

# **UNOLS**

**Fleet Improvement Committee Meeting**

## **Meeting Summary Report**



**Tuesday, February 26, 2002, 8:30 a.m.**

**Jacksonville University  
2800 University Boulevard  
Reid Medical Science Center, Room 201  
Jacksonville, FL**

**UNOLS Fleet Improvement Committee Meeting**  
**Tuesday, February 26, 2002, 8:30 a.m.**  
**Jacksonville University**  
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**Reid Medical Science Center, Room 201**  
**Jacksonville, FL**

**Appendices**

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- II. [Meeting Participant List](#)
- III. [FIC Presentation: Fleet Renewal and Utilization Trends](#)
- IV. [Navy's Oceanographic Ship Common Scalable Hull Study](#)
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- VI. [CAPE HENLOPEN Replacement Status](#)
- VII. [FIC Statement and Tasks](#)

**Tuesday, February 26, 2002**

The Fleet Improvement Committee met on Tuesday February 26-27, 2002 at Jacksonville University (JU). The second day of the meeting will be a joint session with the UNOLS Council. The meeting opened at 8:30 am. The host for the meeting, Dr. A. Quinton White, Dean of the College of Arts and Sciences at Jacksonville University, gave the introduction and welcomed everyone. Dr. White said that JU has a very good marine program with a focus on estuary sciences. They are also user of UNOLS ships.

Participant introductions were then made around the room.

**Introductory Reports and Comments**

Larry Atkinson, FIC Chair, reviewed the agenda. The agenda is attached as [Appendix I](#) and a list of attendees is included as [Appendix II](#).

Larry began by saying that there has been a lot of activity pertaining to fleet renewal the last couple of days and this is impacting the today's agenda. The FIC's goal for the meeting will be to draft a recommendation to the Council for initiating the fleet renewal process.

Larry went over the FIC goals and the current situation. His viewgraphs are included as [Appendix III](#). The Committee's current goals include:

- Establish a Fleet Renewal Implementation plan in concert with Navy.
- Provide suitable material (SMRs, white papers) to NSF, Navy, NOPP, other agencies and the community
- Continue to urge agencies to develop capitalization plans.
- Keep the community involved via letters to EOS etc.

The current activities relating to fleet renewal are:

- Long-Range Planning for the UNOLS Fleet - NORLC Federal Oceanographic Facilities Committee (FOFC) Report has been published.

- Analysis of Utilization Trends
- Fleet Renewal Efforts in Progress:
  - KILO MOANA – Science testing of vessel’s SWATH characteristics to be considered.
  - Alaska Region Research Vessel (ARRV) – preliminary design phase.
  - CAPE HENLOPEN replacement efforts underway
  - R/V SAVANNAH entered the fleet.
  - N. Atlantic and N. Pacific *Oceans* Class Vessels (OSU/URI effort)

Larry and Annette DeSilva reviewed the Fleet Utilization Charts and provided explanations. These charts are included in [Appendix III](#). The charts include statistics for UNOLS vessels greater than 150 feet in length. The first chart shows utilization from 1972 until 2002. Utilization fluctuates year to year, very roughly 3500 days plus or minus 300 days. The fleet has been able to successfully accommodate these fluctuations. Larry showed the utilization charts for the Fleet by Class for the years 1991 until 2002. The large ship use has increased over this period while the intermediate/Ocean class ship use has generally declined. Use of the Regional Class ships has been relatively level while the smaller vessel use has increased slightly. The attendees commented that it would be helpful to see the ship utilization in terms of percentages. Discussion centered on the charts. Utilization from all funding sources is included in the totals. It appears that there seems to always be a “one-ship” excess in the Fleet. This excess provides flexibility. Bob Knox stated that the scheduling of ships is always a challenge, and pointed out that flexibility is needed and that this flexibility is what allows programs to get scheduled. The FOFC plans calls for one less ship in the future. Based on past trends and practices, it appears that it will be difficult to accommodate peak loads (ship requests) in the future. In 2002, utilization figures show an excess capacity of one to 1.5 ships, yet some programs needed to be deferred because of scheduling conflicts.

A statement was made that flexibility in fleet scheduling (excess capacity) is essential. However, too much over capacity (i.e. ships operating half year) is not good and makes it difficult for crew retention.

Joe Ustach and Chris Measures were tasked with drafting a statement regarding fleet capacity and the need for some excess capacity. Flat growth (no ship additions to the fleet) will lead to no ship time excesses. Anything less than flat growth (subtracting one ship) will lead to under capacity, especially if the projections of increased ship use are considered.

Annette displayed charts that project when there will be shortages in fleet capacity based on average fleet utilization over the past six years and estimated vessel retirement dates. The charts show this by class as well as total Fleet. Current trends project that by 2008 there will be a shortage in overall fleet capacity if no ships are added to the fleet and the ships are retired as scheduled. For Regional Class ships, a shortage can come as early as 2005 if no ship additions are made. By 2008 an Ocean Class shortage is projected.

Annette provided a ship design and construction timeline for Regional and Ocean class vessels. The timeline includes funding request and appropriation steps. Assuming that funds are appropriated, and the design and construction are carried out in a process similar to those used in the past, a new Regional Class vessel may be ready to enter the fleet by 2007. This is two years later than the projected date for Regional Vessel capacity shortage. The new Ocean Class vessel is estimated to enter the fleet in 2008, approximately the same time frame that we would begin to experience a shortage in capacity. In both scenarios, we are assuming that the design/construction effort begins today. Timing is critical.

There was some discussion surrounding the definitions of the Fleet Classes. The question was asked whether the current ships should be reclassified to the FOFC definitions of "Global, Ocean, Regional and Local." It was determined that the existing vessels do not conveniently fit into these classifications and that their existing definitions should be retained.

**NAVY** – Tim Pfeiffer gave a brief history of who is who within the Navy: NAVSEA, Office of Naval Research (ONR), and the Oceanographer. Tim said that in parallel with the FOFC plan, the Oceanographer is looking at new Navy survey ships. He then went on to report on the Navy's interest in possibility conducting a Common, Scalable Hull Study. The Study proposal is included as [Appendix IV](#). The study would consider the Navy Survey ships, UNOLS Ocean Class vessels and perhaps others. It was noted that there is a large difference in size between the TAGS vessels and the new Ocean Class ships. KILO MOANA (AGOR 26) is approximately 2500 tons and the current TAGS vessels are approximately 5000 tons. The new TAGS could even be larger, but how much larger is unknown. The Navy would like to determine whether or not there could be a common approach to design of these. The Navy cannot ignore the two efforts.

This study will have a short time frame and will be funded by ONR. The Navy has some construction funding for the survey ship and would like to identify funding for the Ocean Class vessels. The Common Hull Study is not intended to produce a concept design. The FIC and the Navy will work together to define the vessel missions. It can only be a success if FIC participates.

In Summary: FIC will need to provide the general characteristics of the Ocean Class and the Navy will provide general characteristics of the survey ship. The architect will then go over these to determine if there are any common areas that can result in cost savings for construction. An outcome of the process may be that it is concluded that there are no similarities between the designs and that they should be separate efforts.

Joe Ustach pointed out the mode of operation is very different between the two ships and that TAGS operate with huge crews.

Tim also said the timeline for the Common Hull Study is six months from time of award. ONR may be willing to fund a workshop for establishing a community-working group. It is hoped that the outcome of this project will be useful for the UNOLS fleet renewal effort.

Annette asked about the status of the Navy construction funds. Tim said that the construction funds for the Navy survey ship are in the appropriations stage. Work began a year ago to get SCN funds in the FY2006 budget. Question: "Does this mean that the ARRV is not addressed by this study?" Tim responded that the study does not address the ARRV.

Tim said that the intent is for FIC and the Oceanographer to work with the Naval architect to develop a set of mission requirements. This can and should be part of the UNOLS process to develop Science Mission Requirements (SMRs). Even if the Common Hull study shows that a scalable design is not feasible, the results will provide useful information in the process of developing SMRs and concept designs.

Bob Knox voiced concern over designing ships now, that may not be built or enter the Fleet for many years. Obsolescence can be a real problem. Tim commented that the Admiral is aware of this situation. New science demands require new designs. Tim indicated that these are real concerns.

Wilf Gardner said that Congress is concerned about the number of ships that the Navy is building. He asked how the Navy is dealing with this. Tim deferred the question until tomorrow's discussion with the Council.

There was discussion on the status of FOFC's plans for implementing the Fleet Renewal Plan. Jim Yoder will discuss the FOFC plan tomorrow during the joint session with the Council. Dolly indicated that NSF has an interest in building new ships, but there are no construction funds. Ship construction is not even in the queue for the Agency's Major Research Equipment (MRE) budget. Beth White reported that she has not officially been appointed as the Chair of the FOFC Working Group. Since the FOFC Fleet Renewal Plan was just recently published just two months ago in December 2001, plans for implementation have not been specifically addressed as a group.

NSF has tried to consider ways in which ship construction could be accomplished outside of their MRE process. By keeping construction costs below \$25M, this may be possible. The Regional Ship cost may be able to be built at that funding level. Funding for the construction would come from taxing Geosciences across all programs. Margaret Leinen and Jim Yoder are supportive of this process.

Wilf asked if there is any experience with buying used ships and converting them as necessary to serve as research vessels. He indicated that they often receive offers of used vessels. He questioned if this could this be a viable option, and if so, should it be further explored? Steve Rabalais pointed out that if the answer is yes, then this is the time to do it. Oil companies are moving their work to deeper water and as a result, their small, coastal ships are being tied up and can be purchased. Steve indicated that some vessels are very new.

**Fleet Renewal Efforts in Progress – Gulf Regional:** Wilf Gardner reported that he and Steve Rabalais have been asked to put together a Steering Committee and a plan for an

SMR Workshop to be held for the Gulf of Mexico region in the near future. Scientists from other areas that work in the region will need to be included. Wilf displayed the graph showing R/V GYRE projected retirement date of 2005. When this ship goes offline, there will be no large ship home-ported in the Gulf for deep-water work. He went on to say that they would like to hold the Gulf SMR Workshop in the spring. Wilf proposes that they have the meeting in Houston at one of the Texas A&M University (TAMU) offices to avoid meeting room expenses. He suggested a two-day meeting.

Questions and Discussion on the Gulf of Mexico/Regional SMR Workshop followed:

The science needs for the region will need to be defined. There are exciting things happening in the deep water of the Gulf of Mexico. There are also strong currents, oil rigs, and environmental questions. There is also a lot of interest in shallow water research. Steve commented that the oil companies as well as the Mineral Management Service often use the research vessels in the Gulf region. Additionally, there are a lot of ship users from institutions outside of the region. These people need to be part of the SMR development process.

It was recommended that a questionnaire be sent to ship users prior to the Workshop. They should be asked to define their needs/science mission requirements for the Gulf region. It was commented that these SMRs might not represent a “Regional” vessel.

Wilf suggested the workshop be held in April 2002, but realized that this is probably not feasible. The workshop should include approximately 25 people. A steering committee should be identified to coordinate the effort. The NSF construction funding constraint of \$25M for a Regional Ship should be considered as a parameter. Steering Committee members were identified and include Tom Shipley, Dennis Hansell, Dennis Wiesenburg, Steve Rabalais, Wilf Gardner, a new FIC member, and an outsider.

**R/V KILO MOANA (AGOR 26)** – Chris Measures (University of Hawaii) reported on KILO MOANA and plans for science testing. Chris reported that the ship is scheduled to arrive in Hawaii on June 13<sup>th</sup>. Science testing will take place during transit from Panama to Hawaii. Chris stated that we need to expand the group who evaluates the cruise to all cruise participants to increase objectivity. We need to encourage evaluation of the platform, especially as a new hull design for science. Chris questioned whether this is possible through the normal UNOLS Post Cruise Assessment form.

