UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

UNOLS COUNCIL MEETING

SUMMARY REPORT

January 16-17, 1997

Biosphere II
Oracle, AZ

Meeting Report
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INTRODUCTION - The UNOLS Council met on 16-17 January 1997 at the Biosphere II Conference Facility in Oracle, AZ. The participants of the meeting are listed in ***Appendix I***. The items of the agenda, ***Appendix II***, were addressed in the order as reported below. The meeting was called to order at 8:30 a.m. by Ken Johnson, UNOLS Chair.

ACCEPTING MINUTES - The minutes from the September 1996 Council meeting were accepted as written.

COMMITTEE REPORTS:

Deep Submergence Science Committee (DESSC) - Mike Perfit provided a review of ALVIN/ROV operations long with a recap of the December DESSC meeting, see ***Appendix III***. ALVIN 1996 operating year ended in July when ATLANTIS II was retired. The remainder of the year was devoted to ALVIN's overhaul. The ROVs were successfully used in three cruises in 1996. During Dan Fornari's LUSTRE cruise to the Mid Atlantic Ridge in July, Jason's manipulative capabilities were demonstrated while conducting sampling operations. In Paul

Johnson's September cruise to Juan de Fuca Jason completed 84 hours of continuous operations on the bottom during one lowering.

Mike presented ATLANTIS' proposed schedule for 1997. The ship will transit from the shipyard to Woods Hole in March/April. It will then undergo an outfitting period at WHOI and ALVIN will be loaded aboard. In May, ATLANTIS is expected to leave WHOI and transit to Washington D.C. for public viewing. Next, ATLANTIS will conduct ALVIN certification dives off Bermuda before beginning science operations in mid to late June. The first cruise will be on the Mid Atlantic Ridge. In July/August, ATLANTIS will transit through the Panama Canal for work off California. ATLANTIS is scheduled to begin a Post Shipyard Availability (PSA) in September through mid October in San Diego. In the fall, ALVIN will resume operations on the Northern East Pacific Rise. At the end of the year, ATLANTIS/ROV operations are planned on the Southern EPR. By conducting ATLANTIS' PSA period in September, the ship's schedule will be open allowing the ship to remain at the Southern EPR to complete all funded programs.

The ROVs have a full schedule in 1997. Two Jason programs are planned in the Western Pacific off of THOMPSON including a 47 day UK funded cruise to survey the wreck of the M/V DERBYSHIRE. The survey will use all three ROV systems. ROV operations are also planned at Juan de Fuca, the Mediterranean Sea and the Southern East Pacific Rise. The systems are scheduled to be used from three different platforms: THOMPSON, C.CHOUEST and ATLANTIS.

Mike Perfit reviewed the geographic areas of interest for ALVIN and ROVs through 1999. This year, letters of interest were submitted to the UNOLS Office via the Web. Considering that it was the first time using this procedure, response was good. Areas of interest included traditional and non-traditional areas: Atlantic, Mediterranean, Gulf of Mexico, Juan de Fuca, Off California, NEPR, Guaymus Basin, Equatorial Pacific, SEPR, Hawaii, Western Pacific and the Indian Ocean.

At the December DESSC meeting WHOI presented their Concept of Operations for the Deep Submergence Facility. The plan outlines the integration of ALVIN and the ROVs. WHOI's concept would centralize cruise preparation and science liaison with a single point of contact, Don Moller, the Marine Operations Coordinator. There are a number of operational issues associated with an integrated facility. A 24 hour switch-over period is required between ALVIN and Jason. ROV and tethered vehicle switch-over time is 18 hours. Special requirements for cruises must be indicated by PIs early during the planning period. ROVs are NOT "night-time" survey vehicles.

The December DESSC meeting also included a discussion on WHOI's archive policy. WHOI reviewed their current policy of preserving data. A draft policy is in the works and will be circulated for review. Mike reported that WHOI has submitted an ALVIN upgrade proposal to NSF which includes DESSC's prioritized list of eleven upgrades. The first three items on the list are datalogger/video upgrades, increased payload capabilities and power improvements. Additionally, WHOI requested upgrades for the VB system, navigation and digital imaging. If funded, the upgrades would be integrated during 1997/98.

ALVIN's overhaul is coming along smoothly. Various components are being upgraded on ALVIN during the overhaul including wiring for a third battery, pan/tilt installation, and a new single chip video camera. Component re-installation has begun. Upgrades are also planned and being installed on the ROV systems. These include modifications necessary for surveying the M/V DERBYSHIRE wreck. ***Appendix III*** provides a full list of the ROV upgrades.

Lastly, Mike reported that the NSF/ONR/NOAA Memorandum of Agreement (MOA) for the Deep Submergence Facility is still on hold. The agencies plan on discussing it later in the year.

In other deep submergence news, the Canadian ROV, ROPOS, was lost in the fall from THOMPSON during a fast moving storm. ROPOS was insured and it will be replaced.

Fleet Improvement Committee (FIC) - Chris Mooers, FIC Chair, reported on the Committee's December meeting in San Francisco. The first day and a half was devoted to developing Science Mission Requirements (SMRs) for the central Pacific. In addition to FIC, scientists with seagoing experience in the Pacific were invited to attend the meeting and assist in the SMR development. University of Hawaii representatives came to the meeting with a revised (scaled-down) set of UH SMRs based on comments received from the community.

The Committee began its development of the SMRs by reviewing the values reported in existing UNOLS Science Mission Requirements for Class II and Class III monohull research vessels and Class I and III SWATH research vessels. They then established the minimum acceptable and desirable values for the central Pacific. The desirable requirements were prioritized by the meeting participants. The meeting participants were able to achieve a consensus on the SMRs, however, the degree of enthusiasm over the SMRs varied. They expressed concern for the associated construction and operating costs for a new vessel. It was recommended that a subcommittee be appointed to work with ONR during the construction of the new vessel.

The remainder of the FIC meeting was devoted to updating the Interim Fleet Improvement Plan (IFIP) and preparing the 1998 Fleet Improvement Plan (FIP98). The FIC decided that this may not be the appropriate time to develop a full FIP98. Instead, they plan to prepare a supplement to the 1995 FIP since many of the original sections do not require updates.

During the FIC meeting, the estimated useful life of the UNOLS vessels was reviewed, see ***Appendix IV***. By the year 2015, many of the intermediate vessel will be retired. The FIC recommends that now is the time to start planning for their replacement and the development of a conceptual design for intermediate vessels should be considered. Regulatory issues regarding crewing and inspection need to be addressed prior to design development.

Research Vessel Operators' Committee (RVOC) - Paul Ljunggren, RVOC Chair, reported on the RVOC 1996 Annual Meeting and other activities underway. The Annual Meeting was hosted by Florida Institution of Oceanography and the University of South Florida in St. Petersburg, Florida in October. It was a well attended meeting. Representatives from both NAVO and NOAA were present. RVOC expressed the importance of having new partners involved in UNOLS activities so that strong relationships can be built.

Paul reported that Mike Prince has developed a Post Cruise Assessment form for the Web. It is hoped that the electronic form will make submissions easier and increase responses. Mike is preparing a preamble explaining the importance of the form.

A Request for Proposals (RFP) for ship inspections is being prepared by the UNOLS Office. A number of groups have expressed interest in submitting proposals. Jack Bash hopes to have an inspector selected by spring. Once the contract is awarded, NSF will manage and coordinate the inspection. UNOLS will serve only as the contract administrator.

The RVOC meeting included three workshops: (1) Developing medical standards for maritime employees, (2) Strategies for maintaining a healthy fleet, and (3) Research vessel safety. The medical standards workshop was attended by Dr. Brown of the Medical Health Service (MHS) and Dennis Nixon. MHS will work with RVOC to develop a medical history form. RVOC is also drafting a list of performance standards to be used in job descriptions. This information should be useful when hiring new crew members. Robert Hinton is the new chair of this subcommittee. The workshop to develop strategies for maintaining a healthy fleet discussed the importance in re-establishing the ship inspection program as soon as possible. Also, they are looking at ISO9000 and ORV regulations on tonnage to see how these will impact ship inspections. The group plans to review the criteria for designation as a UNOLS vessel. The focus of the safety workshop was to develop a safety orientation film approximately 10-12 minutes in length. A proposal to produce the film will be submitted by WHOI. RVOC viewed a safety video produced in the Netherlands that meets many of their objectives. The RVOC film will be more tailored to the requirements of the UNOLS vessels. The Council requested that the Dutch video be viewed at the next Council meeting.

Other business of the RVOC includes reviewing the *Research Vessel Safety Standards* and preparing a small R/V compendium. Dave Powell has agreed to lead the compendium effort. The 1997 RVOC meeting will be hosted by WHOI and the 1998 meeting will be hosted by the University of Hawaii.

Research Vessel Technical Enhancement Committee (RVTEC) - John Freitag, RVTEC Chair, reported on their 1996 Annual Meeting. The meeting was hosted by Harbor Branch Oceanographic Institution in Ft. Pierce, Florida in November. The meeting included a show-and-tell session in which Rich Findley presented MERLIN and a single-mode fiber optic cable. Dan White of HBOI made a presentation of data transfer/communication technology. He discussed MSAT, not to be confused with INMARSAT-M. MSAT is much cheaper than INMARSAT, however, there is considerable delay-time associated with its use. The FAX feature is not yet available.

The meeting was highlighted by a presentation from Phil Gibson of Tension Member Technology. He provided a very informative report on cables and connections. He 'unraveled" a number of issues. The trend today is the ability to transfer greater amounts of data through the wires. The 0.322 cable is nearing the end of its lifespan. There is great need to move to fiber optic cables to meet future demands.

John reported that NAVO provided a review of their programs scheduled on UNOLS vessels. The importance of all parties communicating early and often was stressed. So far, discussions have been open and the differences between UNOLS and NAVO are being surfaced. There has been nothing that cannot be resolved.

The RVTEC meeting also included reports from their various subcommittees. Not much progress has been made on the establishing NetCDF as the standard for data storage over the past year. It needs impetus from the science community. Chris Mooers indicated that he will ask the FIC to provide input. The database committee, chaired by Tom Wilson, has developed an RVTEC homepage, **<http://www.gso.uri.edu/unols/rvtec/rvtec.html>**. The site provides UNOLS resource lists including technical support groups and scientific equipment. Lastly, Sandy Shor provide the RVTEC with NSF budget information.

Suggestions for the next RVTEC meeting include presentations on marine corrosion, RDI and SEABIRD. The next meeting is tentatively scheduled to be hosted by the University of Washington in Seattle. John indicated that he will serve as the RVTEC liaison to the FIC.

Ship Scheduling Committee (SSC) - Don Moller, SSC Chair, reported on the 1997 ship schedules. Scheduling was faced with many issues this past year: multi agency programs, equipment constraints, personnel constraints and multi-year programs. The large ship have healthy schedules. The JGOFS work was taken off THOMPSON and moved onto MELVILLE. In turn, THOMPSON will do the Juan de Fuca programs. There are still three cruises which remain to be settled. These are Hey's cruise on the Southern East Pacific Rise, Stephen/Orcutt/Speiss cruise for borehole operations and Karsen's cruise to the Hess Deep. The intermediate vessels are almost all underutilized in 1997. Don presented a viewgraph of the charge days for each UNOLS ship for the years 1995, 1996 and 1997 (see ***Appendix V***). A total of 5,034 days are scheduled in 1997, which is a substantial increase over last year. As was shown in Don's last viewgraph, the increase can largely be accredited to the addition of the NAVO and NOAA time, and the U.K. funded work to survey DERBYSHIRE. The Council discussed ways of outreaching to the Navy labs. It was suggested that representatives from the Navy labs be invited to our next Council meeting. It was also recommended that Ken bring this topic up at the next FOFCC meeting scheduled for February 27th.

Arctic Icebreaker Coordinating Committee (AICC) - Jim Swift reported on the AICC activities. The AICC was formed this year and is charged with providing scientific oversight of Arctic polar science support on USCG vessels. The committee is supported by NSF and the USCG and includes eight members. Jim commented that they would like to form a tie with RVTEC. Jim provide a list of AICC 1997 activities planned:

- Ship scheduling via the UNOLS format
- Providing science of opportunity guidelines
- Producing a "Chief Scientist" pamphlet
- Identify steps for technical support continuity
- Coordinate science missions
- Support for future initiatives
- Science oversight for HEALY construction.

Jim reported that HEALY's construction is well underway. The ship is scheduled to operate in a test mode in 1998 and commence science operations in 1999. With the assistance of the AICC, HEALY's science space and outfitting is being modeled after the AGORs. Cost for science use is expected to be approximately $20,000 per day. Using deck layout plans, Jim reviewed the committee's recommendations for HEALY modifications and reported that the committee has made remarkable progress. He showed revised deck outlines with the revisions included. The Coast Guard has agreed to remove the dive locker, make a two-story garage which will fit a van, rearrange the passages and double the bench space in the main lab. A very positive relationship with the Coast Guard has developed. Over the next year, the AICC may suggest to the Coast Guard to subcontract with a UNOLS marine operations group for routine consulting and to increase access to technical expertise via RVTEC. AICC plans to form better ties with the community involved with PALMER and the AGORs. Jim's full report to the Council is provided as ***Appendix VI***.

The UNOLS Council approved a motion to provide $1000 from the UNOLS dues in honor of Marcus Langseth. Jack Bash was asked to establish an appropriate fund.

AGENCY REPORTS:

National Science Foundation (NSF) - Don Heinrichs gave the report for NSF. His view graphs are included in ***Appendix VII***. A new NSF science program, Life in Extreme Environments (LExEN) has been established. The purpose of the program is to provide knowledge fundamental to understanding the processes that led to the formation and adaptation of life on Earth, and whether and how life may thrive on other planets. It has a budget of $6M in FY97.

Don reviewed the OCE budget history since 1982. A graph showing both current dollars and constant dollars indicates that there has been some leveling of the budget in recent years. Next Don reviewed the OCE/OSRS success rates for competitive proposals since 1985. The success rates are shown by discipline and then on average. The average success rate now is roughly 25 % and shows a downward trend.

Don reviewed the NSF Ocean Sciences Division budget for the past four years. The Research budget has risen approximately 10% since FY94. A separate line item was added in FY97 for Major Research Instruments and is budgeted at $4.5M. The FY97 budgets for Operations is $38.1M. Don reviewed his 1997 UNOLS ship classification that divides the fleet into large, intermediate, local and regional vessels. The UNOLS operations support trends since 1993 shows that NSF continues to be the major contributor. There was a spike in NSF funding in FY95 due to the support of Indian Ocean operations. In 1997, the biggest increase in ship support came from "other" non-traditional support. This increase was largely due to the introduction of NAVOCEANO's ship time. International support for the DERBYSHIRE cruise was also a major "other" contributor. Don showed how the "other support" was distributed among the ship classes with the largest share of the "other" ship time on the large ships. Regional vessels have the

second largest share of the "other support". Although the NAVO support is high in FY97, the traditional "other" support is down.

In summary, NSF predicts that if fleet support returns to the traditional sponsors only, a reduction of the fleet size would probably be necessary. Support from traditional sponsors has declined in recent years. New ships have been added to the fleet, increasing costs by approximately $4.8M in 1997. Outside support in 1997 from NAVO and the UK may not be available in future years. NSF predicts that all of these factors make the future of the large ships vulnerable.

Don concluded by reviewing some of the quotes from the Ocean Studies Board report, *"Oceanography in the Next Decade" - Building New Partnerships.*

Office of Naval Research (ONR) and Oceanographer of the Navy - Pat Dennis gave the reports for the Oceanographer and ONR. He began with an update on the Navy's TAG-60 Class construction efforts. PATHFINDER, TAG-60, has been operating since summer and is planned to work in waters away from the U.S. for the next ten years. SUMNER and BOWDITCH (TAG-61 and TAG-62) are both in operation. HENSON, TAG-63, was launched in the fall. Presently, the budget includes funds for TAG-64. If built, there will be a nationwide "name the ship" contest for grades K-12. The Navy hopes that there will be funds appropriated for construction of a TAG-65 ship.

Pat was asked by the Council if the change in ONR's formula to support ship time (Facilities pay 80%/science program pays 20%) has made a difference in the amount of ship time being funded by ONR. Pat indicated that it is still hard to tell. However, he noted that Admiral Gaffney is a strong supporter of ocean research. His goals are not to allow the ONR research budget to shrink and if possible, help it grow. Presently, there have been no changes in Sujata's facilities support budget.

National Oceanographic and Atmospheric Administration (NOAA) - Beth White provided the report for NOAA beginning with an update on ship construction and operations. Delivery of NOAA's AGOR, RON BROWN, is scheduled for late March. The ship will then transit to Norfolk, VA for outfitting before starting science operations in August. The ship will undergo its PSA during February to April 1998. The KA'IMIMOANA's cruises are going well. Preparations for the ship's A-76 are in progress and a work statement is expected to be completed by late February. DELAWARE II has completed its shipyard work. The FASTEX cruise on KNORR in the North Atlantic is progressing smoothly. The next NOAA cruise using a UNOLS ship will be on REVELLE. Beth reported that NOAA funds for 1997 have not yet been distributed within NOAA.

Beth reviewed the OAR requests received for NOAA ship time in 1998 and 1999, see ***Appendix VIII***. The 1998 Class I requests for the North Atlantic include three major programs: OACES, CO_2 cruise in June; ACCE transatlantic cruise in January/February; and a Brazil Current cruise in June to August. There are four major, non-KA'IMIMOANA program requests in the Pacific: Global Drifters in the South Pacific, four PACS/TAO cruises, two vents cruises at Juan de Fuca,

Global Drifters in the South Pacific, four PACS/TAO cruises, two vents cruises at Juan de Fuca, and two FOCI cruises off Alaska. UNOLS vessels may be considered for the NOAA Atlantic work because NOAA expects to use their vessels in the Pacific in 1998. There are also four coastal and nearshore programs: FOCI, Tsunami off Alaska, Sea Grant of the East Coast, Florida Bay and IASCS. UNOLS vessels may be considered for some of these programs. In 1999 six major, non-KA'IMIMOANA programs have requested ship time in the Pacific. These are GLOBAL DRIFTERS in the South Pacific, OACES in both the North and South Pacific, PACS in the Equatorial Pacific, VENTS at Juan de Fuca, ARM & TRMM in the Western Pacific, and FOCI off Alaska and in the Bering Sea. There are also three programs requested for the Indian Ocean in 1999: INDOEX, GOALS and ARM & TRMM.

Naval Oceanographic Center (NAVO) - Gordon Wilkes of NAVO provided an overview of the ten NAVO programs scheduled on UNOLS vessels, see ***Appendix IX***. The work will use eleven different ships. Four programs are in the Atlantic, five are in the Pacific and one program is in the Gulf of Mexico. NAVO welcomes university work onboard the ships as long as it does not hamper their programs. Gordon noted that working with UNOLS has provided a good learning experience. The NAVO visits to the ships and the communications with RVTEC have been beneficial. Woody Sutherland at Scripps is developing a procedure for processing the NAVO collected data.

In 1998, there is potential for additional NAVO work on UNOLS ships. There is interest in repeating the 1997 physical oceanography work, conducting a West Coast ODISTA survey and continuing the gravity surveys. There may also be a need to conduct an AUTEC range survey for the Naval Undersea Warfare Center, Newport, RI. Lastly, there is potential for an expansion of the SOCAL range environmental survey. All of the potential work would be on the same funding scope as this year's work.

