

# UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

SUMMARY REPORT OF THE JUNE 4, 1986

UNOLS SEMIANNUAL MEETING  
NATIONAL TRUST FOR HISTORIC PRESERVATION  
1785 Massachusetts Avenue NW  
Washington, DC

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Summary Report of the UNOLS Semiannual Meeting

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Summary Report of UNOLS Semiannual Meeting  
June 4, 1986

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1785 Massachusetts Avenue NW  
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**General:** Issues and items considered at the June 1986 Semiannual Meeting are reported in the order in which they were addressed. Unless otherwise noted, all items are from the published agenda (Appendix I).

A list of registered attendees, compiled from forms completed at the meeting is Appendix II. Information from the UNOLS Office available at the meeting: UNOLS Directory, List of Research Vessels with Ship Scheduling Contacts, with Marine Operations Contacts, UNOLS Advisory Council Membership 1971-1986, UNOLS Chairmen, Vice Chairmen and Executive Committee 1971-1986 (Appendices II-VII). A Summary of UNOLS Vessel Fleet Operations - 1985 (5/29/86) is Appendix VIII.

**Introduction and Welcome.** The Spring, 1986 Semiannual Meeting was called to order by UNOLS Chairman Ferris Webster. He welcomed attendees and presented the agenda, noting that he had changed the order of addressing items to accommodate participants to assure broad attendance for critical business and to complete the meeting by a reasonable hour.

*The Chairman welcomed David Menzel, designated UNOLS representative and Director, Skidaway Institute of Oceanography, University System of Georgia. This was Dave's first UNOLS meeting since his serious truck-bicycle accident. (Dave was on the bicycle.) The UNOLS membership joined the Chairman in welcoming Dr. Menzel.*

**Chairman's Report.** Chairman Webster noted that the period since the last Semiannual Meeting had been one of relatively low activity for UNOLS. He noted that UNOLS had not been represented at the last Federal Oceanographic Fleet Coordinating Council (FOFCC) meeting April 17, 1986. The UNOLS fleet is one of the principal elements of the Federal Oceanographic Fleet, and so it has become the practice to have an observer from the Executive Committee at meetings. Unfortunately representation could not be made at the April meeting.

The principal concern of the UNOLS Chairman and Executive Committee and the most critical and urgent issue before UNOLS is the status of the fleet. There are both short term and long term problems facing the fleet. It is important, though, to differentiate between short and long term concerns and, to a degree, decouple them.

In the short term, prospects are not bright. Ship availability from the UNOLS fleet will exceed funded research requirements (and available ship operations funding) during 1986 and 1987.

This situation, of several years' duration, obtains in large part from general Federal budget strictures now prevalent. Causes notwithstanding, the situation must be addressed. UNOLS must work with supporting agencies to provide efficient, effective research vessel support within the funding levels available.

The long term situation is a challenge: to provide capable ship support for academic ocean research beginning in the 1990's and into the 21st century. Prospects for achieving this objective and progress in planning for ocean research and operations provide bases for optimism. In particular, two reports, *EMERGENCE OF A UNIFIED OCEAN SCIENCE, A Long-Range Plan for the Ocean Sciences Program of the National Science Foundation* prepared by the NSF's Advisory Committee and Ocean Sciences, and *A PLAN FOR IMPROVED CAPABILITY OF THE UNIVERSITY OCEANOGRAPHIC RESEARCH FLEET* by UNOLS' Fleet Replacement Committee are key to UNOLS plans and policy. *The Long-Range Plan for Ocean Sciences* provides guidance for ocean research in the 1990's, and should be helpful in achieving a strong, well-supported ocean research program. *The Research Fleet Plan* should help to gain modern ships capable of supporting expanded research programs.

*The UNOLS position, reached through consultation with the Executive Committee, Advisory Council and UNOLS membership is to continue to use these reports to press our case for a strong ocean science program and the parallel need for a capable academic research fleet.*

The Oceanographic Subcommittee of the House Merchant Marine and Fisheries Committee will hold hearings on June 24, 1986 on the Federal Oceanographic Fleet. The UNOLS Chairman has been asked and agreed to testify, as one of a panel of experts from the academic community. The panel, which also includes Robert Ballard, Robert Corell, James Baker, Donald Boesch, Edward Dorbin and Feenan Jennings, will provide coordinated testimony.

UNOLS members are invited to comment or provide suggestions, both on the UNOLS position and for the Chairman's testimony.

**UNOLS Advisory Council Report.** Charles Miller began his report with an Advisory Council endorsement of the position announced by UNOLS Chairman Webster: to continue to press for a strong, Federally-supported ocean science program and for a fleet of research vessels capable of supporting an expanded program.

Much of the Advisory Council's activity during the year has been in consideration of or connected with activities of various UNOLS Committees and Advisory Council subcommittees. The AC Report reflects those circumstances.

The Council has assessed the **ALVIN Program** and applauds it. Arrangements whereby UNOLS has designated ALVIN a National Oceanographic Facility and established the ALVIN Review Committee to help manage the program are working well. The tripartite agreement among NOAA, NSF and ONR that provides for ALVIN



support is a model for interagency support. Operations through the Woods Hole Oceanographic Institution's marine operations for ATLANTIS II and Submersible Program for ALVIN are dedicated, effective and efficient. The science produced with ALVIN/ATLANTIS II support is among the most impressive from our community.

A status and review report *ALVIN '86* has suggested some modifications and fine tuning to ALVIN program management. Recommendations from that report with the Advisory Council modifications will be submitted to UNOLS in the ALVIN Review Committee's report (below).

Harris B. Stewart, Jr., has polled UNOLS institutions concerning their experience with procedures for requesting clearances for research in foreign waters and clearance request procedures now in effect. (The Advisory Council had earlier requested that Dr. Stewart conduct this survey and review for the **International Restrictions to Ocean Science Committee, IROSC**). A preliminary report based on the survey will be presented to UNOLS in the IROSC report. The Advisory Council is encouraged that progress is being made in defining problems in obtaining foreign clearances, and requested that the report be completed.

The Advisory Council has interacted with the UNOLS **Fleet Replacement Committee** throughout the year. (The FRC report was to be delivered to UNOLS later during the meeting.) The Council has endorsed the FRC's excellent report and plan of improving the academic fleet. They commend FRC for their efforts.

The Fleet Replacement Committee had earlier reported to the Advisory Council that with completion of their report and plan for improved capability of the university research fleet they had discharged their tasks. The FRC suggested that the Committee be reconstituted, to be a UNOLS focus for efforts to improve the fleet, to help in tracking the Navy's process of research fleet construction, and further pursue the design process for two of the existing new concept designs and; by modifying and amplifying on science mission requirements, capabilities required, design concepts and other information, to continue efforts to maintain the Fleet Improvement Plan as a dynamic document responsive to current needs. *Advisory Council recommendations consistent with the FRC's suggestions were to be a part of the Fleet Replacement Committee's report to UNOLS.*

The Council continues its appraisal of their **ship user assessment process** and of the forms and procedures used for Cruise Assessments. Shortcomings in the existing procedures are recognized: because forms are submitted through operating institutions (or, in some cases, the ship's captain) users are reluctant to be critical. Returns tend to be bland and noncommittal. At the same time, the system's strengths are that it provides for quick communications between user and operator, the forms provide some statistical basis for assessing research



time lost to weather, equipment, instrumentation, etc., and the returns are useful to funding agencies. The Advisory Council has not reached agreement on means to improve the assessment process, and so, no changes have yet been made. Council consideration will continue.

The Advisory Council had, throughout the year, examined the need for and potential UNOLS roles in extraordinary arrangements for the **acquisition and management of advanced technical facilities**. The Advisory Council has singled out supercomputers for oceanography as a facility need with an appropriate UNOLS role. The Council recommended the formation of an Oceanographic Supercomputing Committee (OSCC) and, perhaps, establishment of a UNOLS position to represent Oceanographic community interests on supercomputers at NCAR. An OSCC has not been established, but will be.

The Advisory Council continues to be concerned over the substantial gap between funds necessary to run the full UNOLS fleet and the funds expected to be available. This is a problem that must be resolved. In addition to traditional UNOLS activities in planning, managing and operating the fleet, the Advisory Council has found widespread sentiment for examining alternatives for planning and management. The Council, therefore, reached a resolution:

*A Study of  
UNOLS Fleet Policies and Strategies for the 1990's*

*There are significant and time critical trends and patterns pertinent to Academic Ocean Science (Federal funding pattern of the ocean sciences, long range planning at NSF and elsewhere, the report of the UNOLS Fleet Replacement Committee, etc.) which suggest that the UNOLS Advisory Council undertake a special study of the strategies and mechanisms for managing and operating the U.S. Academic Oceanographic Fleet. Therefore, the UNOLS Advisory Council shall review and make recommendations concerning:*

- 1. The general composition of the UNOLS Fleet for the 1990's and beyond. (An assessment not by specific ships or platforms, but of sizes, classes, general characteristics and capabilities of the fleet essential to the support of the ocean sciences forecast for the 1990's and beyond.)*
- 2. Current and alternative mechanism for managing and operating the vessels of the UNOLS academic research fleet and for funding and supporting that fleet.*
- 3. Management strategies and mechanism to match the UNOLS fleet to the needs of the ocean science research.*

*The UNOLS Advisory Council shall upon completion of such a study and review submit its report early in 1987 (i.e., complete the study for consideration at the mid-winter Advisory Council meeting. The report shall be submitted to the UNOLS membership and to Federal funding agencies, and will be available to interested members of the ocean sciences community.*

The UNOLS membership accepted the Advisory Council report without comment.

**ALVIN Review Committee Report.** Committee Chairman Robert Corell reported on the ALVIN program status.

In November 1985, the ALVIN/ATLANTIS II completed the most productive season ever, completing 161 dives before returning to Woods Hole for ALVIN overhaul and Atlantis II maintenance.

The **ALVIN overhaul** has been successful, all major objectives have been met, and the submersible has been certified until 1991. The overhaul and refit have resulted in a virtually new ALVIN. A new, more versatile propulsion system and increased power essentially doubled performance. A new data logging system is more capable and should be easier to maintain, a new hydraulic system has been installed, and payload has been significantly increased.

*The ALVIN Review Committee commends the operating institution, Woods Hole Oceanographic Institution, and their Submersible Program, both for their continuing operation and management and for their execution of the ALVIN overhaul.*

The **ALVIN/ATLANTIS II** were presently at sea on the first research project of 1986, on the **Mid-Atlantic Ridge**. During the remainder of the year they will support research investigations in the northwest Atlantic, engineering development at the TITANIC site, investigations in the Gulf of Mexico, Panama Basin and off California, and end the year in San Diego.

In May 1986 the **ALVIN Review Committee** reviewed dive requests for **1987 and beyond**. The pressure of ALVIN time requests remains high, perhaps even is increasing. The quality of the science proposed is excellent, as are the requests for ALVIN dives. The results are to enhance the already excellent science program to be supported by ALVIN/ATLANTIS II.

A tentative schedule was developed for 1987 wherein the ALVIN/ATLANTIS II would take up work in the California Basin, then begin transit westward across the Pacific with investigations enroute near Hawaii and in the Central Pacific. Investigations in the Mariana region and Bonin Island Arc would be conducted during April through August. ALVIN/ATLANTIS II would then return to the eastern Pacific for one project off the Oregon coast and end the operational year with a series of investigations off California.

At their May 1986 meeting the **ARC** continued to emphasize **long-range planning**. The Committee, during the winter 1985-86, had held two workshops to solicit interest in using ALVIN/ATLANTIS II during 1988 and beyond. (A Report of these workshops had earlier been distributed to the UNOLS and the ALVIN-user communities.)

The ALVIN Review Committee will, later in summer, 1986, issue a **PROSPECTUS** for the ALVIN in 1988 and beyond.

The ARC continued their earlier efforts to assist the Navy and ONR in developing a science program that would utilize Navy submersibles SEA CLIFF and TURTLE. The Committee's statement: *The ALVIN Review Committee reiterated its belief that the 6000 meter capability of the SEA CLIFF is of critical importance to submersible science in the U.S. There is need for great care in planning and implementing a science program using these Navy assets. The forthright effort from the ocean science community in responding to ARC workshops in 1985-86 should be recognized by the Navy, and Notices of Interest should be followed up.*

In September 1985, the ALVIN Review Committee, with the encouragement of the UNOLS Advisory Council, appointed a Special ALVIN Study Committee to "gain an objective and critical overview of the total ALVIN program" at a time 20 years after the inception of ALVIN operations and shortly after establishing worldwide capabilities through the new support vessel, the RV ATLANTIS II. The Committee, chaired by Dr. Dirk Frankenberg, has completed its work and published its report (May 1986). The report *ALVIN '86 A Report on the Program's Status*, will be circulated to the UNOLS membership in the near future.

The Special ALVIN Study Committee made two specific recommendations that need to be reviewed by the UNOLS Advisory Council and full UNOLS membership. These are:

1. Recommended changes in the ALVIN Review Committee. That the ALVIN Review Committee be enlarged, renamed the ALVIN Advisory Committee and establish standing subcommittees for Long Range Planning, Scheduling, and Technology Development. In addition, the committee recommends an annual meeting be held for Principal Investigators of ALVIN-based research projects. This meeting should augment present procedures for obtaining user and community input to ALVIN activities.
2. Recommendation for a Submersible Science Study. A major Submersible Science Study be sponsored in 1986 with a specific charge to identify: (1) Scientifically important research topics at 0-1000 m depths that have been precluded by cost or technological limitations but which now can be attacked through newly available technology, and (2) Scientifically important research topics that would be open to effective study from submersibles with depth capability substantially greater than that of ALVIN.

The ALVIN Review Committee, at its May 1986 meeting, reviewed the report and developed two recommendations to UNOLS that preserved the sense of the Special Committee recommendations.



The Advisory Council received the recommendations from both the Special ALVIN Study Committee and the ALVIN Review Committee. After review, the Advisory Council *recommends* that:

1. UNOLS endorse the Special ALVIN Study Committee recommendation concerning subcommittees for the ALVIN Review Committee, and ask the ARC to establish subcommittees to address (a) long-range planning, (b) technology development for ALVIN science, and (c) scheduling, and charge these subcommittees with implementing the spirit of the Special Committee Report. Further, the Advisory Council strongly recommends that the ALVIN Review Committee retain its current name.

2. UNOLS endorse the recommendations of the Special ALVIN Study Committee for a major submersible science study, as a follow-on to the April 1982 submersible science study, and which addresses submersible and related technologies (ROV's, etc.) for science needs and requirements for the 1990's and beyond. The Advisory Council recommends that the ARC be charged with the responsibility for structuring such a study (drafting a charge and membership arrangements, establishing a mechanism for the conduct of the study, and arranging for agency support and funding), and report these recommendations to the Advisory Council and UNOLS in the Fall of 1986.

The UNOLS membership endorsed recommendation one that ARC subcommittees be established and that the name ALVIN Review Committee be retained. The membership also endorsed recommendation two for a major submersible science study to be initiated through ARC in 1986.

**International Restrictions to Ocean Sciences Committee Report.** Harris B. Stewart, Jr., IROSC Chairman, discussed two items: a survey of UNOLS institutions on procedures for obtaining clearances for foreign research together with identification of problems within those procedures, and the issuance of a *Handbook for International Operations of U.S. Scientific Research Vessels*.

The **Handbook for International Operations** was written by Lee R. Stevens as a task under the UNOLS Office support grant. The task was explicitly funded by the National Science Foundation under the grants OCE82-07326 and OCE85-00868, to the University of Washington.

The Handbook includes information on zones of jurisdiction, research activities for which consent (clearance) is required, when and how to seek consent and what kinds of vessels must have clearance under what conditions. Clearance request procedures are described in detail, with information on the responsibilities of operating institutions, principal investigators and masters, the content and conditions of requests, foreign observers and postcruise obligations. Appendices to the Handbook include a Law of the Sea context for marine scientific research, a checklist

for foreign clearances and appropriate Department of State *Notice to Research Vessel Operators*. The Handbook should prove very useful to any operator or investigator who anticipates participation in oceanographic research in waters under foreign jurisdiction. *Lee Stevens and others involved in producing this Handbook are to be commended.*

Harris Stewart had, for IROSC and at the request for the Advisory Council, undertaken a survey of UNOLS institutions to help define problems being experienced in obtaining clearances for research in foreign waters and with the process for obtaining foreign clearances.

A preliminary *Report to the UNOLS Advisory Council on Problems Encountered by the UNOLS Ship-operating Institutions in Obtaining Clearances to Work in Waters under Foreign Jurisdiction* had been presented to the Advisory Council and is appended to the minutes of their June 2, 1986 meeting (distributed separately). Based on returns from thirteen of nineteen institutions queried, denials of clearance requests are not the overriding problem. Only eight of 131 requests during 1984 and 1985 were denied. However, delays in the clearance request process and late receipt of clearances is a serious problem. Responses to the survey frequently cited instances wherein clearances were received only weeks or days prior to the scheduled start of the research. Some responses implied problems of a lack of communication within the clearance process. Instances which cited identified problems with individual clearances were not promptly relayed to investigators or institutions. The report also suggests that, especially since the Law of the Sea regime has expanded the current regime, the clearance request workload has dramatically increased so that a more efficient process is needed.

The report will be completed by securing the remaining responses and by reflecting discussions with agency officials.

There was brief discussion of the report with and among Member Institution representatives. Several representatives urged that the Office of Marine Science and Technology Affairs exercise better communication with Embassies, to impress on them the critical need for timely action on clearance requests. Another ocean community need is for up-to-date information on the receptiveness in various countries for clearance requests for U.S. ocean research.

**Clearance Requests for Research in Foreign Jurisdictions.** Tom Cocke reported for the Department of State, Office of Marine Science and Technology Affairs, on the Clearance Request Process for 1985. (This report was rescheduled on the agenda to continue themes introduced in the IROSC report.)

A *Summary of 1985 Clearance Requests* was provided (Appendix IX). The number of requests in 1985 was about 70% over 1984, to more than 250 requests. One reason: under the existing regime a research

cruise through the Caribbean can require separate clearance requests to as many as twelve countries.

Lead times for submission of clearance requests are perhaps the most serious current problem. Institutions and investigators are advised that they must allow at least one month for clearance request processing in addition to the published clearance request lead time (usually six months). In more and more instances foreign countries will not consider or grant permits that are not submitted with the full lead time.

Areas of special interest include Canada, where agreement has been reached to allow a straightforward clearance process.

Some confusion has existed concerning ocean research clearances for Venezuela. Mr. Cocke reported that the State Department is processing and submitting clearance requests for research in Venezuelan waters. In 1985 Venezuela did grant research permits, albeit with extraordinary conditions attached. (In discussion NSF representatives reported that their earlier advisory to UNOLS institutions and scientists was still in effect that proposals for research requiring Venezuelan clearance would continue to receive especially close scrutiny because clearance conditions might jeopardize the research.)

Visits and other participation by scientists from Scripps have helped in obtaining permits from Indonesia.

Less favorable developments: France has notified DOS that they require four months lead time on requests and Morocco has announced a six months requirement. Clearances from Mexico remain a problem. They are almost invariably granted only at the last minute, and there is rarely any advanced assurance that they will be granted.

Discussion centered on questions concerning specific individual clearance requests.

**U.S.-United Kingdom Cooperative Research Vessel Use.** John McMillan reported on the history and status of efforts at NSF to arrange research shiptime exchanges with the United Kingdom and France to allow investigators in those countries to have ship time in areas where their countries' vessels do not normally operate. Over the last three years agreements have been reached with IFREMER, France and NERC, United Kingdom whereby equivalent-value ship use can be exchanged without actually paying for the time.

In 1985, French investigators conducted a program on the CONRAD, and later a U.S. scientist worked off the French LE NROIT in the Mediterranean. During 1986-87 U.S. scientists will use the DARWIN in the Indian Ocean in exchange for U.K. scientists use of the WASHINGTON in the Western Pacific.



Mr. Christopher Adams, Operations Planning and Logistics Officer, Research Vessel Services, Natural Environmental Research Council for the U.K. endorsed efforts toward co-operative research vessel scheduling and arrangements for exchanging shiptime.

**UNOLS National Expeditionary Planning Committee.** George Shor, Chairman, UNEPC, reported that little of substance had been accomplished through the Committee over the past year. Concern over budget strictures and funding for both science and operations make all parties reluctant to describe out-year requirements on which to base advanced planning. Furthermore, earlier efforts to develop out-year plans haven't been completely successful. Earlier information had indicated that the Ocean Drilling Program would sponsor investigations in the Southwest Indian Ocean during 1986. UNOLS ships were available there, but no projects were funded. A ship was committed to support a Black Sea expedition during 1987, but to date, science funding decisions have not been reached.

*The Chairman, UNEPC, and the UNOLS Executive Committee have agreed that in the present circumstances the UNOLS Expeditionary Planning Committee is not serving a useful purpose. UNEPC will be inactive, at least for one year. At that time the need for the Committee and potential for a successful advanced planning function should be reappraised.*

**Fleet Replacement Committee Report.** Robertson P. Dinsmore, FRC Chairman, delivered the Committee's report, *A Plan for Improved Capability of the University Oceanographic Fleet, April, 1986*, and discussed FRC status and their *Plan*. He noted that the FRC had been an excellent group to work with, and had been very effective.

The Plan includes eight volumes:

Plan for Improved Capability of the University  
Oceanographic Research Fleet;  
Science Mission Requirements for New  
Oceanographic Ships;  
Summary of Conceptual Designs of  
New Oceanographic Ships; and  
Eight Reports of Individual  
New Ship Design Studies

The Committee had earlier submitted the *Plan, A Summary* (Appendix X), by letter to the UNOLS Chairman and Membership (Appendix XI). The *Plan*, although it is a comprehensive report on the first phase of UNOLS fleet improvement, should be considered as a dynamic document. In particular, efforts should be continued toward *continued refinement of science mission requirements, initiation of conceptual designs for intermediate, coastal and special vessels, further refinement of at least two conceptual designs for large vessels (a SWATH and a medium endurance)*. A UNOLS committee should continue to act as focus of activities toward realizing an improved UNOLS fleet.

UNOLS members, in active discussion, raised questions:

Commitment to a relatively untried design such as a SWATH represents a risk? Is that risk acceptable?

Is it reasonable to advocate an improved fleet of larger, more expensive ships, still with about the same number of ships as in the existing fleet?

Is progress being made on a coordinated federal agency (i.e., NSF and Navy) approach to funding construction of a new fleet?

Captain Dinsmore responded that the FRC had recognized that the SWATH concept is innovative but that solid conceptual and developmental work was in hand, and the FRC stands by its endorsement.

The number and mix of ships in the plan for an improved fleet represents broad community input and the FRC's best estimate. The number of ships in the improved fleet should be subject to continuing assessment.

The FRC has been working with the Navy in the planning for early construction of the first ship. The plan is also consistent with NSF long-range ocean research plans.

Fleet replacement Committee recommendations (see Appendix XI) had been discussed with the UNOLS Executive committee and the Advisory Council. As a result of these consultations, the following was presented to UNOLS:

RECOMMENDATION ON CONTINUATION  
OF THE FLEET REPLACEMENT COMMITTEE

1. **Noting** the submission by the UNOLS Fleet Replacement Committee of its Report, "A Plan for Improved Capability of the University Oceanographic Research Fleet," UNOLS **hereby** endorses in principle the plan set forth in the report.

2. **Further Noting** the recommendations by the Committee for a continuing effort toward planning for improvements of the UNOLS Fleet as set forth in the Chairman's letter of 20 May, 1986, **hereby** endorses those recommendations.

