

IODP-Industry Science Program Planning Group Meeting

Minutes

23-24 July 2007

Sapporo, Japan

IIS-PPG Attendees:

Andrew Pepper, apepper_at_hess.com, IIS-PPG
Martin Perlmutter, mperlmutter_at_chevron.com, IIS-PPG
Kurt Rudolph, kurt.w.rudolph_at_exxonmobil.com, IIS-PPG
Ralph Stephen, rstephen_at_who.edu, IIS-PPG (Chair)
Yoshihiro Tsuji, tsuji-yoshihiro_at_jogmec.go.jp, IIS-PPG (Co-Host)
Yasuhiro Yamada, yama_at_electra.kumst.kyoto-u.ac.jp, IIS-PPG (Co-Host)

Ex-Officio Attendees:

Jamie Allan, NSF, by conference call on Tuesday morning
Tim Byrne, Science Planning Committee Liaison
Nobu Eguchi, science_at_iodp-mi-sapporo.org, IODP-MI
Hiroshi Kawamura, IODP-MI
Issa Kagaya, J-DESC
Hans Christian Larsen, IODP-MI
Manami Ono, AESTO
Toshiyuki Oshima, MEXT
Manik Talwani, mtalwani_at_iodp.org, IODP-MI

IIS-PPG Regrets:

Richard Davies, Richard.Davies_at_durham.ac.uk, IIS-PPG
Harry Doust, harrydoust_at_hotmail.com, IIS-PPG
Didier-Hubert Drapeau, didier-hubert.drapeau_at_totalfinaelf.com, IIS-PPG
David Roberts, d.g.roberts_at_dsl.pipex.com, IIS-PPG
Neil Frewin, IIS-PPG

Executive Summary

This was the third meeting of the IODP/Industry Science Program Planning Group. To promote development of industry related drilling proposals, to facilitate communication, and to develop effective links between academic and industry scientists, we generated seven consensus statements at the meeting:

IISPPG Consensus Statement 0707-01: SASEC Consensus Statements 0706-07 and 0706-08 represent radical changes in the manner with which academic scientists collaborate with industry in ocean drilling. The “Deal” between academic scientists and the funding agencies and the drill ship operators is changing dramatically. We recommend that options for pursuing substantial industry support for the IODP drilling platforms be pursued by an Industry Task Force (ITF) independent of the IODP SAS. The ITF would consist of representatives from the petroleum industry, the Implementing Organizations, IODP-MI and SAS (ex-officio) facilitated by IODP-MI.

IISPPG Consensus Statement 0707-02: Given the already strong proposal pressure and the much reduced availability of the IODP drilling platforms for the remainder of the program, there is little point in further “promoting development of IODP drilling proposals to address industrial priority research within SAS or within the context of the ISP”. We recommend an IISPPG meeting in Paris in January-February 2008 to complete the white papers and to consider other avenues for pursuing academic-industry liaisons within SAS (for example, more mini-workshops similar to the Tokyo workshop).

IISPPG Consensus Statement 0707-03: The industry members of IISPPG would like to investigate the potential of using platforms currently utilized by IODP for industry developed drilling consortiums. A possible project envisioned could be, for example, an Arctic basin analysis program. In order to proceed in a timely manner, we request that IODP-MI ascertain the level of interest of the IO’s in pursuing and facilitating this approach to solving IODP funding issues. If there is interest, prior to the IISPPG or ITF engaging the entire industrial community to inquire about creating this consortium, we need the following information that will drive corporate decisions: (1) the approximate cost of the ships for drilling in both ice free and ice covered locations in the Arctic, (2) the drilling capabilities of each ship, (3) the scheduling and availability, and (4) the fiscal responsibilities (liability, etc). While this potential program would be driven by industry interests we believe that there could be significant opportunities for scientific collaboration with academia and government.

IISPPG Consensus 0707-04: We recommend that the SPC appoint Andrew Bell (Shell) as a new member of the Industry-IODP Science Program Planning Group (IIS PPG), replacing resigned member Neil Frewin, effective immediately.

IISPPG Consensus 0707-05: We request that SPC and the National Funding Agencies sort out all funding issues with respect to IISPPG member travel reimbursement. To be effective, the IISPPG needs members from multi-national oil companies and negotiating “who pays the travel” is not an effective use of IISPPG time.

IISPPG Consensus 0707-06: We recommend industry participation at the IODP rapid climate change workshop if approved (Kurt Rudolph).

IISPPG Consensus 0707-07: We recommend that technical sessions and/or panel discussions be held at AAPG, GSA and/or EAGE (Kurt Rudolph, Andy Pepper, and Marty Perlmutter to evaluate).

We thank Yoshihiro Tsuji and Yasuhiro Yamada for graciously hosting the meeting that was held at the IODP-MI Sapporo offices. We also thank Tatsuya Murayama and Takashi Agatsuma from JAPEx for hosting a celebratory, traditional Japanese dinner on Tuesday night and Osamu Takano for organizing the tour of the JAPEx Yufutsu Oil and Gas Field on Wednesday morning.

In conjunction with the IIS-PPG meeting on Monday and Tuesday in Sapporo, the PPG participated in a mini-workshop on Thursday at the JAMSTEC Tokyo offices. Over 60 representatives of academia, government and industry from the Tokyo area participated in the mini-workshop that was organized by Tsuji-san and Yamada-san. Taira-sensei, Director General of CDEX/JAMSTEC, gave the key-note address. The excellent presentations were followed by active discussion and the mini-workshop was a great success.

1) Introduction

In addition to furthering the white paper process that had been initiated in The Hague, a primary concern of this meeting was responding to programmatic changes associated with budget restrictions.

2) Minutes of the Previous Meeting

The minutes of the previous meeting, in Houston, 19-20 January, 2007 were accepted.

3) Review the Progress on Consensus Items from the Houston Meeting.

IIS-PPG Consensus 0701-1: IISPPG is promoting the submission of two projects for the April 1/07 proposal deadline: 1) A South Atlantic rifted margins project which will be included in a rifted margins mission proposal. 2) A pre-proposal on the theme of silica diagenesis, shallow compaction and fluid flow. **The South Atlantic rifted margins project was included in the rifted margins mission proposal at the April 1/07 deadline. The silica diagenesis pre-proposal was not submitted.**

IIS-PPG Consensus 0701-2: IISPPG is promoting a proposal or pre-proposal on Mesozoic source rocks and paleo-oceanography for possible submission in April 1/08. **As reported below we are making good progress with the Mesozoic source rocks and paleo-oceanography white paper and pre-proposal.**

IIS-PPG Consensus 0701-3: The Arctic Basin is one of the last remaining scientific frontiers on a number of fronts, from basin evolution to paleo-oceanography and paleo-climate change. IISPPG believes this is an area of great mutual interest to academia and industry. The panel will prepare a 2-3 page white paper scoping out possible Arctic drilling of joint industry-academic scientific interest. **See below.**

IIS-PPG Consensus 0701-4: IISPPG recommends that IODP-MI increase the awareness of IODP in the Japanese petroleum industry in addition to US and European efforts, for

example by having a booth at the JAPT. In conjunction with the next meeting in Sapporo, IISPPG will participate in a mini-workshop in Tokyo on "Applications of IODP data in petroleum exploration". **IISPPG members have been active in raising the awareness of IODP in the Japanese petroleum industry, and the mini-workshop was held on July 26, 2007.**

IIS-PPG Consensus 0701-5: IISPPG supports the IODP data management efforts (SEDIS portal) which involve interoperable data portals. Coordination between US, Japanese, and European data management efforts is obviously essential. Specifically we request that the industry "user community" be involved in pilot projects to guide the development and to ensure the utility of the data management infrastructure. **After investigating these issues further we concluded that no further action was required at this time.**

ISS-PPG Consensus 0701-6: IISPPG will contact EGI (Energy Geoscience Institute - University of Utah) to identify whether they would have interest in developing with IODP scientists an integrated database of DSDP, ODP and IODP well data. **See above.**

IIS-PPG Consensus 0701-7: IISPPG supports the membership of IODP-MI in the RPSEA and Deep Star projects. IISPPG will monitor developments on the Deep Star Technical Advisory Committees on Geoscience and Downhole Measurements. **IODP-MI has joined RPSEA and DeepStar and has been attending planning meetings.**

IIS-PPG Consensus 0701-8: IIS-PPG members will identify alternates for themselves whom they know and with whom they can communicate easily. Ideally these alternates will meet the criteria for PPG membership outlined in the terms of reference. National committees (PMOs for US and Japan) should confirm that they will pay travel costs for the designated alternates if necessary. Action item for IIS-PPG members and Chair. **The concept of alternates met with mixed reviews at the March SPC meeting. The perennial problem of "who pays for travel" is an issue here. Given the attendance of European members at the Sapporo meeting we still feel that alternates would be a good idea, but PPG members have been slow to embrace the concept.**

4) Update on IODP activities and the March 2007 SPC meeting

Although Harry Doust did not attend this meeting he did prepare some valuable materials that were presented and discussed. Harry's updated figure on "Active proposals of possible industry interest" was presented (see Appendix 1). It was noted that *Gulf of Mexico - 589Full-3 MacDonald/Flemings* was missing. It was also noted that ~~threetwo~~ possible new themes of industry interest were gas hydrates, borehole observatories and formation monitoring.

Tim Byrne gave an update on IODP activities (see Appendix 2). This was based on a presentation that Keir Becker made to the EDP in June. Sections of the Executive Summary and Minutes that are relevant to the IISPPG from the March SPC meeting were

presented (Appendix 3). In June 07 SASEC accepted a working group report on the IODP Science Advisory Structure (Appendix 4). In the report no changes to the IISPPG were recommended, but it was clear the IISPPG performance would be reviewed in its third year.

Two important Consensus Statements from the June 2007 SASEC meeting (encouraging industry funded legs and complementary project proposals) were presented (Appendix 5).

5) Progress reports on IIS-PPG white papers.

5a) Rifted margins mission proposal

Ralph Stephen presented a progress report on the BESACM (Birth and Evolution of the South Atlantic Conjugate Margins) white paper (see Appendix 6 for an overview of the relevant documentation). There was a planning meeting in Houston in March 07 hosted by Garry Karner to prepare the BESACM section of the Rifted Margins Mission Proposal. (Exxon subsidized some of the travel for academic scientists to attend this meeting.) Harm van Avendonk lead the effort by writing an updated white paper on South Atlantic passive margin drilling (Appendix 7). The BESACM project was a sub-section in the Rifted Margins Mission Proposal (COBBOOM - #720) that was submitted for the April 1, 2007 deadline by John Hopper. The South Atlantic project provided a case study of the issues involved in proprietary industry data and other materials (see the GXT data offer - Appendix 8).

5b) Mesozoic paleo-oceanography and source rocks

In Harry Doust's absence Marty Perlmutter lead the discussion on Mesozoic Source Rocks (Appendix 9). Harry had prepared a white paper (Appendix 10) and a slide presentation (Appendix 11). Harry had also prepared an outline for a workshop on paleo-oceanography and source rocks to be held in Durham, U.K. in September 2007 (Appendix 12).

5c) Silica diagenesis, shallow compaction and fluid flow

There were no presentations or discussion on this topic.

5d) High-scientific-value single wells

There were no presentations or discussion on this topic.

5e) Source-to-sink sediment transport processes (TBD),

There were no presentations or discussion on this topic.

6) Updates on national IODP-Industry Liaison efforts.

6a) UK ILP

There were no presentations or discussion on this topic.

6b) Japanese - encouraging industry participation and planned mini-workshop

Yoshihiro Tsuji gave a summary of activities that had been carried-out in Japan (Appendix 13). These included a progress report on the post-meeting mini-workshop to be held on Thursday, July 26.

6c) US liaison efforts - RPSEA, DeepStar, Society of Exploration Geophysicists, Offshore Technology Conference

Ralph Stephen gave an update on the membership of IODP-MI in both RPSEA and DeepStar (Appendix 14). More details on the collaboration, which was initiated at the IISPPG Houston meeting, are given in Tom Janeczek's presentation at the June SASEC meeting (Appendix 27). There was also discussion of special sessions at the SEG meeting in San Antonio and the OTC next Spring.

7) Industry role in IODP data management and an integrated data base for all well data (ISS-PPG Consensus 0701-6)

There had been some discussion at the Houston IISPPG meeting on making DSDP, ODP, and IODP data bases compatible with interoperable data portals (eg, SEDIS portal). (**IIS-PPG Consensus 0701-5**) Coordination between US, Japanese, and European data management efforts is obviously essential. Some correspondence following-up on the Houston meeting is given in Appendices 15. Hans Christian Larsen gave overviews and demonstrations of SEDIS which is being developed by IODP-MI Sapporo (Appendix 16). Although we had originally thought that the industry “user community” should be involved in pilot projects to guide the development and to ensure the utility of the data management infrastructure, the SEDIS program seems to be handling this very well. Direct involvement by the IISPPG is not required at this time.

At the Houston meeting we recommended that an integrated data base for all well data, IODP and industry, be established (**ISS-PPG Consensus 0701-6**). Marty Perlmutter presented a presentation from EGI (Energy Geoscience Institute - University of Utah) (Appendix 17). After further presentations by Hans Christian Larsen on SEDIS (Appendix 18) and GeoMapApp (Appendix 19) it was determined that further direct involvement by the IISPPG is not required at this time.

8) Proprietary Data Stuff

At the Houston meeting there had been some discussion about the suitability of IODP's policy on proprietary data for industry related work in all phases of the process:

- a) in the proposal and review process,
- b) in open literature pre-drilling,
- c) in the pollution prevention and safety panel review,

- d) in shipboard scientific activities, and
- e) in post-cruise scientific publications.

The discussion here was lead by Ralph Stephen using the South Atlantic Rifted Margins project as case study (Appendices 20 and 21). Although many issues are still confusing it was determined that further direct involvement by the IISPPG is not required at this time. It is best to work through the issues on a case by case basis.

9) Guidelines and planning for expeditions of joint industry-IODP interest

There was considerable discussion on the recent SASEC Consensus Statements (Appendices 22, 23 and 24) involving industry financial support for IODP programs including mechanisms and prospects for the "complementary project concept". Manik Talwani lead this discussion, last thing on Monday afternoon, which included material from David Divens (Appendix 25).

In a conference call with Jamie Allan, first thing on Tuesday morning, we received NSF's perspective. Much of this was summarized in an email to Oshima and Talwani on December 5, 2006 (Appendix 26) and in Tom Janecek's June presentation to SASEC (Appendix 27). Marty Perlmutter reminded us of an earlier summary of topics that were of critical industry interest in IODP (Appendix 28).

10) Arctic Drilling White Paper

At the Houston meeting we had decided that the Arctic was a potentially very interesting area for joint industry-IODP collaboration. Andy Pepper with input from Kurt Rudolph gave a summary of the various geographical regions within the Arctic, work that had been done so far, and possible new projects (Appendix 29). It seemed that the Arctic would be an obvious focus topic for detailed industry-IODP discussion.

After considerable debate it was resolved that industry-IODP collaboration would best be addressed by an Industry Task Force independent of SAS and lead by IODP-MI. At one stage we felt that this effort should be funded by industry but this recommendation did not survive the consensus editing process. It was suggested that a meeting of interested industry representatives be held in Houston in the Fall of 2007 to launch this concept. The industry representatives on IISPPG would be the nucleus for this new Industry Task Force. It was not clear what, if any, role the IISPPG would have after the formation of the ITF. Marty Perlmutter started a list of questions that industry representatives would have prior to getting involved in the ITF (Appendix 30).

11) Replacement of Neil Frewin with Andrew Bell.

Since the process of appointing a Shell representative to the IISPPG was already underway, Ralph Stephen lead a discussion regarding membership (Appendix 31) and the appointment of Andrew Bell to the IISPPG (Appendix 32).

12) Review of IIS-PPG mandate & achievements

Ralph Stephen lead a discussion of the activities that IISPPG had been doing in response to their mandate since The Hague meeting in July 2006 (Appendix 33).

13) Next Meeting

The next meeting was tentatively scheduled for Paris in January or February, 2008. Didier Drapeau, Total, volunteered to host the meeting.

14) Mini-Workshop

In conjunction with the IIS-PPG meeting on Monday and Tuesday in Sapporo, the PPG participated in a mini-workshop on Thursday at the JAMSTEC Tokyo offices. Over 60 representatives of academia, government and industry from the Tokyo area participated in the mini-workshop that was organized by Tsuji-san and Yamada-san. Taira-san, Director General of CDEX/JAMSTEC, gave the key note address. The excellent presentations were followed by active discussion and the mini-workshop was a great success. The list of attendees is given in Appendix 34.

Acknowledgements

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Active proposals of potential interest in context of IIS-PPG themes

Mesozoic Source Rocks & Palaeoceanography

- 549 Arabian Sea OMZ
- 626 Pacific equatorial seds
- 658 N Atlantic Pg volc/SR
- 691 Weddel Shelf restricted MZ
- 700 S Ocean PG/carbon cycle
- 709 DeePac: MZ OAEs/climate Excursions, deepwater Pacific
- 711 Tanzania Pg climate

Selection as of
07/07 (HD)
(missions in red)

<http://www.iodp.org/500/600/700>

Continental breakup & ocean birth

- 556 Brazil-Malvinas late Tertiary
 - 604 Ulleung Basin
 - 645 E Greenland Margin
 - 657 Galicia rifted margin
 - 659 Newfoundland non-volc
 - 686/7 S Alaska tectonics/seds
- 692 conjugate non-volc margins
 - 710 Gulf of Corinth rift
 - **720 COBBOOM Mission**
 - 724 N Atlantic voc margins

Source2sink

- 618 Red/Mekong river drainage
- 664 Brazos-Trinity fill & spill
- 676 Ps/Q Tropical epeiric seas
- 683 East China Sea

Others

- 701 Deep biosphere GAB
- **713 Mission monsoon - Asia climate/tectonics**

Arctic

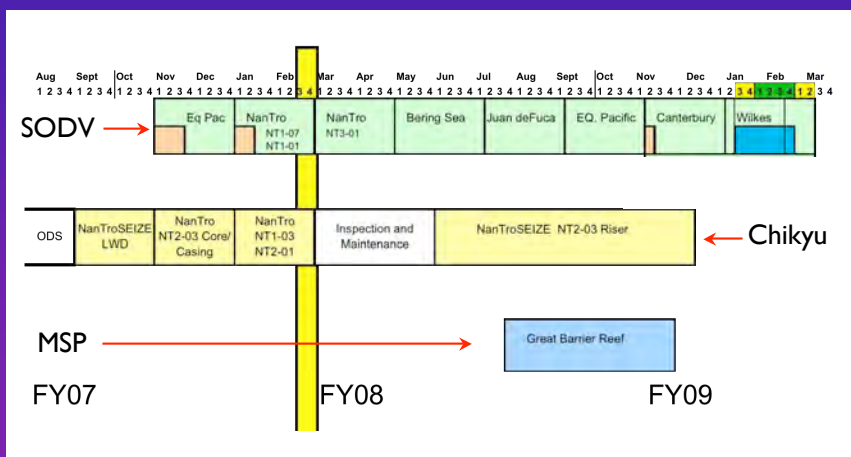
- 708 Central Arctic Cenozoic (Lomonosov Ridge revisit)
- ? Mz-Cz Arctic (Alpha Ridge)

SPC Report to Industry-IODP

(after K. Becker report to EDP, Tokyo, July 2007)

1. Update on FY08-09 schedule development, in light of realistic budget projections and start date for JR IODP operations - 3 OTF meetings and 2 major schedule adjustments required.
2. March 2007 SPC rankings for FY09 + beyond
3. Update from March and June SASEC meeting
4. Update on SAS review by SASEC WG (Science Advisory Structure Executive Committee Working Group)

Summary FY07-09 Schedule as of August SPC



March 2007 SPC FY08 Schedule Adjustment

- In late January/early February, NSF issued FY08 budget guidance to USIO below expectations, and also specified a Jan 1 2008 earliest start date for SODV international operations.
- Operations Task Force (OTF) met Feb 22 and March 2 primarily to develop alternative SODV schedule options in response to NSF financial guidance.
- March SPC SODV schedule consensus on next 2 slides
- SPC also accepted minor schedule adjustments made by OTF to previously approved Chikyu and MSP FY08/09 operations - these are essentially the same from science perspective.

SODV Schedule Adjustment - SPC Consensus (1 of 2)

SPC Consensus 0703-15. The SPC accepts the adjustments recommended by the Operations Task Force to the FY08-09 SODV science operations schedule in response to NSF budgetary guidance for FY08 and other logistical factors. After a January 1 start date to international operations and a short transit, the approved schedule would include the following sequence:

- NanTroSEIZE Stage I coring (Proposals 603A-Full2, 603C-Full; subduction inputs and NT3-01)
- Equatorial Pacific Paleogene Transect I (Proposal 626-Full2)
- Equatorial Pacific Paleogene Transect II, ending with remedial cementing of two Juan de Fuca CORKs installed on Expedition 301
- Bering Sea Pliocene/Pleistocene Paleoceanography (Proposal 477-Full4)
- Spanning the FY transition, a transit to the Southern Oceans with undetermined potential for brief additional science operations
- Canterbury Basin Sea Level (Proposal 600-Full)
- Wilkes Land Paleoceanography (Proposals 478-Full3, 638-APL2)

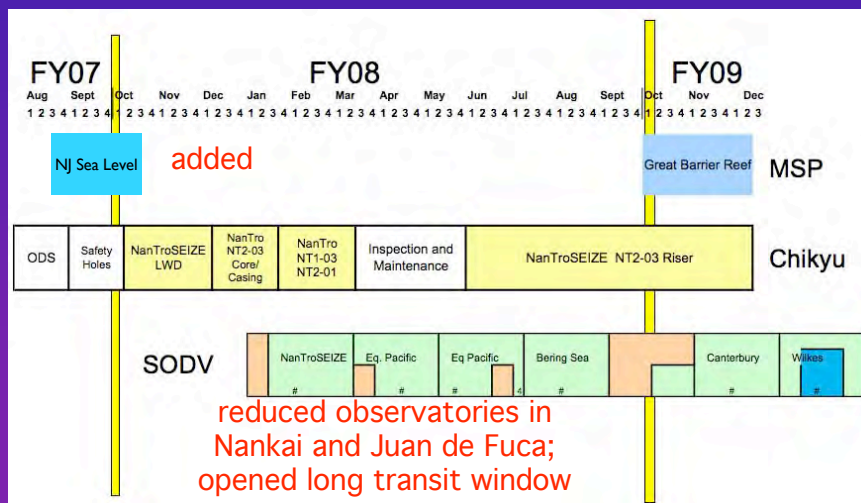
SODV Schedule Adjustment - SPC Consensus (2 of 2)

This adjusted schedule is as close as possible to the previously approved FY08-09 schedule given the budgetary and logistical constraints, except that it does **not include an initial NanTroSEIZE observatory and the observatory-intensive second Juan de Fuca** IODP expedition.

Nevertheless, it still presents a strong mix of societally-relevant, highly-rated seismogenic zone, paleoclimate, and sea level objectives, early enough in Phase II that the results can be expected to have a significant positive impact on renewal of IODP post-2013.

In the event that NSF, IODP-MI, and the USIO cannot identify the resources to achieve the full sequence of FY08 SODV operations above, SPC recognizes that the fourth FY08 expedition (Bering Sea paleoceanography) would need to be deferred, and that a completely different model for FY09 SODV operations would need to be developed at the June 2007 Operations Task Force and August 2007 Science Planning Committee meetings.

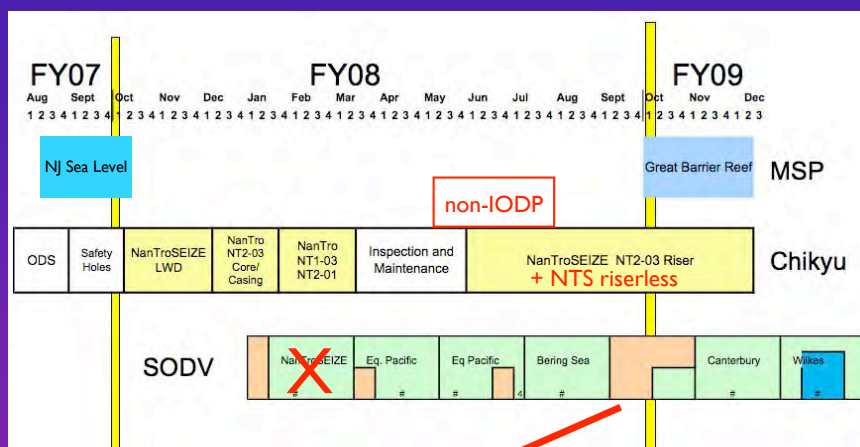
Summary FY07-09 Schedule as of March SPC



June OTF: Further FY08 Schedule Adjustments

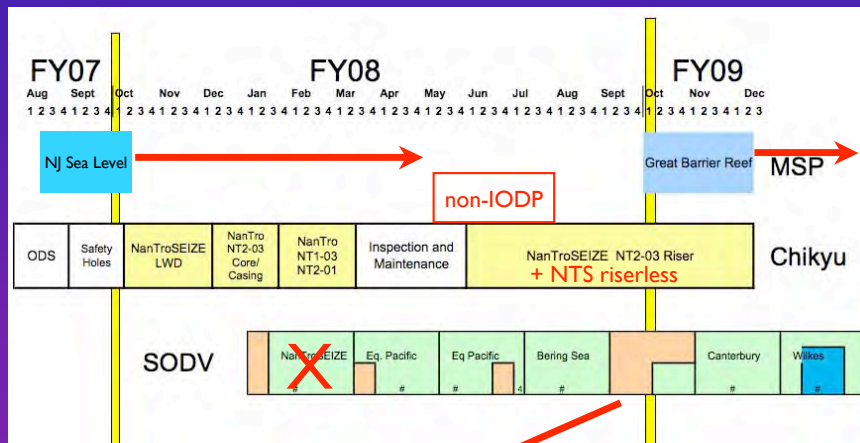
- The initial SODV NanTroSEIZE expedition cannot remain on the schedule because of combination of (a) **slippage of SODV shipyard schedule** and (b) Japanese fishing union **ban on NanTroSEIZE operations March 1 - May 31**.
- The adjusted SODV schedule recommended by OTF retains the subsequent three programs in slightly earlier slots, as well as the early FY09 Southern Ocean pair of programs, as in the previously approved schedule and APP.
- OTF agreed that a good part of the deferred NTS riserless work can be picked up by Chikyu during a 2-3 month period of riserless operations in fall of 2008, as proposed by CDEX. Subject to PMT and SPC endorsement, this could include some combination of subduction inputs coring and the Kumano Basin (NT3-01) objectives, hopefully including the initial observatory that was dropped from the SODV FY08 schedule as of March OTF and SPC meetings.
- This means that some NTS Stage 2 riser work will probably be deferred to late FY09/FY10, assuming plan to continue with the NTS program as the top priority for riser work beyond FY09.
- For the August SPC, the USIO is exploring three possibilities for the potential slot on the transit between Bering Sea and Southern Oceans: NTS riserless work, Mariana fore-arc, Shatsky Rise basement.

Summary FY07-09 Schedule as of June OTF



For the August SPC, the USIO is exploring three possibilities for the potential slot on the transit between Bering Sea and Southern Oceans: NTS riserless work, Mariana fore-arc, Shatsky Rise basement. (All have potential typhoon issues.)

Summary FY07-09 Schedule as of July



For the August SPC, the USIO is exploring three possibilities for the potential slot on the transit between Bering Sea and Southern Oceans: NTS riserless work, Mariana fore-arc, Shatsky Rise basement. All have potential typhoon issues.

March 2007 SPC Proposal Review/Ranking

- 18 proposals reviewed
 - 13 from previous SPC review/ranking meetings; 5 newly forwarded from SSEP in last year
 - 1 riser program, 3 MSP, rest riserless
- 3 excluded from ranking (consensus 0703-11)
 - 2 for completion of ongoing site survey data analysis and site characterization; these are expected to be available for review and ranking at March 2008 SPC.
 - 1 for a major expansion of proposed objectives in an addendum, rendering the past reviews inadequate and raising issues of site survey data adequacy; submission of revised proposal requested, with SSEP review.

SPC March 2007 Global Rankings (excludes 3 reviewed proposals)

Rank			Mean	Stdv
1	505-Full5	Mariana Convergent Margin	5.59	3.36
2	659-Full	Newfoundland Rifted Margin	5.76	3.80
3	633-Full2	Costa Rica Mud Mounds	6.12	3.48
4	552-Full3	Bengal Fan	6.29	4.06
5	644-Full2	Mediterranean Outflow	6.35	3.44
6	654-Full2	Shatsky Rise Origin	6.65	4.00
7	537B-Full3	Costa Rica Seismogenesis Phase B (Riser)	6.94	2.93
8	522-Full5	Superfast Spreading Crust	7.18	4.00
9	661-Full2	Newfoundland Sediment Drifts	7.29	4.13
10	548-Full2	Chixculub K-T Impact Crater (MSP)	8.18	5.04
11	612-Full3	Geodynamo	9.71	5.64
12	581-Full2	Late Pleistocene Coralgall Banks (MSP)	9.94	4.19
13	618-Full3	East Asia Margin (MSP with riser)	10.47	3.79
14	584-Full2	TAG II Hydrothermal	11.35	3.32
15	547-Full4	Oceanic Subsurface Biosphere	12.18	1.94

This is by far the most even ranking on statistical basis, ever
since SCICOM began annual global ranking (1997).

SPC March 2007 Rankings - Forwarded to OTF

(blue = Group 1* for FY09 and beyond
yellow = Group 2** for FY09/10 only)

Rank			Mean	Stdv
1	505-Full5	Mariana Convergent Margin	5.59	3.36
2	659-Full	Newfoundland Rifted Margin	5.76	3.80
3	633-Full2	Costa Rica Mud Mounds	6.12	3.48
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6	654-Full2	Shatsky Rise Origin	6.65	4.00
7	537B-Full3	Costa Rica Seismogenesis Phase B (Riser)	6.94	2.93
8	522-Full5	Superfast Spreading Crust	7.18	4.00
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15	547-Full4	Oceanic Subsurface Biosphere	12.18	1.94

* All Group 1 proposals from 2003-2007 to be reevaluated at Aug SPC

** Group 2 to be re-ranked at March 2008 if not scheduled in FY09/10

SPC Perspective on June 20 OTF Meeting

- In the current budget situation, it seemed clear that the best way for the USIO to afford programs with any special expenses (long casing, observatories, etc) is to conduct "off-contract" work to pay some proportion of annual fixed costs, banking the savings for the next fiscal year.
- Thus, only simple, inexpensive SODV expeditions are possible for FY08-09; FY10 is the earliest possible time for expensive observatory/casing programs, assuming that the USIO can find off-contract work in FY09.
- OTF explored a range of hypothetical scheduling approaches for coordinated scheduling of IODP and off-contract work. No single model was adopted, but there was general agreement it could be worked out on an ad hoc basis with appropriate approaches.
- Initially, the best potential for USIO off-contract work seems to be in Gulf of Mexico and Atlantic (North Sea and West Africa), possibly Indonesia or India.
- The Gulf of Mexico/Atlantic prospects are consistent with a critical mass of OTF programs in Atlantic/E. Pacific, which would allow for reasonable scheduling options to accommodate both.

So how bad is the financial situation?

- CDEX projects to be able to conduct IODP operations 14 months of every two years.
- USIO projects to be able to conduct IODP operations ~7-9 months/year (3-4 expeditions?).
- Options for remaining time include: (a) idle time in port, (b) IO-solicited "off-IODP-contract" work, or (c) co-funded work of IODP interest.
- MSP operations are very expensive in current industry climate.
- Flexibility will be required, but to what degree?
- SPC chair personal opinion: the situation is difficult, and flexibility is indeed required, but IODP science principles must remain paramount.
- SASEC and Management Forum endorsed mix of high-priority IODP economical programs and ambitious (expensive) programs, as opposed to option for scheduling only less expensive programs in order to maximize platform operating time.
- Implication: Rigorous SAS science review is even more important. The best IODP science should still be scheduled, but SAS will need to be even more selective in review process.

August SPC Review of OTF proposals

Currently at OTF are about 25 “Group 1” proposals from the 2003-2006 SPC rankings. The original plan discussed at the March SPC meeting was to review these in August on an ISP thematic basis, and then prioritize them on the same basis. However, given the difficult budget situation, we are intending instead to review them in groups according to three main issues:

1. Just over half include observatories, only a few of which seem possible before renewal. SPC will review these as a group and prioritize them, perhaps deactivating some (unless proponents raise external funding?).
2. Two are major riser programs, when at best only one more riser program besides NTS can just be started before renewal. SPC will review and prioritize the two riser programs.
3. The MSP programs at OTF are very expensive, with one exception that will still cost >\$5M. Also, there are not many MSP programs coming through SSEP, particularly inexpensive MSP programs. SPC needs to decide how to handle the very expensive proposals, and SPC/SASEC may need to do something to encourage more MSP proposals.

Highlights of March SASEC Mtg

- SASEC formally approved Jim Mori as next SPC chair.
- SASEC received interim recommendations of SAS review WG and asked for final report at June 2007 SASEC meeting, including reduced SAS scenarios if required by budget situation.
- In light of IODP budget shortfalls, SASEC endorsed IODP-MI pursuit of mutually beneficial collaborative relationships with industry to utilize IODP platforms, with flexibility as long as scientific integrity of the IODP program is preserved.
- SASEC also endorsed exploration of ICDP-IODP mutual core curation and proposal evaluation efforts.
- SASEC took nominations for editorial board to update ISP, at the same time recognizing the need to prioritize among ISP objectives.
- SASEC reviewed 7 workshop proposals for FY08 and prioritized ultra-high resolution paleoclimate first. SASEC also endorsed FY07 co-sponsorship of ICDP-IODP sea level workshop.

