UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

UNOLS Council Meeting

SUMMARY REPORT

21 & 22 June, 2000

National Science Foundation, Room 1235
4201 Wilson Boulevard
Arlington, VA

UNOLS COUNCIL MEETING
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XI. Submersible Comparison Chart and Option Costs

Wednesday, June 21, 2000
NSF, room 1235
8:30 am

The meeting was called to order by Bob Knox, Chair. Introductions were made around the table. A list of attendees is attached as ***Appendix I***.

Accept Minutes - A motion was made, seconded and passed to accept the minutes of the February 2000 Council meeting with some minor corrections.

The agenda (***Appendix II***) was slightly modified to accommodate a conflict for NSF program managers by moving the afternoon break to 3:00 pm.

COMMITTEE REPORTS: Bob Knox provided summaries of the written reports submitted by Committee Chairs prior to the meeting. (***Appendix III***)

Deep Submergence Science Committee (DESSC) - Bob provided a summary of the DESSC Report. There was no discussion or questions.

Fleet Improvement Committee (FIC) Report. -There was a question from Dennis Hansell regarding the workshop on future science needs. Tim Cowles and Mike Reeve explained how Tim is putting together a workshop of around 20 scientists who will be looking at the long range need for facilities to support the science discussed in the Futures reports. FIC and Tim's efforts are being coordinated. Larry Atkinson pointed out that doing this with a workshop is necessary

because it has been difficult to extract what facilities are needed from the Futures reports. The workshop is tentatively scheduled for Aug. 10 & 11 or the week after.

Research Vessel Operators' Committee (RVOC) - The RVOC report was summarized and there were no comments or questions.

Research Vessel Technical Enhancement Committee (RVTEC) - The RVTEC report was summarized. John Freitag was asked for a summary of experiences on the HEALY. He reported that the US Coast Guard (USCG) crew was enthusiastic and cooperative. Testing is going well. John was asked what the rotation plan was for the USCG Marine Science Techs. Some billets on HEALY are being stretched out to longer periods to maintain continuity. Some discussion has been taking place about a UNOLS institution or institutions supporting HEALY operations on a continuous basis.

HEALY's Sea Beam system is operating "as well as any system in the Fleet." The system has returned 119 to 120 beams consistently in water as deep as 4,000 meters.

There was a question from Bob about where we stand with regards to establishing uniform standards for safe working loads on the various UNOLS cables. RVOC and RVTEC will put two members each on a working committee to draft some consensus standards for maximum working load (MWL) on standard UNOLS wires. With regards to conducting cable, longevity of conductors is one goal and safety of operations, breaking of the cable is the other criteria.

Ship Scheduling Committee (SSC) report was reviewed. Will be discussed further in agenda.

Arctic Icebreaker Coordinating Committee (AICC) – The AICC report was summarized with Bob giving a report on HEALY's visit to Baltimore in March.

Larry Atkinson, FIC Chair, reported additionally that FIC was publishing a letter in EOS that will draw the communities attention to the need for UNOLS fleet replacement planning. In addition a more complete report which will be the bulk of the FIC Biennial Review of the UNOLS fleet is available on the UNOLS web site:
http://www.unols.org/fic/planning/fltplan.htm

Federal Agency Reports:

Representatives of the Federal Agencies were given an opportunity to report on activities of interest to the Council or to bring any issues before the council requiring their input or action.

National Science Foundation (NSF):
Mike Reeve, Oceanographic Centers and Facilities Section (OCFS) section head reported that the NSF budget was being considered on the hill. The House is taking up the HUD and Independent Agencies funding bill with lots of amendments in the works. He thought that they might have some indications in the next few days. The potential budget increase for NSF could be anywhere from 0% to 22%.

There are a couple of staff actions pending in Ocean Sciences. They have interviewed seven people for Research Section Head. The Ship Operations Manager position, which will work with Dolly Dieter has been closed and NSF will now screen applicants for interview candidates.

The National Ocean Research Leadership Council (NORLC) of NOPP met about one month ago and approved the adoption of FOFC (Federal Oceanographic Facilities Committee) as an advisory committee reporting to them. FOFC was formerly the Federal Oceanographic Fleet Coordinating Committee (FOFCC) and it includes senior managers in the various Federal Agencies concerned with the facilities (ships, aircraft, submersibles and other facilities) that support the ocean sciences. FOFFC held a meeting on Thursday afternoon to officially form itself as FOFC and elect Margaret Leinen (NSF) as Chair.

As a subcommittee of FOFC NSF, ONR and NOAA are moving forward on the development of a long range national oceanographic fleet plan. They hope to have a draft report for the community by the end of the year. They are planning a two day retreat-like meeting to get started in July. Over the next few months they will be seeking input from the UNOLS FIC and the workshop being put together by Tim Cowles.

This past year the huge success of Biocomplexity proposals required a large component of ship time the magnitude of which was a surprise and a drain on Ship Operations funds. They have an agreement for the current panel that up to $1 million of the Biocomplexity program money can be used for shiptime costs. Trying to get this as a normal method of funding ships for programs outside of Ocean Sciences is being considered, especially in cases where there is a large sea going field program. Biocomplexity funding decisions were made late in the year and the amount of shiptime/costs was far greater than expected. It amounted to four 30 day cruises for Intermediate to Large ships. OCE ship operations normally pays for any ship needs for NSF regardless of program.

Dolly reported that the Ship operations program had difficulty making the budget for 2000, but was able to get it done with help from the operators and by keeping the Shipboard Scientific Support Equipment (SSSE) budget smaller than normal. Now there is funding available for training and for some special equipment purchases such as immersion suits through Lamont-Doherty Earth Observatory (LDEO) and for vans through University of Delaware (UDel). UDel is beginning the process by standardizing the van design and is getting bids. The specifications and designs will be posted on the Web for everyone's review.

Tom Royer asked about the Major Research Equipment (MRE) line item in the NSF budget, which was eliminated from the budget in congress. CORE says that these were specific items that were eliminated without "prejudice," that it is possible to put them back in again and that it is not an indication of future plans for the budget.

Office of Naval Research (ONR):
Sujata Millick reported that Admiral Gaffney has been nominated for a third star and will be relieved as Chief of Naval Research by RADM Jay Cohen. RADM Cohen's background is as a submariner and he has completed postgraduate work at Woods Hole Oceanographic Institution (WHOI) and Massachusetts Institute of Technology (MIT).

In 2000, the Navy has funded about $14 million in ship time including $3m for NAVO operations of UNOLS vessels. A larger and larger portion of ONR funding is 6.2 money for applied research. These programs are impacted by permits for acoustic research. Also, interacting with other Navy vessels may impact the status of UNOLS vessels with regards to clearances, etc.

Construction of AGOR 26 is on schedule. Lockheed Martin is the overall contractor doing the design and engineering. Atlantic Marine Inc. (AMI) is doing the construction with an architect in Seattle doing the detailed design. The team is working very well. Minor changes to the hull form were made to facilitate construction, which is one example of how the team is working together. The ship will be built modularly. AMI plans to start construction in August or September, and be complete by May 2001. Model tests were conducted recently in San Diego.

Oceanographer of the Navy:
Pat Dennis reported that Capt. Gunderson will be deputy to the Oceanographer relieving Capt. Donaldson who will become CNMOC. USNS BRUCE C. HEEZEN will call in the DC area and will be open to the public. The ship will then go to Rhode Island where the students that named the vessel will be invited to visit. HEEZEN will be in Providence around 26 July and will then go to New York City where LDEO will host the visit.

The Navy's newest TAGS survey ship, USNS MARY SEARS, will be commissioned in the near future.

Spare parts from Sea Cliff will be transferred to WHOI in the next few months and are valued between seven and eight million dollars.

Naval Oceanographic Office (NAVO):
Gordon Wilkes gave the report with view graphs that are included as ***Appendix IV***. In 2000, NAVO has used about 200 days on six ships with a budget of about $3 million. They have more needs but are accomplishing the higher priority work items based on the available funding. A view graph showed that work accomplished so far has amounted to about five ship years of work that would not normally have been accomplished because NAVO's ships are deployed away from the continental US. Since the program started, UNOLS has provided 1,454 days on 15 different ships. Gordon reviewed the work scheduled in 2000 that does not include any large ship operations and showed a view graph of planned 2001 work. Hawaiian Island work probably will

not be needed and would be scheduled if there is sufficient funding and a ship was available with out a lot of transit. Ship time Requests (STR's) have been submitted for plans based on $5 million of funding, but they have a 3 million dollar plan if needed. One large ship cruise on the East Coast is included but it would go away with $3m funding level. The consensus seems to be that 5 million dollars is the right number for NAVO funding, but it can't come out of Navy's existing budget. Support for adding this as additional funding to the Navy's budget on the hill is always needed.

US COAST GUARD:
The Coast Guard's written report was reviewed and is included as ***Appendix V***. It was noted that the date of HEALY's Commissioning is uncertain and this could impact the dates of the next AICC meeting.

National Oceanographic and Atmospheric Administration (NOAA):
Beth White reported for NOAA. Their Hurricane Hunter P3 aircraft was damaged when hit by small airplanes which broke free from their tie downs during a strong windstorm (microburst) while tied to the tarmac in Galveston, TX. They are looking for used parts to fix the P3 due to the difficulty of getting new parts.

Beth reported on RON BROWN's grounding incident. RON BROWN glanced off a rock ledge in Hiekish Narrows which is in Canadian inside waters. There was no hull penetration, no injuries, and no environmental damages. The port bilge keel took the brunt of the damage. They could not get into Alaska Dry Dock in Ketchikan, so went to Todd shipyard in Seattle and were repaired and back in service in two weeks.

NOAA is impacted by fuel costs and is trying to recover some of the added costs from the programs. NOS funding took a cut in the House and the hope is that it will be put back by the Senate. NOAA is working on training and compliance with ISM and STCW. They have started publishing an ISM newsletter.

Conducting the Sustainable Seas program has been a difficult process because of the efforts needed to keep the program with in safe bounds. Operations have been resumed from the NOAA ship McARTHUR in Monterey Bay and Channel Islands National Marine Sanctuaries. The program will continue with better guidelines for emergency procedures, sub pilot training and launch/recovery procedures. NOAA has been enforcing the use of emergency drills and pilot training. Procedures and rigging for launch and recovery need to be improved for the vehicles being used. A lot of pressure to "just do it" versus doing it safely has made the program a difficult one.

NOAA/National Marine Fisheries Service (NOAA/NMFS):
Jim Meehan reported that the bid package for the Fisheries Research Vessels (FRV) went out last week and will be open for 60 days. After receiving bids, there will be a review which will take about six weeks. They hope to have a contract out by October 2000. It should then take three years to build and outfit the six vessels.

NMFS will be working with UDel on the CAPE HENLOPEN replacement so that it will be capable of conducting fisheries research. NMFS also sent a letter endorsing the Univ. of Alaska's plans to design a fisheries capable research vessel as a replacement for ALPHA HELIX.

In the process of getting approval for the Memorandum of Understanding (MOU) between UNOLS and NMFS, Dr. Baker indicated that he would like one MOU between UNOLS and NOAA rather than separate MOU's for OAR and NMFS. The UNOLS office will work with Beth and Jim Meehan to make the necessary changes.

Beth has let line officers know about the FOFC long range plan process which Dr. Baker has said everyone should take seriously. Beth will provide their feedback to the FOFC subcommittee working on the Fleet Plan.

The web site with information on the NOAA FRV is at: http://www.sao.noaa.gov/frv

Consortium for Oceanographic Research and Education (CORE):
The CORE report was given by Bob Winokur. There was a joint hearing on Ocean Observatories with six congressmen present from the Saxton and Taylor committees. Congressman Taylor wanted to know about lack of coordination between Navy and Army Corp. More important was interest in a program called OCEAN.US which is an integrated national approach to ocean observing.

On June 13th Bob gave a briefing to the Ocean Caucus on Governance. He addressed the issue of how the US currently manages the oceans and coastal zones that make up our large EEZ and how a more coordinated approach for the 21st century should be on the agenda of the Oceans Caucus. Congressional staff were encouraged by representatives Farr and Saxon to take the oceans seriously. There are encouraging signs that the Oceans act may pass this year. http://core.cast.msstate.edu/oceansact.html

On July 17th, 2000, the American Association for the Advancement of Science (AAAS) will host an International Ocean Science Day, a special one-day exploration of the science of three key ocean issues: fisheries, gas hydrates, and ocean born diseases. The purpose in bringing together leading authorities is to provide all those concerned with ocean issues a close look at the important scientific findings that define these topics.

On July 18th, 2000, the American Geophysical Union (AGU) and the AAAS will host a conference and reception entitled, Oceans for the New Millennium: Developing and Implementing Ocean Policy. The event has been organized in consultation with the House Oceans Caucus, a bi-partisan caucus formed earlier this year to foster awareness and develop policy on ocean issues. The Caucus is co-chaired by Representatives Tom Allen (D-ME), Sam Farr (D-CA), Jim Greenwood (R-PA), and Curt Weldon (R-PA) and includes approximately 50 members. http://www.house.gov/curtweldon/oceans/

This will be a daylong forum to assist the House Oceans Caucus in developing a policy framework on the following four topics: Biology, Pollution, National Security, and Governance. Panels will be composed of Caucus Members, representatives from federal agencies, and experts from the private sector, academia, and the non-governmental organization community. Keynote

speakers include Dr. Sylvia Earle; Dr. Robert Ballard; and Jean-Michel Cousteau. There will also be a reception on USNS BRUCE C. HEEZEN (T-AGS 64) which will be organized along with the Oceanographer of the Navy to honor the House Oceans Caucus and provide a showcase for the Navy's new, state-of-the-art survey vessel. A keynote speech will be delivered by Admiral Donald L. Pilling, Vice Chief of Naval Operations. http://www.aaas.org/spp/cstc/oceans/

A CORE project: Census of Marine Life is proceeding. The steering committee is putting together a strategy. The Sloan Foundation is partnering with NOPP to provide about 4.5 million dollars of funding. Initially the Ocean Biographic Information System (OBIS) is where most of the funding is going. In the future there may be a greater need for facilities such as ships. http://core.cast.msstate.edu/censhome.html

A White House Millennium evening event, with Marcia McNutt as the Oceans Speaker went well. During the evening President Clinton endorsed some important existing NOAA led exploration programs and stated his support for increased funding for science and technology. Marcia was able to make the point in answering a question that Ocean Science received about one tenth the money for research than the space programs. Text of Dr. McNutt's and the Presidents remarks can be read at:
http://www.pub.whitehouse.gov/uri-res/I2R?urn:pdi://oma.eop.gov.us/2000/6/13/4.text.1

State Department: Tom Cocke introduced his boss Ray Arnaudo, Acting Director of the Ocean Affairs Office, who gave a brief overview of the State Department from Tom Cocke to Madeleine Albright. There are Regional Bureaus and Function Bureaus. Oceans, Environments and Science (OES) is a functional office and works on administrative aspects of clearances first but must interact with Regional Bureaus in obtaining the clearances. Within OES the Oceans Affairs office deals with Ocean Science. Bill Erb was the head of the Ocean Affairs office. Tucker Scully is the Acting Deputy Secretary for OES. Their office handles all aspects of oceans except fisheries which is in conservation. Tom has vessel clearances as his primary duty and Ray gets involved when there are problems related to access. The office continues to ask for a position to support Tom's work so that Liz Maruschak can be funded by the State Department. Ray thanked those that have been funding her position. He also mentioned the computer software upgrade that will help with the program.

Ray emphasized that working with Tom and OES in obtaining permits is important because it fosters a uniform method for dealing with the Foreign Countries. Although Mexico continues to be difficult, the key person in Mexico City, Larry Kerr has been promoted to deputy chief of mission, which will help to ensure that top levels at the embassy are aware first hand of the problems. His replacement has not yet been identified.

Ray brought up the issue of whether or not Navy owned vessels are public vessels or private. State Dept. maintains that vessels operated on charter doing research under grants to private institutions are in fact private vessels. Public vessels have to go through diplomatic channels to arrange port calls. ATLANTIS was viewed by Mexico as a public vessel and because only three US Navy vessels could call in Mexico at any one time, they were not allowed to enter port during a recent cruise.

Is the issue of public versus private vessel still an open question? At the moment the long-standing policy that these (UNOLS vessels) are private vessels is reaffirmed and it should be consistently applied. The meeting that was held with Navy, NSF and State confirmed that the status of the Navy and NSF owned vessels remains private. It still remains to be determined if it makes more sense to treat these vessels as public or private, however all factors such as regulations, clearances, insurance, crewing, etc. should be considered before any actions are taken that would result in a change of status. Mexico, Brazil and Spain require that port calls for research vessels must be requested through diplomatic channels even though they may be private vessels. Mexican Port Call clearance requirements nominally need two weeks notice. It remains to be seen if Mexico accepts the status of Navy (or NSF) owned research vessels operated under charter as private vessels.

Tom Lee asked about clearances in Cuba. They are requiring at least six months notice for the request in Cuba, which means a much greater lead time to State Department in order to make sure they are submitted on time. There are some pending approval, so we might find out how well they fare in the near future.

UNOLS ISSUES: Improvement of the Quality of Service

Tim Cowles is the chair of the ad hoc committee appointed at the last Council meeting to examine how UNOLS accomplishes the recommendations regarding quality of service in the NSF Academic Fleet Review (AFR) report. He introduced the session, which will focus on the goals and strategies for instituting a Quality of Service Improvement program within the UNOLS fleet.

Tim Cowles started the session by reading the sections from the NSF AFR regarding continuous improvement and formal quality control in the UNOLS fleet. Getting a handle on the scope of the problem and how to define quality control for the UNOLS fleet has been the hardest thing. It was compared to pushing a marshmallow. Tim began by passing around a draft report and reviewing the recommendations from the AFR. He also pointed out that the UNOLS office had established a web site to facilitate the discussion of the committee and that it included links to a good deal of information on quality in organizations. The web site is located at www.unols.org/quality/Quality_of_Service.html and it includes a link to a program at NSF called Innovation and Organizational Change (IOC).

Tim introduced Dr Marianne (Sam) Jelinek, the IOC program manager, who gave an overview and history of the program. The program exists because there were people who in the past knew how to accomplish quality results but they had been displaced and nobody knew a lot about the methods they used to achieve quality. Since the program started, the research has developed a pool of knowledge on how organizations can achieve quality. Most of that research is focused on single organizations such as a corporation or government agency with some work being done on cross-organizational relationships such as those between manufacturers and suppliers. She found the challenge of establishing a formal quality program for UNOLS to be a very interesting and complex challenge due to the multi-varied relationships between the independent operators, funding agencies and scientific users. She thought that designing a workable quality management

structure for UNOLS would be of interest to researchers in her field. To date she knows of no research on a highly collaborative organization such as UNOLS.

In developing a formal quality control or improvement program Dr. Jelinek warned of some common dangers that need to be avoided:

- "Premature Closure" on something that's true and useful, but may only be partial, and, in absence of a broader view, could be dysfunctional (if only by creating the illusion that "we've solved the quality problem)
- "Formalized but Useless" rigor, documentation or procedures. It's easy to count some things, but these may not be especially useful to really address the quality issues of concern.
- "Cultural Misfit" a real danger, given academic researchers and mariners, if an overly bureaucratic method is chosen.

Next she outlined some potential targets for our attention:

- The need to collect real data about quality; surveys may not be enough. Interviews with research vessel users might generate a clearer picture.
- Means to access real data? The issue is perceived risk to a complainer. If we use an outsider to assess quality issues, their credibility is an issue; we should use technology as a bridge for on-going assessment (e.g., chat space inviting complaints/criticisms, which can be monitored)
- "Ownership" issues – how to include clients? staff? funding agencies?
- Cross-organizational culture is a key element in a co-operative formal program of quality improvement.

Lastly she outlined important issues to consider when formalizing a program:

- Means to tie "quality" into performance assessment across organizations: Quality measured as research achievement, safety and cost savings. Quality is free because it pays for itself by getting the job done right the first time.
- Means to create "UNOLS culture" across organizations: use technology for creating "custom service" (e.g., where Mexican waters research is proposed, send back information reflecting the six month timeline, diplomatic channels, etc.)
- Data-driven problem identification & response:
    - Researcher expectations
    - Formalized resource descriptions, choice
    - Trade-offs made explicit?
- You're a RESEARCH organization, so sponsor some research! There are some researchers that would be qualified and may be interested in tackling this problem such as a researcher at UC Berkeley who specialized in Aircraft Carrier operations. The IOC program looks for researchers who come in with a partner organization that lets them in to the process of the organization.

Sandy Shor indicated that working on the quality of service issue is important to the Technical Services program and that he would contact Dr. Jelenick to determine what the possibilities were for collaborating on research in this area.

Tom Shipley asked about the time frame for completing a "research project" on quality for the UNOLS organization. His concern was that normally research projects take 3 to 5 years from conception to completion. Dr. Jelenick pointed out that we would not be starting at square one, that there is a lot of applicable research that has already been done. Also we have already made a head start on defining the problems with the work of the committee and the online discussion.