Terry Whitledge commented that a list of systems to be tested is needed. Tim Pfeiffer reported that the University of Hawaii submitted a proposal to instrument the ship to examine how its hull structure performs. ONR would appreciate outside input on the need for this instrumentation. The proposal will need review and letters of endorsement. The proposal requests stress analysis, motion analysis, etc. It is to study ship performance.

Bob Knox said that it would also be good to hear from the crew and get their feedback on operations.

The ship inspection is planned for June 2002. There will be time set aside for science system testing and the University of Hawaii will take the lead. Steve Poulos reported that there are people within the university that are working on various elements of the science testing. He noted that they need to finalize a test plan and identify areas where outside help might be needed. Annette said she had envisioned a HEALY type of science systems test plan, however, is realized that HEALY's testing had significant financial support, while KILO MOANA testing is minimally supported.

Steve has drafted an outline of the testing. The KILO MOANA mission trial outline is included as [Appendix V](#). Prior to the Panama Canal transit vendor tests will be conducted. Other testing will be conducted once the ship is in the Pacific. Many people have been identified to assist in the testing, but there are still some missing slots. Terry Whitledge indicated that the system should undergo testing under unique conditions, such as, high sea states to examine the SWATH hull performance.

In summary of the KILO MOANA testing plans:

- A proposal for instrumentation to evaluate ship performance of ship has been submitted to ONR.
- There will be ongoing evaluations of operations.
- Steve Poulos is drafting a pre-science operations test plan and he should request input as needed.
- Mike Prince reported that post-cruise evaluations/de-briefs of HEALY operations have been very useful to the crew, operator, user, and agency. These should be considered for KILO MOANA.

FIC is interested in finding out how this ship works and if it should it be considered as a model for future hull designs. It was recommended that Post Cruise Assessments by FIC members be conducted. Bob indicated that it would be good to ask them specific questions about the performance of the ship. A form can be put together for evaluating the ship. Terry and Dave Hebert will prepare a draft form for the evaluation of science operations of R/V KILO MOANA

**Alaska Region Research Vessel (ARRV) - Status and FIC's Role in design review** – Terry Whitledge reported that the ARRV Concept Design was completed in August 2001. They are now in the preliminary design phase. A request for comments on the design was sent to the community and they have started to receive some comments.

As part of the Preliminary Design phase, model testing will be performed. Bids have been received and a firm has been selected to conduct the model testing. They hope to have the results in May. A meeting is tentatively planned for the second week in June to disclose the results of the model testing and preliminary design. The meeting will be in the Washington, DC area. Terry said that he needs input on who to invite to this meeting.

Terry reviewed the ARRV poster, which includes the concept design parameters. The poster is posted on the UNOLS website at <http://www.unols.org/fic/arrv/arrvposter.pdf>. There was discussion of the tradeoffs within the design and the impacts on quietness. NOAA's National Marine Fisheries

Service (NMFS) is still interested in the ARRV and its ice-capable fisheries research capabilities. The concept design phase addressed the hull features and propulsion system. In the preliminary design phase, space requirements will be addressed. Woods Hole Oceanographic Institution (WHOI) has been contributing to the design development, particularly Bob Dinsmore.

The azipod propulsion system is being strongly considered in the design. The preliminary design is scheduled to be complete by August 2002. All of the SMRs have been incorporated into the design. The only parameter that has been exceeded is ship's length. The ship stability looks very high. The vessel will likely exceed ICES requirements for noise. The tradeoff for noise is the ability to work in ice.

The big unknown is funding for construction of the ARRV. The FOFC renewal plan calls for the ARRV as the first new vessel. How can this be implemented?

Terry emphasized that they would like to have a good community turnout at the June ARRV design review meeting. The concept design, preliminary design, and model test results will all be available for review. The model tests will examine the ship's maneuverability capabilities.

**CAPE HENLOPEN Replacement Status** – Matt Hawkins provided a written report on the status of efforts to replace CAPE HENLOPEN. His full report is included as [Appendix VI](#). The project is progressing on schedule. They will be seeking private funding for the ship's construction.

**R/V SAVANNAH** – Skidaway replaced their vessel BLUE FIN with R/V SAVANNAH. The ship arrived at its homeport at Skidaway in September and completed its outfitting. A number of shipyard deficiencies required corrections. The ship began science operations in the fall with a busy schedule.

### **Science Mission Requirements (SMRs) and Conceptual Design Development**

The FIC discussed the need to identify SMRs that will be needed to support the fleet renewal process. SMRs will need to be developed for the new vessel classifications. Additionally, the FIC needs to identify the geographic regions where SMR and design efforts should be initiated. As a starting point, it was recognized that the Gulf of Mexico region would need to initiate a design process. Additionally, since many of the intermediate vessels are scheduled for retirement by the end of the decade, the new Ocean Class requirements should be addressed. The ARRV SMRs have been developed, but the design phase is still underway.

**Ocean Class SMR Process** – The FIC discussed the activities that need to be initiated for development of Ocean Class SMRs. There will be need to be two parallel activities, The Navy's Scalable, Common Hull Study and the community's development of SMRs. A Naval Architect will conduct the Navy's study. Input from UNOLS will be required to assist in this project. The Navy will be requesting general science parameters. For their study, required design ranges would meet their needs.



To initiate the Ocean Class SMR development process it was recommended that a steering committee be formed. The steering committee would include individuals located at the following institutions: URI, OSU, SIO, WHOI, and the SE Atlantic. Dave Hebert, Tim Cowles, Joe Coburn and Bob Knox were volunteered for the committee. It was recommended that additional members from HBOI and a non-operator institution be added. The steering committee's task will be to develop a process for getting broad community input to SMRs. An additional effort would be to work with Tim Pfeiffer to provide input to the Navy's common hull study. To summarize, tasking will include the following:

1. Compile vessel use data for intermediate vessels.
2. Supply Tim Pfeiffer with existing SMRs for intermediate/ocean class vessels.
3. Develop a proposal to carry out the SMR process and gather community feedback.
4. As part of their charge, the steering committee will need to define their role in the rest of design development process.

It was recommended that there be liaisons between the Gulf of Mexico, the Ocean Class, and the ARRIV efforts.

**Fleet Renewal Implementation Plan and Roadmap** – Larry reviewed the fleet renewal implementation plan and roadmap that has been drafted and posted on the UNOLS website at: <<http://www.unols.org/fic/renewal/roadmap.html>>. The draft plan includes an introduction, fleet construction schedule (2000-2020), an [Implementation Road Map](#), ship construction efforts in progress, and [2002 Timelines](#).

The roadmap was developed to generate community comment. It attempts to identify the steps/responsibilities needed for fleet renewal. One of the first steps is forming steering committees and this is what we have done at this FIC meeting. Beth White said that FOFC would review the roadmap and let us know if this agrees with their plans. Dolly and Beth both emphasized that broad community input is needed.

**FIC Membership** – Two FIC seats are currently vacant:

- One Non-operator Institution representative, and
- One Representative from any UNOLS institution.

A call for nominations has been advertised in EOS. First terms for Dave Hebert and Mark Brzezinski will end on 9/02. Both are eligible for second terms and will be asked about their willingness to continue serving.

The FIC reviewed the nominations that have been made. A motion was made and seconded to nominate Niall Slowey to fill the FIC position to be represented by any UNOLS institution. The FIC then recommended candidates for the non-operator institution position. These people will be contacted to determine their willingness to serve.

Dave Hebert and Wilf Gardner were asked to draft their respective steering committee task statements for presentation to the Council at tomorrow's meeting. Additionally, FIC's statement regarding the need for excess fleet capacity will be presented to the Council. These statements are included as [Appendix VII](#).

### **OTHER FIC ISSUES**

A Coastal Ocean Observatory Workshop will be held in May 2002. Rick Jahnke and Larry will be hosting the meeting at NSF. They will address observatory ship needs. Larry is the liaison between UNOLS and DEOS. It seems that many of the observatories are still ramping up. We need to stay on top of their efforts. We will need to consider observatory needs when developing SMRs. Beth White suggested that Ken Johnson be asked to speak to FOFC regarding observatory needs.

The FIC meeting will resume tomorrow, February 27, as a joint session with the UNOLS Council. Minutes for the remainder of the meeting are posted at <http://www.unols.org/council/cncmt202/cncmi202.html>.

***The meeting adjourned at 5:00PM.***

# APPENDIX I

## *Meeting Agenda*

**UNOLS Fleet Improvement Committee Meeting**  
**Tuesday, February 26, 2002, 8:30 a.m.**  
**Jacksonville University**  
**2800 University Boulevard**  
**Reid Medical Science Center, Room 210**  
**Jacksonville, FL**

**Tuesday, February 26, 2002 - 8:30 am - 5:00 pm**

Key aspects of this meeting:

The major focus of the Fleet Improvement Committee is Fleet Renewal. FIC must:

- Establish a Fleet Renewal Implementation plan
- Provide suitable material (SMRs, white papers) to NSF, NOPP, other agencies and the community
- Continue to urge the agencies to develop capitalization plans.
- Keep the community involved via letters to EOS etc.

This meeting must provide our plans to achieve the above.

**0830 Introductory Reports and Discussion** - The meeting will begin with about 1.5 hours of comments that will bring us up to date. Topics will include the following:

**Long-Range Planning for the UNOLS Fleet** - The NORLC endorsed FOFC's paper, *Charting the Future for the National Academic Research Fleet*. The final paper along with the UNOLS response to previous drafts can be viewed at: [http://www.unols.org/fic/fofc\\_fleet\\_plan.html](http://www.unols.org/fic/fofc_fleet_plan.html).

### **Analysis of Fleet Utilization Trends**

- Review Fleet utilization projections. Click here [stats.htm](http://www.unols.org/fic/stats.htm) for fleet charts (these will be updated prior to the meeting)

### **Fleet Renewal Efforts in Progress**

- KILO MOANA - Status and Operation Plans  
-Status report on Construction
- Alaska Regional Research Vessel - Status and FIC's Role in design review
- CAPE HENLOPEN Replacement Status
- SAVANNAH - Construction status and Operations Plans
- N. Atlantic and NW Pacific Oceans Class Vessels (OSU and URI plans)

**AGU/ASLO Evening Session** – Larry will summarize discussion.

At this point we should all understand the current situation regarding the FOFC process and what plans institutions are making.

### **10:00 to 10:20 Coffee Break**

Most of the remainder of the day will be spent addressing the four over-arching items (implementation, capitalization, planning, community involvement).

### **Fleet Renewal Implementation Plan**

- **Renewal Implementation Plan Website** – A roadmap for fleet renewal has been drafted and posted on the UNOLS website < <http://www.unols.org/fic/renewal/roadmap.html>>. Please be prepared to discuss.
- **FOFC Fleet Renewal Implementation Plan** – Status
- **Do the two plans agree?** How can the agencies and FIC work together?

### **Fleet Capitalization**

- **Appropriations and Funding for Fleet Renewal** – Agency Status
- **FIC's Role** - What can FIC do to help the agencies achieve their capitalization goals?

**LUNCH 12:30 to 13:30** - UNOLS 101 seminar for Jacksonville University (Prince or Knox), Reid Medical Science Center, Auditorium Room 105

### **Science Mission Requirements (SMRs) and Conceptual Design Development**

- Establish guidelines for producing SMRs including timeline
  - What information is valuable
  - Obtain input from ship construction managers and architects
- Identify SMRs for development (based on new vessel classifications)
- Identify geographic regions where efforts should be initiated
- Review the status of efforts in progress:
  - URI/OSU Ocean Class Vessel
  - Gulf of Mexico Regional Class Vessel
- Discuss Community Input and potential workshop options
- **FIC's Role** - How will FIC work with the institutions/consortia? U. Delaware and U. Alaska are examples.

