UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

UNOLS Council Meeting

Summary Report

July 13-14, 1999

Bermuda Biological Station for Research Inc.
Hanson Hall
17 Biological Station Lane
Ferry Reach, St. George's Bermuda

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Welcome and Introductions – The UNOLS Council met in Hanson Hall at the Bermuda Biological Station for Research. Bob Knox, UNOLS Chair, called the meeting to order at 8:45 am on 13 July 1999. The items of the agenda, ***Appendix I***, were addressed in the order as reported below. The participants of the meeting are listed in ***Appendix II***.

Tony Knap welcomed Council Meeting participants to Bermuda Biological Research Station.

Accept minutes – The minutes of the February 1999 UNOLS Council Meeting were accepted as written.

COMMITTEE REPORTS:

The UNOLS Committee Chairs provided written reports of their respective committee activities prior to the meeting, see ***Appendix III.*** Bob Knox provided a summary of the reports. The Committee Chairs added comments to their written reports.

Arctic Icebreaker Coordinating Committee (AICC) - Jim Swift reported that a NSF funded PI on a recent POLAR SEA cruise sent a post-cruise letter to the US Coast Guard. The letter gave a critical account of the science support provided during the cruise. The USCG has taken the letter under review and will provide a response. Jim commented that the letter provides good suggestions that would benefit future USCG science cruises. One suggestion was to have USCG officers participate in research cruises on UNOLS vessels.

There was discussion on OMB's suggestion to have NSF take over the operation of HEALY. It was noted that the suggestion is dead for the time being. If the suggestion had been endorsed, it would have made HEALY a UNOLS ship, and not be operated by the USCG.

Fleet Improvement Committee (FIC) – Bob Knox summarized the written FIC report. There was a brief discussion on why a letter was sent to WHOI requesting that they make their SWATH a UNOLS vessel. Larry explained that after presentations by WHOI on their SWATH design, the FIC recommended that the SWATH vessel become a UNOLS vessel since it would offer a unique capability to the scientific community. It was suggested that in the future FIC should continue to be proactive in recommending ships to the UNOLS Fleet when appropriate.

Research Vessel Operators' Committee (RVOC) – Bob Knox summarized the written RVOC report. Paul Ljunggren added that a subcommittee has been formed to study portable vans. The study will include an inventory of containers now available in the fleet. The inventory of vans will provide a clear picture of what is available and allow budgeting for replacements. The study also hopes to provide guidelines for procurement and use of vans. Issues such as proper securing of vans and size recommendations will be addressed. The study was initiated in response to comments that some vans being used today are old, substandard and not USCG approved.

Research Vessel Technical Enhancement Committee (RVTEC) – Bob Knox summarized the RVTEC written report. Jack Bash commented on the growth and interest in technical support issues. In the eight years that RVTEC has been in existence it has grown in interest and helped to heighten awareness of support issues.

Ship Scheduling Committee (SSC) – Mike Prince distributed spreadsheets for UNOLS ship utilization in 2000, see ***Appendix IV***. The sheets include the numbers which were available to date. The total days requested is a bit lower than the past two years, but the 2000 statistics do not include the SEWARD JOHNSON schedule. NSF's ship time is up from the past two years; however; Navy, NOAA, other, and institution days are down from the previous years. The NAVO ship time has not been included on some of the schedules. The small ship schedules are strong with LAURENTIAN at 232 days. On the other hand, coastal intermediate ships on the West Coast are showing relatively weak schedules at this time. The ship scheduling meeting will be held on 15 July.

DEep Submergence Science Committee (DESSC) - Bob Knox summarized the written DESSC report. Mike Prince commented that the ROV schedule for 2000 is very demanding and will be perhaps be impossible to fully accommodate in 2000.

Agency Reports:

Department of State (DOS) – Tom Cocke reported that, on the whole, things are going smoothly with clearance requests. Liz Maruschak has been of great assistance in Tom's

office. NSF and ONR are providing support for Liz's position. She has been working to bring the computer systems up-to-date. Tom reported that Cuba has not been granting approval for clearance requests and that it does not look good for the future. It is unclear as to why Cuba is not responding to clearance requests. Clearances requests for work in China waters has also been a problem. Part of the problem is that China claims a lot of territory. Many times clearances are needed for both Taiwan and China.

Tom commented that his office is receiving many clearance requests that have not been submitted using proper procedures. The normal practice is for a scientist to work with a UNOLS Operator when submitting a request. Tom estimated that there are approximately ten people who do not use the system properly. The Council suggested that Tom send the names of the offenders to the UNOLS Office, SSC Chair, or ship operator, who in turn will educate the offender on how to properly submit a request.

When asked about the state of the computer systems in Tom's office, Tom indicated that there are still problems. As an example he reported that his e-mail was down from December until July. It is very distressing that the State Department is not providing adequate computer systems or e-mail service. There is also concern from the other agencies about funding a person to work in the State Department (although everyone has high praise for Liz and greatly appreciates her efforts).

National Oceanic and Atmospheric Administration/Ocean and Atmospheric Research (NOAA/OAR) – CDR. Beth White gave the report for NOAA/OAR. She began by reporting on personnel changes. RADM Bill Stubblefield retired this year and RADM Evelyn Fields has taken over command as the new director of the NOAA Corp Operations. RADM Albridge retired in July from the NOAA Commissioned Corps.

The Senate mark on the NOAA budget has just been released. Funds for chartering are included. The Sustainable Seas program is underway. The Sustainable Seas Expeditions will explore the underwater rim of the United States. It is a multi-million dollar project of the National Geographic Society that will span five years. The program was funded through a $5 million grant from the Goldman Fund in partnership with NOAA's national marine sanctuaries. The program will apply new submersible technology. This year operations began in April on NOAA's ship, McARTHUR along the West Coast.

NOAA/National Marine Fisheries Service (NOAA/NMFS) – Jim Meehan gave the report for NOAA/NMFS. He began by reporting that the Senate mark appropriates approximately $54 M for a fisheries vessel. Th mark also indicates approximately $60M per year for the next six years for fisheries vessels. NOAA had requested four vessels, but the mark indicates six vessels. Ship construction for the fisheries vessels will be through NAVSEA. The CBA is expected to be on the street in July. The Data Acquisition Plan which, among other things, lays out the NMFS long-term needs for ship use can be found at the website: http://www.st.nmfs.gov/st2/omb_link.html . The NOAA fishery research vessel (FRV) design calls for vessel 213-ft LOA, ~46-ft beam, and ~19-ft draft. The ship is to be diesel/electric with the goal of meeting ICES noise

requirements. The first four FRVs are to be FRV40s. Ships are needed in the Alaska region and off the Northeast US.

A variety of questions arose regarding the NOAA FRVs and ship needs. There was a general discussion on whether any of these ships would be brought into the UNOLS system. The question arose on whether or not there will be funds in NOAA's budget for chartering after construction and operation of the new FRVs.

National Science Foundation (NSF) – Dolly Dieter began the NSF report by noting that the budget looks level for 2000. Don Heinrichs will retire at the end of the year. Holly Smith has come aboard at NSF as a science officer in the Facilities Section. Beth White is on loan from NOAA a couple of days a week to assist NSF in the Facilities Section. She will be involved with ship scheduling.

As a result of the NSF Academic Fleet Review, improvements to the fleet and operations are already underway:

- UNOLS ships will be equipped with de-fibrillators. Mike Prince has been spearheading this effort to provide de-fibrillators to all UNOLS vessels.
- A van study is underway. Joe Coburn is heading a group to provide guidelines for van design as well as an inventory of the vans that are presently in the system. This effort was partially a result of the comments provided by the science user community.
- Plans for a Winch and Wire Symposium are underway. This effort again stemmed from comments received from the science user community. Heavy science packages are being handled. Additionally new cables are coming on the market. A steering committee has been formed by Jack Bash to coordinate this effort.
- A workshop is being planned to address submergence science facility needs into the future. The workshop will address the science to be conducted in the next 5,10, 15 years as well as the facilities needed to meet these research requirements. NSF, ONR and NOAA are funding the workshop.
- NSF encouraged proposals for crew training from UNOLS operators. A number of UNOLS operators submitted proposals. These proposals are either being fully or partially funded. The proposals requested support for STCW, management, safety, and engine training.

There was a brief discussion on long-coring and what efforts are underway. Dolly reported that there are some individuals who are addressing this issue. Recently there was a visit to the French vessel, MARION DUFRESNE, which has a 50m coring capability. The US does not have this capability. The US community will need to determine what long-core capability is needed? They also need to determine if a portable system is feasible? HEALY will have a 30m capability. The long-core will require a synthetic wire and heavy-duty winch.

Naval Oceanographic Office (NAVO) – Gordon Wilkes provided an overview of the UNOLS/NAVO ship activities over the past three years (1997-1999), see ***Appendix V***. The NAVO scientists have enjoyed the cruises with high grades for support (and food). Nine different UNOLS institutions supported NAVO ship use. In the three years, there

are a total of 1297 NAVO ship days on nine different ships. With the data collected from these ships, all of the Navy's gravity requirements outside of the EEZ have been met. The 1999 NAVO work schedule includes a shallow water bathymetry survey using CAPE HATTERAS. This project required a special equipment installation. Most of the 2000 NAVO work will be in shallow water. Gordon presented the NAVO CY2000 projections for UNOLS ship time. The projections include two options; one if they receive full support at $7.5M and the other if they receive partial support of $3M. It is unclear at this time how much funding will be available for NAVO use of UNOLS ships in CY2000.

There was a brief discussion on the feasibility of using UNOLS vessels for NAVO surveys in foreign EEZs. UNOLS vessels doing research in an EEZ require foreign clearance. It was questioned on whether or not it would be possible to combine academic research programs with NAVO work in a foreign EEZ when the UNOLS ship received a clearance to do the academic work. This is a complex situation which would need to be further investigated.

Terry Schaff pointed out that support for NAVO ship time on UNOLS vessels has been coming through NOPP. It would probably be more appropriate if this funding now began coming from the Navy's budget. NAVO has had a chance over the past few years to become familiar with UNOLS operations.

Oceanographer of the Navy (OON) – Pat Dennis reported that RADM Ellis has been replaced by RADM Dick West as the Oceanographer. Admiral West is new to the academic research community; his background is in missile defense. Adm. Ellis has moved on to the Pentagon to work with in the deep submergence program. Rick Spinrad is now aboard as the new Technical Director of the OON. He has hired Tom Cuff as his deputy.

Pat continued by reporting on the NAVO ships. USNS HENSON (T-AGS 63) will be deployed in the fall. BRUCE HEEZEN (T-AGS 64) will be delivered in the beginning of 2000. The keel laying ceremony for T-AGS 65 is planned for the end of July 1999. The sponsors for the ship are the wives of the three admirals (Gaffney, Ellis, and Sargent) who have been involved in the T-AGS 60 Class construction project.

The Navy survey vessel, BENT, will be transferred to Turkey. The future of the MOANA WAVE is still to be decided. One option would be to have the MOANA WAVE transferred to the state of Alaska. University of Alaska has requested that this not be a replacement for ALPHA HELIX. The ship would perhaps be run jointly by the University of Alaska, Alaska Fish and Wildlife, and a private Native American group. The ship would be used for fisheries research, training, and oil spill disaster assessment. The ship would not be a UNOLS vessel. The issue of transfer will likely not be resolved before the end of the summer. The Navy would prefer to transfer the ship as opposed to laying it ups since a lay-up can be expensive.

Office of Naval Research (ONR) – Tim Pfeiffer provided the report for ONR and began by reporting that ONR and NRL ship time is down in 2000 from 1999. There are approximately 770 days scheduled in 2000. Work will include a program in the Sea of Japan, as well as a program using KNORR in the Mediterranean. Within ONR there has been a change in emphasis, with less physical research and more acoustic research.

Consortium for Oceanographic Research and Education (CORE) – Terry Schaff gave the CORE report and provided information on the budget. The Senate has marked up the NOAA bill. NOAA requested $3M for NOS use of UNOLS vessels. The Senate mark shows an increased NOAA budget, but it looks like it may exceed the funding caps. Terry is dismayed by the lack of support from UNOLS institutions regarding future NAVO use of UNOLS ships. Only five institutions have expressed concern. There is $3M included in the budget for Navy survey work on UNOLS ships in 2000. There is $9M added for the SWATH construction project. This amount should cover the estimated added construction costs of the SWATH.

Terry also discussed future facility planning. At the National Ocean Research Leadership Council meeting there was a discussion on facility planning. The group is considering taking the lead on this activity. This may overtake the efforts of FOFCC. The Leadership Council includes the leaders of the nine agencies. In the testimony provided by Bob Knox at the NOAA fisheries hearing, he alluded to the lack of facility long term planning. There may be another hearing in the near future to address this issue. Some of this is being driven by the need for long-term observatory systems. Efforts to convene a Stratton-II committee are on hold for time being. A new commission may be considered after the election year.

United States Coast Guard (USCG) – A written report was provided by the USCG prior to the Council meeting, see ***Appendix VI***. The report provides a HEALY update, Polar Icebreaker Update, and news on the status of the USCG/NSF MOA.

UNOLS Issues:

NSF Academic Research Fleet Review – Dolly Dieter reported on the Academic Research Fleet Review, her viewgraphs are included as ***Appendix VII***. The Review Committee's report is being printed and will be presented to the Board of Directors later in the month (July). Dolly provided the names of the review committee as well as their charge. To perform the fleet review, the committee met four times; three time in 1998 and once in 1999. On the whole the report indicates that the system is working and major overhaul is not needed. However, some fine-tuning could lead to improvements. Dolly summarized the report's findings and recommendations:

- There is a present and projected near-term period of reduced utilization of the UNOLS Fleet. This period should be used to address management issues and improve capability, productivity, and quality of fleet operations as a means of achieving NSF research and educational.

- NSF must accelerate and expand efforts to articulate a broadly based vision for the future of ocean science and technology.

- The UNOLS system should be retained. UNOLS services are meeting community needs and costs appear comparable to other government and commercial operators.

- The funding agencies and UNOLS should work to enhance quality control, expand training of personnel in technical and safety procedures, and develop even higher standards for shared use facilities. This is a very high priority and continuing theme. It was one of the initiatives for offering support for crew training.

- NSF should continue the practice of periodically competing the management of the UNOLS office, and should consider funding it by a cooperative agreement rather than a grant. A cooperative agreement would add management oversight by NSF to the office. It increases report writing and feedback to the agencies. Fleet operations agreements need to be tightened also. A cooperative agreement would be more consistent with the way the rest of NSF does business.

- NSF should consider a trial including commercial ship operators as UNOLS non-member operators to provide unique fleet capabilities.

- There is a need for a strong, continuing program of new technology introduction; steady improvement of existing facilities and technologies; greater, continuing attention to quality control and safety; and a more systematic, standard approach to maintenance, renovation, upgrading, and replacement.

- There should be prepared and maintained a long-range plan for the modernization and composition of the oceanographic research fleet that reaches well into the 21st century.

The Committee's findings will be presented to the NSF Board of Directors later this month (July). The Board will then decide whether they agree or disagree with the report's recommendations. NSF will then have 30 days to respond to the recommendations of the Board

Executive Committee Appointments - Bob announced the appointments to the UNOLS Executive Committee: Bob Knox (Chair), Tom Royer (Vice Chair), Paul Ljunggren, and Patty Fryer.

Winch and Wire Symposium – Jack Bash reported on plans for a winch and wire symposium. The UNOLS Office has been funded by NSF to coordinate a winch and wire symposium. The symposium is very timely. During the Fleet review, comments were received from the community that the Fleet is not able to meet some of the winch and wire requirements that are currently demanded. Larger science packages continue to

come on-line. We need to examine the next generation cables and what impact they will have on winch requirements. The symposium will be used to update the Winch and Wire book. The current book was printed approximately ten years ago and all copies have been distributed.

A steering committee has been assembled with representatives from ocean engineering, ship operators, technicians and the four primary research disciplines. NOAA has representation on the committee. A winch and wire questionnaire has been distributed to the community. Heroes are being identified to introduce the various topics at the symposium. Speakers from each of the fields will provide presentations to be followed by panel discussions.

The symposium is tentatively scheduled for 1-2 December.

DESCEND Workshop – Annette DeSilva reported on plans for a workshop titled, DEveloping Submersible SCiencE for the Next Decade, DESCEND. Viewgraphs are included as ***Appendix VIII***. The proposal for the meeting was jointly funded by NSF, ONR and NOAA (60%/20%/20%). A Steering Committee (Keir Becker, Jim Bellingham, Craig Cary, Patty Fryer (Chair), Lisa Levin, and Marv Lilley) was established and held a planning meeting in La Jolla on 24 June. The UNOLS office has designed a website for the workshop. The announcement for the meeting was included in the spring UNOLS Newsletter and was distributed broadly by e-mail and postal mail. Several individuals were selected as potential breakout session leaders and these individuals are being contacted by the steering committee. The workshop will be held on October 25-27, 1999 at the National Science Foundation in Arlington, VA.

The principal focus of the workshop will be to address the scientific problems and research needs, with regard to submergence work. Technological discussions will provide participants an opportunity to integrate scientific and engineering priorities. The workshop is open to all investigators who are interested in carrying out submergence research and/or who develop technology important to submergence systems. The workshop will be held over three days. The first day will be devoted to science discussions. Day 2 will be for technology and instrumentation discussions. The last day will be a wrap-up session. Participants are required to complete an on-line application form as well as submit an abstract in advance of the workshop. Information about DESCEND can be found at the Website:

http://www.gso.uri.edu/unols/descend/descend.htm

The steering committee hopes to have a draft report from the workshop ready for distribution at the December DESSC meeting.

Research Vessel Safety Standards (RVSS) Update – Paul Ljunggren reported on the RVOC Safety Standards update. The Safety Committee has completed the update and forwarded it to the Council prior to the meeting for their endorsement. Paul reviewed some of the major revisions. The revised RVSS addresses Standards of Training, Certification and Watchkeeping (STCW), as well as, the International Management Code for the Safe Operations of Ships and for Pollution Prevention (ISM Code). Changes were

made to Chapter 4 on Stability. Chapter 8 updated references to SOLAS and added information on rescue boats. Chapter 12 added information on portable vans. Chapter 14 discussed STCW requirements. Chapter 15 added information on weight handling gear. Additional information was included in Chapter 17 addressing chartering of non-UNOLS vessels. Lastly, Appendix B was added which provides a recommended checklist for shipboard vans.

The Council discussed the importance of the RVSS and ways to inform the scientific community that it is available. There is a need for scientists to refer to the RVSS early in their cruise planning so that they factor it into their budget. It was recommended that an index be added to the RVSS to make them more useful as a reference. It was also recommended to post them on the UNOLS website. There should be a link from the ship time request form to the RVSS. The white paper on responsibilities for PIs and chief scientists should also be linked to the RVSS.

The Council passed a motion to adopt the updated Research Vessel Safety Standards, subject to minor editing.

Public Outreach Activities and Plans – Jack Bash reported on UNOLS public outreach activities. In June, Annette attended the Undersea Exploration '99 Conference in Portland, OR. The UNOLS poster was on display at the conference. Jack Bash reported on his activities with Peter Betzer's group who are putting together an educational book on oceanography. He has been helping to match the science writers of the book with oceanographic experts. Jack will also be writing the sidebars on research vessels for each chapter. The UNOLS Office will have a booth at the fall AGU in San Francisco. Dennis Hansell recommended that the UNOLS Office support the DICO meeting. The meeting provides information to new researchers on how to conduct science programs. The UNOLS Office can provide the group with information on the Fleet and how to gain access to the ships.

Session on Aspects of Future Fleet Evolution:

Bob Knox lead the discussion on fleet evolution and began by reporting that there is a lot of activity on the horizon regarding fleet evolution and planning. At the last Council meeting, viewgraphs were provided by Pat Dennis regarding the aging of the National oceanographic fleet. Following that meeting, Bob Knox sent a letter to Dr. Saalfeld, FOFCC Chair, indicating UNOLS' concern on this matter. Dr. Saalfeld responded with a letter indicated that FOFCC would provide comments at the completion of the NSF Fleet Review. The National Ocean Research Leadership Council has also expressed a concern in this area. The Academic Fleet Review report listed as one of its recommendations a need for future fleet planning. Related to this issue is the uncertainty of the level of future NAVO ship time needs on UNOLS vessels. Bob reported that he plans to attend the CLIVAR-UOP/OOPC meeting in October on ocean climate observations. The future role of research ships in performing global observations will be addressed.

