

# UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

ADVISORY COUNCIL MEETING  
National Academy of Sciences  
Joseph Henry Building  
2100 Pennsylvania Avenue NW  
Washington, D.C.

Minutes of Meeting October 24, 1984

Advisory Council members, representatives from the National Science Foundation, the National Oceanic and Atmospheric Administration, the Office of Naval Research, the U.S. Geological Survey and observer-participants met in Room 455, Joseph Henry Building, National Academy of Sciences, Washington, D.C. The meeting was called to order at 8:40 a.m. by Chairman Charles B. Miller.

## Attendees

### Advisory Council

Charles B. Miller, Chairman  
Harris B. Stewart, Jr., Vice Chairman  
Robertson P. Dinsmore  
~~Donn S. Gorsline~~  
Carl Lorenzen  
Thomas C. Malone  
Arthur E. Maxwell  
~~Bruce Robison~~  
Ferris Webster, *ex-officio*  
Robert W. Corell, *ex-officio*

### Observers

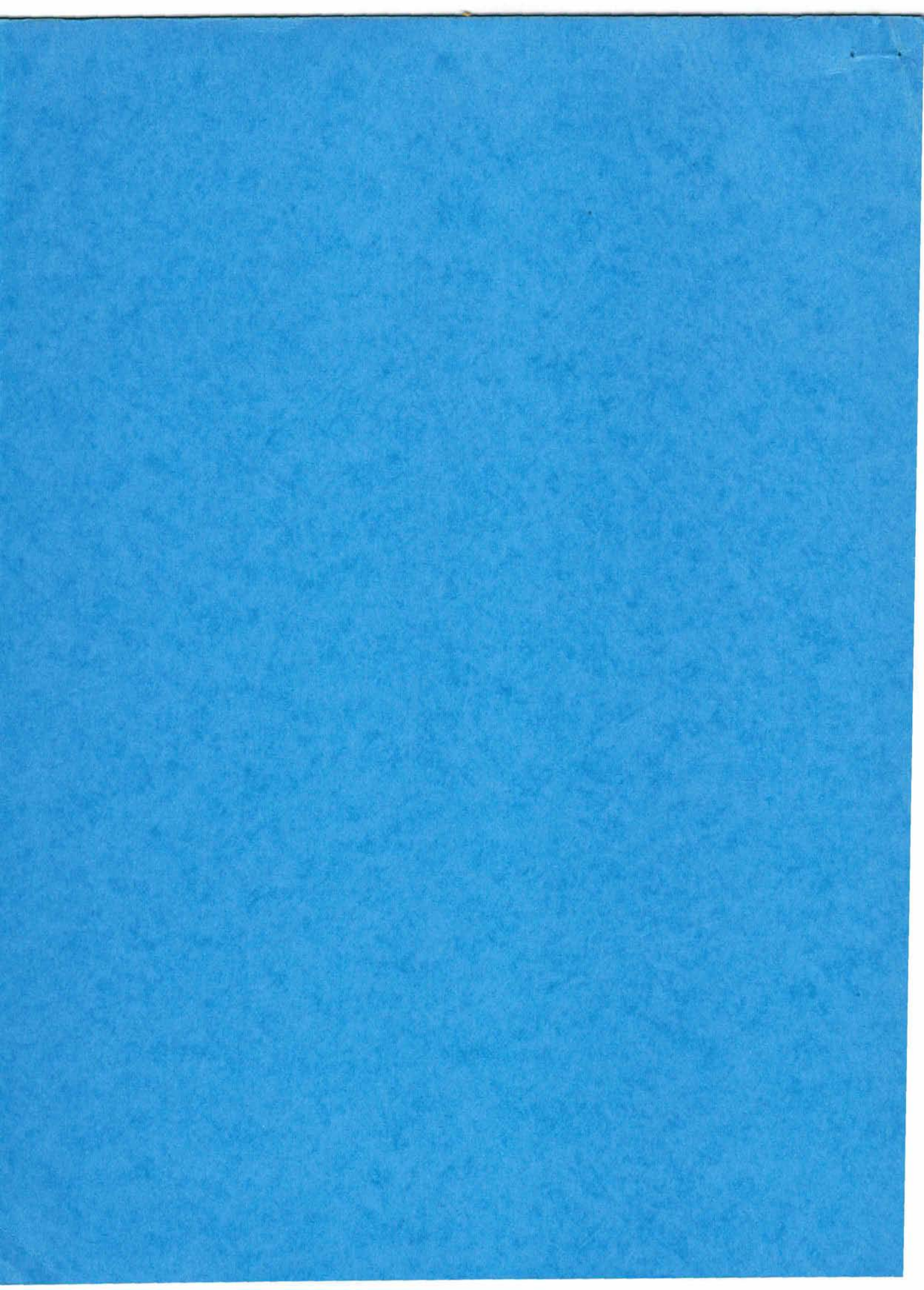
Garrett Brass, NSF  
Larry Clark, NSF  
Tom Cooley, NSF  
Ronald R. La Count, NSF  
John McMillan, NSF  
Adair Montgomery, NSF  
Richard Alderman, NOAA  
Keith Kaulum, ONR  
Robert Rowland, USGS  
Don Keach, USC  
Barrie Walden, W.H.O.I.

### UNOLS Office

William D. Barbee  
Mitchell Stebens









The Chairman welcomed Thomas C. Malone and Arthur E. Maxwell, Council members attending their first meeting.

Except as noted, the meeting followed the order shown in the Agenda (Appendix I).

*Plans for Conversion and Operation of OSPREY.* At the invitation of the Advisory Council, Donald L. Keach Director, Institute for Marine and Coastal Studies, University of Southern California made a presentation on USC's acquisition of and plans to convert the tuna seiner, OSPREY to a research vessel replacement for the VELERO IV.

USC's history as an academic institution with a strong program in ocean research and marine operations was reviewed briefly. Emphasis was placed on their sharing of research vessels with neighboring institutions.

The advanced age of the VELERO IV together with trends in ocean research toward larger scientific parties, more strenuous requirements for handling gear and growing requirements for seakindliness make the vessel increasingly less adequate to support regional ocean research. Those factors together with USC's perception of an increasing level of field research in the region have prompted an effort to acquire a larger, more capable research vessel. From their consideration of operational requirements USC formulated target ship characteristics for a replacement:

Age	0-16 years	Speed	12-18 Kts.
Length	135-200 ft.	Endurance	20-40 days
Beam	25-50 ft.	Crew	6-14
Displacement	500-1500 tons	Scientists	12-20
Range	at least 3500 miles	Operation days/year	250

The vessel would have adequate capabilities for slow speed maneuverability, roll stabilization, open deck space, laboratory space, etc. (These characteristics are generally similar to those for a UNOLS Class C vessel.)

The University then surveyed both government and commercial markets for a vessel with appropriate characteristics. Their assessment was that available vessels in the modern purse seiner fleet would best meet target characteristics. The vessel OSPREY was deemed the most appropriate vessel, and in September, 1984, as the result of an unusual opportunity, USC purchased that vessel. The University now seeks UNOLS and Advisory Council endorsement and funding agency support to convert the OSPREY to research vessel use and to replace VELERO IV in the UNOLS fleet. USC notes that lacking endorsement and support for the conversion they could dispose of OSPREY without disastrous financial loss. Subject to positive recommendations and approval by the National Science Foundation USC has developed a schedule for conversion of OSPREY and replacement of VELERO IV:

- 1984 purchase replacement vessel and develop overhaul/conversion package in concert with CENCAL members,
- 1984 December - issue RFP for interim overhaul, conversion,
- 1985 January-June - interim overhaul, conversion,
- 1985 July-November - shakedown and research operations,

1985 December  
1986 March - additional overhaul, conversion,  
1986 April - research operations.

The conversion would essentially consist of addition and equipping of scientific spaces, addition of sickbay, installation of winches and A-frames, removal of refrigeration system/equipment and general overhaul.

USC has already done some minor overhaul work (e.g., overhaul of auxiliaries).

After earlier presentations on OSPREY as a potential VELERO IV replacement vessel, the Advisory Council (together with the UNOLS Fleet Replacement Committee) had raised several questions:

1. Could reasonable modifications/changes to the OSPREY allow it to be certified for research vessel service, and do USC's conversion plans provide for all those modifications?

2. Can the conversion be accomplished for the price that USC estimates, and will that conversion provide a research vessel satisfactory to the UNOLS fleet and regional needs?

3. Can the converted OSPREY operate at approximately the annual cost of a Class C vessel, and will it have approximately Class C capabilities?

4. Will the converted vessel satisfy scientific investigators in terms of seakindliness, capabilities to support general ocean science, efficient layout of lab spaces, deck equipment and handling gear? (i.e., Will scientists like to work off it?)