The Council noted that there is a great deal of overlap in the geographic areas of interest between both academia and NAVO. The academic community would benefit by an overview of the NAVO work. The Council requested NAVO to prepare a brief written summary of the NAVO programs carried out on the UNOLS ships.

Department of State - Tom Cocke provided the report for the Department of State. A summary list of research clearances for 1996 is included in ***Appendix X***. The State Department now has a homepage on the Web. It includes speeches, legislation and treaties. Tom reported that an arrangement has been made with the UK that unless we hear from them after submitting a clearance request, the request is granted. The State Department is trying to make this same arrangement with Barbados. Mexico's new science coordinator has indicated that they will meet with the U.S. to discuss clearances issues. Hopefully they will be able to resolve the problem of late responses to clearance requests. Russia still remains a problem; no clearances have been granted in the last couple of years. Problems have also been experienced with Chile. The embassy received many complaints after three clearances were negatively affected by ship changes.

Tom reported that the State Department is being adversely impacted by many personnel cuts. As a result, there is increasing difficulty in processing clearances efficiently. Tom would welcome any assistance in this matter.

UNOLS ISSUES:

Science Mission Requirements (SMRs) for Central Pacific - Pat Dennis provided a brief update on the status of the Navy's plans for construction of a replacement for MOANA WAVE. ONR is requesting UNOLS' input into the research needs for the central Pacific. At the December FIC meeting, Sujata provided a report on the new vessel plans, see ***Appendix XI***. Language was included in the Defense Authorization and Appropriation Bills which directs the Navy to review the SWATH and SLICE design options for replacement of MOANA WAVE. ONR plans to forward ship specifications to NAVSEA based on the input received from UNOLS and U.Hawaii. ONR and the Oceanographer of the Navy have issued a tasking letter to NAVSEA allowing them to conduct a SWATH market survey, study ship acquisition options, and begin preparing a program of actions and milestones. NAVSEA cannot develop a design that substantially exceeds the $45M appropriation. NAVSEA will evaluate the SWATH, SLICE, and monohull designs in their considerations. The Navy plans call for release of an RFP by June 1997, selection of a ship builder in September 1997, ship delivery in September 1999, and operations by the year 2000. The schedule is very optimistic and slippage should be anticipated.

Ken Johnson reported that the FIC held a meeting on 12-13 December and invited seagoing scientists who had experience in the Pacific. Using the UNOLS SMRs for Class II and III monohulls and Class I and III SWATHs as guidelines, the group developed a set of SMRs for the central Pacific. Requirements were established for minimum allowable and desirable values. The requirements were then prioritized based on their desirable value. The FIC expressed concern regarding the cost of operating a new vessel.

Ken opened the SMR review to the Council and a lengthy discussion followed. Bob Knox began by remarking that the FIC's SMRs dictate a large ship design. Referring to Tables III and IV of the Betzer report, Bob noted that by the year 2000 a 28% shortfall is predicted. Bob made a series of calculations using the estimates from the Betzer report and data from NSF, see ***Appendix XII***. He estimated that UNOLS ship support in 1997 will be $48,500. Bob extrapolated to estimate the fleet support expected in the year 2002. He pointed out that according to the Betzer Report and the AAAS predictions, the anticipated fleet support will be less than that required to meet the fleet costs. In the worst case, the gap between support received and fleet costs is estimated at $22,845. Bob's calculations do not consider replacement for MOANA WAVE. NSF's and UNOLS projections show that we are heading for a major deficit in the short time frame.

Bob continued by asking what subset of work could most efficiently be done by a vessel located in Hawaii. Dick Pittenger provided a series of world maps showing the UNOLS fleet coverage by the intermediate and regional vessels, see ***Appendix XIII.*** From the charts, it appears that a 3,000 nm range is adequate for the intermediate vessels. The ocean areas without shading can be covered by the five large ships.

DAY TWO:

SMRs for Central Pacific (continued) - The morning of Day Two was again devoted to review of the SMRs for the Central Pacific. During the discussion, the following points were made:

1. There is general support for a Class II/III vessel based in Hawaii to support ship operations in the mid-Western Pacific region.
2. There is general support for consideration of a SWATH design.
3. There is general endorsement of FIC's SMRs with the following qualifications:
   a) They appear to fit Class I/II SMR s than Class II/III.
   b) There is more than adequate Class I/II capacity in the current fleet through 2010.
   c) The real need is for a Class II/III ship based in Hawaii.
   d) The $45M appropriation should meet this need.
   e) Operational costs should be kept to a minimum since projections indicate a gap between the cost of the fleet and the support available (which we are dealing with some suggestions).
   f) It is important to get institutional commitment to provide significant continuing operations support.
   g) Selection of an operating institution should be either immediate pre-selection of Hawaii or a fair and open competition.

Ken Johnson agreed to draft a cover letter for the SMRs and incorporate the Council's points. He will e-mail his draft to the Council prior to sending it to ONR.

Next the Council reviewed each FIC SMR and made specific comments:

> Cruise Range - Reduce the minimum range value to 8,000 nm to be consistent with Class III specifications.
>
> Endurance: The minimum endurance should be reduced to 30 days to be consistent with Class III specifications.
>
> Size: Beam and draft should be restricted to sizes that would allow servicing of the vessel in the dry docks typically found throughout its proposed operating region.

The Council recommended that a statement regarding the cost of operation for the new vessel be included in the letter to ONR: 'Due consideration should be given to reducing the cost of operation of this vessel. Such features as fuel efficiency, automation (to reduce manning levels), and ease and cost of maintenance should be factored into the design." Also, the Council agreed with FIC's recommendation to form an ad-hoc committee to work with ONR in the construction of the vessel.

Future NAVO Funding - Ken Johnson reported that CORE is exploring ways to secure NAVO funding for UNOLS ship time in 1998. The Council expressed interest in obtaining NAVO's long

range plans to determine their future ship needs. The Council also discussed the potential of UNOLS ships doing NAVO work in other countries' EEZs. The topic will be discussed further at the next Council meeting.

NOAA/UNOLS Cooperation - A Memorandum of Understanding (MOU) between NOAA/OAR and UNOLS has been drafted. The MOU allows NOAA to enter RON BROWN into the UNOLS scheduling process. NOAA responsibilities will include supporting RON BROWN for a full operating year in addition to providing $2.6 M of support for outsourcing of NOAA research and NOAA sponsored research on UNOLS vessels. The MOU addresses effective, cost efficient ship scheduling; safety standards; insurance practices; and coordination of equipment through RVTEC. It was recommended that cruise assessment reporting should be included in the MOU. The MOU, when accepted, would be in effect for two years unless terminated earlier.

The Council recommended that, if possible, the MOU be expanded to include all of the branches of NOAA which interact with UNOLS, in addition to OAR. This would include NURP. Ken Johnson asked the Council to review the MOU and provide comments to him as soon as possible.

Reassessing the Status of a UNOLS Research - Bob Wall reported on the recommendations of his subcommittee's efforts to reassess of the status of a UNOLS vessel. Prior to the meeting, Bob provided the Council with an Interim Subcommittee Report on, *THE UNOLS FLEET: Focused Resources in an Expanded Capacity*, by Steve Rabalais, Tom Royer, and Bob Wall. Bob gave a summary of the background and charge to the committee, see ***Appendix XIV***. The committee's charge was to re-examine the guidelines for becoming and UNOLS vessel and to evaluate the status of the UNOLS operator. Bob reviewed the small vessel issue and explained why it is an issue. In summary:

- the criteria for designating smaller ships as UNOLS vessels is not available.
- Coastal marine research conducted from smaller ships is growing.
- A number of smaller ships already exist and more will be coming on line.
- Small UNOLS vessels have advantages over small non-UNOLS vessels in attracting researchers and in obtaining equipage and technical support.
- UNOLS vessels are likely to be safer vessels.
- Support for UNOLS vessels is becoming more and more limited.
- UNOLS and the agencies have little control over the design, construction, location and who owns and operates these smaller ships.

Bob reviewed the two research vessel pipelines for construction, use and operation. In the first case, the ship is planned, built and operated Federally and by the National community. Use and operations are in accordance with UNOLS/Federal policies. In the second case, the ship is built and operated by the institution or state. Use and operations are variable and the crux of the issue. The subcommittee recommended that UNOLS' goal should be to provide a fleet of sea-going ships that best meets the needs of the academic marine research community with a maximum of safe and effective operations; and a minimum of cost to the Federal agencies. Possible directions to follow to achieve this goal were outlined:

1. Maintain status quo.
2. Select and implement one of the three models provided by the subcommittee in their interim report.
3. Define and implement a different model.
4. Collect additional information on:
    a) The level of interest in the community of UNOLS-designation for smaller ships- and under what conditions.
    b) Policies that would foster regional cooperation and sharing.
    c) Agency views/policies related to this issue:
        i) Ship support policies for UNOLS vs. non-UNOLS ships
        ii) Level of responsibility (Federal) for small ships.

It was noted that this is a timely issue. Rick Jahnke of Skidaway recently sent a letter to Ken Johnson requesting UNOLS status for their BLUE FIN replacement vessel, see ***Appendix XV***. Conceptually, the replacement vessel will be a 90-100 foot, fiberglass monohull outfitted for general-purpose oceanography. Don Heinrichs reported that Mike Purdy has begun a review within NSF on the topic of small vessels. Their program managers are being polled to determine the NSF use of small vessels. They expect to have their review completed later in the winter.

The Council recommended that the subcommittee collect additional information on this subject. They were also asked to research the ship needs of the coastal community.

Scheduling Ad-hoc Review Group - Jack Bash reported on the Ship Scheduling Procedure Ad-hoc Review Group meeting held on 7 January. The draft minutes of the meeting were provided to the Council. An ad-hoc committee was formed to examine all areas of the scheduling process and to consider how it might be improved. The committee was chaired by Rick Jahnke and included Bob Detrick, Pat Dennis, Dolly Dieter, Dave Epp, Robert Hinton and Rose Dufour. In general, the group agreed that the community needs educating on scheduling and that there is a need to increase communications between the PIs and schedulers. The group recommended that the ship time request form be modified to be a two tier system. The first tier would be used to establish preliminary schedules. The second tier would be used after the science program was funded and would provide detail requirements/constraints of the cruise. Schedulers would establish an electronic folder of all correspondences relating to a ship time request. A world map would be posted on the Web which would include all ship requests by region. Also, the group recommended establishing track charts by year for each ship.

The Council recommended including a disclaimer at the top of each schedule noting that it was tentative and subject to change. The need to re-educate the community on the realities of operations was noted and it was recommended that a ship scheduling primer be developed.

White Paper on Crewing Requirements - Ken Johnson lead a discussion on the need to develop a white paper on crewing requirements. The new Coast Guard admeasurement rules essentially eliminate the opportunity for builders to construct large ships that are under 300 gross tons. Ships over 300 gross tons are required to be "Inspected" vessels. This could have a serious

impact on the ability to build ships comparable to the Class III and IV research vessels now operating. The inspection requirement normally brings with it a need for a larger crew. Will there be no future ships in the 150 to 200-foot range that carry a crew of 12 or 13? Ken reported that we need to assess the actual meaning of the new Coast Guard regulations and whether or not there are other avenues to peruse to keep the crew size down (thus reducing the daily operating cost). Ken has discussed this matter with naval architects, The Glosten Associates, who are prepared to conduct a study, see ***Appendix XVI***. The study could be completed in time for the summer FIC meeting if Glosten were to get the go-ahead soon. The UNOLS Office is to submit a supplemental proposal to conduct the above study. The scope of the requirements will need refining.

Concept Design for an Intermediate/Coastal Research Vessel - The Council discussed the need to develop a conceptual design for Intermediate and Coastal research vessels. They considered it important to have such designs "on the shelf" so that institutions will have a base from which to work, particularly if new or "found" money becomes available for ship construction. Don Heinrichs cautioned that any proposal would need to be well thought through. He reminded the Council that three such proposals have failed funding in the past. The proposal should make it clear that the effort is for the benefit of the Community at large and that funding could come from a variety of sources. The consensus of the Council was that this effort should proceed after the completion of the white paper on crewing requirements.

CORE/UNOLS Cooperation - A draft MOU between CORE and UNOLS was distributed to the Council for their review. Ken lead the discussion on the history of the draft and the reason for the wording. The Council was concerned that UNOLS did not become involved in any lobbying effort and that this MOU can not be construed as such. The MOU was approved and will be forwarded to the CORE Board for their approval, see ***Appendix XVII***.

Interim Fleet Improvement Plan (IFIP) - Chris Mooers opened the discussion by presenting the revised IFIP. The revised plan removed references to regional consortium. Discussion followed. The Council was concerned that the Plan needs to conform with the FIC report "*Projections for UNOLS' Future-Substantial Financial Challenges*" and that the numbers are based on the same premise. Chris will make the minor changes suggested and publish the IFIP.

SEA CLIFF Retirement - Mike Perfit provided the Council with the background on the Navy's proposed retirement of SEA CLIFF and TURTLE. The Navy plans to retire TURTLE at the end of FY97 and SEA CLIFF at the end of FY98. DESSC has been asked by the Navy for input regarding utilization of the Navy's deep submergence assets and an assessment of deep submergence research objectives for the next few decades. The Navy also approached WHOI requesting the cost implications for the Deep Submergence Group to transition SEA CLIFF into the National Facility. Mike is preparing a questionnaire for the community to solicit their views. An ad hoc committee will meet in March to review the results of the questionnaire and make a recommendation to the Navy. Attached, as ***Appendix XVIII***, are view graphs presented by Mike.

Undersea Vehicles and National Needs - Mike reported that a recent National Research Council (NRC) Report titled "Undersea Vehicles and National Needs" has been published. The report had

been several years in the making and much of the information is dated. The report is primarily technologically oriented and approaches the matter of undersea vehicles from an engineering standpoint and not from the perspective of science or research. Charlie Bookman of the NRC suggested a meeting with Mike and others to review the report and determine if it can be of value to the research community.

UNOLS Committee Appointments - Ken Johnson announced the appointments for the Executive Committee. These are Ken Johnson, Tom Royer, Dick Pittenger and Bob Wall. The new Chair of RVOC is Paul Ljunggren and the Vice Chair is Steve Rabalais. The new Chair of RVTEC is John Freitag. The AICC member appointments are Jim Swift, Chair, Lisa Clough, Larry Lauver, Kelly Falkner, Glenn Cota, Tom Weingartner, Joe Coburn, and Dan Lubin.

Other UNOLS Business - Ken Johnson discussed a letter he received from Rick Jahnke concerning the replacement of BLUE FIN, see ***Appendix XV***. Skidaway would like a commitment from UNOLS that this replacement would be a UNOLS vessel. The Council suggested that the reply should explain to Skidaway that UNOLS would entertain an application for the new ship and that there were no changes to UNOLS policy regarding the designation of research vessels in the UNOLS Fleet. Ken will write the letter.

Calendar for UNOLS Meetings - Chris Mooers announced that the next FIC meeting would be the week of 21 July at in Rhode Island. The summer UNOLS Council meeting will be in Michigan, probably Grand Haven. Jack Bash would survey the Council to select the best dates.

The meeting was adjourned at 3:00 p.m.

APPENDIX I

Council Meeting - Jan 16-17, 1997

NAME	AFFILIATION	PHONE/FAX /INTERNET ADDRESS
John Bash	UNOLS	(401) 874-6825/(401) 874-6167/unols@ gsosun1.gso.uri.edu
Tom Cocke	Department of State	(202) 647-0240/(202) 647-1106, 9099/tcocke@state.gov
Patrick Dennis	CORE/USN Support	(703) 696-2161/(703) 696-2007/dennisp@onrhq.onr.navy.mil.
Annette DeSilva	UNOLS	(401) 874-6825/(401) 874-6167/unols@gsosun1.gso.uri.edu
John Freitag	URI	(401) 874-6579/(401) 874-6578/jfreitag@gsosun1.gso.uri.edu
Dennis Hayes	LDEO	(914) 365-8470/(914) 365-8156/deph@ldeo.columbia.edu
Don Heinrichs	NSF	(703) 306-1576/(703) 306-0390/dheinric@nsf.gov
Ken Johnson	MLML	(408) 755-8657/(408) 753-2826/johnson@mlml.clastate.edu
Bob Knox	SIO/UCSD	(619) 534-4729/(619) 535-1817/rknox@ucsd.edu
Paul Ljunggren	LDEO	(914) 365-8845/(914) 359-6817/marsupt@ldeo.columbia.edu
Cdr. Dave McCarren	NAVO	(601) 688-5634/dmccarren@wpo.navo.navy.mil
Don Moller	WHOI	(508) 289-2277/(508) 457-2185/dmoller@whoi.edu
Chris Mooers	U of Miami	(305) 361-4825,4088/(305) 361-4797,4701/cmooers@rsmas.maimi.edu
Mike Perfit	U of Florida	(352) 392-2128/(352) 392-9294/perfit@geology.ful.edu
Dick Pittenger	WHOI	(508) 289-2597/(508) 457-2185/rpittenger@whoi.edu
Steve Rabalais	LUMCON	(504) 851-2808/(504) 851-2874/srabalais@coco.lumcon.edu
Clare Reimers	Rutgers	(908) 932-6555x236/(908) 932-8578/reimers@ahab.rutgers.edu
Jim Swift	UCSD/SIO	(619) 534-3387/(619) 534-7383/jswift@ucsd.edu
Robert Wall	U of Maine	(207) 581-1435/(207) 581-1426/robert_wall@voyager.umeres.maine.edu
Beth White	NOAA/OAR	(301) 713-2465 x184/(301) 713-0163/elizabeth.white@noaa.gov
Gordon Wilkes	NAVOCEANO	(601) 688-4376/(601) 688-5602/gwilkes@navo.navy.mil

APPENDIX II

UNOLS COUNCIL MEETING
January 16-17, 1997
Biosphere 2 Center
Oracle, AZ

Call the Meeting: Ken Johnson, UNOLS Chair, will call the meeting to order at 8:30 a.m. on 16 January, 1997.

Accept Minutes of September, 1997 Meeting.

COMMITTEE REPORTS:

DEep Submergence Science Committee - Mike Perfit, Chair, will report on ALVIN and ROV operations and highlights of the December DESSC meeting.

Fleet Improvement Committee - Chris Mooers, Chair, will summarize the outcome of the December FIC meeting.

Research Vessel Operators' Committee - Paul Ljunggren, Chair, will report on RVOC's 1996 Annual Meeting and plans for the upcoming year.

Research Vessel Technical Enhancement Committee - John Freitag, Chair, will summarize the highlights of the RVTEC 1996 Annual Meeting and provide an update of plans for 1997.

Ship Scheduling Committee - Don Moller, Chair, will summarize the 1997 ship schedules including the NAVO funded ship time.

Arctic Icebreaker Coordinating Committee - Jim Swift, Chair, will report on the fall AICC meetings and science modifications for HEALY.

AGENCY REPORTS: Reports from agency representatives on funding outlooks and special projects:

National Science Foundation - Don Heinrichs
Office of Naval Research & Oceanographer of Navy - Pat Dennis
National Oceanographic and Atmospheric Administration - Beth White
National Oceanographic and Atmospheric Administration/OAR - Beth White
Naval Oceanographic Center -
Naval Undersea Research Program -
United States Coast Guard -
Department of State - Tom Cocke

UNOLS ISSUES:

Science Mission Requirements for Central Pacific - Pat Dennis will provide a status on the Navy's plan for construction of a replacement vessel for MOANA WAVE. Ken Johnson and Chris Mooers will review FIC's efforts to develop Science Mission Requirements for the central Pacific. **Attachment 1** provides a prioritized list of requirements developed by FIC and University of Hawaii representatives.