**Community Outreach** - What is needed to keep and/or get the community involved?

- **EOS letters**
- **SMR workshops/meetings of opportunity**
- **FIC Website** - Recognizing the day's discussion what should be done with the FIC web site?
  - ⇒ Living Document Status

⇒ Additions/Deletions/Modifications

## **OTHER FIC ISSUES**

**KILO MOANA Science Shakedown Cruise Planning** – Plans to conduct science testing of KILO MOANA will be discussed.

- Development of a test plan
- Test Schedule
- Participation
- End product

**Fleet Capabilities needed to support Observatory Work**

- Will new ships be needed?
- What are the options?

**Quality of Service - What is FIC's Role?**

**Safety Recommendations for Shipboard Scientific operations - FIC's role.**

**FIC Membership** – Two FIC seats are vacant. A call for nominations has been advertised. FIC will review the nominations received. First terms for Dave Hebert and Mark Brzezinski end on 9/02. Both are eligible for second terms.

**Other Business**

**Wrap-Up** – Summarize items to report to Council

**5:00 pm      Adjourn**

**KILO MOANA Tours** - Wednesday Evening (depart from meeting for shipyard at 1600)

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**Wednesday, February 27<sup>th</sup>** – The FIC will meet jointly with the Council 8AM-12 Noon. The agenda posted for the Council will be followed. The focus is Fleet Renewal.

# APPENDIX II

**UNOLS Fleet Improvement Committee Meeting****Tuesday, February 26, 2002 – Jacksonville University, Jacksonville, FL**

<b>Name</b>	<b>Affiliation</b>	<b>Phone</b>	<b>Fax</b>	<b>E-mail</b>
Atkinson, Larry.	Old Dominion University	(757) 683-4926	(757) 683-5550	atkinson@ccpo.odu.edu
Coburn, Joe	Woods Hole Oceanographic Institution	(508) 289-2624	(508) 540-8675	jcoburn@whoi.edu
DeSilva, Annette	UNOLS Office - URI	(401) 874-6827	(401) 874-6167	office@unols.org
Dieter, Dolly	National Science Foundation	(703) 292-8581	(703) 292-3090	edieter@nsf.gov
Fornes, Bill	CORE	(202) 332-0063 X220	(202) 332-8887	wfornes@COREocean.org
Gardner, Wilford	Texas A & M University	(979) 845-7211	(979) 845-6331	wgardner@ocean.tamu.edu
Hebert, David	University of Rhode Island	(401) 874-6610	(401) 874-6728	hebert@gso.uri.edu
Knox, Robert A.	University of California at San Diego	(858) 534-4729	(858) 822-5811	rknox@ucsd.edu
Measures, Chris	University of Hawaii	(808) 956-5924	(808) 956-7112	chrism@soest.hawaii.edu
Meehan, James	National Marine Fisheries Service	(301) 713-2363	(301) 713-1875	james.m.meehan@noaa.gov
Pfeiffer, Tim	Office of Naval Research	(703) 696-6999	(703) 696-2710	pfeift@onr.navy.mil
Poulos, Steve	University of Hawaii at Manoa	(808) 956-6650	(808) 956-9971	poulos@poha.soest.hawaii.edu
Prince, Mike	UNOLS Office - MLML	(831) 632-4410	(831) 632-4413	office@unols.org
Rabalais, Steve	LUMCON	(985) 851-2808	(985) 851- 2863	srabalais@lumcon.edu
Smethie, William	Lamont-Doherty Earth Observatory	(914) 365-8566	(845) 365-8176	bsmeth@ldeo.columbia.edu
White, Beth	NOAA	(301) 713-3435 X135	(301) 713-1541	elizabeth.white@noaa.gov
Whitledge, Terry	University of Alaska at Fairbanks	(907) 474-7229	(907) 474-7204	terry@ims.uaf.edu



# APPENDIX III

# Renewal of the Academic Fleet



**UNOLS Fleet Improvement Committee Meeting**  
**Tuesday, February 26, 2002, 8:30 a.m.**  
**Jacksonville, Florida**

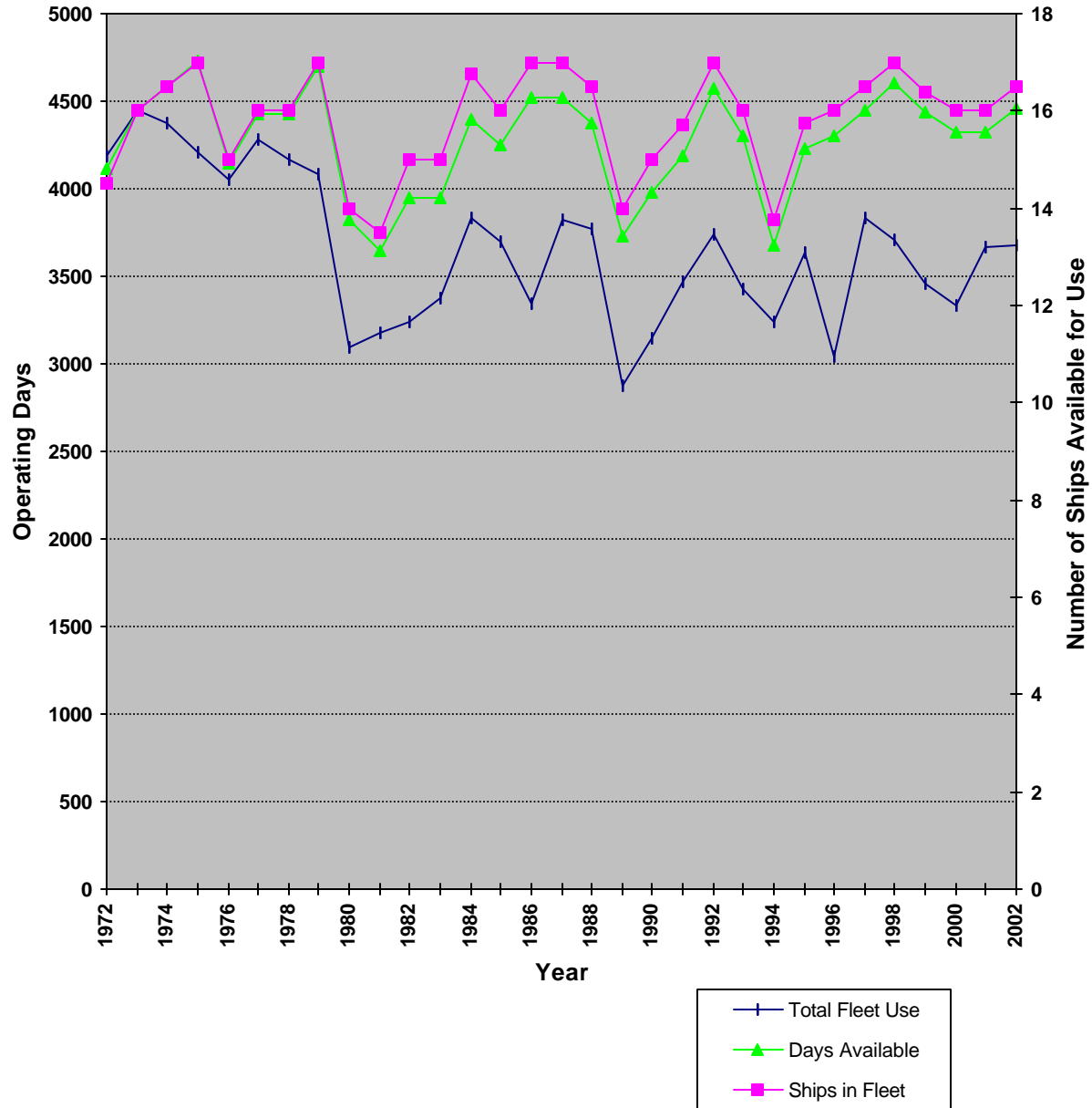
# Current Goals

- Establish a Fleet Renewal Implementation plan in concert with Navy.
- Provide suitable material (SMRs, white papers) to NSF, Navy, NOPP, other agencies and the community
- Continue to urge agencies to develop capitalization plans.
- Keep the community involved via letters to EOS etc.

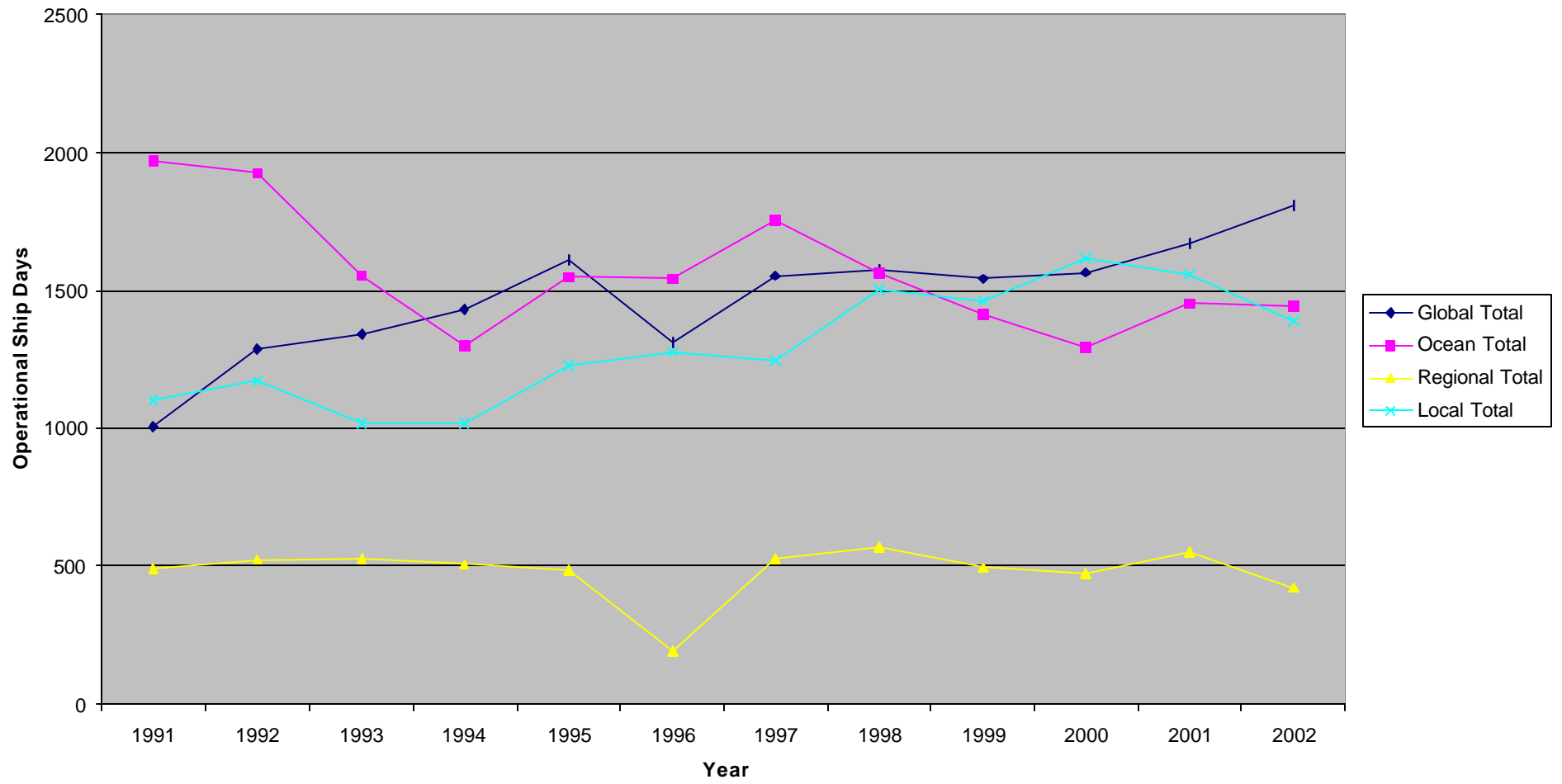
# The Current Situation

- **Long-Range Planning for the UNOLS Fleet. NORLC FOFC Report.**
- **Analysis of Utilization Trends**
- **Fleet Renewal Efforts in Progress**
  - **Kilo Moana - Our SWATH Test**
  - **ARRV**
  - **Cape Henlopen**
  - **Savannah**
  - **N. Atlantic and N. Pacific *Oceans* Class Vessels (OSU/URI effort)**