Bob continued by presenting the National fleet charts which had been compiled by Pat Dennis for the last Council meeting. These showed that the National fleet on the whole would be significantly downsized unless replacement plans are put into action. He then presented a series of graphics on the future attrition of UNOLS ships, see ***Appendix IX***. Dick Pittenger compiled these viewgraphs with assistance from the UNOLS Office. The first two charts show today's fleet and the fleet as it will look in 15 years if no replacement plans are carried out. In fifteen years, all of the small, Class IV ships will have been retired and there will only be two intermediate vessels left. Specific examples of the considerable length of time it takes to bring new ships on line were provided. Next Bob showed the estimated excess/shortage of UNOLS ship days by year. For the large ships, there will be excess ship days from the time AGOR 26 comes into service until KNORR/MELVILLE go off line in 2013. For the small, Class IV, ships the problem is now. Using the estimated retirement dates of the small ships, it appears that by 2002 there will be a shortage of available small ship days. The last viewgraph indicates that for a one-for-one ship replacement plan, an estimated $540M would be needed by 2015 to replace the fleet. The message is clear that fleet planning needs immediate attention.

The Council discussed ways to proceed with fleet planning. Many institutions are assuming this responsibility to meet their own replacement needs. The problem of institutions pursuing political means to get their replacements was noted. Without an established/endorsed fleet replacement plan it is difficult to avoid political interference. The need for a sponsor or sponsors for fleet replacement was suggested. There needs to be a planning structure. Based on trends, the fleet shortfalls for the next five to ten years can be predicted. It was recommended that based on this information, FIC could be tasked to develop design parameters to meet the shortfalls. It was suggested to have FIC establish a timeline that shows when ships will leave service and when new ships are expected to come on-line. The results of NSF's Futures workshop can be applied to estimate facility needs.

UNOLS Biennial Review of Sea Going Oceanographic Facilities – Larry Atkinson continued the discussion on Fleet evolution with a status report on FIC's Biennial Review report. FIC realized that with the changing environment for funding research vessels the existing mode of planning was not responsive to the realities. At the November 1998 FIC meeting it was decided to publish a Biennial Review that would attempt to illustrate where the fleet is going and what needs should be addressed. An outline for the report was posted on OMNET and was available for comment.

The Review is being organized into Sections and Chapters. It will be a living document and most likely be published on the UNOLS website. Larry listed the potential chapters of the Review. He asked the Council members to volunteer to write chapters and/or make suggestions for people they think could contribute to the report. The report address the following topics:

- Future Research Requirements
- Future Observing Systems
- State of the Fleet and Trends in Fleet Use

- Historical Perspective of Fleet Replacement and New Assets -
  - Trends in support of Research Vessels (New Sponsorship)
  - New types of vessels/facilities
    - → Icebreakers
    - → Seismic Vessels
    - → SWATH Vessels
    - → ROV's/ AUV's
    - → Ocean Observatories
- Fisheries Surveys
- Hydrographic Surveys
- New Regulations
- Shore Side Technical Support
- Ship Supported Technology

Larry plans to finalize the outline and recruit volunteers. The final outline will be posted on the UNOLS website.

AGOR 26 Construction Update – Pat Dennis reported that the AGOR 26 construction project is moving along with significant recent activity. He retraced the history of the AGOR 26 acquisition project, see ***Appendix X***. In 1997, the appropriation of $45M was made for design and construction of the vessel. However, the type of money had to be changed in order to comply with the procurement method desired. In October 1997 (FY98), the money was converted from SCN funds to R&D funding. Bids then went out to solicit a design/builder. In May 98, a contract was awarded to Lockheed/Martin with Ingalls as their contractor for construction. The Lockheed/Martin design was similar to the KAIYO design. In August 1998, the Ingalls construction estimate vastly exceeded the dollars available. The budgeted construction cost was $36M. Lockheed/Martin rebid the construction and awarded it to American Marine, Inc (AMI) in December 1998. In March 1999, AMI came in with their construction cost estimate which would bring the total project cost to $54M. Again this exceeded the total budgeted project cost of $45M. The Navy decided that to reduce the design requirements of the vessel in order to stay within the budget would not satisfy the operator or the Navy. Therefore, the Senate has included $9M in their appropriation bill.

Pat provided the AGOR 26 operational capabilities, see ***Appendix X***. NAVSEA is negotiating with Lockheed/Martin on the design and cost. In the very near future (any day) the Navy will decide on whether to accept the negotiated cost. The Navy is not permitted to contract for more money than is in the budget. As a result, anything in excess of the $45M total cost will need to be considered as options. The multibeam system for the ship is not included in the construction cost. There was an additional $1.5M funded by the Navy and Hawaii for the system. Hawaii will select the bathymetry system.

If all proceeds along the latest acquisition timeline as planned, the ship will be available for science operations in August 2001.

New Ship Construction:

SAVANAH – Jack Bash reported that Skidaway's construction project of SAVANAH (BLUE FIN replacement) is on hold. There is not enough funding available from the state to issue a contract for construction.

CALANUS Replacement - Tom Lee reported that construction of the CALANUS replacement is underway at Eastern Shipyard. ABS and USCG have approved the ship's catamaran design. A January 23rd delivery date is expect.

RV CONNECTICUT – University of Connecticut's vessel, RV CONNECTICUT, is in operation. The ship is 86-feet long and is a capable, coastal vessel. They expect to work in the Long Island Sound as well as to the Gulf of Maine. They will not request UNOLS vessel status at this time.

WHOI SWATH – The WHOI SWATH design is complete and is proceeding through the WHOI review cycle. Currently there are not enough funds to cover the entire construction project. WHOI does not plan to go to bid until all funding is available. A decision to apply for UNOLS status for the SWATH will be on hold until WHOI decides to build the vessel.

MTS SWATH Session – Jack Bash reported that he will chair a session on SWATH vessels at the fall MTS Conference in Seattle. Originally there were four SWATH papers planned. For a variety of reasons, they are down two; one on the WHOI SWATH and the other on WESTERN FLYER.

SEACLIFF Report- Annette DeSilva reported that WHOI's SEA CLIFF engineering study is ongoing. They are examining the submersible technologies of the other countries; Russia, France, Finland and Japan. They have also been surveying potential sphere materials such light weight strong steel and titanium. As part of the study, WHOI is examining ways to modify the SEACLIFF sphere to improve visibility as well as increase the vehicle's comfort factor. Pat Dennis added that a letter request has been made from the Office of the Oceanographer for the transfer of the SEA CLIFF spares/equipment from the Navy to WHOI. It had been the original intent to transfer SEA CLIFF with all of its spares.

End of Session on Future Fleet Evolution

UNOLS Charter Revision – Bob Knox reported that a UNOLS Charter revision has been proposed to clarify the definition of UNOLS membership in terms of consortium and individual institution. The Council passed a motion to accept the revision with editorial corrections and present the revisions to the full UNOLS membership at the annual meeting for vote.

UNOLS Office Transfer – Jack Bash reported that the current UNOLS Office grant with the University of Rhode Island will expire on April 30, 2000. MLML (with Mike Prince as Executive Secretary) was submitted the only proposal to host the office. The appointed committee of Garry Brass, Dennis Hansell and Rachel Haymon reviewed the proposal. They requested clarification on the employment status of Annette DeSilva in the proposal. It was indicated that Annette DeSilva would work as a subcontractor to MLML. The committee then recommended approval of the proposal to the Council. The Council concurred with the committee's recommendation.

Jack suggested two ways to obtain the concurrence from the UNOLS membership: 1) present the recommendation for approval of MLML's proposal to the UNOLS membership at the Annual meeting in September, or 2) Send a letter to members asking for concurrence with 30 days to respond. Option 2 would provide a quicker response. The Council passed a motion to send letter to the UNOLS membership requesting concurrence of the MLML proposal to host the UNOLS Office.

White Paper on Ship Scheduling – Jack Bash reviewed the revised White Paper on Ship Scheduling. The revision incorporates comments received at the last Council meeting. The revised paper is condensed from three pages to one page. It provides guidelines for sea-going scientists on how to request UNOLS ship time. It also provides the necessary website addresses for obtaining information on ships as well as the on-line forms. It was recommended that additional information is needed regarding part one and part two of the ship time request. It was also recommended to expand on how PIs can look for potential collaborations through use of the web map. Jack will add links on the White Paper to the RVSS and Safety Training Manual.

UNOLS Website Upgrades – Jack Bash discussed potential plans for an electronic database system for collecting and summarizing Post Cruise Assessments. Cruise assessment feedback is presently at 65%. It is difficult to get a larger response without making the forms mandatory. There is no way to enforce 100% feedback unless they are made mandatory. Dolly indicated that the Fleet Review Committee seemed to be very interested in having better reporting and fleet operations assessment. The Council discussed the pros and cons of mandatory post cruise assessment reporting. It was indicated that candid responses could sometimes be much more meaningful and useful. It was suggested that a reminder to chief scientists one week after their cruise to submit the assessment form could be the best time to get a useful response.

It is important to remember that the purpose of the assessment reports is to improve the fleet. The reports should be easy to complete. It was recommended to make the answers digital for easy completion and compilation. A numeric grade system should be considered. The operator must make responses to low grades. The goal of the assessments needs to be clearly stated and conveyed to the community.

Mike Prince reported that the RVOC debated this topic over a couple of years. They decided that it was beneficial to have a written dialog on any problems encountered. The operators wanted to specifically hear the problems so that they could respond

appropriately. After considerable discussion, Bob Knox requested that the Council think about this issue overnight and that the discussion would be continued on Day 2 of the meeting.

Ship Scheduling Procedures – Mike Prince reported on the status of changes to the ship scheduling procedures which were being tried this year. As part of the changes, schedulers were asked to submit letters of intent in place of ship schedules until funding decisions were known. Mike asked for agency feedback. Agency representatives indicated that all of the information on the letters of intents was useful, especially the grant number. It was commented that ship schedules are probably a bit more useful to the program managers. Also, some of the schedulers indicated they preferred the schedules to the letters of intent. However, it is difficult for the large ship operators to put together schedules with limited funding information. It was commented that links to the ship time requests from the letter of interests and schedules were very useful and should be encouraged.

The other change to the scheduling process was moving the scheduling meeting back. The reason for this change was so that most of the funding decisions would be known by the time of the meeting. Since this is a trial year for the revised scheduling process, there will be additional feedback after the September meeting. It is expected that most ship schedules will be firm by September.

Discussion of Scheduling Problems – Bob Knox reported that most of the ship scheduling problems involving actual or potential withdrawal of "funded" programs from schedules as discussed at the last Council meeting have been addressed. Hopefully this year's scheduling process will go smoothly.

Moorings as a Facility – Dennis Hansell lead a discussion on the concept of running deep-sea moorings as facilities. These facilities would be accessible to scientists outside of the operating institution in a scenario similar to that of a UNOLS ship. The responsibility of operating and maintaining a mooring by individuals can be a daunting task. To maintain moorings, engineering support as well as ship support is required. Global ocean observations require moorings and interest continues to grow in this area. It is a struggle for scientists to get access to time on a mooring wire. Moorings need to be available in both deep water and shallow water. They can be institutionally supported in much the same way as institutions operate ships. PIs would be able to request time on the mooring in a manner similar to the ship time requesting. Dennis reported that he has been in touch with NSF on this issue and they seem supportive of the concept.

The Council discussed the role of UNOLS in this area. The Council members were in general supportive of the need and concept; however, the exact role of UNOLS could not be decided until additional information is available. Some of the questions on this issue included how would the mooring facilities be supported? How would they be scheduled? Would there be standards for mooring equipment/instrumentation and installation? How would mooring placement be decided? What would be the status of UNOLS institutions that operate moorings – would they become UNOLS Operator Institutions?

A subcommittee of Dennis Hansell (Chair), Larry Atkinson, Clare Reimers, Tom Lee and Tom Royer was formed to coordinate a moorings workshop. They will identify other persons who should be included in the group and plan a meeting to be held at NSF following the UNOLS Annual meeting. Program managers should also be contacted about the September meeting. The September meeting could be used to organize a community workshop. It was recommended to hold the workshop during an evening session at the winter Ocean Sciences meeting in San Antonio, TX.

Two-Year Review of the NOAA/OAR and UNOLS Memorandum of Understanding (MOU) – The current NOAA/OAR MOU with UNOLS requires that it be reviewed every two years, see ***Appendix XI***. John Freitag pointed out that the MOU has had a positive effect on technician support. NOAA has shared their data acquisition program with the UNOLS community through RVTEC. An annual users meeting is planned. The MOU was cited as the vehicle which allowed this process. Beth White also noted that NOAA appreciates its involvement with UNOLS. OAR leaders plan to attend the September UNOLS meeting. The Council passed a motion to readopt the MOU.

NOAA Fishery Needs – Bob Knox reported that the SIO/WHOI proposal to provide ship support for NOAA's AMLR work off the Antarctic has been submitted. The matter will likely be decided over the summer. There were also a few commercial bidders. If selected, the proposal calls for modifying KNORR/MELVILLE to be able to accommodate fisheries research. This would have the overall benefit of adding a fisheries capability to the UNOLS fleet. The work would add roughly 100 days of ship time a year to support AMLR.

UNOLS/NMFS MOU – Jack Bash reported that a MOU has been drafted to provide a more formalized relationship between UNOLS and NOAA/NMFS. There had been some discussion on whether to revise the current MOU with OAR to include the NMFS. However, since the NMFS has a very different mission from OAR, it was decided to write a separate MOU for NMFS. This would allow for more flexibility. Also, as our relationships mature, the documents may be able to be merged in the future. NMFS has not received the draft MOU officially.

After discussion by the Council, it was recommended to modify Section IV, Parts "c" and "d" to read "advisory role." A motion was made and approved to accept the MOU as modified and pass to NOAA/NMFS for their consideration and comment.

Status of Hawaii as a UNOLS Operator – The status of the University of Hawaii as a UNOLS operator institution was discussed as a result of the recent retirement of their ship, MOANA WAVE. AGOR 26 will not come on line for a couple of years and Hawaii will be without a UNOLS ship during this period. If their status were changed to non-ship operator institution they would not be allowed to participate in the ship scheduling process. It was noted that there is precedence in non-operator institutions participating in the ship scheduling process. USC participated in ship scheduling

although their vessel VICKERS had not received UNOLS status. The Council decided to make no change in the status of University of Hawaii as an operator institution.

UNOLS Council Slate – Barbara Prezelin presented the 1999 UNOLS Council slate. Two positions were open for election, one from any UNOLS member institution and one from a UNOLS Operator institution. The call for nominations was announced in the UNOLS Newsletter. Additionally each UNOLS member institution was notified by e-mail and by letter through postal mail. There was a strong response and as a result not all nominees could be selected for the slate. Only those nominations which were received prior to the announced deadline were considered. The nominating committee worked to maintain a disciplinary balance when developing the slate. The suggested slate was as follows:

Member-at-Large representative:

- James Bauer, biogeochemistry (College of William and Mary, VIMs)
- David Naar, marine geology (Univ. of South Florida)
- Denis Wiesenburg, geochemistry (Univ. of Southern Miss)

UNOLS Operator Institution representative:

- Dennis Hansell, biogeochemistry (BBRS)
- Will Sager, marine geology, geophysics (TAMU)
- Marsh Youngbluth, geochemistry (HBOI)

After considerable discussion on how to handle nominations from the floor, the Council moved to approve the 1999 slate as presented. The nominating committee will notify the nominees who did not get selected for the slate.

Application for UNOLS Vessel Status – The Council discussed the application by University of Minnesota, Duluth for UNOLS status of their vessel BLUE HERON, see ***Appendix XII***. They considered how this vessel would match the ship needs of that area. This year and next year, LAURENTIAN's schedule is very demanding with many CoOP programs. As a result, it would have been difficult if not impossible for LAURENTIAN to accommodate the programs scheduled on BLUE HERON. LAURENTIAN and BLUE HERON are separated by a considerable distance. The Council discussed the cost implications of bringing another ship into the UNOLS system. Every two years the ship will be required to have an inspection paid for by NSF. As a UNOLS vessel they will also be eligible for funding for equipment upgrades, etc. Overall, it was decided that the ship meets the UNOLS vessel criteria. BLUE HERON compares quite well with the other small ships in the UNOLS Fleet. A motion was made and passed to approve the application and designation of BLUE HERON as a UNOLS vessel.

1999 Annual Meeting Plans – The Annual Meeting will be held on 21 October at NSF headquarters. Peter Brewer has agreed to be the keynote speaker. The council elections will be held. The agency reports will only be scheduled for the Annual meeting and will be included on the Council Meeting agenda.

SeaNet Update – A written report prepared by SeaNet personnel updating the SeaNet project was provided to the Council prior to the meeting and is included as ***Appendix***

XIII. Since the system has been available for a relatively short time, the Council suggested that its operation continue to be observed over a longer period. Concern over the security of the system was noted.

UNOLS Brochure – A review copy of the updated UNOLS Brochure has been sent to the review team. The review copy includes only the text of the document. Selection of the graphics is on going. The brochure is expected to go to print in the next couple of months. NSF funded the update. The previous issue of the UNOLS brochure was printed in 1991 with 10,000 copies. The UNOLS Office is down to the last box of brochures; it has been a popular document.

Other Business:

Underway Data Collection – Jim Swift introduced a discussion on underway data collection. There is an issue over what should be collected and what should be done with the data after it is collected. This is an issue which has been debated over the years. It has been argued that if the PI is using the ship he/she gets full access to all data for two years. It is difficult for ship operators to know what equipment should be kept on and what should be turned off while underway. Some data is automatically turned over to the science party. There are already established places to send a lot of the data such as meteorology data and ADCP data. AICC has recommended to the USCG to collect underway data. There was no action by the Council at this time.

Post Cruise Assessments (revisited) – This discussion is continued from Day 1. Jack Bash noted that some of the goals of the post cruise assessment process are being met, but not all. The statistical analysis of compiling the assessments is not being met. NSF has indicated in the past that they need the statistical analysis. Dolly Dieter suggested that a report indicating where the shortfalls exist might be more useful. Bob Knox recommended establishing a small group to address this problem and report back to the Council in September. Charlie Flagg suggested consulting with a professional on how to best design an assessment form. The question of making the assessment mandatory is still debatable. A small group was formed and includes Jack Bash, Paul Ljunggren, Mike Prince, and John Freitag. They will contact the ship operators who get 100% return of the assessment reports to find out what methods are being used.

The meeting was adjourned at 11:45 am.

Appendix I

7/7/99

Bermuda Biological Station for Research will host a social on the evening of July 13th at Wright Hall on their campus.

UNOLS COUNCIL MEETING
July 13-14, 1999
Bermuda Biological Station for Research
Hanson Hall, 17 Biological Station Lane
Ferry Reach, St. George's, Bermuda

Tuesday

8:30 am **Call the Meeting:** Bob Knox, UNOLS Chair, will call the meeting to order at 8:30 a.m., July 13, 1999.

8:40 am **Accept Minutes of the February 1999 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 for distribution to meeting participants.) Chairs will identify any important issues that need to be addressed further by the Council. ***10 minutes per report for presentation and discussion combined, six committees.***

9:45 am **AGENCY and OTHER REPORTS:** Reports from agency representatives and CORE on funding outlooks, facility updates, and special projects.

10 minutes per report for presentation and discussion combined; 20-minute morning break inserted.

- **Department of State** – Tom Cocke
- **National Oceanic and Atmospheric Administration/ Oceanographic and Atmospheric Research (NOAA/OAR)-** CDR Elizabeth White
- **NOAA/National Marine Fisheries Service** – Jim Meehan
- **National Science Foundation** – Dolly Dieter
- **Naval Oceanographic Center** – Gordon Wilkes
- **Oceanographer of the Navy** – Pat Dennis
- **Office of Naval Research** – Tim Pfeiffer
- **Consortium for Oceanographic Research and Education** – Terry Schaff

UNOLS ISSUES:

11:25 am **Executive Committee Appointments** – Bob Knox will announce the Executive Committee Appointments.

