Operations Task Force Meeting Report

Scheduling Updates: FY2008 and FY2009

Note: Pages 21 and 22 show graphical summaries of expedition schedules to date

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This report covers four meetings held between January and June 2007 that addressed issues primarily related to the FY08/09 operational schedules. The January and March meetings were short ~3 hour impromptu meetings associated with other Science Advisory Structure Meetings (EPSP and SPC, respectively). The February and June meetings were 1-day meetings.

January 11th, OTF Meeting Attendees (Yokohama, Japan)

Jack Baldauf	JOI Alliance (USIO), Texas A&M University, TX, USA
Keir Becker	RSMAS, University of Miami, Miami, FL, USA
Dan Evans	ECORD Science Operator (ESO), British Geol Survey, UK
Shin'ichi Kuramoto	Center for Deep Earth Exploration (CDEX), Japan
Thomas Janecek	IODP Management International, Washington, D.C., USA
Hans Christian Larsen	IODP Management International, Sapporo, Japan

February 22nd, OTF Meeting Attendees (Washington, DC, USIO)

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Jack Baldauf	JOI Alliance (USIO), Texas A&M University, TX, USA
Keir Becker	RSMAS, University of Miami, Miami, FL, USA
David Divins	JOI Alliance (USIO), JOI Inc, Washington, DC, USA
Gabe Fillipelli	Indiana Univ - Purdue Univ. Indianapolis, Indiana, USA
Jun Fukutomi	Center for Deep Earth Exploration (CDEX), Japan
Thomas Janecek	IODP Management International, Washington, D.C., USA
Hans Christian Larsen	IODP Management International, Sapporo, Japan
Yoshi Kawamura	Center for Deep Earth Exploration (CDEX), Japan
Mary Reagan	JOI Alliance (USIO), LDEO, Palisades, NY, USA
Ali Skinner	ECORD Science Operator (ESO), British Geol Survey, UK

Observers

Jamie Allan	National Science Foundation, USA
Toshi Oshima	MEXT, Japan
Kelly Oskvig	IODP-MI, Washington, D.C., USA

March 2nd, 2007 OTF meeting Attendees (Osaka, Japan)

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Jack Baldauf	JOI Alliance (USIO), Texas A&M University, TX, USA
Keir Becker	RSMAS, University of Miami, Miami, FL, USA
Jan Behrmann	Geologisches Institut, Universität Freiburg, Germany
David Divins	JOI Alliance (USIO), JOI Inc, Washington, DC, USA
Thomas Janecek	IODP Management International, Washington, D.C., USA
Alberto Malinvero	JOI Alliance (USIO), LDEO, Palisades, NY, USA
Shin'ichi Kuramoto	Center for Deep Earth Exploration (CDEX), Japan

June 20th, 2007 OTF Meeting Attendees (Houston, TX, USA)

Jack Baldauf	JOI Alliance (USIO), Texas A&M University, TX, USA
Keir Becker	RSMAS, University of Miami, Miami, FL, USA
Jan Behrmann	Marine Geodynamics, IFM-GEOMAR, Germany
Dan Evans	ECORD Science Operator (ESO), British Geol Survey, UK
Jun Fukutomi	Center for Deep Earth Exploration (CDEX), Japan
Thomas Janecek	IODP Management International, Washington, D.C., USA
Hans Christian Larsen	IODP Management International, Sapporo, Japan
Jim Mori	Disaster Prevention Research Inst, Kyoto University, Japan
Shin'ichi Kuramoto	Center for Deep Earth Exploration (CDEX), Japan
Mitch Malone	JOI Alliance (USIO), Texas A&M University, USA
Mary Reagan	JOI Alliance (USIO), LDEO, Palisades, NY, USA

Observers

Jamie Allan Kelly Oskvig National Science Foundation, USA IODP MI, Washington, D.C., USA

1 Introduction

This report incorporates the results of four Operations Task Force meetings held in January, February, March and June (2007). These meeting primarily addressed revisions to the FY08/early FY09 operational schedules. The June 2007 meeting also incorporated discussion relevant to the scheduling of a mixture of IODP and non-IODP operations.

2 FY08/FY09 Schedule Modifications (Aug 06–Mar 07)

Figure OTF-07-1 shows the operational schedule as approved at the August 2006 SPC meeting. *See the SPC 0608 meeting minutes for a complete summary of the discussion and resulting FY08 schedule (and the SPC Consensus Statements 0608-03, -04, and -05 related to that schedule)*. At the time of the August 2006 SPC meeting, the SODV schedule still required EPSP review of the Canterbury shallow hazard survey before operations for that expedition could be formally approved. Thus **Figure 0TF-07-1** shows several potential programs (e.g., CRISP, Equatorial Pacific II, Superfast) that could be inserted into the schedule should the review of the shallow hazard survey reveal that operations at Canterbury could not be conducted safely with the SODV.



Figure OTF-07-1: Approved Schedule as of August 2006 SPC meeting

2.1 SODV FY08 Schedule Modifications

2.1.1 OTF Revisions Part 1 – January 2007

In January 2007, the EPSP reviewed the results of the shallow hazard survey for Canterbury and approved operations at all the requested sites. Also in January, the USIO informed OTF that the delivery date for the SODV was delayed until November 15, 2007. The OTF met following the EPSP meeting to address this new information. The schedule for the SODV was modified to confirm the Canterbury/Wilkes options and to adjust the start date to November 15th (see **Figure OTF-07-2**). This latter adjustment did not adversely affect the Bering Sea and Juan de Fuca programs and associated weather windows.



Figure OTF-07-2: Upper Panel: Approved SODV schedule as of August 2006 SPC meeting. Lower Panel: OTF recommended schedule (as of January 2007) that takes into account EPSP review of Canterbury shallow hazard survey and change in SODV start date to November 15, 2007.