Mike Reeve talked about the efforts of National Environment Research Council (NERC) and their quality control efforts. The consulting firm, Europort, specializing in quality improvement programs in the maritime industry has worked with Paul Stone on quality issues at NERC. The council decided to invite Jeff Ford of this company to address the fall meeting.

Tim Cowles ended the morning session by listing the outcomes that he would like to see from the discussion in the afternoon.

12:00 pm Lunch Break

Quality of Service Improvement: Continued Discussion

The areas outlined by Tim Cowles for discussion were as follows:

How do we (users, operators, agencies) define the type and level of services that are subject to a quality of service assessment? It is clear that users must participate with operators in this process. What is the appropriate forum for this? Workshops? Special sessions at national meetings? Questionnaires and surveys? How does this process overlap with the ongoing efforts to establish consistent service levels within the fleet?

How do we assess how well we are doing? What new assessment approaches should we employ? Users and operators should agree on appropriate metrics for assessment, particularly from the standpoint of compliance to standards versus excellence in performance. Do we need professional assistance to establish these assessment approaches?

Who should oversee a 'quality of service' program within the academic fleet? Is UNOLS the appropriate supervising body?

What criteria should we use to evaluate when we are ready to implement or suggest specific quality strategies? The 'quality' literature warns against premature implementation of strategies before the quality problem has been defined well.

It was pointed out that open sessions at national meetings don't always work. Patty suggested that perhaps having workshops and inviting speakers like Sam to educate the community would help generate meaningful input.

It was also suggested that users and providers need to agree on key elements of any quality program. In order to get real responses a person needs to call and speak directly with users and operators. Surveys alone will not get the job done thoroughly.

Dennis Hansell asked how we improve the input to the committees that exist. RVOC and RVTEC are examples. Perhaps there should be scientists on RVTEC and RVOC. Tom Shipley agreed that this would put the user and provider in the same room.

It doesn't seem that the assessments we now use are effective. Just figuring out what things need to be assessed is a project. One of the issues that was addressed in the discussion was the nature of feedback, or lack thereof, that we have regarding the level of service. The current methods of collecting input through post cruise assessments are not uniform in getting the feedback necessary to correctly evaluate where improvements are needed.

We need to convince the scientists that the post cruise assessments are used in a meaningful way. We need to let them know that the cruise assessments are used to get new improved equipment, modify procedures and correct safety problems.

Tom Lee discussed ways of getting information. Are we asking the right questions?

Mike Prince displayed the current assessment form and showed the questions that are currently being asked. Tom Royer asked how the user gets the form. Perhaps it needs to be sent directly to the PI. It was noted that in some cases this is done by email and in other cases a paper version is given to the PI before they leave the ship.

Sandy Shor suggested that we ask "What problems did you encounter in your cruise to prevent it from being 100% successful?" This is similar to a question that is asked on the current form.

Dolly reinforced the need to talk one on one with the PIs. Patty suggested that perhaps it should be a requirement that a scientist at each operator institution survey the PIs. He/she would be responsible for providing feedback.

Annette recommended that we add a statement up front on the assessment form letting everyone know how the assessment form is used and whom it goes to. We need to improve the communications between the operator and the chief scientists. We should also add this to the assessment form.

Dolly cited the DESSC model. It is a committee that includes technicians, operator, scientists and agencies. The model works well. It is also a community that is very vocal. They never hold back in their criticisms. It was pointed out that many of the ALVIN users are experts.

There was discussion on how we need to educate the new, young PIs. Patty noted that the Web and Fastlane are helping the process. The Ship Time Request form could be used for educating users and operators about expectations and how they are met.

Beth asks if UNOLS has a cruise planning guideline. NOAA has a very detailed guideline that is step-by-step and month-by-month. Their criteria are very detailed. UNOLS pre-cruise plans exist, but are not uniform throughout the fleet and use of them is not uniform among scientists.

Sandy asked whether the pre-cruise plan is ever compared to the post cruise assessment. Annette remarked that UNOLS Office does not do this since the office does not normally see the pre-cruise plans. Operators and PI's would be in a position to compare pre-cruise specifications with actual cruise products. It is unknown if scientists are clearly making known the specifications of what is needed or if they are getting what they ask for.

Mike showed the elements that are examined as part of the Baldridge Quality Awards process. The first areas that are examined are leadership and strategic planning which could easily be the responsibility of the Council.

Tim brought up the issue that there is a perception that UNOLS is an operator driven institution. Bob suggested that we start with a White Paper or article for EOS and other more direct means of communication to the UNOLS science community that addresses the need for this Quality of Service Initiative and seeks community input. Sandy recommended a series of EOS articles. Bob indicated that the first article should let the community know that we are working towards quality and that it is a work in process.

Mike Reeve said that he would pursue inviting the NERC consultant, Jeff Ford of Europort in the UK for the September meeting.

There was some discussion on the standardization of technician services and equipment on the various research vessels. It appears that this is an issue for some PI's that move from one vessel to another. Many of these scientists are expecting to find standardized processes, equipment and services. A formal program for standard services does not really exist per se. Conforming to program criteria specified in proposal guidelines for Technical Services and Ship Operations programs creates some level of uniformity. There is probably a certain level of misunderstanding about what is expected. We still need to work on establishing clear and realistic expectations among science users and funding/methods for uniformly fulfilling those expectations.

It was agreed that the Quality committee and Sandy Shor would pursue the possibilities for research and assistance with our Quality of Service Initiative that might be afforded through NSF's Innovation and Organizational Change program.

Emerging Issues in Acoustic Research - Frank Herr (ONR) discussed recent issues regarding field programs in ocean acoustics, the potential impacts on marine mammals and the need to get permits.

Marine Mammals and acoustics is not a new issue. Walter Munk and ATOC brought a lot of this to the fore. The marine mammal activists have focused on low frequency acoustics, but we don't

know if this is the right focus. ONR is funding a lot of research on acoustics. A March stranding incident in the Bahamas was coincident with an LWAD experiment in the Caribbean and near the location of a Navy exercise. An ongoing investigation includes necropsies of some mammals that show acoustic caused damage to the animals. The Navy does not know whether or not the damage was a result of their activities or some other acoustic event or explosion. The operational Navy is interested in being good stewards of the oceans and do not want to be considered as a harmful agent to the ocean environment even though operational limitations may prevent them from going through the normal permitting processes. The Research and Development arm of the Navy does consider it necessary to ensure compliance with the various rules and regulations which Frank listed in his presentation. These include the National Environmental Protection Act (NEPA), the Marine Mammals Protection Act (MMPA) and the Endangered Species Act (ESA). See Frank's view graphs in ***Appendix VI.***

The Navy has specific policies that are a part of their acquisition rules and operational policy. The Navy's policies are include in the following documents:

Secnavinst 5000.1, 5000.2
Opnavinst 5090.1b
ONR interm policy 01 Oct 99

ONR policy follows funding and they must obtain certification from delegated project management (PI's) that they have complied with all applicable laws and instructions. The Navy determines if action has potential to disturb then works with the NMFS if there are incidental takes (as defined by the MMPA "take" is harass, hunt, capture, kill or attempt to injure or disturb.) Principal investigators are responsible for making the determinations, but ONR retains responsibility for supporting the costs of any EIS or other determination process.

Coastal Zone Management Act:
Long lead times are usually needed for all permits and actions that are necessary to carry out a project, i.e. 90 days or more. ONR is taking the stance that it is an unrecoverable and probably illegal expenditure to carry out acoustic work without proper permits. Reviews conducted as part of Environmental Assessments (EA) or an Overseas Environmental Assessment (OEA) must result in a "finding of no significant impact" (FONSI) and it must be documented. In some cases planned worked can be granted a "categorical exclusion." If a "FONSI" statement cannot be made as a result of the EA or OEA then a full Environmental Impact Statement must be prepared. This would be the most lengthy and costly process with mandatory public input periods and hearings. This would be called an Environmental Review overseas. In all cases, ONR policy would not allow funding of projects where harm is likely. The problem is that the data is not as complete as it should be to make a clear determination about the likely harm to mammals or the environment. Some of the fundamental information is not well documented. NMFS is increasingly demanding good data to support findings of no significant impact. The permitting process will increase the overhead of the Acoustic programs.

UNOLS and the UNOLS Office will need to continue the process of making the information available to scientists that are planning experiments that may require permits. It may soon be necessary to obtain permits for additional types of research operations involving acoustic techniques.

Future Fleet and Facility Planning Session

Long Range Planning for the UNOLS Fleet: Larry Atkinson reviewed FIC's activities related to fleet planning, such as the FIC report, *UNOLS Biennial Review of Sea Going Oceanographic Facilities* and FIC's effort to engage the ocean science community in the planning process for the replacement of research vessels. Larry reviewed the document on Fleet replacement planning that is referred to in FIC's article to the community that will be published in the next few weeks in EOS. He showed the various graphs from the report and discussed the conclusions from the report for each class of ship. ***Appendix VII*** contains the full report from FIC which will become the main part of the FIC *Biennial Review of Sea Going Oceanographic Facilities.*

A discussion of optimum utilization of ships is needed, so that we do not have two different numbers. The 300 day operating year for large ships is what the operators currently view as appropriate. This number was arrived at through discussions between Dolly Dieter and the large ship operators. The lower RVOC number was developed in the late 1980's prior to the arrival of the new, larger AGOR's. The number takes into account some variation between operators. For example, some ships operate mostly from home port, where busy port call days do not count as operating days, while other ships of similar capability operate mostly in out-ports, where similar port days do count. The UNOLS fleet is not a one size fits all enterprise and we therefore end up with some amount of excess capacity (by these standards) of ships or available bunk space.

Larry presented data on bunk utilization which was thought to be a little misleading because it shows total bunk space used or an average of bunks used. The reality is that on many cruises the bunk space may be totally occupied and on some cruises just a few bunks are used. NSF and others involved in future fleet planning need to know what number of bunks are needed for future ships. Council asked that the UNOLS office present data on percentage of cruises where bunks are maxed out by type of science and size of ship. This information and data on how many bunks were available, will determine if the number of bunks available currently is adequate or if more are needed on future ships.

A particularly dramatic chart from the FIC report is a graph that shows how the total ship days available drops as ships retire if they are not replaced. Pat Dennis asked what UNOLS will be doing with regards to the planning process. Are we endorsing the replacement of specific vessels or are we merely recommending numbers and types of ships needed in the various regions? Who will be replacing ships? Pat also thought that it would be important to develop a plan that shows the total number of ships needed in the future and use that as a benchmark or goal for all agencies or institutions that would be considering the acquisition of new ships.

As a way of ensuring community input into the types of vessels planned for the future several people thought that renewing the Science Mission Requirements (SMR) and making them living documents would be useful. Charlie Flagg and others also thought that developing preliminary designs would ensure that future ships would be built to community standards. We will need to decide at what point to do this. Discussion centered on whether we need conceptual designs or SMR's to make sure that new ships meet the community needs. This was done in the mid to late 1980's and it makes sense to update those efforts in the light of the number of ships that will need replacing or overhauling in the next 10 to 15 years. Planning for the replacement of seven

small or regional ships might be done as a group, but the final stages would probably be done individually because of different requirements. FIC and UNOLS have a role, how does it fit with FOFC? These efforts need to be part of a National Plan for the National Research Vessel Fleet.

UNOLS and FIC will do what ever they can to assist the agencies in creating a meaningful National Fleet Plan by providing data on trends regarding the exciting science that has been and can be accomplished and by providing a vehicle for community input.

Thursday, June 22, 2000
NSF, room 375

Session on ship scheduling and related issues
Bob Knox gave a brief summary of scheduling issues and problems for 2000 that had been provided by Joe Ustach and Dan Schwartz as follows:

Reported by Dan Schwartz – Scheduling Vice Chair and West Coast Representative:
There have been some major scheduling problems on the West Coast of which PROD only played a small part. The largest challenge is the "traffic jam" on Juan de Fuca Ridge: ATLANTIS, THOMPSON, REVELLE, WECOMA, and especially the German R/V SONNE. The latter ship, whose schedulers we were never able to make contact with, ended up driving the schedule of four UNOLS vessels and at least a dozen PIs. Our role was completely reactive as their schedule (and the needs of U.S. PIs who had been given ship time on SONNE) determined the sequence and timing of a number of our ships' cruises. If this is going to be a regular occurrence we need to work on bringing SONNE and her operators into at least some sort of liaison/communications with our community at the time her schedules are prepared.

The other major West Coast problem, also associated with the work at Juan-de-Fuca, is related to the utilization of incompatible submersible assets at the same sites during the short acceptable weather window off the Pacific NW Coast. This has caused major scheduling headaches for Jon Alberts at WHOI, and nearly the same level of complication in satisfying the THOMPSON users. The repeated negotiations that have been required among a dozen or more PIs (users of ROPOS, Jason, Alvin, ABE, seismic systems, etc.) have occupied a disproportionate chunk of Jon's and Dan's time this year.

Reported by Joe Ustach – Scheduling Chair and East/Gulf Coast Representative
One other problem in 2000 on the East Coast happened with ENDEAVOR and OCEANUS and is related to the discussion on permits, etc. Those cruises were curtailed because the PI didn't get permits for acoustic source use from NOAA/NMFS. Joe talked with URI and WHOI and both schedulers feel that it was a time problem - the request didn't get in early enough for NOAA/NMFS to review it properly. Duke also ran into similar problems for HATTERAS with the NAVO sound propagation loss cruise. It was resolved at the last minute with quite a lot of back and forth discussions between the Navy and NMFS lawyers. Part of the problem was a

stiffening by NMFS because of the Bahamas mammal beaching being in the news and minds of the public; this sort of attention will probably not go away. The memo and web page on permitting requirements will help, but this will have to become part of the PI's burden since they are the ones who can explain the work to the regulating agencies.

2001 Scheduling: There was a brief discussion on the initial outlook for 2001 schedules and the status of the current scheduling process. JGOFS is uncertain and Biocomplexity panel is not completed yet. Globec/NOS House mark is zero and it is not certain how that will be resolved. The letters of intent from schedulers are coming in with most ships showing at least a first draft. There are quite a few double bookings at this point and quite a few funding decisions still to be made so it is difficult to determine how strong the demand is for next year. The Ship Scheduling Committee will meet on July 13th at NSF.

Report on the Ship Scheduling System - Joe Ustach and Mike Prince reported on recent changes, the transit bank and a uniform definition of transit days. Primarily, minor changes have been made to the existing system to allow it to be more useful for putting schedule information into data base format.
The Letter of Intent system was designed to mirror the scheduling format and is working well for most schedulers. It too, allows for input to data bases that facilitate tracking double bookings, number of days per agency and other data. Definition of transit days is almost done. We will need to educate schedulers about this and the transit bank. Need to disseminate transit bank info appropriately when it is used so that the information can be used by scientists and educators that might have a need fulfilled by a transiting vessel.

Dolly asked that the PIs provide the grant numbers with their STRs so that it can be linked to the proposals. This will help the agency program managers keep track of all requests.

Status of UNOLS Office Transfer.

The UNOLS office staff have settled into their permanent space in the brand new Moss Landing Marine Laboratories building. Staff have been hired and include, Kate Sawyers as the Administrative Assistant and Laura Dippold and Sara Anderson as webmasters/student assistants. Annette DeSilva, continues to serve UNOLS as the Assistant Executive Assistant with a remote office in Rhode Island. The phone number for the new office is 831-632-4410. The domain name UNOLS.ORG has been registered allowing the UNOLS website to remain http://www.unols.org no matter where the UNOLS office goes in the future.

Nomination Committee Report - The first Council terms of Bob Knox (Chair), Tim Cowles, Barbara Prezelin, and Tom Shipley are expiring in 2000 as well as the second term of Tom Royer (Vice Chair). The nominating committee presented their proposed slate of candidates to the Council and discussed the difficulties they have had in obtaining a second candidate for the Chair position. A call for nominations was broadly advertised and 14 nominations were received for the five open slots. Barbara Prezelin will not stand for re-election and Tom Royer is not eligible for re-election. The current version of the proposed slate has three candidates for each of the regular Council positions and two for the Vice Chair slot. There are no candidates to run against Bob Knox for chair. Another e-mail to the membership calling for Chair nominations will be made.

10:00 am Morning Break

Meetings and Travel - A discussion of the need to reduce the travel budget, how to conduct business with fewer meetings and how UNOLS and the UNOLS office should best utilize their resources was held. Who should contribute to the UNOLS office was discussed as this impacts the total budget for travel and meetings. Some of the agencies do not use UNOLS vessels as much as they used to, but it is felt that they still have a stake in the health of the UNOLS fleet. It was determined that each UNOLS committee and the Council would review their needs for meetings in order to conduct their business and that this information would be used to instruct the Executive Secretary with regards to the level of support to request in the proposal for next year's travel budget.

Another recommendation is to set the UNOLS meeting calendar a year in advance. Council members were requested to send the Office their 2001 schedules/obligations. The Office will attempt to draft a calendar around any conflicts.

UNOLS Charter Clarification - Recommended changes to the charter were discussed. These changes would clarify the procedure for replacing members of the council that leave before the end of their term and modify the provisions for the number of meetings that would allow UNOLS to operate within budget limitations without violating the charter. A motion was made, seconded and approved to present the charter changes to the membership at the annual meeting.

Other UNOLS Issues

Seismic Acquisition Issues and UNOLS Fleet Capabilities – This discussion is a follow up from the last Council meeting to determine if there is a need for any UNOLS action in this area. Tom Shipley presented the recommendations from the Seismic Acquisitions workshop he co-chaired, see ***Appendix VIII***. The future looks very promising. About 50 scientists attended the workshop. There are several new or renewed programs that need seismic data. Japanese are building a riser drilling ship and there needs to be more than two million dollars in seismic data collection to support this effort. There may be enough work to keep a dedicated MCS ship busy for more than just a part of a year as is true now. Tom provided a table of projected seismic acquisition needs for the next decade which totals around 276 months of ship time needed. Currently there is about six months of seismic work being done per year. The actual work load will be between six and 27 months of survey work per year, some of this is commercial. There will most likely be a major ramp up in the next three to five years. The Integrated Ocean Drilling Program (IODP) is not funded yet, but they are working towards operating in 2003 and will need new site surveys unlike any done previously.

In order to meet the increased needs, especially for those scientists that do not have their own trained technicians and equipment there will be a large increase in the need for facilities support. This leads to a perceived need for facilities development. Currently, EWING is the major facility, but there are other operators as well. A model would be to create a user oversight group similar to DESSC that would interact with the EWING/LDEO operation and others. This group could meet in conjunction with AGU and at the facility. High performance users currently bring

their own technicians, equipment and software to add to the eight or so technicians that EWING contributes.

There was some discussion about whether or not a need for a long term standing committee or a short-term ad hoc committee is needed. Who would fund this? How much would it cost? There is not currently a ship operations committee at LDEO and their operations seem to be controlled by LDEO PI's.

It was recommended that between now and the next council meeting the Council take the time to review the relationship with LDEO and the community and the need for a committee at the LDEO level or UNOLS level.

RECAP on the Quality of Service issue:

Tim Cowles reviewed the next steps that should be taken to improve quality:

- UNOLS will submit news/info items to the ocean community (email, newsletter, EOS) about the quality improvement initiative.
- A feedback mechanism for quality of service will be developed – what is it? How to measure it?
- Jeff Ford will be asked to make presentation to the Council in September.
- Council members are encourage to participate in Quality discussion via web page
- Sandy Shor & Sam Jelinek will discuss mechanisms for research funding about quality within the fleet.

The question was asked as to what the deliverables will be. Tim indicated that we first need to define the problem then come up with an implementation plan. The deliverable is to provide a more improved quality program and this has to be an ongoing process within the entire fleet.

ADCP Improvements — Charlie Flagg gave a report on plans to hold a workshop to improve the quality and availability of hull mounted ADCP's in the UNOLS fleet. In the winter a small group got together at The Ocean Sciences (TOS) meeting to address the ADCP issues. They put out a call to users about the need for a workshop or further work on defining ADCP needs and received very little response. There are new phased array equipment and new data acquisition programs coming on line from manufacturers and individual scientists. This to some extent addresses the needs. The idea of a user group and workshop is on hold.

The need for repair, maintenance and upkeep of the older narrow band equipment is still an issue. There still may be a need for a pool of parts and equipment/transducers. A group (probably within RVTEC) should work together on maintaining the older equipment. The only proposals received recently have been for phased array ADCP's and there are no more requests for broadband ADCP units. Self contained narrow band units which are much more plentiful can supply parts for narrow band units. It is still uncertain as to whether or not the phased array units will be accepted as an alternative to the narrow band. The data acquisition program now uses more updated computer equipment.

New Ship Construction - Updates since the February Council meeting:

R/V SAVANNAH - Skidaway's plans for construction of R/V SAVANNAH have not changed. A contract may be let in near future.