3. Specifically, the Advisory Council proposes the following change to a new **UNOLS FLEET IMPROVEMENT COMMITTEE** to continue the work of the Fleet Replacement Committee.

- a. Amplify and update the UNOLS Fleet Improvement Plan in accordance with continuing efforts, new information and changing circumstances.
- b. Continue the planning effort to include the roles, scientific mission requirements, and conceptual

designs for smaller vessels and innovative platforms.

- c. In the case of the larger research vessels, two of the existing new concept designs should be carried into a more detailed design phase. Specifically, the SWATH ship by SSS Co. and the Medium Endurance Ship by Glosten Associates show exciting promise as innovative new research ships.
- d. The Committee should serve as a liaison activity and a source of information for Federal Agency Representatives working on behalf of the community in matters of planning for new ship construction and upgrading.

4. The new Committee shall comprise eight members of whom about half should come from the former FRC. Unless otherwise renewed, the Committee's term shall expire in June, 1989.

Approved by Advisory Council June 2, 1986

Adopted by UNOLS June 4, 1986

The UNOLS membership commended the Fleet Replacement Committee for their work and gave a vote of confidence for the Plan for Improved Capability.

**Commendation for Robert Wall.** Thomas Royer, University of Alaska, was recognized, to introduce a new matter:

As many of you know, Bob Wall will be leaving NSF this summer having served as Head of the Science Research Support Section since 1975.

This job is not a highly desirable one since it involves very little interaction with scientists and their research. Bob has worked well with NSF staff and has made things work. Perhaps most importantly he has inspired the highest level of professionalism in his staff. He has received several NSF awards and has been recognized by AGU as being "the champion of the peer review system".

I move that we extend our appreciation and thanks to Bob Wall for a job well done. I think that we view his departure with mixed emotion as we would a good shipmate leaving a ship in perilous times. We regret and maybe envy his departure but wish him well in his new endeavors in Maine.

The UNOLS membership endorsed the commendation and extended their appreciation to Robert Wall by acclamation.

**Outlook for FY-1986 and FY-1987 Ship and Program Support.** Reports from agency representatives.

Tom Aldrich, USGS Labs, Woods Hole reported that USGS ship operations funding for 1986 and 1987 was almost entirely



committed to GLORIA surveys conducted on United Kingdom ships. No UNOLS shiptime is expected. Tom Kelly, West Coast Marine Geology reported that the OSPREY conversion is still supported in principle, and that some equipment has been committed. Earlier USGS estimates of 90-use-days per year are probably optimistic.

Various UNOLS member representatives expressed concern over the trend toward use of facility support funds to foreign research vessels, especially from USGS programs. In response it was noted that those decisions were generally reached on economic bases. In addition, UNOLS institutions are sometimes constrained in competitive bid situations.

Charles Townsend reported that NOAA had 23 ships in operation, generally on reduced schedules. The OCEANOGRAPHER had been reactivated, at the expense of de-activating two smaller ships. Oceanographic research has high priority in NOAA fleet allocation. The DISCOVERER is being equipped with SEA BEAM, sea trials during June. The MT MITCHELL is being transferred to the West coast for most of 1986 at least.

Projections for 1987 are difficult. NOAA will operate from 11 to 23 ships.

Updated 1986 schedules were provided. (Information will be incorporated into UNOLS SHIP.SCHED bulletin boards.)

Information will also be provided on the new dynamic winch (designed to handle Kevlar) installed on the DISCOVERER.

NOAA project and other information were provided in an Office of Marine Operations NOAA Fleet Information Exchange (Appendix XII).

Hawley Thomas, Minerals Management Service, reported that G-R-H cuts has reduced the Environmental Studies FY-1986 budget 7% to \$25.192M. In FY-1987 proposed funding will be \$22.965M. Distribution would be Alaska \$9.0M, Atlantic \$2.3M, Gulf of Mexico \$3.4M, Pacific \$5-8M. An information sheet is Appendix XIII.

Keith Kaulum, ONR, introduced CDR Geoffrey Whiting who is representing the Chief of Naval Research concerning research vessel acquisition.

A recent Chief of Naval Operations Executive Board reviewed Navy plans for research and survey ships. Overhauls for KNORR and MELVILLE were approved for FY-1988 or FY-1989. Funds would not come from ship construction funds. The overhauls will include more than repowering and should result in like-new ships of excellent capability.

Rationale for the research fleet replacement effort is to respond to and take advantage of the Secretary of Navy's initiative, and to address the fleet obsolescence.

AGOR-23 funds were exempted from G-R-H cuts. The vessel is funded at \$33M. The procurement process is on track, with the Request for Proposals expected in July 1986. Response would be due in February 1987, with a contract in June.

A two-ship buy is planned under the SENCAV initiative to replace the oceanographic fleet. Cost estimates exceed \$100M, to provide two ships of greater capabilities than AGOR-23.

In response to a question, "On What basis will the ship (AGOR-23) be assigned?", Mr. Kaulum responded that ONR is working with NSF and will develop an open system to select the operating institution. AGOR-23 will replace one of the three AGOR-3's now in the UNOLS fleet.

ONR expects that ocean science and ship operations support in FY-1987 will be level, with possible addition of support to a U.K. ship in the south Atlantic.

Don Heinrichs, NSF, advised that the broad perspective of Foundation and Geosciences Directorate outlook would be provided in William Merrell's principal address.

Concerning FY-1986 and FY-1987 budgets end results of G-R-H process:

	Actual 1985	Requested 1986	Actual 1986	Requested 1987
OFS (ship ops)	\$29.1M	\$29.5M	\$28.1M	\$30.5M
Shipboard equipment, instrumentation, etc.	5.8M		5.6M	7.2M

Although the 1987 request had Congressional Committee approval, a level between that for 1986 and a 4.8% (inflation) increase seems most likely.

Ship operations are supporting all funded science.

NSF is pleased and happy with the Navy's success in getting new research ships: two new ships and the overhauled KNORR and MELVILLE. NSF plans are expressed in the OCE Advisory Committee Long Range Plan. The 1986 update, available later in the month, will amplify ocean program facility needs (ocean technology and ship operations, fleet upgrade). The Long Range Plan is consistent with the Fleet Replacement Committee's plan and coupled with Navy efforts for new ships. The NSF plan identifies acquisition of two intermediate and one large ship in the early 1990's. Total cost is estimated at \$120M.

The Ocean Drilling Program and its interactions with the UNOLS fleet were discussed.

The membership was advised that Lee Stevens is aboard assisting John McMillan.

**William J. Merrell, Assistant Director for Geosciences, National Science Foundation, provided the principal address.** He discussed trends in Federal research and development funding, inflation and other economic issues, NSF's planning environment, funding distribution and trends, the reorganization that resulted in the Geosciences Directorate, GEO/OCE funding trends, thrusts in 1987, long-range plans and outlook.

The agency environment for science funding stresses:

- . economic competitiveness,
- . fostering R & D infrastructure,
- . fairness,
- . changing culture of the research enterprise,
- . leveraging and willingness to change (with limited resources).

The Director, Erich Bloch, has emphasized the NSF commitment to basic research and the need for an atmosphere of economic competitiveness.

The NSF Budget (from the President's budget):

\$BILLION			
FY-1985	FY-1986	FY-1987	FY-1988
1.346	1.334	1.508	+13%

The total U.S. R&D budget exceeds \$49B/year. In comparison with other industrialized nations (e.g., western Europe, Japan) the U.S. has very strong R&D support, the highest of all as a percentage of national labor force. The national investment in R&D is perhaps too constrained, to government, especially Federal programs.

Prior to reorganization, the Directorate for Astronomical, Atmospheric, Earth and Ocean Sciences (AAEO) was the largest (about \$500M), OCE was the largest Division (\$134M) followed by DPP (\$117M). A rationale for the reorganization that resulted in the Geosciences Directorate was to achieve an alignment suitable for managing large interdisciplinary geoscience projects. Coincidentally, it resulted in Geoscience as the second largest NSF Directorate.

NSF provides much of the Federal support for geosciences research and development:

Atmospheric sciences	60%
Earth sciences	70%
Ocean sciences	60%
Arctic	15-20%
Antarctic	99%



Is this healthy, or perhaps too dominant for a single agency? Federal support for geosciences research and development should be extended to ONR, NASA, NOAA, USGS and DOE.

Recent budgets reveal disturbing trends in funding for GEO(\$M):

	84	85	85/84	86	86/85
Atmos Sci					
Earth Sci					
OCE	114.28	120.53	+5/5%	119.44	-0.9%
Arctic					
GEO	251	268	+6.9%	265	-1.0%

OCE's budget request for 1987 is \$133.7M, up \$14.3M (12.0%) over 1986. That request has held through House and Senate Committees. Accounting for inflation, 1987 funding is down from 1984. As a result of these funding strictures GEO faces two related problems: the rejection rate for fundable science proposals is high and rising, and the size of individual science grants has fallen to about the minimum for effective research.

The principles guiding GEO science funding decisions include:

protect excellence	relevance
human resources	timeliness
advance technology	continuity

In summary: GEO/OCE now have a large share of NSF resources. GEO science initiatives address global issues of great social and economic import. GEO infrastructure thrusts provide a technological base for cutting edge research.

Chairman Webster thanked Dr. Merrell for his far-ranging address.

**East-West Ship Scheduling.** Robertson P. Dinsmore, Chairman, East Coast Scheduling Group, reported on recent scheduling meeting for both Brian Lewis, Chairman, West Coast Group, and himself. The report of their individual and joint meetings is Appendix XIV.

The compelling factor in scheduling the UNOLS fleet for 1987 is that serious budget strictures produce a shortfall between available operating funds and estimated operating costs. This raises the potential for some ship lay-ups in 1987.

Efforts to achieve timely science funding decisions for ship scheduling purposes have been effective; 60-65% of the ship use shown on tentative schedules is for science already funded. This is gratifying. Nevertheless, some individual ships submitted schedules heavily depend on science project decisions not yet recorded.

Furthermore, the combined fleet schedule for 1987 estimates a total of 5,754 ship-use days. This is strikingly similar to the

1986 projection made at this time last year (5,757 days). It represents about the full capacity of the fleet. Agency representatives estimate that funded science requirements in 1987 will be about the same as in 1986, about 4,350 days. These differences related to a now-projected shortfall of \$9M, and the need for measures to reduce fleet costs. Profiles of funding for both 1986 and 1987 are in the tables below.

PROFILE OF FUNDING CYCLES						
\$Million						
	OP DAYS	NSF	ONR	OTHER	TOTAL	SHORT FALL
1984	4816	23.1	4.0	7.0	34.6	-
1985	4766	25.9	4.1	6.0	36.0	-
1986 COST PROJECTIONS						
	OP DAYS	NSF	ONR	OTHER	TOTAL	SHORT FALL
March 1985	5700	32.0	5.4	3.8	41.2	-
May 1985 (Anticipated)	5757	32.2 (26.0)	5.8 (4.2)	4.8 (3.8)	42.8 (34.6)	- (8.2)
October 1985 (Anticipated)	5310	31.2 (25.5)	4.8 (4.8)	5.8 (5.8)	41.8 (36.1)	- (5.7)
March 1986 (Anticipated)	4502	26.6 (25.0)	5.0 (5.0)	3.3 (3.3)	34.9 (33.3)	- (1.6)
June 1986 (Anticipated)	4370	26.4 (25.0)	4.3 (4.3)	3.3 (3.3)	33.8 (32.6)	- (1.2)

The estimate of 1986 operating days is now 4,370, contrasted with the 4,502 days reported in March, 1986. Fleet cost projections (\$33.8M) continue to converge with the estimate of funds

available. The remaining shortfall is the subject of continuing negotiations between NSF/OCFS and individual UNOLS institutions.

SUMMARY OF 1987 COST PROJECTIONS  
\$Millions

	OP DAYS	COSTS			TOTAL
		NSF	ONR	OTHER	
<b>JUNE, 1986 PROJECTIONS</b>					
East	3211	18.532	2.469	1.473	22.473
West	2545	16.443	1.081	1.620	19.144
Total	5756	34.975	3.550	3.093	41.617
(Anticipated)		25.9*	3.6	3.1	32.6
Projected Shortfall		9.1	-	-	9.1
<b>MARCH, 1986 PROJECTIONS</b>					
East	3203	18.474	2.927	1.677	23.078
West	2589	17.461	1.270	1.427	20.159
Total	5792	35.935	4.197	3.104	43.237
(Anticipated)		26.2**	4.2	3.1	33.5
Projected Shortfall		9.7	-	-	9.7

\*Funds anticipated (June, 1986) from NSF are estimated on the basis of information provided by NSF officials: OCFS (worst case) \$24.7M, Ocean Drilling Program, \$1.2M.

\*\*Funds anticipated (March, 1986) from NSF included most optimistic OCFS projection: \$26.2M.

A subject of concern is the continuing reduction of ship use sponsored by Federal agencies other than NSF. For 1987, ONR is at its lowest point in years. Furthermore, other agencies (USCG, DOE, MMS, NOAA) has dropped from \$6-7M in 1984 and 1985 to \$3.6M in 1986 and a projected \$3.1M for 1987.



Recommendations. The Chairmen of the Joint Scheduling Group made the following recommendations:

1. R/V KNORR has a proposed 1987 schedule which depends almost totally on science funding decisions to be made relating to proposed Black Sea Projects. It is unfortunate that these decisions have not been made for an expedition which has been the initial focus of UNEPP and several years in the planning. Nevertheless, unless science project funding assures a viable Black Sea and Mediterranean Cruise, KNORR should be considered for lay-up during all or most of 1987.
2. Based on scheduling and funding information available June 3, 1986, three West Coast ships, the MELVILLE, OSPREY and THOMPSON should be scrutinized as potential candidates for lay-up in 1987. More explicit recommendations should await science funding decisions still pending.
3. R/V's ENDEAVOR, GYRE, ISELIN and OCEANUS show proposed schedules which could reasonably be accomplished on three ships operating with one ship laid up for all or part of 1987. Of the 142 cruise days shown by the GYRE schedule, 94 are in the Gulf of Maine. This deployment could be reassigned to other ships, leaving the GYRE schedule sufficiently flexible for consideration of a full or partial lay-up in 1987.
4. The recent and drastic cutbacks by "other" Federal Sponsoring Agencies, particularly by USGS and DOE gives cause for alarm. It is recommended that the work of the UNOLS Advisory Council include a study of the future roles of those Agencies and the potential impact on the UNOLS fleet.

Captain Thurman K. Treadwell, UNOLS representative from Texas A&M University, took exception to Recommendation #3 above, stating that it did not represent the views or vote of the East Coast Meeting, nor was it discussed. He specifically objected to singling out the GYRE from among the four ships as a candidate for lay-up. The Chairman of the East Coast Scheduling Group agreed that recommendations did not arise from a vote of the Group but were recommendations of the the Chairman taking into account information presented at the meetings.

Captain Treadwell objected to the Ship Schedule recommendations going forward as UNOLS recommendations. Discussion by various UNOLS members included some urging UNOLS endorsement, others suggesting that the recommendations be tabled. Chairman Webster ruled that the recommendations would be reported by UNOLS, as would Captain Treadwell's objection.

**Election of UNOLS Officers and Advisory Council Members.** A nominating Committee chaired by Charles Miller, Oregon State University had earlier developed and distributed a slate of candidates (Appendix XV).

Elections, held in accordance with the UNOLS Charter, resulted in the following:

Chairman, UNOLS	George Keller, Oregon State University
Vice Chairman, UNOLS	Robert W. Corell, University of New Hampshire
Advisory Council	
Member Representatives	Robertson P. Dinsmore, Woods Hole Oceanographic Institution
	Robert A. Knox, Scripps Institution of Oceanography
Associate Representative	Ken C. MacDonald, University of California, Santa Barbara

**Appointments to ALVIN Review Committee.** The ALVIN Review Committee had, at their May 1986 meeting, recommended reappointment of one member and one new member to replace a member whose term had expired.

By action of the assembled membership, UNOLS appointed to the ALVIN Review Committee:

James Eckman, Skidaway Institute of Oceanography

Daniel Karig, Cornell University (reappointment)

**Procedures for Reporting Surface and Subsurface Obstacles.** UNOLS had, for some time, been participating in procedures for reporting surface and subsurface obstacles deployed in research investigations (e.g., towed arrays, seismic sound sources, moorings). Recently the Navy Oceanography Command recommended to FOFCC more formal and expanded procedures. Some UNOLS members had suggested that the NOC recommendations were not entirely appropriate. It was questioned whether or not the Navy had the blanket jurisdiction implied in the recommendation. Furthermore, the procedures recommended might not be adequate when applied in some local situations.

The sense of the UNOLS membership was that the Executive Secretary should inform the FOFCC's Coordinating Committee that UNOLS did not agree that the recommendations were appropriate. He should work with the Coordinating Board to develop recommended procedures appropriate for UNOLS ship operations.

**There being no other business, the UNOLS Semiannual Meeting was adjourned.**



# UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

## SEMIANNUAL MEETING AGENDA

0830 Wednesday, June 4, 1986

National Trust for Historic Preservation  
1785 Massachusetts Avenue NW  
Washington, D.C. 20036

INTRODUCTION AND WELCOME - *Ferris Webster, Chairman, UNOLS*

CHAIRMAN'S REPORT - *Ferris Webster*

UNOLS ADVISORY COUNCIL REPORT - *Charles Miller, Advisory Council Chairman*

ALVIN REVIEW COMMITTEE REPORT - *Robert Corell, Chairman*

INTERNATIONAL RESTRICTIONS TO OCEAN SCIENCE COMMITTEE REPORT - *Harris B. Stewart, Chairman*

UNOLS NATIONAL EXPEDITIONARY PLANNING PROCESS COMMITTEE REPORT - *George Shor, Jr., Chairman*

FLEET REPLACEMENT COMMITTEE REPORT - *Robertson P. Dinsmore, Chairman*

EAST WEST SHIP SCHEDULING - *A joint report on progress in developing schedules for 1987 and Scheduling Group recommendations for UNOLS considerations.*

AN ADDRESS TO UNOLS - *William J. Merrell, Assistant Director for Geosciences, National Science Foundation, will address the UNOLS membership on matters of interest to UNOLS, the ocean science community and NSF. (This address will be at 1:30 p.m.)*

OUTLOOK FOR FY-1986 AND FY-1987 SHIP AND PROGRAM SUPPORT - *Forecasts by Federal Funding Agencies (NSF, ONR, MMS, USGS, NOAA, DOE).*

U.S.-U.K. COOPERATION IN RESEARCH VESSEL USE - *Frank P. Verdon, Research Vessel Services, United Kingdom, has been invited to attend the UNOLS meeting and to address members on the U.K. system for research vessel scheduling and operation, and on the status of efforts toward cooperative U.S.-U.K. research vessel use.*

CLEARANCES FOR RESEARCH IN OCEAN REGIONS RESTRICTED BY FOREIGN STATES - *An overview from the Department of State, Office of Marine Science and Technology Affairs.*

### UNOLS BUSINESS MEETING

ELECTIONS OF UNOLS CHAIR AND VICE-CHAIR - *Slates of Nominations have been distributed.*

ELECTION OF THREE MEMBERS TO ADVISORY COUNCIL - *The terms of two Advisory Council members from Member Institutions and one from Associate Members expire. Slates of Nominations have been distributed.*

APPOINTMENT OF TWO MEMBERS TO ALVIN REVIEW COMMITTEE - *Recommendations for the ALVIN Review Committee will be presented for UNOLS action.*

PROCEDURES FOR REPORTING SURFACE AND SUBSURFACE OBSTACLES - *UNOLS has been participating in procedures for reporting surface and subsurface obstacles, etc. (through a point of contact in the Defense Mapping Agency, thence to Notice-to-Mariners). Recently, recommendations have been made by the Navy Oceanography Command for presentation to the Federal Oceanographic Fleet Coordinating Council that would modify and expand these procedures. Some UNOLS members have questioned whether certain aspects of the recommendations are appropriate. A preliminary discussion will be held for developing UNOLS position/policy.*

OTHER BUSINESS - *Issues and recommendations as might be introduced by the Advisory Council, committees, sponsors, or the membership.*

*The order of items on the agenda may be rearranged to speed things along toward a hoped-for mid-afternoon adjournment.*





ATTENDANCE  
UNOLS SEMIANNUAL MEETING  
Washington, DC - June 4, 1986

APPENDIX II

Chris Adams, *Natural Environmental Research Council for the UK*  
Thomas C. Aldrich, *United States Geological Survey, Quissett Campus*  
Harry Stuart Barnes, *Bermuda Biological Station*  
John F. Bash, *University of Rhode Island*  
Alfred M. Beeton, *University of Michigan\**  
Donald F. Boesch, *Louisiana Universities Marine Consortium*  
Richard T. Buffler, *ODP, National Science Foundation*  
J. Frisbee Campbell, *Hawaii Institute of Geophysics\**  
W. Thomas Cocke, *OES/OMS, U.S. Dept. of State*  
Robert W. Corell, *University of New Hampshire*  
Bruce K. Cornwall, *CBI/Johns Hopkins University*  
James W. Coste, *University of Hawaii*  
Dolly Dieter, *University of Alaska*  
R. P. Dinsmore, *Woods Hole Oceanographic Institution*  
Robert Douglas, *University of Southern California\**  
John Ray Dudley, *Lamont-Doherty Geological Observatory*  
William Erb, *OMS/Technology Affairs, Dept. of State*  
George D. Grice, *Woods Hole Oceanographic Institution\**  
James J. Griffin, *University of Rhode Island\**  
Grant Gross, *DOS, National Science Foundation*  
Lawrence W. Harding, Jr., *Johns Hopkins University\**  
Donald F. Heinrichs, *OCF, National Science Foundation*  
Charles Helsley, *Hawaii Institute of Geophysics\**  
Emily M. Henager, *Texas A & M Research Foundation*  
Ron Hutchinson, *University of Miami\**  
Karl William Jeffers, *University of Washington*  
Thomas C. Johnson, *Duke/UNC Oceanographic Consortium*  
Robert S. Jones, *University of Texas Marine Science Institute*  
Jay T. Katz, *University of Michigan*  
Terry Lee Kelley, *United States Geological Survey*  
Brian T. R. Lewis, *University of Washington\**  
Wes Lovaas, *ONR/NSTL*  
Tom C. Malone, *University of Maryland*  
John H. Martin, *Moss Landing Marine Laboratories\**  
Barbara J. Martineau, *Woods Hole Oceanographic Institution*  
John G. McMillan, *National Science Foundation*  
David W. Menzel, *Skidaway Institute of Oceanography\**  
Charles B. Miller, *Oregon State University\**  
William A. Mitchell, *University of Texas at Austin\**  
Donald A. Moller, *Woods Hole Oceanographic Institution*  
Steve Rabalais, *Louisiana Universities Marine Consortium*  
Michael Rawson, *Lamont-Doherty Geological Observatory\**  
Thomas C. Royer, *University of Alaska\**  
Dieter Klaus Rudolph, *U.S. Naval Observatory*  
Dr. George Shor, Jr., *Scripps Institution of Oceanography\**  
Lee R. Stevens, *National Science Foundation*  
Harris B. Stewart, Jr., *Retired*  
Alexander L. Sutherland, *ODP, National Science Foundation*  
Phillip R. Taylor, *National Science Foundation*  
Carolyn Thoroughgood, *University of Delaware\**  
Charles K. Townsend, *NOAA/NOS*  
T. K. Treadwell, *Texas A & M University\**  
Joseph F. Ustach, *DUKE/UNC Oceanographic Consortium\**  
Ferris Webster, *University of Delaware*  
Richard W. West, *National Science Foundation*  
Geoffrey A. Whiting, *Office of Chief of Naval Research*  
Jim Williams, *Scripps Institution of Oceanography*  
Donald D. Winter, *OES/OMS, Dept. of State*

