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UNOLS FLEET IMPROVEMENT COMMITTEE MEETING
Scripps Institution of Oceanography
Scripps Seaside Forum
La Jolla, CA 92037
Tuesday and Wednesday, March 5-6, 2013

Meeting Minutes

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Tuesday, March 5th – Roberts Scripps Room

Call the Meeting: Clare Reimers, FIC Chair, called the meeting to order and provided an opportunity for introductions. The meeting agenda is included as ***Appendix I*** and the participant list is included as ***Appendix II***.

The meeting minutes from the October 2012 FIC Meeting are available at: **http://www.unols.org/meetings/2012/201210fic/201210ficmi.html**

Agency Comments:

National Science Foundation - Bob Houtman reported that Sequestration has been enacted. The agencies need to submit an implementation plan on how they will operate under the Sequestration. Across NSF the budget reduction is estimated at 5.1%, but they are not sure how it will be distributed. This will be part of the implementation plan that they are developing. The plan will have to be approved by OMB. If the 5.1% budget reduction were enacted, it would be based on the FY2012 enacted budget. While working under the continuing resolution, the budget is at 80% of the FY2012 budget.

In personnel changes, Dr. Suresh is leaving NSF. Dr. Roger Wakimoto will replace Dr. Tim Killian as the new Division Director.

Navy - Mike Prince provided the Navy report. In addition to the Continuing Resolution and Sequestration, Navy is also facing the issue of furloughs. Navy personnel are not allowed to work or travel on the furlough days. This could impact project timelines. The AGOR construction was funded by FY11 and FY12 funds so it will not be impacted by the furloughs.

Knorr and *Melville* are slated to retire from UNOLS service in 2014. Plans for their disposal are underway. Scrapping and/or sales of these ships to other federal agencies are unlikely.
Discussion:

- Sandy Shor - Does ITAR factor into the disposal? Mike Prince - The Navy ships are no longer subject to the ITAR munitions list, so it won't factor into disposal.
- Peter Ortner – Is the sequestration impacts within the Defense Department greater for Navy? Mike - Yes.
- Bob Houtman - Dr Suresh indicated that rather that budget cuts, the sequester would result in fewer awards.
- Rose Dufour - She has partially awarded ship operation proposals (the Globals 50%, Intermediates 75%, and smaller 100%). The remainder of the proposal budgets will be negotiated when the budget is known.
- Bob Houtman – The later part of the fiscal year may see budget cuts once the budget levels are known.
- Fernando Martinez- Are *Knorr* and *Melville* still in the ship time request system (STRS)? Mike Prince - They are still in the STRS. The requests could easily be scheduled on a differnt ship if *Knorr* and *Melville* are no longer available. Fernando - The community should be informed about the status of these vessels. Perhaps there should be an announcement.
- Miles Sundermeyer - How much time is there between the retirement of a ship and the new ship coming on line? Mike Prince - It can be a year.
- Rose Dufour - It should be recognized that scientists won't be able to do everything on the new Ocean Class R/Vs (OCRVs) that you can do on the *Knorr*. OOI cannot be supported and there are fewer berths.
- Mike Prince - Correct, these ships are not Globals, but they will be able to take some of the work from the Globals.

Ship Design, Construction, and Acquisition Activities:

Ocean Class Research Vessel – Mike Prince reported that the project is on schedule. The input from WHOI ship rep, Gary McGrath, was been very valuable to the project. Gary was the Chief Engineer on *Oceanus* and Relief Chief on *Knorr*.

SIO has submitted their name suggestion for AGOR 28. The suggestion is with the Secretary of the Navy.

RV *Sikuliaq* – Bob Houtman reported on the progress of R/V *Sikuliaq*. His slides are included as ***Appendix III***.

The project timeline is as follows:

- Dock and Builders Sea Trials – May 2013
- Preliminary Acceptance by UAF – August 2, 2013 (1 week delay)
- Science Trials/Transit (Phase IV) – Sept 2013 – Jan 2014
- Alongside Seward, AK – February – March, 2014
- Ice Trials – April 2014
- Warranty Shipyard – May/June 2014
- Begin Science Operations – June 2014 (Ship Ops Program)

They are in Phase III of the *Sikuliaq* construction project. After the ship leaves the Great Lakes, it will travel south along the US east coast, they hope to stop in DC and open the vessel for tours. The project advisory committee has been very helpful.

NSF's Office of Polar Programs (OPP) is now the Polar Division. Polar is working with OCE's IFE section on science schedules and infrastructure related to the ship. The ship will be global ranging. The vessel's ice strengthened propellers can be switched out when working in ice-free waters. This will allow quieter and more fuel-efficient operations.

Regional Class Research Vessel – Bob Houtman (NSF) and Clare Reimers (OSU) provided the report. Bob began and his slides are included as ***Appendix IV***.

OSU was selected as the Lead Institution for the RCRV project. The funds awarded to date are to Conceptual Design Review (CDR) only. The CDR is scheduled for December 3-5, 2013 at NSF. Advancement to Preliminary Design Review (PDR) is contingent upon successful CDR and availability of funding. Three vessels are currently planned, but the actual number of vessels is based on projected science utilization and availability of funding. Operator selection will take place once the number of vessels is known. Solicitation is expected in early CY 2017.

There is an open design refresh process through the RCRV Science Oversight Committee (SOC) and OSU. The MREFC Funding Request for FY17 would be submitted in March 2015. The first RCRV would be operational in ~CY 2020. OSU will operate the first RCRV.

Clare continued the report. Her slides are included as ***Appendix V***. A four Phase Acquisition Process is planned. Clare reviewed the RCRV Project Organization and the SOC membership. The SOC had their first meeting last week. It was very productive. The chair is Bill Fanning and co-Chair is Joe Malbrough.

Clare reviewed the RCRV design specifications. The design length is 175 ft and the beam is 40 ft. Accommodations will include 16 science berths. The draft is 12 ft, but it might go deeper.

Design highlights include:
- Enhanced station keeping with twin azimuthing drives (Dynamic Positioning) for placement and servicing of benthic instrumentation and sample collection.
- Integrated shallow water acoustic Multibeam bottom mapping and sub-bottom profiling systems.
- Large aft deck for operational flexibility: two 20' laboratory vans, plus adequate remaining deck space for multidisciplinary operations.

The RCRV project will include student internship opportunities.

R/V *Clifford A. Barnes* Replacement Plans – Allan Devol provided the report. His slides are included as ***Appendix VI*.**

R/V *Clifford A. Barnes* is 50 years old. In October 2011 the NSF Inspection results for R/V *Barnes* were:

- Material condition - Good
- Documentation & Stability – Good
- Lifesaving & Firefighting – Good
- Habitability – Fair
- Hull – Good
- Engineering Systems – Good
- Load Handling Systems & Science Facilities – Fair
- Science Outfitting – Good

R/V *Barnes*' May 2012 dry-dock period addressed hull structure issues and the hull is now in excellent condition. The shaft, rudder, sea valve, and diesel engine are all in excellent condition. An ADCP transducer was installed and the hull was painted.