11:30 am **NSF Academic Research Fleet Review** – Dolly Dieter will provide a status report on the NSF Academic Fleet Review. Discussion of this process, future implications of the results.

12:00 *Lunch Break*

1:15 pm **Winch and Wire Symposium** – Jack Bash will report on plans underway to conduct a Winch and Wire Symposium in the fall.

1:25 pm **DESCEND Workshop Plans** - A report on plans for the DEveloping Submergence SCiencE into the Next Decade, DESCEND. The workshop is planned for October 25-27, 1999.

1:45 pm **RVOC Safety Standards Update** – The RVOC has submitted an update to the RVOC Safety Standards for Council review, see ***Enclosure 1***. The update will be discussed and considered for adoption.

2:05 pm **Public Outreach Plans** – Jack Bash will review 1999 public outreach projects and plans: Undersea Exploration Conference, Betzer Book, UNOLS Brochure, Fall AGU, and UNOLS Tutorial on CD-ROM.

2:20 pm *Afternoon Break*

2:40 pm **Session on aspects of future fleet evolution (Continued from the last meeting).** Bob Knox will note developments on this topic since the winter meeting. Included are (a) data and charts showing more clearly the future attrition of the UNOLS fleet in the absence of new constructions – see ***Enclosure 2***, (b) recent correspondence with FOFCC, (c) linkage to NSF Fleet Review, (d) future course of NAVO/Navy needs for use of UNOLS ships, and (e) future role of research ships in performing global observations for climate and other purposes, including mention of an October CLIVAR-UOP/OOPC meeting on ocean climate observations. General discussion of (a)-(e) or any other facets of this topic will follow.

3:10 pm **AGOR 26 Construction Update** – Sujata Millick will provide an update on the Navy's construction of AGOR 26, SWATH research vessel will be provided.

3:30 pm **New Ship Construction** - Updates on Skidaway's construction of R/V SAVANNAH and Miami's replacement plans for CALANUS will be provided. UConn's new vessel RV CONNECTICUT will also be discussed. The status of WHOI's plans to build a SWATH vessel will be reported. Jack will report on the MTS SWATH session.

3:50 pm **SEA CLIFF Report** - The status of DSV SEA CLIFF engineering study by WHOI will be discussed.

4:10 pm **The UNOLS Biennial Review of Sea Going Oceanographic Facilities** – Larry Atkinson will report on the status of FIC's plans to prepare a UNOLS Biennial Review of Sea Going Oceanographic Facilities.

End of session on aspects of future fleet evolution.

4:30 pm **UNOLS Charter Revision** – Jack Bash will review proposed modifications to the UNOLS Charter, see ***Enclosure 3***.

4:50 pm **UNOLS Office Transfer** - The current UNOLS Office grant with the University of Rhode Island will expire on 30 April, 2000. MLML with Mike Prince as Executive Secretary was the only applicant to host the office. Jack Bash will brief the Council on the current status.

Wednesday

Session on scheduling and related issues:

8:30 am **White Paper on Ship Scheduling** – At the last Council Meeting there was a discussion on the Interchangeability of Ships. It was recommended that a white paper be developed to educate PIs on the fleet capabilities and scheduling process. Jack Bash will review modifications to the White Paper on ship scheduling, see ***Enclosure 4***.

8:45 am **UNOLS Website Upgrades** - Jack Bash will review the status of development of an electronic database system for collecting and summarizing Post Cruise Assessments. He will also report on the latest progress of the improvements to the UNOLS ship scheduling process.

9:05 am **Progress Report on the New Ship Scheduling Procedures** – Mike Prince will report on the new ship scheduling procedures being tried this year.

9:25 am **Discussion of scheduling problems** - Bob Knox will report on any developments related to the ship scheduling problems addressed during the February Council Meeting.

End of session on scheduling and related issues.

9:45 am **Moorings as a Facility** – Dennis Hansell will lead a discussion on the concept of running deep-sea moorings as facilities. These facilities would then be accessible to scientists outside of the operating institution in a scenario similar to that of a UNOLS Ship.

10:15 am ***Morning break***

10:35 am **Two-Year Review of the NOAA/OAR and UNOLS MOA** – Review of the UNOLS and NOAA/OAR MOA is required two years from adoption, see ***Enclosure 5***.

10:55 am **NOAA Fishery Needs** – Bob Knox will report on the status of NOAA's AMLR work off the Antarctic. A discussion on potential future fisheries work by UNOLS vessels will follow.

11:15 am **UNOLS/NMFS Memorandum of Agreement (MOA)** – Jack Bash will review the draft MOA between NMFS and UNOLS, see ***Enclosure 6***.

11:35 am **Status of U.Hawaii as a UNOLS Operator** – The MOANA WAVE has been retired from UNOLS Fleet Operations. As a result, the University of Hawaii is currently not operating a UNOLS vessel. The Council will discuss their status as an Operator Institution.

12:00 pm ***Lunch Break***

1:15 pm **UNOLS Council Slate** - The first terms of Dennis Hansell and Clare Reimers are expiring in 1999. The nominating committee will present the draft 1999 state for discussion. ***Enclosure 7*** includes the list of nominations received.

1:35 pm **Application for UNOLS Vessel Status** – The University of Minnesota, Duluth, has applied for UNOLS Vessel Status for their vessel, Blue Heron. (see ***Enclosure 8***). The Council will discuss the application

1:55 pm **1999 Annual Meeting Plans** – The 1999 Annual Meeting is scheduled for 21 September. Discussion on Keynote Speaker and agenda items.

2:15 pm **SeaNet Update** – A report on the progress of the SeaNet installations will be provided.

2:25 pm **UNOLS Brochure** – The status of plans for updating the UNOLS brochure will be discussed.

2:35 pm **Adjourn**

Calendar for UNOLS Meetings:

MEETING	LOCATION	DATES
UNOLS Council	St. Georges, Bermuda	July 13-14, 1999
Ship Scheduling Committee	NSF, Arlington, VA	July 15, 1999
DESSC	Woods Hole, MA	July 27-28, 1999
Schedule Review	NSF, Arlington, VA	Sept 9, 1999
UNOLS Council	NSF, Arlington, VA	Sept 20, 1999
UNOLS Annual	NSF, Arlington, VA	Sept 21, 1999
RVTEC	Pt. Aransas, TX	Oct 20-22, 1999
RVOC	Ft. Pierce, FL	Nov 2-4, 1999
DESSC	San Francisco, CA	Dec 1999

Appendix II

Council Meeting - July 13-14, 1999

NAME	AFFILIATION	PHONE/FAX/INTERNET ADDRESS
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Tom Cocke	DOS	202-647-0240/202-647-1106/tcocke@state.gov
Patrick Dennis	ONR/096	703-696-2161/703-696-2007/dennisp@onr.navy.mil
Annette DeSilva	UNOLS	401-874-6825/401-874-6167/unols@gso.uri.edu
Dolly Dieter	NSF/OCE	703-306-1577/703-306-0390/edieter@nsf.gov
Charles Flagg	Brookhaven National Lab	516-344-3128/516-344-2060/flagg@bnl.gov
John Freitag	URI	401-874-6579/401-874-6578/jfreitag@gso.uri.edu
Dennis Hansell	BBSR	441-297-1880x210/441-297-8153/dennis@bbsr.edu
Bob Knox	SIO/UCSD	858-534-4729/858-535-1817/rknox@ucsd.edu
Tom Lee	U of Miami/RSMAS	305-361-4046/305-361-4696/tlee@rsmas.miami.edu
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Jim Meehan	NOAA/NMFS	301-713-2363/301-713-1875/james.m.meehan@noaa.gov
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Barbara Prezelin	UCSB	805-893-2879/805-893-4319/barbara@icess.ucsb.edu
Mike Prince	MLML	831-633-3534/831-633-4580/prince@mlml.calstate.edu
Clare Reimers	Rutgers U	732-932-6555x236/732-932-8578/reimers@ahab.rutgers.edu
Tom Royer	ODU	757-683-5547/757-683-5550/royer@ccpo.odu.edu
Terry Schaff	CORE	202-232-3900x210/202-797-5979/TSchaff@brook.edu
Jim Swift	SIO	858-534-3387/858-534-7383/jswift@ucsd.edu
Paul Taylor	NAVO	228-688-5843/228-688-5102/taylorp@navo.navy.mil
Beth White	NOAA/OAR	301-713-2465x184/301-713-0158/elizabeth.white@noaa.gov
Gordon Wilkes	NAVOCEANO/A&T	228-688-4376/wilkesg@navo.navy.mil

Appendix III

UNOLS
Committee Reports

July 1999

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

UNOLS Arctic Icebreaker Coordinating Committee

Report to the UNOLS Council
June 10, 1999
James H. Swift, Chair AICC

The UNOLS Arctic Icebreaker Coordinating Committee (AICC) held its most recent meeting 24-25 March 1999 in New Orleans.

Several notable changes have taken place in the Coast Guard personnel overseeing construction of USCGC HEALY. The head of the group, Capt. Greg Johnson, is on medical leave and his second in command, CDR Ian Grunther, has taken command of a new Coast Guard cutter. Capt. Jeff Gamble will be filling in during Capt. Johnson's absence.

HEALY delivery has been delayed until ca. October 1999. This is a result of delays in equipment and sensor testing, and will cause some rescheduling of the post delivery trials. Warm water trials should take place ca. January/February 2000, after which the ship will make a public relations visit to Baltimore. NSF and USCG will be getting together to discuss planning for this, and the AICC plans to assist by providing posters for labs and persons to explain Arctic research projects. The ship will conduct ice trials in the eastern Arctic in winter/spring 2000 and will not transit to its homeport until after completion of both ice and science trials. Present plans call for HEALY's availability for agency-funded Arctic marine science support - the vessel's primary mission – beginning early 2001. HEALY crew training is well underway. Crew familiarization of the ship is receiving a high priority. Marine Science Technicians (MSTs) continue to be sent on UNOLS vessels. The meeting included an in-depth tour of the vessel, during which the AICC noted:

1. HEALY's science winch systems will remain a question mark until those systems are thoroughly proven. The caution arises because the installed system is much more complex than the simple winch-sheave-water systems which are the norm on research vessels. The AICC has advised the Coast Guard to begin thinking what can be done during the post-shakedown availability period to improve winch performance if the present winch arrangements do not work satisfactorily.

2. A low overhead clearance in the main lab was an unwelcome surprise. The AICC has advised the Coast Guard to investigate gaining additional headroom. Ample space appears to be available in the overhead.

3. Moving large objects on the main deck to and from the science hoist is hindered by lack of a clear path. The AICC has advised the Coast Guard to remove the present blockage.

4. Other needs include science network connections in the Science Freezer, Science Refrigerator, and Climate Controlled Chambers; cable ports for running cable between labs (interior and exterior); a means to keep CTD wire on equipment between casts while in the Starboard Staging Area with the roll-down door closed; improving diver access to the water; and improving visibility to the helmsman of video monitors on the bridge.

5. Somewhat lower immediate priority was given to providing 480 volt capability for van power, improving visibility from the science conning station (less important only in the sense that the vessel may not frequently be conned from this station), reducing condensation on exposed copper piping in Climate Controlled Chambers, providing matting on some hard deck surfaces, providing pan/tilt for more of the video cameras, addition of port lights in all exterior mounted hatches and stair towers, providing an area to launch weather balloons, improving tie down provisions in the aft staging area, and adding finished overheads for the labs.

6. Lower priority was given to addressing drainage for the daylight incubation area, improving the size of the Met Lab, improving access to the XBT launch station, addressing means to handle the heavy doors to the Science Hoist, and to improving a number of minor habitability concerns.

7. A list of safety-related concerns was also drawn up.

The Coast Guard has begun work in making or scheduling most of the needed modifications.

John Freitag (UNOLS RVTEC) continues to coordinate the oceanographic community's participation in HEALY's science systems testing and has kept the AICC up to date. The basic outline of this program includes: (a) Warm water Phase I testing of SeaBeam, ADCP, data network, CTD, Bathy 2000, coring and winch systems and hull and machinery acoustic noise tests; (b) Transit Phase II includes little or no science system testing; (c) Level Ice trial, Phase III is almost exclusively a programmed sequence of ice breaking, with little science systems testing per se except for bathymetry and the data network, though teachers and or wildlife observers might be appropriate for his phase; (d) Science Systems Testing, Phase IV consists of four, one week legs moving to progressively more intense and complex tests of all major science systems in a high arctic environment, and may also include teachers. AICC member Kelly Falkner has indicated that she would write a proposal to NSF requesting funding for teacher participation.

The Committee discussed the need to develop a process by which test evaluation reports are developed and routed through the system. The Committee discussed the release of data after the science systems testing program. All data coming out of the science testing program are public. A plan and data policy is needed. Further discussion on this matter will be included in the next AICC meeting and must take into account relevant USCG
policies.

The AICC discussed the National Oceans Partnership Program (NOPP) with Dr. Cynthia Decker, including examples of the programs funded through that program, and possible future Arctic interests.

The outlook is positive for NSF's Arctic marine science programs, including both that HEALY funding will not eat into traditional ocean science funding at NSF and that OPP Arctic science funding looks healthy. The deadline for OPP Arctic proposals will be the same as for other ocean science programs at NSF. NSF agrees that expeditionary planning will be important for developing cohesive programs. The Arctic Section is working on the question of how to handle equipment upgrades and new equipment needs and is planning to hire an Arctic Research Support and Logistic Manager. In response to questions of how technical support, over and above that provided by HEALY, should be handled - i.e., be part of the proposals and come out of science

budgets or provided outside the science proposal budgets - it is possible that OPP may adopt practices similar to those in Ocean Sciences, where technical support is shifting over from the research budgets to the technician support budgets.

AICC has been modeled after DESSC for expeditionary planning. The Committee's responsibility is to pull together a critical mass to give direction for scientists in writing proposals but in no way be meant to influence agency funding decisions. To advance expeditionary planning and to keep the community at large informed the AICC plans to continue its involvement with the UNOLS booth at AGU and will conduct a town meeting on the day before AGU. Participation in some form will also be necessary at ASLO in San Antonio and at the next OAII meeting in October.

NSF has funded a study to develop capital and operating costs for a SSN operating for science. A steering committee has met to provide the contractor, Rand Corporation, study direction. At least two AICC members are on this steering committee and in addition to other business will keep an eye toward joint HEALY/SSN science programs.

The AICC continues to be represented at Antarctic Research Vessel Oversight Committee meetings when possible, and vice versa. This has proven useful to both committees.

AICC member Dan Lubin and USCG Commander George Dupree provided a presentation about Science of Opportunity cruises on USCGC HEALY at a recent Oceans Studies Board meeting. George explained that the Coast Guard would be seeking $20,000 as reimbursement for the daily operating cost for HEALY. The specific language in the Arctic Research Policy Act states the USCG can only charge incremental costs for ship use. If full reimbursement were to become necessary this act would need to be changed. The Coast Guard position is to continue with the incremental charge procedure.

Other Coast Guard news includes continuation of plans to keep alternating the polar class ships with six months of a year in the yard and a year operating. The Coast Guard's mission for breaking into Thule remains. Presently the Canadians have been picking up the mission but this may not always be possible.

The AICC has completed its 1999 Science of Opportunity (SOO) review and reported to the Coast Guard and scientists. It was likely that, once again, all applicants with active requests will be accommodated. The 2000 SOO cruise announcement will be published in September 1999. The AICC is charged with assessing SOO proposals for logistic and overall compatibility with the SOO mission. No decisions are made by the AICC with regard to participation, and AICC comments are specifically not to be used to leverage agency support for any proposal. The AICC continues to caution the community that science support is not necessarily the chief mission of SOO cruises, and the AICC reminds all that the Coast Guard will continue to accept ship-time requests for funded Arctic science missions on the Polar-class vessels and HEALY. On funded science missions the expectation and goal is that science will be supported in a manner and devotion to mission similar to that supported by the operators of large UNOLS vessels.

The AICC sees potential benefit in a direct, funded conduit for supplemental UNOLS technical support for USCG Arctic marine science operations. The University of Washington has expressed interest in pursuing this and is considering submitting a proposal.

The AICC has been briefed by Dr. Bernie Coakley of Tulane University regarding his recent experience with Arctic bathymetric and sub-bottom surveys. In ice-covered waters it is most effective to use a submarine. With heavy emphasis on central Arctic marine geology and geophysics expected for future HEALY proposals, joint submarine/HEALY ventures could provide a substantial science benefit.

The next AICC meeting will probably be held in the fall on the east coast, possibly Virginia Beach in association with the OAII meeting.

Fleet Improvement Committee Report
Submitted by: Larry Atkinson

The Fleet Improvement Committee is finalizing plans for the document, "The UNOLS Biennial Review of Sea Going Oceanographic Facilities". The outline has been under review by the Committee and the Council for several months and will be adopted at the Summer Council meeting. Immediately after that the meeting authors of the various chapters will be contacted and schedules agreed upon. We anticipate the review being an online document appearing and modified as the situation merits.

FIC has represented the community in the various reviews of AGOR-26, the Hawaii SWATH. While the path to this new ship is a new one and sometimes torturous we have managed to have input at critical points to help insure a ship that meets the needs of the oceanographic community.

The planning of the WHOI coastal swath ship has resulted in a letter from FIC congratulating WHOI on their work that will benefit the whole oceanographic community with a very capable ship. FIC also urged WHOI to have the new ship within the UNOLS scheduling system.

The Alaska Science Mission Requirement document was accepted and is now in the hands of U. Alaska. The East Coast SMR is nearly complete depending decisions on how detailed it should be.

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5 July 1999

From: Paul Ljunggren, RVOC Chairman
To: UNOLS Council
Subj: RVOC Report - UNOLS Council Meeting 13-14 July 1999

Earlier this year NSF requested that RVOC take steps to develop an inventory of portable labs/containers, their use/capabilities, and their condition. Additional areas to be addressed will include:

-Are these portable labs/vans Coast Guard compliant?
-Requirements/standards that our portable vans/labs should be complying with in order to be used onboard R/V's.
-Proposing a schedule for replacement or upgrading of portable vans/labs.
-How should portable lab/vans be secured on board research vessels

Joe Coburn of WHOI has already been addressing these issues at WHOI and has agreed to head up this project.

As a result of a discussion at the last RVOC Meeting NSF agreed to fund the acquisition of automatic external defibrillators (AED) for UNOLS vessels. Mike Prince coordinated the acquisition and delivery of Automatic External Defibrillators (AED) for each of vessels. The AED's have been distributed and personnel at the various institutions have been receiving training in their use.

The 1999 RVOC Meeting is scheduled to be held at Harbor Branch Oceanographic Institute from 2-4 November. Topics being considered for the agenda include; discussion and demonstration of computerized machinery maintenance and ship stability systems; an update on the new FRVs for NOAA-NMFS; panel discussion on the implications of issues such as STCW, GMDSS, and ISM for those vessels less than 300 grt; and recommendations of the Academic Fleet Review and the implications of these recommendations for operators.

The Safety Committee has completed the change to RVOC Safety Standards. This amendment will be presented during the course of this meeting for approval and adoption by the UNOLS Council. The Safety Committee is planning to hold a meeting later this year to further examine the application of the Code of Federal Regulations to uninspected oceanographic research vessels in light of new international standards being accepted and implemented.

Sincerely,
Paul Ljunggren

Committee report from RVTEC to UNOLS Council 6 July 1999

RVTEC activities for the first half of this year have focussed on the science trials of the Icebreaker HEALY in conjunction with the AICC. At the present time the delivery of HEALY has been delayed until 29 October of this year and may well be delayed until sometime in January of 2000. Many of the delays to date have been due to the inability to maintain the testing schedule upon which the original delivery date was predicated. This includes tests of many of the major ship systems. The latest problems involve the propulsion plant system. Although the cycloconverter AC drive system is not a new concept it has not been extensively applied in the US and has never been used on an icebreaker. To date the contractor has not been able to achieve the required results under impulse load testing. Because the ship utilizes an integrated propulsion-hotel electrical generating system it is crucial that stability be maintained under dynamic loading conditions. This may well be the cause of a delay until January 2000. Should that be the case, science testing will be delayed until the late spring/summer of that year. RVTEC involvement has been in the design and staffing of the science ice trials to be conducted subsequent to the HEALY's delivery.

