Meeting Minutes

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UNOLS *Marcus Langseth* Science Oversight Committee (MLSOC)
May 20 & 21, 2008
UCSD - Scripps - Nimitz Marine Facility (MARFAC)

Executive Summary:

The UNOLS *Marcus Langseth* Science Oversight Committee (MLSOC) met at the Scripps Institution of Oceanography Marine Facility in San Diego. The Research Vessel *Marcus G. Langseth* was moored at the facility, which allowed for an extensive tour of the vessel by the committee. Major topics reported on and discussed at the meeting included a summary and preliminary evaluation of the first two science cruises just completed for Principal Investigators Steve Holbrook and Jeff McGuire. The details of work to be completed and further underway testing in order to be ready for the next cruise for John Mutter, which will be the first 3-D seismic effort were thoroughly reviewed with recommendations from the committee regarding priorities. Remaining conversion items, scheduled operations for 2008 and 2009 and organizational challenges were also covered during the meeting.

Action Items:

Action Item	*Assigned to*
LDEO provide SSSE and OI equipment proposal list to MLSOC for review and prioritization input.	LDEO, MLSOC
EOS article on first cruise	Steve Holbrook
Website improvements	UNOLS Office, MLSOC
Survey of community	MLSOC
Meeting prior to AGU with a DESSC like approach including reports from the past year's PI's.	UNOLS Office, MLSOC
Table structure of action items and recommendations	Steve Holbrook and Mike Prince
Seek new members to replace Tom Shipley (UT), and for Marine Mammal and Industry positions as needed.	MLSOC

Work out a rotation scheme for second terms so that membership terms are staggered in the future.	MLSOC
White paper on potential methods for improving scheduling and utilization so that it can be more efficient and still encourage innovative proposals.	MLSOC

Appendices:

I. Agenda
II. Participants
III. Al Walsh Report (PDF File 12.6MB)
IV. MLSOC Chair Report (PDF File 6.4MB)

Meeting Summary Report

The meeting was called to order by Dr. Steve Holbrook of the University of Wyoming, Chair of MLSOC. Introductions were made around the room.

Dr. Holbrook reviewed the agenda (Appendix I). A list of participants is in Appendix II.

LDEO overview - Mike Purdy

For less than $30M we have brought a capability into the UNOLS fleet that would have otherwise cost over a 100M dollars. We have made tremendous progress since the meeting in San Francisco. The two cruises off Costa Rica and the cruise for Jeff McGuire were both very successful. They have achieved this success because of the people on the ship. They now have a stable core of technical expertise with Johnson and Steinhouse serving in the science officer positions.

There is still is a lot of work. The prime driver for LDEO is to make sure that the Mutter 3D cruise is a success. Automatically all items related to the success of this cruise are at the top of their priority list. John Diebold will lead a short 3D shakedown. LDEO is under a lot of pressure to make everything a success.

Rex Dalton west coast correspondent for Nature introduced himself and said he was here to learn about this facility for background. He would take quotes from individual discussions later.

LDEO background and update - Al Walsh (Appendix III)

Al reviewed the background that led up to the current state and the reasons for moving to a new ship and the modifications that allowed for OBS and General Oceanographic support along with 3-D seismic capability. He detailed the steps and milestones.

Shakedown cruises

Practiced handling the gun arrays, firing and towing.

- Paravanes were launched and towed.
- 3D arrangement for the streamers. 3 were towed and sound source arrays were not completely arranged. Need to get all four streamers deployed still.
- The vessel conversion is complete and the ship is operating successfully.
- They have towed 2D eight kilometer streamers, have handled OBS and taken XBTs.

Remaining areas where we need work

- Ship appearance - ongoing but need to make more progress. They have made progress in a lot of areas.
- Habitability - some problems with Norwegian suppliers for existing equipment.
- Auxiliary systems. - magnetometer, gravimeter. other systems.
- Operational steady state - still getting used to the ship and its systems.