\*Member Representative

UNOLS DIRECTORY  
(with designated representatives)MEMBERS

- UNIVERSITY OF ALASKA  
*Dr. Thomas C. Royer*
- UNIVERSITY OF DELAWARE  
*Dr. Carolyn A. Thoroughgood*
- DUKE/UNIVERSITY OF NORTH CAROLINA  
*Dr. Dirk Frankenberg*
- UNIVERSITY OF HAWAII  
*Dr. Charles E. Helsley*
- THE JOHNS HOPKINS UNIVERSITY  
*Dr. Lawrence Harding*
- COLUMBIA UNIVERSITY, LAMONT-DOHERTY  
GEOLOGICAL OBSERVATORY  
*Dr. Dennis E. Hayes*
- UNIVERSITY OF MIAMI, ROSENSTIEL SCHOOL  
OF MARINE AND ATMOSPHERIC SCIENCE  
*Dr. John C. Van Leer*
- UNIVERSITY OF MICHIGAN, GREAT LAKES  
AND MARINE WATERS CENTER  
*Dr. Alfred M. Beeton*
- MOSS LANDING MARINE LABORATORIES  
*Dr. John H. Martin*
- OREGON STATE UNIVERSITY  
*Dr. Douglas Caldwell*
- UNIVERSITY OF RHODE ISLAND  
*Dr. James J. Griffin*
- UNIVERSITY OF CALIFORNIA, SAN DIEGO  
SCRIPPS INSTITUTION OF OCEANOGRAPHY  
*Dr. George G. Shor, Jr.*
- UNIVERSITY SYSTEM OF GEORGIA  
SKIDAWAY INSTITUTE OF OCEANOGRAPHY  
*Dr. David W. Menzel*
- UNIVERSITY OF SOUTHERN CALIFORNIA  
*Dr. Robert Douglas*
- UNIVERSITY OF TEXAS  
*Dr. Arthur E. Maxwell*
- TEXAS A & M UNIVERSITY  
*Captain T. K. Treadwell*
- UNIVERSITY OF WASHINGTON  
*Dr. Brian Lewis*
- WOODS HOLE OCEANOGRAPHIC INSTITUTION  
*Dr. George Grice*
- ASSOCIATE MEMBERS
- UNIVERSITY OF ALABAMA  
*Dr. George F. Crozier*
- BERMUDA BIOLOGICAL STATION  
*Dr. Wolfgang E. Sterrer*
- BIGELOW LABORATORY FOR OCEAN SCIENCES  
*Dr. Charles S. Yentsch*
- BROOKHAVEN NATIONAL LABORATORY  
*Dr. Terry E. Whitledge*
- UNIVERSITY OF CALIFORNIA, SANTA  
BARBARA  
*Dr. Bruce H. Robison*
- CAPE FEAR TECHNICAL INSTITUTE  
*Mr. Edward Foss*
- UNIVERSITY OF CONNECTICUT  
*Dr. Donald F. Squires*
- FLORIDA INSTITUTE FOR OCEANOGRAPHY  
*Dr. William W. Behrens*
- FLORIDA INSTITUTE OF TECHNOLOGY  
*Mr. Jack Morton*
- FLORIDA STATE UNIVERSITY  
*Dr. Ya Hsueh*
- HARBOR BRANCH OCEANOGRAPHIC INSTITUTION  
*Dr. Jay Langfelder*
- HARVARD UNIVERSITY  
*Dr. Alan Robinson*
- HOBART & WILLIAM SMITH COLLEGES  
*Mr. F. Richard Wilkins*
- LEHIGH UNIVERSITY  
*Dr. Bobb Carson*
- LOUISIANA UNIVERSITIES MARINE CONSORTIUM  
*Dr. Donald F. Boesch*
- UNIVERSITY OF MAINE  
*Dr. Bernard J. McAlice*
- MARINE SCIENCE CONSORTIUM  
*Dr. Robert W. Hinds*
- UNIVERSITY OF MARYLAND  
*Dr. Ian Morris*
- MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
*Dr. John M. Edmond*
- NAVAL POSTGRADUATE SCHOOL  
*Dr. Christopher N. K. Mooers*
- UNIVERSITY OF NEW HAMPSHIRE  
*Professor E. Eugene Allmendinger*
- NEW YORK STATE UNIVERSITY COLLEGE  
AT BUFFALO
- NEW YORK STATE UNIVERSITY  
AT STONY BROOK  
*Dr. J.R. Schubel*
- NORTH CAROLINA STATE UNIVERSITY  
*Dr. Robert H. Weisberg*
- UNIVERSITY OF NORTH CAROLINA AT  
WILMINGTON  
*Dr. Robert Y. George*
- NOVA UNIVERSITY  
*Dr. Julian P. McCreary*
- OCCIDENTAL COLLEGE  
*Dr. John S. Stephens, Jr.*
- OLD DOMINION UNIVERSITY  
*Dr. William M. Dunstan*
- UNIVERSITY OF PUERTO RICO  
*Dr. Thomas Tosteson*
- SAN DIEGO STATE UNIVERSITY  
*Dr. Clive Dorman*
- SEA EDUCATION ASSOCIATION  
*Dr. Susan E. Humphris*
- UNIVERSITY OF SOUTH CAROLINA  
*Dr. Robert Thunell*
- UNIVERSITY OF SOUTH FLORIDA  
*Dr. Peter R. Betzer*
- VIRGINIA INSTITUTE OF MARINE SCIENCE  
*Dr. John M. Ziegler*
- WALLA WALLA COLLEGE  
*Dr. Lawrence McCloskey*
- UNIVERSITY OF WISCONSIN AT MADISON  
*Dr. Robert A. Ragotzkie*
- UNIVERSITY OF WISCONSIN AT MILWAUKEE  
*Dr. David N. Edgington*
- UNIVERSITY OF WISCONSIN AT SUPERIOR  
*Ms. Mary Balcer*

THE UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM  
LIST OF RESEARCH VESSELS (>20H) OPERATED BY UNOLS INSTITUTIONS

8-86

OPERATOR	NAME	LOA (FT/M)	BUILT/ CONVERTED	NUMBER OF SCIENTISTS	OWNER	SHIP SCHEDULING CONTACT
University of Hawaii Hawaii Institute of Geophysics 2525 Correa Road Honolulu, Hawaii 96822	MOANA WAVE	213/65	1973/1984	20	NAVY	Mr. J. Frisbee Campbell Scientific Coordinator for Marine Operations (808) 948-7654
University of Alaska Institute of Marine Science Fairbanks, Alaska 99701	ALPHA HELIX	133/41	1966	15	NSF	Dr. Thomas Royer Associate Professor (907) 474-7835
University of Washington School of Oceanography, WB-10 Seattle, Washington 98195	T.G. THOMPSON C.A. BARNES	209/64 66/20	1965 1966/1984	22# 6	NAVY NSF	Dr. Brian T.R. Lewis Director (206) 543-6487
Oregon State University School of Oceanography Newport, Oregon 97365	WECOMA	177/54	1975	16	NSF	Captain Ken Palfrey Marine Superintendent (503) 867-3011
Moss Landing Marine Laboratories P.O. Box 223 Moss Landing, California 95039	POINT SUR	135/41	1981	12	NSF	Mr. Michael Prince Ship Scheduler (408) 633-3304
University of Southern California Inst. for Marine & Coastal Studies 820 South Seaside Avenue Terminal Island, California 90731	VELERO IV	110/34	1948/1972	12	USC	Mr. Don Newman, Mgr. Marine Support Facility (213) 830-4570
University of California, San Diego Scripps Institution of Oceanography La Jolla, California 92093	MELVILLE T. WASHINGTON NEW HORIZON R.G. SPROUL	245/75 209/64 170/52 125/38	1969 1965 1978 1981/1985	29 22 13 12	NAVY NAVY U.C. U.C.	Dr. George Shor, Jr. Ship Scheduler Code A-010 (619) 452-2840
University of Michigan Great Lakes & Marine Waters Center 2200 Bonisteel Boulevard Ann Arbor, Michigan 48109	LAURENTIAN	80/24	1974	8	U.MI.	Dr. Alfred Beeton Director (313) 763-3515
Texas A & M University Department of Oceanography College Station, Texas 77843	GYRE	182/54	1973	21	NAVY	Captain T.K. Treadwell Marine Operations Officer (409) 845-7211
The University of Texas 700 The Strand Galveston, Texas 77550	FRED MOORE	165/50	1967	20	U.T.	Mr. William H. Mitchell Marine Superintendent (409) 761-2276
University of Miami, RSMAS Oceanographic Facility 1620 Port Boulevard Miami, Florida 33132	ISELIN CALANUS	170/52 64/20	1972 1971	16 6	U.M. U.M.	Mr. Ronald Hutchinson Marine Operations (305) 373-3830
University System of Georgia Skidaway Institute of Oceanography P.O. Box 13687 Savannah, Georgia 31416-0687	BLUE FIN	72/22	1972/1975	8	U.G.	Dr. David W. Menzel Director (912) 356-2480
Duke/UNC Oceanographic Consortium Duke University Marine Laboratory Beaufort, North Carolina 28516	CAPE HATTERAS	135/41	1981	12	NSF	Captain Eric B. Nelson Marine Superintendent (919) 728-3372
The Johns Hopkins University Chesapeake Bay Institute Shady Side, Maryland 20764	R. WARFIELD	106/32	1967	10	J.H.U.	Mr. Bruce Cornwall Marine Superintendent (301) 867-7550, Ext. 246
University of Delaware College of Marine Studies 700 Pilottown Road Lewes, Delaware 19958	CAPE HENLOPEN	120/37	1976	12	U.D.	Mr. Wadsworth Owen Dir. of Marine Operations (302) 645-4320
Lamont-Doherty Geological Observatory Columbia University Palisades, New York 10964	CONRAD	209/64	1962	23	NAVY	Dr. Michael Rawson Marine Science Coordinator (914) 359-2900
University of Rhode Island Graduate School of Oceanography Narragansett, Rhode Island 02882	ENDEAVOR	177/54	1976	16	NSF	Mr. John F. Bash Marine Superintendent (401) 792-6203
Woods Hole Oceanographic Institution Woods Hole, Massachusetts 02543	KNORR ATLANTIS II OCEANUS DSRV ALVIN	245/75 210/64 177/54 25.8	1970 1963 1975 1964	24 29* 12 2	NAVY WHOI NSF NAVY	Ms. Barbara Martineau Marine Ops Administrator (617) 548-1400, Ext. 2450

\*20 Scientists (includes one medic)  
Plus 9 ALVIN group

#Includes one Marine Technician



## Marine Operations Contacts for

THE UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM  
LIST OF RESEARCH VESSELS (>20M) OPERATED BY UNOLS INSTITUTIONS

8-86

OPERATOR	NAME	LOA (FT/M)	BUILT/ CONVERTED	CREW	NUMBER OF SCIENTISTS	OWNER	MARINE OPERATIONS CONTACT
University of Hawaii Hawaii Institute of Geophysics 2525 Correa Road Honolulu, Hawaii 96822	MOANA WAVE	213/65	1973/1984	16	20	NAVY	Captain J. W. Coste Marine Superintendent (808) 847-2661
University of Alaska Institute of Marine Science P.O. Box 730 Seward, Alaska 99664	ALPHA HELIX	133/41	1966	9	15	NSF	Ms. E. R. Dieter Assoc. Dir. for Mar. Ops (907) 224-5261
University of Washington School of Oceanography, WB-10 Seattle, Washington 98195	T.G. THOMPSON C.A. BARNES	209/64 66/20	1965 1966/1983	22 2	22# 6	NAVY NSF	Captain William Jeffers Marine Superintendent (206) 543-5062
Oregon State University School of Oceanography Newport, Oregon 97365	WECOMA	177/54	1975	12	16	NSF	Captain Ken Palfrey Marine Superintendent (503) 867-3011
Moss Landing Marine Laboratories P.O. Box 223 Moss Landing, California 95039	POINT SUR	135/41	1981	9	12	NSF	Mr. Michael Prince Ship Scheduler (408) 633-3304
University of Southern California Marine Support Facility 820 South Seaside Avenue Terminal Island, CA 90731	VELERO IV	110/34	1948/1972	11	12	USC	Mr. Don Newman, Mgr. Marine Support Facility (213) 743-6977
University of California, San Diego Scripps Institution of Oceanography La Jolla, California 92093	MELVILLE T. WASHINGTON NEW HORIZON ROBERT SPROUL	245/75 209/64 170/52 125/38	1969 1965 1978 1981/1985	23 23 12 5	29 22 13 12	NAVY NAVY U.C. U.C.	Capt. Jim Williams Marine Facilities Code P-005 (619) 225-9600
University of Michigan Great Lakes & Marine Waters Center 2200 Bonisteel Boulevard Ann Arbor, Michigan 48109	LAURENTIAN	80/24	1974	6	8	U.M.I.	Dr. Alfred Beeton Director (313) 763-3515
Texas A & M University Department of Oceanography College Station, Texas 77843	GYRE	182/54	1973	11	21	NAVY	Captain T.K. Treadwell Marine Operations Officer (409) 845-7211
The University of Texas 700 The Strand Galveston, Texas 77550	FRED MOORE	165/50	1967	10	20	U.T.	Mr. William H. Mitchell Marine Superintendent (409) 761-2276
University of Miami, RSMAS Oceanographic Facility 1620 Port Boulevard Miami, Florida 33132	ISELIN CALANUS	170/52 64/20	1972 1971	12 2	16 6	U.M. U.M.	Mr. Ronald Hutchinson Operations Manager (305) 373-3830
University System of Georgia Skidaway Institute of Oceanography P.O. Box 13687 Savannah, Georgia 31416-0687	BLUE FIN	72/22	1972/1975	5	8	U.G.	Dr. David W. Menzel Director (912) 356-2480
Duke/UNC Oceanographic Consortium Duke University Marine Laboratory Beaufort, North Carolina 28516	CAPE HATTERAS	135/41	1981	10	12	NSF	Captain Eric B. Nelson Marine Superintendent (919) 728-3372
The Johns Hopkins University Chesapeake Bay Institute Shady Side, Maryland 20764	R. WARFIELD	106/32	1967	11	10	J.H.U.	Mr. Bruce Cornwall Marine Superintendent (301) 867-7550, Ext. 246
University of Delaware College of Marine Studies 700 Pilottown Road Lewes, Delaware 19958	CAPE HENLOPEN	120/37	1976	7	12	U.D.	Mr. Wadsworth Owen Dir. of Marine Operations (302) 645-4320
Lamont-Doherty Geological Observatory Columbia University Palisades, New York 10964	CONRAD	209/64	1962	23	23	NAVY	Captain John Dudley Marine Superintendent (914) 359-2900, Ext. 245
University of Rhode Island Graduate School of Oceanography Narragansett, Rhode Island 02882	ENDEAVOR	177/54	1976	12	16	NSF	Mr. John F. Bash Marine Superintendent (401) 792-6203
Woods Hole Oceanographic Institution Woods Hole, Massachusetts 02543	KNORR ATLANTIS II OCEANUS	245/75 210/64 177/54	1970 1963 1975	25 27 12	24 29* 12	NAVY WHOI NSF	Donald A. Moller Marine Ops Coordinator (617) 548-1400, Ext. 2277
				Totals	317	396	

\*20 Scientists (includes one medic)  
Plus 9 ALVIN group  
#Includes one marine technician

UNOLS ADVISORY COUNCIL

1971-1976. Comprised of four members from Member Institutions  
and three from Associate Members Institutions

1977. Charter Revision at Annual Meeting increased membership  
in the Advisory Council to eight - five from Member Institutions,  
and three from Associate Member Institutions. Three year term.

Term	Member	Term	Member
1971-1972	J. V. Byrne, OSU, Chairman	1979-1980	G. C. Anderson, U/WA, Chairman
	D. W. Menzel, SKIO		J. R. Schubel, SUNY/SB, V-Chairman
	R. A. Ragotzkie, U/WISC		G. H. Keller, OSU
	H. M. Stommel, MIT		B. H. Robison, USCB
	W. S. Wooster, SIO		H. T. Rossby, URI
	J. P. Craven, U/HAWAII		W. B. F. Ryan, L-DGO
	C. L. Drake, DARTMOUTH (resigned 1972)		R. L. Fisher, SIO
			J. M. Zeigler, VIMS
			T. K. Treadwell, TAMU, ex-officio
			J. H. Martin, MLML, ex-officio
1973-1974	J. V. Byrne, OSU, Chairman	1980-1981	G. C. Anderson, U/WA, Chairman
	J. P. Craven, U/HAWAII		H. T. Rossby, URI, V-Chairman
	D. W. Menzel, SKIO		B. H. Robison, USCB
	A. F. Richards, LEHIGH		C. B. Miller, OSU
	R. A. Ragotzkie, U/WISC		W. B. F. Ryan, L-DGO
	H. M. Stommel, MIT		W. M. Sackett, U/S FL
	P. L. Parker, U/TEXAS		D. W. Spencer, WHOI
	R. C. Dugdale, U/WA		J. M. Zeigler, VIMS
	R. Colwell, U/MARYLAND (Interim Appointee)		T. K. Treadwell, TAMU, ex-officio
			J. H. Martin, MLML, ex-officio
1974-1975	J. V. Byrne, SIO, Acting Chairman	1981-1982	B. H. Robison, UCSB, Chairman
	P. L. Parker, U/TEXAS		H. T. Rossby, URI, V-Chairman
	A. F. Richards, LEHIGH		R. W. Corell, UNH
	W. S. Richardson, NOVA U, Ch (deceased)		J. R. Curray, SIO
	R. J. Wold, U/WISC (resigned)		D. S. Gorsline, USC
	R. C. Dugdale, U/WA		C. B. Miller, OSU
	J. P. Craven, U/HAWAII		W. M. Sackett, U/S FL
			J. C. Van Leer, U/MIAMI
			D. W. Spencer, WHOI, ex-officio
			D. Frankenberg, UNC, ex-officio
1975-1976	R. C. Dugdale, BIGELOW, Chairman	1982-1983	B. H. Robison, UCSB, Chairman
	P. L. Parker, U/TEXAS		J. R. Curray, SCRIPPS, V-Chairman
	A. F. Richards, LEHIGH		R. W. Corell, UNH
	T. K. Treadwell, TAMU		C. B. Miller, OSU
	D. Hood, U/ALASKA		D. S. Gorsline, USC
	F. Webster, WHOI		W. B. Sackett, U/S FL
			J. C. Van Leer, U/MIAMI
			D. W. Spencer, WHOI, ex-officio
			D. Frankenberg, UNC, ex-officio
1976-1977	R. C. Dugdale, BIGELOW, Chairman	1983-1984	C. B. Miller, OSU, Chairman
	R. T. Barber, DUKE		H. B. Stewart, Jr., OLD DOMINION, V-CH
	D. Frankenberg, UNC		R. W. Corell, UNH
	M. G. Gross, JHU		R. P. Dinsmore, WHOI
	G. H. Keller, OSU		D. S. Gorsline, USC
	J. H. Martin, MLML		R. Larson, URI
	T. K. Treadwell, TAMU		B. H. Robison, UCSB
	W. S. Wooster, U/WA, ex-officio		J. C. Van Leer, U/MIAMI
	F. Webster, WHOI, ex-officio		F. Webster, U/DEL, ex-officio
			J. R. Curray, SCRIPPS, ex-officio
1977-1978	G. H. Keller, OSU, Chairman	1984-1985	C. B. Miller, OSU, Chairman
	D. Frankenberg, UNC, V-Chairman		H. B. Stewart, Jr., OLD DOMINION, V-CH
	R. T. Barber, DUKE		D. S. Gorsline, USC
	R. L. Fisher, SIO		R. P. Dinsmore, WHOI
	M. G. Gross, JHU		B. H. Robison, UCSB
	J. H. Martin, MLML		A. E. Maxwell, U/TX, Austin
	J. R. Schubel, SUNY		C. J. Lorenzen, U/WA
	T. K. Treadwell, TAMU		T. Malone, U/MD
	F. Webster, WHOI, ex-officio		F. Webster, U/DEL, ex-officio
	W. S. Wooster, U/WA, ex-officio		R. W. Corell, UNH, ex-officio
1978-1979	G. H. Keller, OSU, Chairman		
	R. T. Barber, DUKE, V-Chairman		
	G. C. Anderson, U/WA		
	R. L. Fisher, SIO		
	J. H. Martin, MLML		
	W. B. F. Ryan, L-DGO		
	J. R. Schubel, SUNY/STONY BROOK		
	J. M. Zeigler, VMS		
	T. K. Treadwell, TAMU, ex-officio		
	A. F. Richards, LEHIGH, ex-officio		

## 1985-1986

C. B. Miller, OSU, Chairman	7/80-6/86
T. Malone, UMD, V-Chairman	7/84-6/87
R. P. Dinsmore, WHOI	7/83-6/86
C. J. Lorenzen, U/WA	7/84-6/87
J. H. Martin, MLML	7/85-6/88
A. E. Maxwell, U/TX, Austin	7/84-6/87
C. N. Mooers, NPS	7/85-6/88
H. B. Stewart, Jr., OLD DOMINION	7/83-6/86
F. Webster, U/DEL, ex-officio	7/83-6/86 UNOLS CH
R. W. Corell, UNH, ex-officio	7/81/6/86 UNOLS V-CH

## 1986-1987

R. P. Dinsmore, WHOI	7/83-6/89
R. A. Knox, Scripps	7/86-6/89
C. D. Lorenzen, UWA	7/84-6/87
K. C. MacDonald, UCSB	7/86-6/89
J. H. Martin, MLML	7/85-6/88
T. Malone, UMD	7/84-6/87
A. E. Maxwell, U TX/Austin	7/84-6/87
C. N. Mooers, NPS	7/85-6/88
G. H. Keller, OSU, ex-officio	7/86-6/88 UNOLS CH
R. W. Corell, UNH, ex-officio	7/84-6/88 UNOLS V-CH



UNOLS Chairman and Vice-Chairman 7/86  
 Advisory Council Chairman and Vice-Chairman and Executive Secretary  
 (Executive Subcommittee consists of UNOLS Chairman and Vice-Chairman,  
 Advisory Council Chairman and Executive Secretary)

*May 1971-1972*

A.E. Maxwell, WHOI UNOLS CH  
 J. M. Savage, USC UNOLS V-CH.  
 J. V. Byrne, OSU A/C Ch.  
 R. P. Dinsmore, UNOLS E/S

*May 1972-1973*

A. E. Maxwell, WHOI UNOLS CH.  
 J. M. Savage, USC UNOLS V-CH.  
 J. V. Byrne, OSU A/C CH.  
 R. P. Dinsmore, UNOLS E/S

*May 1973-1974*

A. E. Maxwell, WHOI UNOLS CH.  
 J. M. Savage, USC UNOLS V-C  
 J. V. Byrne, OSU A/C CH.  
 R. P. Dinsmore, UNOLS E/S

*May 1974-1975*

J. A. Knauss, URI UNOLS CH.  
 G. C. Shor, SIO UNOLS V-CH.  
 R. C. Dugdale, BIGELOW A/C CH.  
 R. P. Dinsmore, UNOLS E/S

*May 1975-1976*

J. A. Knauss, URI UNOLS CH.  
 G. C. Shor, SIO UNOLS V-CH.  
 R. C. Dugdale, BIGELOW A/C CH.  
 R. P. Dinsmore, UNOLS E/S