In June 2009 a Barnes Replacement Committee was formed (the member list is included in the slides). From the Fall 2009 to the Spring 2010 a systematic survey of past and potential users for *Barnes* and a replacement vessel was carried out to seek design requirements.

In June 2010, Jensen Maritime Consultants was commissioned to create a conceptual design. In October 2010 a Conceptual Design was presented to UNOLS FIC and shared with the UW Faculty.

In June 2012, FIC recommended to NSF continued operations of *Barnes* until end of 2016 and NSF concurred. In the Fall 2012, UW committed $1.5M to the replacement project. The College of the Environment (CoEnv) Committee meets regularly. There is a three-pronged approach for fundraising. There has been authorization by UW to engage state legislature for inclusion of vessel acquisition funds in the 2013-15 budget. Private donors will be approached. Extensive planning is underway. Federal and Local stakeholders in Puget Sound are being engaged.

They are seeking educational uses and support for future vessel days from UW Oceanography, UW CoEnv, UW Tacoma, other 4-year colleges, and community colleges. They are exploring the potential to combine regular educational cruises with monitoring objectives.

Design requirements for the Barnes replacement are:

- Capability to operate further afield including offshore in summer
- Increased Cruising Speed (~12 knots)
- Improved maneuverability and station keeping
- Increased Berthing (10 scientists, up to 5 crew) and day use capacity (~30 students)
- Option for 24 hour operations (flexible day rate)
- 12-hour operations at same crewing level and comparable day rate to Barnes
- Increased Deck Space

- Increased Lab Space (flexible wet and dry lab spaces)
- Expanded/Increased Scientific Capability
- Improved Efficiency – Fuel economy and emissions

Allan reviewed the potential operating areas for the vessel (see slides).

Capabilities for the vessel include:
- 2 person crew
- 6 person science party
- 10.2 knot max speed
- 8.5 cruising speed
- 4.5 day range – food & habitability
- 8 day range - fuel
- 1,600 lb telescoping crane
- 2 hydrographic winches – 4,500 ft of wire on each (0.322 & 3/16)
- 150 kHz ADCP
- Knudsen sub-bottom profilers (38 7 200 kHz)
- Data acquisition system
- CTD system
- 119 sq foot laboratory

The preliminary Rough Order of Magnitude (ROM) is $8.8M - $12M for the entire design and construction project. To include a hybrid option would add $500K,

Rose Dufour commented that any funds from the sale of *Barnes* couldn't be used toward the purchase of a replacement vessel. However it can be used for outfitting.

Mid-Life Refit Plans for *Thompson, Revelle*, and *Atlantis* – Mike Prince reported that the Navy would like to make *Thompson, Revelle*, and *Atlantis* more capable for another 10 years. Some of the upgrades under consideration during the mid-life are:
- Overhauling all of the diesel generator sets
- Ballast
- New drives
- New switchboards
- New environmental systems.
- Propulsion addition.

The integrated propulsion is more expensive, but it will lower fuel costs. This would bring the mid-life cost up to $30M per ship (from an initial estimate of $15M). Approval from the CNR Admiral is needed to move forward. The effort now will be to identify those things that need to be done sooner than later. We need to determine what should be approved and included in the mid-life refits and what science upgrades should be made.

There are no new Global ships in the Fleet Plan. The *Thompson* will be 30 years old in 2021. Although there is a recommendation from FIC to start the process for building a new ship so one could enter the fleet 10 years down the road, we are already too late. We need to detemine the need for Global vessels.

Discussion:

- Clare - Since these are Navy ships, how will the other agencies help? Mike Prince - The funding is only a Navy problem. Bob Houtman - NSF funds SSSE (science equipment) for the vessels and there is a strong partnership with the Navy. Mike Prince - As an example, the *Melville* is at Dakota Creek shipyard getting a new CTD handling system and NSF is funding this.
- Al Suchy - Germaine to the mid-life process, NSF continues to support the MOSA through the annual ship operations proposal and this relieves pressure on things that need to be supported during overhauls.
- Mike Prince - The MOSA, DURIP, SSSE, and Instrumentation support from NSF are very helpful.
- Bob Houtman - The ship inspections are very important and will help prioritize work for the mid-life refits.
- Clare Reimers - Since the *Atlantis* is the support platform for *Alvin*, would NSF be more supportive? Rose Dufour - NSF pays about 90% of the MOSA for *Atlantis* as compared to 60% on the other ships.
- Bob Houtman - NSF is not going to step forward to build a new ship. It would be useful for *Thompson, Atlantis,* and *Revelle* to each be in service for 45 years. NSF is supportive of the Navy's efforts to carryout the mid-life refits.

David Checkley volunteered to draft a FIC recommendation that the Navy move forward with the mid-life refits.

Break

R/V *Langseth* – Sandy Shor began the MLSOC/FIC liaison report and stated that there was an early career scientist/student program at the MLSOC meeting in December 2012.

Sean Higgins took over the report and provided a *Langseth* overview. His slides are included as ***Appendix VII***. LDEO recently received the final shipment of the streamers from the Western Greco. This could allow for a portable seismic system.

In 2013, the Langseth has approximately 187 Operating days, which includes about 50 transit days. The potential 2014-15 projects include:
- Canadian Geological Survey – Hudson Bay (~25-35 days) –Fall 2015
- USGS Cruises –Extended Continental Shelf (ECS) Mapping Project possible on Atlantic Coast in 2014 and 2015
- Geoprism Project -- Fall 2014
- New Jersey Margin 3D, etc. in Summer 2014

There have been issues with the ship exhaust location and the marine mammal observer platform. Options to improve the location and/or enclose the platform will be included in LDEO's SSSE proposal to NSF.

Discussion:
- Dan Schwartz - Having marine mammal observers stationed on a platform, is archaic. Are you looking at any new technologies for mammal observations? Sean Higgins – LDEO is looking at FLIRs. The FLIRs can identify things, but they don't tell what it is. Visual observations are still needed for identification. However unmanned aerial systems (UAS) would help a lot. It would expand the visual window. Across the industry, they are

looking hard at this, but still using human observation. Drone technology would be helpful.

- David Checkley - Does industry have the same issues? Sean Higgins - Seismic surveys are definitely targeted internationally. Pile driving for wind turbines, is also targeted. The commercial world is very concerned. It is expanding to beyond seismics to other systems, like Multibeam. Bob Houtman - he has heard that NOAA is pursuing EOS for their ships.

Long Core System (LCS) Repositioning Study – Clare Reimers reported that NSF has requested input from UNOLS (FIC) on whether to move forward with the Long corer repositioning to the *Langseth*. A community webinar was held on February 13, 2013 to consider trade-offs and hear from users.

Jon Alberts continued the report. His slides are included as ***Appendix VIII***.