2.1.2 OTF Revisions Part II - February/March 2007:

Following the January OTF meeting, several new developments arose with respect to the SODV operations, including:

- IODP-MI and the IOs were informed by the Lead Agencies that FY08 budgets would be 25-30% less than expected.
- IODP-MI was informed by NSF that the SODV delivery date would change from November 15th, 2007 to January 1st, 2008.
- The USIO was informed that the Japanese fishing unions would not permit SODV operations in the NanTroSEIZE area between March and May.

As a result of this new information, OTF met twice in short succession (February 22nd and March 2nd, 2007) to revise the SODV FY08 schedule once again. The topics of discussion included (1) how to best approach meeting budget targets via operational

revisions and (2) a re-examination of each expedition's operations and costs, with the goal to develop a revised SODV schedule for SPC approval at its March 2007 meeting.

As the reduced budget targets specified by the Lead Agencies will only allow ~ 8 months of operational time each year for the SDODV, the OTF examined two generic operational models that would assist the USIO in supplementing the remaining time with "non-IODP" work. These two models (the "Bookend Model" and the "Upfront" model – **Figure OTF-07-3**, below) provide a way to minimize the transfer of platform time between non-IODP and IODP work by allocating large blocks of time to each mode over a two fiscal year period.



Figure OTF-07-3: Two-year operational models discussed by OTF that would allow significant blocks of time to be allocated to IODP and non-IODP operations and would minimize mob/demob efforts.

After a period of discussion, OTF preferred the "Upfront model" for near-term operations (FY08 and FY09) as it provides:

- a good message to community by starting and maintaining the maximum number of expeditions immediately following the SODV refurbishment
- the most science impact toward renewal
- more time to investigate other IODP and non-IODP options for the bulk of FY09

OTF also developed additional criteria upon which to base the selection of programs for the FY08 SODV schedule revisions. These criteria include:

- Schedule the highest-ranked FY08 science to fit the available budget
- Keep the spirit of previous SPC Consensus Statements regarding FY08/FY09
- Strive for a full year of FY08 operations (upfront model)

- Keep at a polar program in FY08 (Bering Sea)
 - FY09 scenario uncertain at this point and thus at least one of the two Polar programs would be conducted
- Minimize number (cost) of long-lead items required for FY09
- Respect weather windows

OTF then examined ways to meet the FY08 budget targets. Three areas were examined with the recognition that some combination of all three would most likely be necessary to meet the budget targets and maintain a viable, robust science program. These areas include:

- 1) Descoping scheduled operations
 - Juan de Fuca : Remove CORKS; consider remedial cementing only
 - 603A/B NanTroSEIZE : Remove CORKS; Reduce casing
- 2) Minimizing transit
 - Reduce fuel costs / maximize science days
 - Keep ship in North Pacific (defer Southern Ocean program)??
- 3) Reduce number of expeditions for fiscal year

With the above criteria in mind, as well as recognizing the change in SODV start date and the fishing union restrictions, the OTF set about to revise the SODV schedule.

OTF first addressed the change in start date of SODV operation to Jan 1, 2008. OTF utilized the SPC Consensus 0608-3 that, in part, stated:

".....In the event of a slight delay in the start of SODV operations, the entire schedule should simply shift later, as long as good weather windows remain open for the Bering Sea and Juan de Fuca expeditions. In the event of a longer SODV delay that would preclude such a simple shift, the first Equatorial Pacific expedition would be deferred until later and the schedule would begin with NanTroSEIZE Stage I operations.

As the shift in start date from November 15th, 2007 to January 1st, 2008 is more than a "slight delay" and would preclude a "simple shift" of the schedule, the OTF invoked the latter part of SPC Consensus 0608-3 and deferred the first Equatorial Pacific expedition to a later date and recommended starting the FY08 SODV operations with NanTroSEIZE (**Figure OTF-07-4**)



Figure OTF-07-4: FY08 Scheduling scenario discussed by OTF that removes the first Eq Pac operation per SPC Consensus 0608-3 in order to reach a target start date of January 1st 2008 for SODV operations

Next the OTF addressed the Japanese fishing union restrictions. These restrictions dictated that no operations could be conducted in the NanTroSEIZE area during the March – May time frame. Thus OTF determined that it must reschedule/revise the second NanTroSEIZE slot (the Subduction Inputs expedition). In addition, given budget restrictions and the need to de-scope (for FY08) the observatory aspects from the first NanTroSEIZE expedition (Kumano Basin), OTF decided to combine the coring elements of both the Kumano Basin and Subduction Inputs expeditions into one "simple" coring expedition (**Figure OTF-07-5**)



 Pacific
 Pacific

 Figure OTF-07-5: FY08 Scheduling scenario discussed by OTF that removes one

 NanTroSEIZE expedition (Subduction Inputs) from the SODV schedule to accommodate fishing

union restrictions. OTF then combined the coring elements of the two expeditions (Kumano Basin and Subduction inputs) into the remaining NanTroSEIZE expedition (with no observatory installation in FY08).

Following these two decisions, OTF then examine how best to "repackage" the remaining SODV expeditions for FY08. OTF developed 5 models and divided them into two basic groups: the "Equatorial Pacific" and the "NanTroSEIZE" models. These models are presented below in **Figure OTF-07-6**.



Equatorial Pacific vs. NanTroSEIZE models

OTF examined the two basic model options and preferred the NanTroSEIZE models (Options 4 and 5 in **Figure OTF-07-6**) for numerous reasons, including:

- Provide for coring at Subduction Input sites and riser prep drilling at NT3-01
 - These models will allow us to continue to move forward with the Stage 1 operations for NanTroSEIZE and gain the basic geotechnical information required for properly planning the NanTroSEIZE Stage 3 deep riser hole (NT3-01).
- Multiple types of science
 - The models provide a mixture of science (tectonic and paleoceanography) that allow IODP to make progress in multiple areas of the ISP.
- Mininize initial transit / Maximize time on site
- NanTroSEIZE planning / implementation well underway
 - Over the past several years significant planning efforts by the IOs and the NanTroSEIZE project management team (PMT) have been expended toward this program. These efforts should be built upon in a timely fashion.
- NanTroSEIZE highest-ranked Pacific science not yet drilled.