F. G. WALTON SMITH - Tom Lee reported on F. G. WALTON SMITH's initial operations and inspection, see ***Appendix IX***. Ship was delivered on 2 February and has completed eight cruises so far. It has a shallow draft and cruising speed is 10.5 knots at full load. Performance is better than design criteria. They have been able to do Swath Bathymetry at six to seven knots if the proper window of rpm is adhered to. The ship is very stable and operated well in fifteen feet seas. Miami is very happy with the vessel. When the Council receives the Ship Inspection report, it will consider the vessel for UNOLS vessel status.

CAPE HENLOPEN Replacement – Matt Hawkins briefly reviewed replacement plans for CAPE HENLOPEN, see ***Appendix X.*** UDel presented FIC with a status report at their March meeting. They are on schedule for their process.

Regional Ship Replacement Activities It was reported that a meeting was held in Baltimore in March at which methods for moving forward on improving SMRs and getting community input for developing plans for replacing or upgrading regional ships were discussed. Regional ship operators attended as well as agency and FIC representatives.

ALPHA HELIX Replacement plans -The University of Alaska is submitting a proposal to NSF and has received an endorsement from FIC and NMFS.

WHOI SWATH - WHOI's plans to build a SWATH vessel are going forward. They received a large funding donation. Their plans can be seen on the web at:
http://www.marine.whoi.edu/ships/swath/index.html

AGOR 26 construction - The report was given earlier in meeting.

NOAA FRV: Competition for acquisition of the FRVs will be open to all shipbuilders. Details were reported earlier in the meeting.

SeaNet Update - An update on the status of SeaNet was provided. The initial proposal that funded the development and installation on the five UNOLS ships has run out. The SeaNet partners have submitted a 3-year proposal to NSF for on-going operations, continued development, and support for new and existing systems. There is a website, www.seanet.edu that gives an education on SeaNet and seeks input from the users and potential users. A question was asked about the cost of the satellite connection. There has not been as much progress in reducing that cost of the transmission as had originally been hoped. MSAT is the only possible alternative but it is coastal in nature. Sujata indicated that the Navy may be making progress in this area and encouraged RVTEC to inquire at ONR.

SEA CLIFF and ATV Report:
SEA CLIFF - The results of WHOI's DSV SEA CLIFF engineering study were reported. Patty Fryer presented the highlights of the engineering study, see ***Appendix XI***. The Navy transferred

SEACLIFF to WHOI. WHOI in turn studied various options to improve the capabilities of the National Deep Submergence Facility. The option included:

- Use of SEACLIFF without modification
- modification of SEACLIFF
- modification of ALVIN
- construction of a new sub
- survey of international sub operations to see if any might be available for purchase.

The study was somewhat driven by the communities need for improved, greater access to the abyss in terms of depth, viewport location, vehicle size, etc. Patty presented WHOI's chart which provides a comparison of the various options along with the costs associated with each option. Their conclusion was that construction of a new 6,000m vehicle would offer the best capabilities to the community. The cost of a new vehicle is estimated at $15 million. The report needs to go to the funding agencies and the deep submergence community. The full report is available at: http://www.marine.whoi.edu/ships/seacliff/report.htm

Advanced Tethered Vehicle (ATV): Future plans for ATV were reported. A MOU is being drafted between the Navy, Scripps Institution of Oceanography (SIO) and University of Hawaii (UH) that would transfer the vehicle from the Navy to these institutions. At present, it appears that ATV will be operated by SIO 75% of the time and UH 25%. SIO is ok with this arrangement but UH does not agree. The issue needs to be resolved by the Navy.

HEALY Public Relations Visit in Baltimore - A brief report on this successful event was made by Bob Knox. The ship was well attended during its visit to Baltimore.

Winch and Wire Symposium: A report on plans to implement recommendations from the symposium was provided. Maximum working load for wires is an RVTEC/RVOC work. The beginning stages of draft specifications for newer wire that may replace .322 are underway but this will wait for the maximum working load project to be further down the road. Dolly needs the inventory of winches, cranes etc. that were part of the report. Jack is receiving material/chapters that will update the Winch and Wire manual.

DESCEND Workshop: Patty Fryer provided an update on the report from the DEveloping Submergence SCiencE into the Next Decade, DESCEND workshop along with follow-on plans. The workshop proceedings are now written up and formatted and are being edited down. They will be published on the website. A four-page brochure highlighting the recommendations will be published in hard copy for distribution.. One of the recommendations of DESCEND was to have a closer relationship with the shallow water community. They have different assets that are needed. Much of the shallow work is done by NOAA. As a result of this, Shirley Pompani (HBOI) who works in the shallow waters has been asked to participate with DESSC as a liaison.

UNOLS/NMFS Memorandum of Understanding (MOU) and the NOAA/OAR and UNOLS MOU - The UNOLS office will work with Beth White to draft a combined MOU for NOAA.

UNOLS Brochure: The UNOLS brochure update will be published by July and will be distributed.

Mystic Seaport Display: Interactions with the Mystic Seaport display is currently one on one with operators. The SeaNet partners are sharing their technology with the people at Mystic.

2000 Annual meeting – The keynote speaker and discussion of action items for this meeting were discussed. Margaret Leinen will not be available as keynote speaker. Other ideas for keynote speaker included Sam Farr or other congressmen or the new Director of Naval Research, RADM Jay Cohen. Agenda items for the fall meeting include the quality issue, Fleet planning and outreach activities.

The meeting was adjourned at 12:00 pm.

2000 Calendar for UNOLS Meetings

Meeting	Location	Dates
Ship Scheduling Committee	NSF, Arlington, VA	July 13, 2000 (Thur)
HEALY Commissioning AICC	Seattle, WA	August 26, 2000 August 27-28, 2000
Schedule Review	NSF, Arlington, VA	September 20, 2000 (Wed)
FIC	NSF, Arlington, VA	September 20, 20000 (Wed)
UNOLS Council	NSF, Arlington, VA	September 21, 2000 (Thurs)
UNOLS Annual	NSF, Arlington, VA	September 22, 2000 (Fri)
RVTEC	Palisades, NY (LDEO)	October 18 - 20, 2000 (W-F)
RVOC	Newport, OR (OSU)	October 24 - 26, 2000 (T-Th)
DESSC	San Francisco, CA (AGU)	December 14, 2000 (Thur)

2001 Calendar for UNOLS Meetings

Meeting	Location	Dates
AICC	NSF, Arlington, VA	Jan - Feb
Council	???	Jan - Feb
FIC	???	Feb - Mar
DESSC	WHOI, MA	June
Council	???	June or July
Ship Scheduling Committee	NSF, Arlington, VA	July
AICC	Seattle, WA	August or September
Schedule Review	NSF, Arlington, VA	September
FIC	NSF, Arlington, VA	September
UNOLS Council	NSF, Arlington, VA	September
UNOLS Annual	NSF, Arlington, VA	September
RVTEC	URI	October
RVOC	URI	October
DESSC	San Francisco, CA (AGU)	December

2001: Major Oceanographic Conferences and Federal Agency Meetings

NOAA - Office of Marine and Aviation Operations Annual Conference	To be Announced	Jan 7-12, 2001
Oceanology	TBD	April 3-5, 2001
NSF OCE/Panels	NSF, Arlington, VA	May 21-25, 2001
AGU Spring Meeting	Boston, MA	May 29-June 2, 2001
MTS - Oceans 2001	Honolulu, HI	Nov 4-7, 2001
NSF OCE/Panels	NSF, Arlington, VA	Nov 12-16, 2001
AGU Fall Meeting	San Francisco, CA	Dec 10-14, 2001

Appendix I
List of Participants at June 21 and 22, 2000 Council Meeting
Arlington, VA

http://www.unols.org/council/cncmt006/cncmi006.html#Appendix I

Attendees at UNOLS Council Meeting

June 21 & 22, 2000

NAME	ORGANIZATION /INSTITUTION	PHONE	FAX	E-MAIL
Arnaldo, R.	STATE DEPT.	(202) 647-3262	(202) 647-1106	
Atkinson, Larry	ODU	(757) 683-4926	(757) 683-5550	atkinson@ccpo.edu.edu
Cocke, Tom	STATE DEPT.	(202) 647-0240	(202) 647-1106	cockewt@state.gov
Cowles, Tim	OSU	(541) 737-3966	(541) 737-2064	tjc@oce.orst.edu
Dennis, Patrick	096/ONR	(703) 696-2161	(703) 696-2716	
Dieter,Dolly	NSF	(703) 306-1577	(703) 306-0390	edieter@nsf.gov
Flagg, Charles	BNL	(631) 344-3128	(631) 344-2060	flagg@bnl.gov
Freitag,John	URI/RVTEC	(401) 874-6579	(401) 874-6578	jfreitag@gso.uri.edu
Fryer,Patty	AIGP/U.Hawaii	(808) 956-3146	(808) 956-3188	pfryer@soest
Hansell, Dennis	BBSR	(441) 297-1880 X210	(441) 297-8143	dennis@bbsr.edu
Hotrling, John	NOAA/NMFS	(301) 713-2363	(301) 713-4057	john.hotrling@noaa.gov
Knox, Bob	SIO/UCSD	(858) 534-4729	(858) 535-1817	bknox@ucsd.edu
Lee, Tom	U.Miami	(305) 361-4046	(305) 361-4696	tlee@rsmas.miami.edu
Ljunggren, Paul	LDEO/RVOC	(914) 365-8845	(914) 359-6817	pwl@ldeo.columbia.edu
Meehan, Jim	NMFS	(301) 713-2363	(301) 713-1875	james.m.meehan@noaa.gov
Millick,Sujata	ONR	(703) 696-4530	(703) 696-2710	millics@onr.navy.mil
O'Clock, Bill	NOAA/PMAO	(301) 713-3435 X146		
Reeve,Mike	NSF	(703) 306-1582	(703) 306-0390	mreeve@nsf.gov
Rossman, Fred	NOAA/OAR	(301) 713-2465 X184	-	
Royer,Tom	ODU	(757) 683-5547	(757) 683-5550	royer@ccpo.odu.edu
Shipley, Tom	UTIG/U.Texas	(512) 471-0430		tom@utig.ig.utexas.edu
Shor, Alexander	NSF	(703) 306-1580	(703) 306-0390	ashor@nsf.gov
Taylor, Paul	NAVOCEANO	(228) 688-5843	(228) 688-5602	taylorp@navo.navy.mil
Ustach, Joe	Duke/UNC	(252) 504-7579	(252) 504-7651	joeu@duke.edu
Wiesenburg, Denis	USM	(228) 688-3177	(228) 688-1121	denis.wiesenburg@usm.edu
Wilkes, Gordon	NAVOCEANO	(228) 688-4376		wilkesg@navo.navy.mil
Winokur, Robert	CORS	(202) 232-2900	(202) 332-9751	rwinokur@brook.edu

Appendix II
Agenda
June 21 & 22, 2000 Council Meeting

http://www.unols.org/council/cncmt006/cncag006.html

Revised 6/14/00

Tentative Agenda

UNOLS COUNCIL MEETING

8:30 a.m., 21 & 22 June, 2000
National Science Foundation
Arlington, Va
Download as a Word Document

Wednesday, June 21, 2000

NSF, room 1235

8:30 am Call the Meeting: Bob Knox, UNOLS Chair, will call the meeting to order and provide an opportunity for introductions.

8:40 am Accept Minutes of the February 2000 Council Meeting.

8:45 am COMMITTEE REPORTS: Bob Knox will provide a brief summary of the UNOLS Committee written reports and open the floor to a question/answer period. (Prior to the meeting, Committee Chairs submitted written reports on activities since the February Council meeting.) Chairs will identify any important issues that need to be addressed further by the Council. The committee reports can be viewed on-line by clicking on: Committee Reports, June 2000. To download the document as a word document, click here: commrpt.doc.

9:30 am Federal Agency Reports:

Representatives of the Federal Agencies will be given an opportunity to report on activities of interest to the Council or to bring any issues before the council requiring their input or action.

10:00 am Morning Break

10:20 am Continue Federal Agency Reports and discussion

10:40 am Discussion of clearance problems and possible solutions with State Department representatives.

UNOLS ISSUES: Improvement of the Quality of Service

11:00 am Quality of Service Initiative: committee report and discusion - Tim Cowles, committee chair will introduce a session which will focus on the goals and strategies for instituting a Quality of Service Improvement program within the UNOLS fleet.

12:00 pm Lunch

1:00 pm Quality of Service Improvement: Continue discussion and establish goals, methods and assignments for furthering this intitiative.

2:10 pm Afternoon Break

2:30 am Emerging Issues in Acoustic Research - Frank Herr (ONR) will discuss recent issues regarding field programs in ocean acoustics.

Future Fleet and Facility Planning Session

3:00 pm Long Range Planning for the UNOLS Fleet: Larry Atkinson will review FIC's activities related to fleet planning, such as the FIC report, *UNOLS Biennial Review of Sea Going Oceanographic Facilities* and FIC's effort to engage the ocean science community in the planning process for the replacement of research vessels. Agency representatives will discuss the fleet planning process being undertaken by the recently renamed Federal Oceanographic Facilities Committee (FOFC, formerly FOFCC). In addition a discussion of UNOLS role and FIC's role in the planning process for the future composition and capabilities of the UNOLS fleet will be held. This discussion should help to focus the efforts of UNOLS, FIC and the Council and determine how best to support the efforts of FOFC in completing the long range planning process for Oceanographic Facilities.

Thursday, June 22, 2000

NSF, room 375

Session on ship scheduling and related issues

***8:30 am* Discussion on any ship scheduling problems in 2000 - Bob Knox will identify any potential issues related to ship scheduling in 2000.**

9:00 am 2001 Scheduling - Discussion on the initial outlook for 2001 schedules and the status of the current scheduling process.

9:15 am Report on the Ship Scheduling System - Joe Ustach and Mike Prince will report on recent changes, the transit bank and a uniform definition of transit days. Plans for implementing future changes and improvements to the online scheduling and shiptime request systems will be reported.

End of session on scheduling and related issues

9:30 Status of UNOLS Office Transfer.

9:35 am Nomination Committee Report - The first Council terms of Bob Knox (Chair), Tim Cowles, Barbara Prezelin, and Tom Shipley are expiring in 2000 as well as

the second term of Tom Royer (Vice Chair). The nominating committee will present their proposed slate of candidates to the Council and discuss any difficulties in preparing a complete slate.

10:00 am Morning Break

10:20 am Meetings and Travel - A discussion of the need to reduce the travel budget, how to conduct business with fewer meetings and how UNOLS and the UNOLS office should best utilize their resources. Discuss and decide on the number and type of meetings necessary to conduct UNOLS business.

10:40 am UNOLS Charter Clarification - Recommended changes to the charter will be discussed and approved for presentation to the membership for a vote at the annual meeting.

11:00 am Other UNOLS Issues (Items below will be addressed if not already discussed in earlier reports or discussions)

Seismic Acquisition Issues and UNOLS Fleet Capabilities - Follow up on the need for any UNOLS action in this area.

ADCP Improvements — Report by Charlie Flagg on plans to hold a workshop to improve the quality and availability of hull mounted ADCP's in the UNOLS fleet.

New Ship Construction - Updates since the February Council meeting on the status of:

- Skidaway's plans for construction of R/V SAVANNAH
- F. G. WALTON SMITH report on initial operations and inspection
- Replacement of CAPE HENLOPEN
- Regional Ship Replacement Activities
- ALPHA HELIX Replacement plans
- WHOI's plans to build a SWATH vessel
- AGOR 26 construction
- NOAA FRV

SeaNet Update - An update on the status of SeaNet will be provided.

SEA CLIFF and ATV Report:

- **SEA CLIFF** - The results of WHOI's DSV SEA CLIFF engineering study will be reported.
- **ATV**: Future plans for ATV will be reported.

HEALY Public Relations Visit in Baltimore - Report on this event and status of testing program.

Winch and Wire Symposium: Report on plans to implement recommendations from the symposium.

DESCEND Workshop: Patty Fryer will provide an update on the report from the DEveloping Submergence SCiencE into the Next Decade, DESCEND workshop along with follow-on plans.

UNOLS/NMFS Memorandum of Understanding (MOU): Review the status of the draft MOU between NMFS and UNOLS.

Two-Year Review of the NOAA/OAR and UNOLS MOU: Review of the UNOLS and NOAA/OAR MOU is required every two years. The status of the MOU readoption by NOAA/OAR will be provided.

UNOLS Brochure: A status report on the UNOLS brochure update will be provided.

Review meeting calendars (below), and other business.

- **2000 Annual meeting - Ways to improve participation will be discussed. Decision or report on the Keynote Speaker and discussion of action items for this meeting.**

12:00 pm Adjourn

2000 Calendar for UNOLS Meetings

Meeting	Location	Dates
Ship Scheduling Committee	NSF, Arlington, VA	July 13, 2000 (Thur)
HEALY Commissioning AICC	Seattle, WA	August 26, 2000 August 27-28, 2000
Schedule Review	NSF, Arlington, VA	September 20, 2000 (Wed)
FIC	NSF, Arlington, VA	September 20, 20000 (Wed)
UNOLS Council	NSF, Arlington, VA	September 21, 2000 (Thurs)
UNOLS Annual	NSF, Arlington, VA	September 22, 2000 (Fri)
RVTEC	Palisades, NY (LDEO)	October 18 - 20, 2000 (W-F)
RVOC	Newport, OR (OSU)	October 24 - 26, 2000 (T-Th)
DESSC	San Francisco, CA (AGU)	December 14, 2000 (Thur)

2001 Calendar for UNOLS Meetings

Meeting	Location	Dates
AICC	NSF, Arlington, VA	Jan - Feb
Council	???	Jan - Feb
FIC	???	Feb - Mar
DESSC	WHOI, MA	June
Council	???	June or July
Ship Scheduling Committee	NSF, Arlington, VA	July
AICC	Seattle, WA	August or September
Schedule Review	NSF, Arlington, VA	September
FIC	NSF, Arlington, VA	September
UNOLS Council	NSF, Arlington, VA	September
UNOLS Annual	NSF, Arlington, VA	September
RVTEC	URI	October
RVOC	URI	October
DESSC	San Francisco, CA (AGU)	December

2001: Major Oceanographic Conferences and Federal Agency Meetings

NOAA - Office of Marine and Aviation Operations Annual Conference	To be Announced	Jan 7-12, 2001
Oceanology	TBD	April 3-5, 2001
NSF OCE/Panels	NSF, Arlington, VA	May 21-25, 2001
AGU Spring Meeting	Boston, MA	May 29-June 2, 2001
MTS - Oceans 2001	Honolulu, HI	Nov 4-7, 2001
NSF OCE/Panels	NSF, Arlington, VA	Nov 12-16, 2001
AGU Fall Meeting	San Francisco, CA	Dec 10-14, 2001

Appendix III
UNOLS Committee Reports
June 21 & 22, 2000

Arctic Icebreaker Coordinating Committee
Deep Submergence Science Committee
Fleet Improvement Committee
Research Vessel Operators' Committee
Research Vessel Technical Enhancement Committee
Ship Scheduling Committee

http://www.unols.org/council/cncmt006/commrpt.html

UNOLS
Committee Reports

June 2000

Arctic Icebreaker Coordinating Committee

Report to the UNOLS Council

June 19, 2000

James H. Swift, Chair AICC

The AICC hosted a community long-term planning workshop on Arctic icebreaker use at the Ocean Science Meeting in San Antonio 24-28 January. As at the AGU Fall meeting, the audience was principally concerned with understanding the planning and scheduling process, and understanding science equipment and technical support.

Since that time AICC activities have been dominated by the science systems testing for USCGC Healy. Jack Bash and John Freitag have led this effort, arranging a cadre of top-flight UNOLS technical specialists to evaluate each primary science system on the ship, first in warm water trials, and, now, in cold water testing.

AICC member Lisa Clough was Chief Scientist, with member Larry Lawver assisting, during the Healy's warm water trials. They endured a start date saga as the Coast Guard

worked the ship to readiness. Once underway the trials were a strong success, not that problems were not found - a list was growing before the first trial day at sea - but because a huge amount was learned and accomplished in virtually every arena. Perhaps the most spectacular scientific success was coring in over 5000 meters of water, but that leads a long list on the plus side. The AICC reports will later be available from the UNOLS web site.

The AICC was a significant presence during the Healy's Baltimore public relations visit 22-24 March. The Chair, several other AICC members, and other UNOLS representatives were among a large group who boarded Healy in Norfolk on 21 March and rode the ship to Baltimore. The AICC had solicited science posters from the community and there was a strong response. The posters were set up in the ship's laboratories, where the AICC hosted many visitors during the open house. In addition to the posters there were videos, a model of a coring rig, the actual core from warm water trials, and science equipment on the decks and in the staging bays. Visitors included the general public, teachers and students, press, many from the Coast Guard, including several admirals, an NSF contingent, and representatives from Congressional and departmental staffs.

AICC member Joe Coburn was aboard during the first phase of the Healy's ice trials in April and May between Canada and Greenland. The agenda was mostly directed at learning more about and then testing the Healy's unique propulsion plant and its icebreaking capabilities. Propulsion plant lessons did not come without cost, but the vendors and Coast Guard worked out the problems and had the ship performing well. The ship was heavily instrumented during this six week period, yielding a wealth of data on icebreaking performance and the attendant stresses. The Healy has been shown to be a fine icebreaker, exceeding its icebreaking specifications, without excessive ice milling.