The Long Core webinar was facilitated by UNOLS and the session was recorded. There were 34 participants on the call and included NSF program officers, FIC members, and the community. Institutions represented on the call included BIOS, Brown, Boston Univ., Duke, OSU, WHOI, Georgia Tech, RSMAS, TAMU, MIT, LDEO, Univ. of Michigan, URI, UCSB, Williams, and the Univ. of Hawaii.

Some of the questions addressed during the webinar included:

- Does current and future science demand justify the need to reposition to a new ship?
- How important is it that the US academic fleet maintains long coring capability?
- Are there reasonable alternatives to the Long Core System?
- What is the best model for using the LCS in the future (pre and post 2015)?

An overview of the present Long Core capabilities was provided. There was a brief review of the LCS cruises conducted so far (7 Long Core cruises). Anticipated proposal pressure to use the system is low (to none). The quality and the access issues of using the French R/V *Marion Dufraene* were discussed. A subcommittee was formed to draft recommendations to UNOLS/NSF on the Long Core Future and they are working on their report.

Discussion:

- Comments that have been received regarding the LCS are included in ***Appendix IX***.
- One comment that was received stated that NSF is no longer funding large proposals, so the cummunity feels discouraged from submitting proposals to use the LCS.
- Joan Bernhard - NSF sent out a message from MG&G stating that any proposal over $500K should be withdrawn.
- Kenneth Coale - What other systems are comparable to the LCS? Sandy Shor - There are only two other systems. However, the *Mariann Dufraene* system distorts the cores and the ODP cores are in sections. If you want a continuous 50m core, it would have to be from the LCS.
- Clare Reimers - The subcommittee's report will provide options for moving forward along with the pros and cons.
- Bob Houtman - If we decide to maintain the capability, the study to transition it to the *Langseth* can be carried out now. When funds come available, the study can be referred to.
- Miles Sundermeyer - What are the tradeoffs of not having the LCS? Sean Higgins - The Drill ship is limited and takes a lot of scheduling. It only goes to certain areas.

- Sand Shor - He, Dolly Dieter, Bill Hoq, and OPP funded the LCS design and fabrication. At that time, the drill ship was not accessible and the cores from the French system were distorted. There were 7 projects funded. Sandy can't see transferring the system to the *Langseth* at this time based on the low proposal pressure. The drill ship can get the cores. The option to modify the *Langseth* at the cost of $6M so that it can accommodate the LCS doesn't seem to be worthwhile. It might increase the cost of the ship operations requiring more fuel.
- Miles Sundermeyer - What is the cost of the drill ship? Bob Houtman - About $15M a leg.
- Rose Dufour – Jim Broda has built a long core system for the Koreans, but it is shorter than 50m.
- Mike Prince - The LCS wasn't part of the OCRV because it wasn't in the SMRs, so NAVSEA wasn't willing to include it.
- The LCS is in storage at WHOI and fully maintained.
- Some people have suggested that proposals to use the LCS were submitted, but were declined. Candace said that this is not the case; the demand is not there.
- Mike Prince - The *Knorr* is in good shape for another five years; however, the Navy will retire the vessel in 2014.
- Annette DeSilva - There are many suggestions that came out of the webinar and this meeting. It seems like rather than funding the *Langseth* study further, perhaps it makes more sense to look into some of the other options for acquiring long cores.

Sandy Shor made a motion, "We recommend that NSF proceed with the next stage of the design feasibility work that would allow the Long Core System (LCS) to be repositioned on the R/V *Langseth*." David Checkley seconded the motion.

The FIC voted unanimously against the motion, none in favor, and no abstentions.

Lunch Break

New Technologies and System Evaluations:

Dynacon Traction Winch with Synthetic 14mm Conducting Cable – Greg Cutter reported on his research experience using the Dynacon traction winch and the US Geotraces Clean Sampling System. His slides are included as ***Appendix X***.

He reviewed the Geotraces mission, themes, and program elements. The US Geotraces Clean Sampling System includes a Seabird Trace Element-clean Carousel with (24) 12 L GO-FLO bottles, capable of firing up to three at once. There are Titanium housings on the CTD and sensors (T, S, O_2, fluor, trans). The Dynacon winch has 7800 m of 14 mm Vectran conducting cable. They use a UNOLS-compliant clean lab van. The system includes an allied portable A-frame and Dynacon composite overboarding sheave. There is a boom for underway towing. Images of the system are included in the slides. Greg has had the system since 2008. Geotraces looks at all of the elements of the periodic table.

The winch is now part of the UNOLS winch pool, but Greg sends a technician along when the winch is requested. The system can be operated from the Ocean Class Research Vessels, but the Geotraces cruises require large science parties.

The winch is compliant with the *Research Vessel Safety Standards* Appendix A and B. The

system has been used on the *Knorr*, *Thompson,* and the German ship *Meteor*.

Discussion:

- Bob Houtman - Is there a way to reduce the number of people on the cruises? Greg - As the Geotraces is currently laid out, it would be challenging to reduce the number of people. Q/A and Q/C require analysts who must be part of the science party.
- Stewart Lamerdin - There always seems to be a trace metal concern with the flow through pipe system when working on ships. Greg – In his opinion there isn't a good one. What is good for one element is horrible for another element.
- Clare Reimers - Are there any special maintenance issues with the system. Greg – Synthetic cable is great because you don't have to worry about rust. The cover protects it from UV. They just rinse it off. They haven't seen any temperature issues.
- Mike Prince - *Sikuliaq* and the new OCRVs have new integrated handling systems.

University of Hawaii's ROV - Sandy Shor reported that U. Hawaii's new ROV was tested in the factory and will be shipped to Hawaii at the end of the month. The ROV has passed acceptance tests. It is rated to 6000 meters and will service Aloha observatory in the fall. The ROV can operate off of *KOK* or *Kilo Moana*. They plan to get the cable from the winch pool.

Fleet Improvement Plan (FIP): Clare Reimers reviewed the draft plan outline. Her slides are included as ***Appendix XI***. The anticipated publication date is 2014. Discussion followed:

- Section I - US science at sea:
  - This section should be a focus and tie to societal benefits.
  - There might be some existing dialog from the IWG-FI report and other documents for this area.
  - Include discussion of scientists at sea and telepresense
  - Review the UNOLS Mission, but no need to reinvent the wheel
- Section II - The UNOLS Fleet of 2014 to 2024
  - Clare - Are there any new developments regarding the Decadal survey? Bob Houtman - David Conover received the letter from UNOLS. He has put together a draft plan for executing the Decadal Survey. The survey would take about 24 months to complete and require funding. The Decadal Survey would be executed by OSB/NRC. It could move forward in as soon as three months. It is before OMB for input.
  - The Fleet Plan could include a Fleet-wide SMR matrix that includes a geography overlay.
  - There should be an analysis of where requirements, facilities, capabilities, and budgets allign.
- Fleet renewal considerations include:
  - Green technologies
  - Polar programs
  - Bob Houtman - will there be retirement recommendations?
  - Clare Reimers - The ships that are aging can be recommended for retirement.
- Fleet Plan Report Format – Annette DeSilva presented slides regarding the report format and provided on-line examples. Slides are included as ***Appendix XII***. There will be a date stamp on the report. Older revisions of the Plan will be archived as the report is updated.