Don Keach addressed these concerns (and reiterations):

1. USC has been working with both the U.S. Coast Guard and ABS on the certification questions. The New Orleans ABS Office has stated that they can certify hull welding, etc. Although Coast Guard will not assure certification in advance of conversion and their inspection/analysis, they have seen and discussed USC conversion plans. They have not raised objections.

2. USC has preliminary conversion estimates to support their projected cost for conversion. Their working estimates has converged with earlier estimates made by the Fleet Replacement Committee (when the scope of conversion for individual estimates are made comparable). USC's estimates account for cost reduction factors such as the sale of some OSPREY equipment, scrap value of the VELERO IV, etc.) USC would underwrite the difference between actual conversion costs and costs agreed to between the University and funding agencies (NSF).

3. A converted OSPREY would exceed most Class C vessel capabilities for speed, endurance and space. The conversion would provide for adequate lab and deck space. Estimated fuel consumption rates are generally comparable to those for Class C vessels. USC proposes a crew of 14, which although it is



two or three more than existing Class C vessels is significantly less than the 22-25 generally employed on Classes A and B. (This crew plan has been discussed with the Coast Guard.)

4. The proposed conversion, especially lab and deck layouts, equipment to be installed and accommodation of science, has been discussed with user groups from the proposed CENCAL consortium. Plans have been modified to accommodate needs advanced by these user groups (e.g., biologists requested changes to allow deployment of specialized gear). Discussions have been held with USGS Marine Programs officials concerning their ship needs on the West Coast (see letter from Robert W. Rowland, Appendix II). The converted OSPREY would satisfy USGS vessel needs, and GS would provide about \$1,000,000 in shared-use G&G equipment and instrumentation.

After Mr. Keach's presentation and his departure, the Council discussed the information received. The discussion included a report on efforts to establish a cooperative arrangement among central California oceanographic institutions and ship users (CENCAL).

Before discussing possible Council recommendations concerning the OSPREY, Donn Gorsline, Council member and USC faculty, withdrew.

*Preliminary recommendations were introduced concerning replacement of the VELERO IV and other aspects of research vessel availability and need in the central California region. The Council then deferred further discussion and tabled the motions pending receipt of additional information from the Fleet Replacement Committee and fuller discussion of the overall central California situation. (Resolutions appear later in this report.)*

Accept minutes of June 28, 29, 1984 Advisory Council meeting. The Advisory Council accepted the minutes of their June 28, 29, 1984 meeting.

#### *Advisory Council Standing Roles.*

*Fleet efficiency and effectiveness.* The Council reviewed summaries of Cruise Assessment Reports received for UNOLS ship cruises made during the second quarter, calendar 1984.

These summaries generally portray the fleet in good material condition, competently crewed and well operated. A continuing trend (over the last 12 to 18 months) is for citation of the effectiveness of marine technicians throughout the fleet. Significant problems (more than one or two individual ships/cruises) include: unsatisfactory gear for handling over-the-side equipment, especially CTDs, 12 KHZ sounding systems unsatisfactory, winch/wire/hydraulic systems and, on specific ships, lack of seakindliness or weather worthiness. Operating institutions are generally aware of problems on their ships, and are reasonably responsive.

*The Advisory Council directed the Executive Secretary write all UNOLS operating institutions reiterating the Council's concern with the effective and efficient operation of the UNOLS fleet. Special emphasis should be given to liaison and operations for cruises supporting users from other institutions.*

Several Council members had been approached concerning disagreements over berthing practices within the UNOLS fleet. The Council decided that this was not a policy matter within their purview, and so, declined review.

*Access for Ocean Research.* Harris B. Stewart, Jr., Chairman, International Restrictions on Ocean Science Committee (IROSC) reported that the IROSC had been re-formed in accordance with Advisory Council determinations of June 29, 1984. IROSC membership:

<u>Name</u>	<u>Term Expires</u>
Harris B. Stewart, Jr., Chairman	June, 1986
Robert Corell	June, 1985
Thomas A. Clingan	June, 1986
Dirk Frankenberg	June, 1985
John Knauss	June, 1985
David Ross	June, 1986
Warren Wooster	June, 1986

The Council discussed briefly the earlier resolution from IROSC concerning a Program for Marine Science Cooperation (the David Ross proposal), noting that the resolution to the Council remains tabled pending development of a proposal explicitly establishing organizational arrangements.

The Council was informed that at the RVOC meeting (October 15-17) draft copies of *Handbook for International Operations of U.S. Scientific Research Vessels* were distributed to attendees, including marine superintendents from UNOLS operating institutions. The Handbook, written for UNOLS by Lee R. Stevens, was distributed for institution comments before being published.

Also at the RVOC meeting Tom Cocke, Clearance Officer, Office of Marine Science and Technology Affairs, Department of State, presented draft revisions of the Cruise prospectus and Notice to Research Vessel Operators #57 - Post Cruise Obligations. The need to revise these notices arises from the large increase in the number of foreign clearances requested and processed and inadequacies in the present system to handle this increased number. Current procedures provide little leverage to assure that post cruise obligations are met, and an unacceptably large portion of these obligations are not now being filled on schedule. The Office of Marine Science and Technology Affairs is concerned that unfilled post cruise obligations might lead to denial of subsequent clearance requests to the detriment of U.S. ocean research.

(Note that the proposed Program for Marine Science Cooperation, the Handbook for International Operations and the Office of Marine Science and Technology Affairs efforts address related problems.)

*Specialized Instrumentation Facilities.* Charles Miller recounted Advisory Council efforts to make new technology available to the academic ocean community. He characterized those efforts as largely unproductive. To achieve progress he introduced to the Council a recommendation for presentation to UNOLS to establish a Special Facilities Committee. The Committee would review emerging technologies as candidate National Ocean Facilities, work to secure funding, seek out candidate operating institutions, help develop operating modes similar to that for ALVIN and explore modes of



acquiring new technologies such as leasing, cooperative academic-industrial agreements, joint ownership, etc.

In discussion it was noted a Subcommittee under Brian Lewis within the Advisory Committee to NSF's Division of Ocean Sciences (OCE) was, at NSF's request, addressing similar objectives. That subcommittee would have recommendations to OCE by mid-1985. In addition, a group under Brian Lewis is examining the need and availability of MCS ships, with the objectives of acquiring state-of-the-art MCS equipment for the academic community and establishing one or more MCS ships as national oceanographic facilities.

The sense of further discussion was to favor a Special Facilities Committee, with the constraint that UNOLS efforts should be coordinated with Lewis's under the OCE Advisory Committee.

A resolution was then proposed and adopted:

*Adding New Technologies to UNOLS' Capabilities*

*New techniques are emerging rapidly in all areas of science and exploration. Many of these have already demonstrated their potential to open new vistas and to produce new kinds of research data. Some derive from progress in electronics and instrumentation generally; others are products of industrial interest in the sea. In the first category are flow cytometry now proving its great promise for studies of the particulate content of the sea and vector computers with prospect of orders of magnitude improvement in fluid dynamical modelling. In the second category are a variety of ROV's, the Deep Rover submersible, and WASP suits giving much improved access for direct observation below the surface of the sea.*

*All of these technological advances provide unique research opportunities for oceanography, but by-and-large they are not available to academic oceanographers on a regular, schedulable basis. Many new technologies have such dramatic potential that they should be added to the general capability of UNOLS as National Facilities. Therefore, the Advisory Council recommends to UNOLS that a new Committee be established to be called the UNOLS Special Facilities Committee.*

*We propose the following charge for the Special Facilities Committee:*

- 1) To review the range of emerging technology and to select systems that will substantially enhance the progress of ocean research as candidates for establishment as National Oceanographic Facilities.*
- 2) To work directly with government agencies to develop new sources of funding for new capabilities. For example, we foresee that new funds can be appropriated for use by NSF and ONR specifically for support of high technology oceanographic facilities. The Special Facilities Committee should assist with promoting these new appropriations and should take a strong role in designing the review and distribution system for them.*
- 3) To seek operating institutions for high technology National Oceanographic Facilities. These operating institutions will be*

expected to model their stewardship of facilities after the operation of ALVIN by Woods Hole Oceanographic Institution, seeking to serve a community-wide user group.

4) To participate with operating institutions in preparation of proposals to sponsoring government agencies for funding of high technology National Oceanographic Facilities.

5) To review and enhance access to new oceanographic tools through such means as leasing, cooperative industrial-academic agreements, and joint ownership between oceanographic institutions.

The UNOLS Special Facilities Committee would be composed of four members: two from UNOLS member institutions, one from an associate member institution, and one a representative from the Advisory Council.

This resolution does not speak to any emergency nor to measures required for maintenance of the status quo. It is a response to beckoning opportunity. UNOLS can be an instrument for progress, and we strongly recommend that it try.

Potential membership of a Special Facilities Committee was discussed with the Executive Committee.

Replacement, Additions and Retirements in the UNOLS Fleet and information report from the UNOLS Fleet Replacement Committee. Robertson Dinsmore, provided information on prospective actions that would affect the composition of the UNOLS fleet and previewed for the Council the Fleet Replacement Committee (FRC) report to be delivered to UNOLS on October 26.