Interim Fleet Improvement Plan (IFIP) - Chris Mooers will present the Interim Fleet Improvement Plan for Council Adoption, see **Attachment 2**.

Fleet Improvement Plan Update - Chris Mooers will review the FIC plans for updating the Fleet Improvement Plan.

Future NAVO Funding - Ken Johnson will lead a discussion on the future for funding from NAVO.

NOAA/UNOLS Cooperation - Ken Johnson will lead a discussion on the NOAA/UNOLS cooperation planning including the status of R/V RON BROWN being brought into the UNOLS scheduling process.

Reassessing the Status of a UNOLS Research Vessel - Bob Wall will review his subcommittee's recommendations for a modified model for the ships of the UNOLS Fleet, see **Attachment 3.**

Scheduling Ad-hoc Review Group - Don Moller and Jack Bash will report on the outcome of the Scheduling Ad-hoc Review Group meeting. The Group, chaired by Rick Jahnke, met on 7 January to review the UNOLS scheduling procedures and provide recommendations for improvement.

White Paper on Crewing Requirements - Ken Johnson will lead a discussion on Coast Guard Regulations regarding crew size requirements.

Concept Design for an Intermediate/Coastal Research Vessel - At the December FIC meeting, a chart of the estimated use-life of each UNOLS vessel was presented, see **Attachment 4**. It was determined that now is the time to start planning for the replacement of the intermediate/coastal class vessels. Ken Johnson will provide tasking for development of a conceptual design for intermediates.

SEA CLIFF Retirement - The Navy plans to retire the submersible SEA CLIFF at the end of FY98. DESSC has been requested to provide the Navy with recommendations for future uses of the vehicle. Mike Perfit will review DESSC's plans regarding this topic.

Ship Inspection Program - Jack Bash will review the status of the UNOLS Ship Inspection Program.

CORE/UNOLS Cooperation - Ken Johnson will report on discussions with Rick Spinrad, CORE.

Undersea Vehicles and National Needs - The National Research Council has published a report on undersea vehicles and national needs. They are willing to review their findings with UNOLS and DESSC.

Post Cruise Assessments - Paul Ljunggren will review the status of the electronic Post Cruise Assessment report.

New Ship Construction - Dick Pittenger will update the Council on the status of ATLANTIS.

UNOLS Committee Appointments:

EXECUTIVE COMMITTEE - Ken Johnson will appoint new members.
RVOC - Paul Ljunggren, Chair; Steve Rabalais, Vice-Chair
RVTEC - John Freitag, Chair
AICC - Jim Swift, Chair - Jim will announce appointments for the AICC.

Calendar for UNOLS Meetings:

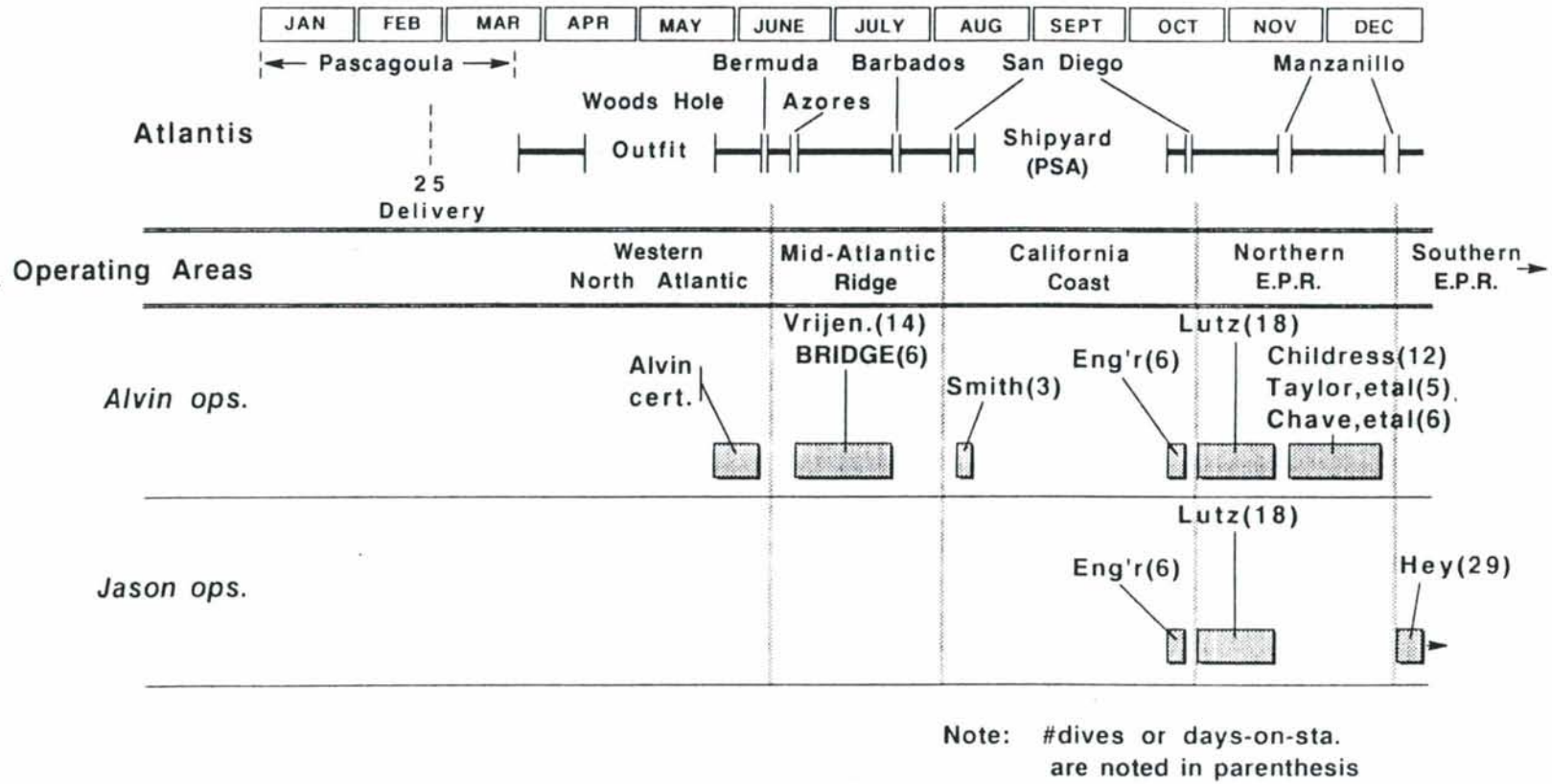
MEETING	LOCATION	DATES
DESSC Working Group	TBD	February 1997
DESSC	Woods Hole, MA	Spring, 1997
Ship Scheduling Review	Arlington, VA	June 1997
AICC	TBD	Spring/Summer
FIC	URI/GSO - tentative	Summer 1997
Council	TBD	Summer 1997
Ship Scheduling Committee	Arlington, VA	September 1997
Scheduling Review	Arlington, VA	September 1997
UNOLS Council	Arlington, VA	Fall 1997
UNOLS Annual	Arlington, VA	Fall 1997
RVOC	Woods Hole, MA	October 1997
RVTEC	West Coast	October 1997
DESSC	San Francisco, CA	December 1997

Adjournment

APPENDIX III

1997 R/V ATLANTIS 1997

Proposed Ship Schedule



Note: #dives or days-on-sta.
are noted in parenthesis

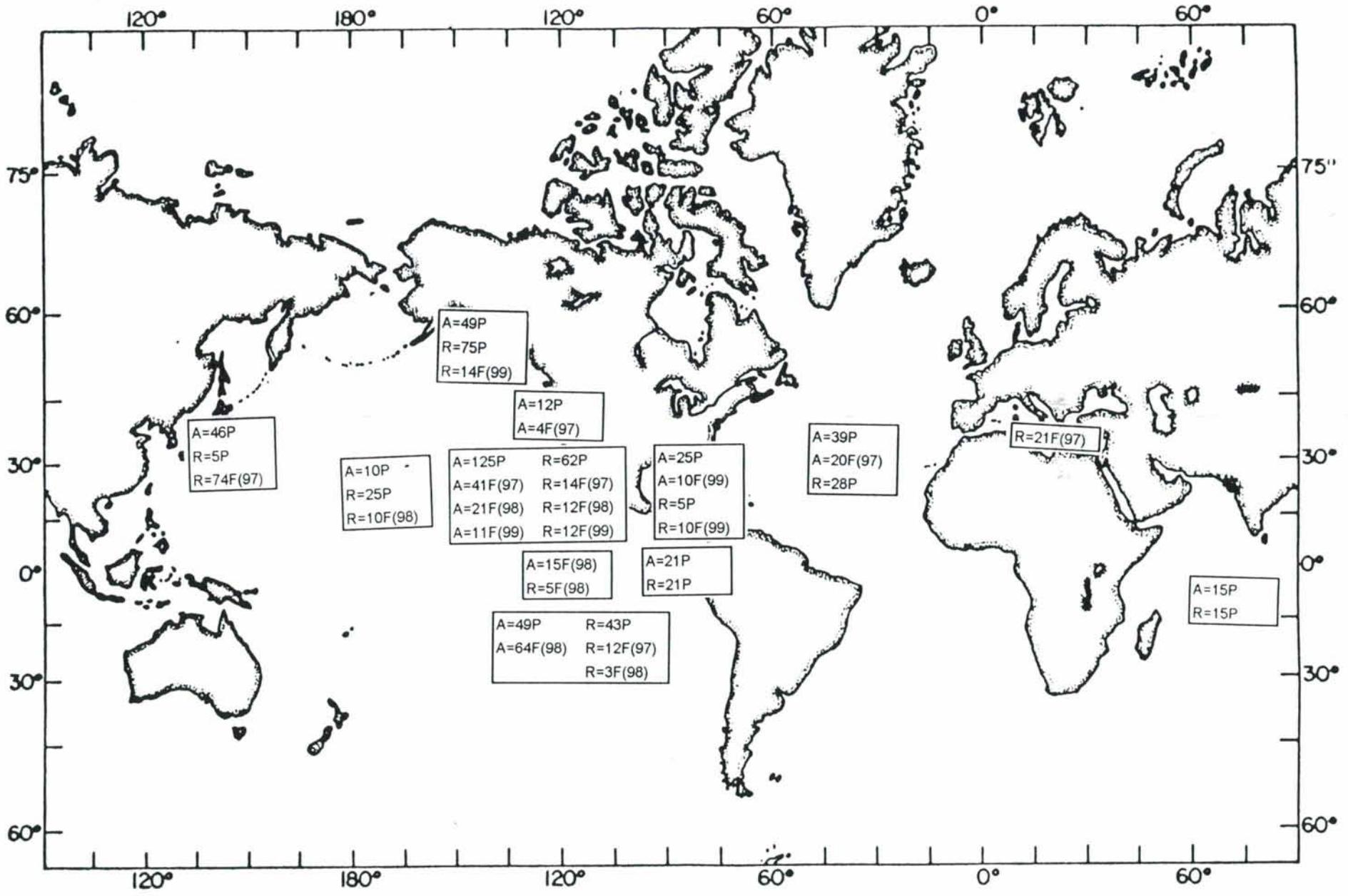
DAM-12/10/96

ALVIN/ROV LETTERS OF INTEREST: SUMMARY 1997 - 1999

	97 ALVIN PROP	97 ALVIN FUND	97 ROV PROP	97 ROV FUND	98 ALVIN PROP	98 ALVIN FUND	98 ROV PROP	98 ROV FUND	99+ ALVIN PROP	99+ ALVIN FUND	99+ ROV PROP	99+ ROV FUND
# OF LETTERS												
ATLANTIC												
4 LETTERS	24	20	15	0	15	0	13	0	0	0	0	0
MEDITERRANEAN												
1 LETTER	0	0	0	21	0	0	0	0	0	0	0	0
GULF OF MEXICO												
3 LETTERS	0	0	0	0	25	0	5	0	0	10	0	10
JUAN DE FUCA												
8 LETTERS	17	0	43	14	32	0	27	0	0	0	5	0
OFF CALIFORNIA												
2 LETTERS	0	4	0	0	12	0	0	0	0	0	0	0
NORTH EAST PACIFIC RISE												
16 LETTERS	12	41	41	14	77	21	21	12	36	11	0	12
GUAYMAS BASIN												
1 LETTER	0	0	0	0	21	0	21	0	0	0	0	0
EQUATORIAL PACIFIC												
1 LETTER	0	0	0	0	0	15	0	5	0	0	0	0
SOUTHERN EAST PACIFIC RISE												
10 LETTERS	0	0	0	12	49	64	43	3	0	0	0	0
HAWAII												
3 LETTERS	0	0	0	0	10	0	25	10	0	0	0	0
WESTERN PACIFIC												
5 LETTERS	0	0	0	74	46	0	5	0	0	0	0	0
INDIAN OCEAN												
1 LETTER	0	0	0	0	0	0	0	0	15	0	15	0
TOTALS	53	65	99	135	287	100	160	30	51	21	20	22

Revised: 1/14/96

ALVIN AND ROV REQUEST SUMMARY: 1997 AND BEYOND

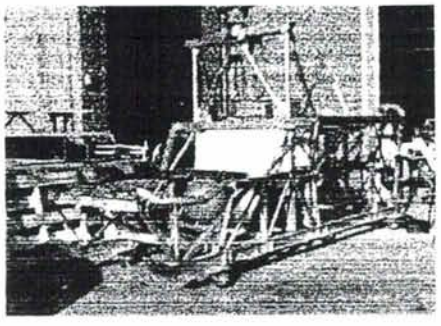


		97	97	97	97	98	98	98	98	99+	99+	99+	99+
		ALVIN	ALVIN	ROV	ROV	ALVIN	ALVIN	ROV	ROV	ALVIN	ALVIN	ROV	ROV
#	PI	PROP	FUND	PROP	FUND	PROP	FUND	PROP	FUND	PROP	FUND	PROP	FUND
ATLANTIC													
1	BLACKMAN	14		15									
2	RONA	10											
3	VRIJENHOEK/BRIDGE		20										
4	TUCHOLKE					15		13					
		24	**20**	**15**	**0**	**15**	**0**	**13**	**0**	**0**	**0**	**0**	**0**
MEDITERRANEAN													
5	BALLARD				21								
		0	**0**	**0**	**21**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
GULF OF MEXICO													
6	ROBERTS					15							
7	AHARON					10		5					
8	MACDONALD										10		10
		0	**0**	**0**	**0**	**25**	**0**	**5**	**0**	**0**	**10**	**0**	**10**
JUAN DE FUCA													
	CHADWICK				5								
	JOHNSON				3								
9	EMBLEY			10									
10	BECKER				6								
11	KARSTEN	17											
12	COLLIER					20							
13	JOHNSON					12						5	
14	DELANEY			33				27					
		17	**0**	**43**	**14**	**32**	**0**	**27**	**0**	**0**	**0**	**5**	**0**
OFF CALIFORNIA													
15	ECKMAN					12							
16	C.R. SMITH		4										
		0	**4**	**0**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
NORTH EAST PACIFIC RISE													
17	FISHER				14								
18	FISHER						10						
19	CARBOTTE			36									
20	LUTZ		18										
21	LUTZ						11		12		11		12
22	FORNARI	2											
23	TAYLOR/WIRSEN		5										
24	BALLARD					21		21					
25	FORNARI			5									
26	MEG TIVEY					20							
27	TOLSTOY					8							
28	VON DAMM	10				10				10			
29	CHAVE		6										
30	MULLINEAUX					10				10			
31	MANAHAN					8				16			
32	CHILDRESS		12										
		12	**41**	**41**	**14**	**77**	**21**	**21**	**12**	**36**	**11**	**0**	**12**

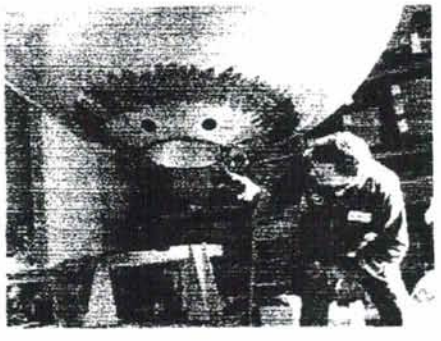
GUAYMAS BASIN													
33	BALLARD					21		21					
		0	**0**	**0**	**0**	**21**	**0**	**21**	**0**	**0**	**0**	**0**	**0**
EQUATORIAL PACIFIC													
34	KARSON						15		5				
		0	**0**	**0**	**0**	**0**	**15**	**0**	**5**	**0**	**0**	**0**	**0**
SOUTHERN EAST PACIFIC RISE													
35	KLEINROCK					6		21					
36	HEY				12								
37	LILLEY						25						
38	FORNARI					2		3					
39	LUPTON					20							
40	LUTZ						14						
41	NAAR					18		12					
42	URABE						5						
43	SINTON						20		3				
44	VAN DOVER					3		7					
		0	**0**	**0**	**12**	**49**	**64**	**43**	**3**	**0**	**0**	**0**	**0**
HAWAII													
45	D.K. SMITH							25					
46	GARCIA					10							
47	CHAVE								10				
		0	**0**	**0**	**0**	**10**	**0**	**25**	**10**	**0**	**0**	**0**	**0**
WESTERN PACIFIC													
48	PERFIT					15		5					
49	TBA					6							
50	CLEFT					25							
51	FRYER				27								
	DERBYSHIRE				47								
		0	**0**	**0**	**74**	**46**	**0**	**5**	**0**	**0**	**0**	**0**	**0**
INDIAN OCEAN													
52	FORNARI									15		15	
		0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15**	**0**	**15**	**0**
		97	**97**	**97**	**97**	**98**	**98**	**98**	**98**	**99+**	**99+**	**99+**	**99+**
		ALVIN	**ALVIN**	**ROV**	**ROV**	**ALVIN**	**ALVIN**	**ROV**	**ROV**	**ALVIN**	**ALVIN**	**ROV**	**ROV**
#		**PROP**	**FUND**	**PROP**	**FUND**	**PROP**	**FUND**	**PROP**	**FUND**	**PROP**	**FUND**	**PROP**	**FUND**
	TOTALS	**53**	**65**	**99**	**135**	**287**	**100**	**160**	**30**	**51**	**21**	**20**	**22**

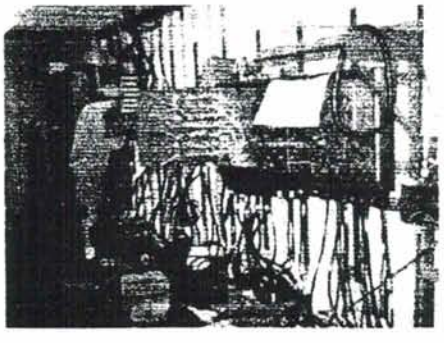
ALVIN Overhaul Status

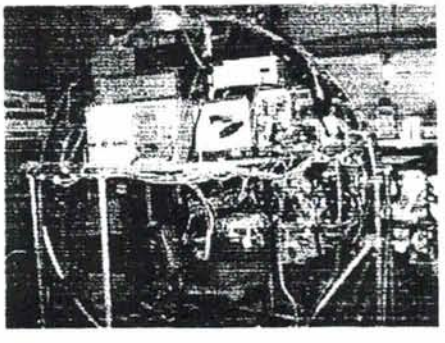
- Some personnel on ROV ops
- Frame repaired..100%
- Variable ballast rebuilt..70%
- Manipulators rebuilt..90%
- Electronic Equip maint..75%