Highlights of June SASEC Mtg

- SASEC was unable to issue formal approval of the FY08 program plan because of the rescheduling uncertainties.
- SASEC rescoped and advanced the timeline for its plan to update the ISP. The plan is now to reaffirm the basic ISP science themes and initiatives, but focus on selected subjects through Phase 2 before 2013 IODP renewal.
- SASEC accepted the report of its WG to review SAS (later slide).
- In light of IODP budget shortfalls, SASEC endorsed two specific avenues for pursuing outside funding sources for IODP platform operations: (1) a purely non-IODP option and (2) a hybrid model with quick SAS evaluation of "Complementary Project Proposal."

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IODP Science Planning Committee
9th Meeting, 4-7 March 2007
Osaka International House Foundation
Osaka, Japan
DRAFT EXECUTIVE SUMMARY (v1.2)

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6.2. Updates from PPG and DPG

6.2.1. Industry-IODP Science Program Planning Group (IIS PPG)

SPC Consensus 0703-08: The SPC endorses the initiative by the Industry-IODP Science Program Planning Group (IIS PPG) to actively participate in a mini-workshop held in association with its planned July 2007 meeting in Japan, with the aim of engaging Japanese and Asian industry and fostering increased interest in the IODP.

SPC Consensus 0703-09: The SPC appoints Neil Frewin as a new member of the Industry-IODP Science Program Planning Group (IIS PPG), replacing resigned member John Hogg, effective immediately.

6.2. Updates from Program Planning Groups (PPGs) and Detailed Planning Groups (DPGs)

6.2.1. Industry-IODP Science Program Planning Group (IIS PPG)

Ralph Stephen reported on the January 2007 IIS PPG meeting. He noted that the IIS PPG has a mandate and membership, but still needed mechanisms to achieve results. He reported that the IISPPG is promoting the submission of two proposals for the 1 April 2007 submission deadline, and a third for possible submission one year later. Stephen noted that the Arctic Basin is one of the last remaining scientific frontiers and an area of mutual interest to academia and industry. He mentioned that the IIS PPG will prepare a white paper on possible Arctic targets of joint industry-academic interest. Stephen noted that the IIS PPG was trying to engage industry professionals as ambassadors in communicating and promoting IODP activities, and presented a related consensus statement from their latest meeting. IIS-PPG Consensus 0701-4: IISPPG recommends that IODP-MI increase the awareness of IODP in the Japanese petroleum industry in addition to US and European efforts, for example by having a booth at the JAPT. In conjunction with the next meeting in Sapporo, IISPPG will participate in a mini-workshop in Tokyo on "Applications of IODP data in petroleum exploration". The SPC supported this initiative by consensus SPC Consensus 0703-08.

On the topic of industry expeditions, Stephen described two end member models for industry involvement: (1) the present mode of industry scientists participating in IODP expeditions; and (2) use of the drill ship for non-IODP purposes. In the latter mode, the IODP-MI would not be involved and the ship operators would be free to make arrangements such as leasing the vessel to industry. Allan noted that only when a vessel is off contract can it be used for industry use, and that otherwise it is difficult to involve

industry use of vessels within the IODP. Addressing the IIS PPG's mandate, membership and mechanisms, Stephen suggested that industry participation would require a change in the operational governance of the IODP. He recommended reducing the time between proposal submission and implementation as one step that could make the IODP more attractive to industry.

Stephen reported that the IIS PPG proposed to replace industry representative John Hogg (ConocoPhillips, Canada), who has resigned his membership on the IIS PPG, with Neil Frewin (Shell, Netherlands, recently relocated to Australia). Becker noted that the terms of reference of the IIS PPG specify the rights of lead agency countries and other IODP members to appoint members to the PPG, but that other appointments were approved by the SPC, and that Frewin falls in the latter category. SPC Consensus 0703-09: The SPC appoints Neil Frewin as a new member of the Industry-IODP Science Program Planning Group (IIS PPG), replacing resigned member John Hogg, effective immediately.

Stephen announced that the next meeting of the IIS PPG will take place 24-25 July 2007 in Sapporo, Japan.

7. Science Advisory Structure Executive Committee (SASEC) Working Group on SAS I

Keir Becker presented a report on the SASEC-appointed working group charged with reviewing the Science Advisory Structure (SAS).

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(2) Where should we look for additional funding and what accommodations to the IODP model would be necessary?

Byrne noted that he had trouble understanding what the question really means. He suggested that, because the magnitude of additional funding required was in the order of \$10M, the options are very limited, and that industry was the only realistic option. Thus, the question reduces to how the program can accommodate industry. Becker noted that the program was already trying to do this with the Industry-IODP Science Program Planning Group (IIS PPG), but reiterated that industry charter of Chikyu or the U.S. SODV would have to be off-contract only. He wondered if a middle ground could be found, for example, if industry could contribute to the cost of observatories for 589-Full3 (Gulf of Mexico Overpressures II) then this project could go forward. Allan stated that he saw no problem with this type of industry involvement (e.g., third-party tool development), but what would not be acceptable would be a situation where only industry would get access to the data, as the rights of access are specified in the Memoranda of Understanding.

Becker noted that another kind of accommodation that has been mentioned was the concept of a fast-track review process for proposals from industry, but that this raised questions about the scientific integrity of the program. Mountain agreed that if the

scientific integrity of the program was maintained, this idea could be considered, but otherwise he was against it. Katz suggested looking at potential overlap in interests between industry and the IODP, for example, stratigraphic information is very valuable to industry, whereas the program typically wants other information from drill sites.

Stephen raised the issue of site survey data and noted that sometimes these data are proprietary to a company, and therefore a mechanism was required to deal with this. Katz noted that the program can, and already has, dealt with proprietary site survey data.

Larsen pointed out that the new draft data confidentiality policy, which appears in the agenda book, specifies that all data required to document an expedition will eventually become public. Becker noted that in the past the data bank could handle proprietary data.

Sawyer pointed out that a mechanism exists with the new digital Site Survey Data Bank.

Larsen continued to explain that in the new draft policy, data can be proprietary for planning purposes, but the SAS have stated that once an expedition is finished, it wants the data to become public. Becker suggested that allowing industry site survey data to remain proprietary is an accommodation that needs to be made. Mountain stated that data that go into planning does not need to be made public, only the data that result from the expedition. Larsen asked for comments from the committee on the draft data confidentiality policy.

Allan commented that releasing industry proprietary data could jeopardize the well-being of the program. Becker interjected that this was a lead agency-central management organization (CMO) issue. Mountain reiterated that drilling products belong in the public domain, but data used to frame the scientific justification for site locations could remain proprietary. Sawyer suggested that if understanding the well data did not require the site survey data for interpretation, then it would not be necessary to release the site survey data. On the other hand, if, for example, the seismic data were necessary to place the well data into context, then the seismic data should be made publicly available. Becker wondered who would make this decision, on what basis, and when. Sawyer suggested that the decision had to be made early, but otherwise was not sure who would decide, or on what basis. Becker suggested that an exception for proprietary industry data could be inserted into the data confidentiality policy.

D'Hondt agreed but echoed Sawyer's comment that it can be important to have access to data for integration of the results, and that declaring all industry data as proprietary would create an unequal playing field. Becker suggested that he could point out this issue to the SASEC at their March 2007 meeting as a possible accommodation that could be made to encourage industry involvement. He noted that if the program wants to be able to use industry proprietary data, this issue will need to be addressed.

(3) What role does SAS want to play in raising additional funds?

Larsen asked for clarification on the kind of funds referred to in the question. Becker answered that he did not know, and explained that the question came from the IODP-MI president. Becker suggested that the question was asking for any good ideas to help increase the funding base. Stephen pointed out that the IIS PPG was already addressing the issue of funding from industry. Becker agreed that trying to increase the involvement of industry was already included in the IISPPG's mandate, so in that sense the SAS is already addressing this question. Byrne suggested that the SAS needs to be involved in developing new sources of funding for the program. Becker agreed that if a new source of

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funding could be identified, the SAS should be prepared to be involved in terms of explaining the scientific objectives of the program.

SASEC Working Group on SAS – Summary Report, June 2007

Purpose: At its July 2006 initial meeting, SASEC formed a small working group (SAS WG) to review the IODP Science Advisory Structure (SAS) and recommend “any changes to optimally configure its activities as IODP enters Phase II” and “any changes in structure necessary to integrate mission planning into the IODP proposal review process.” After FY08/09 budget shortfalls came to light in January 2007, in March of 2007 SASEC added a request that the SAS WG also investigate scenarios for a reduced SAS if required by budget projections.

Timeline: The SAS WG met twice, once immediately before the November SASEC meeting and again immediately before the March 2007 SPC meeting. The first meeting was held after the separate mission implementation working group developed the approved plan to integrate mission planning without requiring structural changes to SAS. At its November 2006 meeting, SASEC confirmed that this was to be considered an “internal” review, but asked that the SAS WG poll the IODP community with a questionnaire for their views on the SAS. That questionnaire was issued in December 2006, with responses received through February 2007. The second SAS WG meeting considered the responses and was followed by a session with SAS panel chairs for their immediate feedback. Interim reports were then made at the March 2007 SPC and SASEC meetings, and this draft final report reflects feedback from those meetings.

Recommendations and implementation timelines for integrating mission planning into the IODP proposal review process: The SAS WG concurred with the plan developed by the mission implementation working group to utilize the core SAS proposal review committees for review of mission proposals and mission progress, and to enlist volunteer SAS panel members on mission teams on an as-needed basis. Thus, no structural changes to SAS are recommended in order to integrate mission planning into the IODP proposal review process. (It should be noted that the mission proposal review will include an independent, external review panel already approved by SASEC.) In fact, mission planning under the current SAS began as of the May 2007 SSEP meeting, when the mission proposals from the April 1 deadline were reviewed.

Recommendations and implementation timelines for optimally configuring SAS activities as IODP enters Phase II:

- Overall SAS structure: The basic SAS structure is based largely on the JOIDES and interim SAS structures that served the program well during ODP and IODP Phase I, with some refinements introduced in 2005 after a SPPOC review of SAS. Under SASEC executive authority, SAS includes three primary core functions: (1) proposal review and IODP science plan selection (SSEP/SPC), (2) technical advice (EDP/STP/SPC), and (3) assessment of site survey and drilling readiness (SSP/EPSP/SPC). In addition, there is a provision for SASEC and SPC to form short-term specific planning groups as needed (WG’s, DPG’s, and PPG’s). The SAS WG recommends that such an integrated structure should be retained for full multi-platform operations in Phase II, as opposed to introducing any platform-specific structuring. The SAS WG does not recommend any major structural changes at present, although it suggests various refinements to SAS panel mandates and procedures (below). Most of these refinements are already under way under the authority of either the program member offices or the SPC Chair and IODP-MI vice-chair in approving meeting agendas. If major changes are contemplated or required in the future, the SAS WG consensus is that it would be better if

they were designed after the program has developed (a) at least a year or two of actual experience with full multi-platform operations and (b) a clearer understanding of the impact of budgetary limitations.

- Panel sizes: Half-way through the SAS WG term, it became clear that IODP Phase II would be marked by budget projections insufficient for full-time IODP operations of the two primary drillships. Thus, even before SASEC added its request for investigation of “reduced SAS” scenarios, the SAS WG was including cost efficiencies in SAS functions among its recommendations for optimally configuring SAS. Most important, the program member offices agreed shortly after the March SPC with the SAS WG suggestion that most SAS panel memberships (and travel costs) could be reduced. In particular, we understand that the US and Japan agreed to reduce their membership levels to 5/5 on SPC and each panel, down from the original levels of 7/7; ECORD and IODP Associate Members will hold to their current membership levels as specified in their Memoranda, helping to maintain a range of expertise on the panels. The US and Japanese membership level reductions are expected to be implemented by the end of FY08, coordinated by IODP-MI, USAC, and JDESC.
- Proposal Review Function (SSEP/SPC): The core functions of proposal review and annual science plan selection are handled well on an integrated basis by SSEP and SPC, using time-tested procedures. As long as IODP proposal pressure remains strong and the IODP Memoranda specify a proposal-responsive planning process, the SAS WG recommends retaining the core SSEP/SPC structure. The review process will be tested given the new budgetary realities and limits on IODP operations time, so the SAS WG recommends that the SSEP and SPC modify their procedures for a franker assessment of scientific relevance of each proposal and likelihood of scheduling, if possible at earlier stages in the proposal review process. This is for the sake of proponents primarily but also the IO’s and IODP-MI in attempting early planning. Suggestions include (a) earlier SSEP rejection of proposals deemed unlikely to succeed, e.g., unlikely to ever reach SSEP status of 3 stars or higher, (b) more careful SPC assessment of programs that repeatedly rank too low to forward to OTF for potential scheduling, and (c) periodic SPC review of any backlogs of approved proposals forwarded to OTF but remaining unscheduled. Suggestions for applying firm guidelines or rules for all three have met with resistance, so a more flexible approach should be attempted. SSEP has started applying stricter standards as of its May 2007 meeting, where 7 of 31 reviewed proposals were recommended for deactivation. SPC plans a major review of all programs remaining at OTF at its August 2007 meeting, bringing in assessments of drilling readiness and cost information to be provided by OTF.
- Coordination of proposal reviews with ICDP: The SAS WG did not devote significant attention to this issue, being unfamiliar with ICDP proposal review procedures in any detail. Questions were raised about the differences in IODP and ICDP member representation rights in the review process, but there was agreement that a coordinated review process should be explored at least for “amphibious” projects that involve both onshore (ICDP) and offshore (IODP) components. The WG chair attended the April 2007 meeting of the ICDP Science Advisory Group (SAG) to participate in their proposal review process, and there was subsequent agreement by the ICDP Executive Committee to form an ad-hoc IODP-ICDP working group to explore coordinated review of amphibious proposals as well as joint core curation when appropriate. This is to be considered at the June 2007 SASEC meeting.

- Survey and drilling readiness assessment (SSP/EPSP): The SSP and EPSP review drill site survey data in different ways: SSP reviews survey data for all active proposals primarily to advise SPC (and SSEP to a lesser degree) as to survey data readiness in the proposal review process, whereas EPSP conducts more detailed reviews of site data mostly for those highly-ranked proposals approved for scheduling, primarily to advise SPC, OTF, and the IO's about safety and environmental protection matters. The SAS WG reaffirmed the need for separate SAS panels for these two functions, despite various alternative suggestions. The SAS WG did note the need for earlier EPSP "previews" of an increasing number of proposals, and EPSP is already accommodating this need as of its June 2007 meeting. Partly in recognition of the reduced platform operating time to be expected under the realistic budget predictions, the SAS WG suggests that both SSP and EPSP can work toward meeting frequencies of less than twice per year. It appears that EPSP can increase the meeting-to-meeting interval from every 6 mos to every 9-12 mos after its June 2007 meeting. Given the electronic availability of site survey data, SSP should consider at its July 2007 meeting whether it can conduct its business thereafter by one main physical meeting per year and an intervening electronic review process. They and IODP-MI should also consider whether their meeting schedule could/should be coordinated better with SSEP meeting schedules, if IODP-MI can coordinate proposal and data-submission deadlines more closely.
- Technical advice function (EDP/STP): A major change resulting from the 2004-2005 SPPOC review of SAS was replacing TAP with EDP and renaming/refocusing SciMP to STP. EDP and STP both were given more focused mandates and an added direct advisory pathway to IODP-MI and IO's when appropriate. EDP was more carefully focused on engineering development, minimizing operational advice, and it has developed a very effective annual cycle for its two meetings to provide both SPC and IODP-MI advice on engineering development priorities and review of IODP-MI engineering development proposals. The STP mandate is broader, and the SAS WG endorsed the effort already underway as of Dec 2006 for STP to develop a similar annual meeting cycle to focus its delivery of advice to SPC and IODP-MI. There is some overlap in the EDP and STP mandates, but sufficient differences in focus to justify keeping separate panels unless required by budgetary realities. Partly because of STP's broader mandate, but also for potential cost-savings, the SAS WG suggests it may function more effectively with one main annual meeting as a whole, and more specialized working groups as needed in place of its traditional second annual meeting. This should be carefully considered by STP, SPC, and IODP-MI starting at the June 2007 STP meeting.
- Ad-hoc planning groups (DPG's/PPG's): SAS should retain these possible planning elements but continue to utilize DPGs and PPGs sparingly, particularly in light of the budget situation. To date, SAS has had one of each, and the Hotspot Geodynamics DPG provides a great model in issuing a draft final report after only one meeting and less than a year in existence. Similar performance should be the expectation for future DPG's and PPG's. The Industry-IODP Science PPG is a special case, having been formed with a renewable 3-year mandate as a result of the 2004-2005 SPPOC review of SAS. It is about to enter its second year of existence and is making progress on its main task of promoting IODP proposals of joint industry-IODP interest. When it enters its third year, SPC should begin evaluating its performance very carefully, particularly in light of the imperative to develop IODP-industry collaborations that may contribute resources to IODP that help to overcome budget shortfalls.

Experience in the next year or so may or may not dictate a different model than the PPG for fostering such collaborations. (Note that the SPC chair has drafted a potential modification to the IODP proposal process for “Complementary Project Proposals” that would actually bring outside resources to the program for projects of mutual interest to both IODP and other entities when IODP budgets cannot support full operation of primary IODP drillships. This is appended to the SAS WG report and may be considered independently at the June 2007 SASEC meeting.)

Recommendations for reduced SAS scenarios if required by budget projections: The planned reductions in US and Japanese panel memberships should save those national programs ~25% in their SAS travel costs. Additional savings in direct SAS costs would accrue from the potential changes in meeting frequencies and styles outlined above for the 4 service panels, and from minimizing use of DPG’s and PPG’s in the near-term. Even more savings in indirect SAS costs would accrue from proportional reductions in numbers and travel costs of liaisons and observers at panel meetings. When initially presented at SPC, that idea met with objections, but perhaps future budget realities at IO’s, CMO, and IODP agencies will dictate some such reductions. All told, the adjustments described above should result in ~40 % savings in SAS costs but preserve what the SAS WG views as a truly critical function provided by the SAS: allowing the IODP user/client community strong representation in the IODP process, especially at a time of budget shortfalls when difficult decisions are to be made.

If budget reductions require even further reductions in SAS, then SAS should be carefully consulted to ensure IODP user participation in designing the necessary reductions. The process that SASEC has set up to update the Initial Science Plan might result in justification for changes in SAS structure and procedures, especially if the updated ISP refines or prioritizes IODP goals. As expressed in SASEC consensus statements, the updating process is planned to include strong consultation with SAS, so it should also allow for SAS input on further reductions in SAS if dictated by budget realities. Formal adoption of the updated ISP would then be the appropriate trigger for implementing any further changes in SAS outlined in the updated ISP.

Several potential ideas for more serious reduction in SAS, and their implications, are explored in the addendum but not recommended at present. When the full impact of budget reductions on the whole IODP program can be accurately projected, then these or other ideas developed in consultation with SAS should be carefully considered.

Addendum: Possible Reductions in SAS if Dictated by Budget Realities

It is not clear yet whether budget realities will dictate further reductions in SAS beyond those recommended above by the SAS WG. Because there are different national and consortium funding models to support their participation in SAS, it needs to be clarified to what extent reductions in SAS would translate to cost savings that can actually be applied to formal IODP program costs. If it becomes clear that further reductions in SAS are required and justified, e.g., in the process of updating the ISP, then SAS itself or a new SAS working group can attempt an informed cost-benefit analysis of the elements of SAS to meet the goal. Any cost-benefit analysis needs to take into account the value of the thousands of man-hours of volunteered expertise provided annually by SAS members and the larger value of their participation as user representatives in IODP decision-making processes. For now, the SAS WG presents in this brief addendum some pros and cons of several ideas that came up in its discussions. The scope of these ideas reflect the SAS WG consensus that the core proposal review process by SSEP and SPC is handled well, so those structural elements should be preserved through any potential further reductions in SAS. But note again that the SAS WG was not in favor of proceeding immediately on any of the thoughts below.

1. SASEC and SPC: As suggested by SASEC itself (a bit facetiously), is there really a need for both a SASEC and an SPC? If the Annual Program Plan is essentially an implementation plan for the science plan approved by SPC, why is a separate SAS body from SPC needed for approval of the APP? If SPC is now given increased authority for IODP policy-making, as verified at the last SASEC meeting, is it not coming closer to being assigned the role of the “Executive Authority” as described in the IODP memoranda: “...to formulate scientific and policy recommendations with respect to IODP planning and operations”?
2. EDP and STP: If budget reductions are such that IODP can support only limited engineering development and/or improvements of shipboard technologies, then the roles of EDP and STP can probably be reduced appropriately. The level of reduction might be such that a consolidated panel can integrate the functions. The form of such a consolidated panel might include a core group supplemented by added expertise as needed for advice required at a given time. If such an EDP/STP consolidation is considered, there should also be a careful assessment whether it will lead to a need for more IODP-MI task forces (with potential offsetting added costs) like those closely associated with the current EDP and STP. Note that input from both EDP and STP will be essential in providing SAS feedback over the coming year on the extent to which IODP services could/should be reduced to meet budget projections. Thus, potential consolidation of their functions should probably not be implemented until this feedback is provided.
3. SSP: There have been suggestions to phase out the Site Survey Panel, somehow consolidating its review of survey data with the SSEP and/or SPC proposal review. If this is considered, SSP, SPC, and SSEP should be consulted to determine how best to implement the latter. Attempting to join the SSP review too closely with the SSEP review may not improve the process, given that the timing and nature of the reviews are

quite distinct: e.g., there are many past examples of site survey funding being provided by national agencies after proponents report positive SSEP review of conceptual drilling science, or even later, after SPC ranking of proposals forwarded by SSEP. Currently, SSP advice is directly mainly at SPC and the proponents. If budget realities dictate phasing out a separate SSP, one potential mechanism for keeping the functionality might be to ensure that a certain proportion of the SPC members (and SSEP?) is qualified in this regard; this might justify or require bringing US and Japanese SPC (and SSEP? memberships back up to 7/7 levels. The rather technical assessment that SSP currently makes whether or not submitted data satisfy the data guidelines for the type of proposed drilling could probably be done initially by the IODP-MI Science Coordinators, but this might require additional resources at IODP-MI and offset some of the apparent cost savings.

4. EPSP: In questionnaire responses, it was asked why there is a need for an EPSP safety assessment in SAS along with the final safety assessments by the operators required for liability reasons. Should the entire safety assessment be an IO expense or is it a legitimate activity for SAS to approach on an integrated basis? The SAS WG thinks the latter is the case, and it is not clear whether shifting the burden to IOs would result in any cost savings to the overall program.

Note: A further disadvantage shared by the last three ideas is that the four service panels include the majority of the industry participation within SAS, other than the finite-term IIS-PPG (currently 17 industry reps on the 4 service panels, 7 on the PPG).

IODP Science Advisory Structure Executive Committee

4th Meeting, 25-26 June 2007
Bremerhaven, Germany

DRAFT EXECUTIVE SUMMARY (v1.0)

12. IODP and Industry

SASEC Consensus 0706-07: The Lead Agencies have urged IODP-MI, working in concert with SASEC, “to exert leadership in the reduction of IODP costs which may involve difficult restructuring of the program”. One mechanism of reducing program costs, and/or redistributing them to allow some other more expensive drilling legs, is to use drilling platforms for non-IODP activities for some periods.

In that context, SASEC recommends that IODP-MI work with the Implementing Organizations (who are the science operators of the platforms and therefore control the opportunities to be pursued) and the scientific community to develop/facilitate non-IODP work with industry consortia and/or governments.

Ideally, it would be beneficial for cores and data to become part of IODP after the appropriate moratorium period. Ideally, the projects will be of high societal relevance including:

Carbon sequestration

Gas hydrates

Frontier stratigraphic test/reference sites

Hydrogeology and geotechnical drilling.

Enabling these issues to be addressed, even as non-IODP projects, would be a major benefit and legacy of the IODP.

SASEC Consensus 0706-08: SASEC endorses the concept of the Complementary Project Proposal for hybrid IODP projects with substantial external funding, and the evaluation criteria as set out in the June 5, 2007 concept description. In light of the current IODP budget situation, SASEC urges SPC to formally adopt Complementary Project Proposals as an IODP planning mechanism, and to refine the SAS evaluation process for such proposals as appropriate. Ideally, such proposals could be accepted as soon as the October 1, 2007 IODP proposal deadline.

Birth and Evolution of South Atlantic Continental Margins

Relevant documents:

The Rifted Margins Mission Proposal submitted for the April 1, 2007 deadline by John Hopper - COBBOOM - #720

Minutes of the January 07 IISPPG meeting

Dale Sawyer's article on Continental Break-up in Scientific Drilling

The GXT Data Offer in Manik's Feb 28 email

Harm van Avendonk 's South Atlantic White Paper 30 March/07 (proprietary figure)

From Garry Karner, Feb 12/07

Hi Ralph,

After your IISPPG meeting in January, Kurt Rudolph spoke to me about inviting Mladen Nedimovic to the March meeting as ExxonMobil's guest. This I will do.

Cheers for now,
Garry

> Hi Manik,
> The issue has arisen because of Petrobras requesting that their line
> drawings be kept confidential or in their words, the line drawing is "to be
> used only for the IODP mission breakup and I beg to not publish or use it
> without Petrobras agreement for any other purpose". When we reach the
> proposal stage, I suspect that such line drawings will be totally
> insufficient for review purposes. And what of the white paper? I would
> image it will be published and widely circulated via EOS, etc. If this is
> the case, then it will be extremely difficult for IODP to insure that
> individual figures remain confidential. It is not clear to me or John
> Hopper for that matter that Petrobras has given permission for their
> figures to be published. Maybe Dimas could help here by clearly stating
> Petrobras' wishes given that the South Atlantic paper will be published. Or
> am I wrong in terms of how the white paper will be used and disseminated?
> Cheers,
> Garry
>

from Harm, March 30/07

Dear colleagues,

Attached is the complete version of the South Atlantic margins white paper that I submit for the IODP mission proposal on continental breakup. Some of you visited the IODP workshop in Pontresina last year, and some of you came to a work meeting in Houston recently to further shape this document. I thank everyone for their input. As I understand it, John Hopper can include most but not all of this document in the mission proposal. If this white paper is used as a stand-alone document anywhere else, I would like to credit all of you. If, however, you would not want to be listed as a co-author, just let me know. You can also have me correct your name or affiliation if you think I should change it. The IODP forms attached to this file are tentative IODP site summary forms for 5 proposed drill sites in the South Atlantic.

Best regards, Harm.

from Ralph April 2/07

Harm,

I think you have done an excellent job on the white paper. Thanks. Although as Chair of IISPPG I support and encourage the South Atlantic Rifted Margins effort, there is little point in my being listed as a proponent on the white paper. I don't mind staying on the mailing list.

Based on emails that I have seen from Hans-Christian Larsen and Dimas Coelho, it is my understanding that your Figure 1 (from Petrobras) is just for use in the proposal where its distribution would be limited to community evaluating the proposal and co-authors, of course. This figure is not to be used in any open publication or to be distributed openly on the web. Is this your understanding as well? Whatever the deal is, it should be made clear to everyone who receives the white paper.

Thanks, Ralph.

from Harm April 2/07

Ralph,

As you wish, I can take your name off as a proponent. Your help as a coordinator has been essential, though.

Yes, the industry seismic interpretations such as Figure 1 will not be circulated outside the IODP review process. That was agreed during and after the meeting of March 16th.

It would help, as Garry Karner suggested, if IODP proactively contacts industry seismic vendors (Veritas, Western/Geco, Fugro, GXT) to come to a general agreement to support IODP site characterization. Approval for individual data sets is then still necessary on a case by case basis.

Cheers, Harm.

from Hopper April 3/07

Greetings again folks,

I have placed a copy of the proposal on the web for you download. I removed the site survey forms from this copy (all 128 pages of them). If you are interested in having these, let me know and I can put that pdf on the web too.

<http://geoweb.tamu.edu/Faculty/Hopper/COBBOOM_noforms.pdf>

all for now,
John R. Hopper

from InterRidge April 23/07

2. Upcoming Meetings

Ocean Continent Transition workshop

Just a short update on the Ocean Continent Transition workshop to be held in Paris in September (19 to 21) 2007 at the Academy of Sciences. So far the response has been encouraging with people from academia and industry from a wide range of countries. Oral presentations (mainly key note speeches) and poster presentations, the latter introduced by short 3 minute talks, will form the frame for discussions that will focus on the structure of deep margins and the processes controlling continental breakup. Particular attention will be paid to poster sessions (see preliminary program). More information concerning the meeting, its aim as well as a preliminary program of invited presentations can be found, together with the specific abstract guidelines at the following web site:

<http://www.academie-sciences.fr/conferences/colloques/pdf/OCTmeeting2007Paris.pdf>
The deadline for submission of abstracts for posters is May 1st. In case of problems or of questions do not hesitate to contact one of the three convenors:

Gianreto Manatschal (manatschal_at_illite.u-strasbg.fr)
Gwenn Péron-Pinvidic (gwenn_at_eost.u-strasbg.fr)
Philippe Huchon (philippe.huchon_at_lgs.jussieu.fr)

South Atlantic passive margins: Interactions between continental breakup and coeval sedimentation

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1. General objective

Western Gondwana ruptured in the Late Jurassic and Early Cretaceous as the southern Atlantic Ocean opened from south to north. Resulting South Atlantic passive margins can be divided broadly into three provinces, based on their crustal structure and bathymetric morphology: 1) South of Walvis Ridge (offshore northern Namibia) and south of Florianopolis basement high (offshore southern Brazil), magmatism was voluminous, leading to ~100 km wide volcanic wedges within the crust. These wedges are manifested as seaward-dipping reflections (SDR's) in extensive seismic reflection data sets gathered by industry and academic groups on the conjugate Namibian and Argentine margins. 2) North of Walvis Ridge, the rifted margins of eastern Brazil and the conjugate margins of Angola, Congo and Gabon also experienced volcanism during breakup, but their syn-rift and post-rift evolution was dominated by deposition of Aptian salt, carbonate platforms and clastic sediments. 3) Rifted margins of the equatorial Atlantic are narrow compared to margins to the south. Continental crust of these margins probably stretched relatively little, since the opening of this last portion of the South Atlantic Ocean was in part achieved by strike-slip motion along major transform faults. The Amazon Cone and Niger Delta, the two large fluvial depocenters in this region, probably lie mostly on oceanic crust.

Passive margins bordering the South Atlantic offer unique opportunities to learn about fundamental geological processes linking continental rifting and subsidence with syn- and early post-rift sedimentation. For example, investigation of thick volcanic wedges of the southern South Atlantic may help us understand influences of the Paraná-Etendeka hotspot and associated magmatism on the strain history of the Argentinian and Namibian divergent margins. A prominent and characteristic feature of these margins that is as yet poorly understood is the presence of sag basins, deep sedimentary basins that formed on what is believed to be rifted continental crust. The relative absence of faults within these sediment accumulations suggests that while most subsidence occurred landward of the interpreted continent-ocean boundary (COB), sedimentation occurred predominantly after extension of the continental basement had ceased. Observed margin subsidence is not consistent with pure shear extension of the continental crust and simple conductive cooling. Instead, extension of the lower crust must have continued after the end of brittle extension in the shallow basement directly beneath the sag basins. Subsequently, competing effects of basin infill, sediment loading and thermal effects appear to

have kept the margins near ambient sea level, leading to formation of the large Aptian salt basin in the central South Atlantic Ocean. Drilling through the seaward edge of the sag basins is the only means to understand the complex interplay among basement tectonics, margin subsidence and sedimentation, by sampling both the basement (to determine its composition *en route* to assessing its origin) and syn-rift/early post-rift sediments (for assessment of facies and absolute age).

The development of syn-extensional sag basins, including the deposition and mobilization of salt, has been documented extensively using industry seismic data in the Campos Basin offshore Brazil and in the Kwanza Basin offshore Angola. Nevertheless, the relative timing of Early Cretaceous syn-rift volcanism, the formation and deposition of evaporites, and the onset of seafloor spreading are still debated. For example, [Jackson *et al.*, 2000] have suggested that the seaward edge of the Aptian salt basin lies on thick volcanic wedges with SDR's. If this structural configuration is correct, salt must have been deposited after final continental breakup. Thick volcanic constructs in the continent-ocean transition zone may then have acted as a barrier between the episodically dry marginal basin and the open ocean, where new oceanic crust was forming. However, Aptian salt is also abundant in the vicinity of the Congo Fan, where no thick igneous crust or SDR's are imaged in the continent-ocean transition zone [Contrucci *et al.*, 2004]. Even in the absence of a potentially bounding basement high, the seaward limit of autochthonous salt appears to lie close to the inferred landward limit of oceanic crust [Marton *et al.*, 2000]. Evaporites may even have been deposited over serpentized mantle in the continent-ocean transition [Moulin *et al.*, 2005]. Mantle exhumation prior to continental breakup has been studied extensively in ODP programs in the Newfoundland-Iberia rift, and conceptual models show how the continental mantle may be excised by low-angle normal faults [Lavier and Manatschal, 2006; Whitmarsh *et al.*, 2001]. However, whereas the results of ODP Leg 210 [Shipboard Scientific Party, 2004] have shown that the exhumation of mantle must have occurred deep below ambient sea level, the results of Contrucci *et al.* [2004] and Moulin *et al.* [2005] indicate that the COB in this part of the South Atlantic, which may similarly consist of exhumed continental mantle, was close to sea level before continental breakup. Understanding this apparent and fundamental difference between the Newfoundland-Iberia rift and the South Atlantic divergent margins is crucial for constructing a robust global model of continental breakup.