- Clare reviewed the Plan assignments and timeline.

Break

Review Fleet Projected Service Life End Dates – Clare Reimers reviewed the Fleet projected service life end dates. Her slides are included as ***Appendix XIII*** and contain the service life memos matrix and the timeline chart.

Discussion:
- Mike Prince asked why there was uncertainty about the *Melville* end date. Clare - A Navy memo regarding the service life for the Navy ships would be very valuable. Clarification on the retirement dates on the Navy ships is needed.
- Bob Houtman - The NSF memos provide a recommendation for a service life end date. Perhaps FIC should send a formal reply to each memo.

Coastal/Local Vessel Class Evaluation– FIC has been tasked to evaluate the need for a new design concept for Coastal/Local vessels and to propose an approach for replacement of aging Coastal/Local ships. Also, FIC has been requested to evaluate how the Coastal/Local Class fits into the UNOLS fleet renewal plan.

Clare Reimers provided a brief history on this topic. Her slides are included as ***Appendix XIV***. This action item was initiated from a presentation that John Morrison made regarding a new class of coastal research vessels. In response to the action item, Clare distributed a memo to the UNOLS Membership asking that they provide feedback on small vessels:

> *Feb 4, 2012*
> *Dear UNOLS Membership,*
>
> *The UNOLS Fleet Improvement Committee is in the process of developing plans for strategic replacement of aging Local/Coastal class ships in the fleet. These are vessels in the size range of 66-125 ft (LOA), and their mission is to support near shore research and educational activities.*
>
> *In this size class there are many non-UNOLS institution- and privately-owned vessels nationally. By March 1, 2013 we ask if you could take time to submit to the UNOLS Office and to Clare Reimers, Chair of the Fleet Improvement Committee, entries to the attached spreadsheet, which will be used to list all Local/Coastal size vessels regularly operated or used by UNOLS members. Please indicate any vessels specifications available and scheduling procedures. This information will help assess demand for new Local/Coastal class vessels.*
>
> *Thank you.*
>
> *Clare Reimers: creimers@coas.oregonstate.edu*
> *UNOLS Office: office@unols.org*

Clare reviewed the survey results (see slides).

The questions for FIC to consider are:

- What science and educational activities are currently done by federally funded researchers on vessels in the 60-125' range?
- What capabilities should be provided by Coastal/Local vessels?
- Do Coastal/Local vessels belong in UNOLS? And if so how many?
- Should UNOLS recommend agency support to design and build new Coastal/Local vessels?

Discussion:
- Peter Ortner - John Morrison is saying that these vessels are less expensive than the larger vessels and can be used in series.
- Dan Schwartz - When he was operating the *Barnes* he was told to keep it within UNOLS, but don't come to the agencies for replacement funds. It seems like it makes it sense to keep these vessels in UNOLS.
- Sandy Shor - He feels it very much dilutes the Fleet. Perhaps there should be a separate ship organization of these ships.
- David Checkley - He feels that these vessels are very useful in supporting science and they belong in the fleet. It helps a lot that the ship cost for the use of these small vessels don't have to be included in their science projects.
- Mike Prince - It really depends on the how the small vessel is used and scheduled. Many of the small ship operators want flexibility in scheduling their vessel for institutional use and don't want it as part of UNOLS.
- The discussion continued to debate on whether these small ships should be in UNOLS.
- Bruce Appelgate - He sees that some of the SIO scientists charter ships on their own and they don't go through the process of having the ships inspected.

Autonomous System Requirements - FIC was tasked to integrate autonomous systems requirements into SMR documents so these needs are fully considered in future ship designs, and operations. To better understand the requirements, guest speaker, Luc Lenain (SIO) was invited to provide a presentation on Unmanned Aerial Vehicles (UAV). The title of Luc's talk was, "Ship-based UAV measurements of the marine atmospheric boundary layer in the equatorial Pacific." He discussed the EquatorMix experiment on R/V *Revelle* in October 2012 where unmanned aerial systems were utilized to gather science data. Luc joined the meeting by web conference. He is currently in Hawaii conducting wave gliders tests.

Luc is a member of the UNOLS SCOAR committee. In discussions with Tim Schnoor and SCOAR, the idea of an UAV science demonstration was introduced. A proposal was submitted and awarded for a program off of the *Revelle*. Luc's slides are includes as ***Appendix XV***.

The cruise included air-sea interaction measurements using UAVs. The Boeing-Insitu ScanEagle UAV was used and it has a 2 – 3 kg payload and more than 11 hrs endurance. They carried out real-time Google Earth plotting and they were able to plot any variable as color along the flight track. The UAV was used to profile wind, temperature, and water vapor. The vertical profiles were taken upwind of the *Revelle*, during one 11-hr flight (taking off in the middle of the night). They also conducted low-altitude (32-m) time series sampling. There was positive correlation between vertical wind and water vapor, and temperature.

The advantages over manned aircraft experiments include:
- Long endurance (> 11 hours)

- 71 flight-hours were accumulated over 12 days aboard Revelle.
- The UAV greatly extends the scientific reach of a research vessel.
- Low-altitude flights permit safe air-sea flux measurements over large spatial scales and over long science missions.
- UAVs can extend the reach of small research aircraft beyond coastal waters, with no transit times
- Real-time data monitoring allows for real-time mission planning
- Can combine with simultaneous surface and subsurface ship measurements
- The ScanEagle doesn't require a runway for launch and recovery.

Luc described the various UAV payloads:
- The flux payload is the most popular
- Imaging payloads
- Radiometric payloads

Luc provided two movies that showed launch and recovery, as well as some data. During one of the operations, they had two UAV craft in the sky in stacked formation. It worked well.

In summary, the ScanEagle greatly extend the scientific reach of the research vessel. Low altitude flights permit safe air-sea flux measurements over large spatial scales.

Discussion:
- Clare Reimers - What special things were requested of the vessel? Luc - The system is designed for the military so it is very portable.
- Sandy Shor - Who owns the system? Luc - NUWC in Virginia
- Peter Ortner - Do you have to have a certain heading to recover? Luc - Yes. When you are flying at 15m and going slow, they have to fly into the wake.
- What is the cost? - They are about 120K each?
- Luc - They were exempt from the export license.
- Dave Checkley - What is the training for pilots? Luc - They must be licensed.
- Miles Sundermeyer - What is the power on the payload? Luc - doesn't use much power - about 60W
- Sandy - What are the requirements for operations geographically? Luc – They can be very limited. This exercise took place in the middle of nowhere.
- Annette DeSilva - What was the size of your science party? Luc - 4 scientists and 5 pilots. They can go with a smaller support team with only one aircraft.
- Clare Reimers - What size vessel can you work on? Luc - They can use smaller vessels, but a crane is needed for take-off.
- Miles Sundermeyer - Is sea-state an issue? Luc - The crane has a GPS on it. If the UAV gets a bad signal (like from a wave) it will abort the landing and try again.
- Rose Dufour - This was an NSF funded cruise and the ONR UAV demo was an add-on.