*May 1976-1977*

W. S. Wooster, U/WA UNOLS CH.  
 T. F. Webster, WHOI UNOLS V-CH.  
 R. C. Dugdale, BIGELOW A/C CH.  
 T. R. Stetson, UNOLS E/S

*May 1977-1978*

W. S. Wooster, U/WA UNOLS CH.  
 T. F. Webster, WHOI UNOLS V-CH.  
 G. H. Keller, OSU A/C CH.  
 D. Frankenberg, UNC A/C V-CH.  
 T. R. Stetson, UNOLS E/S

*May 1978-1979*

T. K. Treadwell, TAMU UNOLS CH.  
 A. F. Richards, LEHIGH UNOLS V-CH.  
 G. H. Keller, OSU A/C CH.  
 R. T. Barber, DUKE A/C V-CH.  
 T. R. Stetson, UNOLS E/S

*May 1979-1980*

T. K. Treadwell, TAMU UNOLS CH.  
 J. H. Martin, MLML UNOLS V-CH.  
 G. C. Anderson, U/WA A/C CH.  
 H. T. Rossby, URI A/C V-CH.  
 T. R. Stetson, UNOLS E/S

*May 1980-1981*

T. K. Treadwell, TAMU UNOLS CH.  
 J. H. Martin, MLML UNOLS V-CH.  
 G. C. Anderson, U/WA A/C CH.  
 H. T. Rossby, URI A/C V-CH.  
 T. R. Stetson, UNOLS E/S

*May 1981-1982*

D. W. Spencer, WHOI UNOLS CH.  
 D. Frankenberg, UNC/CH UNOLS V-CH  
 B. H. Robison, UCSB A/C  
 H. T. Rossby, URI A/C V-CH.  
 T. R. Stetson, UNOLS E/S

*May 1982 -1983*

D. W. Spencer, WHOI UNOLS CH.  
 D. Frankenberg, UNC/CH UNOLS V-CH  
 B. H. Robison, UCSB A/C CH.  
 J. R. Curray, SCRIPPS A/C V-CH.  
 W. D. Barbee, UNOLS E/S

*May 1983-1984*

F. Webster, U/DEL UNOLS CH.  
 J. R. Curray, SCRIPPS UNOLS V-CH  
 C. B. Miller, OSU A/C CH.  
 W. D. Barbee, UNOLS E/S

*May 1985-1986*

F. Webster, U/DEL UNOLS CH.  
 R. W. Corell, UNH UNOLS V-CH  
 C. B. Miller, OSU A/C CH.  
 T. Malone, U/MD A/C V-CH.  
 W. B. Barbee, UNOLS E/S

*May 1986-1987*

G. H. Keller, OSU UNOLS CH.  
 R. W. Corell, UNH UNOLS V-CH  
 A/C CH  
 A/C V-CH  
 W. D. Barbee, UNOLS E/S

UNOLS RESEARCH VESSELS FLEET OPERATIONS - 1985 -

CRUISE DAYS PROFILES													05/29/86
AGENCY	PHYS OCEAN	ACCOU STICS	CHEM OCEAN	BIOL OCEAN	ENVIR ECOL	FISH INVST	CLIM METEO	GEOLO GEOPH	MAP CHRTG	OCEAN ENGRG	TRAIN ING	TRANS NONSCI	TOTAL -----
NATL SCIENCE FNDTN	702.0	.00	303.00	1272.00	73.00	21.00	11.00	915.00	.00	3.00	1.00	105.50	3406.50
OFF. NAVAL RESEARCH	119.0	.00	17.00	55.00	.00	.00	.00	211.50	.00	68.00	.00	8.00	478.50
U. S. GEOL. SURVEY	.0	.00	.00	.00	.00	.00	.00	38.00	.00	.00	.00	.00	38.00
MINERALS MNGT. SER.	26.0	.00	7.00	69.00	.00	.00	.00	61.00	.00	.00	.00	.00	163.00
NATL OCEAN/ATMOSPH	14.0	.00	.00	1.00	.00	.00	.00	30.00	.00	.00	.00	.00	45.00
DEPT. OF ENERGY	65.0	.00	9.00	60.00	.00	.00	.00	21.00	.00	.00	.00	.00	155.00
OTHER FEDERAL	.0	.00	4.00	12.00	.00	.00	.00	19.00	.00	22.00	.00	.00	57.00
STATE/MUNICIPAL	44.0	.00	26.00	61.00	16.00	1.00	.00	47.00	.00	1.00	38.00	11.00	245.00
OTHER/PRIVATE	18.0	.00	3.00	6.00	.00	.00	.00	135.00	.00	.00	.00	16.00	178.00
*****													
TOTALS	988.00	.00	369.00	1536.00	89.00	22.00	11.00	1477.50	.00	94.00	39.00	140.50	4766.00
PERCENT	20.73	.00	7.74	32.23	1.87	.46	.23	31.00	.00	1.97	.82	2.95	100.00

## CRUISE DAYS PROFILES

05/29/86

INSTITUTION	PHYS OCEAN	ACQV STICS	CHEM OCEAN	BIOL OCEAN	ENVIR ECOL	FISH INVS1	CLIM METEO	GEOLO GEOPH	MAP CHRTG	OCEAN ENGRG	TRAIN ING	TRANS NONSCI	TOTAL -----
UNIV. HAWAII	38.00	.00	.00	.00	.00	.00	.00	225.00	.00	.00	.00	38.00	301.00
UNIV. ALASKA	44.00	.00	5.00	98.00	.00	.00	.00	.00	.00	.00	2.00	.00	149.00
UNIV. WASHINGTON	196.00	.00	46.00	116.00	.00	.00	.00	50.00	.00	.00	.00	17.00	425.00
OREGON STATE UNIV.	34.00	.00	7.00	88.00	54.00	.00	.00	30.00	.00	.00	.00	.00	213.00
SCRIPPS INST. OCEAN	183.00	.00	60.00	219.00	.00	.00	.00	298.00	.00	45.00	2.00	28.00	835.00
UNIV. SO. CALIF.	.00	.00	14.00	67.00	.00	.00	.00	4.00	.00	.00	.00	.00	85.00
TEXAS A&M UNIV.	64.00	.00	65.00	12.00	.00	.00	.00	88.00	.00	.00	30.00	.00	259.00
UNIV. TEXAS	.00	.00	.00	.00	.00	.00	.00	44.00	.00	.00	.00	.00	44.00
UNIV. MIAMI, RSMAS	47.00	.00	60.00	222.00	.00	.00	.00	40.00	.00	.00	1.00	.00	370.00
UNIV GA., SKIDAWAY	32.00	.00	44.00	49.00	.00	.00	.00	5.00	.00	.00	.00	.00	130.00
DUKE UNIV/UNC	24.00	.00	.00	127.00	9.00	.00	11.00	61.00	.00	.00	1.00	.00	233.00
JOHNS HOPKINS UNIV.	24.00	.00	.00	87.00	.00	21.00	.00	.00	.00	.00	.00	.00	132.00
UNIV. DELAWARE	73.00	.00	18.00	70.00	.00	.00	.00	.00	.00	.00	.00	.00	161.00
LAMONT-DOHERTY GEOL	.00	.00	.00	.00	.00	.00	.00	354.50	.00	.00	.00	4.50	359.00
UNIV. RHODE ISLAND	121.00	.00	.00	80.00	.00	.00	.00	21.00	.00	.00	.00	18.00	240.00
WOODS HOLE OCEAN	96.00	.00	45.00	215.00	.00	.00	.00	255.00	.00	49.00	.00	35.00	695.00
UNIV. MICHIGAN	.00	.00	.00	23.00	.00	.00	.00	.00	.00	.00	1.00	.00	24.00
MOSS LANDING MAR LAB	12.00	.00	5.00	63.00	26.00	1.00	.00	2.00	.00	.00	2.00	.00	111.00
*****													
TOTALS	788.00	.00	369.00	1536.00	89.00	22.00	11.00	1477.50	.00	94.00	39.00	140.50	4766.00
PERCENT	20.73	.00	7.74	32.23	1.87	.46	.23	31.00	.00	1.97	.82	2.95	100.00



## CRUISE DAYS PROFILES

05/29/86

VESSEL	PHYS OCEAN	ACCOU STICS	CHEM OCEAN	BIOL OCEAN	ENVIR ECOL	FISH INVST	CLIM METEO	GEOLG GEOPH	MAP CHRTG	OCEAN ENGRG	TRAIN ING	TRANS NONSCI	TOTAL
MELVILLE	37.00	.00	38.00	103.00	.00	.00	.00	35.00	.00	45.00	.00	13.00	271.00
KNORR	37.00	.00	5.00	41.00	.00	.00	.00	65.00	.00	28.00	.00	9.00	185.00
ATLANTIS II	.00	.00	.00	67.00	.00	.00	.00	184.00	.00	21.00	.00	13.00	287.00
CONRAD	.00	.00	.00	.00	.00	.00	.00	354.50	.00	.00	.00	4.50	359.00
T. G. THOMPSON	196.00	.00	.00	21.00	.00	.00	.00	39.00	.00	.00	.00	16.00	272.00
T. WASHINGTON	40.00	.00	.00	.00	.00	.00	.00	186.00	.00	.00	.00	15.00	241.00
ENDEAVOR	121.00	.00	.00	80.00	.00	.00	.00	21.00	.00	.00	.00	18.00	240.00
OCEANUS	59.00	.00	40.00	105.00	.00	.00	.00	6.00	.00	.00	.00	13.00	223.00
WECOMA	34.00	.00	7.00	88.00	54.00	.00	.00	30.00	.00	.00	.00	.00	213.00
GYRE	64.00	.00	65.00	12.00	.00	.00	.00	88.00	.00	.00	30.00	.00	259.00
MOANA WAVE	38.00	.00	.00	.00	.00	.00	.00	225.00	.00	.00	.00	38.00	301.00
ISELIN	4.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	4.00
NEW HORIZON	64.00	.00	22.00	44.00	.00	.00	.00	65.00	.00	.00	.00	.00	195.00
FRED H. MOORE	.00	.00	.00	.00	.00	.00	.00	44.00	.00	.00	.00	.00	44.00
CAPE FLORIDA	31.00	.00	43.00	140.00	.00	.00	.00	4.00	.00	.00	.00	.00	218.00
CAPE HATTERAS	24.00	.00	.00	127.00	9.00	.00	11.00	61.00	.00	.00	1.00	.00	233.00
ALPHA HELIX	44.00	.00	5.00	98.00	.00	.00	.00	.00	.00	.00	2.00	.00	149.00
ROBERT G. SPROUL	42.00	.00	.00	72.00	.00	.00	.00	12.00	.00	.00	2.00	.00	128.00
CAPE HENLOPEN	73.00	.00	18.00	70.00	.00	.00	.00	.00	.00	.00	.00	.00	161.00
VELERO IV	.00	.00	14.00	67.00	.00	.00	.00	4.00	.00	.00	.00	.00	85.00
WARFIELD	24.00	.00	.00	87.00	.00	21.00	.00	.00	.00	.00	.00	.00	132.00
CAYUSE	12.00	.00	5.00	63.00	26.00	1.00	.00	2.00	.00	.00	2.00	.00	111.00
BLUE FIN	32.00	.00	44.00	49.00	.00	.00	.00	5.00	.00	.00	.00	.00	130.00
CLIFFORD BARNES	.00	.00	46.00	95.00	.00	.00	.00	11.00	.00	.00	.00	1.00	153.00
CALANUS	12.00	.00	17.00	82.00	.00	.00	.00	36.00	.00	.00	1.00	.00	148.00
LAURENTIAN	.00	.00	.00	23.00	.00	.00	.00	.00	.00	.00	1.00	.00	24.00
TOTALS	988.00	.00	369.00	1536.00	89.00	22.00	11.00	1477.50	.00	94.00	39.00	140.50	4766.00
PERCENT	20.73	.00	7.74	32.23	1.87	.46	.23	31.00	.00	1.97	.82	2.95	100.00



## OPERATIONAL DAYS CHARGED BY SPONSOR

05/29/86

INSTITUTION	NATL SCI. FNDTN	OFF. NAVAL RES.	U. S. GEOL SURV.	BUR. LAND MNGMT	NATL OCEAN ATMOS	DEPT OF ENRGY	OTHER FEDER FUNDS	STATE OR MUNIC	PRIV/ FORGN FUNDS	TOTALS
UNIV. HAWAII	189.00	.00	.00	9.00	2.00	.00	.00	11.00	90.00	301.00
UNIV. ALASKA	144.00	.00	.00	.00	.00	.00	.00	2.00	3.00	149.00
UNIV. WASHINGTON	361.00	40.00	2.00	.00	.00	.00	4.00	18.00	.00	425.00
OREGON STATE UNIV.	187.00	19.00	.00	7.00	.00	.00	.00	.00	.00	213.00
SCRIPPS INST. OCEAN	490.00	181.00	.00	.00	3.00	11.00	36.00	114.00	.00	835.00
UNIV. SO. CALIF.	81.00	.00	.00	.00	.00	.00	.00	4.00	.00	85.00
TEXAS A&M UNIV.	115.00	12.00	36.00	52.00	.00	.00	.00	44.00	.00	259.00
UNIV. TEXAS	29.00	.00	.00	.00	.00	.00	.00	11.00	8.00	44.00
UNIV. MIAMI, RSMAS	305.00	24.00	.00	.00	10.00	30.00	.00	1.00	.00	370.00
UNIV GA., SKIDAWAY	61.00	.00	.00	.00	1.00	63.00	5.00	.00	.00	130.00
DUKE UNIV/UNC	172.00	.00	.00	24.00	.00	27.00	.00	10.00	.00	233.00
JOHNS HOPKINS UNIV.	132.00	.00	.00	.00	.00	.00	.00	.00	.00	132.00
UNIV. DELAWARE	116.00	.00	.00	26.00	1.00	.00	.00	.00	18.00	161.00
LAMONT-DOHERTY GEOL.	242.50	65.50	.00	.00	.00	.00	.00	.00	51.00	359.00
UNIV. RHODE ISLAND	193.00	11.00	.00	.00	.00	24.00	12.00	.00	.00	240.00
WOODS HOLE OCEAN	509.00	110.00	.00	45.00	28.00	.00	.00	1.00	2.00	695.00
UNIV. MICHIGAN	24.00	.00	.00	.00	.00	.00	.00	.00	.00	24.00
MOSS LANDING MAR LAB	60.00	16.00	.00	.00	.00	.00	.00	29.00	6.00	111.00
*****										
TOTALS	3406.50	478.50	38.00	163.00	45.00	155.00	57.00	245.00	178.00	4766.00
PERCENT	71.5	10.0	.8	3.4	.9	3.3	1.2	5.1	3.7	100.0

189  
144  
361  
187  
490  
81  
60  
1512

## OPERATIONAL DAYS CHARGED BY SPONSOR

05/29/86

VESSEL	LOA	NATL SCI. FNDTN	OFF. NAVAL RES.	U. S. GEOLOGICAL SURV.	BUR. LAND MNGMT	NATL OCEAN ATMOS	DEPT OF ENRGY	OTHER FEDER FUNDS	STATE OR MUNIC	PRIV/ FORGN FUNDS	TOTALS -----
MELVILLE	245FT	222.00	22.00	.00	.00	3.00	.00	22.00	2.00	.00	271.00
KNORR	245FT	99.00	85.00	.00	.00	.00	.00	.00	.00	.00	185.00
ATLANTIS II	210FT	238.00	18.00	.00	.00	28.00	.00	.00	1.00	2.00	287.00
CONRAD	209FT	242.50	65.50	.00	.00	.00	.00	.00	.00	51.00	359.00
T. G. THOMPSON	209FT	232.00	40.00	.00	.00	.00	.00	.00	.00	.00	272.00
T. WASHINGTON	209FT	88.00	120.00	.00	.00	.00	.00	14.00	19.00	.00	241.00
ENDEAVOR	177FT	193.00	11.00	.00	.00	.00	24.00	12.00	.00	.00	240.00
OCEANUS	177FT	172.00	6.00	.00	45.00	.00	.00	.00	.00	.00	223.00
WECOMA	177FT	187.00	19.00	.00	7.00	.00	.00	.00	.00	.00	213.00
OYRE	174FT	115.00	12.00	36.00	52.00	.00	.00	.00	44.00	.00	259.00
MDANA WAVE	174FT	189.00	.00	.00	9.00	2.00	.00	.00	11.00	90.00	301.00
ISELIN	170FT	2.00	2.00	.00	.00	.00	.00	.00	.00	.00	4.00
NEW HORIZON	170FT	97.00	24.00	.00	.00	.00	11.00	.00	63.00	.00	195.00
FRED H. MOORE	168FT	28.00	.00	.00	.00	.00	.00	.00	11.00	8.00	44.00
CAPE FLORIDA	135FT	183.00	5.00	.00	.00	.00	30.00	.00	.00	.00	218.00
CAPE HATTERAS	135FT	172.00	.00	.00	24.00	.00	27.00	.00	10.00	.00	233.00
ALPHA HELIX	133FT	144.00	.00	.00	.00	.00	.00	.00	2.00	3.00	149.00
ROBERT G. SPROUL	125FT	83.00	15.00	.00	.00	.00	.00	.00	30.00	.00	128.00
CAPE HENLOPEN	120FT	116.00	.00	.00	26.00	1.00	.00	.00	.00	18.00	161.00
VELERO IV	110FT	81.00	.00	.00	.00	.00	.00	.00	4.00	.00	85.00
WARFIELD	105FT	132.00	.00	.00	.00	.00	.00	.00	.00	.00	132.00
CAYUSE	80FT	60.00	16.00	.00	.00	.00	.00	.00	29.00	6.00	111.00
BLUE FIN	72FT	51.00	.00	.00	.00	1.00	63.00	5.00	.00	.00	130.00
CLIFFORD BARNES	65FT	129.00	.00	2.00	.00	.00	.00	4.00	18.00	.00	153.00
CALANUS	64FT	120.00	17.00	.00	.00	10.00	.00	.00	1.00	.00	148.00
LAURENTIAN	60FT	24.00	.00	.00	.00	.00	.00	.00	.00	.00	24.00
TOTALS		3406.50	478.50	38.00	163.00	45.00	155.00	57.00	245.00	178.00	4766.00
PERCENT		71.5	10.0	.8	3.4	.9	3.3	1.2	5.1	3.7	100.0

PROJECT PERSON-DAYS AT SEA BY SPONSOR

05/29/86

VESSEL	LOA	TOTAL DAYS CHRGD	NATL SCI. FNDTN	OFF. NAVAL RES.	U. S. GEOL. SURV.	BUR. LAND MNGMT	NATL OCEAN ATMOS	DEPT. OF ENRGY	OTHER FEDER FUNDS	STATE OR MUNIC	PRIV/ FORGN FUNDS	TOTALS -----
MELVILLE	245	271.00	4430.00	616.00	.00	.00	48.00	.00	572.00	38.00	.00	5704.00
KNOX	245	185.00	1448.00	1721.00	.00	.00	.00	.00	.00	.00	.00	3169.00
ATLANTIS II	210	287.00	5281.00	432.00	.00	.00	700.00	.00	.00	.00	50.00	6463.00
CONRAD	209	359.00	3452.00	990.00	.00	.00	.00	.00	.00	.00	862.00	5304.00
T. G. THOMPSON	209	272.00	3600.00	352.00	.00	.00	.00	.00	.00	.00	.00	4032.00
T. WASHINGTON	209	241.00	1256.00	1816.00	.00	.00	.00	.00	112.00	190.00	.00	3374.00
ENDEAVOR	177	240.00	2020.00	148.00	.00	.00	.00	357.00	108.00	.00	.00	2633.00
OCEANUS	177	223.00	1630.00	42.00	.00	540.00	.00	.00	.00	.00	.00	2212.00
WECOMA	177	213.00	2784.00	295.00	.00	91.00	.00	.00	.00	.00	.00	3172.00
GYRE	174	259.00	1626.00	.00	540.00	624.00	.00	.00	.00	342.00	.00	3132.00
MOANA WAVE	174	301.00	2800.00	.00	.00	144.00	98.00	.00	.00	129.00	1551.00	4722.00
ISELIN	170	4.00	16.00	16.00	.00	.00	.00	.00	.00	.00	.00	32.00
NEW HORIZON	170	195.00	1203.00	402.00	.00	.00	.00	176.00	.00	843.00	.00	2624.00
FRED H. MOORE	165	44.00	275.00	.00	.00	.00	.00	.00	.00	237.00	120.00	632.00
CAPE FLORIDA	135	218.00	2111.00	60.00	.00	.00	.00	310.00	.00	.00	.00	2481.00
CAPE HATTERAS	135	233.00	2309.00	.00	.00	288.00	.00	316.00	.00	137.00	.00	3050.00
ALPHA HELIX	133	149.00	1511.00	.00	.00	.00	.00	.00	.00	26.00	24.00	1561.00
ROBERT G. SPROUL	125	128.00	665.00	150.00	.00	.00	.00	.00	.00	281.00	.00	1096.00
CAPE HENLOPEN	120	161.00	1095.00	.00	.00	180.00	22.00	.00	.00	.00	98.00	1395.00
VELERO IV	110	85.00	805.00	.00	.00	.00	.00	.00	.00	28.00	.00	833.00
WARFIELD	106	132.00	904.00	.00	.00	.00	.00	.00	.00	.00	.00	904.00
CAYUSE	080	111.00	555.00	84.00	.00	.00	.00	.00	.00	335.00	48.00	1022.00
BLUE FIN	072	130.00	79.00	.00	.00	.00	1.00	224.00	35.00	.00	.00	339.00
CLIFFORD BARNES	065	153.00	475.00	.00	6.00	.00	.00	.00	13.00	481.00	.00	975.00
CALANUS	064	148.00	656.00	84.00	.00	.00	40.00	.00	.00	10.00	.00	790.00
LAURENTIAN	080	24.00	127.00	.00	.00	.00	.00	.00	.00	.00	.00	127.00
*****												
TOTALS		4766.00	43195.00	7208.00	546.00	1867.00	909.00	1383.00	840.00	3077.00	2753.00	61778.00
PERCENT				48.0	11.7	0	2.0	1.5	2.2	1.4	5.0	100.0



## UNOLS CRUISE PARTICIPANTS AND AFFILIATIONS

05/29/86

SHIP	SOI	TECH	GRAD	STU/OBS	TOTAL	ASSOC	NON-UNOLS	FED	FRGN	TOTAL
MOANA WAVE	87	99	31	47	264	0	9	4	32	45
ALPHA HELIX	47	35	28	9	119	14	22	0	1	37
T. G. THOMPSON	29	80	23	2	134	5	5	5	2	17
CLIFFORD BARNES	46	59	97	251	453	0	1	2	0	3
WECOMA	46	51	39	35	171	21	17	3	22	63
MELVILLE	50	92	64	16	222	27	9	1	10	47
ROBERT G. SPROUL	44	56	65	30	195	7	16	0	2	25
NEW HORIZON	67	100	34	27	228	2	17	3	9	31
T. WASHINGTON	36	61	53	9	159	7	13	1	7	28
VELERO IV	64	21	28	12	125	42	7	0	0	49
GYRE	40	62	20	1	123	19	24	14	0	57
FRED H. MOORE	7	23	4	33	67	0	0	0	0	0
ISELIN	6	1	1	0	8	0	0	0	0	0
CAPE FLORIDA	76	56	38	2	172	33	31	8	1	73
CALANUS	53	18	24	9	104	49	7	6	0	62
BLUE FIN	76	110	34	3	223	0	0	0	0	0
CAPE HATTERAS	164	79	86	40	369	106	37	5	6	154
WARFIELD	74	106	19	51	250	85	18	0	0	103
CAPE HENLOPEN	45	100	58	23	226	21	37	2	0	60
CONRAD	77	104	23	14	218	0	15	5	13	33
ENDEAVOR	65	48	13	13	139	9	8	4	5	26
ATLANTIS II	106	151	42	10	309	25	45	3	23	96
KNORR	61	80	13	4	158	17	15	3	5	40
OCEANUS	45	82	22	3	152	21	45	1	1	68
LAURENTIAN	16	3	22	5	46	0	0	0	0	0
CAYUSE	67	51	138	90	346	8	94	8	0	110
*****										
TOTALS	1496	1728	1019	739	4982	518	492	78	139	1227
PERCENT	30.0	34.7	20.5	14.8	100.0	10.4	9.9	1.6	2.8	24.6



