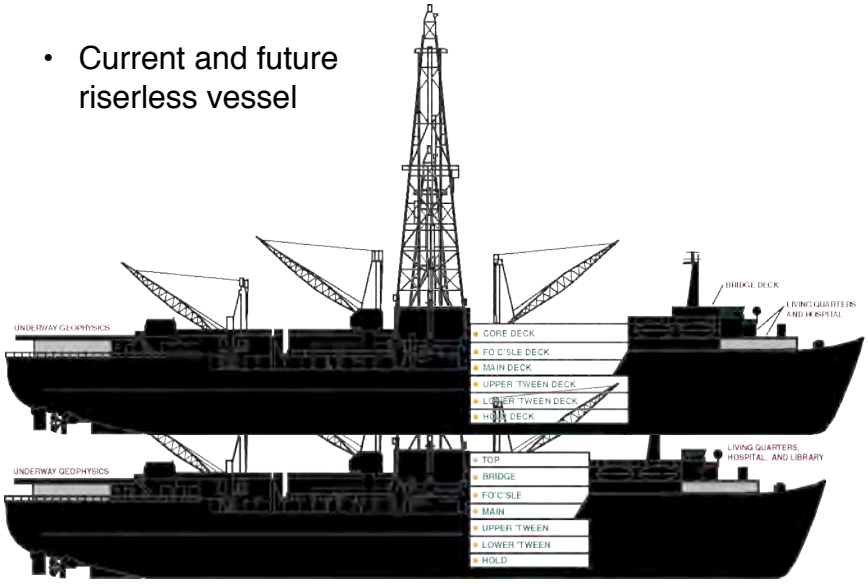
Introduction

- Vessel extension
- Laboratory layouts
- Drill pipe
- Heave compensation
- Subsea visualization
- DSS/RMM and PTM
- Downhole T, P, and water sampling

Vessel Extension

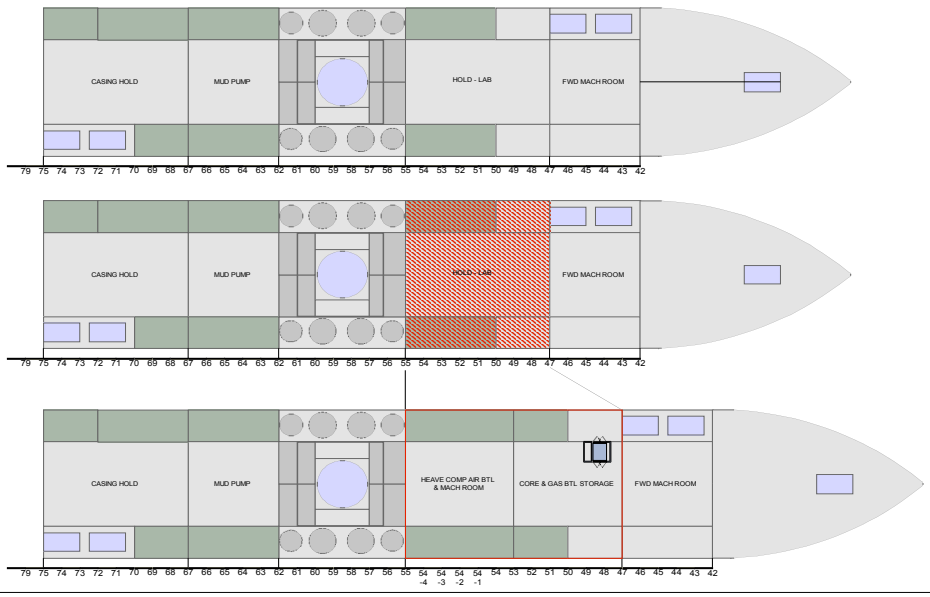
USIO

- Current and future riserless vessel



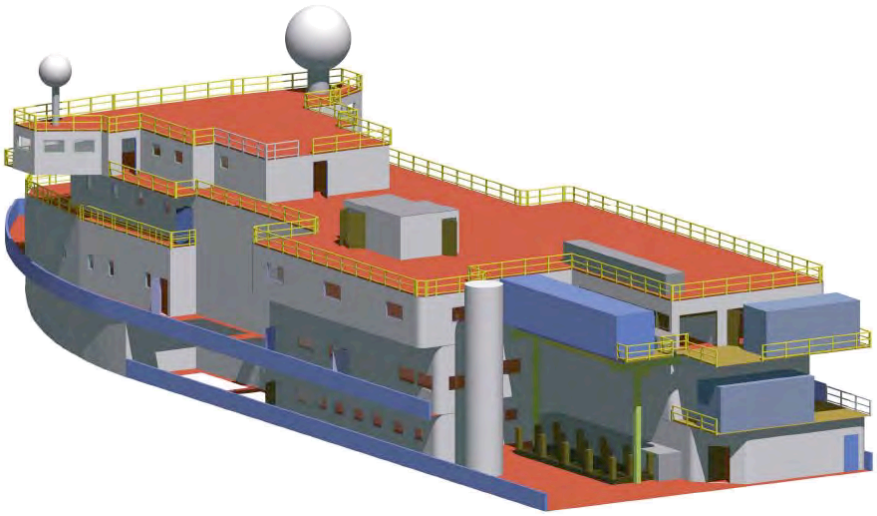
Vessel Extension

USIO



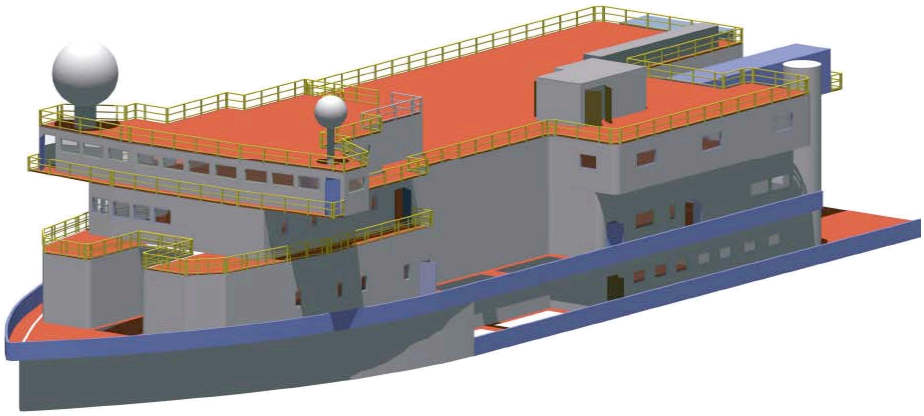
Vessel Extension

USIO



Vessel Extension

USIO



SODV Laboratories Layouts

USIO

- All Corelab layout recommendations from the last STP meeting are being implemented
  - Except: Core splitting room stays in center of Corelab
- Chemistry, microbiology, and paleontology area was significantly re-designed
  - Ample input from internal and external stakeholders
  - All STP recommendations are incorporated
    - Traffic from core receiving platform to paleo and chemistry/microbiology labs was streamlined

SODV Laboratories Layouts

USIO

- Other work environments (last STP
  - Larger conference room in design
  - Science study/library will provide quiet working environment for ~16 people
    - Will maintain a limited library of original (hard) resources
  - Large tables for seismic lines will be available in downhole lab, conference room, and (limited size) in Geophysical Analysis area.

Drill Pipe

USIO

- Large diameter drill pipe objectives
  - Improve log resolution using larger diameter tools Some IODP wireline slim-hole tool technology is 20-30 years old
    - Improvements in minimum measurement capabilities:
      - e.g., Increased measurement resolution (e.g. wide-swath images)
      - e.g., Large-hole clamping capacity (e.g., VSP)
      - e.g., Less downhole logging time (e.g., shorter tool strings, faster sampling)
  - Allows new downhole measurements
    - NMR (nuclear magnetic resonance)
    - Geochemical spectroscopy
    - In situ bulk permeability
    - In situ fluid sampling
  - Does not include larger diameter cores

Drill Pipe

USIO

- Large diameter drill pipe study
  - Commissioned study ($85K) with Stress Engineering and Howard and Associates (June)
    - Viability of a 6 5/8" x 5" Tapered string and associated changes, including handling equipment.
    - Analysis of existing equipment and proposed equipment for handling 6 5/8" pipe.
    - Identification of all potential drill string configurations
    - Comparison chart on drilling depths under various conditions.
    - Review of previous studies surrounding ODP pipe
    - New analysis of 6 5/8" pipe and existing guidehorn
    - Specifications for selected pipe for bid process

Drill Pipe

USIO

- Drill pipe status
  - Converted additional 5” pipe racker to handle 6 5/8” pipe
  - Completed planning for new drill string (currently based on tapered string)
  - Preparing specifications on drill pipe to go out for quotes
    - Purchase 2800 m of 5” Drill Pipe ASAP
    - Split order of 5 ½” Drill Pipe
    - Order 1300 m of 5 ½” Drill Pipe ASAP
  - Decision of purchasing 3000 m of 6 5/8 pending assessment (summer)
  - Cost estimate to move to a 6 5/8” tapered string is $2,214,000

Heave Compensation

USIO

- Objectives
  - Improved core recovery
  - Improved core quality
  - Land equipment at sea floor safely and efficiently
- Current capabilities
  - Passive heave compensation (PHC)
  - Active heave compensation (AHC)
    - Can only rune PHC or AHC at any one time
    - Little ability to adjust or “tune” the system to reduce cross-coupling effects while operating
  - System controls motion at the top and this does not necessarily translate to control weight at the bit

Heave Compensation

USIO

- Market research
  - System performance varies with respect to the system arrangement and the type of vessel
  - Depending on the vessel and the system there can be as much as a 10x variance in performance.
- Status
  - PHC will be refurbished
  - AHC: fate to be determined
    - Effectiveness has been questioned

Subsea Visualization

USIO

- Subsea visualization objectives
  - Re-entries
  - Seafloor Surveys
  - Borehole observation – Safety
  - Specialized equipment observation
  - Geological and biological observation
  - Reliability and improved visualization

Subsea Visualization

USIO

- Current VIT Capability
  - ~7 km water depth capability (10,000 psi)
  - Sonar Head
  - Remote Video Camera B/W Fixed Focus, no pan/tilt
  - Vibration Isolated Television (VIT) frame
  - Hydraulic Winch with 22,000' cable (coax)
  - Specialized installation crane (hydraulic)
  - Every situation involving a rotating string involves risk to the umbilical

Subsea Visualization

USIO

- Status
  - Infrastructure in place to accommodate mission specific ROV
    - Power, space for third party equipment, network, phones, video distribution, air, water, drains etc. (JAPEX equivalent ROV)
  - Enhanced VIT system required
    - Current system obsolete, many parts no longer available, winch is in poor condition, video is bandwidth limited and subsea portion is power limited
    - Need pan, tilt, and zoom capability
  - Assessment underway to determine options
    - TAS to prepare recommendations for subsea visualization in June
    - Co-axial or fiberoptics cable?
    - Obtain input from drilling contractor and third party for market solutions

Borehole Camera

USIO

- Vessel and coring design team (VCDT) asked LDEO to contact Schlumberger re: camera availability.
  - Schlumberger uses a contract instrument that runs on the Schlumberger wireline.
  - Provides black and white images and is only down-looking.
  - Science requirement is side looking, operations drives down-looking.
  - All commercial vendors identified only down looking *or* side looking (no multi-view angle availability).
  - Biggest issue is keeping the borehole fluid clear enough to see anything.
  - VCDT recommendation: this is not a tool used frequently; could be contracted with Schlumberger on a one off basis for the time being
  - Project was removed from SODV consideration.
  - LDEO was going to continue pursuit of per expedition cost

DSS-RMM Project

USIO

- DSSL: Drilling Sensor Sub
- RMM: Retrievable Memory Module
- Non-SODV; long-term project
- Description:
  - DSS is an instrumented sensor with memory in the BHA
  - Part of the data collected by the DSS is uploaded to the RMM and recovered with each core barrel
  - Provides driller indication of at-bit parameters
    - Weight on bit, torque on bit, pore pressure, annulus temperature
  - Can be used each core barrel run
  - Additional measurements can be added
  - Data are not available until core barrel returns to surface
  - Complete data package not available until DSS is recovered

DSS-RMM Project Background

USIO

- 2001: TAMU contracted with APS Technologies to build a drill collar capable of acquiring drilling dynamics data (DSS-1)
  - Successfully pressure and temperature tested in the laboratory
  - Deployed on Leg 208 (March – April 2003); mechanical failure; repaired
  - APS Technologies contracted to build a second collar, DSS-2, with inductive coupling coils and support electronics
- LDEO partnered with TAMU by modifying an existing downhole tool to create the RMM
- DSS-2 and RMM were deployed on Leg 210 (August – September 2003): mechanical failure
- DSS-1 was converted to include an inductive linking system after Leg 210
- Both DSS and RMM were tested at Schlumberger's Genesis rig in 2005
  - DSS and RMM have never worked in combination
  - Glitch in Schlumberger software to be fixed
  - No known hardware failures
  - RMM ready for sea trials

DSS-RMM-PTM Project

USIO

- FY06 activities
  - Complete acceptance testing for WOB and TOB measurements
  - Testing scheduled for mid September at Schlumberger facility in Sugar Land, Texas
- Development plan after sea trials is to couple DSS-RMM to a mud pulse telemetry system (PTM)
- Description:
  - Mud pulse technology uses drilling fluid as a low frequency acoustic channel that can be used to send signals from a downhole measurement package to the surface
  - Data transmission is accomplished via an encoder that actuates a valve to episodically constrict the drilling fluid flow, sending a pressure pulse up the fluid column to the rig floor
  - A pressure sensor acts as the signal receiver at the rig floor, and a decoder translates the pressure pulses into digital data stream
  - The essential elements (battery, encoder, valve, sensor, decoder) are off-the-shelf technology

DSS-RMM-PTM Project

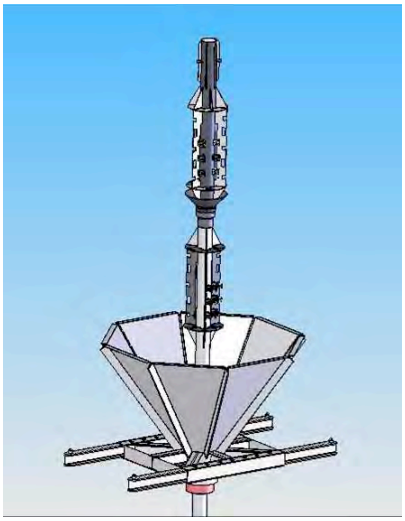
USIO

- FY07
  - Contract feasibility study for PTM to be used with the DSS and RMM to provide real time WOB and TOB measurements while coring
  - Provide real-time drilling parameters (12 bps)
  - Larger data set recovered with each core barrel
  - Complete data set recovered each pipe trip
- FY08
  - Purchase Pulse Telemetry Module (PTM) for use with DSS & RMM
- FY09-FY10
  - Pending positive sea trials and feasibility and design study, fabrication, testing, and implementation
- Cost:
  - ~$1.2 million spent between 2001 and 2010 (each DSS $250K, RMM $100K,
  - PTM $250K each (*2), testing and modifications $100K).
  - Most of the existing DSS and RMM components will be used, however, new or modified parts will be required

CORK Design Work

USIO

- NanTRO SEIZE 2
  - Design of ACORK and CORK II to be installed on NanTRO SEIZE 2 in IODP Phase II
  - Design Review Scheduled for Aug. 2006
- Juan de Fuca II
  - Design of CORK II to be deployed on Juan de Fuca II Expedition in IODP Phase II
  - Work to include design of free flow CORK II head and 10-3/4” – 16” casing seal
  - Tom Pettigrew contracted for design work—design review scheduled



Downhole T, P, and Fluid Sampling

USIO

- APC-deployed Temperature (APCT) Tools
  - FY06: The third party APCT3 tool was tested successfully on Expedition 311
    - Antares electronics modules; coordinated by H. Villinger
    - ODP APC shoe modified by A. Fisher to accommodate Antares electronics
  - FY07 non-SODV budget includes the procurement of five new APCT tools
    - The most likely scenario is for IODP-TAMU to obtain (some of) the existing APCT3 tools and construct additional units
      - 5x electronics
      - computers
- APC methane tool
  - Budgeted electronics upgrade for FY07

Downhole T, P, and Fluid Sampling

USIO

- DVTP/DVTPP
  - Currently using the Davies-Villinger Temperature Probe (DVTP) and Davies-Villinger Temperature and Pressure Probe (DVTPP) tools
  - DVTP and DVTPP use relatively old electronics modules that can be replaced with much smaller and more robust units
  - Upgrade temperature sensor and probe tip
  - Research and develop common data logger to be used in the DVTP/DVTP-P and IWS tools
- IWS
  - FY07: begin 2 year project to redesign hardware and electronics
  - FY08: purchase/fabricate 2 new tools and spares
  - Implement common data logger for IWS, DVTP, DVTPP

Downhole T, P, and Fluid Sampling

USIO

- Hydraulic piston core delivery
  - FY07: budget for design and purchase and testing of equipment for a Hydraulic Piston Delivery System (HPDS)
    - for DVTP/DVTPP and IWS
- Common electronics/data logger package for DVTP, DVTPP, IWS, and APCM tools
  - Features
    - 4x differential inputs (pressure and strain)
    - 4x single-ended inputs (thermistor)
    - 2x control outputs (IWS)
    - 16-bit resolution
  - Multichannel A to D, programmable gain amplification, etc.
- PCS
  - FY07: Begin 2 year project to enhance temperature and pressure measurements
  - FY08: Purchase 3 new tools and spares

Downhole Tool Calibration: Temperature

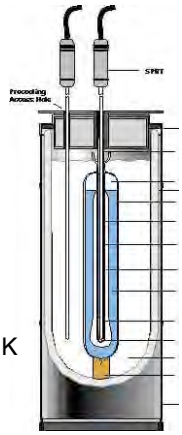
USIO

- Temperature Calibration Facility at TAMU for routine calibration of thermistors used in T tools.
- Calibration of absolute temperature to resistance
  - Standard Platinum Resistive Thermometer (SPRT)
    - W(t)=R(t)/R(0.01°C)
    - Procuring more accurate SPRT
  - Temperature bath (Hart Scientific)
    - Fully automated
    - -10 to 110 degC; ± 0.001 degC

Downhole Tool Calibration: Temperature

USIO

- Annealing of SPRT
  - Annealing furnace (Hart Scientific, Inc.)
    - Annealing relieves the stress on the SPRT caused by mechanical shock
    - Recommended by NIST prior to any calibration of an SPRT
    - 300 -1100 ± 0.5 degC

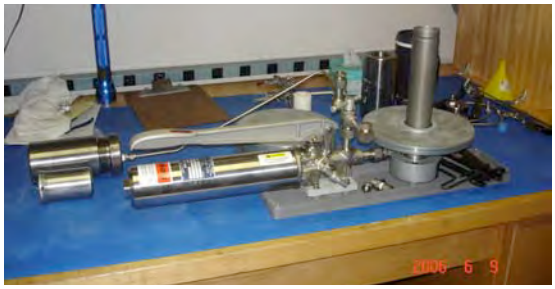


- Calibration of SPRT
  - Triple Point of Water cell (Hart Scientific, Inc.)
    - International Temperature Scale 1990 (ITS-90)
    - Thermal equilibrium of three phases at 273.16 ± 0.0001 K
    - Still need to buy dewer

Downhole Tool Calibration: Pressure

USIO

- Calibration of pressure transducers
  - Dead-weight tester
    - 1000 psi intervals
  - Procuring T, P, and humidity tester for calibration room
    - Will determine if better environmental control is needed for routine calibration work



Downhole Tool Calibration Information

USIO

- All calibration information from all devices will be archived and made available through the LIMS
  - Includes original calibration data as well as coefficients derived from the data and applied to the measurements
- Calibration data will be linked to the measurement data and accessible via web browser through the LIMS
  - According to new standard schema used for all analytical systems

Simulated Borehole Test Facility

USIO

- Riverside test facility (pictures of rig)

Simulated Borehole Test Facility

USIO

Simulated Borehole Test Facility

USIO

Simulated Borehole Test Facility

USIO

- FY06 plans
  - Develop method of consolidating sediments for use in testing
  - Purchase equipment for mixing and consolidating clay
- FY07 plans
  - Test temperature and pressure tools
  - Order dynamometer equipment
- FY08 plans
  - Test of temperature, pressure and fluid sampling tools
  - Complete dynamometer and commission for operation

USIO

Downhole Measurements:

Enhanced Logging

(Separate presentation by Sean Higgins)

SODV

Enhanced Logging

- **Alternatives Considered, Assessment and Any Compromises**
- **Construction Costs, Operating Costs, Impact on Science**

Integrated Ocean Drilling Program
U.S. Implementing Organization
June 15-16 2006

SODV

Why Enhanced Logging?