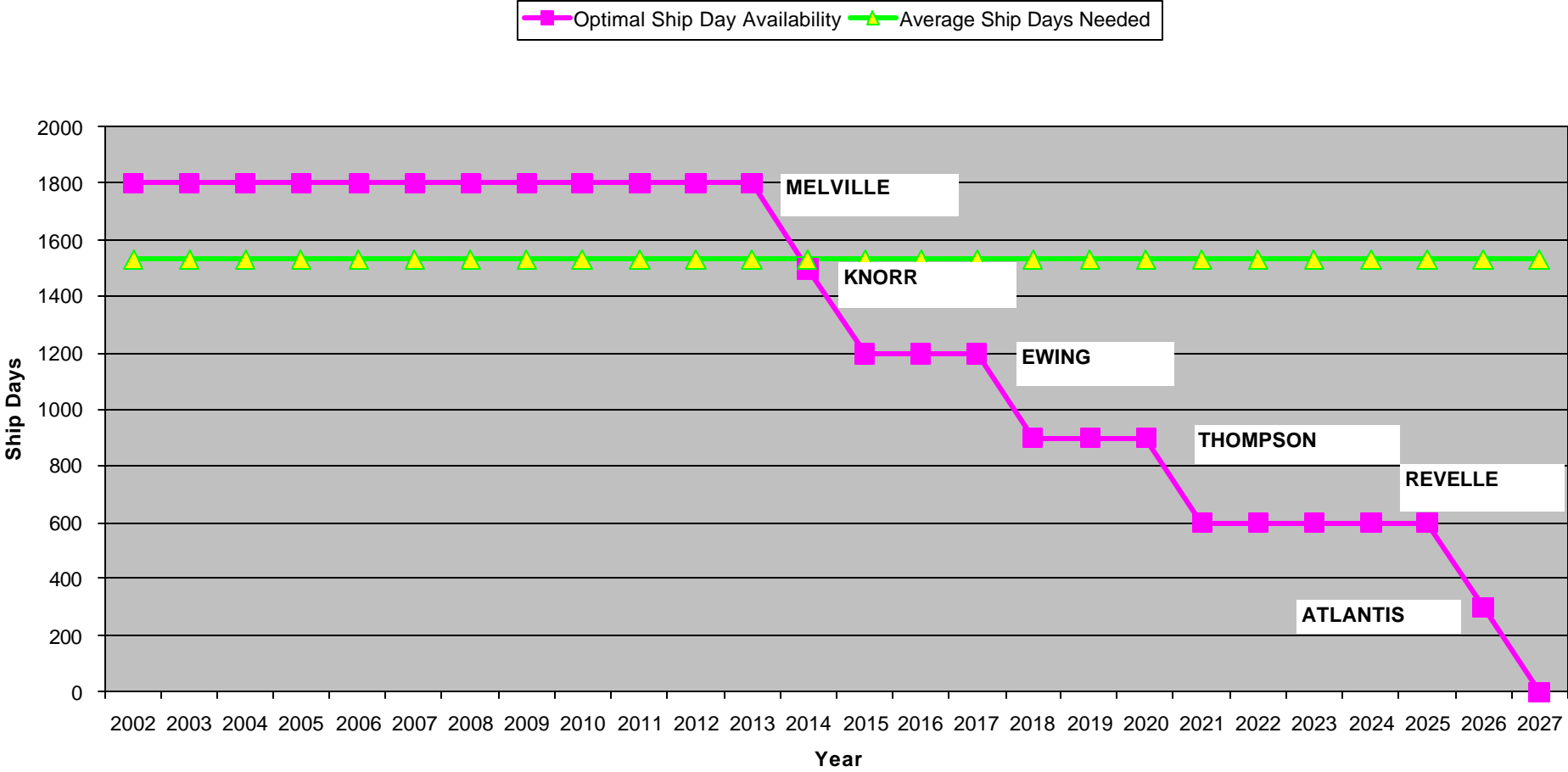
## UNOLS Vessels >150 ft: Days Available, Days Used, and Number of Ships