Having the ship operational is a big boost to morale and team building. It makes it clearer where work is needed and they can focus their attention appropriately.

Paul Ljunggren asked about the gravity meter, saying that they are cranky and can be affected by the ship. The Western Legend had a gravity meter. The problems seemed to be with electronics

Reviewed personnel issues

Some of the people that have left have come back. They are set through this year. They have two new IT people and four others that will be out for training.

Schedule

They are in the maintenance block now during which they will deploy the exact array that they will use at EPR, but they will not shoot the guns. Still working on preparing for Toomey, but it may still slide into 2009.

Current plan for the shakedown May 26th - June 6th. June 22nd depart San Diego, arrive Manzanillo and depart June 29th. After Gulick and Toomey they will do a maintenance period then transit to Lau

Basin.

Issues to be addressed by MLSOC

- Equipment prioritization Streamer (day two)
- Shakedown Plan (day two)
- Technical Manning Model (afternoon)
- Short term work list priorities (afternoon)
- Operating with decreasing budgets
- AGU Workshop planning

Mitch Lyle is interested in how the day rates will differ between 2D and 3D. 2D commercial vessels are running at 100K/day. 3D runs from $350K to 500K/day.

A big part of the cost for *Langseth* are for specialized services, which only charge for science days. Technical services are stretched with one team. Maintenance periods are critical for the technical staff. A lot more work will be needed to support two teams.

Tour of R/V Marcus G. Langseth

The committee toured all of the science, berthing, operational and engine room spaces on board the vessel to examine the progress made to date in the conversion and to see first hand what work was still needed to complete the process.

NSF report – Linda Goad, Jim Holik and Bill Lang

Linda reported on ship operations and scheduling. They are funding the proposal as requested. Working with LDEO on work list items and scheduling cruises in good weather windows. Most of next year's work is spread out across the Pacific.

The community has to follow the guidelines for seismic proposals on the NSF website. Proposals need to be submitted at least 18 months before sailing to take care of permitting and clearances. READ the Guidelines. Discussion about how pending cruises can be fit into schedules, the need to consult with program managers on feasibility and submitting proposals for potential work.

Budget that was submitted had approximately 15% increase, but this is never across the board. Linda expects to have the same amount of money or maybe a little more, but probably will not know for sure until after the new administration takes office. Question about the TAIGER project and how it will benefit the budget/schedule.

Jim Holik discussed technical services and instrumentation. It is great to have this meeting after we have obtained some good data. The *Langseth* has a big impact on the technical services budget. The cost of

providing the specialized services are sometimes as much as 600% over others. The tech services budget is still being settled. This year we are working on establishing a baseline and part of that is understanding the steady state cost of maintenance and operations.

The instrumentation budget was only spent at about 50% of planned in order to make more money available for technical services. There is a strong commitment on the part of NSF to make *Langseth* work. If something happens, Jim will do what they can to help find solutions.

Tom asked what Jim's view of where the committee should make input and make recommendations about proposals.

Discussion about whether or not post cruise assessments should be sent to the chair and committee members. Need to discuss this in the context of debriefs, etc.

Need to set up the policies and procedures in place that will allow the committee to have meaningful input to the operator about equipment proposals and then to NSF for use by the panels.

Expand the website to be more useful for prospective PIs.

Need to contact prospective PIs and work out the details of debriefs and post cruise assessments.

Question about whether or not any general oceanography cruises will be scheduled. Probably not in the immediate future unless they fit well for moving the ship from one area to another.

Bill Lang covered permitting issues. Holly Smith and Caroline Blanco are also working permitting and regulatory issues. Caroline Blanco is in the general counsels office. Holly and Bill get involved in anything having to do with seismic work. They work on permitting for individual cruises. They are also working on the programmatic EIS for the use of active source cruises. This would address typical cruises around the world. The EIS is already two years behind schedule. They are hoping to have public meetings in July and final programmatic submittal by December.