The FRC schedule for developing a fleet replacement plan has been accelerated in some aspects by requests from ONR. In response to the Secretary of Navy's initiatives to enhance the Navy's oceanographic endeavors, particularly that initiative on the construction of a new research vessel to support academic ocean research, ONR has responsibility to develop tentative operational requirements (TOR) for the new ship, and requested assistance from UNOLS' FRC. In addition the Navy initiatives include support for more general replacement of university research vessels on a slightly longer time scale. To implement this initiative and to include it in the earliest Navy budget planning cycle (called POM-87) a UNOLS replacement plan was requested by 30 September 1984.

The FRC met twice during late summer to respond to the two ONR requests.

In developing operational requirements (the TOR) the Replacement Committee relied heavily on scientific and operational requirements developed earlier by NECOR and then modified and tentatively adopted by the FRC. The requirements provided to ONR would be consistent with a SWATH vessel.

Navy plans for general replacement of university research vessels revolve around construction of three new large general purpose ships: a SWATH, termed a high performance AGOR, a large high endurance AGOR, with performance/scientific characteristics similar to those developed by NECOR for a large ship, and a medium endurance AGOR about the size of existing large



UNOLS ships. The Navy has also investigated modifications to the KNORR and MELVILLE that would increase reliability, and economy of operation, reduce maintenance costs but retain valuable station-keeping and maneuverability characteristics.

*The tentative plan submitted for UNOLS by the Fleet Replacement Committee is to replace the existing fleet on about a 30 year age basis. It also addresses four new specialized vessels, two for geology and geophysics, one for polar research and one for submersible handling.*

The FRC did not provide a detailed schedule for individual ship construction/replacement, or for location or assignment of new ships. ONR has asked for a replacement plan, and this must be addressed by FRC, the Advisory Council and UNOLS.

*Keith Kaulum* gave an ONR perspective on current ship construction planning, with a description of the Navy planning and design process. He gave the rationale for ONR requests for UNOLS input. He noted that an operating institution has not been selected for the first (SWATH) ship to be constructed. The initial two year test and evaluation operation could be by the uniformed Navy, by Military Sealift or by an institution. The ONR philosophy is that the mode of test-period operation should *not* drive ship design.

ONR is coordinating with the National Science Foundation and with FOFCC.

*Arthur Maxwell* described efforts at the University of Texas toward the design and construction of a special geology and geophysics ship. The drive for this effort is because the U.S. academic community does not now have access to a state of the art geology and geophysics ship, especially equipped with highest capability multichannel seismic gear. The aim is to provide that capability.

The University of Texas has commissioned five conceptual designs which were reviewed at a late summer meeting (with participation by FRC). The five concepts include four monohulls that are generally consistent with the NECOR/UNOLS high endurance concepts provided to ONR and a SWATH design, performance characteristics generally similar to the SWATH being studied by ONR. All five UT concepts are for a specialized G and G ship with general purpose oceanographic capabilities. Estimated costs for the vessels range from \$12M to \$25M. The next step will be to decide on a concept and naval architect and then proceed through preliminary design to construction design. The UT will hold a workshop open to the community to help make scientific requirements known to the architect selected.

A slide presentation illustrated characteristics of the five concepts and compared key performance and operational characteristics.

*Recent or proposed changes to several ships* at various institutions would also affect the UNOLS fleet.

Since being stretched the MOANA WAVE might better be classed as an A or B vessel. In comparison with an AGOR:



## MOANA WAVE

## T. G. THOMPSON

Length	213 feet	209 feet
Beam	35 feet	39 feet
Draft	10 feet	15 feet 3 inches
Gross tonnage	292	1150
Displacement	950	1300
Cruise speed	12 kts.	10 kts.
Full speed	13 1/2 kts.	12 kts.
Endurance	40 days	40 days
Range	8000 miles	8000 miles
Labs	1500 feet <sup>2</sup>	1200 feet <sup>2</sup>
Crew	12	22
Scientists	20	23

After outfitting the MOANA WAVE, the KANA KEOKI is almost a bare boat.

TAMU has submitted a preliminary request to stretch the GYRE in a manner similar to MOANA WAVE.

At the last UNOLS Ship Scheduling meeting (May, 1984) and in their June, 1984 Ship Operations Proposal, the University of Miami advanced schedules of 200 to 250 days for the CAPE FLORIDA and for the ISELIN. Representatives from the Ocean Sciences Division, NSF noted, however, that because of some investigators who will work from other UNOLS ships and some science proposals recently declined it now appears that these will be only enough days to schedule one of the two ships efficiently. The Advisory Council's May 24, 1984 recommendation to the National Science Foundation remains open.

Several developments concerning central California institutions and ships could affect UNOLS fleet composition there and elsewhere. A Navy survey panel has reported that the ACANIA should be laid up. The Navy Postgraduate School advances program requirements for about 200 days/year on about a 130 foot vessel. Moss Landing Marine Laboratories asserts that CAYUSE is becoming less adequate to support their program mostly because of poor seakindliness. Although it had appeared earlier that the KAIMALINO might be available for transfer to the UNOLS fleet for central California service it now seems likely that it will remain in Hawaii.

Scripps' addition of the SPROUL in place of the SCRIPPS enhances UNOLS fleet capability in southern California.

Reports from Skidaway are that BLUE FIN weather limitations have impact on an increasing number of investigations. Skidaway has expressed interest in the CAYUSE should it become available for transfer.

The Fleet Replacement Committee notes that a converted OSPREY would, in terms of scientists accommodations, laboratory space, deck space and equipment correspond to UNOLS Class C vessels.



*Regional Ship Scheduling Groups* had not met since before the May 24 Advisory Council meeting.

*ALVIN-ATLANTIS II* - Robert Corell, *ALVIN Review Committee Chairman*, reported that the *ALVIN-ATLANTIS II* continues on a highly successful 1984 season of investigations.

He noted for the Council that ARC will hold an *ALVIN-ATLANTIS II* planning workshop on December 2 in San Francisco (immediately preceeding the Fall AGU/ASLO meeting). The workshop will be to gather notices of intent to use *ALVIN* 1986-1988, and to allow prospective investigators to describe their submersible research.

At the Council's request *Barrie Walden, Submersible Program Manager, W.H.O.I.* reported on the status of the *ALVIN/ATLANTIS II* program. (His report is Appendix III.)

*ALVIN's* history can be divided into two phases: the first, from commissioning in 1964 through 1973 was mostly engineering development, and was underwritten by the Navy through ONR. Many technological advances were made, but scientific utility was not fully demonstrated. In 1983 a tripartite funding agreement was reached among NSF, ONR and NOAA, and *ALVIN* participated in Project FAMOUS, research investigations on the Mid Atlantic Ridge. From that time *ALVIN* has been instrumental in a strong deep submergence scientific research program. In 1984, the first year of operation using *ATLANTIS II* as a support vessel, *ALVIN* has already (October 24, 1984) completed 142 dives. This has required 227 days at sea, 164 days on station. The *ALVIN/ATLANTIS II* system nominally can accommodate 180 dives per year; that number is typically oversubscribed by at least a factor of two by quality dive requests.

Schedules such as that in 1984 overtax the *ALVIN* Group. Both shore and at sea personnel are overextended under existing conditions. Solutions would include revising operational schedules to limit the number of dives and provided more operational maintenance time, to increase both the operations team and engineering staff, and to modify the program support provided. New proposals will be based on appropriate schedules and will request staff augmentation. The *ALVIN* Group will continue their strong level of scientific program support.

In discussion it was noted that the *ALVIN* program has been instrumental in many scientific advances and that the program and *ALVIN* operators are frequently cited.

*The Advisory Council expressed their concern that the current program level is overtaxing the ALVIN Group and recommended that steps be taken to provide relief while maintaining the program's high quality.*

*Communications.* Donn Gorsline reported that the next issue of *UNOLS News* would be ready for distribution early in November. The distribution list is expanding, an expression of general interest in the community.

The Council briefly discussed potential new standing roles. Fleet manning, shore support manning and levels of marine technician staffing were suggested as areas that might warrant Council attention. No conclusion was reached.



*UNOLS Membership.* At its June 28, 29, 1984 meeting the Council had reached recommendation that the 18 institutions currently designated Member institutions be reaffirmed by UNOLS as Members. *That recommendation is to be made to UNOLS on October 26.*

The Council had also directed that a survey be made of some Associate Member institutions to determine their continued interest in UNOLS. Most of the Associate Member institutions queried responded promptly and positively concerning their UNOLS affiliation. The Council directed that four institutions be queried again concerning their continued interest in UNOLS or their designated representation.