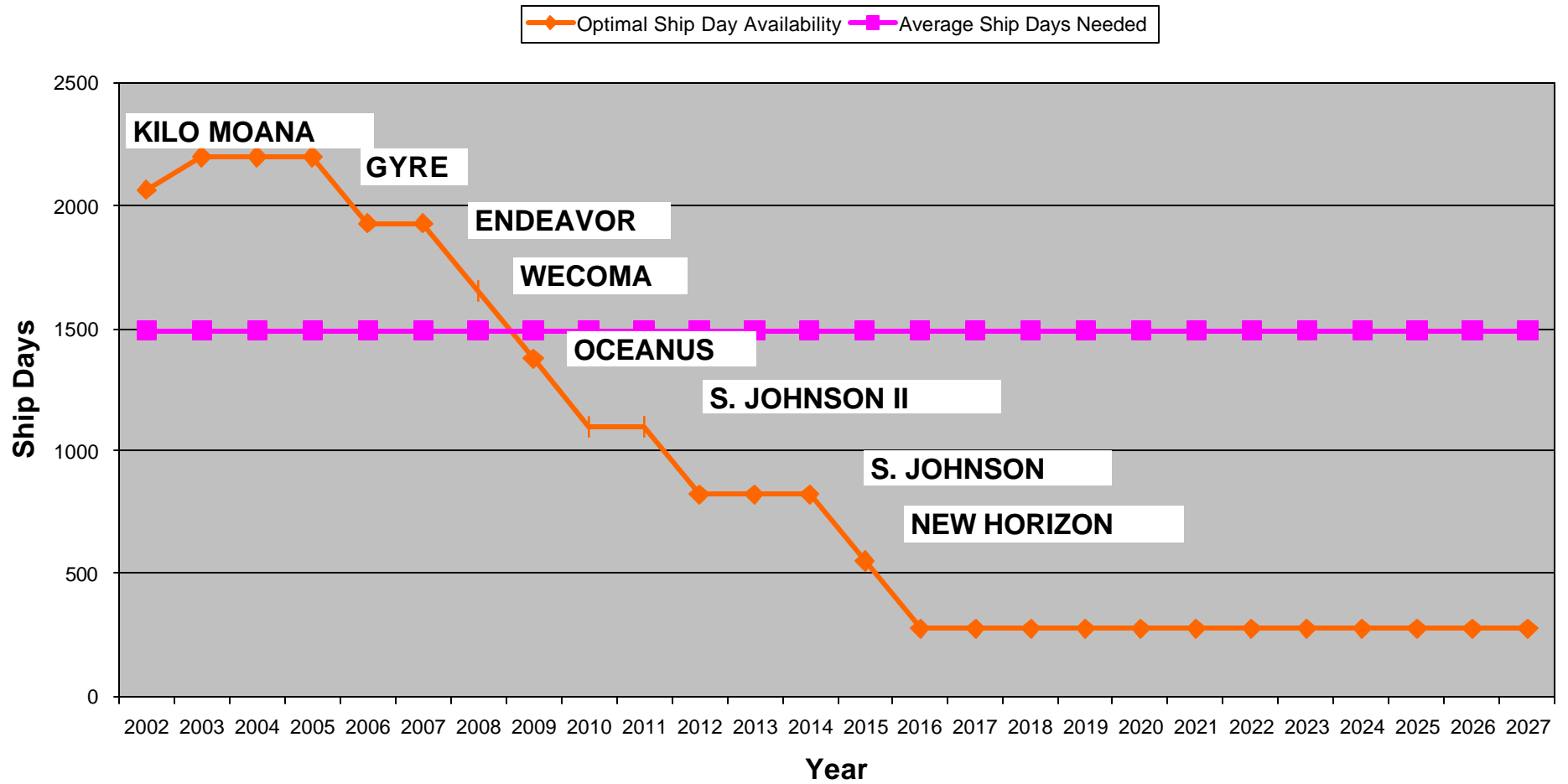
Utilization by Vessel Class: 1991-2002



# Global - Optimal Ship Days vs Average Days Needed

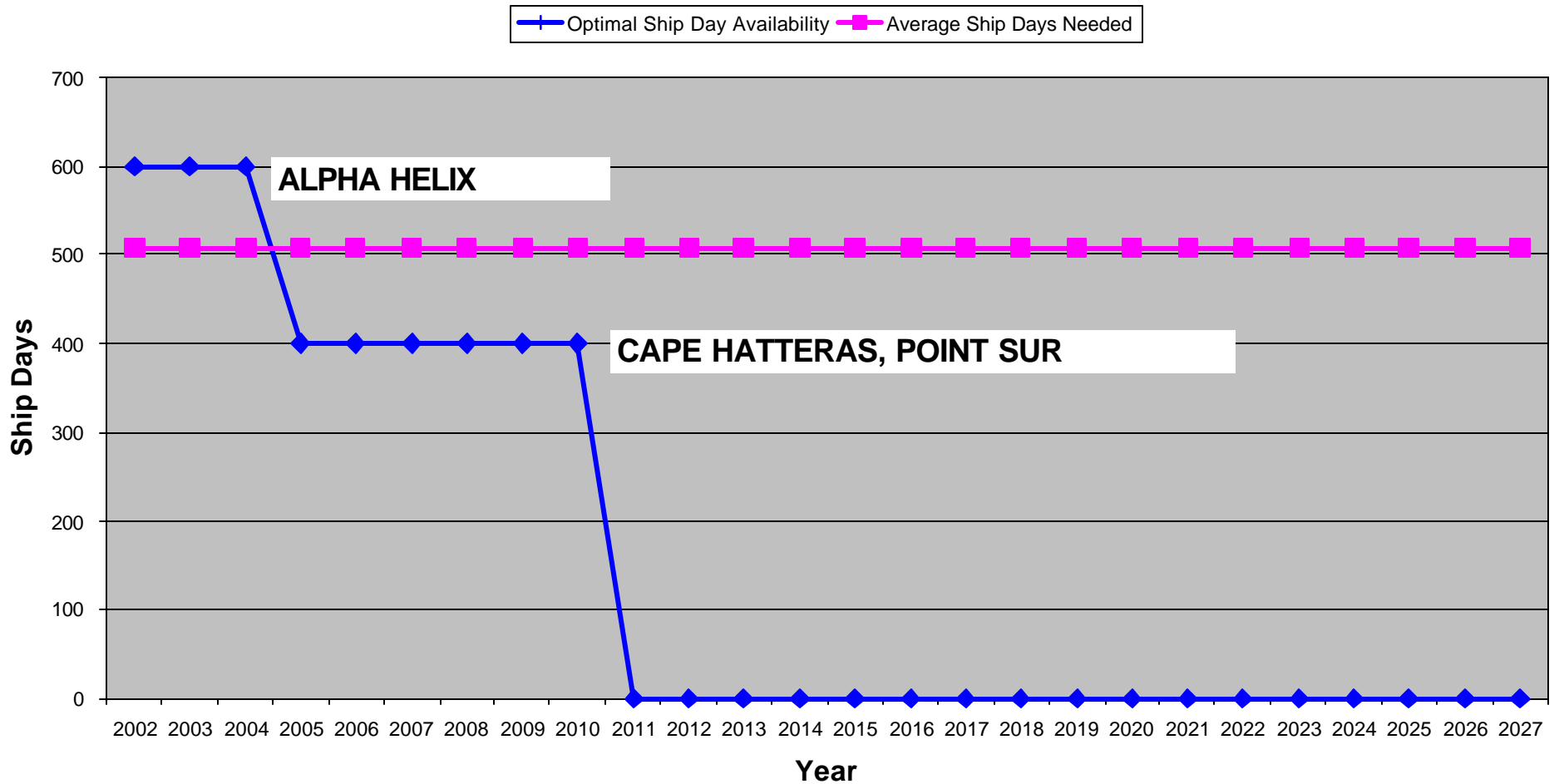


## Ocean Class - Optimal Ship Days vs Average Days Needed

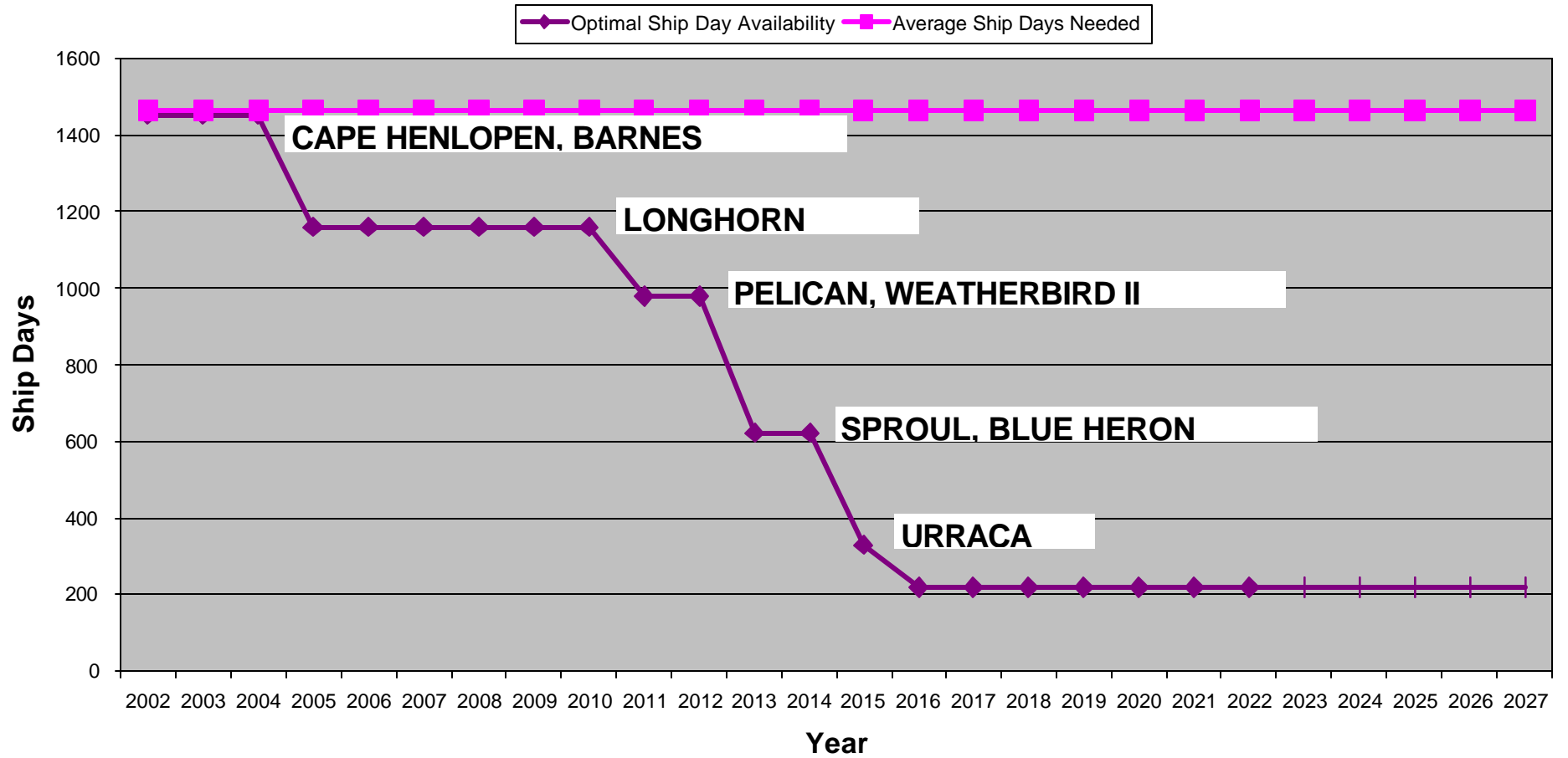




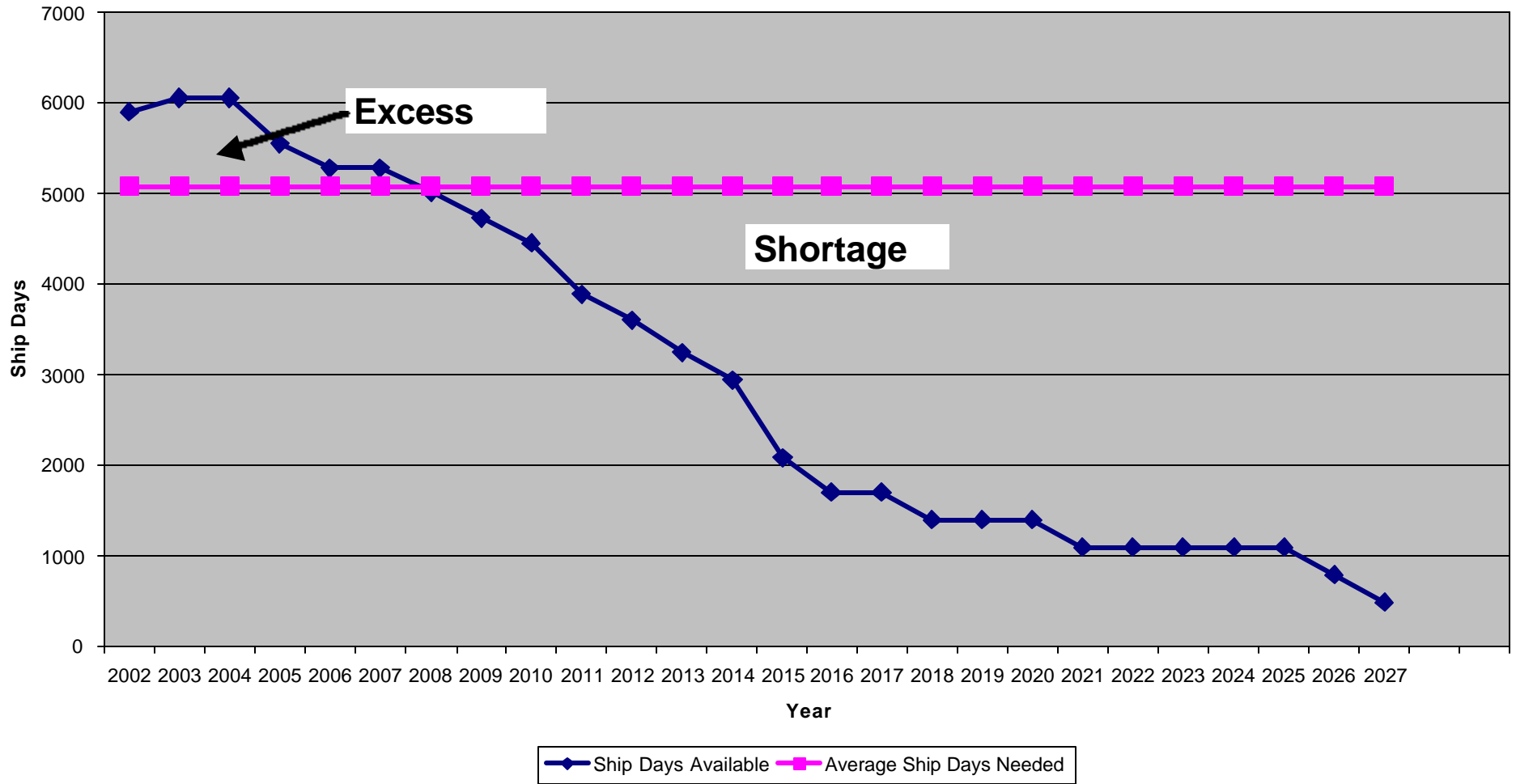
## Regional Class - Optimal Ship Days vs Average Days Needed



## Local Class - Optimal Ship Days vs Average Days Needed



Total Ship Days Available vs Average Ship Days Needed

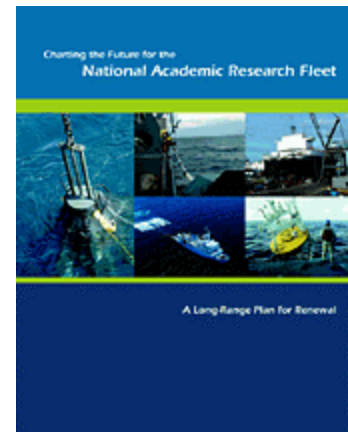


# **Fleet Renewal Implementation Plan**

- **Renewal Implementation Plan Website**
- **FOFC Fleet Renewal Implementation Plan**
- **Navy suggested approach.**

# Charting the Future for the National Academic Research Fleet – A Long-Range Plan for Renewal

- *“Building a portfolio of ship-concept designs and identifying science mission requirements (SMRs) will also be important functions undertaken to maintain a modern, technologically viable fleet capable of supporting evolving science needs.”*



# FOFC Plan



# Revised FOFC Ship Classification

<b>Ship Performance</b>	<b>Global Class</b>	<b>Ocean Class</b>	<b>Regional Class</b>	<b>Local Class</b>
Endurance .....	50 days .....	40 days .....	30 days .....	20 days
Range .....	25,000 km .....	20,000 km .....	15,000 km .....	10,000 km
Length .....	70-90 m .....	55-70 m .....	40-55 m .....	< 40 m
Science berths .....	30-35 .....	20-25 .....	15-20 .....	15 or less