Based upon presently available industry seismic control, we propose to drill sites in the approximately conjugate Campos Basin offshore Brazil and the Moçamedes Basin offshore Angola to establish the tectonic setting in which the marginal basins of the central South Atlantic formed. The two proposed sites within the Campos Basin lie at the seaward end of a sag basin offshore. Drilling there will establish the time and environment in which the Aptian salt basin formed. A third site on the Brazilian margin lies just seaward of the COB; we would use it to sample the oldest oceanic crust. In the Moçamedes Basin on the Angola margin, we will penetrate the basement where a low-angle fault appears to have exhumed presumed continental mantle. These wells, along with site survey characterization of all of the locations, will address the following fundamental objectives: 1) Degree of applicability of conceptual models developed from Newfoundland-Iberia rift characteristics to South Atlantic passive margins. 2) Age of the oldest oceanic crust, and relative timing of both continental breakup and the deposition of pre-salt sag basin sedimentary (i.e., syn-rift) sequences. 3) Nature and composition of the crust on which the pre-salt sequences were deposited. 4) Existence of exhumed continental mantle in the continent-ocean transition zone. 5) Possible existence of top-basement detachment faults. 6) Syn-rift and early post-rift subsidence along a geophysical transect crossing the margins of the central South Atlantic Ocean.

2. Campos Basin

Continental rifting in the central South Atlantic Ocean generally followed the grain of the Neoproterozoic Brasiliana and Pan-African orogenic belts [Heilbron *et al.*, 2000]. Basement extension in the continental margins of eastern Brazil occurred during a few extensional pulses between the earliest Cretaceous and Aptian time [Karner, 2000]. During this rifting, two basement hinge zones formed, one on land (the Serra do Mar) and one offshore (see Figure 1). Crustal thinning initially resulted in tholeiitic volcanism and formation of a deep lacustrine depositional system. Regional early Aptian erosion, forming the pre-Alagoas unconformity, separates these nonmarine deposits from overlying marine sediments. Further thinning of the lower crust caused the start of subsidence in the sag basins later in the Aptian, which allowed accumulation of a thick evaporate sequence. Timing of the initiation of seafloor spreading is not well known, since it occurred during the Cretaceous Quiet Zone [Chang *et al.*, 1992]. As discussed in the previous section, even the relative timing of salt formation and the rift-to-drift transition is not yet clear.

Seismic data provided and interpreted by Petrobras (Figure 1) show that a basement high bounds both the marginal sag basin and salt diapirs in the Campos Basin. Syn-rift sediments may be sampled through windows in the salt canopy (sites Campos-1 and Campos-2). Although it remains unclear where the seaward limit of salt deposition is, salt may have been bounded by the prominent basement outer high. This structure could be a volcanic edifice, a serpentinite mound, or perhaps even an outlying block of continental crust. Knowing the origin of this block is important for our understanding of the development of the marginal basin around the time of continental breakup. Therefore, site Campos-2 is designed to bottom into the flank of this high. In order to learn the timing of earliest seafloor spreading and the thermal regime of the incipient spreading center, we choose site Campos-3 just seaward of the basement high, within the presumed oceanic realm (Figure 1).

3. Moçamedes Basin

The Moçamedes basin lies offshore Angola in a position approximately conjugate to the Campos Basin. An interpretation of industry seismic data provided by Exxon-Mobil shows the Moho clearly in areas not obscured by salt (Figure 2). Presumed continental Moho appears to rise rapidly from beneath the African coast towards the COB, where it appears to merge with the top of basement. Further seaward, another deep seismic reflection likely represents Moho that formed in oceanic lithosphere after continental breakup. Continental mantle cannot breach the basement surface without depth-dependent extension, so the reflection may instead represent a tectonic boundary, perhaps a low-angle fault along which the continental mantle was exhumed to the seafloor of the incipient South Atlantic Ocean. The seaward merging of the continental Moho with basement roughly coincides with the location of the COB inferred from gravity data [Karner and Driscoll, 1999], which suggests that exhumation of the continental mantle was soon followed by continental breakup and seafloor spreading.

Both landward-dipping and seaward-dipping, low-angle detachment faults have been interpreted in marine seismic data from rifted margins [Maillard *et al.*, 2006; Whitmarsh *et al.*, 2001]. As mentioned, these faults provide a mechanism for exhumation of continental mantle in the continent-ocean transition zone. Other low-angle faults may have exposed deep-crustal rocks landward of the COB in an earlier phase of continental extension. Existence of such faults can explain the discrepancy between extension seismically observed in crustal faults and thinning of continental crust calculated at rifted margins [Reston, 2007]. Therefore, it is as yet uncertain

whether rocks that overlie the continental Moho represent upper, middle or lower continental crust (Figure 2). Only by drilling at site Moçamedes-1 through the deepest sediments and into the basement immediately landward of the COB/merging of interpreted continental mantle and basement can we constrain the mode and the timing of crustal deformation prior to final breakup.

Exhumation of continental mantle in the last phase of rifting between Africa and South America must have been accompanied by a large amount of extension of the entire lithosphere and significant adiabatic decompression of the underlying asthenospheric mantle. Apparent delay between continental breakup and production of normal oceanic crust can be explained by the thermal regime of the rift and by mantle depletion [Müntener and Manatschal, 2006]. Sampling of the oldest oceanic lithosphere seaward of the COB will help distinguish between different processes that may control the onset of seafloor spreading. Proposed drill site Moçamedes-1 extends into the basement just landward of where the continental Moho appears to merge with the top of basement (Figure 2). Knowing the mechanical properties of the fault that is interpreted to exhume the continental mantle is important to assess models for the strain development in the lithosphere before breakup. Moçamedes-2 (not shown, except in map view, Figure 2) is another drill site that samples the oceanic crust just seaward of the continent-ocean transition on this margin. Objectives for this second site are similar to those for site Campos-3 on the conjugate Brazilian margin.

4. Relation to mission themes

Along South Atlantic margins, we can address problems in continental rifting by studying, using both industry-standard geophysical control and drilling, both deep lithospheric structure and intimately linked overlying sediment stratigraphy. Since academic groups have focused much attention on sediment-starved passive margins over the last few decades, South Atlantic margins may be particularly important because syn-rift and early post-rift sediment infill within sag basins can be imaged and then sampled to understand the margin's crustal evolution (Theme 5). For example, possible existence of a breakup unconformity and its relationship to the rheology and isostatic balance of rifted margins has been a long-standing issue. That issue can be addressed offshore Brazil by sampling the pre-Alagoas unconformity in the South Atlantic, as one key objective of an integrated study of these rift basins.

Proposed drilling in the syn-rift section of the Campos Basin is essential, but the stratigraphic response must also be compared to the strain history in the lithosphere (Theme 2). We hope to deduce both from a combination of proposed deep-seismic studies and eventual drilling of the basement along a geophysical transect that spans the conjugate margins of Brazil and Angola. Final thinning of the crust and exhumation of upper mantle by an interpreted low-angle fault are best studied by drilling in the Moçamedes Basin.

5. Proposed drill sites

We consider five potential drill sites along the central South Atlantic margins. Three of these sites are in the Campos Basin offshore Brazil, and two sites are proposed in the Moçamedes Basin offshore Angola. At each of these sites, a very thick sediment section must be penetrated, *en route* to reaching the underlying basement. Seafloor depths, thicknesses of the sediments, and other statistics can be found in the site survey forms.

6. Additional data required

Industry seismic reflection data from the South Atlantic margins allow a first-order characterization of these margins. In order to determine the best locations for drilling, spatial constraints on the deep structure of these margins must still be mapped in detail. Furthermore, the lack of velocity control still hampers time-depth conversion and interpretation of existing industry

seismic reflection data. Given the complexity of proposed deep drilling in the Campos Basin and Moçamedes Basin, gathering additional seismic reflection and refraction data is therefore essential, before a mature IODP drilling proposal can be constructed. Efforts are underway by the proponents to collect such data.

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GXT Data Offer

Apropos our discussion on making CongoSpan dataset available to IODP members for picking an approximate location for the next drill-site location in South Atlantic, on behalf of GXT, I am quite delighted to be able to contribute in this manner. GXT's CongoSpan dataset covers the Aptian Salt basin from Northern Gabon to Namibe Basin in Angola and will be a great dataset to sample some of the facets of the pre-drill studies you will have to study.

I understand from you that the members and review panel will consist of industry members (read oil companies), universities and other groups. Based on our discussions this afternoon, you expressed interest in data over Kwanza Basin from lines 2200 to line 1600 and the strike lines contained therein. There was also some interest to look at South Gabon near the line 4600 for a possible Jurassic section.

GXT will be able to contribute CongoSpan dataset in area of interest to pick the next drilling site. We do ask that this data be held confidentially with the IODP consortium within the member group. Confidentiality in this context, implies that members can review, look at the data for drilling purposes but cannot make copies for their own internal use outside the IODP purposes. Customers who have already purchased CongoSpan are not bound by this as they have a license of the dataset with its own clause. IODP can use the dataset and publish small portions of the seismic section on their website or communication about the next drilling location. However, I ask that you send us this dataset and material you wish to publish for review in advance so we can ensure this shows the data in its best light. GXT will make available a SEG-Y of the files for IODP use and they will be bound by above confidentiality requirements. We will also be able to send you interpretation in advance. When showing GXT data, we also ask that you post acknowledgements as appropriate. One of our geoscientists will be more than happy to discuss some of the data results this with you and the member groups.

If there are questions from your side, please do not hesitate to email me. I thank you in advance for thinking about us in this regard. We are grateful for an association with your group in this worthy cause.

Sincerely, Sujata Venkatraman, Program Manager, Africa and South Asia

GX Technology Corporation, 2101 City West Blvd., Suite 900, Houston, TX 77042

Mesozoic Paleo-Oceanography and Source Rocks

Relevant documents:

Harry Doust's March White paper and powerpoint

Harry Doust's Durham prep paper from June 27

Harry, Mar 5/07

Dear Richard. Tom and Sasha, fellow IIS-PPG members,

Excuse my absence from the radar screen on this subject for the past month – I've been so snowed by student work and other things that I haven't had the time to get down to this at all (and as I'm off this week too, won't have until next week at the earliest). So I'm very grateful for the lead you (Richard, Tom and Sasha) have taken in pushing this along. It would be marvelous if we could get a joint academic-industry workshop together sometime in the summer months (relatively early if possible to miss the holiday season!) to discuss our various themes of interest and formulate a joint "mission plan", preparatory to getting groups together to start developing proposals.

At the IIS-PPG meeting late January, I proposed the following action from my perspective:

- (i) Establish a small interest group representative for industry in IIS-PPG. Richard Davies, Marty Perlmutter (who will chair a session on deep time climates at the April AAPG together with John Armentrout), Andy Pepper, Kurt Rudolph and (in his absence) Dave Roberts have already expressed an interest in forming such a group. Tsuji-san is also hereby asked to identify relevant interested scientists in the Japanese community.
- (ii) Liaise with yourselves and others in the academic community to identify a similar core group of those interested (mainly, I guess the palaeoceanographic community working on the Mesozoic), together with Service companies (eg. Fugro-Robertson) etc.
- (iii) These groups to work via e-mail / personal contacts to develop a Mission and nominate PIs. A workshop as you suggest this coming summer (in Newcastle?) would be an ideal method to kick-start this whole process. By the way, Keir Becker informed me that a Cretaceous/Palaeogene extreme climates workshop is proposed for early 2008 (contacts are Greg Ravizza and Elizabeth Erba, (Univ. Hawaii) and Rudiger Stein (Bremerhaven). We need to liaise with this group too.
- (iv) Following the workshop, individual working groups will need to define hypotheses to test in individual elements of the overall mission. I would anticipate that one or two such proposal elements or expedition proposals (plus the umbrella mission statement) should be ready for submission for 01/04/08 (01/10/07 could be a stretch target?).

I would be very grateful for all of your comments and input to the attached word and PPT files (the latter is knocked down to text slide3s only to ease transmission) and your reactions to the above. If we take up the offer of Tom and Richard to host / facilitate a workshop this summer (for which very many thanks) could IIS-PPG members consider workshop contributions / formats and forward your availability time-wise? (They suggest

a total group of about 15-20). Remember that IIS-PPG plan to meet again in Sapporo 23-25 July.

Please forward this mail to whoever you think might be interested, or who I have left out.

With thanks and kindest regards to you all,

Harry

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Harry May 1

Gentlemen,

As you may have heard, there has been some further discussion on the IIS-PPG “Mesozoic source rocks and palaeoceanography” theme since we met in Houston in January. The idea has been taken up pretty enthusiastically in the UK by the NERC IODP industry liaison panel (ILP) and a workshop is now being planned with the objective of facilitating a drilling mission plus, hopefully, some early component proposals. The workshop will take place in the University of Durham (Richard Davies’ home base) on 28 and 29 June 2007, and will be organized by the universities of Durham and Newcastle, with the strong support of the UK-ILP committee. We plan to invite about 30 experts from academia and industry to get this whole theme on the rails and, really, this will be a real industry/academic initiative.

I think it’s important that one or more of you join us if you can and the UK-ILP is very supportive of this. We need a transatlantic perspective. Could you let me and/or Richard Davies know whether you could / would like to attend? Formal invitations will be coming out shortly.

If you cannot attend, but know of a colleague who could contribute that would be great also. In the meantime, Marty, I’d be very interested to hear how your session at the AAPG went, and what insights emerged from it.

I’m taking a couple of week’s holiday – back on 18 May.

Harry
Prof. dr. Harry Doust
Department of Tectonics

Harry June 15

Dear Ralph,

Not yet, though I'm working on it. The thing is that the workshop in Durham has been postponed at a rather late stage by the organizers until September 21/22 (which means, amongst other things, that I shall not be able to attend). This, of course, means that there will be not so much progress to report on in Sapporo.

I am, however, talking at the moment to old Shell colleagues and we shall try to prepare a sort of note or paper on industry perspectives w.r.t. palaeoceanography and source rocks before the end of June. I shall then circulate this for comments to interested IIS-PPG members so that, by the end of July there will, hopefully, an industry objectives document to discuss at the IIS-PPG meeting.

I am going to try to see whether one of the Shell people could attend the Sapporo meeting - for this job we need an industry person. I'm not sure that this will be possible; if not, I would suggest that Marty Perlmutter or, failing that, Richard Davies makes the presentation - which I shall prepare and forward in time. This applies also to the mini workshop in Tokyo, I guess.

For information, the convenors plan to work on three themes at the Durham workshop. These are: (1) Palaeoceanography and palaeoclimate of the Eocene-Oligocene transition (2) A mid-Cretaceous cross-latitudinal climate transect from mid latitude to pole (3) Boundaries of extreme life. In part this will cover our needs, I think.

I'll revert when I know more. Hope this suffices for the present,

all the best,

Harry

> > Harry,

> >

> > Have you made any progress on identifying an alternate for the
> > Mesozoic paleo-oceanography topic in the draft agenda (attached)? We
need this information to make-up the final agenda.

> >

Harry June 18

Gentlemen,

I'm not sure if this is good news or not, but I guess you will have guessed by now from the radio silence that all is not as it was originally with the workshop. The conveners at Durham University have recently concluded that they cannot get enough critical people together for a late June timing, and have postponed the meeting until 21 and 22 September (2007). Invitations will be forwarded to you shortly when I receive them. This unfortunately means that I shall personally not be able to attend, but perhaps it may give one or more of you the chance to do so. I do think it is an opportunity that it is important for the IIS-PPG to follow up and so I am discussing at present with some old colleagues in Shell here in the Netherlands (some of whom will attend the workshop in September) what might be some crucial industry objectives in this theme area. I will meet with them again on 22 June and we will prepare a preliminary document summarizing our thoughts – which could form the basis for an industry-wide contribution to IODP expedition planning at the workshop. As soon as we have prepared the document I will forward it to you all for comments / additions / etc – please react, this is an opportunity that we should (with limited human resources) grasp. I suggest that you react to me via e-mail and/or use it as a basis for discussion at the IIS-PPG meeting in Sapporo, which again, unfortunately, I shall miss. Perhaps one of you (Marty?) would volunteer to lead the discussion on the subject in Sapporo?

I'll keep you posted,

With best wishes,

Harry
Prof. dr. Harry Doust

Stronack email March 13

Richard

◇ I note that the momentum is gathering around the SR workshop. Some notes follow which hopefully contribute to the debate.

The following notes are intended to supplement those from the UKIODP planning meeting held 28/02/07, circulated 01/03/07. They draw on the concepts described by Harry Doust in the IIS PPG White Paper and in my previous note to the UK-ILP (17/11/06). The intention is to suggest a structure to the approach and to make some comment concerning existing proposals and database.

A Definition of objective:

Endorse DGR view (02/03/07) that the key industry objective is to provide an understanding of process that will lead to more effective source rock prediction in the frontier/deep water basins. The Late Cretaceous/Early Tertiary would seem most fruitful interval to characterise.

B Possible staged approach to strategy of study:

1. Background state of the Mesozoic ocean – temperature, salinity and stratification etc. Organic matter production and sedimentary process affecting its deposition.
2. Evolution of that state during tectonic development of ocean – there is a local dimension to this in the development of individual rift basins and a regional in that of major connective gateways.
3. Perturbations to the “background” state via major tectonic events and/or volcanic episodes – timing duration, influence and magnitude – a description/understanding of the various types of “OAE”.
4. Input to modelling to produce a predictive framework incorporating all of the above.

Within this structure, and focussing on the Cretaceous, there is a lot of work on the Western Interior Seaway and on Northwest Europe, with a detailed understanding of the oceanography and sedimentation. What is the scope to extend this into the proto-North Atlantic to produce a series of pan-regional models? Current distribution of data is shown on the attached map, depicting the preservation of early Late Cretaceous and older (>80Ma) and the DSDP/ODP wells which sample rock of at least that age. Proposal 661 (Newfoundland Drifts) would seem a key location. Could this form the nucleus of a “key transect” mentioned in the Planning Meeting notes? What about other North Atlantic locations?

An Early Tertiary “gateway” proposal is that of Jokat et al in the Fram Strait (645), which would seem critical to understanding one of the Arctic connections. Proposals 652 and 708 seek to continue to open the Arctic Frontier – although could these more effectively be considered part of the separate Arctic initiative mentioned at the last UK-ILP meeting?

Proposals 623, 630 and 658 attempt to examine the control and influence of major perturbations in the Selli Event and the PETM.

C Workshop/Personnel

Proponents for the following proposals could be interested and potentially involved in a workshop, including (but not limited) to those listed:

◁645: Jokat, Stein, (Alfred Wegener Institute, Bremerhaven)
652: Jenkyns, (Oxford)

661: Palike, Watson (NOCS), Rickaby (Oxford), Wagner (Newcastle)

708: Stein

623: Jenkyns

630: Erba, (Milano)

658: Planke

Is it worth getting a representative of the old RGGE study to speak at the workshop on its achievements and lessons in techniques successfully applied to that particular intensive source rock study?

I would be happy to try and build on these notions if thought appropriate.

Regards

Nick Stronach

Wagner email Feb 6

Dear Richard,

I think a workshop on this topic is timely and certainly helpful to join forces and merge ideas how to move on with IODP activities on eg extreme warm climate linked to energy aspects. For the Cretaceous research community it is quite clear that we need to develop new drilling proposals in particular from the high latitudes to back up the huge amount of results from the low latitudes.

I personally would regard such a workshop also as an opportunity to formulate a wider strategy how to tackle FP7. It is now the time to meet and discuss these issues and I am happy to spend some effort and time in organising/co-organising such an event. Depending on the number of participants we could possibly host such a workshop at IRES in Newcastle.

I suggest that we meet soon (next week) at your institute to discuss the strategy in more detail. I will be back to the UK on Friday this week.

Ciao, Tom

Davies feb 9

Tom et al,

Thanks for getting back to me....in summary....:

1. We need to draw up list of 15-20 or so key people who could come to the workshop (industry and academia). Smaller groups will be more effective
2. We need to decide a date and venue and convenor team
3. We need to pass this information to NERC who can send out the invitations and look after logistics for the meeting.
4. We need to identify key people to give presentations on where the key issues are in this subject at the workshop.
5. At the workshop we need to agree on who will act as primary for proposal/s and who are contributing.
6. Target is to submit drilling proposal by next realistic submission deadline - Oct 1st 2007. (April 1st 2007 obviously out of the question)

This is moving fast (as I would hope) so please speak up Nick, David, Harry if you have comments, since you have shown interest.

I am happy to help in an 'advisor' capacity.

Regards

Richard

Leigh on Feb 9

Dear All,

As UK IODP administrator and after speaking to Richard and others about this idea, I would like to say that it has the full support of NERC, both in possible contributions to the costs of running the workshop and in organisation through the ILP. We are certainly keen to see new, UK-led drilling proposals in the system and would like to facilitate this as much as possible.

Do let me know how things progress when you meet (next week?) and maybe we can liaise further.

I look forward to seeing this progressing and the momentum continuing!

All the best
Sasha

IIS-PPG White paper

Mesozoic Palaeo-oceanography and Source rocks

The issue

During the mainly greenhouse world of the Mesozoic, repeated periods of apparently global thermal maxima (or extreme climate excursions) occurred, the so-called Ocean Anoxic Events or OAEs. These are recorded in the geological succession in the form of widespread intervals of black shale deposits. Some of these organic rich shales are among the most important source rocks for oil and gas known, responsible for much of the petroleum discovered in such prolific provinces as the Middle East, the North Sea, Western Siberia and Venezuela.

It is vital for future discoveries of petroleum in both well-explored and frontier areas and basins to fully understand the origin of these deposits, so that their development and distribution, where presently poorly or totally unknown, can be predicted.

These deposits are palaeo-environmental indicators and tell us much about the causes of extreme climate change and the Earth's responses and recovery mechanisms: By contributing to our knowledge in this sector, research into Mesozoic OAEs may have wider societal impact – understanding the causes and effects of disturbances in the steady-state carbon cycle is a primary objective of ocean science.

The state of knowledge:

Several OAEs, ranging in age from Toarcian to Santonian are known from the Mesozoic. They are characterized by Oxygen¹⁸ isotope excursions from (-) to (+) and by the deposition of laminated organic-rich claystones.

Detailed knowledge of these events is limited mainly to repeated intervals in the Aptian to Early Campanian (120 – 80Ma), which have been penetrated in several ODP legs (older sequences have hardly been penetrated). Up to five such events have been recorded from several of the world's oceans in the Middle Cretaceous in both shallow basins and on the deep ocean floor. The duration of these events makes it impossible to invoke cyclical orbital forcing as a causal mechanism, while the apparent absence of Mesozoic ice caps makes present-day climate models difficult to apply. The sea-bottom environment does in many places appear to have been unstable, as evidenced by intercalations of glauconitic, mass waste and bioturbated sediments.

Currently, some of our thoughts on causal mechanisms are projected from the Paleocene-Eocene thermal maximum (55.5Ma), during which, over a 200,000 year interval, ocean temperatures rose by 5-8 degrees. It is thought that the event may have been triggered by large quantities of methane that were suddenly were injected into or taken up by the oceans, causing a runaway greenhouse reaction. This methane then oxidized, removing O₂ from the deep ocean. Similar perturbations appear to have characterized the Cretaceous, although foraminiferal populations from ODP cores from the Albian OAE 1b (112Ma) of the tropical Atlantic suggest that this OAE was caused by intense layering of the water column induced by a change of surface waters from cool and salty to warm and

more fresh. Evidence for very extensive anoxia, reaching and including the photic zone, comes from green sulphur bacteria found in several Jurassic and Cretaceous OAEs. One of the most intriguing occurrences of Aptian black shale was located in ODP leg 198 on the Shatsky Rise in the Pacific Ocean, which suggests that at least this event may be of truly global extent. Improved age determinations have in fact made it possible to see a temporal link between Cretaceous OAE development and the formation of Large Igneous Provinces (LIPs): This raises the possibility that global warming may have been triggered by periodic increases in submarine volcanism.

Clearly, the distribution, thickness and organic composition of the black shales is of critical importance to their generative potential. While the Late Jurassic Kimmeridgian-Tithonian interval lies at one extreme, several of the Cretaceous intervals are of less clear potential: What, for instance, is the regional significance of the intervals between 50 and 100m thick with TOCs of 5 – 50% recorded on the Demarara Rise?

On continent margins, one of the main contributors to the widespread development of black shale deposition is known to be an expansion of the Oxygen Minimum Zone (OMZ). This is known to occur at periods of elevated ocean temperature, such that extensive areas stagnate. Conversely, the OMZ contracts during cold periods.

The main questions:

- What were the dominant mechanisms that led to perturbations in the global carbon cycle and the development of global ocean anoxic events (OAEs) in the Mesozoic? Were they primarily oceanographic, sedimentary, geodynamic or tectonic?
 - What was responsible for the special character of the Late Jurassic and late Cretaceous OAEs?
 - Can this be related to specific geodynamic events, such as Atlantic rifting and break-up?
 - Which specific depositional environments were particularly ideal for accumulation and preservation of organic material?
- What was the nature of the climate prior to, during and following the OAE excursion? Is there indeed a close relationship between OAEs and greenhouse warming?
- Is there a clear link to the eustatic sea-level curve or to formation of LIPs, and can a systematic shoaling of the CCD (Calcite compensation depth) be correlated with OAEs?
- What can we conclude about the lateral and vertical extent of oxygen deficiency?
- What was the relative importance of organic production versus preservation?
 - High biological productivity involves rapid supply of organic matter overwhelming the oceanic dissolved oxygen. ODP studies have shown that this mechanism is dominant in the mid-Cretaceous episodes at least.
 - Ocean stagnation, where external processes such as temperature or evaporation lead to stable stratification of the water column and reduced oxygen supply to the ocean bottom
- Were these events indeed (semi-)global or were they locally triggered (eg by gas hydrate release)?
- What dictated the time these events lasted and their periodicity?

- Mid Cretaceous events appear to have lasted for periods of 50,000 years on average
- What can we learn from the biological affinities of the organisms that contribute the organic material? Similarly, how did the anoxia affect biological systems?

Where IODP can contribute: Proposals:

Specific proposals need to be developed, but currently several potential directions can be envisaged. We need penetrations of stratigraphically complete and undisturbed OAEs (typically located in the deep oceans), particularly:

- Older, ie Early Cretaceous and Late Jurassic OAEs. This means oceanic locations with little sedimentary cover in the northern Atlantic, western Pacific or Timor Sea.
- High resolution age determinations from OAEs, including isotope stratigraphy, allowing correlations with other well-dated Mesozoic events, such as LIP developments.
- A number of depth and latitudinal transects to study black shale development and quality in specific environments and areas in three dimensions
- Dedicated well sampling to allow study of palaeo-ocean chemistry prior to, within and following OAE events, as well as the impact on the biota.

References:

- Bralower, T.J., Kelly, D.C. and Leckie, R.M. 2002. Biotic effects of abrupt Paleocene and Cretaceous climate events. *Joides Journal* 28 (1): 29-34
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- Kroon, D. et al. 2000. Excerpts from the final report of the JOIDES Extreme Climates Program. *Joides Journal* 26 (1): 17 - 28
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- Pancost, R.D., Crawford, N., Magness, S., Turner, A., Jenkyns, H.C. and Maxwell, J.R. 2004. Further evidence for the development of photic-zone euxinic conditions during Mesozoic oceanic anoxic events. *Geological Society, Journal*, 161 (3): 353 - 364
- Paytan, A. 2004(?). Tales of Black Shales. ODP highlights. Brochure, Joint Oceanographic Institutions: 11

The issue

- The Mesozoic
 - A mainly greenhouse world with repeated periods of apparently global thermal maxima (or extreme climate excursions) - Ocean Anoxic Events or OAEs -widespread deposition of black shale deposits.
 - Some of these organic rich shales are among the most important source rocks for oil and gas known, responsible for much of the petroleum discovered in such prolific provinces as the Middle East, the North Sea, Western Siberia and Venezuela.
- For future discoveries of petroleum in both well-explored and frontier areas and basins we need to fully understand the origin of these deposits, so that their development and distribution, where presently poorly or totally unknown, can be predicted.
- These organic rich shales are palaeo-environmental indicators and tell us much about the causes of extreme climate change and the Earth's responses and recovery mechanisms
 - By contributing to our knowledge in this sector, research into Mesozoic OAEs may have wider societal impact
 - understanding the causes and effects of disturbances in the steady-state carbon cycle is a primary objective of ocean science.

State of knowledge 1

- OAE intervals range in age from Toarcian to Santonian. They are characterized by Oxygen18 isotope excursions from (-) to (+) and by the deposition of laminated organic-rich claystones.
 - Detailed knowledge of Mz OAEs is limited mainly to repeated intervals in the Aptian to Early Campanian (120 – 80Ma), penetrated in several ODP legs (older sequences have hardly been penetrated). <5 OAEs have been recorded from several of the world's oceans in both shallow basins and on the deep ocean floor.
 - The duration of these events means that cyclical orbital forcing cannot be a causal mechanism, while the apparent absence of Mesozoic ice caps makes present-day climate models difficult to apply. The sea-bottom appears in many places to have been unstable, as evidenced by intercalations of glauconitic, mass waste and bioturbated sediments.
- Currently, our thoughts on causal mechanisms are projected from the Paleocene-Eocene thermal maximum (55.5Ma), when, over a 200,000 year interval, ocean temperatures rose by 5-8 degrees. The event may have been triggered by release of large quantities of methane, suddenly injected into or taken up by the oceans, causing a runaway greenhouse reaction. This methane then oxidized, removing O₂ from the deep ocean.

State of knowledge 2

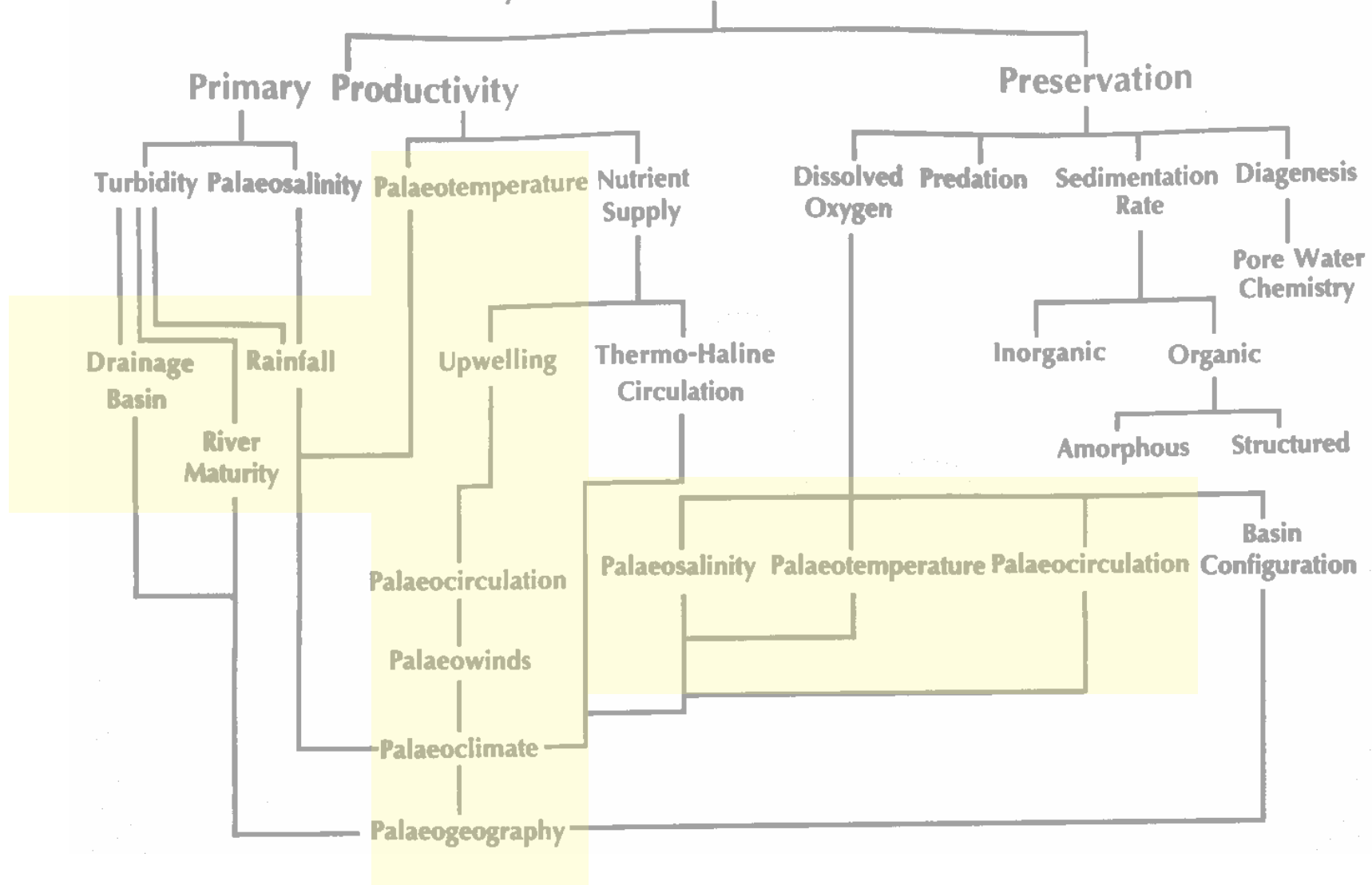
- Similar perturbations may have characterized the Cretaceous
 - However, foraminifera from ODP cores from the Albian OAE 1b (112Ma tropical Atlantic) suggest that the water column was layered and that surface waters changed from cool and salty to warm and more fresh. Green sulphur bacteria demonstrate evidence for very extensive anoxia, reaching up to and including the photic zone in several Jurassic and Cretaceous OAEs.
- Aptian black shale located in ODP leg 198 on the Shatsky Rise in the Pacific Ocean, suggests that at least this event may be truly global.
 - Improved age determinations suggest the possibility of a temporal link between Cretaceous OAE development and the formation of Large Igneous Provinces (LIPs): This raises the possibility that global warming may have been triggered by periodic increases in submarine volcanism.
- The distribution, thickness and organic composition of OAE shales is of critical importance to their generative potential.
 - The Late Jurassic Kimmeridgian-Tithonian interval is exceptional, but several of the Cretaceous intervals have less clear potential: What, for instance, is the regional significance of intervals between 50 and 100m thick with TOCs of 5 – 50% recorded on the Demarara Rise?
- On continent margins, one of the main contributors to the widespread development of black shale deposition is expansion of the Oxygen Minimum Zone (OMZ).
 - This occurs at periods of elevated ocean temperature, such that extensive areas stagnate. Conversely, the OMZ contracts during cold periods.