From the onset it was deemed mandatory by the AICC that the science community be heavily involved in the specification and testing of this vessel in order to avoid the pitfalls of previous projects which were conducted without science community involvement. As has been mentioned previously, the Coast Guard has been extremely cooperative in this regard. NAVSEA requires that a uniform testing sequence in a prescribed format be followed for all tests conducted for final acceptance from the builder. We have been working closely with the NAVSEA group responsible for writing these procedures and although some of our needs are not easily accommodated in the Mil Spec style of format we are working collectively toward a common goal.

The cross training of Coast Guard Technicians on UNOLS vessels put into place more than a year ago has been very successful. Technicians have served on board several vessels including REVELLE, MELVILLE, THOMPSON and SEWARD JOHNSON. The feedback from both sides has been uniformly positive and it is anticipated that this interaction will have a positive effect on the level of technical support provided to scientists using HEALY.

Unfortunately the several delays in the delivery date have hindered securing contracts with the various participating institutions. We have held off in this regard because cruises on the institutions own vessel would naturally preempt HEALY participation should there be a conflict. Once the date has been cast in stone we are prepared to proceed in due course with final contracts for the science testing program. The delays will ultimately effect not only the timing of the operations but also the location of the science testing. At the present time it is anticipated that much of the testing will take place in the Davis strait and Baffin Bay possibly using the port of Iquallat (Frobisher Bay) and Western Greenland ports. At the present time we have secured commitments for the testing of the major systems from institutions having expertise is particular areas.

Plans are proceeding for the 1999 RVTEC meeting in Port Aransas, Texas. Our Vice Chair Tony Amos of University of Texas offered the location. At this time plans are in the works for a session on data management and the implementation of a common data format among the various operator institutions. The meeting will take place in Port Aransas from 20 through 22 October.

Submitted,
John S. Freitag
Chair, RVTEC

SCHEDULING COMMITTEE
Report to the UNOLS COUNCIL
July, 1999

UNOLS ship's schedulers are in the process of creating first drafts of their CY2000 schedules and preparing for the first scheduling meeting on July 15 in Arlington. As part of the new approach to scheduling, almost all schedulers submitted letters of intent, which provided a list of ship time requests that might be accommodated on each ship. These letters arrived in several different forms, including some that followed the instructions. The different formats did reveal some weaknesses and better ideas that will most probably lead to a modified form of the process. In just the past week, schedulers have started to hear the results of the latest NSF panels. This has allowed us to move to the next step in the process which is to create draft schedules. A conference call was held on July 6th to work on large ship schedules. This session revealed a few double bookings and identified issues that will impact these schedules such as the ROV schedule and transits. In preparation for refining these large ship schedules, we will be trying to better define the schedule for the ROV's, verify what the NAVO and LWAD requirements are, determine if any of the commercial/foreign interest in large ships might come to fruition and attempt to remove the double bookings. To date, there are 245 days of NAVO requests that have been formally submitted and an indication that there will three LWAD exercises again next year including one in the Mediterranean. Clearly identifying if there are any other Navy requirements will be important to all vessels of the fleet.

The large ships all have reasonable schedules that accommodate projects around the world. It appears at first glance that there could be sufficient work for all Class I vessels. Remaining funding decisions and the advent of additional work will determine the final outcome. For the time being the plans for the Class I's is as follows. The REVELLE starts with work out of Korea and then moves to Hawaii and the West Coast and then back to Hawaii at the end of the year. MELVILLE spends the year mostly along the West Coast of Central and South America, with one trip out to Tahiti. THOMPSON will work along the US West Coast, with the possibility of a trip to Hawaii. EWING starts the year in New Zealand, where they will complete two projects before moving north to Fiji and New Guinea. Next, EWING transits to Newport, Oregon and completes several projects on the West Coast moving south to Panama after which they transit to Halifax and begin a series of cruises on the East Coast, ending the year in Florida. KNORR leaves Woods Hole in January and works in the Caribbean and off Brazil before heading back to Bermuda, Norfolk and Woods Hole. Next, KNORR transits to the Mediterranean for an LWAD project and a Bob Ballard project and then possibly on to the Indian Ocean, ending the year near Cape Town. The ATLANTIS and ALVIN will spend the year at the Guaymas basin, the East Pacific Rise and the Juan De Fuca Ridge.

Intermediate and smaller research vessel schedulers were still getting calls regarding funding decisions as of July 6th and schedules had not all been published. I hope to have a summary of activity for these vessels by the time of the Council meeting.

Respectfully,

Mike Prince, Chair

Report of the UNOLS DEep Submergence Science Committee (DESSC)
Activities from Dec. 1998 through June 1999

Patty Fryer, Chair

Executive Summary

Since the December 1998 DESSC meeting, the DESSC has engaged in two major efforts:

1. Support for the WC/PR NURP office's commitments to scientists promised funding to perform submergence science in the Gulf of Alaska,
2. Aspects of planning for the UNOLS Submergence Workshop "Developing Submergence Science for the Next Decade" (DESCEND).

In addition, DESSC has carried out some minor business:

1. DESSC sent out an announcement to the scientific community regarding opportunities for submergence science in the Pacific and Indian Oceans
2. DESSC has considered mechanisms for disseminating to the scientific community information regarding funded submergence science programs (so as to encourage expeditionary science efforts).
3. The committee is working toward revision of its Terms of Reference. Once these are revised, UNOLS will be asked to review them.

Major Activities since December 1998

The two main efforts of DESSC thus far this year have been to lend its support to the scientists promised funding to work on WC/PR NURP projects and to plan the DESCENC workshop. At the December DESSC Meeting Dr. Ray Highsmith of the WC/PR NURP Center described changes in funding allocations for support of NURP Centers and the ramifications of the change. The reductions allotted to the WC/PR NURP office would have severely impacted the 1999 ALVIN schedule. DESSC sent a letter of concern regarding this situation to Dr. Barbara Moore at NURP supporting the science commitments made by the WC/PR NURP Center, expressing concern regarding the procedure and a hope that the science could be reinstated. Fortunately, the issue has been resolved and funding was reallocated so that most of the work will be done.

Although the DESCEND workshop will be a UNOLS meeting and is designed to tap a broader representation than just the DESSC, several members of the committee were involved in planning. The proposal for the meeting was approved in early spring. A Steering Committee (Keir Becker, Jim Bellingham, Craig Cary, Annette DeSilva, Patty Fryer, Lisa Levin, Mar Lilley) was established and held a planning meeting in La Jolla on June 24. The minutes of the meeting are attached. A website has been designed by the UNOLS office with modifications suggested by the steering committee and will be put on line shortly. The announcement/invitation for the meeting will also be distributed shortly by UNOLS via an email blast to its distribution list. The chairs of the RIDGE and MARGINS offices have volunteered to send out announcements via their offices as well. Several individuals were selected as potential breakout session leaders and these individuals will be contacted directly by the steering committee.

The proposed agenda for the July 27 - 28 DESSC meeting is attached.

DEveloping Submersible SCiencE for the Next Decade
DESCEND
Steering Committee Meeting
Hotel La Jolla
La Jolla, CA
June 24, 1999

Introductions: Patty Fryer opened the meeting at 8:30 am. The participants introduced themselves. Bob Knox, UNOLS Chair, welcomed the group to La Jolla.

General Information Regarding the Workshop:

Annette DeSilva provided a brief overview of the proposal that had been submitted to NSF, ONR, and NOAA. The workshop is scheduled for 25-27 October at NSF. There was some concern as to why shallow submergence needs were to be addressed by this workshop. It was explained that there are agency interests in shallow water/coastal processes and this community needs to be represented when considering future science and directions for technical developments. There was also concern as to how to reach these groups to let them know about the workshop. It was suggested that the following people be contacted for names of shallow water scientists:

- Barbara Moore, NOAA/NURP
- Phil Taylor, NSF
- Sujata Millick, ONR

An announcement for the meeting will be mailed out from the UNOLS Office. It will also be sent by e-mail blast from the UNOLS Office to the UNOLS list as well as to the RIDGE and MARGIN offices for distribution. In addition, steering committee members will contact some individuals (particularly potential breakout session leaders) directly. A limited travel budget is available to help defray costs for participants. The number of participants attending as well as distance traveled will determine the amount of reimbursement. All people requiring travel funds will need to apply by 24 August.

DESCEND Website – Annette reviewed the draft DESCEND website pages. The site should be posted in the next couple of weeks for the committee's review. She requested an image for use on the website cover page. Craig Cary offered to send an image. A list of the breakout sessions will be added to the on-line application form. We will ask that participants prioritize the sessions they prefer to attend. We will use the applications to assign participants to sessions. The leaders can then contact their respective session participants in advance of the workshop with specific questions to assist in writing the report. It was recommended that the website include links to related sites.

Report Writing – How and When - Patty Fryer suggested that the session leaders (including the assigned steering committee member) be responsible for writing a summary of the session discussions and that these written summaries be ready by Wednesday noon. This will require that the session leaders finalize the text of their report during the evenings of Monday and Tuesday after the plenary sessions. Much of the report writing will be finished before the participants leave

the workshop. We would like to have a final draft report ready for distribution at the December DESSC meeting. The afternoon of the third day of the workshop will be devoted to report writing.

General Workshop Strategies – The steering committee discussed the workshop organization and session leader and steering committee member responsibilities. It was generally decided that the first day was to be dedicated to science discussions and the second day would be for technological discussions. Each day would start with a series of brief introductory presentations. This would be followed by breakout sessions until mid-afternoon. Each breakout session will be assigned two leaders from the applicant pool well in advance of the workshop and will be assigned at least one steering committee member. These individuals will be responsible for stimulating and guiding discussions, for writing a report of the discussion and presenting a brief summary of the session. In the late afternoon, everyone will regroup for a plenary session. The third day of the meeting will be devoted to a morning wrap-up session for all participants and a writing session for steering committee members.

Introductory Speakers: Patty Fryer led a discussion to identify workshop presentation topics and speakers. The committee also developed a rough schedule for the workshop.

Breakout Sessions: After considerable deliberation on how to compose breakout sessions, the following sessions were agreed on (science breakouts to focus on processes occurring in the various environments listed and the technological breakouts to focus on how to accomplish this science within the requirements of the field approaches listed):

Science Breakout Sessions:
- Ridge Processes
- The Abyss/Open Ocean
- Margins (passive & convergent)
- Shelf & Coastal
- Polar

Technological Breakout Sessions:
- Event Response
- Time Series – Long
- Time Series – Short
- Expeditionary
- Global

Participants would be assigned sessions in advance of the workshop. We would strive to maintain a balance among disciplines and at the same time try to assure that everyone's interests are being met.

Next the steering committee suggested session leaders to go along with the topics. The leaders would need to be dynamic individuals, well organized and dedicated to fulfilling their writing assignments. Laptops at each session would be required. Two leaders would be assigned to each session. A member of the steering committee would also be assigned to each breakout session. A

set of ground rules would be provided to each leader. Leaders must be willing to arrive late Sunday afternoon for an evening preliminary meeting with the steering committee.

Pre-workshop Application Form – The steering committee revisited the draft on-line participant application form. They recommended some modifications to the questions on the draft from. All completed applications will be posted on the DESCEND website. Additionally it was recommended that each applicant submit an abstract answering specific questions:

Abstract Questions:

1. What technological development would you like to see in support of your current work?
2. What are the current technological limitations on your research?
3. What science would you like to do if technological limitations were not a problem?
4. What capabilities should be generally available for submergence science?
5. Where do you see submergence science going in the next decade?

Adjourn – The DESCEND steering committee meeting was adjourned at 6:00 p.m.

Revised 6/30/99

Tentative Agenda

DEep Submergence Science Committee

Woods Hole Oceanographic Institution
Carriage House
27-28 July 1999

MEETING BEGINS AT 8:30 AM

Day One: Tuesday, 27 July 1999

AM

I. Introductory Remarks, Meeting Logistics, Introductions, Any Changes to Agenda Items, Accept minutes (Fryer)

II. National Facility Operators Report (Pittenger/WHOI Personnel)

A. National Facility Vehicles Operations Summary

III. Operational Summary of Other Deep Submergence Activities (Fryer)

A. MBARI
B. MPL
C. Navy
D. NURP
E. ROPOS

IV. Agency Reports

A. NSF - (E. Dieter)
B. ONR – (S. Millick)
C. NOAA – (E. Smith)

V. Terms of Reference

VI. Deep Submergence Scheduling: 2000 and Beyond

A. Results from May panel - updating DESSC/UNOLS deep submergence funded programs listing. Mechanism for dissemination of funded programs information to potential PIs.

PM

VI. Deep Submergence Scheduling: 2000 and Beyond (continued)

A. Review of Planning Letters and Website postings and identification of funded programs.
B. Review strawman schedule for 2000

VII. Long-Range Planning Issues

A. Science/logistical constraints, different vehicle requests - Additional Long-Range Planning and dissemination of funded programs information to potential PIs.
B. Future global deep submergence initiatives: Western Pacific, Indian Ocean, S.EPR, Mediterranean, Polar Regions (DESSC members/area champions), HURL RFP for Hawaii and Western Pacific initiatives.

Day Two: Wednesday, 28 July 1998 **MEETING BEGINS AT 8:30 AM**

AM

VII. Long-Range Planning Issues (continued)

A. Future funding for deep submergence science (possible new mechanisms)

VIII. Upgrades to National Facility Vehicles, Science Sensors, and ATLANTIS (WHOI-DSF Personnel)

A. Status Report on current upgrades proposal (ROV - Bowen)
B. Annual request for upgrades to science sensors and operational capabilities of NDSF vehicles - joint WHOI/DESSC
C. SEA CLIFF Engineering Study
D. ATLANTIS – Review backlog items and pending projects
E. Other items?

IX. DESSC Membership Replacements - Summary of Current Membership Status and Suggestions for Replacements (The CVs for individuals interested in serving on DESSC are enclosed.)

PM

X. DESCEND Workshop discussion: role of DESSC in preparation for and as follow up after the Workshop

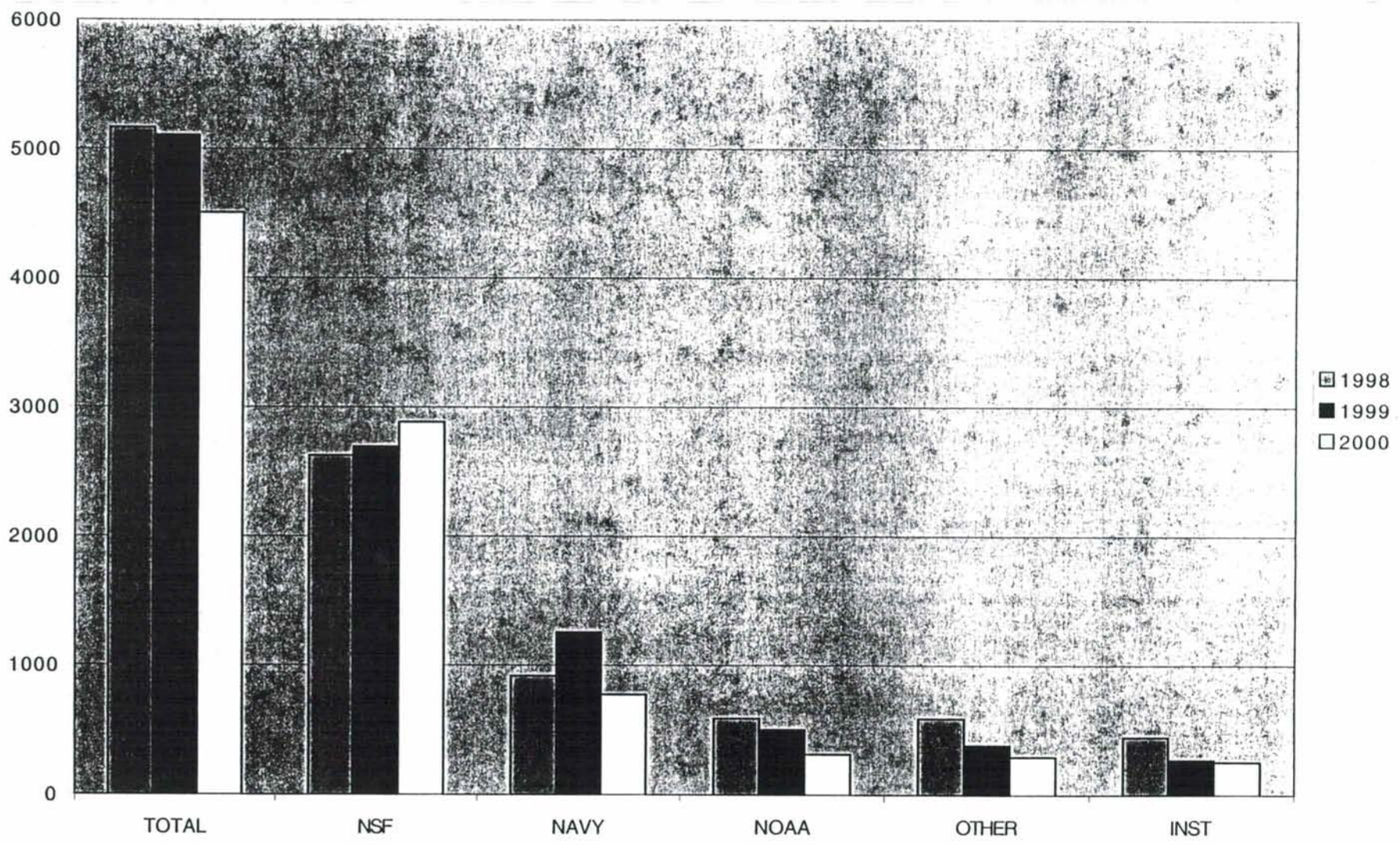
Appendix IV

~~1999~~ UNOLS Ship Utilization
2000

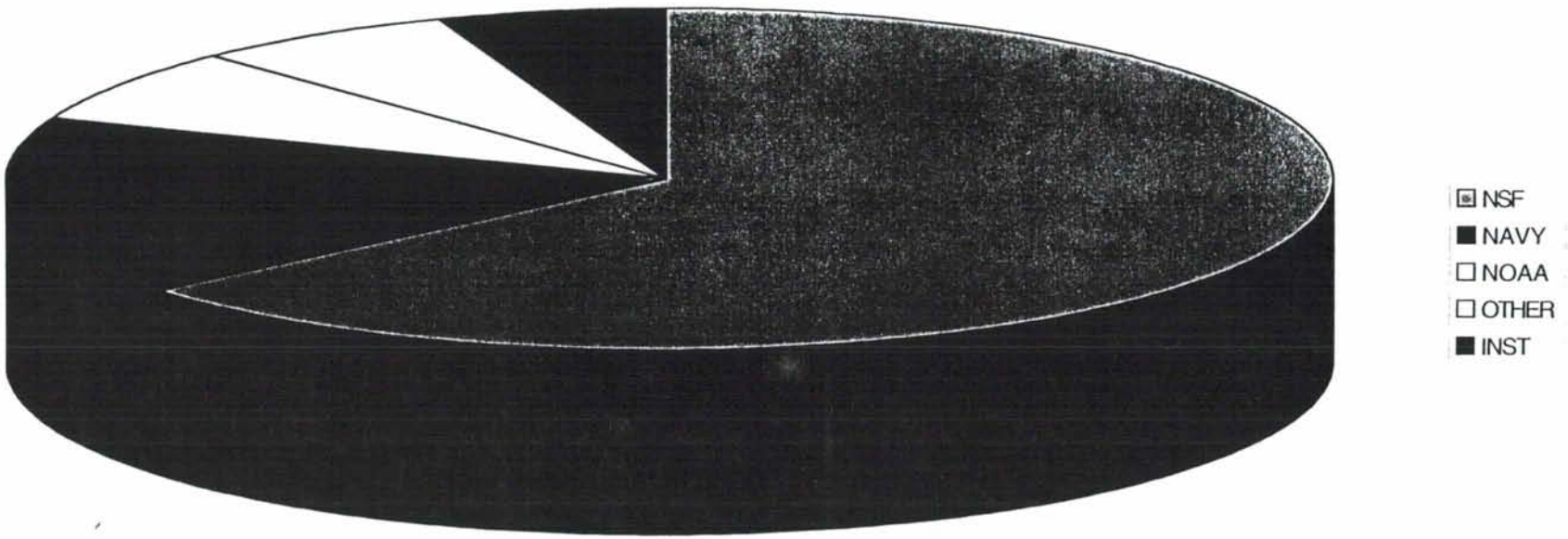
		Class	Updated	NSF	ONR	NAVO	Navy	NOAA	Inst	Other	Total	Funded	% Funded	Other Navy
Alpha Helix	U of Alaska	4									0		#DIV/0!	
Atlantis	WHOI	1	7/8/99	250				13		26	289	220	76%	
Barnes	UW	5	7/8/99	17				10	13	10	50	30	60%	
Blue Fin	Skidaway	5	7/9/99	83			20	25		5	133	88	66%	NOPP
Calanus	Miami	5	7/8/99	45	21	35		61	2		164	127	77%	
Endeavor	URI	3	7/8/99	180							180	140	78%	
Ewing	LDEO	1	7/5/99	306						8	314	260	83%	
Gyre	TAMU	3	7/9/99	0	34		15		14	67	130	77	59%	LWAD
Hatteras	Duke	4	7/8/99	120	9	30		37	7	9	212	88	42%	
Henlopen	U of Del	4	LOI only	95							95	37	39%	
Horizon	SIO	3	7/9/99	38		30	15	23	36		142	69	49%	NOPP
Johnson	HBOI	3									0		#DIV/0!	
Knorr	WHOI	1	7/8/99	254	33		24				311	170	55%	
Laurentian	U. Mich	5	7/7/99	232							232	232	100%	
Link	HBOI	3	7/9/99	63	81		16			45	205	93	45%	
Longhorn	U of T	5	LOI only	49					5	15	69	69	100%	
Melville	SIO	1	7/9/99	271				15			286	263	92%	
Oceanus	WHOI	3	7/8/99	180							180	140	78%	
Pelican	LUMCON	5	7/8/99	95	22	83		32	2	67	301	141	47%	
Pt Sur	MLML	4	7/7/99	42	24		30	6	15	33	150	114	76%	NPS & NOPP
Revelle	SIO	1	7/8/99	168	101						269	251	93%	Transit split 7/8
Sea Diver	HBOI	5	7/9/99	25	20		16				61	25	41%	
Sproul	SIO	4	7/7/99	20	24		3			6	53	22	42%	NOPP
Thompson	UW	1	7/8/99	65	20	45		51	66		247	143	58%	LWAD
Uracca	STRI	5	7/7/99	15					93		108	0	0%	
Weatherbird	BBS	4	7/8/99	137							137	132	96%	
Wecoma	OSU	3	7/9/99	132	21		0	38			191	115	60%	LWAD
Totals				2882	410	223	139	311	253	291	4509	3046	68%	
% of Total				64%	9%	5%	3%	7%	6%	6%				