*The Advisory Council recommended that UNOLS reaffirm the Associate Membership of the 34 institutions currently designated.*

*UNOLS Ship Designation.* The Council reviewed their June 28 and 29 recommendations concerning the designation of ships in the UNOLS fleet. (Twenty-six ships from 18 Member institutions were designated. See Advisory Council Meeting Report, June 28, 29, 1984.) It was noted that Scripps had replaced the ELLEN B. SCRIPPS with the ROBERT GORDON SPROUL.

*The Advisory Council revised their earlier recommendations to include the ROBERT GORDON SPROUL as a designated UNOLS vessel and deleting the ELLEN B. SCRIPPS from the list of designated vessels.*

*Actions Affecting the UNOLS Fleet.* In brief discussion those actions that might affect the UNOLS fleet, and before the Council were summarized. These include: earlier Council recommendations concerning ships assigned to R.S.M.A.S., University of Miami and their 1985 schedules, the probable retirement of ACANIA and NPG School vessel requirements, inadequacy of the CAYUSE for work off central California, need to replace VELERO IV, OSPREY as a candidate replacement, and efforts to form a central California consortium (CENCAL) for ship use and operation. Prior to consideration of ships at USC, Donn Gorsline, Council Member and USC faculty member left the meeting.

After summarizing, the Council deferred consideration of potential fleet recommendations until an evening session.

*Sponsoring Agency Information.* R. R. La Count, NSF/OFS introduced ship statistics summaries (e.g., NSF non-OCE ship costs by fiscal year) as examples of what his section might provide to the Advisory Council to help them in re-examination of their fleet study.

He also discussed further NSF/OCE response to the 1982 and 1983 studies. On the issue of requiring that projected ship costs be a part of every proposal for at sea investigation, he noted that NSF does provide to reviewers information on ship costs. Reviewers are asked explicitly if the amount of time and the ship requested are appropriate for the proposed investigation.

*Robert Rowland*, reported that 1984 USGS work on the West Coast EEZ has been very productive. The Secretary of Interior wants the EEZ program to increase by one half next year. (This would return funding to FY 1983 levels but would not restore personnel to those levels.) The USGS-University of



Hawaii, HIG Agreement for operation of the S. P. LEE is working well. The LEE has worked extensively throughout the Pacific. The ship will conduct investigations on Gorda-Juan de Fuca in about April, 1985.

GLORIA surveys of West Coast EEZ are being processed by IOS/USGS in Flagstaff, Arizona. Posters will be available at the fall AGU meeting, at GSA, etc.

No 1985 use of West Coast UNOLS ships is contemplated but targets are being developed from GLORIA surveys for about four months/year beginning in 1986. (See Appendix II).

USGS has been participating with counterparts in Indonesia on a government to government development of a marine geology program. The program would welcome a suitable ship if one were available. There is a similar request from Pakistan.

*Richard Alderman* reported that Anthony Callio will become NOAA's acting Administrator upon John Byrne's departure November 1.

The NOAA fleet is being modernized under Paul Wolff's direction, although no new funds have been appropriated for that purpose. One or two new SEABEAM systems will be acquired, the first in summer, 1985 for DISCOVERER, the second probably for RESEARCHER. The intent is to provide GPS navigation systems for all ocean-going NOAA ships. SEAS systems (for reporting meteorological information by satellite link) will be installed on all NOAA vessels, and may later be made available to UNOLS vessels.

The NOAA FY 1985 budget has been passed at the same level as in 1984.

*Keith Kaulum* reported that ONR is working toward implementation of the Secretary of Navy's initiatives on research ship construction. These developments are as reported by Robertson Dinsmore earlier, and to be described more fully by Robert Winokur at the UNOLS Semi Annual meeting. ONR may request of the Advisory Council their recommendations for replacing specific UNOLS ships at specific institutions.

Another of the Secretary's initiatives is to optimize the use of Navy-operated submersibles for research. This initiative covers SEACLIFF, TURTLE, NR-1 and DOLPHIN, although UNOLS involvement has emphasized SEACLIFF and TURTLE. ONR is acting as the Navy's agent for the submersible research program, and has asked Robert Corell and a working group from the ALVIN Review Committee and the ALVIN user community to help draft a plan for multidisciplinary submersible research. The Secretary has been briefed with a draft plan and recommendations to commit up to 60 dive days/year beginning in FY 1986 (from SEACLIFF/TURTLE) to research investigations, to improve technical support arrangements (probably through SCRIPPS) and to provide better support (and scheduling commitments) to diving scientists and research institutions. One intent is to launch a major, dedicated submersible research program that would demonstrate SEACLIFF's research capabilities in depths of more than 4000 meters. (Probable time frame would be 1987.) The Navy would also acquire a suitable ship to support SEACLIFF and TURTLE for a long term, wide ranging program (extended range, Cawley-type A-frame, ample scientist accommodations).



There is also interest in enhancing ROV capabilities. Implementation of this plan for the initiative would make research a mandated part of the Navy mission, rather than a discretionary task that can be added to their operational function.

*RVOC Meeting.* William Barbee gave the Council a preliminary report on the October 14-16, 1984 RVOC meeting in Bermuda. (A complete report will be made at the UNOLS meeting October 26). The meeting was well attended and included presentations of interest on Navy Weather Forecasting, research vessels SEWARD JOHNSON and POLAR DUKE, medical and firefighter training, telecommunications and the University of Texas plans for a G & G ship. Information was provided on acoustic doppler current profiling systems and GPS navigation systems. Development and current use of manned and unmanned submersibles were described. Successful workshops were held on foreign clearance procedures and post cruise obligations and on users' manuals. Although the workshop on shared use equipment provided good definition of common problems, it was not the appropriate vehicle to develop solutions.

*Other Business.* Ferris Webster, UNOLS Chair discussed his recent testimony before the House Merchant Marine and Fisheries Committee, Oceanography Subcommittee, (Appendix IV) together with a subsequent letter from the Honorable Joel Pritchard, Congressman from Washington and Ranking Minority, HMMFC (Appendix V).

*Actions Affecting the UNOLS Fleet.* The Council reconvened after recess for dinner to address the several issues of fleet distribution that had been earlier summarized. After lengthy discussion, the Advisory Council reached a set of unified recommendations and an additional recommendation addressing R/V OSPREY plans and proposals.

RECOMMENDATION  
OCTOBER 25, 1984

The UNOLS Advisory Council, in its continuing role of evaluating the effectiveness, composition, and distribution of research vessels within the UNOLS fleet, has considered recent proposals (both formal and informal) for reassignments and/or replacements of research vessels within the fleet. We have re-evaluated the Advisory Council's actions taken in June 1984. As a consequence of this effort, the Advisory Council is submitting several recommendations to the UNOLS Membership and to the federal funding agencies.

RECOMMENDATION 1

Based upon schedules and research vessel use patterns reviewed by the Advisory Council during the past several years, the Council concludes that it is timely and appropriate for one of the two major research vessels operated by the University of Miami to be transferred to another geographic region with greater demand for research vessel time. While the Advisory Council previously suggested that the R/V COLUMBUS ISELIN be reassigned, discussions between representatives of the University of Miami and the National Science Foundation, and developments in the Central California Region (discussed in subsequent recommendations) strongly suggest that the University of Miami should retain and continue to operate the R/V COLUMBUS ISELIN and that the R/V CAPE FLORIDA be reassigned. Therefore, THE ADVISORY COUNCIL RECOMMENDS TO THE



UNOLS MEMBERSHIP AND TO THE NATIONAL SCIENCE FOUNDATION THAT THE R/V CAPE FLORIDA BE REASSIGNED.

RECOMMENDATION 2

Developments in the central California region (the schedule retirement of the R/V ACANIA, the need to replace the R/V CAYUSE with a more capable vessel, and the retirement and replacement of the VELERO IV) suggest that UNOLS and the federal funding agencies should encourage the development and submission of comprehensive proposals to operate two research vessels in that region. THE ADVISORY COUNCIL RECOMMENDS TO UNOLS AND TO THE FEDERAL FUNDING AGENCIES THAT PROPOSALS BE PREPARED BY AN ACADEMICALLY-BASED, CENTRAL CALIFORNIA CONSORTIUM (SUCH AS THE PROPOSED CENCAL CONSORTIUM), SPECIFICALLY FORMED FOR THE PURPOSE, INCLUDING BUT NOT NECESSARILY LIMITED TO THE UNIVERSITY OF SOUTHERN CALIFORNIA, UNIVERSITY OF CALIFORNIA AT SANTA BARBARA, UNIVERSITY OF CALIFORNIA AT SANTA CRUZ, THE MOSS LANDING MARINE LABORATORIES OF THE CALIFORNIA STATE UNIVERSITY SYSTEM, AND THE UNITED STATES NAVAL POSTGRADUATE SCHOOL. THE COUNCIL FURTHER RECOMMENDS THAT THE CAPE FLORIDA BE CONSIDERED FOR TRANSFER TO THIS REGION, AND THAT THE R/V ACANIA BE RETIRED AND THAT THE R/V CAYUSE BE TRANSFERRED TO ANOTHER GEOGRAPHICAL REGION. IF A MEMORANDUM OF UNDERSTANDING FROM THE CONSORTIUM IS NOT FORTHCOMING WITHIN SIX MONTHS TO FACILITATE R/V OPERATIONS IN CENTRAL CALIFORNIA, THE ADVISORY COUNCIL WILL PREPARE ALTERNATE RECOMMENDATIONS.