Once the OTF made the selection to recommend the "NanTroSEIZE" models, it then evaluated the relative merits of the "Asian Monsoon" vs. "Equatorial Pacific" NanTroSEIZE models. The "Equatorial Pacific" model (Option 5 in Figure **Figure OTF-07-6**) was ultimately recommended by OTF for several reasons:

- Retains more of previously approved SPC FY08 schedule
- Provides for remedial cementing at Juan de Fuca (Site 1301)
- Provides opportunity to finish Equatorial Pacific program in one FY
- Good opportunity for Asian Monsoon in FY09/10 (*Chikyu*/SODV)
 - In addition, there are site survey status issues with Asian Monsoon that would preclude FY08 scheduling, as only 3 of 9 currently have enough site survey information

Based upon the above discussion, the final recommended SODV model (as of March 2007) is shown in **Figure OTF-07-7**



Figure OTF-07-7: Recommended SODV operations (as of March 2007). Note that the Transit/Operations across the FY08/FY09 boundary were to be determined at the June 2007 OTF meeting. In addition, FY08 budgets it was recognized that budgetary constraints might dictate removal of Bering Sea Program. This option will also be revisited at the June 2007 OTF meeting (see Section 3.1 below).

2.2 FY08 *Chikyu* Schedule Modifications

At its January, February, and March meetings the OTF recommended several small revisions to *Chikyu*'s FY08 schedule. Prior to the first NanTroSEIZE Stage 1 *Chikyu* expedition (LWD expedition), CDEX requested time for the drilling of "safety holes" at several of the sites in order to examine hole conditions and the potential for fluid flow. Given the risks associated with using logging tools with radioactive sources in this environment, OTF accepted this request by CDEX. The integration of these "safety holes" in *Chikyu*'s operational schedule did not reduce the amount of "science" time available for NanTroSEIZE. In Figure **OTF-07-8** (below) it appears that operational time is reduced for the second expedition. This is an artifact of older operational time estimates. Revised coring/casing operational time estimates provided by CDEX at these meetings have maintained the same coring operations.



Figure OTF- 07-8: Recommended Chikyu operations (as of March 2007). Safety holes are drilled prior to IODP operations to ensure safe conditions for LWD operations.

2.3 FY08 MSP Schedule Modifications

For cost saving measures, the Lead Agencies requested that the Great Barrier Reef expedition, tentatively scheduled for the end of FY08, be moved into FY09. OTF approved this change, but noted at the time that this shift implied that no MSP offshore operations would be conducted in FY08 and the next expedition after Great Barrier Reef would not occur until 2010 (at least). ESO also noted that, although shifting off-shore operations totally into FY09 might save some costs, there would still be significant lead time expenses required for preparation of this expedition.

2.4 Approved Revised FY08 / Early FY09 Schedule

Figure OTF 07-9 (below) shows the composite, revised FY08 schedule as approved at the March 2007 SPC meeting.



Figure OTF 07-9: *Revised IODP FY08/early FY09 operations schedule approved by SPC at its March 2007 meeting.*

The relevant SPC Consensus statements regarding the schedule shown above in **Figure OTF-07-9** are provided below.

SPC Consensus 0703-14: The SPC receives the update on minor schedule adjustments reported by the Operations Task Force (OTF) for FY2008 Chikyu NanTroSEIZE operations and FY2008-2009 Mission Specific Platform (MSP) operations at Great Barrier Reef, and confirms that these are fully consistent with the August SPC consensus statements (0608-04 and 0608-05, respectively) approving those programs for the FY2008-2009 schedules.

SPC Consensus 0703-15: The SPC accepts the adjustments recommended by the Operations Task Force (OTF) to the FY2008-2009 U.S. Scientific Ocean Drilling Vessel (SODV) science operations schedule in response to National Science Foundation (NSF) budgetary guidance for FY2008 and other logistical factors. After a 1 January 2008 start date to international operations and a short transit, the approved schedule would include the following sequence:

- NanTroSEIZE Stage 1 coring (Proposals 603A-Full2, 603C-Full; subduction inputs and site 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)

This adjusted schedule is as close as possible to the previously approved FY2008-2009 schedule (SPC Consensus 0608-03) 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 the NSF, IODP-MI, and USIO cannot identify the resources to achieve the full sequence of FY2008 SODV operations above, the SPC recognizes that the fourth FY2008 expedition (Bering Sea paleoceanography) would need to be deferred, and that a completely different model for FY2009 SODV operations would need to be developed at the June 2007 Operations Task Force and August 2007 Science Planning Committee meetings

3 FY08/FY09 Schedule Modifications (Mar 07 – Jul 07)

The OTF met June 20th, 2007 to finalize platform schedules for FY08 and develop scheduling options for FY09. The USIO and CDEX brought new information to the meeting that required OTF to revise (once again) the FY08 schedules. No major changes for the FY08/FY09 MSP operations were discussed at the meeting. However, subsequent to the meeting, ESO informed OTF that the New Jersey Shallow Shelf operation (Exp 313) planned for FY2007 would have to be deferred. Thus OTF, via email, dealt with the effects of this FY07 schedule change on FY08 and FY09 MSP operations. Further discussion and refinement of the SODV FY08/ early FY09 schedule occurred via several emails exchanges (in July). The schedule presented at the end of this section is the sum of discussion at the June OTF and the subsequent email exchanges (to date).

3.1 SODV FY08 / Early FY09 Schedule Modifications

At the June 2007 OTF meeting, the USIO updated OTF on the status of the SODV conversion. As of March 2007, loading and sea-trials were to be completed in December 2007, with initiation of IODP operations (NanTroSEIZE) in January 2008. The new reality, so far, is that the science integration, load out, sea trials, vessel acceptance, and transit to the first port will not finish until early/mid February.