Enhancements to the logging capability are a key feature of the SODV because, larger logging tools will:

1) Improve log resolution using state-of-the-art technology
   a) Some IODP wireline slim-hole tool technology is 20-30 years old
   b) Large-diameter wireline tools are current industry standard; increasing substitution for slim-hole tool capabilities
      - Logging market survey at www.joiscience.org/MREFC/planning
   c) Off-the-shelf improvements in minimum measurement capabilities:
      - e.g., Increased measurement resolution (e.g. wide-swath images)
      - e.g., Large-hole clamping capacity (e.g., VSP)
      - e.g., Less downhole time (e.g., shorter tool strings, faster sampling)

2) Add NEW downhole measurements
   - NMR (nuclear magnetic resonance)
   - Geochemical spectroscopy
   - *In situ* bulk permeability
   - *In situ* fluid sampling

Proposal Pressure for Large Diameter Logging Tools

SODV

A count of individual proposals reviewed at the last 3 SSEP meetings show the following:

30% = percentage of proposals with proponents requesting measurements requiring large diameter tool deployments (26 proposals out of 87)

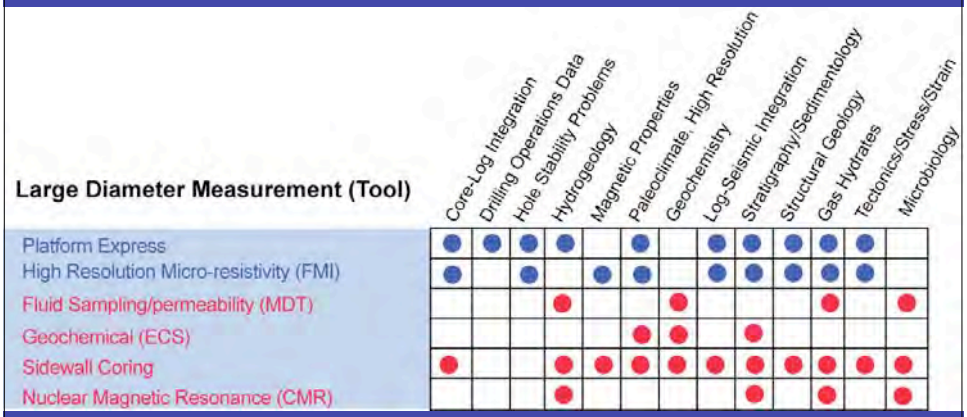
77% = percentage of proposals with all holes at water depths < 3000 m (20 proposals out of 26)

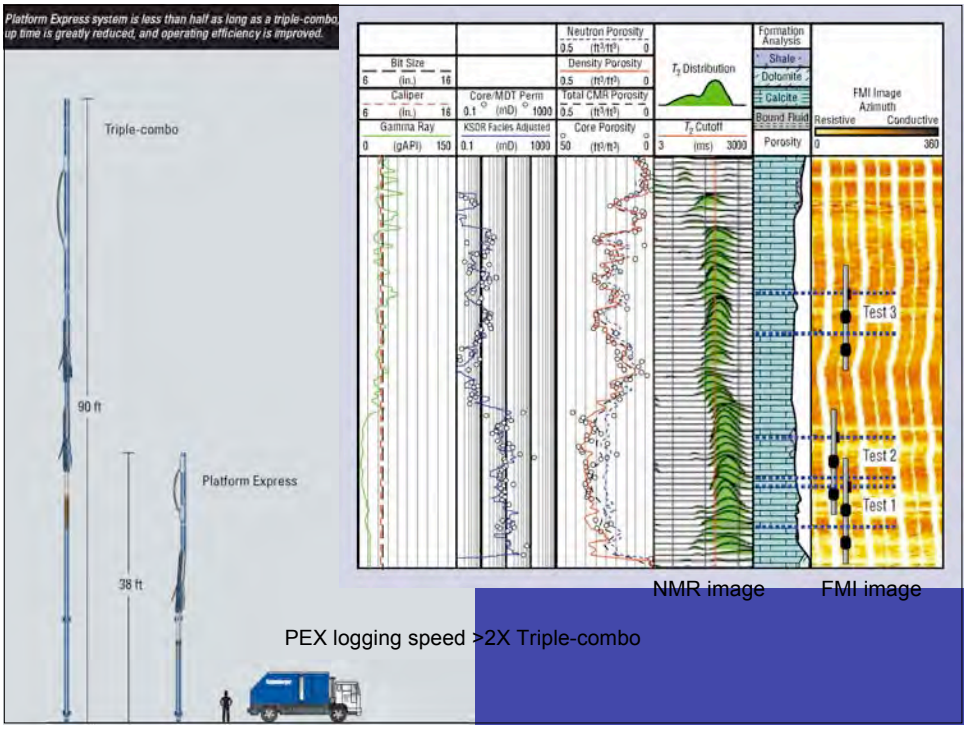
85% = percentage of proposals where all or some of the holes can be logged at water depths < 3000 m (22 proposals out of 26)

Other proposals highlight fluid sampling, permeability, and geochemistry as main scientific objectives. These would potentially benefit from large diameter tool deployments as well

Enhanced Capabilities Brought by Large Diameter Tools

SODV





SODV

IN SITU FLUIDS - why does IODP care?

Scientific objectives:

- Microbiology: enable recovery of pore fluids at in situ P/T conditions
- Hydrogeology: allow pore fluid chemistry and in situ permeability measurements
- Paleo-fluids: enable recovery of dissolved noble gases at in situ conditions
- Fault zones: allow measurement of in situ permeability and fluid composition

Time-lapse measurements:

- Initial conditions: 'snapshot' sampling of pore fluids at in situ conditions after drilling
- Repeat sampling: complement to ACORK (SCIMPI?) measurements at offset sites

Operational Strategies

SODV

For logging operations in water to 3000m

1. A shortened length of 6 5/8" of pipe (approx ~3,000 m) that would allow large diameter deployments in reentry holes
2. Standard large diameter tools such as the platform express and formation micro-imager can be run routinely to water depths of 3000 m
3. Specialty tools such as the fluid sampler or nuclear magnetic resonance tool may be deployed using a mini-leg approach

For operations in water greater than 3000m

1. To log with larger tools in water depths greater than 3000m in existing holes, deployment of additional 6 5/8" pipe in ship/shore-based storage for expedition specific needs, possibly using a pick-up/drop-off strategy (i.e., not onboard at all times)
2. Additional lengths of 6 5/8” pipe could be acquired and stored on land for mini-leg deployments

Logging Benefits Summary

SODV

Deployment of large-diameter logging tools on the riserless vessel are essential for implementation the scientific objectives in the ISP.

Scientific benefits include: recovery of pore fluids at *in situ* conditions, high-density permeability measurements, improved log resolution and state-of-the-art measurements, as well as potential for larger coring and/or 3rd-party downhole tools.

Large-diameter conduit is well-established as the recommended mode of conveyance for large-diameter tool deployment. Alternative modes of conveyance for large-diameter tools are operationally unrealistic and/or incur unacceptable risks.

Operational strategies for deployment of large-diameter pipe are under investigation. Options for shipboard storage and pick-up/drop-off usage are recommended in order to allow for both full drilling depths and large-tool capabilities without limitation on the SODV.

Impacts on Cost and Time when logging with large logging tools

SODV

- **Cost**
  - $2,066,000 additional for 4000 m of 6 5/8" pipe and ancillary equipment
  - ~$42/day difference of lease charges for using standard large diameter measurements (platform express and formation micro-imager)
  - ~$5,000 for free fall funnel needed for each hole logged
  - Special tool deployments are prioritized by SAS/OTF within normal annual program planning process
- **Costs for logistics and additional 6 5/8" pipe (greater than 3000m)**
  - Up to $18,000 per container to ship 6 5/8" pipe round trip from TX to Asia
    - 7 1/2 containers = 3000m
  - Cost of additional pipe approximately $531K per 1000m

Impacts on Cost and Time when logging with large logging tools

SODV

- **Operational Impacts**
  - Round trip to install logging string
  - One reentry required to deploy logging string
  - Rig up and drop of free fall funnel
  - New knobbies can not be made up with iron roughneck and need to be made up with tongs
  - New Drill Collars (large ID) will also have to be made up with tongs
  - Changing out handling equipment x 2
- Summary-
  - Estimated additional time of 12 to 15 hours per hole for logging

Summary of Logging Tool Conveyance Decisions and Capabilities

- Large diameter conduit is the preferred method of deploying large diameter logging tools
- SODV will be capable of storing and utilizing 6 5/8" pipe
- SODV will continue to use a "tapered" string for drilling operations (either 6 5/8" x 5 or 5 ½" x 5")
- Purchase of 2800 meters of 5" and 1300 meters of 5 ½" pipe now
- Delay purchase of additional pipe until shipyard budget is known
- Option remains to either purchase additional 1300 meters of 5 ½" pipe or 4000 meters of 6 5/8" pipe in Fall of 2006
- SODV would be capable of routinely carrying 3000 meters of 6 5/8" pipe which can be used for logging, essentially replacing 5 ½" pipe

USIO

USIO Report Part 3 of 4

SODV Analytical Services: A. Information Management

STP Meeting, Helsinki

June 26, 2006

USIO

Outline

- Introduction
- LIMS
- Sampling/SMCS
- Operations
- Access to data and documentation
- IT support

Introduction - Issues

USIO

- Information management will be more complex in IODP Phase 2 compared to earlier program phases:
  - Evolving user expectations
    - Seamless access to all analytical and operational data
    - Larger data volumes (images, hyperspectral images, video...)
    - Better QA/QC
    - More data types
  - Complex organizations
    - Need better integration of JOI Alliance services
    - First-time integration of three IO services

Introduction - Design Goals

USIO

- Create independent data systems to support specific purposes.
  - Design for continuing change as new data systems are likely to be added periodically
- Link these systems to each other and to applications in a loosely coupled environment
  - The linkages will not be dependent on specific database schemas.
  - Linkages follow IODP-MI plans for metadata capture.
  - Linkages can be reused to connect to external applications.
  - Applications we develop can be used on any data system that matches the linkage.
- Do not duplicate data.; use it from where it is managed.
- Acquire capabilities where they are available and meet our requirements.

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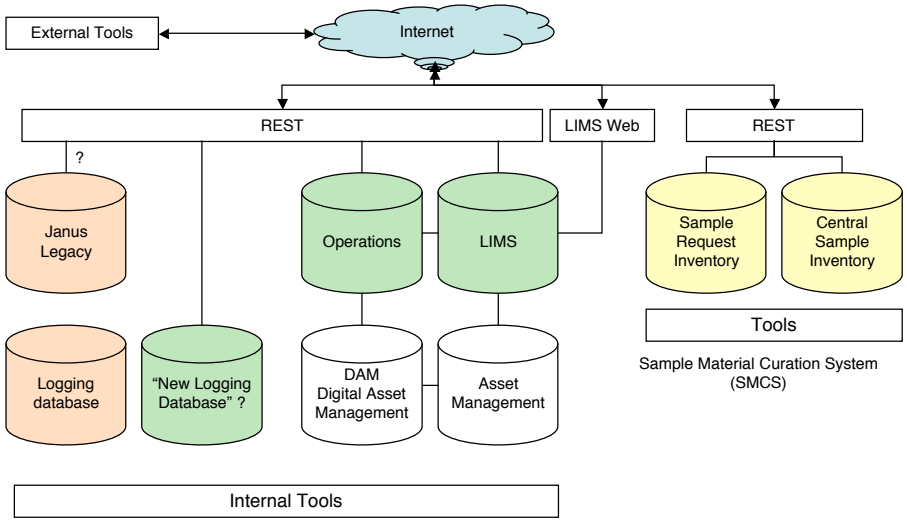
USIO



Information Management - LIMS

USIO

- LIMS = Laboratory Information Management System
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  - SODV 1.2.2.2.1.2. LIMS Blueprint (completed)
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  - A LIMS is essentially a relational database with a suite of supporting applications.
  - Provide sample information capture and management, including more flexible sample type, depth, and age concepts
  - Framework for associating analytical information (instrumental and descriptive and interpretative data) with sample information
  - Framework for the provision of new QA/QC capabilities
  - Provide more versatile and user-friendly data access, including web-based graphical reports
  - Provide workflow management tools

LIMS - Project

USIO

- LIMS Assumptions
  - A commercial, configurable LIMS tool box will provide far more user-requested and extensible features and functions than can be implemented by patching or creating a home-grown system
  - Schedule: Many laboratories in a broad range of industries have successfully implemented LIMS within 0.5-1 year
  - Cost: will be less than for any other ODP/IODP analytical information system built to date.
- LIMS Risks
  - Worst case: many data management tasks will not be automated to the degree intended for the first expedition
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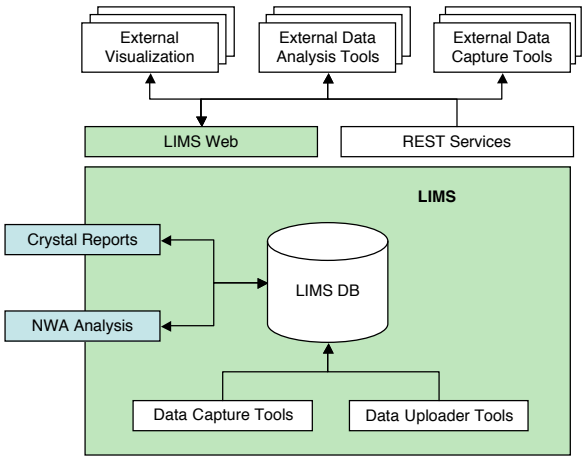
LIMS - Architecture

USIO



LIMS - Features

USIO

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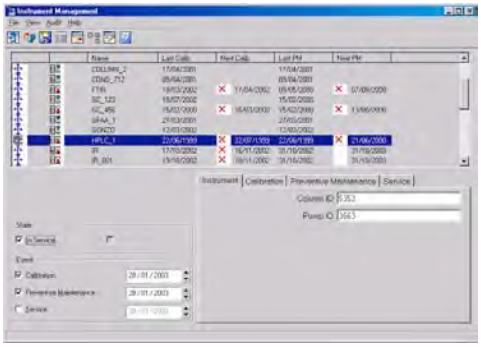
  - The LIMS can interpret data files in a large number of different formats.



LIMS - Features

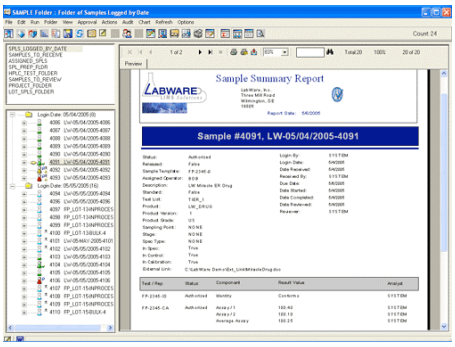
USIO

- Results Review
  - Rich functionality for reviewing and accepting data.
  - Multiple levels of approval can be implemented
    - E.g., analyst and scientist
  - Standard or custom-configure data views
- Control charting (QA/QC)
  - Statistical tool set used to plot trends in QC indicators over time.
  - Uses an integrated and widely used software package called NWA Quality Analyst.

LIMS - Features

USIO

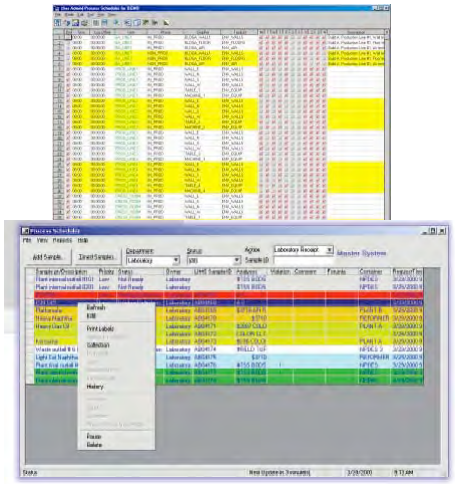
- Reporting
  - Crystal Reports™, which is included with the LIMS, is a powerful and widely used tool for creating report templates.
  - Using this tool, the LIMS can produce tabular and graphical data reports:
    - Generated on the fly by the user
    - "Canned" IODP standard reports



LIMS - Workflow Management

USIO

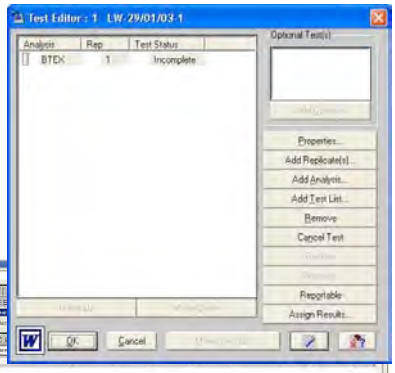
- The LIMS features scheduling tools that display a project's status (e.g., batch of samples for a particular analysis) graphically in a user-configurable color scheme.
- The LIMS can also issue email alerts to appropriate personnel when schedules aren't being met.



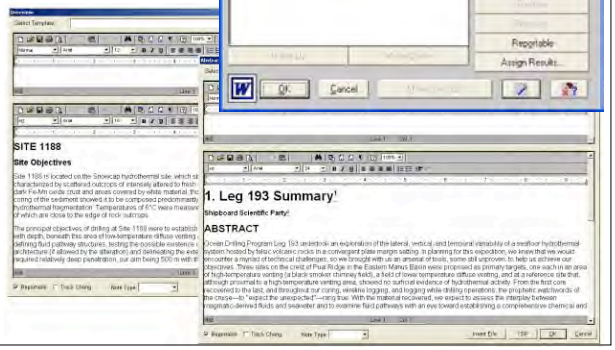
LIMS - Features

USIO

- Document access
  - Clicking the Word icon brings up the analytical method. These icons can be attached anywhere the administrators desire.



- Observations can be entered directly into the LIMS.



LIMS - Depth Framework

USIO

- Design goals
  - Maintain correct position of samples relative to each other regardless of change in core section length with time
  - Infinite number of depth scales can be generated based on
    - Interval shifting of cores relative to the drilled interval in the hole
    - Type of core section length:
      - Originally cut
      - Latest length measurement
      - Length measurement at a certain measurement time (e.g., imaging)
    - Overlaps (caused by core expansion upon recovery) prevented or allowed
  - Provide consistent retrieval to obtain depth for all samples
    - Do not use separate algorithms or applications for different samples
    - Do not use separate algorithms or applications for different depth maps
  - Minimize computation times for sample depths

LIMS - Depth Framework

USIO

- Implications
  - Collection of fractional positioning of samples within core section
  - Collection of core section lengths over time
  - Protocols need to be defined for default displays
  - Move computation time into depth map generation

Information Management - Sampling

USIO

- Sampling Packages (non-LIMS) - Approved/Funded
  - SODV 1.2.2.2.1.4. Sample Request Management
  - SODV 1.2.2.2.1.5. Sample Planning Specification
  - SODV 1.2.2.2.1.6. Sample Planning System
- Sampling Scope
  - Build modular sample request and planning systems that can be used in conjunction with an IODP-central inventory for sample information
- Sampling Assumptions
  - Systems must by suitable for IODP integration
  - No significant cost apart from labor
- Sampling Risks
  - Sample request requirements are well defined and easy to implement - no risk.
  - Sample planning tools will be new and any progress will be a success - no risk

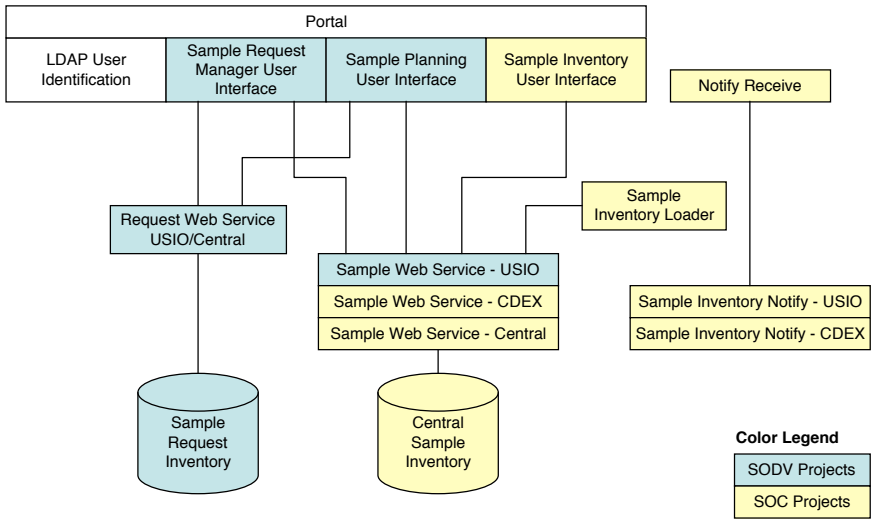
Information Management - SMCS

USIO

- The Sample Material Curation System (SMCS) is a new information management system in response to new organizational paradigms and user requirements.
- SMCS Package
  - SOC - Central Sample Inventory (Sample Material Central Inventory)
- SMCS Scope
  - Provide a central IODP inventory for sample information
  - Original capture of sample information at USIO facilities is covered by LIMS
  - A sample request web application form is covered by SODV work package
  - A first version of a sample planning tool is covered by a SODV package
- SMCS Assumptions
  - Systems must by designed for IODP integration

