The UNOLS FIC
The University of South Florida
Marine Science Lab – Conference Room (Room 134)
St. Petersburg, FL
February 6-7, 2008

Executive Summary:

The UNOLS Fleet Improvement Committee met at the University of South Florida on February 6-7, 2008. The first day of the meeting focused on the draft Fleet Improvement Plan. Fleet projections were discussed. The Committee formulated the Plan's recommendations and findings.

Day two of the meeting included a joint session with the UNOLS Council. Reports and updates on Fleet renewal activities were provided. Agency representatives reported on budget projections and facility acquisition efforts. The Americans with Disabilities Act (ADA) Guidelines for UNOLS Vessels were endorsed by the Council.

FIC Action Items – New and Continuing

Task Description	Action/Status
Global Class Science Mission Requirements (SMRs): Update the Global SMRs with community input. Reformat the Global Class SMRs to using the template for the Ocean/Regional Class SMRs.	Mike Prince
Kilo Moana: • Contact Sandy Shor to keep abreast of Handling System details. • Draft EOS or other appropriate article	Dave Hebert
Design and Constructions Efforts - Stay engaged in ongoing design and construction efforts (Regional Class, Ocean Class, ARRV, *Langseth* Conversion, etc.)	FIC
Ocean Observatories – Stay in contact with OOI Office.	FIC
Science User Debriefs for R/V *Hugh Sharp* - Dave Hebert working with U. Delaware will draft user debrief questions that will evaluate the new technologies of the ship. Conduct debrief interviews with *Sharp* users.	Dave and FIC
Fleet Improvement Plan: • Change title to 2008 • Incorporate FIC comments/suggestions – from meeting and draft mark-ups • Convert all units to metric, show English in (ft) • Increase font size in figures. • Add acronym list at the start of document • Confirm ship construction dates with Dolly and Bob Houtman • Remove figure 43 • Contact Local Ship operators for revised retirement dates and plans for replacement (if any)	Annette and FIC

• Finalize draft	
Science User Debriefs for *Knorr*'s Long Coring Capability - Dave Hebert working with Jim Broda will draft user debrief questions that will evaluate the operation of *Knorr*'s long core capability. It will also assess the impact on the general-purpose capability of the ship. Conduct debrief interviews with *Knorr* users.	Dave Hebert and FIC

Appendices:

I.	Agenda
II.	Participants
III.	FIC Chair's Slides including OOI Projections
IV.	Ship Scheduling Report
V.	NOAA Report
VI.	Fleet Improvement Committee - Meeting Summary Report
VII.	R/V *Marcus G. Langseth* Update
VIII.	Alaska Region Research Vessel Update
IX.	Interagency Working Group on Facilities Report
X.	International Cruise Information Database and Web-site - POGO
XI.	FIC - Fleet Improvement Plan - Draft Findings and Recommendations

Day 1 – Wednesday, February 6th

Call the Meeting: The UNOLS Fleet Improvement Committee (FIC) met on February 6-7, 2008 at the University of South Florida (USF) in St. Petersburg, FL. Dave Hebert, FIC Chair, called the meeting to order at 0830 and provided an opportunity for introductions. The meeting agenda was followed in the order recorded in these minutes. The meeting agenda is included as ***Appendix I*** and the meeting participant list is ***Appendix II***.

October Meeting Minutes - The October FIC Meeting minutes will be circulated for review following the meeting.

Review FIC Action/Task List from October meeting – Dave Hebert reviewed the status of the various Committee action items (***Appendix III***):

- Global Class Science Mission Requirements (SMRs) Update – The update is pending further action by Mike Prince.
- *Kilo Moana* Actions - Brian Taylor has become the Dean at SOEST, University of Hawaii. Sandy Shor will now be the point of contact regarding the ship's handling system. The handling system still has not been delivered to University of Hawaii and there are still issues with the ABS approval. Stan Winslow will give additional details on day two of the meeting. Once the handling system is installed, Dave Hebert will work with U. Hawaii to draft an EOS or other appropriate article about the SWATH capabilities.

- Ship Design and Constructions Efforts – Reports will be given on the status of ongoing design and construction efforts later in the meeting.
- Fleet Improvement Plan (FIP) Update – Update of the FIP will be the focus of this FIC meeting.
- Ocean Observatories – Dave has been staying in contact with the OOI Office and will give a report later in the meeting.
- ADA Guidelines – The Guidelines are on the agenda for endorsement later in the meeting.
- Science User Debriefs for R/V *Hugh Sharp* –Dave Hebert will work with University of Delaware to draft user debrief questions. Focus will be on the handling system.
- Science User Debriefs for *Knorr*'s Long Coring Capability - Dave Hebert, working with Jim Broda, will draft user debrief questions that will evaluate the operation of *Knorr*'s long core capability. The first science cruise is planned in January 2009.