- Personnel/VB/HP spheres insp..100%
- Pressure test implodables..50%
- Hydraulic system rebuild..80%
- Electrical J-boxes rebuild..75%
- Explosive bolts..20%
- Battery Boxes..10%
- Foam repairs..50%
- Blow/vent system.. 100%
- Internal panels/wiring.. 75%
- Skin repairs/painting..5%
- Component re-installations started..5%







ALVIN Upgrades

- Wiring for 3rd battery
- Pan/Tilt installation
- New single chip video camera
- New motor controllers
- Pelagic pump motors
- New in-hull Nikon cameras

1997-1999 Upgrade Plans
Deep Submergence

DESSC Upgrade Priority List

- Datalogger/video upgrades
- Additional foam
- ALVIN power management
- Wiring for 3rd battery
- Slurp pumps
- Dual head scanning sonar
- Laser ring gyro
- Imaging infrastructure
- 35mm inhull cameras and auto strobes
- Pencil cameras
- Homer probes

1997-1999 Upgrade Plans Deep Submergence

Additional Upgrade Priorities

- VB System- planned '97-'98 engineering proposal
- Navigation
- Digital imaging for ALVIN/Jason/ARGO
- Remote data and temperature logging via inductive coupling
- ALVIN thermistor probes

ROV Status

M/V Derbyshire Preparations

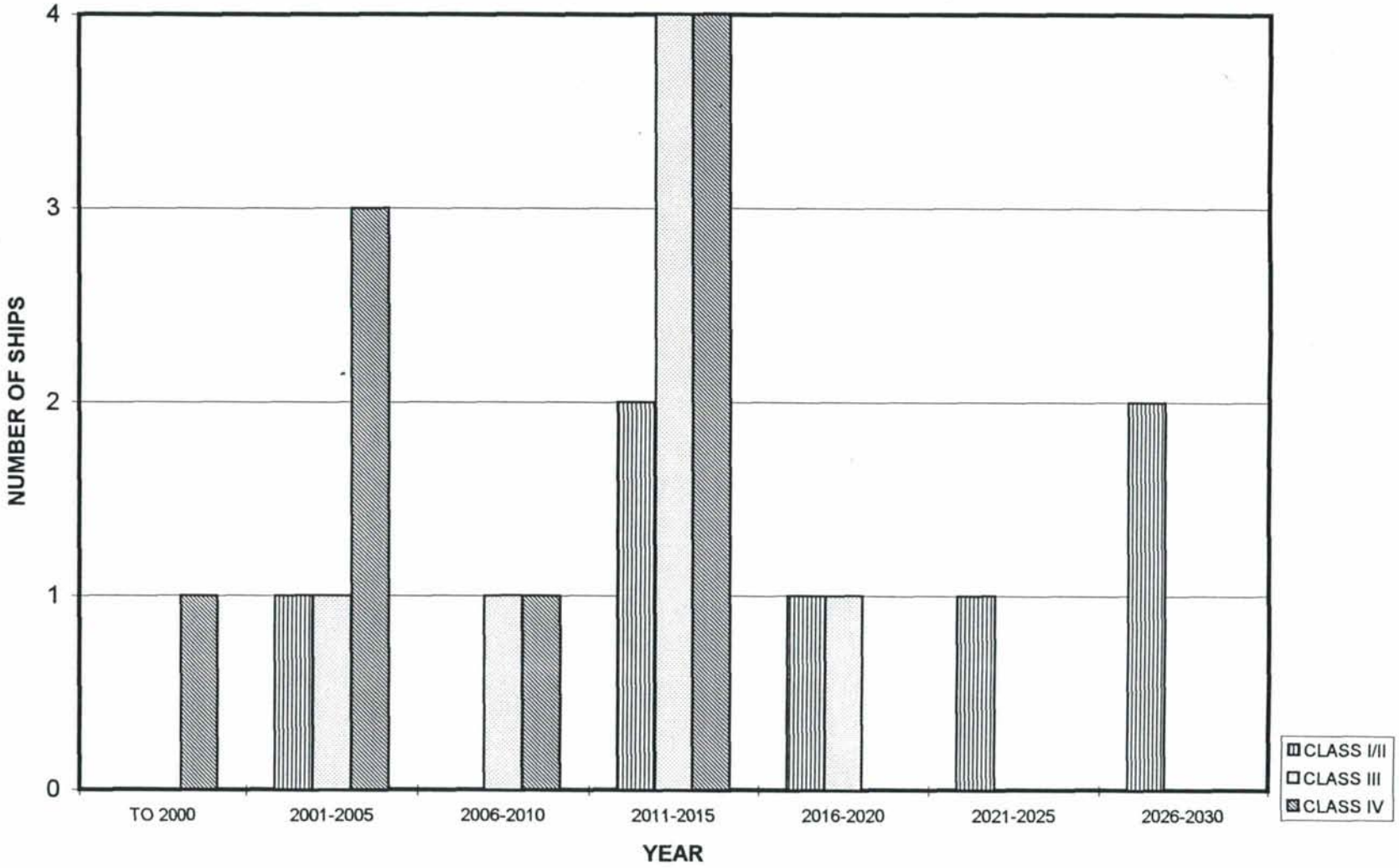
- 47 day survey requiring deployment of DSL-120, Argo-II and Jason vehicles from R/V Thompson
- Installation of HDTV camera and associated telemetry, display and recording subsystems
- Installation of digital high resolution color video camera including enhanced telemetry and recording
- Installation of stereo video system
- Upgrade to existing mosaicking capability
- Refinement of DSG data reduction and processing capabilities

ROV Upgrade Plans

- DSL-120 real-time display and processing
- Jason ascent/descent weight dropper
- "Smart" elevator
- Video telemetry upgrade for Jason and Argo-II
- Jason payload increase
- Enhancement to Jason's auxiliary hydraulic system
- Replacement of Jason neutral tether cable

APPENDIX IV

UNOLS VESSEL ESTIMATED USEFUL LIFE



APPENDIX V

Charge/Operating Days
(1995-1996-1997)

	1995 Total	1996 Total	1997 Total
Atlantis II	319	93 *	145 *
Ewing	310	319	276
Knorr	350	279	291
Melville	297	297	@300
Revelle		80 *	@290
Thompson	333	246	264
Edwin Link	175 *	187	187
Endeavor	228	147	189
Gyre	122	229	@100
Moana Wave	195	144	188
New Horizon	240	174 *	267
Oceanus	187	168	215
Seward Johnson	271	305	253
Wecoma	145	195	188
Alpha Helix	144	73	161
Cape Hatteras	175	0	256
Cape Henlopen	198	185	186
Longhorn	72	133	@118
Pelican	182	201	182
Pt. Sur	164	118 *	197
Sea Diver	180	134	33
Sproul	145	155	200
Weatherbird	154	171	150
Barnes	77	94	133
Bluefin	75	96	113
Calanus	48	64	107
Laurentian	91	72	@45
Days	4877	4359	5034

* Overhaul or partial service

Note: Based on data available on 13 January '97

D.A.M.- 1/13/97

UNOLS FLEET CHARGE DAYS

(by Agency & Year)

	1995		1996		1997	
	DAYS	%	DAYS	%	DAYS	%
NSF	3249	66.6	2745	62.4	3023	60.1
ONR	403	8.3	432	9.8	484	9.6
NOAA	354	7.3	152	3.8	282	5.6
NAVO	0	0	0	0	393	7.8
OTHER	872	17.9	1030	24.0	852	16.9
TOTALS	4877		4359		5034	

1/13/97 - DAM

APPENDIX VI

Report from the Chair of the UNOLS Arctic Icebreaker Coordinating Committee to the UNOLS Council - based on presentation at the UNOLS Council meeting 16-17 January 1997, Biosphere2, Tucson, Arizona

The UNOLS Arctic Icebreaker Coordinating Committee (AICC) was established September 1996 to provide scientific oversight of Arctic polar science support on US vessels. There are eight members from the US academic community. The AICC is supported by NSF and the US Coast Guard, and maintains (and is strengthening) ties to agencies supporting Arctic research from vessels as well to science organizations concerned with Arctic research from vessels.

The AICC members are:

Jim Swift, SIO, Chair (jswift@ucsd.edu)
Lisa Clough, East Carolina University
Joe Coburn, WHOI
Glenn Cota, Old Dominion University
Kelly Falkner, Oregon State University
Larry Lawver, University of Texas at Austin
Dan Lubin, SIO
Tom Weingartner, University of Alaska

Jack Bash, UNOLS executive secretary
Ken Johnson, UNOLS Chair

The AICC 1997 business includes:

Moving ship scheduling towards the UNOLS format
Providing science-of-opportunity guidelines
Overseeing production of a "Chief Scientist" pamphlet
Identifying steps to provide technical support continuity
Coordination of science missions
Support for future science initiatives
Oversight of science aspects of HEALY construction/outfitting

The Science of Opportunity guidelines are an attempt to provide community communication and coordination for what are expected to be annual opportunities to carry out occasional "not to interfere" science programs during Coast Guard training and test cruises in the Arctic, without any "day rate" charge being assessed to the science program (and with no assurance that the science program will be carried out). The AICC's 1997 program is a trial to establish procedures. The 1997 opportunity and attendant guidelines have been provided to the

community.

The construction of the USCGC HEALY provides some of the most urgent present business for the AICC. The US academic community was involved in planning for the Arctic Research Vessel (ARV), and some have been caught unawares by the cancellation of the ARV and construction of the HEALY. Bringing news of the HEALY status to the community and acting on community concerns and ideas - for a ship which is already well under construction - provides a challenge for the AICC.

One working definition of USCGC HEALY is that this is "a modern polar research vessel designed to be operated by the US Coast Guard for the US polar science community." The vessel is a large, 4-season polar research vessel with icebreaking capacity projected to be about one class reduced from that of the Coast Guard's Polar class icebreakers. Ship costs on science missions will likely be partly underwritten by the Coast Guard and partly charged to the sponsoring agencies, perhaps at a "$20,000/day" type of rate. Crewing with 75 (including 14 in the aviation group) and the near-exclusive science mission represent significant departures from past Coast Guard norms.

The AICC has held an internal workshop with the Coast Guard regarding the science-related layout and specifications, and has come up with a number of recommendations, including:

increasing area and bench space in labs
improve traffic flow
fantail staging area
choices for vans
lab temp control
seawater temp monitor/control
area for incubations
reduce/move science freezer
stowage for on-ice equipment
relocate dive locker
work area visibility
portable lab freezers and refrigerators
portable con station
upgrade data archiving

The Coast Guard has been receptive to these concerns, and for example has proposed a revision of the layout of the main deck science areas that would greatly improve the highest priority concerns on the AICC list.

The flow and urgency of issues regarding the HEALY tend to overwhelm the AICC at times. The AICC in the coming year may suggest that the Coast Guard subcontract with a UNOLS marine operator for routine HEALY consulting, providing direct contact between the subcontractor and USCG, monitored by the AICC. Increased access to technical expertise may also be provided via RVTECH and possibly adding to AICC membership. And the AICC will form closer ties with the community involved with Palmer, Thompson, Revelle, and Atlantis construction and scientific outfitting.

The AICC does not propose that all community concerns regarding the HEALY will be solved, or that they are all solvable. It is clear, however, that the context of recent events makes the HEALY the "Arctic Research Vessel" for the beginning of the next century. We must make the best of this resource and opportunity, providing a fair trial, as we form long-term plans for US Arctic logistics. The working relationship between the AICC and the Coast Guard regarding HEALY matters is cordial and effective. The AICC is strongly heartened and cautiously optimistic. There are many hurdles to overcome, but it appears that within the framework of options available that the AICC and Coast Guard are off to an excellent start.

Via reports from its meetings and discussions with the Council, the AICC will keep UNOLS informed of the status of its business. We invite suggestions and participation from the UNOLS community.

APPENDIX VII

Division of Ocean Sciences

Life in Extreme Environments (LExEn)

Purpose: To provide knowledge fundamental to understanding the processes that led to the formation and adaptation of life on Earth, and whether and how life may thrive on other planets.

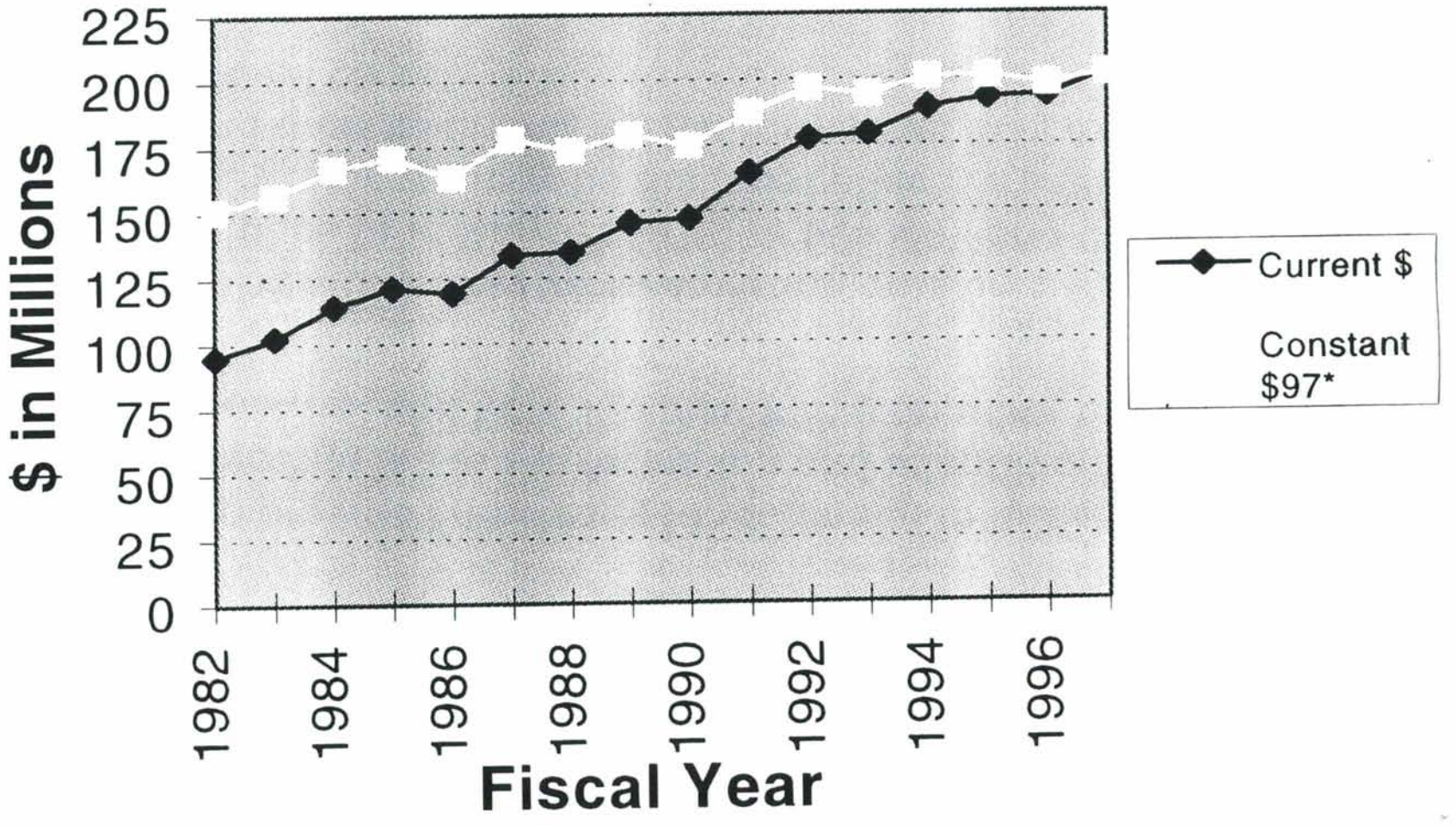
Rationale: The study of extreme environments on Earth (from mid-ocean ridges to volcanoes to polar sea ice), and the study of the life they support, may be the most effective path toward detecting and understanding the life forms that may exist beyond our own planet.

Themes:

- Microbial Systems of Earth
- Exploration of Extreme Environments
- Planetary Studies

Division of Ocean Sciences

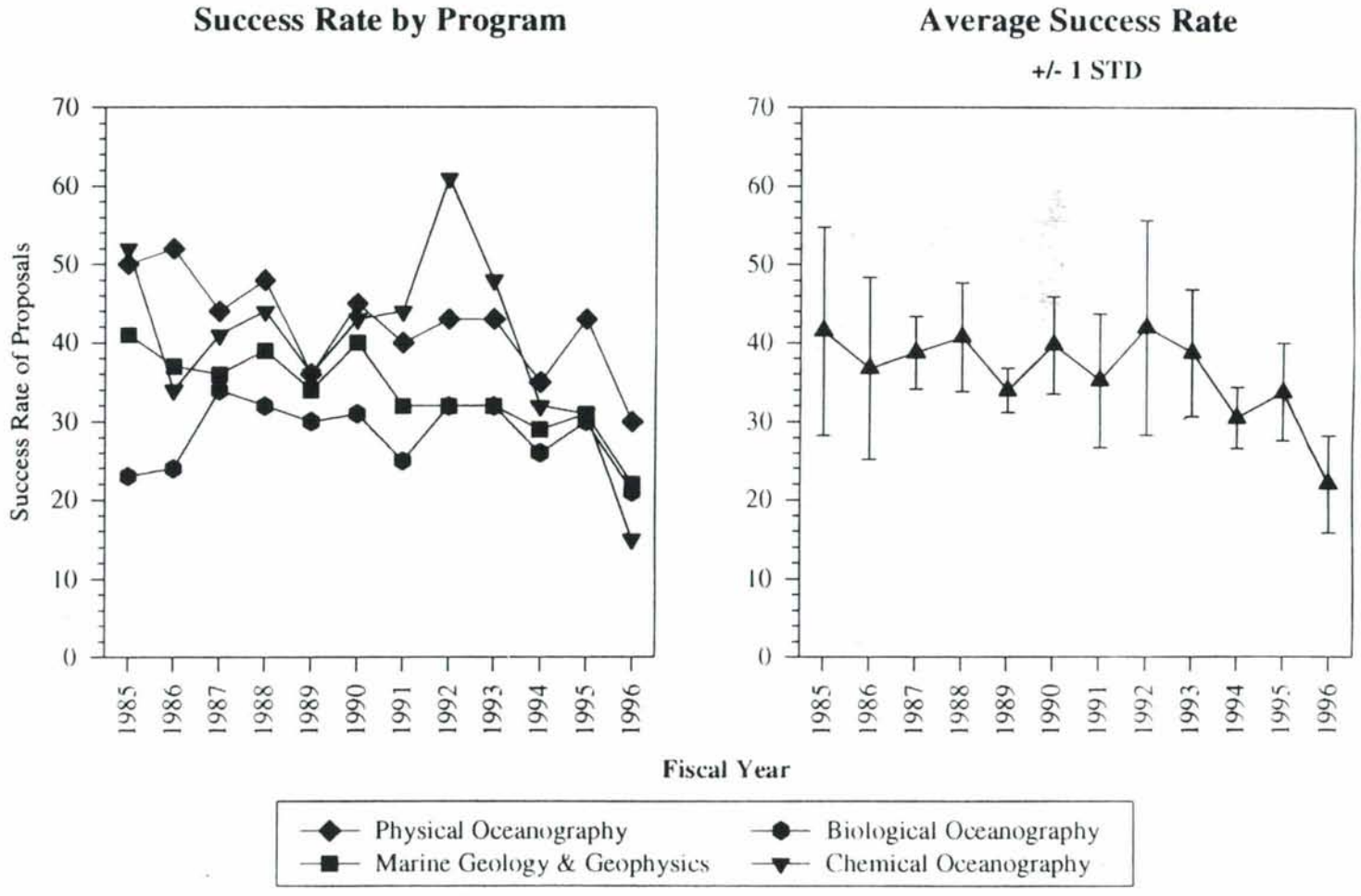
OCE Budget History: FY 1982 - FY 1997



* Deflators used are current as of July, 1996.