They are also working on use of *Langseth* in other Governmental partnerships. It is probable that the *Langseth* will be used for Extended Continental Shelf (ECS) work and for studies of the impacts of sound on marine mammals. The *Langseth* will probably be used as a test platform for an x-band radar that is set up to detect marine mammals.

The Toomey permitting process is continuing on schedule, but may be amended. The permitting is about a nine-month process and would never take less than six months.

Some of the problems with permitting is the public perception of the value of the science versus the negatives of doing seismic work. After a proposal has been accepted for funding, then Bill would like to

work with PIs on developing plain English description of the benefits of the science. Characterize the cruises as research projects that use seismics as opposed to a Seismic cruise. Also think about minimizing the impacts by only using the only the level of sound source you need.

A summary of the NSF needs from the committee.

- Recommendations for instrumentation and equipment to operator and NSF
- Get information to the community on proposal and permitting requirements and timing.
- Set up a process for debriefing and assessing post cruise reports.

MLSOC Chair Report – Steve Holbrook (Appendix IV)

Summary of first three cruises:

MGL0804 - Costa Rica

MGL0807 Costa Rica II

MGL0808 EPR/McGuire

All successful cruises with good data, but still some issues. Showed cruise map for Holbrook cruises. The highlight is the transect across the entire subduction zone. They were successful in getting data on four legs. They did not tow streamers in the very shallow water (~20 meters) and used guns only.

Technical achievements include:

- Towed an 8 km streamer.
- The source is better than anything we have in the fleet before.
- Getting data at 200-600 hz frequencies, which is much higher resolution. The higher rates can only be done over shorter streamer lengths (~3 km)

The community needs to explore this ship as an international asset. The Germans paid for two days of ship time in the area of Steve's cruise. Nobody came on board from the German group, so Steve did have to do some data copying and transmitting. We should work to make it easier to do this so that future PIs can say yes to these collaborations without too much of a burden.

Steve showed data from land instruments that recorded shots from the Atlantic and Pacific sides.

OBS recoveries went well, with good ship handling. Both OBSIP groups were happy with the *Langseth* as an OBS deployment/recovery platform.

Physical Oceanography work was also successful. Committee member Ray Schmidt was on the second leg as a Co-PI on a project using seismic tools for oceanography. They did around 240 XBTs and ACTs. They were able to get temperature structures over many kilometers using the sound source.

McGuire cruise

Recovered 16 of 17 OBS. Great support from techs. Most significant problem was UNIX support. Had problems with gravimeter and magnetometer including cabling problems with the magnetometer.

Improvements since MGL0804

- PAM spare onboard - needs to be permanent
- New shot-time logger acquired and tested.
- 2D towing arrangement refined and improved (float head of streamer)
- Additional gun tow ropes acquired for full suite of tow depths (3, 4.5,6 and 9M)
- Some progress in SEGD to SEGY conversion (headers etc.)
- Shipboard website ("how to") improved
- Real time shot processing.

Areas of Concern

- Personnel - Robert Steinhaus coming back is great news
- Equipment issues to talk about
- Software/data flow needs to be worked on more
- MMO issues
- Habitability
- Engine Room
- 3D test cruise completion.
- MLSOC role with Scheduling?
- How do we broaden the funding base beyond NSF?

    o Encourage coordinate foreign collaborations/contracts
    o industry use?

- Streamer tension and 8 km streamer - policy needed, or ad hoc?
- Seismic work boat - get in working condition. Would be useful for e.g., bird replacement and removal of fishing gear.

MLSOC business

- Staggered rotations beginning Oct. 2009
- Any subcommittees needed?