7/9/99

UNOLS SHIP UTILIZATION



Fleet Utilization by Agency 2000



Appendix V

UNOLS AND NAVOCEANO 1997 - 1999

Gordon Wilkes

Paul Taylor

Naval Oceanographic Office

INSTITUTIONS

- Scripps Institute of Oceanography
- Duke Marine Laboratory
- University of Delaware
- Louisiana Consortium
- Oregon State University
- Moss Landing/NPGS
- Texas A&M
- Lamont-Doherty
- University of Washington

Three Years of UNOLS

- Total Ship Days - 1297
- Different Ships Used - 9
- Data Collected
  - Gravity - All Navy Requirements Outside EEZ's Met
  - Physical Oceanography
    - Core/grabs - *297/163*
    - CTD - *5832*
    - XBT - *2149*
    - ADCP - *Undetermined*
  - Side Scan Sonar
  - High Resolution Bathymetry
- Ranges
  - SOCAL
  - AUTEC
  - ECSWTR Onslow Bay
- Other
  - HITS
  - ODISTA

UTILIZATION

1997	1998	1999
Ship Days 373	Ship Days 431	Ship Days 483
Funds 7.5M - Ships 6.4 -Other 1.1	Funds 7.3M -Ships 6.6M -Other 0.7M	Funds 7.4M -Ships 6.1M -Other 1.3M
Institutions 8	Institutions 6	Institutions 6
Ships 9	Ships 8	Ships 8

CY2000 PROJECTIONS

POTENTIAL CALYR 2000 UNOLS SHIP TIME				
	SHIPDAYS AT $7.5M		SHIPDAYS AT $3.0M	SUBMITTED TO UNOLS
GOMEX Monitoring	60		0	x
ECSWTR Onslow	30		30	x
SOCAL	30		30	x
NARRAG	10		10	x
CAPE COD	10		10	x
KEYWEST	20		20	x
GOMEX	60		60	x
So. FLA Range	20		20	x
	240		180	
PUERTO RICO	30		0	x
MIW WGOMEX	30		0	
HAWAII Maui Range	60		0	
	360		180	

Appendix VI

U. S. COAST GUARD AGENCY REPORT
UNOLS COUNCIL MEETING
13-14 JULY 1999

USCGC HEALY UPDATE

In March, Avondale Industries advised the Coast Guard that the July 1999 delivery date for HEALY would not be met. The revised delivery date is 29 October 1999. The Ice Trials Planning Team met after Avondale's announcement to assess the impact on the trials schedule. After reviewing the many variables in play, it was concluded that all phases of the trials could be scheduled into the more compressed window by moving ice and science trials to the eastern Arctic. Key points in the revised schedule include:

Underway Crew Training	07 DEC – 11 JAN
Initial Science Trials (PR Trench)	19-30 JAN
Helicopter Dynamic Interface	10-24 FEB
Baltimore VIP Port Call	26-29 FEB
Icebreaking Performance Trials	07 MAR-01 MAY
Science Trials	01 MAY – 01JUN

The Coast Guard and the State Department have drafted a letter to the Canadian Department of External Affairs proposing that a meeting be held in Ottawa in late summer to discuss the feasibility of conducting trials in Canadian waters, including timing and locations. It is anticipated that HEALY will transit the Northwest Pass en route Seattle. A formal commissioning will be held in Seattle in September 2000.

POLAR ICEBREAKER UPDATE

POLAR SEA returned to Seattle on 18 MAY 99 after a 184-day deployment that included the McMurdo Station re-supply mission and two weeks of science support at the St. Lawrence Island polynia (J. Grebmeier, Chief Scientist). In June POLAR SEA went into Todd Shipyard in Seattle for a six-month Reliability Improvement Project availability.

POLAR STAR is scheduled for a six week Arctic cruise to commence mid-July, followed by a deployment to the Antarctic in November.

USCG – NSF MEMORANDUM OF AGREEMENT

In May, the Coast Guard and National Science Foundation signed a Memorandum of Agreement updating the existing and quite dated 1982 MOA. The new document formalized a variety of interagency responsibilities and procedures currently in practice, established the Polar Icebreaker Planning Working Group, and formally recognized the Arctic Icebreaker Coordinating Committee as a NSF-sanctioned advisory body to the Coast Guard for addressing science community requirements on Coast Guard icebreakers. The MOA also re-validated the existing incremental reimbursement of operating costs for NSF-funded research on Coast Guard ships.

Appendix VII

THE ACADEMIC RESEARCH FLEET REVIEW: Committee Membership

Roland Schmitt, Chair

Earl Doyle, Steven Ramberg, Hugo Bezdek, Christopher D'Elia, Ellen Druffel, Larry Mayer, Georges Weatherly

FLEET REVIEW: CHARGE FROM AD/GEO

- Review and evaluate the current Academic Research Fleet.
- Review and evaluate management structure, existing capabilities and services and possible future changes.
- Recommend actions to improve the organization, management and cost effective operation of the fleet.

FLEET REVIEW: MEETINGS HELD

- June 8-10, 1998, NSF, Arlington, VA
- September 1-3, 1998, Scripps Institution of Oceanography, La Jolla, CA
- December 2-3, 1998, University of Rhode Island, Narragansett, RI
- March 3-4, 1999, NSF, Arlington, VA

FLEET REVIEW: FINDING AND RECOMMENDATION

- There is a present and projected near-term period of reduced utilization of the UNOLS fleet by NSF grantees.
- This period should be used to address management issues and improve capability, productivity and quality of fleet operations to achieve NSF research and education objectives.

FLEET REVIEW: RECOMMENDATION

- NSF must accelerate and expand efforts to articulate a broadly based vision for the future of ocean science and technology.

FLEET REVIEW: FINDING AND RECOMMENDATION

- UNOLS services are meeting community needs and costs are comparable to other commercial and government operators.
- **The UNOLS system should be retained.**

FLEET REVIEW: RECOMMENDATION

- Funding Agencies and UNOLS should work to enhance quality control, expand technical and safety training, and develop even higher standards for shared-use facilities.

FLEET REVIEW: RECOMMENDATION

- NSF should continue the practice of competing the office of UNOLS management, and should consider supporting this office by cooperative agreement rather than by grant.

FLEET REVIEW: RECOMMENDATION

- NSF should consider a trial including commercial ship operators as UNOLS non-member operators to provide unique fleet capabilities.

FLEET REVIEW: FINDING

- There is a need for a strong, continuing program of new technology introduction, steady improvement of existing facilities and technologies, greater and continuing attention to quality control and safety, and a more systematic approach to maintenance, renovation, upgrade and replacement.

FLEET REVIEW: RECOMMENDATION

There should be prepared and maintained a long range plan for modernization and composition of the oceanographic research fleet that reaches well into the 21st century

FLEET REVIEW: FINDING

- Special requirements which cannot be met by UNOLS vessels are supported by NSF using non-UNOLS vessels. This raises concerns about safety and due diligence, and places extra burden on investigators.

Appendix VIII

DEveloping Submersible SCiencE for the Next Decade
DESCEND Workshop

Scientific Challenges, Technology Developments, and Investigative Strategies

October 25-27, 1999
National Science Foundation, Arlington, VA

Funded by: NSF, ONR, and NOAA

Focus:

The principal focus of the workshop will be to address the compelling scientific problems, as defined by the research community with regard to submergence work. Technological discussions will provide participants an opportunity to integrate scientific and engineering priorities. These discussions will include the challenges associated with the need for submergence assets capable of accessing 6000+m depths and with the proliferation of and technologies associated with shallow water vehicles. Participants will be invited to address a series of questions about scientific priorities, investigative methodologies, new directions in submergence technology development, and the operation, availability, and scheduling of submergence assets.

Participation:

The workshop is open to all investigators who are interested in carrying out submergence research and/or who develop technology important to submergence systems. Participants are required to complete an on-line application form as well as submit an abstract in advance of the workshop.

Steering Committee

Patty Fryer (Chair), U. Hawaii
Keir Becker, RSMAS
Jim Bellingham, MIT/MBARI
Craig Cary, U. Del
Lisa Levin, SIO
Marv Lilley, U. Wash

Steering Committee Meeting – June 24, La Jolla

Attended by the Steering Committee Meeting; Annette DeSilva, UNOLS Office; Dolly Dieter, NSF; and Bob Knox, UNOLS Chair

Discussed: Workshop Agenda & Speakers
Break-out Sessions & Leaders
Website Design
Strategies for Report Writing

Workshop Announcement Distribution:

UNOLS Newsletter
UNOLS Office mailing
E-mail blast from UNOLS Office
RIDGE and MARGIN distribution

DESCEND Website:

http://www.gso.uri.edu/unols/descend/descend.htm

Workshop Report - Final draft report to be ready for distribution at the December DESSC meeting.

DESCEND Workshop
Tentative Agenda

Monday, October 25th, Day 1: Science Discussions:
8:30 a.m. Open Meeting

- **UNOLS Welcome/Introduction –**
- **Overview DESCEND – Patty Fryer**
- **Overview of FUTURES**
- **Overview of Submersible Science – Dan Fornari**
- **Observatory Science Overview – Keir Becker**
- **Charge to Participants/Workshop Groundrules – Patty Fryer**

10:15 a.m. Breakout Sessions: Science Breakout Sessions:

- **Ridge Processes**
- **The Abyss/Open Ocean**
- **Margins (passive & convergent)**
- **Shelf & Coastal**
- **Polar**

12:00 Lunch

1:00 p.m. Reconvene Break-Out Sessions

3:45 p.m. Break

4:00 p.m. Plenary Session – Each session leader will provide a 10-minute summary of their respective session. At the conclusion of all summaries there will be an open discussion.

6:00 p.m. Adjourn

DESCEND Workshop
Tentative Agenda

Tuesday, October 26th, Day 2: Technology & Instrumentation:
8:30 a.m. start time

- **Overview of untethered systems – AUVs: Jim Bellingham**
- **Manned and Unmanned Vehicles: Mapping**
- **Data Systems – Case studies within and outside of MG&G:**

10:15 a.m. **Technological Breakout Sessions:**

- **Event Response**
- **Time Series – Long**
- **Time Series – Short**
- **Expeditionary**
- **Global**

12:00 **Lunch**

1:00 p.m. **Reconvene Break-Out Sessions**

3:45 p.m. **Break**

4:00 p.m. **Plenary Session – Each session leader will provide a brief (one bulleted overhead) summary of their respective session. At the conclusion of all summaries there will be an open discussion.**

6:00 p.m. **Adjourn**

DESCEND Workshop
Tentative Agenda

Wednesday, October 27th, Day 3: Wrap-Up: 8:30 Start Time

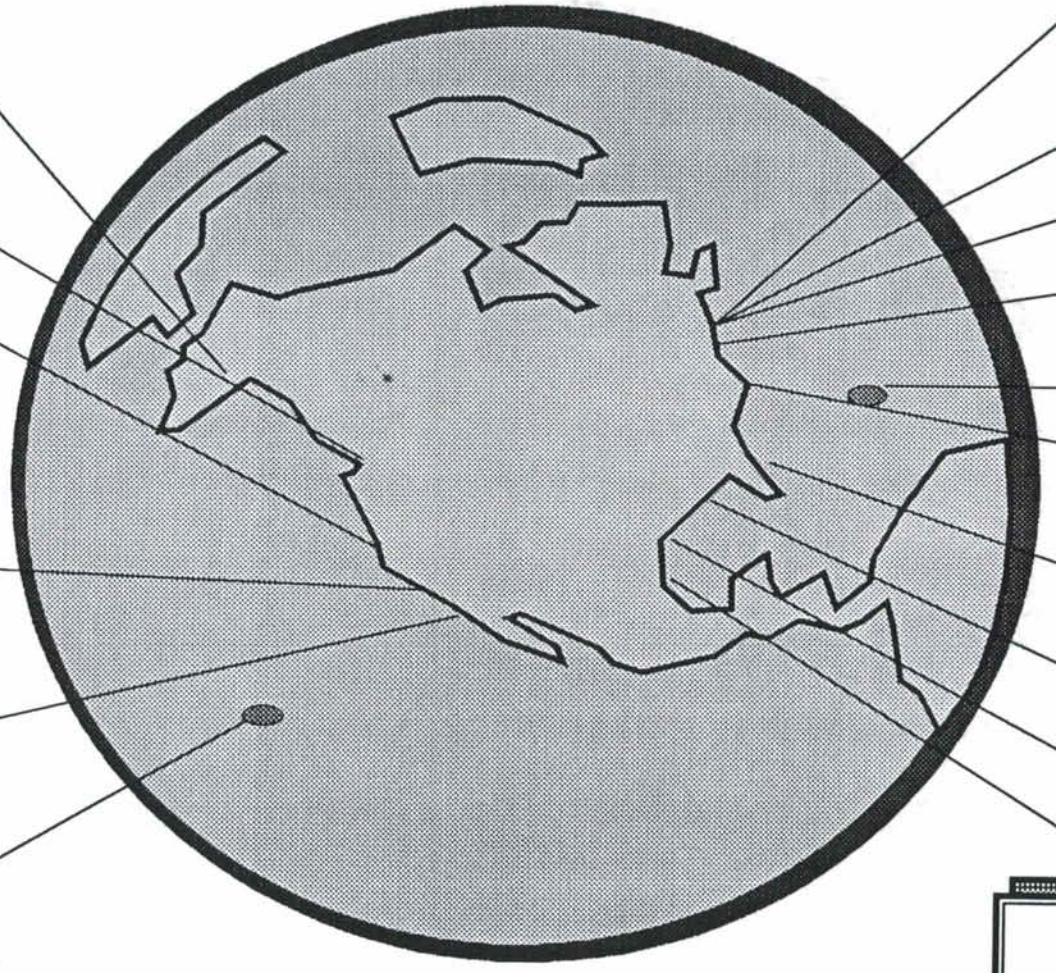
Morning: **Overview of Technology Costs and Realities – Jim Bellingham**

A Discussion period would follow.

Afternoon: **The afternoon would be set aside to allow the Steering Committee to complete writing assignments.**

Appendix IX

UNOLS Ships (Retirement Dates)



Alpha Helix ('97 +)

Thompson ('21)

Wecoma ('09-'14)

Pt. Sur ('10-'11)

Melville ('06-'15)
Revelle ('26)
N. Horizon ('10-'16)
Sproul ('11-'15)

Moana Wave ('99)

Atlantis ('27)
Knorr ('06-'12)
Oceanus ('09-'14)

Endeavor ('08)

Ewing ('14-'19)

Cape Henlopen ('04-'06)

Weatherbird II ('04-'13)

Cape Hatteras ('10 –'11)

Seward Johnson ('15)
Edwin Link ('12)
Sea Diver ('12)

Pelican ('05)

Gyre ('03)

Longhorn ('01)

Ship Size

Large (Class I/II)
Medium (Class III)
Small (Class IV)

Retirement Date = (FIP95 date – Operator date)

UNOLS Ships (Retirement Dates)

Thompson ('21)

Revelle ('26)
Melville ('15)
New Horizon ('16)

AGOR-26

Atlantis ('27)

Ewing ('19)

Seward Johnson ('15)

Ship Size

Large (Class I/II)
Medium (Class III)
Small (Class IV)

Retirement Date = Operator Date

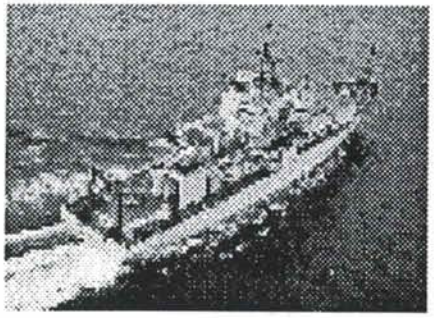
UNOLS Fleet 15 Years from Today (2014)
By Existing Plans

"It Shouldn't Take That Long!" (*But It Does*) Examples

Navy Oceanographic Initiatives - October 1984: Build Three New AGORS, Upgrade *Knorr/Melville*

AGOR-23 (*Thompson*)

1983	Science Requirements Stated
1984	SECNAV/CNO Initiative
1985	Point Design Begun (with community inputs)
1986	Funds Appropriated
1986 (Nov)	RFP
1987 (Aug)	Award
1988 (Oct)	Start Construction
1990 (Feb)	Delivery
1991	Enter Fleet



AGOR-24 (*Revelle*)

1991 Funds Appropriated

1993 Begin Construction

1996 Enter Fleet

AGOR-25 (*Atlantis*)

FY'92 Funds Appropriated

1994 Begin Construction

1997 Enter Fleet

"It Shouldn't Take That Long!" (*But It* It *Does*) Examples

Navy Oceanographic Initiatives - October 1984: Build Three New AGORS, Upgrade *Knorr/Melville*

Knorr/Melville Project

1983	Science Requirements
1984	SECNAV/CNO Initiative
1986	Funds Available
1989 Feb	Work Begins
1991Oct	Work "Complete"
1992	*Knorr* back in service