Division of Ocean Sciences

OCE/OSRS Success Rates for Competitive Proposals



NSF Ocean Sciences Division

	FY 1994	FY 1995	FY 1996	FY 1997
Ocean Sciences Research	100.0M	102.6M	104.9M	109.3M
Oceanographic Centers & Facilities	50.3M	50.4M	48.9M	52.3M
Ocean Drilling Program	38.7M	39.8M	39.9M	40.2M
	$189.0M	$192.8M	$193.7M	$201.8M
OCEANOGRAPHIC FACILITIES DETAIL				
Operations				
Ship Operations*	32.2M	35.1M	31.1M	31.4M
ALVIN, Aircraft, etc.	2.2M	2.1M	2.4M	2.7M
Marine Techs.	4.2M	4.4M	3.8M	4.0M
	$38.6M	$41.6M	$37.3M	$38.1M
Infrasturcture				
Major Research Inst.	--	--	--	4.5M
Science Instruments	2.5M	1.9M	2.3M	2.1M
Shipboard Equipment	2.1M	1.1M	1.7M	1.5M
Ships, Upgrades	2.1M	0.2M	1.5M	1.0M
UNOLS, misc.	0.5M	0.5M	0.3M	0.5M
	$7.2M	$3.7M	$5.8M	$9.6M
Centers & Reserves				
AMS	1.2M	1.0M	1.4M	1.2M
IAI	1.3M	2.0M	1.9M	1.6M
Cross Directorate/Reserves	2.0M	2.1M	2.5M	1.8M
	$4.5M	$5.1M	$5.8M	$4.6M

*Plus $1.6M from ODP (1994), $1.8M (1995), $1.4M (1996), $2.0M (1997)

Nov 96

1997 UNOLS Ship Classification (Heinrichs Model)

Large Ships

- THOMPSON
- KNORR
- MELVILLE
- EWING
- ATLANTIS
- REVELLE

Local

- PELICAN
- LONGHORN
- BLUE FIN
- SEA DIVER
- BARNES
- CALANUS
- LAURENTIAN
- URRACA

Intermediate Ships

- MOANA WAVE
- OCEANUS
- WECOMA
- ENDEAVOR
- GYRE
- NEW HORIZON
- S. JOHNSON
- E. LINK

Regional

- ALPHA HELIX
- POINT SUR
- CAPE HATTERAS
- SPROUL
- CAPE HENLOPEN
- WEATHER BIRD

Nov 96

UNOLS Operations Support Trends 1993-1997 ($K)

	ACTUAL 1993	ACTUAL 1994	ACTUAL 1995	PRELIM 1996	REQUEST* 1997
NSF	30,558	33,336	36,022	30,785	32,815
ONR/NRL	6,484	3,588	6,455	4,530	4,358
NOAA	1,981	1,956	2,209	1,143	3,509
OTHER	2,982	2,479	2,280	2,796	7,634
INST/STATE	3,074	2,591	1,563	3,112	2,536
	$45,079	$43,950	$48,529	$42,366	$50,852
	ENDEAVOR midlife	OCEANUS, WECOMA, and S. JOHNSON midlife	ISELIN retired	CAPE HATTERAS layup PT. SUR overhaul N. HORIZON midlife, ATLANTIS II retired	REVELLE and URRACA added ATLANTIS replaces ATLANTIS II

* 1997 Request In Ship Operations Proposals. Some Projects Still Pending. Expect Some Reduction In Actual Support.

Nov 96

"Other Support" -- UNOLS Operations Trends 1993-1997

	ACTUAL 1993	ACTUAL 1994	ACTUAL 1995	PRELIM 1996	REQUEST 1997
NAVOCEANO	---	---	---	---	4,655
INTERNATIONAL	815	191	687	494	1,849
INDUSTRY	467	119	614	652	551
DOE	401	641	36	950	---
NAVY	322	338	202	86	294
POSTGRAD					
"NAVY LABS"	521	281	8	136	---
ARPA	44	442	284	175	---
MMS	325	145	117	124	---
USGS	15	88	144	7	103
ALL OTHERS	72	234	188	172	183
	$2,982	$2,479	$2,280	$2,796	$7,635

Notes:
"NAVY LABS" -- NRAD, NOSC, ARL, NUSC, "NAVY", JHU/APL
ALL OTHER -- MBARI, JOI, EPA, NASA, ARMY, MUSEUMS

Nov 96

"Other Support" - UNOLS Ship Classes 1994-1997

SHIPS	ACTUAL 1994	ACTUAL 1995	PRELIM 1996	REQUEST 1997
Large	338	403	60	4,670
Intermediate	814	736	1,465	614
Regional	732	896	1,039	1,858
Local	595	245	232	493
	$2,479	$2,280	$2,796	$7,635

1997 DETAIL

	NAVOCEANO	U.K.	OTHER
Large	3,084	1,381	205
Intermediate	614	---	---
Regional	778	---	1,080
Local	179	---	314
	$4,655	$1,381	1,599

UNOLS Operations Support Trends Summary

Ships

- One Or More Intermediate/Regional Ship with Reduced Operations 1993-1996
- One Additional Large Ship 1997
- One Additional Local Ship 1997

Funds

- Traditional Sponsors Have Modest Decline In Total Support 1993-1996
- Additional Ships Increase Overall Fleet Cost By Approx. $4.8m In 1997
- New (One Time?) Funds From Navoceano and United Kingdom Of $6.0M In 1997
- NOAA Increase Of Approx. $2.4m In 1997

Future

- ??????
- Probable Reduction Of Academic Fleet If Support Returns To Traditional Sponsors Only
- Large Ships Vulnerable

Nov 96

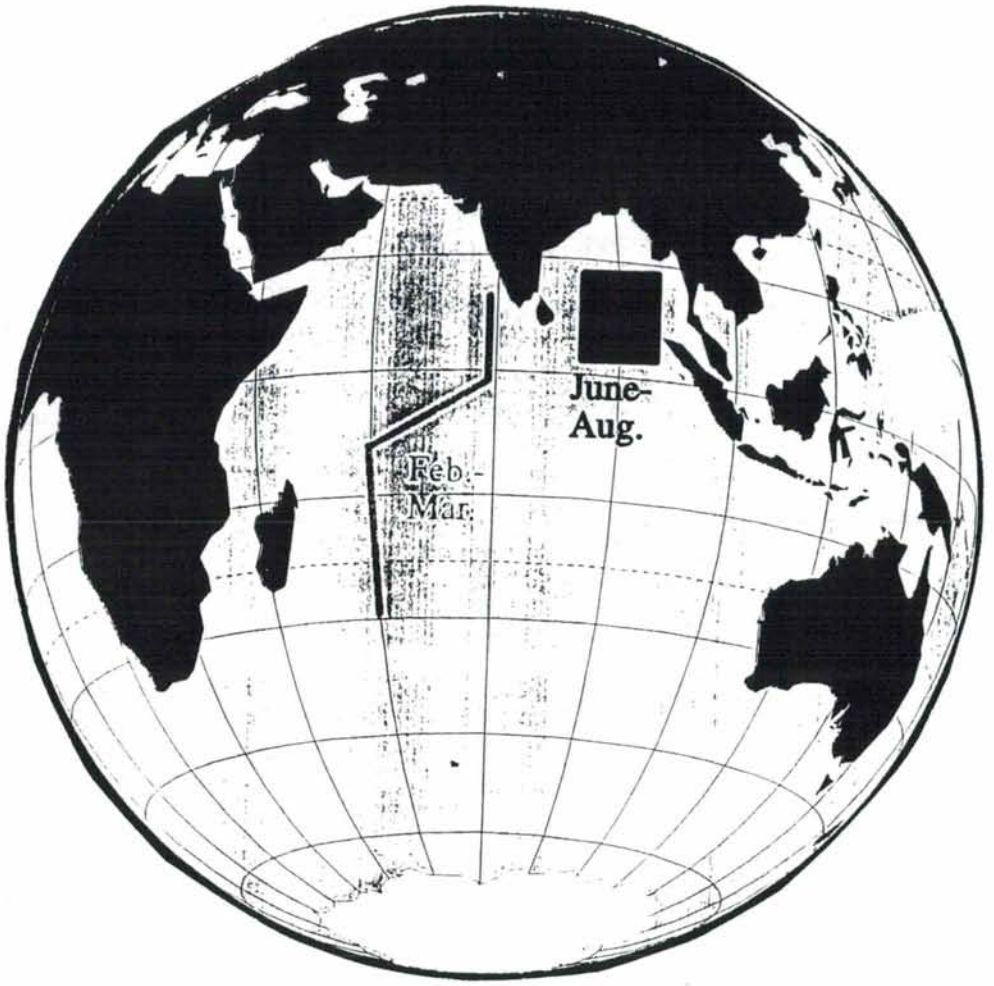
"Oceanography in the Next Decade" Building New Partnerships

- The Board recommends that federal agencies with marine-related missions find mechanisms to guarantee the continued vitality of the underlying basic science on which they depend.
- NSF, and secondarily ONR, should retain primary responsibility for the vitality of the basic science....
- It is particularly important to encourage involvement of mission agencies in sampling and monitoring programs.
- At present, a disproportionate share of funds is provided by NSF.
- ...resources for individual investigator grants could be reduced if other agencies do not assume responsibility for some of the funding.

(Ocean Studies Board, NAS, 1992)

APPENDIX VIII

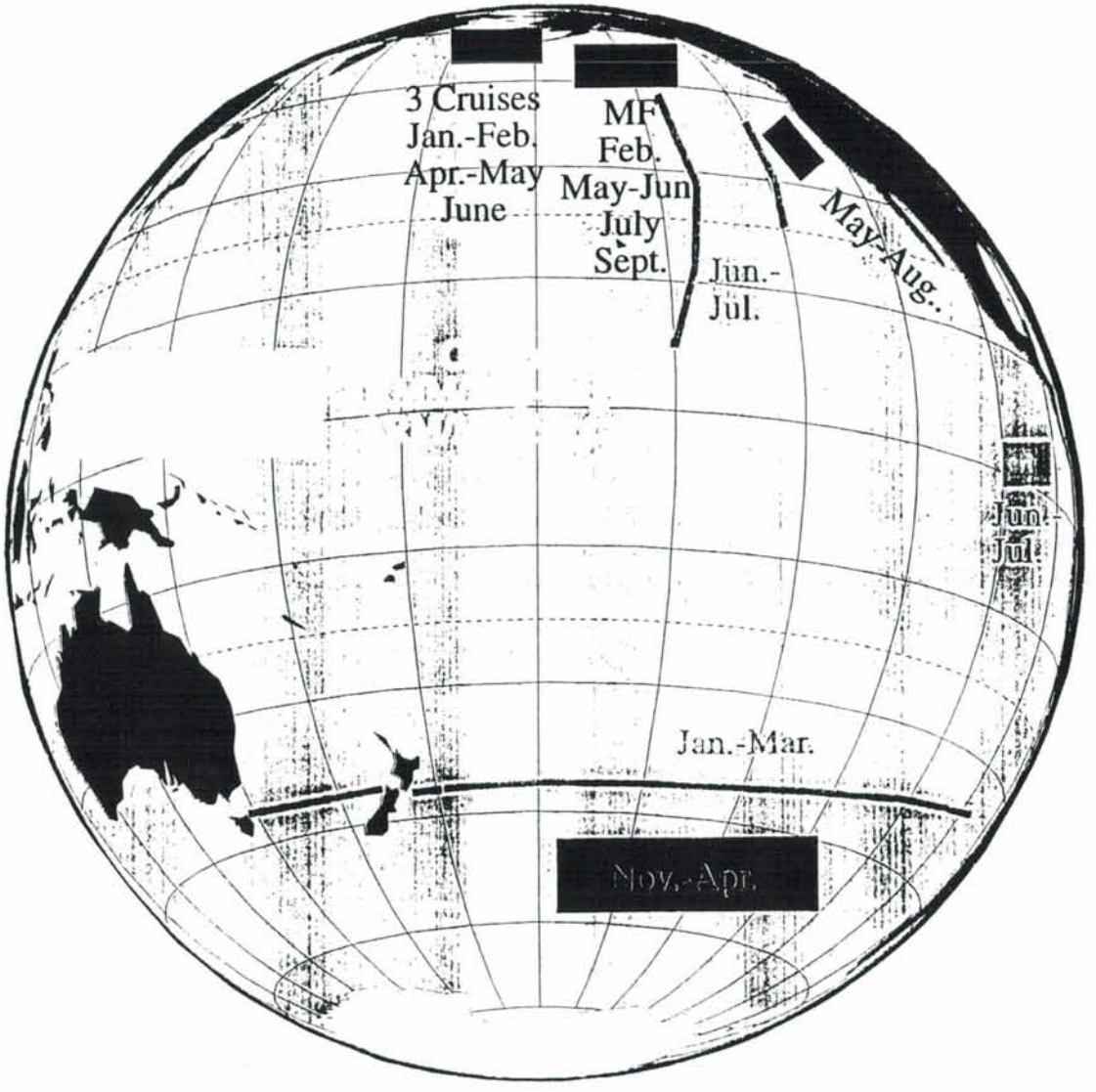
FY 1999 CLASS I RESEARCH OPERATIONS IN INDIAN OCEAN



Legend

- INDOEX
- GOALS
- ARM & TRMM

MAJOR, non-KA'IMIMOANA, FY 1999 RESEARCH OPERATIONS in the PACIFIC OCEAN



Legend

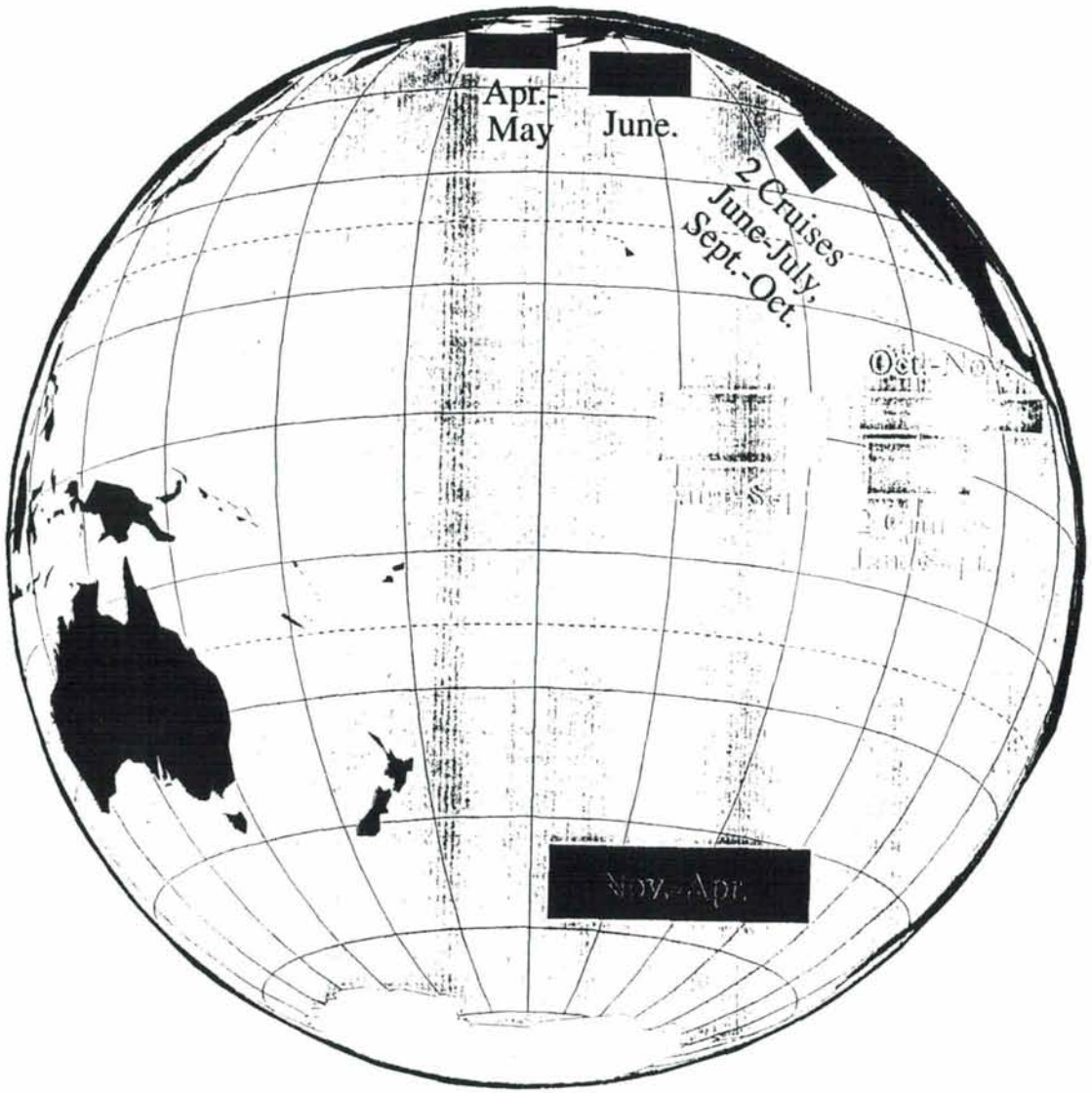
- GLOBAL DRIFTERS
- OACES
- PACS
- VENTS
- ARM & TRMM
- FOCI