RECOMMENDATION 3

THE ADVISORY COUNCIL RECOMMENDS TO THE UNOLS MEMBERSHIP AND THE FEDERAL FUNDING AGENCIES THAT ANY PROPOSED REPLACEMENT OF THE R/V VELERO IV BE DONE IN COOPERATION WITH THE RECOMMENDED CENTRAL CALIFORNIA CONSORTIUM.

RECOMMENDATION 4

THE ADVISORY COUNCIL RECOMMENDS TO THE UNOLS MEMBERSHIP AND TO THE FEDERAL FUNDING AGENCIES THAT ACADEMIC INSTITUTIONS WITH STRONG PROGRAMS OF RESEARCH AND EDUCATION IN THE OCEAN SCIENCES AND RELATED FIELDS BE ENCOURAGED TO REVIEW THEIR REGIONAL NEEDS FOR A RESEARCH VESSEL AND BE INVITED TO SUBMIT COMPREHENSIVE PROPOSALS TO THE FUNDING AGENCIES FOR THE TRANSFER AND OPERATION OF THE R/V CAYUSE AS A UNOLS VESSEL.

*UNOLS Advisory Council Recommendation Regarding R/V OSPREY*

Development by the University of Southern California (USC) of a plan for replacing R/V VELERO IV with a modification of R/V OSPREY has proceeded to an advanced stage. The AC has reviewed this plan and has the following recommendation:

NSF should urge USC to proceed with a comprehensive proposal for conversion of R/V OSPREY as a replacement for R/V VELERO IV. The proposal should detail

- a) conversion plans and costs together with the basis for estimation;
- b) an analysis of the user market foreseen for OSPREY;



c) *expected operating costs.*

We note that USC should expect NSF review to consider the increase in operating costs over those of VELERO IV as they will affect total ship support resources. This is particularly important given recent increases in operating costs entailed in other fleet changes: replacement of E. B. SCRIPPS by R. SPROUL, and the stretch of MOANA WAVE.

The Advisory Council feels that inclusion in R/V OSPREY of compartments with water tight integrity is essential for safety, for meeting UNOLS safety standards, and for passing Coast Guard inspection. This inclusion or its omission should be addressed both by the USC proposal and the NSF review.

We recommend that the report of a detailed ABS or Coast Guard inspection of basic hull welding be a required inclusion in the proposal.

Upon completion of the proposal, the Advisory Council would be pleased to review it, if requested, and we will consider the proposed converted ship for inclusion in the UNOLS fleet.

Donn Gorsline again left prior to consideration of VELERO IV and OSPREY issues.

The meeting adjourned at 1:15 a.m., October 25.



UNOLS Advisory Council  
 Agenda for Meeting  
 8:30 a.m., Wednesday, October 24, 1984  
 Room 455  
 Joseph Henry Building-National Academy of Sciences  
 2100 Pennsylvania Avenue N.W.  
 Washington, D.C.

ACCEPT MINUTES OF JUNE 28, 29, 1984

PLANS FOR OSPREY CONVERSION AND OPERATION - Don Keach will present to the Council USC's plans for the OSPREY

ADVISORY COUNCIL STANDING ROLES

Fleet Efficiency and Effectiveness - Lorenzen  
 Review 1st and 2nd quarter, 1984 Cruise Assessments

Access for Ocean Research - Stewart  
 Report on Committee reorganization and activities

Specialized Instrumentation Facilities - Miller  
 Report on activities and consider involving additional Council member(s) in this role.

Replacements, Additions and Retirements, UNOLS Fleet - Dinsmore. Fleet Replacement Committee report and activities (to include USC, UT, UH, MLML and NPG actions, Committee progress on "UNOLS" proposal and response to ONR ship construction planning).

Regional Ship Scheduling Groups - Robison, Stewart  
 (Note that Fall Ship Scheduling Meetings will not be held until October 25).

Fleet Management - Robison. Discussion of update on Fleet Composition Report.

Corell - ALVIN/ATLANTIS II, 1984 season. Workshops for outyear planning.

Barrie Walden, W.H.O.I. will report on the ALVIN/ATLANTIS II 1984 season to date.

Communications - UNOLS News, other

Platform Design Ideas - Discussion of the role

In addition, the Council may wish to tune role assignments, establish new roles, etc.

UNOLS MEMBERSHIP - Examination of responses to queries directed to some Associate Members. Final consideration of A/C recommendations to UNOLS.



UNOLS SHIP DESIGNATION - *Final consideration of A/C recommendations. (No new information since June meeting.)*

CONSIDERATION AND RECOMMENDATIONS ON ACTIONS THAT WOULD AFFECT THE UNOLS FLEET - *(Standard agenda, item.) The Council's recommendation on RSMAS/ISELIN is still open. (There may also be other ships or institutions facing short schedules in 1985.)*

SPONSORING AGENCY INFORMATION TO ADVISORY COUNCIL - ONR - K. Kaulum will discuss Secretary of Navy Initiatives in Oceanography, especially those of interest to UNOLS, including ship construction plans, use of Navy operated submersibles, etc.

NSF - R. R. La Count will discuss NSF ocean program projections, etc. (R.R.L. will provide me with input later this week.)

USGS - R. Rowland will review and update USGS (and Interim) ocean and ship-use programs.

NOAA - R. Alderman will discuss NOAA (chiefly NOS) programs.

RVOC Meeting - W. Barbee will report to the Council on RVOC meeting Oct. 14-17 in Bermuda. (Dolly Dieter will report to UNOLS on Oct. 26.)

UNOLS Chairman - Ferris Webster will discuss his September 26 testimony to Oceanography Subcommittee, House Merchant Marine and Fisheries Committee.

In Reply Refer To:  
Mail Stop 915

August 3, 1984

Dr. Robert G. Douglas, Chairman  
Marine Program Executive Committee  
Department of Geological Sciences  
University of Southern California  
University Park  
Los Angeles, California 90089-0741

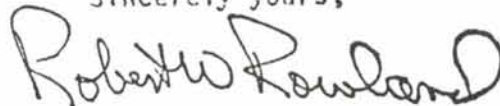
Dear Dr. Douglas:

Two weeks ago I attended the University National Oceanographic Laboratory System (UNOLS) advisory committee meeting in Seattle. At that time, they discussed the under-subscription of the Columbus Islin and the potential transfer of the vessel to your University.

In response to this option, I would like to reiterate the U.S. Geological Survey's previously stated desire to join in a ship consortium with USC so as to insure our access to an oceanographic research vessel for use along the Pacific margin. In addition, I would like to restate that our research programs will require a ship fully capable of working off the northern California, Oregon, and Washington margins throughout the year for piston coring and retrieving and deploying large sea-floor tripod instrument packages and strings of current meters and sediment traps. While other projects will be conducting geophysical surveys and sampling, it is the station keeping and stability requirements of working in relatively rough seas while minimizing our downtime that is critical to the vessel's operational capability. With this factor in mind, the Columbus Islin is a very questionable vessel for eastern Pacific operations. We presume that an operational evaluation of the ship will take place before any trial or permanent transfer to the west coast. If we can be of additional assistance, contact Mark Holmes or James Gardner at (415) 856-7141.

In closing, our EEZ GLORIA survey is nearly complete and has provided a great deal of new insight into geology of the Pacific margin. The next phase of our investigations will be to ground-truth the sonar data and begin topical studies which will begin as soon as possible. We need access to a strong, fully capable ship now more than previously.

Sincerely yours,



Robert W. Rowland  
Deputy Chief for Marine Programs

Copy to: Ron La Count, National Science Foundation  
Robert Dinsmore, Woods Hole Oceanographic Institution

cc: T. Offield, G. Hill, M. Holmes, J. Gardner, OEMG Subj., OEMG Reading, Rowland Chron  
RWRRowland:gh:8/3/84



## ALVIN OPERATIONS SUMMARY

## HISTORY

The deep submergence vehicle ALVIN was commissioned in 1964 making this its twentieth anniversary. ALVIN operations up to this year can be logically split into two phases, with the shift to ATLANTIS II marking the beginning of phase three.