Optimal Window of Vessel Usage Definitions – Clare Reimers reviewed the ship operator responses to the vessel optimal use definitions. Her slides are included as ***Appendix XVI***.

At issue is how we define fleet capacity now and in the future. Clare reviewed the 2009 Fleet Improvement Plan (FIP) Full Optimal Year (FOY) old class definitions. Ideally the FOY should be the sweet spot for reducing vessel day rates and optimizing maintenance and should be tuned to each vessel.

In October 2012, Clare sent a memo to the Marine Superintendents asking for FOY assessments. In February 2013, a new assessment table was distributed, corrections received and incorporated.

Clare showed the results. The Global ships seem to be 300 days. Clare commented that she is not sure what to show in terms of the FOY for the *Marcus Langseth*.

Discussion:
- Sandy it is important to understand the numbers. Crew and maintenance are key factors.
- There was discussion on the port days. Small ships can't charge for these days
- There should be a lower number in the FOY range for which you would start losing crew. This would define the lower end of the range.
- Sandy - He thought that we were trying to determine how to optimally operate the vessel - factor in maintenance, crew retention, and in-port days for small ships
- Clare – We can think about ways to ask the question again and develop a survey for the operators. The on-line survey would have required fields and the form could not be submitted unless you fill out all fields. We would articulate how you will use the optimal numbers. The form fields would include maintenance days, sea days, mob and demob days, and transit days.
- Stewart Lamerdin - The daily rate should factor in this.
- Sandy Shor - He would like to ask each operator what their non-operation day total is.

As next steps we will work to finalize these FOY numbers and factor new FOY numbers into days available vs. days scheduled for 2013 and 2014. We will continue discussions of fleet "right sizing" based on the new capacity projections.

Other Business:

FIC Membership Status - Three FIC members have terms expiring in 2013.
- David Checkley is completing his second term. There will be a call for nominations for this position.
- Miles and David Bradley are willing to stay on for a second term.

Opportunity for Additional Reports:
- Woody requested that FIC to consider bandwidth requirements for UNOLS vessels.

Adjourn Day 1

Wednesday, March 6, 2013, Ted Scripps Room: *Joint session of Council and FIC*

Meeting Appendices:

D2- I	Agenda
D2-II	Participant List
D2-III	Navy Report
D2-IV	Interagency Working Group on Facilities (IWG-FI) Report
D2-V	UNOLS 2013 Fleet schedules and 2014 Ship Scheduling
D2-VI	Summary of Fleet Improvement Committee Meeting

D2-VII Early Career Investigator Cruise Training Opportunity
D2-VIII Ocean Class AGOR Acquisition Status
D2-IX Unmanned Aircraft System Operations & SCOAR Report
D2-X *Sikuliaq* Update
D2-XI Regional Class Research Vessel Acquisition Status
D2-XII Ocean Observatories Initiative

Wednesday, March 6, 2013, Scripps Seaside Forum - Ted Scripps Room: *Joint session of the Council and FIC*

Call the Meeting - Peter Ortner, UNOLS Chair, called the meeting to order and provided an opportunity for introductions. The meeting agenda is included as ***Appendix D2-I*** and the participant list is included as ***Appendix D2-II***.

Accept the Minutes of the October 2012 Council Meeting – The meeting minutes of the October 2012 were accepted as written: http://www.unols.org/meetings/2012/201210cnc/201210cncmi.html (Schwartz/Morrison).

Agency Reports:

National Science Foundation (NSF) – Bob Houtman provided the NSF report. NSF is facing federal budget sequestration issues. As a minimum, the anticipated budget reduction could be about 5.1%, but it could be more at the division level. If the Continuing Resolution were extended for the remainder of the year, the budget level would be 80% of the FY2012 level. So far, NSF has been informed that furloughs are not considered.

STEM will be a high NSF priority as stated in Dr. Suresh's letter. Fewer awards can be expected with the reduced budget. Rose Dufour has been awarding partial budgets for ship operations.

Dr. Suresh will leave NSF and is taking on a new position as the president of Carnegie Mellon University. There will be acting director in his place.

Dr Roger Wakamoto is the new head of the Geosciences Directorate. He was previously the Director of NCAR. He has expressed interest in learning all about GEO programs before making any adjustments.

Discussion:
- Bruce Appelgate - When decisions are made about funding, how do we preserve access to the sea? Bob Houtman - He doesn't see any huge impacts to fleet operations. There is some flexibility. Operators are already doing the things that need to be done. When the NSF AD or David Conover visit your institution, express the importance of infrastructure and efficiency of operations.
- Debbie Smith – David Conover referenced plans for a Decadal Planning process. Bob - David has been entertaining the idea of a Decadal Review. Other disciplines do this. The question is going to be whether the cost of another study will be feasible.

Navy – Mike Prince provided the ONR report. His slides are included as ***Appendix D2-III.***

The Navy is considering furloughs and personnel won't be allowed to work those days. For NAVSEA, furloughs are an issue because of their involvement with the *Alvin* certification and the ship projects. The furloughs would not apply to Mike Prince's position and to government contractors.

There are 540 days of Navy research funded in CY13. The days are spread among 12 UNOLS vessels and the cost for ship time is $14M. Navy supported 30 days on FLIP for $700K.

Navy has faced major bills for repairs on *Thompson*'s Z-Drive and *Kilo Moana*'s Engine Control Software. Tom Althouse is doing an in depth study on the z-drives. He is trying to develop a predictor method for failures. Al Suchy said that it could be very valuable and it might inform them on actions that they should not be doing.

Other costs to Navy included:
- Two *Alvin* engineering dives $120K
- Ship Layup Costs - $350K
- Fleet Broadband - $448K
- Ship Improvements - $250K

The Navy owned vessel usage this year totals 1376 days.

Mike reviewed the major ONR sponsored projects at sea. Geographic research areas include Columbia Bar, South China Sea, Bay of Bengal, and the Arctic

The Navy funded a variety of ship capability improvements in FY13/14. The list is included in the slides.

The Navy process for retirement and disposal of *Knorr* and *Melville* has begun. SENAV and CNO offices have been notified. *Knorr* is scheduled to retire in early 2014 and *Melville* is scheduled to retire at the end of 2014. However the controlling factors will be the UNOLS schedule needs and the construction schedule for AGOR 27 and 28.

There are various options for *Knorr* and *Melville* after retirement:
- Retention by Navy in the mothball fleet (not likely)
- Transfer to another Federal agency
- Transfer to a State agency
- Foreign Military Sale/Transfer (NIPO interest)
- Scrapping (not likely)

Glosten has completed a scoping study for an AGOR 23 "Mid-Life" refit and possible Service Life Extension Program (SLEP). Options include "must-do" and "nice to have" paths. Areas considered include:
- New/replacement systems for environmental compliance
- New/replacement systems to overcome obsolescence
- New/replacement systems for improved ship performance

Funds to support the mid life refit were in the FY15 budget request presented to CNR in December. The "high option" was recommended which would SLEP the vessel to 45 years.