# Parallel Process Begins

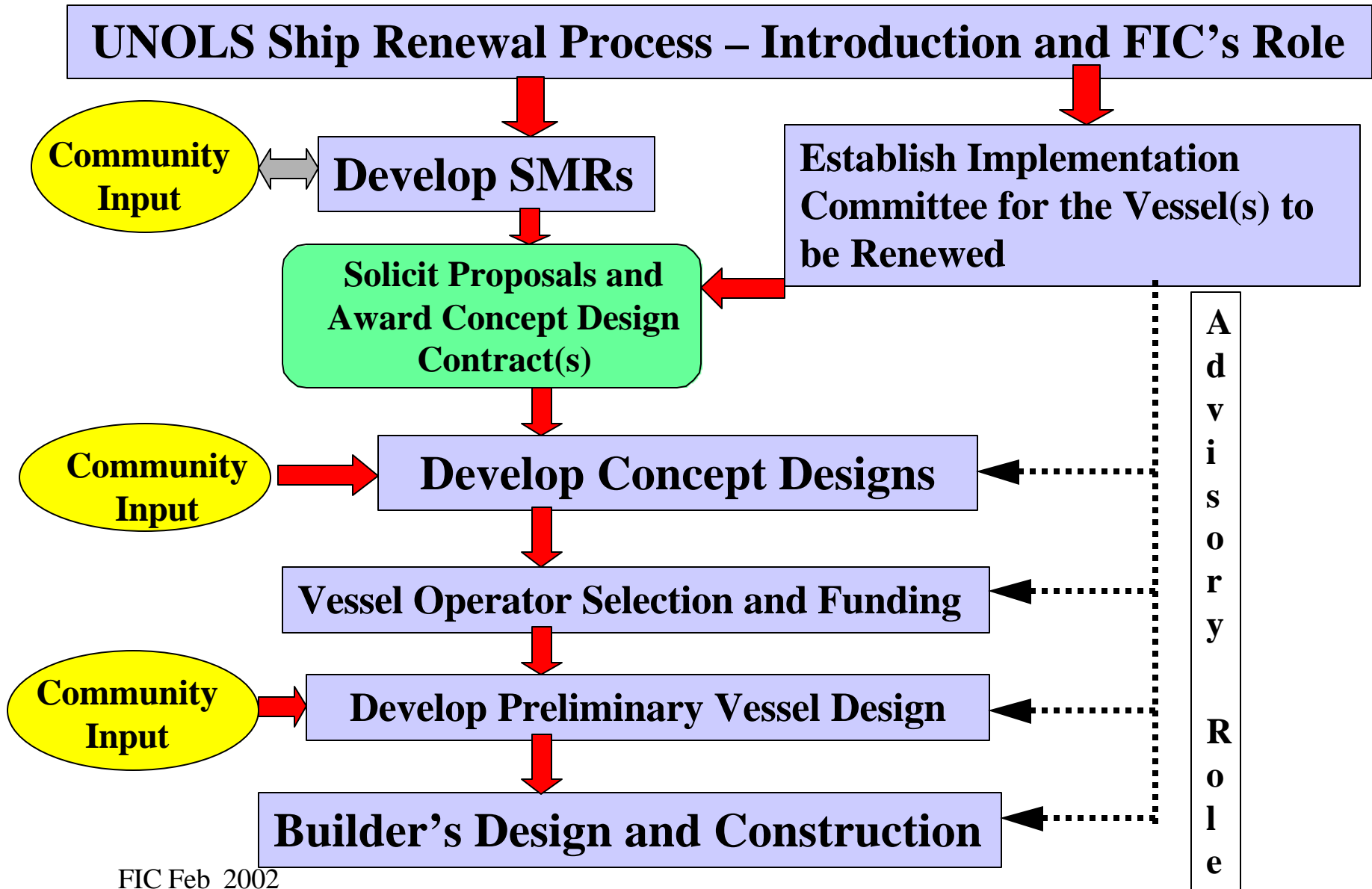
- Federal Side
  - Funding scenarios (who pays?)
  - Sponsorship (who builds?)
  - Operation (something we can afford)
- Academic Side
  - Capabilities of ships.
  - Number of ships.
  - Geographic distribution
  - Keeping vitality of the distributed system intact
  - Science Mission Requirements (Where scientists shape the ship)



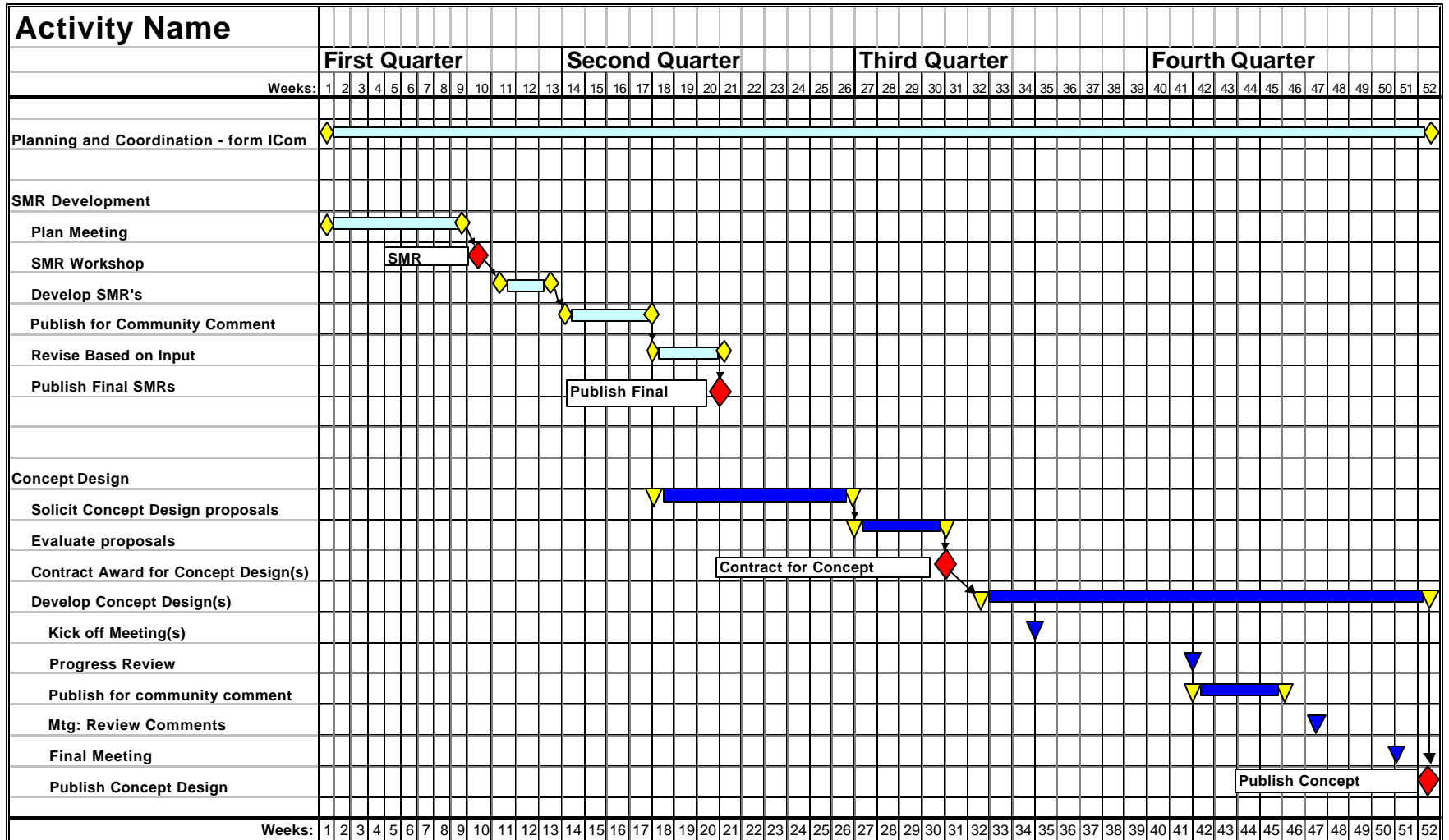
# Now the Navy Proposal

To reduce the Navy's acquisition cost for new oceanographic ships by investigating the feasibility of using a common hull platform for future T-AGS(X) and UNOLS Ocean Class ships.

# The SMR and Concept Design Process



# The SMR to Concept Design Process



# Design/Construction Funding Schedule

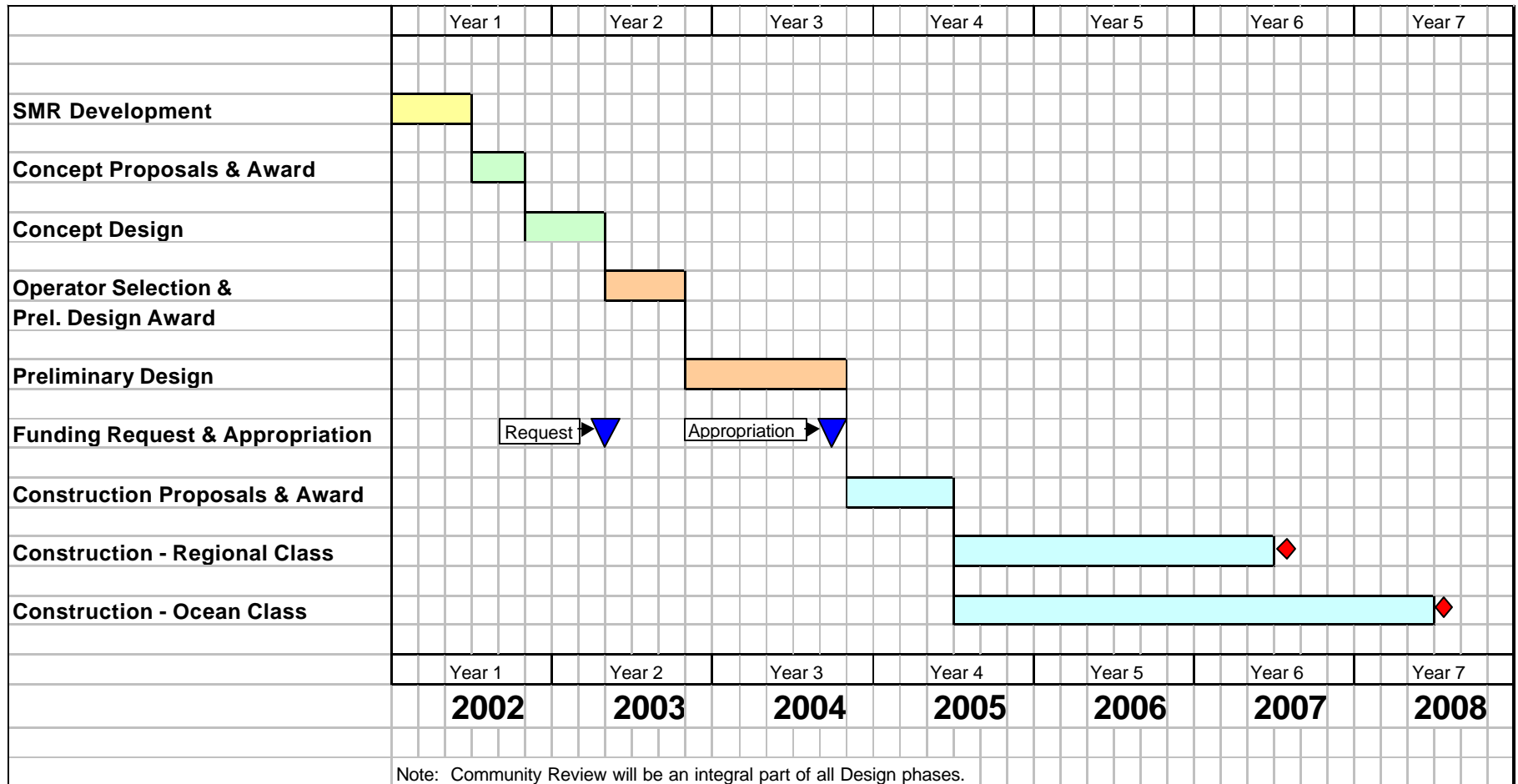
## **Gulf of Mexico Regional Vessel: Needed in 2006**

- **2002 (now) - Concept Funds(\$25K)**
- **Late 2003 - Preliminary Design Funding (\$500K)**
- **Early 2003 - Construction Funding Request (\$25M) –**
- **10/1/04 - Construction Appropriation**
- **2007 - Vessel in service**

## **NE Atlantic /NW Pacific Vessel: Needed in 2008**

- **2002 (now) - Concept Funds(\$25K)**
- **Late 2003 - Preliminary Design Funding (\$1M)**
- **Early 2003 - Construction Funding Request (\$50M)**
- **10/1/04 - Construction Appropriation**
- **2008 - Vessel in service**

# Design and Construction Timeline: Regional and Ocean Class



# Fleet Capitalization

- Appropriations and Funding for Fleet Renewal - Agencies
- FIC Role? What can we do?

# Community Outreach and Involvement

- Letters - EOS, etc.
- SMR Workshops.
- FIC Website.
- Ocean Sciences Town Hall.
- Recommendation
  - Regular (2/year in EOS and other society newsletters (ASLO, ?))
  - UNOLS Rep. Give specific instructions regarding contact.