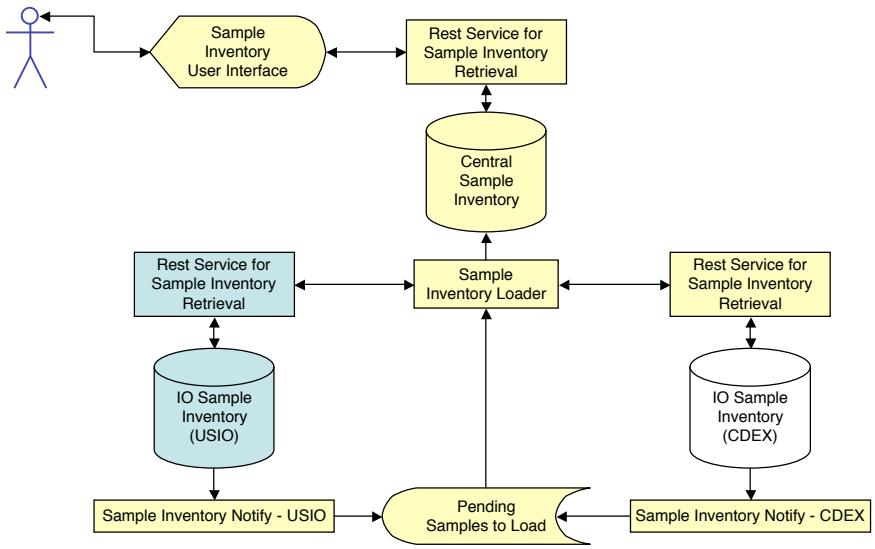
Sampling/SMCS - Project Definition

USIO



SMCS - Use Case

USIO



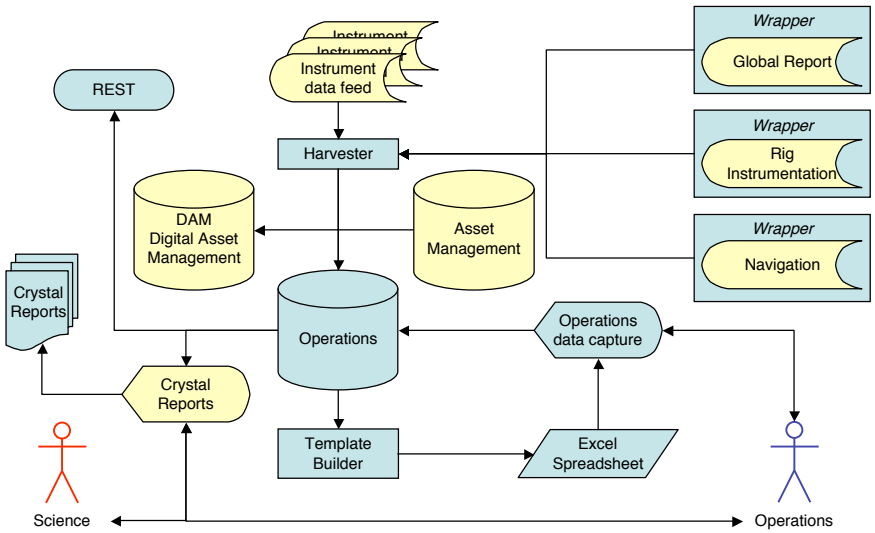
Information Management - Operations

USIO

- Operations Packages - Approved/Funded
  - SODV 1.2.2.2.2.1. Rig Instrumentation System Selection
  - SODV 1.2.2.2.2.2. Operations Information System
  - SODV 1.2.2.2.2.3. Operations and Analytical Integration
- Operations Scope
  - Capture and report operational events and activities, including drilling and other hole-completion information
  - Integrate operational information with analytical information
  - External data systems may include rig instrumentation system, navigation data, and rig crew data system
- Operations Assumptions
  - A number of external operations data capture applications and data storages will have to be wrapped and harvested.
  - No significant cost apart from labor.
- Operations Risk
  - External systems will not be defined in time or provide unforeseen challenges to integration
  - Mitigation: Use a file system initially; implement integration later

Operations - Architecture

USIO



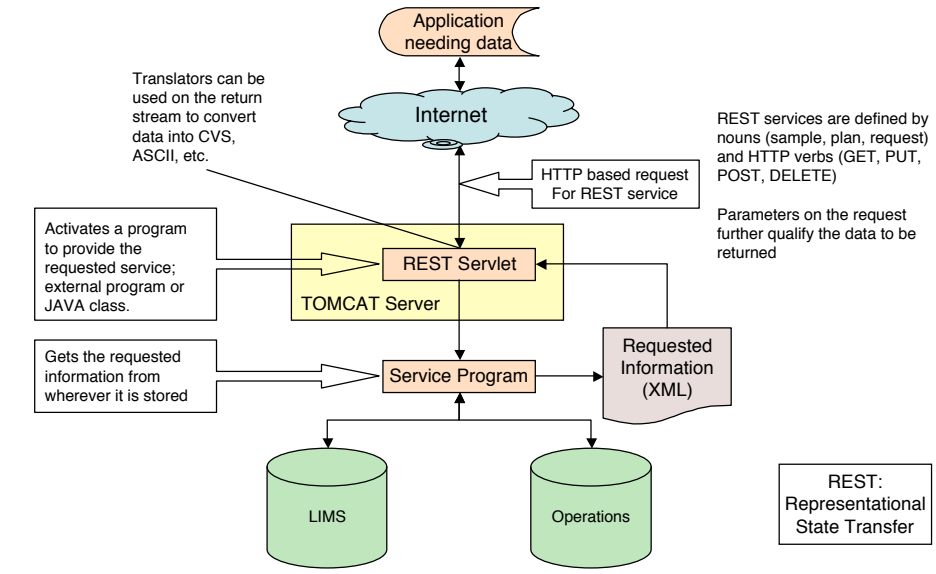
Information Management - Access

USIO

- Information Access Packages (non-LIMS) - Approved/Funded
  - SODV 1.2.2.2.1.7. Document Access
  - SODV 1.2.2.2.1.8. Web Services
- Scope
  - Provide a central storage for technical (and any other) documentation that can be accessed inside and outside of the LIMS
  - Provide a web-services tier that allows external applications to harvest any data from the USIO information repository using standard data exchange formats and protocols
- Assumptions
  - No cost apart from labor
- Risks
  - New capabilities - no risk.

REST-Based Web Services

USIO



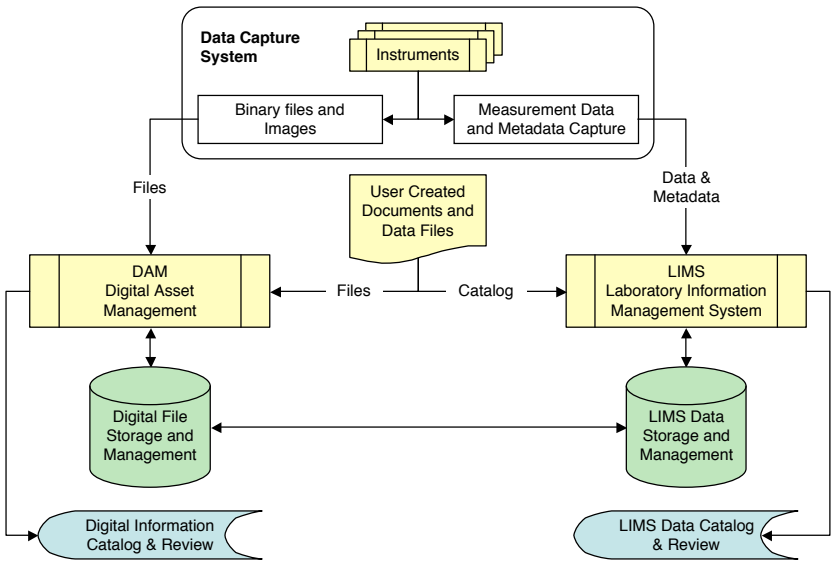
Information Management - DAM

USIO

- A digital asset management (DAM) system provides a consistent access method to all types of binary information
  - Data can be moved between locations without breaking the link within the LIMS database
  - Provides reliable cataloging tool for managing all kinds of files received during an expedition
    - Raw instrument data
    - Excel, Word, etc.
    - Operations file
- Can include access to manuals, procedures, and other documentation files that are saved and used within the LIMS

DAM - Architecture

USIO



IT Support

USIO

- Facilitate use of personal laptops
  - Space
    - Upper Tween science study provides 16 spaces
      - >> do we need to provide machines?
    - More spaces will be available here and there
  - Need to implement programmatic way to review/check personal machines to prevent hazards
  - Wireless access is very likely
- Storage and backup
  - 1-2 orders of magnitude more data volume
  - Backups in port needs to be done differently
- Provision of personal data copies
  - Is this a program responsibility? What? How?

USIO

USIO Report Part 3 of 4

SODV Analytical Services: A. Information Management

STP Meeting, Helsinki

June 26, 2006

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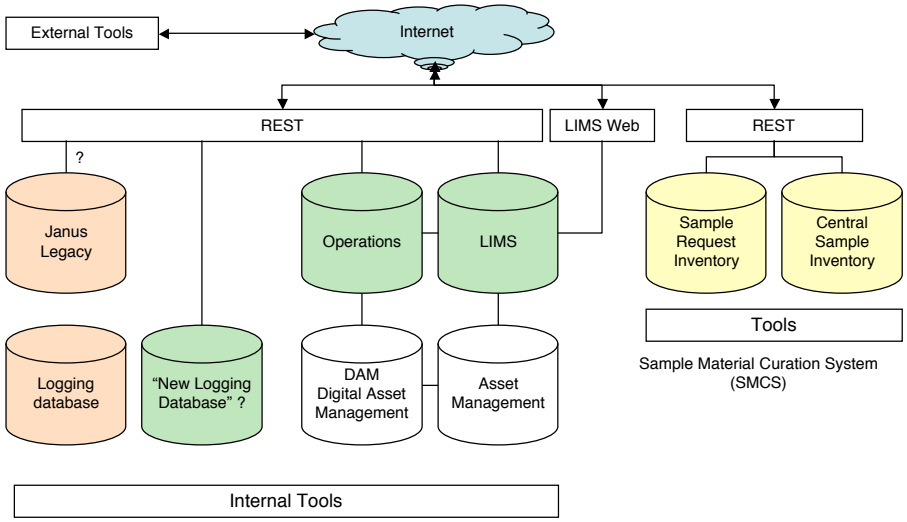

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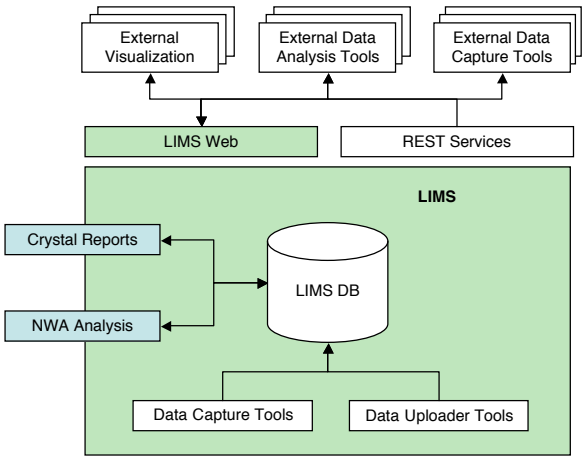

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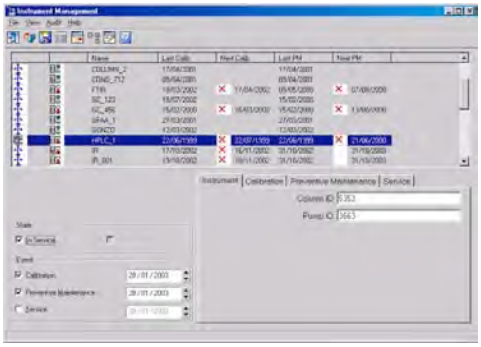
  - Modules exist to interface standard analytical instruments directly
  - The LIMS can interpret data files in a large number of different formats.



LIMS - Features

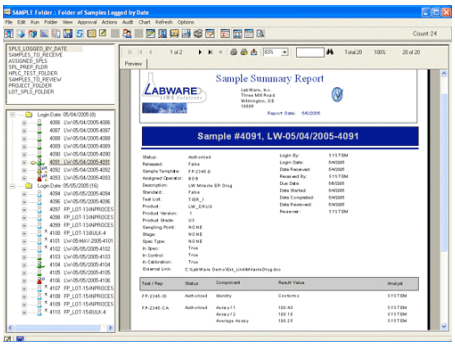
USIO

- Results Review
  - Rich functionality for reviewing and accepting data.
  - Multiple levels of approval can be implemented
    - E.g., analyst and scientist
  - Standard or custom-configure data views
- Control charting (QA/QC)
  - Statistical tool set used to plot trends in QC indicators over time.
  - Uses an integrated and widely used software package called NWA Quality Analyst.

LIMS - Features

USIO

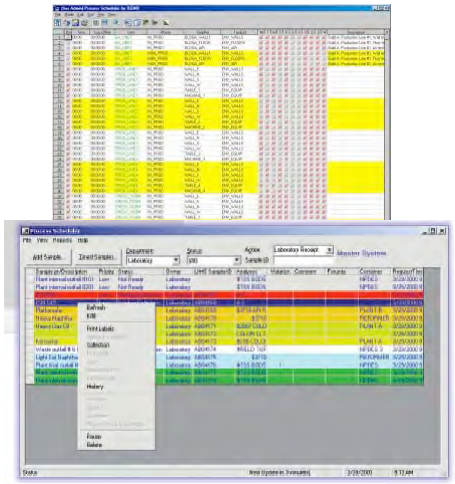
- Reporting
  - Crystal Reports™, which is included with the LIMS, is a powerful and widely used tool for creating report templates.
  - Using this tool, the LIMS can produce tabular and graphical data reports:
    - Generated on the fly by the user
    - "Canned" IODP standard reports



LIMS - Workflow Management

USIO

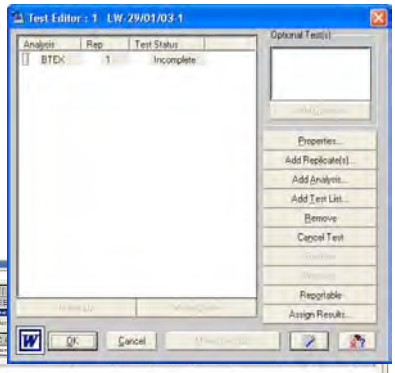
- The LIMS features scheduling tools that display a project's status (e.g., batch of samples for a particular analysis) graphically in a user-configurable color scheme.
- The LIMS can also issue email alerts to appropriate personnel when schedules aren't being met.



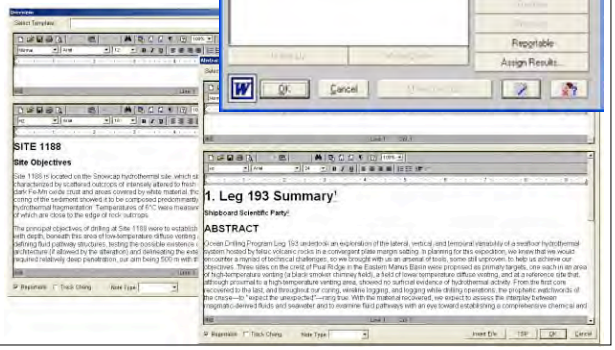
LIMS - Features

USIO

- Document access
  - Clicking the Word icon brings up the analytical method. These icons can be attached anywhere the administrators desire.



- Observations can be entered directly into the LIMS.



LIMS - Depth Framework

USIO

- Design goals
  - Maintain correct position of samples relative to each other regardless of change in core section length with time
  - Infinite number of depth scales can be generated based on
    - Interval shifting of cores relative to the drilled interval in the hole
    - Type of core section length:
      - Originally cut
      - Latest length measurement
      - Length measurement at a certain measurement time (e.g., imaging)
    - Overlaps (caused by core expansion upon recovery) prevented or allowed
  - Provide consistent retrieval to obtain depth for all samples
    - Do not use separate algorithms or applications for different samples
    - Do not use separate algorithms or applications for different depth maps
  - Minimize computation times for sample depths

LIMS - Depth Framework

USIO

- Implications
  - Collection of fractional positioning of samples within core section
  - Collection of core section lengths over time
  - Protocols need to be defined for default displays
  - Move computation time into depth map generation

Information Management - Sampling

USIO

- Sampling Packages (non-LIMS) - Approved/Funded
  - SODV 1.2.2.2.1.4. Sample Request Management
  - SODV 1.2.2.2.1.5. Sample Planning Specification
  - SODV 1.2.2.2.1.6. Sample Planning System
- Sampling Scope
  - Build modular sample request and planning systems that can be used in conjunction with an IODP-central inventory for sample information
- Sampling Assumptions
  - Systems must by suitable for IODP integration
  - No significant cost apart from labor
- Sampling Risks
  - Sample request requirements are well defined and easy to implement - no risk.
  - Sample planning tools will be new and any progress will be a success - no risk

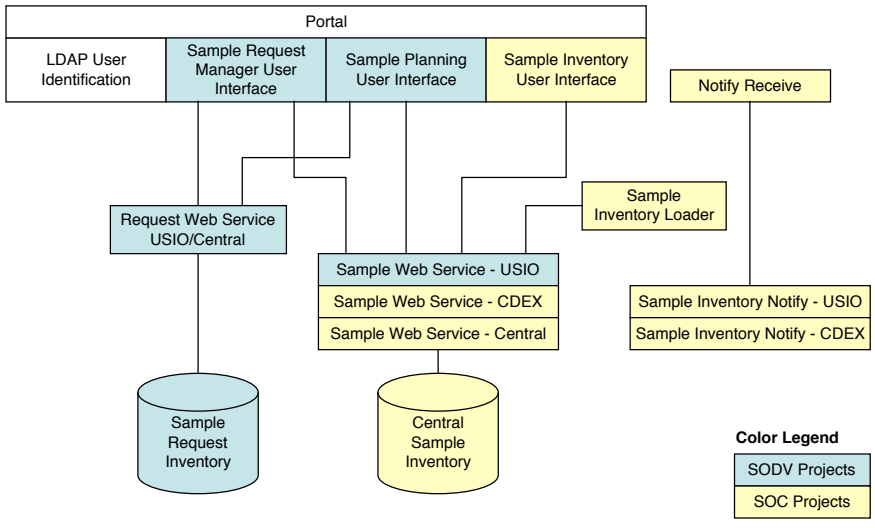
Information Management - SMCS

USIO

- The Sample Material Curation System (SMCS) is a new information management system in response to new organizational paradigms and user requirements.
- SMCS Package
  - SOC - Central Sample Inventory (Sample Material Central Inventory)
- SMCS Scope
  - Provide a central IODP inventory for sample information
  - Original capture of sample information at USIO facilities is covered by LIMS
  - A sample request web application form is covered by SODV work package
  - A first version of a sample planning tool is covered by a SODV package
- SMCS Assumptions
  - Systems must by designed for IODP integration

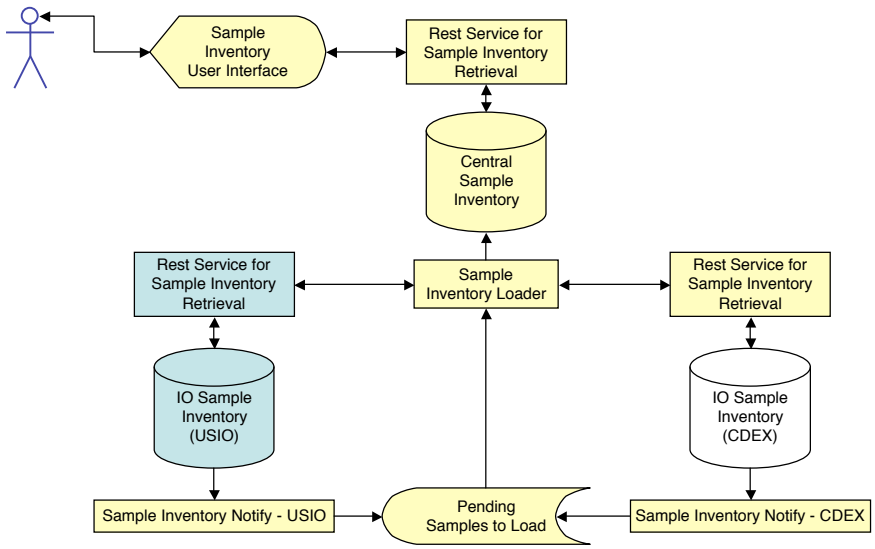
Sampling/SMCS - Project Definition

USIO



SMCS - Use Case

USIO



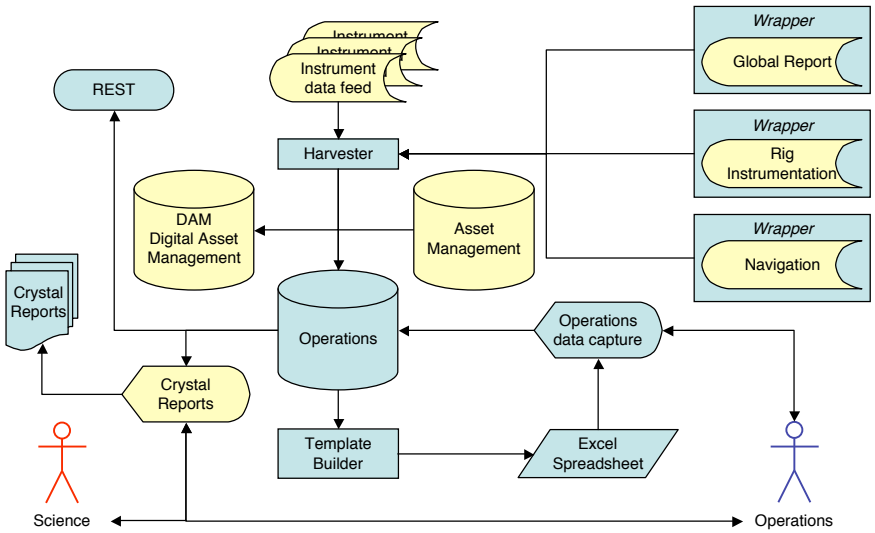
Information Management - Operations

USIO

- Operations Packages - Approved/Funded
  - SODV 1.2.2.2.2.1. Rig Instrumentation System Selection
  - SODV 1.2.2.2.2.2. Operations Information System
  - SODV 1.2.2.2.2.3. Operations and Analytical Integration
- Operations Scope
  - Capture and report operational events and activities, including drilling and other hole-completion information
  - Integrate operational information with analytical information
  - External data systems may include rig instrumentation system, navigation data, and rig crew data system
- Operations Assumptions
  - A number of external operations data capture applications and data storages will have to be wrapped and harvested.
  - No significant cost apart from labor.
- Operations Risk
  - External systems will not be defined in time or provide unforeseen challenges to integration
  - Mitigation: Use a file system initially; implement integration later

Operations - Architecture

USIO



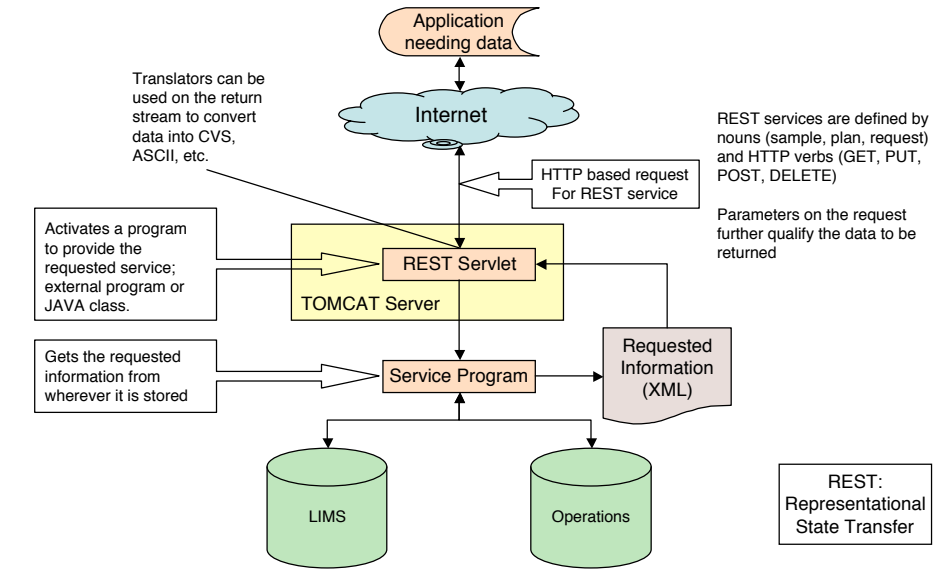
Information Management - Access

USIO

- Information Access Packages (non-LIMS) - Approved/Funded
  - SODV 1.2.2.2.1.7. Document Access
  - SODV 1.2.2.2.1.8. Web Services
- Scope
  - Provide a central storage for technical (and any other) documentation that can be accessed inside and outside of the LIMS
  - Provide a web-services tier that allows external applications to harvest any data from the USIO information repository using standard data exchange formats and protocols
- Assumptions
  - No cost apart from labor
- Risks
  - New capabilities - no risk.