The submersible delivered by Litton Industries in 1964 would bear little resemblance to ALVIN today. It was a technological leap forward, and as such, contained many new and untested engineering features. The United States Navy, via the Office of Naval Research, funded the early operating years in order to obtain information on how a vehicle of this nature would perform and obtain insight into what areas of research and development should be pursued in order to further our deep submergence capabilities. At the same time, the ALVIN Group worked toward acceptance of the submersible as a viable oceanographic research tool, taking advantage of the Navy block funding to allow use by scientists at below real cost. Acceptance by the scientific community was painfully slow; most expeditions accomplished work which could have been done using conventional methods. Few attempts were made to develop techniques and equipment specifically designed for submersible use and therefore, able to take advantage of the unique capabilities. In defense of the scientific community, ALVIN was not totally reliable; its capabilities were not fully realized and its funding was always questionable, making long range plans which relied on the submersible risky.

In 1970, the U.S. Navy accepted the submersibles SEA CLIFF and TURTLE, constructed at least in part, by building on the knowledge obtained from ALVIN operations. Submarine Development Group One undertook the operation of these vehicles and the wisdom of continued Navy-backed funding for ALVIN was questioned. If ALVIN was in fact an important scientific tool the time had come for the scientific community to accept financial responsibility.

Although scientific support had been increasing, ALVIN had yet to demonstrate that its costs were justified in research results. In 1973, negotiations were conducted with the funding agencies to determine the best way to terminate operations. Fortunately, a major international expedition, Project FAMOUS, was in the planning stages. This program received support, and ALVIN was given one last chance to prove its value. The Mid-Atlantic Ridge research program was extremely successful, and the three submersibles involved obtained results not possible by other means. This expedition was the start of ALVIN operations, phase two.

The decline in Navy funding forced ALVIN users to take their submersible cruises seriously. Also, the ALVIN Group had to adjust its thinking, recognizing that its existence depended on successful scientific programs. Researchers developed specialized equipment and the ALVIN engineering section and operations group increased their support for these efforts. As time progressed, the complexity of the science programs and associated equipment increased, as did the demands on the submersible and its support ship. Figure 1 shows a history of the yearly number of dives and the changes associated with phase two are apparent.

Throughout this period, R/V LULU was ALVIN's support ship. This vessel was constructed in 1965 to provide a means for conducting operations in the immediate area of Woods Hole. By 1983, it had covered 136,000 miles in support of 1,328 ALVIN dives. LULU's advertised speed was 6 knots, with a launch and recovery capability in sea state 3. Its size limited the science party to approximately eight persons and it had no general oceanographic research capabilities beyond submersible support. It became common for an ALVIN expedition to involve multiple ships in order to increase the number of science participants and accomplish related research activities. The capability of the support ship rather than that of the submersible became the limiting factor in many programs.



In 1982, Woods Hole requested funding for the conversion of ATLANTIS II to an ALVIN support vessel. The increased speed (12 knots), endurance (45 days), scientific accommodations, and general oceanographic capability, were considered essential to meeting future ALVIN demand.

Conversion was not a simple undertaking, requiring major modifications to both ATLANTIS II and ALVIN. The largest task involved development of a launch and recovery system based on a single overhead attachment point. ALVIN was designed for elevator lifts with all weight supported by the bottom skids. The structural frame weighed only 650 pounds and was located almost entirely below the center line. Adding additional frame members strong enough to allow supporting the submersible's 35,000 pound static weight from a single point was further complicated by a decision to retain the forebody release safety feature. Preliminary design studies indicated that the task might be possible and the resulting submarine might still float.

The changes required to ATLANTIS II were also major. An A-frame handling arrangement was recognized as the only system suitable for this conversion, although a large crane was closely investigated. Studies of existing A-frames led to the selection of Caley Hydraulics, of Glasgow, Scotland, as the supplier. The decision was based upon the unique characteristics of Caley's design, plus their experience and reputation resulting from similar systems working in the North Sea. The perceived advantage of the Caley concept came from the fact that the submersible was physically restrained by mating with the A-frame during all phases of launch and recovery except for the final lowering to the water.

This benefit, however, was obtained at the cost of increased ALVIN modification requirements. The new frame members would not only have to support the submersible's weight, but would also be required to withstand the loads associated with preventing pitch, roll, and yaw. Obtaining a successful design for both submarine and A-frame required a highly cooperative effort between the Caley and ALVIN Group design teams.

ATLANTIS II underwent numerous other changes during the modification period. Many, such as installation of a new bow thruster, the submersible hangar and shop spaces, were ALVIN-related, but the ship was also undergoing a general mid-life (20 year) refit and receiving oceanographic equipment improvements such as a SEA BEAM transducer array. The work schedule was extremely tight, with sea trials expected in September of 1983.

The major ALVIN modifications were close to completion in June following the winter overhaul and the final science dives utilizing LULU were conducted during the summer. Transfer of submersible support equipment to ATLANTIS II began in late August, but delays prevented scheduling actual launch and recovery tests until December. By that time the weather in Woods Hole was too cold to allow full testing, since ALVIN's water-filled variable ballast system cannot be allowed to freeze. The most that could be accomplished was a trial mating between the submersible and the A-frame using electric blankets to compensate for the below-freezing temperatures.

The trials were not totally successful. It was discovered that the tail-down angle resulting from the lift point's location slightly forward of the center of gravity caused interference between ALVIN's sail and the A-frame mating assembly. Modification of the sail was a simple solution but the amount to be removed was excessive if the trim condition resulting from jettisoning the manipulators and science basket was considered. It was decided to modify the A-frame by incorporating a second winch and lift line designed solely to provide the force required to maintain a level or tail-up attitude despite changing trim conditions. This addition was made in January while ATLANTIS II was enroute to Charleston, South Carolina.

The first real launch and recovery tests in which the submersible was lowered into the water occurred at the dock in Charleston on January 29. Two days later ALVIN was launched in open water as part of an NSF inspection. On February 3, ATLANTIS II sailed for its first submersible scientific dive series, beginning ALVIN Operations - Phase Three.



## ATLANTIS II OPERATIONS

As of today, ALVIN has completed 142 dives since joining ATLANTIS II. This has involved 227 days at sea with 164 days on station. Operations have been conducted in sea state 4 without difficulties and only 16 planned dives have been weathered out. Two unexpected scientific discoveries have been made: the existence of a "vent community" in the Gulf of Mexico and 400° C black smokers at Juan de Fuca. Generally, the cruises have proceeded smoothly involving 24 hour per day operations utilizing both the submersible and conventional techniques. The shore support staff has moved directly from the problems of ALVIN single point lift modifications to those of cruise support, sampler development and submersible/support systems improvements. During the year, four U.S. Navy certification milestones have been successfully passed; unmanned launch system certification, manned launch system certification, plus both submarine and launch system certification reviews. Three new pilots have been Navy-certified, making seven out of the ten member operations team qualified.

The workload on the ALVIN Group required to sustain this effort is excessive. We have learned the hard way that LULU's lengthy transits caused by her slow speed did not represent wasted time. Cruise preparation plus submersible repair and maintenance were conducted during this time, which has now been cut in half. Port periods during this year have been generally three days long, which frequently results in only four hours of leave time for much of the operations team. A rotation policy has been instituted which allows operations team members to take vacations, but the group consists of only ten men making it shorthanded if more than one leaves at a time. To date, most cruises have been at less than full strength despite attempts to fill them out using engineering staff members. The result is that the ALVIN Group is not as responsive to the problems of the scientists as it could be, and the submersible's preventative maintenance is suffering. The shore support staff consisting of

nine people, six of whom are funded for half time, has difficulty staying ahead of immediate problems when it should be concentrating on the future.

Solutions exist but guidance is required from UNOLS and the funding agencies. Three possibilities are apparent. The number of dives can be decreased, thereby reducing the workload while maintaining the same or a slightly reduced daily rate. A drastic reduction would be required since the first increment would simply allow spending adequate time in areas which are suffering at present. The second method involves increasing the ALVIN Group size, thereby reducing the workload of individuals, but increasing the daily rate. Again, the first increment would simply allow obtaining a sustainable level of performance. The third method is to reduce the work associated with each dive. Over the years, the ALVIN Group has made many changes to both equipment and procedures for this purpose. This will continue as a result of purposeful planning and increased experience on ATLANTIS II. However, the easy gains have been made and, to large extent, they have been offset by increased science program complexity and demands. What remains now for beneficial changes involves either considerable engineering effort aimed at reduced maintenance requirements and increased reliability or decreasing our support for the science programs.