ONR is awaiting final word, but they are not optimistic it will be funded.

In December 2012, the Navy got approval to remove the ITAR and munitions list designation from the AGORs.

Interagency Working Group on Facilities and Infrastructure (IWG-FI) – Bob Houtman provided the IWG-FI report. His slides are included as ***Appendix D2-IV***.

Robert Winokur and RADM Devany are the IWG-FI Co-chairs. The IWG-FI is responsible for drafting an updated Fleet Status Report (FSR). The document has been drafted. The UNOLS Office has provided input and has reviewed drafts. OMB was briefed on the FSR in December 2012. The OMB comments are being assessed. In January 2013, the SOST clearance process was initiated for the report.

The major message items for the report are:
- There has been success on procurements/acquisitions of vessels that were planned in the previous FSR. Federal agencies are adjusting to increased fuel costs. There has been a 400% increase in price/gallon (2003 vs. 2012).
- There have been decreasing utilization trend across all ship classes.
- There is a change in Fleet composition.

A chart showing the Federal Oceanographic Fleet modernization was presented and is included in the FSR.

A chart showing the total federal fleet operating costs shows an increase in costs. Increases to fuel, operating costs, non-mission requirements result in decreased operating days with neutral or decreasing budget.

A chart with the projected composition of the Federal Fleet shows a much smaller fleet by 2035.

A ship scheduling portal will be hosted on the UNOLS server to allow for more efficient collaborative opportunities between principle investigators. The portal will include oceanographic cruise information for UNOLS, NOAA, EPA, USAP, and USCG ships. This portal satisfies a milestone in the National Ocean Policy Implementation Plan.

In summary:
- A robust Federal fleet is a fundamental tool needed to advance our knowledge of the ocean and to support operational requirements.
- Fleet capacity to support the NOP priorities and the NOP Implementation Plan is determined by individual agency requirements.
- IWG-FI will continue to assess opportunities to increase efficiency and effectiveness of the Federal fleet through initiatives such as the fleet scheduling portal.
- Emerging technologies provide both new opportunities and new challenges to balancing ocean infrastructure and research.
- Challenges and barriers exist and include budget
- IWG-FI is addressing the current status of the fleet and identifying key issues for sustainment and replacement. It must be a needs driven process for ship replacement and construction.

- Long time lines for ship construction make funding difficult.

Discussion:
- Wilf Gardner – What is the TAGS-66? Bob - This was a congressional add-on for a Navy survey ship. This is totally separate from the academic research fleet.
- Annette DeSilva - Will it be a problem if the UNOLS chart doesn't match the FSR? UNOLS has the *Sikuliaq* and AGORS 27 & 28 one year later. Bob - it shouldn't be a problem.

UNOLS 2013 Fleet schedules and science operations, estimated operation costs, and 2014 ship scheduling – Liz Brenner and Stewart Lamerdin provided a summary of 2013 operations and the 2014 scheduling process. The Committee Chair is Stewart Lamerdin and the Committee Vice Chair is Liz Brenner. Their slides are included as ***Appendix D2-V*** and include charts showing multi-year Fleet utilization. Charts showing utilization by ship for 2012 and 2013 were presented. The 2013 schedule chart is about a week old and it already has changed. The Alvin Upgrade Science Verification Cruise (SVC) was cancelled. Al Suchy explained that the vehicle certification process has been more time consuming than initially envisioned. Although the SVC was cancelled, the agencies, WHOI, and DESSC are still committed to verifying the systems and are exploring options.

Some other schedule changes include:
- There was a Craig Lee cruise that didn't get its Vietnam clearance and now they are looking at a work area off Taiwan as an alternate.
- *Revelle* also lost a cruise for PI Constable.
- *Oceanus* lost a cruise just hours before it was to leave the dock.
- *Langseth* lost the PG&E cruise.
- Cruises were taken off *Sproul* and put on *New Horizon*.

For 2014, there are currently 2990 estimated operational ship days. This is a very preliminary estimate. A chart with the multi-year ship time demand data shows that 2014 demand is lower that past years, but it is still a bit early and additional requests are likely.

Discussion:
- David Checkley – There should be a footnote on the slide to indicate that a new ship time request system was implemented in 2008 and might be partially be responsible for the decline in demand.
- Annette DeSilva reported that she tried to correct the old ship time request data and removed duplicate requests in the system. She probably didn't catch all of the duplicates and other non-realistic requests, but regardless there was clearly a drop in request demand.
- Joan Bernhard – The 2007 time period was about the time when NSF announced that they would not fund ship time and as a result many PIs did not submit proposals.
- Rose Dufour commented that the red line on the Fleet funding chart represents about 60% of the ship time. Three of the Global ships take up 45% of the NSF ship ops budget.

Break

Summary of Fleet Improvement Committee Meeting and Action Items that require Council Attention - Clare Reimers, FIC Chair, provided the report. Her slides are included as ***Appendix D2-VI***. Clare reported on the FIC action items that the committee is taking on.

FIC plans to draft a letter of support for mid-life refit plans for *Thompson, Revelle* and *Atlantis.* The letter will stress the importance of this $15-30M/vessel investment for science missions (e.g., OOI and GEOTRACES) requiring Global Class vessels over next 15-20 years.

A Council motion was made to approve the FIC pending recommendation supportive of mid-life refits for *Thompson, Revelle* and *Atlantis* (Appelgate/Morrison). The motion passed. FIC will draft a letter to Tim Schnoor and Frank Herr and send it to the Council. The Council will review and endorse the letter for delivery to ONR.

During the FIC meeting, the committee voted unanimously against recommending continued NSF support for further evaluations of Long Corer repositioning on the *Marcus Langseth.* The MG&G community is encouraged to continue looking at other alternatives for Long Corer (LC) and to increase proposal pressure

Discussion:

- Sean Higgins - How will the long core system be stored for long periods? Sandy Shor - NSF funded WHOI for a storage facility that is enclosed. Also, the Long Core winch is in the winch pool.
- Bob Houtman - Related to this, agencies would want to know how UNOLS feels about the continued funding of the LC support facility.
- Sandy Shor – Is the maintenance of the winch now in the winch pool? David Fisichella - The overboarding system of the LC is in the winch pool.
- Clare Reimers - The MG&G community highly values the LC system and they are looking at the options for maintaining a capability.
- Bob Houtman - It would be good if UNOLS could take action on the issue of LC maintenance.
- Dale Sawyers - What has been the LC usage? What would it take for a ramp up if the LC system were put into long-term storage? Jon - There have been six LC science cruises, with the last one in 2010. Proposal pressure has been down.
- Peter Ortner – There are two FIC actions. One action is the recommendation to not fund the LC repositioning study on the *Langseth*. The other activity is to complete the LC community webinar report and formulate the recommendations.