- Continuing issues
- Data Flow

- EOS article
- Adoption of Action Items for LDEO
- Web Site:

- User survey
- Advice for PI's

Chair's report continued:

Personnel

- IT - 2 new hires; unfamiliar with UNIX - futures plans - training? Other personnel?
- ET - no dedicated ET personnel on cruises -- needed?
- Science Officers - Dolan resigned, Steinhaus returned - role?, search underway?
- Gunners - need one more Chief Gunner (Robbie Gunn? Justin Walsh?)
- Role of industry consultants (NCS SubSea)

- Navigation - watchstander role?
- Standardization of roles/products

- Communication/management/morale

- Annual reviews of staff; advancement pathways

- Training

- Plan for regular training (critical needs: Spectra, Digishot)

Science Equipment

- Winches, hydraulics

- No fully operational winches?
- Hydraulics need overhaul

- Computer rack room

- o Power requirements
- o Hardwired wiring and organization
- o Computer rack stabilization
- o Climate control and isolations

- Gravimeter and magnetometer not operational
- 3.5 kHz not operational
- ADCP not operational
- POSNET and SIPS - working? Navigation systems for the arrays
- Catwalk for access to CTD/hydro winches
- Marine-grade handheld radios required
- CCTV system must be routed and installed in all critical cabins/science spaces
- HiSeasNet excellent capability but needs prioritization
- Calibrate load cells

Software/Data Flow

- SEGD to SEGY

  - o need standard process flows and products
  - o compatibility with sioseis (future?)

- Real time stack capability

  - o Need standard process flows and products

- Automated data copying protocols

  - o Spectra disk filling up

- Digishot/seisnet crashes

  - o USB key isolation and spares
  - o Digishot/IO consultant/training
  - o Redundant spare Digishot system (8 minutes not enough)
  - o Shoot now button?

- Additional workstation heads and focus licenses for ms and compute machines
- Shot time files (standard format as product)
- Alternative to Spectra for 2D cruises (save on $750/day)
- Seisnet disk upgrade & redundant spare system

- Standard product for multibeam data: GMT - compatible.grd file
- eLog system - need useful final product

MMO Issues

- Clarity of IHA procedures
    - o Review confusing language/situations after each cruise
- Send IHA, MMO Handbook, and Biological Opinion to Science Officers, Capt. and PIs in advance of cruise
- Legal basis of "Biological Opinion"
    - o Communicate clearly to S.O., Capt., PI's
- Stack Exhaust at MMO tower
    - o health and visibility issue
- PAM
    - o working electrical connection to lab?
    - o must replace or weatherproof "laptop on back deck" arrangement
    - o adopt procedures for testing PAM early on in cruise
    - o any mitigation consequences to PAM observations?
- Communication
    - o LGL and NMFS personnel must be available/reachable nights/weekends
- Establish protocols for actions upon sighting animal carcass
- Safety radii
    - o new results from calibration cruise?
    - o encourage PI's to request all possible gun depths/strings in IHA

Habitability - several issues

Engine Department

- Critical spares to keep both engines running

- o fuel pumps, etc.
- o critical for 3D cruise

- Policy on running two compressors
- Maintenance software for engine department - working?
- Water
- Spares for compressors
- Climate control - individual control for cabins and lab space

Other issues

3D test cruise

- Plans for May/June test cruise
- What needs to happen for MGL to be considered ready to undertake the Mutter/Carbotte 3D cruise?
  - o No 3D data will be recorded prior to that cruise.
- Suzanne Carbotte email 19 march 2008: Four critical aspects
  - o complete rigging with all 4 streamers
  - o test acoustic positioning
  - o interface Kongsberg software with Spectra (Kongsberg personnel)
  - o tentative - gain experience turning with industry captain aboard
- Suzanne Carbotte email 20 May 2008:
  - o "confident that MGL has first rate personnel in place"
  - o "ready for a successful first 3D cruise"
- Procedures for gun drop-outs
  - o critical for 4D?
  - o Diebold source dropout analysis
  - o other (industry) experience with dropout procedures?

Discussion about whether or not the streamer's should be insured for $10M with a $750K deductible for a premium of $50K. After discussion the consensus of the committee was that NSF should invest in the insurance.

Jim Holik asked about what would indicate they should not do the 3D cruise. It would depend what the failure entailed and whether it could be corrected.