Climate and Source rocks

- Climatic influence on volume of river / air derived nutrients into the marine realm
 - Cooler and drier periods allow more erosion from continents
- Climatic effect on development of thermohaline circulation
 - Impact of circulation patterns on development of weak THC in deep basins
- Climate effect on palaeogeography
 - Widespread development of high productivity shelves during high stands (especially warm periods leading to volume increase?)
 - Palaeolatitude of Mz source rocks – confined to +/- 45 degr?
- Relationship of black shale development to solar activity
 - Higher radiation increases photosynthesis and productivity
 - Signs of Milankovich cycles in deeper marine Mesozoic source rocks
- Decomposition of organic material and changes in ocean chemistry
 - Link carbon and sulphur cycles
 - Sea water alkalinity
 - Possible contribution of volcanic-derived dissolved phosphate in OAE development

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21/7/07
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Hydrocarbon Source Rock



Interrelationships between factors controlling the deposition and preservation of organic-rich sediments. From Katz 1995, Geol Soc Sp Pub 80

The IODP Science Plan & initiatives

Environmental change, processes & effects

Internal forcing of environmental change / extreme climates

- Conditions that led to transient extreme climate events & deposition of organic carbon-rich sediments / greenhouse anoxia (and recovery)
- Forcing mechanisms for development of greenhouse & icehouse Earth conditions (eg tectonics, igneous activity, sea-level change)

External forcing of environmental change

- Climate system interaction with orbital forcing in Cenozoic and older, where no ice – Milankovitch cycles (also impact events)

Rapid climate change

- Millennial and decadal scale climate events & ocean circulation
- Recovery of laminated marine sediments, coral reefs and deep water drift deposits are needed to develop realistic models

The main questions 1

- What were the dominant mechanisms that led to perturbations in the global carbon cycle and the development of global ocean anoxic events (OAEs) in the Mesozoic? Were they primarily oceanographic, sedimentary, geodynamic or tectonic?
 - What was responsible for the special character of the Late Jurassic and late Cretaceous OAEs?
 - Can this be related to specific geodynamic events, such as Atlantic rifting and break-up?
 - What was responsible for the high biologic production and what type of organisms were involved?
 - Which specific depositional environments were particularly ideal for accumulation and preservation of organic material?
- What was the nature of the climate prior to, during and following the OAE excursion? Is there indeed a close relationship between OAEs and greenhouse warming?
- Is there a clear link to the eustatic sea-level curve or to formation of LIPs, and can a systematic shoaling of the CCD (Calcite compensation depth) be correlated with OAEs?

The main questions 2

- What can we conclude about the lateral and vertical extent of oxygen deficiency?
- What was the relative importance of organic production versus preservation?
 - High biological productivity involves rapid supply of organic matter overwhelming the oceanic dissolved oxygen. ODP studies have shown that this mechanism is dominant in the mid-Cretaceous episodes at least.
 - Ocean stagnation, where external processes such as temperature or evaporation lead to stable stratification of the water column and reduced oxygen supply to the ocean bottom
- Were these events indeed (semi-)global or were they locally triggered?
 - eg by gas hydrate release,
 - mantle plume activity (as suspected for the Shatsky Rise)
- What dictated the time these events lasted and their periodicity?
 - Mid Cretaceous events appear to have lasted for periods of 50.000years on average
 - Why did some last longer than others?

The main questions 3

- What can we learn from the biological affinities of the organisms that contribute the organic material? Similarly, how did the anoxia affect biological systems?
- How efficient is pelagic settling across a range of water depths? How important is slumping as a mechanism for accumulation?
 - The role of the continental slope as major carbon sink.
- Can climate variations be correlated with mineral composition?
 - In the deep water Kimmeridge Clay, kaolinite-rich source levels have been correlated with warmer, humid periods. During more arid conditions (less run-off) lower sedimentation rates leads to higher carbonate content (JU of northern hemisphere shows a northward expansion of low latitude arid belt)

Where IODP can contribute: Proposals:

- Specific proposals need to be developed, but currently several potential directions can be envisaged. We need penetrations of stratigraphically complete and undisturbed OAEs (typically located in the deep oceans), particularly:
 - Older, ie Early Cretaceous and Late Jurassic OAEs. This means oceanic locations with little sedimentary cover in the northern Atlantic, western Pacific or Timor Sea.
 - High resolution age determinations from OAEs, including isotope stratigraphy, allowing correlations with other well-dated Mesozoic events, such as LIP developments.
 - A number of depth and latitudinal transects to study black shale development and quality in specific environments and areas in three dimensions
 - Dedicated well sampling to allow study of palaeo-ocean chemistry prior to, within and following OAE events, as well as the impact on the biota.

Some proposed actions for IIS-PPG

- Decisions
 - Discuss and rank main areas of industry interest
 - Investigate the academic interest in Mesozoic black shales amongst the climate-modelling community
 - Group of proposals (eg transect) covering number of aspects or single sites per issue?
 - Geographic location and location on continent margin / deep sea
 - Do we need a workshop with academics?
- Test Mesozoic oceanographic models for main periods of OAE development
 - C. Scotese for Plate models
 - Involve climate modellers and IODP “black shale” community to prepare sequential models (with perturbations due to gas release, volcanic ash, Sulphur aerosols, etc)
 - Involve ocean water chemists

References

- Bralower, T.J., Kelly, D.C. and Leckie, R.M. 2002. Biotic effects of abrupt Paleocene and Cretaceous climate events. *Joides Journal* 28 (1): 29-34
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IODP: Palaeoceanography and Source Rocks.

Potential industry participation in theme.

History:

The IIS-PPG in the SAS has been tasked with identifying scientific objectives of mutual interest to industry and academic scientists that could be answered by IODP drilling expeditions. In 2006 the theme “Mesozoic Palaeoceanography and source rocks” was identified as a principal theme of industry interest and a “white paper” summarizing the state of knowledge and possible industry approaches was prepared by Harry Doust late in 2006 (attachment). In January 2007 it was decided to pursue the theme with the aim to (i) more widely investigate the level of industry support (ii) identify corresponding academic themes with which to link any proposal, and (iii) to develop one or more proposals for submission to IODP by early 2008.

The theme has been received with interest by the UK-ILP industry liaison group and a workshop to review the topic has been organized under the auspices of NERC. This will be held on 21/22 September 2007 in Durham, UK, with the primary aim to develop a framework for the development and submission of IODP drilling proposals. It will explore the climatic, biological, geochemical and physical processes involved in the formation (and modification) of organic rich sediments.

Three academic-driven sub themes have been identified for workshop focus:

- Eocene-Oligocene closure of central Tethys gateway, Oligocene glaciation and source rocks (coordinator Howard Armstrong, Univ. Durham).
- Cretaceous (and Palaeogene) black shale transects (coordinator Tom Wagner, Univ. Newcastle)
- Boundaries of extreme life (coordinator Ian Head, Univ. Newcastle).

Status of industry w.r.t. theme, June 2006:

Participation in the Durham workshop is regarded as probably the best shorter-term opportunity for industry scientists to participate in IODP expeditions associated with palaeoceanography and source rock development. With this in mind, Harry has met with Shell staff in Rijswijk, The Netherlands, to identify potential issues and topics of importance to the “source rock” staff there. We must now ensure that a wide range of industry scientists agree on a series of relatively specific topics that they wish to address as a group through IODP, so that representatives attending the workshop can guarantee maximum integration and industry benefit.

This document summarizes the ideas discussed, and is now circulated to you all for comments. Please circulate to interested staff within your company as well as to others you know have valuable input. Your e-mail comments, additions and ideas, combined with discussions on the subject at the upcoming IIS-PPG meeting in Sapporo, will be used to finalize this document prior to the workshop. So this is urgent!

Topics for investigation (discussed with Shell scientists*):

1. changes in source rock geochemistry across the continent – ocean crust transition.

2. possible role of sea-level fall in enhancement of isolation in deep water basins and source rock development.
3. the detailed relationship between Milankovitch orbital cycles and nutrient supply in the Mesozoic ocean
4. persistence of organic rich sediment accumulation prior to and following OAEs in some areas.
5. apparent diachronicity of some organic rich sediments related to OAEs given the global time-limited nature of temperature excursions.
6. the impact of palaeogeography (eg ocean age, depth and width) on duration and character of OAE-related source rocks
7. the contribution of faecal material to deposition and preservation of oceanic source rocks
8. chemical changes in organic-rich sediments due to microbiological activity in the shallow and deeper subsurface

Possible objective sequences and localities:

- a combined Central - North Atlantic latitudinal and longitudinal transect with several wells
 - north – south transect, Galicia to Senegal, close to the continent – ocean crust transition zone, to study mid – low latitude variations in development of the Late Jurassic to Late Cretaceous OAEs (DSDP 79 site 547 can be incorporated in this transect)
 - east - west transect, Galicia to Newfoundland, across the conjugate continent – ocean crust transition zones to study the changes through the Cretaceous in the development of OAEs and related organic-rich sediments in relation to ocean width, circulation patterns, climate, etc.
- a combined South Atlantic latitudinal and longitudinal transect with several wells, concentrating on the impact of the Walvis Ridge on the long term development of source rocks in west Africa and Brazil
 - north – south transect from Angola to Namibia, close to the continent – ocean crust transition zone, to investigate changes (as recorded, for instance, in biomarkers) in time-equivalent organic-rich Cretaceous sediments
 - east - west transect across the continent – ocean crust transition zone in the distal Congo fan area to investigate the impact of rapid subsidence in the Albian on ocean circulation and organic matter accumulation
- Isolated tests of the Late Jurassic (Tithonian/Volgian) in the distal palaeo-Tethys (current Indian Ocean NW of Australia) and Mesozoic Pacific (east of the Philippines Sea) to gain more regional understanding of the global ocean chemistry at this critical period
- Follow-up tests of Late Cretaceous and early Tertiary black shales in the Arctic Ocean, as drilled by IODP 302 on the Lomonosov Ridge (see Rudiger Stein, *Marine & Petroleum Geology* 2007, 24: 67-73). The objectives include gaining a better understanding of the tectonic and climatic evolution of the Arctic Ocean during the Cretaceous to Tertiary.

Hypotheses to test / integration:

Following the workshop, specific hypothesis will have to be formulated from the above in cooperation with academic partners.

Wherever potential for integration with other IODP proponents is seen, it should be exploited, either through joint proposal development (preferable) or via collaboration with a proposal currently being evaluated. This applies especially to the geographic location of the proposed wells, where the potential for testing multiple objectives can lead to IODP efficiencies. Abstracts of current proposals can be found at www.iodp.org. See for instance proposal 669, testing the hotspot hypothesis at the Walvis Ridge. Also remember that there may be synergies with the IIS-PPG Continental Breakup and Rifting theme, which is concentrating effort on the Atlantic – contact Harm van Avendonk at harm_at_ig.utexas.edu)

The way ahead:

At the workshop it will be vital to integrate industry and academic objectives to develop joint proposals, probably with multiple objectives. Proponents must come from both sides and work together: Key academic scientists with IODP experience must be therefore identified – we shall rely on them to quite a large extent in getting proposals prepared.

We should also, in my view aim to develop

- An umbrella document, covering the high-level industry objectives of the theme, illustrating the full integration with related academic objectives. This may emphasize the broader activities of industry in integrating data from exploration wells and seismic from ocean basin to shelf, as well as the potential spin-off of these studies for IODP.
- A prioritized list of objectives and possible expeditions, with approved supporting data and special sampling requirements (no contamination, retention of subsurface P/T conditions, as appropriate)
- One or two specific expedition proposals for submission to IODP by 01.04.2008.

Actions:

All: comment / add to the above and contact colleague scientists for discussion prior to and at IIS-PPG meeting end July 2007.

Erdem Idiz will contact Brian Horsfield at GFC Potsdam to liaise on deep biosphere issues.

Contact ESI, Salt Lake City to investigate possible cooperation on DSDP/ODP geochemical legacy data base.

Seismic vendors (eg Geco) should be approached for data as and when preferred expedition locations have been specified more precisely.

Petrobras scientists to be included in the planning

* Shell scientists Andy Bell, Kees van der Zwan, Erdem Idiz, Cees van Oosterhout, all of whom intend to attend the Durham workshop

A few things to keep in mind:

- IODP is not a data-gathering organization; it concentrates on hypothesis-proving. Any proposals should therefore be hypothesis-driven and related to investigation of

natural processes rather than directed at, for instance, proving that source rock x is present in a particular location.

- Clearly any proposal has to be one that can be addressed only by IODP drilling.
- IODP evaluates, nurtures and ranks the proposals it receives on the basis of the following criteria:
 - Alignment with the IODP Initial Science Plan (ISP, see www.iodp.org). This can be assumed since the overall theme is central to IODP strategy.
 - Excellence of the science behind the proposal and the investigation plan, including a clear explanation for why the chosen location is the best place to test the hypothesis.
 - Appeal to a broad community of IODP scientists. ie. integration with related topics and communities
 - Do-ability – this is usually related to accessibility of high quality data underpinning the proposal and represents a real opportunity for industry proponents to get proposals rapidly passing through the system (not only for operational reasons, but also because the scientific objectives can be much sharper with, eg HIRIS 3D data).
- Academic scientists use a slightly different language to industry people, often to describe similar things from a slightly different viewpoint (eg source rocks = palaeo-productivity, maturation = heat flow and kinetic models, biodegradation = microbial biology).
- The logistics of IODP activities mean that there is a greater chance of getting a proposal executed fairly early if the drill sites are in the Atlantic.

Japan Geoscience Union Meeting 2007
held May 19 (Sat) to 24 (Thu)



Japanese Association for Petroleum Technology Meeting 2007
held June 5th (Tue) to 7th (Thu)

Booth of IODP/JAMSTEC

- Video show of the drilling by Chikyu
- Presentation of Cores drilled off Shimokita Peninsula
- Every Chairman of the sessions encouraged participants to visit the booth

Presentations

- A presentation by JAMSTEC in a symposium entitled "Challenges of Drilling Engineers"
- A presentation by JAMSTEC in a oral session for "Drilling"
- No presentation in geology and geophysics related sessions

**Meeting of Site Survey Subcommittee for
Japan Drilling Earth Science Consortium (J-DESC)
held July 11th**

- Introduction of the survey plans of Japanese Oil Industry
- Introduction to the workshop of July 26th

**Committee Meeting of JAPT Exploration Technology
held June 20th**

- Introduction to the workshop of July 26th

The workshop:

13:00~13:40

Key Note Speech "Industry and IODP"
A. Taira, JAMSTEC

13:40-15:20 (20 min×5 persons)

"Advances in Exploration Geophysics and Expectations to IODP"
T. Saeki, JOGMEC

"Geochemical information from ODP/ IODP and methane hydrate exploration"
A. Waseda, JAPEX

"A view from Japanese Petroleum Industry: what we want to IODP"
A. Takahashi, JAPEX

"IODP: A new avenue of sandstone reservoir characterization"
M. Ito, Chiba Univ.

"ODP and IODP contributions to reef studies"
Y. Iryu, Tohoku Univ.

15:20-15:40 Coffee Break

15:40-17:00 (20 min×4 persons)

“ Representative Insights from IODP Data to Hydrocarbon Reservoirs in Deep-Water Settings”

K. Rudolph, Exxon

“Source Rock distribution on the mid- Cretaceous margin of NE South America”

A. Pepper, HESS Corp.

“Third Party Borehole Seismic Experiments during the Ocean Drilling Program”

R. Stephen (Woods Hole Oceanographic Institution)

“The Impact on High Frequency Climate Cycles on Marine Stratigraphy: Predictable Differences Between the Northern & Southern Hemispheres”

M. Perlmutter (Chevron Energy Technology)

17:00-17:30 Discussion (Chairs: Stephen•Tsuji•Yamada)

17:30 Adjourn

The workshop program is shown in the home pages of J-DESC, JAPT and SEGJ. It was also distributed by emails to the members of these societies with encouragements to join.

US National Liaison Efforts

from Marty mar 19/07

Ralph

Here is the Deep Star update from Mike Grecco:

"IODP has joined DeepStar Phase VIII as a contributor. Greg Myers Engineering & Operations Manager for IODP was present at our DeepStar/RPSEA meetings last week. We discussed several areas where we may want to cooperate among those were full scale riser measurements, riserless drilling systems, and vortex induced vibrations. These are preliminary discussions as the RPSEA program is still being developed. Greg intends to participate in our follow up meetings and plans to get more of their experts involved."

...

Marty

Ralph's message Mar 4

Fellows,

FYI see the attached email regarding a special session at the San Antonio SEG on IODP related activities. Please let your colleagues know about this. If you or your colleagues are planning to attend the SEG please consider submitting a paper to this session.

Regards, Ralph.

----- Forwarded message from IODP E-News <newsletters_at_iodp.org> -----

Date: Fri, 02 Feb 2007 11:11:25 -0700

...

IODP E-News

February, 2007

Volume 3, No. 2

CALL TO SEG ABSTRACT SUBMITTERS

ATTN: All Scientists Planning to Submit Abstracts to SEG Annual Meeting

IODP and the Society of Exploration Geophysicists (SEG) Research Committee are currently gauging the community's interest in convening a Special Session on IODP at the upcoming SEG annual meeting, Sept. 23-28, 2007, in San Antonio, Texas. (<http://meeting.seg.org/>) The Call for Papers for the technical program

opens online on March 14, 2007, 15:00 GMT and extends until April 11, 2007, at 22:00 GMT.

If you intend to submit an abstract related to IODP/ODP/DSDP on any topic, please contact Kelly Kryw, kkryw_at_iodp.org, by Feb. 14, 2007. Kelly welcomes messages from all scientists who express interest in presenting papers in a Special Session.

Interoperable Data Portals

Relevant document:

See SEDIS_2007 document.

Marty June 4

----- Original Message -----

From: Ralph Stephen <rstephen_at_who.edu>

To: Pepper, Andy

Cc: kurt.w.rudolph_at_exxonmobil.com <kurt.w.rudolph_at_exxonmobil.com>;

Nobuhisa O. Eguchi <neguchi_at_iodp-mi-sapporo.org>

Sent: Mon Mar 19 10:53:11 2007

Subject: Data management pilot projectsEID

Andy,

Apparently Kurt is out of the office until April 5. I just wanted to touch base and see if there has been any progress on identifying pilot projects which might involve industry with IODP data bases such as SEDIS. Do you have any thoughts on Nobu's email on 26 January regarding SEDIS? Are there contacts within Hess who may be able to pursue this?

Thanks, Ralph.

from Miville June 5/07

Hi Ralph,

I have no idea why they do not link to their own database other than they recently changed their logging database to a new system. But the best person to ask about GeoMapApp is Bill Ryan: billr_at_ldeo.columbia.edu

As for IODP we are currently developing a central access and search database for all DSDP, ODP and IODP data both core and logging data. We will not duplicate the data but rather harvest metadata from the different data centers.

The system should be running this September. For more details:

<http://sedis.iodp.org>

Cheers,

Bernard

Ralph Stephen wrote:

> Bernard,

>

> As Chairman of the IISPPG I have been working with Marty Perlmutter at Chevron on an integrated data base for all well data (industry and DSDP, ODP and IODP). Can you help with Marty's questions below.

>

> Thanks, Ralph Stephen.

>

> Ralph

> I have a presentation by EGI for creating a database for well data that

> I intended to review with the panel in Sapporo. However, I recently

> discovered GeoMaps Aps. At first look, it seems like a logical approach

> to outputting GIS related information, including well data. However, I

> also noticed that they no longer link to Lamont's own ODP borehole

> database. They go straight to IODP's website.

> (1) Do you know whether IODP has an affiliation with the Marine

> Geoscience Data System and if not why not? Seems to me this is the way

> to go. (2) Assuming MGDS had linked to an ODP Borehole database, then something

> must exist already for this info. I have to assume that WHOI knows about

> this. Whats the scoop?

>

> Marty

>

from Miville on June 6/07

Hi Ralph,

SEDIS is a metadata database, so it will not store the data but point to the data. We use ISO 19115 as the metadata standard and ISO 19139 as its XML implementation. Our metadata will be available for any external system to harvest. We plan to add in the near future access to ICDP well data. As for industry data, we could surely extend SEDIS to harvest publicly available industry metadata.

A merger of scientific and industry well data should be possible. We just have to agree on a common method of sharing our available information and metadata. The data would need to have metadata formatted in XML so it can be easily read by a computer. It does not need to be compliant with ISO 19115 but it would be much simpler if it was. Our metadata guide and standard is available here:

http://sedis.iodp.org/documents/Guide_IODP_Metadata.doc

The LDEO Log database will have metadata compliant with this standard.

SEDIS has two different group helping in formalizing the requirements. One is the Data Management Coordination Group (DMCG) compose of internal implementation organization users, programmers and data managers. The other group is a Data Management Task Force composed of external experts in different aspect of scientific data management. We do not have any industry representative (however there are some in our other Panels). However we do have some contact with POSC, where we invited a representative at our last Visual Core Description meeting.

As for feedback from the Geosciences community, we always make our system requirements publicly available and have specific period of time allocated where we request input from the general community (both scientific and industry). However we never received feedback from industry, probably because they might not be aware of what we are working on.

Are there some public databases available now that shows all industry well data?

The only one that I know are (not all public):

EGI: <http://associates.egi.utah.edu/> (no link to the actual data)

US: <http://www.gomr.mms.gov/homepg/fastfacts/borehole/master.asp>

US: http://www.whitestar.com/gulf_of_mexico_data.htm

US: <http://energy.ihs.com/Products/Usdata/Online/index.htm>

US: <http://www.geodev.com/well-log-database.php>

Energy Citation: <http://www.osti.gov/energycitations/index.jsp>

Netherlands: <http://www.fugro-robertson.nl/products/nloffshore.asp>

Canada: http://basin.gsca.nrcan.gc.ca/index_e.php

UK: <http://energy.ihs.com/Products/Subsurfacedatasolutions/global-areas.htm>

Africa: <http://www.equatorialoil.com/pages/Database.htm>

Denmark: <http://www.geus.dk/program-areas/energy/denmark/index-energy-dk-uk.htm>

Worldwide: http://www.infield.com/offshore_energy_database_section.htm

<http://www.infieldonline.com/>

I hope it helps,

Bernard

Ralph Stephen wrote:

> Bernard,

> Thanks for your quick reply. Our main goal of our IISPPG effort is to have a common central access and search database for all of the core and logging data from scientific ocean drilling (SEDIS) as well as the industry wells. Hence our interest in EGI and GeoMapApp. Two questions:

>

> 1) How do you see the merger of scientific and industry data occurring? Would SEDIS be extended to include access and searching of the publicly available industry

data? Is the SEDIS format standard enough that it could be a subset of , or used by, EGI or GeoMapApp?

>

> 2) Does SEDIS have an advisory committee of users that provides guidelines on the sorts of tools and interfaces that would be most worthwhile? If so, are there any industry representatives on the advisory committee? What mechanisms does SEDIS have in place for receiving feedback from the scientific and industrial user communities?

>

> Thanks, Ralph.

>

From Ralph, June 7,/07

Bernard Miville

IODP Data Manager

IODP-MI Sapporo Office

CRIS Bldg., Room 05-103, Hokkaido University, N21, W10, Kita-ku

Sapporo, Hokkaido, Japan 001-0021

Voice: +81 (0)11 738-1072

Fax: +81 (0)11 738-3520

Marty,

I guess the technical pieces are in place for joint industry and science access to logging and core data bases. The next question is "who cares?". At the Hague meeting Andy Pepper mentioned some frustration in accessing ODP data. (I am not sure if this was well data or seismic data.) From the perspective of the IISPPG it would be nice to identify some actual users and/or applications in industry that could be used to evaluate how effective the SEDIS approach is.

Thanks, Ralph.

From Meville July 20

Hi Ralph,

I will not be able to attend the meeting on Monday and Tuesday. I am in the process of moving to New Zealand and will not be working for IODP-MI anymore. Meanwhile you might be interested in viewing this Google Earth file I did that integrates the access to all IODP data: <http://www.iodp.org/borehole-map>

Cheers, Bernard

IODP-MI - SEDIS

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 legacy data.
- **Phase II:** Addition of scientific publications to the metadata catalog. Provide tools to efficiently search IODP publications independent of format and location.
- **Phase III:** Advanced search and extraction of data from distributed databases. Provided advanced mapping and data visualization tools.



INTEGRATED OCEAN DRILLING PROGRAM
MANAGEMENT INTERNATIONAL

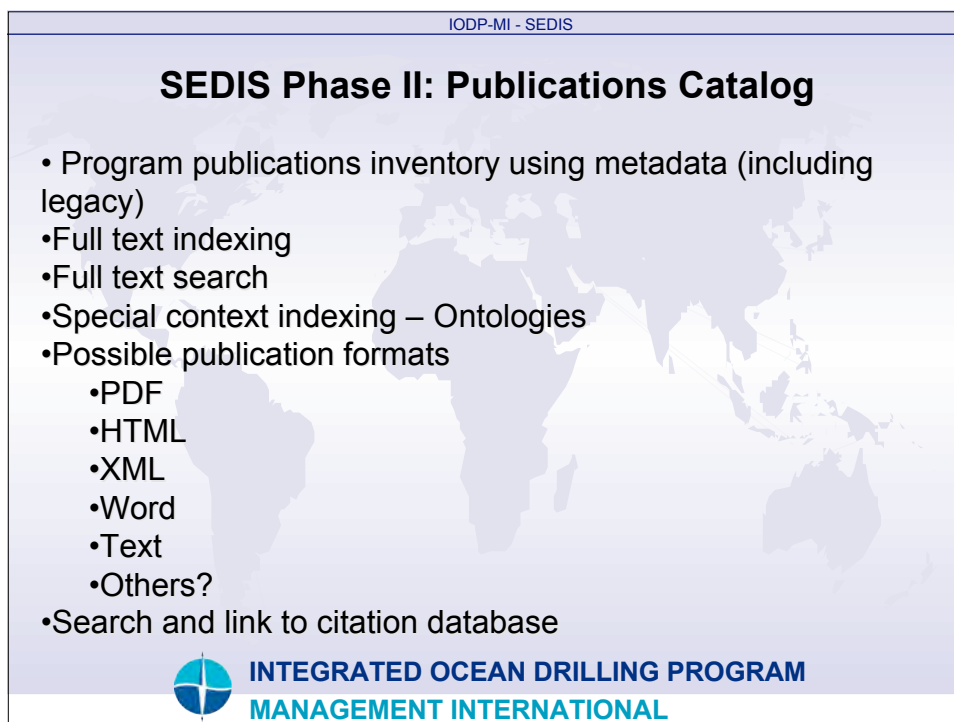
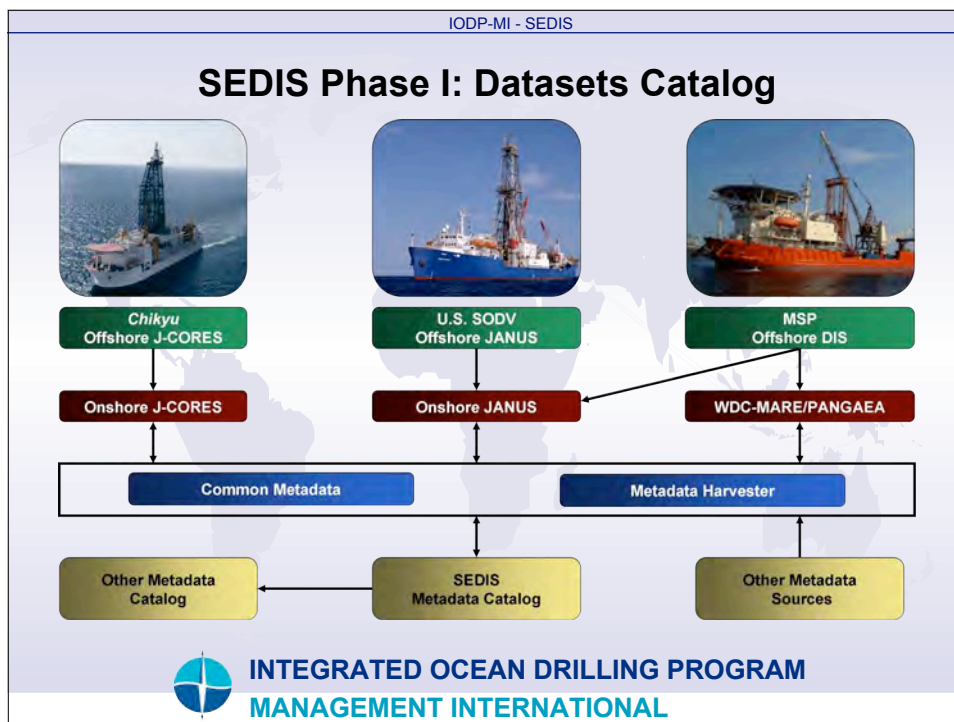
IODP-MI - SEDIS

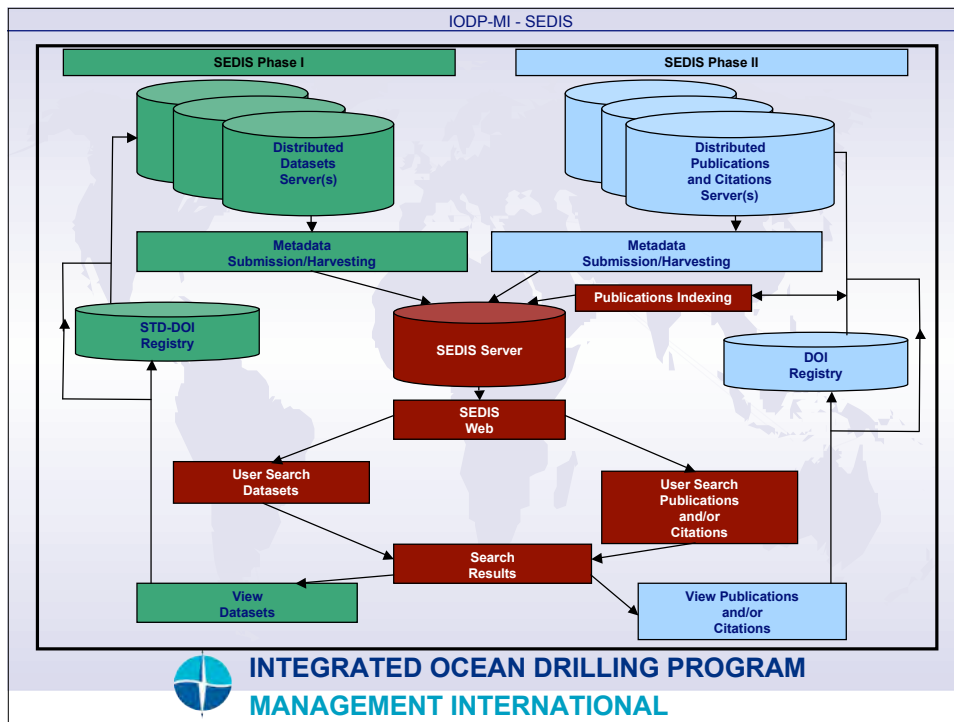
SEDIS Phase I: Datasets Catalog

- A searchable inventory of IODP Core and Logging data via a metadata catalog
 - Datasets at the hole level
 - Listing of measurements for each hole
 - Link to distributed data
- Web-based GIS server, plot data locations (expedition, site and hole locations), do geographical searches, and link map elements to metadata
- Making the SEDIS metadata available to other Geosciences metadata portals
- Include metadata for other types of earth drilling datasets not necessarily coming from IODP. (manually and/or automated)



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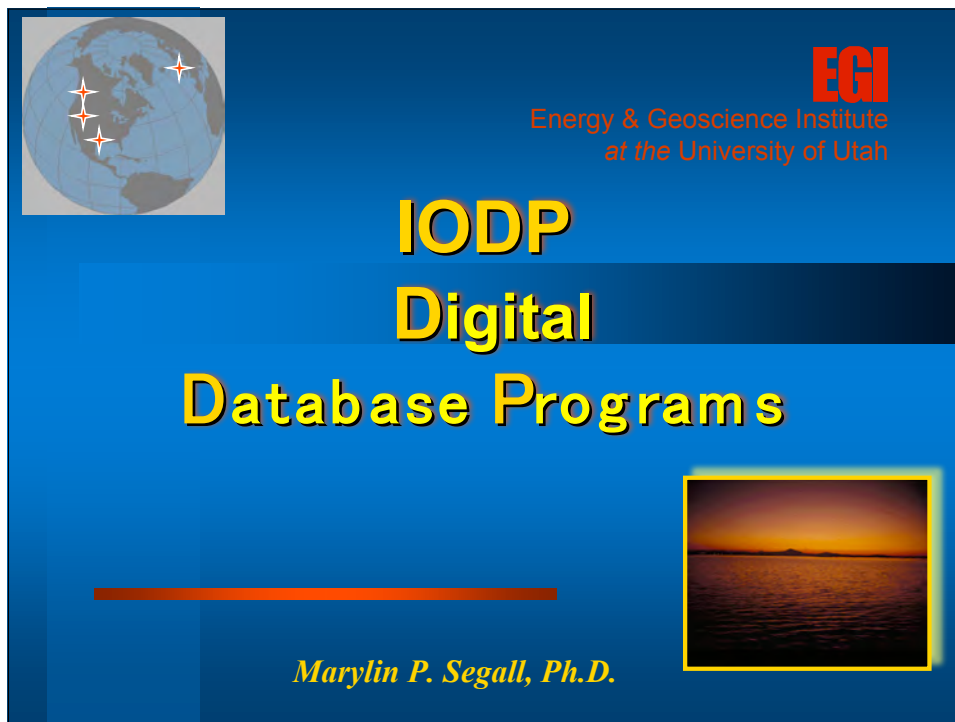


IODP-MI - SEDIS

SEDIS Phase III: Data extraction and visualization

- Advanced data search tools (data mining, integration, analysis, extraction) via direct database query or data aggregators.
- Advanced data visualization and mapping tools, web services
- Develop and/or use existing interoperable and interportable data formats in XML for the advanced data tools
- Involve other organizations working on similar advance tools
- Store Taxonomy and Lithology name lists

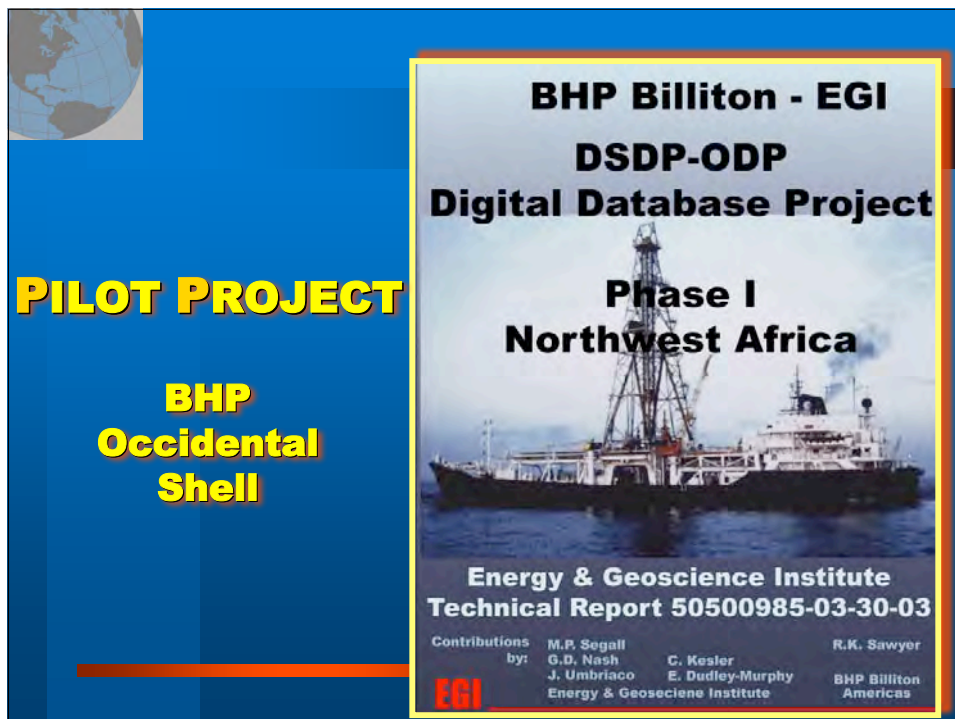
INTEGRATED OCEAN DRILLING PROGRAM
MANAGEMENT INTERNATIONAL



**IODP
Digital
Database Programs**

Marylin P. Segall, Ph.D.