Starting with AICC member Kelly Falkner in late May, and continuing with Jack Bash, Lisa Clough, John Freitag, Larry Lawver, Terry Whitledge at one time or another, and with the Chair as Chief Scientist from 3 June onwards, the Healy is presently in the midst of the cold water science system tests which are continuing, refining, and extending the earlier tests, generally with the same UNOLS technical support experts as before carrying out the tests. In a nutshell, the tests are going great. Leg 1 emphasized underway acoustic systems and the science data network (SeaBeam is now working as well as on a large UNOLS vessel, and it works fairly well in the ice), Leg 2 the uncontaminated seawater system, scientific towing (MOCNESS), and the CTD/rosette package, Leg 3 scientific mooring deployments and recoveries, and Leg 4 (the present and final leg) coring and dredging. Enriching the test cruises have been teachers from NSF's TEA program, arranged through the efforts of Kelly Falkner. It may be worthwhile for the UNOLS web

page to point to the outstanding web pages the teachers have developed from their experiences aboard [available through http://tea.rice.edu].

While the list of suggested modifications, fixes, and new acquisitions for Healy grows daily, these belie a longer and faster-growing list of successes. Matters are basically business as usual for a new ship, and the ship will clearly be ready for science support in 2001. The heroes of the Healy are Captain Garrett, his officers and crew, and those who support them ashore. Every person who has been aboard comes away impressed with their professionalism, support, interest, and friendliness. The AICC will be preparing a complete report to supplement the test memos and reports. The present goal is to have this ready for review in early September. After review and comments, it will be made public, for example as a pdf file on the UNOLS web site.

The AICC stands ready to provide advice to NSF and the Coast Guard during the Healy's scheduling process, which is now underway for 2001. As the schedule clarifies, the AICC plans to contact PIs (after they have been notified through official channels) to help them contact key Coast Guard personnel, to help them assess their logistics, personnel, and work plan needs, and to provide feedback to NSF and the Coast Guard about the panoply of logistic considerations that are coming so much clearer to the AICC now that we have been to sea on the ship.

Healy's commissioning ceremony is set for 26 August in Seattle. The AICC will be there, and will hold its next regular meeting on board in the science conference room on 28-29 August.

Deep Submergence Science Committee
Report to UNOLS Council
DESSC activities February to June, 2000

Patricia Fryer, DESSC Chair

The Deep Submergence Science Committee held its Summer meeting on Wednesday, and Thursday, 24 -25 May 2000 at WHOI.

The meeting began with introductory remarks, meeting logistics, introductions, and acceptance of the minutes of the Dec. DESSC meeting.

National Deep Submergence Facility personnel gave an operators report that included a National Facility Vehicles operations summary (a very successful year, 335 days at sea last year, and as always a fine record of operations successes) and presentation of the final results of the NDSF Seacliff Engineering study. Highlighted in the discussion were the several options for attaining a human-occupied vehicle with 6000+m capability for the US science community. These options included use of the Seacliff as substitution for Alvin, modification of Seacliff using Alvin parts, upgrading of Alvin with Seacliff parts. The final report of this study will be presented to NSF shortly. DESSC heard a summary of upgrades to National Facility vehicles, science sensors, and ATLANTIS, which included a status report on current upgrades proposal for the ROVs. Andy Bowen had held a day-long review of these upgrades with detailed discussion of engineering and design developments and status reports the day before the DESSC meeting and several of the DESSC members were present. Fine progress is being made on this project and DESSC members were grateful for the opportunity to attend the review meeting. ALVIN overhaul plans and priorities were presented and discussed with the DESSC. Prior to the meeting the scientific community was polled for suggestions to the upgrade list. About half of the science community that normally attends the Dec. DESSC meeting responded. WHOI personnel and DESSC members jointly discussed the annual request for upgrades to science sensors and operational capabilities of NDSF vehicles and suggestions from the community were incorporated in the general plan where possible. WHOI personnel also presented the shipyard work list for the upcoming ATLANTIS yard/dry dock and discussed these with DESSC. The community suggestions for upgrade items was also incorporated in plans for yard work on the support ship.

Reports from two of the three funding agencies for the NDSF were given by Mike Reeve (NSF) and Sujata Mallick (ONR), but at the time of the meeting there had been no report from NOAA.

The DESSC Terms of Reference were discussed. Updated terms were presented at the UNOLS Council meeting Feb. 2000 with a request for permission to update them. The updated Terms had been listed on the UNOLS web site prior to the DESSC summer meeting, but a couple of typos were noted by DESSC members and the Terms of Reference need to be slightly modified to accommodate the necessary changes. Annette DeSilva was going to check to see if the changes need UNOLS Council approval.

A summary activities of other deep submergence was presented. These included MPL (no formal report as of meeting date), Navy (given by Sujata Millick), NURP (no formal report as of meeting date), and ROPOS. New DESSC member, Mark Chaffey (from MBARI) presented a report from MBARI. The formal reports will be included as appendices to the DESSC summer meeting minutes. It is expected that brief reports from MPL, and NOAA NURL offices will be forthcoming. These will also be included when (and if) they arrive.

DESSC discussed deep submergence scheduling for 2001 and beyond. DESSC heard results from April NSF panel updating DESSC/UNOLS deep submergence funded programs listing. The committee reviewed planning letters and website postings and identification of funded programs. The committee reviewed the Strawman schedule for 2001 and discussed some potential problems regarding conflicts between weather windows and science objectives for some PIs.

A status report on the archiving of all deep submergence data in the WHOI archives was presented by WHOI personnel. After this report the DESSC initiated a discussion of database issues. Several aspects of database problems were brought up and discussed including what data should be considered appropriate for inclusion, how the data were to be standardized, what formats to be used what access and how the data were to be used. Discussion of several current parallel efforts toward establishments of data bases ensued. IT was suggested that for the future the submergence science community will find it most effective to partner with other groups who have a shorter term need to establish such databases. Several members of DESSC are involved with these efforts and will continue to provide liaison with these groups.

DESSC discussed long-range planning issues concerning science/logistical constraints on cruises, problems related to various vehicle requests, mechanisms for dissemination of information regarding funded programs to potential PIs, and future funding for deep submergence science.
DESSC discussed the DESCEND Workshop results. The proceedings of the DESCEND Workshop has been drafted and sent to the DESCEND steering committee, DESSC and all the leaders of the various working sessions at the workshop. Feedback from these individuals is coming in slowly. DESSC discussed the method for dissemination of the results of the meeting more widely and suggested a shorter version of the draft be prepared for printing. A 4-page brochure will be prepared for more popular use. The role of DESSC as follow up after the Workshop, was discussed and the suggestion made that DESSC initiate discussion with members of the community involved in other facilities and especially with shallow water submersible science community to initiate actions recommended by the Workshop participants.

Fleet Improvement Committee
Submitted by Larry Atkinson

The last FIC meeting was held on the new Coast Guard Icebreaker HEALY as it sailed from Norfolk to Baltimore. Recent activities of FIC include the following:

- Support for Alaska Replacement Vessel: FIC provided a letter endorsing the recent UAF proposal to NSF.
- Letter to Community: A letter was submitted to EOS alerting the community to the ship replacement situation. The letter should be published in early July.
- WWW report: Graphical documentation of the past and future trends in ship use and availability are on line at www.unols.org/fic/fleetreplacement.html
- NSF Workshop: FIC is working with Tim Cowles on a workshop addressing the community perception of future ship needs. The workshop will be held at OSU in August.
- Delaware Replacement: FIC has been staying cognizant of the Delaware replacement process and will provide review at appropriate times.

RVOC Report
UNOLS Council Meeting
21-22 June 2000

Submitted by Paul Ljunggren, RVOC Chair

Greater emphasis on volume purchase has been placed by the NSF. Two group purchases were funded. The first resulted in the purchase of 78 immersion suits for 65 institutions (LDEO, UMich, OSU, URI, Uof AK). The second involved 5 institutions (UDEL, SIO, UW, OSU, UT) requesting 6 portable lab vans. Of the 6 vans 2 were general purpose, 3 radioisotope, and 1 was for electronics. NSF requested that standard specifications be developed to allow all vans to be contracted for from one contractor. Matt Hawkins UDEL has been working specifically with the 4 other institutions requesting vans and the community in general to develop these specifications. The intent will be to post these specifications on the web.

Marine Superintendents operating vessels from 7 UNOLS institutions met in Baltimore MD on 22-23 March 2000 to discuss future plans for the upgrade or replacement of the

regional vessels that they operate. Representatives from the UNOLS Fleet Improvement Committee, National Science Foundation, Office of Naval Research, and the UNOLS Office were also present. The group discussed the impact of new national and international regulations on regional vessels, and developed revisions to the 1988 Science Mission Requirements (SMR's) for this class vessel. Plans for midlife re-fits on selected regional vessels were reviewed by the operators in attendance

I attended meeting on 22 May at WHOI in which future wire requirements were discussed. An issue that came out of this was establishing a uniform standard for maximum working load of the various types of UNOLS wire/cable. Currently different institutions have varying work loads for this wire. We plan to put together a work group from RVOC and RVTEC to recommend a uniform standard for defining the maximum work load to allowed on UNOLS standard wire/cable.

All sections of the Small R/V Compendium have been received and forwarded to the UNOLS office for assembly and review. Jack Bash will write the introduction for the Compendium. The intent will be to post this document on the UNOLS website.

Both the Chair and Vice Chair of RVOC will have completed two terms in their current positions and a new Chairman and Vice Chairman will be elected at the next RVOC meeting. The Vice Chairman Steve Rabalais is eligible to stand for Chair. We are seeking nominations. To be eligible the individual must be a Marine Superintendent or equivalent at a UNOLS Operator institution.

The RVOC Meeting is scheduled for 24-26 October and will be hosted by Oregon State University.

RVTEC Report to UNOLS Council

Submitted by John S. Freitag, Chair

The primary activity since the last council meeting has been Science Testing for Ice Breaker Healy. The first testing took place on the Warm Water Phase conducted during February and March between Pensacola, FL , San Juan, PR and Ft Lauderdale, FL. During this testing period initial testing was conducted on the Multibeam Sonar, CTD/Rosette and the Coring system. As with all of the planned testing operations the operation was conducted as a quasi science cruise with Lisa Clough as Chief Scientist from the AICC. UNOLS was represented alternately by john Freitag and Jack Bash. Also in accordance with the plan, tests were conducted by Technicians representing a variety of UNOLS institutions. CTD testing was under the direction of the University of Washington, Sonars and Science Data Network under WHOI and Lamont-Doherty,

ADCP conducted by the University of Hawaii and coring was overseen by the Oregon State University coring group.

This model proved highly successful in operation. Excellent cooperation from the Coast Guard Technicians gave a great deal of insight into future scientific missions on the vessel. The Coast Guard, NavSea and Avondale launched a tremendous effort to correct faults discovered on the Warm Water phase prior to commencement of Cold Water testing in May.

The Cold Water testing phase was/is being conducted under the same model in 4 one week legs. Leg one out of St Johns, NFLD was under Kelly Faulkner from AICC and John Freitag represented UNOLS/RVTEC. Leg one concentrated on Multibeam and Sediment profiling Sonar (WHOI), ADCP (UH) and Science Data Network (WHOI). Leg 2 under Jim Swift (AICC Chair) and John Freitag (UNOLS/RVTEC). Testing concentrated on CTD (UW), Flow through seawater systems (UTexas), MOCNESS Towing (UMiami) and ended in Nuuk, Greenland. Leg 3 under Jim Swift (AICC) and Jack Bash (UNOLS) concentrated on Ice Moorings (WHOI) and Meteorological Data systems (UMiami). Leg 4 under Swift and Bash will concentrate on Coring and dredging (OSU) operations in the ice.

Upon the completion of the trials the team will meet and produce the final document as described in the original proposal.

In other activities the RVTEC meeting this year will be held at Lamont-Doherty the 18th through the 20th of October. Work is in progress with program scheduling with possibilities including on a hands on type program featuring EM wire terminations, NMEA interfacing standards, Autosal techniques and SeaNet protocols and procedures.

Several RVTEC members plan on attending the INMARTECH meeting which is in The Netherlands this year.

Ship Scheduling Committee

Submitted by Joe Ustach

The total number of days scheduled for CY 2000 decreased by 53 days since the last Council meeting. This reflects loss due to the PROD Drill problems on the West Coast and acoustic permit problems on the East Coast. There also is a problem with scheduling ship time at the Juan de Fuca region. These issues will be discussed further during the Council's meeting.

The second year of the Letter of Intent has gone smoothly. Only two schedulers have not completed at least one Letter of Intent. The UNOLS electronic letter format

isn't very difficult to master and the Letters can be converted into schedules easily once funding decisions are made. That being said, the number of days requested in all the Letters appears to be small. With double bookings and declines imminent, I would hope that the total number of days in the Letters would be at least three times the number of days funded in CY 2000. As of June 14, the total number of days requested was 6,905.5; this is only 1.3 times the number of operating days in CY 2000. These days can be broken down by agency, with NSF having 4,862days requested (1.8 times CY 2000); the Navy has 947 days (1.0 times CY 2000) and the other category has 1,096.5 days (0.67 times CY 2000). While EWING and URRACA are not included in these totals, their inclusion will not up the numbers dramatically. The other category should increase somewhat as the year progresses. I fear these numbers bode for a lean CY 2001.

Appendix IV
NAVO Viewgraphs

http://www.unols.org/council/cncmt006/navo.htm

UNOLS/NAVOCEANO - 2000/2001

UNOLS Council June 2000

Gordon Wilkes/Paul Taylor
Naval Oceanographic Office

Utilization of Academic Fleet

1997	1998	1999	2000
Ship Days 373	Ship Days 431	Ship Days 451	Ship Days 199
Funds 7.5M	Funds 7.3M	Funds 7.4M	Funds 3.0M
Ships 6.4	Ships 6.6M	Ships 6.1M	Ships 2.7M
Other 1.1	Other 0.7M	Other 1.3M	Other 0.3M
Institutions 8	Institutions 6	Institutions 6	Institutions 6
Ships 9	Ships 8	Ships 8	Ships 6

What We Have Achieved

- Total UNOLS Ship Days - 1454
- Navy ship year equivalent - approx. 5 ship years
- Ships Used - 15
- Accomplishments:
  - — Gravity - All Navy Requirements Outside EEZ s Met
  - — Physical Oceanography
    - ¥ Core/grabs - *297/163*
    - ¥ CTD - *5832*
    - ¥ XBT - *2149*
  - — High Resolution Bathymetry
- Range Support
  - — WCSWTR So. California
  - — AUTEC
  - — ECSWTR Onslow Bay
- Other
  - — HITS
  - — ODISTA

Ship Employment 2000

ENDEAVOR	SWATH BATHYMETRY	(12)	NARRAGANSET BAY TEST RANGE
HATTERAS	ACOUSTIC SURVEY	(10)	E.C. SHALLOW WATER TEST RANGE
	PHYS. OCEANOGRAPHY	(15)	E. COAST US
PELICAN	N. GULF LITTORAL	(60)	GULF OF MEXICO
W. SMITH	SWATH BATHYMETRY	(30)	SOUTH FLORIDA TEST RANGE
LONGHORN	SIDE SCAN SURVEY	(30)	W. GULF OF MEXICO
NEW HORIZON	GEOPHYSICAL SURVEY	(12)	W.C. SHALLOW WATER TEST RANGE
	ACOUSTIC SURVEY	(15)	W.C. SHALLOW WATER TEST RANGE
	PHYS. OCEANOGRAPHY	(15)	CENTRAL CALIFORNIA
		(199)	

Ship Employment 2001

AREA	SHIP SIZE	DAYS
HAWAIIAN ISLANDS	LARGE	20
SCORE RANGE	MEDIUM	20
WEST GOMEX	SMALL	15
MAYPORT	MEDIUM	35
NGLI	SMALL	30
ONSLOW BAY	MEDIUM	15
S. FLA. TEST RANGE	SMALL	15
EAST COAST US	LARGE	0
		150

Ship Employment 2001

AREA	SHIP SIZE	DAYS
HAWAIIAN ISLANDS	LARGE	60
SCORE RANGE	MEDIUM	40
WEST GOMEX	SMALL	30
MAYPORT	MEDIUM	35
NGLI	SMALL	30
ONSLOW BAY	MEDIUM	30
S. FLA. TEST RANGE	SMALL	25
EAST COAST US	LARGE	10
		260

Appendix V
USCG Report

http://www.unols.org/council/cncmt006/cncmi006.html#Appendix V

UNOLS COUNCIL MEETING
Coast Guard Agency Report
21 June 2000

USCGC HEALY Update

After delivery on 9 November 99 by Litton-Avondale Industries, HEALY underwent a period of fitting-out availability and repairs, and then departed New Orleans on 26 January 2000 to conduct Machinery/hull and science suite testing. Initial warm water trials were completed in March and then ice trials were conducted from April to June in an area near Baffin Island in the eastern Arctic. HEALY performed well, with icebreaking performance exceeding design requirements of 3.0 kts through 4.5 ft of ice. The maximum thickness of unbroken level ice encountered was 5.5 ft, which HEALY transited at a continuous speed of 2.6 kts. Ice ridges of 45 ft were broken through in 3 rams. At the time of this meeting, the warm water science trial and three legs of the science trials in ice have been completed and the final fourth science leg has just begun. Dr. James Swift reports that "Science systems are mostly working well. Problems are the same in general as those faced by each of the new large UNOLS vessels as they came on line." Members of the AICC and RVTEC have been major players in the planning of these tests and the Coast Guard is highly appreciative of their efforts.

After completion of the last science trial and a port call, HEALY will return to Seattle by transiting the Northwest Passage and then formal commissioning will take place in late August or early September. The first unrestricted science cruise is scheduled for spring of 2001.

POLAR Class Update

POLAR SEA started Operation Deep Freeze 1999 in the Antarctic in early November 1998. Upon completion of that 5-month deployment, the ship transited to the Arctic for a spring mission near St. Lawrence Island in April 99. POLAR SEA is now undergoing a "Reliability Improvement Project" yard availability in Todd Shipyards, Seattle. It is anticipated that this work will be completed in August 2000 and that the ship will be departing for Operation Deep Freeze 2001 in November 2000.

POLAR STAR completed major repairs to the centerline shaft and then deployed for Antarctic in mid-November 1999, completed Operation Deep Freeze 2000, and returned to Seattle in April 2000. Following an in-port period for voyage repairs, it will sail on an Arctic mission from late July to mid September.

Science Mission Planning
The first planning meeting for HEALY's 2001 missions was held at the National Science Foundation (NSF) on 13 June. The meeting was attended by representatives of the Coast Guard and NSF. The group began work on drafting a preliminary schedule that NSF program managers can use to refine requirements with Principal Investigators. It is anticipated that the schedule will be released in August after final funding decisions have been made.

The Coast Guard Pacific Area Office has added a position to its Icebreaker Science Liaison staff to handle coordination of science logistics for HEALY cruises. The position has been filled with the hiring of Mr. Dave Forcucci, who comes to the Coast Guard from NOAA's Atlantic Oceanographic & Meteorological Laboratory.

Appendix VI
Navy/Acoustic Research Viewgraphs

http://www.unols.org/council/cncmt006/navr.html

Environmental Policy – All Federal Government

National Environmental Protection Act (NEPA)

- applies within US territorial waters

Executive Order 12114

- applies within global commons or in other nations territorial waters

Endangered Species Act

Marine Mammal Protection Act

Coastal Zone Management Act

ONR At Sea Mitigation Procedures

Site experimentation outside regions of marine mammal habitats or apart from migrations

Provide trained lookouts

- avoid collisions

- visual surveys

Mainain ZOI's

Ramp up acoustic sources (30 min)

Suspend operations until out of ZOI of and sited animal

Methodology

1. **Source level and transmission loss establish receive level at range**
2. **Receive level ranges and threshold shift level for animals define zone of influence (ZOI)**
3. **Density of animals in operations area**
4. **All above lead to number of animals (or probability) affected within ZOI.**

Underwater Sound Considerations

Source character (frequency, exposure level, duration)

Environment (propagation loss)

Frequency sensitivities of species

Hearing threshold shifts

- **190 dB rel (1 sq microPa-sec) at 1 m**

Animal Zones of Influence

NEPA / EO 12114 Documentation

Categorical Exclusions

Environmental Assessments (EA) or overseas Environmental Assessments (OEA)

Finding No Significant Impacts (FONSI)

Environmental Impact Statement (EIS,DEIS,FEIS)
- **name changes during public comment phase**

Environmental Review (for overseas)

Coastal Zone Management Act

Covers federal actions "reasonably likely to affect..."