3.1.1 Deferring NanTroSEIZE

The February delivery date of the SODV for IODP expedition operations, combined with the Japan fishing union restrictions on March-May operations, meant that less than 20 days (including transits) would be available for NanTroSEIZE operations if the previously approved schedule order remained the same (see **Figure OTF-07-9**, above). OTF discussed the ramifications of conducting NanTroSEIZE operations with the SODV in this limited time frame. In addition, OTF considered the ever-present possibility of additional SODV delivery delays and thus loss of more operating days against a hard deadline of March 1 (fishing union restrictions). The limited number of operating days,

the possibility of further delays to the SODV schedule, and the inability to slide NanTroSEIZE operations past March 1 led OTF to recommend removing/deferring the Kumano Basin/Subduction Inputs coring expedition (Exp 317) from the SODV schedule.

3.1.2 Start Date of SODV operations

One effect of removing NanTroSEIZE operations from the start of SODV FY08 operations is that it provides the opportunity to insert a ~1 month "cushion" before the time that Equatorial Pacific operations would need to begin in March (to maintain weather windows for subsequent programs). This "cushion" has two very positive aspects. The first, and most important, is fiscal. Starting coring operations in March instead of February provides the USIO with a cost-effective mechanism for meeting budget targets while still providing high-quality services on the SODV in FY08. Second, given the fluidity of shipyard issues, the already very tight vessel load-out schedule prior to departure from Singapore, and the need for more time for sea trials/ shakedown and vessel acceptance, this "cushion" is a good mechanism to ensure the SODV is ready for international operations. Subsequent delays, if any, would not require continual reshuffling of staffing

3.1.3 Early FY08 SODV model options

OTF then discussed options for the remainder of the FY08 schedule taking into account this deferral of the NanTroSEIZE expeditions, first concentrating on the initial part of FY08 operations. Only a few options existed that (1) were affordable, (2) had viable (efficient) transits and (3) maintained appropriate weather windows for the polar options. Two options were developed and examined:

Option 1) Equatorial Pacific I, Equatorial Pacific II (w/ remedial cementing at Juan de Fuca), and Bering Sea

In this model (**Figure OTF-07-10**; below) the removal of NanTroSEIZE provides for an increase in the number of operational days for the Equatorial Pacific I expedition because transit time is decreased (due to a Honolulu vs. Yokohama starting port). Following the end of Equatorial Pacific operations (Eq Pac expeditions I and II), the SODV would move around the North Pacific in a counter-clockwise rotation first conducting remedial cementing operations at Juan de Fuca and then continue on to Bering Sea. This counter-clockwise rotation (as opposed to the clockwise rotation of option 2; below) also maximizes on-site time at Bering Sea (by nearly 10 days).



Figure OTF-07-10; One option developed by OTF for starting the FY08 SODV schedule without the NanTroSEIZE operation in the March-May window.

OTF preferred this string of expeditions to begin FY08 as it:

1) Retains much of the previous SPC consensus (0603) regarding operations

- 2) Maximizes Equatorial Pacific I and Bering Sea on-site time
- 3) Allows for the completion of the Equatorial Pacific program in one FY
- 4) Allows for remedial cementing at Juan de Fuca
- 5) Allows for a Polar program in FY08 (as does option 2; below)

Option 2) Equatorial Pacific I, NanTroSEIZE, Bering Sea

OTF examined an option that would attempt to retain the Kumano Basin/Subuction Inputs coring of NanTroSEIZE in the SODV schedule (**Figure OTF-07-11**; below). This option proved very problematic. Given the Japanese fishing union constraints (no operations March-May), the earliest that NanTroSEIZE could start would be June. Thus, given the need for a mid-March start of Equatorial Pacific 1, there would be a 2-3 week gap between Equatorial Pacific 1 operations and the start of NanTroSEIZE that would be very difficult to fill with any operations. In addition, this scenario would not provide for remedial cementing at Juan de Fuca and would push Bering Sea into a less desirable weather window. This scenario would also not allow for completion of Equatorial Pacific program before the transit down to Canterbury (due to an inefficient transit from Bering to Equatorial Pacific II to Canterbury. Finally, OTF determined that there would be numerous opportunities for completing this NanTroSEIZE expedition with *Chikyu* (See discussion about "TBD" slot; next page)



Figure OTF-07-11: One option considered by OTF after deferring the NanTroSEIZE expedition from the initial SODV FY 08 starting position

Given the above issues surrounding this model and the likelihood of completing NanTroSEIZE riserless expeditions on *Chikyu*, OTF rejected this model.

Thus OTF recommended that the initial part of the schedule (after removal of NanTroSEIZE from the starting spot) remain Equatorial Pacific I, Equatorial Pacific II, and Bering Sea as this model maximizes the number of science days for these three high priority expeditions (**Figure OTF-7-12**; below).



Figure OTF-07-12: *Revised SODV schedule recommended by OTF at its June 2007 meeting after deferring NanTroSEIZE (exp 317) from the initial starting spot. The OTF examined the "TBD" slot during later in the June meeting and also via email after the meeting.*

3.1.4 "TBD" Slot

Following discussion of the initial part of the FY08 program, OTF examined programs that would fit into the "TBD" slot (see **Figure OTF-07-12**; above).

NOTE: OTF first quickly discussed the option of re-inserting the deferred NanTroSEIZE expedition in place of Canterbury/Wilkes. The replacement of Canterbury or Wilkes by NanTroSEIZE was rejected as previous SPC discussion (Kyoto) emphasized the importance of maintaining the Southern Ocean expeditions. In addition, several other options remained for re-scheduling the deferred NanTroSEIZE expedition.

The OTF discussion then centered on the "TBD" slot. Three possibilities arose in the discussion: NanTroSEIZE, Marianna, and Shatsky Rise. All are Group 1 proposals.