Ocean Observatory Projections – Prior to the FIC meeting, Sue Banahan (OOI Office) provided a set of slides on the latest OOI facility projections, timeline, and implementation plans. Her slides are included in ***Appendix III***. Dave Hebert summarized Sue's report.

The latest OOI projections now include:
- 3 Global scale nodes in the Southern Ocean, Ocean Station Papa, and Irminger Sea
- 5 Regional scale nodes in the NE Pacific, cabled plate-scale observatory
- Coastal scale assets in the Mid- Atlantic Bight shelf-break (Pioneer Array) and NE Pacific continental slope (Endurance line)

Each scale incorporates mobile assets and there is a unifying cyberinfrastructure to allow adaptive sampling, custom observatory view, and collaborative analysis. Interfaces for education users are planned.

The Global scale nodes will consist of paired surface and profiler moorings that will cover the full water column. There are no longer plans to deploy spar buoys at these sites. Three gliders are planned to observe evolution on sections and two gliders are planned to track/survey features. There will be two subsurface moorings with fixed depth sensors. Telemetry will be via the gliders.

The OOI implementation schedule through 2013 was presented. The last OOI slide is shows the estimated ship days at sea that would be needed to support OOI though 2015 by year. UNOLS Global ships, Intermediate ships, and ROVs will be needed. The ship time ramps up by year, until leveling off in 2013. Once the observatories are installed, the number of ship days needed for operation and maintenance (O&M) support is estimated at 65 days of Global ship time, 66 additional days of Global ship time with an ROV, and 25 days of Intermediate ship time.

FY09 President's Budget – Dave Hebert continued the report by discussing the FY09 President's budget just released two days before the meeting (slides are included in ***Appendix III***). The NSF GEO budget that supports operations of the academic research fleet includes an increase of $14.8 million, to a total of $87.96 million. This would augment support of ship operations and provide a number of enhancements to the fleet.

FY 2009 is planned as the start year for construction of up to three Regional Class research vessels. Support for the Replacement Human Occupied Vehicle (RHOV) construction continues at a level of $1.0 million. Ocean Observatories is budgeted at +$1.5 million to support activities to prepare for the Ocean Observatories Initiative.

The big budget news was in regard to NSF's FY09 Major Research Equipment Facilities Construction (MREFC) account: "No additional MREFC funding is requested for the Alaska Region Research Vessel (ARRV), the National Ecological Observatory Network (NEON), or the Ocean Observatories Initiative (OOI) in FY 2009." NSF is concerned about future budget overruns. As a result, they would like to postpone construction and installation of these three items until the designs are very complete and the estimated budgets are well established. NSF would like to avoid requests for additional funds to complete projects. "To help avoid future cost and schedule overruns, MREFC funds will only be requested once a risk adjusted cost has been defined for each project that defines, with high confidence, the budgetary resources and schedule needed to accomplish the requested scope. These projects will be eligible for additional MREFC construction funding in a future budget request following successful completion of Preliminary and Final Design Reviews (FDRs). Until they have passed these approved performance baselines, these projects will continue to be supported by the sponsoring research directorates as they carry out the range of activities necessary to achieve sufficient project maturity."

There was a Preliminary Design Review (PDR) for OOI in December 2007. A Final Design Review (FDR) is planned in October 2008 to determine the readiness of the OOI design, execution plans, and risk analyses for full construction, and to establish the baseline for the OOI. A cost review will be held after the National Science Board (NSB) approval for construction start and prior to the beginning of construction effort.

As for the ARRV, NSF obligated $2.58 million of the appropriated $9.43 million for the ARRV for updated engineering drawings and preparing the project execution plan. The remaining carryover of $6.85 million will be competed and awarded in FY 2008 and will include acquisition planning, shipyard contract award, design verification, and ordering of long lead equipment items. Dave pointed out that there is language in the budget document stating that the FIC will review progress and provide advice regarding scientific outfitting of the vessel. Future ARRV initial operating costs have been estimated at $8.50 million.

Fleet Improvement Plan (FIP) Discussion – Annette DeSilva reviewed the revisions and additions that have been made to the draft Fleet Improvement Plan since the last FIC meeting. She requested that any comments or edits to the draft document be sent to her. A summary of the revisions follow:

The Table of Contents was updated as needed to reflect the latest draft revisions.

Executive Summary – No changes were made. The Executive Summary should be drafted last and should also be useful as a standalone, 2 to 4 page brochure that includes the report's findings and recommendations. A committee volunteer is needed to draft the summary.

Section I. Introduction – The introduction explains the purpose of the FIP. It has been updated a bit since the last meeting.