EGI
Energy & Geoscience Institute
at the University of Utah



PILOT PROJECT

**BHP
Occidental
Shell**

**BHP Billiton - EGI
DSDP-ODP
Digital Database Project**

**Phase I
Northwest Africa**

**Energy & Geoscience Institute
Technical Report 50500985-03-30-03**

Contributions by: M.P. Segall, G.D. Nash, J. Umbrico, C. Kesler, E. Dudley-Murphy, R.K. Sawyer
Energy & Geoscience Institute, BHP Billiton Americas



PILOT PROJECT

EGI

BHP - EGI Database Initiative

DSDP Data Storage - Retrieval

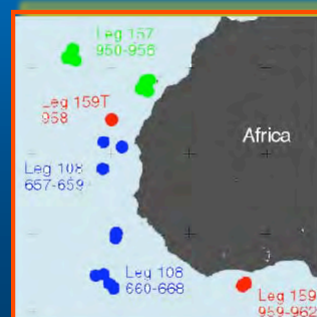
- combine multiple, disparate data types into standardized geospatial data suite
- easily accessed
- easily visualized
- easily queried
- easily manipulated/analyzed




Merged multi-component system


EGI

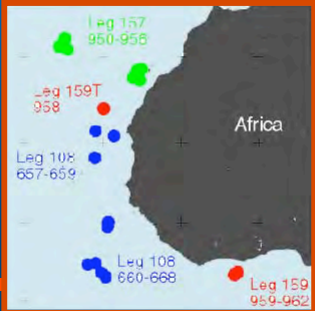
Customized desk-top version compatible with
ArcGIStm





Pilot Project Data Management



Data Type	Primary Data Interface Map	Tools
<ul style="list-style-type: none"> tabular spreadsheet graphic <hr style="border-top: 1px dashed yellow;"/> <ul style="list-style-type: none"> geochemical lithologic mineralogic fission track seismic x-sections 		<ul style="list-style-type: none"> spatial - boolean queries hotlinks - non-tabular data automated import of tabular data into shape file

Phase I Area


32 wells

total depth

ages

images

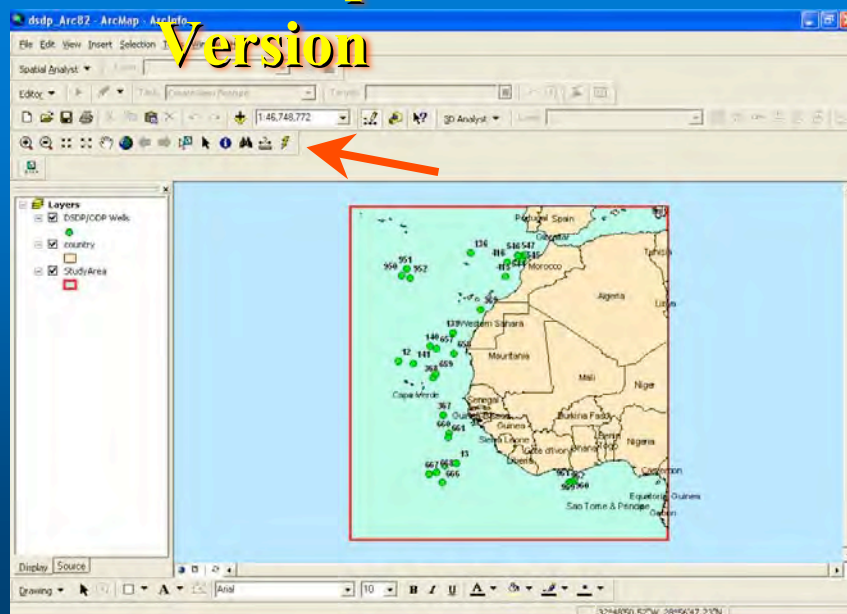
excel files

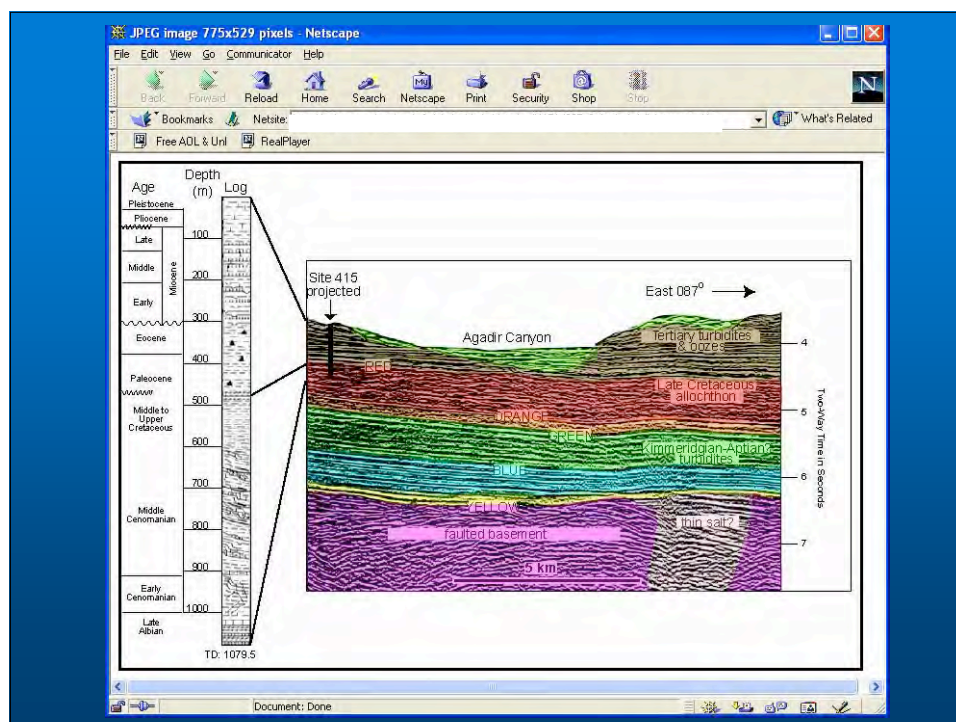
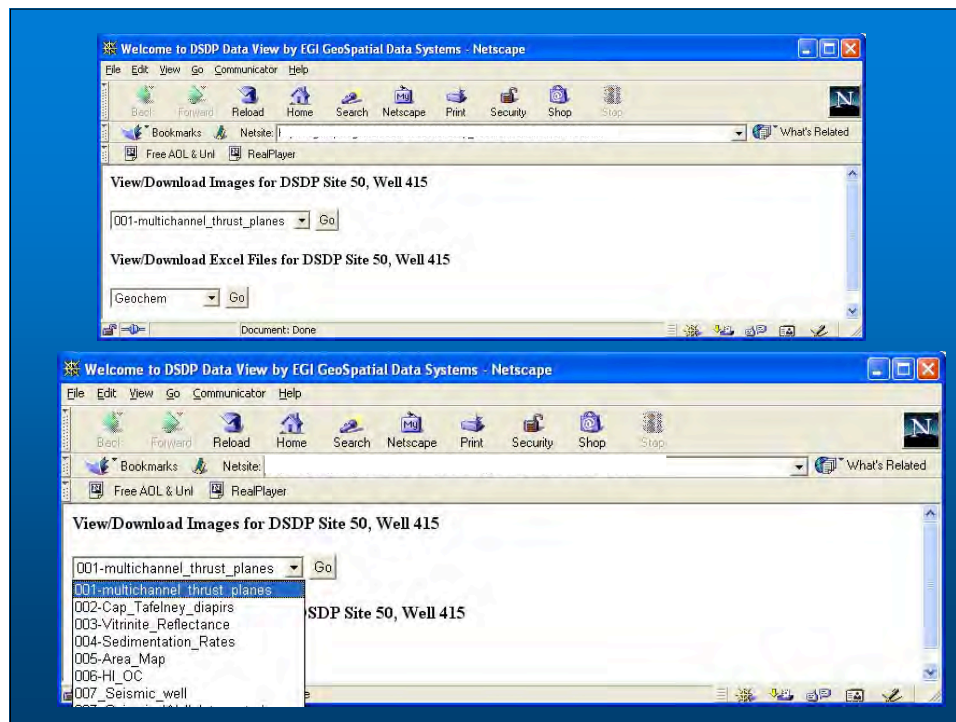


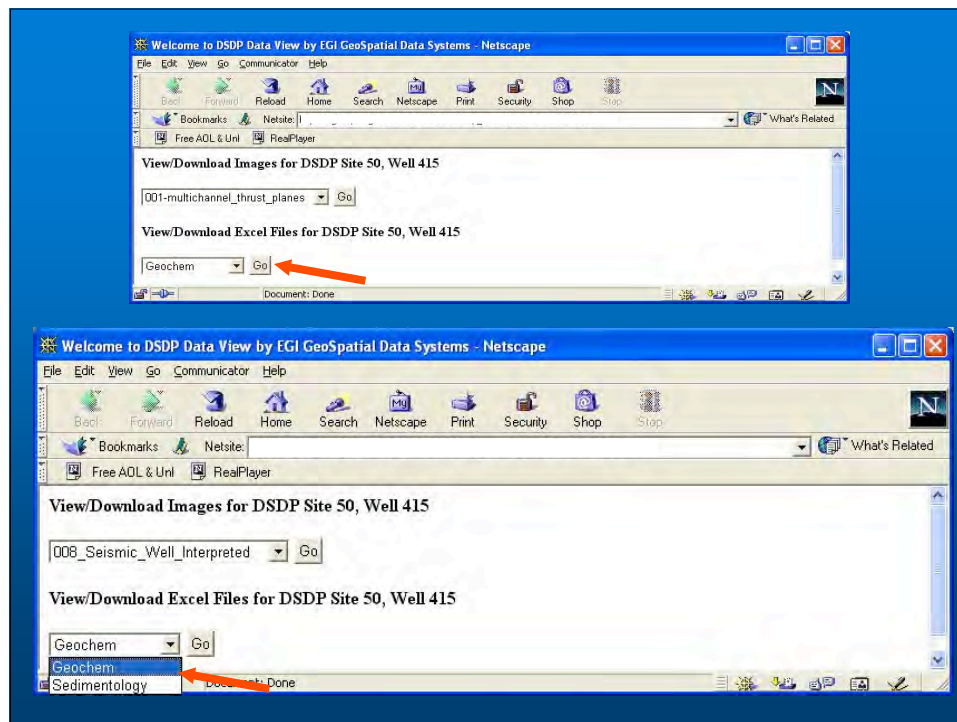
Data Table for DSDP-ODP Wells – Northwest Africa

	Well	Lat	Long	H ₂ O (m)	Age	Depth (m)	Images	S e d	G e o
1	136	34°16	16°30	4169	Aptian	308	1. Location Map 2. Base Map 3. Seismic 1 4. Seismic 2 5. Lithology 6. Sed. Log	Y	Y
2	415	31°01	11°39	2794	Late Albian	1080	1. Multichannel seismic 2. Seismic 2 3. Vitrinite Reflectance 4. Sedimentation Rates 5. Area Map 6. HI-OC 7. Seismic Well 8. Seismic Well-Interpret 9. Sed. Log 10. Geochem Log	Y	Y
3	416	32°50	10°48	4191	Tith- Kimm	1624	1. Sed. Log 2. Geochem Log 3. Vitrinite Reflectance 4. Area Map 5. Seismic 1 - Interpreted 6. Seismic 2 - Interpreted 7. Vitrinite Reflectance	pyrol. data Incorr.	

Desktop Version

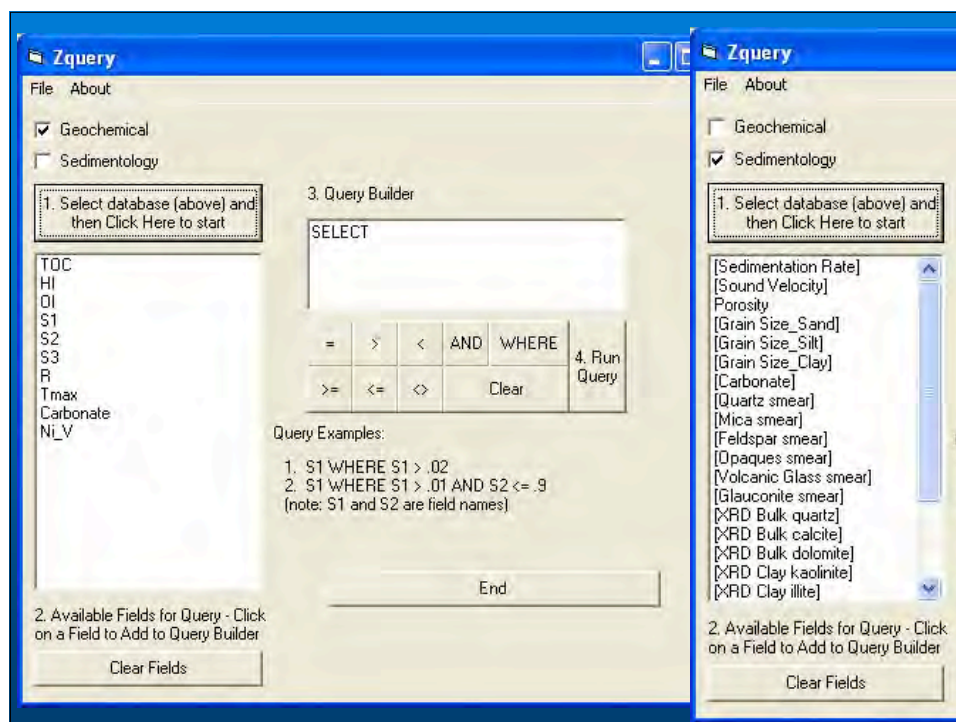
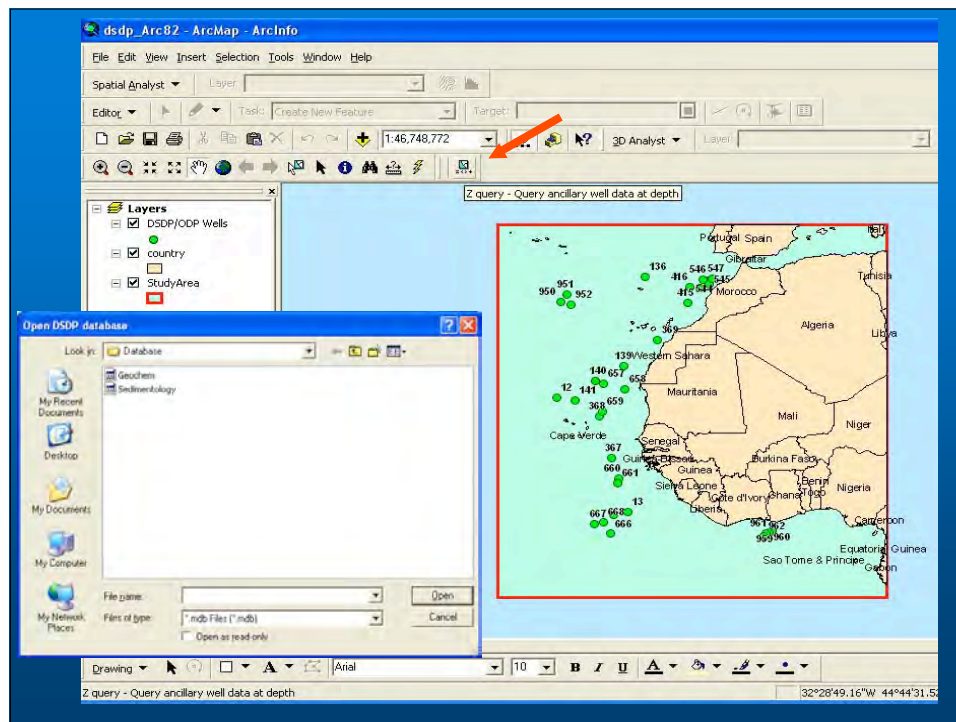


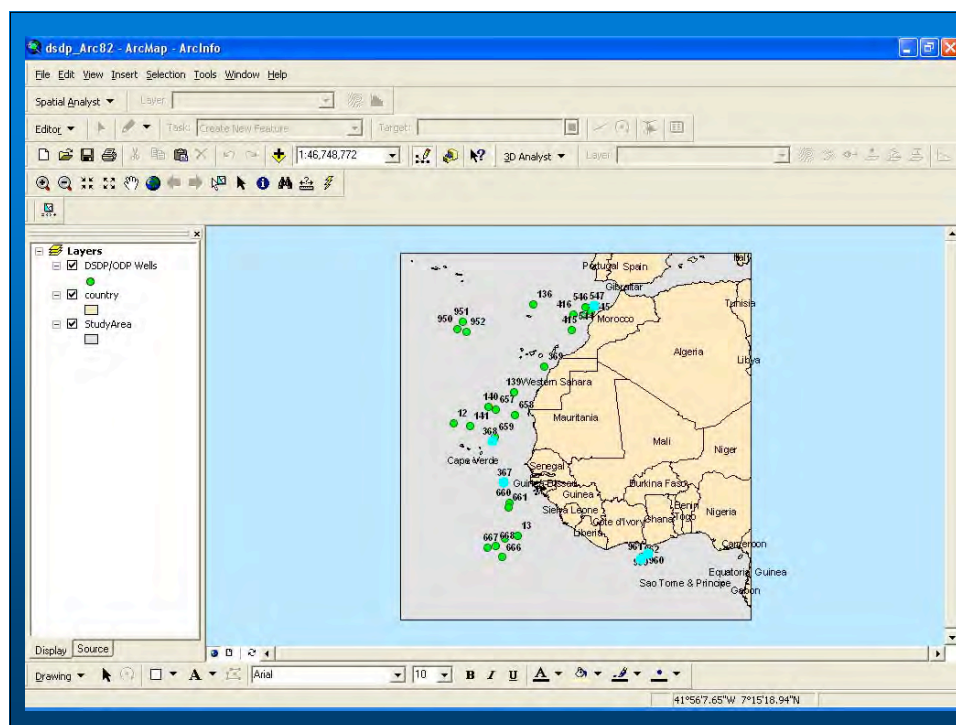
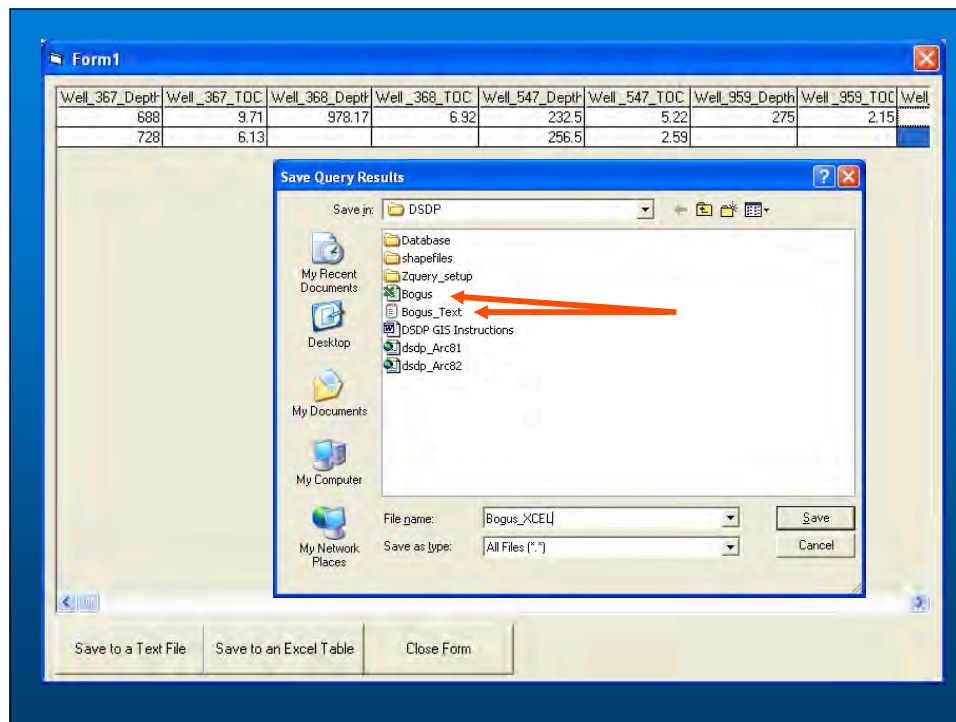




Microsoft Excel - Geochem

	A	B	C	D	E	F	G	H	I	J	K	L
1	DSDP Well 415 - Geochemical Data - Latitude 31°01.7 N - Longitude 11°39.1 W											
2	Depth (m)	Sample Depth (m)	AGE	Lithology	Max TOC %	Avg TOC %	TOC (%)	HI_Max (mg/g Orgc)	HI_Avg (mg/g Orgc)	OI_Max (mg/g Orgc)	OI_Avg (mg/g Orgc)	S1_Max
3	0-110		Late Miocene-Pleistocene	nannofossil marl and ooze	0.85	0.49		187	140	1495	830	
4		7.5	Pleistocene				0.12			1495		0.06
5		74-83.5	Late Miocene-Early Pleistocene				0.13					0.06
6	110-199		Middle to Late Miocene	marl and nannofossil chalk	0.19	0.17		132	120	1343	1175	
7		137.5-147	Middle Miocene				0.19					0.01
8		137.5	Late Miocene									
9	199-313		Early and Middle Miocene	alternating nannofossil chalk and siliceous debris-bearing marl	1.6	0.92		197	171	860	469	
10		207-216.5	Early and Middle Miocene				0.10					
11		273.5-283	Early Miocene			0.18						0.03
12	313-476.5		Late Paleocene to Early Eocene	mudstone with some chert	0.62	0.54		179	154	679	998	
13		443-452.5	Late Paleocene				0.19					0.05
14		452.5-509.5	Early Paleocene				0.20					0.003
15	476.5-491		Early and Late Paleocene	marlstone with limestone								
16	491-551		Middle Cretaceous (Albian-Coniacian)	pelagic clay	0.22	0.22		195	160	477	385	
17	551-1041.5		Late Albian to Middle Cenomanian	mudstone, marlstone, limestone	1.2	0.65		248	128	375	111	
18		576-585.5	Albian-Coniacian				1.14	143	125	286	236	0.02







MetOcean Conditions and Seabed Stability – Digital Database Studies

Microsoft Excel - Bogus2

File Edit View Insert Format Tools Data Window Help Acrobat

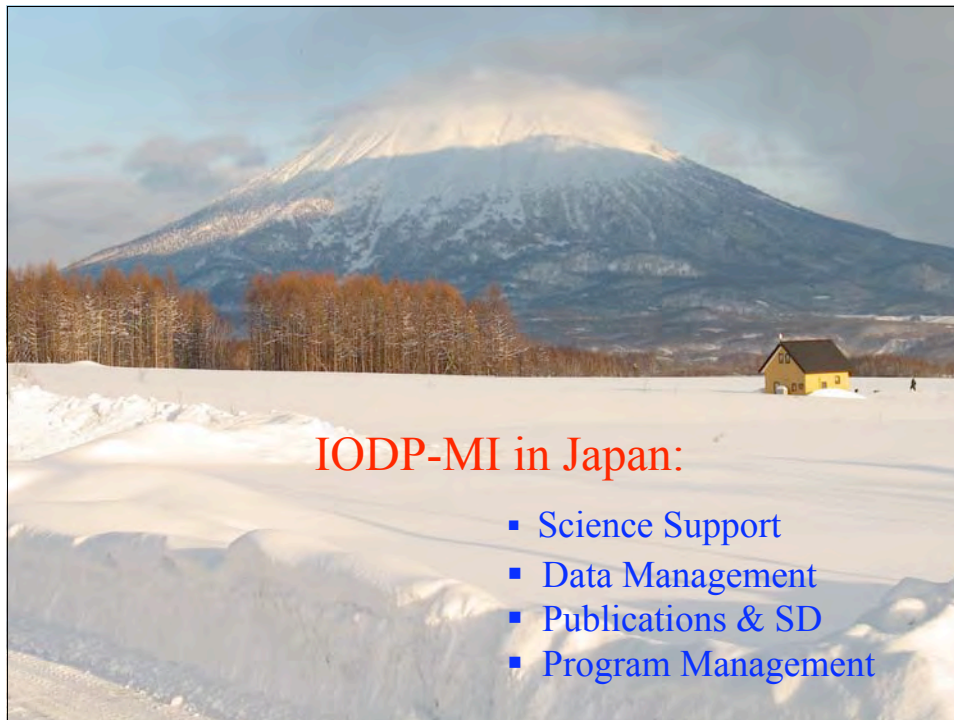
Type a question for help

MS Sans Serif 10 B I U

Q18

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Well_367_	Well_367_	Well_368_	Well_368_	Well_416_	Well_416_	Well_545_	Well_545_	Well_547_	Well_547_	Well_660_	Well_660_	Well_665_	Well_665_	Well_959_	Well_959_	Well_962_	Well_962_	
2	Depth	HI	Depth	HI	Depth	HI	Depth	HI	Depth	HI	Depth	HI	Depth	HI	Depth	HI	Depth	HI	
3	688	477	978.17	496	608	534	396	618	232.5	527	8.85	556	7.1	1047	275	566	3.98	452	
4	728	453							256.5		28.28	690	8.6	933			6.38	615	
5													15.01	1172			8.27	926	
6													15.07	1309			11.46	667	
7													14.24	933			14.24	744	
8													15.2	933			158.94	460	
9													16.59	993			186.21	527	
10																	336.68	551	
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Ready NUM



IODP-MI in Japan:

- Science Support
- Data Management
- Publications & SD
- Program Management

IODP Scientific Data Management

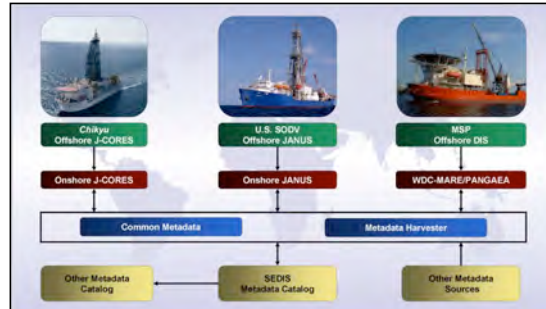
- Proposal data base (IODP-MI)
- Site Survey Data Bank (IODP-MI/subcontract)
- Platform generated data (IO data bases)
- Sample information and distribution (IOs/IODP-MI)
- Post expedition generated data & Publications (IOs/IODP-MI)
- Program Data Portal (SEDIS) (IODP-MI)



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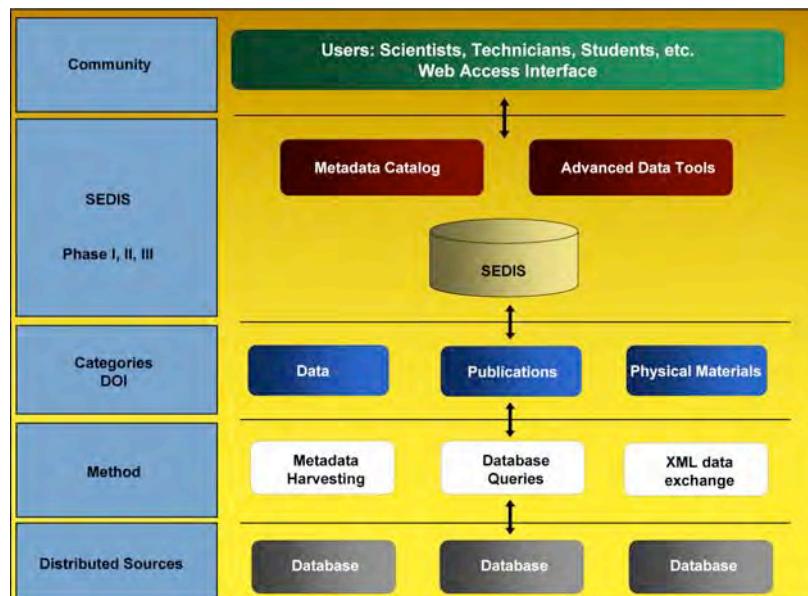
SEDIS Scientific Earth Drilling Information Service

- **Situation:** Multiple participants with established or new data capture systems and databases



- **Solution:** Central access portal
- **Web:** <http://sedis.iodp.org>
- **Phase I:** Datasets catalog using metadata
- **Phase II:** Full text search for publications linked to datasets
- **Phase III:** Advanced data search and visualization tools

SEDIS OVERVIEW



SEDIS

Scientific Earth Drilling Information Service

<http://sedis.iodp.org>

- **Phase I:** Metadata catalog providing searchable inventory of all data for each IODP (and ODP/DSDP) holes.
- **Phase II:** Add scientific publications to metadata catalog. Tools to search publications and content from distributed databases including content based searches.
- **Phase III:** Search and Extraction of data from distributed databases. Mapping and data visualization tools.