# Kilo Moana Shakedown Planning

- Goal - assure adequate assessment by oceanographers for oceanographers
- Process - Test plan, test schedule, participation, end product.



# FIC Membership

- Two vacancies
  - Renewal of existing members
  - Nominations

# What will demand be?

- Effect of new technology. More buoys, gliders, and observatories and few ships?
- Most think demand will increase as new phenomena are observed.
- Funding priorities. Agencies can drive ship demand up or down. Reality is funding for field operations will stay essentially flat.

# Recent Developments

- Federal Review of Academic Fleet: UNOLS concept is OK. Asks for replacement plan.
- Federal Oceanographic Facilities Committee (FOFC) develops recommendations for fleet replacement.
- Community Review and Comment of Federal plans.
- Leads to ....FOFC Report

# New Recommended Classes

- **Global Class:** high-endurance vessels, operating worldwide.
- **Ocean Class:** Replacement for the “Intermediate” ships with vessels of increased endurance, technological capability, and number of science berths. These will be ocean-going vessels, though not globally ranging.
- **Regional Class:** ships will work in and near the continental margins and coastal zone, but with improved technology and more science berths than in current, comparably sized vessels.
- **Local Class** ships will fulfill near-shore needs that do not require larger or higher-endurance ships.

# **Our proposed process**

- **FIC identification of Fleet renewal needs**
- **Establish Implementation Committee (ICom) for each Vessel Class or Vessel to be constructed**
  - **Provide guidance and leadership for executing the design and construction of a vessel or class of vessels.**
- **Develop SMRs**
  - **Assess current inventory of SMRs**
  - **Develop SMR template of necessary elements**
  - **Generate (or update) general SMR's by Vessel Class**
  - **BROAD COMMUNITY INPUT**
  - **Evolve to Specific SMR's by Region, Ocean or Special Purpose**
  - **Review by ICom, FIC, community and agencies.**
  - **Finalize, publish, review and periodically update**

# **Our proposed process (continued)**

- **Develop Concept Designs**
  - **Based on SMRs**
  - **Solicit proposals from institution/architect teams (award may be to one or more)**
  - **Formal mechanism for community review during development**
  - **Finalize and publish**
  - **Use as a basis for operator selection and appropriation**
- **Operator Selection and Funding**
- **Develop Preliminary Designs**
- **Builder's Design and Construction**

# Latest Activities

- Discussions are progressing between ONR, Oceanographer of the Navy, NavSea and NSF regarding ways to get renewal process started.
- It is a given that the academic community will be involved.
- UNOLS/FIC assessment of best procedure for SMR process. Input from concept design groups.

# Other Present Activities

- R/V *Kilo Moana* - Construction
- Alaska Region Research Vessel – Design development
- *Cape Henlopen* Replacement
- Activities to replace ‘Ocean Class’ such as *Wecoma* and *Endeavor*
- Gulf of Mexico – initiated
- Many smaller, capable coastal vessels.



# **Role of Ocean Science Community**

- Participate in the SMR process.  
Whether you are on committees or not you can have influence.
- Talk with your UNOLS representative occasionally.
- Stay informed.

# Members of FIC

- Larry Atkinson, Chair (ODU)
- Mark Brzezinski (UCSB)
- David Hebert (URI)
- Chris Measures (U. Hawaii)
- Bill Smethie (LDEO)
- Terry Whitley (U. Alaska)
- Joe Coburn, ex-officio (WHOI)
- Web site <<http://www.unols.org/fic/>> for addresses and information

# APPENDIX IV

# OCEANOGRAPHIC SHIP COMMON SCALABLE HULL STUDY

## Proposed Scope of Work for Phase I – Requirements Analysis

21 Feb 2002

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### STUDY GOAL:

To reduce the Navy's acquisition cost for new oceanographic ships by investigating the feasibility of using a common hull platform for future T-AGS(X) and UNOLS Ocean Class ships.

### TASKS:

#### 1) Establish Requirements:

- a) In cooperation with program participants (ONR, UNOLS, Oceanographer, NSF, NAVSEA), establish requirements and desired operational capabilities for future UNOLS Ocean Class and T-AGS(X) ships.
- b) Establish a prioritized set of requirements and desired capabilities. Wherever possible, requirements should be expressed in ranges (threshold and objective values) rather than discrete values to improve the possibility of arriving at common hull attributes.

#### 2) Data Collection and Parametric Studies:

- a) Continue to gather parametric data for recent oceanographic ships. Expand data collection to include foreign research vessels. Include as many vessels as possible that incorporate key desired features – i.e. moon pool, higher speed. Since it is unlikely that existing research vessels incorporate all of the desired capabilities of the Multi Mission Ship (MMS) (particularly speed), expand data collection to include other types of ships whose designs might be adapted to oceanographic missions.
- b) Identify selected ships of interest for further investigation. Arrange ship visits to obtain more information and feedback from operators.
- c) Perform in-depth analysis of parametric data to establish ranges of parameters to investigate in ROM studies. Provide feedback to program participants for refinement of requirements and desired operational capabilities.

#### 3) ROM Ship Sizing Studies:

- a) Perform ROM studies to determine platform size and characteristics that would meet requirements and desired operational capabilities. Studies should address a variety of hull types including monohull, SWATH, trimaran, catamaran, HSV and SLICE. Study each ship type, to determine the ship size that accommodates requirements.

# OCEANOGRAPHIC SHIP COMMON SCALABLE HULL STUDY

## Proposed Scope of Work for Phase I – Requirements Analysis

21 Feb 2002

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- b) Investigate innovative ways that a common hull platform could be cost effectively modified to meet different user requirements
    - i) Hull size – i.e. parallel midbody, scalability
    - ii) Modularity – mission equipment, laboratories, propulsion plant, generating plant, sonars
  - c) Determine characteristics of each candidate platform including:
    - Principal dimensions
    - Weight estimate using NAVSEA Ship Work Breakdown Structure (SWBS)
    - General arrangements including mission spaces and working deck areas
    - Intact and damaged stability characteristics
    - Sonar transducer arrangements
    - Speed and power
    - Seakeeping Operability
  - d) Acoustic analysis - Assess sonar self noise, bubble sweep down, and overall sonar performance for each platform. Investigate acoustic impacts of moon pool.
  - e) Develop arrangements covering AUV handling alternatives
  - f) Determine advantages and disadvantages of each candidate hull type. Identify compromises (shortfalls) of common hull design.
  - g) Identify requirements that drive design features and their associated costs.
  - h) Identify features of design not required by all sponsors. Also identify areas of commonality. Investigate modifications that could be made to requirements to get closer to commonality.
  - i) Provide feedback for refinement of requirements and desired operational capabilities.
- 4) **Cost Estimates** –
- a) Prepare Class R acquisition cost estimates for candidate platforms.
  - b) Assess platform operating cost and total ownership cost.
  - c) Identify the requirements that drive cost and provide feedback and recommendations to participants on ways to reduce cost impact.
- 5) **Refine requirements** –

# OCEANOGRAPHIC SHIP COMMON SCALABLE HULL STUDY

## Proposed Scope of Work for Phase I – Requirements Analysis

21 Feb 2002

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- a) In cooperation with participants, identify refinements to requirements and desired operational capabilities that would improve the likelihood of arriving at a common hull platform.

### 6) **Develop Initial Common Hull Assessment** -

- a) Prepare report to document results of study including conclusions and recommendations.

### 7) **Acquisition**

- a) Develop a potential acquisition strategy and schedule to support sponsor's desired lead ship award year.

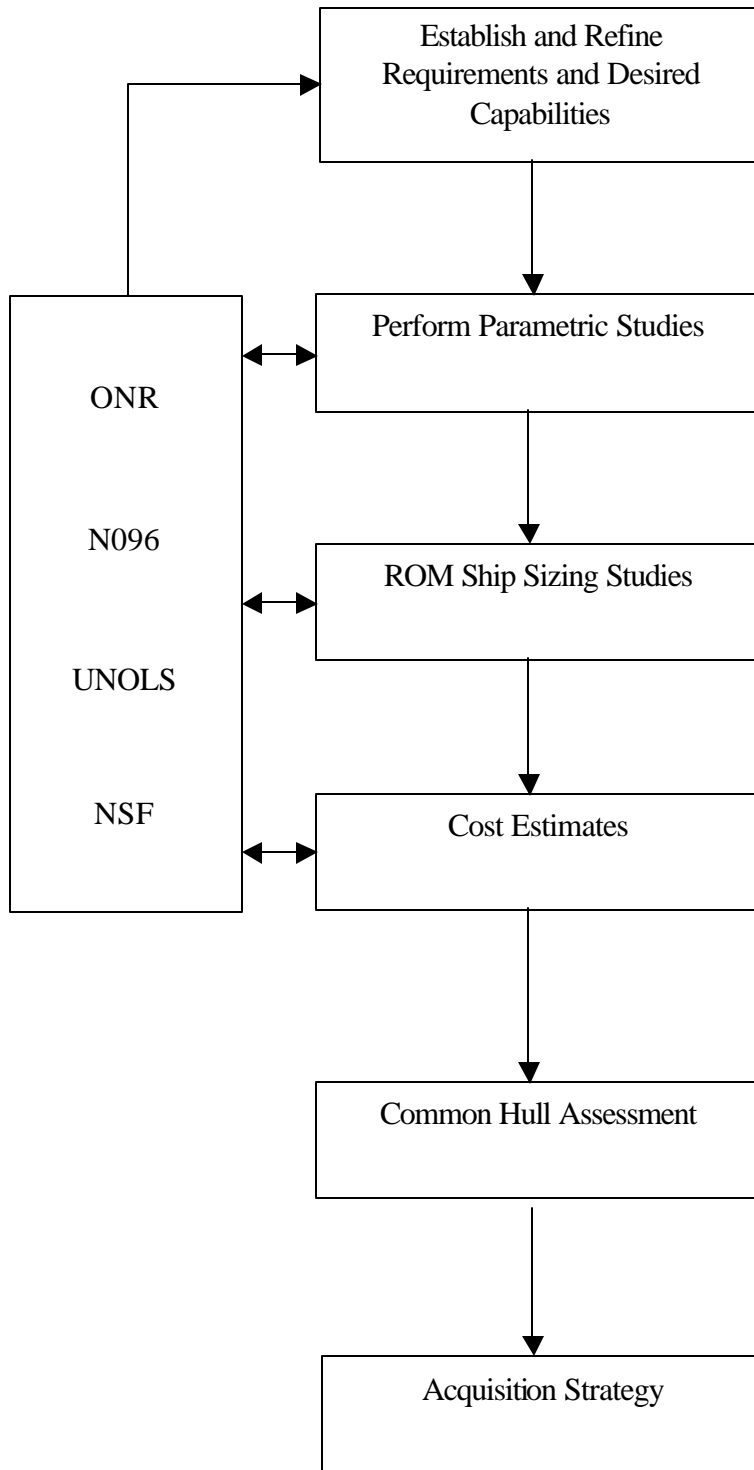
### 8) **Deliverables** –

- a) Oceanographic Ship Common Hull Assessment Report including conclusion and recommendations on feasibility of common hull
- b) ROM Ship Sizing Studies – Prepare the following for each selected hull type (note that some candidate hulls may not merit full consideration):
  - Principal characteristics
  - Speed and power characteristics
  - Weight estimate (SWBS 1 digit)
  - General Arrangements – sketches of deck plans and topsides
  - Sketch of sonar transducer arrangements
  - Acoustic assessment
  - Seakeeping assessment
  - Stability assessment
  - AUV handling arrangement sketches
  - Discussion of advantages and disadvantages, design driving features, areas of commonality and areas of difference
  - Class R cost estimates
  - Assessment of platform operating cost
- c) Parametric data and analysis results (tabular and graphical)
- d) Complete summary of requirements and desired operational capabilities for UNOLS Ocean Class and T-AGS(X) ships
- e) Trip reports from ship visits
- f) Meeting minutes
- g) Proposed Acquisition Strategy