SUMMARY OF 1985 CLEARANCE REQUESTS

	<u>SHIP</u>	<u>COUNTRY(S)</u>	<u>RESEARCH PERIOD</u>
85-01	RESEARCHER <sup>1</sup>	Bahamas Haiti Dominican Republic France (Guadeloupe & Martinique) U.K. (Turks & Caicos, Montserrat) St. Kitts-Nevis Antigua and Barbuda St. Lucia Dominica St. Vincent and the Grenadines Grenada Venezuela Trinidad-Tobago Barbados	April-May 1985 August 1985
85-02	POWELL	Iceland <sup>2</sup>	May-September 1985
85-03	ENDEAVOR	Brazil	October-November 1985
85-04	WESTWARD	U.K. (Bermuda)	April-May 1985
85-05	ENDEAVOR	Canada Iceland Denmark (Greenland)	August-September 1985
85-06	ALBATROSS IV	Canada	May-June 1985
85-07	NMFS (Shrimp tagging)	Mexico <sup>3</sup>	May 1985
85-08	WHITING	Bahamas <sup>4</sup>	March-May 1985
85-09	GLORIA MICHELLE JOHNSON/SEA LINK	Canada <sup>5</sup>	April-May 1985 July 1985
85-10	SEAHAWK	U.K. (Bermuda)	May-June 1985
85-11	SPROUL NEW HORIZON	Mexico <sup>6</sup>	July 1985
85-12	MOANA WAVE	Ecuador Kiribati	June-July 1985

85-13	HARKNESS	U.K. (Diego Garcia)	April 1985-April 1987
85-14	GYRE	Canada	July 1985
85-15	HARKNESS	Oman	August-September 1985
85-16	POWELL <sup>7</sup>	Bahamas U.K. (BVI, Anguilla, Montserrat) Antigua and Barbuda St. Kitts-Nevis France (Martinique, Guadeloupe, etc.) Netherlands (Antilles Islands) Dominica St. Lucia St. Vincent and the Grenadines Grenada Barbados	March 1985-March 1987
85-17	BARNES	Canada	July & August 1985
85-18	NOS (Hydro Survey)	Canada	May-October 1985
85-19	CONRAD	Colombia Ecuador	May 1985
85-20	CAPE FLORIDA	France (Martinique, Guadeloupe) Antigua and Barbuda St. Kitts-Nevis U.K. (Montserrat) Dominica St. Lucia St. Vincent and the Grenadines	August-September 1985
85-21	NRL (Aircraft) <sup>8</sup>	France (Fr. Guiana, Martinique, Guadeloupe) Antigua and Barbuda Dominica St. Lucia St. Vincent and the Grenadines Grenada Barbados Trinidad-Tobago Venezuela Suriname Guyana Brazil	March-April 1985

85-22	WESTWARD	Canada U.K. (Bermuda)	May-July 1985
85-23	THOMPSON <sup>9</sup>	Papua New Guinea	June-July 1985
85-24	SEWARD JOHNSON	Canada	June 1985
85-25	NOS (Hydro survey)	Canada	June-November 1985
85-26	POLAR DUKE	U.K. (So. Georgia Is.)	May-June 1985
85-27	WESTWARD	Canada	July-August 1985
85-28	THOMAS WASHINGTON <sup>10</sup>	Mexico	November-December 1985
85-29	DISCOVERER	France (Clipperton Is.)	May-June 1985
85-30	THOMAS WASHINGTON <sup>11</sup>	Australia New Zealand Fiji Tonga France (New Caledonia) Vanuata	February-March 1985
85-31	THOMAS WASHINGTON <sup>12</sup>	Tonga	December 1985-Jan 1986
85-32	MARATHON (Charter) <sup>13</sup>	Canada	May 1985
85-33	SURVEYOR	Canada	May-July 1985
85-34	THOMPSON	Japan	November-December 1985
85-35	PACIFIC STATES I (Charter)	Mexico <sup>14</sup>	September 1985
85-36	TOHITIKA (Charter) <sup>15</sup>	France (Fr. Polynesia) Kiribati	April 1985
85-37	POWELL	Bahamas	April 1985
85-38	DELAWARE II	Canada	June 1985
85-39	CAPE HATTERAS	Canada	June-July 1985
85-40	NRL (Aircraft)	France (Fr. Guiana) Guyana Brazil Barbados	May 1985

85-41	DE STEIGUER	Mexico <sup>16</sup>	October-November 1985
85-42	DMA/NAVOCEANO (Contractor Hydro Surveys)	Oman <sup>17</sup>	October 85-October 86
85-43	ENDEAVOR <sup>18</sup>	Brazil	December 85-January 86
85-44	NAI'A II (Charter)	Mexico <sup>19</sup>	November 85-April 86
85-45	ALBATROSS IV	Canada	July 1985
85-46	RESEARCHER	Bahamas	May-June 1985
85-47	THOMPSON	Japan	July 1985
85-48	KNORR	Guyana Barbados Trinidad-Tobago <sup>20</sup>	October-December 1985
85-49	DELAWARE II	Canada	July 1985
85-50	CAPE HENLOPEN	Canada	July 1985
85-51	POWELL	Canada	July-August 1985
85-52	NEREID SEAFARER (Charter)	Canada	July-October 1985
85-53	ALBATROSS IV	Canada	July-August 1985
85-54	SPROUL	Canada <sup>21</sup>	June-July 1985
85-55	SEWARD JOHNSON	Canada	July-August 1985
85-56	Marine Mammal Research (Heath)	Mexico <sup>22</sup>	June-July 1985
85-57	NEW HORIZON	Mexico <sup>23</sup>	May-June 1985
85-58	DELAWARE II	Canada	August-September 1985
85-59	OCEANUS	Mauritania <sup>24</sup>	August-September 1985
85-60	WESTWARD	U.K. (Bermuda) Antigua & Barbuda France (Martinique & Guadeloupe) Dominica St. Lucia St. Vincent and the Grenadines Grenada	October-November 1985



85-61	NRL (Aircraft)	France (Fr. Guiana, Martinique, Guadeloupe) Antigua and Barbuda Dominica St. Lucia St. Vincent and the Grenadines Grenada Barbados Trinidad-Tobago Venezuela Suriname Guyana Brazil	October-November 1985
85-62	THOMPSON <sup>25</sup>	People's Republic of China South Korea	January 1986
85-63	RAMBLER	Canada	July-August 1985
85-64	SEDCO/BP 471	Canada <sup>26</sup>	August-October 1985
85-65	DELAWARE II	Canada	August 1985
85-66	RAMBLER	Canada	June-July 1985
85-67	Marine Research (Hendrickson) <sup>27</sup>	Mexico	August-November 1985
85-68	GYRE	Canada	October-November 1985
85-69	ATLANTIS II <sup>28</sup>	Brazil	January-February 1986
85-70	CONRAD	Australia	March-April 1986
85-71	SEDCO/BP 471	Denmark (Greenland) <sup>29</sup>	August-October 1985
85-72	CONRAD	Oman	May-June 1986
85-73	ALBATROSS IV	Canada	September-November 1985
85-74	RESEARCHER	Peru	September-October 1985
85-75	MISS TRACY (Charter) <sup>30</sup>	Mexico	February 1986
85-76	LYNCH	Spain <sup>31</sup> Morocco	October-November 1985
85-77	PEIRCE	U.K. (BVI)	October-December 1985

85-78	FARNELLA (Charter) <sup>32</sup>	Honduras Dominican Republic Haiti Jamaica U.K. (Cayman Is.)	August-December 1985
85-79	POWELL	U.K. (Bermuda)	October 1985
85-80	Marine Research (Tershy)	Mexico <sup>33</sup>	September 85-Feb 86
85-81	SEDCO/BP 471	Italy <sup>34</sup>	December 85-Feb 86
85-82	MOANA WAVE	Kiribati Western Samoa Cook Islands Fiji Vanuata Papua New Guinea Tuvalu Solomon Is. New Zealand	November 85-March 86
85-83	POLAR DUKE	Chile	September-October 1985
85-84	JEAN A	Dominican Republic Haiti	September 1985
85-85	Marine Research (Turner)	Mexico <sup>35</sup>	February-June 1986
85-86	WESTWARD	Jamaica Honduras Venezuela Dominican Republic Haiti France (Martinique, Guadeloupe) Dominica St. Lucia St. Vincent and the Grenadines Grenada	November 85-January 86
85-87	DELAWARE II	Canada	September-October 1985
85-88	WESTWARD	Bahamas Haiti Jamaica U.K. (Cayman Is.) Mexico Belize Honduras	January-March 1986

85-89	DISCOVERER <sup>36</sup>	Canada	September-October 1985
85-90	KARLUK	Canada <sup>37</sup>	September 1985
85-91	SEWARD JOHNSON	Dominican Republic Bahamas U.K. (Cayman Is. Turks & Caicos) Haiti Honduras Belize	October-November 1985
85-92	DELAWARE II	Canada	November-December 1985
85-93	BARTLETT <sup>38</sup>	Barbados Guyana Trinidad & Tobago	October-December 1985
85-94	OCEANUS <sup>39</sup>	Spain Morocco U.K. (Gibraltar)	April-May 1986
85-95	OCEANUS	Spain Morocco Portugal (Madeira Is)	May-June 1986
85-96	MC ARTHUR <sup>40</sup>	Mexico	February-March 1986
85-97	Marine Research (Goodyear)	Mexico <sup>41</sup>	February-April 1986
85-98	COLUMBUS ISELIN	Venezuela	February-March 1986
85-99	DELAWARE II	Canada	January-February 1986
85-100	THOMAS WASHINGTON	Solomon Is. Papua New Guinea	February-March 1986
85-101	THOMAS WASHINGTON	Philippines Indonesia <sup>42</sup>	March-April 1986
85-102	Marine Research (Aircraft) <sup>43</sup>	Mexico Honduras Guatemala Belize	October 1985
85-103	VIRGINIA KEY	Bahamas	October-November 1985
85-104	MELVILLE	U.K. (Falklands, So. Ga. Is.)	January-February 1986

85-105	RESEARCHER	Bahamas Haiti Dominican Republic <sup>44</sup> France (Guadeloupe, Martinique) U.K. (Turks & Caicos, Montserrat) St. Kitts-Nevis Antigua and Barbuda St. Lucia Dominica St. Vincent and the Grenadines Grenada Venezuela Trinidad-Tobago <sup>45</sup> Barbados <sup>45</sup>	January-February 1986 March-April 1986 July-August 1986
85-106	SEDCO/BP 471	Rep. of Cape Verde	February-April 1986
85-107	Marine Mammal Research (Cole)	Mexico <sup>46</sup>	March 1986
85-108	TOWNSEND CROMWELL	New Zealand Tonga Kiribati Cook Islands Western Samoa	January-March 1986
85-109	MARSYS RESOLUTE	Bahamas U.K. (Turks and Caicos, Anguilla) Dominican Republic Haiti Netherlands (Neth. Antilles) Antigua and Barbuda France (Martinique and Guadeloupe) St. Vincent and the Grenadines Grenada	December 85-June 86
85-110	Marine Research (Burns)	Mexico <sup>47</sup>	November-December 1985
85-111	POLAR DUKE	Argentina	May-June 1986
85-112	SEDCO/BP 471	Guinea-Bissau	February-April 1986



85-113	OCEANOGRAPHER	Peru Ecuador France (Clipperton Is.)	April-May 1986
85-114	NOAA (Contractor) <sup>48</sup>	Honduras	January-December 1986
85-115	SEWARD JOHNSON	Ecuador	October-December 1986
85-116	THOMPSON	Costa Rica Panama <sup>49</sup> Colombia <sup>49</sup> Ecuador <sup>50</sup> Peru <sup>49</sup>	June 1986
85-117	THOMPSON	Costa Rica Guatemala	July 1986 <sup>51</sup>
85-118	NMFS (Shrimp tagging)	Mexico <sup>52</sup>	May-July 1986
85-119	LONGHORN	Mexico	June, August, October 1986 <sup>53</sup>
85-120	SEDCO/BP 471 <sup>54</sup>	France	January-February 1986
85-121	RESEARCHER	Liberia Brazil <sup>55</sup>	August-September 1986
85-122	ALBATROSS IV	Canada	February 1986
85-123	DELAWARE II	Canada	February-March 1986
85-124	THOMPSON	Ecuador	April-May 1986
85-125	XIANGYANGHONG 14 <sup>56</sup> (PRC/NOAA)	Federated States of Micronesia Palau	December 1985- February 1986

The following footnotes indicate specific problems or unusual circumstances of major significance regarding the requests received during 1985; however, there were many small problems which result in additional work for institutions and OMS alike. The following general problems should be avoided to save time in our efforts to secure the required clearances:

1) All requests should comply with NTRVO #67. The majority of requests received do not include full information required to implement a clearance request. Much time is spent in having to go back to the originator for this information.

2) Lack of timely response to requests for additional information creates a timing problem for clearances.

3) Lack of adequate lead-time. Many requesters mistakenly feel they have complied with lead time requirements of a clearance is mailed within the time requested by a coastal state. NTRVO #68 clearly indicates the need for an additional month for processing at this end and to allow our Embassy to prepare the diplomatic note requesting clearance. This time is necessary more now than ever before. It is the responsibility of the R/V operators to ensure that appropriate lead-time is provided. We cannot absorb this additional pressure any longer and absent extraordinary circumstances we will not accept requests which don't comply with NTRVO #67 and 68.

4) If a response from a foreign government is required by a certain date prior to commencing research, and it usually is; the date should be stated in the request. Many coastal states, by design, hold off approvals until the last minute. Also if R/V operators become alarmed by not hearing any information regarding their requests, they should call and ask for a status check.

As indicated above, these problems in themselves may not affect the outcome of a clearance, but in addition to creating more work, several of these problems together could result in approval not being received on a timely basis. Please work to assist us in our efforts to acquire clearances for U.S. scientists.

- 1) Problems with clearances in the southern Antilles area, primarily with Trinidad-Tobago, caused NOAA to conduct all research in the Bahamas during April and May, however, similar problems in the fall led to dropping only Trinidad-Tobago and Barbados from research plans.
- 2) Gravity surveys indefinitely postponed by the U.S. Defense Mapping Agency due to ship scheduling problems.
- 3) Request denied by Mexico due to lack of 6-month prior notice.
- 4) Request cancelled by U.S. Navy prior to approval.
- 5) Request cancelled by USGS due to budget reductions after approval by Canada.
- 6) Request processed and approved by Mexico in 5 months.
- 7) Gravity surveys approved by coastal states only after specific areas and dates were provided. Blanket clearance was rejected by all but the U.K.
- 8) Research flights cancelled prior to most approvals.
- 9) R/V THOMPSON replaced R/V MOANA WAVE for research.
- 10) Two major revisions to schedule late in the clearance process greatly complicated clearance request.
- 11) Same as above.
- 12) Same as above.
- 13) Research cancelled after approval by Canada, owing to bad weather on previous cruise leg.
- 14) Request denied by Mexico due to lack of 6-month prior notice.
- 15) Requests not approved due to lack of sufficient lead time (10 days).
- 16) Research delayed 4 days awaiting Mexican approval.
- 17) Request denied for classified reasons.
- 18) Research cancelled due to lack of funding.
- 19) Research delayed 3 months awaiting Mexican approval.
- 20) Request not approved by Trinidad-Tobago owing to pre-publication approval requirement.

- 21) Request made by chief scientist when problems developed with Mexican clearance. Request cancelled 2 weeks later.
- 22) This was first request by an individual scientist to be referred by Pesca because Mexico wanted official channels used. Request approved.
- 23) Request cancelled due to ship scheduling problems.
- 24) Mauritania requested participation after research was completed.
- 25) Extremely troublesome and time-consuming clearance request. Problems encountered too numerous and sensitive to mention here.
- 26) Ocean Drilling Program. Advised by Canada that request must be made through official channels.
- 27) Individual request which Mexicans required to be made through official channels. Approval never received.
- 28) Request cancelled prior to Brazilian response owing to funding being denied.
- 29) Ocean Drilling Program. Advised by Denmark that request must be made through official channels.
- 30) Request approved. Research cancelled due to mechanical problems with charter vessel.
- 31) Gibraltar Experiment. U.S. Navy-sponsored cooperative project with Spain and Morocco.
- 32) U.S. requested to seek clearances for U.K. vessel.
- 33) Individual request - no research vessel. Research delayed pending Mexican approval.
- 34) Ocean Drilling Program. Extremely troublesome clearance owing to holiday period immediately prior to research. Approval, with restrictions received, just prior to scheduled start of drilling.
- 35) Individual request - no research vessel. Research delayed pending Mexican approval.
- 36) Cancelled by NOAA prior to approval owing to high probability of bad weather and predicted ice conditions.
- 37) Canadian approval granted on short notice.



- 38) Request cancelled by U.S. Navy prior to request to coastal states.
- 39) Gibraltar Experiment. U.S. Navy-sponsored cooperation research project with Spain and Morocco.
- 40) Research cancelled by NOAA owing to budget restrictions.
- 41) Individual request - no research vessel. Request never approved by Mexico.
- 42) Indonesian clearance granted after extraordinary measures by Embassy Science Officer.
- 43) No approvals received, owing to extremely short notice given by researchers.
- 44) Dominican approval came too late for research in first leg. No research planned for 2 subsequent legs.
- 45) Request cancelled by NOAA researcher owing to lack of data from previous cruises.
- 46) Individual request - no research vessel. Request never approved by Mexico.
- 47) Individual request - no research vessel. Request never approved by Mexico.
- 48) Research cancelled by NOAA owing to budget cuts.
- 49) Request cancelled by researcher (no underway data to be collected).
- 50) Request pending.
- 51) Request pending.
- 52) Request not approved by Mexico.
- 53) Request pending.
- 54) Ocean Drilling Program. Request implemented by ODP when Italian clearance encountered problems.  
Request denied.
- 55) Request not received with sufficient lead time for Brazil.
- 56) U.S. requested to seek clearance on behalf of PRC.

TOTAL REQUESTS PER COUNTRY - 1985

Canada - 36	United Kingdom - 18
Mexico - 20	France - 15
Honduras - 6	Spain - 3
Belize - 3	Denmark - 2
Costa Rica - 2	Iceland - 2
Guatemala - 2	Netherlands - 2
Panama - 1	Italy - 1
	Portugal - 1
Brazil - 7	Morocco - 3
Ecuador - 6	Oman - 3
Venezuela - 6	Guinea-Bissau - 1
Guyana - 5	Liberia - 1
Peru - 3	Mauritania - 1
Colombia - 2	Republic of Cape Verde - 1
Suriname - 2	
Argentina - 1	Kiribati - 4
Chile - 1	New Zealand - 3
	Papua New Guinea - 3
Bahamas - 10	Tonga - 3
St. Vincent - 9	Australia - 2
Antigua - 8	Cook Islands - 2
Barbados - 8	Fiji - 2
Dominica - 8	Japan - 2
Grenada - 8	Solomon Islands - 2
Haiti - 8	Vanuata - 2
St. Lucia - 8	Western Samoa - 2
Dominican Republic - 7	Federated States of Micronesia - 1
Trinidad-Tobago - 6	Indonesia - 1
St. Kitts-Nevis - 4	Palau - 1
Jamaica - 3	Philippines - 1
	PRC - 1
	ROK - 1
	Tuvalu - 1

The Department of State submitted a total of 278 clearance requests to 60 foreign governments during 1985.

Four clearances were denied. Research was delayed or cancelled in nine other instances owing to non-receipt of timely clearances. Several other cruises were disrupted owing to clearances given immediately prior to research. Four clearances are still pending.

In addition, 25 requests were received from 6 foreign states to conduct research in U.S. waters. All were approved.



# UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

## A PLAN FOR IMPROVED CAPABILITY OF THE UNIVERSITY OCEANOGRAPHIC RESEARCH FLEET, APRIL 1986

### SUMMARY

The purpose of the University-National Oceanographic Laboratory System is to provide for community-wide coordination and review of the utilization of available facilities and for access to those facilities. UNOLS assesses the current match of facilities to the needs of academic oceanographic programs and makes appropriate recommendations of priorities for replacing, modifying, or improving the numbers and mix of facilities for the community of users.

Ships of the University-National Oceanographic Laboratory System (UNOLS) comprise a twenty ship fleet operated by fifteen academic institutions. The "Fleet" considered here comprises seagoing ships over 100 feet in length. The operating institutions are autonomous, but scheduling and performance standards are coordinated by the group acting jointly.

Most of the basic research projects of the Federal oceanographic program are carried out by ships of this fleet. The ships are, therefore, primarily general purpose types with special capabilities in the basic sciences disciplines. Chief sponsors for UNOLS ships utilization are the National Science Foundation and the Office of Naval Research. However, to some extent oceanographic projects of most Federal agencies are included in UNOLS ship operations.

The need to plan for new, more capable research ships to conduct scientific programs at sea has become virtually self evident. Numerous studies have amply demonstrated that our ships, mostly constructed in the 1960's are becoming obsolete in their capability to support oceanography for the 1980's and 1990's. The 1984 Federal Oceanographic Fleet Study (FOFCC) reported that two of its major findings give cause for concern. These are:

- Within the next fifteen years over 70% of the Federal fleet will have become overage and obsolete.
- No Agency has an approved plan for the replacement of ships as they become obsolete.

It concluded that the issue of fleet replacement is a matter of urgency and is to be considered one of the priority matters resulting from the Federal Fleet Study.

Nowhere is this more apparent than in the UNOLS fleet where a total of seven large seagoing ships are present to serve the university community. Of these, most were constructed in the 1960's. The requirements now being posed by scientific investigations render these ships marginally capable.

A 1982 National Academy of Sciences study on the needs for academic research vessels examined the growing demands being placed upon these ships. It noted the following: Much scientific equipment, especially that going onto or into the bottom, has increased in weight, bulk and complexity, therefore requiring deployment from large, stable ships. Increasing complexity of electronic sensors and shipboard computers often result in an increase in the number of technicians who must go to sea, rather than a reduction in their number. The nature of new interdisciplinary ocean science research projects requires that several scientists from different disciplines be able to work on the same ship at the same time. This increases the demand for laboratory, storage and other work-ing spaces aboard ship. Large high performance overside handling arrangements and modern state-of-the-art shipboard laboratories will be needed to support major ongoing ocean programs. In addition, a high quality working and living environment is essential in order to attract competent seagoing personnel.

In 1984, based on recommendations of its Advisory Council, UNOLS established a Committee charged with planning for the orderly replacement of the UNOLS Fleet.

That Committee is completing its work and the preparation of its report. Its goals are to: (1) Recommend the numbers and types of new ships and replacement dates; (2) Prepare a set of science mission requirements for the various classes of ships; and (3) Undertake representative conceptual designs.

The principal findings upon which its report is based are:

1. The average age of the UNOLS fleet is 19 years, and by the mid-1990's most of the seven large ships (over 200-ft) will have exceeded their generally recognized 30 year service life. Furthermore, many, if not most of the existing large ships are mission obsolete and are marginally capable of meeting the requirements of ongoing science of sea.