INTEGRATED OCEAN DRILLING PROGRAM
MANAGEMENT INTERNATIONAL

Data Management 2007-2008 Plan

- **Data Management Systems development**
 - SEDIS Phase I (Ready March 2007)
 - SEDIS Phase II (Ready late 2008)
 - SEDIS Phase III (requirements and early development)
 - Post expedition data search and capture (Will be part of SEDIS)
- **Data management coordination**
 - **Terminology**
 - Creating an IODP terminology dictionary in SEDIS
 - Adding Paleontology taxon in SEDIS
 - Adding a lithology classification catalog as part of SEDIS
 - **Future data exchange format**
 - Needed for SEDIS Phase III


**MARINE
GEOSCIENCE
DATA
SYSTEM**

Tools and Services	Data	Partners	Explore Further
Search for Data: GeoMapApp Data Link Create Maps & Grids Web Services Data for Google Earth Education Modules	Antarctic Bathymetry MARGINS Ridge 2000 Ridge Bathymetry Seismic Reflection	GRC ODP Borehole IODE Core Repository UTIG Processed Seis NSDC GeoWS	What's New Related Links Contribute Data Meetings & Reports Acknowledgements Statistics & Holdings Advisory Committee


GeoMapApp®



Download Options	Image Gallery	Development History	Help Pages 2007 Update in Progress!	Multimedia Tutorials 2007 Update in Progress!
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Join the mailing list: If you are a regular GeoMapApp user please join the [announce-list](#) for GeoMapApp. The announce-list is a moderated list where the GeoMapApp developers will post release information and critical updates.

News flash: If you are having difficulties in opening (starting) recent versions of the GeoMapApp application (>


**MARINE
GEOSCIENCE
DATA
SYSTEM**

Tools and Services	Data	Partners	Explore Further
Search for Data: GeoMapApp Data Link Create Maps & Grids Web Services Data for Google Earth Education Modules	Antarctic Bathymetry MARGINS Ridge 2000 Ridge Bathymetry Seismic Reflection	GRC ODP Borehole IODC Core Repository UTIG Processed Seis NSDC GeoWS	What's New Related Links Contribute Data Meetings & Reports Acknowledgements Statistics & Holdings Advisory Committee

MGDS: Data Link

Search Location By: Geographic Region

Geographic Region:

North

90

West

-180

East

180

South

-90

Focus/Study Site: (world)

Field Program ID: (all)
(e.g. cruise, flight, transect...)
☒ include submersible dives

Select Data By: By Data Type

Data Type: Heatflow *

* Indicates data online (viewable and/or downloadable)

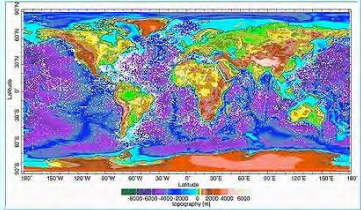
Select: ☒ Any Data ☐ Field Only ☐ Derived Only

Sort Output By: ☒ Field Program ID ☐ Data Type ☐ Device Type

Deep-Sea Sample Repository

A Long History of Coring the Ocean Floor

The Lamont-Doherty Earth Observatory Deep-Sea Sample Repository is both an archive of sediment and rocks from beneath the ocean floor, and an archive of the digital data pertaining to the material. They are all used for research in climate, environment, and other deep-sea studies, and for education.



The white dots on the above image are sites where deep-sea cores have been taken and archived at the Lamont Deep-Sea Sample Repository. You can find out [what](#) cores are, [how](#) we get cores, see some of the research [results](#) from working on cores, and find out [more](#) about the Core Repository. You can also [search our database](#) for core sites of a given area for mineralogy

Deep-Sea Sample Repository

About the Repository

About Shipboard Coring

What We See In Cores

Who Works Here

The LAMONT CORE DATABASE

New

1. Search by Description, Sample History, and more

2. Search

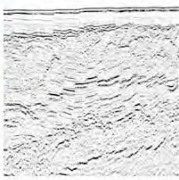
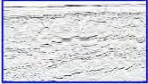

Seismic Reflection Field Data Center

This page provides access to marine seismic reflection images, navigation, acquisition parameters and field data. Browse [Project Related Documents](#) and Summary Tables of [Data Within the Database](#) and of [Data Planned to be Incorporated](#).

Use [GeoMapApp](#) to explore the global topography database, create and download custom maps and grids as well as multibeam ping files. With GeoMapApp you can also view and explore trackline gravity and magnetics data, geochemical data from PetDB, seismicity, and seismic reflection profiles.

Use [Data Link](#) to search for a cruise or data type of interest by keyword or geographic region.

Use [Create Maps and Grids](#) to generate a quick bathymetry map or grid for a region of interest.

[Extract Seismic Data](#)
[Processed Seismic Data Center at UTIG](#)

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[National Science Foundation](#)

GeoMapApp Bathymetry Displayed on Google Earth



GeoMapApp Gravity Displayed on Google Earth



IODP Site Survey Data Confidentiality Policy (DRAFT)

Site-survey data in support of an IODP proposal must be submitted to the Site Survey Data Bank (SSDB) in electronic form. Data objects submitted to the SSDB are flagged, at the discretion of the submitter, as either non-proprietary or proprietary. The metadata (data that describe an object) of all data objects held in the SSDB, whether of a proprietary nature or not, are publicly available for viewing and downloading. Non-proprietary data objects are publicly available for both viewing and downloading. Proprietary data objects associated with a proposal can be viewed and downloaded by all proponents associated with that proposal (i.e., any proponent registered with the SSDB and given proponent-level access to the proposal by IODP-MI). Additionally, during the period of time that a proposal, or part of a proposal, resides with the Science Advisory Structure (SAS), proprietary data objects associated with the proposal can be viewed and downloaded by SAS panel and committee members for purposes of scientific or safety evaluation and by Implementing Organization (IO) representatives for purposes of expedition planning. All other uses of proprietary data by SAS panel and committee members and IO representatives is forbidden. When a proposal, or part of a proposal, becomes a scheduled expedition, a definitive list of all scientific site-survey data necessary to conduct the expedition and to address all scientific contingencies is published in the expedition Scientific Prospectus (SP). The data listed in the SP, including any proprietary data, can be viewed and downloaded by members of the Science Party when the SP is published. At the end of the expedition sample and data moratorium period, all data listed in the Scientific Prospectus become publicly available for viewing and downloading. Exceptions to the latter can be made on a case by case basis for proprietary data provided by an industry for-profit organization. Proprietary data objects associated with deactivated proposals that have not become an expedition remain proprietary and can be viewed and downloaded only by the proponents associated with the proposal.

Data inherited from the Ocean Drilling Program were submitted under a policy whereby data were generally considered proprietary unless they were freely available from other data repositories. To honor that policy, legacy data submitted prior to the start of the IODP are flagged as proprietary in the SSDB. Only with the written approval of a responsible proponent can the proprietary status of these data be changed to non-proprietary.

Background:

Excerpt from the "Guide to the Ocean Drilling Program" (Winter 1998-1999):

All data submitted by proponents to the Site Survey Data Bank are considered proprietary to the Ocean Drilling Program unless they are freely available from other data repositories (e.g., the National Geophysical Data Center). Data are made available to Panels and individuals on a need-to-know basis only. Members of SSP and PPSP are given access to any pertinent site survey data deemed necessary to carry out their mandated tasks. In addition, site survey data are provided to the Science Operator and to members of the shipboard scientific party. Requests for data in support of pre-cruise planning or post-cruise studies are honored; all data requests not considered essential to ODP operations are denied.

After the drilling leg, these restrictions remain in effect unless explicit permission is given by the proponents to relax them. All post-cruise data requests not originating from a shipboard scientific party member will be honored only after the original proponent has been consulted. These restrictions do not hold for the vast library of freely available "background" geophysical data held at the Site Survey Data Bank, and all JOIDES scientists seeking data for ODP purposes are encouraged to continue requesting data from the Data Bank in support of their drilling or site survey proposals.

SSP Recommendation 0602-1: The Site Survey Data Bank Advisory Board and the Site Survey Panel

- Believes that a policy of maximising openness is desirable;
 - Believes that it would be in the best interests of IODP and science in general to make the accumulated data as widely available as possible;
 - and encourages IODP to move towards a policy of maximum data release.
- Such release would be subject to:
- Proponents being told that data are subject to release unless designated proprietary;
 - Proponents being told that putting data in SSDB does not meet their obligation to funding agencies to archive their data
 - All credit to funding agencies needs to maintained

SSP Recommendation 0602-2: Given SSP Recommendation 0602-1 and the great value of the SSP Data Bank resource, how can we best work with other international science and data-banking organisations? Should we:

- a) Do nothing;
- b) Share metadata only (of value since it points enquirers to the data owners);
- c) share data without metadata (effectively of little value);
- d) share data and metadata?

Our preference is for (d); failing this we recommend (b), and as a last resort, (c).

Various options exist for implementing this recommendation.

- SSDB personnel would prefer to make a free-standing clone of the data bank that is open to the public (subject to proprietary issues) – this would insulate main data base from hackers etc.
- Other options might be to include all relevant data as appendices to IODP Proceedings volumes.

SPC Consensus 0603-4: The SPC accepts SSP Recommendations 0602-1 and 0602-2 on maintaining an open access policy for the IODP site-survey data bank (SSDB) and sharing site-survey data and metadata with other international scientific organizations and data banks.

SPPOC Consensus 0506-9: The SPPOC receives SPC Consensus 0503-31 and approves the recommended proposal confidentiality policy for use on an interim basis. The committee recommends that the IODP-MI develop an integrated policy as soon as possible concerning the confidentiality of proposals and site-survey data.

Notes on IODP Proprietary Data, Reports and Figures

from Ralph March 6

Fellows,

Here is some correspondence regarding proprietary data and planning for the South Atlantic rifted margins proposal that is underway. This group is meeting on March 16, trying to prepare material for an April 1 proposal, and it would be useful to have some feedback for them.

Regards, Ralph.

----- Forwarded message from "John R. Hopper" <hopper_at_geo.tamu.edu> -----

Date: Mon, 26 Feb 2007 16:34:59 -0600

From: "John R. Hopper" <hopper_at_geo.tamu.edu>

Reply-To: "John R. Hopper" <hopper_at_geo.tamu.edu>

Subject: Re(2): mission proposals

To: Ralph Stephen <rstephen_at_who.edu>, Harm van Avendonk <harm_at_utig.ig.utexas.edu>

I think the issue is figure out what industry thinks will be the result of any drilling. Any important drilling results of scientific value will need to be published and will become general knowledge, otherwise IODP has no interest in the drilling the hole.

At least for the rifting and breakup problem, I guess I have a hard time imagining a drilling result that will stand entirely on its own without the supporting data being part of the record. Most people will want to see the geometries and regional context, and that means publishing the seismic data along with the drilling results. Hopefully there are places of interest to both industry and academia where this is possible.

cheers,
jrh

> > John's feedback makes sense to me. I don't think that
> > confidential seismic data are required for the Mission proposal due on
> > April 1/07. Since the release of confidential data will be an issue in
> > many industry-IODP projects, I think our IISPPG committee needs to
> > define a process where confidential data can be used in the review
> > process. Perhaps the South Atlantic margins project will be a "guinea
> > pig" to work out this procedure. I'll bring this up at the SPC meeting
> > next week. Meanwhile it would be good to get feedback from your March
> > 16 meeting, on what sort of conditions, the companies might impose. For
> > example, would it be sufficient for reviewers to see the data after
> > signing a non-disclosure agreement.

John R. Hopper
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Katz March 8

Ralph

As I mentioned at the SPC meeting there are a number of examples where industry has provided proprietary information to the program to support the development of drilling locations as well as to deal with specific safety issues. These data were not released to the general public and remained confidential. Among the examples that I am familiar include: Texaco permitting the proponents of Leg 175 to review proprietary data to aid in site selection and more recently Shell and BP permitting the use but not release of their data in the Gulf of Mexico for both site selection and safety review purposes. In the examples that I am aware of there were sufficient non-proprietary data to justify the scientific merit of the program (i.e., the industry data did not provide the sole support for the drilling program). I would assume that this policy remains the case today.

Barry Jay Katz, Chevron Fellow
Team Leader - Hydrocarbon Charge

From Garry March 8

Hi Ralph,

These conditions of data "perusal" are on an ad-hoc and one-on-one application. IODP needs a policy. For example, we need seismic data to be used in a proposal - this means that data is public to a certain degree. Barry's comments will serve no purpose when we want to review data at this early planning stage. As I explained in earlier emails, seismic data is not owned by the oil companies - they are licensed from the geophysical companies and ultimately the host governments. That is, data access will remain a huge problem. I am hoping that Manik can gain approval for a small release of data for planning purposed from the geophysical companies.

Cheers, Garry

From Manik March 9

Dear Garry, Keir and Ralph

I believe that Garry is right on both counts. Data are generally owned by service companies, not by energy companies. IODP policy is needed on the subject. Let me elaborate.

Service companies have a different reason than energy companies to not release data. If they release data freely, the value of data goes down and they will not get new buyers. On the other hand, they have actually to gain from a limited release of data. Their data gets publicized and especially with the prospects of a drill hole based on their data, a hole where core data are publicly released, the value of the seismic data actually goes up. I believe that was the reason for GXT's earlier positive statement about release of data.

I therefore think that it would be useful for IODP to engage in discussions with service companies to see if general agreement can be reached for limited release of data. However before that discussion takes place SAS has to develop policy with regard to what conditions and concessions are acceptable in exchange for data. I had a conversation with Sujata Venkataraman of GXT and this is what we thought would be doable. I would draft a general memorandum of understanding probably based on what GXT sent to me earlier (and which I feel is quite generous), and send it to Keir for approval by SPC. On SPC's approval we can forward it to GXT and possibly to other service companies for agreement for a generic basis for release of data. Specific releases will have to be obtained on a case by case basis but the generic umbrella should be useful.

I hope this helps. Manik

from Keir Mar 9/07

Hello Manik et al -

I did not see in the email threads assembled by Ralph any mention of the discussion at the final day of SPC this week of the draft site survey data open access policy that was presented by IODP-MI in the SPC agenda book and I believe is to be presented at the SASEC meeting in two weeks. Suffice it to say that the issues relating to confidentiality of industry data were recognized at SPC, and SPC seemed willing to allow for addition of a sentence to the draft open-access policy that allows for exceptions on a case-by-case basis where industry confidentiality is an issue. If SASEC agrees, I believe the intent was for Hans Christian to take this advice and attempt to craft the exception clause, but I'm cc'ing to him to verify his plan.

Cheers, Keir

from Hans Mar 9/07

Dear Keir:

Thanks for reminding everybody that IODP-MI did come to SPC with a draft policy (in agenda book) that I presented for discussion. It will be amended over the next couple of days to reflect SPC discussion, and then presented to SASEC for approval. It has already been on the SASEC agenda for a while.

I see no problems given the SPC recognition of the need for in certain cases keep data confidential, even if related to an expedition completed. For planning purposes, the current draft policy does the job already.

Hope this helps, Hans Christian

from Ralph Mar 12/07

Hans Christian/Keir,

I searched the agenda book for "open access" and the only place it appears is in Bullet 12 of the "Principles of Scientific Investigation" on page 348 (which is attached). Is this the "draft site survey data open access policy" referred to in Keir's email? (Perhaps I am not looking at the most recent version of the agenda book. If so, would you please distribute a current version of the draft policy?) Bullet 12 only refers to "samples and data collected and produced during a drilling project". Site survey data that might have been acquired prior to the drilling project or independently of the drilling project is not addressed.

Some quick thoughts:

1) Barry Katz mentioned at the recent SPC meeting that, in the past, proprietary data had been used by the program and not been publicly released. He summarized this in his email on March 8:

" As I mentioned at the SPC meeting there are a number of examples where industry has provided proprietary information to the program to support the development of drilling locations as well as to deal with specific safety issues. These data were not released to the general public and remained confidential. Among the examples that I am familiar include: Texaco permitting the proponents of Leg 175 to review proprietary data to aid in site selection and more recently Shell and BP permitting the use but not release of their data in the Gulf of Mexico for both site selection and safety review purposes. In the examples that I am aware of there were sufficient non-proprietary data to justify the scientific merit of the program (i.e., the industry data did not provide the sole support for the drilling program). I would assume that this policy remains the case today. "

2) When I distributed this to the fellows planning the South Atlantic Rifted Margins work (involving Exxon, Petrobras, Total, GXT, ...) Garry Karner had the following response (March 8):

" These conditions of data "perusal" are on an ad-hoc and one-on-one application. IODP needs a policy. For example, we need seismic data to be used in a proposal - this means

that data is public to a certain degree. Barry's comments will serve no purpose when we want to review data at this early planning stage. As I explained in earlier emails, seismic data is not owned by the oil companies - they are licensed from the geophysical companies and ultimately the host governments. That is, data access will remain a huge problem. I am hoping that Manik can gain approval for a small release of data for planning purposed from the geophysical companies."

3) Then Manik provided a more detailed example in his email of March 9:

"Service companies have a different reason than energy companies to not release data. If they release data freely, the value of data goes down and they will not get new buyers. On the other hand, they have actually to gain from a limited release of data. Their data gets publicized and especially with the prospects of a drill hole based on their data, a hole where core data are publicly released, the value of the seismic data actually goes up. I believe that was the reason for GXT's earlier positive statement about release of data.

I therefore think that it would be useful for IODP to engage in discussions with service companies to see if general agreement can be reached for limited release of data. However before that discussion takes place SAS has to develop policy with regard to what conditions and concessions are acceptable in exchange for data. I had a conversation with Sujata Venkataraman of GXT and this is what we thought would be doable. I would draft a general memorandum of understanding probably based on what GXT sent to me earlier (and which I feel is quite generous), and send it to Keir for approval by SPC. On SPC's approval we can forward it to GXT and possibly to other service companies for agreement for a generic basis for release of data. Specific releases will have to be obtained on a case by case basis but the generic umbrella should be useful."

4) I think it is clear from this correspondence that the IODP policy on proprietary data needs to be more specific than the single bullet in the PSI. Also it would seem reasonable that industry representatives should have an opportunity to provide feedback on the policy before it is blessed by SASEC, beyond the brief but important discussion at the SPC last week.

5) The South Atlantic Rifted Margins effort is an excellent pilot project to test out some of these concepts.

Regards, Ralph Stephen
Chairman, IODP-Industry Science Program Planning Group

from Hans on March 13/07

Dear Ralph and Keir.,

I asked SPC last week for comments on the draft policy IODP-MI had prepared. Next discussion venue is SASEC in late March.

I enclose attached a revised draft (with track changes) that includes accommodations supported by SPC. The essential change is the option to waive, on a case by case basis, the obligation for scientific data in support of a proposal to eventually be public domain data. Note, that reference to safety data also has been taken out with regards to the definitive list of data Scientific Prospectus. The distribution of these can be handled differently (but also include SAS members, IOs etc), see Guidelines for Safety Review Report posted at <iodp.org>.

Note, however, that according to the current wording, the scientific data underpinning the expedition, proprietary or not, still are available to all shipboard scientists, IOs etc, and of course, also in the pre-scheduling phase, to SAS members as needed. This could be changed too in order to further limit distribution of industry proprietary data. However, at some point, one would have to ask how confidential we can keep scientific data supporting our science.

The document attached is therefore only a draft for further consideration. Feel free to use as a preliminary guideline. Feedback from the troops that works with industry will be appreciated and should be send to me (cc to Keir Becker) no later than March 19 (at the very latest, March 21), so I can include it in my briefing of SASEC. Following SASEC, IODP-MI may need to look into the details of possible legal issues before a final policy can be in place. As a minimum legal protection, we will need to install a process whereby the entity providing such data sign a document in which they declare they have read, understood and accepted our data policy as stated.

It is important that industry understands and accept that metadata for any data that are uploaded to the SSDB are visible to the public. So the existence, location and general nature of data will be known. However, the actual data or images hereof will of course not be publicly known unless they are released.

The technical release mechanism within the SSDB will be by IODP-MI staff going in and changing status of data. No one else will have authority to do that.

I suggest that any for-profit institution/entity is considered industry.

Best regards,

Hans Christian

from Hans on MArch 13/07

Dear Manik:

A few more comments on this issue to a smaller group of people.

Eventually, it may be an IODP-MI Board of Govenors issue. There is no doubt that any inclusion of industry proprietary data in the proposal handling process carries with it a certain risk of unauthorized distribution, being out of ignorance or by deliberation, in which case IODP-MI could be sued by industry.

There might be a potential problem with uploading of proprietary industry data by the proponents. This particularly in relation to the signing a document in which the data provider declare they have read, understood and accepted our data policy as stated. A proponents signature here will not be enough to protect us, we need the original data entity to sign. As you have pointed out, this might not even be the exploration company, but a service company.

I suggest that John Emmittee starts looking into the issue from a legal perspective.

Best regards, Hans Christian

New Ideas for IODP-Industry Collaboration

From Keir July 5

Hello Manik and Ralph -

In a phone conversation a few minutes ago with Manik, we agreed that I should forward you a message I sent to Jamie Austin just after I returned from last week's SASEC meeting. I haven't heard back from Jamie, and I was intending to contact you and Tim Byrne once Jamie responded. In any case, Manik and I also agreed it would be good for one of them to attend the upcoming PPG for these issues.

Ralph, I think much of the material below is self-explanatory, but please don't hesitate to contact me if you have any questions. (Note I leave Saturday morning for the EDP meeting M-W in Tokyo, so I may be a bit out of email touch early next week.)

cheers

Keir

Begin forwarded message:

> From: Keir Becker <kbecker_at_rsmas.miami.edu>

> Date: June 28, 2007 11:30:42 AM EDT

> To: Jamie Austin <jamie_at_utig.ig.utexas.edu>

> Subject: SASEC on IODP-industry work

>

> Hi Jamie -

>

> I'm just back from this week's SASEC meeting, where there were two consensus statements in support of two models for industry work. One is for non-IODP "off-contract" work, the other is for hybrid co-funded work that would still be considered IODP. I've pasted in the two statements below, and I've attached the version of the "complementary project" procedure that was approved in the second statement.

>

> Also, at EPSP last week in Houston, Barry Katz said he thought that Chevron could be very interested in contributing, if there were a clear pathway to do so. Perhaps the two consensus statements provide two options for the pathway. Equally important, Barry gave me the name of the most senior geoscientist at Chevron, who he said was very aware of IODP and would be the best higher-level point of contact toward developing such projects. I've included his contact info below in the forwarded email thread between Barry and myself.

>

> Within SAS, Chevron also has Marty Perlmutter (a RSMAS PhD like Barry) on the industry PPG, but Koelmel is clearly at a higher, decision-making level. In your work for IODP-MI, do you have any intent to attend the upcoming PPG meeting (Sapporo, July

23-24)? Tim Byrne is the normal SPC liaison to the PPG, and I'd like to keep him in the loop about your role with IODP-MI and whether or not you might be attending the PPG.

>

> Cheers

> Keir

IODP Science Advisory Structure Executive Committee

4th Meeting, 25-26 June 2007
Bremerhaven, Germany

DRAFT EXECUTIVE SUMMARY (v1.0)

12. IODP and Industry

SASEC Consensus 0706-07: The Lead Agencies have urged IODP-MI, working in concert with SASEC, “to exert leadership in the reduction of IODP costs which may involve difficult restructuring of the program”. One mechanism of reducing program costs, and/or redistributing them to allow some other more expensive drilling legs, is to use drilling platforms for non-IODP activities for some periods.

In that context, SASEC recommends that IODP-MI work with the Implementing Organizations (who are the science operators of the platforms and therefore control the opportunities to be pursued) and the scientific community to develop/facilitate non-IODP work with industry consortia and/or governments.

Ideally, it would be beneficial for cores and data to become part of IODP after the appropriate moratorium period. Ideally, the projects will be of high societal relevance including:

Carbon sequestration

Gas hydrates

Frontier stratigraphic test/reference sites

Hydrogeology and geotechnical drilling.

Enabling these issues to be addressed, even as non-IODP projects, would be a major benefit and legacy of the IODP.

SASEC Consensus 0706-08: SASEC endorses the concept of the Complementary Project Proposal for hybrid IODP projects with substantial external funding, and the evaluation criteria as set out in the June 5, 2007 concept description. In light of the current IODP budget situation, SASEC urges SPC to formally adopt Complementary Project Proposals as an IODP planning mechanism, and to refine the SAS evaluation process for such proposals as appropriate. Ideally, such proposals could be accepted as soon as the October 1, 2007 IODP proposal deadline.

Thoughts on Potential IODP “Complementary Project Proposals”

K. Becker, original draft March 13, 2007, revised March 29, 2007, following discussions at March 2007 SASEC and Management Forum meetings, minor editing June 5, 2007.

This proposition expands the existing APL (Ancillary Project Letter) and third-party funding concepts to provide a framework for SAS evaluation of proposals for “hybrid” IODP projects with significant support from a non-IODP entity such as industry, governments of countries not formally IODP members, or additional agencies from IODP member countries. It is based partly on the 2004-2005 SPC experience in dealing with an APL to the Tahiti Sea Level program of great industry interest in terms of adding casing to the holes and conducting detailed cross-hole geophysical imaging of the reef formations. (See summary appended below of that experience and relevant SPC consensus statements from its meetings of June and October 2004 and March 2005.) Basically this experience set up a precedent that an APL for an MSP operation probably had to provide its own additional funding for the necessary platform time. This model could be expanded to apply to the IODP drillships if future POC/SOC funding does not provide for year-round IODP operations.

In this expanded model, an IODP “Complementary Project Proposal” (CPP) could allow for requests of IODP platform time for projects deemed to be (1) a high priority to an outside entity that offers resources to the program, (2) of interest to the respective IO and the IODP Agencies, (3) in compliance with IODP data/sample access policies, (4) of scientific interest to IODP as determined by SAS (even if not necessarily top-ranked IODP scientific priority), and (5) of minimal negative impact to other high-priority IODP projects as determined by IODP-MI and SAS.

With respect to evaluation of a CPP within SAS: if the initial CPP presentation were strong, a single-pass SSEP/SPC review cycle (as for an APL or any really good IODP full proposal) could be sufficient for a SAS judgment of relevance or interest to IODP. Likelihood of scheduling would depend on the SSEP/SPC evaluation of this interest or relevance to IODP balanced against the benefits of accepting the proffered resources in exchange for keeping the relevant IODP platform(s) operating when IODP budgets don’t allow full-time operation. At SPC, the CPP review would lead not to inclusion in the regular SPC annual proposal ranking on scientific grounds, but to a separate yes-or-no decision to forward to OTF for potential scheduling, much as SPC handles APL’s.

Obviously, the perceived benefit at SPC will depend to large degree on the IODP budget situation, such that projects that bring full or major POC/SOC funding will have greater likelihood of gaining endorsement when IODP budgets are inadequate for full-time operation. In practice, when SPC is evaluating schedule options from OTF, complementary projects that require full or major POC/SOC funding from IODP will probably not fare well against highly-rated regular proposals that are also competing for the same POC/SOC funding. Thus, proponents who cannot provide for a significant contribution of POC/SOC funding should probably apply via the regular IODP proposal process in which the decision is based on evaluation of scientific merit as for all regular IODP proposals.

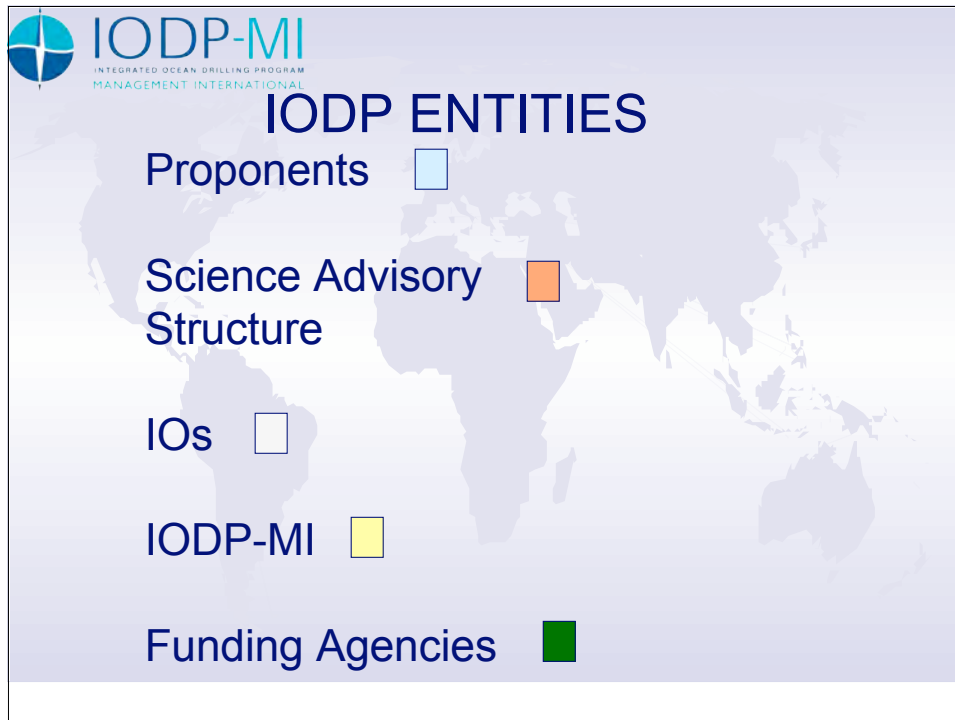
Summary of SPC experience with Tahiti APL-650

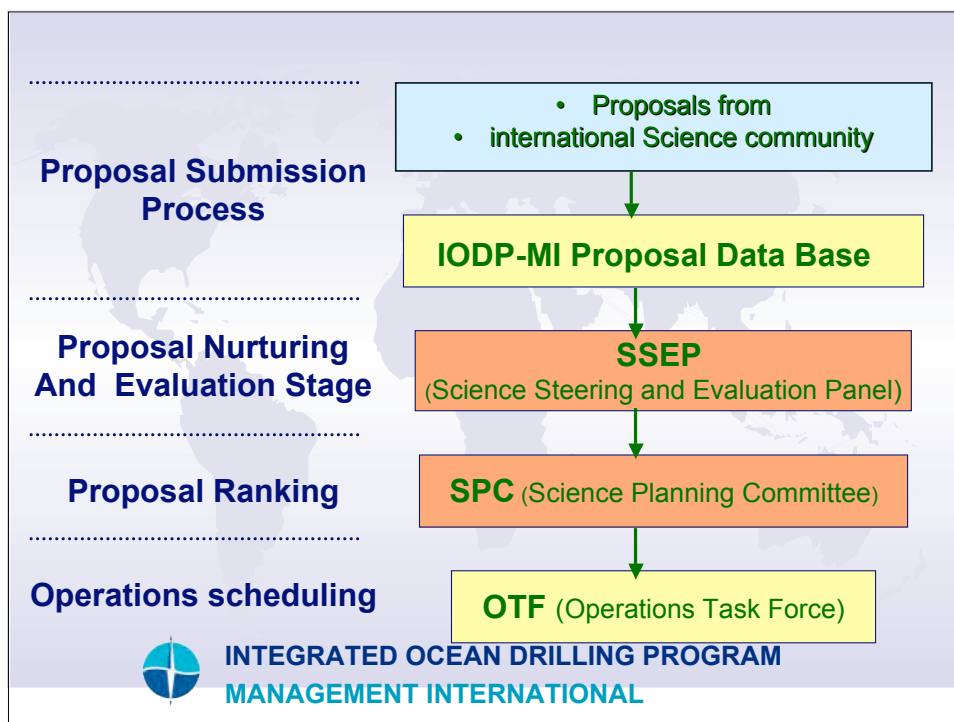
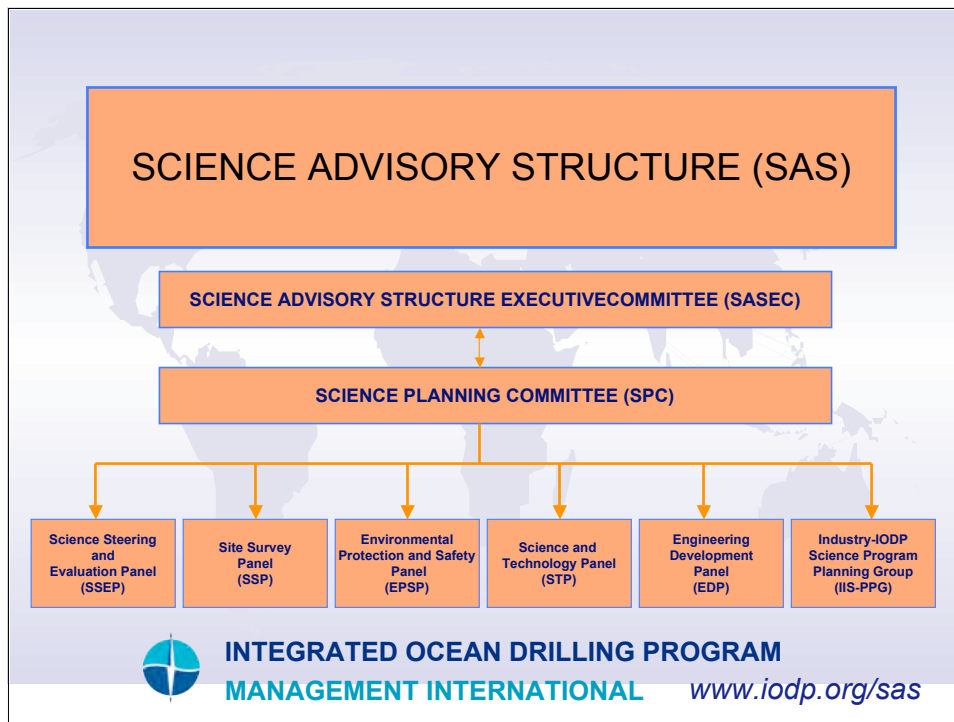
In brief, SPC was quite supportive of the objectives and industry interest, but wanted an assessment from OPCOM as to the logistical and financial implications with respect to conducting the work already approved in the highly-rated main proposal. The proponent was initially confident of industry third-party support for the geophysical experiments, but the EMA POC funding could not cover the additional platform time (~5 days) for the proposed experiment. Thus, the PI was also asked to seek industry funding for the necessary additional platform time, in order not to negatively impact the highly-rated program already scheduled. In the end, the industry funding could not be obtained and the APL was withdrawn from consideration, but it almost certainly would have been scheduled if the industry funding had been obtained.