Graham Kent discussed his major concern that IT is the major problem to look at. During the McGuire cruise there was some sort of power or equipment problem that resulted in a loss of a day's worth of data. It did not end up being a big issue for McGuire because the science party had been copying the data on their own. Ensuring that there is UNIX Expertise on board and that the IT infrastructure for safely recording all data is in place and working will be very important.

Linda asked that the major maintenance items be reviewed with an eye to determine whether it is more critical to conduct the 3D shakedown cruise or complete other maintenance items.

The committee looked at major categories of items. The test Cruise takes care of several critical items on the science list.

Engine list:

- Engine load capacity - has been dealt with.
- AC service and final humidity determination
- Work boat and davit is being taken care of.
- Rack support is being taken care of.
- OWS/RO/LO Purifier/Fisher Valve being taken care of.
- Hose - Deck machinery - engine room.
- Spare parts/requisitions

Habitability - Deck list - this list is most impacted by the test cruise.

One item that might be a problem will be whether or not stateroom 309 will be ready to use. MLSOC thought this should be a high priority. The science and engine room lists should be doable with the time allowed even with the test cruise.

Steve Holbrook asked the experienced ex-industry people how they would feel if the test cruise was not conducted. They would be very reluctant to do the Mutter cruise without the test cruise. Two slides showed all of the important goals of the test cruise related to making sure all aspects of the 3D deployment worked correctly. Most important was the training of everyone in the crew on deployment and recovery as well as driving the ship with the 3D array deployed.

An MLSOC recommendation is to have the Mutter cruise Captain make the test cruise (not currently planned). This is considered critical by the committee.

Day Two -

Discussion about the need of the 3D test cruise versus staying in port for additional maintenance. Also discussed the importance of having the Mutter cruise captain on board for the 3D test cruise.

Recommendation: That the test cruise take place as proposed by LDEO. Also, that the Captain scheduled for the Mutter cruise should take part in the 3D test cruise if at all possible. The committee also recommended that insurance for the streamer array be obtained for this test cruise.

The remainder of the planned priority work items are agreed to by the committee based on the assumption that the engine and science work will be complete. In the Habitability list, the committee recommends that the room 309 outfitting and the theatre seating be at the top of the priority list and completed before Mutter, which would make living conditions better for this long cruise.

Digi-shot and reliability of the air gun array

Tom Shipley wanted to know if there was information on auto-fires, mis-fires, etc. that would let you know how well the gun array is working. They don't have that data at this time. Some items proposed to help with monitoring the array include a Near Field Seismic Sound Source Hydrophones ($11,200), which was not funded this year. Also, a more expensive item that would allow turning individual guns on and off might be proposed in the future.

2008 Instrumentation

Mammal Mitigation PAM System at $135,587. This was considered expensive, but it is a much better system that could provide useful data on marine mammal observations. There is a concern that this higher capability would set a new level of requirement for IHA permits. This new system is yet to be built, but would have much higher quality hydrophones.

Mike Purdy made the point that the *Langseth* operation should be at the forefront in real and provable ways in terms of mitigation of impacts on marine mammals and the environment. Having the best possible acoustic monitoring system would be one way to take the lead in this regard. It is important that LDEO is a leader, in the lead on developing and using the best methods for mitigation efforts.

Recommendation from the Committee: Explore with the supplier the options and ramifications of leasing versus buying a new prototype system now, with the possibility of buying later or perhaps always leasing. Al, John and Megan will follow up with the manufacturer. This will determine quickly whether or not the $135k would be used for the PAM system or could be used instead for the near field hydrophones and the air management manifolds.

Items that were not funded but considered high priority by the committee are:

- Near Field Seismic Sound Source hydrophones - $11,200 (long lead time idea)
- Dual Conversion UPSs - $12,990 (panel recommendation was to buy them from the

maintenance budget)
• Screens and UPS should be included in normal supplies/maintenance funds per panel and program managers.
• MCS Digital Air Management Manifolds - $129,500 - this allows the guns to be turned on and off individually. This is an important element for quality control of data, etc. This should be considered a high priority for next year's proposal.
• ADCP - strong argument for updating the ADCP to one with modern software/UI and better depth range. Would need to purchase in time for the end of 2009 shipyard.