REST-Based Web Services

USIO



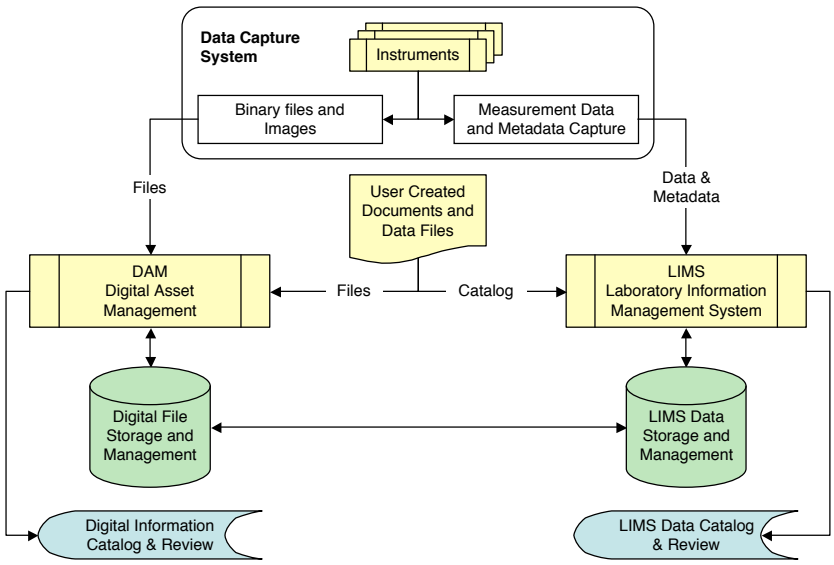
Information Management - DAM

USIO

- A digital asset management (DAM) system provides a consistent access method to all types of binary information
  - Data can be moved between locations without breaking the link within the LIMS database
  - Provides reliable cataloging tool for managing all kinds of files received during an expedition
    - Raw instrument data
    - Excel, Word, etc.
    - Operations file
- Can include access to manuals, procedures, and other documentation files that are saved and used within the LIMS

DAM - Architecture

USIO



IT Support

USIO

- Facilitate use of personal laptops
  - Space
    - Upper Tween science study provides 16 spaces
      - >> do we need to provide machines?
    - More spaces will be available here and there
  - Need to implement programmatic way to review/check personal machines to prevent hazards
  - Wireless access is very likely
- Storage and backup
  - 1-2 orders of magnitude more data volume
  - Backups in port needs to be done differently
- Provision of personal data copies
  - Is this a program responsibility? What? How?

IODP
INTEGRATED OCEAN DRILLING PROGRAM

STP Meeting

26th - 28th June 2006, Helsinki

ECORD Science Operator (ESO) Report

Ursula Röhl (Bremen) & Jenny Inwood (Leicester)

ECORD
ESO ECORD Science Operator
Universität Bremen marum
EPC
BGS British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL

ACEX IODP Expedition 2004

- Expedition Report published 7th March
- 3 *Nature* papers published 1st June
  - Extensive associated outreach; many hundreds of news stories have been generated.
- 2nd Post-cruise meeting held in Sicily, May 22-24th

IODP Expedition 310: Tahiti Sea Level

ECORD

ECORD Science Operator

IODP Expedition 310: Tahiti Sea Level

Offshore operation

October – November 2005

Objectives:

- To establish the course of post-glacial sea-level rise at Tahiti, i.e. to define the exact shape of the deglaciation curve for the period 20 to 10kyr BP.
- To define SST variations for the region over the period 20 to 10kyr BP.
- To analyze the impact of sea-level changes on reef growth and geometry.

ECORD

ECORD Science Operator

IODP Expedition 310: Tahiti Sea Level

Total drilled length	1099.83 m
Total recovered	632.12 m
Average recovery	57.47 % (+ ca. 20% porosity)
Duration	43 days
Water depth	41 – 117 m

IODP Expedition 310: Tahiti Sea Level

DP Hunter, offshore Tahiti	Onshore Science Party, Bremen
Core catcher description Core catcher photography Whole-core multi-sensor core logging (MSCL) · density · velocity · magnetic susceptibility · electrical resistivity Microbiology · activity testing by ATP monitoring · exoenzymes activity · microscopy (DAPI staining) Inorganic geochemistry · pH · alkalinity · ammonia concentration · chlorinity Downhole logging · optical imaging · acoustic imaging · borehole fluid temperature and pressure · electrical conductivity · pH · oxydo-reduction potential (Eh) · spectral natural gamma-ray · induction resistivity · full waveform sonic · caliper	Split-core visual core description Full-core and close-up photography Discrete sample index physical properties · compressional p-wave velocity · bulk, dry and grain density · water content, porosity and void ratio Thermal conductivity (where possible) Color reflectance of split-core surface at discrete points Continuous digital line-scanning of split-core surface Inorganic geochemistry · dissolved cations · bromide, chloride and sulphate concentrations · dissolved phosphate · chlorinity X-ray fluorescence analysis · 14 samples from Hole M0008A Microbiology* · SEM analysis (including SEM-EDAX analysis) · Cultivation of microorganisms · Culturing Mineralogy · X-ray diffraction (XRD) analysis · Thin sections descriptions

* Analyses conducted at the Swiss Federal Institute of Technology (ETH) Zürich, Switzerland, between the end of the offshore phase and the beginning of the Onshore Science Party.

From: Expedition 310 Scientists, 2006. Tahiti Sea Level Expedition. *IODP Prel. Rept.*, in press.

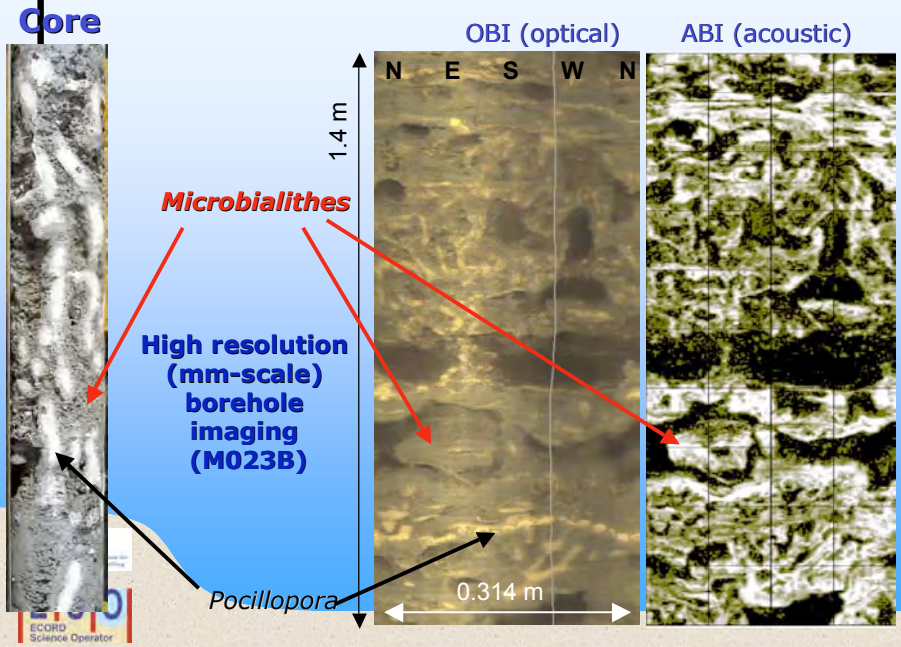
IODP Expedition 310: Tahiti Sea Level

Downhole Logging and Petrophysics Program

10 boreholes logged (partly or entirely): >66 runs downhole

- **Optical images** (for mm-scale geological description)
- **Acoustic images** (for cm-scale impedance and mesoscale porosity)
- **Spectral gamma logging** (for U, Th, K and red algaes)
- **Acoustic velocity logging** (for Vp and Vs at 10 to 20 kHz)
- **Induction resistivity logging** (for pore fluid salinity and porosity)
- **Hydrochemical borehole fluid logging** (with p, T, pH, Eh, SP and fluid electrical conductivity to identify fluid circulations)
- **Hole size (caliper)** (for more precise data analyses)
- **550 cores logged on the MSCL** (>70 with 2+ sections)

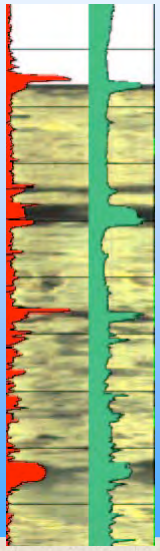
IODP Expedition 310: Tahiti Sea Level



IODP Expedition 310: Tahiti Sea Level

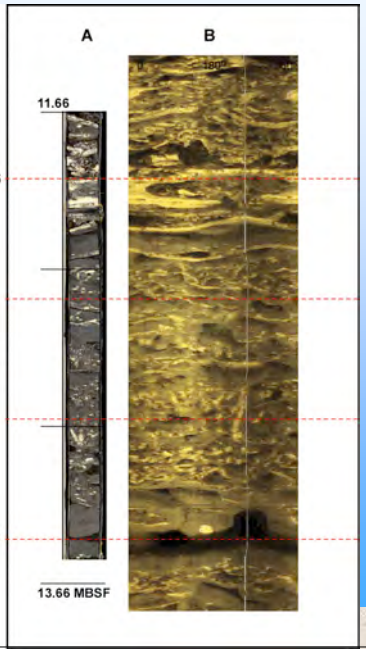
Core location and Macro-porosity (M0009D)

True core recovery > 90 %



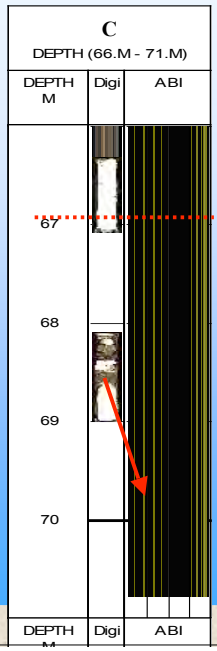
RED: drilling rate
GREEN: pull back pressure

IODP Expedition 310: Tahiti Sea Level



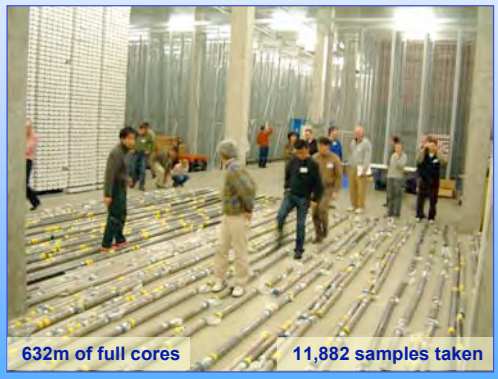
Core-log integration

Left image to be included in logging web summary.



IODP Expedition 310: Tahiti Sea Level

Onshore Science Party
February 13 – March 4, 2006



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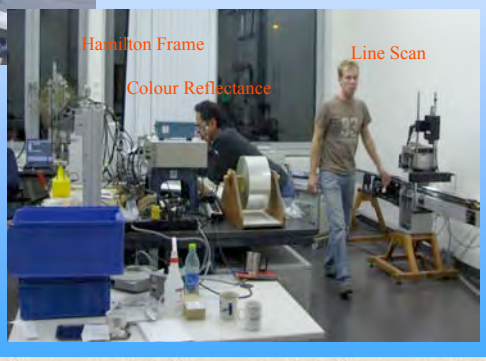
IODP Expedition 310: Tahiti Sea Level



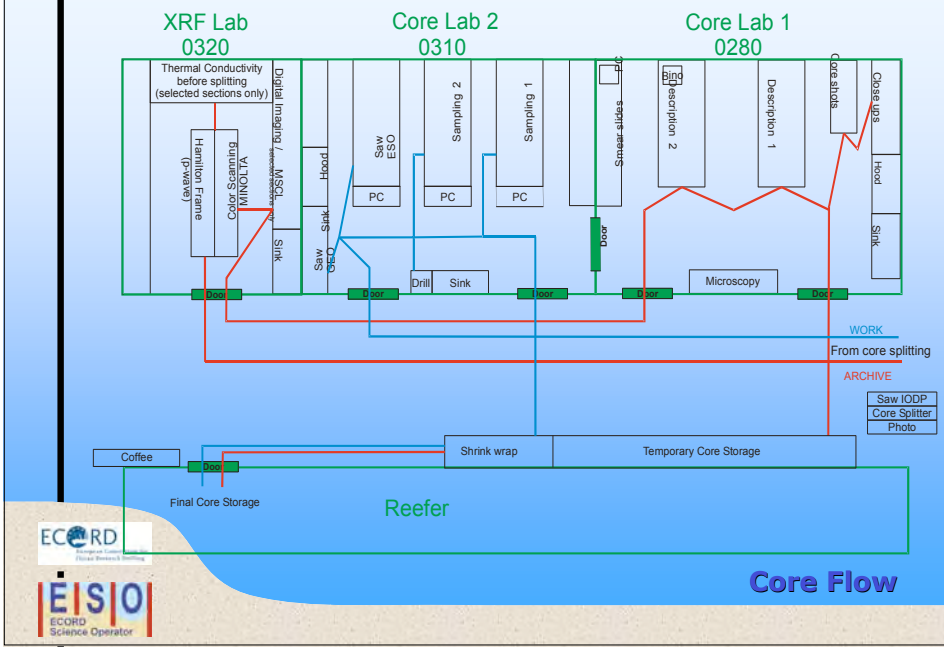

IODP Expedition 310: Tahiti Sea Level

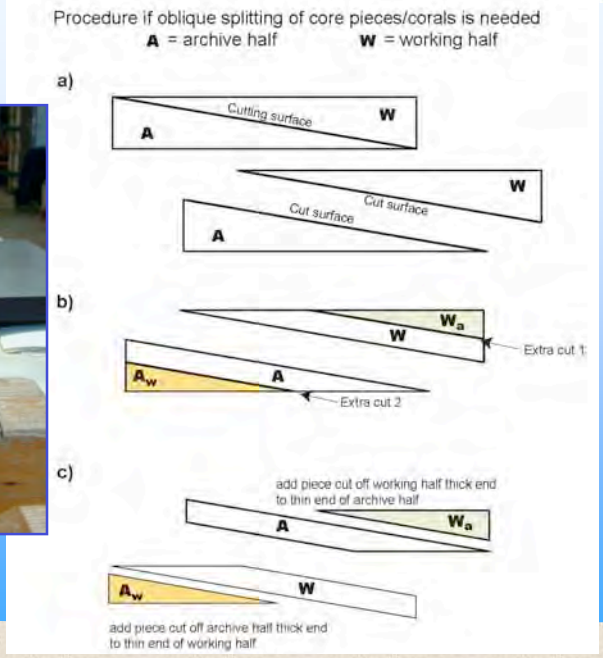
IODP Expedition 310: Tahiti Sea Level

Coral *(Porites)* slab sampling

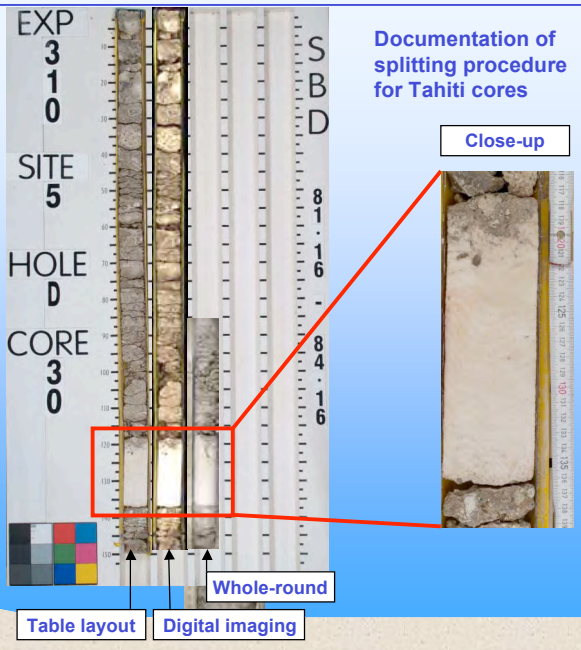
IODP Expedition 310: Tahiti Sea Level



IODP Expedition 310: Tahiti Sea Level



IODP Expedition 310: Tahiti Sea Level



IODP Expedition 310: Tahiti Sea Level

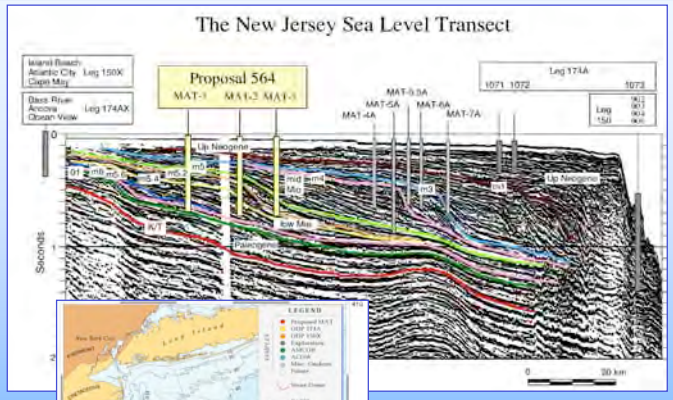
Preliminary Report now available on line:

http://ww.ecord.org/exp/tahiti/310PR.html

IODP Expedition 310: Tahiti Sea Level

Traditional silk screen T-shirt printing

IODP Exp. 313: New Jersey Shallow Shelf



Offshore Operation 2007

Objectives:

- To estimate amplitudes, rates and mechanisms of Paleogene-Neogene eustatic change;
- To evaluate the response of passive continental margin sedimentation to eustatic change.