Section II. Future Science Initiatives:

- The draft was edited for continuity.
- Dave Checkley redrafted/updated the Biology section (II.C)
- Dave Checkley also provided an insert box for the biology section. It highlights the Fe Experiment.
- Using input received from the OOI Office, the OOI components and scope text was updated by Annette in Section II.G.
- Section II.H, the "Science Summary," still must be drafted and a volunteer is needed.

III. Facility Composition and Trends – Revisions to Section III included:

- Annette updated all of the figures so that they included 2007 statistics. Text was also updated as needed.
- General clean-up of figures and numbering.
- The ship scheduling section was updated by Mike Prince.

Annette scrolled though the figures in Section III.D which provides the Fleet utilization trends, Full Operating Year definitions, and the ship time demand chart. The geographic utilization and seasonal trends charts were not updated because it is very time consuming and because they still convey the message that is intended.

Discussion followed and suggestions were made:

- Change the title of the FIP to "2008" and revise the document accordingly
- Some of the charts are difficult to read in gray-scale. Revise the document figures so that they can easily be read in black and white.
- Clare – on page 32, R/V *Savannah* –check the number of bunks. The table indicates 20 bunks, which is a lot for a Local ship.
- In section III.A, add descriptions for all of the UNOLS standing committees for balance.
- Edit the text for the *Polar* ships so that it is more balanced with the other ship descriptions (scale it back).
- Edit UNOLS Facility Scheduling Process (Section III.B.5.c) text so that it is less detailed.
- Increase figure fonts as needed.
- Add titles as needed on the charts.
- In Section III.D.6 add a paragraph on how the "other" category is increasing.
- Change title on "utilization by agency" to "utilization by funding source," since the support is provided by sponsors in addition to the federal agencies.

Section IV. Future Fleet Projections and Future Requirements - This section was drafted since the last meeting. Committee suggestions:

- Units throughout the document should be converted to metric with English units in parentheses.
- Acronyms are spelled out in the first appearance in each section. The Acronym list should be moved from Appendix III to the front of the document.

Section IV. A.1. Fleet Renewal Activities, Plans, and Timeline:

- R/V *Marcus G. Langseth* – remove *Langseth* since it will be in service in 2008.
- Alaska Region Research Vessel - rewrite as needed to update.
- Regional Class – Add text to indicate that geographic distribution of these ships are anticipated.
- Renewal Timeline – The timeline was updated with the latest dates for entering service:
    - *Langseth* – 2008
    - ARRV – 2011: Change this date to 2013.
    - RC#1 – 2012
    - RC#2 – 2014
    - RC#3 – 2016
    - The OC dates– 2014 and 2015.
- The dates should be confirmed with Dolly Dieter and Bob Houtman. NSF should be contacted regarding impact of the Nichols Brothers bankruptcy on the timeline for Regional Class construction.
- Figure 39 – Remove the dollar amounts out. Explain why some ships are black ships and others are blue. Change *Langseth* to black. Change title, "New Ships" to "Fleet Renewal."

Section IV.A.2. Projected Fleet Size and Configuration

- Figure 40 is a list all of the current ships plus the renewal ships and shows their dates of service. Figure 41 provides basically the same information as Figure 40, but in a different way. Figure 41 shows the Intermediates phasing out and Ocean Class being introduced. It also shows the reduction in fleet size.
- Table 4 is the Fleet composition in 2025. It lists each ship and their characteristics. *Atlantic Explorer* is missing and should be added to the Regional Class. The retirement date for the ship is 2026, based on 20 years after conversion. Remove "mid-life" from the column title. Add the conversion date to *Atlantic Explorer* (2006).

Section IV.A.3 - Figure 42 shows the ships days funded through 2007 and the ship days available through 2025. There is an error with the chart. The days available in 2025 should be 3270, which would match Table 5. This needs to be corrected.

Section IV.A.4. - Table 5 provides a comparison of the 2007 Fleet with the Fleet of 2025. By 2025, the fleet size will reduce by eight ships overall and the number of science berths will decrease by more than 100 bunks. Table 5 shows a significant loss in Global ship general-purpose capability.

Discussion Followed:

- The Fleet of 2025 will present many challenges. There is uncertainly as to whether or not the Ocean Class vessels can replace the capabilities of the Global Class vessels. With fewer ships there will be less flexibility in scheduling. There is the potential of a large gap between the new Regional Class vessels and the new Ocean Class vessels in terms of capabilities, size, sea keeping, etc. With more and more time series and observatories, the Ocean Class may be anchored to one location and not available for remote work. Only one Global general purpose vessel will be available in 2025.

- It was suggested that a paragraph be added to address whether unmet future ship demand could be fulfilled by chartering ships.