SPC Consensus 0406-9: The SPC applauds the initiative represented by Proposal 650-APL and in particular the potential for a productive interaction among the proponents, the scientific party of the Tahiti component of Proposal 519-Full2 (the expected FY2005 MSP project), and industry. However, the committee cannot yet fully assess the operational, environmental, and fiscal impacts of operations associated with the proposed imaging experiments, and in particular the need to install and remove PVC liners from a subset of the holes proposed for the TAH-02A transect. The SPC therefore requests that OPCOM consider Proposal 650-APL at its September 2004 meeting, with input from the proponents and the ECORD Science Operator as appropriate, and provide a report and a recommendation at the October 2004 SPC meeting.

SPC Consensus 0410-33: The SPC reaffirms SPC Consensus 0406-9. The committee applauds the initiative represented by Proposal 650-APL and in particular the potential for a productive interaction among the proponents, the scientific party of the Tahiti component of Proposal 519-Full2 (the FY2005 MSP project), and industry. However, the committee cannot yet fully assess the operational, environmental, and fiscal impacts of operations associated with the proposed imaging experiments, and in particular the need to install and remove PVC liners from a subset of the holes proposed for the TAH-02A transect. The SPC therefore requests that OPCOM consider Proposal 650-APL at its earliest convenience, with input from the proponents and the ECORD Science Operator as appropriate.

SPC Consensus 0503-18: The SPC recognizes Proposal 650-APL Tahiti Reef Imaging as a potentially excellent and exciting added value to the impending IODP Expedition 310 Tahiti Sea Level. The committee remains supportive of and recommends conducting the proposed ancillary project, as long as it does not impact the highly ranked science of the scheduled drilling expedition.



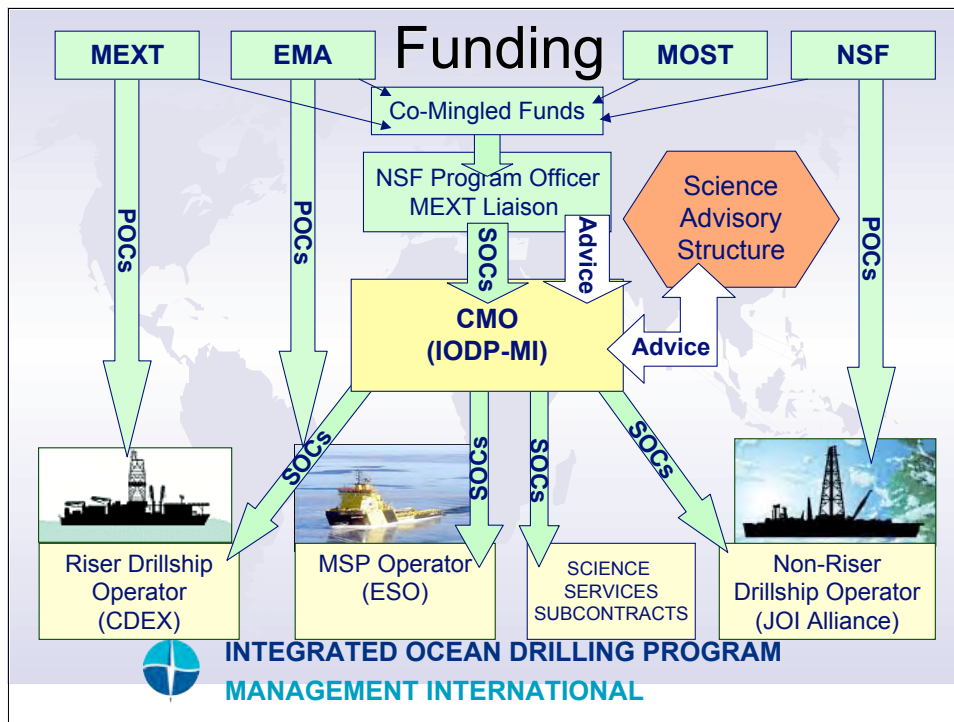


IODP Funding and Structure

Funding

- IODP is funded by four entities acting as international partners:
- **The U.S. National Science Foundation (NSF)** and **Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT)** are Lead Agencies.
- **The ECORD Managing Agency (EMA)** is a Contributing Member
- **The People's Republic of China Ministry of Science and Technology (MOST)** is an Associate Member.
- The Ocean Drilling Program office at NSF administers commingled funds directed towards the **Science Operating Costs (SOCs)** of all IODP operations. These commingled funds come from the international partners as part of their membership fees used for the conduct of IODP science. **Platform Operating Costs (POCs)** are the responsibility of the agency supplying the platform capability.





What is IODP-MI?

- IODP Management International, Inc. is a not-for-profit, non-stock U.S. corporation with an international membership committed to IODP from IODP member countries.



INTEGRATED OCEAN DRILLING PROGRAM
MANAGEMENT INTERNATIONAL

Membership List

Japan	USA	EUROPE
AIST	Florida State University	Alfred-Wegener -Institut
Hokkaido	Lamont Doherty Earth Obs.	British Geo Survey
University	Oregon State University	Cardiff Unive rsity
JAMSTEC	Rutgers University	ETH, Geological Institute
Kochi University	Texas A&M University	IFM-GEOMAR
Kyusyu University	UC, San Diego (SIO)	IPG -Paris
Tohoku University	UC, Santa Cruz	Universitaet Bremen
Tokai University	University of Florida	University of Leicester
University of Tokyo	University of Hawaii	University of Southampton
	University of Miami	Vrije Universiteit
	University of Michigan	
	University of Rhode Island	
	University of Texas at Austin	
	University of Washington	
	Woods Hole Ocean Instit.	



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IODP-MI has a Board of Governors, elected by the membership.

It has two offices, one in Washington DC and the other in Sapporo, Japan



IODP-MI has been awarded a contract by the lead agencies to be the Central Management Organization for the duration of IODP

Central Management Organization-- IODP-MI

The principal functions of the IODP-MI are:

1. Obtaining scientific advice from the SAS
2. Producing Annual Program Plans for IODP scientific operations based on this advice and in consultation with the Implementing Organizations (IOs)
3. Presenting this plan to NSF/MEXT for approval, and
4. Implementing the approved plan.

In addition the IODP-MI will be responsible for:

- coordinating program-wide engineering development
- coordinate data services
- provide for site survey data bank and repositories
- coordinating education and outreach activities
- arranging for publication of drilling results



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:WHAT'S THE PROBLEM?

For a total program cost approaching \$200 million the two drill ships are available for perhaps only 6-7 months per year.

Is that ship time adequate? Is the program sustainable from the point of view of scientists?

Are there other sources of
funding?

Industry?

Non IODP countries?

THREE PATHS FOR INDUSTRY PARTICIPATION

1.REGULAR IODP PROPOSAL

2.COMPLEMENTARY PROJECT
PROPOSAL (Keir Becker)

3.NON-IODP (David Divins)



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SASEC Consensus 0706-08: SASEC endorses the concept of the Complementary Project Proposal for hybrid IODP projects with substantial external funding, and the evaluation criteria as set out in the June 5, 2007 concept description. In light of the current IODP budget situation, SASEC urges SPC to formally adopt Complementary Project Proposals as an IODP planning mechanism, and to refine the SAS evaluation process for such proposals as appropriate. Ideally, such proposals could be accepted as soon as the October 1, 2007 IODP proposal deadline.



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COMPLEMENTARY PROJECT PROPOSAL

This proposition expands the existing APL (Ancillary Project Letter) and third-party funding concepts to provide a framework for SAS evaluation of proposals for “hybrid” IODP projects with significant support from a non-IODP entity such as industry, governments of countries not formally IODP members, or additional agencies from IODP member countries.



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In this expanded model, an IODP “Complementary Project Proposal” (CPP) could allow for requests of IODP platform time for projects deemed to be (1) a high priority to an outside entity that offers resources to the program, (2) of interest to the respective IO and the IODP Agencies, (3) in compliance with IODP data/sample access policies, (4) of scientific interest to IODP as determined by SAS (even if not necessarily top-ranked IODP scientific priority), and (5) of minimal negative impact to other high-priority IODP projects as determined by IODP-MI and SAS.



With respect to evaluation of a CPP within SAS: if the initial CPP presentation were strong, a single-pass SSEP/SPC review cycle (as for an APL or any really good IODP full proposal) could be sufficient for a SAS judgment of relevance or interest to IODP. Likelihood of scheduling would depend on the SSEP/SPC evaluation of this interest or relevance to IODP balanced against the benefits of accepting the proffered resources in exchange for keeping the relevant IODP platform(s) operating when IODP budgets don't allow full-time operation. At SPC, the CPP review would lead not to inclusion in the regular SPC annual proposal ranking on scientific grounds, but to a separate yes-or-no decision to forward to OTF for potential scheduling, much as SPC handles APL's.



Obviously, the perceived benefit at SPC will depend to large degree on the IODP budget situation, such that projects that bring full or major POC/SOC funding will have greater likelihood of gaining endorsement when IODP budgets are inadequate for full-time operation. In practice, when SPC is evaluating schedule options from OTF, complementary projects that require full or major POC/SOC funding from IODP will probably not fare well against highly-rated regular proposals that are also competing for the same POC/SOC funding. Thus, proponents who cannot provide for a significant contribution of POC/SOC funding should probably apply via the regular IODP proposal process in which the decision is based on evaluation of scientific merit as for all regular IODP proposals.



NON-IODP





SASEC Consensus 0706-07: The Lead Agencies have urged IODP-MI, working in concert with SASEC, "to exert leadership in the reduction of IODP costs which may involve difficult restructuring of the program". One mechanism of reducing program costs, and/or redistributing them to allow some other more expensive drilling legs, is to use drilling platforms for non-IODP activities for some periods.

In that context, SASEC recommends that IODP-MI work with the Implementing Organizations (who are the science operators of the platforms and therefore control the opportunities to be pursued) and the scientific community to develop/facilitate non-IODP work with industry consortia and/or governments.

Ideally, it would be beneficial for cores and data to become part of IODP after the appropriate moratorium period. Ideally, the projects will be of high societal relevance including:

- Carbon sequestration
- Gas hydrates
- Frontier stratigraphic test/reference sites
- Hydrogeology and geotechnical drilling.

Enabling these issues to be addressed, even as non-IODP projects, would be a major benefit and legacy of the IODP.



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The following slides relate primarily to how the USIO ship *JR* could be employed to the advantage of the program and the scientific community when it is not fully financed by NSF for a full twelve months. Some of the points made here could also apply to the use of the *Chikyu* and to MSPs.

This information is based on a conversation with David Divins



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USIO operates with two contracts. It obtains a contract for funding from NSF and it awards a subcontract to ODL for the services of the *JR*. For the time period when *JR* is not fully financed it can, instead of being tied to the dock still, operate in one of two alternative modes. The first alternative mode is “off ODL mode” and the second alternative mode is the “off IODP mode.”



In the “off ODL mode” both the NSF and ODL contracts are suspended and ODL regains the ship and uses it as it chooses. In this mode the advantage to the program is that the day rate costs, which would have to be paid to ODL, would now otherwise revert back to the program. One further advantage is that the contracting is clear cut and easier to carry out. The disadvantage is that *JR* is not available at all to the program scientists.



In the “off IODP mode”, the NSF IODP contract is suspended, but USIO (actually TAMREF) continues to lease the ship from ODL. USIO then leases it out by itself to entities, such as industry or other governments. In this mode, the main disadvantage is the extra work entailed in arranging new contracts.



In both modes above, it is possible that *JR* may be allowed to retain the government furnished equipment by NSF. There are several advantages for all parties concerned in the “off IODP mode”.



Advantages to USIO

The drill ship could be leased out to industry or other governments at a slightly higher rate than the negotiated day rate with ODL. This additional amount in the day rate could help continue the USIO infrastructure on the drill ship and therefore, enhance IODP operations.



Advantages to the Scientific Community and to the Program

An advantage would be the possibility of participation in industry programs that could be of mutual interest to academia and industry. Another advantage would be the possibility of negotiating ancillary contracts with industry for core examination, site surveys, etc.





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Advantages to Industry

Availability of a drill ship at relatively cheap rates, with the inclusion of all tools, as well as technicians. If industry involved academic scientists in their drilling programs the involvement of these scientists could be helpful in many ways. They could lend their expertise to the projects. This could be a good recruiting tool for industry.

If these projects decide to store cores, it may be possible to have them stored at the TAMU core repository site. This repository being in the vicinity of Houston could be of great advantage to industry scientists working in Houston.



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“Off IODP” is a brand new concept and has not been tried before because full funding was available for ODP and IODP. There may be several obstacles or at least, hoops to go through in making this a reality, but if it can be done it could be a winning strategy for all concerned.



INTEGRATED OCEAN DRILLING PROGRAM
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From: Allan, James F.
Sent: Tuesday, December 05, 2006 5:26 PM
To: Oshima, Toshiyuki; mtalwani_at_iodp.org
Cc: Morris, Julie D.; Batiza, Rodey; Allan, James F.; Welsh, Patrick A.
Subject: FW: On commercial uses of the JOIDES Resolution

Dear Manik and Toshi:

See below for comments on how far NSF can go regarding commercial use of the JR, pertaining to discussions at the recent MEXT-NSF meeting in Odawara.

Jamie

Rodey and I met with Patrick Welsh to discuss what is contractually, legally, and programmatically possible regarding use of the JOIDES Resolution in "partnership" with industry. These notes represent a record of our discussion.

The "cleanest" such use of the JOIDES Resolution (JR) would involve NSF permission for JOI to take the JR off contract so that ODL could seek commercial use of the ship. Such use would require NSF permission for ODL to use NSF-owned equipment, such as drillstring, drilling collars, drillbits, elevators, logging winches, specialty tools (such as for high-pressure sampling of gas hydrates), etc. We have previously given such permission for both governmental (India) and industry (JNOC) use, finding these uses of NSF-owned equipment greatly advantageous to the interests of the U.S. Government. Such permission needs to be carefully considered in that NSF must avoid giving commercial advantage to a private company. It would be wise to limit use of such equipment, giving permission only when absolutely necessary, and also ensuring that any equipment damaged or lost is replaced in such a manner that it does not affect future science operations. It is imperative to understand that to make this use possible would likely require the JR to be off NSF contract for 6-9 months or more at a stretch, with significant impact on the science planning process.

We discussed other uses of the ship involving industry partnership, as were suggested by Manik Talwani at the recent MEXT-NSF meeting. It was noted that the present IODP is compatible with industry scientists proposing drilling on the basis of science, subsequently fully participating as scientists, and thereby gaining access to the data as scientists during the data moratorium. The present IODP is also compatible with provision of data and tools by commercial interests on a fee or unconditional grant basis. Following the IWG Principles, the various IODP Memoranda, the actual IODP-MI and SIC contracts, and the U.S. Federal Acquisition Regulations, any change in drilling strategy as proposed by industry scientists or representatives would need to meet two basic criteria- 1) approval by the SAS, and 2) data and sample distribution that follows accepted IODP practice. There cannot be a mixing of industry funds with U.S.

governmental or commingled international funds that would provide commercial advantage to a single corporate entity or a consortium of corporate entities, such as would be provided by restrictions on data or samples.

We also agreed we cannot go beyond discussion of the above scenarios for industry collaboration without more specific requests.

James F. Allan, PhD
Program Director and COTR
Ocean Drilling Program
National Science Foundation
4201 Wilson Blvd.
Arlington, VA 22230
703-292-8581
jallan_at_nsf.gov

IODP / Industry Collaborations

SASEC

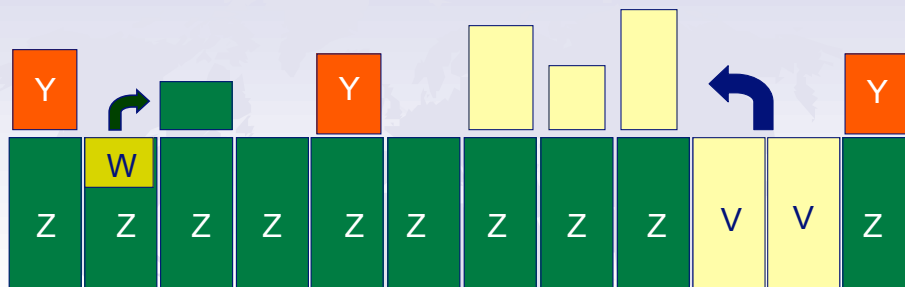
Bremerhaven

June 25-27, 2007

Thomas Janecek
IODP-MI



Potential Funding Models



"Z" funding -- base level of funding to maintain 12-month platform contract -

Additional Funding:

"Y" Funding- External funding to conduct IODP (SAS approved) science operations over and above the base cost of the expedition

"W" Funding - External funding for tool/equipment testing used to offset "Z" funding. Frees up base funds for other expeditions.

"V" Funding - Non-IODP use of vessel. Frees up base funds for other expeditions



Potential External Funding

1) Commodity level projects -

- Vessel used for large blocks of time for industry work (e.g., installing in deepwater casing).

2) Technology and Science driven projects -

- Projects that either can utilize or contribute *technology* (e.g., DeepStar/RPSEA) or *science* (e.g., DOE-Hydrate program).
- Direct and/or indirect benefits
- Can utilize vessel staff and expertise.

3) Service level or endowment funding -

- Equipment donation from vendors or foundations (e.g., Hewlett Packard donating lab equipment).

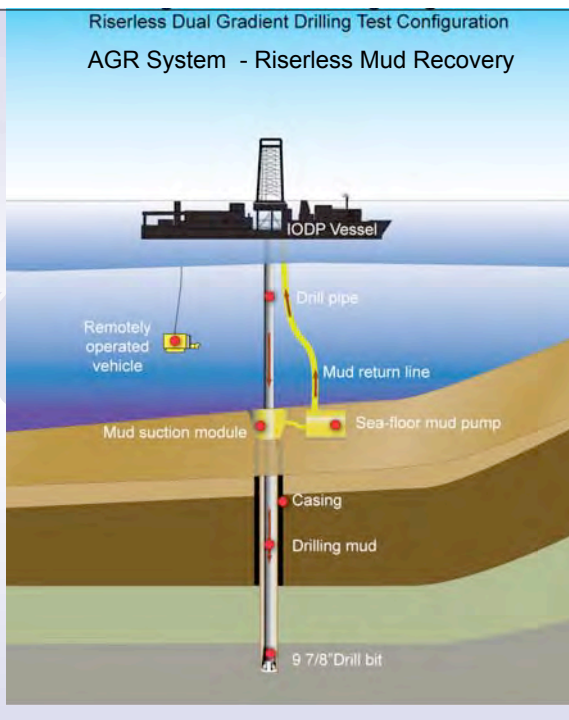


Emerging possibilities

Riserless Mud Recovery systems are presently of great interest to the ultra-deep (>1500 m) drilling programs such as DeepStar and RPSEA.

Need platform(s) for system testing.

Test riserless drilling equipment for industry while coring at sites of high interest to the IODP science community (e.g., Gulf of Mexico)



DeepStar/RPSEA

www.deepstar.org

- ☐ Joint industry collaboration to produce oil and gas in ultra – deepwater
- ☐ DeepStar has ~\$5,000,000 per year to spend in research
- ☐ Led by Chevron, BP, Petrobras, Total, Kerr-McGee, Anadarko, Marathon, Statoil.....

www.rpsea.org

- ☐ Research Partnership to Secure Energy for America
- ☐ A DOE –NETL initiative
- ☐ RPSEA has \$15,000,000 in 2007 and \$15,000,000 in 2008 to spend on technology.
- ☐ 32 themes have been identified for research.
- ☐ No predetermined allocation amount between themes.



What needs to happen - *Soon*

- NSF/USIO determine operating principles
- TAMRF/ODL negotiate contractual issues
- USIO - Determine point(s) of contact for interaction with IODP entities and others
- Define Roles and Responsibilities.
 - IO's responsible for contracts
 - IODP-MI --- making introductions (e.g., DeepStar)



Critical Industry Interests for IODP (9/01- present)

Depositional systems - reservoir (Solid Earth Cycles)

- Integrated models for coarse clastic sediment depositional settings
- Essential differences in age-equivalent depositional sequences resulting from climate
- Drowned carbonate platforms, forcing factors & variability
- Unconfined basin floor fan systems

Climate variability and source & reservoir rocks (Environmental Change)

- Unconfined basin floor fan systems (turbidite reservoirs)
- Depositional system reaction to extreme climatic events (source & reservoir variability)
- Impact of oceanic circulation & climate on carbon cycle (source rock variability)
- Global anoxic events, how global & how synchronous? (source rock variability)
- Potential relation to impact events

Fluid flow in sedimentary basins (Deep Biosphere/Sub-Sea Floor)

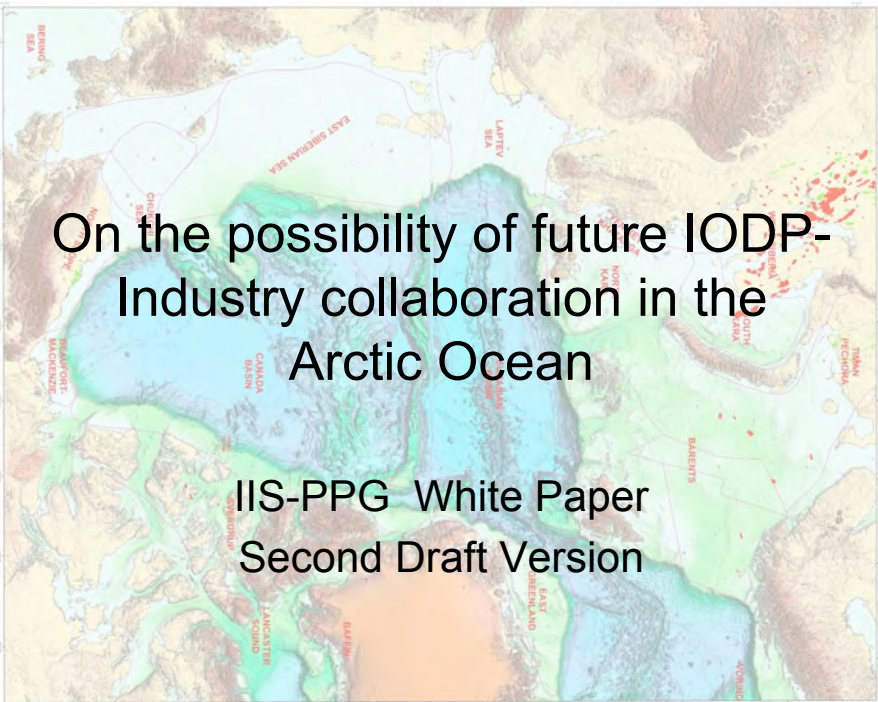
- Links between seismicity, fluid flow and slope stability
- Dependency of flow variations on stratigraphy & geography
- Impact of fluid flow on diagenesis and compaction, fault sealing
- Influence of pressure changes on migration and entrapment
- Long term impact of microbial communities on eg bio-degradation
- Heat transfer and fluid flow in basins (eg accretionary prisms)

Non-magmatic extensional model (Solid Earth Cycles)

- Faulting and syn-rift facies development
- Impact of early heat pulse on diagenesis etc
- Charge and trapping potential in distal parts of continental margins

Single deep holes of interest (eg: east Medit. Pre-salt, black sea ridges, Sprattly arch., Arctic ocean ridges)

Tool Development (better resolution, etc.)



On the possibility of future IODP- Industry collaboration in the Arctic Ocean

IIS-PPG White Paper
Second Draft Version



Layout

- Introduction to the “Arctic Mega-Basin”
- One-page Basin Summaries
- General topics of mutual academic-industry scientific interest in the Arctic
- Current Issues
- Proposals
- Industry Contacts

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2

Introduction to the “Arctic Mega-Basin”

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The Arctic “Mega-Basin”: Geography

- For the purposes of this discussion, the series of offshore shallow and deep water sedimentary basins that comprise and fringe the greater Arctic Ocean will be termed the “Arctic Mega-Basin” or “AMB”).
- Further, the term “exploration” is used to describe both scientific and industry geoscience activity leading to improved geologic understanding of the constitutive sedimentary basins
- Geographically the AMB comprises
 - Up to the internationally recognized 200 mile limit the waters belong to five sovereign states:
 - USA
 - Canada
 - Denmark (via Greenland)
 - Norway
 - Russia*
 - International waters further offshore than the 200 mile limit

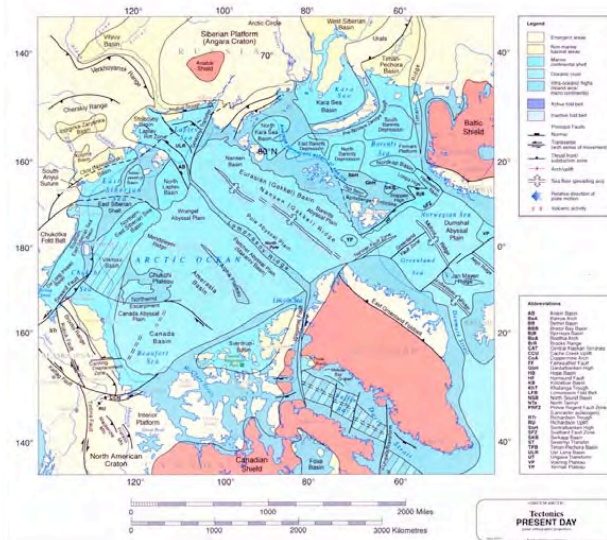
[*as we write the draft of this document, Russia has just asserted its sovereignty further north into the deep water AMB, including the Lomonosov Ridge (Platts Energy, July)]

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Arctic Mega-Basin Reference Map



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The Arctic “Mega-Basin”: Current Extent of Knowledge

- With the exception of Antarctica and its margins, the “AMB” constitutes the last frontier of geological knowledge on Earth
 - A theoretical exploratory drilling window of varying duration exists across the whole AMB. However, from a practical standpoint:
 - Western Industry seismic and drilling activity in the AMB peaked in the 80’s and was limited to the shallower, more southerly, offshore regions. This northern limit reflected the then – as now – technical limitation on petroleum development under winter ice
 - Scientific activity - in deeper waters of the AMB - has been limited to:
 - dredging on the Windstar Ridge in the Chukchi Sea region
 - the recent drilling in IODP Expedition 302 on the Lomonosov Ridge, ca. 88 °N

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The map displays the Arctic region with various continental margins and basins highlighted in different colors. The Beaufort Sea is shown in light blue, the Laptev Sea in light green, and the East Siberian Sea in light yellow. Other labeled areas include the Canadian Basin, North Green Sea, North Barents Sea, and the Laptev Sea. The map also shows the Arctic Ocean, the Barents Sea, and the Kara Sea. The landmasses of North America, Europe, and Asia are visible in the background.

One-Page Continental Margin Summaries

1. Chukchi-East Siberia
2. Beaufort
3. Sverdrup
4. North Greenland
5. North Barents
6. Laptev

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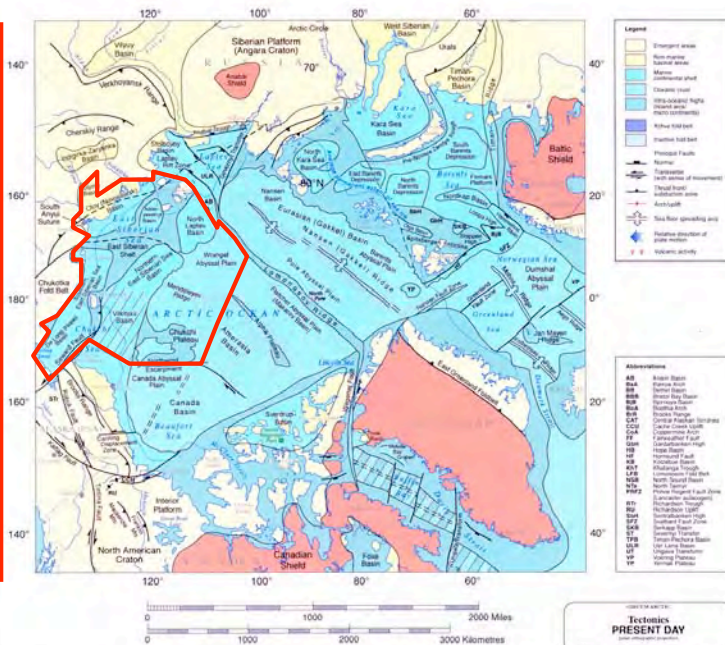


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Chukchi –
East
Siberian
Margin

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- Limits
 - Eastern: the eastern limit of the Seward / Chukchi strike-slip fault system (i.e. the western limit of the North Slope passive margin)
 - Western: the first extensional fault of the Anisin & Ust_Lena Basins below the Laptev Sea
- Geographic Extent and Geologic Entity:
 - Shelf / USA: Chukchi Sea (Chukchi Basin) & Bering Strait (Hope Basin);
 - Shelf / Russia: Chukchi Sea (De Long Basin) & East Siberian Sea (Southern East Siberian Basin; Oloy / Novosibirsk Basin; Addeyevskiy Basin)
 - Slope-Deep Water / USA: Beaufort Sea & Arctic Ocean (Canada Basin and Abyssal Plain):
 - Slope-Deep Water / Russia: East Siberian Sea (Northern East Siberian Sea Basin (inner part); Villikitskii Basin (inner part); North Laptev Basin (inner part))
 - Slope-Deep Water / International: Arctic Ocean (Chukchi Plateau & Northwind Ridge; Canada Basin and Abyssal Plain; Northern East Siberian Sea Basin (outer part); Villikitskii Basin (part); North Laptev Basin (part); Wrangel Abyssal Plain; Mendeleyev Ridge)
- Data:
 - Shelf / USA Chukchi Sea: substantial seismic data; 5 wells, limited to shallower water area
 - Slope and deep water Chukchi Plateau & Canada basin: undrilled, but dredge sampling on Northwind Ridge on the southern flank of Chukchi Plateau
- Limits of geologic knowledge:
 - Contains complex interaction between geology of the western "North Slope" and that of the margin below the East Siberian Sea
 - US Chukchi: industry wells penetrate to Carboniferous; Russian Chukchi remains undrilled
 - East Siberian Sea: Poorly known basin, no wells and little seismic, stratigraphic model needed, difficult to correlate to onshore databases. Need stratigraphic ages to build models / define source presence / type.
 - Chukchi Sea: Northwind Ridge dredge samples provide fragments of a geologic history to at least Triassic
 - Without a continuous quantitative record (i.e. a well), tectonic history will remain poorly understood
 - Presence / distribution of potential Shublik (Triassic), Kingak (Jurassic), HRZ (Aptian) and Hue (Cenomanian-Turonian) organic-rich mudstones unknown
 - Chukchi Cap: Does Paleozoic-Mesozoic reservoir exist here and what is the relationship to the North Chukchi basin.