2. The numbers of future ships will not differ significantly from the existing fleet.

3. The mix of ships should be about evenly divided between the size classes, i.e., large ships, intermediate and small ships.

4. New ships should have improved seakeeping and station keeping characteristics; and should have upgraded laboratory, overside handling, and scientific outfitting.



5. Several of the new ships in addition to providing for regular multi-disciplinary research, should have an enhanced capability for a particular discipline or field of work. These include Multichannel Seismics; Submersible and Polar Research.

6. Up to one-third of all the existing ships, mostly the larger ones, are approaching obsolescence; some already are mission obsolete. Replacement should start in the near term - 1987-1990.

7. The existing fleet should be totally replaced by the year 2015.

The proposed new fleet is recommended to be eight large ships (200-300 ft LOA); six intermediate ships (150-200 ft); and six small ships (100-150 ft). Because they are older and are demonstrably incapable of meeting modern science requirements, priority attention has been focused on the larger ships.

**Profile of Planned  
UNOLS Fleet**

	<u>Existing Fleet</u>	<u>Plan For Upgraded Fleet</u>
<b>Large Ships: Classes I &amp; II (over 200 ft)</b>		
General Purpose	5	4
MCS Capable	1	2
Ice Capable	0	1
Submersible Handling Capable	1	1
<b>Intermediate Ships: Class III (150-199 ft)</b>		
General Purpose	6	6
MG&G Ship	1	0
<b>Small Ships: Class IV (100-149 ft)</b>		
General Purpose	6	5
Ice Capable	0	1
TOTAL	20	20

In looking to new ships the first step has been to describe the science mission requirements to which the new ships will be

expected to respond. In accomplishing this the UNOLS Committee took on a massive campaign of meetings, interviews and questionnaires in order to gain the views of the scientific community. The most overriding requirement upon which all oceanographers agreed was seakeeping, that is for a ship which will allow both overside and laboratory work to proceed in higher sea states than is now available. Other requirements include overside and deck handling arrangements to allow work in greater capacity and sizes than is now possible; larger and improved scientific laboratories; increased scientific complement (up to 35 scientific and technical personnel); reduced noise and vibration; greater speeds (up to 15 knots) and cruising range. Endurance should provide for cruising to any part of the world ocean and working there for 3-4 weeks before returning.

In describing new ships for the future, the UNOLS Committee sought innovative new designs with an emphasis on seakeeping. With support from the National Science Foundation and the Office of Naval Research, eight conceptual ship designs were undertaken for the purpose of fitting the science requirements into a real hull. The conceptual designs included two each of the following types of ships.

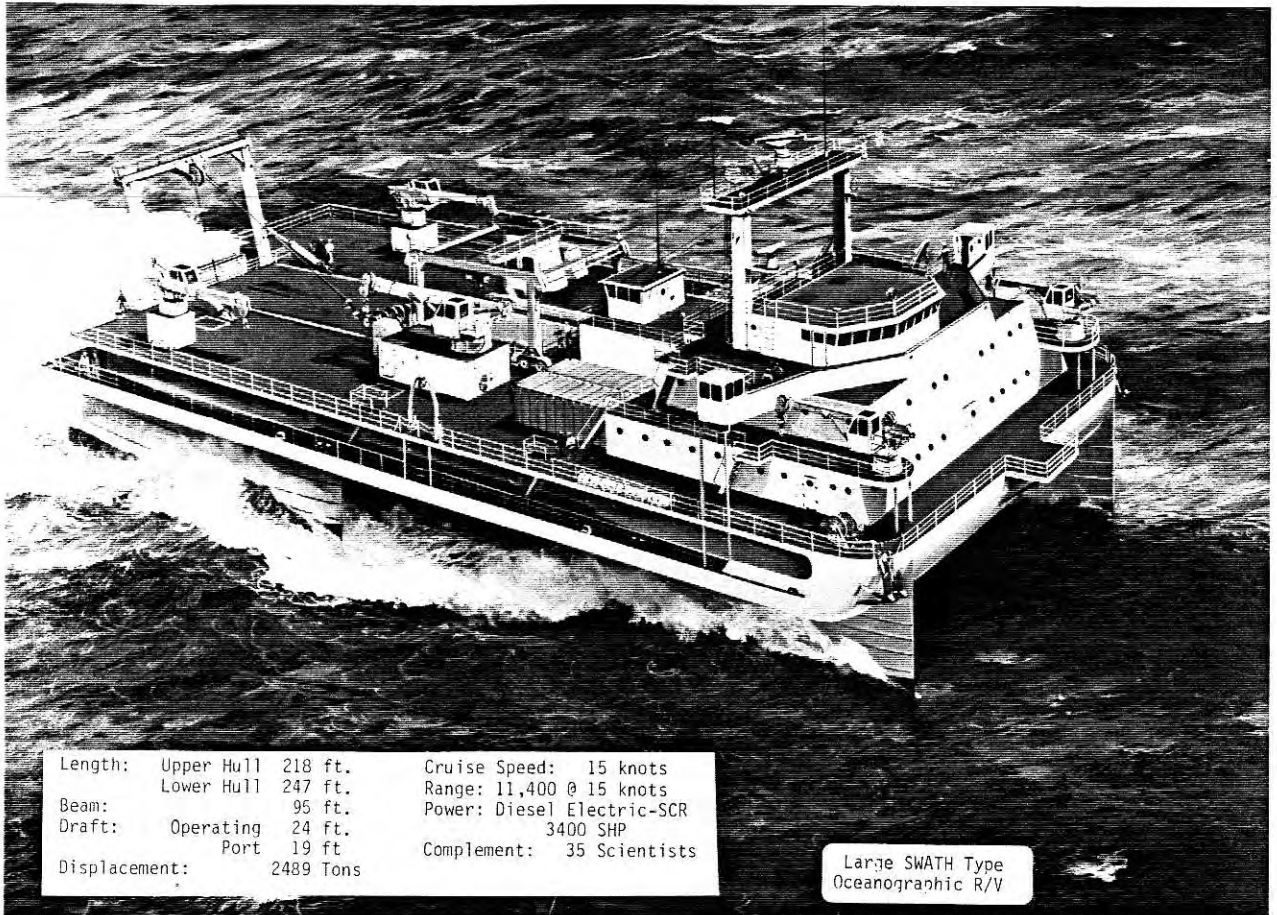
- **SWATH Ships.** The SWATH or semi-submerged ship is a relatively recent development in ship design. SWATH ships, in theory and performance, demonstrate a remarkably stable environment. Additionally, they have a platform configuration which is highly attractive for science and engineering operations at sea. It is time for the oceanographic community to take a hard look at what SWATH can offer.

- **High Endurance Ships.** Ships 250-300 ft LOA are not now available in the UNOLS Fleet. They are intended to meet requirements for extended worldwide cruising including high latitudes with larger scientific parties and to permit both overside and laboratory work to proceed in higher sea states than is now possible.

- **Medium Endurance Ships.** Ships of a 200-250 ft size range are intended to have the highest capability commensurate with this size range. Although of similar size to existing ships, they should provide superior seakeeping, laboratory arrangements and overall ability to do science at sea than is presently available and at the same time be more economical in their operation.

- **Ships With Enhanced Geology & Geophysics Capability.** These are ships intended to have the same multi-discipline capability as the above ships, but in addition are to carry a configuration for multichannel seismics investigations. Such ships inevitably are larger than their corresponding general purpose type class.

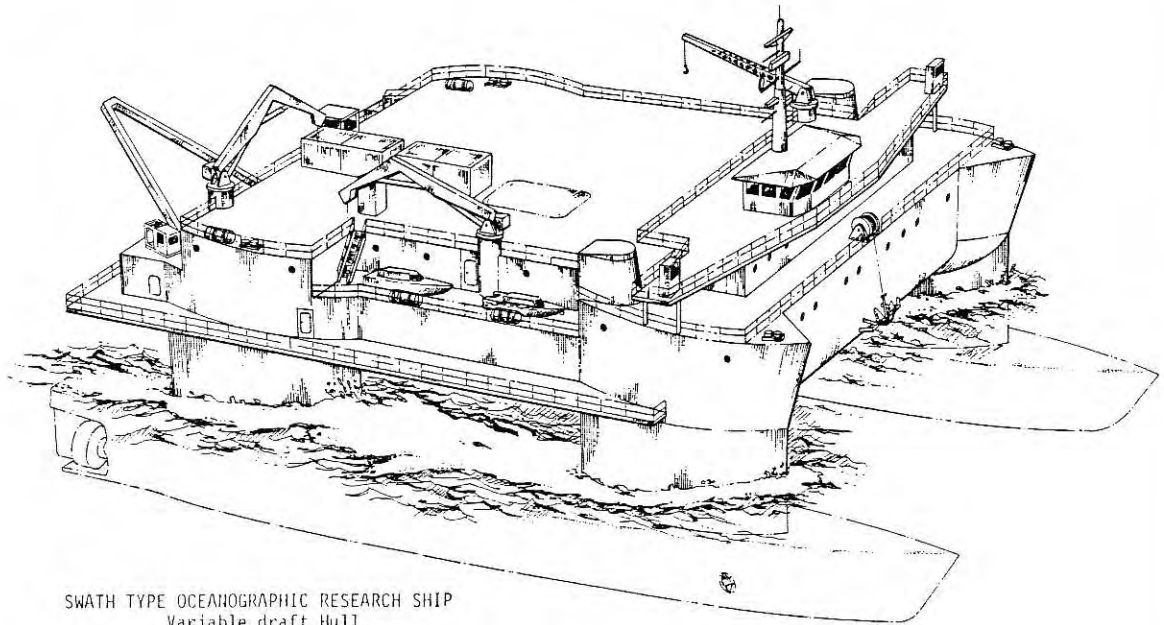
The eight designs forming part of the UNOLS Study are depicted in the following figures.



Length:	Upper Hull	218 ft.	Cruise Speed:	15 knots
	Lower Hull	247 ft.	Range:	11,400 @ 15 knots
Beam:		95 ft.	Power:	Diesel Electric-SCR
Draft:	Operating	24 ft.		3400 SHP
	Port	19 ft.	Complement:	35 Scientists
Displacement:		2489 Tons		

Large SWATH Type  
Oceanographic R/V

Small Waterplane Twin Hull (SWATH) Ship. Note abundance of deck space and overside handling capability including center well.

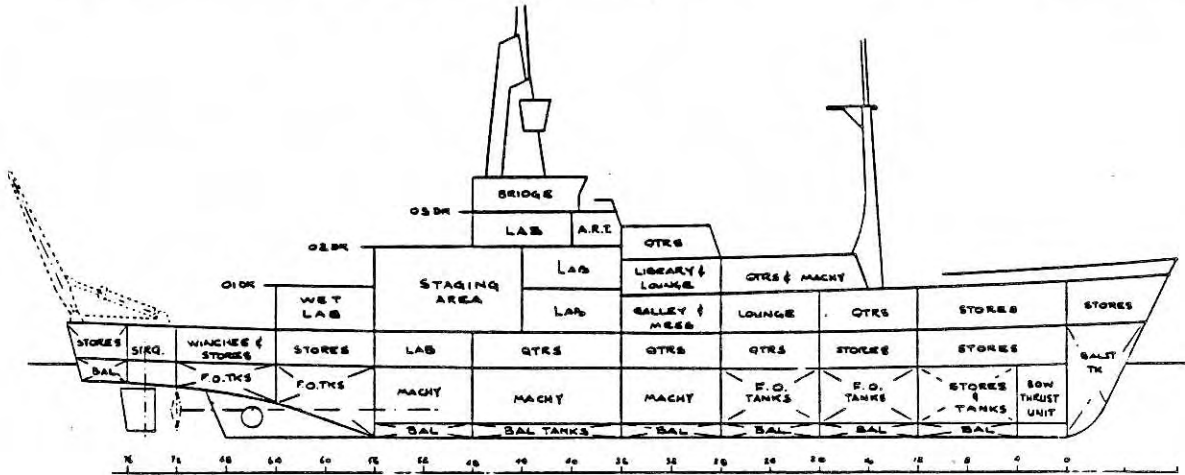
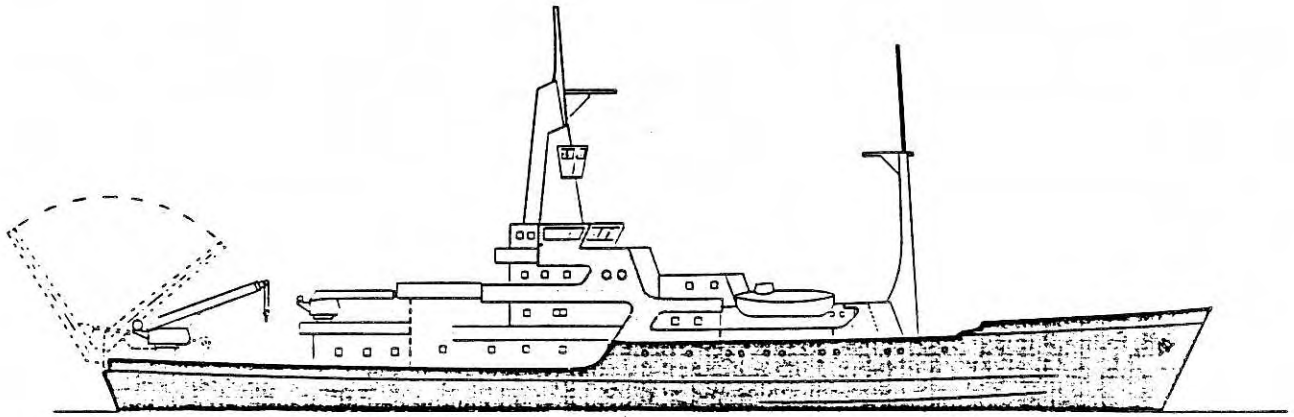


SWATH TYPE OCEANOGRAPHIC RESEARCH SHIP  
Variable draft Hull

Length:	Upper Hull	147 ft	Cruise Speed:	Transit - 15 knots
	Lower Hull	202 ft		Operating - 10 knots
Beam:		104 ft.	Power:	Diesel Electric 6000 SHP
Draft:	Operating	26 ft.	Complement:	30 Scientists
	Transit	15 ft.		
Displacement:		3220 L.Tons		

Blue Sea McClure  
Houston, Texas

SWATH with interior center well area. Variable draft allows ballasting working deck close to water. Transits in catamaran mode.

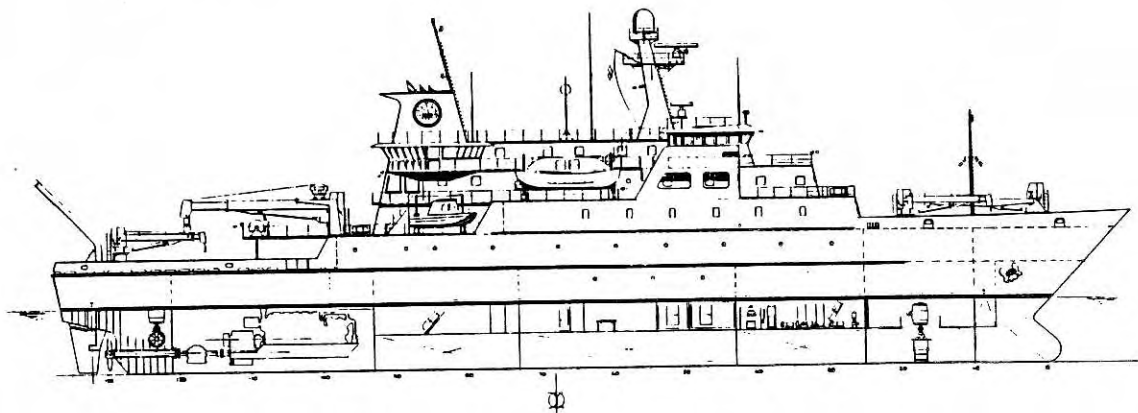


Length 275 LBP 310 LOA      Cruise Speed 16 Kts  
 Beam 68 Ft.      Range 12,000 mi. @ 16 Kts  
 Draft 21 Ft.      Power (Diesel Elec. SCR) 6,300 SHP  
 Displacement 5,840 LT      Complement 35 Scientific

WOODS HOLE  
 OCEANOGRAPHIC INSTITUTION  
 WOODS HOLE, MASSACHUSETTS 02540  
 JONATHAN LEIBY  
 MARINE DEPARTMENT  
 TEL. 617 552-1000

DN 7/81      NECOR-LARGE RES SHI  
 APD 0/81      - PRELIMINARY ARRGT  
 X6-1-0      10-8-85 DWG No 8506-

Large High Endurance R/V where primary attention has been given to seakeeping and deck working area.



LARGE GENERAL PURPOSE OCEANOGRAPHIC RESEARCH SHIP

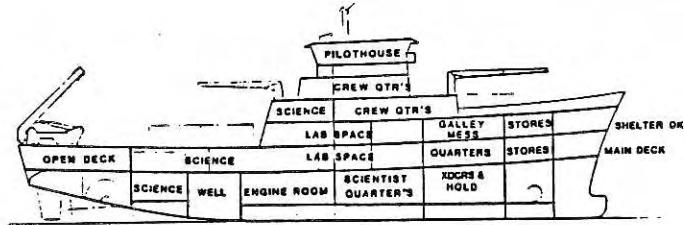
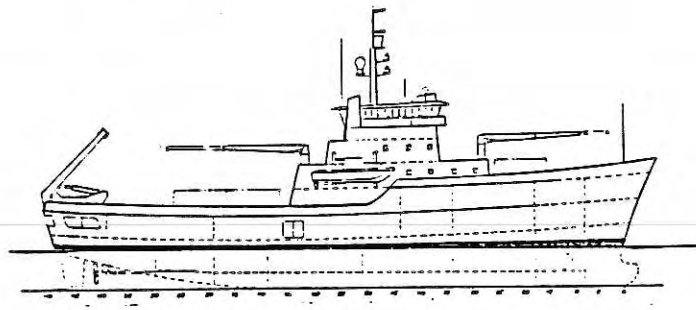
Length 273 LBP 300 LOA      Cruise Speed 14 knots  
 Beam 54 Ft.      Range 10,000 nm  
 Draft 18 Ft.      Power 4,000 SHP  
 Displ. LT      Complement 33 Science

Large High Endurance R/V where emphasis is on laboratory and economy of operation.

ROONEY E LAY & ASSOCIATES  
 MARINE ARCHITECTS

OUTBOARD PROFILE  
 300'-0" x 54'-0" x 28'-0"  
 RESEARCH VESSEL





INBOARD PROFILE

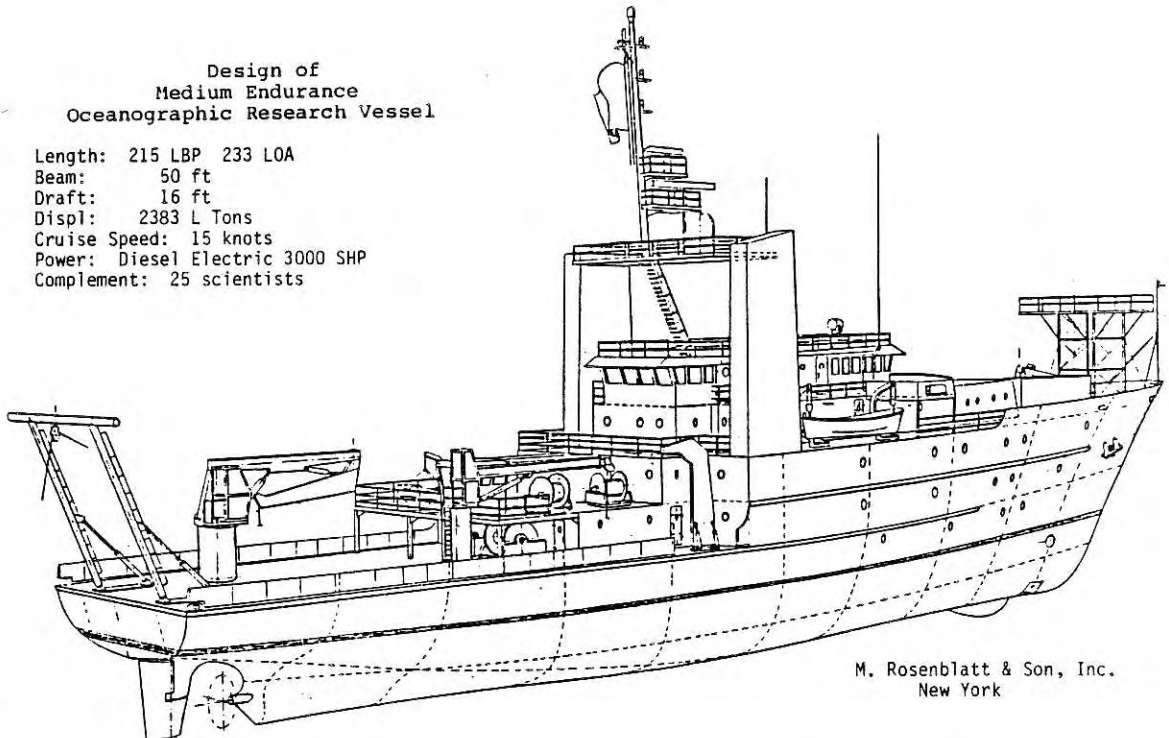
Length	212 LWL 228 LOA	Cruise Speed	14 knots
Beam	64 ft.	Range	10,500 nm
Draft	15 ft.	Power	3,000 SHP
Displ.	2,468 LT	Complement	25 Scientific

SCRIPPS INSTITUTION OF OCEANOGR	
UNIVERSITY OF CALIFORNIA, SAN DIE	
212' LWL RESEARCH VESSEL	
DESIGN CONCEPT- ARRANGEMENT	
THE GLOSTEN ASSOCIATES	
<small>           201 California Street, Suite 200, San Diego, California 92101            602 Main St. Boston, MA 02109            1000 Pennsylvania Ave. N.W. Washington, D.C. 20004         </small>	
CA/BLH	NO SCALE
OCT 1985	8534-2

Medium Endurance R/V. Shelter deck design shows two working deck and interaction with laboratories. Wide beam permits a sizeable centerwell not ordinarily found on monohull.

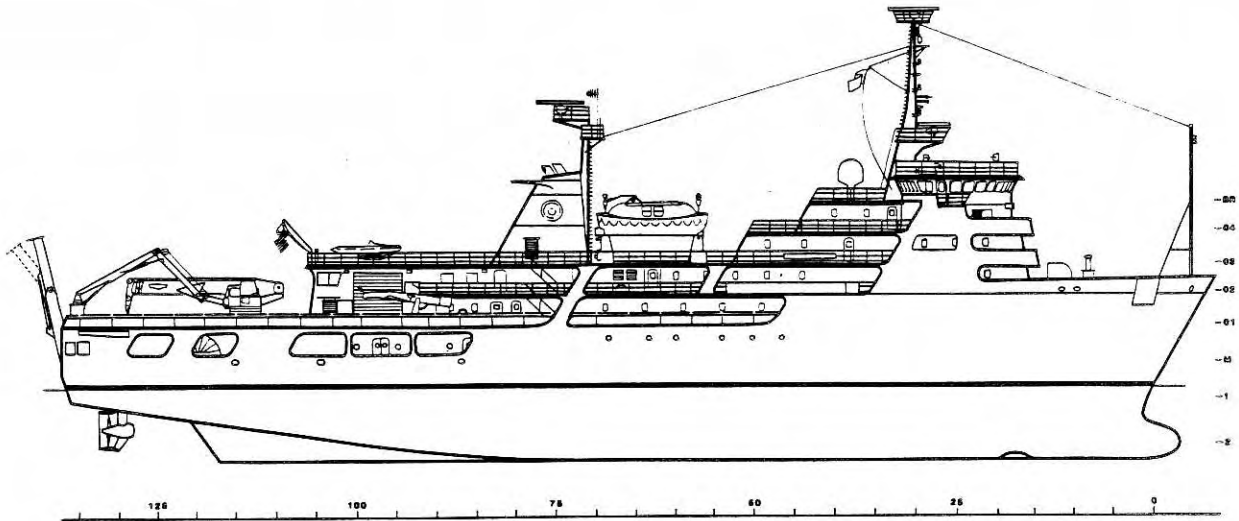
Design of  
Medium Endurance  
Oceanographic Research Vessel

Length: 215 LBP 233 LOA  
 Beam: 50 ft  
 Draft: 16 ft  
 Displ: 2383 L Tons  
 Cruise Speed: 15 knots  
 Power: Diesel Electric 3000 SHP  
 Complement: 25 scientists



M. Rosenblatt & Son, Inc.  
New York

Medium Endurance R/V. Attention has been given to overside handling and economy of operation.