After considerable discussion during the June 2007 meeting and subsequent emails after the June meeting, NanTroSEIZE was removed from consideration from this slot for the primary reason that there appears to be ample opportunity to address the Subduction Inputs and Kumano Basin sites with *Chikyu*. With a general *Chikyu* schedule of 2 months of riserless and 5 months of riser operations each fiscal year, there will be at least four opportunities (2009, 2010, 2011, 2012) for additional NantroSEIZE riserless drilling by *Chikyu* between now and the end of drilling operations at NanTroSEIZE (~2012). In addition, riserless NanTroSEIZE drilling is also a stated contingency for NanTroSEIZE riser drilling should the Kuroshio current affect riser operations. Thus, with at least 8 months of *Chikyu* riserless time between 2009-2012 (plus potential contingency time) there is ample opportunity for completion of most, if not all, of the high priority NantroSEIZE riserless drilling (and possibly some other non-NanTroSEIZE programs, too) with *Chikyu*. This utilization of *Chikyu* for NanTroSEIZE operations is in line with a recent SASEC (June, 2007) prioritization of *Chikyu* time to finish major milestones in NanTroSEIZE.

With NanTroSEIZE removed from consideration of the TBD slot, OTF needed to decide between Shatsky Rise and Marianna. Both are essentially the same rank. Below are the Group 1 rankings from latest SPC (March 07) meeting.

	<u>Short Title</u>	<u>Mean</u>	Std Dev
1	Marianna	5.59	3.36
2	New Foundland Rifted Margin	5.76	3.80
3	Costa Rica Mud Mounds	6.12	3.48
4	Bengal Fan	6.29	4.06
5	Mediterranean Outflow	6.35	3.44
6	Shatsky Rise Origin	6.65	4.00
7	CRISP Phase B	6.94	2.93
8	Superfast Spreading Cruist	7.18	4.00
9	Newfoundland Sediment Drifts	7.29	4.13

Based upon this ranking, Shatsky and Marianna are not statistically different. Thus given the equal "science ranking", OTF looked at logistical and fiscal efficiency of the two programs. Fiscally, they are similar. Looking at logistics, particularly weather windows, the frequency of tropical storms/typhoons in the area of operations becomes very important. Below, each of the programs in question are listed along with Tropical Storm/Typhoon occurrences for each month (10-year total based upon Unisys Weather data 1997-2006)

NanTroSEIZE:	Aug 15/3	Sep 13/3	Oct 11/1
Mariana:	Aug 8/1	Sep 9/2	Oct 8/2
Shatsky Rise:	Aug 6/1	Sep 4/1	Oct 3/1

Of particular importance to note is that for the time period of expected operations (Sept-Oct) there is a greater than 2:1 frequency of storms in the Marianna area than at the Shatsky operational area and a greater than 3:1 difference between NanTroSEIZE and Shatsky. Given the reduced operational schedule of the SODV (~8 months/year), any downtime related to weather becomes even more significant. While IODP should always attempt to minimize "waiting on weather", such a philosophy becomes even more important now.

Based upon the above discussion and the possibility of addressing Marianna later in FY09 (see Section 4, below), OTF recommended Shatsky for the SODV "TBD" slot.

Thus based upon the above discussion, the preferred FY08/early FY09 SODV schedule awaiting SPC approval is shown in **Figure OTF-07-13**.

			FY09				
Jan Feb Mar 1 2 3 4 1 2 3 4 1 2	Apr May 34123412	Jun Jul 34123412	Aug Sept 3 4 1 2 3 4 1 2	0 <mark>ct</mark> 3 4 1 2	Nov 2 3 4 1 2	Dec Jan 34123412	Feb March 341234123
SODV Mobilization, Sea Trials, Acceptance, Transit	EQ. Pacific	Eq Pac/ JDF	Bering Sea	Sh	natsky	Canterbury	Wilkes

Figure OTF-07-13: *The OTF recommended FY08/early FY09 SODV schedule (now awaiting SPC approval).*

3.2 *Chikyu* FY08 / Early FY09 Schedule Modifications

The approved FY08 *Chikyu* schedule (as of the March 2007 SPC meeting) is shown in **Figure OTF-07-14** below. The original plan was to conduct three NanTroSEIZE riserless expeditions in the Oct 2007-Feb 2008 time frame and then begin the first IODP Riser operations at the NanTroSEIZE mega-splay site NT2-03 in June 2008. Following the completion of Riser operations at NT203, *Chikyu* would be available for several months of "to-be-determined" riserless operations in FY2009.

2007												
						US FY08						
	JP FY H18	3					JP FY H19)	-			
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Se	р	Oct	Nov	Dec
	ODS (Oversea's Drilling Shakedown)								Safety holes	0	DP:NanTr Stage1 ris	oSEIZE eless

2008											
			US FY09								
	JP FY H19						JP FY H20				
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
IODP Stage1/	/ <mark>RL</mark>	Dock 8	Inspecti	on			IODP:Nan Stage2				

	2009											
US FY09 US FY10												
	JP FY H20)	JP FY H21									
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
		(1	-2 TBD R	iserless c	operation	s?)			I	ODP:Rise	er	

Figure OTF-07-14: *The approved FY08 Chikyu schedule (as of March 2007). This schedule required modification during the June 2007 OTF meeting.*

However, at the June 2007 OTF meeting, CDEX updated the group about some problems *Chikyu* has experienced with its riser tensioner system. The extent of the problem is under review but the logistical and budgetary considerations associated with this issue have resulted in CDEX proposing to delay the start of riser operations at NT2-03 until January 2009. Thus the only operations CDEX will be able to conduct in FY08 are the three previously approved Stage 1 riserless operations.

In addition to a proposed change in riser operations from that shown above in **Figure OTF-07-14**, CDEX informed the OTF members that *Chikyu* would be available for \sim 2 months of *riserless* operations in early FY09 (Oct-Dec timeframe), prior to the beginning of riser operations at NT2-03. OTF readily agreed to insert this block of time into *Chikyu*'s schedule.