FY 1998 COASTAL & NEARSHORE RESEARCH PROGRAMS

Legend

- FOCI, Tsunami
- Sea Grant
- Florida Bay
- IASCS

MAJOR, non-KA'IMIMOANA, FY 1998 RESEARCH OPERATIONS in the PACIFIC OCEAN



Legend

- GLOBAL DRIFTERS
- PACS/ TAO
- VENTS
- FOCI

MAJOR FY 1998 CLASS I RESEARCH OPERATIONS IN ATLANTIC OCEAN

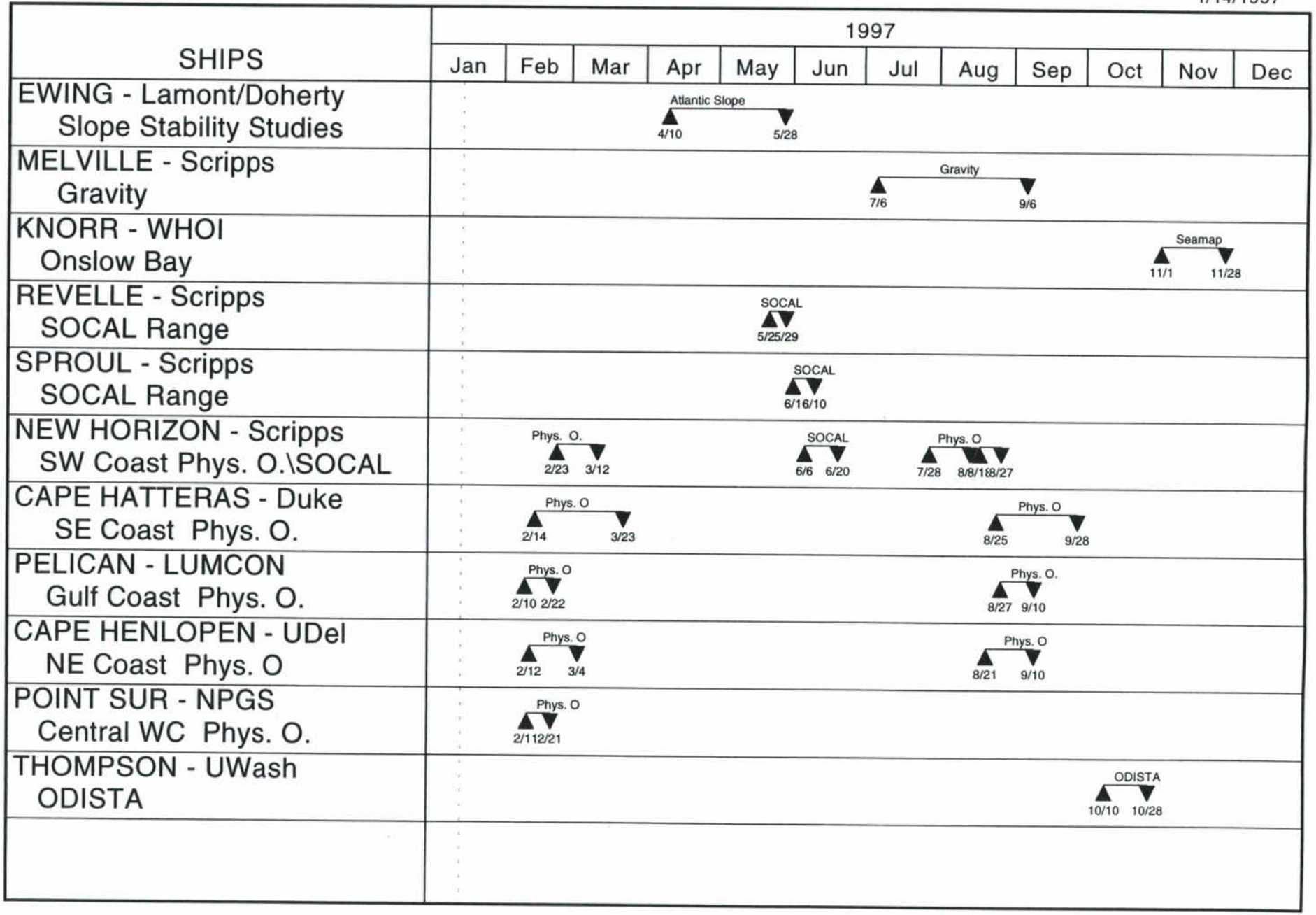
Legend

- ACCE
- OACES, CO_2
- Brazil Current

APPENDIX IX

UNOLS SHIPS SCHEDULES - NAVOCEANO

1/14/1997



NAVAL OCEANOGRAPHIC OFFICE

POTENTIAL UNOLS SHIP NEEDS

1998

- REPEAT 1997 PHYS. O. AREAS FOR SPRING AND FALL SEASON
- WEST COAST ODISTA SURVEY
- CONTINUE GRAVITY SURVEYS
- AUTEC RANGE SURVEY FOR NUWC NEWPORT
- EXPANSION OF SOCAL RANGE ENVIRONMENTAL SURVEY

APPENDIX X

RESEARCH CLEARANCE SUMMARY 01/01/1996 TO 12/31/1996

CRUISE SHIP TITLE	COASTAL STATE	START	END
95-010 R/V LONGHORN	Mexico	09/21/1996	10/10/1996
95-035 R/V MAURICE EWING	New Zealand	02/08/1996	03/14/1996
95-052 R/V MAURICE EWING	French Polynesia	03/24/1996	05/11/1996
95-066 NOAA DISCOVERER	Australia New Zealand Cook Islands Niue Tokelau Kiribati	01/05/1996	03/12/1996
95-094 COLLECTION PERMIT-BURHANS	Mexico	01/01/1996	12/31/1996
95-095 R/V MAURICE EWING	Greenland Iceland Canada	08/23/1996	10/08/1996
95-097 R/V MOANA WAVE	Fiji Tonga	02/08/1996	03/11/1996
95-103 R/V SEWARD JOHNSON	Brazil	01/20/1996	02/28/1996
95-104 R/V SEWARD JOHNSON	Brazil	03/04/1996	03/25/1996
95-114 NOAA DISCOVERER	Western Samoa Tokelau Kiribati Nauru Papua New Guinea	03/12/1996	04/16/1996
95-117 R/V NEW HORIZON	Mexico	11/20/1996	12/20/1996
95-120 R/V SEDCO/BP 471	Bahamas	02/23/1996	04/11/1996
95-122 R/V ATLANTIS II	Mexico	04/01/1996	04/12/1996
95-125 NOAA MALCOLM BALDRIGE	Clipperton Island Marquesas Island	05/03/1996	07/02/1996
95-126 R/V WECOMA	Mexico	03/01/1996	03/03/1996
95-127 R/V THOMAS G. THOMPSON	Kiribati Nauru	04/08/1996	05/13/1996
95-128 R/V SEDCO/BP 471	Mexico	04/21/1996	05/05/1996
95-129 R/V MELVILLE	Australia	02/22/1996	04/15/1996

CRUISE	SHIP TITLE	COASTAL STATE	START	END
		Amsterdam/Saint-Paul		
95-130	R/V WESTWARD	Bahamas Turks and Caicos Cayman Islands Haiti Jamaica Honduras	02/06/1996	03/16/1996
95-131	R/V CORWITH CRAMER	Bahamas Turks and Caicos Cayman Islands Haiti Jamaica	02/05/1996	03/15/1996
95-132	AIRBORNE HYDROGRAPHY	Mexico	01/16/1996	03/15/1996
95-133	NOAA MALCOLM BALDRIGE	Trinidad and Tobago Grenada St. Vincent Barbados St. Lucia Martinique Guadeloupe Antigua and Barbuda Dominica Dominican Republic Anguilla British Virgin Is. Haiti Cuba Bahamas	03/04/1996	03/25/1996
95-135	M/V SCORPIO DEL GOLFO	Eritrea Yemen Djibouti	03/24/1996	04/11/1996
95-136	R/V SEWARD JOHNSON	France Suriname	03/22/1996	03/25/1996
95-137	R/V KNORR	Brazil	05/16/1996	06/19/1996
95-138	USNS SILAS BENT	Korea	01/11/1996	02/03/1996
95-139	R/V CORWITH CRAMER	Bahamas Cayman Islands Haiti Jamaica Turks and Caicos	03/21/1996	04/28/1996
95-140	R/V WESTWARD	Bahamas	03/22/1996	04/29/1996

CRUISE	SHIP TITLE	COASTAL STATE	START	END
		Cayman Islands Haiti Jamaica Turks and Caicos		
95-141	R/V ROGER REVELLE	Mexico Guatemala El Salvador Nicaragua Costa Rica Panama	07/01/1996	07/31/1996
95-142	R/V SEWARD JOHNSON	Barbados	04/28/1996	05/29/1996
95-143	R/V KNORR	Azores	06/27/1996	08/08/1996
95-144	RESEARCH VESSEL	Russia	07/01/1996	09/30/1996
95-145	R/V ENDEAVOR	Canada	01/08/1996	01/22/1996
95-146	R/V ENDEAVOR	Canada	02/10/1996	02/24/1996
95-147	R/V ENDEAVOR	Canada	04/07/1996	04/21/1996
95-148	R/V MELVILLE	Tonga Fiji	05/05/1996	06/06/1996
95-149	R/V GYRE	Mexico	06/15/1996	06/25/1996
95-150	NOAA ALBATROSS IV	Canada	01/16/1996	01/26/1996
96-001	R/V CORWITH CRAMER	Bermuda Canada Bahamas	05/04/1996	06/10/1996
96-002	R/V WESTWARD	Bermuda Canada Bahamas	05/05/1996	06/11/1996
96-003	R/V MELVILLE	Australia Papua New Guinea Solomon Islands New Caledonia Vanuatu Fiji	04/15/1996	05/05/1996
96-004	R/V SEA DIVER	Dominican Republic Haiti Cuba Cayman Islands Honduras	05/09/1996	06/13/1996

CRUISE	SHIP TITLE	COASTAL STATE	START	END
		Turks and Caicos Jamaica		
96-005	R/V ALPHA HELIX	Russia	08/26/1996	10/06/1996
96-006	R/V MELVILLE	Mexico French Polynesia Cook Islands Niue Kiribati	06/08/1996	06/28/1996
96-007	NOAA ALBATROSS IV	Canada	01/29/1996	02/02/1996
96-008	NOAA ALBATROSS IV	Canada	02/20/1996	03/02/1996
96-009	R/V OCEANUS	Canada	03/11/1996	03/23/1996
96-010	R/V OCEANUS	Canada	03/29/1996	04/13/1996
96-011	F/V ISABEL S.	Canada	02/26/1996	03/15/1996
96-012	NOAA ALBATROSS IV	Canada	03/04/1996	04/26/1996
96-013	R/V EDWIN LINK	Brazil French Guiana	04/10/1996	05/15/1996
96-014	NOAA MALCOLM BALDRIGE	Trinidad and Tobago Grenada St. Vincent Barbados St. Lucia Martinique Guadeloupe Antigua and Barbuda Dominica Dominican Republic Anguilla British Virgin Is. Haiti Cuba Bahamas	07/15/1996	08/03/1996
96-015	R/V MAKO	Mexico	08/02/1996	08/20/1996
96-016	R/V ARGO MAINE	Canada	03/18/1996	03/20/1996
96-017	USNS SILAS BENT	Russia	05/31/1996	07/01/1996
96-018	R/V POINT SUR	Mexico	09/26/1996	10/11/1996
96-019	F/V SHOGUN	Mexico	09/26/1996	10/21/1996

CRUISE	SHIP TITLE	COASTAL STATE	START	END
96-020	R/V SEDCO/BP 471	Canada	06/21/1996	08/16/1996
96-021	R/V NEW HORIZON	Canada	08/29/1996	09/25/1996
96-022	NOAA KA'IMIMOANA	Marshall Island Kiribati Tokelau Tuvalu Nauru Solomon Islands Micronesia	06/18/1996	08/13/1996
96-023	R/V ISLA MAGUEYES	British Virgin Is. Anguilla	06/19/1996	06/21/1996
96-024	R/V ISLA MAGUEYES	British Virgin Is. Anguilla	10/15/1996	10/17/1996
96-025	R/V ISLA MAGUEYES	British Virgin Is. Anguilla	11/20/1996	11/22/1996
96-026	M/V DIANE G	Canada	05/25/1996	06/01/1996
96-027	NOAA DISCOVERER	Canada	06/10/1996	08/07/1996
96-028	R/V KNORR	South Africa	02/10/1996	03/28/1996
96-029	R/V MAURICE EWING	Dominican Republic British Virgin Is. Anguilla	06/15/1996	07/06/1996
96-030	NOAA ALBATROSS IV	Canada	05/05/1996	05/17/1996
96-031	NOAA MILLER FREEMAN	Russia	07/17/1996	09/03/1996
96-032	R/V NATHANIEL B. PALMER	New Zealand	08/29/1996	03/30/1998
96-033	R/V ARGO MAINE	Canada	05/04/1996	05/14/1996
96-034	NOAA ALBATROSS IV	Canada	05/20/1996	05/31/1996
96-035	NOAA ALBATROSS IV	Canada	06/17/1996	06/28/1996
96-036	NOAA ALBATROSS IV	Canada	08/28/1996	09/06/1996
96-037	R/V CORWITH CRAMER	Canada St. Pierre/Miquelon	07/02/1996	07/29/1996
96-038	R/V SEDCO/BP 471	Canada	08/18/1996	08/21/1996

CRUISE	SHIP TITLE	COASTAL STATE	START	END
96-039	R/V SEDCO/BP 471	Canada	08/21/1996	10/17/1996
96-040	R/V MOANA WAVE	Kiribati	08/28/1996	09/11/1996
96-041	R/V KNORR	Tristan da Cunha	04/03/1996	05/10/1996
96-042	R/V KNORR	Greenland Ireland Azores Iceland United Kingdom	10/24/1996	12/05/1996
96-043	R/V ISLA MAGUEYES	St. Lucia St. Vincent Grenada Trinidad and Tobago Venezuela	10/23/1996	11/01/1996
96-044	R/V PELICAN	Canada	05/31/1996	06/15/1996
96-045	NOAA ALBATROSS IV	Canada	06/03/1996	06/14/1996
96-046	R/V ROBERT G. SPROUL	Canada	08/05/1996	08/15/1996
96-047	R/V SEDCO/BP 471	Costa Rica	10/22/1996	12/17/1996
96-048	R/V ABEL-J	Canada	06/18/1996	08/01/1996
96-049	NOAA ALBATROSS IV	Canada	07/29/1996	08/26/1996
96-050	NOAA ALBATROSS IV	Canada	09/09/1996	11/01/1996
96-051	NOAA DELAWARE II	Canada	08/05/1996	08/16/1996
96-052	NOAA AIRCRAFT	Mexico	07/15/1996	10/31/1996
96-053	R/V MELVILLE	Easter Island	11/06/1996	12/22/1996
96-054	R/V DAN MOORE	Bahamas	07/10/1996	08/02/1996
96-055	R/V CORWITH CRAMER	Antigua and Barbuda Anguilla Barbados Bermuda British Virgin Is. Dominica Grenada Guadeloupe Martinique Montserrat Saba	10/16/1996	11/26/1996

CRUISE	SHIP TITLE	COASTAL STATE	START	END
		St. Kitts and Nevis St. Lucia St. Vincent Trinidad and Tobago		
96-056	R/V WESTWARD	Antigua and Barbuda Anguilla Barbados Bermuda British Virgin Is. Dominica Grenada Guadeloupe Martinique Montserrat Saba St. Kitts and Nevis St. Lucia St. Vincent Trinidad and Tobago	10/15/1996	11/25/1996
96-057	R/V POLAR DUKE	Argentina	09/02/1996	05/06/1997
96-058	NOAA MCARTHUR	Canada	06/27/1996	07/10/1996
96-059	R/V MELVILLE	Mexico French Polynesia	09/03/1996	10/16/1996
96-060	R/V THOMAS G. THOMPSON	Canada	08/10/1996	08/27/1996
96-061	R/V SEA DIVER	Aruba Bonaire Curacao Trinidad and Tobago Venezuela	11/30/1996	12/20/1996
96-062	R/V CORWITH CRAMER	Aruba Bonaire British Virgin Is. Cayman Islands Curacao Dominica Dominican Republic Grenada Guadeloupe Haiti Jamaica Martinique Montserrat Saba Sint Eustatius	12/02/1996	01/10/1997

CRUISE	SHIP TITLE	COASTAL STATE	START	END
		St. Kitts and Nevis St. Lucia St. Vincent Trinidad and Tobago Venezuela		
96-063	R/V WESTWARD	Aruba Bonaire British Virgin Is. Cayman Islands Curacao Dominica Dominican Republic Grenada Guadeloupe Haiti Honduras Jamaica Martinique Montserrat Saba Sint Eustatius St. Kitts and Nevis St. Lucia St. Vincent Venezuela	12/01/1996	01/09/1997
96-065	R/V NEREID	Canada	08/01/1996	10/15/1996
96-066	R/V GYRE	Venezuela Colombia Panama Ecuador Peru Chile	06/28/1996	09/30/1996
96-067	R/V ABEL-J	Canada	08/06/1996	08/28/1996
96-068	F/V ISABEL S.	Canada	08/19/1996	08/30/1996
96-069	R/V ARGO MAINE	Canada	08/01/1996	08/10/1996
96-072	NOAA KA'IMIMOANA	Clipperton Island Marquesas Island Mexico	08/23/1996	10/31/1996
96-073	R/V SEDCO/BP 471	Martinique	12/20/1996	01/08/1997
96-074	NOAA KA'IMIMOANA	Kiribati Cook Islands Tokelau	11/22/1996	12/19/1996

CRUISE	SHIP TITLE	COASTAL STATE	START	END
96-075	USNS PATHFINDER	Italy	08/29/1996	10/04/1996
96-076	S/V CROW	Canada	08/10/1996	09/30/1996
96-077	R/V ENDEAVOR	Canada	09/06/1996	09/16/1996
96-078	R/V SEWARD JOHNSON	Bahamas Dominican Republic British Virgin Is. Turks and Caicos Montserrat Anguilla Saba Sint Eustatius Sint Maarten Guadeloupe St. Martin St. Barthelemy Antigua and Barbuda St. Kitts and Nevis	10/14/1996	11/08/1996
96-079	M/V BABY MAX	Bahamas	10/01/1996	09/30/1997
96-081	F/V ISABEL S	Canada	09/05/1996	09/20/1996
96-082	R/V ISLA MAGUEYES	British Virgin Is. Anguilla Antigua and Barbuda Guadeloupe Martinique Dominica St. Lucia St. Vincent Grenada	10/15/1996	10/23/1996
96-083	R/V ENDEAVOR	Canada	12/17/1996	12/22/1996
96-084	M/V BIG ORANGE IV	Eritrea Djibouti Yemen	11/19/1996	12/10/1996
96-085	R/V OCEANUS	Canada	10/24/1996	11/04/1996
96-086	R/V ARGO MAINE	Canada	11/01/1996	11/15/1996
96-088	R/V ARGO MAINE	Canada	09/25/1996	10/12/1996
96-091	R/V THOMAS G. THOMPSON	Canada	10/09/1996	10/18/1996
96-092	M/V BIG ORANGE IV	Oman	12/11/1996	12/20/1996

CRUISE	SHIP TITLE	COASTAL STATE	START	END
96-095	R/V ABEL-J	Canada	10/29/1996	11/14/1996
96-096	NOAA ALBATROSS IV	Canada	11/04/1996	11/13/1996
96-101	R/V MELVILLE	Chile Malvinas/Arg. South Georgia/Arg. Falklands/UK South Georgia/UK South Africa Australia New Zealand Cook Islands French Polynesia Mexico Gough Island Tristan da Cunha Niue Tonga	12/12/1996	06/28/1997

CRUISE CANCELLATION, DENIALS AND COMMENTS

95-010 R/V LONGHORN 09/21/1996 10/10/1996
- Cruise delayed 5 months at the request of the chief scientist. Cruise delayed an additional 6 months owing to permitting requirements.

95-095 R/V MAURICE EWING 08/23/1996 10/08/1996
- Port call only for Canada.

95-103 R/V SEWARD JOHNSON 01/20/1996 02/28/1996
- Request denied
- Brazilian Navy would not approve research owing to delinquent post cruise obligations from another U.S. research cruise.

95-117 R/V NEW HORIZON 11/20/1996 12/20/1996
- Research dates slipped 10 months after request made. Final revision made after approval received.

95-122 R/V ATLANTIS II 04/01/1996 04/12/1996
- Cruise cancelled
- Project cancelled after approval had been received owing to lack of funding.

95-125 NOAA MALCOLM BALDRIGE 05/03/1996 07/02/1996
- Research rescheduled from the NOAA Ship KA'IMIMOANA. Delivery of NOAA Ship KA'IMIMOANA was delayed several times, resulting in the juggling of the NOAA Ship MALCOLM BALDRIGE schedule.