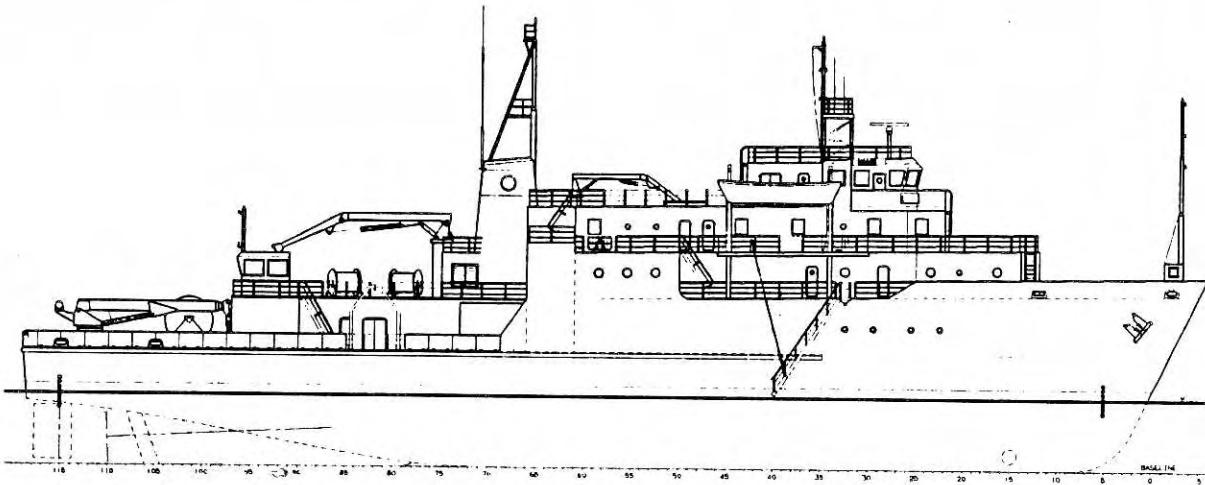


John Gilbert Associates

LARGE GENERAL PURPOSE RESEARCH AND GEOPHYSICAL SHIP

LOA:	291 Feet	Displacement:	4,997 L Tons
LBP:	275 Feet	Cruising Speed:	14.5 Knots
Beam:	58 Feet	Range:	24,000 N Miles
Draft:	19 Feet	Power:	5,000 SHP


High Endurance R/V with enhanced ecology and geophysics capability. MCS Streamer and air-guns are handled from lower deck. Upper deck is for general purpose activity.



GENERAL PURPOSE RESEARCH SHIP WITH GEOPHYSICS CAPABILITY

Length:	238 LBP 250 LOA	Power:	Diesel Elec. 3000 SHP
Beam:	52 ft	Cruise Speed:	14 knots
Draft:	15 ft	Range:	13,700 miles
Disp:	2,790 LT	Complement:	28 Scientists

Medium Endurance R/V with enhanced multichannel seismics capability. MCS and other outfitting share the same working area.

 <b>MARQUETTE MARINE CORPORATION</b> MARINETTE, WISCONSIN 54143	
250 FT RESEARCH VESSEL	
ARPD: ARPD: IIRB: CAP DRAWN: PER 3-26-87	<b>OUTBOARD PROFILE</b>

SUMMARY COMPARISON OF SCIENCE REQUIREMENTS FOR LARGE SHIPS

	HIGH ENDURANCE R/V (Monohull)	SWATH R/V	MEDIUM ENDURANCE R/V (Monohull)
SIZE RANGE	Class I (250-300 ft)	Class II (200-250 ft)	
ENDURANCE	Sixty Days: 30 days cruising; 30 days working. 15,000 miles total range at cruising	Fifty Days: 25 days cruising; 25 days working. 12,000 miles total range at cruising	
CRUISING SPEED	15 knots		14 knots
SEAKEEPING	15 knots through SS 4 13 knots through SS 5 8 knots through SS 6	15 knots through SS 6 10 knots through SS 7	14 knots through SS 4 12 knots through SS 5 8 knots through SS 6
STATION KEEPING	Dynamic Positioning at best heading: Wind Vel. 35 knots; Sea State 5; 3 knot current; $\pm 5^\circ$ head; $\pm 150$ ft maximum excursion		
PRECISION TRACKLINE	Maintain a precision trackline, including towing, at speeds as slow as 2 knots with maximum 45° heading deviation from the trackline in wind speed 35 knots; Sea State 5; 3 knot current. Speed control along track to be $\pm 0.1$ knot; maximum lateral excursion 150 ft		
TOWING	Capable of towing large scientific packages up to 10,000 lbs tension at 6 knots, and 25,000 lbs tension at 2.5 knots into a sea state 5 and 3 knot current		
SCIENCE ACCOMMODATIONS	30-35 scientific personnel in two person staterooms. Expandable to 40 in portable berthing vans.		20-25 scientific personnel in two person staterooms. Expandable to 30 in portable berthing vans
DECK WORK AREA	3,000 sq ft with contiguous 12 x 50 ft area along side 100 tons disposable load	4,000 sq ft with 15 x 30 ft centerwell 100 tons disposable load	2,000 sq ft with contiguous 12 x 40 ft area along side 90 tons disposable load
LABORATORY AREA	4,000 sq. ft. plus 4 portable vans with inside access		3,000 sq ft plus 2 portable vans with inside access
SCIENCE STORAGE	20,000 cu. ft.		15,000 cu. ft.
ICE STRENGTHENING	ABS Class IB except ABS Class IAA when specified as ice capable	None	ABS Class IC
ACOUSTICAL SYSTEMS	All ships to carry precision echo sounding ("SEA BEAM"); 3.5 kHz and 12 kHz echo sounding; Doppler current profiling; bottom positioning to 6,000 m depth. Design underway - target is echo sounding at Sea State 4		
MULTI-CHANNEL SEISMICS	Selected vessels to carry seismic air compressors for 4,000 scfm at 2,000 psi; and a large array MCS system	Selected vessels to carry seismic air compressors for 3,000 scfm at 2,000 psi; and a large array MCS system	

Implementing the plan should take into account a meld of motivating factors:

1. A replacement schedule which is realistic in terms of the national effort and an economy. The effect of this would be to smooth the peaks of existing ship construction dates into a reasonably uniform number of replacements per year.
2. A priority of new construction based upon the material condition and scientific capability of existing ships.
3. A priority of new construction based upon the needs of ongoing science.

**Fleet Improvement Plan Shown by 5-year Increments**

Time Frame	LARGE (Over 200 ft.) Classes I & II	INTERMEDIATE (150-199 ft.) Class III	SMALL (100-149 ft.) Class IV
1986-1989	1 new 1 new (MCS capable) modernize two	---	---
1990-1994	1 new (ice capable) 1 new (MCS capable)	---	1 new (ice capable)
1995-1999	---	2 new	1 new
2000-2004	1 new (sub-handling capable)	1 new	2 new
2005-2009	1 new	3 new	---
2010-2014	2 new	---	2 new
TOTAL	8	6	6

This plan will need continuing review and updating in order to keep up with changing times and requirements. In addition, selected designs might be further developed; and new concept designs started on smaller ships and innovative platforms. This calls upon UNOLS to provide for continuing efforts in the fleet replacement process.

**UNOLS FLEET REPLACEMENT COMMITTEE**

**MEMBERS**

- Robertson P. Dinsmore, Woods Hole Oceanographic Institution  
- Chairman
- George H. Keller, Oregon State University
- Marcus G. Langseth, Lamont-Doherty Geological Observatory
- David W. Menzel, Skidaway Institute
- Worth D. Nowlin, Jr., Texas A & M
- Joseph D. Phillips, University of Texas
- Derek W. Spencer, Woods Hole Oceanographic Institution
- Frederick W. Spiess, Scripps Institution of Oceanography
- Richard W. West, National Science Foundation, Observer
- Keith W. Kaulum, Office of Naval Research, Observer



## UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

23 May 1986

Dr. Ferris Webster, Chairman

UNOLS

Professor of Oceanography  
College of Marine Studies  
University of Delaware  
Lewes, Delaware 19958

Dear Ferris:

On behalf of the Fleet Replacement Committee I am pleased to transmit the report of the Committee. In all, the "Report" comprises eleven volumes:

- Plan For Improved Capability Of The University Oceanographic Research Fleet
- Science Mission Requirements For New Oceanographic Ships
- Summary Of Conceptual Designs Of New Oceanographic Ships, and
- Eight reports of individual new ship design studies.

The effort in producing the Report has been particularly exciting and rewarding. We have watched a growing interest throughout the community in planning for new ships and even to the extent of anticipated new construction. We are not claiming credit for this, but we are proud to have been a part.

With the completion of our report, the Committee work is finished. However, it is important that the community not lose the momentum toward improving research fleet capability which has been generated by the activities of the Ad Hoc FRC. We recommend that UNOLS continue a fleet improvement planning activity. The Committee name might be kept but the membership should be reconstituted, with some members rotating off and some new members added. The Chairman for the next phase should be one of the present members to maintain the aim. The new membership should have a somewhat larger proportion of active users or proponents of intermediate and coastal vessels, because the larger vessels were the principal thrust of phase one just completed. The balance toward larger vessels should be maintained because those are the vessels being designed now and which will be constructed in the nearer term.

The Committee should undertake four classes of activity.

1. They would continue to serve as a sounding board and source of information for the agency representatives working on behalf of the community for upgrades, replacements and other new R/V budget initiatives. Such a "Point of Contact", consisting of knowledgeable ship users, is needed.
2. The Committee would continue the refinement of mission requirements and might begin conceptual studies, as appropriate, for intermediate, coastal and special (innovative) vessels.
3. The Committee should refine designs for the larger vessel classes. The best features of the various existing conceptual designs should be incorporated and "Advanced Conceptual Designs" (including weights and model tests) should be commissioned for a medium endurance and a SWATH vessel.
4. The Committee should maintain an updated plan for increased capability of the UNOLS Research Fleet. Input regarding the plan completed in phase one should be sought from a broad segment of the community, including program and planning offices for large programs, as well as from ONR and NSF.

Sincerely,



Bob Dinsmore

Enclosure

RPD/jaw



# NATIONAL OCEAN SERVICE

## OFFICE OF MARINE OPERATIONS



### NOAA FLEET INFORMATION EXCHANGE

April 1986

In an effort to provide the scientific community with current events concerning the NOAA Fleet, the National Ocean Service's Office of Marine Operations issues this semiannual NOAA Fleet Information Exchange. It is intended as a mechanism for providing interesting information and for indicating how the NOAA Fleet may serve you.

#### FOR THOSE OF YOU WHO ARE NEW...AN OVERVIEW!

NOAA operates a fleet of 23 ocean and coastal vessels to obtain data on the chemical, physical, biological, and geological characteristics and behavior of the oceans, the seafloor, the Great Lakes and the ocean-atmosphere interface. The ships and the data and information they obtain are used by NOAA, other Federal agencies, and academic institutions in carrying out programs which support national defense, marine navigation, marine resource development, business and economic activity, protection of life and property, and increased scientific knowledge. NOAA's National Ocean Service, Office of Marine Operations, manages and maintains the fleet.

The ships are deployed for multiprogram or specialized use depending upon size, range, laboratory space, equipment, and accommodations. They range in length from 86 to 303 feet and conduct operations that support NOAA's programs in nautical charting, Exclusive Economic Zone bathymetric mapping, fisheries research and resource assessment, marine environmental baseline assessment, coastal ocean circulation, deep ocean mineral site assessment, and oceanographic and atmospheric research. The Class I through IV ships have the necessary size, endurance, and equipment to conduct surveys and investigations from the near shore to the deep ocean or in remote areas such as Alaska. The smaller Class V and VI ships were designed for near-shore operation only. The following table shows the distribution of the NOAA Fleet by vessel class, and the type of NOAA programs which the vessels support:

<u>Ship Class</u>	<u># Vessels</u>	<u>Length</u>	<u>NOAA Programs Supported</u>
I	4	278-303 ft.	- deep ocean atmospheric and oceanographic research - mapping and charting - environmental assessment
II	4	215-231 ft.	- mapping and charting - environmental assessment - fisheries research
III	6	163-187 ft.	- mapping and charting - fisheries research - environmental assessment - near-shore oceanography
IV	5	127-171 ft.	- fisheries research - environmental assessment
V-VI	4	86-93 ft.	- fisheries research - mapping and charting

The Atlantic Marine Center (AMC) in Norfolk, Virginia, is home port for six ships and provides docks, maintenance, stores, supplies, repair facilities, data processing facilities, and administrative support. The Southeast Marine Support Facility in Miami, Florida, under the operational control of AMC, is the RESEARCHER's home port. Two fisheries research ships are operated out of Woods Hole, Massachusetts, and two more are operated from Pascagoula, Mississippi. The Pacific Marine Center (PMC) in Seattle, Washington, is home port for nine ships and also provides docks, maintenance, stores, supplies, repair facilities, data processing facilities, and administrative support. Fisheries research ships are operated out of San Diego, California; Honolulu, Hawaii; and Juneau, Alaska.

#### THE "O" IS BACK IN OCEANOGRAPHY!

The Class I NOAA Ship OCEANOGRAPHER is being reactivated following a 4-year layup. Commanded by Captain Freddie Jeffries, the OCEANOGRAPHER is a 303-foot long oceanographic research vessel which was commissioned in 1966 and home ported at PMC in Seattle, Washington. The ship departed the Seattle ship base on



February 12 for drydock and routine repairs at Marine Power and Equipment in Seattle. The ship's first project will entail investigation of the dominate mechanisms that produce variations in sea surface temperature in the eastern equatorial Pacific Ocean. These variations are believed to be linked to perturbations in the midlatitude atmospheric pressure field and hence, to weather. The ultimate goal of this research, conducted by NOAA's Pacific Marine Environmental Laboratory, is to improve climate predictions through an understanding of air-sea interaction processes, ocean dynamics, and sea surface temperature variability.

#### PEIRCE AND WHITING DEACTIVATION

Due to changing program requirements, including a reduced need for single-beam ship hydrography on the east coast, the Class III NOAA Ships PEIRCE and WHITING will be deactivated in 1986. Prior to deactivation, the WHITING will complete a 52-day nautical charting survey in the Bahamas in cooperation with the U.S. Navy.

#### GRAMM-RUDMAN-HOLLINGS REDUCTIONS

The Gramm-Rudman-Hollings reductions impacted all program areas. Most NOAA vessels will experience reductions of approximately 40 days at sea this fiscal year, exceptions occurring only where programs have provided additional funding to offset sea day decreases.

#### HONDURAS HYDROGRAPHIC PROJECT

The Honduras hydrographic project, first started by the MT. MITCHELL in January 1985, was completed by the WHITING in September 1985. It was a cooperative project along the Caribbean Coast involving the participation of the Defense Mapping Agency, U.S. Naval Oceanographic Office, USMC Coastal Survey Team, and the Government of Honduras. Twelve survey sheets, totaling 14,257 linear nautical miles of hydrography in an area of 1,960 square miles, were completed by the MT. MITCHELL and the WHITING. In the process, the two ships promoted goodwill by hosting public tours of the ships and, on one occasion, the MT. MITCHELL hosted a luncheon at which the Vice-President of Honduras was the principal guest.

#### VISITORS TO TOWNSEND CROMWELL

On January 5, Dr. Yan Hangmo, Director General, State Oceanic Administration, Peoples Republic of China, visited the TOWNSEND CROMWELL. On January 7, sea trials were held onboard, and a dependents' cruise which included the NOAA Administrator, Dr. Calio, was conducted.

### TOWNSEND CROMWELL GOES TO AMERICAN SAMOA

The TOWNSEND CROMWELL sailed on January 7 for Pago Pago, American Samoa, on a South Pacific Albacore Research Cruise. During the Pago Pago port call on January 27, approximately 15 students from the marine science class at the Samoan High School were given a tour of the vessel. Two Samoan personnel were onboard to participate in Leg II of the cruise. During the cruise, the CROMWELL made a port call in Gisborn, New Zealand, and conducted fisheries research in Kiribati and Raratonga, Cook Islands. The ship returned to Snug Harbor, Hawaii, on March 18, 1986, after a successful cruise.

### RESEARCHER EPOCS CRUISE

The RESEARCHER departed September 16, 1985, on the EPOCS Cruise from Miami, Florida. Four representatives of the Peoples Republic of China and one Peruvian citizen were onboard to observe operations.

The primary goal of EPOCS is to investigate the dominant mechanisms that produce variations of the sea surface temperature in the Eastern Equatorial Pacific Ocean. Scientists from Duke University and Pt. Reyes Bird Observatory were aboard to conduct cooperative studies. RESEARCHER returned to Miami on December 15, 1986.

### SHIPBOARD ENVIRONMENTAL (DATA) ACQUISITION SYSTEM (SEAS)

Much of the marine meteorological data now used by the National Weather Service is provided through radio communication from personnel aboard cooperating vessels. The potential data return from the current network of cooperating vessels is large, but analysis of the data return has shown that only a small percentage of the observations arrive in time to be used in NOAA's atmospheric or oceanographic models and forecast products. To improve the availability of data for input into forecast analysis, NOAA has installed Shipboard Environmental (Data) Acquisition Systems (SEAS) aboard all fleet ships and has an ongoing installation program for Ships of Opportunity. SEAS is a system that receives, stores, and transmits meteorological and XBT data quickly using the GOES satellite data link. The data are telemetered through the satellite to the National Environmental Satellite Data and Information Service (NESDIS) via a ground station at Wallops Island, Virginia. The data are then sent to the National Meteorological Center for processing and use in NOAA's forecast models and for distribution to regional forecast offices.

### DISCOVERER SEA BEAM UPGRADE

The 1986 DISCOVERER upgrade includes the installation of SEA BEAM, a multibeam bathymetric survey system. The data gathered by SEA BEAM will be used for charting, oceanographic and

atmospheric research, ocean pollution monitoring, fisheries research, and stock assessment in the U.S. Exclusive Economic Zone (EEZ).

#### PUBLIC AWARENESS ACTIVITIES

MT. MITCHELL participated in public awareness activities in Washington, D.C., in October 1985. The ship was visited by 4,200 people during public open houses. In addition, congressional receptions, NOAA's 15th Anniversary celebration, and special tours for student visitors from the Army War College, Dunbar High School, and various other secondary schools were conducted.

The MT. MITCHELL hosted an open house for participants of the American Society of Photogrammetry and the American Congress of Surveying and Mapping Convention on March 18, 19, and 20. Tours were conducted aboard the 231-foot long Class II hydrographic survey vessel and its launches. Additional tours were given for members of NOAA's EEO Committee and the new Director of HHS' Indian Health Service. On March 21, MT. MITCHELL departed Washington, D.C. to return to its home port, AMC, Norfolk, VA.

The ship also hosted an open house during the Hydrographic Conference held March 25-27 in Norfolk, VA, at the Omni Hotel. The theme of the conference, sponsored by NOAA and the Hydrographic Society, was "HYDRO U.S.A. '86, Charting for the Future." Over 200 full-term and short-term registrants were in attendance together with 33 exhibitors from Government and industry. The Conference, which included keynote speaker R.Adm. Sir David Haslam, U.K. Hydrographer Retired, was a complete success.

#### NO PROJECT TOO LARGE OR TOO SMALL!

NOAA is continuing its effort to increase the utilization of the NOAA Fleet to the maximum extent possible. To this end, NOAA ships are available to other Federal and state agencies, academic institutions, and private industry for hydrographic and geophysical surveys, environmental monitoring, physical and chemical oceanographic research, and biological resource assessments. Projects may be accomplished as:

- \* Ancillary projects - accomplished by ship personnel on a noninterference basis with the primary mission.

- \* Piggyback projects - accomplished by additional scientific personnel on a noninterference basis with the primary mission.

- \* Cooperative projects - accomplished by vessel personnel and/or personnel from the cooperating organization on a partially or fully dedicated basis, and on a resource availability basis. Funding by the cooperating organization may be required.

For more information on opportunities for use of the NOAA Fleet, please contact the Marine Centers or Headquarters, Office of Marine Operations, as listed below:

NOAA, National Ocean Service  
Office of Marine Operations  
6001 Executive Boulevard  
Rockville, Maryland 20852  
Attn: Cdr. J. Albright  
(301) 443-8641

NOAA, National Ocean Service  
Atlantic Marine Center  
439 West York Street  
Norfolk, Virginia 23510  
Attn: Capt. R. Speer  
(804) 441-6206

NOAA, National Ocean Service  
Pacific Marine Center  
1801 Fairview Avenue, East  
Seattle, Washington 98102  
Attn: Lt. Cdr. G. Stanley  
(206) 442-4548





# United States Department of the Interior

MINERALS MANAGEMENT SERVICE  
WASHINGTON, DC 20240

MAY 20 1986

MINERAL MANAGEMENT SERVICE (MMS) ENVIRONMENTAL STUDIES ARE AWARDED IN THE FORM OF CONTRACTS, USUALLY BY COMPETITIVE PROCUREMENT, TO PRIVATE COMPANIES OR, IN A FEW CASES, AS INTERAGENCY AGREEMENTS TO OTHER FEDERAL AGENCIES. THE COORDINATION AND DIRECTION OF RESEARCH VESSELS FOR STUDIES IS NOT A FUNCTION OF MMS HEADQUARTERS. VESSELS ARE SELECTED BY EACH POTENTIAL VENDOR AT THE REGIONAL LEVEL AND APPROVED BY THE MMS HEADQUARTERS LEVEL. COORDINATED USE OF THE GIVEN VESSEL BY MULTIPLE VENDOR IS INITIATED AT THE REGIONAL LEVEL. COST SHARING FOR SHIPTIME WITH OTHER FEDERAL AGENCIES IS ONGOING.

IMPACT OF GRANN-RUDMANN-HOLLONGS LAW, AND OTHER CHANGES, REDUCED THE FISCAL YEAR (FY)86 FUNDING FOR THE ENVIRONMENTAL STUDIES PROGRAM TO \$25,192,000. THIS REPRESENTS A 7.0% DECREASE FROM THE ENACTED BUDGET FOR FY86. THE PROPOSED ENVIRONMENTAL STUDIES FUNDING FOR FY87 IS \$22,965,000. PROPOSED REGIONAL FUNDING DISTRIBUTIONS ARE: ALASKA, \$9.0 MILLION., ATLANTIC, \$2.3 MILLION., GULF OF MEXICO, \$3.4 MILLION., PACIFIC, \$5.8 MILLION., AND WASHINGTON (HDO), \$2.4 MILLION.