Effects: direct, indirect, and cumulative

Applicable within 3 nmi, except Gulf states (10nmi)

Consistency determination by state requires 90 days before final agency action

MMPA vs. ESA

MMPA	ESA
All marine mammals	**Limited species**
Worldwide application	**worldwide application**

"Takes"
"Likely to be affected"

Marine Mammal Protection Act

Defines "TAKE"

"…harass, hunt, capture or kill, or attempt to harass, hunt, capture, or kill…"

Level A – potential to injure

Level B – potential to disturb

Navy determines if action has potential to disturb, then works with NMFS if incidental takes are likely

Endangered Species Act

Ensures actions

"...not likely to jeopardize the continued existence of any endangered species or threatened species or result in destruction of or adverse modification of habitat..."

Navy consults (informally or formally) with NMFS if Navy determines proposed action may affect species or habitats

Navy Specific Policy

SECNAVINST 5000.1, 5000.2

OPNAVINST 5090.1B

ONR Interm Policy 01 Oct 1999

For ONR, policy follows the funding

- **must get certification that delegated project management has complied with all above laws and instructions**

Appendix VII
Fleet Planning Report

http://www.unols.org/fic/planning/fltplan.htm

UNOLS

Past Trends and Future Projections for the Academic Research Fleet

In the next two decades the ships in the academic research fleet will reach the end of their useful life. Intermediate ships are nearest to their retirement age while the larger ships will be retired later. By about 2007 we will have fewer ships days available per year than is normally used now. At the extreme, if we assume that no ships are replaced as they are retired, we will, by 2030 or so, have no operating academic research ships. The obvious conclusion is that we must replace UNOLS ships as they retire, we must plan on the use of non-UNOLS ships, or spend fewer days at sea than we have in the past. Assuming ship use continues as it has in the recent past, resources you are used to having will disappear unless action is taken soon. Ships are not designed, funding established and construction completed automatically. The oceanographic community must act.

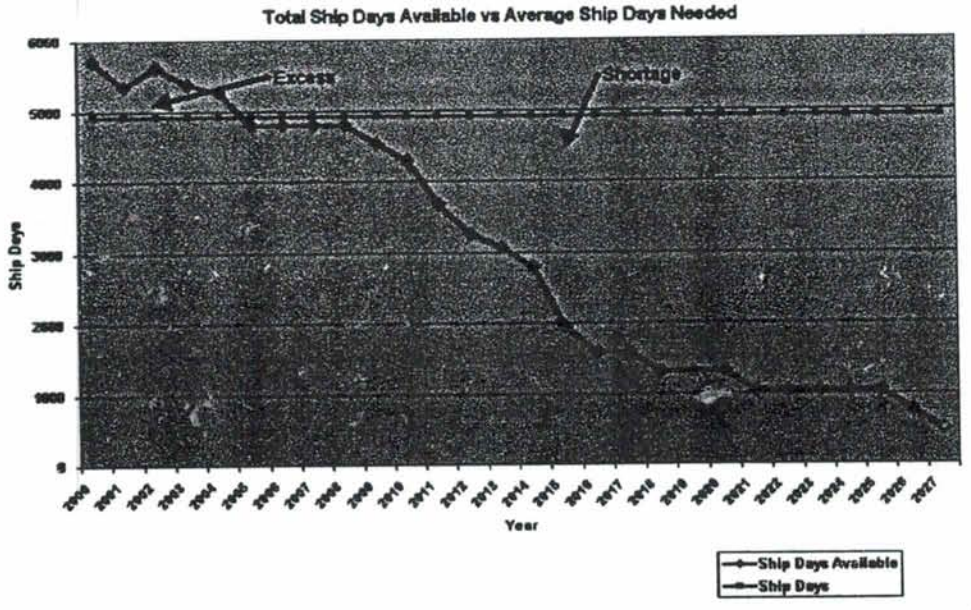
Introduction

The Fleet Improvement Committee (FIC) of the University National Oceanography Laboratory System (UNOLS), which consists of experienced ship using faculty from various universities around the U.S., is seriously concerned that the oceanographic research community as a whole does not appreciate the critical situation looming on the horizon. We are concerned because of the long lead-time to acquire new vessels and the apparent lack of Federal budget commitment. To help in the process of getting the academic user community involved FIC, with the assistance of the UNOLS office and interested colleagues, gathered and interpreted data showing past use and future projections so that the user community can better understand the situation. Since, in this case, a picture is worth more than a thousand words we have focussed the discussion around several key figures.

Throughout this paper you will no doubt see where different assumptions can be made that will affect the outcome. We hope you will agree that regardless of the assumptions there are some realities that cannot be avoided: ships get old, new science mission requirements appear, more research is done, and acquisition is a lengthy process.

Perhaps the best way to get your immediate attention is to show a projection of ship days available in the academic fleet in the future (Figure 1). This plot shows the days available in future years assuming that demand remains constant and ships are retired on schedule and not replaced. Clearly ships must be replaced and if research demands grow the fleet must grow.

Figure 1: The Future



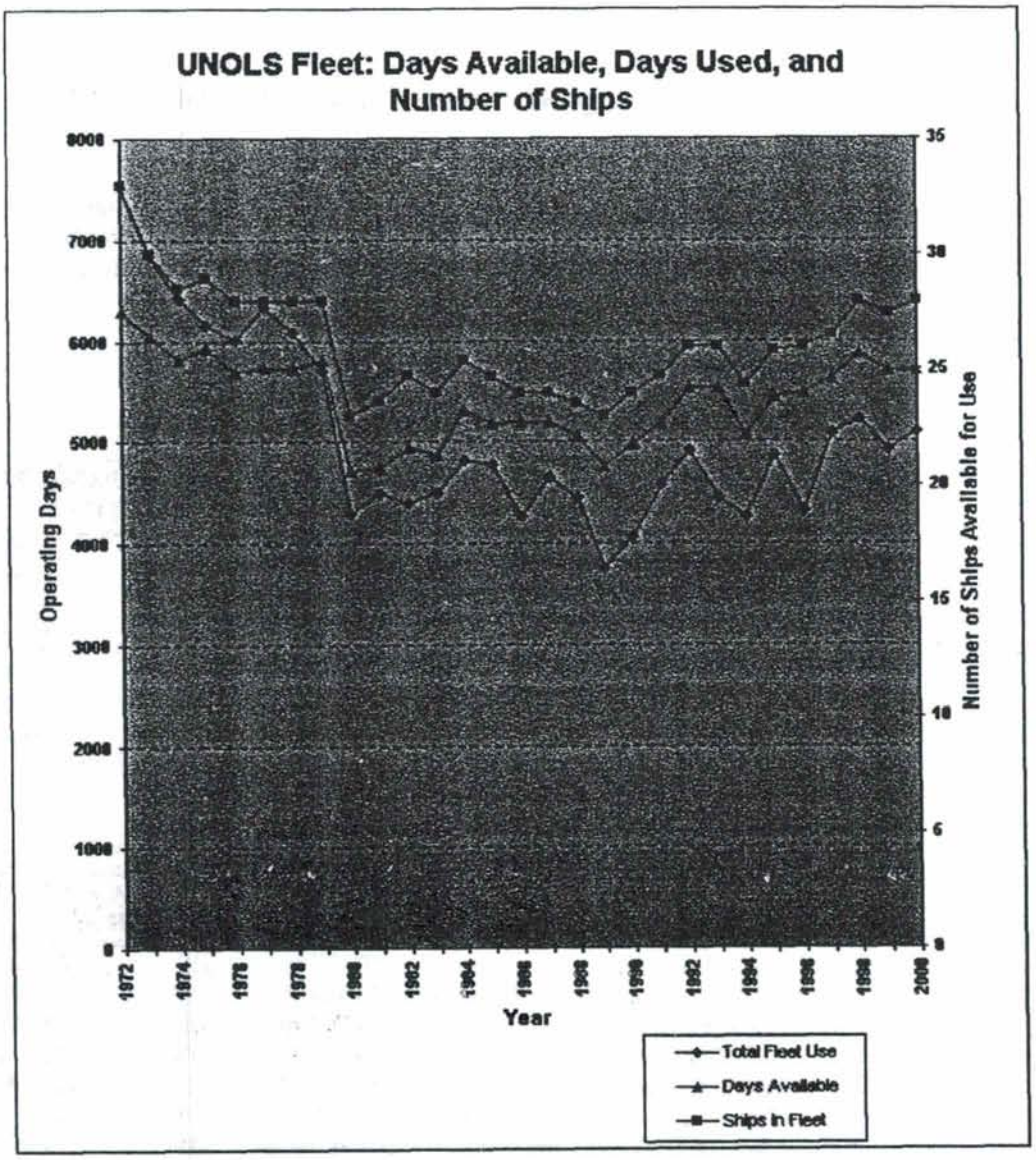
In the following sections we will present past trends in academic research vessel capacity and use followed by projections into the future.

The Past

Overall Trends in UNOLS Fleet Capacity and Utilization

The trends in the number of ships, the days available* and the days used since 1972 is shown in Figure 2.

Figure 2: Ships in the fleet, days available and days used.



The number of ships in the fleet has varied from 33 in 1972 to the present level of 28. Prior to 1980 there were many smaller ships in the fleet and should not be considered in the analysis of the present situation. The trend since 1980 is probably more realistic suggesting an over all growth in the fleet of about five ships.

The total number of days available on UNOLS ships has varied from about 3800 4800 in 1980 to the present high of 5800 days per year. The number of days used has varied from a low of 3800 in 1990 to a high in 1998 of 5300.

The recent trend appears to be an increase of about 1000 days available and used over a period of about 10 years. This equates to an increase of about three to four ships over a ten-year period since a ship provides about 300 days per year. This is consistent with the actual number of new ships.

The recent variability in ship use amounts to about two ships (600 days per year). This variability has been reflected in the laying up of several ships every year for various amounts of time depending on the demand that year.

> **Conclusion:** Recent trends suggest that ship use is increasing at a rate of about 100 days per year with a variation of 600 days per year. If we assume this trend will continue we may face a situation in the future where the variation in demand cannot be met with the present excess ship time. Thus in about six years the size of the present fleet, assuming replacements when needed, will be adequate for the demand and there will be no capacity for years with excess demand.

Definition of Global/Expeditionary, Regional/Intermediate, and Local/Near-shore Ships

The academic fleet is divided into classes: large and expeditionary, intermediate and regional, and local and near-shore. Other classifications have been used over the years (Class I, II, III and IV) but this division is most logical when considering the size combined with the funding mechanisms for construction.

Table 1: The UNOLS Fleet

UNOLS Global/Expeditionary Ships

SHIP	OPERATING INSTITUTION	OWNER	BUILT/CONV or M-L	SCIENCE BERTHS	LENGTH
MELVILLE	Scripps Institution of Oceanography	Navy	1969/1990	38	279 ft.
KNORR	Woods Hole Oceanographic Inst.	Navy	1970/1989	34	279 ft.
T. G. THOMPSON	University of Washington	Navy	1991	36	274 ft.
ROGER REVELLE	Scripps Institution of Oceanography	Navy	1996	37	274 ft.
ATLANTIS	Woods Hole Oceanographic Inst.	Navy	1997	24	274 ft.
MAURICE EWING	Lamont-Doherty Earth Observatory	NSF	1983/1990	32	239 ft.
AGOR 26 -SWATH	University of Hawaii	Navy	2002	31	182 ft.

UNOLS Intermediate/Regional Ships

SHIP	OPERATING INSTITUTION	OWNER	BUILT/CONV or M-L	SCIENCE BERTHS	LENGTH
MOANA WAVE	University of Hawaii	Navy	1973/1984	19	210 ft.
SEWARD JOHNSON	Harbor Branch Ocean. Inst.	HBOI	1984/1994	29	204 ft.
WECOMA	Oregon State University	NSF	1976/1994	20	185 ft.
ENDEAVOR	University of Rhode Island	NSF	1977/1993	18	184 ft.
GYRE	Texas A&M University	TAMU	1973/1980	23	182 ft.
OCEANUS	Woods Hole Ocean. Inst.	NSF	1976/1994	18	177 ft.
NEW HORIZON	Scripps Inst. of Oceanography	SIO	1978/1996	19	170 ft.
EDWIN LINK	Harbor Branch Ocean. Inst.	HBOI	1982/1988	20	168 ft.
POINT SUR	Moss Landing Marine Lab.	NSF	1981	12	135 ft.
CAPE HATTERAS	Duke University/UNC	NSF	1981	12	135 ft.
ALPHA HELIX	University of Alaska	NSF	1966	15	133 ft.
ROBERT G. SPROUL	Scripps Inst. of Oceanography	SIO	1981/1985	12	125 ft.

UNOLS Local Near-Shore Ships

SHIP	OPERATING INSTITUTION	OWNER	BUILT/CONV or M-L	SCIENCE BERTHS	LENGTH
CAPE HENLOPEN	University of Delaware	UD	1976	12	120 ft.
WEATHERBIRD II	Bermuda Biological Stat. for Res.	BBSR	1981/1993	12	115 ft.
SEA DIVER	Harbor Branch Oceanographic Inst.	HBOI	1959/1992	12	113 ft.
PELICAN	Louisiana Universities Marine Cons.	LUMCON	1985	15	105 ft.
LONGHORN	University of Texas	UT	1971/1986	12	105 ft.
F.G. WALTON SMITH*	University of Miami	UMiami	2000	16	96 ft.
URRACA	Smithsonian Tropical Research Inst.	STRI	1986/1994	10	96 ft.
BLUE HERON	University of Minnesota	U.Minn	1985/1998	5	86 ft.
LAURENTIAN	University of Michigan	UMich	1974	8	80 ft.
BLUE FIN	University System of Georgia	UG	1972/1975	8	72 ft.
CALANUS	University of Miami	UMiami	1971	6	68 ft.
CLIFFORD A. BARNES	University of Washington	NSF	1966/1984	6	66 ft.

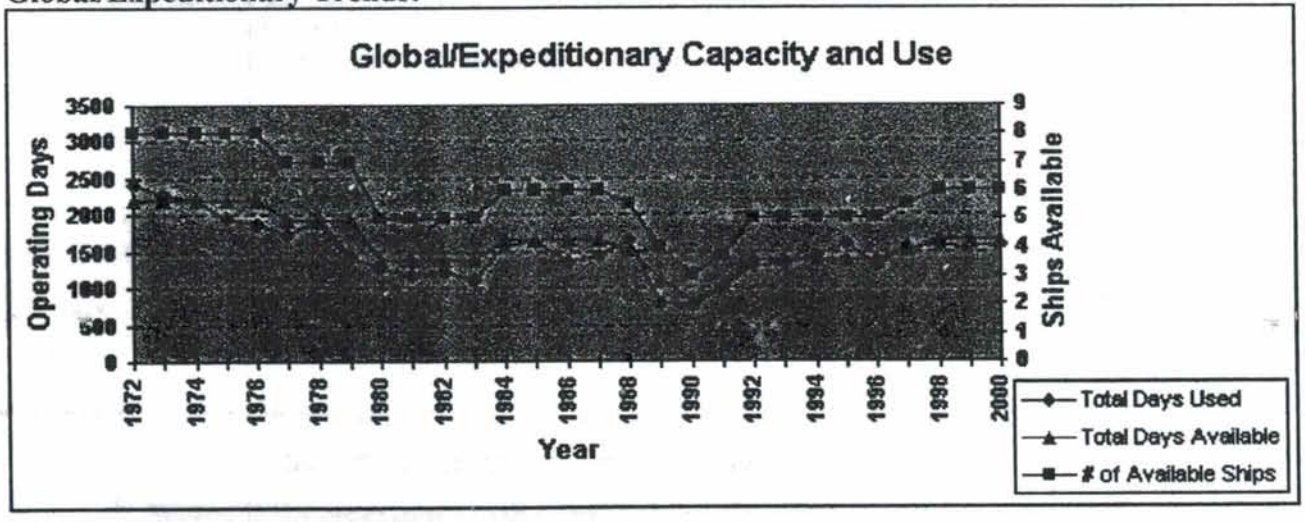
* Expected to replace CALANUS in 2000 after successful completion of NSF ship inspection

Capacity and Utilization Trends by Ship Class

In this section we will look at the historic capacity and utilization of the fleet. We do not make any attempt to judge why plots appear as they do. For example the recent use of the UNOLS fleet by the Navy increased utilization. We make no attempt to make judgements on continued demand by any group. We have just looked at the trends (Figure 3).

Figure 3: Capacity and Use by Class

Global/Expeditionary Trends:

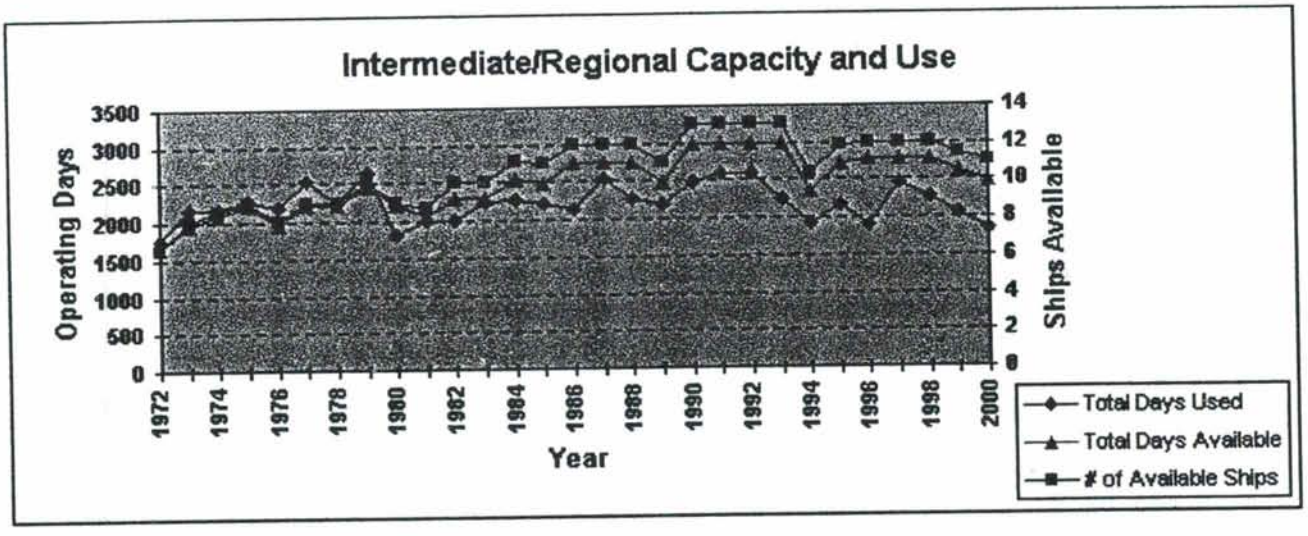


Global and expeditionary ship numbers have increased since 1991. The result is that we now have six ships available and they provide about 1600 days per year and it is essentially all used. These ships have been operating at capacity since 1992 even as new ships are added to the fleet. There are now 700 more days available than there was in 1992. If this trend continues at least two and possibly four new ships will be required in the coming twenty years to meet the demand.

Conclusions:

- Global/expeditionary ships are operating at near capacity. The usage trend over the past decade suggests a need for between two and four new ships in the next twenty years assuming replacement of all existing ships.

Intermediate/Regional Trends:

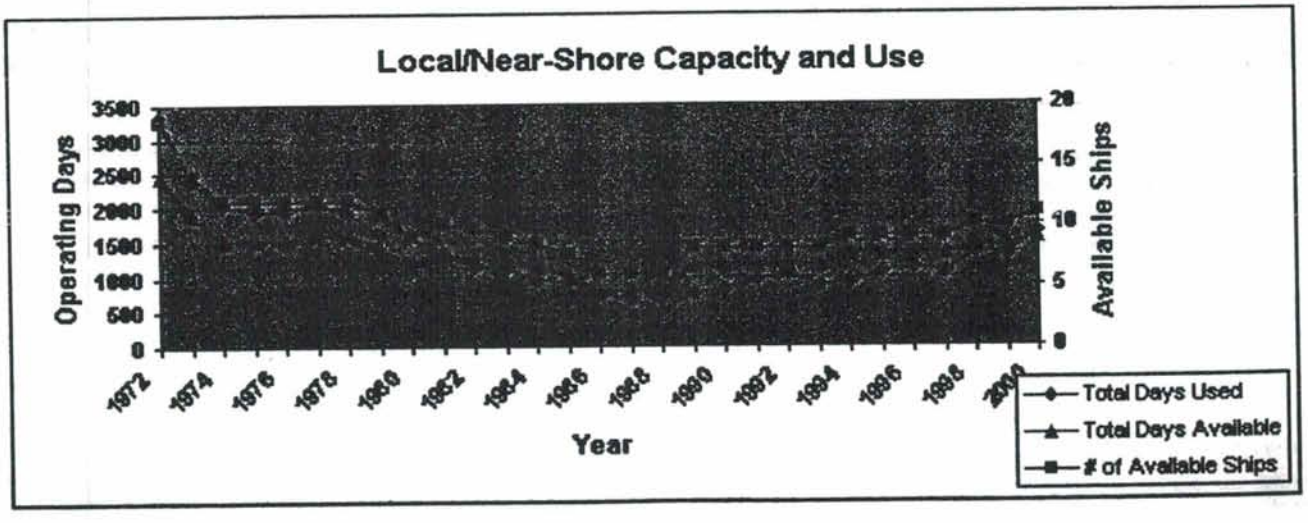


Intermediate and regional ship numbers have remained relatively flat constant with ten to thirteen ships in the fleet with an average of twelve. Those ships provide about 2800 days per year at sea. Of that available time the amount used has varied from 1900 days to 2500 days with an annual variation of about 500 days. This variation represents most of the variation in overall fleet utilization. There is no obvious trend in the total days used but the long term view suggests 2000 to 2500 days represents the demand. This class has, on occasion, an excess of two ships when demand is down and one ship when demand is up.