A Council motion was made recommending NSF does not further pursue study of *Langseth* as a support platform for Long Corer System (Morrison/Schwartz). The motion passed unanimously.

FIC is drafting a new web-based *Fleet Improvement Plan* (FIP) that considers elements of a Decadal Ocean Science plan and a matrix of future Fleet-wide Science Mission Requirements. Developing the matrix will be challenging.

FIC and the UNOLS Office will develop a more specific survey for operator feedback to arrive at ranges for Full Optimal Year (FOY) estimates for UNOLS vessels. The old FOY definitions are not realistic. Geographic demands and constraints should be considered (e.g. R/V *Blue Heron* has a short year due to the Great lakes icing. The survey will request data on

maintenance days and port days. The FOY should be a range of days as opposed to a single number.

Discussion:
- Mike Prince – This could be a joint RVOC/FIC effort. RVOC needs to have ownership in the FOY definition.
- Clare – Ship operators need to know why this is important.
- Sandy Shor – Data on the non-operation days should be considered.
- Mike Prince - There was a document from the 1980s that took these things into consideration with developing the FOY definitions.
- Al Suchy – He has seen the non-operational time requirements change since he has been on board. More ship inspections that have been added over the years. In the past, operators were able to reduce the crew size when in non-operational periods. Now the non-op times have crew requirements - ABS, NAVSEA process, etc. The demands of the non-op periods are increasing.
- Clare Reimers - The mobilization time for complicated cruises takes a lot of effort.

FIC discussion of the recommendations for replacement of the aging Coastal/Local class will continue.

Early Career Investigator Oceanographic Research Cruise Training Opportunity -Clare Reimers provided the report. Her slides are included as ***Appendix D2-VII***.

In 2011 there were two training cruises and in 2012 there was one cruise. The 2013 cruise will be in mid-October on R/V *Endeavor.* The deadline for application is March 30, 2013.

Clare presented the post-cruise questionnaire results from the training cruise participants (see slides).

There are some immediate impacts that have been observed from the training cruises. For the February 2013 NSF proposal cycle, ship time three participants submitted requests.

Some plans for the future include:
- Development of a Chief Scientist Manual
- Post-cruise engagement in UNOLS meetings
- Future training cruises

Discussion:
- Lee Cooper - What are the criteria used for selection of the participants? Clare - How well the applicant articulated the cruise plan.
- David Checkley complimented Clare for her leadership. The chief scientist participants learned a lot. They learned how to deal with the unexpected. The two co-chief scientists learned the most. But each of the others benefited. He feels this project is a good investment. He learned a lot about the other science disciplines. David highly recommends that the program continue. It is good for UNOLS.
- Clare had high compliments to Meagan, the marine technician at SIO.
- Mike Prince - Should MS students be considered for the cruise? Clare gears the program to Post Docs and Early Career Scientists (ECS).

- Sean Higgins - A lessons learned document would really help. Clare - A chief scientist manual is something that they would like to draft.
- Wilf Gardner - Some of the ships have cruise manuals and these are good references. Rose Dufour added that the ship inspection looks for these manuals.
- Rose Dufour - NSF funded this pilot program. Perhaps ONR could contribute to the program in the future.
- Annette DeSilva - Opportunities on larger ships and in different regions could be useful.
- Bruce Appelgate - Are there other programs within NSF that could support this effort?
- Clare - Lisa Rom's education programs had requirements that weren't consistent with the chief scientist training objectives.
- Lee Cooper - He often takes students on board his cruises. What was unique about this opportunity is that the ECS have responsibilities.

Academic Fleet Modernization Activities

Ocean Class Acquisition Status - Mike Prince provided the report. His slides are included as ***Appendix D2-VIII***. The slides provide details about the ship key characteristics and construction events and acquisition schedule. WHOI will operate AGOR 27 (R/V *Neil Armstrong)* and SIO will operate AGOR 28 (yet to be named).

Mike reviewed the Operator Phase II efforts. PMS325 is very happy with the extent and quality of review and input provided by the Operator Representatives at the shipyard. Operator Phase II efforts to date have included:
- Production Surveillance
- Technical Reviews
- Integrated Logistics Support
- Mission Equipment ("Phase III") planning
- Post Delivery Test & Trials planning

Dakota Creek Industries (DCI) continues to capitalize on production efficiencies by moving crews immediately from AGOR 27 to AGOR 28 assemblies. Lessons learned are being incorporated into AGOR 28 in terms of more efficient assemblies, or cleaner runs of distributive systems. AGOR 27 is on schedule and AGOR 28 is about eight weeks ahead of schedule.

Factory Acceptance Testing and Delivery of Major Equipment includes the diesel generators, propulsion drives, start air receivers, galley exhaust hood, exhaust silencers, bow thruster motor, water mist FF system, etc. The Functional Design was complete in July 2012 and 3-D modeling is nearing completion.

Spare parts, tech manuals, and training are all on track and far ahead of other comparable projects and of excellent quality.

Planning for tests and trials are well under way.

Mike showed images of AGOR 27 and AGOR 28 (see slides).

SCOAR Report - Dan Schwartz, SCOAR Chair, provided the report. His slides are included as ***Appendix D2-IX***. The slides were prepared by Dr. Phil McGillivary (USCG PACAREA and Icebreaker Science Liaison).

Unmanned Aircraft Systems (UAS) inclusion into ship operations was discussed. Luc Lenain (SCOAR member) provided a report at the FIC meeting on UAS operations that were conducted off *Revelle* in the fall. Other US groups have operated off foreign RVs and in foreign airspace due to FAA restrictions. MBARI and WHOI have operated UAS in recent months from ships; they have done this as 'hobbyists.' MBARI used UAS to locate fronts and direct AUVs to them, saving batteries. WHOI is still developing UAS use scenarios, but is keenly interested in using UAS for Coastal (i.e. <12mi) operations, not just >12mi ops. SIO ops and WHOI ops to date have been mostly coordinated with DoD/NAVY management.