Combining the change in Riser operation start time with the new riserless time slot, OTF developed and discussed the schedule shown below in **Figure OTF-07-15** (next page). In this revised schedule, Riser operations at NT2-03 would begin with a 2-month expedition (January-February 2009) immediately following the new riserless operations. Riser operations would then resume again in June 2009, following a 3-month interval of non-IODP work. There may be an option for an additional month or so of riserless work in the June-November 2009 time frame (either before or after the NT2-03 riser operation schedule for that time). OTF will investigate this option further at its August meeting prior to SPC.

2007											
US FY07										US FY08	
	JP FY H18	}	JP FY H19								
Jan	Feb	Mar	Apr	May	Jun Jul Aug Sep					Nov	Dec
ODS (Oversea's Drilling Shakedown)									IODP:N Stage	anTroSEI	ZE

2008												
	US FY08 US FY09											
JP FY H19			JP FY H20									
Jan	Jan Feb Mar		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
IODF Stage1	/RL	Dock 8	& Inspecti	on		Non	IODP	IODP:NanTroSEIZE Stage 1 Riserless				

2009											
US FY09											
JP FY H20			JP FY H21								
Jan	Feb	Mar	Apr	Apr May Jun Jul Aug Sep					Oct	Nov	Dec
IODP:NanTro Stage2/Riser			Non-IODF)		IC S'	DP:NanT tage2/Rise		IODP R/L ??		

Figure OTF-07-15: Proposed Chikyu schedule for FY08 and FY09 operations. Major changes include the shift in start date for riser operations to June 2008 to January 2009 and the inclusion of a new riserless time slot in early FY2009.

OTF examined the potential operations that would be feasible for the early FY2009 riserless time frame (Oct-Dec 2009). Given that two high priority NanTroSEIZE operations were cancelled from the SODV schedule (Kumano Basin and Subduction Inputs), the OTF preference would be to fill in this slot with as much of this deferred work as possible. OTF then tasked the NanTroSEIZE project management team (PMT) to prioritize the NanTroSEIZE riserless options for this slot. This PMT prioritization and the OTF recommendation for operations to be conducted in this time slot will be presented at the August 2007 OTF meeting and the SPC meeting immediately following.

Finally, the CDEX proposal for the change in timing of riser operations at NT2-03 from June 2008 to January 2009 was approved by the OTF.

3.3 MSP FY08 / Early FY09 Schedule Modifications

At the June OTF meeting ESO updated the group about the status of New Jersey Shallow Shelf planning with the expectation that operations would start at the end of July / beginning of August 2007 and extend into October.

ESO also provided updates regarding the operational planning for the Great Barrier Reef. At the time of the OTF meeting, the contracting process for securing a vessel had begun. Site locations still need to be finalized for the Marine Park authority. The EPSP has agreed to approve the site survey by email if necessary. Subsequent to the meeting, ESO informed OTF (and the community) that due to further delays in availability of the mission-specific platform that had been identified for the New Jersey Shallow Shelf Expedition, ESO had to make the decision to discontinue plans to carry out the expedition in 2007.

In sum, following several delays to the original mid-May start, the New Jersey expedition team had been working towards starting offshore operations in mid/late July. However, these new delays would push the start time to a mid or late August time frame and take operations through the peak of the hurricane season in early September (which has always been a potential risk). In addition, the new delays would have the effect of moving much of the operations during this likely deteriorating weather of October and November. Conducting operations during this likely deteriorating weather window would raise issues of supply to the platform, increased likelihood of downtime, increased risks associated with personnel transfer, and general safety concerns. Also, as the lift boat has limited capacity for steaming in adverse weather, it could take a very long time to return to the Gulf (for which a very substantial contingency would have to be set aside to cover potential costs, thus reducing the time available for drilling).

Based upon this information, the Chair of OTF proposed (via email) to the Operations Task Force members that ESO move both the New Jersey Shallow Shelf and Great Barrier Reef operations forward one fiscal year (**Figure OTF 07-16**). That is, plan for conducting New Jersey operations in FY2008 and Great Barrier Reef operations in late FY2009.



Figure OTF-07-16: Proposed changes to ESO operations in FY07-09. Due to delays in contracting a platform for the New Jersey Shallow Shelf Expedition, ESO was forced to defer operations. OTF recommended moving New Jersey Shallow Shelf Expedition to FY08 and Great Barrier Reef to late FY09.

This plan would (a) allow ESO to prepare an FY08 annual program plan by the August 1, 2007 deadline, and (b) provide ESO with time – approximately two months -- before the next OTF/SPC meetings to examine contracting issues related to New Jersey. If, at the time of next OTF meeting (August- just prior to SPC), ESO reports that issues surrounding re-contracting for New Jersey operations in 2008 are too problematic, OTF can provide other schedule option recommendations for SPC consideration.

One added benefit of this scenario is that it provides more time for evaluation of the Great Barrier Reef site survey data being collected this fall.

3.4 Proposed FY08 / Early FY09 Operations

Figure OTF-07-17 (below) provides a composite look at the FY08 / early FY09 operations recommended by the Operations Task Force. Long-lead items for the early FY09 operations would be included, as appropriate in the FY08 Annual Program Plan.

FY()7			F١	′08	FY09						
Aug Sept <mark>Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sept</mark> Oct Nov Dec Jan Feb												
SO	DV Ship /	yard, Mobil Acceptance	ization, Sea , Transit	Trials,	EQ. Pacific	Eq Pac/ JDF	Bering Sea	Bering Sea Shatsky			ıry	Wilkes
ODS	Safety Holes	NanTro LWD	NT2-03 Riser Prep	NanTro NT1-03 NT2-01	Inspection and Maintenance Non-IODP Work				NanTroSEIZE Riserless		Nan	Tro Riser
New Jersey Shallow Shelf												

Figure OTF-07-17: *Summary of OTF recommended FY08/Early FY09 Operations*

4 FY09 and Beyond

Figure OTF-07-18 shows the OTF recommended operations for FY09. The schedule still requires further definition with respect to the specific riserless expeditions on *Chikyu* in the early part of FY09, and the SODV operations after Wilkes Land. Options regarding these operations are discussed below.