Conclusions:

- Intermediate/regional ships are not fully utilized and there is often an excess of two ships in the fleet. The trend over the past decade does not indicate a need for more intermediate vessels. The high variation in usage suggests some degree of over capacity is acceptable.

Local/Near-Shore Trends:



Local and near-shore ships number about ten and that has increased from a low of about six in the late 80's. All numbers related to these ships must be viewed carefully as this portion of the fleet is subject to local forcing outside the federal domain that we are addressing. Nevertheless these ships have an impact and use federal resources. The recent trend suggests an increase of the number of ships at about three over the last twenty years. The available operating days has increased from about 750 to 1500 over this time. Utilization in the past was considerably less that what was available but now these ships appear to be fully utilized.

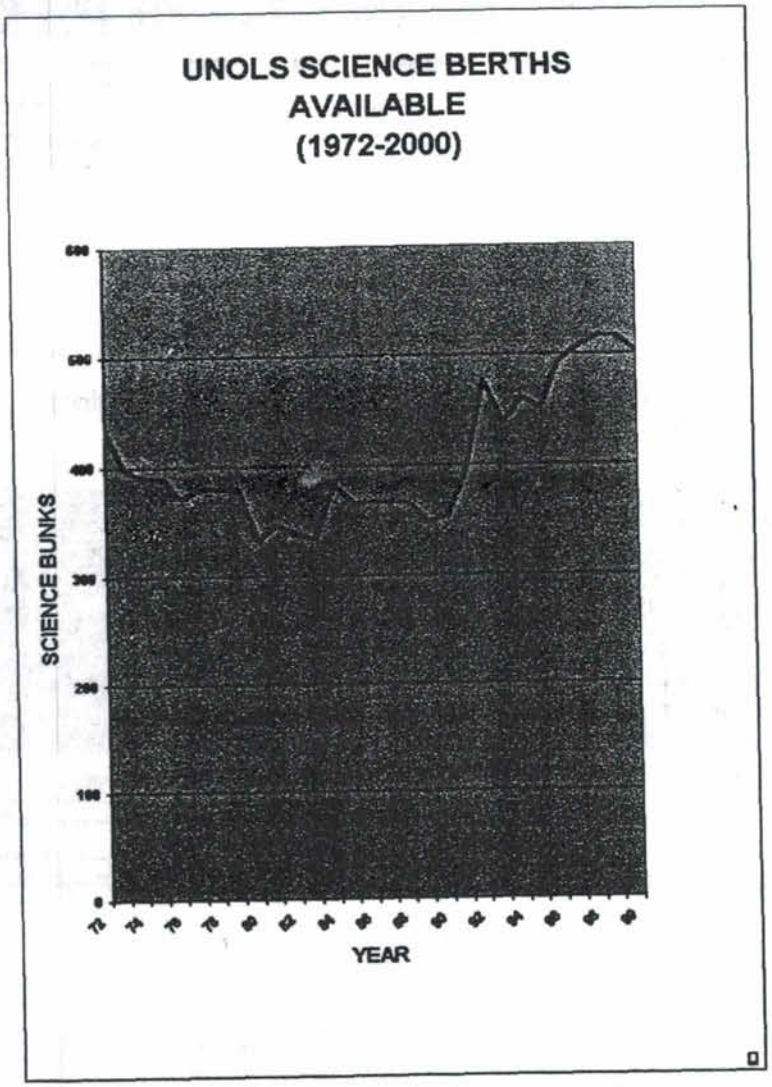
Conclusions:

- Local and near-shore ship capacity is growing and the trends and usage suggest a need for three new ships in the next two decades in addition to replacing existing ships.

Scientific Berths Available in the Fleet

Scientific berths are one of the main constraints in ship requirements and the trend has been for more berths per ship. As would be expected from an overall increase in the number of ships, the increasing size of ships, and the allocation of more space to berthing the number of berths available. In the early 1980's about 330 berths were available and that has now risen to the present high of 503 berths (Figure 4). The trend suggests an increase of about 175 berths over the past ten years. This reflects the new large ships with more berthing capacity.

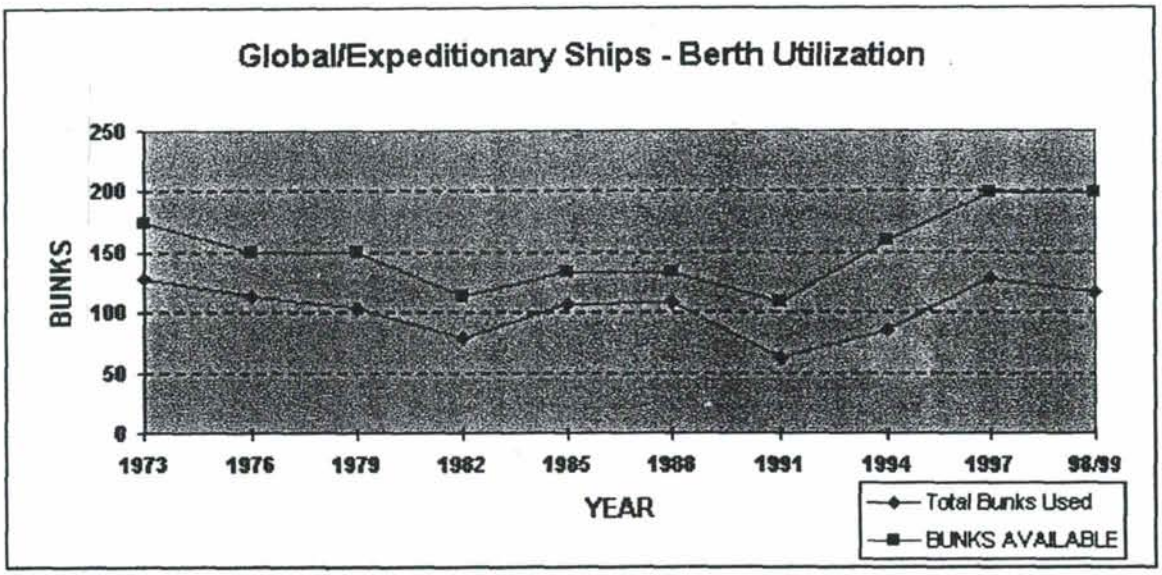
Figure 4: Fleet Berthing Capacity

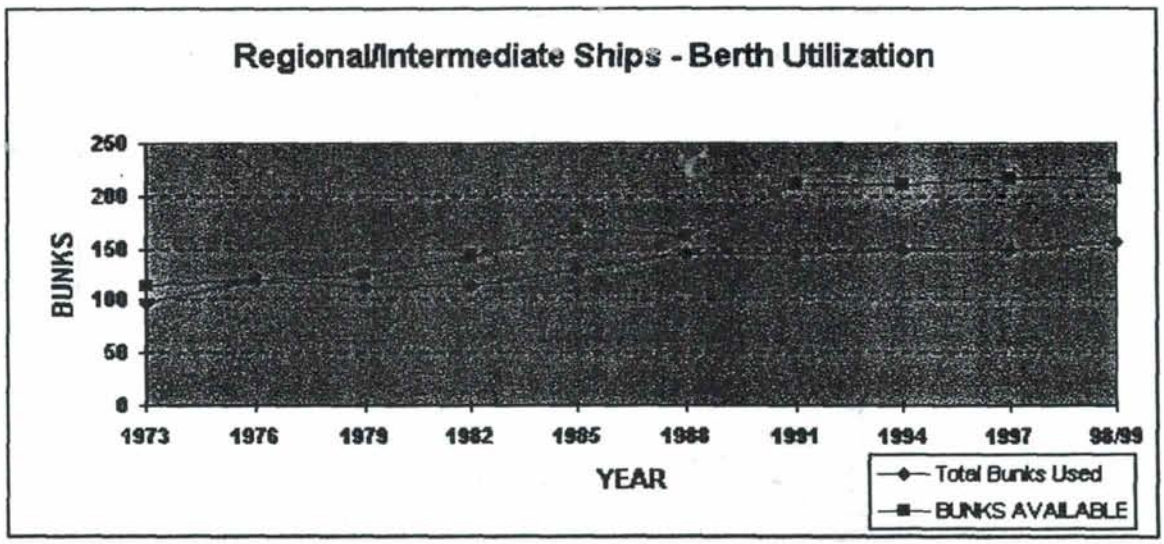


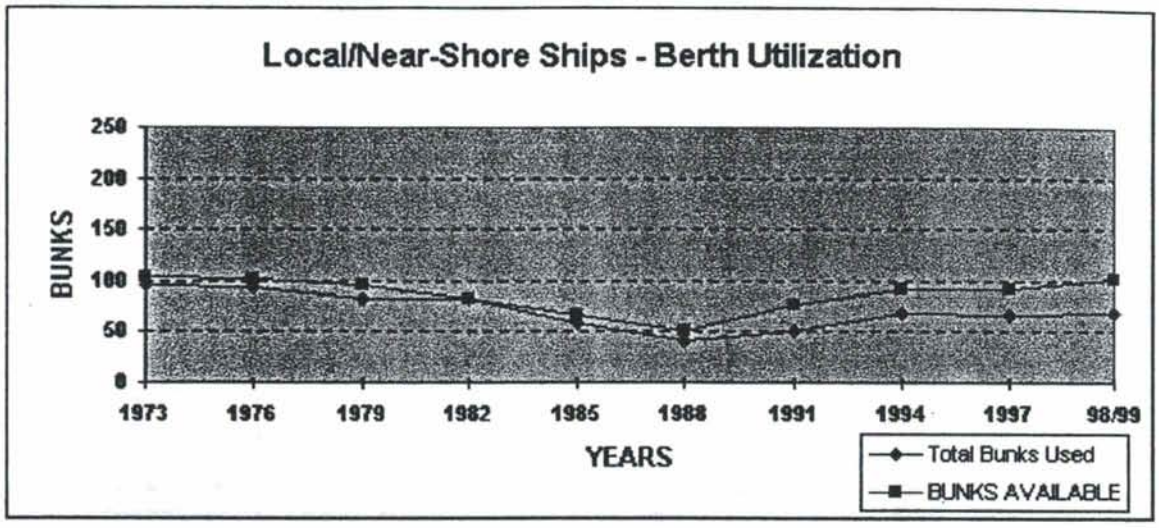
Berth Use by Class:

The increase in berths over the past decade occurred in the Large Ships (100 berths) while the Intermediate Ship berths were flat and the Small Ship berths increased slightly . Figure 5 shows the berth availabilty as well as the utilization of berths by class.

Figure 5: Fleet Berthing Capacity and Utilization in the Fleet by Class



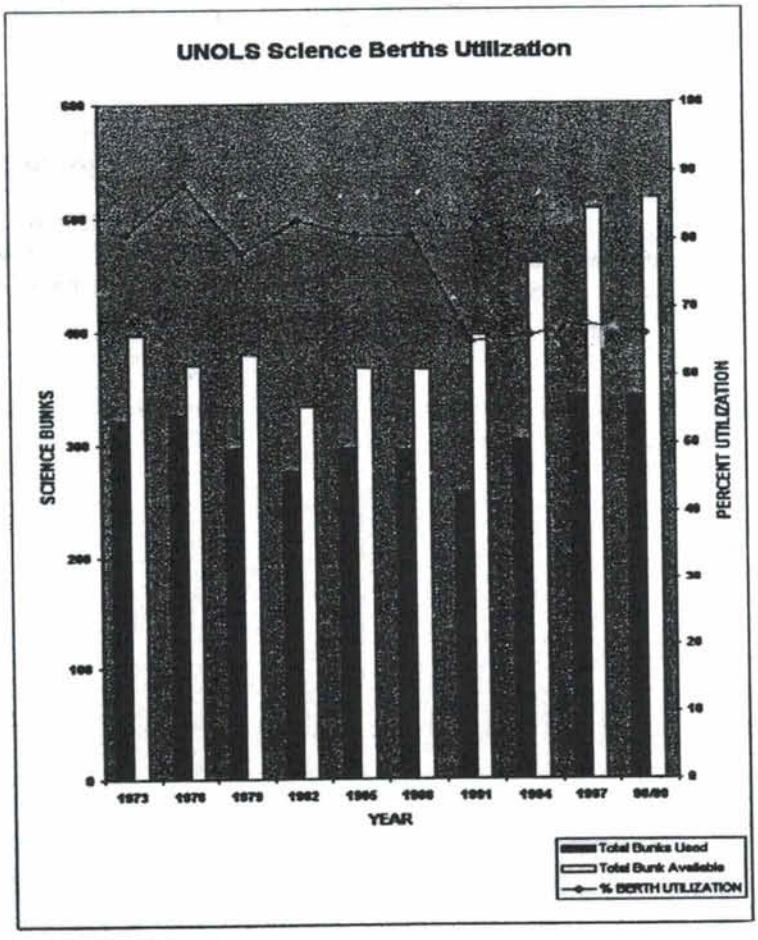




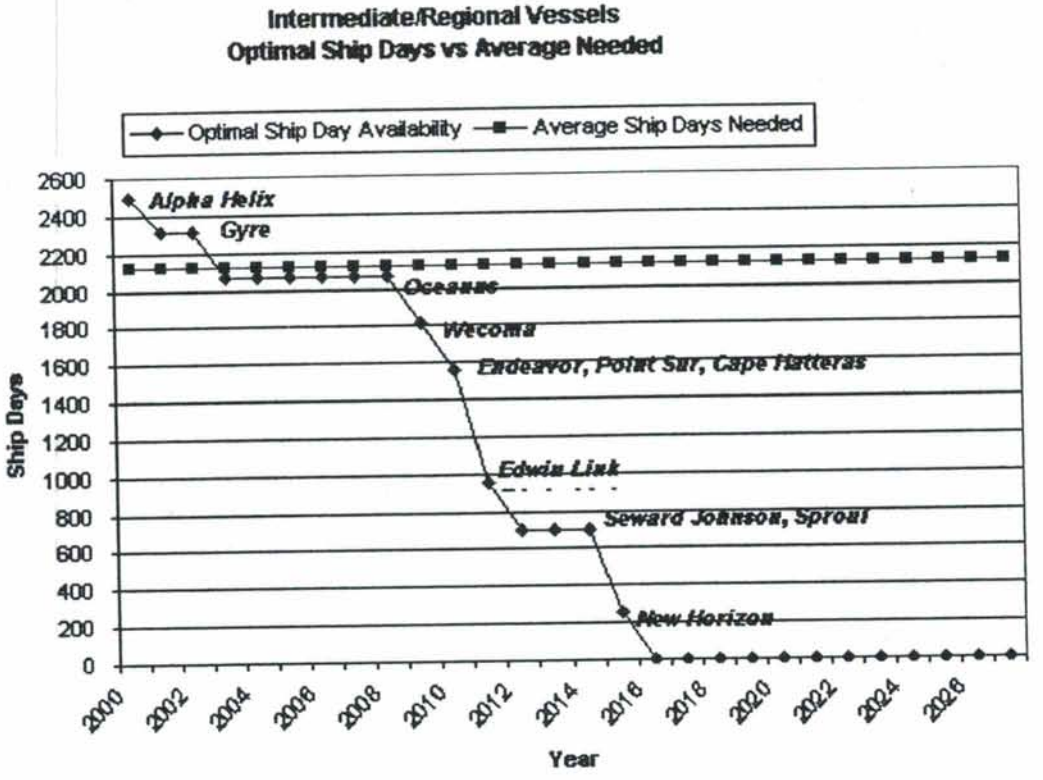
Overall Berth Utilization:

The overall utilization of berths has decreased from a high of about 80% in the 70's and 80's to around 70% in the last decade. (Figure 6). The berth utilization data suggest that the number of bunks presently available on ships is sufficient. Changes in ship use (more laboratory work at ocean observatories for example) could well justify increased bunk numbers. Estimating future berthing requirements must be done as part of science mission requirement activities.

Figure 6. Fleet Science Berth Utilization



Intermediate/Regional Ship Day Utilization:



Intermediate and regional ship: The intermediate ships are in a very different situation than the larger ships. Many will reach their planned retirement date over an eight or nine year period between 2008 and 2016. With projected retirements the excess capacity will disappear by 2009. It is conceivable that the projected increase in large/expeditionary ship demand will be partly assumed by this class. The serious problem is, however, that many of the ships reach their retirement date in a short period of time. This class takes a shorter time to acquire so we must carefully assess the demand and regional requirements over the next few years.

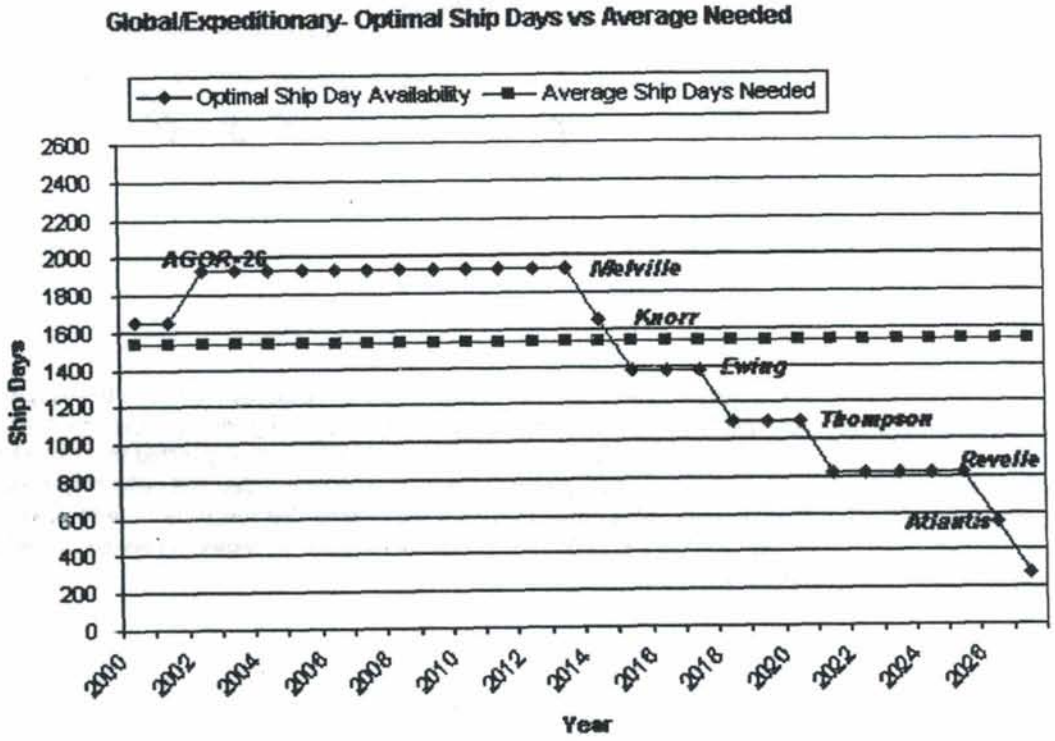
The Future

All ships have a finite lifetime. The usual assumption is that a ship can remain operational for about thirty years if there is major refit after about fifteen years. Of course many ships stay in the fleet longer and some for a shorter time. Figure 7 shows our best estimate of when presently existing ships will go 'off line'. This plot is not our endorsement of a retirement. It is merely an attempt by FIC,UNOLS, UNOLS and ship operators to look at the future.

The conclusions we make are based on the size of the fleet, the anticipated retirement dates and the projected demand. Clearly the demand is difficult to judge. We want to make it clear that we have stayed with the trend lines established in the 1990's. The reader can easily assume different demand projections and make their own assessment. We have made no attempt to assess regional requirements although we fully appreciate the regional demands on all classes of ships.