# OCEANOGRAPHIC SHIP COMMON SCALABLE HULL STUDY

## Proposed Scope of Work for Phase I – Requirements Analysis

21 Feb 2002



# APPENDIX V



**R/V Kilo Moana Mission trial Part 1 Outline (primarily a time line)**

KILO MOANA Cruise 2002-01 (KM0201: JAX 5/1/02 - BALBOA 5/18/02)

Depart Mayport 0800 May 1st 2002

Transit to Michaelson sonar test area: 33 hours  
 U/way maneuvering & acoustic tests: 12 hours  
 EM120 SAT & survey (5 km bsl): 72 hours  
 Acoustic Characterization: 12 hours  
 Transit to Key West sonar test area: 48 hours  
 EM1002 SAT & survey (60-70 mbsl): 24 hours  
 Transit to Key West/Dry Tortugas: 6 hours  
 Additional Contingency: 9 hours  
 Personnel Transfer 0800-1000 May 10th: 2 hours (small boat from/to shore)

Depart Key West/Dry Tortugas by 1000 May 10th

Transit to Cayman Trough: 60 hours  
 Deep Water Survey (~7-7.5 km bsl): 12 hours  
 Transit to George Town (Grand Cayman, UK): 6 hours  
 Personnel Transfer 1600-1800 May 13th: 2 hours (small boat from/to shore)

Depart George Town (Grand Cayman) by 1800 May 13th

Transit to Colon (Panama): 60 hours  
 Additional Contingency: 2 hours  
 Arrive Colon 0800 May 16th  
 Transit Panama Canal: 48 hours  
 Arrive Balboa 0800 May 18th

All transits are calculated at 10 knots to build in contingency time (for weather/equipment) equivalent to 4 hours per 24 hours transit at 12 knots.

Basic Ship schedule thru June:

KM0201	01 MAY	NA6,NA9/N.ATL/	TAYLOR,B./UHI/	JACKSONVIL	15/NAVY/F
	15 MAY	MISSION TRIALS		COLON	
KM0202	16 MAY	PANAMA CANAL	TAYLOR,B./UHI/	COLON	03/STATE/F
	18 MAY	TRANSIT		BALBOA	
KM0203	19 MAY	NP11,12,13/N.PAC/	SMITH,C./UHI/	BALBOA	15/NAVY/F
	13 JUN	MISSION TRIALS + BENTHIC BIOLOGY		HONOLULU	05/STATE/F
					06/OTHER/F
Note: additional testing & checks of over-the-side ops: Piston Coring, Dredging, CTD					
During 19 May – 13 Jun Trials					
	16 JUN	KILO MOANA OPEN HOUSE		HONOLULU	N/A
KM0204	18 JUN	NP11/N.PAC/EQUIP	RALEIGH,B./UHI/	HONOLULU	06/STATE/F
	23 JUN	Test – STUDENT CRUISE			
	25 JUN	NP11/N.PAC/NSF	RALEIGH,B./UHI/	HONOLULU	0 (Non-Op)
	27 JUN	Inspection		HONOLULU	State

# APPENDIX VI

February 21, 2002

Dr. Larry Atkinson  
Chair, Fleet Improvement Committee  
Old Dominion University  
4600 Elkhorn Avenue  
Norfolk, VA 23508

Dear Dr. Atkinson:

I would like to provide the Fleet Improvement Committee with a brief status report on the University of Delaware's progress in designing a replacement vessel for the R/V CAPE HENLOPEN. As of this date, we are still on schedule in our design process as outlined in the timetable presented to FIC in November 1999 (attached).

The Concept Design was completed in October 2001, after which the University immediately proceeded to the Preliminary Design Phase. Bay Marine, Inc., was selected as the principle naval architecture firm, and Noise Control Engineering, Inc., as the primary acoustical consultant. The goal of the Preliminary Design Phase is to have the bid package (including drawings, specifications, and contract) completed by February 2003 so that the shipyard can be selected. The chosen yard will be involved in developing the Final Design. Construction is still forecast to begin in mid-2004. The artist's rendition, 3-dimensional model, and the selection of primary subcontractors, are currently underway.

Because of the estimated completion dates on several key design items (mainly model testing), we anticipate that the next meeting of the Delaware Research Vessel Committee (DRVC) will be in the fall of this year (September). The DRVC will focus primarily on detailed review of the labs, working deck, and accommodations. Their recommendations will be incorporated into the design prior to FIC's review, which we intend to do in November.

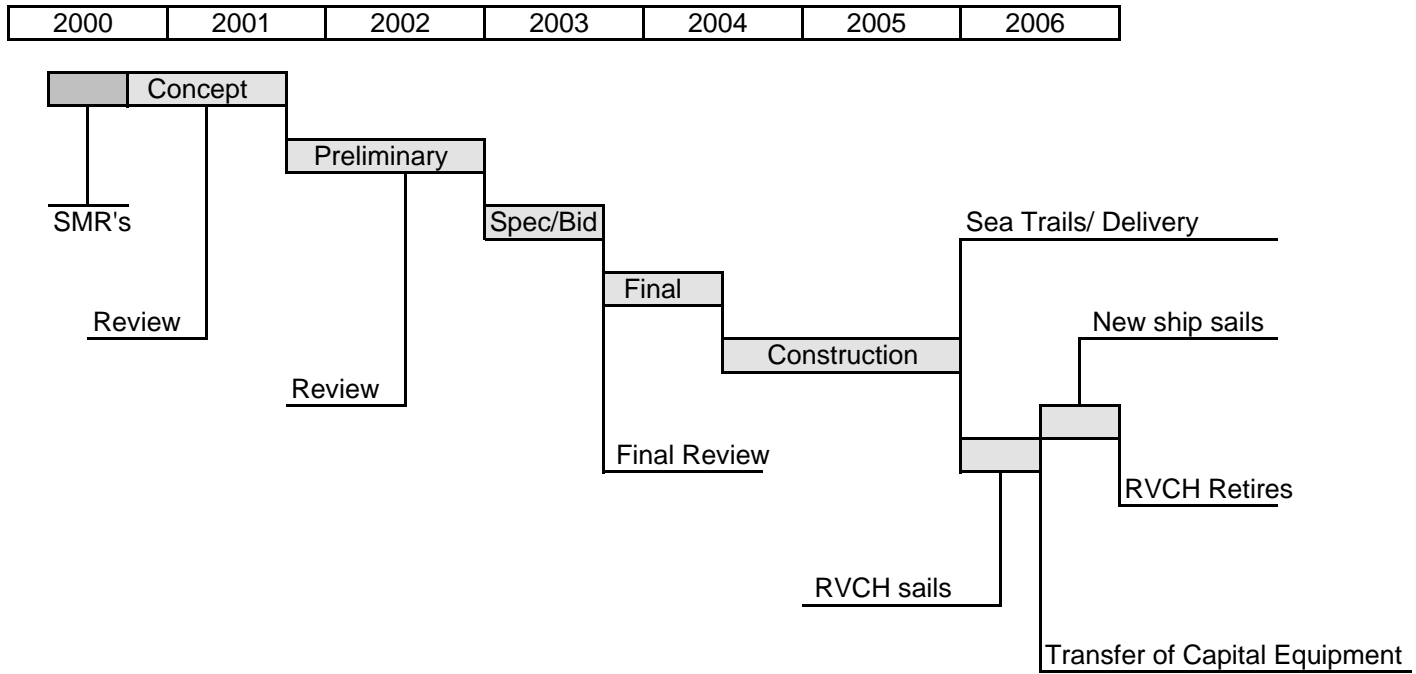
Sincerely,

Matthew J. Hawkins  
Director, Marine Operations

Enclosure

C/c: Dr. Carolyn Thoroughgood, Dean  
Dr. David Kirchman, DRVC Chair  
UNOLS Office  
Ms. Dolly Dieter, NSF  
Ship Program Officer, ONR

**Design and Construction Timetable  
R/V CAPE HENLOPEN Replacement Vessel  
University of Delaware**



**Note:** The "Design-Bid-Verify-Construct" Method Used for Discussion (Glosten Report, 1998)  
 - Good Control Over Design Process  
 - Lowers Technical Risk and Exposure to Claims at Construction

# APPENDIX VII

## **Apparent Over-Capacity**

The utilization figures seem to indicate an excess capacity of one ship. However science cannot be responsively scheduled without the flexibility afforded by the apparent over-capacity.

The long-term history is that the funding has been basically flat and ship demand comes from funded science proposals. The best estimate is that funding and ship demand will remain flat.

The FOFC plan seems to indicate a reduction in fleet size by one vessel, which if the demand remains flat will result in a fleet, which could not be scheduled to meet the demand of science.

Utilization is a balance between numerical efficiency and scientific flexibility. Obtaining 100% fleet use efficiency can only come by sacrificing flexibility needed to meet scientific goals – the point of the oceanographic fleet. In addition, the current excess capacity would disappear rapidly were there to be a 10 – 15% increase in sea-going funding or a similar increase in demand for sea-going research.

# Ocean Class Vessel

## Steering Committee:

**Dave Hebert (URI)**  
**Tim Cowles (OSU)**  
**Bob Knox (SIO)**  
**Joe Coburn (WHOI)**  
**SE Atlantic representative.**

## Tasking:

- **Develop a process for SMR development. - The process should define methods for getting broad community input. Identify workshop/meeting needs and essential participants including Naval architect. Establish a project timeline.**
- **Prepare a proposal to support workshop/meetings and submit to the UNOLS Office. Upon award, proceed to workshop and SMR development.**
- **Work with the Navy in support of their “Oceanographic Ship Common Scaleable Hull Study.”**
  - **Provide Tim Pfeiffer with a Steering Committee POC.**
  - **Provide a prioritized set of requirements and desired capabilities. Wherever possible, requirements should be expressed in ranges rather than discrete values. Evaluate existing SMRs.**
  - **Participate in study review meetings.**
- **Define steering committee’s role in implementation process (activities following SMR Development).**

# Gulf of Mexico Vessel

## **Steering Committee:**

Wilf Gardner, Chair

Steve Rabalais

Tom Shipley

Denis Wiesenburg

Dennis Hansell

Fic member - Gulf of Mexico

Rep. from outside Gulf

## **Tasks:**

1. What are the future science plans of investigators working in the Gulf?
2. Given that the region loses an Ocean class vessel in 2006, what are the science mission requirements of a new vessel to accomplish the anticipated work in the Gulf?



## **Proposed Meeting:**

- **Houston, TX - April 22**
  - **TAMU System - Institute of Biosciences & Technology (IBT) Building in Museum District - no cost**
  - **National call for meeting participation - e-mail, web, EOS**
  - **Anticipate ~25 people attending**
  - **Send request for funding to Mike Prince, UNOLS Office**
  - **Request statement of future use needs and SMR's in advance of meeting (from anyone)**
  - **Annette DeSilva to provide history of ship use data and type of work.**
- 
- **Update progress through UNOLS website**
  - **Liaison with UNOLS/ONR Oceans Class committee**

## **KILO MOANA Testing**

- Ship performance tests – proposal submitted to ONR
- Post cruise evaluations - entire science party
- Science equipment/systems testing (pre-science ops) – U.Hawaii is drafting plan
- Post-cruise de-briefs by FIC - Draft form to ask specific questions regarding the science performance of the ship. Obtain feedback from science party and crew. Terry Whitledge and Dave Hebert will draft form.