ECORD Science Operator

IODP Exp. 313: New Jersey Shallow Shelf

- SPC have ruled that 3 holes are necessary to achieve the scientific goals
- Safety survey conducted by an independent contractor
- Tenders were issued to 5 contractors that submitted expressions of interest via the Official Journal of the European Union (OJEU)
  - 4 Contractors responded 10th March
- ESO held meeting in London on 20th March
  - Decided to delay offshore operations until 2007

ECORD Science Operator

IODP Exp. 313: New Jersey Shallow Shelf

- 4 tenders are currently being assessed
- Technical clarifications have been obtained
- Contractual meeting with 'preferred contractor' July 18th
- Aim for May 2007 start, with Onshore Science Party in January-February 2008
  - Platform not certain until contractual discussions take place
  - If jack-up selected as platform, will need geotechnical survey that will satisfy insurance for post-Katrina regulations

IODP Exp. 313: New Jersey Shallow Shelf

- One co-chief appointed (Greg Mountain, USA), UK Co-chief, Steven Hesselbo, expected to confirm acceptance
- Remainder of staffing in advanced stage
  - Japan have agreed to have only 6 places
  - China and Korea 1 each
  - Anticipate 10 US places
  - Anticipate 9 ECORD places (2 – 2 – 2 – 3)
    - 3 are from Finland, Canada and Denmark

IODP MSP Scheduling after FY07

- Coralgal Banks and Chixulub not considered for ranking in March 06
- Possibilities are confined to:
  - FY08-09 Great Barrier Reef At OTF
    - Site survey incomplete, but several proposals
    - Probably Sept-November 2008
  - ? FY09 New England Hydrogeology At OTF
    - Highly ranked but no site survey
    - Many issues to be addressed
    - IODP-MI have set up a scoping group following Operations Task Force meeting

Member (*co-chair)	Petrophysics								Biology & Chemistry						Core description												
	Physical Properties	Downhole Logging	Palaeomagnetics	Downhole Measurements	Seismics	Underway geophysics	Hydrogeology	Observatories	Microbiology	Biochemistry	chemical oceanography	Sediment geochemistry	Organic geochemistry	Igneous geochemistry	Micropalaontology	Structural geology/tectonics	Startigrphic Correlator	Sedimentoogy	Igeous petrology	database	other - please suggest							
																						06-06	07-01	07-07	08-01	08-07	09-01	09-07
Ahagon, Naokazu												X			X			X									
Basile, Christophe		X														X											
Paterno Castillo														X					X								
Beth Christensen															X		X										
Ge, Hongkui	X	X		X																							
Kasahara, Junzo	X	X																									
Korja, Annakaisa	X	X		X																							
Lovell, Mike *	X	X																									
Lyons, Timothy											X	X	X					X									
Mandernack, Kevin									X	X																	
Nunoura, Takuro									X																		
Neal, Clive														X					X			---	VC				
Okada, Makoto *			X																								
Sakamoto, Tatsuhiko	X											X					X	X									
Screaton, Elizabeth		X		X			X																				
Suzuki, Noritoshi															X												
Villinger, Heinrich	X	X		X				X																			
Wheat, Geoffrey		X		X			X	X			X																
Wilkens, Roy	X	X		X																							
Yamamoto, Masanobu											X		X														
JDESC recommendations:																											
Ikehara-san																											
Masuda-san																											
TBN																											
TBN																											

Changes:

Added Stratigraphic correlator
HV add physical properties
BC add Stratigraphic correlator and sedimentology

		Petrophysics								Biology & Chemistry						Core description																				
		Physical Properties	Downhole Logging	Palaeomagnetics	Downhole Measurements	Seismics	Underway geophysics	Hydrogeology	Observatories	Microbiology	Biochemistry	chemical oceanography	Sediment geochemistry	Organic geochemistry	Igneous geochemistry	Micropalaontology	Structural geology/tectonics	Startigrphic Correlator	Sedimentoogy	Igeous petrology	database	other - please suggest															
Expertise	**E-Mail Address**																						01-12	02-06	02-12	03-07	**03-12**	**04-06**	**05-02**	**05-07**	**06-01**	**06-06**	**07-01**	**07-07**	**08-01**	**08-07**	**09-01**	**09-07**
	ahagon@ep.sci.hokudai.ac.jp												×			×			×				---	---	---	---	---	---	X	M	M							
Structural Geology	cbasile@ujf-grenoble.fr		X														X						---	A	---	---	---	---	M	X	M							
Igneous Petrology	pcastillo@ucsd.edu														X					X											M						
Micropaleontology	christensen@adelphi.edu															X		X													M						
geophysics	gehk@cea-igp.ac.cn	X	X		X																		---	---	---	---	---	---	---	M	M							
Geophysics, seismology	ri2j_kshr@ybb.ne.jp	X	X																				---	---	---	---	---	M	M	M	M							
Deep-sea seismics, petrophysics, gravity	annakaisa.korja@seismo.helsinki.fi	X	X		X																		---	---	---	---	---	M	M	M	X							
Downhole measurements, physical properties	mtl@leicester.ac.uk	X	X																				M	X	M	X	M	X	CC	CC	VC							
Chemical oceanography	timothy.lyons@ucr.edu											X	X	X					X				---	---	---	---	M	M	M	M	M							
Biogeochemistry, microbiology	kmandern@mines.edu									X	X												---	---	---	---	M	M	M	M	M							
Microbiology	takuron@jamstec.go.jp									X													---	---	---	---	---	A	---	---	---							
Igneous geochemistry	neal.1@nd.edu														X					X			---	---	M	M	M	M	M	M		---	VC					
Paleomagnetics, paleoceanography	okada@mito.ipc.ibaraki.ac.jp			X																			---	---	---	---	M	CC	CC	CC	C							
Paleoceanography, sedimentology	tats-ron@jamstec.go.jp	X											X					X	X				---	---	---	---	X	M	M	M	M							
Hydrogeology	screaton@geology.ufl.edu		X		X			X															---	---	---	---	M	M	M	M	M							
Micropaleontology	suzuki.noritoshi@nifty.com															X							---	---	---	---	---	---	M	M	M							
observatories logging	vill@uni-bremen.de	X	X		X				X														---	---	---	---	---	M	X	M	M							
observatories	wheat@mbari.org		X		X			X	X			X											---	---	---	---	---	---	M	X	M							
Geophysics, physical properties, logging	rwilkens@hawaii.edu	X	X		X																		---	---	---	---	M	M	M	M	M							
Organic geochemistry, paleoceanography, petroleum geology	myama@ees.hokudai.ac.jp											X		X									---	---	---	---	M	M	M	M	X							
inorganic geochemist	will replace yamamoto-san																																					
geophysics	will replace Kasahara-san																																					
palaeomagnetist	replaces Okada-san post summer 07																																					
palaeontologist	replaces Suzuki-san post summer 07																																					

Member (*co-chair)	Petrophysics								Biology & Chemistry						Core description																		
	Physical Properties	Downhole Logging	Palaeomagnetics	Downhole Measurements	Seismics	Underway geophyisics	Hydrogeology	Observatories	Microbiology	Biochemistry	chemical oceanography	Sediment geochemistry	Organic geochemistry	Igneous geochemistry	Micropalaontology	Structural geology/tectonics	Startigrphic Correlator	Sedimentoogy	Igeous petrology	database	06-06	07-01	07-07	08-01	08-07	09-01	09-07	Japan	US	ECORD
Ahagon, Naokazu												1			1			1			1	1	1					1		
Basile, Christophe		1														1					1	1	1							1
Paterno Castillo														1					1		1	1	1	1	1				1	
Beth Christensen															1		1				1	1	1	1	1				2	
Ge, Hongkui	1	1		1																	1	1	1	1						
Ikehara-san	will replace Yamamoto-san												1									1	1	1	1	1	1	2		
Kasahara, Junzo	1	1																			1	1						3		
Korja, Annakaisa	1															T			1	1	1	1								2
Lovell, Mike *	1	1																			1	1	1	1	1					3
Masuda-san	1							will replace Kasahara-san															1	1	1	1	1			
Nunoura, Takuro									1												1	1	1	1	1	1		4		
Neal, Clive*														1					1			1	1	1	1	1	1		3	
Okada, Makoto			1																		1	1	1					5		
Sakamoto, Tatsuhiko	1											1					1	1			1	1						6		
Suzuki, Noritoshi															1						1	1	1					7		
Villinger, Heinrich	1	1		1				1													1	1								4
Wheat, Geoffrey		1		1			1	1			1										1	1	1						4	
TBN - US																						1	1	1	1	1	1		5	
TBN - US																						1	1	1	1	1	1		6	
TBN - US																						1	1	1	1	1	1		7	
Brueckmann	1					replaces Villinger																	1	1	1	1	1			

06-06
07-01
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09-07

Member (*co-chair)	Petrophysics								Biology & Chemistry						Core description																
	Physical Properties	Downhole Logging	Palaeomagnetics	Downhole Measurements	Seismics	Underway geophysics	Hydrogeology	Observatories	Microbiology	Biochemistry	chemical oceanography	Sediment geochemistry	Organic geochemistry	Igneous geochemistry	Micropalaontology	Structural geology/tectonics	Startigrphic Correlator	Sedimentoogy	Igeous petrology	database	06-06	07-01	07-07	08-01	08-07	09-01	09-07	Japan	US	ECORD
Ahagon, Naokazu												X			X			X									1		
Basile, Christophe		X														X													1
Paterno Castillo														X					X									1	
Beth Christensen															X		X											2	
Ge, Hongkui	X	X		X																										
Ikehara-san	will replace Yamamoto-san												X														2		
Kasahara, Junzo	X	X																									3		
Korja, Annakaisa	X															T			X	X									2
Lovell, Mike *	X	X																											3
Masuda-san	X							will replace Kasahara-san														VC							
Nunoura, Takuro									X																		4		
Neal, Clive*														X					X			VC						3	
Okada, Makoto			X																								5		
Sakamoto, Tatsuhiko	X											X					X	X									6		
Suzuki, Noritoshi															X												7		
Villinger, Heinrich	X	X		X				X																					4
Wheat, Geoffrey		X		X			X	X			X																	4	
TBN - US																												5	
TBN - US																												6	
TBN - US																												7	

06-06
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09-07

A brief review on relations between physical properties of rock core-samples and temperature, pressure and other measurement conditions

Weiren Lin (JAMSTEC)
Koji Masuda (Geological Survey of Japan, AIST)
Osamu Matsubayashi (Geological Survey of Japan, AIST)
Junzo Kasahara (Japan Continental Shelf Survey Co Ltd.)
And
Members of the Working group for non-destructive measurement, J-DESC, Japan

STP Action Item 0601-02

- Priority: Low
- Date: Next meeting
- In order to better interpret in situ measurements, it is recognized that laboratory measurements under in situ temperature and pressure are important. STP should investigate temperature and pressure controlled physical properties measurements for IODP.
- For example, velocity anisotropy, density, porosity, permeability, electrical resistivity, as well as other measurements.
- Lead: Sakamoto, & Screaton, Kasahara, Wilkens, Ge

Contents

- Effects of pressure and high-temperature on Velocities
  - Vp, Vs – pressure, temperature
  - Velocity anisotropy
- Effects of pressure and high-temperature on Permeability
- Effects of pressure and high-temperature on Electric resistivity (conductivity)
- Effects of pressure and high-temperature on Thermal conductivity
- Porosity, Density,
- Problems:
  - Effects of water content (pore water), saturated degree
  - Effects of pore pressure:
    effective pressure=confining pressure – pore pressure?
  - Effects of pressure on fractures and their physical properties

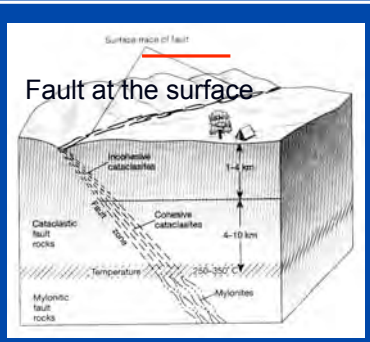
- Others: Dielectric constant (permittivity) , (Specific storage)

Measurements of physical properties under the pressure

Geophysical exploration can not identify the materials

compare

Measurements of physical properties under HPT



estimate

In situ conditions（P，Pp，T），water

Friction and/or fracture under HPT

Elastic-wave speed
Electrical conductivity
permeability

Rock structure (Matrix and Pore)

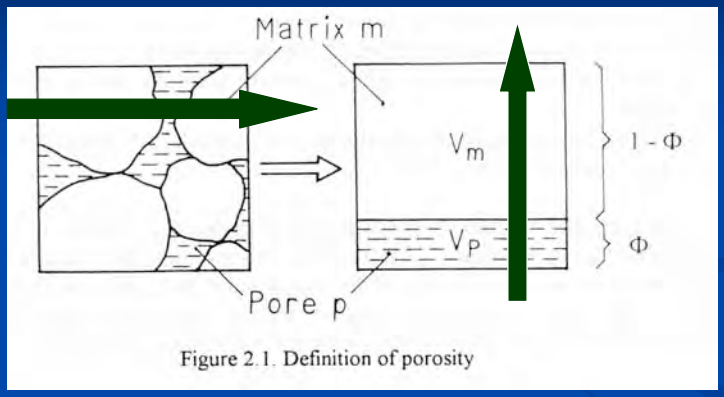


Figure 2.1. Definition of porosity

Rock : matrix and pore
Vp, Vs : Vp/Vs, Young modulus, Poisson's ratio

Vp Vs measured under the pressure

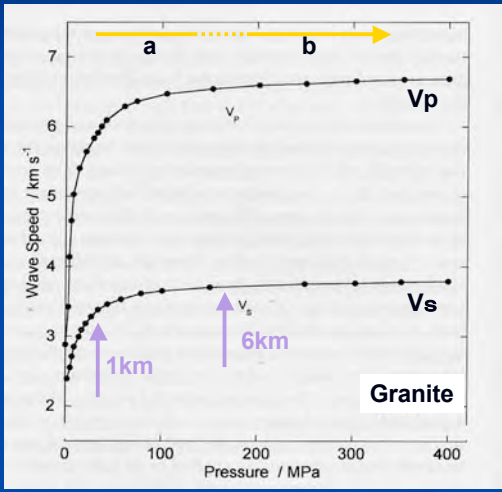
Logging data
Vp & Vs
(Matrix + pore) at depth

Fractures at depth

Velocities under the pressure
Vp & Vs (matrix, intrinsic)

Models in rock physics

Influence of pressure on Vp and Vs for Granite



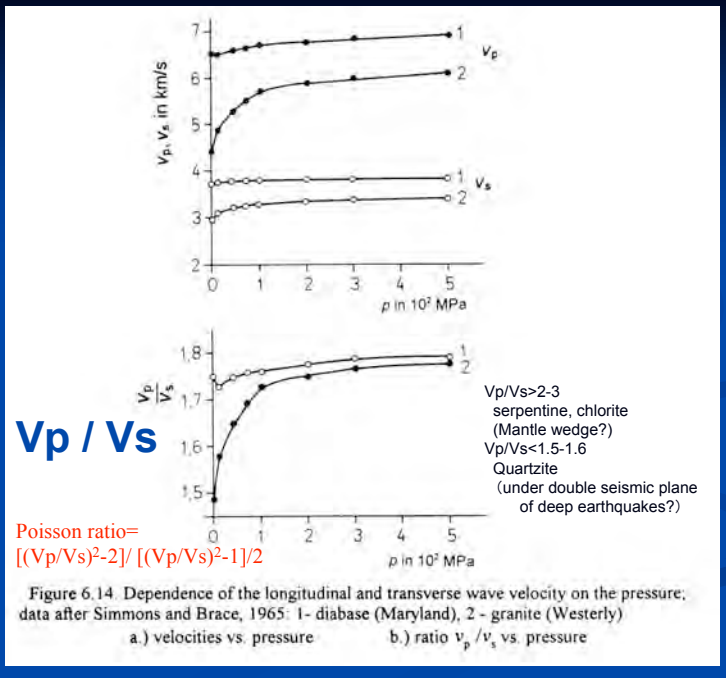
(Nur and Simmons 1969)

a. Pressure closes the cracks & microjoint
ca. Eα (α:aspect ratio, E:Young modulus)
b. crack-free state
> ca. 200MPa

(1)Vp and Vs are dependent on the pressure.

(2)Vp and Vs are NOT linearly proportional to the pressure.

(3)V-P curves are different for rock types.



Vp / Vs

Vp/Vs>2-3
serpentine, chlorite
(Mantle wedge?)
Vp/Vs<1.5-1.6
Quartzite
(under double seismic plane of deep earthquakes?)

Poisson ratio=
$[(Vp/Vs)^2-2]/[(Vp/Vs)^2-1]/2$

Figure 6.14. Dependence of the longitudinal and transverse wave velocity on the pressure; data after Simmons and Brace, 1965: 1- diabase (Maryland), 2 - granite (Westerly)
a.) velocities vs. pressure b.) ratio v_p/v_s vs. pressure

Influence of Temperature on Vp and Vs for Crystalline rocks

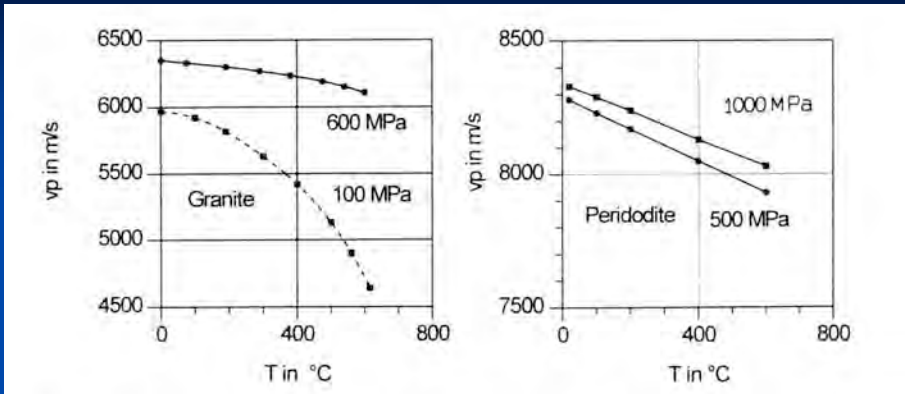


Figure 6.19. Temperature dependence of longitudinal wave velocities at different confining pressures; a.) granite, after Kern, 1990 b.) peridodite, data after Bajuk and Levitova, 1990.

<150°C, change of fluid properties
higher, T dependence of elastic properties of rock-forming minerals and phase change
>100°C , thermal microcracking for some crystalline rocks

Permeability change of Granite with pressure change

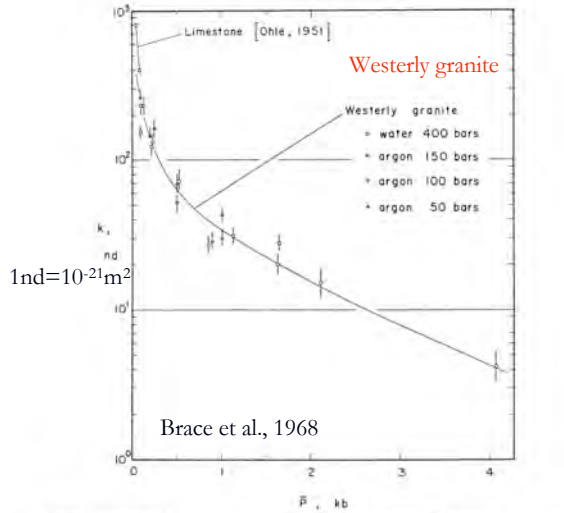
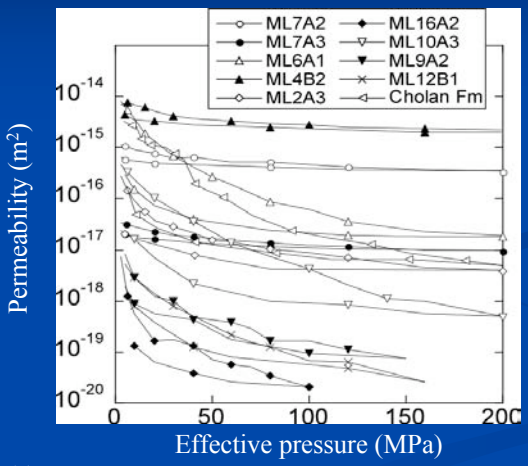


Fig. 5. Permeability k as a function of effective confining pressure $\bar{P}$. Length of short bars indicates probable error for each measurement.

Due to closure of cracks and connectivity change as pressure increase

Permeability of sedimentary rocks



Tanikawa et al., 2006

Due to decreasing of porosity and connectivity change as pressure increase

Permeability change of Granite with temperature change

1nd=$10^{-21}m^2$

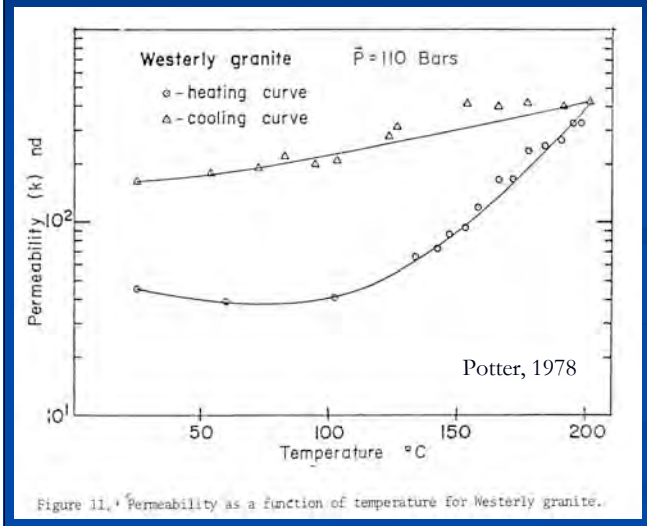
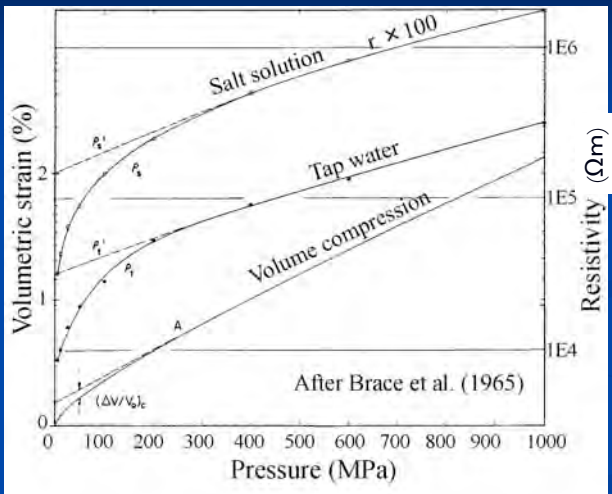


Figure 11. Permeability as a function of temperature for Westerly granite.

Due to thermal cracking and connectivity change as temperature increases

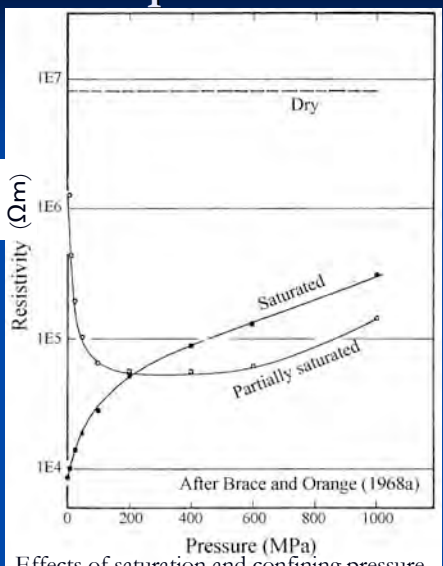
Effects of Pressure on resistivity



Resistivity and volume change of Westerly granite as a function of confining pressure (after Brace et al., 1965)

- Granite
- Trend of resistivity variation with pressure increase agree with the trend of volumetric change
- Main reason of resistivity change can be interpreted due to pore volume change

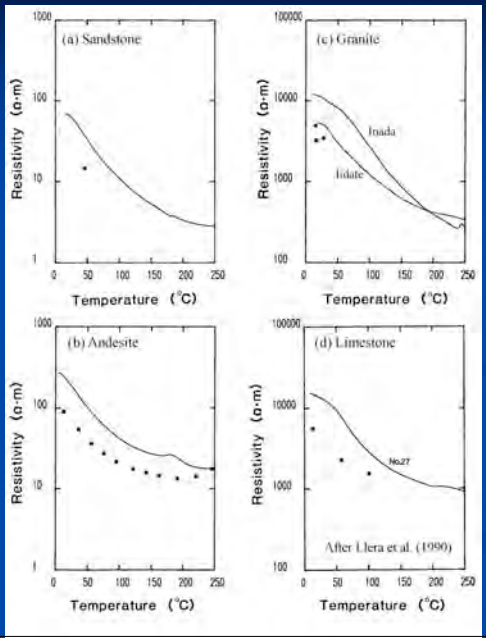
Effects of pore water and pressure on resistivity



Effects of saturation and confining pressure on resistivity of Westerly granite in tap water (after Brace and Orange, 1968a).