Figure OTF-07-18: Proposed operations for FY09 for all three IODP operators. Further refinement of the latter part of the SODV schedule and the riserless operations for Chikyu will be attempted by OTF in late August.

4.1 SODV FY09 and beyond

The proposed SODV FY09 schedule is shown above in **Figure OTF-07-18**. The post-Wilkes Land operations still need to be defined. Given that the FY09 program has ~2.5 expeditions already allocated (Shatsky, Canterbury and Wilkes Land), budgetary considerations suggest that we may be able to conduct at least one more expedition (perhaps two) with the remainder of the time potentially allocated to "non-IODP" work.

Whether the USIO can conduct more than one IODP expedition after Wilkes Land in FY09 will be determined by a number of factors, including the FY09 budget guidance from the Lead Agencies (which will not be known for another 6 months), the type of expeditions that are run post-Wilkes, the location/length of non-IODP work in FY09, and the priorities of SPC regarding where the SODV should be operating beyond FY09.

OTF will attempt to address the latter part of the FY09 SODV schedule at its August meeting. A definitive option beyond one Post-Wilkes expedition may be difficult to develop in August primarily because of the unknowns with respect to FY09 budgets and

the location/length of any non-IODP work that might occur in FY09. The best OTF may be able to do is to define a set prioritized options for the USIO to implement as some of the unknowns are determined.

A first step will be for OTF/SPC to determine the area of operations for the SODV after Wilkes Land in the latter part of FY09. Options include:

(1) Stay in Pacific --- move toward the Western Pacific to conduct expeditions like Marianna or Asian Monsoon.

2) Stay in Pacific ---but move toward the Atlantic (suggesting a Superfast, CRISP, or Costa Rica Mud Mounds expedition following Wilkes), or

(3) conduct operations in some other area of priority (e.g. Atlantic or Indian Ocean).

Along these lines, an active SPC Consensus Statement exists that states a preference for an FY09 clockwise track around the Pacific following Wilkes (suggesting an Option 1 scenario).

SPC Consensus 0608-17: The SPC approves a ship-track model for SODV operations in FY2009-10 that would proceed clockwise through the Pacific Ocean, assuming a start at Wilkes Land.

While OTF will discuss several options (with resulting risks/benefits) at its August meeting, the final recommendation may depend on (1) which proposals remaining at OTF after the SPC reprioritization and (2) more information about the potential location of "non-IODP" work for the SODV. Depending on progress during the pre-SPC OTF meeting and the reprioritization of proposals at SPC, OTF may hold a short meeting during SPC to further refine options for SPC members to consider.

4.2 *Chikyu* FY09 and beyond

The proposed FY09 schedule for *Chikyu* is shown in **Figure OTF-07-18**, above. The specific riserless operations to be conducted in the Oct-Dec time frame (which will consist of a single ~2-month-long expedition) will be discussed at the August OTF meeting. As discussed above in **Section 3.2**, OTF has tasked the NanTroSEIZE Project Management Team (PMT) to prioritize the NanTroSEIZE riserless options for this slot. This PMT prioritization will be ready by the August OTF meeting and the OTF will develop a recommendation for SPC consideration.

Additionally, **Figure OTF-07-18** shows a short ~1 month riserless expedition immediately following the completion of the NT2-03 riser operations (in FY10). This riserless slot has some flexibility and could either be inserted prior to the resumption of riser operations at NT2-03 in June 2009 or after these operations (as shown **in Figure OTF-07-18**). OTF recommendations for those operations will also be made at its August meeting as those operations are contingent upon the above-mentioned PMT recommendations.

Finally, a major decision that SPC will need to make at its August meeting is what riser operations are to follow those at NanTroSEIZE. Currently, there are two major riser programs at OTF besides NanTroSEIZE (CRISP and Murray Ridge). A commitment to the NanTroSEIZE riser program (NT2-03 and NT3-01) will likely take most of *Chikyu*'s riser drilling time through renewal (at least into FY12). NT2-03 Riser operations should be finished in FY09 with NT3-01 Riser operations beginning in FY10. Given the ~400+ days of expected operations for NT3-01, these operations will span nearly three Fiscal Years (2010, 2011, 2012; ~150 days of Riser operations each year).

At best, it may be possible for IODP to start one more riser program before renewal. Because of the long riser planning lead times, SPC will need to give OTF a sense of priority for starting either Murray Ridge or CRISP riser operations after NanTroSEIZE. Planning must begin soon for an FY12 operation.

4.3 MSP FY09 and Beyond

The proposed FY09 MSP operations are shown in **Figure OTF-07-18** (above) and include the Great Barrier Reef, which OTF has recommended delaying one fiscal year in order to accommodate a change in New Jersey Shallow Shelf operations from FY07 to FY08 (See Section 3.3 above).

Beyond Great Barrier Reef, there are two other MSP programs at OTF status (Coralgal Banks, Chicxulub K-T Impact Crater). A third, New England Hydrogeology, is lacking site surveys and thus has not officially been forwarded to OTF.

OTF has not developed a formal recommendation for FY10 MSP operations at this point, preferring to wait until SPC reprioritization of OTF proposals determines which MSP proposals remain at OTF.

5 Other OTF business

5.1 Monterey Bay Observatory (621-Full)

The status of the Monterey Bay Observatory (621-Full) was discussed at the June 2007 OTF meeting. This proposal was forwarded by SPC to OTF for potential implementation as an engineering test-bed (see June 2004 SPC minutes) but the scheduling of this program has been problematic for several reasons.

First, it has never been clear to OTF (or at least to the Chair of OTF) what specific operations will be conducted at this test bed. Is the purpose to establish a multi-use test

facility?, a scientific facility with a relatively permanent installation?, a single-use test facility with scientific application?, or a multi-use test facility with scientific application? More importantly, if IODP is going to establish a test bed, is this the best area for a long-term, test bed that can be used for a wide variety of engineering and observatory testing?

Second, as the location of this test facility is in a marine sanctuary, the issues surrounding permitting and multiple entries are also problematic.