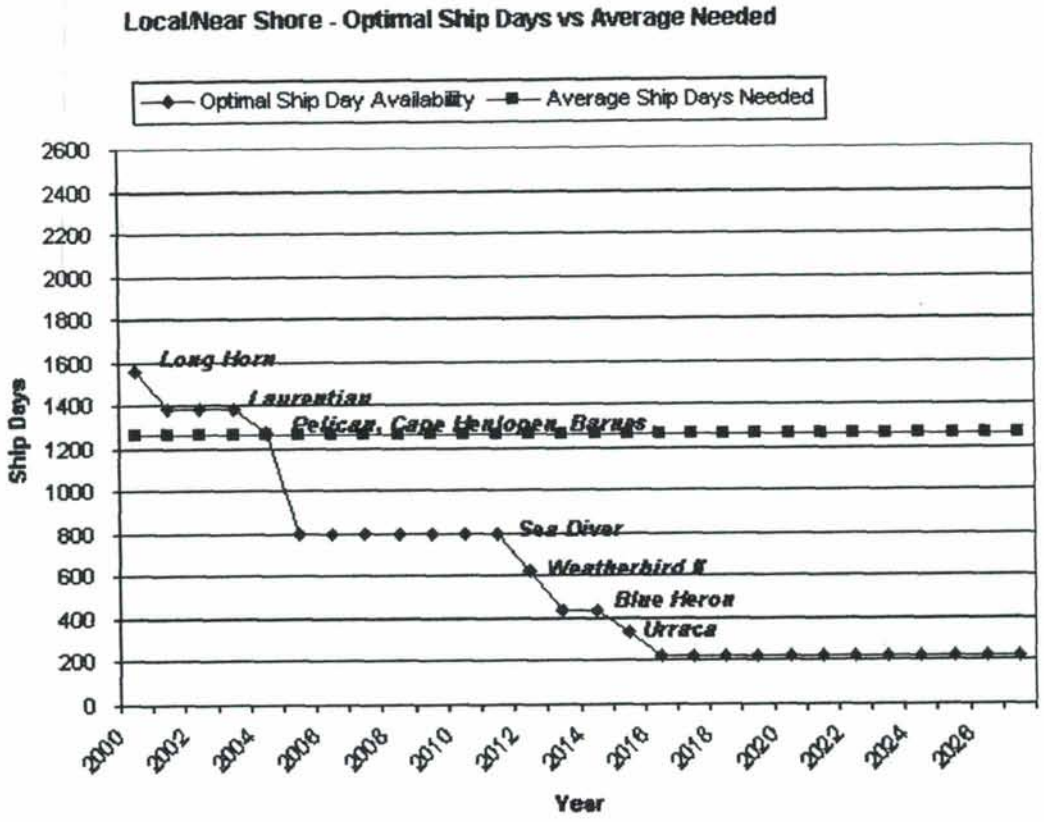
Figure 7: Projection of Ship Day Capacity and Utilization

Global/Expeditionary Ship Day Utilization:



Large/Expeditionary Ships: In 2002, with the inclusion of the AGOR-26 to the UNOLS fleet, 1900 days per year will be available. With our estimate of 1650 days per year of ship demand there may be an excess of about 250 days of large/expeditionary ship time until the first retirement in 2013. A modest increase in demand will eliminate that excess capacity. Our interpretation of recent trends suggest that the ships must be replaced and two to four added. Since it takes five to ten years to acquire a vessel in this class, time is available. However within the next two years replacement and addition plans should start.

Local/Near-Shore Ship Day Utilization:



Local and near-shore ships: Several small ships are quite old and some are past their retirement date. In the next seven years four ships are reaching retirement age followed by a several year gap then between 2011 and 2016 all the remaining ships would be retired. The analysis of past trends suggested that there has been some modest growth (three ships increase over twenty years). Thus it seems that not only must these ships be replaced but as many as three new ships of the local and near-shore class must be added to the fleet. Since these ships are often acquired with non-Federal funds we assume the regional user community and operators will assess and address the situation.

The Cost of Replacement

The schedule and cost for replacement of the fleet as each ship retires is obviously impossible to predict. Nevertheless it is informative to see one realistic scenario (Figure 8). In the next five years approximately $135M is required to and over the next 15 years about $540M is required. At present there is no public Federal agency plan indicating where that money will come from.

Figure 8: The Cost of Replacement

One-for-One Replacement Cost Estimate														
														Grand
Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Global @ $60M														
(Melville, Knorr, Ewing)						Design 10M		60M	60M			60M		**$190M**
Intermediate/Regional @$30M/15M														
(Seward Johnson, Wecoma, Endeavor, Gyre, Oceanus, New Horizon, Edwin Link, Point Sur, Cape Hatteras, Alpha Helix, Sproul)	Design 3M	45M			30M	30M	30M	60M			30M	45M		**$273M**
Local @$15M														
(Cape Henlopen, Weatherbird II, Sea Diver, Pelican, Longhorn) Ships less than 100 ft are not included in the chart.	Design 2M 15M	30M							15M	15M				**$ 77M**
Grand Total	20M	75M	0	0	30M	40M	30M	120M	75M	15M	30M	105M	0	$540M
Notes														
Construction Times: Large Ship = 5 years, Intermediate = 3 years Small Ship = 2 years														
Cost Estimates are in FY2000 Constant Dollars.														
Gyre, Alpha Helix, and *Longhorn* are scheduled to go out of service before 2003.														

This scenario only replaces ships. However, as our discussion suggests, it is likely that new large/expeditionary ships and possibly intermediate/regional and small/near-shore ships will be required to meet future science needs. Those needs could exceed $200m placing the total cost through 2014 at nearly $800m.

Lead Time in Ship Design and Construction

It takes at least five years to bring a large ship into the fleet and three and two years respectively for intermediates and small. Experience shows however that it takes much longer because funding must be obtained. Three Four recent examples for large ships are *Knorr/Melville*, *Thompson*, *Revelle* and *Atlantis*.

- *Knorr/Melville* (mid-life refit and conversion)
- 1983 - Science Requirements established
- 1984 - Navy initiative begun for funding
- 1986 - Funds available
- 1989 - (February) - Conversion begins
- 1992 - (October) - *Knorr* and *Melville* rejoin the fleet
- *Thompson* (AGOR - 23)
- 1983 - Science Requirements established
- 1984 - Navy initiative begun for funding
- 1985 - Design begun with community input
- 1986 - Funds appropriated
- 1986 (Nov.) - RFP released
- 1987 (Aug.) - Contract Awarded
- 1988 (Oct.) - Begin construction
- 1990 (Feb.) - Delivery
- 1991 - *Thompson* joins the fleet.
- *Revelle* (AGOR - 24) and *Atlantis* (AGOR - 25)
- 1993 - Begin Construction
- 1996 - *Revelle* joins the fleet
- 1997 - *Atlantis* joins the fleet
- AGOR - 26 (The new SWATH vessel for the University of Hawaii)
- 1997 - Funds appropriated
- 1999 - Construction begins
- 2002 - Anticipated delivery.

The point here is that planning must begin now.

Planning for New and Replacement Ships and assessing future needs

The academic fleet is renewed through a process that includes all aspects of the oceanographic community. Without going into all the details we would like to mention that an important first step is for the user community of oceanographers to reach a consensus on what is needed in the future based on assessments of future trends.

Recently, NSF asked the oceanographic community to assess the future of the traditional four sub-disciplines of oceanography. The members of FIC reviewed these documents to determine if there was any requirements related to ship use. We did find some common threads through the reports. They are as follows:

- Launch and retrieve autonomous, remotely operated vehicles, and submersible.
- Send and receive large amounts of data
- High capacity shallow draft coastal vessels
- Service ocean observatories and moorings
- Sample ocean surface boundary layer and undisturbed surface waters
- Sample hydrothermal vents and the deep sea
- Support large multidisciplinary field experiments with several ships
- Deep crustal drilling and rapid drilling in sediment and shallow basement
- Long term geophysical deployments

The new aspects of this list are the arrival of undersea vehicles, the tending of ocean observatories, and the trend to even larger multi-disciplinary, multi-ship field experiments. These requirements in some cases do not imply significant changes to ship design but others require new features such as dynamic positioning and specialized winches.

The size of ships, the number of bunks, the special facilities and the regional location must be determined as well as possible for the fleet to operate effectively and efficiently. Assessing future needs is difficult but necessary to meet this task.

The science mission requirement process is specifically designed to address these needs.

Conclusions and Recommendations

Recommendation number one is:

> Sit down with your colleagues and discuss the information presented. Discuss how the trends and projections will affect your research and, more importantly, the research of your younger colleagues. Participate in the process.

The construction and design of new ships, the replacement of retiring ships and the addition of new ships to the fleet require participation by the whole community. The scientific community must present the case to the funding agencies: What types of new ships are needed? Why are they needed? What new, exciting, relevant research can be done? What might be lost if ships are not replaced?

Acknowledgements

This document would not have appeared without the initial help from Richard Pittenger (WHOI) and Annette DeSilva (UNOLS office) who gathered the data and made the original plots. We thank them. We also thank the operators and users who fill out the forms. Without information on each and every cruise we cannot make any projections on the future. Keep filling out the forms!

Figure Captions.

Figure 1. The Future. The number of available ship days in the academic research fleet assuming no ships are replaced as they are retired and that demand remains constant at the 1999 level. By 2007 there will be fewer day available than the demand.

Figure 2. Ships in the Fleet, Days Available and Days Used. Number of ships in fleet, days available and days used: 1972 to 1999. Since 1992 the number of ships and ship days available has increased steadily. The usage has also increased although with a good deal of variability.

Figure 3. Capacity and Use by Class. The number of ships available, the number of day s available and the number of days used for each of the three classes of research ships.

Figure 4. Fleet Berthing Capacity. The number of berths for scientists available in the whole fleet.

Figure 5. Fleet berthing capacity and utilization in the fleet by class.

Figure 6. Total Fleet Berthing Capacity and Utilization.

Figure 7. Projections of ship day capacity and utilization. The available ship days in each class assuming ships retire on schedule and are not replaced. Demand is assumed constant at 1999 levels.

Figure 8. The cost of replacement. The cost of replacement (2000 constant dollars) by year based on retirement schedules.

End Notes

* The Research Vessel Operators Committee recommended definition of a Full Operating Year (FOY): Ships 200'-300'=275 days, ships 150'-199'=250 days, ships 100'-149'=180 dyas, ships <100'=110 days.

Appendix VIII
Seismic Acquisition Recommendations

http://www.unols.org/council/cncmt006/sacqr.html

SUMMARY OF RECOMMENDATIONS

1. Recognize that current seismic data acquisition levels will not support projected science programs. To achieve these programs' minimum scientific objectives will require an eight-fold increase in seismic data acquisition activities over the next decade. Budgetary remedies must be explored.
2. Develop one or More facilities to support two classes of seismic operations:

   Portable 2-D and 3-D single channel seismic (SCS) and multichannel Seismic (MCS) acquisition

   Large UNOLS single-ship 2-D and 3-D seismic acquisition

   Provide a program of technology enhancement for these facilities. Establishing NSF facilities should help meet the basis needs for the next decade, since many present shortcomings could be addressed by consolidating management and incorporating coherent community-based input to facilities operations.

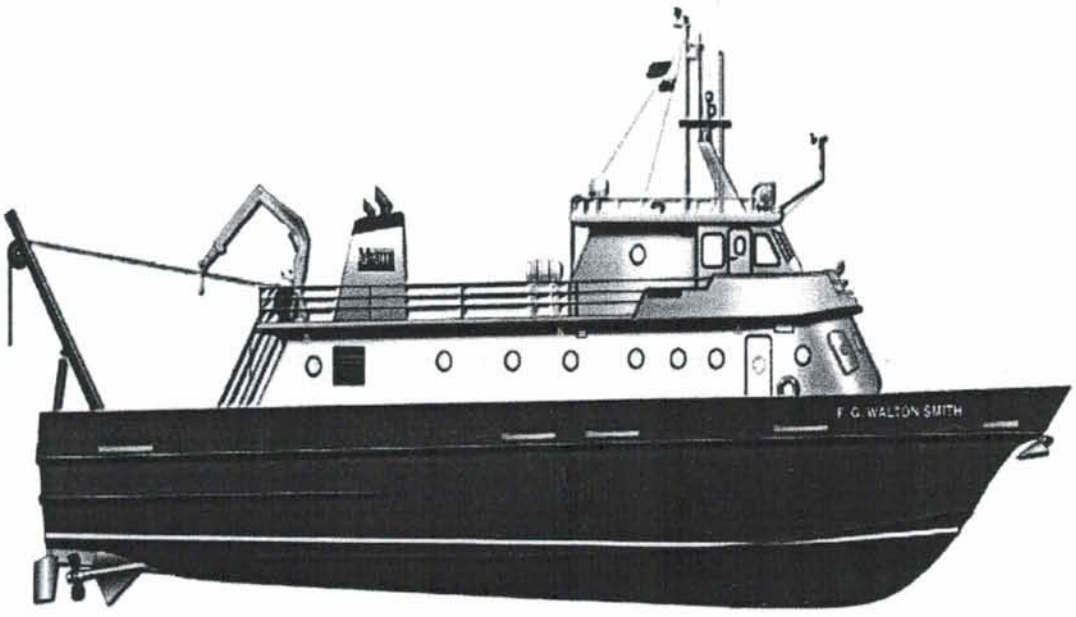
3. Develop a multinational collaborative program for long-term contracting of commercial multi-streamer 3-D MCS. Major cost savings accrue with six-month or longer contracts.

4. Begin planning for a UNOLS seismic vessel anticipating the retirement of the R/V Ewing in 2010-2015.

5. Develop a seismic data archive facility to improve access for the broader Scientific community and students. Currently there is no central archive or Standard data formats.

Appendix IX
F.G. Walton Smith

http://www.unols.org/council/cncmt006/walsm.html



F.G. Walton Smith
Principal Characteristics

Thanks to a gift from the Alex G. Nason Foundation, Inc., the Rosenstiel School has acquired a state-of-the-art catamaran, unrivaled worldwide for both shallow and deep water research. The new vessel, named the F.G. WALTON SMITH, in honor of the founder of the Rosenstiel School, signals a new era in scientific research. The Smith was built in 1999 and placed in service in February, 2000.

The 96-foot-long catamaran is capable of reaching speeds of over 12 knots and has a draft of only 5-1/2 feet, which enables it to explore heretofore inaccessible areas such as reefs, mangroves, grassbeds, and other shallow environments. The vessel accommodates 20 people in its ten two-person staterooms and encompasses 800 square feet of laboratory space, as well as an additional 800 square feet of multi-use space astern. Constructed by Eastern Shipbuilding Group in Panama City, Florida, the catamaran boasts twin Cummins engines at 760 hp each, Servogear variable pitch propellers, a 3,000-gallon tank of fresh water plus a reverse osmosis water maker, and 10,000 gallons of fuel storage.

The vessel also has the capability of dynamic positioning for precise station keeping, using bow thrusters, controllable pitch propellers, and independent rudders. Other specialized instruments include a transducer suite that includes ADCP transducers for measuring ocean currents; a moon pool between the hulls for drilling or coring operations; and a notched stern to facilitate maneuvering equipment into the water using the A-frame.

Length	96'
Breadth	40'
Draft	5' 6"
Gross Tonnage	97
Propulsion	Twin Cummins QSK 19 760hp each
Propellers	Servogear Variable Pitch Electrical
Electrical	Twin 80kw generators 208 vac 3 phase, 110/120 vac single phase UPS in laboratories
Fresh water maker	3,000 gallons plus Reverse Osmosis water maker
Fuel	10,000 gallons
Complement	20 berths, 4 crew, 16 science party
Speed	12 knots

-Dynamic positioning for precise station keeping using bow thrusters, controllable pitch propellers, and independent rudders and controlled by a Kongsberg Simrad DP system which is tied to a TSS POS/ MV 320 Position, Attitude, Heading, and Vertical Reference Sensor.

-A transducer suite that includes ADCP transducers for measuring ocean currents, a 7 x 3.5kHz transducer array for sub-bottom profiling, and a 12kHz transducer for deep water bathymetry.

-A moon pool between the hulls for drilling or coring operations.

-A notched stern to facilitate handling equipment into the water using the A-frame.

-An A-frame, a conductor wire winch, a hydro wire winch, two cranes on the after end of the 01 deck, space for vans, space for small boats, tie downs on both decks on 2 foot centers.

-Sea water flowing systems with pick ups at the bow and space in the wet lab for instrumentation that would typically include a thermosalinograph, a partial CO2 monitor, a nutrient monitor, fluorometers, and a dissolved oxygen monitor.

-Meteorological sensors include wind speed and direction, air temperature, relative humidity, barometric pressure, and solar radiation.

-Over-the-side systems include a Sea Bird CTD system with a fluorometer on a 12 bottle rosette.

-A W. S. Ocean undulating system that allows continuous, underway vertical sampling through a pre-set section of the water column. It can be equipped with a variety of sensors.

-Vessel control stations are located in the bridge, on the 01 deck wings, and at the after control station on the 01 deck
The vessel will be built to USCG Subchapter T specifications and will have an ABS International Load Line.

Deck Plans: Upper Deck & Flying Bridge • Main Deck • Lower Deck • Aerial View

Appendix X
CAPE HENLOPEN Replacement Plan

http://www.unols.org/council/cncmt006/henlopen.html

June 21, 2000

Dr. Larry Atkinson
Chair, UNOLS Fleet Improvement Committee
Old Dominion University
P.O. Box 6369
Norfolk, VA 23508

Dear Dr. Atkinson:

Please find attached a status report outlining where the University of Delaware stands in the design effort to replace the R/V CAPE HENLOPEN. At this point in time, the University is on schedule according to the proposed timetable presented to the Fleet Improvement Committee on November 10, 1999.

Sincerely,

Matthew J. Hawkins
Director, Marine Operations

c/c: Dr. Robert Knox, UNOLS Council
Mike Prince, UNOLS Office
Dolly Dieter, NSF
Sujata Millick, ONR

STATUS REPORT
Design and Replacement Effort
For the R/V CAPE HENLOPEN
University of Delaware
June 2000

Prepared For the UNOLS Fleet Improvement Committee
Dr. Larry Atkinson, Chair

The "Delaware Research Vessel Committee" (DRVC) was established in February of 2000 to aid in the design and review process for the new vessel. The committee is composed primarily of sea-going scientists from the mid-Atlantic region who represent the R/V CAPE HENLOPEN's normal user base. Also included are representatives from NOAA, NAVO, USGS and a fellow ship operating institution. The members were selected such they represent many of the major oceanographic institutions in the mid-Atlantic and the principle disciplines in oceanography. A list of the committee members is included as an attachment to this report.

A "Preliminary Planning Package" was sent to all the committee members in March to help them prepare for the first meeting. The Preliminary Planning Package included a draft "Mission Statement" and "Science Mission Requirement (SMR) Sheets" for them to review. The intent was to guide their thinking in the kinds of questions that would need to be addressed and to elicit their thoughts prior to the meeting. It was hoped that this would aid in making the first meeting productive by: 1) focusing on the most important topics, and 2) identifying areas which would require additional background information and preparation.

The SMR Sheets were tabular in nature and based on SMR's developed by FIC and other institutions in the past. The sheets were divided into four sections to help make the volume of information easier to process. The sections were: 1) General "Regional Ship" Requirements, 2) Region Specific (mid-Atlantic) Requirements, 3) Scientific Outfit, and 4) Operational/Regulatory Considerations. A column showing the current capabilities of the R/V CAPE HENLOPEN was given for reference, and a blank column was included to write in suggestions for the new vessel. Because the vessel is intended to be general purpose in nature, the committee members were asked to comment only on those criteria that were important to their particular disciplines. The complete SMR would be compiled from their individual input into one set of SMR's.

The first meeting of the DRVC was held on Monday, April 10th, at the College of Marine Studies in Lewes. Fourteen of the fifteen committee members were able to attend. The meeting was run by the Chair of the committee, Dr. David Kirchman from the University of Delaware. David Bradley from Pennsylvania State University was also present as an observer. Marine Operations and college staff were also on hand to provide background information to the committee as the discussion progressed.

The first meeting was very productive with most major issues being resolved. A compilation of the committee's preliminary responses was used as a guide in orchestrating the meeting and focusing topics of discussion. There were numerous minor topics that were not addressed at the committee meeting, but they should be able to be resolved by e-mail and phone conversations as part of the final review process . With the major issues resolved, there is ample information to proceed to the "concept" design phase. A preliminary overview of the new vessel's primary characteristics is included as an attachment to this report.

Marine Operations was asked to gather more historical information on issues such as size of the scientific party, area of operation, and prevailing weather and sea states to help confirm the views of the committee. Though important for the review process, it was not felt that this information would severely affect the design of the vessel as envisioned by the committee, and could wait to be presented along with the "concept" design at the second meeting in 2001.

The Mission Statement and Science Mission Requirement Sheets were revised based on the committee's comments at the first meeting. These revised sheets were sent out to the DRVC for final review and comment on June 7th. Results of this review process should be completed by June 23rd. The University of Delaware anticipates that the final Mission Statement and SMR sheets will be ready for submittal to the Fleet Improvement Committee for review during the first week in July 2000. Once FIC has completed their review, these documents will be revised and development of the "concept" design will begin. Draft deck plans, profiles, and estimates of ship capabilities should be available by the second meeting in 2001. For reference, a copy of the overall design process presented to FIC in November 1999 is included as an attachment to this report.

Key Characteristics of New Delaware R/V
as Determined by the DRVC

- Vessel to support multi-disciplinary research, and operated on 24-hour basis.
- Draft at (or just below) 10 feet - work both inshore and offshore.
- Acoustically quiet to ICES standards (if possible) for shallower draft vessel. Would like to see to 11 knots but may be acceptable if achievable at slower survey speeds.
- Though no atmospheric researchers on committee - generally accepted that low emissions is important.
- 12 permanent scientific berths expandable to 16 (by conversion of scientific office) and then again to 20 by use of van.