- Granite
- No influence of pressure for dry sample.
- For partially saturated sample, the resistivity decreases until pore was saturated with water, then increases as confining pressure increasing

Effects of Temperature on resistivity



Temperature dependence of the resistivity of (a) Kimachi sandstone, (b) Emochi andesite, (c) Iidate and Inada granites, and (d) Tohoku crystalline limestone, saturated with 0.001M KCl (afer Llera et al., 1990). The curves represent the data measured during heating process; solid symbols represent those during cooling process.

Thermal Conductivity of Rocks

1) "Distinct" temperature dependence of λ (T. C.) is known by many workers.

$(\lambda(T))^{-1} = D + E \cdot T$
[Buntebarth, 1991]

or
$\lambda(T) = A + B/(350+T)$
[Zoth and Haenel, 1988]

or
$\lambda(T) = F(T, \lambda_{20})$: see Fig.V-28
[Somerton, 1992]

2) Trend of TC-Temp. curves dependent on lithology

3) TC should be measured at same pore water condition as in situ

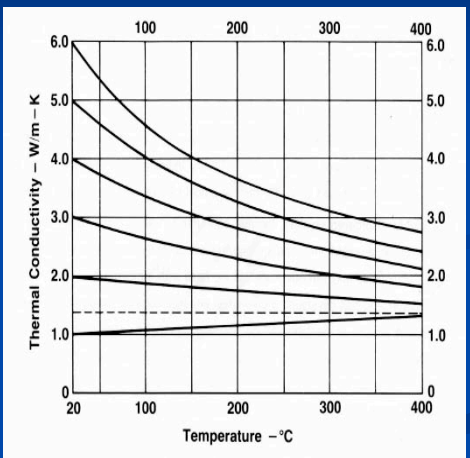


Fig. V-28. Temperature correction chart for thermal conductivities based on Eq. V-25 in SI units.

2) Pressure dependence of T.C.

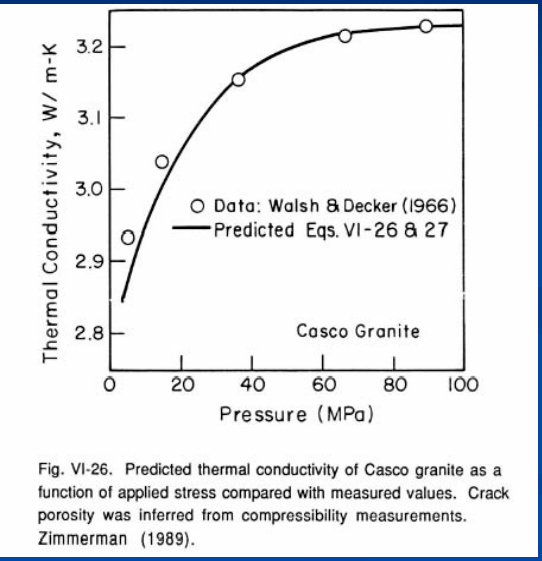


Fig. VI-26. Predicted thermal conductivity of Casco granite as a function of applied stress compared with measured values. Crack porosity was inferred from compressibility measurements. Zimmerman (1989).

Variation of T.C. with pressure is "slight" but visible in the range typically

$p < 20$ MPa

for crystalline rocks.

3) Other controlling factors for T.C.

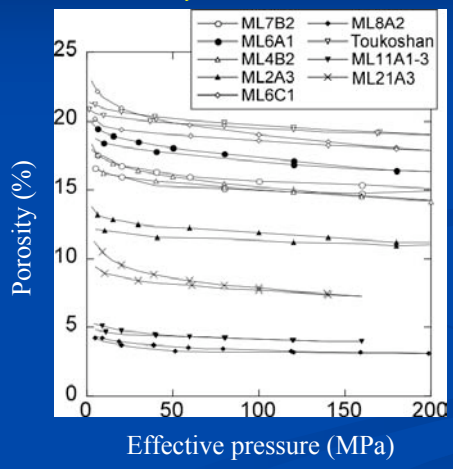
- Mineral compositions ··· major effect !
- Porosity ··· secondary effect.

- Saturating fluid (water; oil; gas; hydrate)

··· depending on thermal contact model.

Porosity versus Pressure

Sedimentary Rocks



Tanikawa et al., 2006

Density versus Pressure

- Density of rock samples may change as pressure and temperature change. The change is secondary due to volumetric changes of pores and minerals.
- Density change may be slighter than porosity change; and can be considered to be negligible generally.

Dielectric constants

- Dielectric constants of rock samples may slightly change as pressure changes. The change is secondary due to change of porosity (water content).
- Dielectric constants may also change with temperature. It is due to change of pore water dielectric constants.
- Dielectric constants change may be slighter than porosity change; and can be considered to be negligible generally.

Summary

		Vp&Vs	Velocity anisotropy	Permeability	Resistivity	Thermal conductivity	Porosity	Density	Dielectric constnts
Pressure	Sedimentary rocks	very distinct	distinct	very distinct	distinct	slight	slight	negligible (?)	slight or negligible
	Crystalline rosks	very distinct	slight	very distinct	distinct	slight	slight	negligible (?)	slight or negligible
Temperature	Sedimentary rocks	?	negligible (?)	slight	slight	slight	negligible (?)	negligible (?)	slight or negligible
	Crystalline rosks	distinct	negligible (?)	distinct	slight	distinct	slight	negligible (?)	slight or negligible
Ranking:	very distinct, distinct, slight, negligible, no								

Some problems needed to be studied

How to estimate following factors/effects?

- Phase change of minerals due to temperature increasing
- Temperature effects of minerals (with interlayer water, T e.g. clay minerals, alteration minerals etc.)
- Especially, effects of clay minerals on electric property
- Effects of salinity
- Effects of microbe on permeability and permeability change

- Evaluation of accuracy, reliability, drift and sensor calibration for temperature and pressure measurements are important too.

END

Temperature measurement

(after Kasahara, personal communication)

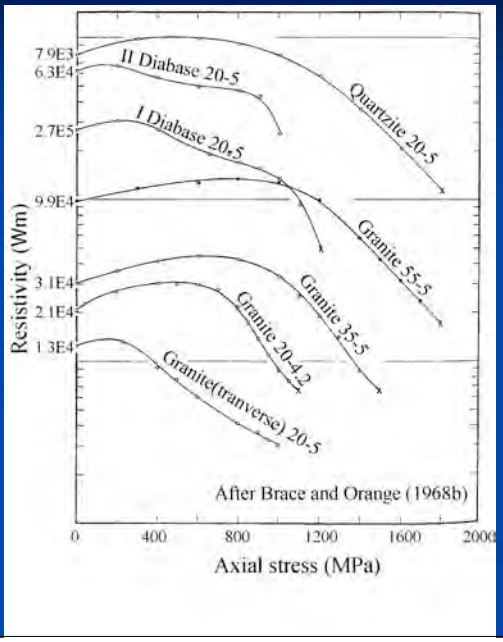
- Short duration
  - 0.001°C (relative precision)
  - 0.1°C (absolute precision)
  - Response time: 0.1 sec
  - Dynamic range: 10^4
  - Drift: 0.01°C/one year
  - calibration: every year (absolute, relative)
- Long duration
  - Low drift: 0.01°C /5 years
  - High precision absolute value:0.05°C
  - High resolution:0.001°C (relative)

Pressure measurement

(after Kasahara, personal communication)

- Short duration (Permeability or fluid flow)
  - 1Pa> (1ms) (Relative)
  - Response time:1-10ms
  - Calibration: every year
  - Drift: OK for relative measurement
  - Low temperature effect especially for Qz sensor
- Long duration
  - 10 Pa for 1 year (absolute :important)
  - 100 Pa for 5 year (absolute: important)
  - Low temperature effect, especially for Qz sensor
  - Acoustic wave transducer use
  - Seismic or T-phase detection use

Effects of differential stress on resistivity



Resistivity as a function of axial stress (after Brace and Orange, 1968b). The numbers after the rock name are the confining and pore pressures in MPa, respectively. The curves have been shifted vertically for convenience; the number at zero stress is the resistivity before loading of axial stress.

OUTLINE

Vp Vs measurements under the pressure

- Why Vp Vs measurements should be done under the pressure
- Procedure of the velocity measurements

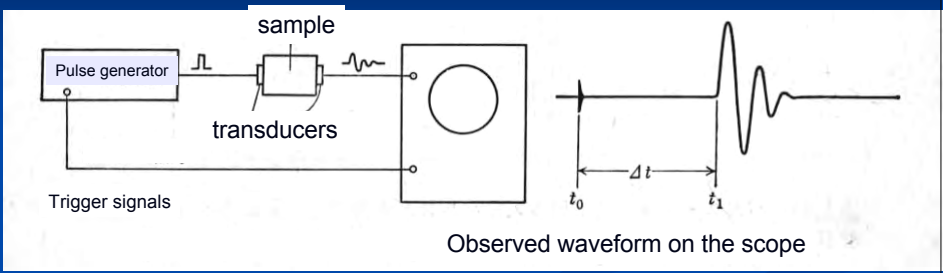
Conclusions:
- Vp Vs measurements under the pressure are important and necessary.
- Measurements can be done routine-basis in safe way.
- We need hard rock samples from drilling.

Procedure of the velocity measurements
under the pressure

(1) Prepare the specimen
cut, glue the transducers, jacket
(2) Apply the pressure
(3) Measure Vp and Vs

Routine base, safe

Pulse transition method



L :length of the sample
Δt:travel time
V :elastic-wave velocity

$$V = L / \Delta t$$

Measure Vp and Vs

Measure Vp and Vs up to 200 MPa
Ex. every 20MPa (10 points)

Sampling interval:
fixed intervals or each geological settiong

Time necessary for each sample
（1）prepare the specimen: ca.1－2 hours
hardening of the glue or rubber
（2）apply the pressure: a few minutes

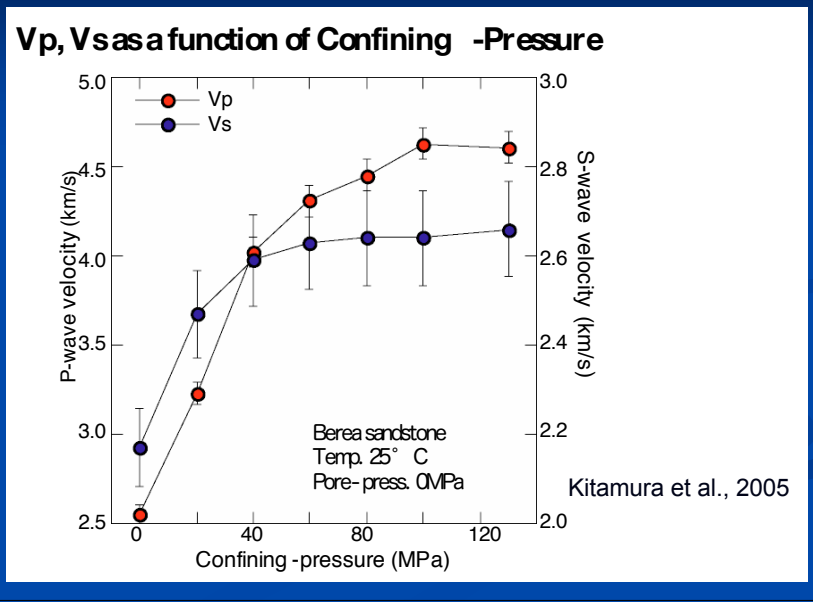
（3）measure Vp and Vs: very short time

Routine basis, safe

Conclusions

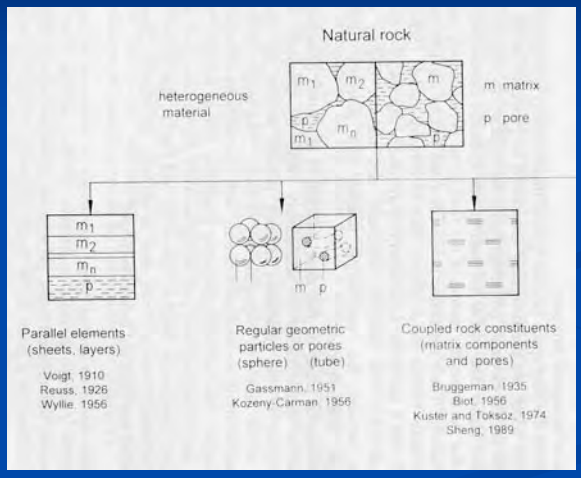
- Vp Vs measurements under the pressure are important and necessary.
- Measurements can be done routine-basis in safe way.
- We need hard rock samples from drilling.

Influence of pressure on Vp and Vs for Sandstone



Kitamura et al., 2005

Types of models in rock physics



IODP
INTEGRATED OCEAN DRILLING PROGRAM

STP Meeting

26th - 28th June 2006, Helsinki

Temperature measurements on ESO MSP Expeditions

Ursula Röhl (Bremen) & Jenny Inwood (Leicester)

ECORD
ESO ECORD Science Operator
Universität Bremen marum
EPC
BGS British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL

Temperature Measurements on ESO MSP Expeditions

IODP

ESO will measure temperature on each MSP operation. The actual tool to be used will depend very much on the choice of pipe (slim versus standard) and then once this is known the most appropriate tool will be selected.

Since ESO may have different logging contractors on individual expeditions, ESO cannot say that each time *tool "x"* will be used.

Therefore, ESO will always endeavour to select the most appropriate and highest quality tool.

ECORD
ESO ECORD Science Operator

Temperature Measurements on ESO MSP Expeditions

As part of MSP operations the choice of the tool used to collect temperature measurements will be dictated by the pipe size employed during each specific expedition.

The options for pipe size include:

- slim line pipe similar to that used during Expedition 310 (Tahiti Sea level),
- standard ODP pipe (used on Expedition 302 ACEX)
- or standard oil field pipe.

Temperature Measurements on ESO MSP Expeditions

Following the choice of pipe size, the logging operations will be selected which may be standard wireline as used in other IODP operations, logging while drilling or possibly memory tools. The choice will be governed by:

- the scientific demands of each expedition
- but other important factors may include
  - hole stability,
  - timing (i.e. ice covered waters), and
  - financial.

The optimum temperature tool will be selected as part of the logging program.

Any future use by ESO of temperature tools will include pre- and post-cruise calibration to ensure compatibility with specifications and functionality of the tools.

Temperature Measurements on ESO MSP Expeditions

Previous Work

A. On the ACEX Expedition ESO provided two types of temperature probe for downhole measurements.

1. The ODP standard Piston Coring instrumented Shoe APCT
2. The BGS designed 'push in' slim hole memory probe

B. On the Tahiti Expedition ESO provided the BGS memory probe only.

On both expeditions there was also the possibility to measure downhole temperature via the wireline logging tools.

Temperature Measurements on ESO MSP Expeditions

Future Work

ESO will continue to provide the BGS memory probe to all MSP expeditions.
It will combine this with a suitable deployment system designed for the drilling equipment being used on the expedition.
This is seen as routine as it is a slim hole system compatible with all known offshore coring systems.

Other temperature tools may be carried by design or specific request of the prospectus.

However all will need to be provided in good time for training in their operation and with a calibration certificate or with sufficient time to create a calibration curve.

Temperature Measurements on ESO MSP Expeditions

Future Work, cont´d

Improvements can also be made to the BGS system to reduce '–in-hole – in-situ time' by using titanium housings and a wider variety of temperature range and this could be the subject of an EDP assessment.

It is proposed that the method of emplacement and the sizing which matches geotechnical probe equipment is a good standard to keep.

Other configurations are also possible, most, without extensive development are 'stand-alone' and do not collect core at the same time.

Temperature Measurements on ESO MSP Expeditions

Future Work, cont´d

Improvements can also be made to the BGS system to reduce '–in-hole – in-situ time' by using titanium housings and a wider variety of temperature range and this could be the subject of an EDP assessment.

It is proposed that the method of emplacement and the sizing which matches geotechnical probe equipment is a good standard to keep.

Other configurations are also possible, most, without extensive development are 'stand-alone' and do not collect core at the same time.

APCT

Advanced Piston Corer Temperature

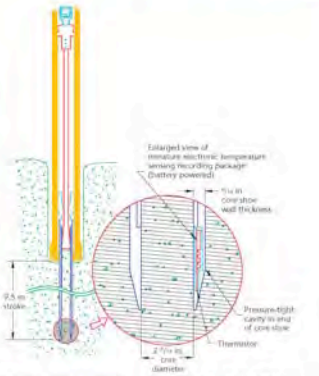
OCEAN DRILLING PROGRAM
www.oceandrilling.org

Scientific Application

The Advanced Piston Corer Temperature (APCT) tool is an instrumented version of the coring shoe that is run on the Advanced Piston Corer (APC). It is deployed in soft sediments to obtain formation temperatures to determine the heat flow gradient and is essential in determining hydrocarbon maturity for pollution prevention purposes.

Tool Operation

The APCT is deployed on an APC inner core barrel and provides a precise in situ temperature measurement while adding only 10 min to each core barrel run. Typically, the tool is run starting at 30 m below seafloor (mbsf) and then run after every other core until four good readings are obtained. The shoe is hydraulically stroked 9.5 m into the sediment and remains stationary for ~10 min. The APC inner core barrel is then retrieved, the instrumented shoe is removed, and the data is downloaded into a computer.



Continuous temperature measurements are recorded with the APCT core shoe embedded in the sediment.

Design Features

1) Temperature Measurement Without Wireline Trip

The APCT sensor, electronics, and memory are contained in an annular cavity inside the APC coring shoe.

Benefit: Temperature measurements can be obtained without a special wireline trip with a temperature tool.

2) Minimal Time Impact

The APCT tool is deployed on an APC inner core barrel and remains stationary for ~10 min in the sediment.

ECORD Science Operator

APCT shoe with milled pocket to accept electronics, memory board, and battery for temperature measurements while taking an APC core.

Benefit: The APCT provides a precise in situ temperature while adding only 10 min to each core barrel run.

3) Rapid Data Download

The instrumented shoe is removed as soon as the APC inner core barrel is retrieved, and the data are downloaded into a computer program for immediate processing.

Benefit: Hydrocarbon maturity evaluations can proceed during coring to avoid delays for data handling.

APCT Specifications

Motorola 68HC811 microprocessor

32K x 8 bit CMOS RAM data storage

Real-time clock

14-bit analog-to-digital converter

Platinum temperature sensor

±0.02°C accuracy

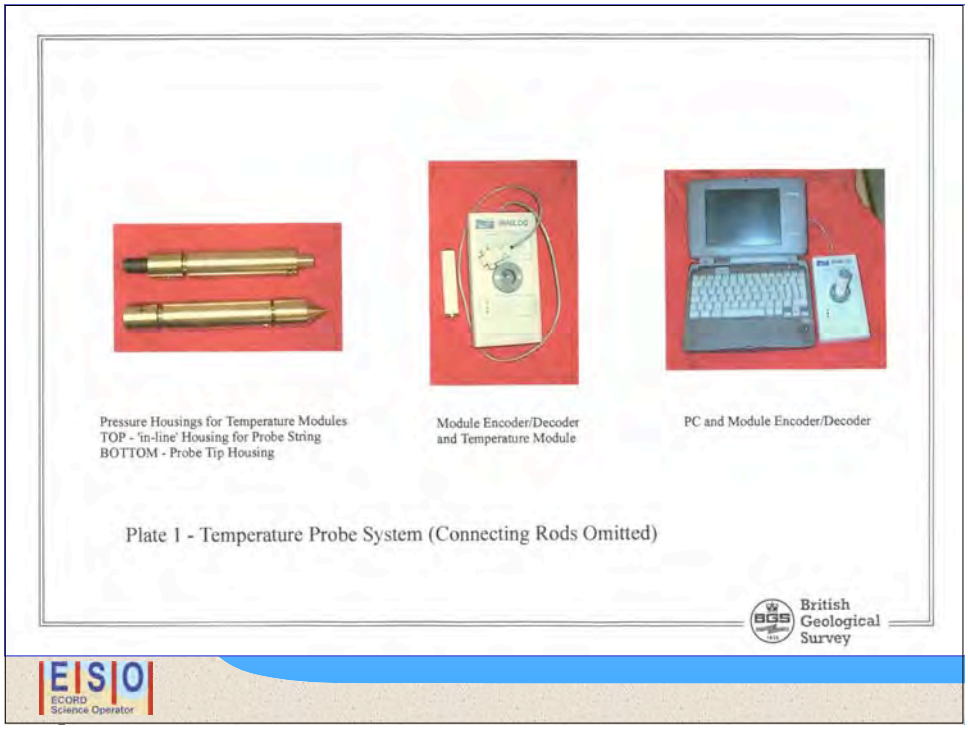
Typical Operating Range

-20°C to +100°C temperature measurement range

Limitations

Can only be used in soft sediments appropriate for piston coring

Can only be used in relatively stable sediments where danger of hole collapse is minimal



Pressure Housings for Temperature Modules
TOP - 'in-line' Housing for Probe String
BOTTOM - Probe Tip Housing

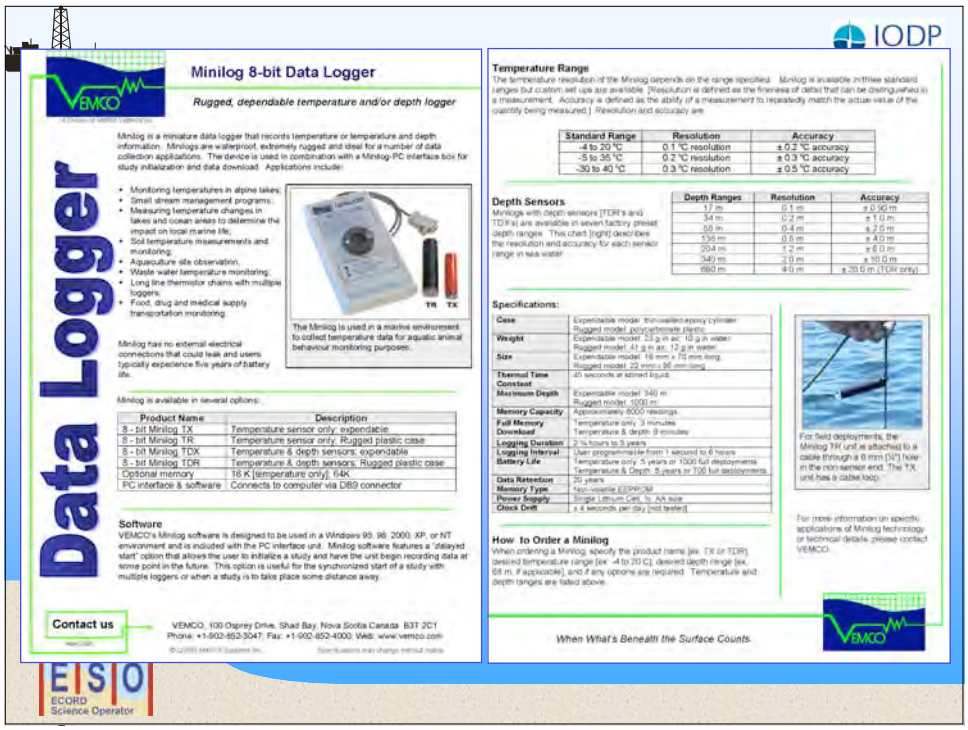
Module Encoder/Decoder
and Temperature Module

PC and Module Encoder/Decoder

Plate 1 - Temperature Probe System (Connecting Rods Omitted)

British Geological Survey

ECORD Science Operator



IODP

VEMCO

Minilog 8-bit Data Logger

Rugged, dependable temperature and/or depth logger

Data Logger

Minilog is a miniature data logger that records temperature or temperature and depth information. Minilogs are waterproof, extremely rugged and ideal for a number of data collection applications. The device is used in combination with a Minilog-PC interface box for study initialization and data download. Applications include:

- Monitoring temperatures in alpine lakes;
- Small stream management programs;
- Measuring temperature changes in lakes and ocean areas to determine the impact on local marine life;
- Soil temperature measurements and monitoring;
- Aquaculture site observation;
- Waste water temperature monitoring;
- Long line thermistor chains with multiple loggers;
- Food, drug and medical supply transportation monitoring.