Based upon the issues described above and the intense fiscal climate for IODP operations, OTF felt that this program could not be scheduled in its current form. OTF has sent this proposal back to SPC for more definition and general discussion related to the concept of engineering test beds.

5.2 Scheduling Options (mixing IODP and non-IODP work)

The new fiscal climate that is upon IODP appears to require substantial (~4-6 months) of non-IODP work each year to supplement operations of the SODV and *Chikyu*. The various entities in IODP are only beginning to understand how to mix the two types of operations. In particular, scheduling of the two types of operations poses a significant number of challenges to ensure that IODP will continue to deliver high quality science.

The Chair of OTF developed a spectrum of scheduling options to facilitate a discussion of scheduling models at OTF and SPC. These models were presented to OTF only to provide initial discussion on the topic. Each has issues/problems as well as benefits. Some aspects may simply not be tenable from the viewpoint of the Lead Agencies, the IOs or SAS. However, OTF discussed these models in light of trying to determine the balance between science priorities and operational constraints associated with scheduling a mixture of IODP and non-IODP work. The OTF discussion did not result in the recommendation or implementation of any specific model. In fact, the prevailing consensus after the discussion was that there were still too many unknowns with respect to budgets and how the IOs will develop/identify non-IODP work to implement any specific model. And thus, for the short term (FY08 and FY09), we most likely will be working in an ad hoc environment with respect to scheduling this mixture of work.

Potential scheduling models for OTF discussion.

1) Based upon SPC rankings, OTF develops pre-determined time blocks with specific expeditions identified for IODP work and non-IODP work and gets this schedule approved at the annual summer/fall SPC meeting. Basically, this model is the "String of Pearls" scenario that we normally utilize but, in this case, the "string" incorporates both IODP and non-IODP expeditions. This scenario requires very little change, if any, to the current planning scenario (from the Annual Program Planning point of view) but does restrict the IOs to finding non-IODP work for very specific time slots.

2) Based upon SPC rankings, OTF identifies a set of high-priority IODP expeditions in a particular ocean basin/region but with no particular order or timing of operations imposed by OTF. These IODP expeditions would occupy \sim 6-8 months of time. This specific set

of IODP operations (the ~6-8 months of operations) would be approved at the annual summer/fall SPC meeting. The IO would then find "non-IODP" work for the remaining 4-6 months and develop a final platform schedule (i.e., start dates for each expedition) based upon the SPC-approved IODP expeditions and the non-IODP work that the IOs have generated.

3) Based upon SPC rankings, OTF identifies 2 "must have" IODP expeditions and a pool of 4-6 high-priority IODP expeditions (perhaps in several ocean basins), with no particular schedule order or timing of operation imposed by OTF. These IODP expeditions could occupy \sim 6-8 months of time. The IO would find "non-IODP" work for the 4-6 remaining months. The final set of IODP operations would/could be dependent upon the locale of "non-IODP" work. The IODP portion of the schedule (i.e., the two "must have" + 1-2 other high priority expeditions) would be then be approved at the annual summer/fall SPC meeting.

4) SPC prioritizes 3-4 proposals in each ocean basin and then OTF selects 3- 4 of these high-priority proposals each year depending on where off-contract work is located, weather windows, minimizing transit etc. The final set of IODP operations would be dependent upon the locale of "non-IODP" work and the IODP portion of the schedule would be approved at the annual summer/fall SPC meeting.

These models provided a starting point for discussion at the June OTF meeting. A brief summary of some of the discussion points/ideas is provided below. It is the hope that this discussion can continue at SPC where SAS, IOs, Lead Agencies, and IODP-MI representatives can all participate in developing a path forward.

OTF discussed how high-priority science and environmental constraints are significant drivers for scheduling, along with the location and length of non-IODP operations. IODP (OTF and SAS) have been trying to extend operational planning out to several years but, for a number of reasons, have changed operations many times in the short-term (witness the four OTF meetings in 2007 alone!). Thus, given all the complexities associated with scheduling only IODP operations, it is readily apparent that we need increased flexibility for short-term planning when trying to insert non-IODP work into this process. Perhaps one way to assist scheduling is to determine a minimum response time (for planning, staffing, etc) for different types of expeditions. For example, there would be greater flexibility with less complicated expeditions, and even more so with commercial expeditions which may require very little lead time. FY09 has less complex expeditions, therefore model 2 works well, but model 2 may not work for FY10.

IODP is challenged to fit into a budget box. The programs we currently can run are very minimal. Securing non-IODP funding allows an IO to "bank" funds and thus allows more complex projects in the future.

On geographic planning – There appear to be several areas likely for commercial work. In the SODV case, this may be the Gulf of Mexico, North Sea, Indonesia. There may be a lot of commonality in terms of geography between IODP and commercial work. It would be very beneficial to move in parallel and thus minimize mob/demob costs.

The issue of high quality science versus commercial operations controlling ship tracks is an important topic. If IODP starts to be driven by commercial needs, then the science community will begin to disengage. The model could be driven by ship track (i.e. commercial opportunities) but only if it meets high-priority science needs. What if we are currently conducting a program in the Indian ocean and have 3 more highly-ranked proposals in the vicinity, but we need to move into the Atlantic to do some commercial work. Should we stay in the Atlantic after the commercial work to conduct high priority science in that region, or immediately return to the Indian Ocean? What/who would decide this? Commercial opportunities could arise quickly, after the annual program plan has been put together and approved. How can we address this issue? Should we / Can we work on those short time frames?

One part of the answer may be to offer windows of opportunity for commercial work and include these windows in the schedule. We can provide for a science-driven multi-year ship track that leaves time and locations open to the industry. In this case, it would be up to the operators to do the marketing of the vessels for known geographic regions. This scenario would require OTF/SPC to designate areas of concentration at least 2-3 years in advance.

In the end, our scheduling philosophy may depend on what non-IODP and IODP options are available and not on any pre-ordained scheduling protocol or model. And the model may be / will be different for *Chikyu* and SODV.