AGOR-26

FY'97	Funds Appropriated
1999?	Begin Construction
2002	Delivery

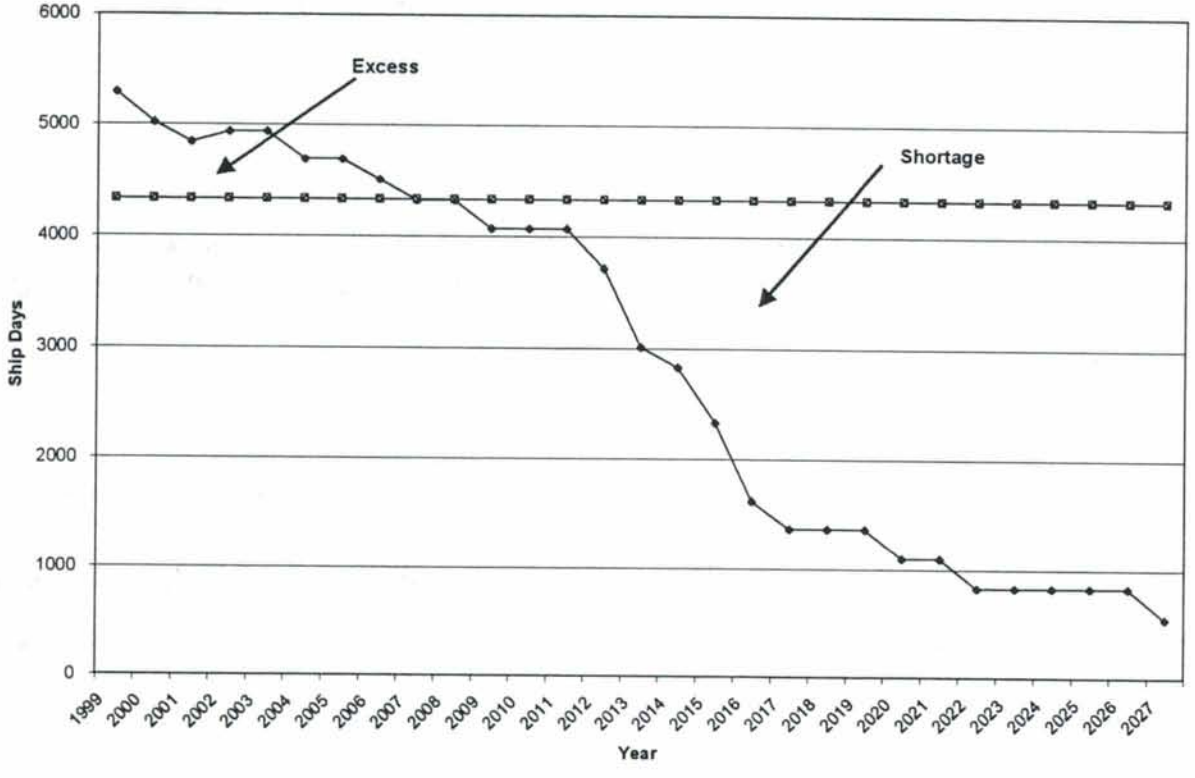
Ship Use Average (days): 1993 - 1998

	1993	1994	1995	1996	1997	1998	Average
Class I/II	1588	1643	1805	1454	1754	1746	1665
Class III	1307	1086	1351	1396	1556	1396	1349
Class IV	1223	1267	1418	1165	1410	1435	1320
Total	4118	3996	4574	4015	4720	4577	4333

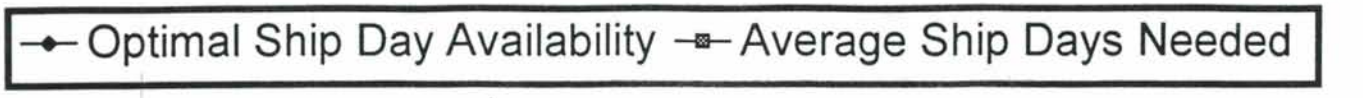
RVOC Definition of Optimal Utilization (FIP95, page 15):

Class	days
Class I/II	275
Class III	250
Class IV	180

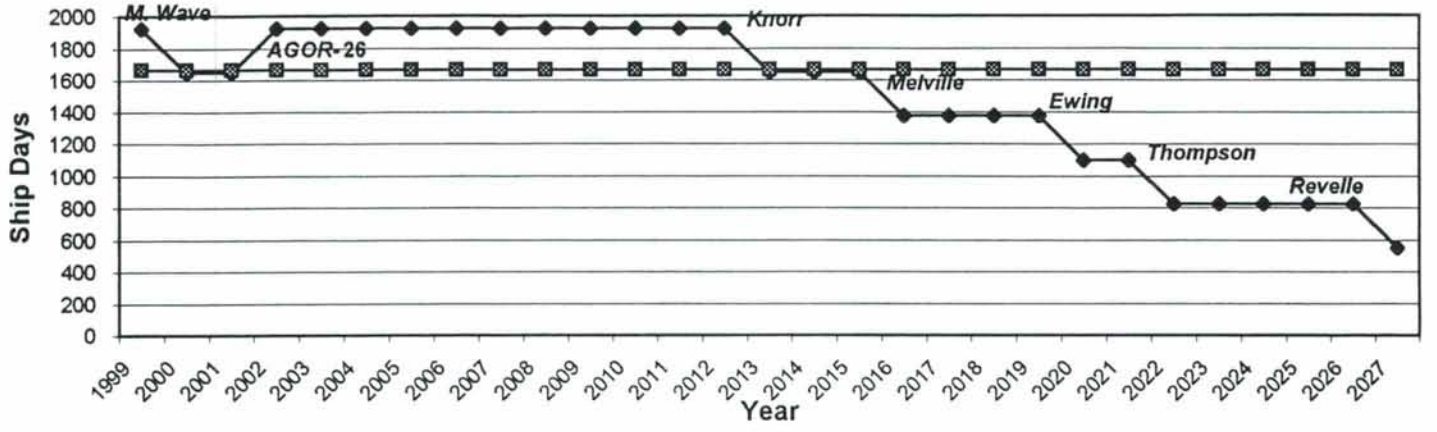
Toal Optimal Ship Use Days vs Average Ship Days Needed (Class I, II, III and IV)



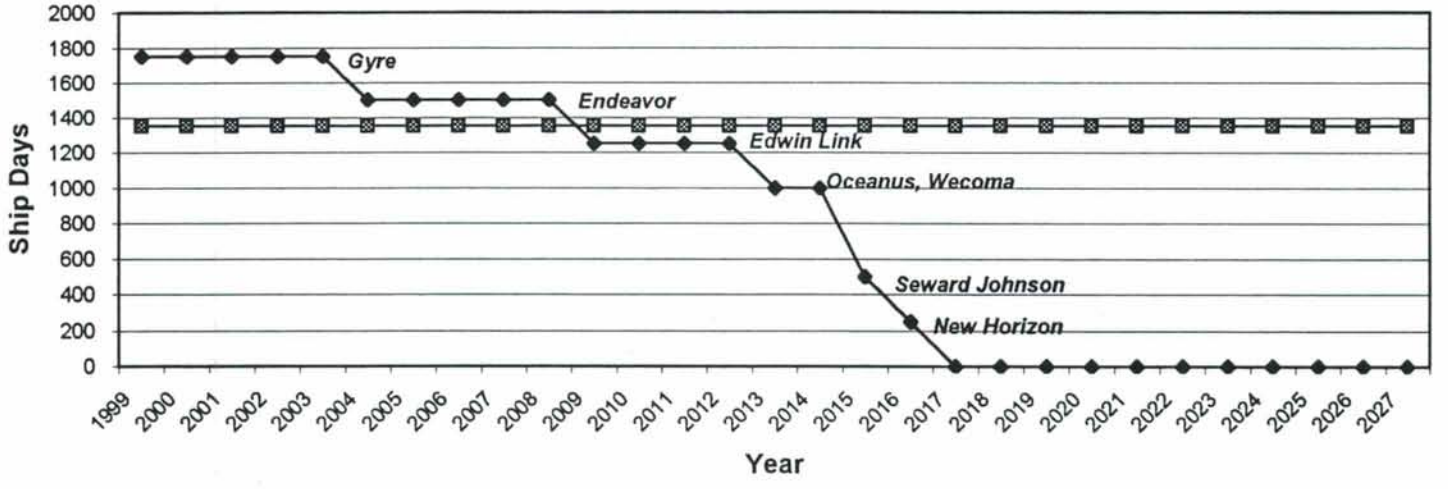
Optimal Total Ship Days versus Average Ship Days Needed



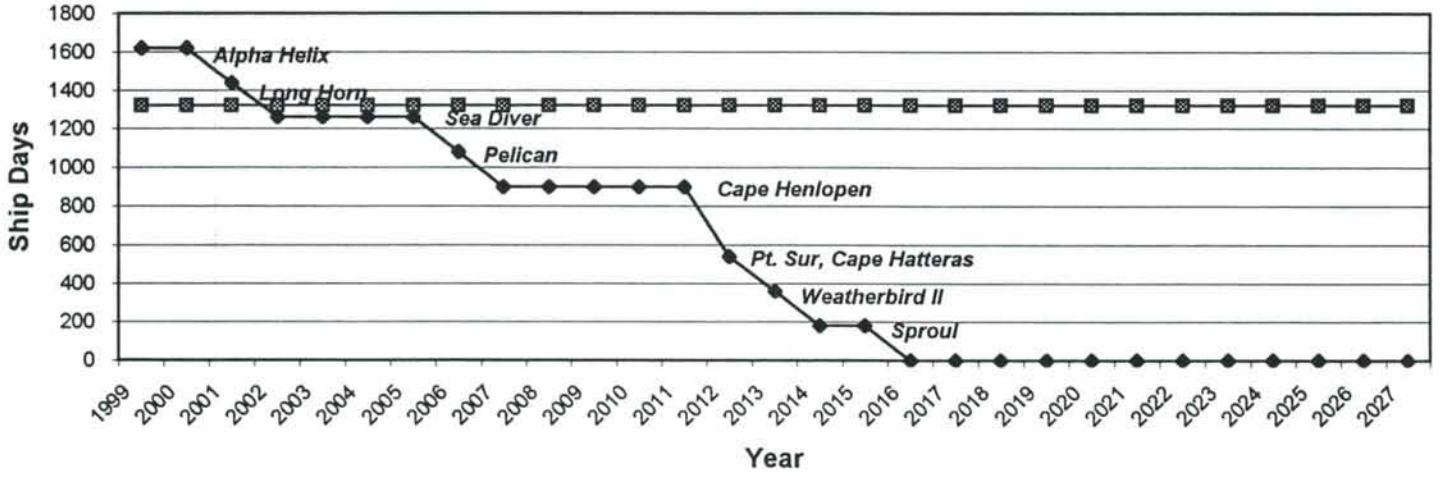
Class I/II - Large



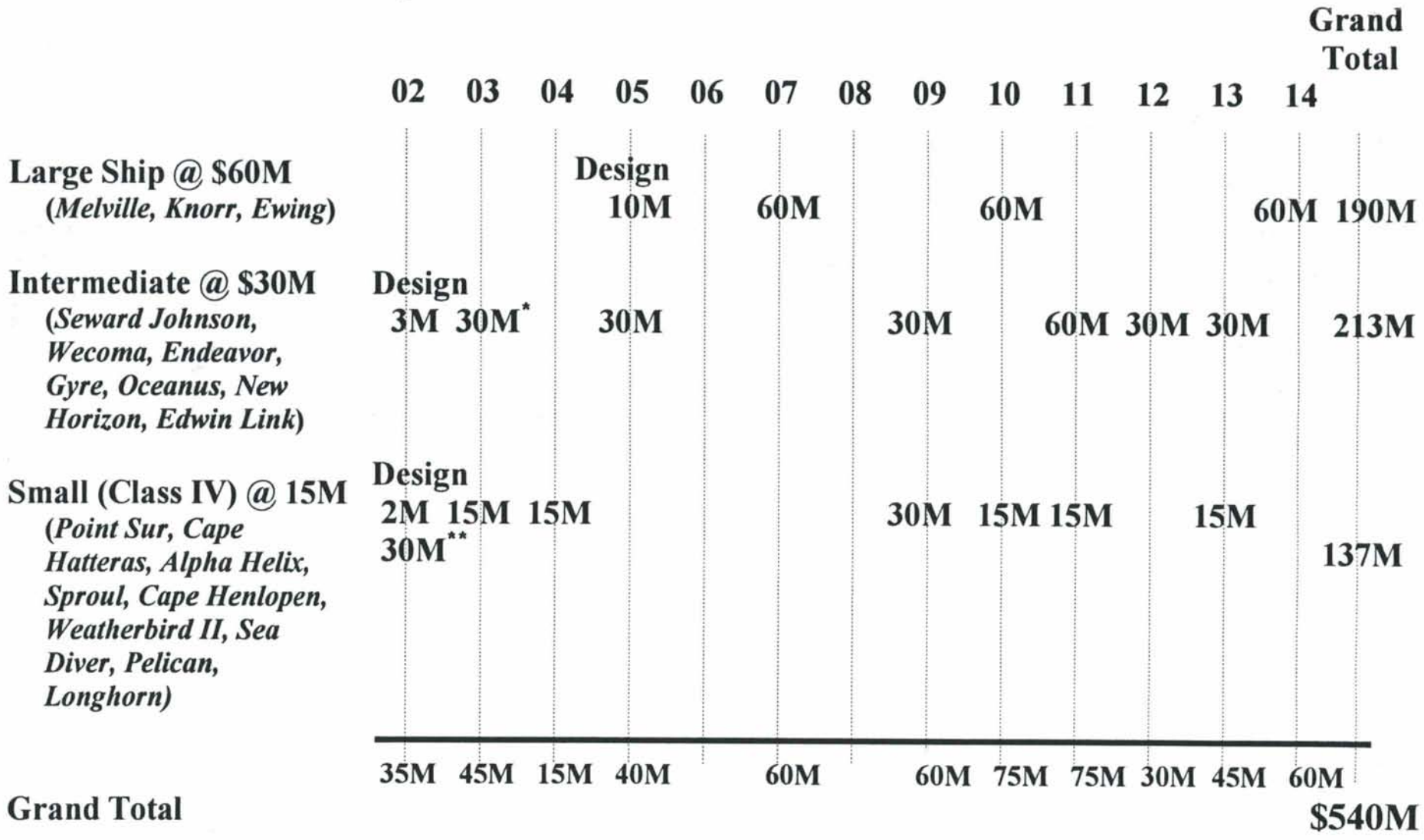
Class III - Intermediate Ships



Class IV - Small Ships > 100 Ft.



One-for-One Replacement Cost Estimate



Notes: Construction Times: Large Ship = 5 years, Intermediate Ship = 3 years, Small Ship = 2 years
Cost Estimates are in FY2000 Constant Dollars

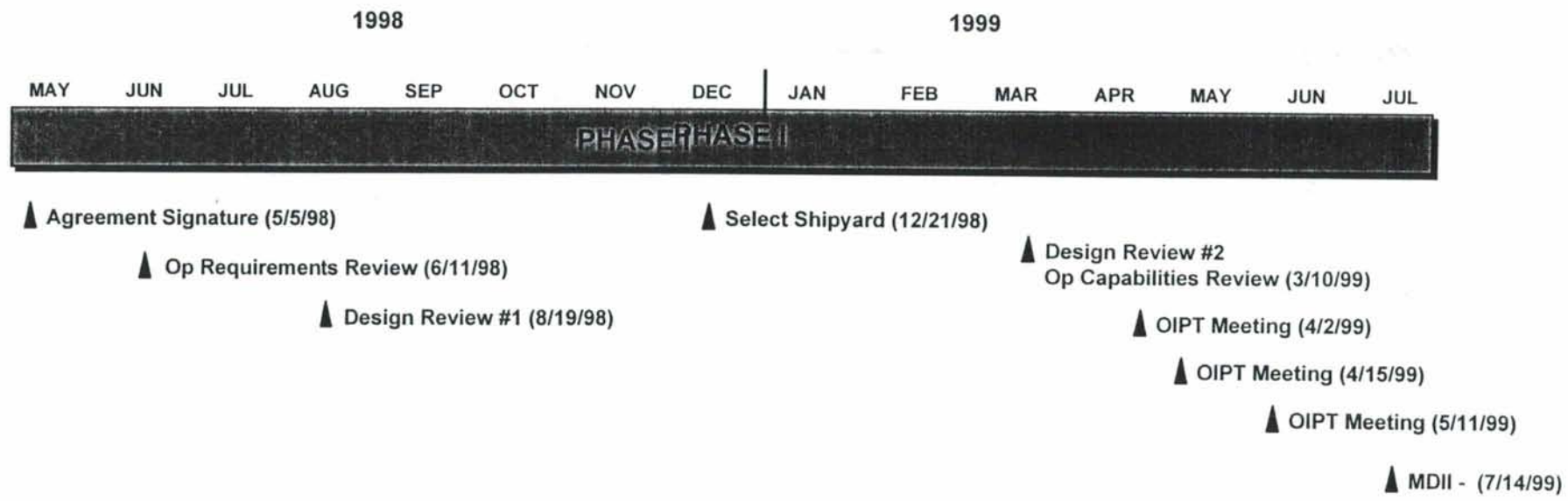
* *Gyre* scheduled for retirement in 2003

** *Alpha Helix* and *Longhorn* scheduled to go out of service before 2003

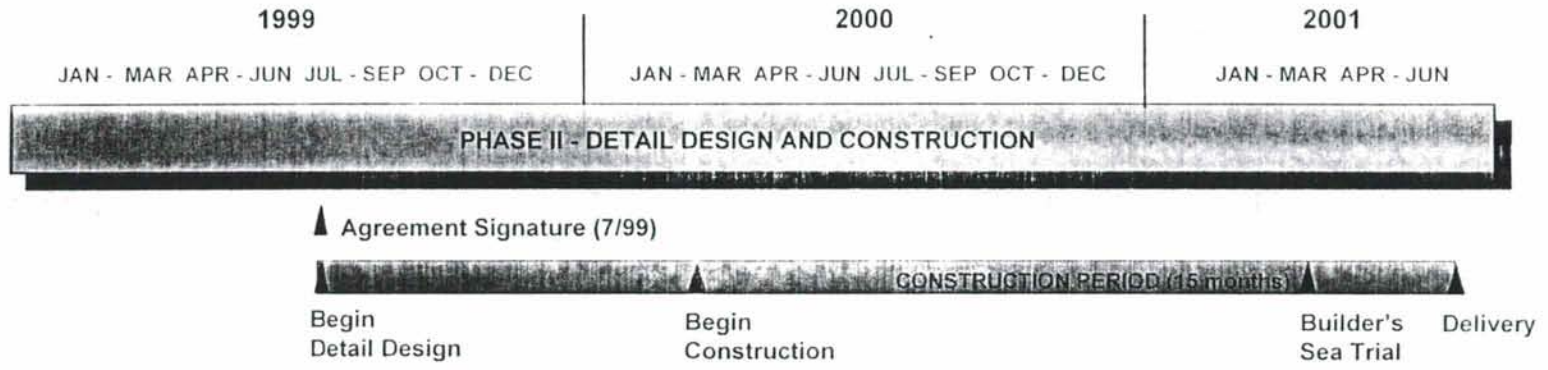
																																	Revised 6/21/99
PROJECTED SCHEDULE OF CONSTRUCTION, MID-LIFE REFIT AND RETIREMENT OF SHIPS IN THE UNOLS FLEET																																	
		BUILT	**96**	**97**	**98**	**99**	**00**	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	
CLAS I/II																																			
	MELVILLE	1969	----	----	----	----	----	----	----	----	----	----	X	----	----	----	----	----	----	----	----	R													MELVILLE
	KNORR	1970	----	----	----	----	----	----	----	----	----	----	X	----	----	----	----	----	R																KNORR
	THOMPSON	1991	----	----	----	----	----	----	----	----	----	----	----	M	----	----	----	----	----	----	----	----	----	----	----	----	----	R							THOMPSON
	REVELLE	1996	C	----	----	----	----	----	----	----	----	----	----	----	----	----	----	M	----	----	----	----	----	----	----	----	----	----	----	----	----	R			REVELLE
	EWING	1983	----	----	----	----	M	----	----	----	----	----	----	----	----	----	----	----	----	----	X	----	----	----	----	R									EWING
	MOANA WAVE	1973	----	----	----	X																													MOANA WAVE
	AGOR 26	2002							C	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	AGOR 26
CLASS III																																			
	SEWARD JOHNSON	1985	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	R													SEWARD JOHNSON
	WECOMA	1976	----	----	----	----	----	----	----	----	----	----	----	----	----	X	----	----	----	----	R														WECOMA
	ENDEAVOR	1977	----	----	----	----	----	----	----	----	----	----	----	----	X																				ENDEAVOR
	GYRE	1973	----	----	----	----	----	----	----	X																									GYRE
	OCEANUS	1976	----	----	----	----	----	----	----	----	----	----	----	----	----	X	----	----	----	----	R														OCEANUS
	NEW HORIZON	1978	----	----	----	----	----	----	----	----	----	----	----	----	----	----	X	----	----	----	----	----	R												NEW HORIZON
	EDWIN LINK	1982	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	R																EDWIN LINK
CLASS IV																																			
	POINT SUR	1981	----	----	----	----	----	----	----	----	----	----	----	----	----	----	X	R																	POINT SUR
	CAPE HATTERAS	1981	----	----	----	----	----	----	----	----	----	----	----	----	----	----	X	R																	CAPE HATTERAS
	ALPHA HELIX	1966	----	X	----	----	R+																												ALPHA HELIX
	SPROUL	1981	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	X	----	----	----	R													SPROUL
	CAPE HENLOPEN	1976	----	----	----	----	----	----	----	----	X	----	R																						CAPE HENLOPEN
	WEATHERBIRD II	1981	----	----	M	----	----	----	----	----	X	----	----	----	----	----	----	----	----	R																WEATHERBIRD II
	SEA DIVER	1959	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	R																SEA DIVER
	PELICAN	1985	----	----	----	----	----	----	----	----	----	R																							PELICAN
	LONGHORN	1971	----	----	----	----	----	R																											LONGHORN
CLASS V																																			
	URRACA	1986	----	>																															URRACA
	LAURENTIAN	1974	----	>																															LAURENTIAN
	BLUE FIN	1972	----	----	----	----	----	R																											BLUE FIN
	SAVANNAH	2001						C	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	SAVANNAH
	CALANUS	1971	----	----	----	----	----	R																											CALANUS
	CALANUS REPLACE	2001						C	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	CALANUS Replace
	BARNES	1966	----	>																															
SPECIAL PURPOSE SHIP																																			
	ATLANTIS	1997	----	C	----	----	----	----	----	----	----	----	----	----	----	----	----	----	M	----	----	----	----	----	----	----	----	----	----	----	----	----	----	R	
	ATLANTIS II		X																																
C = CONSTRUCTION				X = FIP95 RETIREMENT DATE																																
M = MID-LIFE REFIT				R = RETIREMENT																																