The Minilog is used in a marine environment to collect temperature data for aquatic animal behaviour monitoring purposes.

Minilog has no external electrical connections that could leak and users typically experience five years of battery life.

Minilog is available in several options:

Product Name	Description
8 - bit Minilog_TX	Temperature sensor only; expendable
8 - bit Minilog_TR	Temperature sensor only; Rugged plastic case
8 - bit Minilog_TDX	Temperature & depth sensors; expendable
8 - bit Minilog_TDR	Temperature & depth sensors; Rugged plastic case
Optional memory	16 K [temperature only]; 64K
PC interface & software	Connects to computer via DB9 connector

Software

VEMCO's Minilog software is designed to be used in a Windows 95, 98, 2000, XP, or NT environment and is included with the PC interface unit. Minilog software features a "delayed start" option that allows the user to initialize a study and have the unit begin recording data at some point in the future. This option is useful for the synchronized start of a study with multiple loggers or when a study is to take place some distance away.

Contact us

VEMCO, 100 Osprey Drive, Shad Bay, Nova Scotia Canada B3T 2C1
Phone: +1-902-852-3047, Fax: +1-902-852-4000, Web: www.vemco.com

Temperature Range

The temperature resolution of the Minilog depends on the range specified. Minilog is available in three standard ranges but custom set ups are available. [Resolution is defined as the fineness of detail that can be distinguished in a measurement. Accuracy is defined as the ability of a measurement to repeatedly match the actual value of the quantity being measured.] Resolution and accuracy are:

Standard Range	Resolution	Accuracy
-4 to 20 °C	0.1 °C resolution	± 0.2 °C accuracy
-5 to 35 °C	0.2 °C resolution	± 0.3 °C accuracy
-30 to 40 °C	0.3 °C resolution	± 0.5 °C accuracy

Depth Sensors

Minilogs with depth sensors [TDR's and TDR's] are available in seven factory preset depth ranges. This chart [right] describes the resolution and accuracy for each sensor range in sea water.

Depth Ranges	Resolution	Accuracy
17 m	0.1 m	± 0.90 m
34 m	0.2 m	± 1.0 m
68 m	0.4 m	± 2.5 m
136 m	0.8 m	± 4.0 m
204 m	1.2 m	± 6.0 m
340 m	2.0 m	± 10.0 m
680 m	4.0 m	± 20.0 m (TDR only)

Specifications:

Case	Expendable model: thin-walled epoxy cylinder Rugged model: polycarbonate plastic
Weight	Expendable model: 23 g in air, 10 g in water Rugged model: 41 g in air, 12 g in water
Size	Expendable model: 16 mm x 70 mm long Rugged model: 22 mm x 95 mm long
Thermal Time Constant	45 seconds at stirred liquid
Maximum Depth	Expendable model: 340 m Rugged model: 1000 m
Memory Capacity	Approximately 8000 readings
Full Memory Download	Temperature only: 3 minutes Temperature & depth: 9 minutes
Logging Duration	2 ½ hours to 5 years
Logging Interval	User programmable from 1 second to 6 hours
Battery Life	Temperature only: 5 years or 1000 full deployments Temperature & Depth: 5 years or 700 full deployments
Data Retention	20 years
Memory Type	Non-volatile EEPROM
Power Supply	Single Lithium Cell, ½ AA size
Clock Drift	± 4 seconds per day [not tested]

For field deployments, the Minilog TR unit is attached to a cable through a 8 mm [⅝"] hole in the non-sensor end. The TX unit has a cable loop.

How to Order a Minilog

When ordering a Minilog, specify the product name [ex. TX or TDR], desired temperature range [ex. -4 to 20 C], desired depth range [ex. 68 m, if applicable], and if any options are required. Temperature and depth ranges are listed above.

For more information on specific applications of Minilog technology or technical details, please contact VEMCO.

When What's Beneath the Surface Counts.

VEMCO

ECORD Science Operator

Status of T & P Downhole Tools
STP Meeting Helsinki, June 2006

Liz Screaton
Heiner Villinger
Junzo Kasahara

SODV Phase 2 FY 2007 (Info from Derryl Schroeder)

APC

- budgeted to purchase 5 APC3 systems in FY07, and be ready to go for phase 2
- also have 4 or 5 Adara tools available to run

DVTP & P

- DVTP and DVTPP data loggers are no longer supported by the vendor. There are 2 ea working data loggers for each system.
- We are actively investigating commercial data loggers and data logger components.
- The intent is to come up with a common electronics design for the DVTP/P's as well as the water sampler, TPC (APCM), PCS, and future development.

SODV Phase 2 FY 2007
(Info from Derryl Schroeder)

DVTP & P (cont)

- The thermistor packaging for the DVTP and DVTPP is being evaluated to improve reliability and maintainability, with testing commencing in FY07. Different configurations of the probe tip and filter design for the DVTPP pressure port and the water sampler intake port will also be tested in FY07 using the Simulated Borehole Test Facility.
- The target for the DVTP/P's and TPC upgrades is for the beginning of Phase 2.

ESO (Info from U. Röhl)

T measurments during APEX and Tahiti Expeditions

A.
On the ACEX Expedition ESO provided two types of temperature probe for downhole measurements.
- ODP standard Piston Coring instrumented Shoe APCT
- BGS designed 'push in' slimhole memory probe

B.
On the Tahiti Expedition ESO provided the BGS memory probe only.

C.
On both expeditions there was also the possibility to measure downhole temperature via the wireline logging tools.

CDEX

APC and DVTP & P

- Screaton and Villinger are in ongoing discussions with CDEX about T and P measurements during upcoming Nankai Expeditions
- no decisions made up to now to our knowledge

Measurement of P, T

Junzo Kasahara
Liz Screaton
Heinrich Villinger

Necessity of P and T measurement

- Fluid flow measurements
- Pressure field measurements
  - Acoustic wave observation
  - Pressure test (permeability measurement)
  - Fluid flow
- Temperature filed measurement
  - Heat flow
  - Fluid flow

Observation duration

- Short term measurement
  - Permeability
- Long term measurement
  - Permeability change (CORK):P and T
  - Fluid flow (CORK):P and T

Temperature measurement

- Fluid flow (Hydrothermal circulation)
- Biological activity
- Volcanism
- Temperature change due to fault movement
- Earthquake generation

Pressure measurement

- Fluid flow (Hydrothermal circulation)
- Acoustic wave arrivals
- Pore pressure change
- Earth tide
- Ocean tide

Temperature measurement

- Short duration
  - 0.001°C (relative precision)
  - ~0.01°C (absolute precision)
  - Response time: 0.1 sec
    - Currently APC is ~10 sec.
  - Dynamic range: $6x10^4$ (16bit)
    - **Hopefully 20-22 bit range**
    - **High temperature version:0-300°C**
    - **Low temperature version: 0-5°C with 0.001 °C resolution**
  - Drift: 0.01°C/one year
  - calibration: every year (absolute, relative)
- Long duration
  - Low drift: 0.01°C /1 year ->hopefully /5 years
  - High precision absolute value:0.05°C
  - High resolution:~0.003 - 0.001°C (relative)

Pressure measurement

- Short duration (Permeability or fluid flow)
  - 1Pa> (1ms) (Relative)
  - Response time:1-10ms
  - Calibration: every year
  - Drift: OK for relative measurement
  - Low temperature-effect especially for Qz sensor
- Long duration
  - 10 Pa for 1 year (absolute :important)
  - 100 Pa for 5 year (absolute: important)
  - Low temperature-effect, especially for Qz sensor
  - Acoustic wave transducer use
  - Seismic or T-phase detection use

STP Recommendation 06-0X: Title
The STP recommends….
The database permit results generated by post-expedition investigators to be added post-expedition. Data would be added as an addendum and not as a substitute for original data. Data published in peer- reviewed journals by any scientist should be input into the database. QaQc implications

Vote: X X Yes, X No, X Abstentions, 2 absent (Lyons, Screaton)
Priority: High/Medium/Low

STP suggests this be forwarded to STP and/or IODP-MI

Background to STP Action Item 0606-04:……..

Currently, changes to age models and other data are not recorded in the database. This has led to a reduced quality of science in quite a few post-cruise investigations, particularly by those scientists who aren't part of the working groups associated with the leg.

Although accurate age models are crucial for may of the detailed studies performed, such as tuning, many times the shipboard age model is used instead because it is what is available in the database. Even if a literature search is performed to find the most up-to date age models, there is often a significant publishing delay (up to a few years) before it is available to the community.

Likewise, modifications to data performed post-cruise aren't incorporated in current database. For example, post-cruise research discoveries from techniques such as oxygen isotopes concerning drilling and data quality are not incorporated into the database. Thus, even though the science party may be aware that there problems with the data (e.g., a re-cored interval from a slump; a significant unconformity not identified on ship; error in measurement), other investigators will not know except through personal communication. Even is a literature search is performed, it is rare that manuscripts highlight bad data. So, important information concerning the data is lost to the community, particularly as time passes.

The practice of omitting post-cruise analyses from the database, particularly in the case of age models, has the potential to degenerate the quality of the science.

Action Statement 0606-04. The STP will explore the potential inclusion of post-cruise data by the IO to enhance the value of the database. A significant impact of database development is efficient data delivery but STP recognizes that the shipboard data are preliminary and need to be updated through shore-based studies. The data, such as refined age models, would be treated not as a replacement, but as a supplement with good metadata and quality control. The emphasis would be on voluntary acquisition of datasets rather than developing a policy that emphasizes enforcement.
Leads: Christensen and Suzuki and Ahagon

Laser Ablation (LA) -ICPMS on CHIKYU

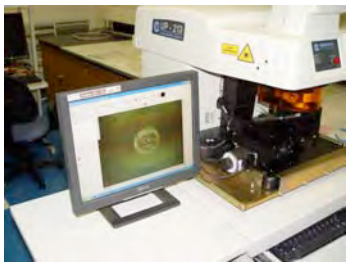
Takamitsu SUGIHARA
CDEX/JAMSTEC

SPC Consensus 0603-12: The SPC receives STP Consensus 0601-2 on installing a laser-ablation inductively coupled plasma mass spectrometer (LA-ICP-MS) on IODP platforms and awaits the results of the planned testing of such an instrument onboard the *Chikyu*.

Status of LA-ICPMS investigation on CHIKYU

- We have borrowed a LA system for demonstration to evaluate its performance on the ship.
- Installation of the demo LA system was conducted on Jun 19th.
- We are carrying out experiments using the demo LA-ICPMS system now on the sea.
- A preliminary result is reported.

Installation of the demo LA system

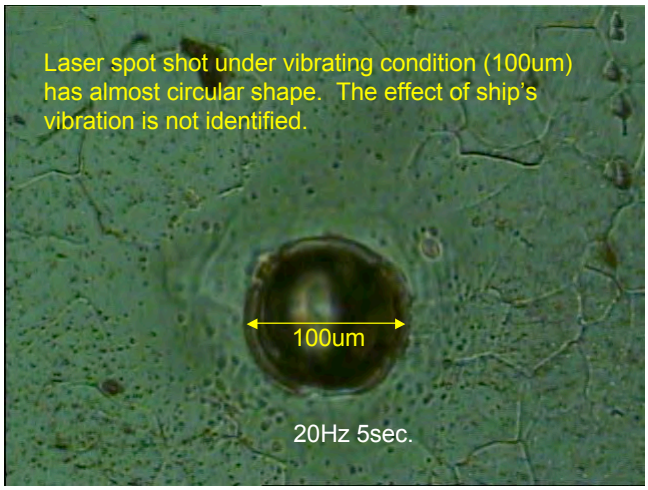


NEW WAVE RESEARCH UP213 system
Nd-YAG Laser with 213nm wavelength

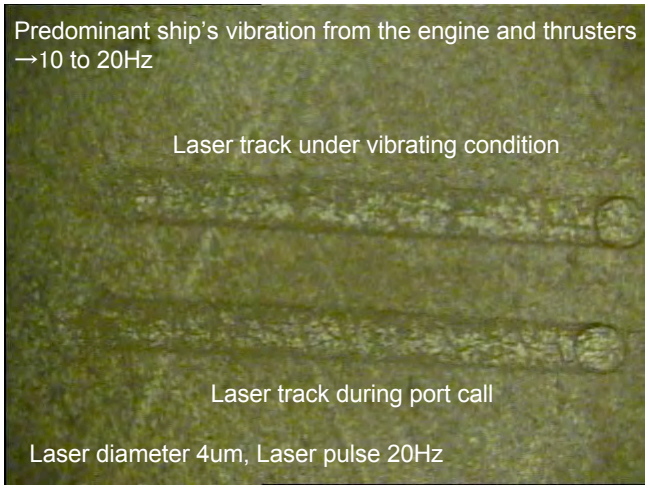
Objective of the demo LA system trial

- To evaluate effect of the ship's vibration for mechanical sample stage and laser focusing
- Quality check of quantitative analysis using the LA system

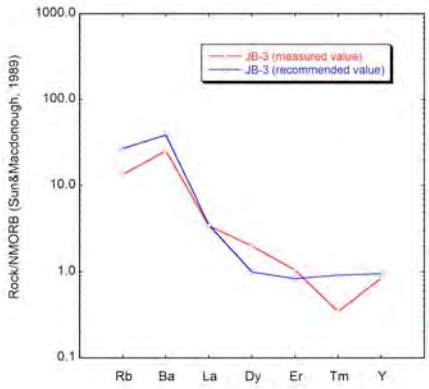
Preliminary result
effect of the ship's vibration



Preliminary result
effect of the ship's vibration2



Preliminary result:
Quantitative analysis (under vibrating condition)



JB-3 is a standard material derived from GSJ

Standard material: NIST612, Measured material: 1:10 glass bead (JB-3)
Integrated 0.1 sec data signal for 180 sec.
Laser diameter: 75um, Laser pulse20Hz

Conclusion

- Effect of the ship's vibration is negligible for the LA system.
- LA-ICPMS has good capability for usage on the ship.
- We start budget requirement for the LA system to JAMSTEC.
- Further tune up for experimental settings of the LA system and ICPMS is needed to obtain quantitative data with enough quality.

→future work

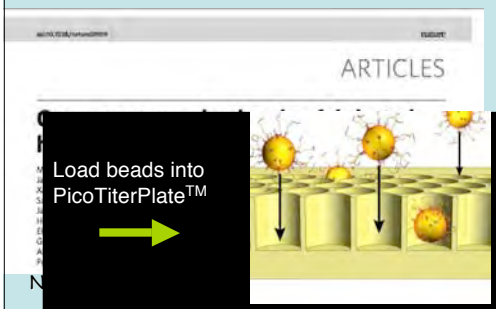
Pyrosequencing ODP Site 1229

Jennifer Biddle
Christopher House
Stephan Schuster

The "$1000 human genome"

- **Cheap "genome" sequencing is desired for medical applications**
- **Industry experts predict the cost of sequencing the human genome to drop to about $1000 during the next decade**
- **Such inexpensive DNA sequencing will greatly impact environmental microbiology**

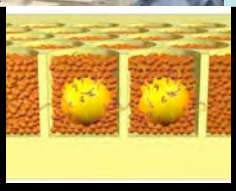
New sequencing technology

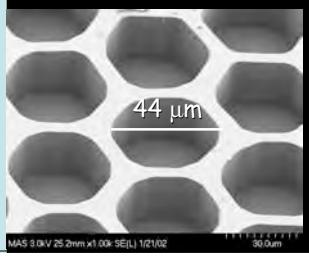


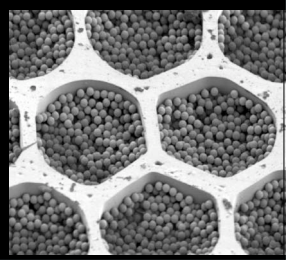
Load beads into PicoTiterPlate™

Load enzyme beads

Centrifugation

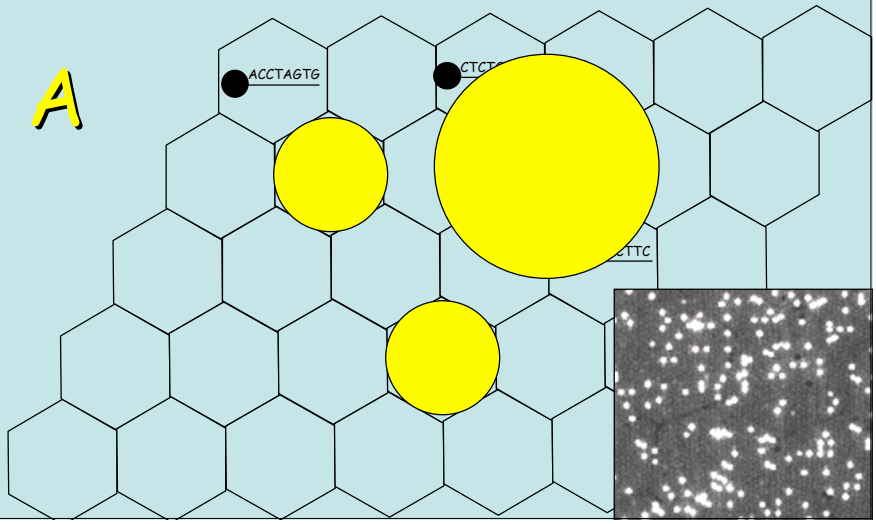






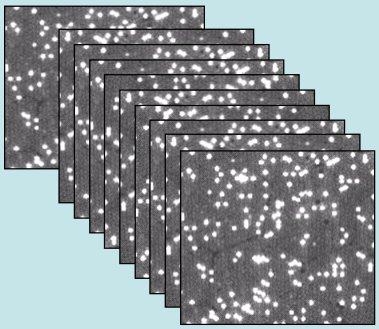
Sequencing-by-synthesis

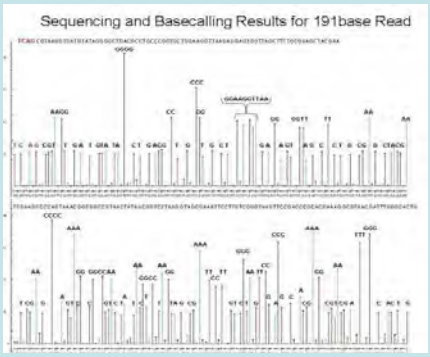
- **Sequence fragments base-by-base in parallel:**