- **High degree of flexibility in outfitting and arrangement** - labs, vans, winches. Vessel able to be configured in a wide variety of ways to suit a full range of missions.

- Capable of carrying **two** 20-foot vans on aft deck - greater flexibility

- Ship should be outfitted with a more substantial work boat which can be carried in place of a 20 foot van for sampling in very shallow water regions. 2-3 scientists, small sheltered cabin, light A-frame/davit - small instruments, grabs, trawls. Higher speed. Deployed at sea from the ship.

- Maximum wire needs on winches: 3000m

- Side towing capability extremely important.

- Two separate trawl winches normally carried below decks - one outfitted with wire rope, the other with E&M cable. Roughly same capacity. Interchangeable drums.

- Variety of deck winches - "Clean", wire rope, and E&M Cable.

- Greater lab and deck space than the CAPE HENLOPEN.

- Wet lab incorporated with CTD "hanger" to allow personnel to work out of the weather.

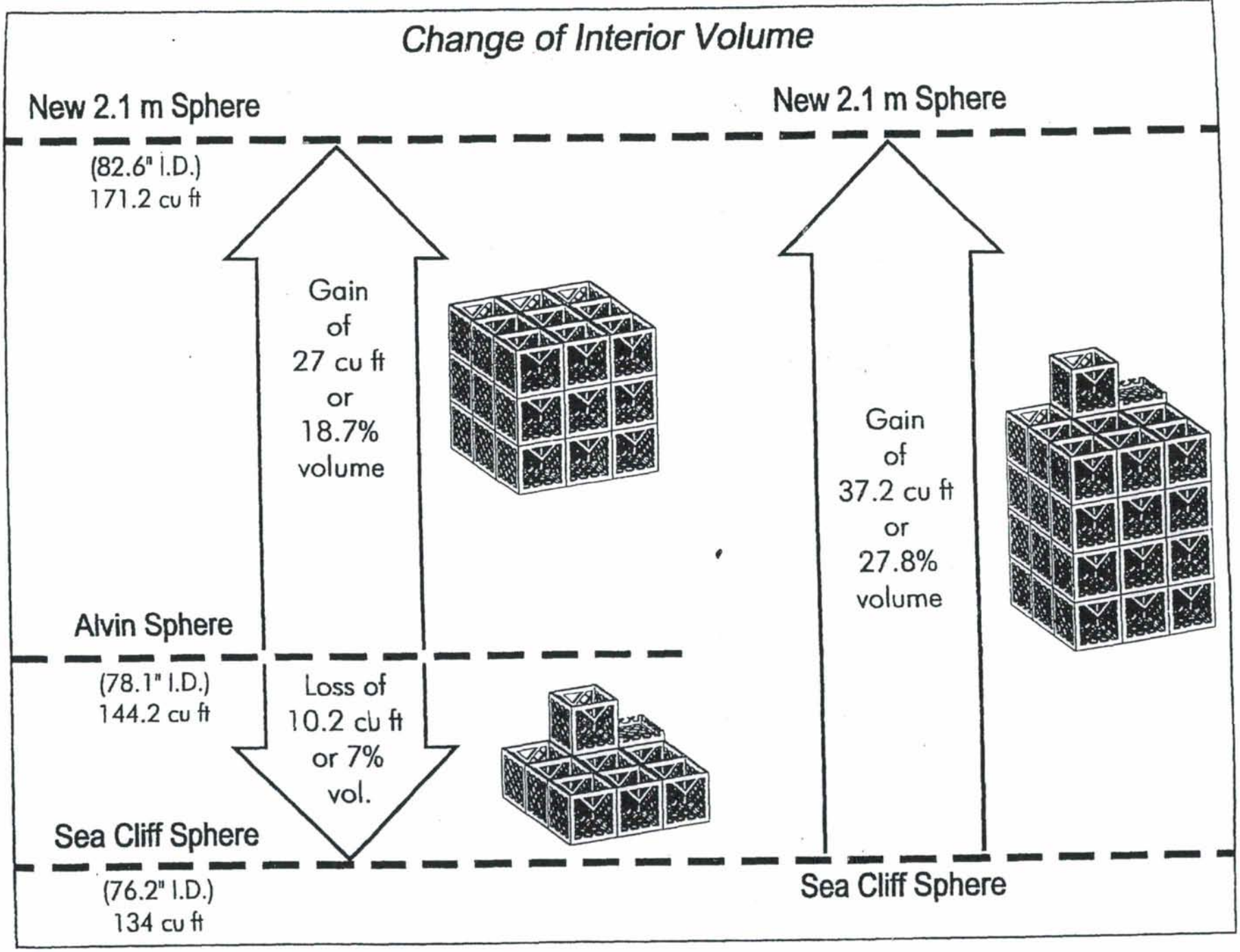
- New ship envisioned approximately 50% larger than the CAPE HENLOPEN and less than 150 feet.

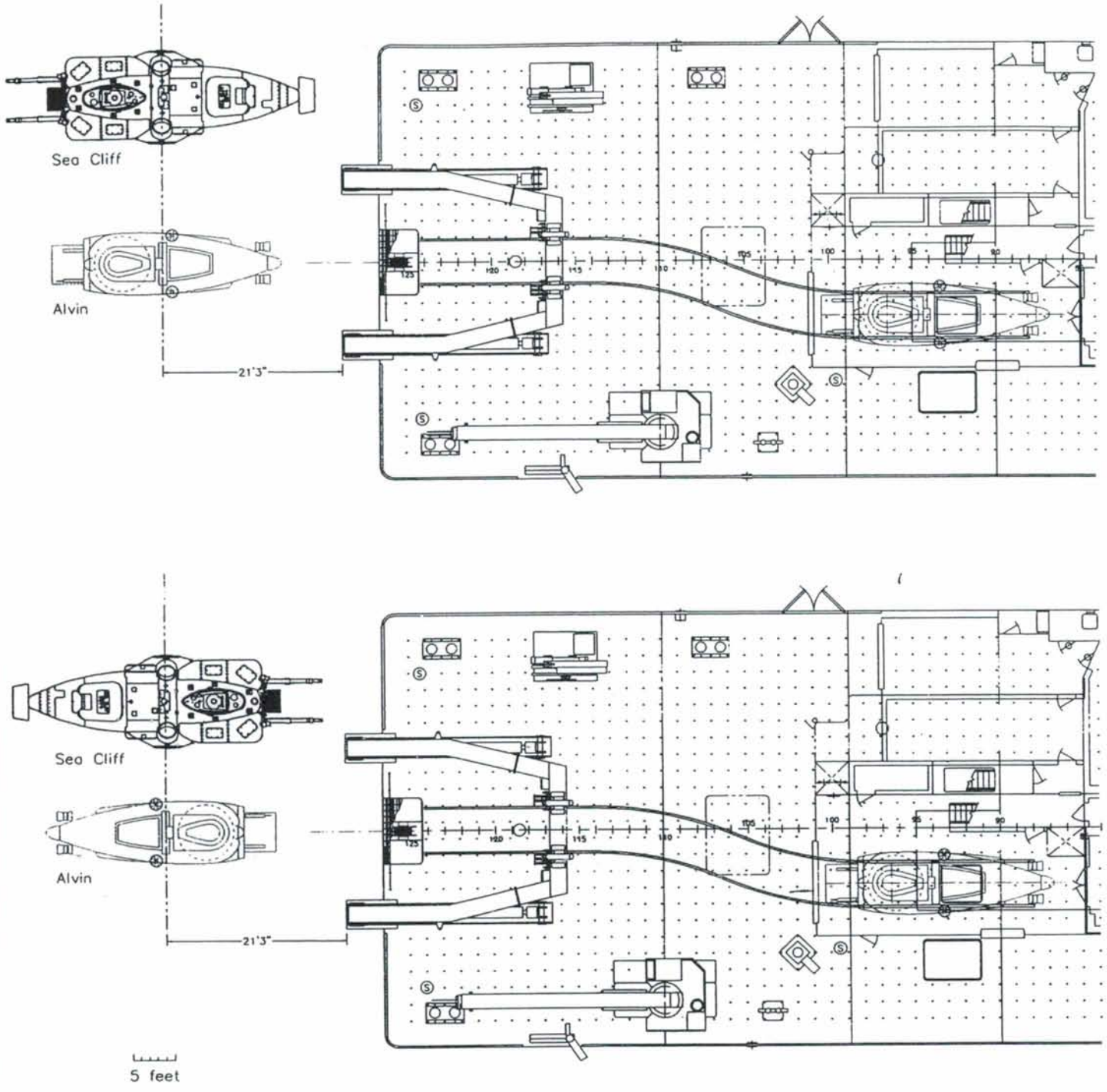
Appendix XI
Submersible Comparison Chart and Option Costs

http://www.marine.whoi.edu/ships/seacliff/report.htm

Comparison of Vehicle Options									
Blue = Pos attribute Red = Neg attribute ↗ = Increase ↘ = Decrease ↔ = No change	Option 1.a Improved 4500 M Alvin	Option 1.b New 4500 Meter DSV (existing ALVIN hull)	Option 1.c New 4500 Meter DSV (new hull)	Option 2 Sea Cliff (as is)	Option 3 Sea Cliff (Mod)	Option 4 6000 M Alvin (Sea Cliff hull)	Option 4.a 6000 M Alvin (Mod Sea Cliff hull)	Option 4.b 6000 M Alvin (Maraged Steel hull)	Option 5 New DSV
6000 Meters	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Sphere									
Window Orientation	↔	↔	↗	↔	↔	↔	↗	↗	↗
Interior Volume	↔	↔	↗	↘	↘	↘	↘	↗	↗
Comfort	↔	↔	↗	↘	↘	↘	↘	↗	↗
Science									
Electrical Capacity	↔	↗	↗	↗	↔(?)	↔	↔	↔	↗
Payload	↗	↗	↗	↗	↗	↔	↔	↔	↗
Sea Floor Footprint	↔	↔	↔	↗	↗	↔	↔	↔	↔
Maneuvering Characteristics									
Ascent/descent Rates	↔	↗	↗	↗	↗	?	?	?	↗
Maneuverability	↔	↗	↗	↘	↘	↔	↔	↔	↗

Comparison of Vehicle Options									
Speed	↔	↗ (?)	↗ (?)	↗	↗	↔	↔	↔	↗ (?)
Launch/ Recovery Hazard	↔	↔	↔	↗	↗	↔	↔	↔	↔
Construction									
Maintainability	↗	↗	↗	↘	↘	↔	↔	↔	↗
Operating Costs	↔	↔	↔	↗	↗	↔	↔	↔	↔
Variable Ballast	Water	Water	Water	Water/ Steel	Water/ Steel	Water	Water	Water	Water
Trim	Hg	Water (?)	Water (?)	Hg	Hg	Hg	Hg	Hg	Water (?)
Ascent/ Descent Weights	Steel	Water (?)	Water (?)	Steel	Steel	Steel	Steel	Steel	Water (?)
Support Ship Infrastructure									
Weight	↘ (?)	↔ (?)	↔ (?)	↗	↗	↗	↗	↗	↔ (?)
A-Frame Mods	No	No	No	YES	YES	No	?	?	No
Hanger Useable	Yes	Yes	Yes	NO	NO	Yes	Yes	Yes	Yes
COST	$686,800	$11,462,876	$13,063,330	-------	$1,507,718	$2,657,533	$3,472,531	$4,207,405+	$13,748,670

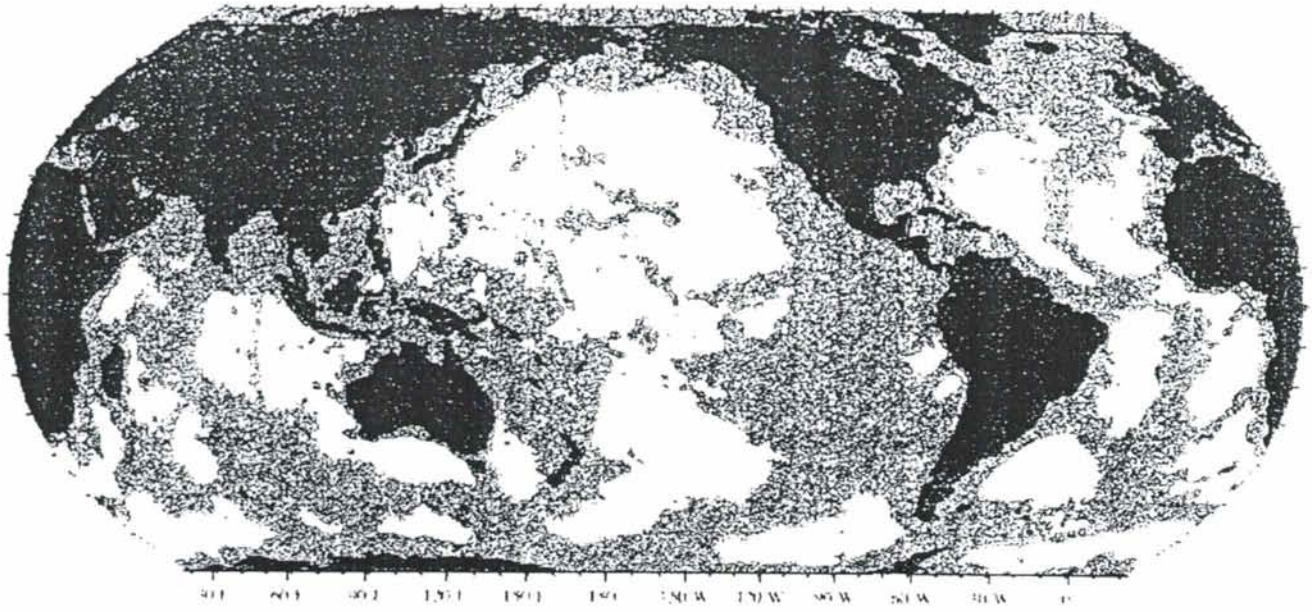

Change of Interior Volume
New 2.1 m Sphere
(82.6" I.D.)
171.2 cu ft
Gain
of
27 cu ft
or
18.7%
volume
Alvin Sphere
(78.1" I.D.)
144.2 cu ft
Loss of
10.2 cu ft
or 7%
vol.
Sea Cliff Sphere
(76.2" I.D.)
134 cu ft
New 2.1 m Sphere
Gain
of
37.2 cu ft
or
27.8%
volume
Sea Cliff Sphere



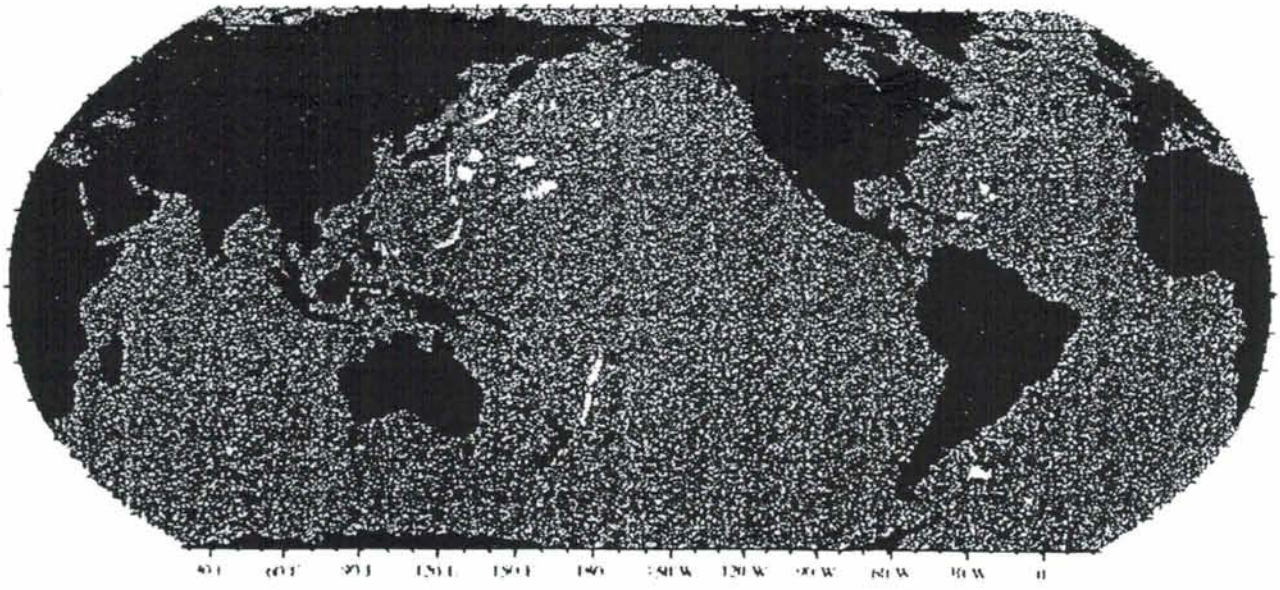
Alvin and Sea Cliff on Atlantis, Plan View

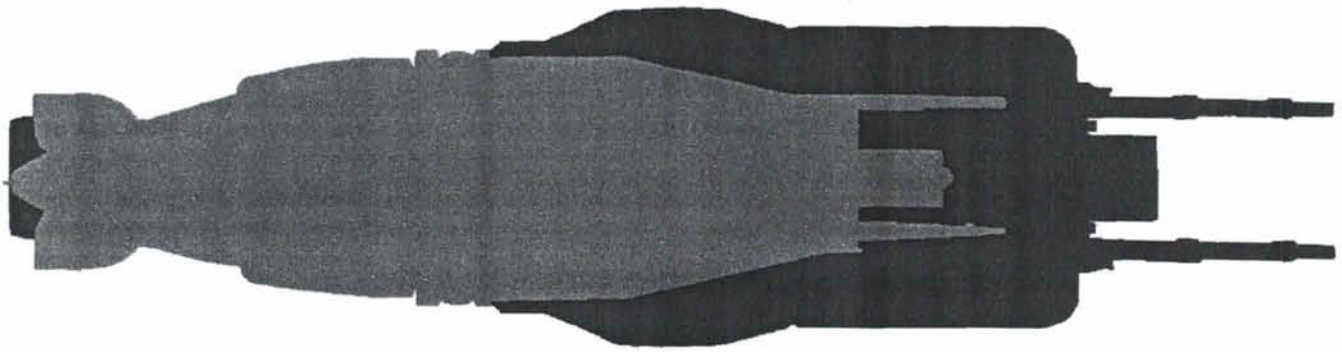
Betsey Doherty date: 05.15.00
file: s:\dwg\alv sea cliff study\
on atlantis.dwg rev 2

4500m Dive Coverage

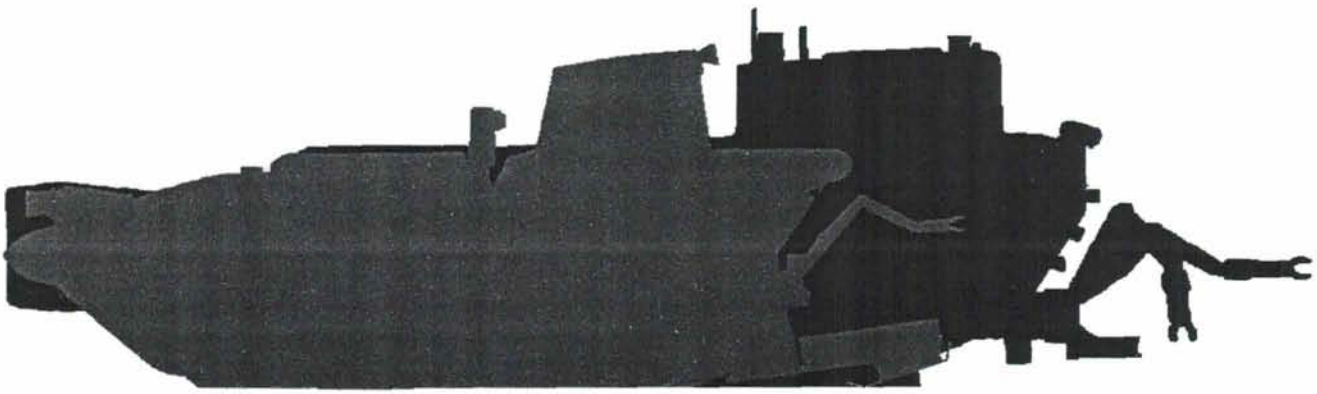


6000m Dive Coverage





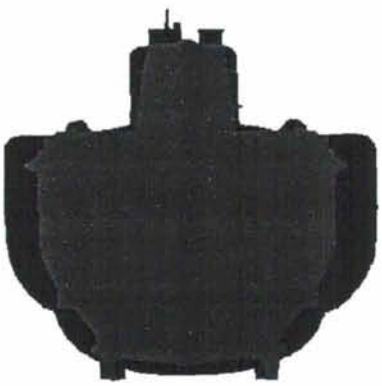
Top View



Side View

Alvin
in Gray

Sea Cliff
In Black



Front View

5 Feet