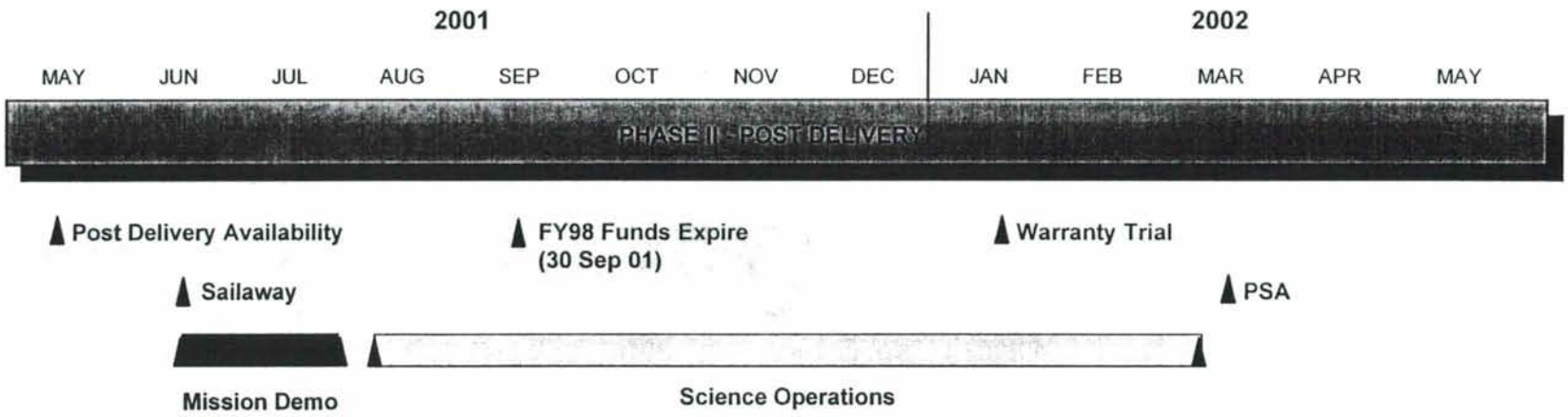
Appendix X

AGOR 26 ACQUISITION SCHEDULE
Figure (1)



AGOR 26 ACQUISITION SCHEDULE
Figure (2)





AGOR 26
Operational Capabilities

1.0 OPERATIONAL REQUIREMENT

New fully equipped, small waterplane area, twin hull (SWATH) oceanographic research ship to extend the capability of performing oceanographic operations in high sea states.

2.0 OPERATIONAL CAPABILITIES

The AGOR 26 will be a modern research ship capable of cost-effectively performing general purpose oceanographic research in coastal and deep ocean areas. The ship will be capable of performing the following tasks:

a) Sampling and data collection of surface, midwater and sea floor parameters using modern scientific instrumentation;

b) Launch, towing, and recovery of scientific packages, both tethered and autonomous, including the handling, monitoring and servicing of remotely operated vehicles (ROVs), autonomous underwater vehicles (AUVs), deep sea moorings, and boats;

c) Shipboard data processing and sample analyses in modern, well-equipped scientific laboratories;

d) Precise navigation and station keeping and track-line maneuvering to support deep sea and coastal operations;

e) Long periods of operation at low speeds.

3.0 OPERATING CHARACTERISTICS

Hull

a. Design Guidance. The AGOR 26 will be built to commercial standards, classified under ABS, ✠A1 circle E, ✠AMS, ✠ACCU, UWILD (underwater inspection in lieu of drydocking), unrestricted ocean service, and certified by USCG in accordance with the Code of Federal Regulations, Title 46, Subchapter U. The ship shall be equipped to satisfy Panama Canal Transit Regulations
b. Ice Strengthening. Ice Class D0

Propulsion

a. Endurance. The ship shall function continuously during a 50 day at-sea deployment without sustaining a system failure that cannot be corrected at sea, or that degrades services required for survival and return.
b. Range. The ship shall be capable of a range of 10,000 nautical miles at 11 kts.

c. Sea Keeping. Operational at 12 knots in Sea State 6 (SS6), 4 to 6 meter wave height; 28 to 47 knot wind. Able to launch and recover scientific equipment on station in a SS6 at best heading.
d. Station Keeping. The ship shall keep position at best heading within a 50 meter radius circle in seas up to 6 meter significant wave height and a wind speed of 47 knots.
e. Towing Capability. Ship shall be capable of towing scientific packages up to 30,000 lbs., including 10,000 lbs. at 10 kts and 25,000 lbs. at 2.5 kts.
f. Ship Control. Maximum visibility of deck working areas during deployment and retrieval of equipment; the functions, communications, and layout of ship control must allow the close interaction of ship and science operations. The propulsion plant shall be designed to allow precise speed control and maneuverability and operate efficiently over the full range of speed. Continuous variable speed control between 0 and 14 knots. Integrated Bridge System in which all machinery monitoring, navigation data sources, and ship control commands are interconnected.
g. Speed. 14 kts.

Electrical

a. Electrical System. Integrated Electric System shall be configured in accordance with IEEE 45-1998.
b. Clean Power. Provision shall be made for clean power to support a scientific load of approximately 100 kW; including a 12kw Uninterrupted Power Supply (UPS).

Mission

a. Exterior Working Deck Area. 2,000 square feet of contiguous, exterior working deck area designed with a minimum of permanently installed equipment to provide flexibility for operational requirements.
b. Van sites. Services and space to accommodate two (2) 20ft x 8ft ISO vans.
c. Laboratories. Total of 3,000 square feet divided among multiple labs and located adjacent to the working deck.
d. Scientific Storage. 15,000 cubic feet in below deck storerooms.
e. Over-the-Stern Handling. Working Deck area configured to carry, launch, and recover equipment over the stern, including an 80 foot core sampler.
f. Deck Equipment. A suite of modern cranes, winches, Stern U-frame and other deck gear provided to permit loading and unloading the ship without assistance and conducting a variety of oceanographic operations at sea, such as coring, water sampling, equipment implantation, and array and trawl towing.
g. Science Payload. Capacity for 100 tons of temporary science equipment brought onboard for specific missions and stored on deck and in storerooms.
h. Video/Audio/Data Network. Scientific Information System consisting of cables and junction boxes to support a network of computers, scientific instruments and audio-visual monitors.

Acoustic Characteristics

a. Shipboard Systems. The choice of shipboard systems, including hull, propulsors, and machinery, their location, and their installation shall be designed to not interfere with the operation of shipboard scientific acoustic systems.

b. Shipboard Sonar Systems. 1 deg x 2 deg Multibeam Sonar System, 95 kHz Shallow Water Multibeam System, Echosounder, Subbottom Profiler, Acoustic Position Indicator System, Doppler Current Profiling System. All installed sonars shall be designed to operate at ship speeds up to 12 knots.

c. Airborne Noise. The ship shall be designed to meet the noise levels recommended by the International Maritime Organization as contained in "The code of Noise Levels Onboard Ships and Recommendation of Methods of Measuring Noise Levels at Listening Post, Resolution A.468 (XII).

Electronics

a. Navigation and Positioning. Differential GPS with chart inputs capable of interfacing with the Dynamic Positioning System, Automatic Radio Detection Finder, Ship's Depth finding systems, Inertial Reference System with gyrocompass backup, Doppler Speed Log, and 10-cm radar and 3-cm radars.

b. Communications. Reliable voice channels for continuous communications to shore stations, other ships, boats and aircraft including satellite, VHF, FAX, aircraft transceivers, cellular phone, INMARSAT B, and high speed data communications links. Marine dial telephone system, public address system, and sound powered telephone system provided to ease communication throughout the ship.

Habitability

a. Accommodations. Permanent berthing accommodations and toilet/showers shall be provided for 48 persons.

b. Temperature and Humidity. Habitability areas and mission essential spaces shall be air-conditioned and shall be designed for a maximum external air temperature of 100 degrees Fahrenheit dry bulb (86 degrees Fahrenheit wet bulb), with a maximum sea water temperature of 85 degrees Fahrenheit, and a minimum external air temperature of 0 degrees Fahrenheit with a minimum sea water temperature of 28 degrees Fahrenheit. Air-conditioning for all laboratory spaces and interior scientific operations spaces shall be designed to provide maximum of 75 degrees Fahrenheit with maximum humidity of 55 percent. Heating for these spaces shall be designed to provide minimum of 70 degrees Fahrenheit. Other payload compartments shall be designed to maintain 70-80 degrees Fahrenheit dry bulb with maximum humidity of 55 percent.

4.0 INTEGRATED LOGISTICS SUPPORT

The ship shall be supported through commercial resources. The ship's crew will be capable of performing routine preventative and corrective maintenance procedures. Maintenance beyond the crew's capability will be commercially performed. The ship will operate independently without fleet support and will often be in remote areas for long periods of time. The ship is expected to average at least 280 days per year at sea with typical missions lasting up to 50 days. Low maintenance, high reliability, and redundancy are important to achieve these goals.

Appendix XI

MEMORANDUM OF UNDERSTANDING BETWEEN

THE UNIVERSITY NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

AND

THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

I. Purpose and Scope:

The purpose of this Memorandum of Understanding (MOU) is to promote increased collaboration between the University National Laboratory System (UNOLS) and the National Oceanic and Atmospheric Administration (NOAA) in carrying out oceanographic and atmospheric research utilizing ship-board platforms of both organizations. The scope of the MOU extends to: (1) the ship-board scientific research conducted by the NOAA Office of Oceanic and Atmospheric Research (OAR), under the purview of the Assistant Administrator for OAR, and (2) the functions of the UNOLS Council and member vessel operators. The authority for NOAA to enter into this MOU is 15 U.S.C. section 1525, which authorizes the Secretary of Commerce to engage in joint projects with other agencies on matters of mutual interest and to apportion the costs equitably. This MOU is to serve as a model and a basis for future NOAA-UNOLS partnerships with OAR and other NOAA line and program offices, in the areas of fisheries related research, coastal research and monitoring, operational oceanography, and satellite calibration. The overall goal of this MOU is to improve the overall efficiency of the broader research community and cost efficiencies in ship operations through increased flexibility in scheduling and utilization of research vessel assets.

II. Executive Direction and Implementation:

a. The Executive Agent for NOAA shall be the Assistant Administrator for Oceanic and Atmospheric Research. The Executive Agent for the University National Oceanographic Laboratory System shall be the Chairperson of UNOLS.

b. The Executive Agents will:

(1) negotiate and conclude amendments and annexes to this MOU;

(2) determine whether new, cooperative arrangements between NOAA and UNOLS institutions and/or NOAA and other agencies (the Parties) are within the purpose and scope of this MOU. Upon mutual written agreement of the Executive Agents, each Party may sign such agreements determined not to be within the scope of this MOU.

(3) review and conclude annexes to this MOU:

(4) give or receive notification of termination of any amendments or annexes to this MOU;

(5) negotiate solutions to any disputes which may arise relative to the interpretation or application of this MOU, or any annex or amendment concluded under the scope of this MOU.

c. NOAA, because it is also a research vessel operator, will be a member of the Schedule Review Group (SRG) but will not be a member of UNOLS or the UNOLS Council.

III. Joint Responsibilities:

a. Subject to the laws and regulations affecting each Party and to the availability of funds, personnel, and other resources, UNOLS and NOAA, through their Executive Agents, undertake the following Joint Responsibilities under this MOU:

(1) UNOLS and NOAA will recognize and accept safety standards produced by each organization with scientists operating under the standards appropriate to the vessel that they are embarked upon. Diving operations will be conducted in accordance with the protocols and safety standards appropriate to the vessel diving operations are being conducted from.

(2) The Schedule Review Group (as is the case with ONR and NSF research fleet operations) may recommend changes to the R/V BROWN's schedule that would make it more efficient and/or cost effective. This might include adding NSF/ONR/NAVO/Other cruises to the BROWN and/or moving work from BROWN to other vessels. Final determinations regarding how best to meet mission objectives reside with the Agencies supporting the vessels.

(3) NOAA and UNOLS will coordinate equipment operations, maintenance, and development for vessels under this MOU through the Research Vessel Technical Enhancement Committee which will have NOAA representation.

(4) NOAA and UNOLS institutions will maintain their respective insurance arrangements.

(5) Each party to this MOU shall collaborate on meeting the annual cycle and timing requirements of each organization.

IV. UNOLS Responsibilities:

a. In support of joint efforts covered by this agreement, the UNOLS will:

(1) Provide NOAA with the annual scheduling cycle requirements that it needs to meet.

V. NOAA Responsibilities:

a. In support of joint efforts covered by this agreement, NOAA will:

(1) Operate the BROWN in a prudent and safe manner.

(2) Commit to support the BROWN with a goal of using the vessel in the most effective (cost and operations) manner consistent with meeting mission responsibilities, however, NOAA reserves the right to operate BROWN during periods of reduced requirements.

(3) Provide support for outsourcing the equivalent of approximately one-half of an operating year on medium and/or large (i.e., Classes I and II) vessels of NOAA research and NOAA sponsored research. NOAA's requirements will first be presented to UNOLS for consideration then to other sources of ship support for those requirements that UNOLS is unable to meet efficiently for reasons such as cost, logistics, and/or operational considerations.

(4) Provide the ship scheduling committee with a proposed operating schedule and mission specific requirements.

(5) Provide final approval of BROWN's schedule.

VI. Comparability:

a. The principal of "Operating Days," i.e., days away from home port but not in a shipyard, shall be used in determining the daily operating cost of BROWN.

b. A common accounting basis should be agreed upon by NSF, ONR, and NOAA for developing annual operating costs of UNOLS vessels and BROWN.

c. The preferred, common denominator for exchanging cruises is daily operating cost. If recommended by the SRG, and agreed upon

by the appropriate Federal agency, operating days may be exchanged between vessels (e.g., for trading cruises between UNOLS Class I vessels and BROWN).

d. NOAA, NSF, and ONR should develop a plan for joint support for equipment acquisition and maintenance on UNOLS and NOAA vessels.

VII. Cooperative Arrangements:

Cooperative Arrangements are subject to all provisions of this MOU and shall, in their introduction, incorporate by reference all provisions of this MOU.

a. Cooperative Arrangements between NOAA and UNOLS institutions (the Parties) may be initiated independent of this MOU, and without any formal agreement, whenever they are: required for a response to an emergency, immediate safety risk, or urgent operational requirement; and are short-term [less than three (3) months] in duration. Each Party shall be responsible for its own internal guidelines for review or approval of these arrangements. If operational requirements dictate extension of such arrangements beyond three (3) months, or the establishment of such arrangements for shorter time-frames, but for repetitive requirements, written authorization for extension beyond three months will be obtained from the Executive Agent for each participant.

b. Additional agencies may participate in Cooperative Arrangements within the scope of this MOU, as appropriate, if mutually agreed by all parties. Decisions involving multi-agency arrangements will be made by the Executive Agents. Detailed arrangements for cooperation under this agreement between UNOLS, NOAA and additional agencies, and detailed responsibilities of the other agencies, will be specified within the annexes to this MOU.

c. All federal agencies have the authority to enter into agreements with UNOLS, UNOLS institutions, or NOAA independent of this agreement.

VIII. Terms of Agreement:

a. The implementation of this MOU in future fiscal years is subject to the availability of funds. NOAA will establish annually, in writing, that funds are available and that it intends to carry out the activities under this MOU.

b. This MOU becomes effective upon the date of the last signature and shall remain in effect for a 2 year period unless

terminated sooner.

c. Either party may terminate this MOU by providing not less that 180 days notice in writing to the signatory of the other Party.

d. If any provisions of this MOU are determined to be inconsistent with existing laws, regulations, or directives governing either Party, then the provisions of this MOU not affected by a finding of inconsistency shall remain in full force and effect.

e. No vessel associated with this MOU shall be guaranteed a full year of operations under this MOU.

IX. Appendix:

a. Terms and definitions.

X. Approval/Signature:

THE UNIVERSITY NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

Kenneth S Johnson
By: Chairperson

Date: 17 Sept 1997

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

D. James Baker
By: Under Secretary for Oceans and Atmosphere

Date: 17 Sept 1997

Appendix XII

UNIVERSITY OF MINNESOTA

Large Lakes Observatory

Office of the Vice President for Research

109 Research Lab Building
10 University Drive
Duluth, Minnesota 55812

218-726-7639
Fax: 218-726-6979
Internet: llo@d.umn.edu

2 April 1999

Mr. Jack Bash
UNOLS Office
P. O. Box 392
Saunderstown, RI 02874

I am writing to request UNOLS status for the University of Minnesota research vessel, R/V BLUE HERON. The BLUE HERON is beginning its second year of operation on Lake Superior, and is being used mostly for NSF-funded research.

Very briefly, the reasons for this request are:

1. The University of Minnesota Large Lakes Observatory (LLO) was established in 1994 and has grown, as a result of a major investment by the University, to 6 tenure track faculty and a 7th to be hired this year. Virtually all of these faculty are receiving funding from OCE and are likely to continue this trend. The Duluth campus has plans to hire a plankton ecologist and an organic geochemist in addition to the new LLO hire within the coming year, most likely with Gt. Lakes research interests. The Twin Cities campus also has two faculty in Ecology who are funded by OCE.

2. The R/V BLUE HERON is a capable research vessel, 87 ft LOA and 195 GWT, outfitted with state-of-the-art instrumentation, including hull-mounted ADCP and multi-beam sonar. It has a spacious working deck and laboratories, well laid out for multi-disciplinary studies and the deployment of large instrument arrays. A brochure is enclosed that provides additional information on the vessel.

3. The BLUE HERON is scheduled for a UNOLS inspection on 17, 18 May 1999.

4. Acquiring UNOLS status for the BLUE HERON will make her readily available for NSF-funded research, particularly on Lake Superior, when she is the appropriate vessel to do the job. Without UNOLS status it can be difficult for scientists to request the BLUE HERON for their needs because ship time is not automatically provided by the OCE Ship Operations Program. Some OCE program managers are reluctant to spend their research funds on ship time.