Discussion about the timing and requirement for the Streamer Leveling system. The $243K would be an upgrade to the acoustic system that is a point of vulnerability with the current obsolete system. The birds/ acoustics would be available from industry.

Other Instrumentation:

• Multibeam spares and upgrade is pending a dedicated multibeam cruise and a real need for spares. Also need Kongsberg needs to be ready.

o Kongsberg SBP120 - 750K = not ready for delivery yet.

• Portable High res system
• Oceanographic Winches - all need upgrading. Trawl winch is the best working and safest winch available. Will build a cat-walk during the maintenance period at the end of the year or during the shipyard. Level wind not tested yet after moving fairlead block. Discussion about whether or not two hydrographic winches are needed. This would depend on the type of cruise that might be run. It would be important to retain the capability to mount two hydrographic winches and always have a good working winch on board. Would also need the trawl winch available. A second winch could be borrowed when needed. With the new SWL standards, it will be important to upgrade the monitoring systems.
• Active Mammal Sonar - $300K - The feeling is that active systems will become more important in the future. The use of these systems are still being developed.

Streamer systems

• Western's Gilavar vessel, which is the only other vessel with the same streamer system is planned for retirement. These streamers are potentially available for around $1M. Support for these streamers would probably go away.
• New compatible 4.5km streamer around $2.3M - this is not a favored option by the committee.
• Another used system.
• Buy one new streamer 12km/system - $5M This would be the adding a much greater

capability for 2D and some mix and match for 3D with the possibility of dual recording system for some high res. This could be added to with new streamers over time. It would also make some of the existing streamers into spares. This cost moves beyond the instrumentation budget and into MRI territory.
• New system with 4x8km streamers with 20% spares would be around $14M.

Storage Area Network - RAID servers.

They could get 12 -15 Tbytes for around $15,000, could replace the entire current setup for around $30K. The Sun V890 could be replaced with two Linux boxes for around $10,000. This would free up the Sun workstation for processing or the boards could be used to upgrade the MCS processing server.

The committee consensus is that the IT infrastructure be continually upgraded. The proposed idea for SAN upgrade and SUN replacement are endorsed as important by the committee. Funds would probably come from the tech services budget.

2008 SSSE items

• Deck Communication Talk Back System $62K
• New Radars
• Self Contained Breathing Apparatus (SCBA)
• JMS report included some items such as a fume hood and fluourometer, which can be deferred.

The lists for next year's proposals will be circulated to the committee in August for feedback and prioritization.

Personnel

Three broad categories of personnel for science support are Data acquisition, Navigation/IT and gunners.

For a general purpose cruise there would be three people on board, two acquisition types, one in a "science officer" role and then one IT person. The basic services rate gets charged for all operational/at sea days.

For 2D cruises there would be additional people for IT and Navigation, data acquisition people and sound source handling people.

Discussion about the roles of IT people with regards to navigation, MCS IT work and general purpose IT work. The reality is that the number of billets that are supportable means people will have to fill dual roles.

Discussion about the support for Mutter. Robert will sail as science officer. Anthony will serve as lead IT/Nav and will stand a watch. Mike Martello (contractor) will stand a watch as IT/Nav.

During deployments, Robert will be on the back deck. David Mardsen (contractor) will work on data acquisition along with Bern and maybe Ted K.

Question about whether things are getting better. With Robert back they now have two people that can lead the cruise and provide the leadership for training and support.