95-127 R/V THOMAS G. THOMPSON 04/08/1996 05/13/1996
- There was no response to U.S. request made to Nauru, and Amembassy Suva failed to respond to status cables and e-mails. Assumption is denial.

95-128 R/V SEDCO/BP 471 04/21/1996 05/05/1996
- Mexican approval received three days after ship's departure. However, since the Mexican participants were aboard, and the transit to the drill site was four days, the drilling took place as proposed.

95-133 NOAA MALCOLM BALDRIGE 03/04/1996 03/25/1996
- Dates revised less than one week prior to scheduled start of research, and two weeks prior to start of revised research. Although clearance was received from Cuba, owing to the downing of U.S. planes by the Cuban government, the research was not conducted there.

95-135 M/V SCORPIO DEL GOLFO 03/24/1996 04/11/1996
- Originally proposed for the M/V MIRIAM TIDE during 10-30 January 1996. Revised to M/V ARGO SERVICE during 22 March to 5 April 1996. Research had to be delayed owing to political problems in the

southern Red Sea area.

95-137 R/V KNORR 05/16/1996 06/19/1996
- Cruise cancelled

95-138 USNS SILAS BENT 01/11/1996 02/03/1996
- Cruise cancelled
- U.S. Navy military survey. No response received; survey cancelled.

95-144 RESEARCH VESSEL 07/01/1996 09/30/1996
- Cruise cancelled

95-148 R/V MELVILLE 05/05/1996 06/06/1996
- According to the Embassy in Suva, there was no official response from Fiji and Tonga. However, SOPAC provided copies of approvals to the scientist.

95-149 R/V GYRE 06/15/1996 06/25/1996
- Cruise cancelled

95-150 NOAA ALBATROSS IV 01/16/1996 01/26/1996
- Cruise cancelled
- Cruise was cancelled due to the ALBATROSS IV being diverted to the North Cape Oil Spill area.

96-005 R/V ALPHA HELIX 08/26/1996 10/06/1996
- Request denied

96-006 R/V MELVILLE 06/08/1996 06/28/1996
- SeaBeam bathymetry and magnetics and gravity during transits. Kiribati and Mexico approvals received after ship's departure at the last minute before ship entered their waters.

96-014 NOAA MALCOLM BALDRIGE 07/15/1996 08/03/1996
- Schedule revised several times.

96-017 USNS SILAS BENT 05/31/1996 07/01/1996
- Cruise cancelled

96-022 NOAA KA'IMIMOANA 06/18/1996 08/13/1996
- Delivery of NOAA KA'IMIMOANA was rescheduled several times resulting in several revisions to the schedule of this research and as well as other NOAA clearance requests. This caused many time-consuming clearance problems involving other vessels and clearances, and with the coastal states involved in this and other clearances. State was advised of the final revision the day before the ship sailed. Truly an unnecessary burden to lay on this office, especially considering the already overburdened aspect of our operation. Amembassy Suva was never able to obtain clearances for Tuvalu and Nauru.

96-024 R/V ISLA MAGUEYES 10/15/1996 10/17/1996
- Dates revised from 11-13 Sept to 15-17 Oct to correspond to NOAA's Windward Islands Passage

Monitoring Program.

96-031 NOAA MILLER FREEMAN 07/17/1996 09/03/1996
- Request denied

96-043 R/V ISLA MAGUEYES 10/23/1996 11/01/1996
- No response from Grenada.

96-051 NOAA DELAWARE II 08/05/1996 08/16/1996
- Cruise cancelled

96-053 R/V MELVILLE 11/06/1996 12/22/1996
- Cruise cancelled
- Cruise was postponed until 1997 and re-assigned to the R/V ATLANTIS.

96-055 R/V CORWITH CRAMER 10/16/1996 11/26/1996
- No response from St. Kitts and Nevis.

96-056 R/V WESTWARD 10/15/1996 11/25/1996
- No response from St. Kitts and Nevis and St. Lucia.

96-057 R/V POLAR DUKE 09/02/1996 05/06/1997
- Blanket clearance request for a series of XBT transits of the Drake Passage.

96-059 R/V MELVILLE 09/03/1996 10/16/1996
- Request denied by Mexico owing to insufficient notice.

96-061 R/V SEA DIVER 11/30/1996 12/20/1996
- Cruise cancelled

96-062 R/V CORWITH CRAMER 12/02/1996 01/10/1997
- No response was received from Haiti and Trinidad and Tobago.

96-063 R/V WESTWARD 12/01/1996 01/09/1997
- No response was received from Haiti and Honduras.

96-066 R/V GYRE 06/28/1996 09/30/1996
- No marine scientific research proposed; commercial cable survey. With the exception of Venezuela and Peru, the operator was able to obtain clearance through the foreign ministries of the various coastal states.

96-072 NOAA KA'IMIMOANA 08/23/1996 10/31/1996
- Port call only for Mexico. No resesrch in Mexican waters.

96-078 R/V SEWARD JOHNSON 10/14/1996 11/08/1996
- France denied request for Martinique and Guadeloupe owing to late request.

96-082 R/V ISLA MAGUEYES 10/15/1996 10/23/1996
- France denied request for Martinique and Guadeloupe owing to late request.

96-083 R/V ENDEAVOR 12/17/1996 12/22/1996
- Research cruise was rescheduled twice, resulting in multiple clearance requests for the same cruise.

96-091 R/V THOMAS G. THOMPSON 10/09/1996 10/18/1996
- Short notice request to investigate a recently-formed vent in the Juan de Fuca Ridge.

96-101 R/V MELVILLE 12/12/1996 06/28/1997
- Chile request had to be withdrawn owing to late request. No response was received from Argentina owing to late request. This resulted in no data being collected in the Falklands and South Georgia Islands area, even though UK approval was received. (U.S. policy calls for clearances from both claimants in a disputed maritime jurisdiction). Requests for Tonga and Niue were cancelled owing to ship scheduling changes.

SUMMARY OF REQUESTS BY COASTAL STATE FOR
01/01/1996 TO 12/31/1996

COASTAL STATE	# OF REQUESTS
Antigua and Barbuda	6
Argentina	1
Australia	4
Azores	2
Bahamas	12
Barbados	5
Brazil	4
Canada	49
Chile	2
Colombia	1
Cook Islands	4
Costa Rica	2
Cuba	3
Djibouti	2
Dominica	7
Dominican Republic	7
Easter Island	1
Ecuador	1
El Salvador	1
Eritrea	2
Fiji	3
Greenland	2
Grenada	8
Guatemala	1
Haiti	9
Honduras	3
Iceland	2
Ireland	1
Italy	1
Jamaica	7
Kiribati	7
Korea	1
Malvinas/Arg.	1
Marshall Island	1
Mexico	17
Micronesia	1
Nauru	3
New Zealand	4
Nicaragua	1
Niue	3
Oman	1
Panama	2
Papua New Guinea	2
Peru	1
Russia	4
Solomon Islands	2
South Africa	2
South Georgia/Arg.	1
St. Kitts and Nevis	5
St. Lucia	8
St. Vincent	8
Suriname	1
Tokelau	4
Tonga	3

Trinidad and Tobago	7
Tuvalu	1
Vanuatu	1
Venezuela	5
Western Samoa	1
Yemen	2
France	31
United Kingdom	50
Netherlands	18

The Department of State received a total of 126 clearance requests for research to be conducted during the period 01/01/1996 - 12/31/1996 . They represent 352 requests to 63 foreign governments for U.S. research. Of the 126 clearances requested, 3 were denied and 10 were cancelled.

APPENDIX XI

STATUS OF NEW RESEARCH VESSEL

Sujata Millick
Office of Naval Research

Current Status

- Language in Defense Authorization and Appropriation Bills regarding replacement of R/V Moana Wave.
- It directs the Navy to look at SWATH and SLICE design options.
- ONR has requested that UNOLS forward science mission requirements for a Class II/III ship by

  Jan 27 1997
- ONR forwards ship specifications to NAVSEA by

  Feb 7 1997

CURRENT ACTIONS

- ONR/N096 has issued a tasking letter to NAVSEA to allow them to begin the following tasks:
  - Conduct a SWATH Market Survey
    - Review the spectrum of current designs, technology, and capabilities
  - Study Ship Acquisition Options
    - COR, will provide the shipbuilder greater flexibility
    - ACAT levels down-selection
    - Detail design
    - Integrated Process and Product Teams
    - Cost as an independent variable, CAIV
  - Program of Actions and Milestones, POA&M

Ship Design Considerations

- NAVSEA cannot develop a design that substantially exceeds the allocated ship construction funding.
- NAVSEA will evaluate SWATH, Monohull, and SLICE.
- NAVSEA currently does not have "design money" to do studies and cannot use SCN funds.

Ship Design Considerations

- "Best Value" Trade Offs, Feasibility Studies
- Prioritize Requirements/Mission Parameters With High-Low Ranges
  - Endurance/Accommodations
  - Speed/Seakeeping
  - Lab Space, etc..

Order of Events

Release RFP.....June 1997

Select Ship Builder.....September 1997

Ship Delivery.....September 1999

Fully Operational.....2000

- Above Schedule is very optimistic, and everyone should anticipate slippage.

APPENDIX XII

A Modification and Extension of Betzer Report Implications
January 10, 1997
R. A. Knox

I. Funding Estimates, Current Era (1996/7)

The first table reproduces Betzer Report numbers (upright type) and interleaves NSF/OCFS data presented at FIC in San Francisco, December 1996, in italics. The Betzer Report estimated 1996 agency funding levels, and then projected them forward in constant dollars to the year 2000. The NSF data afford some more recent funding estimates and preliminary guesses into 1997.

The rightmost column (boxed) is a set of guesses about the approximate realistic current-era funding, in light of the more recent info, to be extrapolated forward in the light of agency trends. The italics show the change (+/-) from the corresponding Betzer Report entry:

- NSF. Given $32-33M numbers for 1996 and 1997, a current era number of $36M to project forward seems optimistic. Guess $33M instead.
- ONR. 1996 and 1997 afford little confidence in the $6.3M figure; guess $4.5M.
- NOAA. We have good reason now to hope for $2.5M in light of recent NOAA meetings.
- OTHER. This includes the NAVO funding, the biggest wild card. It is quite possible that this is a one-year only source. On the other hand, effort is now underway to obtain additional years. The guess of a projectable level of $6M in this category is indeed a guess, and perhaps an optimistic one.
- INST. Some cautious optimism, based on 1996/7 numbers; increase to $2.5M

The net of all this is that the current-era sum to be projected forward is estimated at $48.5M, $1.2M larger than the Betzer Report $47.3M. Another way to say this is that the substantial NOAA and NAVO impacts have produced nearly a wash in the bottom line, offset by decreases elsewhere.

II. Future Trends

The Betzer Report simply projected constant dollars in all categories to the year 2000. There is some macro-information to modify this. Trends to 2002 in three macro-categories from both the President's budget and the Congressional budget resolution of last summer are shown, taken from AAAS budget analysis (http://www.aaas.org/spp/dspp/rd/outyr.htm). "Factors" are the ratios of the 2002 values to the 1996 values. There is no separate Congressional projection in DOD R&D. The three macro-categories selected are NSF R&RA (factor a), NOAA Operations, Research and Facilities R&D (factor b), and DOD R&D (factor c).

Assume that these factors apply as shown in the final table to the UNOLS micro-situation. In particular, assume that the DOD factor applies to "OTHER" because of the preponderance of the NAVO component in "OTHER," assuming the NAVO link holds up at all. Then the UNOLS funding projections to 2002 are as shown in the final table: $48.055M under the President's plan, $51.698M under the Congressional plan.

III. Gap

Fleet costs in 2002 are projected in two ways. Method (a) is to extend the Betzer Report to 2002 with 2 additional years of 4% inflation, the same inflation assumed in the original report. Method (b) is to use the smaller inflation figures, average 2.2%, that AAAS uses, and to recalculate the Betzer Report cost time series (table 4 of Betzer Report) accordingly. In both cases the same assumptions as in the original report about entry and departure of ships in the fleet, and cost changes in consequence thereof, are retained: no replacement for *Moana Wave*, no Arctic vessel.

The result is a range of estimates of the operations funding gap in the year 2002, as shown. Best case (Congressional funding, AAAS inflation) is a $7.4M gap. Worst case (Presidential funding, Betzer Report inflation) is a $22.8M gap. As noted, this situation includes an allowance for ongoing NOAA and NAVO funding, under some projection assumptions, and assumes the 1995 FIP array of UNOLS ships now and in the future period under consideration here.

	Betzer Rpt. Upright			*NSF Data Italic*		Guesses/Extrap
	1993	1994	1995	(A) 96-00		RK Guess (B)
	1993	*1994*	*1995*	*1996*	*1997*	*(A) - (B)*
NSF+ODP	30,558	34,012	37,166	36,000		33,000
		33,800	*36,900*	*32,500*	*33,400*	*-3,000*
ONR+NRL	7,581	4,253	6,395	6,300		4,500
	6,484	*3,588*	*6,455*	*4,530*	*4,358*	*-1,800*
NOAA	1,981	1,975	2,280	1,000		2,500
	1,981	*1,956*	*2,209*	*1,143*	*3,509*	*1,500*
OTHER	3,266	4,484	1,975	2,000		6,000
	2,982	*2,479*	*2,280*	*2,796*	*7,634*	*4,000*
INST	2,790	2,342	1,787	2,000		2,500
	3,074	*2,591*	*1,563*	*3,112*	*2,536*	*500*
				47,300		48,500
						1,200

Budget Trends 1996-2002 per AAAS (millions)

	1996	2002 Pres.	2002 Cong.	Factor Pres.	Factor Congr.
NSF	2,138	2,241	2,507	1.05	1.17 (a)
NOAA	508	534	440	1.05	0.87 (b)
DOD R&D	35,884	28,494	**	0.79	0.79 (c)

UNOLS Projections (thousands)

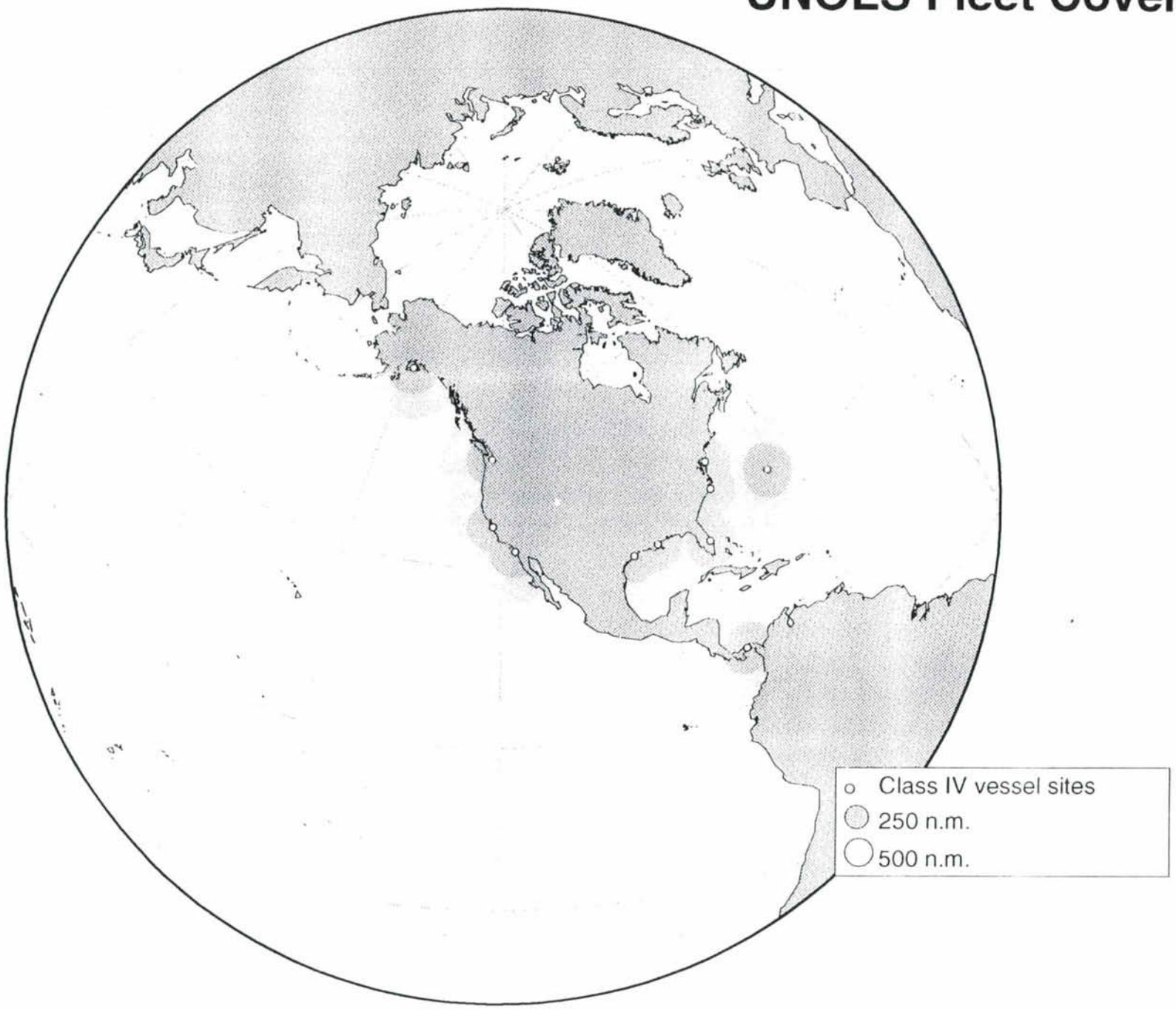
	Now	Factor	2002 Pres.	2002 Congr.
NSF+ODP	33,000	(a)	34,590	38,696
ONR+NRL	4,500	(c)	3,573	3,573
NOAA	2,500	(b)	2,628	2,165
OTHER	6,000	(c)	4,764	4,764
INST	2,500	(const)	2,500	2,500
	48,500		48,055	51,698

2002 Fleet Costs:

a. Betzer (4%)	70,900
b. AAAS (2.2%)	59,100
Best Case Gap	7,402
Worst Case Gap	22,845