Section IV.A.5. - Can 2006 Fleet operations be scheduled on the 2017 Fleet? - This section describes the scheduling model that was created by Mike Prince and provides the model results. All agreed that this section and Figure 43 don't convey the message that is needed. It also doesn't clearly articulate that the unscheduled Atlantic work cannot be accommodated by the 2017 fleet. It was decided that Figure 43 should be removed. There should be a couple of paragraphs describing why the exercise was carried out and the assumptions that were applied in creating the model. The model findings should be provided and should include:

- The future fleet won't be able to do all of the things that the fleet can do now and there will be fewer opportunities for selection of the ship
- There will be difficulty meeting the ship demand during seasonal peaks
- Multi-ship operations may not be possible
- Operations in remote locations will be difficult to schedule
- There are five ships in the model that will not be in the 2017 fleet
- Lose flexibility in scheduling
- More days will be needed for transit (fewer ships)
- The 2006 schedules could not be fully scheduled on the 2017 fleet and the model does not include future initiatives.

Section IV.B. Future Science Facility Needs – It was recommended that the title of Section IVB.1, "The Impact of Future Research Facility Needs on Ship Operations" replace the title of Section IV.B. This section should describe how future facility requirements might change the way that we currently use ships. There should be references back to Section II.

Section IV.B.2. Ocean Observatory Facility Needs - Using the information that the OOI Office provided, Annette drafted this section. Figure 44 and Table 6 are from the OOI Office slides.

Section IV.B.3. Alternate and Emerging Technologies – This section should be redrafted. It should include a brief summary paragraph that explains why the emerging technologies would not replace ships, but instead how the technologies might change the way ships are used. A list of emerging technologies should be included in the section. Toby Garfield will provide the list. Check to make sure that the technologies are also cited in Section II. Also, check to see if the MG&G section includes text about the long-coring capability.

Section IV.B.4. - Specialized UNOLS Facilities – The title of this section should be changed to "National Facilities" or "Other UNOLS Specialized Facilities."

Text should be added to explain that there are other facilities that are used to support science at sea and that are overseen by UNOLS Standing Committees. These National Facilities are important and protecting their future is necessary to ensure their continued availability. This particular document will not address these facilities, but other studies have addressed them – Ice breakers, deep submergence facilities, etc.

In summary, it was recommended that:

- Section IV.B be reorganized and the titled changed to, the "Impact of Future Research Facilities on Fleet Utilization"
- There should be a statement that there are and will continue to be traditional demands for ships to accommodate basic research and education activities. In addition, there will be alternate and emerging technologies.
- A table of emerging technologies could be added.
- Remove the word "needs"

Lunch Break

Section IV.C.1. Federal Budgets and Escalating Operating Costs - Suggestions for charts and subtopics were discussed:

- Toby – Add a chart that shows the percentage of operating costs that represent fuel cost per year over a number of years. Al Suchy said that Bob Detrick has a chart on fuel costs over the years and he will share it with FIC. Mike pointed out that he also made a chart for fuel percentage.
- Explain the challenges facing the fleet due crew and marine technician retention and hiring. Maintaining Fleet expertise is critical.
- Fleet flexibility - Future science initiatives bring new demands on the fleet. With fewer assets, it will take longer for programs to get to sea and this will impact the way researchers can support their labs and personnel.
- New environmental regulations, security, and permitting come with added costs and increased staffing requirements.
- To be competitive, a strong, healthy fleet is needed. Other countries are building ships. Reference the European document on fleet renewal.
- There are consequences of not operating a fully funded fleet. The additional funds needed to maintain the fleet capacity (lay-up costs) is money that is unavailable to support science.
- There was discussion on how this section could be presented in a more positive way. Fleet capacity could present new opportunities:
    - Others can use UNOLS vessels
    - International collaborations could be considered
    - The loss of ice in the Arctic Ocean could open more ocean areas to UNOLS vessels.
- UNOLS should promote collaborations with other users, such as states.
- Using commercial vessels for general-purpose science is probably unreasonable. These ships just don't have the full suite of equipment and instrumentation that is available on UNOLS ships. There are also scheduling issues that would have to be considered.
- Educational uses of the ships should be explored. These might bring new users.
- The document should state that there are no economies in consolidating the fleet. This has been evaluated by past studies.

IV.C.2. An Aging Fleet – Figure 45 should show the "median age" instead of the "average age."

- Move the section on SLEPs (IV.D.2) to this section.

FIP Open discussion: The remainder of Day 1 of the FIC meeting was spent in committee discussions regarding the findings and recommendations of the FIP. The committee brainstormed and their suggested findings and recommendations were recorded into a PowerPoint document. Dave Hebert would present the PowerPoint during the Council Meeting.

At the close of Day 1, the draft PowerPoint document was emailed to the FIC for comment. Their comments were incorporated by Dave and Annette before presentation to the Council. The PowerPoint document that was presented to the Council on 8 February is included as ***Appendix XI***.

Adjourn: FIC Meeting Day One

The minutes of the FIC/Council joint session on 7 February are available at <200802cncmi.html>.