Recent Staff

- Robert Steinhaus - Tech in Charge - Senior Science Officer
- Anthony Johnson - TIC - Chief Nav/IT
- 2 New IT (one trip and two trip experience)
- 2 new ET/Acquisition/IT
- 2 MATE Interns

Existing Staff

- Gunners - two chiefs / 3 shift leaders / 2 others
- Acquisition - Ted K, Bern M, Lance C

Seeking

- Strong Shift Leader Acquisition
- Strong IT
- Others

Salaries for IT people are not at a level that is real attractive, but salary has not been the main detriment.

Calibration cruise

John Diebold showed graphics of the tracks for the calibration shooting. The 180 dB radius is still small at 1.2 km to 1.5 km. The 160 dB radius will be higher for intermediate sites. SEL signal levels are more robust than RMS, and are now being used in IHA permits.

The Southall report will provide new guidance on threshold limits closer to 200 dB and 180 dB and will include a chart matrix that has dB levels and different types of mammals (frequency sensitivity). Industry also conducted a calibration cruise. The results will need to be cleaned up and published to have this data used for permitting purposes.

Scheduling

Jeff Rupert showed 2009 schedule with two very fixed targets, early March for TAIGER in Taiwan and a good weather window for Toomey (August).

Ideas for scheduling in the future would be to have a separate panel that would recommend areas of operation for out years that could be matched to proposals. Another idea would be to schedule the ship as a data collector for the community scheduled logically.

Mike Purdy suggested that it would be useful to look at two or three years of EWING cruises and see if you could schedule those in a more logical manner as proof that setting up this process would be beneficial.

MMO Tower

The committee recommendation is that something be done about exhaust gas for the people in the tower. Suggested remedies are to raise the stacks, move observers to the bridge deck or move the MMO tower over the bridge. Suggestions are to see what the effect on engines will be with raised stacks and whether or not this will improve the situation. Need to do something.

Recommendations for future PIs

Should PIs submit IHAs with related modeling? Recommendation is that NSF investigate what the added cost and problems associated with permitting several different gun string depths and number of gun strings. This would allow changing to different configurations within the terms of the IHA.

Clarity of the IHA - There were some issues with the IHAs on the Holbrook cruise in terms of how they were written. How can input from the previous PIs help improve the way IHAs are constructed. It might be possible for PIs to see a draft IHA about six months before the cruise, which would allow for clarification ahead of time. Also, having feedback from the PIs to Megan Cummings and NSF about the conditions in the IHA and what was clear and not clear would help improve future IHA language.

Suggestions are that PIs provide post cruise assessments of any problems with IHA language or clarity to Megan and NSF. Also PI's and LDEO could provide lessons learned about IHA processes and compliance and how it might affect their cruises. We should also include a note to report on IHA, clearance and permitting issues.

Outreach

Steve Holbrook will co-write an article for EOS on his cruise showing the exciting examples of new data capabilities.

Website improvements and survey of interests from community.

Add meeting minutes. Link to NSF 18 month policy, links to LDEO sites.

Discussion of the relative merits of a town hall meeting, versus sessions versus a DESSC like meeting the day before.

Decided to hold a DESSC like meeting the day before AGU. Mike to check on logistics.

Action Items - Steve and Mike to work on a table structure that could be put into a table for action items. Do this for all committees.

Subcommittees - not needed.

Next meeting decided on for AGU - day before.

New membership - implement rotation by starting with renewal of second terms. Tom Shipley would have to rotate off without being directly replaced because the committee is only supposed to have nine members. On the other hand, the committee would like to retain representation from UTIG because of the size of the user community. Need to find marine mammal type to eventually replace Peter Tyack. Check with WHOI, SIO marine mammal people and Jim Harvey. Should figure out if we need a new industry member and if so who. Several names are suggested. Need to figure out a reasonable plan for rotations and then get approval, followed by finding people.

Approved minutes from December 2007 meeting.

Discussion about how to make scheduling and proposal planning more efficient. Models to look at include the drilling ship, NSF aircraft facilities, Ridge 2000, Healy, DESSC. Committee should consider a short white paper on ideas to explore for improving the way the *Langseth* is utilized and scheduled.

Meeting adjourned.