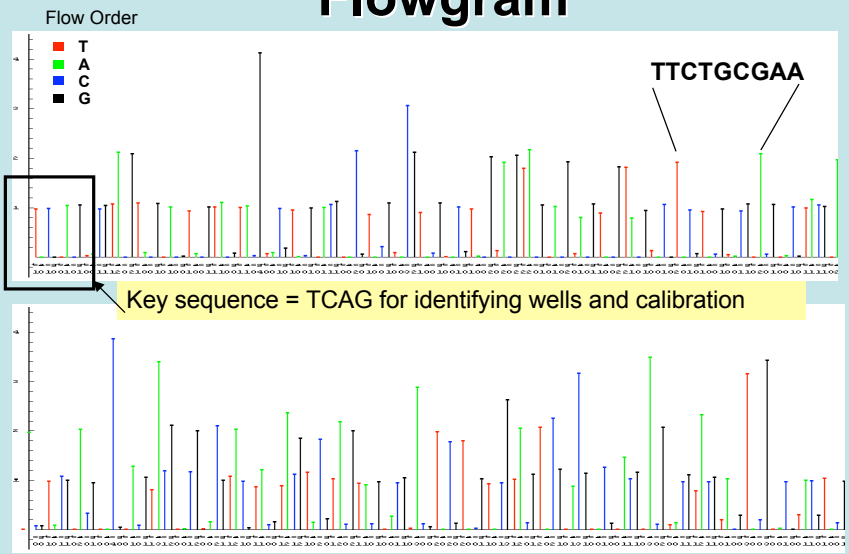
Sequencing-by-synthesis

- **Base-calling analyzes stack of images produced for nucleotide cycles**



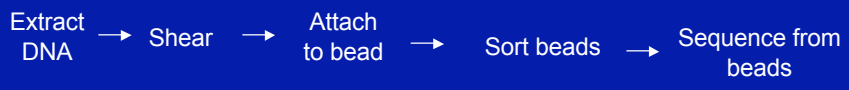


Example of a Flowgram



The subsurface metagenome

- **Rapid, high throughput sequencing**
  - **pyrosequencing : potentially less bias**



- **Sequencer: 454 Life Sciences**
- **Average read ~ 100 base pairs**
- **DNA needed: 300 ng – 10 ug**
  - **Above 1 ug preferred**

Extracting DNA from deeply buried sediments

- **Problem: Not enough DNA is extracted ….**
- **Solution: Whole genome amplification (WGA) using phi29 polymerase**
  - **Also primer independent**
  - **Amplifies EVERYTHING**
  - **Several commercial kits available**
    - **RepliG kit (Qiagen)**

Metagenome of Site 1229

Sample depth (mbsf)	Total reads	Sequence (Mb)
1	125,842	12.5
16	135,726	13.5
32	168,462	16.8

total sequence gained* = 42.8 Mb

*as of June 2006

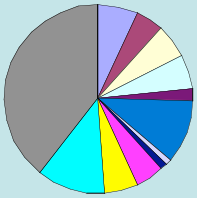
≠SMTZ sediment

Accessing metagenomic information

- Comparison to GenBank non-redundant database shows that the subsurface is a unique environment
  - **Only 5% of reads match a known sequence**
  - **Many subsurface phylotypes are distinct from terrestrial and pelagic**
- Of the hits that match known sequences, they resemble diversity studies

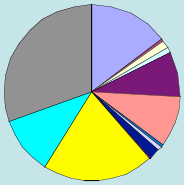
Initial metagenome data:

454 Data, percentage of total hits



Site 1229, 32 mbsf
180 hits out of 1800 total reads
PCR independent: considering ALL genes

Inagaki, 2006: percentage of total clones



Sites 1227 and 1230
256 total clones
PCR dependent: 16S rRNA genes ONLY

Inagaki et al. PNAS 2006

In-silico biomarkers are necessary

- **Most sequences do not resemble those in the databases**
- **Subsurface studies have examined 16S rRNA genes**
  - **These sequences can be compared as phylogenetic markers to determine the diversity of the metagenome**

Results

Site (mbsf)	16S genes	Number of Hits Archaea	Bacteria	%Archaea
1	18	1	17	6
16	56	33	23	59
32	65	36	29	55

Breakdown of results

% Matches to

Site (mbsf)	ODP Archaea	Crenarchaeota	Euryarchaeota
1	100	100	0
16	39	100	0
32	55	97	3

Site (mbsf)	ODP Bacteria	Uncultured Chloroflexi	Other Bacteria
1	21	21	78
16	79	66	34
32	79	72	28

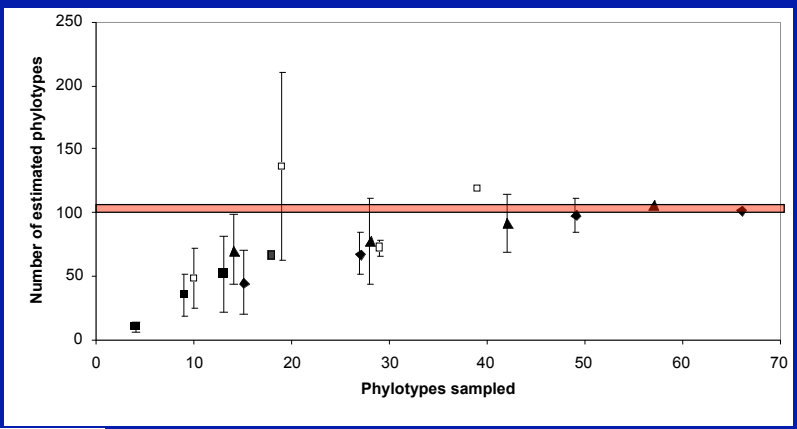
Comparison of microbial populations at ODP Site 1229

Sample depth (mbsf)	Results by sequence analysis	Results by FISH counts
1		
16		
32		

Archaea Bacteria

How diverse is the subsurface?

S_{chao} estimator



Symbol	mbsf
▬	1
▲	16
◆	32

Potentially restricted to 100 phylotypes at depth

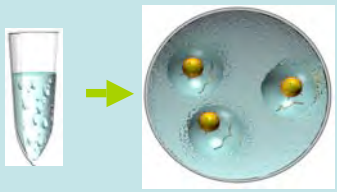
Strategy for 16S rRNA comparison

- Developed independent database of only 16S rRNA genes
- Used BLASTN comparison
- Accepted matches over 50 bp in length
- All matches were double checked against the entire GenBank nr database
- Most homologous sequence reported

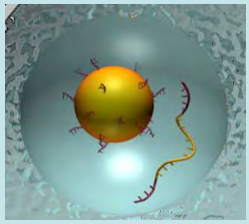
Results of *in-silico* biomarkers

- 0.04 % of total reads match small subunit ribosomal genes
- Most matches are to clones from ODP diversity studies, especially from Leg 201
- Other sequences are strong matches to sediment clones

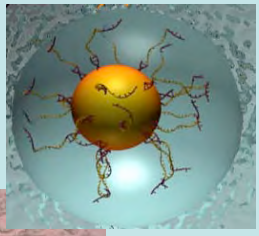
Emulsion-based clonal amplification

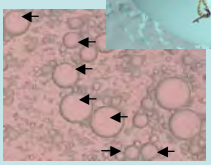


A) Anneal single stranded template to an excess of DNA capture beads



B) Emulsify beads and reagents in water-in-oil microreactors

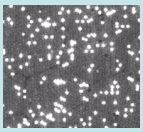




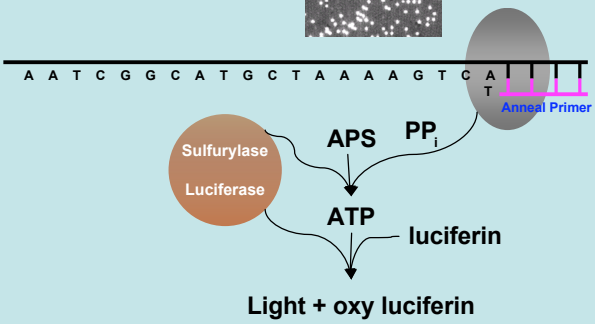
C) Break microreactors, enrich for DNA positive beads, load DNA beads

Sequencing-By-Synthesis

- Simultaneous sequencing of the entire genome in hundreds of thousands of picoliter-size wells
- Pyrophosphate signal generation

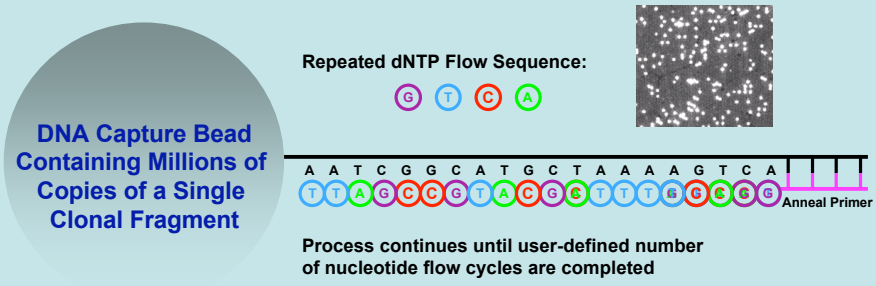


DNA Capture Bead Containing Millions of Copies of a Single Clonal Fragment

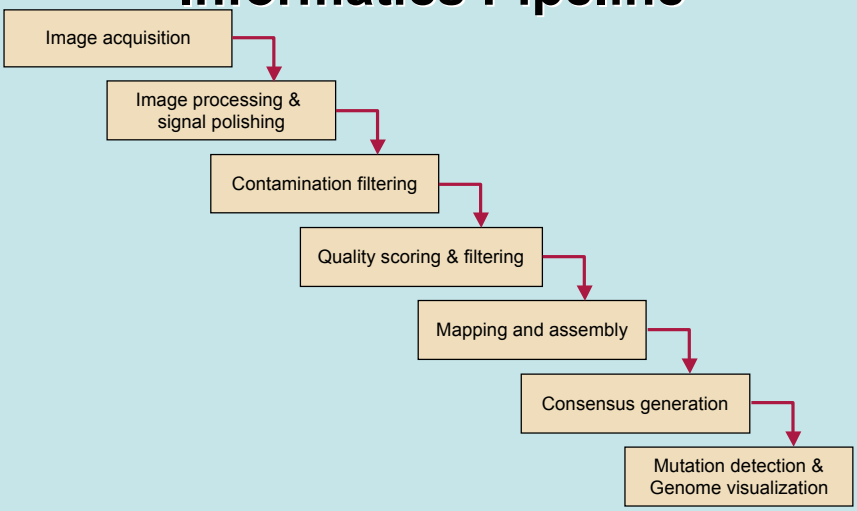


Sequencing-By-Synthesis

- Simultaneous sequencing of the entire genome in hundreds of thousands of picoliter-size wells
- Pyrophosphate signal generation upon complimentary nucleotide incorporation—dark otherwise



454 Integrated Informatics Pipeline



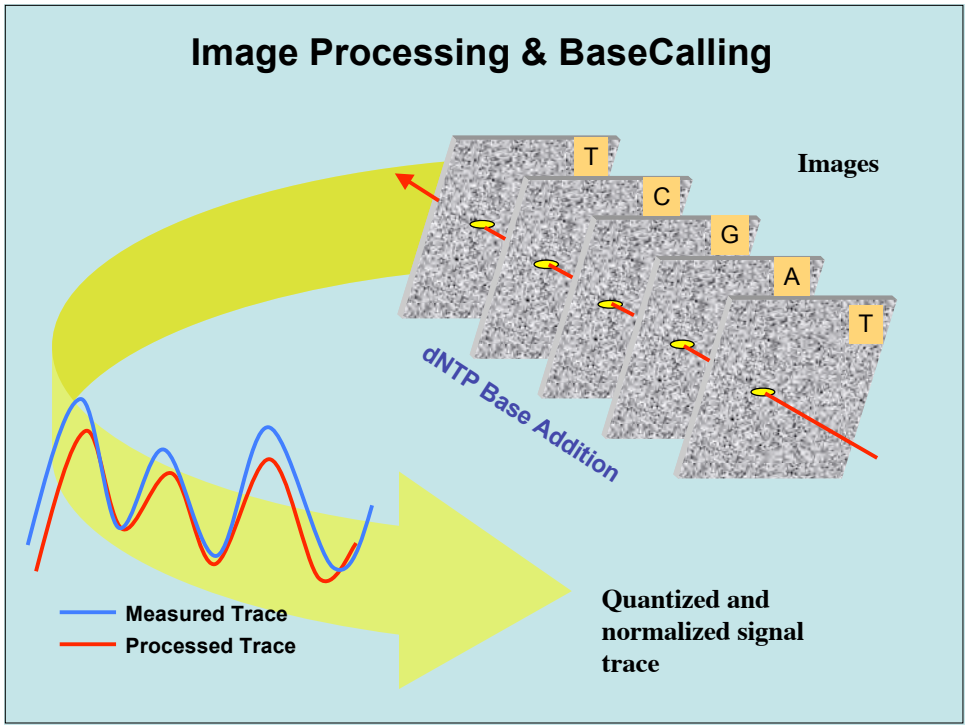


Image Processing & BaseCalling
T
C
G
A
T
Images
dNTP Base Addition
Measured Trace
Processed Trace
Quantized and normalized signal trace

Microbiology and Chemistry

Statement:

That analytical needs should be prioritized based on the minimal measurements and the science of upcoming expeditions (e.g., no basement drilling in the next few legs and thus XRD essential for sediment analysis).

Equipment:

New XRD and ICP-AES are essential.

It is necessary that a second bench top, 36 inch wide, sterile flow hood be purchased and placed in the main microbiology lab. This would hood would be in addition to the sterile flow hood in the cold room.

It is critical that a state-of-the-art fluorescent microscope with image capture be available in the microbiology lab for routine cell counting.

Gases:

Nitrogen blower required in chemical lab for phospholipids analysis and general gas supply lines throughout. Perhaps consider source of compressed air and liquid N_2 generator.

General Organization:

An extra door be placed at the bottom of stairs from core collection platform.

Doors wide enough for equipment placement?

Efficient use of vertical shelving for storing textbooks, shakers, and misc. small equipment.

For microbiology lab, consider environmental room instead of, or in addition to, cold room.

Clean room needs a source of deionized water, a storage locker for double distilled acids, space for cleaning/boiling Teflon beakers and an ‘ultraclean‘ fume hood.

Core Description

Core Description Area

- Needs ability to have flexibility in providing more space
  - Saw Little area for viewing split core
    - Hard rock legs need 24 hours of core on view
    - Capability to add another table/ mobile rack on hard rock legs
- Saw minimal storage area for split cores waiting for analysis
  - Core splitting area door seemed too narrow to accommodate a mobile rack

Core Description Area

- Data visualization system needs to be near core description table for ready access
  - Smear slides area would benefit from data vis.

Core Description

- Move CT scanner towards logging area
  - Swap CT scanner and Thermal Conductivity table to improve core flow

Stratigraphic Correlator

- Makes more sense to have strat correlator close to loggers
  - Currently it is near logging technical lab

Micropaleo

- Still need a dedicated hood or AREA for HF in acid hood
  - Rads, dinos, pollen need isolation
  - OK b/c ig pet lab is separate
- Freeze drier
  - Sample prep
    - Indurated rock (rads, forams)
    - Chemical free δ18O preparation
    - Less destructive to microfossils (*Micropaleontology*)
- Switch scope and data visualization system to end of table so there is a conference area

Sedimentology

- Data entry seems well thought through

Petrology

- Need greater input for VCD
  - Jay Miller could provide names/ comments for the VCD meeting

No metamorphic representative present

No igneous representative present

Structural Geology/ Tectonics

Data input is not well integrated into core descriptions

- DMT of little practical use

Data outputs are equally limited for structural geology

- ?Corewall?

Other issues include limited software available

- Industry stereonet programs are not appropriate
- Structural data traditionally not integrated with ig pet, logging, etc. **but need to be**

Structural Geology/ Tectonics

DMT core scanner

- Not a replacement for the detailed work of determining orientation and correlation to ig pet
- Does not work well for very small features
- Requires long, continuous core (not fragments)
- Difficult to match to log, especially if fragmented

OK as Level 2 funding

DMT- type scanner is not being suggested as a replacement

Want to retain surface image capability

Structural Geology/ Tectonics

True geographical orientation is a goal from post-cruise core-log integration

- P'mag does not allow for independent restoration of orientation of tectonic features
- Range of data needed to do this is supplemental to VCD
- (e.g., redraw core?, id structures, take measurements, plot, link to ig pet and logging for orientation)
- *High resolution digital core imaging* may replace having to redraw core, similar to integrated ig -pet/ structural data entry/ core description prototype in mid 1990's

STP Recommendation 06-0X: Title Seismic source

The STP recommends equipping appropriate size of a seismic source on IODP drilling platforms. Seismic source is necessary to obtain core-logging-seismic correlation through check shots, VSP and under-way-seismic survey. A tuned airgun with 300-1000 cubic inches and impulse like source signature is more appropriate for depths of 4000 mbsf. Tuned airgun arrays offer improved resolution and should be considered where feasible. Accurate timing control, digital recording unit and a short streamer are also necessary to enhance the depth resolution.

Vote: 15 Yes, 1 No (Wilkens), 0 Abstentions, 2 absent (Lyons, Screaton)
Priority: High
STP suggests this be forwarded to IODP-MI

Background to STP Recommendation 0606-0X:……..
Core-logging-seismic correlation is one of the most important tasks to be solved in IODP. In order to obtain high resolution of seismic data, check short and/or walkaway VSP are required using own seismic source.
The characteristics of seismic source requires impulse like wave forms obtained by a tuned airgun array. To obtain enough depth penetration as deep as 4km, appropriate chamber size (300-1000 cubic inches) is required.
For the case of shift of drilling sites, relatively short streamer (12-24 channels) are requested.

STP Recommendation 0606-0X: Downhole T&P Tools

STP recommends that IODP-MI encourages the IOs to combine their efforts with respect to all temperature and pressure downhole tools, including new purchases and developments, in order to facilitate cross-platform technical and scientific compatibility. This would also minimize required funds for purchase of new or upgrade of existing downhole tools and at the same time maximize chances for obtaining high quality downhole measurements.

Vote: 16 Yes, 0 No, 0 Abstentions, 2 absent (Lyons, Screaton)
Priority: High
STP suggests this be forwarded to IODP-MI

Background to STP Consensus 06-0X:
Availability and compatibility of tools will be important during upcoming Nankai drilling because there will be 2 platforms involved.

STP Consensus 0606-0X: SODV review
The STP panel thanks the US Implementing Organization for the opportunity to review the plans for the SODV. In response to this the STP panel has attached the following documents in order to provide feedback on the future design and analytical facilities of the SODV for Chemistry & Microbiology and Core Description. Additional consensus statements concern specific issues below.

Priority: High
STP suggests this be forwarded to IODP-MI
Background to STP Consensus 06-0X: ……..…..

STP Consensus 0606-0X: Computing
The panel recommends that a central system for virus scanning of laptops and storage devices carried on-shore and off-shore laboratories will be carried out. The working laboratories of the ships should be equipped with central computers for feeding in data. Large screens, keypads, mice should be available for scientists working with their laptop computers while writing and reviewing data. Some back-up hard-drives (USB) may be needed during the expeditions. IO's should be prepared for scientists using laptops with different operating systems (dos, mac, linux)

Priority: Medium
STP suggests this be forwarded to IODP-MI
Background to STP Recommendation 0606-0X:……..…..

STP Consensus 0606-0X: Heave Compensation
Heave compensation must be considered for CORK installations and for hydrologic testing (e.g., pump tests with packer deployments), particularly the costs involved in the loss of a CORK (drilling time and hardware). "Loss" ranges from losing a hole (Leg 201) to losing hardware (Leg 301) to destroying a seal thus allowing fluid exchange at the seafloor (e.g. 1026B). Additional expert comments are required to address the issue of the importance of AHC on the SODV before the PAC statement is endorsed by STP (e.g., Fisher/Davis/Storms).

Priority: High
STP suggests this be forwarded to SPC and/or IODP-MI and EDP
Background to STP Recommendation 0606-0X:……..…..

STP Consensus 0606-0X: Seafloor Visualisation
The PAC's discussion of seafloor visualization is a good summary. STP takes a stronger stance than the PAC. The VIT (Vibration Isolated Televiewer) system should be greatly improved with additional lighting, a good quality digital camera, pan, tilt, gyro, etc. A fiber optic cable (such cables do not necessarily result in a larger winch footprint) will open up opportunities in the future for greater bandwidth applications. A heave compensation unit should be considered for this system.

Priority: High
STP suggests this be forwarded to SPC and IODP-MI
Background to STP Recommendation 0606-01:……..…..

STP Consensus 0606-0X: (SODV) Larger Drill Pipe for Enhanced Well Logging
After reviewing revised plans for a tapered drill string on the SODV, STP reiterates its support for larger diameter pipe that will allow the use of state of the art well logging tools during IODP. STP believes the tapered drill string will considerably enhance the potential of IODP borehole geophysical science for years to come.

Priority: High
STP suggests this be forwarded to SPC & IODP-MI
Background to STP Consensus 06-0X:
Many of the well logging tools currently in use are generally 20-30 years old and no longer represents state of the art technology. These constraints are imposed by the diameter of the drill pipe currently used for deep sea drilling. Moving to a larger diameter (6 5/8 inch) pipe will allow for deployment of industry standard logging tools.

The advantages of moving to industry standard tools are several:
- *New tools will be available for measurements not currently possible*
- *Downhole sampling will be possible (formation fluids, sidewall cores)*
- *Existing measurements will be made at higher resolution*
- *Modern logging tools are faster*
- *A logging bit can be fixed to the bottom of the logging pipe (bridge busting)*

Short of moving completely to a larger drill string, it has been proposed to deploy a tapered system consisting of up to 3,000m of larger diameter pipe above a smaller diameter coring string. Logging tools will be run through the larger pipe after coring is completed.

The downsides of a tapered drill string are:
- *A pipe trip will be needed between coring and logging*
- *Industry standard tools will be limited to holes in <3,000m water depth*

The time needed for a pipe trip will be somewhat mitigated by the increased speed of logging using state of the art tools. The 3,000m limitation may be overcome by the addition of another 1,000m of reserve pipe during selected expeditions. However, even without this provision, 77% of all holes proposed in 26 active proposals requesting/requiring larger diameter tools are within the 3,000m range of the tapered drill string.

STP Consensus 0606-0X: STP wishes to thank Chris House for his presentation that centered on the SODV conversion and PAC documents related to the SODV conversion. His lively participation also helped to focus our discussion, leading to many of the consensus statements above. Also, thanks for his presentation on microbiology DNA sequencing.