Having spent 10 years (1983-1993) as Director of the Duke/UNC Oceanographic Consortium, extensively involved with the operation of the R/V CAPE HATTERAS, I am well aware of the responsibilities of operating a UNOLS vessel, as well as the fact that UNOLS status carries no guarantee of support from NSF. I am also well aware of the reluctance of the UNOLS community to admit new vessels, especially small vessels, into the UNOLS fleet. I respond to this reluctance with understanding, but ask the critics to understand that vessels the size of the

BLUE HERON and LAURENTIAN are appropriate for Gt. Lakes operations, and to realize that the distance between the home ports of these two vessels, about 700 miles, is comparable to the distance between Cape Hatteras and Miami or the Gulf of Maine. The next nearest UNOLS vessel is more than 2000 miles away, via a very expensive, slow seaway.

I hope that you will allow the BLUE HERON to enter the UNOLS fleet. I look forward to hearing from you.

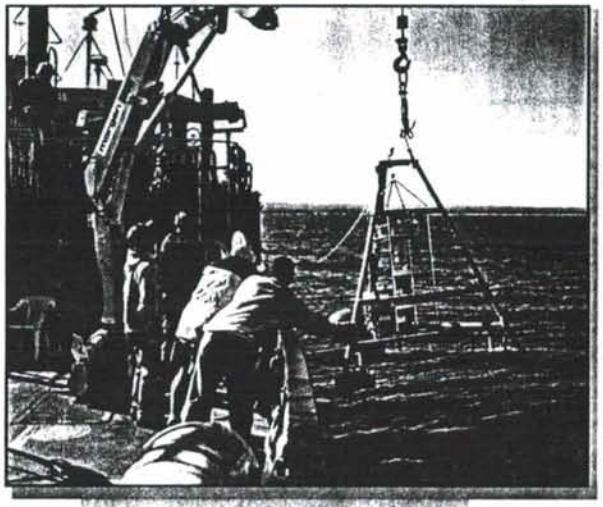
Sincerely,

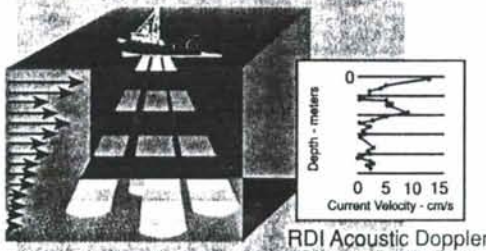
Thomas C. Johnson
Director and Professor
tcj@d.umn.edu
ph: 218-726-8128

cc: E. Dieter

R/V BLUE HERON

equipped with 3 winches (hydrographic, electro-
echanical and heavy-duty), electronic navigation
id communications equipment and state-of-the-art
coustic remote sensing systems with digital
quisition capability, including 28 KHz Knudsen
ho sounder, 1 KHz Geopulse boomer, Bolt
guns, Reson Sea-Bat multi-beam sonar, EG&G
de-scan sonar, and a RDI 150 KHz acoustic
ppler current profiler. The vessel carries a Sea
rd 911 CTD with rosette sampler, 5 liter Nisken
ttles, and sediment sampling equipment, including
onar grab sampler, an Ocean Instruments multi-
rer, and a Kullenberg piston corer.



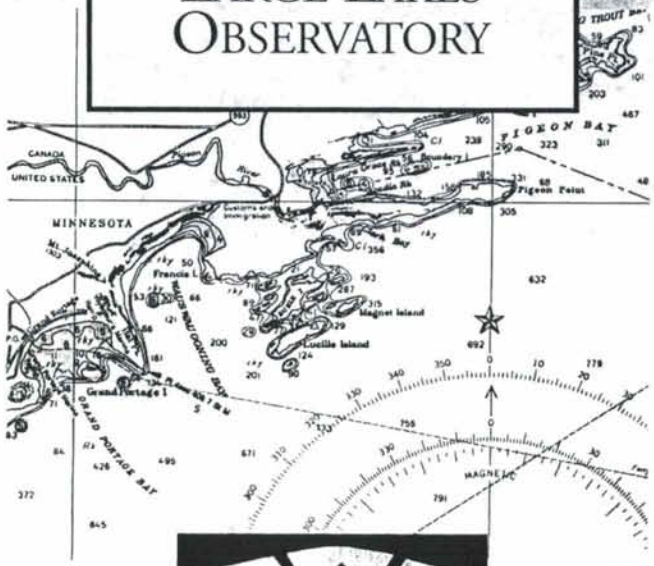


RDI Acoustic Doppler
Current Profile Data

RESEARCH VESSEL
BLUE HERON

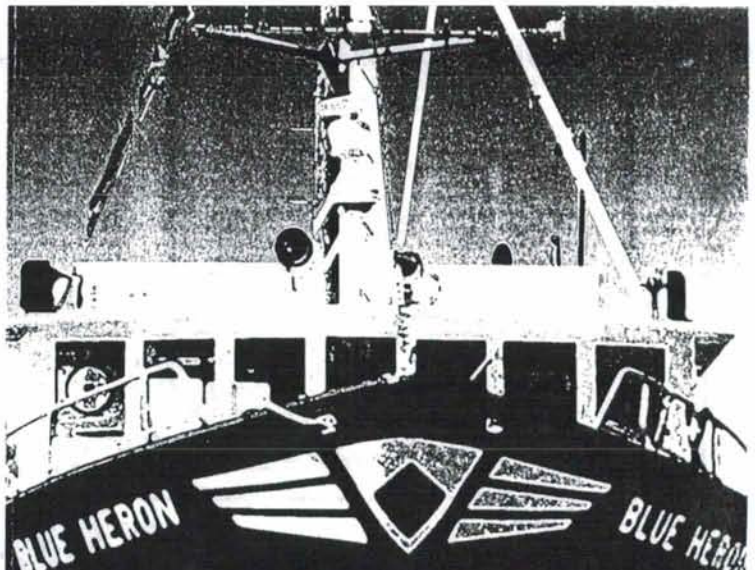
University of Minnesota Duluth

LARGE LAKES
OBSERVATORY



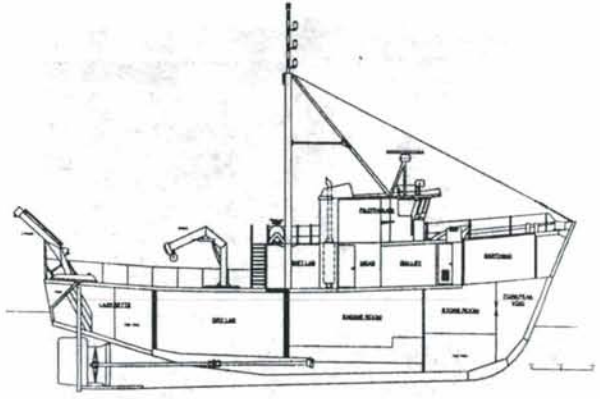
For further information call 218.726-8522
or visit us at www.d.umn.edu/llo

UNIVERSITY OF MINNESOTA
UMD
DULUTH



RESEARCH VESSEL
BLUE HERON

THE LARGE LAKES OBSERVATORY
UNIVERSITY OF MINNESOTA DULUTH
DULUTH, MN 55812
USA



The R/V BLUE HERON

Operator: The Large Lakes Observatory
University of Minnesota Duluth
Home Port: Duluth, MN
Built: 1985
Goudy & Stevens Shipyard
East Boothbay, Maine
LOA: 86'
GWT: 195 tons
Draft: 12 ft
Propulsion: Single Propeller
3508 Caterpillar Kort Nozzle
Power: 65 KW, 480V, 110V
Speed: 10 Knots cruising
12 Knots Maximum
Range: 2500 Nautical Miles
Endurance: 10 days
Accommodations: 4 Crew
5 Scientists

The R/V BLUE HERON

was originally built as the F/V Fairtry, a stern trawler that fished the north-western Atlantic Ocean out of Portland, Maine. She was purchased by the University of Minnesota and sailed up the St. Lawrence Seaway to Duluth in September 1997. The R/V BLUE HERON was converted to a Great Lakes research vessel during the winter of 1997-98 at Fraser Shipyards, Inc., Superior, Wisconsin.

She is operated by the Large Lakes Observatory at the University of Minnesota Duluth, and is available for research and training in limnology on any of the Great Lakes.

The R/V BLUE HERON

has a working deck of 800 sq. ft., a wet lab of 240 sq. ft., and a dry lab of 575 sq. ft. The working deck is equipped with an A-frame with 5-ton capacity, a 2-ton power capstan and a marine crane capable of lifting 1200 lbs. at 30 ft. extension.

The Large Lakes Observatory is a University of Minnesota system research center located at the University of Minnesota Duluth

From tcj@d.umn.edu Thu Jul 8 11:49:09 1999
Date: Thu, 08 Jul 1999 10:43:54 +0600
From: Tom Johnson <tcj@d.umn.edu>
To: unols@gso.uri.edu
Cc: tcj@d.umn.edu
Subject: UNOLS status for R/V Blue Heron

Jack,

Following our phone conversation this morning, I submit the following addendum to my letter of 2 April 1999 (pasted below), requesting UNOLS status for the R/V BLUE HERON. Here I specifically address the items in Paragraph 6 of the UNOLS Guidelines for Requesting/Becoming a UNOLS Vessel:

a. The University of Minnesota Large Lakes Observaatory operates the R/V BLUE HERON for research purposes.

b. We have operated the R/V BLUE HERON as a shared use vessel since May 1998. We have operated the R/V NOODIN, a 28 ft. research work boat, as a shared use facility since I came to LLO in 1994.

c. Our projected use of the R/V BLUE HERON for the coming year (April - December 2000) is: NSF-KITES (Ralph et al.) - 45 days (f); NSF-OCE (Sterner-Brown) - 15 days (p); MN Sea Grant (Wattrus, Johnson, Brown) - 10 days (f); Minnesota State (Sterner, McManus) - 12 days (f); Univ. MN (education) - 10 days (f); NSF LTER (Johnson, Zhou) - 35 days (p); NOAA - NURP (Wattrus) - 10 days (s). Where f=funded, p = pending, and s = proposal to be submitted. These total 77 days funded, 40 days pending, and 10 days to be proposed. We anticipate more days to be proposed to NURP, Sea Grant and the National Research Council in the UK. The KITES cruises carry PI's from WHOI, Michigan Tech, and the University of Washington in addition to the University of Minnesota. While the total number of days is small compared to large oceanographic research vessels, we consider 100 days per year to be a succesful operating schedule given the seasonality of our region and the size of our crew. In 1999 we have 103 funded operating days. We would prefer to not exceed 130 days per year.

d. The R/V BLUE HERON succesfully completed a UNOLS safety inspection on 17, 18 May 1999.

e. The R/V BLUE HERON is capable of operating under UNOLS R/V Safety Standards, January 1996.

f. The R/V BLUE HERON is and will be available to all federally funded users.

g. The vessel is and will be maintained to accomodate the needs of the academic oceanographic programs.

h. We are willing to participate fully in the UNOLS scheduling process.

i. We will submit cruise reports and assessments as UNOLS requires.

j. We will adhere to cost accounting and peformance standards according to UNOLS uniform procedures.

k. We are capable of requesting the necessary funds to suport operation of our vessel.

l. Please consider this and the letter of 2 April 1999 as the written application for UNOLS status.

Thomas C. Johnson, Professor and Director
Large Lakes Observatory
University of Minnesota
Duluth, MN 55812
http://www.d.umn.edu/llo

Appendix XIII

SeaNet Progress Report
July 1999

The SeaNet Collaboratory: Ellen Kappel, Andy Maffei, Steve Lerner, Cindy Sellars, Dale Chayes, Richard Perry, Bob Heinmiller, Susan Kubany, Kevin Kimball, Rex Buddenberg.

The SeaNet/NOPP-ONR grant expires on August 1, 1999. The SeaNet collaboratory is pleased to provide the following progress report, which includes a summary of what we proposed to ONR and a corresponding status report for each item.

Proposal: Build and deploy five SeaNet Communications Nodes (SCNs) on UNOLS vessels, with updated satellite and cellular communications. A SeaNet Advisory Panel would provide guidance as to which ships would be the first to receive these units.

Status: SCN hardware and software have been installed on five ships, as recommended by a SeaNet Advisory Panel, after review of proposals from eight institutions. The current status of each ship is as follows:

ATLANTIS - A pre-production version of the SCN, embodying most of the features of the "production" units was integrated with the Atlantis' existing Nera Saturn Bm satellite communications unit. Lerner, Maffei, Perry, and Sellars installed the SCN during a late August/early September 1998 port call in San Diego, California. The "production" model was installed in Manzanillo, Mexico by Koczynski (filling in for Perry) and Lerner during April 1999. The SeaNet system is currently being used primarily for Cmail, an electronic mail system designed by WHOI's shipboard services group. It is also being used for transferring large files on occasion.

EWING - A SeaNet pre-installation survey was performed on 15 December 1998 while EWING was in dry dock in Norfolk, VA. Locations for the satellite dome and the SCN were determined. The Nera Saturn B marine satellite communications node was purchased and commissioned at LDEO on 14 January 1999. The SeaNet unit was installed during the week of 25 January 1999 while EWING was in dry dock in Norfolk, VA. Because this was the first "production" installation, Lerner, Maffei, and Perry, assisted by Joe Stennet, EWING's science officer, all participated in the installation effort.

We had a one-month test of the system in February 1999 while Maffei sailed on EWING. The system works well but we had a difficult time accommodating the existing email system because of shipboard network problems and need for additional changes to SeaNet software to make transfers more "timely." We are working closely with EWING technical support staff to do this ASAP. Their email system is a "batchuucp" system developed at the University of Hawaii. During

February we supported a Deborah Smith/Chris Fox cruise with some "quick" web browsing and program/data file transfers.

SEWARD JOHNSON - HBOI purchased and commissioned the Nera Saturn Bm marine satellite communications node in December 1998. Perry performed the hardware installation in May while JOHNSON was in homeport at Fort Pierce, FL,. Software integration was performed by Maffei June 4-6, 1999. Modifications are currently being made to accommodate the Microsoft Exchange email system so that it will work with SeaNet.

MELVILLE - A SeaNet pre-installation survey was performed on September 3, 1998 while MELVILLE was in homeport in San Diego. Locations for the satellite dome and the SCN were determined. The Nera Saturn Bm marine satellite communications node was purchased and commissioned in conjunction with the SeaNet installation on 24 April 1999 while MELVILLE was in Honolulu, HI. Lerner and Perry performed the installation. Use of the SeaNet system has so far been minimal. We will be talking to the Scripps group again soon to determine if they need help using the system or are interested in trying to get their email system to work over the INMARSAT-B system.

PELICAN - A SeaNet pre-installation survey was performed on 14 December 1998 while PELICAN was docked in Cocodrie, Louisiana. Locations for the satellite dome and the SCN were determined. The Nera Saturn Bm marine satellite communications node was purchased and commissioned at LDEO in early March. Maffei and Perry performed the SeaNet installation during the week of 22 March 1999. The system on PELICAN has been used to transfer images regularly. They are also interested in exploring video applications and we have been talking to vendors about video technology that could be incorporated into SeaNet.

NOTES: Although original plans did not intend to support shipboard operators' current email systems we found that by retrofitting SeaNet software to accommodate some of the existing system we got increased use of the Inmarsat-B systems because of the better cost/byte. For this reason more effort has been put into supporting existing email systems than we had originally expected.

The SeaNet collaboratory has developed web-based software installed on the Linux operating system. All operations are provided by a shipboard browser. The system provides a new "datapipe" technology designed to automatically collect, compress, and transfer files that sit in directories on a shipboard LAN and transfer them to directories destination directories on the shore-side Internet. Datapipes can also be configured from shore to the ships. An "Interactive IP" mode connects the shipboard LAN directly to the Internet. Accounting, B-HSD, link management, special support for existing support of shipboard email systems and several other functions are also provided.

Instead of working with cellular technology, SeaNet has had an opportunity to work closely with AMSC to develop high-speed data transfers for coastal ships. This is currently a work-in-progress.

*****

Proposal: Provide an accounting and billing system that ensures that participating institutions, researchers, and ships understand the cost implications for their ship-based communications, and also pay their fair share of the infrastructure costs.

Status: We are currently working with the vessel operators, providing custom billing and invoicing. As we develop a better agreement on the best format and on what information is needed by the operators, we will evolve a standard invoice. The system will provide enough information to the vessel operator for internal institutional billing on an individual or project basis, if desired. We also plan to provide the ability to generate month-to-date and date/period traffic/cost figures on request.

The goal is to provide to the vessel operators (and to projects, groups, and individuals who wish to be billed separately) enough information to meet their own needs for internal re-billing, traffic analysis, interim account status, and budgeting.

*****

Proposal: Provide a secure system so that hackers can't find a way to use our expensive satellite connection. The system would also prevent users to transfer very large, but unwanted files over the satellite connection, thus saving money.

Status: The SeaNet nodes are located within a private IP address space. This protects them to a certain extent. TCP wrappers are employed on both the shipboard and shorebased machines.

*****

Proposal: Provide help-desk services so that immediate and accurate answers to SeaNet questions are provided.

Status: A Network Information Center (NIC) is being developed at Omnet. Anyone with SeaNet questions can send an e-mail to SeaNet.Service@seanet.int or call Omnet at 540-885-5800.

We have also provided ship operators with home telephone numbers of key SeaNet staff for use in urgent situations.

*****

Proposal: Build a frame-relay network in cooperation with MCI. This network would be used to interconnect identified key communications facilities.

Status: Because of MCI's merger with WorldCom shortly after the SeaNet grant was funded, this collaboration never panned out despite several face-to-face meetings with MCI. In the event, we designed a different network infrastructure which fit SeaNet as well as the preferred mode of operations for the satellite carriers much better. SeaNet calls are routed from the satellite ground stations to Omnet via public network ISDN lines. Because of the way the ground station switches and billing software are configured, this interfaces well with the carriers' existing way of doing business. It has, however, had a great impact on our efforts, as Omnet has had to take on more of the tasks involved in being an ISP than we had originally expected.

Plans are being made to co-locate the primary SeaNet NIC server to obtain higher bandwidth and better power backup.

*****

Proposal: Provide e-mail filtering and web-page caching.

Status: Work on the Web page caching system is still underway. The next release of the SeaNet Communication Node (SCN) software will have the web-mirror functions incorporated in them.

We are designing a web-page-by-mail service. We have surveyed existing services and decided to develop our own, and a specification is in preparation.

The development of user-definable filters for e-mail from shore to ship accounts has been completed. These filters are intended to allow a SeaNet e-mail user to determine his own priorities for what mail will be forwarded on to the ship (and for which he will pay). Options include sending to ship, return to sender, trash, and archive for later retrieval.

Integration of CMail, an e-mail package developed and used at WHOI, into the SeaNet system is underway. CMail has hooks for the addition of the filter package and associated administrative functions.

*****

Proposal: A shore-based SeaNet reference laboratory would be built at the Naval Postgraduate School to provide a reference model for trouble-shooting SeaNet shipboard software and hardware.

Status: Development of a test lab at NPS proved more difficult than originally thought because of the logistics involved in software and hardware development and R&D efforts.

In addition, Rex Buddenberg had additional and unforeseen responsibilities given to him at NPS, which did not allow for as much time on the SeaNet project as originally planned. To compensate for this, WHOI has set up and maintained the SeaNet test lab, and Omnet has taken on much of the responsibility for AMSC testing originally planned for NPS. NPS still contributes to the SeaNet effort in graduate theses related to SeaNet developments and provides the valuable "crystal ball" input to communications technologies.

Future

The SeaNet collaboratory has submitted a proposal to NSF to continue SeaNet support through the end of the year. A decision on this is pending. SeaNet is also developing a proposal to NSF for support for three years beginning January 2000. This proposal would provide the UNOLS fleet with additional SeaNet units, enhanced software, and continued technical support. SeaNet has had numerous inquiries from the private sector, and is hoping to develop at least one prospect in the near future to set the stage for wider access to our system.

SeaNet is also working out the best way to add ships to the SeaNet network that have purchased the necessary hardware independent of the SeaNet group. We understand that this is a very real possibility and an excellent opportunity to extend services to more ships.

Expansion of service to more vessels will provide the needed critical mass to support the SeaNet infrastructure.