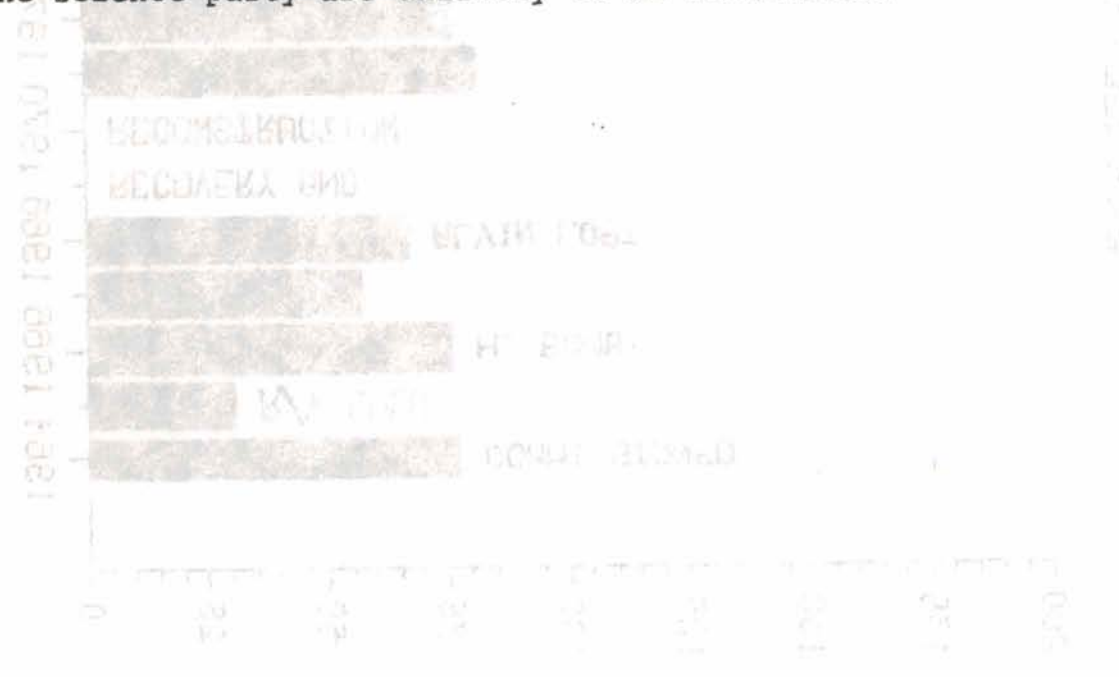
It is the ALVIN Group's opinion that none of these methods is acceptable alone, but that all three should be implemented to some degree. To this end, the following steps are being taken. The 1985 schedule is being revised to increase the port periods to a norm of four days rather than three. Unfortunately, science program pressure has more than compensated for this change by increasing the scheduled dives from 173 to 181. The revised 1985 operating proposal will request funds to increase the operations team to twelve men, thereby allowing it to remain at full strength for all cruises. The cost of these additions will be partially



compensated for by decreased overtime requirements but clearly, the daily rate will increase. Finally, approval will be requested to increase the engineering staff by two half-time persons. This will allow concentration on improvements designed to simplify operations as well as providing better science support. No additional funds will be required for this change in the first year, since money is available in existing non-operational grants.

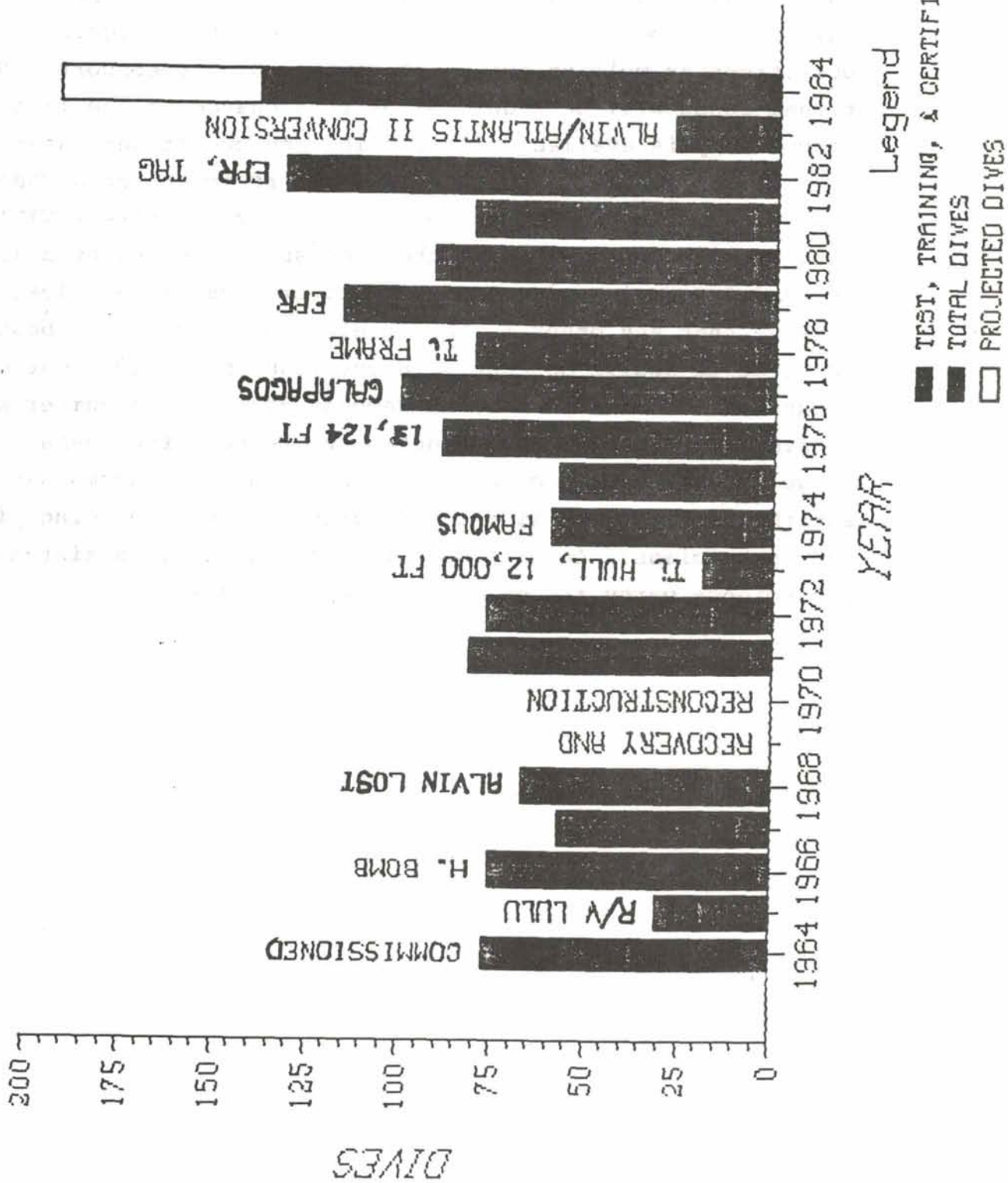
The only area in which we are not recommending a change is that of science program support. We recognize that ALVIN's continued existence depends on the success of the scientists. We feel our engineering group is better, faster, and less expensive than any other in this field and it is in our best interest to assist our users in every way possible. Our operations team is unsurpassed, as demonstrated by the number and complexity of the dives conducted in the past few years. To a large extent, the success of most ALVIN dive programs can be attributed to the skill and dedication of the sea-going pilots and technicians. Any attempts to decrease their assistance to the science party are unlikely to be successful.

680 BELLEU BRAGE  
 1014 STAGE  
 1501 JAWHAWA & C. W. WILKINSON DIMES  
 1501 JAWHAWA & C. W. WILKINSON DIMES



1981

DSV ALVIN DIVE HISTORY





UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM  
STATEMENT TO OCEANOGRAPHY SUBCOMMITTEE,  
MERCHANT MARINE AND FISHERIES COMMITTEE

26 September 1984

I am Ferris Webster, Professor of oceanography at the University of Delaware, and this year's elected chairman of the University-National Oceanographic Laboratory System (better known as UNOLS).

The University-National Oceanographic Laboratory System

UNOLS is a private organization of academic oceanographic institutions which operate oceanographic facilities. To paraphrase the objectives as set forth in the UNOLS charter: UNOLS is a national system that works with the funding agencies to assist in the effective coordinated use, assessment, and planning of oceanographic facilities for graduate-level research and educational programs. By optimizing Federal and other support for academic oceanography, UNOLS will thereby continue and enhance the excellence of this nation's oceanographic program.

Support for the operation of UNOLS is provided by the Federal agencies that support or use the academic oceanographic fleet. These are the National Science Foundation (NSF), the Office of Naval Research (ONR), the National Oceanic and Atmospheric Administration (NOAA), the United States Geological Survey (USGS), the Marine Mineral Service (MMS), and the

Department of Energy (DOE). The funding for UNOLS operations that is provided by this group of agencies is coordinated through the NSF.

Eighteen universities and research institutions are members of UNOLS, and another thirty-one are associate members. Meetings are held twice a year. Between meetings, business is carried out through an Executive Committee, an Advisory Council, and a number of specialized committees. A full-time Executive Secretary is located with the School of Oceanography of the University of Washington in Seattle.

#### Fleet Coordination

The ships and other facilities operated by UNOLS institutions have mainly been acquired through NSF and ONR. Of 26 research vessels in the UNOLS fleet, NSF holds title to 12, ONR to 7, and 7 have been acquired by other means, generally through state or institutional sources.