REGIONAL STUDIES REQUIRING RESEARCH VESSELS INCLUDE PHYSICAL OCEANOGRAPHY AND BIOLOGICAL PROJECTS. BIOLOGICAL PROJECTS THROUGHOUT THE REGIONS REPRESENT OVER 50% OF THIS TOTAL STUDY EFFORT. INFORMATION ON INDIVIDUAL STUDIES PROPOSED IS PROVIDED IN REGIONAL STUDIES PLANS PREPARED ANNUALLY BY EACH REGIONAL OFFICE.

QUESTIONS ON THE ENVIRONMENTAL STUDIES PROGRAM SHOULD BE DIRECTED TO DR. DON AURAND, CHIEF, BRANCH OF ENVIRONMENTAL STUDIES AT (202) 343-7744.



# UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

East Coast Ship Scheduling Group  
West Coast Ship Scheduling Group  
Report of Joint Meeting  
June 3, 1986  
Board Room and Conference Room B  
American Institute of Architects  
1735 New York Avenue NW  
Washington, DC

The East and West Regional Ship Scheduling Groups met separately (8:30 a.m.) and jointly (12:40 p.m.) at the American Institute of Architects, Washington, D.C. The separate meetings were chaired by Robertson P. Dinsmore (East) and Brian Lewis (West). They co-chaired the joint meeting, and arrived at recommendations to be made to UNOLS and to the Federal Funding agencies. *Chairmen reminded the Scheduling Groups of the notification by NSF and the UNOLS Advisory Council (ltr. of 10 February 1986, distributed at March meetings) that anticipated funding will not permit full operations in 1987; lay-ups of some ships are inevitable. Recommendations to allow orderly lay-up planning must be ready at the close of these June meetings.* All UNOLS Member Institutions, together with interested Associate Member Institutions, were represented at the separate and joint meetings. Agency recommendations from ONR, MMS and NSF (OCFS, OSRS, ODP, DPP) provided information on science project funding status and funding projections for 1987 ship and facility operations.



## WEST COAST MEETING

*1986 Schedules and Costs.* Schedules and cost information for 1986 were collected but not discussed. WECOMA continues in lay-up status for the entire year. OSPREY will continue in refit status through the end of 1986. (No new problems had arisen since the March 1986 meeting and report.) The 1986 schedule and cost information is summarized below in the table PROFILE OF FUNDING CYCLES, 1986 COST PROJECTIONS, and in the 1986 ESTIMATES (attached).

*1987 Ship Use Requests, Tentative Schedules and Cost Projections.* Summaries of 1987 Ship Use Requests were exchanged among all West Coast Institutions. NSF and ONR representatives provided information on the current status of science funding for projects corresponding to the Ship Use Requests held by the West Coast Institutions.

*Tentative 1987 Schedules were reviewed by individual institutions and ship:*

### *Scripps*

Several alternative schedules were advanced for the MELVILLE. Selection of the appropriate alternative would be made in concert with the selection of options for the MOANA WAVE schedules. (e.g., Riser/Rosby work on one ship, Betzer (project ADIOS) on the other.) MELVILLE'S schedule would be for not more than 90-170 days if Wedell Sea Work or South Atlantic ventilation work are not forthcoming.

The WASHINGTON schedule includes ONR projects, work for U.K. scientists under NSF's cooperative exchange arrangement and then contemplates regional investigation work for ODP. Science funding decisions for the later have not been made. Most of the 1987 season would be in the Western Pacific, and the season would end in the Southwest Pacific.

The NEW HORIZON advances a fairly solid schedule that includes substantial funding from ONR, other Federal agencies (DOE and NASA) CALCOFI and University of California.

The R. G. SPROUL advanced alternative schedules based in large part on science projects for which funding decisions had not yet been made. (Usual situation for schedule based mainly on short-duration regional projects.)

### *University of Hawaii*

Three schedule options were advanced for the MOANA WAVE, based almost entirely on funded science projects. The probable schedule would concentrate on the Eastern Pacific. The match between MOANA WAVE and MELVILLE is still being developed.

### *University of Alaska*

A schedule of about 215 days, mostly for funded science, was advanced for the ALPHA HELIX. If the ISHTAR project is funded for major 1987 ship time, most would go on the THOMPSON.

*University of Washington*

Of alternatives under consideration, the most likely THOMPSON schedule centers around ISHTAR work in the Bering and Chukchi Seas. THOMPSON schedules are largely predicated on science projects for which funding decisions have not yet been made (e.g., ISHTAR, SUPER, TROPIC HEAT, physical oceanography).

The BARNES would work in Puget Sound on projects for which funding decision have not yet been reached.

*Oregon State University*

The WECOMA schedule appears solid, based on funded NSF and ONR science projects.

*Moss Landing Marine Laboratories*

The POINT SUR schedule is based almost entirely on funded science project, roughly half from NSF and half from ONR, CNOC and others.

*University of Southern California*

A modest schedule was advanced for OSPREY based mainly on funded science projects. Some of the funded projects considered on OSPREY were also considered on other ship schedules.

Summaries of days scheduled and cost estimates are shown below in the table SUMMARY OF 1987 COST PROJECTIONS and in 1987 ESTIMATES (attached).

Information held by institutions together with that provided by agency representatives indicated that of the 2,545 days tentatively scheduled by the West Coast Group, about 65% represented funded science projects:

<i>NSF</i>	<i>1135 days</i>
<i>ONR</i>	<i>212 days</i>
<i>Other</i>	<i><u>270 days</u></i>
<i>TOTAL</i>	<i>1617 days</i>

Cost estimates for 1987 were modestly reduced from those made in March, 1987; but the NSF portion was still well above funds anticipated. The sense of the group was that West Coast ships might reasonably expect NSF funds at the same level as provided in 1986 plus about \$1.2M for ODP projects that would likely be conducted on West Coast Ships. In Summary:

	<i>NSF only</i>
West Coast Tentative Schedules (already funded)	1135
Funded in 1986	<u>1478</u>
Additional days anticipated	343
Anticipated through NSF/ODP	<u>120</u>
Additional Days That Can Be Expected	463



Since the tentative schedules submitted by West Coast Institutions included about 2030 days to be funded by NSF, the sense of the Group was that there was a likely problem of about 400 ship days and perhaps \$3-4M shortfall.

*The Chairman of the West Coast Ship Scheduling Group suggested and the West Coast Group concurred that three ships, MELVILLE, OSPREY and THOMPSON submitted schedules of such brevity or uncertainty that they must be scrutinized as potentials for lay-up. Further, the sense of the Group was that since science funding decisions had not yet been made for a substantial portion (400-500 days) of 1987 West Coast Ship time, more explicit recommendations on lay-ups should not yet be made.*

#### EAST COAST MEETING

*1986 Schedules and Costs.* Schedules and costs for 1986 were quickly reviewed. No outstanding or new problems were reported. The KNORR will enter lay-up status in September through the end of the year. The FRED MOORE will be laid up for most of the second half of the year. Schedule and Cost information is summarized below in PROFILE OF FUNDING CYCLES, 1986 COST PROJECTIONS, and in the 1986 COST ESTIMATES (attached).

*1987 Ship Use Requests, Tentative Schedules and Costs.* Reviews for 1987 occupied the major portion of the meetings. Chairmen reminded the Groups of the notification by NSF and the Advisory Council (Ltr. of 10 Feb. 1986, distributed at the March Meeting) that anticipated 1987 funding will not permit full operations in 1987; that lay-ups of some ships are inevitable; and that recommendations to allow orderly lay-up planning must be ready at the close of the June meeting.

Scheduling reviews proceeded in normal fashion with each representative presenting a summary of proposed 1987 operations and operating data.

Schedule reviews identified several duplications in ship assignments and a list of unscheduled projects was compiled. Most of these, if and when funded, will be able to be accommodated, but several requests, particularly those in the Indian Ocean will, by virtue of ship availability, be deferred.

Regarding these situations, John McMillan (NSF) reported that successful "informed exchanges" of ship time with other nations have been accomplished with France - CNEXO (1985) and U.K. - NERC (1986). This is proving to be a good way of accomplishing distant cruises for which no UNOLS vessel is available, without losing the ship time within UNOLS.

Several 1987 schedules were rearranged between vessels in order to eliminate transits and to provide the most appropriate ship. The extent of funded programs was of special concern. Using information currently available from NSF, about 10% of proposed schedules were noted as declines. For East Coast Ships, 59% of proposed schedule were reported to represent funded science projects. As a result, about 30% of proposed schedules depend on future funding decisions by sponsoring

agencies. The most noteworthy case is the R/V/ KNORR which showed a proposed 336 day schedule of which 214 days is committed to a Black Sea Expedition and associated projects. This is the first of the UNEP declared expeditions and has been two years in planning, but as yet has almost no funded commitments.

Schedule weaknesses were noted for the following East Coast ships:

KNORR (cited above)  
MOORE  
CAPE HENLOPEN  
LAURENTIAN

In the case of the MOORE, CAPE HENLOPEN and LAURENTIAN, these are chronic situations around which the operators have developed operating/lay-up contingencies to insure the continuation of the vessels. The viability of the KNORR schedule depends solely on funding decisions yet to be made for the Black Sea Program.

All intermediate ships (with exception of the MOORE) report relatively strong schedules. The meeting recommended that two Eq. South Atlantic Cruises (ENDEAVOR) be reassigned to CONRAD, and one W. Caribbean Cruise be reassigned to ISELIN. This will reduce unproductive transit time. It was noted that the work proposed for the four East Coast ships (ENDEAVOR, GYRE, ISELIN and OCEANUS) probably could be accomplished by three ships. This was the case on the East coast in 1985 when ISELIN was laid up; and West Coast in 1986 when WECOMA is laid up.

## JOINT MEETING

Profiles of statistics through 1986 (based on the attached 1986 ESTIMATES) are summarized below.

PROFILE OF FUNDING CYCLES						
\$Million						
	OP DAYS	NSF	ONR	OTHER	TOTAL	SHORT FALL
1984	4816	23.1	4.0	7.0	34.6	-
1985	4766	25.9	4.1	6.0	36.0	-

1986 COST PROJECTIONS						
	OP DAYS	NSF	ONR	OTHER	TOTAL	SHORT FALL
March 1985	5700	32.0	5.4	3.8	41.2	-
May 1985 (Anticipated)	5757	32.2 (26.0)	5.8 (4.2)	4.8 (3.8)	42.8 (34.6)	- (8.2)
October 1985 (Anticipated)	5310	31.2 (25.5)	4.8 (4.8)	5.8 (5.8)	41.8 (36.1)	- (5.7)
March 1986 (Anticipated)	4502	26.6 (25.0)	5.0 (5.0)	3.3 (3.3)	34.9 (33.3)	- (1.6)
June 1986 (Anticipated)	4370	26.4 (25.0)	4.3 (4.3)	3.3 (3.3)	33.8 (32.6)	- (1.2)

The estimate of 1986 operating days is now 4370, contrasted with the 4502 days reported in March, 1986. Fleet cost projections (\$33.8M) continue to converge with the estimate of funds available. The remaining shortfall is the subject of continuing negotiations between NSF/OCFS and individual UNOLS institutions.

Update schedules for individual ships appear on UNOLS Bulletin Board: SHIP.SCHED86.

1987 Schedules and Costs. Tentative schedules and costs are summarized in the following table.

SUMMARY OF 1987 COST PROJECTIONS  
\$Millions

	OP DAYS	COSTS			
		NSF	ONR	OTHER	TOTAL
JUNE, 1986 PROJECTIONS					
East	3211	18.532	2.469	1.473	22.473
West	2545	16.443	1.081	1.620	19.144
Total	5756	34.975	3.550	3.093	41.617
(Anticipated)		25.9*	3.6	3.1	32.6
Projected Shortfall		9.1	-	-	9.1
MARCH, 1986 PROJECTIONS					
East	3203	18.474	2.927	1.677	23.078
West	2589	17.461	1.270	1.427	20.159
Total	5792	35.935	4.197	3.104	43.237
(Anticipated)		26.2**	4.2	3.1	33.5
Projected Shortfall		9.7	-	-	9.7

\*Funds anticipated (June, 1986) from NSF are estimated on the basis of information provided by NSF officials: OCFS (worst case) \$24.7M, Ocean Drilling Program, \$1.2M.

\*\*Funds anticipated (March, 1986) from NSF included most optimistic OCFS projection: \$26.2M.

The total operating days projected for 1987 is 5,756 days. This is strikingly similar to the '86 projection made this time last year (5,757 days). This is about the full capacity of the fleet but is 32% more than is being carried out in 1986. Total costs of the proposed schedules are about 28% above overall anticipated funding, and project a \$9.1M shortfall.

A subject of concern - almost alarm - is the continuing reduction of seagoing work sponsored by Federal Agencies other than NSF. For 1987, ONR is at its lowest point in recent years. Furthermore, the "other" category bears serious concern. In 1984 and 1985 "other" Agency sponsorship was \$7.0 and \$6.3 respectively. In 1986 it appears to be \$3.6 and for 1987 it is projected to be \$3.1. In particular, USGS and



DOE are greatly diminished. In 1987 the Geological Survey will use no UNOLS ships at all, finding it more economical to use foreign charters. *The future role of "other" Federal agency sponsorship and its potential impact on the UNOLS fleet should be the subject of a study, probably by the Advisory Council.*

*Recommendations.* The Chairmen of the Joint Scheduling Group made the following recommendations:

1. R/V KNORR has a proposed 1987 schedule which depends almost totally on science funding decisions to be made relating to proposed Black Sea Projects. It is unfortunate that these decisions have not been made for an expedition which has been the initial focus of UNEP and several years in the planning. Nevertheless, unless science project funding assures a viable Black Sea and Mediterranean Cruise, KNORR should be considered for lay-up during all or most of 1987.
2. Based on scheduling and funding information available June 3, 1986, three West Coast ships, The MELVILLE, OSPREY and THOMPSON should be scrutinized as potential candidates for lay-up in 1987. More explicit recommendations should await science funding decisions still pending.
3. R/V's ENDEAVOR, GYRE, ISELIN and OCEANUS show proposed schedules which could reasonably be accomplished on three ships operating with one ship laid up for all or part of 1987. Of the 142 cruise days shown by the GYRE schedule, 94 are in the Gulf of Maine. This deployment could be reassigned to other ships, leaving the GYRE schedule sufficiently flexible for consideration of a full or partial lay-up in 1987.
4. The recent and drastic cutbacks by "other" Federal Sponsoring Agencies, particularly by USGS and DOE gives cause for alarm. It is recommended that the work of the UNOLS Advisory Council include a study of the future roles of those Agencies and the potential impact on the UNOLS Fleet.

Captain Thurman K. Treadwell, UNOLS representative from Texas A & M University, took exception to Recommendation #3 above, stating that it did not represent the views or vote of the East Coast Meeting, nor was it discussed. He specifically objected to singling out the GYRE from among the four ships as a candidate for lay-up. The Chairman of the East Coast Scheduling Group agreed that recommendations did not arise from a vote of the Group but were recommendations of the Chairman taking into account information presented at the meetings.

Date 03 June 1986

## 1986 ESTIMATES

	1985 OP DAYS	1985 COSTS	1986				TOTAL \$K
			OPS DAYS	NSF \$K	ONR \$K	OTHER \$K	
MELVILLE	271	2,988	245	2,447	104	DOE 254 UC 23	2,828
WASHINGTON	241	2,608	199	2,413	0	UC 50	2,462
NEW HORIZON	195	1,479	239	1,062	158	DOE 158 UC 337	1,716
ROBT. G. SPROUL	128	562	126	477	35	DOE 31 UC 9	551
VELERO IV/OSPREY	85	383	0	150	0	0	150
CAYUSE/POINT SUR 1985 1986	111	450	151	253	78	CNOC 397 OTH 52	780
WECOMA	213	1,666	0	Caretaker Costs?			
THOMPSON	272	2,594	246	2,192	328	0	2,520
BARNES	153	206	145	201	0	20	221
ALPHA HELIX	149	1,528	190	188 DA 1,484	0	2 DA 13	1,292*
MOANA WAVE	301	2,248	274	1,476	246	321	2,043
TOTAL	2,119	16,712	1,815	12,155	949	1,665	14,563

\*Approx. 200k carry forward

Date 03 June 1986

## 1986 ESTIMATES

	1985 OP DAYS	1985 COSTS	1986				TOTAL \$K
			OPS DAYS	NSF \$K	ONR \$K	OTHER \$K	
ATLANTIS II	287	3,226	218	1,798	548	NOAA 370 KAPL 434	3,150
KNORR	185	2,423	159	962	1,105	-	2,067
CONRAD	359	3,372	294	2,758	593	-	3,351
OCEANUS	223	1,515	237	1,019	581	-	1,600
ENDEAVOR	240	1,679	235	1,449	220	NUSC 35	1,705
GYRE	259	1,850	286	1,762	20	STATE 78	1,860
ISELIN	LAID UP 4	616	190	1,507	129	-	1,636
CAPE HENLOPEN	161	764	163	582	83	UNIV 53 INDUST 78	796
CAPE HATTERAS	233	1,396	236	1,142	0	MMS 161 STATE 58	1,361
CAPE FLORIDA	218	944	33	214	0	0	*(RSMS Part) 214
WARFIELD	132	506	125	571	-	-	571
BLUE FIN	130	203	136	80	0	DOE 95	175
LAURENTIAN	24	163	70	177	-	17	194
CALANUS	148	222	155	237	43	0	280
MOORE	44	387	18	0	0	STATE 276	276
TOTAL	2,647	19,320	2,555	14,258	3,322	1,655	19,236
WEST COAST	2,119	16,712	1,815	12,155	949	1,665	14,563
FLEET TOTAL	4,766	36,032	4,370	26,413	4,271	3,320	33,799

DATE 03 June 1986

## 1987 ESTIMATES

	PROJECTED 1987 COSTS							
	1986 COSTS NSF	1986 COSTS	1986 OP DAYS	1987 OP DAYS	NSF	ONR	OTHER	TOTAL
MELVILLE	2,447	2,828	245	176	2,024	0	0	2,024
WASHINGTON	2,413	2,462	199	321	3,200	386	UC 52	3,643
NEW HORIZON	1,062	1,716	239	270	1,176	127	DOE 187 UC 301 NASA 13	1,804
ROBERT G. SPROUL	477	551	126	203	598	84	DOE 28 UC 4	714
OSPREY	150	150	0	148	1,262	0	0	1,262
POINT SUR	253	780	151	221	578	53	CNOC 428 OTH 123	1,182
WECOMA	-	-	-	276	1,398	396	0	1,794
THOMPSON	2,192	2,520	246	240	2,655	0	0	2,655
BARNES	201	221	145	160	212	0	23	238
ALPHA HELIX	188 DA 1,484	1,292*	190	213	211 DA 1,398	-	13	1,411
MOANA WAVE	1,476	2,043	274	317	1,942	35	448	2,425
TOTAL	12,155	14,563	1,815	2,545	16,443	1,081	1,620	19,144

\*Approx. 200K carry forward



DATE 03 June 1986

## 1987 COST PROJECTIONS

	PROJECTED 1987 COSTS							
	1986 COSTS NSF	1986 COSTS	1986 OP DAYS	1987 OP DAYS	NSF	ONR	OTHER	TOTAL
ATLANTIS II	1,798	3,150	218	331	3,445	55	-	3,500
KNORR	962	2,067	159	336	3,310	210	-	3,520
CONRAD	2,758	3,351	294	335	2,459	1,061	-	3,520
OCEANUS	1,019	1,600	237	219	1,170	393	-	1,563
ENDEAVOR	1,449	1,705	235	273	1,443	413	DOE 72 NUSC 51	1,979
GYRE	1,762	1,860	286	270	1,770	-	STATE 150	1,920
ISELIN CAPE FLORIDA	1,507 214	1,636 214	190 33	183 CAPE FLORIDA	1,246 CAPE FLORIDA	305 TO W. COAST	DOE 90 STATE 60 DOE 126 NIH 48	1,641 SPRING 86
CAPE HENLOPEN	582	796	163	132	524	-	INDUST 189	713
CAPE HATTERAS	1,142	1,361	236	250	1,144	-	MMS 120 STATE 60 DOE 126 NIH 48	1,497
WARFIELD	571	571	125	156	593	-	-	593
BLUE FIN	80	175	136	190	100	-	DOE 90	190
LAURENTIAN	177	194	70	149	288	-	NOAA 85	373
CALANUS	237	280	155	256	384	32	-	416
MOORE	0	276	18	131	656	-	INDUS 272 STATE 120	1,048
TOTAL	14,258	19,236	2,555	3,211	18,532	2,469	1,473	22,473
WEST COAST	12,155	14,563	1,815	2,545	16,443	1,081	1,620	19,144
FLEET TOTAL	26,413	33,799	4,370	5,756	34,975	3,550	3,093	41,617



# UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

June 1986

## UNOLS NOMINATING COMMITTEE

The Nominating Committee has assembled the following slate of candidates for UNOLS and Advisory Council positions to be filled at the June 1986 Semiannual Meeting.

### THE SLATE

*For Chairman, UNOLS*

George H. Keller	Oregon State University
Brian T. R. Lewis	University of Washington

*For Vice Chairman, UNOLS*

Robert W. Corell (incumbent)	University of New Hampshire
Jay Langfelder	Harbor Branch Foundation

*For Advisory Council - Member Representation*

Vera Alexander	University of Alaska
Robertson P. Dinsmore	Woods Hole Oceanographic Institution
Paul J. Fox	University of Rhode Island
Robert A. Knox	Scripps Institution of Oceanography University of California, San Diego

*For Advisory Council - Associate Member Representation*

Robert S. Carney	Louisiana State University
Ken C. MacDonald	University of California, Santa Barbara



VITAE

Name, Discipline  
Position, Title  
Research Interest

George H. Keller, Geological Oceanography  
Vice President for Research and Graduate Studies  
Professor of Oceanography  
Oregon State University  
Sedimentology, Geomorphology, Currents and Circulation, Civil Engineering

Brian T. R. Lewis, Geological Oceanography  
Director, School of Oceanography, Professor of Oceanography  
University of Washington  
Seismology, Geophysics

Robert W. Corell, Ocean Engineering  
Director, Marine Program, Professor  
University of New Hampshire  
Ocean Engineering, Instrumentation Engineering

Leonard Jay Langfelder, Civil Engineering  
Vice President and Managing Director  
Harbor Branch Foundation, Inc.  
Coastal Zone Processes, Coastal Engineering, Sediment Mechanics

Vera Alexander, Biological Oceanography  
Director, Institute of Marine Science  
University of Alaska  
Phytoplankton, Micro Ecology

Robertson P. Dinsmore, Oceanography  
Consultant for Marine Operations  
Woods Hole Oceanographic Institution  
Marine Operations, Ocean Policy, Program Administration

Paul J. Fox, Marine Geology  
Research Professor, Graduate School of Oceanography  
University of Rhode Island  
Marine Geology and Geophysics; Crustal and Plate Dynamics

Robert A. Knox, Physical Oceanography  
Associate Research Oceanographer and Academic Administrator  
Scripps Institution of Oceanography, University of California, San Diego  
Equatorial Ocean Circulation and Acoustic Remote Sensing

Robert S. Carney, Biological Oceanography  
Director, Coastal Ecology Institute  
Louisiana State University  
Benthic and Deep Sea Ecology, Animal Sediment Interactions, Faunal Zonation

Ken C. MacDonald, Marine Geophysics  
Professor, Department of Geological Sciences  
University of California, Santa Barbara  
Geophysical Processes of Mid-Ocean Ridges, Plate Boundaries