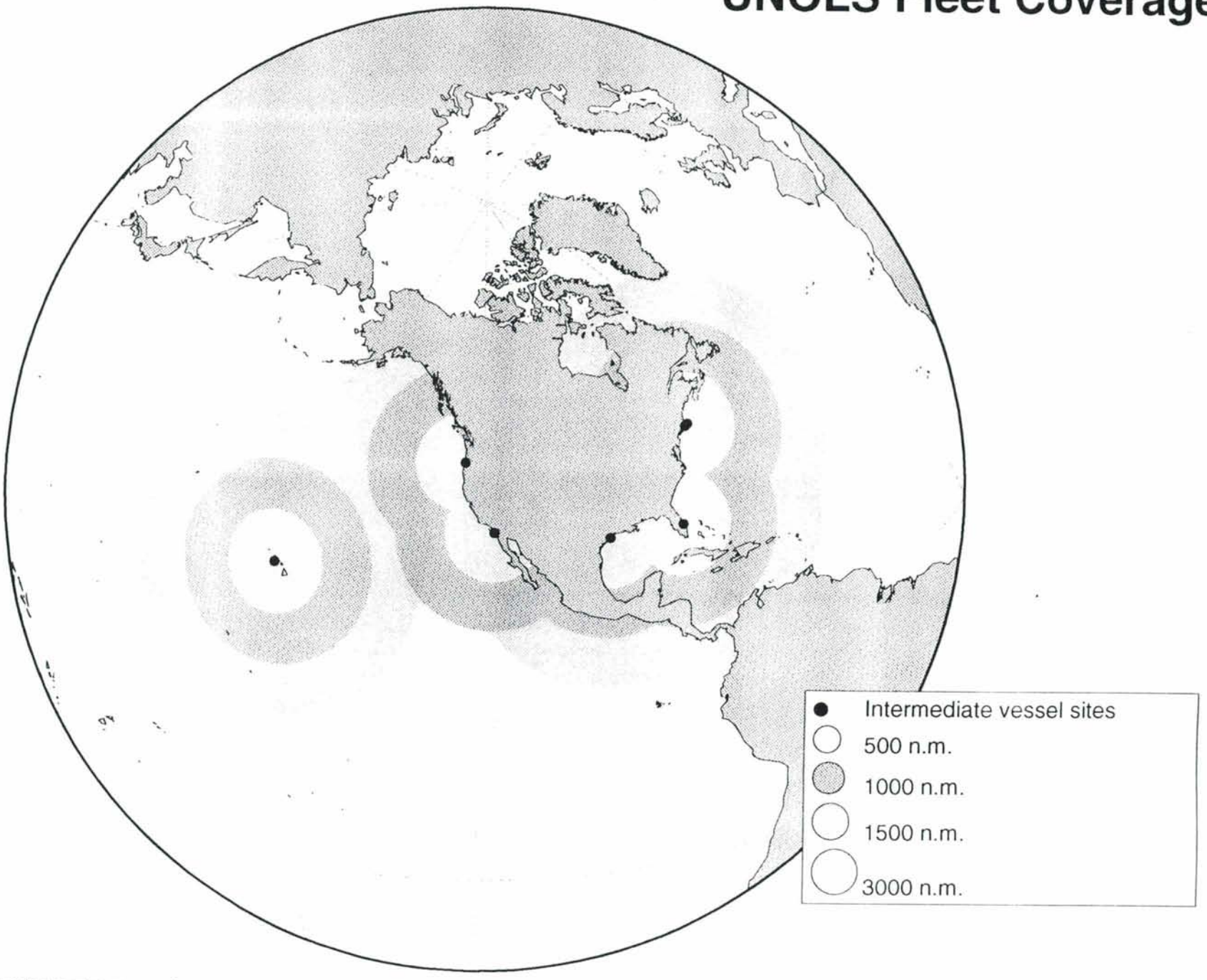
APPENDIX XIII

UNOLS Fleet Coverage



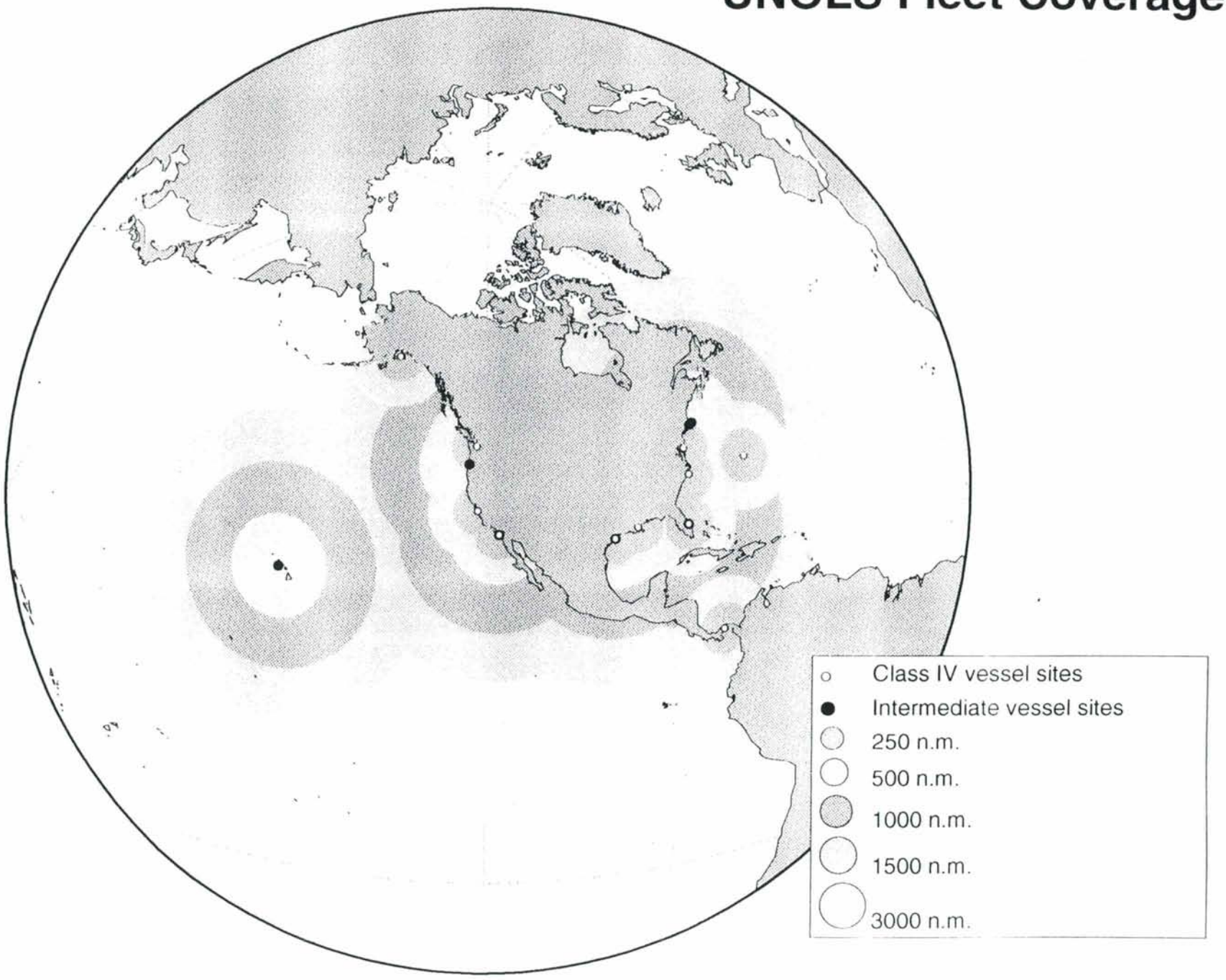
Lambert equal-area projection

UNOLS Fleet Coverage



Lambert equal-area projection

UNOLS Fleet Coverage



Lambert equal-area projection

APPENDIX XIV

THE SMALL VESSEL ISSUE

Original Committee Charge: (Feb. 1996 Council Meeting)

To re-examine the Guidelines for Becoming a UNOLS vessel and evaluate the status of the UNOLS operator.

Note: Committee establishment and charge grew out of Council discussion on designating smaller ships as UNOLS vessels in general and RV Urraca in particular.

THE SMALL VESSEL ISSUE

Discussion Summary and Modified Charge (July 1996 Council Meeting)

1. UNOLS should remain an association of academically-oriented institutions.
2. UNOLS should expand its mission to include more of the marine science community.
3. UNOLS should continue to base the composition of the Fleet on community projections of the needs of sea-going science.
4. UNOLS should continue to base annual ship operating support levels on the research funded to use the ships.
5. The subcommittee will continue work on developing a generic model for a UNOLS vessel. A model that categorizes UNOLS vessels on the basis of type of usage, size national/regional significant ownership etc. and that makes categorical distinctions with regard to "requirements" and "treatment".

THE SMALL VESSEL ISSUE

Why it's an issue

- Clear rationale and useful criteria for designating smaller ships as UNOLS vessels are not available.
- Coastal marine research done from smaller ships is a growth area.
- A number of smaller ships already exist and more will be coming on line in the near future. They may desire UNOLS designation.
- Small UNOLS vessels have advantages over small non- UNOLS vessels in attracting Federally-funded academic researchers and in obtaining funds for equipage and technican support.
- UNOLS vessels are likely to be safer platforms and to be operated more safely than non- UNOLS vessels.
- Operational and other support for UNOLS vessels is becoming more and more limited.
- UNOLS and the Federal agencies have little or no control over the design, construction, location, and who owns and operates these smaller ships.
- They can be distinguished from "national fleet assets", but the boundary is a bit fuzzy and plagued by historical precedent.

APPENDIX XV

Skidaway Institute of Oceanography
University System of Georgia
10 Ocean Science Circle
Savannah, Georgia 31411

5 January 1997

Dr. Kenneth Johnson
Chair, UNOLS Council
Moss Landing Marine Laboratory
P.O. Box 450
Moss Landing, CA 95039

Dear Ken,

This letter is to inform you of our intent to replace the R/V Blue Fin in the near future. The design for the replacement vessel has not been finalized but conceptually, we plan on obtaining a 90-100 foot, fiberglas monohull outfitted for general-purpose oceanographic research. The current design includes berths for 20 scientists and crew. We have already received funding to initiate the final design and are optimistic that funding for construction will be made available in the next fiscal year.

Because we are located in the apex of the South Atlantic Bight with no other UNOLS vessels in our region, we believe that we fulfill a strategic need in support of coastal research. We intend, therefore, to request UNOLS status for the Blue Fin Replacement Vessel. Once the replacement vessel is operational, it is our plan to remove the R/V Blue Fin from the UNOLS fleet thus retaining the fleet at its present distribution.

In developing the final financial plan for the vessel, we have estimated acquisition, maintenance and operations costs based on the usage rate of the Blue Fin over the past few years. It is likely that UNOLS status could influence this rate. Before we proceed further, therefore, we would like to be informed if there is any objection to our planned incorporation of the Blue Fin Replacement Vessel into the UNOLS fleet. If you have any questions, please do not hesitate to contact us. We would be willing to meet with UNOLS officials and discuss this issue. Since the final funding decision will be made in the near future, it would be most useful if a letter supporting our plans could be supplied by UNOLS.

Sincerely,

Richard A. Jahnke
Skidaway UNOLS Representative

cc: Jack Bash, UNOLS
Herb Windom

APPENDIX XVI

GLOSTEN
The Glosten Associates, Incorporated

13 January 1997
File No. 97208

Dr. Ken Johnson, Director
Moss Landing Marine Laboratory
Post Office Box 450
Moss Landing, California 96039

Subject: UNOLS "White Paper" Study

Dear Ken:

We are pleased to offer this proposal to assist UNOLS in the preparation of a "White Paper" study of some of the future issues facing them. We propose to address several subjects in the study, including regulatory considerations, shipbuilding technology, conceptual design approach and procurement methods. While these topics change and develop continuously, we will try to extrapolate to approximate a future status, based on our experience. The four main topics are outlined as follows:

1. Regulatory Considerations

- New ABS Rules are still under development but will soon be published for vessels under 90 meters. We will highlight the significant changes affecting new research vessels and comment on the impact.

- Assuming the vessel will make international voyages, regulations require it to meet SOLAS, MARPOL and GMDSS because the International Tonnage Convention measurement will be over 500 GRT. These and other impacts will be assessed and discussed.

- Domestic regulations continue to change and develop but are slowly converging into the international regulations. USCG inspection of intermediate sized research ships may be required. After meeting SOLAS and MARPOL however, the additional impact from USCG inspection should be minimal. These additional impacts will also be provided and assessed.

- Manning regulations are also in a state of change. Manning is becoming less related to domestic tonnage. In the research fleet the manning required for science operations at sea may exceed the manning requirements imposed by the USCG. We could carry out a brief manning study to assess the USCG required manning level.

2. Shipbuilding Technology

Shipbuilding activity in the Gulf Coast is on the rise, fueled by an upturn in the oil industry. The new generation supply boats are increasingly complex and sophisticated. Small ship technology development is very strong, and improving.

3. Conceptual Design Issues

- Mission requirements would lead to concept studies and an eventual concept design.
- Different hull forms should be evaluated in consideration of the vessel's mission. Although we tend to favor the monohull for its versatility, the seakeeping benefits of a SWATH hull should not be overlooked and mission requirements may point towards different hull forms.
- Azimuthing thrusters are becoming very common on small ships. Some new generation supply boat designs include twin Z-drives aft and a retractable Z-drive forward (*Melville* / *Knorr* configuration) and claim to have found the optimum solution.

4. Procurement Plan

We have had some good experiences recently with cost effective construction of custom designed small ships. For a vessel of this size and type, and recognizing the importance of the many operational aspects of research vessels, contract plans with detailed construction specifications might be the best procurement approach. One particularly effective approach might be to:

a) Develop a preliminary design, complete enough for competitive bidding and for shipyard selection. (6 month duration)

b) Select a yard and develop a contract design in consideration of their building approach, incorporating cost reduction items, and designing for production to realize some of the benefits of a design / build contract. (4 month duration)

c) With a contract design complete, the yard would confirm the price prior to signing a construction contract. At this point you would retain the option to take the contract design and re-issue it for competitive bidding.

We will survey and present the various procurement plans possible and currently in use.

Ken, a "White Paper" discussing these issues can be done at various levels. but we propose that The Glosten Associates could prepare a useful paper on the foregoing within a budget of $10,000. This would include a meeting with you or the Fleet Improvement Committee (FIC) members to formalize the scope, the preparation of the paper and a final presentation to the FIC or other group. A reduced budget approach could be done if meetings are eliminated

We look forward to being of assistance to UNOLS and await your comments.

Yours very truly,

THE GLOSTEN ASSOCIATES, INC.

Duane H. Laible, P.E.
President

DHL:pn

cc: via facsimile

J:\WP\0208\97LETTS\008.DOC

APPENDIX XVII

CORE/UNOLS MEMORANDUM OF AGREEMENT

This is a Memorandum of Agreement between the Consortium for Oceanographic Research and Education (CORE) and the University-National Oceanographic Laboratory System (UNOLS). The purpose is to promote access to and study of the oceans for scientific and educational purposes.

We jointly agree to coordinate our activities in an effort to strengthen our missions of supporting the communities of ocean science researchers and educators. This cooperation will include oceanographic facilities as well as other areas consistent with our respective missions.

We agree to communicate freely, apprising each organization of issues of mutual interest. To enhance this communication, UNOLS extends an invitation to CORE to attend all UNOLS Annual, Council and Committee meetings. In addition, UNOLS will provide CORE with the minutes of these meetings. CORE invites a UNOLS liaison to the CORE Board when such meetings involve issues of interest to UNOLS.

This Memorandum of Agreement will be reviewed every two years and remain in force until canceled or modified.

APPENDIX XVIII

DESSC Preliminary Response Regarding Long Range Scientific Objectives and Vehicle/Facility Requirements for Deep Submergence, and Transitioning of Sea Cliff for use by Academic Research

- **September**: DESSC/UNOLS meeting S. Millick announces plans to retire DSV Sea Cliff and Turtle
- **October 7**: Letter from ONR (F. Saalfeld) to M. Perfit requesting DESSC input regarding utilization of the Navy deep submergence assets and preliminary assessment of deep sea scientific research objectives for the next few decades. List of 8 options.
- DESSC forms Working Group to address future directions and facility requirements for deep submergence
- **October 11**: Navy/ONR/NAVSEA reps. meet with WHOI-DSOG to discuss options provided by ONR and initial assessment of cost and effort required to transition Sea Cliff into the National Facility
- **November:** Meeting of Working Group delayed until community input can be solicited and feasibility study done by WHOI is complete.
- **December**: Initial deliberations by DESSC and preliminary response to Saalfeld.
- **December 13:** DESSC meeting. Discussion/input from community.
- **Early February:** A more formal and comprehensive assessment of these issues will be carried out by a working group comprised of experienced users of deep submergence facilities.
- Report to ONR March 1997.

SUMMARY OF MEMO TO SAALFELD/ONR

• Future Directions in Deep Submergence Science

Most recent, comprehensive assessment of future deep sea research objectives for the coming decades presented *The Global Abyss* which presents a balanced, multidisciplinary view of deep sea research- present and future. Summarizes the important discoveries made by either remotely or by direct observation by manned submersibles.

Scales of investigations require a range of safe, reliable, multi-faceted, high-resolution vehicles, sensors and samplers. We must find a way to provide the right complement of deep submergence vehicles and versatile support ships, and the funding to cost-effectively operate those facilities.

• Present Status and Future Deep Submergence Vehicle and Facility Requirements

National Deep Submergence Facilities: Woods Hole Oceanographic Institution. Alvin which can dive to a depth of 4500 m, and the remotely operated vehicle (ROV) Jason, Argo II imaging system, and DSL-120 sonar can work at depths as great as 6000 m.

U.S. Navy submersibles Sea Cliff and Turtle, and ROV ATV have been made available for limited academic research through a cooperative arrangement between NOAA and the U.S. Navy's Submarine Development Group 1 in San Diego, CA. These vehicles expanded opportunities for science and permitted observations to depths ~6000 m which provides access to 37% more of the sea floor.

French, Japanese or Russian submersibles: Rather limited use and hampered by conflicting foreign national interests and differences in scheduling and funding processes.

- Three critical areas which must be addressed if the U.S. is going to continue to be a leader in deep ocean research.
- a focused, cost-effective, and technically capable national deep submergence facility and operator,
- an integrated mix of vehicle systems including submersible(s), ROV(s), tethered mapping systems and AUVs, and
- a stable, federal funding base to support science, technology and enabling vehicle and ship facilities in the deep ocean.

• A [illegible]

Adequate and long-term funding [illegible] that currently at WHOI. Given the current federal [illegible] constraints for both basic research and facilities support, and the level of technical knowledge and experience to operate deep diving submersibles, it would not be prudent at this time to consider developing additional National centers for operating deep submergence vehicle facilities.

• ***Vehicle Systems***

To meet present and future research and engineering objectives, particularly with a multidisciplinary approach, deep submergence science will require a mix of vehicle systems. Vehicle depth capability should be to ~6000 m to allow for research over the widest range of tectonic, sedimentologic and geographic environments that will be investigated in the decades to come.

The DESSC endorses the plan for WHOI to provide a technical assessment and costing of how to best integrate Sea Cliff into the National Deep Submergence Facility, and believes that the deep submergence technical expertise at WHOI and their operational knowledge of Navy DSV systems makes this the logical approach to evaluating the technical and cost issues.

The DESSC feels that of the options provided by ONR, combining the best attributes of Alvin and Sea Cliff to produce a cost-efficient and capable deep diving submersible with a depth range of ~6000 m. Ignoring, for the moment, the considerable technical and budgetary issues that must be addressed in accomplishing this integration, the committee notes that if such an option is considered, that it will be important for the resulting submersible to retain all of the excellent science capabilities and operational characteristics (safety, reliability, maneuverability, bottom time) which Alvin currently has.

- ***Funding Support***

Perhaps the most serious impediment to integrating Sea Cliff into the US deep submergence program is the lack of an adequate and stable funding base. The DESSC believes in order to successfully utilize and maximize the scientific assets of Sea Cliff, ONR, NSF and NOAA must work together with the community to ensure that adequate funding is provided. In this time of fiscal restraint, funding is clearly not available for an additional facility to maintain and operate Sea Cliff, nor is funding likely to increase to levels that could support science for parallel programs. Additional financial burdens on the funding agencies, without a clearly defined source of new or additional funding at this time would likely put the current successful deep submergence program at WHOI at risk.

The DESSC suggests that the federal agencies work together with the operators at WHOI and the DESSC to fully evaluate the feasibility of melding Sea Cliff and or its components into the National Deep Submergence Facility so that improved submersible facilities could be available to the science community as well as the Navy for operational and strategic needs.