There are a couple upcoming UAS ops off ships including:
- *Sikuliaq*, UAF Quadrotor UAS ops, March 2014 ops in ice, for ice recon
- *Healy* dedicated 6-day UAS cruise, Aug. 15-21, 2013 (assuming no cruise cancellation due to sequestration) involving NOAA PUMA and USCG R&D Center personnel off N. Slope

Key issues for UAS ops off UNOLS vessels are threefold:
- Launch and Recovery
- UAS Video data ingestion, geo-referencing, archiving, and computer and bridge integration, and 'search-ability': including issue of computer systems to accomplish this.
- Technology development and integration with OOS and other research (e.g. Ocean Acidification, marine mammal studies, ocean color studies, air-sea flux, i.e. integration with AUVs and ASVs and OOS)

Three current methods of UAS Launch and Recovery Systems (LARS) are:
- Shipboard LARS: e.g. ScanEagle UAS: compressed air hydraulic launch, 'tetherball' aka SkyHook recovery
- PUMA UAS: air hydraulic launch, small boat/water recovery
- Hand launch, net or hand recovery 'on deck' e.g. RAVEN, Quadrotor UAS, or 'transition' UAS

The slides include a lot of information on the UAS technology and the status of the way forward.
- Key point: UAS Technology is still very rapidly evolving.
- New battery technologies in existence will increase endurance/range when applied to UAS
- UAS sensor systems are rapidly shrinking, also increasing range/endurance
- Ability to beam energy to battery powered UAS from ship/ground to keep them aloft indefinitely without landing exists now, but has not been tested off ships yet. A goal will be to keep UAS aloft without deck landings. This is achievable in near future.
- High-altitude persistent UAS are being tested now; will interface with ship-based or shore-based UAS.

An UAS issue that will need to be addressed is the computer systems on ship. This is a non-trivial and key issue for *Sikuliaq* and the new Navy vessels. Ships must have computers that can ingest video from both AUVs/ROVs and UAS. UNOLS ships handle video separately

from ship science computer systems. Phil recommends that there be a workshop convened to address UAS issues with SIO, WHOI, R2R, and UAF representatives.

Dan concluded the report by stating that SCOAR will work to create a safety guideline for using UAS from research vessels.

Polar Research Vessel Acquisition Status – Bob Houtman reported that UNOLS provided NSF with a Polar Research Vessel SMR refresh in 2012 and the document is working its way through NSF. There has nothing significant to report at this point.

- Clare Reimers - Would acquisition be a process similar to the RCRV and *Sikuliaq*? Bob Houtman – Yes, it would be an MRE-FC process.

Sikuliaq* Update** – Bob Houtman provided an update. His slides are included as ***Appendix D2-X.

The construction timeline is as follows:

- Dock and Builders Sea Trials – May 2013
- Preliminary Acceptance by UAF – August 2, 2013 (1 week delay)
- Science Trials/Transit (Phase IV) – Sept 2013 – Jan 2014
- Alongside Seward, AK – February – March, 2014
- Ice Trials – April 2014 (MREFC)
- Warranty Shipyard – May/June 2014 (MREFC)
- Begin Science Operations – June 2014 (Ship Ops Program)

Regional Class Research Vessel - Bob Houtman provided the update. His slides are included as ***Appendix D2-XI***.

OSU has been selected as the Lead Institution for the RCRV project. Funds were awarded to perform the Conceptual Design Review (CDR) only. The CDR is scheduled for December 3-5, 2013 at NSF. The project will advance to Preliminary Design Review (PDR) contingent upon successful CDR and availability of funding. Three vessels are currently planned. The actual number of vessels will be based on projected science utilization and availability of funding.

Operator selection is to take place once the number of vessels is known. The solicitation is expected in early CY 2017. There will be an open design refresh process through the RCRV Science Oversight Committee (SOC) and OSU. They will provide reports to UNOLS. There is regional representation on the SOC during the design refresh. The MREFC Funding Request for FY17 will be submitted in March 2015. If all proceeds as scheduled, the first RCRV will be operational in ~CY 2020.

Additional details about the project plans and off-ramps are included in the slides.

Ocean Observatories Initiative (OOI) - Bob Houtman provided the report. His slides are included as ***Appendix D2-XII***.

OOI will consist of four Global Sites, two Coastal arrays and one cabled array. The project installation schedule is included in the slides. The installation is scheduled to be complete in 2015. OOI is in Year 4 of a 66-month construction schedule. There have been some delays in the program.

OOI Accomplishments in 2012 include:

- Seven nodes were installed onto the cable
- Instrumented Coastal gliders were tested and delivered.
- 37 moorings were designed.

COL plans to conduct webinars for each array in the pre and post deployment phases. The goals will be to communicate sampling rate strategies, power budget utilization, and governance and logistics (post deployment webinar). The first pre-deployment webinar is scheduled to discuss July 2013 Station Papa deployment in March 2013. The Cabled Array and Pioneer Array will conduct webinars in Summer/Fall 2013. There is an Irminger Sea Logistics Meeting in Southampton, UK on March 25, 2013.

NSF User Workshops will be conducted by the Ocean Observatory Science Committee (UNOLS Committee) in winter 2014. The first workshop will focus on Regional Science (Papa, Cabled Array, and Endurance).

NSF also plans to have Science Workshops. Members of the community can contact their Program Officer at NSF to discuss ideas and implementation.

The OOI proposal process will be the same as other NSF observatories. Proposals enter the core programs and utilize costs and information from observatory websites.

All governance and operations procedures are currently in development and will undergo external review in late 2013.

This concludes the joint session of the UNOLS FIC/Council Meeting.

FIC Action Items:

- **Global Mid-Life Refits** - FIC to draft letter of support for mid-life refit plans for *Thompson, Revelle,* and *Atlantis* – will stress importance of this $15-30M/vessel investment for science missions (e.g., OOI and GEOTRACES) requiring Global Class vessels over next 15-20 years.
- **Coastal/Local Class** - The subcommittee (Greg Cutter, Al Devol, Sandy Shor, and Clare Reimers) will formulate recommendations for committee consideration.
- **Vessel Optimal Usage Definitions** – FIC has been requested to define optimal windows of usage for ships by class rather than single fixed number of days. FIC and UNOLS Office to develop a more specific survey for operator feedback to arrive at ranges for FOY estimates.
- **Long Core Repositioning Study** - FIC voted unanimously against recommending continued NSF support for further evaluations of Long Corer repositioning on the *Marcus Langseth.* MG&G community encouraged to continue looking at other alternatives for Long Corer and to increase proposal pressure. Finalize Webinar Summary report and provide recommendations to NSF via Council.
- **Fleet Improvement Plan (FIP):** Initiate drafting of a new, web-based FIP for beyond 2030 considering elements of a Decadal Ocean Science plan, a matrix of future Fleet-wide Science Mission Requirements, and new models for future fleet acquisitions. Incorporate, where appropriate, Consortium for Ocean Leadership recommendations. Incorporate the update charts developed by the UNOLS Office to reflect the new ship classification

system and trends.

- **Autonomous System Requirements -** FIC to integrate autonomous systems requirements into SMR documents so these needs are fully considered in future ship designs, and operations. This will extend the reach of the vessels. Effort needs to be linked to improved communication systems.
- **Fleet Projected Service Life End Dates** – Continue to work with agencies to update all end of service life projections for existing vessels in the fleet. Send a FIC letter to NSF recommending SLE dates of 2020 for *Oceanus* and *Endeavor*.
- **FIC Early Career Scientist Workshop** – Plan a workshop for the participants of the Chief Scientist Training program. The workshop will be scheduled to coincide with the 2013 UNOLS Annual Meeting. Miles Sunderland is the lead.
- **FIC Membership** – Call for Nominations to replace David Checkley whose second term is expiring.