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Beaufort Margin



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Beaufort Margin

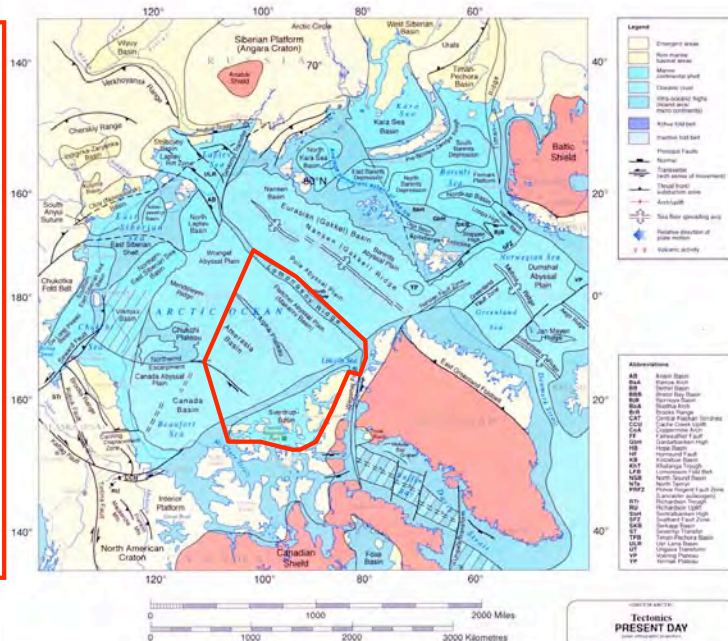
- Limits
 - Western: the eastern limit of the Seward / Chukchi strike-slip fault system (i.e. the eastern limit of the Chukchi pull-apart basin)
 - Eastern: the offshore projection of the Kaltag Fault lateral defining the eastern limit of the Mackenzie Delta Basin
- Geographic Extent and Geologic Entity:
 - Shelf / USA: Shelf: Beaufort Sea (Offshore N. Slope Basin);
 - Shelf / Canada: Mackenzie Delta and Beaufort Sea (Offshore Mackenzie Basin);
 - Slope-Deep Water / USA and Canada: Beaufort Sea & Arctic Ocean (Canada Basin and Abyssal Plain);
 - Slope-Deep Water / International: Arctic Ocean (Canada Basin and Abyssal Plain)
- Data:
 - Shelf: substantial seismic data; substantial well data limited to shallower water
 - Slope and deep water Canada basin undrilled
- Limits of geologic knowledge:
 - US western Beaufort Sea (offshore N. Slope): industry wells penetrate to Permo-Triassic
 - US eastern Beaufort (offshore ANWR) and Canadian Beaufort: only young Tertiary section drilled
 - Stratigraphy and tectonic history related to opening of Beaufort Sea, poorly understood
 - Presence of potential Cenomanian-Turonian and other OAE event organic-rich mudstones, at high paleo-latitudes in deep water, is unknown.
 - Outboard areas of the US Beaufort Sea and Canadian Beaufort-Mackenzie, test Tertiary source potential
 - Also, test extent of Tertiary reservoirs and reservoir quality in the deeper Beaufort basins

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Sverdrup Margin
(Marakov Basin,
Alpha Ridge)



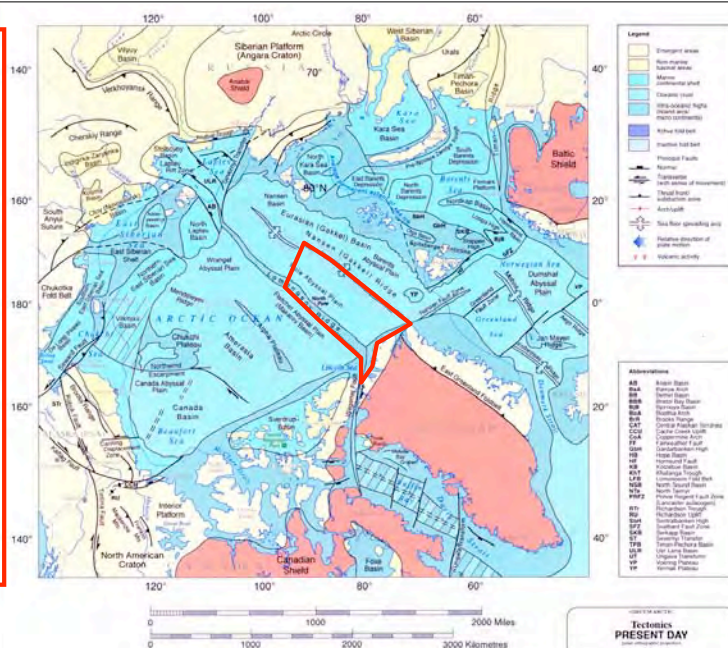
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- Limits
 - Eastern: the Wegener fault-Lomonosov Ridge
 - Western: the offshore projection of the Kaitag Fault lateral defining the eastern limit of the Mackenzie Delta Basin
- Geographic Extent and Geologic Entity:
 - Shelf / Canada: Lincoln Sea (narrow lateral margin to Arctic oceanic basin system);
 - Slope-Deep Water / Canada and International: Arctic Ocean (Amerasia and Fletcher Abyssal Plains; Alpha and Lomonosov Ridges)
- Data:
 - Shelf / Canada: Arctic Islands – Sverdrup Basin: substantial seismic data; substantial well and outcrop data
 - Slope-Deep Water: Arctic Oceanic crust undrilled
 - Lomonosov Ridge Expedition 302 recovered Tertiary ORMs
- Limits of geologic knowledge:
 - Shelf / Canada: Arctic Islands – Sverdrup Basin:
 - Industry wells in Arctic Islands penetrate to Paleozoic
 - Outcrops on Arctic Islands include Cenomanian-Turonian Organic Rich mudstones on Ellesmere Island
 - Offshore Banks Island and Sverdrup - Untested rift margin, Tertiary load provides maturity.
 - Arctic Basin Slope and Oceanic Crust
 - No wells
 - Stratigraphy and tectonic history related to opening of Arctic Ocean, poorly understood
 - Presence of potential Cenomanian-Turonian and other OAE event organic-rich mudstones, at high paleo-latitudes in deep water, is unknown
 - Makarov basin - Early Cretaceous extension of Canadian Ocean basin, west of Lomonosov ridge. Tectonic reconstruction implications
 - Alpha-Mendelev Ridge are the rock units are of continental origin or volcanic, or a combination

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- **Limits**
 - Western: the Wegener fault-Lomonosov Ridge
 - Eastern: the Nansen Fault Zone separating the North Greenland from the East Greenland margin
- **Geographic Extent and Geologic Entity:**
 - Shelf / Denmark (Greenland): Arctic Ocean (narrow lateral margin to Arctic oceanic basin system);
 - Slope-Deep Water / Denmark (Greenland) and International: Arctic Ocean (Pole Abyssal Plain; Nansen (Gakkel) and Lomonosov Ridges)
- **Data:**
 - Denmark (Greenland): North Greenland: substantial Paleozoic outcrop data; shelf undrilled
 - Slope-Deep Water: Arctic Oceanic crust undrilled
 - Lomonosov Ridge Expedition 302 recovered Tertiary ORMs
- **Limits of geologic knowledge:**
 - Shelf / Denmark (Greenland): Arctic Islands – Sverdrup Basin:
 - No wells
 - Arctic Basin Slope and Oceanic Crust
 - Expedition 302 – relatively young stratigraphy only
 - Stratigraphy and tectonic history related to opening of Arctic Ocean, poorly understood
 - Presence of potential Cenomanian-Turonian and other OAE event organic-rich mudstones, at high paleo-latitudes in deep water, is unknown
 - NE Greenland: quality of source / extent, seeps, burial history model.
 - Lomonosov Ridge - documented age of sediments and source potential. Tectonic reconstruction implications

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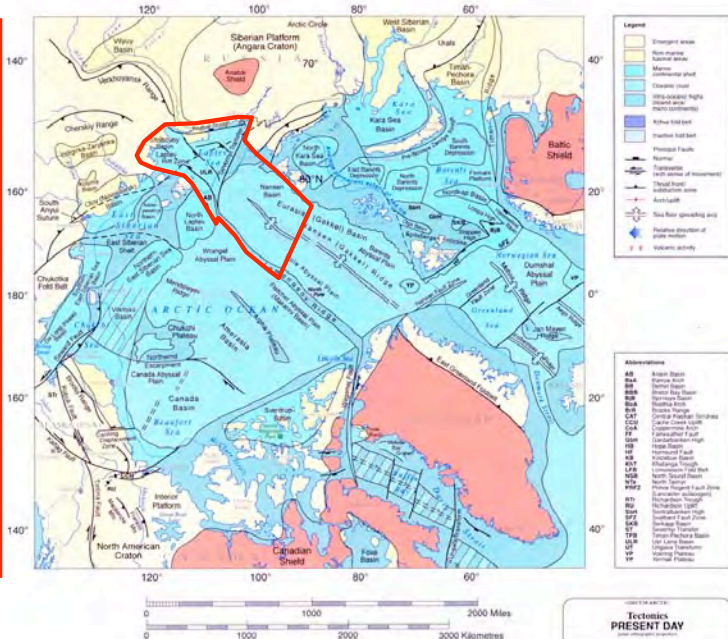
Barents Margin

- **Limits**
 - Eastern: the Severnyl transform below the Laptev Sea
 - Western: the Nansen Fault Zone separating the North Greenland from the East Greenland margin
- **Geographic Extent and Geologic Entity:**
 - Shelf / Norway: Barents Sea - western part (Hammerfest & Nordkapp Basins; Finmark Terrace; Serkapp Basin; Gardarbanken High; Sentraibanken High; Olga basin);
 - Shelf / Russia: Barents Sea –eastern part (South Barents Basin; Timan Ridge; North Barents Depression; East Barents Depression; Kara Sea Basin; North Kara Sea Basin);
 - Slope-Deep Water / Norway: Arctic Ocean (Eurasian (Gakkel) Basin (inner part); Barents Abyssal Plain (inner part); Yermak Plateau (inner part));
 - Slope-Deep Water / Russia: Arctic Ocean (Eurasian (Gakkel) Basin; Barents Abyssal Plain;
 - Slope-Deep Water / International: Arctic Ocean (Barents Abyssal Plain (outer part); Yermak Plateau (outer part); Eurasian (Gakkel) Basin (outer part))
- **Data:**
 - Shelf / Norway Barents Sea: substantial seismic data; many industry wells on inner shelf area. Outcrops of Perm-Triassic on emergent islands (Bjornoya, Svalbard, Spitzbergen) on outer shelf high, containing organic rich Triassic rocks
 - Shelf / Russia. Substantial seismic data; industry wells on inner shelf area (South Barents Basin). Outcrops on emergent islands (Neveraya Zemlya and Zemlya Franzosa) on outer shelf high
 - Slope and deep water basin areas: undrilled
- **Limits of geologic knowledge:**
 - Rapid transition between regional "outer high" emergent islands with outcropping Permo-Trias, to the Arctic basin proper to the north
 - Extent & distribution of Triassic, Bazhenov (Upper Jurassic), HRZ (Aptian) and Hue (Cenomanian-Turonian) organic-rich mudstones unknown north of the inner shelf basins and the islands
 - Disputed zone between Norway and Russia: Expansion of Russian and Norwegian Barents play elements.

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Laptev Margin

- Limits
 - Eastern: the first extensional fault of the Anisin Basin below the Laptev Sea
 - Western: the Severny transform below the Laptev Sea
- Geographic Extent and Geologic Entity:
 - Shelf / Russia: Onshore (Stolboyoy Basin); Offshore Laptev Sea (Anisin and Ust-Lena Basins)
 - Slope-Deep Water / Russia: Arctic Ocean (Nansen-Eurekan (Gakkel) Basin and Pole Abyssal Plain (southern parts); Lomonosov and Nansen (Gakkel) Ridges (southern parts))
 - Slope-Deep Water / International: Arctic Ocean (Nansen-Eurekan (Gakkel) Basin and Pole Abyssal Plain (northern parts); Lomonosov and Nansen (Gakkel) Ridges (northern parts))
- Data:
 - Shelf / Russia Laptev Sea: substantial seismic data; 2 wells in onshore equivalent Stolboyov basin
 - Slope and deep water Arctic Oceanic crust undrilled
 - Lomonosov Ridge Expedition 302 recovered Tertiary ORMs
- Limits of geologic knowledge:
 - Age of onset of rifting imprecisely known – apparently Cretaceous
 - Nature of pre-rift - pre-Cretaceous - remains obscure
 - Laptev Sea: Tertiary depocenter, need stratigraphic ages to build models / define source presence / type.
 - Apparent Paleogene structural inversion of rift
 - Without a continuous quantitative record (i.e. an offshore well), tectonic history will remain poorly understood
 - Presence / distribution of pre-rift potential Shublik (Triassic), Kingak (Jurassic), HRZ (Aptian) and Hue (Cenomanian-Turonian) organic-rich mudstones unknown. Presence and quality of any source rocks in the Cretaceous rift and Cretaceous-Tertiary post rift are unknown.

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General topics of mutual academic-industry scientific interest in the Arctic



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General topics of mutual academic-industry scientific interest in the Arctic

- Organic-rich mudstone deposition
 - Paleo-climatology (e.g surprising results of Expedition 302 demonstrating warm polar climates in the early Tertiary)
 - Potential source rocks
- Basin Development
 - Burial history
 - Subsidence and lithospheric heat flow
 - Burial, thermal stress history and maturation of potential source rocks
 - Magnitude/effect of Pleistocene ice load on continental shelf
 - Tectonic history
 - Refine Plate tectonic rift / drift models and chronology
 - Understand origin and timing of potential petroleum traps

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Organic-rich mudstone deposition

- Opportunity to study processes at high paleo-latitudes
 - Triassic and Jurassic:
 - Crustal fragments now incorporated into the margins of the present Arctic Mega-Basin fringed a high paleo-latitude (late Triassic) to polar paleo-latitude (late Jurassic) oceanic embayment: the “Anyui Ocean”
 - Cretaceous
 - Opening of the Canada Basin to form the earliest oceanic components of the present AMB, at polar latitudes
 - Aptian OAE I equivalent? (e.g. HRZ on North Slope)
 - Potential ?Albian OAE II (ORM deposition not yet documented in Arctic)
 - Cenomanian-Turonian OAE III (e.g. Hue / Shale Wall on North Slope)
 - Tertiary
 - Extend “surprise” findings of Lomonosov well
 - What other surprises remain in the Tertiary polar paleo-latitude stratigraphy of the AMB?
 - Offshore extension of Tertiary sources in Beaufort-MacKenzie to deep-water

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Basin Development

- Burial history
 - Establish stratigraphic templates for presently undrilled areas of the outer continental margins and oceanic basins of the AMB
 - Northern extremities of the continental crust, e.g.
 - outer Laptev Sea margin
 - Chukchi Plateau / Northwind Ridge
 - Oceanic basins e.g.
 - Early Cretaceous Canada & Vilkitskii basins; Alpha Plateau
 - Tertiary Eurasian (Gakkel) Basin, Nansen (Gakkel) Rift and Ridge

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Basin Development

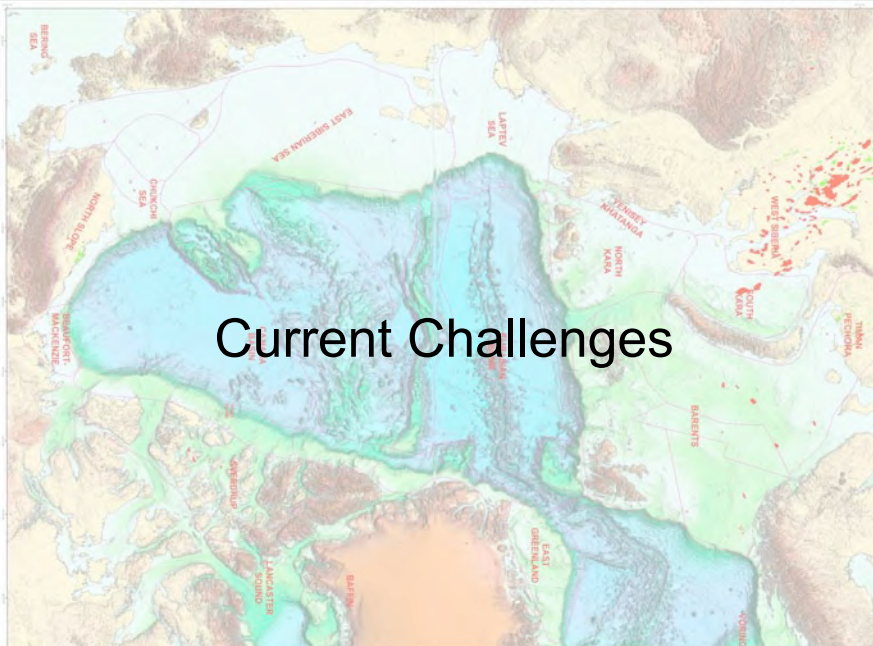
- Tectonic history
 - Establish mechanisms and chronology of multiple rift / drift episodes leading to the present day structure of the AMB
 - Linked emphasis on the same structural fragments as per the stratigraphic / burial history
 - Northern extremities of the continental crust, e.g.
 - outer Laptev Sea margin
 - Chukchi Plateau / Northwind Ridge
 - Oceanic basins e.g.
 - Early Cretaceous Canada & Vilkitskii basins; Alpha Plateau
 - Tertiary Eurasian (Gakkel) Basin, Nansen (Gakkel) Rift and Ridge
 - Investigate unknown crustal elements (eg Alpha Ridge)

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Current Challenges



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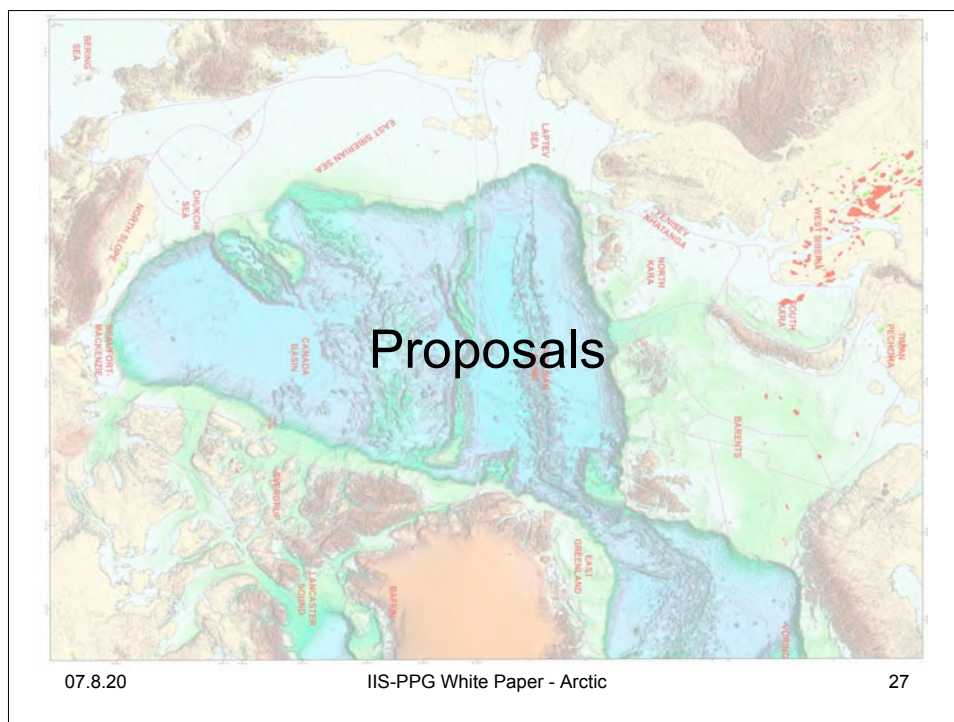
Current Challenges

- The “Deal”
 - Can Scientific and Industry communities find a win-win and attract more drilling \$\$ into the IODP program to everyone’s mutual benefit?
- Pace
 - Short summer operational window – how long to execute how many wells? Priority?
- Confidentiality
 - If, as expected, a limited number of industry companies fund the drilling program, what do they get in return (e.g. term confidentiality limits)?
- Politics
 - Will Russia participate pursuant to recent deep water claim?
 - If not, plan B? (i.e. can a meaningful program be devised, excluding Russian waters?)
- Environmental
 - Deep water locations less sensitive? N.B. ongoing negotiations between Shell and native communities offshore North Slope (Platts, 07/07/05)
- Operating Platform
 - Operating capability, cost, scheduling of Chukyu, JR, vs. MSP
 - Ice free areas needed (?) for Chikyu, JR

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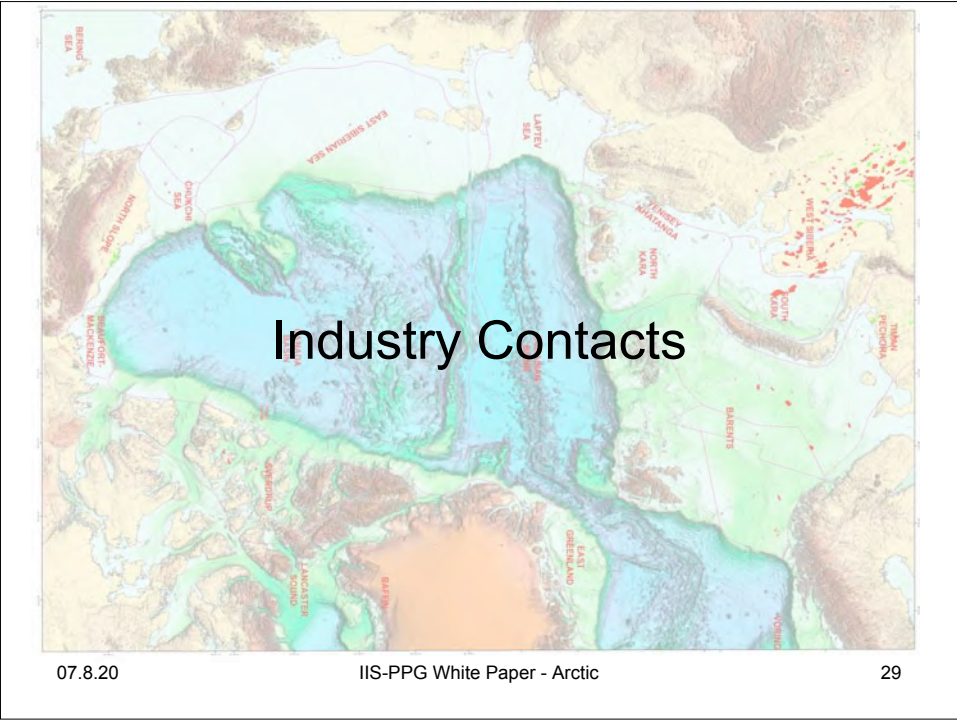
Proposals

- Immediate:
 - IIS-PPG panel agrees to champion industry funding of an Arctic drilling program
- Short term:
 - IODP management to decide whether to invite one or more Russian entities to participate on IIS-PPG panel
- Short-medium term:
 - Scientific-Industry workshops to define most effective locations for a limited number of wells of mutual scientific and industry interest
 - Propose first workshop 2H '07 in Houston
- Long term ('08 and onward):
 - IIS-PPG participants act as:
 - Embassadors to advertise / engage sources of participation / funding (industry / government) for exploration program (including prior site survey and subsequent sample analysis programs)
 - Form separate "Off-IODP" Panel representing interested parties in an Arctic Consortium
 - Brokers for legal agreements (e.g. confidentiality) acceptable to industry

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Industry Contacts

- Industry IODP Panel Members
 - Chevron: Marty Perlmutter
 - Exxon: Kurt Rudolph
 - Hess: Andy Pepper
 - Total: Didier Hubert-Drapeau
 - Shell: Andy Bell?
- Other Industry Arctic Project Leaders
 - BP: Steve Matthews
 - Others: ?

07.8.20 IIS-PPG White Paper - Arctic 30

(1) North Slope of Alaska:
 Outboard areas of the Beaufort Sea, test Tertiary source potential / extent and reservoirs in the deeper Beaufort/Chuckchi basins for quality.

(2) Beaufort-MacKenzie:
 Test Tertiary source outboard extent and reservoir presence / quality,

(4) Offshore Banks Island and Sverdrup:
 Untested rift margin, Tertiary load provides maturity.

(7) NE Greenland
 Quality of source / extent, seeps, burial history model.

(12) Disputed zone between Norway and Russia:
 Expansion of Russian and Norwegian Barents play elements.

(15) North Kara Basin:
 Poorly known basin, need source and reservoir documentation.

(16) Laptev Sea:
 Tertiary depocenter, need stratigraphic ages to build models / define source presence / type.

(17) Eurasian basin
 Tertiary ocean basin East of Lomonosov ridge, large unknown area. Tectonic reconstruction implications.

(18) Lomonosov Ridge
 Documented age of sediments and source potential. Tectonic reconstruction implications

(19) East Siberian Sea
 Poorly known basin, no wells and little seismic, stratigraphic model needed, difficult to correlate to onshore databases. Need stratigraphic ages to build models / define source presence / type.

(20) Makarov basin:
 Early Cretaceous extension of Canadian Ocean basin, west of Lomonosov ridge. Tectonic reconstruction implications

(21) Alpha-Mendeleev Ridge:
 The main issue involved is whether the rock units are of continental origin or volcanic or a combination of both.

(22) Chuckchi Cap:
 Does Paleozoic-Mesozoic reservoir exist here and what is the relationship to the North Chuckchi basin.

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IIS-PPG White Paper - Arctic

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The industry would like to investigate the potential of utilizing IODP ships for industry developed drilling consortiums. Possible projects envisioned could be, for example, an Arctic basin analysis program or a hydrate analysis. In order to proceed in a timely manner, the IODP IISPPG would like to ascertain the level of interest of the IO's in pursuing and facilitating this approach to solving IODP funding issues.

If there is interest, prior to the IISPPG engaging the entire industrial community to inquire about creating this consortium, we need the following information that will drive corporate decisions: (1) the approximate cost of the ships for drilling in an ice free location in the Arctic; (2) the drilling capabilities of each ship; (3) scheduling/availability; & (4) fiscal responsibilities (liability, etc).

While this potential program would be driven by industry interests we believe that there could be significant opportunities for scientific collaboration with academia and government.

From the IODP-MI SAS Terms of Reference for the IISPPG:

5. Membership. The IIS PPG membership shall maintain a reasonable balance of expertise, research interests, and international participation, with an ideal goal of about **two thirds of the members from industry and about one third from academia.**

Lead agency countries [**US and Japan**] shall be entitled to appoint **two members** each, and other IODP members [**Europe**] shall be entitled to appoint one member each. The remaining membership shall be approved by the SPC. IIS PPG members shall have experience in scientific ocean drilling as well as expertise in research related to industry interests. Members shall be appointed to initial terms of three years, and their terms may be extended on SPC approval of a renewed term of activity for IIS PPG.

6. Chair and Vice-Chair. The IIS PPG chair and vice-chair shall be appointed by the SPC. Their terms shall be three years. The IIS PPG chair shall be responsible for providing the IODP-MI Sapporo Office with meeting minutes within one month of each meeting.

7. Liaisons. The IIS PPG chair shall be liaison to the SPC, with vice-chair as alternate. The SPC may appoint a liaison to the IIS PPG;

Lead Agency and IODP Member Representatives:

Yoshihiro Tsuji - Japan member - Industry - JOGMEC

Yasuhiro Yamada - Japan member - Academia - Kyoto University

Alternate: Takano

Martin Perlmutter - US member - Industry - Chevron

Kurt Rudolph - US member - Industry - Exxon

Harry Doust - European member - Academia - Vrije Universiteit -

IISPPG Members in addition to those appointed by the program members:

Ralph Stephen (Chair) - Academia - WHOI

Didier-Hubert Drapeau - Industry - Total

Neil Frewin - Industry - Shell - Replacement is Andrew Bell???

Andrew Pepper - Industry - Amerada Hess

David Roberts - Industry - Rockall Geoscience

Richard Davies - Academia - Durham University

Eugene Shinn - Academia - needs a replacement????

Industry - 7

Academia - 5

Total - 12

Vice-Chair(???)

Progress Report on IIS-PPG

**for IISPPG
July 2007**

Mandate 2.1. Most important, define industrial priority research within the IODP context, and promote development of IODP drilling proposals to address such objectives within the context of the ISP.

IISPPG is promoting the submission of two projects for the April 1/07 proposal deadline: 1) A South Atlantic rifted margins project which will be included in a rifted margins mission proposal. 2) A pre-proposal on the theme of silica diagenesis, shallow compaction and fluid flow.

IISPPG is promoting a proposal or pre-proposal on Mesozoic source rocks and paleo-oceanography for possible submission in April 1/08.

The Arctic Basin is one of the last remaining scientific frontiers on a number of fronts, from basin evolution to paleo-oceanography and paleo-climate change. IISPPG believes this is an area of great mutual interest to academia and industry. The panel will prepare a 2-3 page white paper scoping out possible Arctic drilling of joint industry-academic scientific interest.

Mandate 2.2. As appropriate, develop effective links between academic and industry scientists, facilitate communication and cooperative scientific and technical development activities between the IODP and industry, and identify IODP educational and outreach activities within selected industry professional organizations.

IISPPG supports the IODP data management efforts (SEDIS portal) which involve interoperable data portals. Coordination between US, Japanese, and European data management efforts is obviously essential. Specifically we request that the industry “user community” be involved in pilot projects to guide the development and to ensure the utility of the data management infrastructure.

IISPPG will contact EGI (Energy Geoscience Institute - University of Utah) to identify whether they would have interest in developing with IODP scientists an integrated database of DSDP, ODP and IODP well data.

IISPPG supports the membership of IODP-MI in the RPSEA and Deep Star projects. IISPPG will monitor developments on the Deep Star Technical Advisory Committees on Geoscience and Downhole Measurements.

Discussion of “industry legs”.

Mandate 2.3. Engage industry professionals as ambassadors in communicating and promoting IODP activities.

IISPPG recommends that IODP-MI increase the awareness of IODP in the Japanese petroleum industry in addition to US and European efforts, for example by having a booth at the JAPT. In conjunction with the next meeting in Sapporo, IISPPG will participate in a mini-workshop in Tokyo on "Applications of IODP data in petroleum exploration".

Industry Legs

For industry to partner with IODP, especially where the use of drill ships is involved, a number of sensitivities are involved. There are two end members of participation by industry scientists, for which there do not seem to be any issues.

One end member is the present mode of industry scientists participating in IODP expeditions.

The other end member is the use of the drill ships for non IODP purposes. IODP-MI is not involved and the drill ship operators can make any arrangements that they would like to, including leasing to industry (eg the recent use of the JOIDES Resolution to drill gas hydrates off India).

The possibility of “hybrid” expeditions where both industry and IODP share the science objectives and costs is obviously of some interest and needs to be pursued by both sides.

IIS-PPG Mandate, Membership and Mechanisms

- Is there scope for hybrid programmes to be jointly funded (IODP/industry), eg in the Arctic Ocean?
- If industry were to participate, a change in the operational governance of IODP would be required.
- Nothing in relation to IODP initiatives is likely to be endorsed by senior industry management unless previously proposed by IIS-PPG.
- Limiting the time between proposal submission and operation. Is there a way to develop more bins or categories of acceptance/rejection? SPC to action?

IIS-PPG Mandate, Membership and Mechanisms, cont'd

- There will be no IODP financial support for academics in white paper working groups tasked with maturation of proposals. There is an opportunity for industry to fund academics (for travel costs for example) to participate in proposal planning meetings. Such mechanisms should be informal and could be arranged ad hoc, arranged by the working group involved.
- IIS-PPG should limit its activity to identification of high-level initiatives and the facilitating working groups.
- Building relationships with industry is valuable for academics.
- IIS-PPG to keep the list of “current active proposals with potential industry interest” evergreen.

No.	Name	Affiliation
1	Hikaru Ueirisa	Akishima Laboratories(Mitsui Aosen) Inc.
2	Shogo Miyajima	Akishima Laboratories(Mitsui Aosen) Inc.
3	Shigeharu Mizobata	JGI Inc.
4	Tokujiro Takayama	JOGMEC
5	Naoyuki Shimoda	JOGMEC
6	Yutaka Yanagimoto	JGI Inc.
7	Tim Byrne	Center for Integrative Geoscience
8	Masami Hanefuji	ERSDAC
9	Yukari Kido	JAMSTEC, CDEX
10	Yoshinori Sanada	JAMSTEC, CDEX
11	Toshiro Kaminishi	JAMSTEC, CDEX
12	Ken Tsuji	JAMSTEC, CDEX
13	Masaki Matsuzawa	JOGMEC
14	Toshikatsu Sugawara	Marine Works Japan. Ltd.
15	Toshiyuki Ohshima	MEXT
16	Yoshiaki Watanabe	Arabian Oil Co. Ltd.
17	Shunsuke Ishii	Cosmo Energy Exploration and Development Ltd.
18	Nobuyuki Honda	Cosmo Energy Exploration and Development Ltd.
19	Tatsuki Endo	Schulumberger K.K.
20	Shinichi Watabe	Schulumberger K.K.
21	David Scheibner	Schulumberger K.K.
22	Takeshi Endo	Schulumberger K.K.
23	Yuzo Yamamoto	Schulumberger K.K.
24	Canyun Wang	Schulumberger K.K.
25	Ai Katayama	Schulumberger K.K.
26	Kazuko Suzuki	Schulumberger K.K.
27	Masashi Kato	Kyoto Univ.
28	Yukitugu Tohdake	Inpex Corp.
29	Hiroyuki Tokunaga	Inpex Corp.
30	Masashi Fujiwara	Mitsui Oil Exploration Co., Ltd.
31	Tokio Kaji	Mitsui Oil Exploration Co., Ltd.
32	Ryoichi Yaguchi	Mitsui Oil Exploration Co., Ltd.
33	Hiroshi Yamamoto	Idemitsu Oil & Gas Co., Ltd.
34	Hisao Mitadera	Nippon Oil Exploration Ltd
35	Soichi Tanaka	Fukada Geological Institute
36	Hideaki Shiraki	ICEP
37	Takao Inamori	JAPEX
38	Takamasa Nakagwa	JOGMEC
39	Katsuei Saito	JOGMEC
40	Masaru Nakamizu	JOGMEC

41	Eiichi Honza	JGI Inc.
42	Ryo Anma	Tsukuba Univ.
43	Isao Akiyama	Teikoku Oil Co., Ltd.
44	Tsukasa Takashima	Teikoku Oil Co., Ltd.
45	Futoshi Nanayama	AIST, Geological Survey
46	Sadao Nagakubo	Japan Drilling Co., Ltd.
47	Shozaburo Nagumo	
48	Asahiko Taira	Speaker, JAMSTEC
49	Tatsuo Saeki	Speaker, JOGMEC
50	Syu Waseda	Speaker, JAPEX
51	Akihisa Takahashi	Speaker, JAPEX
52	Makoto Ito	Speaker, Chiba Univ.
53	Yasuhumi Iryu	Speaker, Tohoku Univ.
54	Kurt Rudolph	Speaker, ExxonMobil Exploration
55	Andy Pepper	Speaker, Hess Corp.
56	Ralph Stephen	Speaker, Woods Hole Oceanographic Institution
57	Martin Perlmutter	Speaker, Chevron Energy Tech. Co.
58	Yasuhiro Yamada	Kyoto Univ.
59	Yoshihiro Tsuji	JOGMEC
60	Osamu Himeno	JOGMEC
61	Yujiro Ogawa	Tsukuba Univ.
62	Ryozo Kawato	DRICO Ltd.
63	Osamu Takano	JAPEX