UNOLS members have been working with the funding agencies to improve and maintain effective use of the academic research fleet. NSF is the largest user of the Academic fleet, with the support by agency breaking down as:

NSF	60-70%
ONR	10-15%
NOAA, USGS, MMS, DOE	10-20%
Other	10%

The challenge in managing the fleet is to match the facilities and support available to the needs of the science program. The actual scheduling of the fleet is carried out by



the individual operating institutions. This procedure maintains close ties between the ship operators and the scientific investigators. In general, the science is accommodated, with some competition by funded research programs to get the available ship time. If there is a problem, it's that the field may be underfunded, so that too high a percentage of good science proposals are rejected.

I am pleased to report that the cooperative scheduling of the UNOLS fleet has been working well. I want particularly to acknowledge the constructive help of the National Science Foundation in achieving this.

#### The Current State of the UNOLS Fleet

At the current time, the UNOLS Fleet is in relatively good shape. There is a good balance between science program needs and fleet capacity. The fleet is almost fully utilized.

Fleet usage has been increasing modestly over the last five years, though it is significantly below the levels of the previous five years. Fleet usage was 4,494 days in 1983 and is estimated to be 5,210 days in 1984. The projection for 1985 is 5,999 days. Note however, that the average ship usage over the five-year period from 1975 to 1979 was 6,056 days.

To put the present fleet funding situation in perspective, it may be worth recalling the history of the academic fleet. Over the last fifteen years, the national capability to work at sea from academic research vessels has dramatically decreased.

An analysis prepared by the UNOLS Advisory Council two years

ago indicated that the academic research fleet shrank from 35 vessels in 1971 to 25 in 1982. The size of the research fleet was, however, merely a symptom of the general decline of the overall support of oceanographic research by all the Federal agencies. There has been a particularly strong decrease in funding of oceanographic research by ONR, which has failed to keep up with inflation to the extent that today's program is significantly smaller than it was in the late sixties.

Some increases in Federal funding for the fleet have occurred in the past two years, and there may this year be adequate resources to support the existing fleet.

#### Fleet Replacement

Within the next decade, UNOLS members and the Federal agencies will face a major challenge in coping with the aging of the academic fleet. The FOFCC Oceanographic Fleet Study Report notes that, using a 30-year lifespan for a research vessel, half of the UNOLS fleet should be retired by the end of the century. The problem is most severe with the larger vessels in the UNOLS fleet.

UNOLS has placed a high priority on dealing with the issue of aging of its research vessels, and has established a Fleet Replacement Committee to develop a plan for orderly replacement of the UNOLS fleet. We expect that the results will lead to recommendations to the funding agencies. The committee's work is coordinated with the Federal Oceanographic Fleet Coordinating Council (FOFCC) oceanographic fleet study, with UNOLS



participation and staffing. In addition, the Fleet Replacement Committee is representing the UNOLS community in the Navy's program to develop characteristics for a new ship for the academic fleet.

A related issue is the composition, distribution, and management of the UNOLS fleet. A report to UNOLS on this subject was prepared by the UNOLS Advisory Council in 1982. In the two years since then, the situation regarding fleet usage and needs has changed. Some of the conclusions of the 1982 report relating to fleet composition are no longer applicable. The Advisory Council is preparing an update, which it plans to complete by May, 1985.

#### Future Issues

UNOLS is addressing issues of future importance to the academic research fleet.

The UNOLS Advisory Council is looking at new platform designs as part of its interest in orderly fleet replacement. Might new types of platforms (multi-hulls, semi-submersibles) be more effective than simple replacement of one conventional ship with another?

Oceanographic satellites, despite their promise, have not yet appeared on the scene. When they do, possibly towards the end of this decade, they may stimulate new means for worldwide oceanographic research. New programs being developed to understand global climate variability are examples of how these new tools might be exploited. There will surely be an impact on

ship usage, though I am uncertain that the new global research perspective will mean that will will need fewer ships.

UNOLS is developing new procedure to improve the national planning for distant, expeditional research activities. The idea is to improve the use of ships in distant waters through early discussion of plans by scientists from all interested institutions. The first results are promising, and preliminary plans for coordinated distant-water research operations in 1986 and 1987 are taking shape.

To conclude, I am proud of UNOLS's solid accomplishments in what may be less glamorous areas than those discussed so far: establishing and maintaining standards for safety on all UNOLS ships; promoting the more effective use of shipboard scientific gear; ensuring that funded oceanographers from all U.S. institutions have access to the fleet; promoting communications between the ship-operating institutions and oceanographic research scientists; arranging for at-sea world-wide medical assistance to all UNOLS vessels. These effective steps in improving the use of the academic research fleet have justified the effort put in by many individuals to create UNOLS and to make it work.



UNIVERSITY OF DELAWARE INTER-DEPARTMENTAL

*Memorandum*

4 October 1984

TO: Bill Barbee ✓  
Charlie Miller

FROM: Ferris Webster *FW*

SUBJECT: Testimony for UNOLS

Enclosed is a copy of the testimony I presented to the House of Oceanography Sub-committee hearings.

I was somewhat disappointed with the level of discussion with the sub-committee members. I suppose that's par for the course.

Charlie, I gave a copy of the letter to the sub-committee staff and to Grant Gross of NSF, who also testified. I told them that it was not for distribution and if they wanted more information I urged them to call you.

FW:tb



WALTER B. JONES, N.C., CHAIRMAN

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THOMAS F. HARTNETT, S.C.

**U.S. House of Representatives**  
**Committee on**  
**Merchant Marine and Fisheries**  
**Room 1334, Longworth House Office Building**  
**Washington, D.C. 20515**

October 12, 1984

Dr. Ferris Webster  
Chairman, UNOLS  
University of Delaware  
College of Marine Studies  
700 Pilottown Road  
Lewes, DE 19958

Dear Dr. Webster:

First, I would like to thank you for your participation in the recent Oceanography Subcommittee hearing on marine research. I believe that this hearing provided an important beginning in the development of an oversight record on the status of marine research in the U.S., both within the Federal Government and the academic community. I also believe that your direct involvement in the hearing assisted the Subcommittee in making significant progress toward a better understanding of some of the issues which need to be addressed.

Second, I would like to make the observation that as a result of recent technical advances and increased capabilities in such areas as satellite remote sensing, sophisticated microprocessors, and other instrumentation, there is the potential for significant new initiatives in both basic and applied marine research which could lead to substantial benefits to our nation and the world. As the Ranking Minority Member of the Subcommittee on Oceanography for almost eight years now, I would also like to point out that I have not always been terribly encouraged by the rather ad-hoc process by which priorities are established, coordinated, and followed through on by the Federal agencies responsible for funding marine research and the necessary infrastructure to carry it out. In order for the U.S. to continue to play a leadership role in Oceanography and in order to conduct the type of "big science" projects which will be required, we need a clearer identification of research needs and initiatives, and improved coordination between the scientific community and the Federal agencies involved in the development of marine research priorities and budgets. In this vein, I would appreciate any further comments or suggestions you might have for improving the process by which we establish priorities and initiatives for the enhancement of our overall marine research capability.



- 2 -

Finally, I am attaching a list of specific questions which we did not get an opportunity to discuss during the hearing. I would greatly appreciate your answers to these questions, as well as any additional comments you wish to submit in order to provide as complete a record as possible. In order to complete our record on this subject as soon as possible, I would appreciate receiving your response by no later than October 31, 1984.

Once again, I would like to thank you for your contribution to our oversight hearing and your continuing contribution to marine research generally.

Sincerely,



Joel Pritchard  
Ranking Minority Member  
Committee on Merchant Marine  
and Fisheries

JP:ccm

Attachment

## QUESTIONS FOR UNOLS

1. What is being done on both a national and an international scale to anticipate the problems for data management that the exponential increase in satellite data will cause in the next decade? What is being done to ensure quality control and format standardization?
2. I understand that you have taken a look in trends in the level of Federal research support for oceanographic research over the years. Would you supply these figures for the record, being sure to include a description of how you arrive at these figures? Would you comment on the significance of these trends, and hazard a prediction as to the health of the U.S. oceanographic research capability in the next ten to fifteen years? What do you think should be done?
3. In your recent study for the National Research Council on "An Ocean Climate Strategy", you state that there is "so far no U.S. commitment to establishing long-term ocean climate monitoring". How can these be achieved? What implication will it have on funding agencies, specifically NSF, NOAA, ONR, and EPA?
4. Are long-term weather predictions an ultimate goal for the World Climate Research program? Do you feel it is achievable? What are the necessary resources? If our country established the goal of being able to predict natural weather variations one year in advance, what level of effort would be required to achieve this goal within ten years?
5. The Joint Oceanographic Institutions, Inc., has recently completed a study on the use of satellites in the study of oceanography during the next ten years. How is the increasing remote sensing capability being factored into the overall U.S. oceanographic research effort? What are the implications on the composition, distribution, and management of research platforms?







